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**Information technology — Media  
context and control —**

**Part 4:  
Virtual world object characteristics**

*Technologies de l'information — Contrôle et contexte de supports —  
Partie 4: Caractéristiques d'objet du monde virtuel*

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## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology, Subcommittee SC 29, Coding of audio, picture, multimedia and hypermedia information*.

This fourth edition cancels and replaces the third edition (ISO/IEC 23005-4:2016), which has been technically revised.

The main changes compared to the previous edition are the addition of:

- new element “SensoryEffectList” to VWOBaseType.

A list of all parts in the ISO/IEC 23005 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

The ISO/IEC 23005 series provides an architecture and specifies information representation of data flowing in and out of the real world and virtual worlds.

The data for the real world are communicated through sensors and actuators. The data for virtual worlds consist of properties of virtual objects and multi-sensorial data embedded in audio-visual content. MPEG-V specifies data formats for sensors, actuators, virtual objects, and audio-visual content.

Data captured from the real world may need to be adapted for use in a virtual world and data from virtual worlds may also need to be adapted for use in the real world. The ISO/IEC 23005 series does not specify how the adaptation is carried out but only specifies the interfaces.

Data for sensors are sensor capabilities, sensed data, and sensor adaptation preferences.

Data for actuators are sensory device capabilities, sensory device commands, and sensory effect preferences.

Data for virtual objects are characteristics of avatars and virtual world objects.

Sensory effect may be needed to enrich audio-visual contents.

The system architecture of the ISO/IEC 23005 series is depicted in Figure 1 and the scope of this document is highlighted in yellow. The information representation that acts as an input to the possible  $R \rightarrow V/V \rightarrow R$  Adaptation and as an exchangeable information format to support interoperability between the virtual worlds – as defined in ISO/IEC 23005-1 – is specified in this document.

NOTE The actual  $R \rightarrow V/V \rightarrow R$  Adaptation is deliberately informative and left open for industry competition.

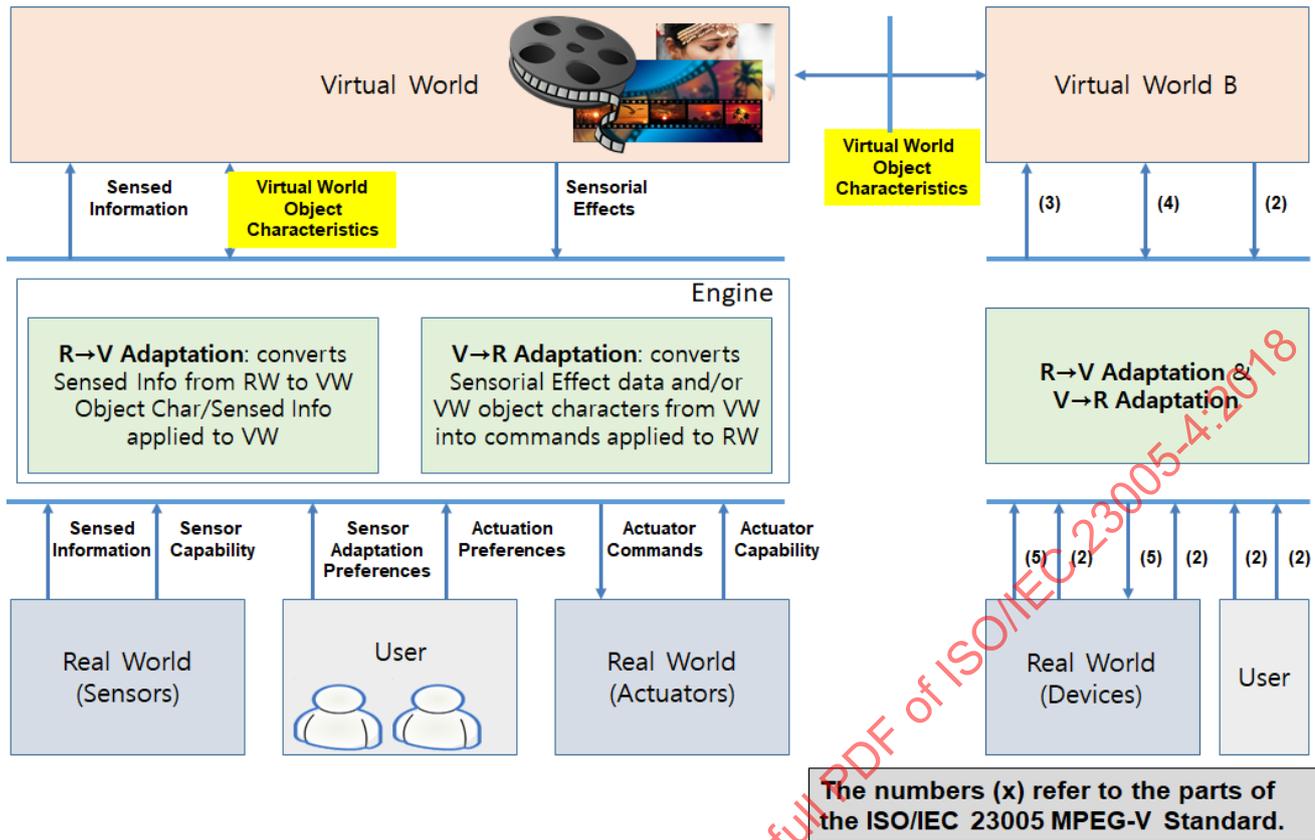


Figure 1 — Scope of the ISO/IEC 23005 series (showing this document in yellow)

This document contains the tools for describing the virtual world object characteristics making it possible to migrate a virtual world object (or only its characteristics) from one virtual world to another and to control a virtual world object in a virtual world by real world devices (Annex C). It addresses the normative aspects of the virtual world object characteristics including avatars and virtual objects, and also illustrates some non-normative examples.

The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this document may involve the use of patents.

ISO and the IEC take no position concerning the evidence, validity and scope of these patent rights. The holders of these patent rights have assured ISO and the IEC that they are willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the holders of these patents right are registered with ISO and the IEC. Information may be obtained from the companies listed below.

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# Information technology — Media context and control —

## Part 4: Virtual world object characteristics

### 1 Scope

The technologies of this document specified are description languages and vocabularies to describe virtual world objects.

The adaptation engine is not within the scope of this document.

This document specifies syntax and semantics of the tools used to characterize a virtual world object related metadata:

- Virtual World Object Characteristics (VWOC) as an XML Schema-based language which enables one to describe a basic structure of avatars and virtual world objects in virtual environments.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 639 (all parts), *Codes for the representation of names of languages*

ISO/IEC 15938-5:2003, *Information technology — Multimedia content description interface — Part 5: Multimedia description schemes*

ISO/IEC 21000-5, *Information technology — Multimedia framework (MPEG-21) — Part 5: Rights Expression Language*

ISO/IEC 23005-6:—,<sup>1</sup> *Information technology — Media context and control — Part 6: Common types and tools*

### 3 Terms, definitions, abbreviated terms, schema documents and prefixes

#### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 23005-6 and the following apply.

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<sup>1</sup> Under preparation. Stage at time of publication: ISO/IEC FDIS 23005-6:2018.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

### 3.1.1

#### **avatar**

entity that can be used as a (visual) representation of the user inside the virtual environments

EXAMPLE A player's representation in the video game and human or fantastic representations of a person's self in non-gaming online worlds.

### 3.1.2

#### **avatar metadata**

definition of the description schemes and descriptors to represent *avatars* (3.1.1)

### 3.1.3

#### **extensible markup language**

##### **XML**

set of rules for encoding documents in machine-readable form

### 3.1.4

#### **rights expression language**

##### **REL**

machine-readable language that declares rights and permissions

### 3.1.5

#### **uniform resource identifier**

##### **URI**

compact string of characters for identifying an abstract or physical resource

### 3.1.6

#### **uniform resource locator**

##### **URL**

compact string representation for a resource available via the Internet

### 3.1.7

#### **virtual object**

entity that is any (visual) object except for avatars in the virtual environment

### 3.1.8

#### **virtual object metadata**

definition of the description schemes and descriptors to represent *virtual objects* (3.1.7)

### 3.1.9

#### **virtual world object**

entity that includes avatars and virtual objects in the virtual world

### 3.1.10

#### **virtual world object metadata**

definition of the description schemes and descriptors to represent *virtual world objects* (3.1.9)

### 3.2 Schema documents

In the main text of this document, the syntax of description schemes and descriptors is provided whenever possible as a single schema document.

In order to form a valid schema document, these schema components should be gathered in a same document with the schema wrapper provided at the head of the clause. For better readability, the relevant schema documents are provided in Annex B.

In all cases, each schema document has a `version` attribute, the value of which is "ISO/IEC 23005-4". Furthermore, an informative identifier is given as the value of the `id` attribute of the `schema` component. This identifier is non-normative and used as a convention in this document to reference another schema document. In particular, it is used for the `schemaLocation` attribute of the `include` and `import` schema components.

In addition, Annex A specifies a set of classification schemes that may be used by applications using description tools specified in this document.

### 3.3 Use of prefixes

For clarity, throughout this document, consistent namespace prefixes are used.

"`xsi:`" prefix is not normative. It is a naming convention in this document to refer to an element of the `http://www.w3.org/2001/XMLSchema-instance` namespace.

"`xml:`" and "`xmlns:`" are normative prefixes defined in [1]. The prefix "`xml:`" is by definition bound to "`http://www.w3.org/XML/1998/namespace`". The prefix "`xmlns:`" is used only for namespace bindings and is not itself bound to any namespace name.

All other prefixes used in either the text or examples of this document are not normative, e.g., "`sedl:`", "`sev:`", "`dia:`", "`si:`", "`mpeg7:`".

In particular, most of the informative examples in this document are provided as XML fragments without the normally required XML document declaration and, thus, miss a correct namespace binding context declaration. In these descriptions fragments the different prefixes are bound to the namespaces as given in Table 1.

**Table 1 — Mapping of prefixes to namespaces in examples and text**

| Prefix | Corresponding namespace                   |
|--------|---|
| ct     | urn:mpeg:mpeg-v:2018:01-CT-NS             |
| sedl   | urn:mpeg:mpeg-v:2018:01-SEDL-NS           |
| sev    | urn:mpeg:mpeg-v:2018:01-SEV-NS            |
| dia    | urn:mpeg:mpeg21:2003:01-DIA-NS            |
| si     | urn:mpeg:mpeg21:2003:01-DIA-XSI-NS        |
| mpeg7  | urn:mpeg:mpeg7:schema:2004                |
| xsi    | http://www.w3.org/2001/XMLSchema-instance |
| xsd    | http://www.w3.org/2001/XMLSchema          |

## 4 Virtual world object metadata

### 4.1 General

A specificity of virtual environments (VEs) with respect to other multimedia applications consists in the representation of virtual world objects inside the environment. The "virtual world object" can be classified into two types: avatars and virtual objects. An avatar can be used as a (visual) representation of the user inside the environment. These virtual world objects serve different purposes:

- characterize various kinds of objects within the VE;
- provide an interaction with the VE.

In general, creating an object is a time consuming task. Even though some components of the object may be related to the VE (e.g. the avatar wearing a medieval suit in a contemporary style VE may be inappropriate), there is a real need of being able to create the object once and import/use it in different VEs. To serve the latter purpose, it should be possible to control the object from external applications (e.g. the emotions one avatar exposes in the VE can be obtained by processing the associated user's physiological sensors). This document proposes an XML schema, called virtual world object characteristics XSD, for describing an object by considering three main requirements:

- it should be possible to easily create importers/exporters from various VEs implementations;
- it should be easy to control an object within an VE;
- it should be possible to modify a proprietary template (specific to the virtual world) of the object by using data contained in the virtual world object characteristics file.

In detail, once the object is created (possibly by an authoring tool specific to a virtual world), it can be used in any other virtual worlds (VW). In case of avatars, a user can have one's own unique presentation inside all VWs, like in real life. He can change and upgrade his avatar, i.e. "virtual himself" in one VW and then all the updated properties will be reflected in all the other VWs. The avatar itself contains representation and animation features but also higher level semantic information. However, each VW may have its own internal structure for handling avatars. The ISO/IEC 23005 series does not impose any specific constraints on the internal structure of representing data by the VW, but proposes a descriptive format able to drive the transformation of a template or a creation from scratch of an avatar compliant with the VW. All the associated characteristics of the avatar (including the associated motion) can be exported from a VW and then imported to another VW. Similarly, any virtual object created by a user can also be exchangeable between VWs by exporting and importing the associated characteristics of the object. In case of interfacing between virtual worlds and the real world, the sensed real world information will be processed to obtain the meaningful data which can be used as control parameters on the associated characteristics of the object in the VW. As for avatar, the captured gesture of a user can be used to control the gesture of the avatar in the VW by updating the associated characteristics of the avatar. Similarly, the avatar motions created in the virtual world can be mapped onto a real robot for use in dangerous areas, for maintenance tasks, to support disabled and/or elderly people, and so on.

The proposed schema deals only with metadata and does not include representation of the geometry, sound, scent, animation or texture. To represent the latter, references to media resources are used. To provide a full interoperable solution, it may be combined with ISO/IEC 14496-16, which includes a framework for defining and animating avatars, and/or ISO/IEC 14496-11, which includes a framework for defining graphical assets.

There is a base type of attributes and characteristics of the virtual world objects which is shared by both avatars and virtual objects.

The base type of the virtual world object characteristics is composed of following type of data.

- **Identity:** contains identification descriptors.
- **Sound:** contains sound resources and the related properties.
- **Scent:** contains scent resources and the related properties.
- **Control:** contains a set of descriptors for controlling motion features of an object such as translation, orientation and scaling.
- **Event:** contains a set of descriptors providing input events from a mouse, keyboard and etc.
- **Behaviour model:** contains a set of descriptors defining the behaviour information of the object according to input events.
- **id:** contains a unique identifier for identifying individual virtual world object information.

The virtual world object base type is inherited to both avatar metadata and virtual object metadata to extend the specific aspects of each of metadata.

#### 4.2 Schema wrapper conventions

The syntax defined in this Clause assumes the following schema wrapper to form a valid XML schema document.

```
<schema xmlns="http://www.w3.org/2001/XMLSchema"
xmlns:mpeg7="urn:mpeg:mpeg7:schema:2004" xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-
NS" xmlns:mpegvct="urn:mpeg:mpeg-v:2018:01-CT-NS" xmlns:vwoc="urn:mpeg:mpeg-
v:2018:01-VWOC-NS" targetNamespace="urn:mpeg:mpeg-v:2018:01-VWOC-NS"
elementFormDefault="qualified" attributeFormDefault="unqualified"
version="ISO/IEC 23005-4" id="MPEG-V-VWOC.xsd">
  <!-- ##### -->
  <!-- Import of reference schema -->
  <!-- ##### -->
  <import namespace="urn:mpeg:mpeg7:schema:2004"
schemaLocation="http://standards.iso.org/ittf/PubliclyAvailableStandards/MPEG-
7_schema_files/mpeg7-v2.xsd"/>
  <import namespace="urn:mpeg:mpeg21:2003:01-REL-R-NS"
schemaLocation="http://standards.iso.org/ittf/PubliclyAvailableStandards/MPEG-
21_schema_files/rel-r/rel-r.xsd"/>
  <import namespace="urn:mpeg:mpeg-v:2018:01-CT-NS"
schemaLocation="http://standards.iso.org/ittf/PubliclyAvailableStandards/MPEG-
V_schema_files/MPEG-V-CT.xsd"/>
```

Additionally, the following line should be appended to the resulting schema document in order to obtain a well-formed XML document.

```
</schema>
```

**4.3 Root element and top-level tools**

**4.3.1 General**

This subclause specifies the root element and the top-level tools which can follow root element in virtual world object characteristics information. The root element is the only element which can appear as the topmost element when the world object characteristics information specified in this document is instantiated. The top-level tools are defined as the elements which are allowed to appear as the topmost element within the root element.

**4.3.2 XML representation syntax**

```

<!-- ##### -->
<!-- Declaration of Root Element -->
<!-- ##### -->
<element name="VWOCInfo" type="vwoc:VWOCInfoType"/>

<complexType name="VWOCInfoType">
  <sequence>
    <element name="AvatarList" type="vwoc:AvatarListType" minOccurs="0"/>
    <element name="VirtualObjectList" type="vwoc:VirtualObjectListType"
minOccurs="0"/>
  </sequence>
</complexType>

<complexType name="AvatarListType">
  <sequence>
    <element name="Avatar" type="vwoc:AvatarBaseType" maxOccurs="unbounded"/>
  </sequence>
</complexType>

<complexType name="VirtualObjectListType">
  <sequence>
    <element name="VirtualObject" type="vwoc:VirtualObjectBaseType"
maxOccurs="unbounded"/>
  </sequence>
</complexType>
    
```

**4.3.3 Binary representation syntax**

|                       | Number of bits | Mnemonic       |
|-----------------------|----------------|----------------|
| VWOCInfo              |                | VWOCInfoType   |
| VWOCInfoType{         |                |                |
| AvatarListFlag        | 1              | bslbf          |
| VritualObjectListFlag | 1              | bslbf          |
| if(AvatarListFlag){   |                |                |
| AvatarList            |                | AvatarListType |
| }                     |                |                |

|  | Number of bits | Mnemonic              |
|--|----------------|-----------------------|
| if(VirtualObjectListFlag){               |                |                       |
| VirtualObjectList                        |                | VirtualObjectListType |
| }  |                |                       |
| AvatarListType{                          |                |                       |
| NumAvatarType                            |                | vluimsbf5             |
| for(k=0;k< NumAvatarType;k++){           |                |                       |
| IndividualAvatarType                     | 8              | bslbf                 |
| Avatar                                   |                | AvatarBaseType        |
| }  |                |                       |
| }  |                |                       |
| VirtualObjectListType{                   |                |                       |
| NumVirtualObjectType                     |                | vluimsbf5             |
| for(k=0;k<<br>NumVirtualObjectType;k++){ |                |                       |
| IndividualVirtualObjectType              | 16             | bslbf                 |
| VirtualObject                            |                | VirtualObjectBaseType |
| }  |                |                       |
| }  |                |                       |

#### 4.3.4 Semantics

| Name           | Description   |
|----------------|---|
| VWOCInfo       | The root element that serves as the topmost element in the virtual world object characteristics description.  |
| VWOCInfoType   | The root type provides basic structure that the virtual world object characteristics information description should follow through the root element.  |
| AvatarListFlag | This field, which is only present in the binary representation, signals the presence of the AvatarList element. "1" means that the element shall be used. "0" means that the element shall not be used. |

| Name                           | Description   |                                |   |                   |          |                  |                 |          |                   |
|--------------------------------|---|--------------------------------|---|-------------------|----------|------------------|-----------------|----------|-------------------|
| VirtualObjectListFlag          | This field, which is only present in the binary representation, signals the presence of the VirtualObjectList element. "1" means that the element shall be used. "0" means that the element shall not be used.  |                                |   |                   |          |                  |                 |          |                   |
| AvatarList                     | Optional wrapper element that serves as the placeholder for the list of avatar characteristics information.   |                                |   |                   |          |                  |                 |          |                   |
| VirtualObjectList              | Optional wrapper element that serves as the placeholder for the list of virtual object characteristics information.   |                                |   |                   |          |                  |                 |          |                   |
| AvatarListType                 | Wrapper element type which allows multiple occurrences of avatar characteristics information.   |                                |   |                   |          |                  |                 |          |                   |
| NumAvatarType                  | This field, which is only present in the binary representation, specifies the number of Avatar information contained in the AvatarListType.   |                                |   |                   |          |                  |                 |          |                   |
| Avatar                         | Specifies the description of avatar characteristics information.  |                                |   |                   |          |                  |                 |          |                   |
| AvatarBaseType                 | AvatarBaseType is a type providing a characteristic description of an individual avatar.  |                                |   |                   |          |                  |                 |          |                   |
| IndividualAvatarType           | <p>This field, which is only presented in the binary representation, specifies the types of each avatar.</p> <table border="1"> <thead> <tr> <th>Individual Avatar Type</th> <th>Binary representation for avatar type (8 bits)</th> </tr> </thead> <tbody> <tr> <td>AvatarType</td> <td>00000000</td> </tr> <tr> <td>MakeupAvatarType</td> <td>00000001</td> </tr> <tr> <td>Reserved</td> <td>00000010-11111111</td> </tr> </tbody> </table> | Individual Avatar Type         | Binary representation for avatar type (8 bits)          | AvatarType        | 00000000 | MakeupAvatarType | 00000001        | Reserved | 00000010-11111111 |
| Individual Avatar Type         | Binary representation for avatar type (8 bits)  |                                |   |                   |          |                  |                 |          |                   |
| AvatarType                     | 00000000  |                                |   |                   |          |                  |                 |          |                   |
| MakeupAvatarType               | 00000001  |                                |   |                   |          |                  |                 |          |                   |
| Reserved                       | 00000010-11111111   |                                |   |                   |          |                  |                 |          |                   |
| VirtualObjectListType          | Wrapper element type which allows multiple occurrences of virtual object characteristics information.   |                                |   |                   |          |                  |                 |          |                   |
| NumVirtualObjectType           | This field, which is only present in the binary representation, specifies the number of virtual object information contained in the virtual object list type.   |                                |   |                   |          |                  |                 |          |                   |
| VirtualObject                  | Specifies the description of virtual object characteristics information.  |                                |   |                   |          |                  |                 |          |                   |
| VirtualObjectBaseType          | VirtualObjectBaseType is a type providing a characteristic description of an individual virtual object.   |                                |   |                   |          |                  |                 |          |                   |
| IndividualVirtualObjectType    | <p>This field, which is only presented in the binary representation, specifies the types of each virtual object.</p> <table border="1"> <thead> <tr> <th>Individual Virtual Object Type</th> <th>Binary representation for virtual object type (16 bits)</th> </tr> </thead> <tbody> <tr> <td>VirtualObjectType</td> <td>0000hex</td> </tr> <tr> <td>Reserved</td> <td>0001hex-FFFFhex</td> </tr> </tbody> </table>   | Individual Virtual Object Type | Binary representation for virtual object type (16 bits) | VirtualObjectType | 0000hex  | Reserved         | 0001hex-FFFFhex |          |                   |
| Individual Virtual Object Type | Binary representation for virtual object type (16 bits)   |                                |   |                   |          |                  |                 |          |                   |
| VirtualObjectType              | 0000hex   |                                |   |                   |          |                  |                 |          |                   |
| Reserved                       | 0001hex-FFFFhex   |                                |   |                   |          |                  |                 |          |                   |

4.3.5 Examples

The following shows two use cases of VWOCInfo element, which are for listing avatar characteristics information and for listing virtual object characteristics information.

The first example shows the case when the VWOCInfo is used for AvatarList.

```
<vwoc:VWOCInfo xsi:schemaLocation="urn:mpeg:mpeg-v:2018:01-VWOC-NS
VWOCSchema.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mpegvct="urn:mpeg:mpeg-v:2012:01-CT-NS" xmlns:vwoc="urn:mpeg:mpeg-
v:2018:01-VWOC-NS" xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
xmlns:mpeg7="urn:mpeg:mpeg7:schema:2004">
  <vwoc:AvatarList>
    <vwoc:Avatar xsi:type="vwoc:AvatarType" id="ID_1" gender="male">
      .
      .
      .
    </vwoc:Avatar>
  </vwoc:AvatarList>
</vwoc:VWOCInfo>
```

The second example shows the case when the VWOCInfo is used for VirtualObjectList.

```
<vwoc:VWOCInfo xsi:schemaLocation="urn:mpeg:mpeg-v:2018:01-VWOC-NS
VWOCSchema.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mpegvct="urn:mpeg:mpeg-v:2012:01-CT-NS" xmlns:vwoc="urn:mpeg:mpeg-
v:2018:01-VWOC-NS" xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
xmlns:mpeg7="urn:mpeg:mpeg7:schema:2004">
  <vwoc:VirtualObjectList>
    <vwoc:VirtualObject xsi:type="vwoc:VirtualObjectType" id="ID_80">
      .
      .
      .
    </vwoc:VirtualObject>
  </vwoc:VirtualObjectList>
</vwoc:VWOCInfo>
```

Note that these examples are only showing a part of the complete XML description to show the use of the root element, VWOCInfo, with the AvatarList and the VirtualObjectList.

## 4.4 Virtual world object base type

### 4.4.1 General

This subclause defines a complex type of VWOCBaseType, which the avatar characteristics information and virtual object characteristics information should inherit.

4.4.2 XML representation syntax

|                |  |
|----------------|--|
| <p>Diagram</p> |  |
| <p>Source</p>  | <pre> &lt;complexType name="VWOBaseType" abstract="true"&gt;   &lt;complexContent&gt;     &lt;restriction base="anyType"&gt;       &lt;sequence&gt;         &lt;element name="Identification" type="vwoc:IdentificationType" minOccurs="0"/&gt;         &lt;element name="Description" type="string" minOccurs="0"/&gt;         &lt;element name="VWOC" minOccurs="0"&gt;           &lt;complexType&gt;             &lt;sequence&gt;               &lt;element name="SoundList" type="vwoc:VWOSoundListType" minOccurs="0"/&gt;               &lt;element name="ScentList" type="vwoc:VWOScentListType" minOccurs="0"/&gt;               &lt;element name="ControlList" type="vwoc:VWOControlListType" minOccurs="0"/&gt;               &lt;element name="EventList" type="vwoc:VWOEventListType" minOccurs="0"/&gt;               &lt;element name="SensoryEffectList" type="vwoc:VWOSensoryEffectType" minOccurs="0"/&gt;             &lt;/sequence&gt;           &lt;/complexType&gt;         &lt;/element&gt;         &lt;element name="BehaviorModelList" type="vwoc:VWOBehaviorModelListType" minOccurs="0"/&gt;       &lt;/sequence&gt;       &lt;attribute name="id" type="ID" use="optional"/&gt;     &lt;/restriction&gt;   &lt;/complexContent&gt; &lt;/complexType&gt;  &lt;complexType name="AvatarBaseType" abstract="true"&gt;   &lt;complexContent&gt;     &lt;extension base="vwoc:VWOBaseType"/&gt;   &lt;/complexContent&gt; &lt;/complexType&gt;  &lt;complexType name="VirtualObjectBaseType" abstract="true"&gt;   &lt;complexContent&gt;     &lt;extension base="vwoc:VWOBaseType"/&gt;   &lt;/complexContent&gt; &lt;/complexType&gt; </pre> |

## 4.4.3 Binary representation syntax

| VWOBaseType{             | Number of bits                      | Mnemonic           |
|--------------------------|-------------------------------------|--------------------|
| IdentificationFlag       | 1                                   | Bslbf              |
| DescriptionFlag          | 1                                   | Bslbf              |
| VWOCFlag                 | 1                                   | Bslbf              |
| BehaviorModelListFlag    | 1                                   | bslbf              |
| IdFlag                   | 1                                   | bslbf              |
|                          |                                     |                    |
| if(IdentificationFlag) { |                                     |                    |
| Identification           |                                     | IdentificationType |
| }                        |                                     |                    |
| if(DescriptionFlag) {    |                                     |                    |
| Description              | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8              |
| }                        |                                     |                    |
| if(VWOCFlag) {           |                                     |                    |
| SoundListFlag            | 1                                   | bslbf              |
| ScentListFlag            | 1                                   | bslbf              |
| ControlListFlag          | 1                                   | bslbf              |
| EventListFlag            | 1                                   | bslbf              |
| SensoryEffectListFlag    | 1                                   | bslbf              |
| if(SoundListFlag) {      |                                     |                    |
| SoundList                |                                     | VWOSoundListType   |
| }                        |                                     |                    |
| if(ScentListFlag) {      |                                     |                    |
| ScentList                |                                     | VWOScentListType   |
| }                        |                                     |                    |

| VWOBaseType{                | Number of bits                      | Mnemonic                 |
|-----------------------------|-------------------------------------|--------------------------|
| if(ControlListFlag) {       |                                     |                          |
| ControlList                 |                                     | VWOControlListType       |
| }                           |                                     |                          |
| if(EventListFlag) {         |                                     |                          |
| EventList                   |                                     | VWOEventListType         |
| }                           |                                     |                          |
| If(SensoryEffectListFlag) { |                                     |                          |
| SensoryEffectList           |                                     | VWOSensoryEffectListType |
| }                           |                                     |                          |
| }                           |                                     |                          |
| if(BehaviorModelListFlag) { |                                     |                          |
| BehaviorModelList           |                                     | VWOBehaviorModelListType |
| }                           |                                     |                          |
| if(IdFlag) {                |                                     |                          |
| id                          | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8                    |
| }                           |                                     |                          |
| }                           |                                     |                          |
|                             |                                     |                          |
| AvatarBaseType {            |                                     |                          |
| VWOBase                     |                                     | VWOBaseType              |
| }                           |                                     |                          |
|                             |                                     |                          |
| VirtualObjectBaseType {     |                                     |                          |
| VWOBase                     |                                     | VWOBaseType              |
| }                           |                                     |                          |

## 4.4.4 Semantics

| Name                  | Description   |
|-----------------------|---|
| VWOBaseType           | The base type that describes common attributes and elements in both avatars and virtual objects.  |
| DescriptionFlag       | This field, which is only presented in the binary representation, signals the presence of the description element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| VWOCFlag              | This field, which is only presented in the binary representation, signals the presence of the <code>VWOC</code> element which contains sound, scent, control and event lists. "1" means that the element shall be used. "0" means that the element shall not be used. |
| IdFlag                | This field, which is only presented in the binary representation, signals the presence of the <code>id</code> attribute. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| IdentificationFlag    | This field, which is only present in the binary representation, signals the presence of the <code>Identification</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| SoundListFlag         | This field, which is only present in the binary representation, signals the presence of the <code>Sound</code> element list. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| ScentListFlag         | This field, which is only present in the binary representation, signals the presence of the <code>Scent</code> element list. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| ControlListFlag       | This field, which is only present in the binary representation, signals the presence of the <code>Control</code> element list. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| EventListFlag         | This field, which is only present in the binary representation, signals the presence of the <code>Event</code> element list. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| SensoryEffectListFlag | This field, which is only present in the binary representation, signals the presence of the <code>SensoryEffect</code> element list. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| BehaviorModelListFlag | This field, which is only present in the binary representation, signals the presence of the <code>BehaviorModel</code> element list. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| Identification        | Describes the identification of the virtual world object.   |
| Description           | Contains the description of the virtual world object.   |
| VWOC                  | Describes a set of characteristics of the virtual world objects.  |
| SoundList             | Describes a list of the sound effects associated to the virtual world object.   |
| ScentList             | Describes a list of the scent effects associated to the virtual world object.   |
| ControlList           | Describes a list of the controls associated to the virtual world object.  |

| Name                  | Description  |
|-----------------------|--|
| EventList             | Describes a list of the input events associated to the virtual world object.     |
| SensoryEffectList     | Describes a list of the sensory effects associated to the virtual world object.  |
| BehaviorModelList     | Describes a list of the behaviour models associated to the virtual world object. |
| id                    | Unique identifier for identifying individual virtual world object information.   |
| AvatarBaseType        | A type providing a characteristic description of an individual avatar.           |
| VirtualObjectBaseType | A type providing a characteristic description of an individual virtual object.   |

4.4.5 Examples

```

<vwoc:VWOCInfo xsi:schemaLocation="urn:mpeg:mpeg-v:2018:01-VWOC-NS
VWOCSchema.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mpegvct="urn:mpeg:mpeg-v:2012:01-CT-NS" xmlns:vwoc="urn:mpeg:mpeg-
v:2018:01-VWOC-NS" xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
xmlns:mpeg7="urn:mpeg:mpeg7:schema:2004">
  <vwoc:AvatarList>
    <vwoc:Avatar xsi:type="vwoc:AvatarType" id="AVATARID_1" gender="male">
      <vwoc:VWOC>
        <vwoc:SoundList>
          <vwoc:Sound loop="1" soundID="SOUNDID_10" duration="10"
intensity="3" name="BurpSound">
            <vwoc:ResourcesURL>http://www.BurpSound.info</vwoc:ResourcesURL>
          </vwoc:Sound>
        </vwoc:SoundList>
        <vwoc:ScentList>
          <vwoc:Scent loop="2" duration="1" intensity="3"
name="BurpingScent" scentID="SCENTID_11">
            <vwoc:ResourcesURL>http://www.Burp.info</vwoc:ResourcesURL>
          </vwoc:Scent>
        </vwoc:ScentList>
        <vwoc:ControlList>
          <vwoc:Control controlID="CTRLID_12">
            <vwoc:MotionFeatureControl>
              <vwoc:Position>
                <mpegvct:X>1</mpegvct:X>
                <mpegvct:Y>1</mpegvct:Y>
                <mpegvct:Z>10</mpegvct:Z>
              </vwoc:Position>
              <vwoc:Orientation>
                <mpegvct:X>0</mpegvct:X>
                <mpegvct:Y>0</mpegvct:Y>
                <mpegvct:Z>0</mpegvct:Z>
              </vwoc:Orientation>
              <vwoc:ScaleFactor>
                <mpegvct:X>1</mpegvct:X>
                <mpegvct:Y>1</mpegvct:Y>
                <mpegvct:Z>3</mpegvct:Z>
              </vwoc:ScaleFactor>
            </vwoc:MotionFeatureControl>
          </vwoc:Control>
        </vwoc:ControlList>
      </vwoc:Avatar>
    </vwoc:AvatarList>
  </vwoc:VWOCInfo>

```

```

        <vwoc:Event eventID="ID_13">
            <vwoc:Mouse>urn:mpeg:mpeg-v:01-VWOC-MouseEventCS-NS:click
        </vwoc:Mouse>
        </vwoc:Event>
    </vwoc:EventList>
</vwoc:VWOC>
<vwoc:BehaviorModelList>
    <vwoc:BehaviorModel>
        <vwoc:BehaviorInput eventIDRef="ID_13"/>
        <vwoc:BehaviorOutput controlIDRefs="CTRLID_12"
scentIDRefs="SCENTID_11" soundIDRefs="SOUNDID_10"/>
    </vwoc:BehaviorModel>
</vwoc:BehaviorModelList>
</vwoc:Avatar>
</vwoc:AvatarList>
</vwoc:VWOCInfo>

```

#### 4.4.6 IdentificationType

##### 4.4.6.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre> &lt;complexType name="IdentificationType"&gt;   &lt;sequence&gt;     &lt;element name="UserID" type="anyURI" minOccurs="0"/&gt;     &lt;element name="Ownership" type="mpeg7:AgentType" minOccurs="0"/&gt;     &lt;element name="Rights" type="r:License" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="Credits" type="mpeg7:AgentType" minOccurs="0" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt;   &lt;attribute name="name" type="string" use="optional"/&gt;   &lt;attribute name="family" type="string" use="optional"/&gt; &lt;/complexType&gt; </pre> |

##### 4.4.6.2 Binary representation syntax

| IdentificationType { | Number of bits | Mnemonic |
|----------------------|----------------|----------|
| UserIDFlag           | 1              | bslbf    |
| OwnershipFlag        | 1              | bslbf    |
| RightsFlag           | 1              | bslbf    |
| CreditsFlag          | 1              | bslbf    |

| IdentificationType {          | Number of bits                      | Mnemonic    |
|-------------------------------|-------------------------------------|-------------|
| nameFlag                      | 1                                   | bslbf       |
| familyFlag                    | 1                                   | bslbf       |
| if(UserIDFlag) {              |                                     |             |
| UserID                        | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8       |
| }                             |                                     |             |
| if(OwnershipFlag) {           |                                     |             |
| Ownership                     |                                     | AgentType   |
| }                             |                                     |             |
| if(RightsFlag) {              |                                     |             |
| NumRights                     |                                     | vluimsbf5   |
| for(k=0; k< NumRights; k++){  |                                     |             |
| Rights[k]                     | See<br>ISO/IEC 21000-16             | LicenseType |
| }                             |                                     |             |
| }                             |                                     |             |
| if(CreditsFlag) {             |                                     |             |
| NumCredits                    |                                     | vluimsbf5   |
| for(k=0; k< NumCredits; k++){ |                                     |             |
| Credits[k]                    |                                     | AgentType   |
| }                             |                                     |             |
| }                             |                                     |             |
| if(nameFlag) {                |                                     |             |
| name                          | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8       |
| }                             |                                     |             |
| if(familyFlag) {              |                                     |             |
| family                        | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8       |

| IdentificationType { | Number of bits | Mnemonic |
|----------------------|----------------|----------|
| }                    |                |          |
| }                    |                |          |
|                      |                |          |
| AgentType{           | Number of bits | Mnemonic |
| mpeg7:AgentType      |                | UTF-8    |
| }                    |                |          |
|                      |                |          |
| LicenseType{         | Number of bits | Mnemonic |
| r:LicenseType        |                | UTF-8    |
| }                    |                |          |

#### 4.4.6.3 Semantics

| Name               | Definition   |
|--------------------|--|
| IdentificationType | Describes the identification of a virtual world object.  |
| UserIDFlag         | This field, which is only present in the binary representation, signals the presence of the <code>UserID</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
| OwnershipFlag      | This field, which is only present in the binary representation, signals the presence of the <code>Ownership</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
| RightsFlag         | This field, which is only presented in the binary representation, signals the presence of the <code>rights</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| CreditsFlag        | This field, which is only presented in the binary representation, signals the presence of the <code>credits</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
| nameFlag           | This field, which is only present in the binary representation, signals the presence of the <code>name</code> attribute. "1" means that the element shall be used. "0" means that the element shall not be used.       |
| familyFlag         | This field, which is only present in the binary representation, signals the presence of the <code>family</code> attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |

| Name       | Definition  |
|------------|---|
| UserID     | Contains the user identification associated to the virtual world object   |
| Ownership  | Describes the ownership of the virtual world object which shall be based on the type "AgentType" defined in ISO/IEC 15938-5:2003, 7.4.2. In the binary representation, the "AgentType" shall be encoded by UTF-8.   |
| NumRights  | This field, which is only present in the binary representation, specifies the number of rights information.   |
| Rights     | Describes the rights of the virtual world object which shall be based on the type "LicenseType" defined in ISO/IEC 21000-5. In the binary representation, the "LicenseType" shall be encoded by UTF-8.  |
| NumCredits | This field, which is only present in the binary representation, specifies the number of credits information.  |
| Credits    | Describes the contributors of the virtual object in chronological order which shall be based on the type "AgentType" defined in ISO/IEC 15938-5:2003, 7.4.2. In the binary representation, the "AgentType" shall be encoded by UTF-8.<br>Note: The 1 <sup>st</sup> listed credit describes an original author of a virtual world object. The subsequent credits represent the list of the contributors of the virtual world object chronologically. |
| name       | Describes the name of the virtual world object.   |
| family     | Describes the relationship with other virtual world objects.  |

4.4.7 VWOSoundListType

4.4.7.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre>&lt;complexType name="VWOSoundListType"&gt;   &lt;sequence&gt;     &lt;element name="Sound" type="vwoc:VWOSoundType" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt;</pre> |

4.4.7.2 Binary representation syntax

| VWOSoundListType {                 | Number of bits | Mnemonic     |
|------------------------------------|----------------|--------------|
| NumVWOSoundType                    |                | vluimsbf5    |
| for(k=0; k< NumVWOSoundType; k++){ |                |              |
| Sound[k]                           |                | VWOSoundType |
| }                                  |                |              |
| }                                  |                |              |

#### 4.4.7.3 Semantics

| Name             | Definition  |
|------------------|---|
| VWOSoundListType | Wrapper element type which allows multiple occurrences of sound effects associated to the virtual world object.                             |
| NumVWOSoundType  | This field, which is only present in the binary representation, specifies the number of Sound information contained in the sound list type. |
| Sound            | Describes a sound effect associated to the virtual world object.  |

#### 4.4.8 VWOScentListType

##### 4.4.8.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre>&lt;complexType name="VWOScentListType"&gt;   &lt;sequence&gt;     &lt;element name="Scent" type="vwoc:VWOScentType" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt;</pre> |

##### 4.4.8.2 Binary representation syntax

| VWOScentListType {                 | Number of bits | Mnemonic     |
|------------------------------------|----------------|--------------|
| NumVWOScentType                    |                | vluimsbf5    |
| for(k=0; k< NumVWOScentType; k++){ |                |              |
| Scent[k]                           |                | VWOScentType |
| }                                  |                |              |
| }                                  |                |              |

##### 4.4.8.3 Semantics

| Name             | Definition  |
|------------------|---|
| VWOScentListType | Wrapper element type which allows multiple occurrences of Scent effects associated to the virtual world object.                             |
| NumVWOScentType  | This field, which is only present in the binary representation, specifies the number of Scent information contained in the scent list type. |
| Scent            | Describes a scent effect associated to the virtual world object.  |

4.4.9 VWOControlListType

4.4.9.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre>&lt;complexType name="VWOControlListType"&gt;   &lt;sequence&gt;     &lt;element name="Control" type="vwoc:VWOControlType" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt;</pre> |

4.4.9.2 Binary representation syntax

| VWOControlListType {                 | Number of bits | Mnemonic       |
|--------------------------------------|----------------|----------------|
| NumVWOControlType                    |                | vluimsbf5      |
| for(k=0; k< NumVWOControlType; k++){ |                |                |
| Control[k]                           |                | VWOControlType |
| }                                    |                |                |
| }                                    |                |                |

4.4.9.3 Semantics

| Name               | Definition  |
|--------------------|---|
| VWOControlListType | Wrapper element type which allows multiple occurrences of the controls associated to the virtual world object.                                  |
| NumVWOControlType  | This field, which is only present in the binary representation, specifies the number of control information contained in the Control list type. |
| Control            | Describes a control associated to the virtual world object.   |

4.4.10 VWOEventListType

4.4.10.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre>&lt;complexType name="VWOEventListType"&gt;   &lt;sequence&gt;     &lt;element name="Event" type="vwoc:VWOEventType" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt;</pre> |

#### 4.4.10.2 Binary representation syntax

| VWOEventListType {                 | Number of bits | Mnemonic     |
|------------------------------------|----------------|--------------|
| NumVWOEventType                    |                | vluimsbf5    |
| for(k=0; k< NumVWOEventType; k++){ |                |              |
| Event[k]                           |                | VWOEventType |
| }                                  |                |              |
| }                                  |                |              |

#### 4.4.10.3 Semantics

| Name             | Definition  |
|------------------|---|
| VWOEventListType | Wrapper element type which allows multiple occurrences of the input events associated to the virtual world object.                          |
| NumVWOEventType  | This field, which is only present in the binary representation, specifies the number of Event information contained in the Event list type. |
| Event            | Describes an input event associated to the virtual world object.  |

#### 4.4.11 VWOBehaviorModellistType

##### 4.4.11.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre>&lt;complexType name="VWOBehaviorModellistType"&gt;   &lt;sequence&gt;     &lt;element name="BehaviorModel" type="vwoc:VWOBehaviorModelType" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt;</pre> |

##### 4.4.11.2 Binary representation syntax

| VWOBehaviorModellistType {                 | Number of bits | Mnemonic             |
|--|----------------|----------------------|
| NumVWOBehaviorModelType                    |                | vluimsbf5            |
| for(k=0; k< NumVWOBehaviorModelType; k++){ |                |                      |
| BehaviorModel[k]                           |                | VWOBehaviorModelType |
| }  |                |                      |
| }  |                |                      |

4.4.11.3 Semantics

| Name                      | Definition  |
|---------------------------|---|
| VWOBbehaviorModelListType | Wrapper element type which allows multiple occurrences of the behaviour models associated to the virtual world object.  |
| NumVWOBbehaviorModelType  | This field, which is only present in the binary representation, specifies the number of BehaviorModel information contained in the behaviour model list type. |
| BehaviorModel             | Describes a behaviour model associated to the virtual world object.   |

4.4.12 VWOSoundType

4.4.12.1 XML representation syntax

|         |  |
|---------|--|
| Diagram |  |
| Source  | <pre> &lt;complexType name="VWOSoundType"&gt;   &lt;sequence&gt;     &lt;element name="ResourcesURL" type="anyURI"/&gt;   &lt;/sequence&gt;   &lt;attribute name="soundID" type="ID" use="optional"/&gt;   &lt;attribute name="intensity" type="float" use="optional"/&gt;   &lt;attribute name="duration" type="unsignedInt" use="optional"/&gt;   &lt;attribute name="loop" type="unsignedInt" use="optional"/&gt;   &lt;attribute name="name" type="string" use="optional"/&gt; &lt;/complexType&gt; </pre> |

4.4.12.2 Binary representation syntax

| VWOSoundType{     | Number of bits                   | Mnemonic |
|-------------------|----------------------------------|----------|
| SoundIDFlag       | 1                                | bslbf    |
| IntensityFlag     | 1                                | bslbf    |
| DurationFlag      | 1                                | bslbf    |
| LoopFlag          | 1                                | bslbf    |
| NameFlag          | 1                                | bslbf    |
| ResourcesURL      | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| if(SoundIDFlag) { |                                  |          |

| VWOSoundType{       | Number of bits                   | Mnemonic |
|---------------------|----------------------------------|----------|
| soundID             | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                   |                                  |          |
| if(IntensityFlag) { |                                  |          |
| intensity           | 32                               | fsbf     |
| }                   |                                  |          |
| if(DurationFlag) {  |                                  |          |
| duration            | 32                               | uimsbf   |
| }                   |                                  |          |
| if(LoopFlag) {      |                                  |          |
| loop                | 8                                | uimsbf   |
| }                   |                                  |          |
| if(NameFlag) {      |                                  |          |
| name                | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                   |                                  |          |
| }                   |                                  |          |

#### 4.4.12.3 Semantics

| Name          | Definition  |
|---------------|---|
| VWOSoundType  | A type that contains the descriptions of a sound effect associated to the virtual world object.   |
| SoundIDFlag   | This field, which is only present in the binary representation, signals the presence of the ID attribute of the sound. "1" means the attribute shall be used and "0" means the attribute shall not be used. |
| IntensityFlag | This field, which is only present in the binary representation, signals the presence of the intensity attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used.       |
| DurationFlag  | This field, which is only present in the binary representation, signals the presence of the duration attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used.        |
| LoopFlag      | This field, which is only present in the binary representation, signals the presence of the loop attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used.            |
| NameFlag      | This field, which is only present in the binary representation, signals the presence of the name attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used.            |

| Name              | Definition  |
|-------------------|---|
| SoundResourcesURL | Element that contains a link to sound file, usually MP4 file..  |
| soundID           | A unique identifier of the object sound.  |
| intensity         | The strength(volume) of the sound   |
| duration          | The length of time that the sound lasts. The default unit is ms.  |
| loop              | A playing option to describe the number of repetition (default value: 1, 0: indefinite repetition, 1:once, 2: twice, ..., n: n times) |
| name              | The name of the sound.  |

**4.4.12.4 Examples**

This example shows the description of the sound information associated to an object with the following semantics. The sound resource whose name is “BigAlarm” is saved at “[http://sounddb.com/alarmsound\\_0001.wav](http://sounddb.com/alarmsound_0001.wav)” and the value of soundID, its identifier is “SoundID3” The length of the sound is 30 seconds. The sound shall be played with the volume of intensity = “50 %” repeatedly.

```
<vwoc:Sound loop="0" soundID="SoundID3" duration="30" intensity="0.5"
name="BigAlarm">
  <vwoc:ResourcesURL>http://sounddb.com/alarmsound\_0001.wav</vwoc:ResourcesURL>
</vwoc:Sound>
```

**4.4.13 VWOScentType**

**4.4.13.1 XML representation syntax**

|         |  |
|---------|--|
| Diagram |  |
| Source  | <pre>&lt;complexType name="VWOScentType"&gt;   &lt;sequence&gt;     &lt;element name="ResourcesURL" type="anyURI"/&gt;   &lt;/sequence&gt;   &lt;attribute name="scentID" type="ID" use="optional"/&gt;   &lt;attribute name="intensity" type="float" use="optional"/&gt;   &lt;attribute name="duration" type="unsignedInt" use="optional"/&gt;   &lt;attribute name="loop" type="unsignedInt" use="optional"/&gt;   &lt;attribute name="name" type="string" use="optional"/&gt; &lt;/complexType&gt;</pre> |

## 4.4.13.2 Binary representation syntax

| VWOScentType{       | Number of bits                   | Mnemonic |
|---------------------|----------------------------------|----------|
| ScentIDFlag         | 1                                | bslbf    |
| IntensityFlag       | 1                                | bslbf    |
| DurationFlag        | 1                                | bslbf    |
| LoopFlag            | 1                                | bslbf    |
| NameFlag            | 1                                | bslbf    |
| ResourcesURL        | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| if(ScentIDFlag) {   |                                  |          |
| scentID             | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                   |                                  |          |
| if(IntensityFlag) { |                                  |          |
| intensity           | 32                               | fsbf     |
| }                   |                                  |          |
| if(DurationFlag) {  |                                  |          |
| duration            | 32                               | uimsbf   |
| }                   |                                  |          |
| if(LoopFlag) {      |                                  |          |
| loop                | 8                                | uimsbf   |
| }                   |                                  |          |
| if(NameFlag) {      |                                  |          |
| name                | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                   |                                  |          |
| }                   |                                  |          |

4.4.13.3 Semantics

| Name               | Definition  |
|--------------------|---|
| VWOScentType       | A type that contains the descriptions of a scent effect associated to the virtual world object.   |
| ScentIDFlag        | This field, which is only present in the binary representation, signals the presence of the ID attribute of the scent. "1" means the attribute shall be used and "0" means the attribute shall not be used. |
| IntensityFlag      | This field, which is only present in the binary representation, signals the presence of the intensity attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used.       |
| DurationFlag       | This field, which is only present in the binary representation, signals the presence of the duration attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used.        |
| LoopFlag           | This field, which is only present in the binary representation, signals the presence of the loop attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used.            |
| NameFlag           | This field, which is only present in the binary representation, signals the presence of the name attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used.            |
| ScentResources URL | Element that contains a link to a scent file.   |
| scentID            | A unique identifier of the object scent.  |
| intensity          | The strength of the scent   |
| duration           | The length of time that the scent lasts. The default unit is ms.  |
| loop               | A playing option to describe the number of repetition (default value: 1, 0: indefinite repetition, 1:once, 2: twice, ..., n: n times)   |
| name               | The name of the scent.  |

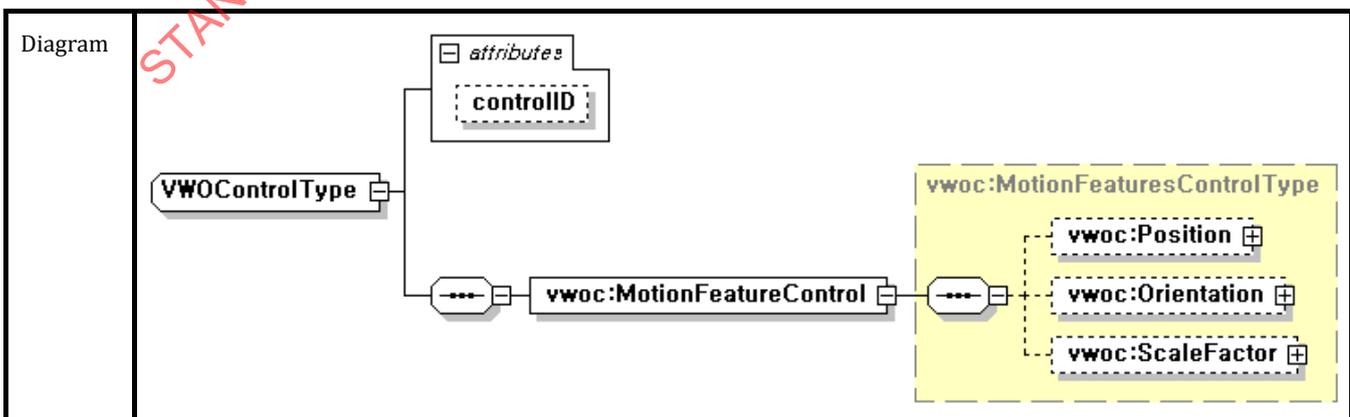
4.4.13.4 Examples

This example shows the description of the scent information associated to the object. The scent resource whose name is "rose" is saved at "http://scentdb.com/flower\_0001.sct" and the value of scentID, its identifier is "ScentID5" The intensity shall be 20 % with duration of 20 seconds.

```
<vwoc:Scent duration="20" intensity="0.2" name="rose" scentID="ScentID5">
  <vwoc:ResourcesURI>http://scentdb.com/flower_0001.sct</vwoc:ResourcesURI>
</vwoc:Scent>
```

4.4.14 VWOControlType

4.4.14.1 XML representation syntax



|        |  |
|--------|--|
| Source | <pre> &lt;complexType name="VWOControlType"&gt;   &lt;sequence&gt;     &lt;element name="MotionFeatureControl" type="vwoc:MotionFeaturesControlType"/&gt;   &lt;/sequence&gt;   &lt;attribute name="controlID" type="ID" use="optional"/&gt; &lt;/complexType&gt;  &lt;complexType name="MotionFeaturesControlType"&gt;   &lt;sequence&gt;     &lt;element name="Position" type="mpegvct:Float3DVectorType" minOccurs="0"/&gt;     &lt;element name="Orientation" type="mpegvct:Float3DVectorType" minOccurs="0"/&gt;     &lt;element name="ScaleFactor" type="mpegvct:Float3DVectorType" minOccurs="0"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt; </pre> |
|--------|--|

#### 4.4.14.2 Binary representation syntax

| VWOControlType {           | Number of bits                   | Mnemonic                 |
|----------------------------|----------------------------------|--------------------------|
| ControlIDFlag              | 1                                | bslbf                    |
| MotionFeatureControl       |                                  | MotionFeatureControlType |
| if(ControlIDFlag) {        |                                  |                          |
| controlID                  | See ISO/IEC 10646 <sup>[9]</sup> | UTF-8                    |
| }                          |                                  |                          |
| }                          |                                  |                          |
| MotionFeaturesControlType{ |                                  |                          |
| PositionFlag               | 1                                | bslbf                    |
| OrientationFlag            | 1                                | bslbf                    |
| ScaleFactorFlag            | 1                                | bslbf                    |
| if(PositionFlag) {         |                                  |                          |
| Position                   |                                  | Float3DVectorType        |
| }                          |                                  |                          |
| if(OrientationFlag) {      |                                  |                          |
| Orientation                |                                  | Float3DVectorType        |
| }                          |                                  |                          |
| if(ScaleFactorFlag) {      |                                  |                          |
| ScaleFactor                |                                  | Float3DVectorType        |
| }                          |                                  |                          |

| VWControlType { | Number of bits | Mnemonic |
|-----------------|----------------|----------|
| }               |                |          |

4.4.14.3 Semantics

| Name                 | Definition  |   |
|----------------------|---|---|
| VWControlType        | A type that contains the descriptions of a control associated to the virtual world object.  |   |
| ControlIDFlag        | This field, which is only present in the binary representation, signals the presence of the ControlID element. "1" means the attribute shall be used and "0" means the attribute shall not be used. |   |
| MotionFeatureControl | Set of elements that control position, orientation and scale of the virtual object.   |   |
|                      | <b>Element</b>  | <b>Information</b>  |
|                      | MotionFeatureControlType  | A type that provides three types of controls such as position control, orientation control, and scaling control.  |
|                      | PositionFlag  | This field, which is only present in the binary representation, signals the presence of the Position element. "1" means the attribute shall be used and "0" means the attribute shall not be used.    |
|                      | OrientationFlag   | This field, which is only present in the binary representation, signals the presence of the Orientation element. "1" means the attribute shall be used and "0" means the attribute shall not be used. |
|                      | ScaleFactorFlag   | This field, which is only present in the binary representation, signals the presence of the ScaleFactor element. "1" means the attribute shall be used and "0" means the attribute shall not be used. |
|                      | Position  | The position of the object in the scene with 3D floating point vector (x, y, z).  |
|                      | Orientation   | The orientation of the object in the scene with 3D floating point vector as an Euler angle (yaw, pitch, roll).  |
| ScaleFactor          | The scale of the object in the scene expressed as 3D floating point vector (Sx, Sy, Sz).  |   |
| controlID            | A unique identifier of the control.   |   |

NOTE 1 If two controllers are associated to the same object but on different parts of the object and if these parts exist hierarchical structures (parent and children relationship) then the controllers do perform the relative motion of the children. If the controllers are associated with the same part, the controller does the scaling or similar effects for the entire object.

NOTE 2 The reference coordinate system of this part is the right-handed coordinate system.

4.4.14.4 Examples

This example shows the description of object control information with the following semantics. The motion feature control of changing a position is given and its value of controlID, its identifier is "CtrlID7" The object shall be positioned at X="122.0", Y="150.0" and Z="40.0".

```
<vwoc:Control controlID="CtrlID7">
  <vwoc:MotionFeatureControl>
    <vwoc:Position>
      <mpegvct:X>122.0</mpegvct:X>
      <mpegvct:Y>150.0</mpegvct:Y>
      <mpegvct:Z>40.0</mpegvct:Z>
    </vwoc:Position>
  </vwoc:MotionFeatureControl>
</vwoc:Control>
```

4.4.15 VWOEventType

4.4.15.1 XML representation syntax

|         |  |
|---------|--|
| Diagram |  |
| Source  | <pre>&lt;complexType name="VWOEventType"&gt;   &lt;sequence&gt;     &lt;element name="Mouse" type="mpeg7:termReferenceType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="Keyboard" minOccurs="0" maxOccurs="unbounded"&gt;       &lt;complexType&gt;         &lt;attribute name="keyCode" type="mpeg7:unsigned8" use="optional"/&gt;         &lt;attribute name="event" use="required"&gt;           &lt;simpleType&gt;             &lt;restriction base="string"&gt;               &lt;enumeration value="pressed"/&gt;               &lt;enumeration value="clicked"/&gt;               &lt;enumeration value="released"/&gt;             &lt;/restriction&gt;           &lt;/simpleType&gt;         &lt;/attribute&gt;       &lt;/complexType&gt;     &lt;/element&gt;     &lt;element name="UserDefinedInput" type="string" minOccurs="0" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt;   &lt;attribute name="eventID" type="ID" use="required"/&gt; &lt;/complexType&gt;</pre> |

4.4.15.2 Binary representation syntax

| VWOEventType {                            | Number of bits                      | Mnemonic     |
|---|-------------------------------------|--------------|
| MouseFlag                                 | 1                                   | bslbf        |
| KeyboardFlag                              | 1                                   | bslbf        |
| UserDefinedInputFlag                      | 1                                   | bslbf        |
| if(MouseFlag) {                           |                                     |              |
| NumOfMouse                                |                                     | vluimsbf5    |
| for (k=0; k<NumOfMouse; k++) {            |                                     |              |
| Mouse[k]                                  |                                     | MouseEventCS |
| }   |                                     |              |
| }   |                                     |              |
| if(KeyboardFlag) {                        |                                     |              |
| NumOfKeyboard                             |                                     | vluimsbf5    |
| for(k=0; k< NumOfKeyboard; k++ ) {        |                                     |              |
| keyCodeFlag[k]                            | 1                                   | bslbf        |
| if(keyCodeFlag[k]) {                      |                                     |              |
| keyCode                                   | 8                                   | uimsbf       |
| }   |                                     |              |
| event[k]                                  | 2                                   | bslbf        |
| }   |                                     |              |
| }   |                                     |              |
| if(UserDefinedInputFlag) {                |                                     |              |
| NumOfUserDefinedInput                     |                                     | vluimsbf5    |
| for(k=0; k<NumOfUserDefinedInput; k++ ) { |                                     |              |
| UserDefinedInput[k]                       | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8        |
| }   |                                     |              |

|                |                                     |                 |
|----------------|-------------------------------------|-----------------|
| VWOEventType { | <b>Number of bits</b>               | <b>Mnemonic</b> |
| }              |                                     |                 |
| eventID        | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8           |
| }              |                                     |                 |

#### 4.4.15.3 Semantics

| Name                 | Definition   |  |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |
|----------------------|--|--|------------------|-------------|-------|------|--|-------------|------|---|-------------|------|---|-----------|------|--|--------------|------|--|
| VWOEventType         | A type that contains the descriptions of an input event associated to the virtual world object.  |  |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |
| MouseFlag            | This field, which is only present in the binary representation, signals the presence of the mouse element. "1" means the element shall be used, and "0" means the element shall not be used.   |  |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |
| KeyboardFlag         | This field, which is only present in the binary representation, signals the presence of the keyboard element. "1" means the element shall be used, and "0" means the element shall not be used.  |  |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |
| UserDefinedInputFlag | This field, which is only present in the binary representation, signals the presence of the UserDefinedInput element. "1" means the element shall be used, and "0" means the element shall not be used.  |  |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |
| NumOfMouse           | This field, which is only present in the binary representation, specifies the number of mouse events contained in the VWOEventType.  |  |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |
| Mouse                | <p>Describes a mouse event as a reference to a classification scheme (CS) term that shall be using the mpeg7:termReferenceType defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the MouseEventCS defined in A.2.1.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Element (4 bits)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>click</td> <td>0000</td> <td>Describes the event of click the left button of a mouse. (click)</td> </tr> <tr> <td>doubleclick</td> <td>0001</td> <td>Describes the event of double-click the left button of a mouse. (doubleclick)</td> </tr> <tr> <td>leftBtnDown</td> <td>0010</td> <td>Describes the event which takes place at the moment of holding down the left button of a mouse. ( LeftButtonDown)</td> </tr> <tr> <td>leftBtnUp</td> <td>0011</td> <td>Describes the event which takes place at the moment of releasing the left button of a mouse. ( LeftButtonUP)</td> </tr> <tr> <td>rightBtnDown</td> <td>0100</td> <td>Describes the event which takes place at the moment of holding down the left button of a mouse. ( RightButtonDown)</td> </tr> </tbody> </table> | Name   | Element (4 bits) | Description | click | 0000 | Describes the event of click the left button of a mouse. (click) | doubleclick | 0001 | Describes the event of double-click the left button of a mouse. (doubleclick) | leftBtnDown | 0010 | Describes the event which takes place at the moment of holding down the left button of a mouse. ( LeftButtonDown) | leftBtnUp | 0011 | Describes the event which takes place at the moment of releasing the left button of a mouse. ( LeftButtonUP) | rightBtnDown | 0100 | Describes the event which takes place at the moment of holding down the left button of a mouse. ( RightButtonDown) |
| Name                 | Element (4 bits)   | Description  |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |
| click                | 0000   | Describes the event of click the left button of a mouse. (click)   |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |
| doubleclick          | 0001   | Describes the event of double-click the left button of a mouse. (doubleclick)                                      |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |
| leftBtnDown          | 0010   | Describes the event which takes place at the moment of holding down the left button of a mouse. ( LeftButtonDown)  |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |
| leftBtnUp            | 0011   | Describes the event which takes place at the moment of releasing the left button of a mouse. ( LeftButtonUP)       |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |
| rightBtnDown         | 0100   | Describes the event which takes place at the moment of holding down the left button of a mouse. ( RightButtonDown) |                  |             |       |      |  |             |      |   |             |      |   |           |      |  |              |      |  |

| Name                  | Definition  |             |  |
|-----------------------|---|-------------|--|
|                       | rightBtnUp  | 0101        | Describes the event which takes place at the moment of releasing the left button of a mouse. (RightButtonUP) |
|                       | move  | 0110        | Describes the event which takes place while changing the mouse position. (Move)                              |
|                       |   | 0111 - 1111 | Reserved   |
| NumOfKeyboard         | This field, which is only present in the binary representation, specifies the number of keyboard events contained in the <code>VWOEventType</code> .  |             |  |
| keyCodeFlag           | This field, which is only present in the binary representation, signals the presence of the <code>keyCode</code> input element. "1" means that the element shall be used, and "0" means that the element shall not be used. |             |  |
| keyCode               | Describes the corresponding key code (0-255) of each key.   |             |  |
| event                 | Describes the keyboard event (pressed, clicked, or released). In the binary representation, the keyboard events are presented as follows. (pressed: 00, clicked: 01, released: 10, and reserved: 11)                        |             |  |
| NumOfUserDefinedInput | This field, which is only present in the binary representation, specifies the number of user-defined input events contained in the <code>VWOEventType</code> .  |             |  |
| UserDefinedInput      | Describes an input event defined by user.   |             |  |
| eventID               | A unique identifier of the event.   |             |  |

#### 4.4.15.4 Examples

EXAMPLE 1 This example shows the description of an input event with the following semantics. The mouse as an input device produces new input value, "click." For identifying this input, the value of eventID is "EventID1."

```
<vwoc:Event eventID="EventID1">
  <vwoc:Mouse>urn:mpeg:mpeg-v:01-VWOC-MouseEventCS-NS:click</vwoc:Mouse>
</vwoc:Event>
```

EXAMPLE 2 This example shows the description of an input event with the following semantics. The Keyboard as an input device produces a new input value which is pressing the key code of "65". For identifying this input, the value of eventID is "EventID2."

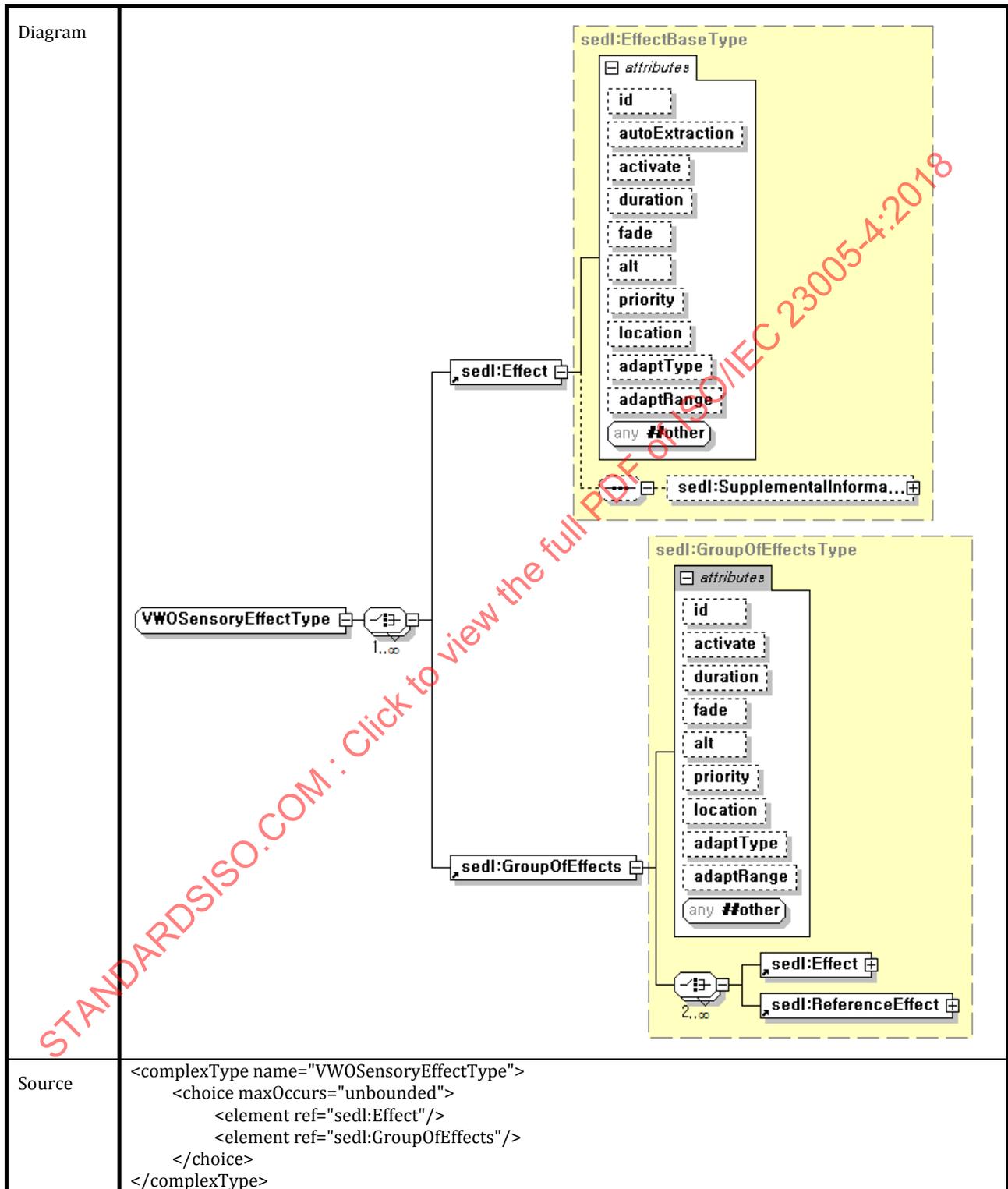
```
<vwoc:Event eventID="EventID2">
  <vwoc:Keyboard keyCode="65" event="pressed"/>
</vwoc:Event>
```

EXAMPLE 3 This example shows the description of an input event with the following semantics. The Keyboard produces a new input event of pressing the two keys "shift" + "a". One of the keyboard events is the pressing event, "pressed", of the "shift" key whose code is "16", and the other one is the pressing event, "pressed", of the "a" key whose code is "65". For identifying this input, the value of eventID is "EventID3."

```
<vwoc:Event eventID="EventID3">
  <vwoc:Keyboard keyCode="16" event="pressed"/>
  <vwoc:Keyboard keyCode="65" event="pressed"/>
</vwoc:Event>
```

4.4.16 VWOsSensoryEffectType

4.4.16.1 XML representation syntax



4.4.16.2 Binary representation syntax

| VWOSensoryEffectType {   | Number of bits | Mnemonic          |
|--------------------------|----------------|-------------------|
| EffectFlag               | 1              | bslbf             |
| GroupOfEffectsFlag       | 1              | bslbf             |
| If(EffectFlag) {         |                |                   |
| EffectBaseType           |                | EffectBaseType    |
| }                        |                |                   |
| If(GroupOfEffectsFlag) { |                |                   |
| GroupOfEffectsType       |                | GroupOfEffectType |
| }                        |                |                   |
| }                        |                |                   |

4.4.16.3 Semantics

| Name                 | Definition   |
|----------------------|--|
| VWOSensoryEffectType | A type that contains the descriptions of sensorial effects associated to the virtual world object.   |
| EffectFlag           | This field, which is only present in the binary representation, signals the presence of the effect element. "1" means the element shall be used, and "0" means the element shall not be used.        |
| GroupOfEffectsFlag   | This field, which is only present in the binary representation, signals the presence of the GroupOfEffect element. "1" means the element shall be used, and "0" means the element shall not be used. |
| Effect               | Describes a sensory effect.  |
| GroupOfEffects       | Describes a group of sensory effects.<br>NOTE The purpose of grouping is to remove some redundancy from its child elements. All attributes included here are inherited to its child elements.        |

4.4.16.4 Examples

This example shows the description of a VWO Sensory effect list with the following semantics.

```
<vwoc:SensoryEffectList>
  <sedl:Effect xsi:type="sev:LightType" duration="5" activate="true">
  </sedl:Effect>
</vwoc:SensoryEffectList>
```

4.4.17 VWOBehaviourModelType

4.4.17.1 XML representation syntax

|         |  |
|---------|--|
| Diagram | <pre> classDiagram     class VWOBehaviorModelType {         +vwoc:BehaviorInput         +vwoc:BehaviorOutput     }     class vwoc:BehaviorInputType {         +eventIDRef     }     class vwoc:BehaviorOutputType {         +soundIDRefs         +scentIDRefs         +animationIDRefs         +controlIDRefs     }     VWOBehaviorModelType -- vwoc:BehaviorInputType     VWOBehaviorModelType -- vwoc:BehaviorOutputType     </pre>  |
| Source  | <pre> &lt;complexType name="VWOBehaviorModelType"&gt;   &lt;sequence&gt;     &lt;element name="BehaviorInput" type="vwoc:BehaviorInputType"/&gt;     &lt;element name="BehaviorOutput" type="vwoc:BehaviorOutputType"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt; &lt;complexType name="BehaviorInputType"&gt;   &lt;attribute name="eventIDRef" type="IDREF"/&gt; &lt;/complexType&gt;  &lt;complexType name="BehaviorOutputType"&gt;   &lt;attribute name="soundIDRefs" type="IDREFS" use="optional"/&gt;   &lt;attribute name="scentIDRefs" type="IDREFS" use="optional"/&gt;   &lt;attribute name="animationIDRefs" type="IDREFS" use="optional"/&gt;   &lt;attribute name="controlIDRefs" type="IDREFS" use="optional"/&gt; &lt;/complexType&gt;     </pre> |

4.4.17.2 Binary representation syntax

| VWOBehaviorModelType{ | Number of bits                   | Mnemonic           |
|-----------------------|----------------------------------|--------------------|
| BehaviorInput         |                                  | BehaviorInputType  |
| BehaviorOutput        |                                  | BehaviorOutputType |
| }                     |                                  |                    |
| BehaviorInputType{    |                                  |                    |
| EventIDRefFlag        | 1                                | bslbf              |
| if(EventIDRefFlag){   |                                  |                    |
| eventIDRef            | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8              |

| VWOBehaviorModelType{ | Number of bits                   | Mnemonic |
|-----------------------|----------------------------------|----------|
| }                     |                                  |          |
| }                     |                                  |          |
| BehaviorOutputType{   |                                  |          |
| SoundIDFlag           | 1                                | bslbf    |
| ScentIDFlag           | 1                                | bslbf    |
| AnimationIDFlag       | 1                                | bslbf    |
| ControlIDFlag         | 1                                | bslbf    |
| if(SoundIDFlag) {     |                                  |          |
| SoundIDRefs           | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                     |                                  |          |
| if(ScentIDFlag) {     |                                  |          |
| ScentIDRefs           | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                     |                                  |          |
| if(AnimationIDFlag) { |                                  |          |
| AnimationIDRefs       | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                     |                                  |          |
| if(ControlIDFlag) {   |                                  |          |
| ControlIDRefs         | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                     |                                  |          |
| }                     |                                  |          |

## 4.4.17.3 Semantics

| Name                 | Description   |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
|----------------------|---|---------|-------------|------------|---|-----------------|---|---------------|---|-------------|---|-------------|--|-------------|--|-----------------|--|---------------|---|
| VWOBehaviorModelType | A type that describes a container of an input event and the associated output object behaviours.  |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| BehaviorInput        | An input event to make an object behaviour.   |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| BehaviorInputType    | Refers to an input event ID <table border="1"> <thead> <tr> <th>Element</th> <th>Information</th> </tr> </thead> <tbody> <tr> <td>eventIDRef</td> <td>Input event ID</td> </tr> <tr> <td>EventIDRef Flag</td> <td>This field, which is only present in the binary representation, signals the presence of the eventIDRef element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> </tbody> </table>  | Element | Information | eventIDRef | Input event ID  | EventIDRef Flag | This field, which is only present in the binary representation, signals the presence of the eventIDRef element. "1" means that the element shall be used. "0" means that the element shall not be used.         |               |   |             |   |             |  |             |  |                 |  |               |   |
| Element              | Information   |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| eventIDRef           | Input event ID  |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| EventIDRef Flag      | This field, which is only present in the binary representation, signals the presence of the eventIDRef element. "1" means that the element shall be used. "0" means that the element shall not be used.   |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| BehaviorOutput       | Object behaviour output according to an input event   |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| BehaviorOutputType   | Refers to a list of object behavioural outputs. <table border="1"> <thead> <tr> <th>Element</th> <th>Information</th> </tr> </thead> <tbody> <tr> <td>SoundFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>sound</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>ScentFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>scent</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>AnimationFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>animation</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>ControlFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>control</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>soundIDRefs</td> <td>It refers soundIDs to provide sound effects of the object.</td> </tr> <tr> <td>scentIDRefs</td> <td>It refers scentIDs to provide scent effects of the object.</td> </tr> <tr> <td>animationIDRefs</td> <td>It refers animationIDs to provide animation clips of the object.</td> </tr> <tr> <td>controlIDRefs</td> <td>It refers controlIDs to provide controls of the object.</td> </tr> </tbody> </table> | Element | Information | SoundFlag  | This field, which is only present in the binary representation, signals the presence of the <code>sound</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | ScentFlag       | This field, which is only present in the binary representation, signals the presence of the <code>scent</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | AnimationFlag | This field, which is only present in the binary representation, signals the presence of the <code>animation</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | ControlFlag | This field, which is only present in the binary representation, signals the presence of the <code>control</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | soundIDRefs | It refers soundIDs to provide sound effects of the object. | scentIDRefs | It refers scentIDs to provide scent effects of the object. | animationIDRefs | It refers animationIDs to provide animation clips of the object. | controlIDRefs | It refers controlIDs to provide controls of the object. |
| Element              | Information   |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| SoundFlag            | This field, which is only present in the binary representation, signals the presence of the <code>sound</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| ScentFlag            | This field, which is only present in the binary representation, signals the presence of the <code>scent</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| AnimationFlag        | This field, which is only present in the binary representation, signals the presence of the <code>animation</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| ControlFlag          | This field, which is only present in the binary representation, signals the presence of the <code>control</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| soundIDRefs          | It refers soundIDs to provide sound effects of the object.  |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| scentIDRefs          | It refers scentIDs to provide scent effects of the object.  |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| animationIDRefs      | It refers animationIDs to provide animation clips of the object.  |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |
| controlIDRefs        | It refers controlIDs to provide controls of the object.   |         |             |            |   |                 |   |               |   |             |   |             |  |             |  |                 |  |               |   |

## 4.4.17.4 Examples

This example shows the description of a VWO behaviour model with the following semantics. If eventID="EventID1" is given as BehaviorInput, then BehaviorOutput shall be executed related to soundID="SoID5" and animationID="AniID4".

```
<vwoc:BehaviorModel>
  <vwoc:BehaviorInput eventIDRef="EventID1"/>
  <vwoc:BehaviorOutput animationIDRefs="AniID4" soundIDRefs="SoID5"/>
</vwoc:BehaviorModel>
```

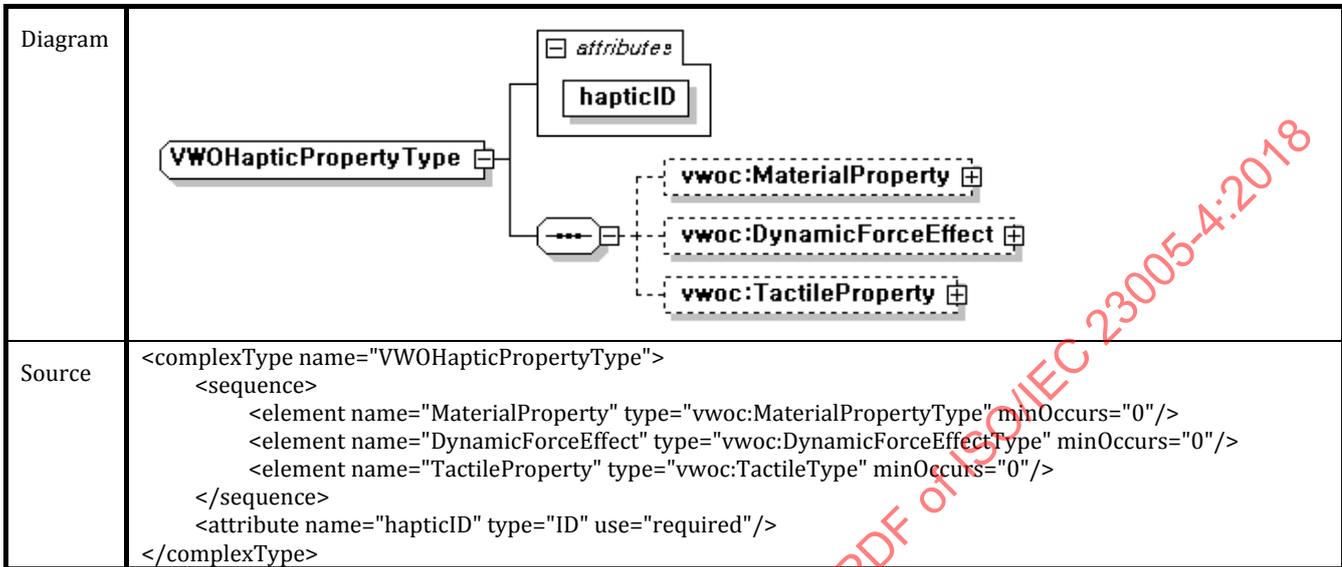
## 4.5 Virtual world object common data types

This subclause specifies syntax and semantics of the common datatypes for avatar and virtual object metadata. To be specific, basic data types which are used as basic building blocks, such as haptic

properties, animation description, and other simple data types.

4.5.1 VWOHapticPropertyType

4.5.1.1 XML representation syntax



4.5.1.2 Binary representation syntax

| VWOHapticPropertyType {      | Number of bits                   | Mnemonic               |
|------------------------------|----------------------------------|------------------------|
| MaterialPropertyFlag         | 1                                | bslbf                  |
| DynamicForceEffectFlag       | 1                                | bslbf                  |
| TactilePropertyFlag          | 1                                | bslbf                  |
| if(MaterialPropertyFlag) {   |                                  |                        |
| MaterialProperty             |                                  | MaterialPropertyType   |
| }                            |                                  |                        |
| if(DynamicForceEffectFlag) { |                                  |                        |
| DynamicForceEffect           |                                  | DynamicForceEffectType |
| }                            |                                  |                        |
| if(TactilePropertyFlag) {    |                                  |                        |
| TactileProperty              |                                  | TactilePropertyType    |
| }                            |                                  |                        |
| hapticID                     | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8                  |

| VWOHapticPropertyType { | Number of bits | Mnemonic |
|-------------------------|----------------|----------|
| }                       |                |          |

4.5.1.3 Semantics

| Name                   | Description  |
|------------------------|--|
| VWOHapticPropertyType  | A type that contains the descriptions of a haptic property associated to the virtual world object.   |
| MaterialPropertyFlag   | This field, which is only present in the binary representation, signals the presence of the MaterialProperty element. "1" means the attribute shall be used and "0" means the attribute shall not be used.   |
| DynamicForceEffectFlag | This field, which is only present in the binary representation, signals the presence of the DynamicForceEffect element. "1" means the attribute shall be used and "0" means the attribute shall not be used. |
| TactilePropertyFlag    | This field, which is only present in the binary representation, signals the presence of the TactileProperty element. "1" means the attribute shall be used and "0" means the attribute shall not be used.    |
| MaterialProperty       | This type contains parameters characterizing material properties.  |
| DynamicForceEffect     | This type contains parameters characterizing force effects.  |
| TactileProperty        | This type contains parameters characterizing tactile properties.   |
| hapticID               | A unique identifier of the haptic property.  |

4.5.1.4 MaterialPropertyType

4.5.1.4.1 XML representation syntax

|         |  |
|---------|--|
| Diagram |  |
| Source  | <pre> &lt;complexType name="MaterialPropertyType"&gt;   &lt;attribute name="stiffness" type="float" use="optional"/&gt;   &lt;attribute name="staticFriction" type="float" use="optional"/&gt;   &lt;attribute name="dynamicFriction" type="float" use="optional"/&gt;   &lt;attribute name="damping" type="float" use="optional"/&gt;   &lt;attribute name="texture" type="anyURI" use="optional"/&gt;   &lt;attribute name="mass" type="float" use="optional"/&gt; &lt;/complexType&gt; </pre> |

4.5.1.4.2 Binary representation syntax

| MaterialPropertyType{ | Number of bits | Mnemonic |
|-----------------------|----------------|----------|
| StiffnessFlag         | 1              | bslbf    |
| StaticFrictionFlag    | 1              | bslbf    |

| MaterialPropertyType{     | Number of bits                   | Mnemonic |
|---------------------------|----------------------------------|----------|
| DynamicFrictionFlag       | 1                                | bslbf    |
| DampingFlag               | 1                                | bslbf    |
| TextureFlag               | 1                                | bslbf    |
| MassFlag                  | 1                                | bslbf    |
| if(StiffnessFlag) {       |                                  |          |
| stiffness                 | 32                               | fsbf     |
| }                         |                                  |          |
| if(StaticFrictionFlag) {  |                                  |          |
| staticFriction            | 32                               | fsbf     |
| }                         |                                  |          |
| if(DynamicFrictionFlag) { |                                  |          |
| dynamicFriction           | 32                               | fsbf     |
| }                         |                                  |          |
| if(DampingFlag) {         |                                  |          |
| damping                   | 32                               | fsbf     |
| }                         |                                  |          |
| if(TextureFlag) {         |                                  |          |
| texture                   | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                         |                                  |          |
| if(MassFlag) {            |                                  |          |
| mass                      | 32                               | fsbf     |
| }                         |                                  |          |
| }                         |                                  |          |

4.5.1.4.3 Semantics

| Name                 | Description  |
|----------------------|--|
| MaterialPropertyType | A type that contains the descriptions of a material property associated to the virtual world object. |
| StiffnessFlag        | This field, which is only present in the binary representation,                                      |

|                                  |  |
|----------------------------------|--|
|                                  | signals the presence of the <code>Stiffness</code> element. "1" means the attribute shall be used and "0" means the attribute shall not be used.   |
| <code>StaticFrictionFlag</code>  | This field, which is only present in the binary representation, signals the presence of the <code>StaticFriction</code> element. "1" means the attribute shall be used and "0" means the attribute shall not be used.  |
| <code>DynamicFrictionFlag</code> | This field, which is only present in the binary representation, signals the presence of the <code>DynamicFriction</code> element. "1" means the attribute shall be used and "0" means the attribute shall not be used. |
| <code>DampingFlag</code>         | This field, which is only present in the binary representation, signals the presence of the <code>Damping</code> element. "1" means the attribute shall be used and "0" means the attribute shall not be used.         |
| <code>TextureFlag</code>         | This field, which is only present in the binary representation, signals the presence of the <code>Texture</code> element. "1" means the attribute shall be used and "0" means the attribute shall not be used.         |
| <code>MassFlag</code>            | This field, which is only present in the binary representation, signals the presence of the <code>Mass</code> element. "1" means the attribute shall be used and "0" means the attribute shall not be used.            |
| <code>stiffness</code>           | The stiffness of the virtual world object (in N/mm).   |
| <code>staticFriction</code>      | The static friction of the virtual world object.   |
| <code>dynamicFriction</code>     | The dynamic friction of the virtual world object.  |
| <code>damping</code>             | The damping of the virtual world object.   |
| <code>texture</code>             | Contains a link to haptic texture file (e.g. bump image)   |
| <code>mass</code>                | The mass of the virtual world object.  |

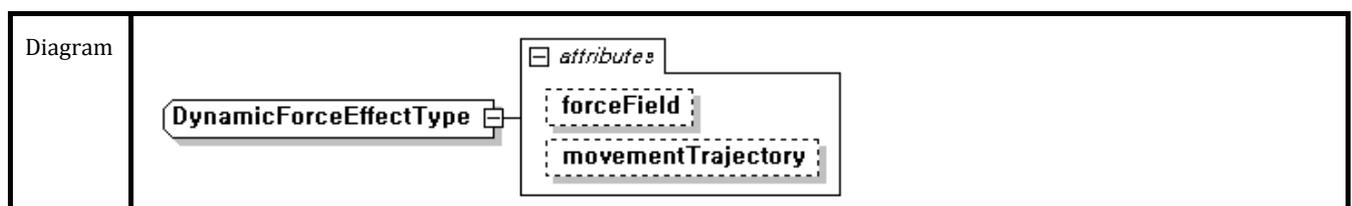
#### 4.5.1.4.4 Examples

This example shows the material properties of a virtual world object which has 0.5 N/mm of stiffness, 0.3 of static coefficient of friction, 0.02 of kinetic coefficient of friction, 0,001 damping coefficient, 0.7 of mass and it's surface haptic texture is loaded from the given URL with the id of MID30.

```
<vwoc:HapticProperty hapticID="MID30">
  <vwoc:MaterialProperty stiffness="0.5" staticFriction="0.3"
dynamicFriction="0.02"
damping="0.001" texture="http://haptic.kr/tactile/texture1.bmp" mass="0.7"/>
</vwoc:HapticProperty>
```

#### 4.5.1.5 DynamicForceEffectType

##### 4.5.1.5.1 XML representation syntax



|        |   |
|--------|---|
| Source | <pre>&lt;complexType name="DynamicForceEffectType"&gt;   &lt;attribute name="forceField" type="anyURI" use="optional"/&gt;   &lt;attribute name="movementTrajectory" type="anyURI" use="optional"/&gt; &lt;/complexType&gt;</pre> |
|--------|---|

**4.5.1.5.2 Binary representation syntax**

| DynamicForceEffectType{    | Number of bits                   | Mnemonic |
|----------------------------|----------------------------------|----------|
| ForceFieldFlag             | 1                                | bslbf    |
| MovementTrajectoryFlag     | 1                                | bslbf    |
| if(ForceFieldFlag) {       |                                  |          |
| forceField                 | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                          |                                  |          |
| if(MovementTrajectoryFlag) |                                  |          |
| {                          |                                  |          |
| movementTrajectory         | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                          |                                  |          |
| }                          |                                  |          |

**4.5.1.5.3 Semantics**

| Name                   | Description  |
|------------------------|--|
| DynamicForceEffectType | A type that contains the descriptions of a dynamic force effect associated to the virtual world object.  |
| ForceFieldFlag         | This field, which is only present in the binary representation, signals the presence of the ForceField element. "1" means the attribute shall be used and "0" means the attribute shall not be used.         |
| MovementTrajectoryFlag | This field, which is only present in the binary representation, signals the presence of the MovementTrajectory element. "1" means the attribute shall be used and "0" means the attribute shall not be used. |
| forceField             | Contains link to force field vector file (sum of force field vectors).   |
| movementTrajectory     | Contains link to force trajectory file (e.g. .dat file including a sequence of motion data).   |

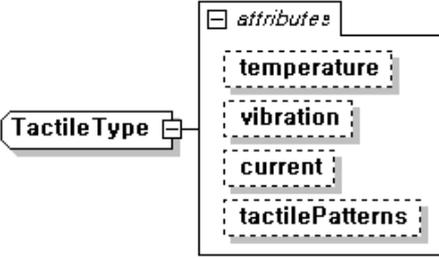
**4.5.1.5.4 Examples**

This example shows the dynamic force effect of an avatar. The force field characteristic of the avatar with its id of FFID30 is determined by the designed force field file from the URL.

|  |
|--|
| <pre>&lt;vwoc:HapticProperty hapticID="FFID30"&gt;   &lt;vwoc:DynamicForceEffect forceField="http://haptic.kr/avatar/forcefield.dat"/&gt; &lt;/vwoc:HapticProperty&gt;</pre> |
|--|

## 4.5.1.6 TactileType

## 4.5.1.6.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |    |
| Source  | <pre> &lt;complexType name="TactileType"&gt;   &lt;attribute name="temperature" type="float" use="optional"/&gt;   &lt;attribute name="vibration" type="float" use="optional"/&gt;   &lt;attribute name="current" type="float" use="optional"/&gt;   &lt;attribute name="tactilePatterns" type="anyURI" use="optional"/&gt; &lt;/complexType&gt; </pre> |

## 4.5.1.6.2 Binary representation syntax

| TactileType{              | Number of bits                   | Mnemonic |
|---------------------------|----------------------------------|----------|
| TemperatureFlag           | 1                                | bslbf    |
| VibrationFlag             | 1                                | bslbf    |
| CurrentFlag               | 1                                | bslbf    |
| TactilePatternsFlag       | 1                                | bslbf    |
| if(TemperatureFlag) {     |                                  |          |
| temperature               | 32                               | fsbf     |
| }                         |                                  |          |
| if(VibrationFlag) {       |                                  |          |
| vibration                 | 32                               | fsbf     |
| }                         |                                  |          |
| if(CurrentFlag) {         |                                  |          |
| current                   | 32                               | fsbf     |
| }                         |                                  |          |
| if(TactilePatternsFlag) { |                                  |          |
| tactilePatterns           | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                         |                                  |          |

| TactileType{ | Number of bits | Mnemonic |
|--------------|----------------|----------|
| }            |                |          |

4.5.1.6.3 Semantics

| Name                         | Description   |
|------------------------------|---|
| TactileType                  | A type that contains the descriptions of a tactile property associated to the virtual world object.   |
| TemperatureFlag              | This field, which is only present in the binary representation, signals the presence of the <code>temperature</code> attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used.      |
| VibrationFlag                | This field, which is only present in the binary representation, signals the presence of the <code>vibration</code> attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used.        |
| CurrentFlag                  | This field, which is only present in the binary representation, signals the presence of the electric <code>current</code> attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used. |
| TactilePatternsFlag          | This field, which is only present in the binary representation, signals the presence of the <code>tactilePatterns</code> attribute. "1" means the attribute shall be used and "0" means the attribute shall not be used.  |
| <code>temperature</code>     | The temperature of the virtual world object (in degree celcius).  |
| <code>vibration</code>       | The vibration of the virtual world object.  |
| <code>current</code>         | The electric current of the virtual world object (in mA).   |
| <code>tactilePatterns</code> | Contains link to tactile pattern file (e.g. grayscale video (.avi, h.264, or .dat file.)  |

4.5.1.6.4 Examples

This example shows the tactile properties, with its id of DFEID30, which has 15 degree of temperature and a tactile effect based on the tactile information from the following URL (<http://www.haptic.kr/avatar/tactile1.avi>).

```
<vwoc:HapticProperty hapticID="DFEID30">
  <vwoc:TactileProperty temperature="15"
  tactilePatterns="http://www.haptic.kr/avatar/tactile1.avi"/>
</vwoc:HapticProperty>
```

4.5.2 AnimationDescriptionType

4.5.2.1 XML representation syntax

|         |  |
|---------|--|
| Diagram |  |
| Source  | <pre> &lt;complexType name="AnimationDescriptionType"&gt;   &lt;choice&gt;     &lt;sequence&gt;       &lt;element name="Name" type="mpeg7:termReferenceType" minOccurs="0"/&gt;       &lt;element name="Uri" type="anyURI" minOccurs="0"/&gt;     &lt;/sequence&gt;     &lt;element name="Extra" type="vwoc:ExtraType"/&gt;   &lt;/choice&gt;   &lt;attribute name="animationID" type="ID" use="optional"/&gt;   &lt;attribute name="duration" type="unsignedInt" use="optional"/&gt;   &lt;attribute name="loop" type="unsignedInt" use="optional"/&gt; &lt;/complexType&gt; </pre> |

4.5.2.2 Binary representation syntax

| AnimationDescriptionType{      | Number of bits                   | Mnemonic |
|--------------------------------|----------------------------------|----------|
| animationIDFlag                | 1                                | bslbf    |
| durationFlag                   | 1                                | bslbf    |
| loopFlag                       | 1                                | bslbf    |
| SelectAnimationDescriptionType | 1                                | bslbf    |
| if(animationIDFlag){           |                                  |          |
| animationID                    | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                              |                                  |          |
| if(durationFlag){              |                                  |          |
| duration                       | 32                               | uimsbf   |
| }                              |                                  |          |
| if(loopFlag){                  |                                  |          |

| AnimationDescriptionType{           | Number of bits                   | Mnemonic  |
|-------------------------------------|----------------------------------|---|
| Loop                                | 8                                | uimsbf  |
| }                                   |                                  |   |
| if(SelectAnimationDescriptionType){ |                                  |   |
| Extra                               |                                  | ExtraType   |
| }                                   |                                  |   |
| else {                              |                                  |   |
| NameFlag                            | 1                                | bslbf   |
| UriFlag                             | 1                                | bslbf   |
| if(NameFlag){                       |                                  |   |
| TypeOfAnimationCS                   | 8                                | bslbf   |
| Name                                | 10                               | Number of bits are defined by the type of AnimationCS |
| }                                   |                                  |   |
| if(UriFlag){                        |                                  |   |
| Uri                                 | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8   |
| }                                   |                                  |   |
| }                                   |                                  |   |
| }                                   |                                  |   |

4.5.2.3 Semantics

| Name                     | Description   |
|--------------------------|---|
| AnimationDescriptionType | A type that contains descriptions and a link to the animation file.   |
| animationIDFlag          | This field, which is only present in the binary representation, signals whether animationID attribute is used or not. "1" means that the attribute shall be used, and "0" means that attribute shall not be used. |
| durationFlag             | This field, which is only present in the binary representation, signals whether duration attribute is used or not. "1" means that the attribute shall be used, and "0" means that attribute shall not be used.    |
| loopFlag                 | This field, which is only present in the binary representation, signals whether loop attribute is used or not. "1" means that the attribute   |

| Name                           | Description   |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
|--------------------------------|---|---------------------|--|-----------------|----------|---------------------|----------|------------------|----------|-----------------|----------|------------------|----------|---------------------|----------|--------------------|----------|------------------|----------|----------------------------|----------|--------------------------|----------|----------------------------|----------|-----------------------------|----------|
|                                | shall be used, and "0" means that attribute shall not be used.  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| SelectAnimationDescriptionType | This field, which is only present in the binary representation, signals which type of animation description shall be used. "0" means that the proprietary description shall be used, and "1" means that the specified name in the classification schemes and the URI shall be used to describe the animation.   |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| animationID                    | A unique identifier of the animation.   |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| duration                       | The length of time that the animation lasts. The default unit is ms.  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| loop                           | A playing option to describe the number of repetition. (default value: 1, 0:indefinite repetition, 1:once, 2: twice, ..., n: n times)   |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| Extra                          | Describes an animation in the form of any proprietary but well-formed XML metadata.   |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| NameFlag                       | This field, which is only present in the binary representation, signals whether the name element is used or not. "1" means that the element shall be used, and "0" means that element shall not be used.  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| UriFlag                        | This field, which is only present in the binary representation, signals whether the Uri element is used or not. "1" means that the element shall be used, and "0" means that element shall not be used.   |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| TypeOfAnimationCS              | This field, which is only present in the binary representation, describes a class of the animation as one of the classification schemes (CS). The CSs that may be used for this purpose is defined in A.4 and A.5.  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
|                                | <table border="1"> <thead> <tr> <th>Type of AnimationCS</th> <th>Binary representation for sensor type (8 bits)</th> </tr> </thead> <tbody> <tr> <td>IdleAnimationCS</td> <td>00000000</td> </tr> <tr> <td>GreetingAnimationCS</td> <td>00000001</td> </tr> <tr> <td>DanceAnimationCS</td> <td>00000010</td> </tr> <tr> <td>WalkAnimationCS</td> <td>00000011</td> </tr> <tr> <td>MovesAnimationCS</td> <td>00000100</td> </tr> <tr> <td>FightingAnimationCS</td> <td>00000101</td> </tr> <tr> <td>HearingAnimationCS</td> <td>00000110</td> </tr> <tr> <td>SmokeAnimationCS</td> <td>00000111</td> </tr> <tr> <td>CongratulationsAnimationCS</td> <td>00001000</td> </tr> <tr> <td>CommonActionsAnimationCS</td> <td>00001001</td> </tr> <tr> <td>SpecificActionsAnimationCS</td> <td>00001010</td> </tr> <tr> <td>FacialExpressionAnimationCS</td> <td>00001011</td> </tr> </tbody> </table> | Type of AnimationCS | Binary representation for sensor type (8 bits) | IdleAnimationCS | 00000000 | GreetingAnimationCS | 00000001 | DanceAnimationCS | 00000010 | WalkAnimationCS | 00000011 | MovesAnimationCS | 00000100 | FightingAnimationCS | 00000101 | HearingAnimationCS | 00000110 | SmokeAnimationCS | 00000111 | CongratulationsAnimationCS | 00001000 | CommonActionsAnimationCS | 00001001 | SpecificActionsAnimationCS | 00001010 | FacialExpressionAnimationCS | 00001011 |
| Type of AnimationCS            | Binary representation for sensor type (8 bits)  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| IdleAnimationCS                | 00000000  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| GreetingAnimationCS            | 00000001  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| DanceAnimationCS               | 00000010  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| WalkAnimationCS                | 00000011  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| MovesAnimationCS               | 00000100  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| FightingAnimationCS            | 00000101  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| HearingAnimationCS             | 00000110  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| SmokeAnimationCS               | 00000111  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| CongratulationsAnimationCS     | 00001000  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| CommonActionsAnimationCS       | 00001001  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| SpecificActionsAnimationCS     | 00001010  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |
| FacialExpressionAnimationCS    | 00001011  |                     |  |                 |          |                     |          |                  |          |                 |          |                  |          |                     |          |                    |          |                  |          |                            |          |                          |          |                            |          |                             |          |

| Name | Description   |                   |
|------|---|-------------------|
|      | BodyExpressionAnimationCS   | 00001100          |
|      | VODeformationCS   | 00001101          |
|      | VOMotionCS  | 00001110          |
|      | Reserved  | 00001111-11111111 |
| Name | Describes a type of the animation as a reference to classification schemes (CSs) term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. The CSs that may be used for this purpose is defined in A.4 and A.5. |                   |
| Uri  | Contains a link to an animation file, usually MP4 file.   |                   |

4.5.3 AnimationResourcesDescriptionType

4.5.3.1 XML representation syntax

|         |  |
|---------|--|
| Diagram |  |
| Source  | <pre> &lt;complexType name="AnimationResourcesDescriptionType"&gt;   &lt;sequence&gt;     &lt;element name="Description" type="string" minOccurs="0"/&gt;     &lt;element name="Uri" type="anyURI" minOccurs="0"/&gt;   &lt;/sequence&gt;   &lt;attribute name="animationID" type="ID" use="optional"/&gt;   &lt;attribute name="duration" type="unsignedInt" use="optional"/&gt;   &lt;attribute name="loop" type="unsignedInt" use="optional"/&gt; &lt;/complexType&gt; </pre> |

4.5.3.2 Binary representation syntax

| AnimationResourcesDescriptionType{ | Number of bits | Mnemonic |
|------------------------------------|----------------|----------|
| animationIDFlag                    | 1              | bslbf    |
| durationFlag                       | 1              | bslbf    |
| loopFlag                           | 1              | bslbf    |
| DescriptionFlag                    | 1              | bslbf    |
| UriFlag                            | 1              | bslbf    |

| AnimationResourcesDescriptionType{ | Number of bits                   | Mnemonic |
|------------------------------------|----------------------------------|----------|
| if(animationIDFlag){               |                                  |          |
| animationID                        | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                                  |                                  |          |
| if(durationFlag){                  |                                  |          |
| duration                           | 8                                | uimsbf   |
| }                                  |                                  |          |
| if(loopFlag){                      |                                  |          |
| loop                               | 8                                | uimsbf   |
| }                                  |                                  |          |
| if(DescriptionFlag){               |                                  |          |
| Description                        | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                                  |                                  |          |
| if(UriFlag){                       |                                  |          |
| Uri                                | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                                  |                                  |          |
| }                                  |                                  |          |

#### 4.5.3.3 Semantics

| Name                              | Description   |
|-----------------------------------|---|
| AnimationResourcesDescriptionType | A type that contains a link to an animation file and its description.   |
| Description                       | Contains the description of the animation resource.   |
| Uri                               | Contains a link to an animation file, usually MP4 file.   |
| animationID                       | A unique identifier of the animation.   |
| duration                          | The length of time that the animation lasts.  |
| loop                              | A playing option to describe the number of repetition. (default value: 1, 0: indefinite repetition, 1: once, 2: twice, ..., n: n times) |

4.5.3.4 PointType

4.5.3.4.1 XML representation syntax

|         |   |
|---------|---|
| Diagram | —   |
| Source  | <pre> &lt;complexType name="PointType" abstract="true" /&gt; &lt;complexType name="LogicalPointType"&gt;   &lt;complexContent&gt;     &lt;extension base="vwoc:PointType"&gt;       &lt;attribute name="name" type="string" use="optional" /&gt;       &lt;attribute name="sensorID" type="anyURI" use="optional" /&gt;     &lt;/extension&gt;   &lt;/complexContent&gt; &lt;/complexType&gt; &lt;complexType name="Physical3DPointType"&gt;   &lt;complexContent&gt;     &lt;extension base="vwoc:PointType"&gt;       &lt;attribute name="x" type="float" use="required" /&gt;       &lt;attribute name="y" type="float" use="required" /&gt;       &lt;attribute name="z" type="float" use="required" /&gt;     &lt;/extension&gt;   &lt;/complexContent&gt; &lt;/complexType&gt; </pre> |

4.5.3.4.2 Binary representation syntax

| PointType{             | Number of bits                      | Mnemonic            |
|------------------------|-------------------------------------|---------------------|
| PointTypeSelect        | 1                                   | bslbf               |
| if (PointTypeSelect) { |                                     |                     |
| Point                  |                                     | LogicalPointType    |
| }                      |                                     |                     |
| else{                  |                                     |                     |
| Point                  |                                     | Physical3DPointType |
| }                      |                                     |                     |
| }                      |                                     |                     |
| LogicalPointType {     |                                     |                     |
| nameflag               | 1                                   | bslbf               |
| sensorIDflag           | 1                                   | bslbf               |
| if(nameflag){          |                                     |                     |
| name                   | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8               |

| PointType{           | Number of bits                      | Mnemonic |
|----------------------|-------------------------------------|----------|
|                      |                                     |          |
| if(sensorIDflag){    |                                     |          |
| sensorID             | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                    |                                     |          |
| }                    |                                     |          |
|                      |                                     |          |
| Physical3DPointType{ |                                     |          |
| x                    | 32                                  | fsbf     |
| y                    | 32                                  | fsbf     |
| z                    | 32                                  | fsbf     |
| }                    |                                     |          |

## 4.5.3.4.3 Semantics

| Name                | Description   |
|---------------------|---|
| PointType           | An abstract type providing root for two different point types, which are LogicalPointType and Physical3DPointType for specifying a feature point for face feature control.  |
| PointTypeSelect     | This field, which is only present in the binary representation, signals whether the type of point is logical point type or the type of point is a physical 3D positional point. "1" means that the logical point type shall be used, and "0" means that the physical 3D point type shall be used. |
| LogicalPointType    | A type providing the name of the feature point  |
| nameflag            | This field, which is only present in the binary representation, signals whether name is used or not. "1" means that the name shall be used, and "0" means that name shall not be used.  |
| sensorIDflag        | This field, which is only present in the binary representation, signals whether sensorID is used or not. "1" means that the sensorID shall be used, and "0" means that the sensorID shall not be used.  |
| name                | The name of the feature point   |
| sensorID            | The sensor ID corresponding to the feature point  |
| Physical3DPointType | A type providing a three dimensional point vector value.  |
| x                   | The point value on x-axis in 3 dimensional space  |
| y                   | The point value on y-axis in 3 dimensional space  |
| z                   | The point value on z-axis in 3 dimensional space  |

4.5.3.5 ExtraType

4.5.3.5.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre> &lt;complexType name="ExtraType"&gt;   &lt;annotation&gt;     &lt;appinfo&gt;enable-xmlns&lt;/appinfo&gt;   &lt;/annotation&gt;   &lt;sequence&gt;     &lt;any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt; </pre> |

4.5.3.5.2 Binary representation syntax

| ExtraType {                   | Number of bits                   | Mnemonic  |
|-------------------------------|----------------------------------|-----------|
| XMLDataFlag                   | 1                                | bslbf     |
| if (XMLDataFlag) {            |                                  |           |
| NumXMLData                    |                                  | vluimsbf5 |
| for(k=0; k<NumXMLData; k++) { |                                  |           |
| XMLLength                     |                                  | vluimsbf5 |
| XMLData                       | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8     |
| }                             |                                  |           |
| }                             |                                  |           |

4.5.3.5.3 Semantics

| Name        | Description  |
|-------------|--|
| ExtraType   | A type that can contain any well-formed XML data   |
| XMLDataFlag | This field, which is only present in the binary representation, signals whether XML data is used or not. "1" means that the XML data shall be used, and "0" means that XML data shall not be used. |
| NumXMLData  | This field, which is only present in the binary representation, specifies the number of XML data contained in the ExtraType element.   |
| XMLLength   | This field, which is only present in the binary representation, specifies the number of characters in terms of UTF-8 in each XML data.   |
| XMLData     | This field contains any well-formed XML data. In the binary representation, the field is encoded by UTF-8.   |

NOTE Element defined as type <ExtraType> allows extending the MPEG-V schema with proprietary but well-defined or at least well-formatted data.

#### 4.5.4 Common simple data types

##### 4.5.4.1 IndicateOfLHType

###### 4.5.4.1.1 XML representation syntax

|        |   |
|--------|---|
| Source | <pre>&lt;simpleType name="indicateOfLHType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="low"/&gt;     &lt;enumeration value="high"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|---|

###### 4.5.4.1.2 Binary representation syntax

|                  | Number of bits | Mnemonic |
|------------------|----------------|----------|
| indicateOfLHType | 1              | bslbf    |

###### 4.5.4.1.3 Semantics

| Name             | Description  |
|------------------|--|
| indicateOfLHType | A type of which the value is either low or high. The binary representation of the type is defined as follows.<br>(0: low, 1: high) |

##### 4.5.4.2 IndicateOfLMHType

###### 4.5.4.2.1 XML representation syntax

|        |  |
|--------|--|
| Source | <pre>&lt;simpleType name="indicateOfLMHType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="low"/&gt;     &lt;enumeration value="medium"/&gt;     &lt;enumeration value="high"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|--|

###### 4.5.4.2.2 Binary representation syntax

|                   | Number of bits | Mnemonic |
|-------------------|----------------|----------|
| indicateOfLMHType | 2              | bslbf    |

###### 4.5.4.2.3 Semantics

| Name              | Description   |
|-------------------|---|
| indicateOfLMHType | A type of which the value is among low, medium or high. The binary representation of the type is defined as follows.<br>(0: low, 1: medium, 2: high, 3: reserved) |

4.5.4.3 IndicateOfSMBType

4.5.4.3.1 XML representation syntax

|        |   |
|--------|---|
| Source | <pre>&lt;simpleType name="indicateOfSMBType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="small"/&gt;     &lt;enumeration value="medium"/&gt;     &lt;enumeration value="big"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|---|

4.5.4.3.2 Binary representation syntax

|                   | Number of bits | Mnemonic |
|-------------------|----------------|----------|
| indicateOfSMBType | 2              | bslbf    |

4.5.4.3.3 Semantics

| Name              | Description  |
|-------------------|--|
| indicateOfSMBType | A type of which the value is among small, medium or big. The binary representation of the type is defined as follows. (0: small, 1: medium, 2: big, 3: reserved) |

4.5.4.4 IndicateOfSMLType

4.5.4.4.1 XML representation syntax

|        |  |
|--------|--|
| Source | <pre>&lt;simpleType name="indicateOfSMLType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="short"/&gt;     &lt;enumeration value="medium"/&gt;     &lt;enumeration value="long"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|--|

4.5.4.4.2 Binary representation syntax

|                   | Number of bits | Mnemonic |
|-------------------|----------------|----------|
| indicateOfSMLType | 2              | bslbf    |

4.5.4.4.3 Semantics

| Name              | Description  |
|-------------------|--|
| indicateOfSMLType | A type of which the value is among short, medium or long. The binary representation of the type is defined as follows. (0: short, 1: medium, 2: long, 3: reserved) |

#### 4.5.4.5 IndicateOfDMUType

##### 4.5.4.5.1 XML representation syntax

|        |   |
|--------|---|
| Source | <pre>&lt;simpleType name="indicateOfDMUType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="down"/&gt;     &lt;enumeration value="medium"/&gt;     &lt;enumeration value="up"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|---|

##### 4.5.4.5.2 Binary representation syntax

|                   | Number of bits | Mnemonic |
|-------------------|----------------|----------|
| indicateOfDMUType | 2              | bslbf    |

##### 4.5.4.5.3 Semantics

| Name              | Description  |
|-------------------|--|
| indicateOfDMUType | A type of which the value is among down, medium or up. The binary representation of the type is defined as follows. (0: down, 1: medium, 2: up, 3: reserved) |

#### 4.5.4.6 IndicateOfDUType

##### 4.5.4.6.1 XML representation syntax

|        |  |
|--------|--|
| Source | <pre>&lt;simpleType name="indicateOfDUType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="down"/&gt;     &lt;enumeration value="up"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|--|

##### 4.5.4.6.2 Binary representation syntax

|                  | Number of bits | Mnemonic |
|------------------|----------------|----------|
| indicateOfDUType | 1              | bslbf    |

##### 4.5.4.6.3 Semantics

| Name             | Description   |
|------------------|---|
| indicateOfDUType | A type of which the value is either down or up. The binary representation of the type is defined as follows. (0: down, 1: up) |

#### 4.5.4.7 IndicateOfPMNType

##### 4.5.4.7.1 XML representation syntax

|        |  |
|--------|--|
| Source | <pre>&lt;simpleType name="indicateOfPMNType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="pointed"/&gt;     &lt;enumeration value="middle"/&gt;     &lt;enumeration value="notpointed"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|--|

##### 4.5.4.7.2 Binary representation syntax

|                   | Number of bits | Mnemonic |
|-------------------|----------------|----------|
| indicateOfPMNType | 2              | bslbf    |

##### 4.5.4.7.3 Semantics

| Name              | Description   |
|-------------------|---|
| indicateOfPMNType | A type of which the value is among pointed, middle or not pointed.<br>The binary representation of the type is defined as follows.<br>(0: short, 1: medium, 2: long, 3: reserved) |

#### 4.5.4.8 IndicateOfRCType

##### 4.5.4.8.1 XML representation syntax

|        |  |
|--------|--|
| Source | <pre>&lt;simpleType name="indicateOfRCType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="round"/&gt;     &lt;enumeration value="cleft"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|--|

##### 4.5.4.8.2 Binary representation syntax

|                  | Number of bits | Mnemonic |
|------------------|----------------|----------|
| indicateOfRCType | 1              | bslbf    |

##### 4.5.4.8.3 Semantics

| Name             | Description   |
|------------------|---|
| indicateOfRCType | A type of which the value is either round or cleft.<br>The binary representation of the type is defined as follows.<br>(0: round, 1: cleft) |

#### 4.5.4.9 IndicateOfLRType

##### 4.5.4.9.1 XML representation syntax

|        |   |
|--------|---|
| Source | <pre>&lt;simpleType name="indicateOfLRType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="left"/&gt;     &lt;enumeration value="right"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|---|

|  |                                 |
|--|---------------------------------|
|  | </restriction><br></simpleType> |
|--|---------------------------------|

#### 4.5.4.9.2 Binary representation syntax

|                  | Number of bits | Mnemonic |
|------------------|----------------|----------|
| indicateOfLRType | 1              | bslbf    |

#### 4.5.4.9.3 Semantics

| Name             | Description   |
|------------------|---|
| indicateOfLRType | A type of which the value is either left or right.<br>The binary representation of the type is defined as follows.<br>(0: left, 1: right) |

#### 4.5.4.10 IndicateOfLMRType

##### 4.5.4.10.1 XML representation syntax

|        |  |
|--------|--|
| Source | <pre>&lt;simpleType name="indicateOfLMRType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="left"/&gt;     &lt;enumeration value="middle"/&gt;     &lt;enumeration value="right"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|--|

##### 4.5.4.10.2 Binary representation syntax

|                   | Number of bits | Mnemonic |
|-------------------|----------------|----------|
| indicateOfLMRType | 2              | bslbf    |

##### 4.5.4.10.3 Semantics

| Name              | Description  |
|-------------------|--|
| indicateOfLMRType | A type of which the value is among left, middle or right.<br>The binary representation of the type is defined as follows.<br>(0: left, 1: middle, 2: right, 3: reserved) |

#### 4.5.4.11 measureUnitLMHType

##### 4.5.4.11.1 XML representation syntax

|        |   |
|--------|---|
| Source | <pre>&lt;simpleType name="measureUnitLMHType"&gt;   &lt;union memberTypes="vwoc:indicateOfLMHType float"/&gt; &lt;/simpleType&gt;</pre> |
|--------|---|

##### 4.5.4.11.2 Binary representation syntax

| measureUnitLMHType{  | Number of bits | Mnemonic |
|----------------------|----------------|----------|
| selectType           | 1              | bslbf    |
| if(selectType == 0){ |                |          |

| measureUnitLMHType{ | Number of bits | Mnemonic          |
|---------------------|----------------|-------------------|
| indicationOfLMH     |                | indicateOfLMHType |
| }else{              |                |                   |
| measure             | 32             | fsbf              |
| }                   |                |                   |
| }                   |                |                   |

4.5.4.11.3 Semantics

| Name               | Description   |
|--------------------|---|
| measureUnitLMHType | A type which may be either indicateOfLMHType or float.  |
| selectType         | This field, which is only present in the binary representation, signals whether a floating point value is used or the indicateOfLMHType is used. "1" means that the indicateOfLMHType shall be used, and "0" means that a floating point value shall not be used. |
| measure            | This field, which is only present in the binary representation, the value of which is a floating point value.   |

4.5.4.12 measureUnitSMBType

4.5.4.12.1 XML representation syntax

|        |   |
|--------|---|
| Source | <pre>&lt;simpleType name="measureUnitSMBType"&gt;   &lt;union memberTypes="vwoc:indicateOfSMBType float"/&gt; &lt;/simpleType&gt;</pre> |
|--------|---|

4.5.4.12.2 Binary representation syntax

| measureUnitSMBType{  | Number of bits | Mnemonic          |
|----------------------|----------------|-------------------|
| selectType           | 1              | bslbf             |
| if(selectType == 0){ |                |                   |
| indicateOfSMB        |                | indicateOfSMBType |
| }else{               |                |                   |
| measure              | 32             | fsbf              |
| }                    |                |                   |
| }                    |                |                   |

## 4.5.4.12.3 Semantics

| Name               | Description   |
|--------------------|---|
| measureUnitSMBType | A type which may be either <code>indicateOfSMBType</code> or <code>float</code> .   |
| selectType         | This field, which is only present in the binary representation, signals whether a floating point value is used or the <code>indicateOfSMBType</code> is used. "1" means that the <code>indicateOfSMBType</code> shall be used, and "0" means that a floating point value shall not be used. |
| measure            | This field, which is only present in the binary representation, the value of which is a floating point value.   |

## 4.5.4.13 levelOf5Type

## 4.5.4.13.1 XML representation syntax

|        |   |
|--------|---|
| Source | <pre>&lt;simpleType name="levelOf5Type"&gt;   &lt;restriction base="integer"&gt;     &lt;minInclusive value="1"/&gt;     &lt;maxInclusive value="5"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|---|

## 4.5.4.13.2 Binary representation syntax

|              | Number of bits | Mnemonic |
|--------------|----------------|----------|
| levelOf5Type | 3              | uimsbf   |

## 4.5.4.13.3 Semantics

| Name         | Description  |
|--------------|--|
| levelOf5Type | A type of which the integer value is from one to five. The binary representation of the type is defined as follows. (0:0, 1:1, 2:2, 3:3, 4:4, 5:5, 6-8:reserved) |

## 4.5.4.14 angleType

## 4.5.4.14.1 XML representation syntax

|        |  |
|--------|--|
| Source | <pre>&lt;simpleType name="angleType"&gt;   &lt;restriction base="float"&gt;     &lt;minInclusive value="0"/&gt;     &lt;maxInclusive value="360"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|--|

## 4.5.4.14.2 Binary representation syntax

|           | Number of bits | Mnemonic |
|-----------|----------------|----------|
| angleType | 32             | fsbf     |

4.5.4.14.3 Semantics

| Name      | Description  |
|-----------|--|
| angleType | A type of which the floating point value is from 0 degree to 360 degree. |

4.5.4.15 percentageType

4.5.4.15.1 XML representation syntax

|        |   |
|--------|---|
| Source | <pre>&lt;simpleType name="percentageType"&gt;   &lt;restriction base="float"&gt;     &lt;minInclusive value="0"/&gt;     &lt;maxInclusive value="100"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|---|

4.5.4.15.2 Binary representation syntax

|                | Number of bits | Mnemonic |
|----------------|----------------|----------|
| percentageType | 32             | fsbf     |

4.5.4.15.3 Semantics

| Name           | Description  |
|----------------|--|
| percentageType | A type of which the floating point value is from 0 percent to 100 percent. |

4.5.4.16 unlimitedPercentageType

4.5.4.16.1 XML representation syntax

|        |  |
|--------|--|
| Source | <pre>&lt;simpleType name="unlimitedPercentageType"&gt;   &lt;restriction base="float"&gt;     &lt;minInclusive value="0"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|--|

4.5.4.16.2 Binary representation syntax

|                         | Number of bits | Mnemonic |
|-------------------------|----------------|----------|
| unlimitedPercentageType | 32             | fsbf     |

4.5.4.16.3 Semantics

| Name                    | Description   |
|-------------------------|---|
| unlimitedPercentageType | A type of which the floating point value is from 0 percent. |

## 5 Avatar metadata

### 5.1 General

Avatar metadata as a (visual) representation of the user inside the environment serves the following purposes:

- makes visible the presence of a real user into the VE,
- characterizes the user within the VE,
- interacts with the VE.

The "Avatar" element is composed of following type of data with the extension of the base type of avatar.

- **Appearance:** contains the high level description of the appearance and may refer a media containing the exact geometry and texture.
- **Animation:** contains the description of a set of animation sequences that the avatar is able to perform and may refer to several media containing the exact (geometric transformations) animation parameters.
- **CommunicationSkills:** contains a set of descriptors providing information on the different modalities an avatar is able to communicate.
- **Personality:** contains a set of descriptors defining the personality of the avatar.
- **ControlFeatures:** contains a set of descriptors defining possible place-holders for sensors on body skeleton and face feature points.
- **HapticPropertyList:** contains a list of high level descriptors of the haptic properties.
- **Gender:** describes the gender of the avatar.

5.2 AvatarType

5.2.1 XML representation syntax

|                |  |
|----------------|--|
| <p>Diagram</p> |  |
| <p>Source</p>  | <pre> &lt;complexType name="AvatarType"&gt;   &lt;complexContent&gt;     &lt;extension base="vwoc:AvatarBaseType"&gt;       &lt;sequence&gt;         &lt;element name="Appearance" type="vwoc:AvatarAppearanceType" minOccurs="0" maxOccurs="unbounded"/&gt;         &lt;element name="Animation" type="vwoc:AvatarAnimationType" minOccurs="0" maxOccurs="unbounded"/&gt;         &lt;element name="CommunicationSkills" type="vwoc:AvatarCommunicationSkillsType" minOccurs="0" maxOccurs="unbounded"/&gt;         &lt;element name="Personality" type="vwoc:AvatarPersonalityType" minOccurs="0" maxOccurs="unbounded"/&gt;         &lt;element name="ControlFeatures" type="vwoc:AvatarControlFeaturesType" minOccurs="0" maxOccurs="unbounded"/&gt;         &lt;element name="HapticPropertyList" type="vwoc:VWOHapticPropertyListType" minOccurs="0"/&gt;       &lt;/sequence&gt;       &lt;attribute name="gender" type="string" use="optional"/&gt;     &lt;/extension&gt;   &lt;/complexContent&gt; &lt;/complexType&gt; </pre> |

## 5.2.2 Binary representation syntax

| AvatarType{                             | Number of bits | Mnemonic             |
|---|----------------|----------------------|
| AvatarBase                              |                | AvatarBaseType       |
| AppereanceFlag                          | 1              | bslbf                |
| AnimationFlag                           | 1              | bslbf                |
| CommunicationSkillsFlag                 | 1              | bslbf                |
| PersonalityFlag                         | 1              | bslbf                |
| ControlFeaturesFlag                     | 1              | bslbf                |
| HapticPropertyListFlag                  | 1              | bslbf                |
| genderFlag                              | 1              | bslbf                |
| if(AppereanceFlag){                     |                |                      |
| LoopAvatarAppereance                    |                | vluimsbf5            |
| for(k=0; k< LoopAvatarAppereance; k++){ |                |                      |
| Appereance[k]                           |                | AvatarAppereanceType |
| }                                       |                |                      |
| }                                       |                |                      |
|   |                |                      |
| if(AnimationFlag){                      |                |                      |
| LoopAvatarAnimation                     |                | vluimsbf5            |
| for(k=0; k<LoopAvatarAnimation; k++){   |                |                      |
| Animation[k]                            |                | AvatarAnimationType  |
| }                                       |                |                      |
| }                                       |                |                      |
|   |                |                      |
| if(CommunicationSkillsFlag){            |                |                      |

| AvatarType{                                    | Number of bits | Mnemonic                      |
|--|----------------|-------------------------------|
| LoopAvatarCommunicationSkills                  |                | vluimsbf5                     |
| for(k=0;k<LoopAvatarCommunicationSkills; k++){ |                |                               |
| CommunicationSkills[k]                         |                | AvatarCommunicationSkillsType |
| }  |                |                               |
| }  |                |                               |
|  |                |                               |
| if(PersonalityFlag){                           |                |                               |
| LoopAvatarPersonality                          |                | vluimsbf5                     |
| for(k=0;k<LoopAvatarPersonality; k++){         |                |                               |
| Personality[k]                                 |                | AvatarPersonalityType         |
| }  |                |                               |
| }  |                |                               |
|  |                |                               |
| if(ControlFeaturesFlag){                       |                |                               |
| LoopAvatarControlFeatures                      |                | vluimsbf5                     |
| for(k=0;k<LoopAvatarControlFeatures; k++){     |                |                               |
| ControlFeatures[k]                             |                | AvatarControlFeaturesType     |
| }  |                |                               |
| }  |                |                               |
|  |                |                               |
| if(HapticPropertyListFlag){                    |                |                               |
| HapticPropertyList                             |                | VWOHapticPropertyListType     |
| }  |                |                               |

| AvatarType{     | Number of bits                      | Mnemonic |
|-----------------|-------------------------------------|----------|
|                 |                                     |          |
| if(genderFlag){ |                                     |          |
| gender          | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }               |                                     |          |
| }               |                                     |          |

### 5.2.3 Semantics

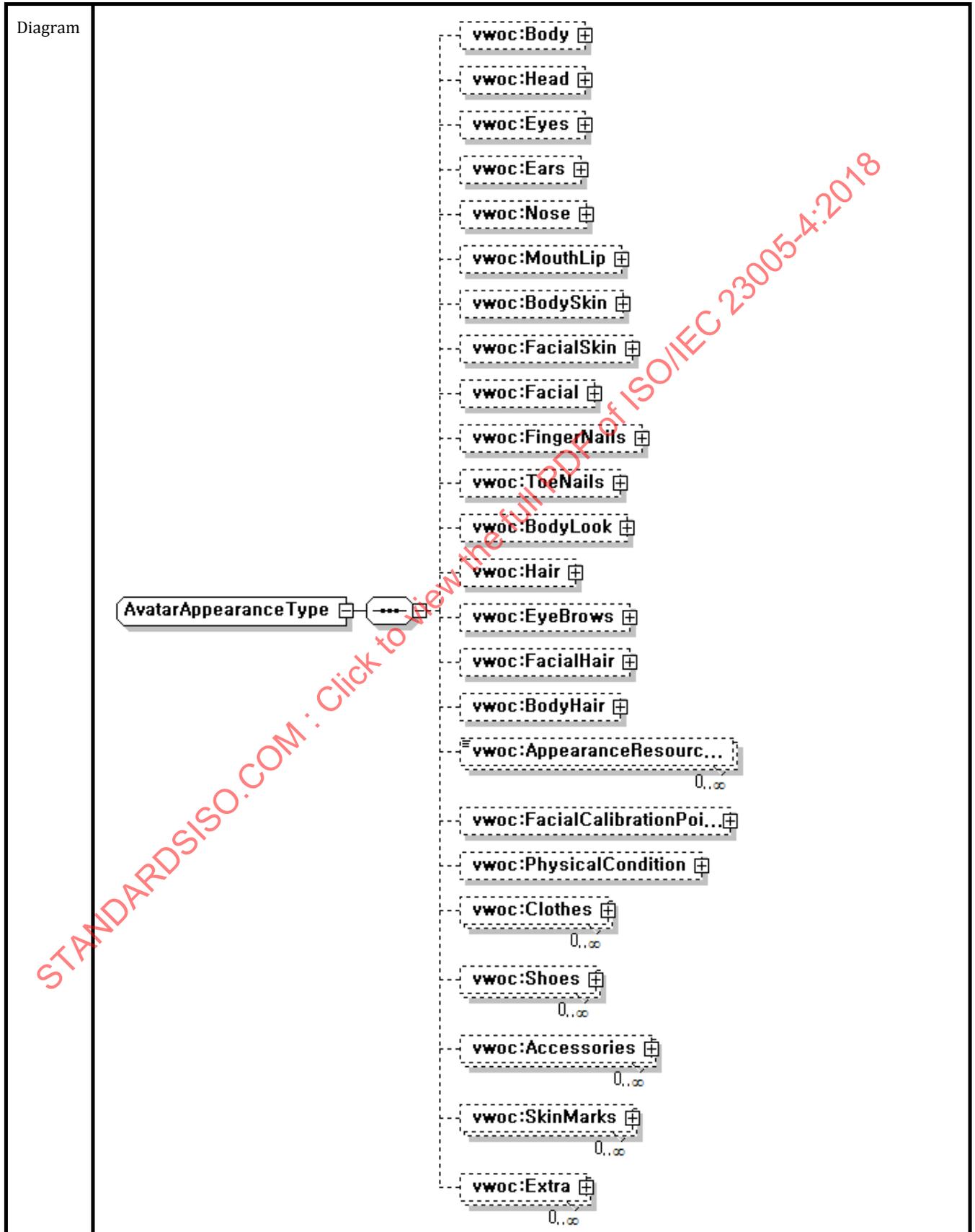
| Name                          | Description   |
|-------------------------------|---|
| AvatarType                    | A type that represents the user inside the virtual world environment.   |
| AvatarBase                    | Contains the base type defined by AvatarBaseType.   |
| AppearanceFlag                | This field, which is only present in the binary representation, signals the presence of the Appearance elements. "1" means that the elements shall be used. "0" means that the elements shall not be used.          |
| AnimationFlag                 | This field, which is only present in the binary representation, signals the presence of the Animation elements. "1" means that the elements shall be used. "0" means that the elements shall not be used.           |
| CommunicationSkillsFlag       | This field, which is only present in the binary representation, signals the presence of the CommunicationSkills elements. "1" means that the elements shall be used. "0" means that the elements shall not be used. |
| PersonalityFlag               | This field, which is only present in the binary representation, signals the presence of the Personality elements. "1" means that the elements shall be used. "0" means that the elements shall not be used.         |
| ControlFeaturesFlag           | This field, which is only present in the binary representation, signals the presence of the ControlFeatures elements. "1" means that the elements shall be used. "0" means that the elements shall not be used.     |
| HapticPropertyListFlag        | This field, which is only present in the binary representation, signals the presence of the HapticPropertyList elements. "1" means that the elements shall be used. "0" means that the elements shall not be used.  |
| genderFlag                    | This field, which is only present in the binary representation, signals the presence of the gender attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used.           |
| LoopAvatarAppearance          | This field, which is only present in the binary representation, specifies the number of appearance information contained in the avatar characteristics.   |
| Appearance                    | Contains the high level description of the appearance of an avatar.   |
| LoopAvatarAnimation           | This field, which is only present in the binary representation, specifies the number of animation information contained in the avatar characteristics.  |
| Animation                     | Contains the description of a set of animation sequences that the avatar is able to perform.  |
| LoopAvatarCommunicationSkills | This field, which is only present in the binary representation, specifies the number of communication skills information contained in the avatar characteristics.   |

| Name                      | Description   |
|---------------------------|---|
| CommunicationSkills       | Contains a set of descriptors providing information on the different modalities an avatar is able to communicate.   |
| LoopAvatarPersonality     | This field, which is only present in the binary representation, specifies the number of personality information contained in the avatar characteristics.  |
| Personality               | Contains a set of descriptors defining the personality of the avatar.   |
| LoopAvatarControlFeatures | This field, which is only present in the binary representation, specifies the number of feature control information contained in the avatar characteristics.  |
| ControlFeatures           | Contains a set of descriptors defining possible place-holders for sensors on body skeleton and face feature points.   |
| HapticPropertyListFlag    | This field, which is only present in the binary representation, signals the presence of the HapticPropertyList. "1" means that the element shall be used. "0" means that the element shall not be used.   |
| HapticPropertyList        | Contains a list of high level descriptors of the haptic properties.   |
| genderFlag                | This field, which is only present in the binary representation, signals the presence of the gender attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |
| gender                    | Describes the gender of the avatar.   |

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### 5.3 AvatarAppearanceType

#### 5.3.1 XML representation syntax



|        |   |
|--------|---|
| Source | <pre> &lt;complexType name="AvatarAppearanceType"&gt;   &lt;sequence&gt;     &lt;element name="Body" type="vwoc:BodyType" minOccurs="0"/&gt;     &lt;element name="Head" type="vwoc:HeadType" minOccurs="0"/&gt;     &lt;element name="Eyes" type="vwoc:EyesType" minOccurs="0"/&gt;     &lt;element name="Ears" type="vwoc:EarsType" minOccurs="0"/&gt;     &lt;element name="Nose" type="vwoc:NoseType" minOccurs="0"/&gt;     &lt;element name="MouthLip" type="vwoc:MouthLipType" minOccurs="0"/&gt;     &lt;element name="BodySkin" type="vwoc:SkinType" minOccurs="0"/&gt;     &lt;element name="FacialSkin" type="vwoc:SkinType" minOccurs="0"/&gt;     &lt;element name="Facial" type="vwoc:FacialType" minOccurs="0"/&gt;     &lt;element name="FingerNails" type="vwoc:NailType" minOccurs="0"/&gt;     &lt;element name="ToeNails" type="vwoc:NailType" minOccurs="0"/&gt;     &lt;element name="BodyLook" type="vwoc:BodyLookType" minOccurs="0"/&gt;     &lt;element name="Hair" type="vwoc:HairType" minOccurs="0"/&gt;     &lt;element name="EyeBrows" type="vwoc:EyeBrowsType" minOccurs="0"/&gt;     &lt;element name="FacialHair" type="vwoc:FacialHairType" minOccurs="0"/&gt;     &lt;element name="BodyHair" type="vwoc:BodyHairType" minOccurs="0"/&gt;     &lt;element name="AppearanceResources" type="anyURI" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="FacialCalibrationPoints" type="vwoc:FacialCalibrationPointsType" minOccurs="0"/&gt;     &lt;element name="PhysicalCondition" type="vwoc:PhysicalConditionType" minOccurs="0"/&gt;     &lt;element name="Clothes" type="vwoc:VirtualObjectType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="Shoes" type="vwoc:VirtualObjectType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="Accessories" type="vwoc:VirtualObjectType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="SkinMarks" type="vwoc:VirtualObjectType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt;  &lt;complexType name="BodyType"&gt;   &lt;sequence&gt;     &lt;element name="BodyHeight" type="float" minOccurs="0"/&gt;     &lt;element name="BodyThickness" type="float" minOccurs="0"/&gt;     &lt;element name="BodyFat" type="vwoc:measureUnitLMHType" minOccurs="0"/&gt;     &lt;element name="TorsoMuscles" type="vwoc:measureUnitLMHType" minOccurs="0"/&gt;     &lt;element name="NeckThikness" type="float" minOccurs="0"/&gt;     &lt;element name="NeckLength" type="float" minOccurs="0"/&gt;     &lt;element name="Shoulders" type="float" minOccurs="0"/&gt;     &lt;element name="Pectorials" type="float" minOccurs="0"/&gt;     &lt;element name="ArmLength" type="float" minOccurs="0"/&gt;     &lt;element name="HeadSize" type="float" minOccurs="0"/&gt;     &lt;element name="TorsoLength" type="float" minOccurs="0"/&gt;     &lt;element name="LoveHandles" type="float" minOccurs="0"/&gt;     &lt;element name="BellySize" type="float" minOccurs="0"/&gt;     &lt;element name="LegMuscles" type="float" minOccurs="0"/&gt;     &lt;element name="LegLength" type="float" minOccurs="0"/&gt;     &lt;element name="HipWidth" type="float" minOccurs="0"/&gt;     &lt;element name="HipLength" type="float" minOccurs="0"/&gt;     &lt;element name="ButtSize" type="float" minOccurs="0"/&gt;     &lt;element name="Package" type="vwoc:indicateOfSMBType" minOccurs="0"/&gt;     &lt;element name="SaddleBags" type="vwoc:indicateOfSMBType" minOccurs="0"/&gt;     &lt;element name="KneeAngle" type="vwoc:angleType" minOccurs="0"/&gt;     &lt;element name="FootSize" type="float" minOccurs="0"/&gt;     &lt;element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt;   &lt;attribute name="hapticIDRef" type="IDREF" use="optional"/&gt; &lt;/complexType&gt;  &lt;complexType name="HeadType"&gt;   &lt;sequence&gt;     &lt;element name="HeadSize" type="vwoc:measureUnitSMBType" minOccurs="0"/&gt;     &lt;element name="HeadStretch" type="vwoc:unlimitedPercentageType" minOccurs="0"/&gt;     &lt;element name="HeadShape" minOccurs="0"&gt; </pre> |
|--------|---|

```

    <simpleType>
      <restriction base="string">
        <enumeration value="square"/>
        <enumeration value="round"/>
        <enumeration value="oval"/>
        <enumeration value="long"/>
      </restriction>
    </simpleType>
  </element>
  <element name="EggHead" type="boolean" minOccurs="0"/>
  <element name="HeadLength" type="float" minOccurs="0"/>
  <element name="FaceShear" type="float" minOccurs="0"/>
  <element name="ForeheadSize" type="float" minOccurs="0"/>
  <element name="ForeheadAngle" type="vwoc:angleType" minOccurs="0"/>
  <element name="BrowSize" type="float" minOccurs="0"/>
  <element name="FaceSkin" minOccurs="0">
    <simpleType>
      <restriction base="string">
        <enumeration value="dry"/>
        <enumeration value="normal"/>
        <enumeration value="greasy"/>
      </restriction>
    </simpleType>
  </element>
  <element name="Cheeks" type="vwoc:measureUnitSMBType" minOccurs="0"/>
  <element name="CheeksDepth" type="float" minOccurs="0"/>
  <element name="CheeksShape" minOccurs="0">
    <simpleType>
      <restriction base="string">
        <enumeration value="chubby"/>
        <enumeration value="high"/>
        <enumeration value="bone"/>
      </restriction>
    </simpleType>
  </element>
  <element name="UpperCheeks" type="vwoc:measureUnitSMBType" minOccurs="0"/>
  <element name="LowerCheeks" type="vwoc:measureUnitSMBType" minOccurs="0"/>
  <element name="CheekBones" type="vwoc:indicateOfDMUType" minOccurs="0"/>
  <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
</sequence>
  <attribute name="hapticIDRef" type="IDREF" use="optional"/>
</complexType>

<complexType name="EyesType">
  <sequence>
    <element name="EyeSize" type="float" minOccurs="0"/>
    <element name="EyeOpening" type="vwoc:unlimitedPercentageType" minOccurs="0"/>
    <element name="EyeSpacing" type="float" minOccurs="0"/>
    <element name="OuterEyeCorner" type="vwoc:indicateOfDMUType" minOccurs="0"/>
    <element name="InnerEyeCorner" type="vwoc:indicateOfDMUType" minOccurs="0"/>
    <element name="EyeDepth" type="float" minOccurs="0"/>
    <element name="UpperEyelidFold" type="float" minOccurs="0"/>
    <element name="EyeBags" type="float" minOccurs="0"/>
    <element name="PuffyEyeLids" type="vwoc:indicateOfSMBType" minOccurs="0"/>
    <element name="EyelashLength" type="float" minOccurs="0"/>
    <element name="EyePop" type="float" minOccurs="0"/>
    <element name="EyeColor" type="mpegvct:colorType" minOccurs="0"/>
    <element name="EyeLightness" type="vwoc:percentageType" minOccurs="0"/>
    <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
  </sequence>
  <attribute name="hapticIDRef" type="IDREF" use="optional"/>
</complexType>

<complexType name="EarsType">
  <sequence>

```

```

<element name="EarSize" type="float" minOccurs="0"/>
<element name="EarPosition" type="vwoc:indicateOfDMUType" minOccurs="0"/>
<element name="EarAngle" minOccurs="0">
  <simpleType>
    <restriction base="vwoc:angleType">
      <maxInclusive value="180"/>
    </restriction>
  </simpleType>
</element>
<element name="AttachedEarlobes" type="float" minOccurs="0"/>
<element name="EarTips" type="vwoc:indicateOfPMNType" minOccurs="0"/>
<element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
</sequence>
<attribute name="hapticIDRef" type="IDREF" use="optional"/>
</complexType>

<complexType name="NoseType">
  <sequence>
    <element name="NoseSize" type="float" minOccurs="0"/>
    <element name="NoseWidth" type="float" minOccurs="0"/>
    <element name="NostrillWidth" type="float" minOccurs="0"/>
    <element name="NostrillDivision" type="float" minOccurs="0"/>
    <element name="NoseThickness" type="float" minOccurs="0"/>
    <element name="UpperBridge" type="float" minOccurs="0"/>
    <element name="LowerBridge" type="float" minOccurs="0"/>
    <element name="BridgeWidth" type="float" minOccurs="0"/>
    <element name="NoseTipAngle" type="vwoc:indicateOfDUType" minOccurs="0"/>
    <element name="NoseTipShape" minOccurs="0">
      <simpleType>
        <restriction base="string">
          <enumeration value="pointy"/>
          <enumeration value="bulbous"/>
        </restriction>
      </simpleType>
    </element>
    <element name="CrookedNose" type="vwoc:indicateOfLRTType" minOccurs="0"/>
    <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
  </sequence>
  <attribute name="hapticIDRef" type="IDREF" use="optional"/>
</complexType>

<complexType name="MouthLipType">
  <sequence>
    <element name="LipWidth" type="float" minOccurs="0"/>
    <element name="LipFullness" type="float" minOccurs="0"/>
    <element name="LipThickness" type="float" minOccurs="0"/>
    <element name="LipRatio" type="float" minOccurs="0"/>
    <element name="MouthSize" type="float" minOccurs="0"/>
    <element name="MouthPosition" type="float" minOccurs="0"/>
    <element name="MouthCorner" type="vwoc:indicateOfDMUType" minOccurs="0"/>
    <element name="LipCleftDepth" type="float" minOccurs="0"/>
    <element name="LipCleft" type="float" minOccurs="0"/>
    <element name="ShiftMouth" type="vwoc:indicateOfLMRType" minOccurs="0"/>
    <element name="ChinAngle" minOccurs="0">
      <simpleType>
        <restriction base="string">
          <enumeration value="inner"/>
          <enumeration value="outer"/>
        </restriction>
      </simpleType>
    </element>
    <element name="JawShape" type="vwoc:indicateOfPMNType" minOccurs="0"/>
    <element name="ChinDepth" type="float" minOccurs="0"/>
    <element name="JawAngle" type="float" minOccurs="0"/>
    <element name="JawJut" minOccurs="0">

```

```

    <simpleType>
      <restriction base="string">
        <enumeration value="inside"/>
        <enumeration value="outside"/>
      </restriction>
    </simpleType>
  </element>
  <element name="Jowls" type="float" minOccurs="0"/>
  <element name="ChinCleft" type="vwoc:indicateOfRCType" minOccurs="0"/>
  <element name="UpperChinCleft" type="vwoc:indicateOfRCType" minOccurs="0"/>
  <element name="ChinNeck" type="float" minOccurs="0"/>
  <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
</sequence>
<attribute name="hapticIDRef" type="IDREF" use="optional"/>
</complexType>

<complexType name="SkinType">
  <sequence>
    <element name="SkinPigment" type="mpegvct:colorType" minOccurs="0"/>
    <element name="SkinRuddiness" type="vwoc:percentageType" minOccurs="0"/>
    <element name="SkinRainbowColor" type="mpegvct:colorType" minOccurs="0"/>
    <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
  </sequence>
  <attribute name="hapticIDRef" type="IDREF" use="optional"/>
</complexType>

<complexType name="FacialType">
  <sequence>
    <element name="FacialDefinition" type="vwoc:levelOf5Type" minOccurs="0"/>
    <element name="Freckles" type="vwoc:levelOf5Type" minOccurs="0"/>
    <element name="Wrinkles" type="boolean" minOccurs="0"/>
    <element name="RosyComplexion" type="boolean" minOccurs="0"/>
    <element name="LipPinkness" type="vwoc:levelOf5Type" minOccurs="0"/>
    <element name="Lipstick" type="boolean" minOccurs="0"/>
    <element name="LipstickColor" type="mpegvct:colorType" minOccurs="0"/>
    <element name="LipGloss" type="vwoc:levelOf5Type" minOccurs="0"/>
    <element name="Blush" type="boolean" minOccurs="0"/>
    <element name="BlushColor" type="mpegvct:colorType" minOccurs="0"/>
    <element name="BlushOpacity" type="vwoc:percentageType" minOccurs="0"/>
    <element name="InnerShadow" type="boolean" minOccurs="0"/>
    <element name="InnerShadowColor" type="mpegvct:colorType" minOccurs="0"/>
    <element name="InnerShadowOpacity" type="vwoc:percentageType" minOccurs="0"/>
    <element name="OuterShadow" type="boolean" minOccurs="0"/>
    <element name="OuterShadowOpacity" type="vwoc:percentageType" minOccurs="0"/>
    <element name="EyeLiner" type="boolean" minOccurs="0"/>
    <element name="EyeLinerColor" type="mpegvct:colorType" minOccurs="0"/>
    <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
  </sequence>
  <attribute name="hapticIDRef" type="IDREF" use="optional"/>
</complexType>

<complexType name="NailType">
  <sequence>
    <element name="NailPolish" type="boolean" minOccurs="0"/>
    <element name="NailPolishColor" type="mpegvct:colorType" minOccurs="0"/>
    <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
  </sequence>
  <attribute name="hapticIDRef" type="IDREF" use="optional"/>
</complexType>

<complexType name="BodyLookType">
  <sequence>
    <element name="BodyDefinition" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="BodyFreckles" type="vwoc:levelOf5Type" minOccurs="0"/>
    <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
  </sequence>

```

```

</sequence>
</complexType>

<complexType name="HairType">
  <sequence>
    <element name="HairSize" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="HairStyle" type="mpeg7:termReferenceType" minOccurs="0"/>
    <element name="HairColor" type="mpegvct:colorType" minOccurs="0"/>
    <element name="WhiteHair" type="vwoc:percentageType" minOccurs="0"/>
    <element name="RainbowColor" type="mpegvct:colorType" minOccurs="0"/>
    <element name="BlondeHair" type="vwoc:percentageType" minOccurs="0"/>
    <element name="RedHair" type="vwoc:percentageType" minOccurs="0"/>
    <element name="HairVolume" type="vwoc:indicateOfSMBType" minOccurs="0"/>
    <element name="HairFront" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="HairSides" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="HairBack" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="BigHairFront" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="BigHairTop" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="BigHairBack" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="FrontFrindge" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="SideFrindge" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="BackFrindge" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="FullHairSides" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="HairSweep" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="ShearFront" type="vwoc:indicateOfLMRType" minOccurs="0"/>
    <element name="ShearBack" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="TuperFront" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="TuperBack" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="RumpledHair" minOccurs="0">
      <simpleType>
        <restriction base="string">
          <enumeration value="low"/>
          <enumeration value="moderate"/>
          <enumeration value="high"/>
        </restriction>
      </simpleType>
    </element>
    <element name="PigTails" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="PonyTail" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="SprikedHair" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="HairTilt" type="float" minOccurs="0"/>
    <element name="HairMiddlePart" type="vwoc:indicateOfLHType" minOccurs="0"/>
    <element name="HairRightPart" type="vwoc:indicateOfLHType" minOccurs="0"/>
    <element name="HairLeftPart" type="vwoc:indicateOfLHType" minOccurs="0"/>
    <element name="HairPartsBangs" type="vwoc:indicateOfLHType" minOccurs="0"/>
    <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
  </sequence>
  <attribute name="hapticIDRef" type="IDREF" use="optional"/>
</complexType>

<complexType name="EyebrowsType">
  <sequence>
    <element name="EyebrowSize" type="vwoc:indicateOfSMLType" minOccurs="0"/>
    <element name="EyebrowDensity" minOccurs="0">
      <simpleType>
        <restriction base="string">
          <enumeration value="low"/>
          <enumeration value="moderate"/>
          <enumeration value="high"/>
        </restriction>
      </simpleType>
    </element>
    <element name="EyebrowHeight" type="vwoc:measureUnitLMHType" minOccurs="0"/>
    <element name="EyebrowArc" minOccurs="0">
      <simpleType>

```

```

        <restriction base="string">
            <enumeration value="flat"/>
            <enumeration value="middle"/>
            <enumeration value="arched"/>
        </restriction>
    </simpleType>
</element>
<element name="EyebrowPoints" type="vwoc:indicateOfDMUType" minOccurs="0"/>
<element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
</sequence>
<attribute name="hapticIDRef" type="IDREF" use="optional"/>
</complexType>

<complexType name="FacialHairType">
    <sequence>
        <element name="FacialHairThickness" type="vwoc:measureUnitLMHType" minOccurs="0"/>
        <element name="FacialSideburns" type="mpegvct:colorType" minOccurs="0"/>
        <element name="FacialMustache" type="boolean" minOccurs="0"/>
        <element name="FacialChinCurtains" type="boolean" minOccurs="0"/>
        <element name="FacialsoulPatch" type="boolean" minOccurs="0"/>
        <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
    <attribute name="hapticIDRef" type="IDREF" use="optional"/>
</complexType>

<complexType name="BodyHairType">
    <sequence>
        <element name="HairColor" type="mpegvct:colorType" minOccurs="0"/>
        <element name="HairThickness" type="vwoc:measureUnitLMHType" minOccurs="0"/>
        <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
</complexType>

<complexType name="FacialCalibrationPointsType">
    <sequence>
        <element name="Sellion" type="vwoc:PointType" minOccurs="0"/>
        <element name="RInfraorbitale" type="vwoc:PointType" minOccurs="0"/>
        <element name="LInfraorbitale" type="vwoc:PointType" minOccurs="0"/>
        <element name="Supramenton" type="vwoc:PointType" minOccurs="0"/>
        <element name="RTragion" type="vwoc:PointType" minOccurs="0"/>
        <element name="RGonion" type="vwoc:PointType" minOccurs="0"/>
        <element name="LTragion" type="vwoc:PointType" minOccurs="0"/>
        <element name="LGonion" type="vwoc:PointType" minOccurs="0"/>
        <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
</complexType>

<complexType name="PhysicalConditionType">
    <sequence>
        <element name="BodyStrength" type="vwoc:unlimitedPercentageType" minOccurs="0"/>
        <element name="BodyFlexibility" type="vwoc:indicateOfLMHType" minOccurs="0"/>
        <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
</complexType>

```

5.3.2 Binary representation syntax

| AvatarAppearanceType{       | Number of bits | Mnemonic |
|-----------------------------|----------------|----------|
| BodyFlag                    | 1              | bslbf    |
| HeadFlag                    | 1              | bslbf    |
| EyesFlag                    | 1              | bslbf    |
| EarsFlag                    | 1              | bslbf    |
| NoseFlag                    | 1              | bslbf    |
| MouthLipFlag                | 1              | bslbf    |
| BodySkinFlag                | 1              | bslbf    |
| FacialSkinFlag              | 1              | bslbf    |
| FacialFlag                  | 1              | bslbf    |
| FingerNailsFlag             | 1              | bslbf    |
| ToeNailsFlag                | 1              | bslbf    |
| BodyLookFlag                | 1              | bslbf    |
| HairFlag                    | 1              | bslbf    |
| EyeBrowsFlag                | 1              | bslbf    |
| FacialHairFlag              | 1              | bslbf    |
| BodyHairFlag                | 1              | bslbf    |
| AppearanceResourcesFlag     | 1              | bslbf    |
| FacialCalibrationPointsFlag | 1              | bslbf    |
| PhysicalConditionFlag       | 1              | bslbf    |
| ClothesFlag                 | 1              | bslbf    |
| ShoesFlag                   | 1              | bslbf    |
| AccessoriesFlag             | 1              | bslbf    |
| SkinMarksFlag               | 1              | bslbf    |
| ExtraFlag                   | 1              | bslbf    |
| if(BodyFlag){               |                |          |

|                      |  |              |
|----------------------|--|--------------|
| Body                 |  | BodyType     |
| }                    |  |              |
| if(HeadFlag){        |  |              |
| Head                 |  | HeadType     |
| }                    |  |              |
| if(EyesFlag){        |  |              |
| Eyes                 |  | EyesType     |
| }                    |  |              |
| if(EarsFlag){        |  |              |
| Ears                 |  | EarsType     |
| }                    |  |              |
| if(NoseFlag){        |  |              |
| Nose                 |  | NoseType     |
| }                    |  |              |
| if(MouthLipFlag){    |  |              |
| MouthLip             |  | MouthLipType |
| }                    |  |              |
| if(BodySkinFlag){    |  |              |
| BodySkin             |  | SkinType     |
| }                    |  |              |
| if(FacialSkinFlag){  |  |              |
| FacialSkin           |  | SkinType     |
| }                    |  |              |
| if(FacialFlag){      |  |              |
| Facial               |  | FacialType   |
| }                    |  |              |
| if(FingerNailsFlag){ |  |              |

|   |                                     |                |
|---|-------------------------------------|----------------|
| FingerNails                               |                                     | NailType       |
| }   |                                     |                |
| if(ToeNailsFlag){                         |                                     |                |
| ToeNails                                  |                                     | NailType       |
| }   |                                     |                |
| if(BodyLookFlag){                         |                                     |                |
| BodyLook                                  |                                     | BodyLookType   |
| }   |                                     |                |
| if(HairFlag){                             |                                     |                |
| Hair                                      |                                     | HairType       |
| }   |                                     |                |
| if(EyeBrowsFlag){                         |                                     |                |
| EyeBrows                                  |                                     | EyeBrowsType   |
| }   |                                     |                |
| if(FacialHairFlag){                       |                                     |                |
| FacialHair                                |                                     | FacialHairType |
| }   |                                     |                |
| if(BodyHairFlag){                         |                                     |                |
| BodyHair                                  |                                     | BodyHairType   |
| }   |                                     |                |
| if(AppearanceResourcesFlag){              |                                     |                |
| NumAppearanceResources                    |                                     | vluimsbf5      |
| for(k=0; k< NumAppearanceResources; k++){ |                                     |                |
| AppearanceResources[k]                    | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8          |
| }   |                                     |                |
| }   |                                     |                |

|                                   |  |                             |
|-----------------------------------|--|-----------------------------|
| if(FacialCalibrationPointsFlag){  |  |                             |
| FacialCalibrationPoints           |  | FacialCalibrationPointsType |
| }                                 |  |                             |
| if(PhysicalConditionFlag){        |  |                             |
| PhysicalCondition                 |  | PhysicalConditionType       |
| }                                 |  |                             |
| if(ClothesFlag){                  |  |                             |
| NumClothes                        |  | vluimsbf5                   |
| for(k=0; k< NumClothes; k++){     |  |                             |
| Clothes[k]                        |  | VirtualObjectType           |
| }                                 |  |                             |
| }                                 |  |                             |
| if(ShoesFlag){                    |  |                             |
| NumShoes                          |  | vluimsbf5                   |
| for(k=0; k< NumShoes; k++){       |  |                             |
| Shoes[k]                          |  | VirtualObjectType           |
| }                                 |  |                             |
| }                                 |  |                             |
| if(AccessoriesFlag){              |  |                             |
| NumAccessories                    |  | vluimsbf5                   |
| for(k=0; k< NumAccessories; k++){ |  |                             |
| Accessories[k]                    |  | VirtualObjectType           |
| }                                 |  |                             |
| }                                 |  |                             |
| if(SkinMarksFlag){                |  |                             |
| NumSkinMarks                      |  | vluimsbf5                   |

|                                 |                       |                   |
|---------------------------------|-----------------------|-------------------|
| for(k=0; k< NumSkinMarks; k++){ |                       |                   |
| SkinMarks[k]                    |                       | VirtualObjectType |
| }                               |                       |                   |
| }                               |                       |                   |
| if(ExtraFlag){                  |                       |                   |
| NumExtra                        |                       | vluimsbf5         |
| for(k=0; k< NumExtra; k++){     |                       |                   |
| Extra[k]                        |                       | ExtraType         |
| }                               |                       |                   |
| }                               |                       |                   |
| }                               |                       |                   |
|                                 |                       |                   |
| <b>BodyType{</b>                | <b>Number of bits</b> | <b>Mnemonic</b>   |
| BodyHeightFlag                  | 1                     | bslbf             |
| BodyThicknessFlag               | 1                     | bslbf             |
| BodyFatFlag                     | 1                     | bslbf             |
| TorsoMusclesFlag                | 1                     | bslbf             |
| NeckThiknessFlag                | 1                     | bslbf             |
| NeckLengthFlag                  | 1                     | bslbf             |
| ShouldersFlag                   | 1                     | bslbf             |
| PectorialsFlag                  | 1                     | bslbf             |
| ArmLengthFlag                   | 1                     | bslbf             |
| HeadSizeFlag                    | 1                     | bslbf             |
| TorsoLengthFlag                 | 1                     | bslbf             |
| LoveHandlesFlag                 | 1                     | bslbf             |
| BellySizeFlag                   | 1                     | bslbf             |
| LegMusclesFlag                  | 1                     | bslbf             |

|                         |    |                        |
|-------------------------|----|------------------------|
| LegLengthFlag           | 1  | bslbf                  |
| HipWidthFlag            | 1  | bslbf                  |
| HipLengthFlag           | 1  | bslbf                  |
| ButtSizeFlag            | 1  | bslbf                  |
| PackageFlag             | 1  | bslbf                  |
| SaddleBagsFlag          | 1  | bslbf                  |
| KneeAngleFlag           | 1  | bslbf                  |
| FootSizeFlag            | 1  | bslbf                  |
| ExtraFlag               | 1  | bslbf                  |
| hapticIDRefFlag         | 1  | bslbf                  |
| if(BodyHeightFlag) {    |    |                        |
| BodyHeight              | 32 | fsbf                   |
| }                       |    |                        |
| if(BodyThicknessFlag) { |    |                        |
| BodyThickness           | 32 | fsbf                   |
| }                       |    |                        |
| if(BodyHeightFlag) {    |    |                        |
| BodyFat                 |    | measureUnitLMHTy<br>pe |
| }                       |    |                        |
| if(TorsoMusclesFlag) {  |    |                        |
| TorsoMuscles            |    | measureUnitLMHTy<br>pe |
| }                       |    |                        |
| if(NeckThicknessFlag) { |    |                        |
| NeckThickness           | 32 | fsbf                   |
| }                       |    |                        |
| if(NeckLengthFlag) {    |    |                        |

|                       |    |      |
|-----------------------|----|------|
| NeckLengthness        | 32 | fsbf |
| }                     |    |      |
| if(ShouldersFlag) {   |    |      |
| Shoulders             | 32 | fsbf |
| }                     |    |      |
| if(PectorialsFlag) {  |    |      |
| Pectorials            | 32 | fsbf |
| }                     |    |      |
| if(ArmLengthFlag) {   |    |      |
| ArmLength             | 32 | fsbf |
| }                     |    |      |
| if(HeadSizeFlag) {    |    |      |
| HeadSize              | 32 | fsbf |
| }                     |    |      |
| if(TorsoLengthFlag) { |    |      |
| TorsoLength           | 32 | fsbf |
| }                     |    |      |
| if(LoveHandlesFlag) { |    |      |
| LoveHandles           | 32 | fsbf |
| }                     |    |      |
| if(BellySizeFlag) {   |    |      |
| BellySize             | 32 | fsbf |
| }                     |    |      |
| if(LegMusclesFlag) {  |    |      |
| LegMuscles            | 32 | fsbf |
| }                     |    |      |
| if(LegLengthFlag) {   |    |      |

|                             |    |                   |
|-----------------------------|----|-------------------|
| LegLength                   | 32 | fsbf              |
| }                           |    |                   |
| if(HipWidthFlag) {          |    |                   |
| HipWidth                    | 32 | fsbf              |
| }                           |    |                   |
| if(HipLengthFlag) {         |    |                   |
| HipLength                   | 32 | fsbf              |
| }                           |    |                   |
| if(ButtSizeFlag) {          |    |                   |
| ButtSize                    | 32 | fsbf              |
| }                           |    |                   |
| if(PackageFlag) {           |    |                   |
| Package                     |    | indicateOfSMBType |
| }                           |    |                   |
| if(SaddleBagsFlag) {        |    |                   |
| SaddleBags                  |    | indicateOfSMBType |
| }                           |    |                   |
| if(KneeAngleFlag) {         |    |                   |
| KneeAngle                   |    | angleType         |
| }                           |    |                   |
| if(FootSizeFlag) {          |    |                   |
| FootSize                    | 32 | fsbf              |
| }                           |    |                   |
| if(ExtraFlag){              |    |                   |
| NumExtra                    |    | vluimsbf5         |
| for(k=0; k< NumExtra; k++){ |    |                   |
| Extra[k]                    |    | ExtraType         |

|                       |                                     |                 |
|-----------------------|-------------------------------------|-----------------|
| }                     |                                     |                 |
| }                     |                                     |                 |
| if(hapticIDRefFlag) { |                                     |                 |
| hapticIDRef           | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8           |
| }                     |                                     |                 |
| }                     |                                     |                 |
|                       |                                     |                 |
| <b>HeadType{</b>      | <b>Number of bits</b>               | <b>Mnemonic</b> |
| HeadSizeFlag          | 1                                   | bslbf           |
| HeadStrechFlag        | 1                                   | bslbf           |
| HeadShapeFlag         | 1                                   | bslbf           |
| EggHeadFlag           | 1                                   | bslbf           |
| HeadLengthFlag        | 1                                   | bslbf           |
| FaceShearFlag         | 1                                   | bslbf           |
| ForeheadSizeFlag      | 1                                   | bslbf           |
| ForeheadAngleFlag     | 1                                   | bslbf           |
| BrowSizeFlag          | 1                                   | bslbf           |
| FaceSkinFlag          | 1                                   | bslbf           |
| CheeksFlag            | 1                                   | bslbf           |
| CheeksDepthFlag       | 1                                   | bslbf           |
| CheeksShapeFlag       | 1                                   | bslbf           |
| UpperCheeksFlag       | 1                                   | bslbf           |
| LowerCheeksFlag       | 1                                   | bslbf           |
| CheekBonesFlag        | 1                                   | bslbf           |
| ExtraFlag             | 1                                   | bslbf           |
| hapticIDRefFlag       | 1                                   | bslbf           |

|                        |    |                         |
|------------------------|----|-------------------------|
| if(HeadSizeFlag){      |    |                         |
| HeadSize               |    | measureUnitSMBType      |
| }                      |    |                         |
| if(HeadStrechFlag){    |    |                         |
| HeadStrech             | 32 | unlimitedPercentageType |
| }                      |    |                         |
| if(HeadShapeFlag){     |    |                         |
| HeadShape              | 2  | bslbf                   |
| }                      |    |                         |
| if(EggHeadFlag){       |    |                         |
| EggHead                | 1  | bslbf                   |
| }                      |    |                         |
| if(HeadLengthFlag){    |    |                         |
| HeadLength             | 32 | fsbf                    |
| }                      |    |                         |
| if(FaceShearFlag){     |    |                         |
| FaceShear              | 32 | fsbf                    |
| }                      |    |                         |
| if(ForeheadSizeFlag){  |    |                         |
| ForeheadSize           | 32 | fsbf                    |
| }                      |    |                         |
| if(ForeheadAngleFlag){ |    |                         |
| ForeheadAngle          |    | angleType               |
| }                      |    |                         |
| if(BrowSizeFlag){      |    |                         |
| BrowSize               | 32 | fsbf                    |

|                             |    |                    |
|-----------------------------|----|--------------------|
| }                           |    |                    |
| if(FaceSkinFlag){           |    |                    |
| FaceSkin                    | 2  | bslbf              |
| }                           |    |                    |
| if(CheeksFlag){             |    |                    |
| Cheeks                      |    | measureUnitSMBType |
| }                           |    |                    |
| if(CheeksDepthFlag){        |    |                    |
| CheeksDepth                 | 32 | fsbf               |
| }                           |    |                    |
| if(CheeksShapeFlag){        |    |                    |
| CheeksShape                 | 2  | bslbf              |
| }                           |    |                    |
| if(UpperCheeksFlag){        |    |                    |
| UpperCheeks                 |    | measureUnitSMBType |
| }                           |    |                    |
| if(LowerCheeksFlag){        |    |                    |
| LowerCheeks                 |    | measureUnitSMBType |
| }                           |    |                    |
| if(CheekBonesFlag){         |    |                    |
| CheekBones                  |    | indicateOfDMUType  |
| }                           |    |                    |
| if(ExtraFlag){              |    |                    |
| NumExtra                    |    | vluimsbf5          |
| for(k=0; k< NumExtra; k++){ |    |                    |

|                      |                                     |                 |
|----------------------|-------------------------------------|-----------------|
| Extra[k]             |                                     | ExtraType       |
| }                    |                                     |                 |
| }                    |                                     |                 |
| if(hapticIDRefFlag){ |                                     |                 |
| hapticIDRef          | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8           |
| }                    |                                     |                 |
| }                    |                                     |                 |
|                      |                                     |                 |
| EyesType{            | <b>Number of bits</b>               | <b>Mnemonic</b> |
| EyeSizeFlag          | 1                                   | bslbf           |
| EyeOpeningFlag       | 1                                   | bslbf           |
| EyeSpacingFlag       | 1                                   | bslbf           |
| OuterEyeCornerFlag   | 1                                   | bslbf           |
| InnerEyeCornerFlag   | 1                                   | bslbf           |
| EyeDepthFlag         | 1                                   | bslbf           |
| UpperEyelidFoldFlag  | 1                                   | bslbf           |
| EyeBagsFlag          | 1                                   | bslbf           |
| PuffyEyeLidsFlag     | 1                                   | bslbf           |
| EyelashLengthFlag    | 1                                   | bslbf           |
| EyePopFlag           | 1                                   | bslbf           |
| EyeColorFlag         | 1                                   | bslbf           |
| EyeLightnessFlag     | 1                                   | bslbf           |
| ExtraFlag            | 1                                   | bslbf           |
| hapticIDRefFlag      | 1                                   | bslbf           |
| if(EyeSizeFlag){     |                                     |                 |
| EyeSize              | 32                                  | fsbf            |

|                          |    |                         |
|--------------------------|----|-------------------------|
| }                        |    |                         |
| if(EyeOpeningFlag){      |    |                         |
| EyeOpening               |    | unlimitedPercentageType |
| }                        |    |                         |
| if(EyeSpacingFlag){      |    |                         |
| EyeSpacing               | 32 | fsbf                    |
| }                        |    |                         |
| if(OuterEyeCornerFlag){  |    |                         |
| OuterEyeCorner           |    | indicateOfDMUType       |
| }                        |    |                         |
| if(InnerEyeCornerFlag){  |    |                         |
| InnerEyeCorner           |    | indicateOfDMUType       |
| }                        |    |                         |
| if(EyeDepthFlag){        |    |                         |
| EyeDepth                 | 32 | fsbf                    |
| }                        |    |                         |
| if(UpperEyelidFoldFlag){ |    |                         |
| UpperEyelidFold          | 32 | fsbf                    |
| }                        |    |                         |
| if(EyeBagsFlag){         |    |                         |
| EyeBags                  | 32 | fsbf                    |
| }                        |    |                         |
| if(PuffyEyeLidsFlag){    |    |                         |
| PuffyEyeLids             |    | indicateOfSMBType       |
| }                        |    |                         |
| if(EyelashLengthFlag){   |    |                         |

|                             |                                     |                |
|-----------------------------|-------------------------------------|----------------|
| EyelashLength               | 32                                  | fsbf           |
| }                           |                                     |                |
| if(EyePopFlag){             |                                     |                |
| EyePop                      | 32                                  | fsbf           |
| }                           |                                     |                |
| if(EyeColorFlag){           |                                     |                |
| EyeColor                    |                                     | colorType      |
| }                           |                                     |                |
| if(EyeLightnessFlag){       |                                     |                |
| EyeLightness                |                                     | percentageType |
| }                           |                                     |                |
| if(ExtraFlag){              |                                     |                |
| NumExtra                    |                                     | vluimsbf5      |
| for(k=0; k< NumExtra; k++){ |                                     |                |
| Extra[k]                    |                                     | ExtraType      |
| }                           |                                     |                |
| }                           |                                     |                |
| if(hapticIDRefFlag){        |                                     |                |
| hapticIDRef                 | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8          |
| }                           |                                     |                |
| }                           |                                     |                |
|                             |                                     |                |

| EarsType{                   | Number of bits | Mnemonic          |
|-----------------------------|----------------|-------------------|
| EarSizeFlag                 | 1              | bslbf             |
| EarPositionFlag             | 1              | bslbf             |
| EarAngleFlag                | 1              | bslbf             |
| AttachedEarlobesFlag        | 1              | bslbf             |
| EarTipsFlag                 | 1              | bslbf             |
| ExtraFlag                   | 1              | bslbf             |
| hapticIDRefFlag             | 1              | bslbf             |
| if(EyeSizeFlag){            |                |                   |
| EarSize                     | 32             | fsbf              |
| }                           |                |                   |
| if(EarPositionFlag){        |                |                   |
| EarPosition                 |                | indicateOfDMUType |
| }                           |                |                   |
| if(EarAngleFlag){           |                |                   |
| EarAngle                    |                | angleType         |
| }                           |                |                   |
| if(AttachedEarlobesFlag){   |                |                   |
| AttachedEarlobes            | 32             | fsbf              |
| }                           |                |                   |
| if(EarTipsFlag){            |                |                   |
| EarTips                     |                | indicateOfPMNType |
| }                           |                |                   |
| if(ExtraFlag){              |                |                   |
| NumExtra                    |                | vluimsbf5         |
| for(k=0; k< NumExtra; k++){ |                |                   |
| Extra[k]                    |                | ExtraType         |

|                      |                                     |                 |
|----------------------|-------------------------------------|-----------------|
| }                    |                                     |                 |
| }                    |                                     |                 |
| if(hapticIDRefFlag){ |                                     |                 |
| hapticIDRef          | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8           |
| }                    |                                     |                 |
| }                    |                                     |                 |
|                      |                                     |                 |
| <b>NoseType{</b>     | <b>Number of bits</b>               | <b>Mnemonic</b> |
| NoseSizeFlag         | 1                                   | bslbf           |
| NoseWidthFlag        | 1                                   | bslbf           |
| NostrillWidthFlag    | 1                                   | bslbf           |
| NostrillDivisionFlag | 1                                   | bslbf           |
| NoseThicknessFlag    | 1                                   | bslbf           |
| UpperBridgeFlag      | 1                                   | bslbf           |
| LowerBridgeFlag      | 1                                   | bslbf           |
| BridgeWidthFlag      | 1                                   | bslbf           |
| NoseTipAngleFlag     | 1                                   | bslbf           |
| NoseTipShapeFlag     | 1                                   | bslbf           |
| CrookedNoseFlag      | 1                                   | bslbf           |
| ExtraFlag            | 1                                   | bslbf           |
| hapticIDRefFlag      | 1                                   | bslbf           |
| if(NoseSizeFlag){    |                                     |                 |
| NoseSize             | 32                                  | fsbf            |
| }                    |                                     |                 |
| if(NoseWidthFlag){   |                                     |                 |
| NoseWidth            | 32                                  | fsbf            |

|                           |    |                  |
|---------------------------|----|------------------|
| }                         |    |                  |
| if(NostrillWidthFlag){    |    |                  |
| NostrillWidth             | 32 | fsbf             |
| }                         |    |                  |
| if(NostrillDivisionFlag){ |    |                  |
| NostrillDivision          | 32 | fsbf             |
| }                         |    |                  |
| if(NoseThicknessFlag){    |    |                  |
| NoseThickness             | 32 | fsbf             |
| }                         |    |                  |
| if(UpperBridgeFlag){      |    |                  |
| UpperBridge               | 32 | fsbf             |
| }                         |    |                  |
| if(LowerBridgeFlag){      |    |                  |
| LowerBridge               | 32 | fsbf             |
| }                         |    |                  |
| if(BridgeWidthFlag){      |    |                  |
| BridgeWidth               | 32 | fsbf             |
| }                         |    |                  |
| if(NoseTipAngleFlag){     |    |                  |
| NoseTipAngle              |    | indicateOfDUType |
| }                         |    |                  |
| if(NoseTipShapeFlag){     |    |                  |
| NoseTipShape              | 1  | bslbf            |
| }                         |    |                  |
| if(CrookedNoseFlag){      |    |                  |
| CrookedNose               |    | indicateOfLRType |

|                             |                                     |                 |
|-----------------------------|-------------------------------------|-----------------|
| }                           |                                     |                 |
| if(ExtraFlag){              |                                     |                 |
| NumExtra                    |                                     | vluimsbf5       |
| for(k=0; k< NumExtra; k++){ |                                     |                 |
| Extra[k]                    |                                     | ExtraType       |
| }                           |                                     |                 |
| }                           |                                     |                 |
| if(hapticIDRefFlag){        |                                     |                 |
| hapticIDRef                 | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8           |
| }                           |                                     |                 |
| }                           |                                     |                 |
|                             |                                     |                 |
| <b>MouthLipType{</b>        | <b>Number of bits</b>               | <b>Mnemonic</b> |
| LipWidthFlag                | 1                                   | bslbf           |
| LipFullnessFlag             | 1                                   | bslbf           |
| LipThicknessFlag            | 1                                   | bslbf           |
| LipRatioFlag                | 1                                   | bslbf           |
| MouthSizeFlag               | 1                                   | bslbf           |
| MouthPositionFlag           | 1                                   | bslbf           |
| MouthCornerFlag             | 1                                   | bslbf           |
| LipCleftDepthFlag           | 1                                   | bslbf           |
| LipCleftFlag                | 1                                   | bslbf           |
| ShiftMouthFlag              | 1                                   | bslbf           |
| ChinAngleFlag               | 1                                   | bslbf           |
| JawShapeFlag                | 1                                   | bslbf           |
| ChinDepthFlag               | 1                                   | bslbf           |

|                        |    |       |
|------------------------|----|-------|
| JawAngleFlag           | 1  | bslbf |
| JawJutFlag             | 1  | bslbf |
| JowlsFlag              | 1  | bslbf |
| ChinCleftFlag          | 1  | bslbf |
| UpperChinCleftFlag     | 1  | bslbf |
| ChinNeckFlag           | 1  | bslbf |
| ExtraFlag              | 1  | bslbf |
| hapticIDRefFlag        | 1  | bslbf |
| if(LipWidthFlag){      |    |       |
| LipWidth               | 32 | fsbf  |
| }                      |    |       |
| if(LipFullnessFlag){   |    |       |
| LipFullness            | 32 | fsbf  |
| }                      |    |       |
| if(LipThicknessFlag){  |    |       |
| LipThickness           | 32 | fsbf  |
| }                      |    |       |
| if(LipRatioFlag){      |    |       |
| LipRatio               | 32 | fsbf  |
| }                      |    |       |
| if(MouthSizeFlag){     |    |       |
| MouthSize              | 32 | fsbf  |
| }                      |    |       |
| if(MouthPositionFlag){ |    |       |
| MouthPosition          | 32 | fsbf  |
| }                      |    |       |
| if(MouthCornerFlag){   |    |       |

|                        |    |                   |
|------------------------|----|-------------------|
| MouthCorner            |    | indicateOfDMUType |
| }                      |    |                   |
| if(LipCleftDepthFlag){ |    |                   |
| LipCleftDepth          | 32 | fsbf              |
| }                      |    |                   |
| if(LipCleftFlag){      |    |                   |
| LipCleft               | 32 | fsbf              |
| }                      |    |                   |
| if(ShiftMouthFlag){    |    |                   |
| ShiftMouth             |    | indicateOfLMRType |
| }                      |    |                   |
| if(ChinAngleFlag){     |    |                   |
| ChinAngle              | 1  | bslbf             |
| }                      |    |                   |
| if(JawShapeFlag){      |    |                   |
| JawShape               |    | indicateOfPMNType |
| }                      |    |                   |
| if(ChinDepthFlag){     |    |                   |
| ChinDepth              | 32 | fsbf              |
| }                      |    |                   |
| if(JawAngleFlag){      |    |                   |
| JawAngle               | 32 | fsbf              |
| }                      |    |                   |
| if(JawJutFlag){        |    |                   |
| JawJut                 | 1  | bslbf             |
| }                      |    |                   |
| if(JowlsFlag){         |    |                   |

|                             |                                     |                  |
|-----------------------------|-------------------------------------|------------------|
| Jowls                       | 32                                  | fsbf             |
| }                           |                                     |                  |
| if(ChinCleftFlag){          |                                     |                  |
| ChinCleft                   |                                     | indicateOfRCType |
| }                           |                                     |                  |
| if(UpperChinCleftFlag){     |                                     |                  |
| UpperChinCleft              |                                     | indicateOfRCType |
| }                           |                                     |                  |
| if(ChinNeckFlag){           |                                     |                  |
| ChinNeck                    | 32                                  | fsbf             |
| }                           |                                     |                  |
| if(ExtraFlag){              |                                     |                  |
| NumExtra                    |                                     | vluimsbf5        |
| for(k=0; k< NumExtra; k++){ |                                     |                  |
| Extra[k]                    |                                     | ExtraType        |
| }                           |                                     |                  |
| }                           |                                     |                  |
| if(hapticIDRefFlag){        |                                     |                  |
| hapticIDRef                 | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8            |
| }                           |                                     |                  |
| }                           |                                     |                  |
|                             |                                     |                  |

| SkinType{                   | Number of bits                      | Mnemonic       |
|-----------------------------|-------------------------------------|----------------|
| SkinPigmentFlag             | 1                                   | bslbf          |
| SkinRuddinessFlag           | 1                                   | bslbf          |
| SkinRainbowColorFlag        | 1                                   | bslbf          |
| ExtraFlag                   | 1                                   | bslbf          |
| hapticIDRefFlag             | 1                                   | bslbf          |
| if(SkinPigmentFlag){        |                                     |                |
| SkinPigment                 |                                     | colorType      |
| }                           |                                     |                |
| if(SkinRuddinessFlag){      |                                     |                |
| SkinRuddiness               |                                     | percentageType |
| }                           |                                     |                |
| if(SkinRainbowColorFlag){   |                                     |                |
| SkinRainbowColor            |                                     | colorType      |
| }                           |                                     |                |
| if(ExtraFlag){              |                                     |                |
| NumExtra                    |                                     | vluimsbf5      |
| for(k=0; k< NumExtra; k++){ |                                     |                |
| Extra[k]                    |                                     | ExtraType      |
| }                           |                                     |                |
| }                           |                                     |                |
| if(hapticIDRefFlag){        |                                     |                |
| hapticIDRef                 | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8          |
| }                           |                                     |                |
| }                           |                                     |                |
|                             |                                     |                |

| FacialType{               | Number of bits | Mnemonic     |
|---------------------------|----------------|--------------|
| FacialDefinitionFlag      | 1              | bslbf        |
| FrecklesFlag              | 1              | bslbf        |
| WrinklesFlag              | 1              | bslbf        |
| RosyComplexionFlag        | 1              | bslbf        |
| LipPinknessFlag           | 1              | bslbf        |
| LipstickFlag              | 1              | bslbf        |
| LipstickColorFlag         | 1              | bslbf        |
| LipGlossFlag              | 1              | bslbf        |
| BlushFlag                 | 1              | bslbf        |
| BlushColorFlag            | 1              | bslbf        |
| BlushOpacityFlag          | 1              | bslbf        |
| InnerShadowFlag           | 1              | bslbf        |
| InnerShadowColorFlag      | 1              | bslbf        |
| InnerShadowOppacityFlag   | 1              | bslbf        |
| OuterShadowFlag           | 1              | bslbf        |
| OuterShadowOppacityFlag   | 1              | bslbf        |
| EyeLinerFlag              | 1              | bslbf        |
| EyeLinerColorFlag         | 1              | bslbf        |
| ExtraFlag                 | 1              | bslbf        |
| hapticIDRefFlag           | 1              | bslbf        |
| if(FacialDefinitionFlag){ |                |              |
| FacialDefinition          |                | levelOf5Type |
| }                         |                |              |
| if(FrecklesFlag){         |                |              |
| Freckles                  |                | levelOf5Type |
| }                         |                |              |

|                         |   |                |
|-------------------------|---|----------------|
| if(WrinklesFlag){       |   |                |
| Wrinkles                | 1 | bslbf          |
| }                       |   |                |
| if(RosyComplexionFlag){ |   |                |
| RosyComplexion          | 1 | bslbf          |
| }                       |   |                |
| if(LipPinknessFlag){    |   |                |
| LipPinkness             |   | levelOf5Type   |
| }                       |   |                |
| if(LipstickFlag){       |   |                |
| Lipstick                | 1 | bslbf          |
| }                       |   |                |
| if(LipstickColorFlag){  |   |                |
| LipstickColor           |   | colorType      |
| }                       |   |                |
| if(LipGlossFlag){       |   |                |
| LipGloss                |   | levelOf5Type   |
| }                       |   |                |
| if(BlushFlag){          |   |                |
| Blush                   | 1 | bslbf          |
| }                       |   |                |
| if(BlushColorFlag){     |   |                |
| BlushColor              |   | colorType      |
| }                       |   |                |
| if(BlushOpacityFlag){   |   |                |
| BlushOpacity            |   | percentageType |
| }                       |   |                |

|                              |   |                |
|------------------------------|---|----------------|
| if(InnerShadowFlag){         |   |                |
| InnerShadow                  | 1 | bslbf          |
| }                            |   |                |
| if(InnerShadowColorFlag){    |   |                |
| InnerShadowColor             |   | colorType      |
| }                            |   |                |
| if(InnerShadowOppacityFlag){ |   |                |
| InnerShadowOppacity          |   | percentageType |
| }                            |   |                |
| if(OuterShadowFlag){         |   |                |
| OuterShadow                  | 1 | bslbf          |
| }                            |   |                |
| if(OuterShadowOppacityFlag){ |   |                |
| OuterShadowOppacity          |   | percentageType |
| }                            |   |                |
| if(EyeLinerFlag){            |   |                |
| EyeLiner                     | 1 | bslbf          |
| }                            |   |                |
| if(EyeLinerColorFlag){       |   |                |
| EyeLinerColor                |   | colorType      |
| }                            |   |                |
| if(ExtraFlag){               |   |                |
| NumExtra                     |   | vluimsbf5      |
| for(k=0; k< NumExtra; k++){  |   |                |
| Extra[k]                     |   | ExtraType      |
| }                            |   |                |
| }                            |   |                |

|                             |                                     |                 |
|-----------------------------|-------------------------------------|-----------------|
| if(hapticIDRefFlag){        |                                     |                 |
| hapticIDRef                 | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8           |
| }                           |                                     |                 |
| }                           |                                     |                 |
|                             |                                     |                 |
| <b>NailType{</b>            | <b>Number of bits</b>               | <b>Mnemonic</b> |
| NailPolishFlag              | 1                                   | bslbf           |
| NailPolishColorFlag         | 1                                   | bslbf           |
| ExtraFlag                   | 1                                   | bslbf           |
| hapticIDRefFlag             | 1                                   | bslbf           |
| if(NailPolishFlag){         |                                     |                 |
| NailPolish                  | 1                                   | bslbf           |
| }                           |                                     |                 |
| if(NailPolishColorFlag){    |                                     |                 |
| NailPolishColor             |                                     | colorType       |
| }                           |                                     |                 |
| if(ExtraFlag){              |                                     |                 |
| NumExtra                    |                                     | vluimsbf5       |
| for(k=0; k< NumExtra; k++){ |                                     |                 |
| Extra[k]                    |                                     | ExtraType       |
| }                           |                                     |                 |
| }                           |                                     |                 |
| if(hapticIDRefFlag){        |                                     |                 |
| hapticIDRef                 | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8           |
| }                           |                                     |                 |
| }                           |                                     |                 |

| BodyLookType{               | Number of bits | Mnemonic          |
|-----------------------------|----------------|-------------------|
| BodyDefinitionFlag          | 1              | bslbf             |
| BodyFrecklesFlag            | 1              | bslbf             |
| ExtraFlag                   | 1              | bslbf             |
| if(BodyDefinitionFlag){     |                |                   |
| BodyDefinition              |                | indicateOfSMLType |
| }                           |                |                   |
| if(BodyFrecklesFlag){       |                |                   |
| BodyFreckles                |                | levelOf5Type      |
| }                           |                |                   |
| if(ExtraFlag){              |                |                   |
| NumExtra                    |                | vluimsbf5         |
| for(k=0; k< NumExtra; k++){ |                |                   |
| Extra[k]                    |                | ExtraType         |
| }                           |                |                   |
| }                           |                |                   |
| }                           |                |                   |
|                             |                |                   |
| HairType{                   | Number of bits | Mnemonic          |
| HairSizeFlag                | 1              | bslbf             |
| HairStyleFlag               | 1              | bslbf             |
| HairColorFlag               | 1              | bslbf             |
| WhiteHairFlag               | 1              | bslbf             |
| RainbowColorFlag            | 1              | bslbf             |
| BlondeHairFlag              | 1              | bslbf             |
| RedHairFlag                 | 1              | bslbf             |

|                    |   |       |
|--------------------|---|-------|
| HairVolumeFlag     | 1 | bslbf |
| HairFrontFlag      | 1 | bslbf |
| HairSidesFlag      | 1 | bslbf |
| HairBackFlag       | 1 | bslbf |
| BigHairFrontFlag   | 1 | bslbf |
| BigHairTopFlag     | 1 | bslbf |
| BigHairBackFlag    | 1 | bslbf |
| FrontFringeFlag    | 1 | bslbf |
| SideFringeFlag     | 1 | bslbf |
| BackFringeFlag     | 1 | bslbf |
| FullHairSidesFlag  | 1 | bslbf |
| HairSweepFlag      | 1 | bslbf |
| ShearFrontFlag     | 1 | bslbf |
| ShearBackFlag      | 1 | bslbf |
| TuperFrontFlag     | 1 | bslbf |
| TuperBackFlag      | 1 | bslbf |
| RumpledhairFlag    | 1 | bslbf |
| PigtailsFlag       | 1 | bslbf |
| PonytailFlag       | 1 | bslbf |
| SpikedHairFlag     | 1 | bslbf |
| HairTiltFlag       | 1 | bslbf |
| HairMiddlePartFlag | 1 | bslbf |
| HairRightPartFlag  | 1 | bslbf |
| HairLeftPartFlag   | 1 | bslbf |
| HairPartBangsFlag  | 1 | bslbf |
| ExtraFlag          | 1 | bslbf |
| hapticIDRefFlag    | 1 | bslbf |

|                       |  |                   |
|-----------------------|--|-------------------|
| if(HairSizeFlag){     |  |                   |
| HairSize              |  | indicateOfSMLType |
| }                     |  |                   |
| if(HairStyleFlag){    |  |                   |
| HairStyle             |  | bslbf             |
| }                     |  |                   |
| if(HairColorFlag){    |  |                   |
| HairColor             |  | colorType         |
| }                     |  |                   |
| if(WhiteHairFlag){    |  |                   |
| WhiteHair             |  | percentageType    |
| }                     |  |                   |
| if(RainbowColorFlag){ |  |                   |
| RainbowColor          |  | colorType         |
| }                     |  |                   |
| if(BlondeHairFlag){   |  |                   |
| BlondeHair            |  | percentageType    |
| }                     |  |                   |
| if(RedHairFlag){      |  |                   |
| RedHair               |  | percentageType    |
| }                     |  |                   |
| if(HairVolumeFlag){   |  |                   |
| HairVolume            |  | indicateOfSMBType |
| }                     |  |                   |
| if(HairFrontFlag){    |  |                   |
| HairFront             |  | indicateOfSMLType |
| }                     |  |                   |

|                        |  |                   |
|------------------------|--|-------------------|
| if(HairSidesFlag){     |  |                   |
| HairSides              |  | indicateOfSMLType |
| }                      |  |                   |
| if(HairBackFlag){      |  |                   |
| HairBack               |  | indicateOfSMLType |
| }                      |  |                   |
| if(BigHairFrontFlag){  |  |                   |
| BigHairFront           |  | indicateOfSMLType |
| }                      |  |                   |
| if(BigHairTopFlag){    |  |                   |
| BigHairTop             |  | indicateOfSMLType |
| }                      |  |                   |
| if(BigHairBackFlag){   |  |                   |
| BigHairBack            |  | indicateOfSMLType |
| }                      |  |                   |
| if(FrontFringeFlag){   |  |                   |
| FrontFringe            |  | indicateOfSMLType |
| }                      |  |                   |
| if(SideFringeFlag){    |  |                   |
| SideFringe             |  | indicateOfSMLType |
| }                      |  |                   |
| if(BackFringeFlag){    |  |                   |
| BackFringe             |  | indicateOfSMLType |
| }                      |  |                   |
| if(FullHairSidesFlag){ |  |                   |
| FullHairSides          |  | indicateOfSMLType |
| }                      |  |                   |

|                      |   |                   |
|----------------------|---|-------------------|
| if(HairSweepFlag){   |   |                   |
| HairSweep            |   | indicateOfSMLType |
| }                    |   |                   |
| if(ShearFrontFlag){  |   |                   |
| ShearFront           |   | indicateOfLMRType |
| }                    |   |                   |
| if(ShearBackFlag){   |   |                   |
| ShearBack            |   | indicateOfSMLType |
| }                    |   |                   |
| if(TuperFrontFlag){  |   |                   |
| TuperFront           |   | indicateOfSMLType |
| }                    |   |                   |
| if(TuperBackFlag){   |   |                   |
| TuperBack            |   | indicateOfSMLType |
| }                    |   |                   |
| if(RumpledhairFlag){ |   |                   |
| Rumpledhair          | 2 | bslbf             |
| }                    |   |                   |
| if(PigtailsFlag){    |   |                   |
| Pigtails             |   | indicateOfSMLType |
| }                    |   |                   |
| if(PonytailFlag){    |   |                   |
| Ponytail             |   | indicateOfSMLType |
| }                    |   |                   |
| if(SpikedHairFlag){  |   |                   |
| SpikedHair           |   | indicateOfSMLType |
| }                    |   |                   |

|                             |                                     |                  |
|-----------------------------|-------------------------------------|------------------|
| if(HairTiltFlag){           |                                     |                  |
| HairTilt                    | 32                                  | fsbf             |
| }                           |                                     |                  |
| if(HairMiddlePartFlag){     |                                     |                  |
| HairMiddlePart              |                                     | indicateOfLHType |
| }                           |                                     |                  |
| if(HairRightPartFlag){      |                                     |                  |
| HairRightPart               |                                     | indicateOfLHType |
| }                           |                                     |                  |
| if(HairLeftPartFlag){       |                                     |                  |
| HairLeftPart                |                                     | indicateOfLHType |
| }                           |                                     |                  |
| if(HairPartBangsFlag){      |                                     |                  |
| HairPartBangs               |                                     | indicateOfLHType |
| }                           |                                     |                  |
| if(ExtraFlag){              |                                     |                  |
| NumExtra                    |                                     | vluimsbf5        |
| for(k=0; k< NumExtra, k++){ |                                     |                  |
| Extra[k]                    |                                     | ExtraType        |
| }                           |                                     |                  |
| }                           |                                     |                  |
| if(hapticIDRefFlag){        |                                     |                  |
| hapticIDRef                 | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8            |
| }                           |                                     |                  |
| }                           |                                     |                  |
|                             |                                     |                  |

| EyebrowsType{               | Number of bits | Mnemonic           |
|-----------------------------|----------------|--------------------|
| EyebrowSizeFlag             | 1              | bslbf              |
| EyebrowDensityFlag          | 1              | bslbf              |
| EyebrowHeightFlag           | 1              | bslbf              |
| EyebrowArcFlag              | 1              | bslbf              |
| EyebrowPointsFlag           | 1              | bslbf              |
| ExtraFlag                   | 1              | bslbf              |
| hapticIDRefFlag             | 1              | bslbf              |
| if(EyebrowSizeFlag){        |                |                    |
| EyebrowSize                 |                | indicateOfSMLType  |
| }                           |                |                    |
| if(EyebrowDensityFlag){     |                |                    |
| EyebrowDensity              | 2              | bslbf              |
| }                           |                |                    |
| if(EyebrowHeightFlag){      |                |                    |
| EyebrowHeight               |                | measureUnitLMHType |
| }                           |                |                    |
| if(EyebrowArcFlag){         |                |                    |
| EyebrowArc                  | 2              | bslbf              |
| }                           |                |                    |
| if(EyebrowPointsFlag){      |                |                    |
| EyebrowPoints               |                | indicateOfDMUType  |
| }                           |                |                    |
| if(ExtraFlag){              |                |                    |
| NumExtra                    |                | vluimsbf5          |
| for(k=0; k< NumExtra; k++){ |                |                    |

|                              |                                     |                        |
|------------------------------|-------------------------------------|------------------------|
| Extra[k]                     |                                     | ExtraType              |
| }                            |                                     |                        |
| }                            |                                     |                        |
| if(hapticIDRefFlag){         |                                     |                        |
| hapticIDRef                  | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8                  |
| }                            |                                     |                        |
| }                            |                                     |                        |
|                              |                                     |                        |
| FacialHairType{              | <b>Number of bits</b>               | <b>Mnemonic</b>        |
| FacialHairThicknessFlag      | 1                                   | bslbf                  |
| FacialSideburnsFlag          | 1                                   | bslbf                  |
| FacialMustacheFlag           | 1                                   | bslbf                  |
| FacialChinCurtainsFlag       | 1                                   | bslbf                  |
| FacialSoulPatchFlag          | 1                                   | bslbf                  |
| ExtraFlag                    | 1                                   | bslbf                  |
| hapticIDRefFlag              | 1                                   | bslbf                  |
| if(FacialHairThicknessFlag){ |                                     |                        |
| FacialHairThickness          |                                     | measureUnitLMHTy<br>pe |
| }                            |                                     |                        |
| if(FacialSideburnsFlag){     |                                     |                        |
| FacialSideburns              |                                     | colorType              |
| }                            |                                     |                        |
| if(FacialMustacheFlag){      |                                     |                        |
| FacialMustache               | 1                                   | bslbf                  |
| }                            |                                     |                        |
| if(FacialChinCurtainsFlag){  |                                     |                        |

|                             |                                     |                        |
|-----------------------------|-------------------------------------|------------------------|
| FacialChinCurtains          | 1                                   | Bslbf                  |
| }                           |                                     |                        |
| if(FacialSoulPatchFlag){    |                                     |                        |
| FacialSoulPatch             | 1                                   | bslbf                  |
| }                           |                                     |                        |
| if(ExtraFlag){              |                                     |                        |
| NumExtra                    |                                     | vluimsbf5              |
| for(k=0; k< NumExtra; k++){ |                                     |                        |
| Extra[k]                    |                                     | ExtraType              |
| }                           |                                     |                        |
| }                           |                                     |                        |
| if(hapticIDRefFlag){        |                                     |                        |
| hapticIDRef                 | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8                  |
| }                           |                                     |                        |
| }                           |                                     |                        |
|                             |                                     |                        |
| <b>BodyHairType {</b>       | <b>Number of bits</b>               | <b>Mnemonic</b>        |
| HairColorFlag               | 1                                   | bslbf                  |
| HairThicknessFlag           | 1                                   | bslbf                  |
| ExtraFlag                   | 1                                   | bslbf                  |
| if(HairColorFlag) {         |                                     |                        |
| HairColor                   |                                     | colorType              |
| }                           |                                     |                        |
| if(HairThicknessFlag) {     |                                     |                        |
| HairThickness               |                                     | measureUnitLMHTy<br>pe |
| }                           |                                     |                        |

|                              |                       |                 |
|------------------------------|-----------------------|-----------------|
| if(ExtraFlag){               |                       |                 |
| NumExtra                     |                       | vluimsbf5       |
| for(k=0; k< NumExtra; k++){  |                       |                 |
| Extra[k]                     |                       | ExtraType       |
| }                            |                       |                 |
| }                            |                       |                 |
|                              |                       |                 |
| FacialCalibrationPointsType{ | <b>Number of bits</b> | <b>Mnemonic</b> |
| SellionFlag                  | 1                     | bslbf           |
| RInfraorbitaleFlag           | 1                     | bslbf           |
| LinfraorbitaleFlag           | 1                     | bslbf           |
| SupramentonFlag              | 1                     | bslbf           |
| RtragonFlag                  | 1                     | bslbf           |
| RgonionFlag                  | 1                     | bslbf           |
| LtragonFlag                  | 1                     | bslbf           |
| LgonionFlag                  | 1                     | bslbf           |
| ExtraFlag                    | 1                     | bslbf           |
| if(SellionFlag){             |                       |                 |
| Sellion                      |                       | PointType       |
| }                            |                       |                 |
| if(RinfraorbitaleFlag){      |                       |                 |
| Rinfraorbitale               |                       | PointType       |
| }                            |                       |                 |
| if(LinfraorbitaleFlag){      |                       |                 |
| Linfraorbitale               |                       | PointType       |
| }                            |                       |                 |

|                               |                       |                 |
|-------------------------------|-----------------------|-----------------|
| if(SupramentonFlag){          |                       |                 |
| Supramenton                   |                       | PointerType     |
| }                             |                       |                 |
| if(RtragonFlag){              |                       |                 |
| Rtragon                       |                       | PointerType     |
| }                             |                       |                 |
| if(RgonionFlag){              |                       |                 |
| Rgonion                       |                       | PointerType     |
| }                             |                       |                 |
| if(LtragonFlag){              |                       |                 |
| Ltragon                       |                       | PointerType     |
| }                             |                       |                 |
| if(LgonionFlag){              |                       |                 |
| Lgonion                       |                       | PointerType     |
| }                             |                       |                 |
| if(ExtraFlag){                |                       |                 |
| NumExtra                      |                       | vluimsbf5       |
| for(k=0; k< NumExtra; k++){   |                       |                 |
| Extra[k]                      |                       | ExtraType       |
| }                             |                       |                 |
| }                             |                       |                 |
| }                             |                       |                 |
|                               |                       |                 |
| <b>PhysicalConditionType{</b> | <b>Number of bits</b> | <b>Mnemonic</b> |
| BodyStrengthFlag              | 1                     | bslbf           |
| BodyFlexibilityFlag           | 1                     | bslbf           |
| ExtraFlag                     | 1                     | bslbf           |

|                             |  |                         |
|-----------------------------|--|-------------------------|
| if(BodyStrengthFlag){       |  |                         |
| BodyStrength                |  | unlimitedPercentageType |
| }                           |  |                         |
| if(BodyFlexibilityFlag){    |  |                         |
| BodyFlexibility             |  | indicateOfLMHType       |
| }                           |  |                         |
| if(ExtraFlag){              |  |                         |
| NumExtra                    |  | vluimsbf5               |
| for(k=0; k< NumExtra; k++){ |  |                         |
| Extra[k]                    |  | ExtraType               |
| }                           |  |                         |
| }                           |  |                         |
| }                           |  |                         |

### 5.3.3 Semantics

| Name                  | Description   |
|-----------------------|---|
| Avatar AppearanceType | A type that contains the high level description of the avatar appearance and may refer a media containing the exact geometry and texture.   |
| BodyFlag              | This field, which is only present in the binary representation, signals the presence of the Body element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| HeadFlag              | This field, which is only present in the binary representation, signals the presence of the Head element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| EyesFlag              | This field, which is only present in the binary representation, signals the presence of the Eyes element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| EarsFlag              | This field, which is only present in the binary representation, signals the presence of the Ears element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| NoseFlag              | This field, which is only present in the binary representation, signals the presence of the Nose element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| MouthLipFlag          | This field, which is only present in the binary representation, signals the presence of the Mouthlip element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| BodySkinFlag          | This field, which is only present in the binary representation, signals the presence of the BodySkin element. "1" means that the element shall be used. "0" means that the element shall not be used. |

| Name                        | Description   |
|-----------------------------|---|
| FacialSkinFlag              | This field, which is only present in the binary representation, signals the presence of the <code>FacialSkin</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.              |
| FacialFlag                  | This field, which is only present in the binary representation, signals the presence of the <code>facial</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.                  |
| FingerNailsFlag             | This field, which is only present in the binary representation, signals the presence of the <code>FingerNails</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.             |
| ToeNailsFlag                | This field, which is only present in the binary representation, signals the presence of the <code>ToeNails</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.                |
| BodyLookFlag                | This field, which is only present in the binary representation, signals the presence of the <code>BodyLook</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.                |
| HairFlag                    | This field, which is only present in the binary representation, signals the presence of the <code>Hair</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.                    |
| EyeBrowsFlag                | This field, which is only present in the binary representation, signals the presence of the <code>EyeBrows</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.                |
| FacialHairFlag              | This field, which is only present in the binary representation, signals the presence of the <code>FacialHair</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.              |
| BodyHairFlag                | This field, which is only present in the binary representation, signals the presence of the <code>BodyHair</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.                |
| AppearanceResourcesFlag     | This field, which is only present in the binary representation, signals the presence of the <code>AppearanceResource</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
| FacialCalibrationPointsFlag | This field, which is only present in the binary representation, signals the presence of the <code>FacialCalibrationPoints</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| PhysicalConditionFlag       | This field, which is only present in the binary representation, signals the presence of the <code>PhysicalCondition</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
| ClothesFlag                 | This field, which is only present in the binary representation, signals the presence of the <code>clothes</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.                 |
| ShoesFlag                   | This field, which is only present in the binary representation, signals the presence of the <code>shoes</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.                   |
| AccessoriesFlag             | This field, which is only present in the binary representation, signals the presence of the <code>accessories</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.             |
| SkinMarksFlag               | This field, which is only present in the binary representation, signals the presence of the <code>SkinMarks</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.               |

| Name              | Description  |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
|-------------------|--|------|-------------|----------|------------------------------------|----------------|--|-------------------|---|-------------|---|------------------|--|-------------------|---|----------------|--|---------------|---|----------------|--|---------------|---|
| ExtraFlag         | This field, which is only present in the binary representation, signals the presence of the <code>extra</code> type element. "1" means that the element shall be used. "0" means that the element shall not be used.   |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
| Body              | <p>Set of descriptions for body of the avatar.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>BodyType</td> <td>A type that describes avatar body.</td> </tr> <tr> <td>BodyHeightFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>BodyHeight</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>BodyThicknessFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>BodyThickness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>BodyFatFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>BodyFat</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>TorsoMusclesFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>TorsoMuscles</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>NeckThicknessFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>NeckThickness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>NeckLengthFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>NeckLength</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>ShouldersFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>Shoulders</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>PectorialsFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>Pectorials</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>ArmLengthFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the <code>ArmLength</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> </tbody> </table> | Name | Description | BodyType | A type that describes avatar body. | BodyHeightFlag | This field, which is only present in the binary representation, signals the presence of the <code>BodyHeight</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | BodyThicknessFlag | This field, which is only present in the binary representation, signals the presence of the <code>BodyThickness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | BodyFatFlag | This field, which is only present in the binary representation, signals the presence of the <code>BodyFat</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | TorsoMusclesFlag | This field, which is only present in the binary representation, signals the presence of the <code>TorsoMuscles</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | NeckThicknessFlag | This field, which is only present in the binary representation, signals the presence of the <code>NeckThickness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | NeckLengthFlag | This field, which is only present in the binary representation, signals the presence of the <code>NeckLength</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | ShouldersFlag | This field, which is only present in the binary representation, signals the presence of the <code>Shoulders</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | PectorialsFlag | This field, which is only present in the binary representation, signals the presence of the <code>Pectorials</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. | ArmLengthFlag | This field, which is only present in the binary representation, signals the presence of the <code>ArmLength</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| Name              | Description  |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
| BodyType          | A type that describes avatar body.   |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
| BodyHeightFlag    | This field, which is only present in the binary representation, signals the presence of the <code>BodyHeight</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
| BodyThicknessFlag | This field, which is only present in the binary representation, signals the presence of the <code>BodyThickness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.  |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
| BodyFatFlag       | This field, which is only present in the binary representation, signals the presence of the <code>BodyFat</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.  |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
| TorsoMusclesFlag  | This field, which is only present in the binary representation, signals the presence of the <code>TorsoMuscles</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
| NeckThicknessFlag | This field, which is only present in the binary representation, signals the presence of the <code>NeckThickness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.  |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
| NeckLengthFlag    | This field, which is only present in the binary representation, signals the presence of the <code>NeckLength</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
| ShouldersFlag     | This field, which is only present in the binary representation, signals the presence of the <code>Shoulders</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.  |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
| PectorialsFlag    | This field, which is only present in the binary representation, signals the presence of the <code>Pectorials</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |
| ArmLengthFlag     | This field, which is only present in the binary representation, signals the presence of the <code>ArmLength</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.  |      |             |          |                                    |                |  |                   |   |             |   |                  |  |                   |   |                |  |               |   |                |  |               |   |

| Name | Description     |   |
|------|-----------------|---|
|      | HeadSizeFlag    | This field, which is only present in the binary representation, signals the presence of the <code>HeadSize</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|      | TorsoLengthFlag | This field, which is only present in the binary representation, signals the presence of the <code>TorsoLength</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. |
|      | LoveHandlesFlag | This field, which is only present in the binary representation, signals the presence of the <code>LoveHandles</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. |
|      | BellySizeFlag   | This field, which is only present in the binary representation, signals the presence of the <code>BellySize</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
|      | LegMusclesFlag  | This field, which is only present in the binary representation, signals the presence of the <code>LegMuscles</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
|      | LegLengthFlag   | This field, which is only present in the binary representation, signals the presence of the <code>LegLength</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
|      | HipWidthFlag    | This field, which is only present in the binary representation, signals the presence of the <code>HipWidth</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|      | HipLengthFlag   | This field, which is only present in the binary representation, signals the presence of the <code>HipLength</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
|      | ButtSizeFlag    | This field, which is only present in the binary representation, signals the presence of the <code>ButtSize</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|      | PackageFlag     | This field, which is only present in the binary representation, signals the presence of the <code>Package</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|      | SaddleBagsFlag  | This field, which is only present in the binary representation, signals the presence of the <code>SaddleBags</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.  |

| Name            | Description |   |
|-----------------|-------------|---|
| KneeAngleFlag   |             | This field, which is only present in the binary representation, signals the presence of the KneeAngle element. "1" means that the element shall be used. "0" means that the element shall not be used.                |
| FootSizeFlag    |             | This field, which is only present in the binary representation, signals the presence of the FootSize element. "1" means that the element shall be used. "0" means that the element shall not be used.                 |
| ExtraFlag       |             | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.                |
| hapticIDRefFlag |             | This field, which is only present in the binary representation, signals the presence of hapticIDRef of the body type element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| BodyHeight      |             | Full height of the character (always in metres)   |
| BodyThickness   |             | This indicates the weight of the bounding box of the avatar (always in metres)  |
| BodyFat         |             | This should be one of Low, Medium, High and indicates the fatness of the body   |
| TorsoMuscles    |             | This should be one of Low, Medium, High and indicates the average muscularity of the avatar's body  |
| NeckThikness    |             | The diameter of the neck (always in metres)   |
| NeckLength      |             | The height of the neck (always in metres)   |
| Shoulders       |             | The width of the shoulders (always in metres)   |
| Pectorials      |             | The size of the pectoral muscles (always in metres)   |
| ArmLength       |             | Length of complete arm (always in metres)   |
| HandSize        |             | Size of the whole hand including fingers (always in metres)   |
| TorsoLength     |             | The length of torso(between pectorals and legs) (always in metres)  |
| LoveHandles     |             | Size of the love handles (always in metres)   |
| BellySize       |             | Diameter of the belly (always in metres)  |
| LegMucles       |             | Size of all leg muscles (always in metres)  |
| LegLength       |             | Length of complete leg (always in metres)   |
| HipWidth        |             | The width of the hip area (always in metres)  |
| HipLength       |             | The vertical size of the hip area (always in metres)  |
| ButtSize        |             | Diameter of the butt's avatar (always in metres)  |
| Package         |             | Size of the package (small, medium, big)  |
| SaddleBags      |             | Volume of saddle bags (small, medium, big)  |
| KneeAngle       |             | The angle between the upper end lower leg, normally 0 when they are aligned (in degrees, from 0 to 360)   |
| FootSize        |             | Size of the whole foot including toes (always in metres)  |
| NumExtra        |             | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the BodyType.   |

| Name | Description                                 |  |
|------|---|--|
|      | Extra                                       | Describes any other descriptions of body.  |
|      | hapticIDRef                                 | Identifier that refers to the haptic properties of the body.   |
| Head | Set of descriptions for head of the avatar. |  |
|      | <b>Name</b>                                 | <b>Description</b>   |
|      | HeadType                                    | A type that describes avatar head.   |
|      | HeadSizeFlag                                | This field, which is only present in the binary representation, signals the presence of the HeadSize element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|      | HeadStretchFlag                             | This field, which is only present in the binary representation, signals the presence of the HeadStretch element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
|      | HeadShapeFlag                               | This field, which is only present in the binary representation, signals the presence of the HeadShape element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|      | EggHeadFlag                                 | This field, which is only present in the binary representation, signals the presence of the EggHead element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
|      | HeadLengthFlag                              | This field, which is only present in the binary representation, signals the presence of the HeadLength element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|      | FaceShearFlag                               | This field, which is only present in the binary representation, signals the presence of the FaceShear element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|      | ForeheadSizeFlag                            | This field, which is only present in the binary representation, signals the presence of the ForeheadSize element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
|      | ForeheadAngleFlag                           | This field, which is only present in the binary representation, signals the presence of the ForeheadAngle element. "1" means that the element shall be used. "0" means that the element shall not be used. |
|      | BrowSizeFlag                                | This field, which is only present in the binary representation, signals the presence of the BrowSize element. "1" means that the element shall be used. "0" means that the element shall not be used.      |

| Name            | Description |  |
|-----------------|-------------|--|
| FaceSkinFlag    |             | This field, which is only present in the binary representation, signals the presence of the FaceSkin element. "1" means that the element shall be used. "0" means that the element shall not be used.          |
| CheeksFlag      |             | This field, which is only present in the binary representation, signals the presence of the Cheeks element. "1" means that the element shall be used. "0" means that the element shall not be used.            |
| CheeksDepthFlag |             | This field, which is only present in the binary representation, signals the presence of the CheeksDepth element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
| CheeksShapeFlag |             | This field, which is only present in the binary representation, signals the presence of the CheeksShape element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
| UpperCheeksFlag |             | This field, which is only present in the binary representation, signals the presence of the UpperCheeks element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
| LowerCheeksFlag |             | This field, which is only present in the binary representation, signals the presence of the LowerCheeks element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
| CheekBonesFlag  |             | This field, which is only present in the binary representation, signals the presence of the CheekBones element. "1" means that the element shall be used. "0" means that the element shall not be used.        |
| ExtraFlag       |             | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
| hapticIDRefFlag |             | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |
| HeadSize        |             | Size of the entire head (small, medium, big)   |
| HeadStretch     |             | Vertical stretch of the head in %  |
| HeadShape       |             | This can be one of "square", "round", "oval", or "long"  |
| EggHead         |             | Head is larger on the top than on the bottom or vice versa. This can be "yes" or "not"   |
| HeadLength      |             | The distance between the face and the back of the head, flat head or long head, measured in metres   |

| Name               | Description  |   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|--------------------|--|---|------|-------------|---------|------------------------------------|-------------|--|----------------|---|----------------|---|--------------------|---|--------------------|---|
|                    | FaceShear  | Changes the height difference between the two sides of the face (always in metres)  |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | ForeheadSize   | The height of the forehead measured in metres   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | ForeheadAngle  | The angle of the forehead measured in degrees   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | BrowSize   | Measures how much the eyebrows are extruded from the face (in metres)   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | FaceSkin   | Describe the type of face skin (dry, normal, greasy)  |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | Cheeks   | The size of the complete cheeks (small, medium, big)  |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | CheeksDepth  | The depth of the complete cheeks (always in metres)   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | CheeksShape  | Different cheeks shapes (one of the following values: chubby, high, bone)   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | UpperCheeks  | The volume of the upper cheeks (small, medium, big)   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | LowerCheeks  | The volume of the lower cheeks (small, medium, big)   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | CheekBones   | The vertical position of the cheek bones (down, medium, up)   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | NumExtra   | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the HeadType. |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | Extra  | Describes any other descriptions of head.   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | hapticIDRef  | Identifier that refers to the haptic properties of the head.  |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
| Eyes               | Set of descriptions for eyes of the avatar.  |   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
|                    | <table border="1"> <thead> <tr> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>EyeType</td> <td>A type that describes avatar eyes.</td> </tr> <tr> <td>EyeSizeFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the EyeSize element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>EyeOpeningFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the EyeOpening element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>EyeSpacingFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the EyeSpacing element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>OuterEyeCornerFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the OuterEyeCorner element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>InnerEyeCornerFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the InnerEyeCorner element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> </tbody> </table> |   | Name | Description | EyeType | A type that describes avatar eyes. | EyeSizeFlag | This field, which is only present in the binary representation, signals the presence of the EyeSize element. "1" means that the element shall be used. "0" means that the element shall not be used. | EyeOpeningFlag | This field, which is only present in the binary representation, signals the presence of the EyeOpening element. "1" means that the element shall be used. "0" means that the element shall not be used. | EyeSpacingFlag | This field, which is only present in the binary representation, signals the presence of the EyeSpacing element. "1" means that the element shall be used. "0" means that the element shall not be used. | OuterEyeCornerFlag | This field, which is only present in the binary representation, signals the presence of the OuterEyeCorner element. "1" means that the element shall be used. "0" means that the element shall not be used. | InnerEyeCornerFlag | This field, which is only present in the binary representation, signals the presence of the InnerEyeCorner element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| Name               | Description  |   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
| EyeType            | A type that describes avatar eyes.   |   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
| EyeSizeFlag        | This field, which is only present in the binary representation, signals the presence of the EyeSize element. "1" means that the element shall be used. "0" means that the element shall not be used.   |   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
| EyeOpeningFlag     | This field, which is only present in the binary representation, signals the presence of the EyeOpening element. "1" means that the element shall be used. "0" means that the element shall not be used.  |   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
| EyeSpacingFlag     | This field, which is only present in the binary representation, signals the presence of the EyeSpacing element. "1" means that the element shall be used. "0" means that the element shall not be used.  |   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
| OuterEyeCornerFlag | This field, which is only present in the binary representation, signals the presence of the OuterEyeCorner element. "1" means that the element shall be used. "0" means that the element shall not be used.  |   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |
| InnerEyeCornerFlag | This field, which is only present in the binary representation, signals the presence of the InnerEyeCorner element. "1" means that the element shall be used. "0" means that the element shall not be used.  |   |      |             |         |                                    |             |  |                |   |                |   |                    |   |                    |   |

| Name                | Description |  |
|---------------------|-------------|--|
| EyeDepthFlag        |             | This field, which is only present in the binary representation, signals the presence of the EyeDepth element. "1" means that the element shall be used. "0" means that the element shall not be used.          |
| UpperEyelidFoldFlag |             | This field, which is only present in the binary representation, signals the presence of the UpperEyelidFold element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
| EyeBagsFlag         |             | This field, which is only present in the binary representation, signals the presence of the EyeBags element. "1" means that the element shall be used. "0" means that the element shall not be used.           |
| PuffyEyeLidsFlag    |             | This field, which is only present in the binary representation, signals the presence of the PuffyEyeLids element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
| EyelashLengthFlag   |             | This field, which is only present in the binary representation, signals the presence of the EyelashLength element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| EyePopFlag          |             | This field, which is only present in the binary representation, signals the presence of the EyePop element. "1" means that the element shall be used. "0" means that the element shall not be used.            |
| EyeColorFlag        |             | This field, which is only present in the binary representation, signals the presence of the EyeColor element. "1" means that the element shall be used. "0" means that the element shall not be used.          |
| EyeLightnessFlag    |             | This field, which is only present in the binary representation, signals the presence of the EyeLightness element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
| ExtraFlag           |             | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
| hapticIDRefFlag     |             | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |
| EyeSize             |             | The size of the entire eyes (always in metres)   |
| EyeOpening          |             | How much the eyelids are opened (always in metres)   |
| EyeSpacing          |             | Distance between the eyes (always in metres)   |

| Name            | Description |   |
|-----------------|-------------|---|
| OuterEyeCorner  |             | Vertical position of the outer eye corner (down, middle, up)  |
| InnerEyeCorner  |             | Vertical position of the inner eye corner (down, middle, up)  |
| EyeDepth        |             | How much the eyes are inside the head (always in metres)  |
| UpperEyelidFold |             | How much the upper eyelid covers the eye (always in metres)   |
| EyeBags         |             | The size of the eye bags (always in metres)   |
| PuffyEyelids    |             | The volume of the eye bags (small, medium, big)   |
| EyelashLength   |             | The length of the eyelashes (always in metres)  |
| EyePop          |             | The size difference between the left and right eye (always in metres)   |
| EyeColor        |             | The color type defined in ISO/IEC 23005-6 shall be used for eye colour.   |
| EyeLightness    |             | The reflectivity of the eye in %  |
| Extra           |             | Describes any other descriptions of eyes.   |
| NumExtra        |             | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the EyesType. |
| hapticIDRef     |             | Identifier that refers to the haptic properties of the eyes.  |

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| Name        | Description  |  |
|-------------|--|--|
| Ears        | Set of descriptions for ears of the avatar.                  |  |
|             | <b>Name</b>  | <b>Description</b>   |
|             | EarsType   | A type that describes avatar ears.   |
|             | EarSizeFlag  | This field, which is only present in the binary representation, signals the presence of the EarSize element. "1" means that the element shall be used. "0" means that the element shall not be used.           |
|             | EarPositionFlag  | This field, which is only present in the binary representation, signals the presence of the EarPosition element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
|             | EarAngleFlag   | This field, which is only present in the binary representation, signals the presence of the EarAngle element. "1" means that the element shall be used. "0" means that the element shall not be used.          |
|             | AttachedEarlobesFlag   | This field, which is only present in the binary representation, signals the presence of the AttachedEarlobes element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
|             | EarTipsFlag  | This field, which is only present in the binary representation, signals the presence of the EarTips element. "1" means that the element shall be used. "0" means that the element shall not be used.           |
|             | ExtraFlag  | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
|             | hapticIDRefFlag  | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |
|             | EarSize  | Size of the entire ear (always in metres)  |
|             | EarPosition  | Vertical ear position on the head (down, middle, up)   |
|             | EarAngle   | The angle between the ear and the head in degrees  |
|             | AttachedEarlobes   | The size of the earlobes (always in metres)  |
|             | EarTips  | How much the ear tips are pointed (pointed, medium, not pointed)   |
|             | NumExtra   | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the EarsType.  |
|             | Extra  | Describes any other descriptions of ears.  |
| hapticIDRef | Identifier that refers to the haptic properties of the ears. |  |
| Nose        | Set of descriptions for nose of the avatar.                  |  |
|             | <b>Name</b>  | <b>Description</b>   |
|             | NoseType   | A type that describes avatar nose.   |

| Name | Description          |  |
|------|----------------------|--|
|      | NoseSizeFlag         | This field, which is only present in the binary representation, signals the presence of the <code>NoseSize</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
|      | NoseWidthFlag        | This field, which is only present in the binary representation, signals the presence of the <code>NoseWidth</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.        |
|      | NostrillWidthFlag    | This field, which is only present in the binary representation, signals the presence of the <code>NostrillWidth</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|      | NostrillDivisionFlag | This field, which is only present in the binary representation, signals the presence of the <code>NostrillDivision</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. |
|      | NoseThicknessFlag    | This field, which is only present in the binary representation, signals the presence of the <code>NoseThickness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|      | UpperBridgeFlag      | This field, which is only present in the binary representation, signals the presence of the <code>UpperBridge</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|      | LowerBridgeFlag      | This field, which is only present in the binary representation, signals the presence of the <code>LowerBridge</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|      | BridgeWidthFlag      | This field, which is only present in the binary representation, signals the presence of the <code>BridgeWidth</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|      | NoseTipAngleFlag     | This field, which is only present in the binary representation, signals the presence of the <code>NoseTipAngle</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|      | NoseTipShapeFlag     | This field, which is only present in the binary representation, signals the presence of the <code>NoseTipShape</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.     |

| Name             | Description  |  |
|------------------|--|--|
| CrookedNoseFlag  |  | This field, which is only present in the binary representation, signals the presence of the CrookedNose element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
| ExtraFlag        |  | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
| hapticIDRefFlag  |  | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |
| NoseSize         |  | The height of the nose from its bottom (always in metres)  |
| NoseWidth        |  | The width of the complete nose (always in metres)  |
| NostrillWidth    |  | Width of only the nostrils (always in metres)  |
| NostrillDivision |  | The size of the nostril division (always in metres)  |
| NoseThickness    |  | The size of the tip of the nose (always in metres)   |
| UpperBridge      |  | The height of the upper part of the nose (always in metres)  |
| LowerBridge      |  | The height of the lower part of the nose (always in metres)  |
| BridgeWidth      |  | The width of the upper part of the nose (always in metres)   |
| NoseTipAngle     |  | The angle of the nose tip, "up" or "down"  |
| NoseTipShape     |  | The shape of the nose tip, "pointy" or "bulbous"   |
| CrookedNose      |  | Displacement of the nose on the left or right side   |
| NumExtra         |  | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the NoseType.  |
| Extra            |  | Describes any other descriptions of nose.  |
| hapticIDRef      |  | Identifier that refers to the haptic properties of the nose.   |
| MouthLip         | <b>Set of descriptions for mouth and lips of the avatar.</b> |  |
|                  | <b>Name</b>  | <b>Description</b>   |
|                  | MouthLipType   | A type that describes avatar eyes.   |
|                  | LipWidthFlag   | This field, which is only present in the binary representation, signals the presence of the LipWidth element. "1" means that the element shall be used. "0" means that the element shall not be used.          |
|                  | LipFullnessFlag  | This field, which is only present in the binary representation, signals the presence of the LipFullness element. "1" means that the element shall be used. "0" means that the element shall not be used.       |

| Name              | Description |  |
|-------------------|-------------|--|
| LipThicknessFlag  |             | This field, which is only present in the binary representation, signals the presence of the LipThickness element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| LipRatioFlag      |             | This field, which is only present in the binary representation, signals the presence of the LipRatio element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
| MouthSizeFlag     |             | This field, which is only present in the binary representation, signals the presence of the MouthSize element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| MouthPositionFlag |             | This field, which is only present in the binary representation, signals the presence of the MouthPosition element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| MouthCornerFlag   |             | This field, which is only present in the binary representation, signals the presence of the MouthCorner element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
| LipCleftDepthFlag |             | This field, which is only present in the binary representation, signals the presence of the LipCleftDepth element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| LipCleftFlag      |             | This field, which is only present in the binary representation, signals the presence of the LipCleft element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
| ShiftMouthFlag    |             | This field, which is only present in the binary representation, signals the presence of the ShiftMouth element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
| ChinAngleFlag     |             | This field, which is only present in the binary representation, signals the presence of the ChinAngle element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| JawShapeFlag      |             | This field, which is only present in the binary representation, signals the presence of the JawShape element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
| ChinDepthFlag     |             | This field, which is only present in the binary representation, signals the presence of the ChinDepth element. "1" means that the element shall be used. "0" means that the element shall not be used.     |

| Name               | Description |   |
|--------------------|-------------|---|
| JawAngleFlag       |             | This field, which is only present in the binary representation, signals the presence of the <code>JawAngle</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.          |
| JawJutFlag         |             | This field, which is only present in the binary representation, signals the presence of the <code>JawJut</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.            |
| JowlsFlag          |             | This field, which is only present in the binary representation, signals the presence of the <code>Jowls</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.             |
| ChinCleftFlag      |             | This field, which is only present in the binary representation, signals the presence of the <code>ChinCleft</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
| UpperChinCleftFlag |             | This field, which is only present in the binary representation, signals the presence of the <code>UpperChinCleft</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
| ChinNeckFlag       |             | This field, which is only present in the binary representation, signals the presence of the <code>ChinNeck</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.          |
| ExtraFlag          |             | This field, which is only present in the binary representation, signals the presence of the <code>ExtraType</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
| hapticIDRefFlag    |             | This field, which is only present in the binary representation, signals the presence of the <code>hapticIDRef</code> attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |
| LipWidth           |             | The width of the lips (m)   |
| LipFullness        |             | The fullness of the lip (m)   |
| LipThickness       |             | The thickness of the lip (m)  |
| LipRatio           |             | Difference between the upper and lower lip (m)  |
| MouthSize          |             | The size of the complete mouth (m)  |
| MouthPosition      |             | Vertical position of the mouth on the face (m)  |
| MouthCorner        |             | Vertical position of the mouth corner (down, middle, up)  |
| LipCleftDepth      |             | The height of the lip cleft (m)   |
| LipCleft           |             | The width of the lip cleft (m)  |
| ShiftMouth         |             | Horizontal position of mouth on the face (left, middle, right)  |
| ChinAngle          |             | The curvature of the chin, outer or inner   |
| JawShape           |             | Pointy to Square jaw (pointed, middle, not pointed)   |
| ChinDepth          |             | Vertical height of the chin (m)   |
| JawAngle           |             | The height of the jaw (m)   |

| Name      | Description                                      |   |
|-----------|--|---|
|           | JawJut   | Position of the jaw inside or out of the face (inside , outside)  |
|           | Jowls  | The size of the jowls (m)   |
|           | ChinCleft  | The shape of the chin cleft, "round" or "cleft"   |
|           | UpperChinCleft                                   | The shape of the upper chin cleft, "round" or "cleft"   |
|           | ChinNeck   | The size of the chin neck (m)   |
|           | NumExtra   | This field, which is only present in the binary representation, specifies the number of <code>ExtraType</code> elements contained in the <code>MouthLipType</code> .  |
|           | Extra  | Describes any other descriptions of mouthlip.   |
|           | hapticIDRef                                      | Identifier that refers to the haptic properties of the mouth and lips.  |
| BodySkin, | Set of descriptions for body skin of the avatar. |   |
|           | <b>Name</b>                                      | <b>Description</b>  |
|           | SkinType   | A type that describes avatar skin.  |
|           | SkinPigmentFlag                                  | This field, which is only present in the binary representation, signals the presence of the <code>SkinPigment</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
|           | SkinRuddinessFlag                                | This field, which is only present in the binary representation, signals the presence of the <code>SkinRuddiness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|           | SkinRainbowColorFlag                             | This field, which is only present in the binary representation, signals the presence of the <code>SkinRainbowColor</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
|           | ExtraFlag  | This field, which is only present in the binary representation, signals the presence of the <code>ExtraType</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
|           | hapticIDRefFlag                                  | This field, which is only present in the binary representation, signals the presence of the <code>hapticIDRef</code> attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |
|           | SkinPigment                                      | Body skin pigment (very light, light, average, olive, brown, black)   |
|           | SkinRuddiness                                    | Body skin ruddiness (few, medium, lot)  |
|           | SkinRainbowColor                                 | The color type defined in ISO/IEC 23005-6 shall be used for body skin rainbow colour.   |
|           | NumExtra   | This field, which is only present in the binary representation, specifies the number of <code>ExtraType</code> elements contained in the <code>BodySkinType</code> .  |
|           | Extra  | Describes any other descriptions of body skin.  |
|           | hapticIDRef                                      | Identifier that refers to the haptic properties of the body skin.   |

| Name         | Description   |  |
|--------------|---|--|
| FacialSkin   | Set of descriptions for facial skin of the avatar.  |  |
|              | <b>Name</b>   | <b>Description</b>   |
|              | SkinType  | A type that describes avatar skin.   |
|              | SkinPigmentFlag   | This field, which is only present in the binary representation, signals the presence of the SkinPigment element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
|              | SkinRuddinessFlag   | This field, which is only present in the binary representation, signals the presence of the SkinRuddiness element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|              | SkinRainbowColorFlag  | This field, which is only present in the binary representation, signals the presence of the SkinRainbowColor element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
|              | ExtraFlag   | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
|              | hapticIDRefFlag   | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |
|              | SkinPigment   | Facial skin pigment (very light, light, average, olive, brown, black)  |
|              | SkinRuddiness   | Facial skin ruddiness (few, medium, lot)   |
|              | SkinRainbowColor  | The color type defined in ISO/IEC 23005-6 shall be used for facial skin rainbow colour.  |
|              | NumExtra  | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the FacialSkinType.  |
|              | Extra   | Describes any other descriptions of facial skin.   |
|              | hapticIDRef   | Identifier that refers to the haptic properties of the skin.   |
| Facial       | Set of descriptions for face of the avatar.   |  |
|              | <b>Name</b>   | <b>Description</b>   |
|              | FacialType  | A type that describes avatar face.   |
|              | FacialDefinitionFlag  | This field, which is only present in the binary representation, signals the presence of the FacialDefinition element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| FrecklesFlag | This field, which is only present in the binary representation, signals the presence of the Freckles element. "1" means that the element shall be used. "0" means that the element shall not be used. |  |

| Name | Description          |  |
|------|----------------------|--|
|      | WrinklesFlag         | This field, which is only present in the binary representation, signals the presence of the <code>Wrinkles</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
|      | RosyComplexionFlag   | This field, which is only present in the binary representation, signals the presence of the <code>RosyComplexion</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
|      | LipPinknessFlag      | This field, which is only present in the binary representation, signals the presence of the <code>LipPinkness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|      | LipstickFlag         | This field, which is only present in the binary representation, signals the presence of the <code>Lipstick</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
|      | LipstickColorFlag    | This field, which is only present in the binary representation, signals the presence of the <code>LipstickColor</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|      | LipGlossFlag         | This field, which is only present in the binary representation, signals the presence of the <code>LipGloss</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
|      | BlushFlag            | This field, which is only present in the binary representation, signals the presence of the <code>Blush</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.            |
|      | BlushColorFlag       | This field, which is only present in the binary representation, signals the presence of the <code>BlushColor</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
|      | BlushOpacityFlag     | This field, which is only present in the binary representation, signals the presence of the <code>BlushOpacity</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|      | InnerShadowFlag      | This field, which is only present in the binary representation, signals the presence of the <code>InnerShadow</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|      | InnerShadowColorFlag | This field, which is only present in the binary representation, signals the presence of the <code>InnerShadowColor</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. |

| Name                   | Description   |
|------------------------|---|
| InnerShadowOpacityFlag | This field, which is only present in the binary representation, signals the presence of the InnerShadowOpacity element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| OuterShadowFlag        | This field, which is only present in the binary representation, signals the presence of the OuterShadow element. "1" means that the element shall be used. "0" means that the element shall not be used.        |
| OuterShadowOpacityFlag | This field, which is only present in the binary representation, signals the presence of the OuterShadowOpacity element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| EyeLinerFlag           | This field, which is only present in the binary representation, signals the presence of the EyeLiner element. "1" means that the element shall be used. "0" means that the element shall not be used.           |
| EyeLinerColorFlag      | This field, which is only present in the binary representation, signals the presence of the EyeLinerColor element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
| ExtraFlag              | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.          |
| hapticIDRefFlag        | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used.  |
| FacialDefinition       | Level of brightness of the face from 1-lighted to 5 dark  |
| Freckles               | Freckles (5 levels, 1=smallest, 5= biggest)   |
| Wrinkles               | Wrinkles (yes or no)  |
| RosyComplexion         | Rosy Complexion (yes or no)   |
| LipPinkness            | Lip Pinkness (5 levels, 1=smallest, 5= biggest)   |
| Lipstick               | Lipstick (yes or no)  |
| LipstickColor          | The color type defined in ISO/IEC 23005-6 shall be used for lipstick colour.  |
| Lipgloss               | Lipgloss (5 levels, 1=smallest, 5= biggest)   |
| Blush                  | Blush (yes or no)   |
| BlushColor             | The color type defined in ISO/IEC 23005-6 shall be used for blush colour.   |
| BlushOpacity           | Blush Opacity (%)   |
| InnerShadow            | Inner Shadow (yes or no)  |
| InnerShadowColor       | The color type defined in ISO/IEC 23005-6 shall be used for inner shadow colour.  |

| Name        | Description   |  |
|-------------|---|--|
|             | InnerShadowOpacity  | Inner Shadow Opacity (%)   |
|             | OuterShadow   | Outer Shadow (yes or no)   |
|             | OuterShadowOpacity  | Outer Shadow Opacity (%)   |
|             | Eyeliner  | Eyeliner (yes or no)   |
|             | EyelinerColor   | The color type defined in ISO/IEC 23005-6 shall be used for eyeliner colour.   |
|             | NumExtra  | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the FacialType.  |
|             | Extra   | Describes any other descriptions of face.  |
|             | hapticIDRef   | Identifier that refers to the haptic properties of the face.   |
| FingerNails | Set of descriptions for finger nails of the avatar.           |  |
|             | <b>Name</b>   | <b>Description</b>   |
|             | NailType  | A type that describes avatar nail.   |
|             | NailPolishFlag  | This field, which is only present in the binary representation, signals the presence of the NailPolish element. "1" means that the element shall be used. "0" means that the element shall not be used.        |
|             | NailPolishColorFlag   | This field, which is only present in the binary representation, signals the presence of the NailPolishColor element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
|             | ExtraFlag   | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
|             | hapticIDRefFlag   | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |
|             | NailPolish  | Finger nail polish (yes or no)   |
|             | NailPolishColor   | The color type defined in ISO/IEC 23005-6 shall be used for finger nail polish colour.   |
|             | NumExtra  | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the NailsType.   |
|             | Extra   | Describes any other descriptions of finger nails.  |
| hapticIDRef | Identifier that refers to the haptic properties of the nails. |  |

| Name     | Description                                      |  |
|----------|--|--|
| ToeNails | Set of descriptions for toe nails of the avatar. |  |
|          | Name   | Description  |
|          | NailType   | A type that describes avatar nail.   |
|          | NailPolishFlag                                   | This field, which is only present in the binary representation, signals the presence of the NailPolish element. "1" means that the element shall be used. "0" means that the element shall not be used.        |
|          | NailPolishColorFlag                              | This field, which is only present in the binary representation, signals the presence of the NailPolishColor element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
|          | ExtraFlag  | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
|          | hapticIDRefFlag                                  | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |
|          | NailPolish                                       | Toe nail polish (yes or no)  |
|          | NailPolishColor                                  | The color type defined in ISO/IEC 23005-6 shall be used for toe nail polish colour.  |
|          | NumExtra   | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the NailsType.   |
|          | Extra  | Describes any other descriptions of toe nails.   |
|          | hapticIDRef                                      | Identifier that refers to the haptic properties of the nails.  |

| Name     | Description                                      |   |
|----------|--|---|
| BodyLook | Set of descriptions for body look of the avatar. |   |
|          | Name   | Description   |
|          | BodyLookType                                     | A type that describes avatar body look.   |
|          | BodyDefinitionFlag                               | This field, which is only present in the binary representation, signals the presence of the BodyDefinition element. "1" means that the element shall be used. "0" means that the element shall not be used. |
|          | BodyFrecklesFlag                                 | This field, which is only present in the binary representation, signals the presence of the BodyFreckles element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
|          | ExtraFlag  | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|          | BodyDefinition                                   | Body definition (small, medium, large)  |
|          | BodyFreckles                                     | Body freckles (5 levels; 1=smallest, 5= biggest)  |
|          | NumExtra   | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the BodyLookType.   |
| Extra    | Describes any other descriptions of bodylook.    |   |

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| Name          | Description  |   |
|---------------|--|---|
| Hair          | Set of elements for general avatar hair description. Containing elements:  |   |
|               | Name   | Description   |
|               | HairType   | A type that describes avatar hair.  |
|               | HairSizeFlag   | This field, which is only present in the binary representation, signals the presence of the HairSize element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|               | HairStyleFlag  | This field, which is only present in the binary representation, signals the presence of the HairStyle element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|               | HairColorFlag  | This field, which is only present in the binary representation, signals the presence of the HairColor element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|               | WhiteHairFlag  | This field, which is only present in the binary representation, signals the presence of the WhiteHair element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|               | RainbowColorFlag   | This field, which is only present in the binary representation, signals the presence of the RainbowColor element. "1" means that the element shall be used. "0" means that the element shall not be used. |
|               | BlondeHairFlag   | This field, which is only present in the binary representation, signals the presence of the BlondeHair element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
|               | RedHairFlag  | This field, which is only present in the binary representation, signals the presence of the RedHair element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|               | HairVolumeFlag   | This field, which is only present in the binary representation, signals the presence of the HairVolume element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
| HairFrontFlag | This field, which is only present in the binary representation, signals the presence of the HairFront element. "1" means that the element shall be used. "0" means that the element shall not be used. |   |
| HairSidesFlag | This field, which is only present in the binary representation, signals the presence of the HairSides element. "1" means that the element shall be used. "0" means that the element shall not be used. |   |

| Name | Description       |  |
|------|-------------------|--|
|      | HairBackFlag      | This field, which is only present in the binary representation, signals the presence of the <code>HairBack</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
|      | BigHairFrontFlag  | This field, which is only present in the binary representation, signals the presence of the <code>BigHairFront</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
|      | BigHairTopFlag    | This field, which is only present in the binary representation, signals the presence of the <code>BigHairTop</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|      | BigHairBackFlag   | This field, which is only present in the binary representation, signals the presence of the <code>BigHairBack</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|      | FrontFringeFlag   | This field, which is only present in the binary representation, signals the presence of the <code>FrontFringe</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|      | SideFringeFlag    | This field, which is only present in the binary representation, signals the presence of the <code>SideFringeFlag</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. |
|      | BackFringeFlag    | This field, which is only present in the binary representation, signals the presence of the <code>BackFringe</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|      | FullHairSidesFlag | This field, which is only present in the binary representation, signals the presence of the <code>FullHairSides</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
|      | HairSweepFlag     | This field, which is only present in the binary representation, signals the presence of the <code>HairSweep</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|      | ShearFrontFlag    | This field, which is only present in the binary representation, signals the presence of the <code>ShearFront</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.     |

| Name | Description        |  |
|------|--------------------|--|
|      | ShearBackFlag      | This field, which is only present in the binary representation, signals the presence of the ShearBack element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
|      | TuperFrontFlag     | This field, which is only present in the binary representation, signals the presence of the TuperFront element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|      | TuperBackFlag      | This field, which is only present in the binary representation, signals the presence of the TuperBack element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
|      | RumpledhairFlag    | This field, which is only present in the binary representation, signals the presence of the RumpledhairFlag element. "1" means that the element shall be used. "0" means that the element shall not be used. |
|      | PigtailsFlag       | This field, which is only present in the binary representation, signals the presence of the Pigtails element. "1" means that the element shall be used. "0" means that the element shall not be used.        |
|      | PonytailFlag       | This field, which is only present in the binary representation, signals the presence of the Ponytail element. "1" means that the element shall be used. "0" means that the element shall not be used.        |
|      | SpikedHairFlag     | This field, which is only present in the binary representation, signals the presence of the SpikedHair element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|      | HairTiltFlag       | This field, which is only present in the binary representation, signals the presence of the HairTilt element. "1" means that the element shall be used. "0" means that the element shall not be used.        |
|      | HairMiddlePartFlag | This field, which is only present in the binary representation, signals the presence of the HairMiddlePart element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
|      | HairRightPartFlag  | This field, which is only present in the binary representation, signals the presence of the HairRightPart element. "1" means that the element shall be used. "0" means that the element shall not be used.   |

| Name              | Description   |                     |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
|-------------------|---|---------------------|--------------------------------|-------------|------|---|----------------|-----|---|---------------|----------|---|--------------------|---------|---|-------------------|--------|---|------------------|--------|---|------------------|----------|---|--------------------|-----------|---|---------------------|----------|---|--------------------|--|----------|----------|
| HairLeftPartFlag  | This field, which is only present in the binary representation, signals the presence of the HairLeftPart element. "1" means that the element shall be used. "0" means that the element shall not be used.   |                     |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| HairPartBangsFlag | This field, which is only present in the binary representation, signals the presence of the HairPartBangs element. "1" means that the element shall be used. "0" means that the element shall not be used.  |                     |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| ExtraFlag         | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.  |                     |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| hapticIDRefFlag   | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used.  |                     |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| HairSize          | The length of the hair (can be one of short, medium or long)  |                     |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| HairStyle         | <p>The style of the hair as a reference to a classification scheme (CS) term that shall be using the mpeg7:termReferenceType defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the HairStyleCS defined in A.3.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Binary representation (8 bits)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>afro</td> <td>1</td> <td>Afro hairstyle</td> </tr> <tr> <td>bun</td> <td>2</td> <td>Bun hairstyle</td> </tr> <tr> <td>combover</td> <td>3</td> <td>Combover hairstyle</td> </tr> <tr> <td>crewcut</td> <td>4</td> <td>Crewcut hairstyle</td> </tr> <tr> <td>mohawk</td> <td>5</td> <td>Mohawk hairstyle</td> </tr> <tr> <td>odando</td> <td>6</td> <td>Odando hairstyle</td> </tr> <tr> <td>pigtails</td> <td>7</td> <td>Pigtails hairstyle</td> </tr> <tr> <td>pompadour</td> <td>8</td> <td>Pompadour hairstyle</td> </tr> <tr> <td>ponytail</td> <td>9</td> <td>Ponytail hairstyle</td> </tr> <tr> <td></td> <td>0,10-255</td> <td>Reserved</td> </tr> </tbody> </table> | Name                | Binary representation (8 bits) | Description | afro | 1 | Afro hairstyle | bun | 2 | Bun hairstyle | combover | 3 | Combover hairstyle | crewcut | 4 | Crewcut hairstyle | mohawk | 5 | Mohawk hairstyle | odando | 6 | Odando hairstyle | pigtails | 7 | Pigtails hairstyle | pompadour | 8 | Pompadour hairstyle | ponytail | 9 | Ponytail hairstyle |  | 0,10-255 | Reserved |
| Name              | Binary representation (8 bits)  | Description         |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| afro              | 1   | Afro hairstyle      |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| bun               | 2   | Bun hairstyle       |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| combover          | 3   | Combover hairstyle  |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| crewcut           | 4   | Crewcut hairstyle   |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| mohawk            | 5   | Mohawk hairstyle    |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| odando            | 6   | Odando hairstyle    |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| pigtails          | 7   | Pigtails hairstyle  |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| pompadour         | 8   | Pompadour hairstyle |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| ponytail          | 9   | Ponytail hairstyle  |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
|                   | 0,10-255  | Reserved            |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| HairColor         | The color type defined in ISO/IEC 23005-6 shall be used for hair colour.  |                     |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |
| WhiteHair         | Amount of white hair (%)  |                     |                                |             |      |   |                |     |   |               |          |   |                    |         |   |                   |        |   |                  |        |   |                  |          |   |                    |           |   |                     |          |   |                    |  |          |          |

| Name           | Description |  |
|----------------|-------------|--|
| RainbowColor   |             | The color type defined in ISO/IEC 23005-6 shall be used for rainbow hair colour. |
| BlondeHair     |             | How blond is the hair (%)  |
| RedHair        |             | How red is the hair (%)  |
| HairVolume     |             | The volume of the complete hair (small, medium or big)                           |
| HairFront      |             | How much the hair goes toward front (short, medium or long)                      |
| HairSides      |             | The height of the sides of the hair (short, medium or long)                      |
| HairBack       |             | How long is the hair at the back (short, medium or long)                         |
| BigHairFront   |             | How high is the hair at the front of the skull (short, medium or long)           |
| BigHairTop     |             | How high is the hair at the top of the skull (short, medium or long)             |
| BigHairBack    |             | How high is the hair at the back of the skull (short, medium or long)            |
| FrontFringe    |             | The length of the front fringe of the hair (short, medium or long)               |
| SideFringe     |             | The length of the side fringe of the hair (short, medium or long)                |
| BackFringe     |             | The length of the back fringe of the hair (short, medium or long)                |
| FullHairSides  |             | The width of the hair (short, medium or long)                                    |
| HairSweep      |             | How much the hair is turned towards the front (left, middle, right)              |
| ShearFront     |             | How much the hair extends towards front (short, medium or long)                  |
| ShearBack      |             | How much the hair extends towards back (short, medium or long)                   |
| TuperFront     |             | The width of the hair at the front (short, medium or long)                       |
| TuperBack      |             | The width of the hair on the back (short, medium or long)                        |
| Rumpledhair    |             | How much the hair is rumpled (low, moderate or high)                             |
| Pigtails       |             | The length of the pigtails (short, medium or long)                               |
| Ponytail       |             | The length of the ponytail (short, medium or long)                               |
| SpikedHair     |             | The length of the spikes in the hair (short, medium or long)                     |
| HairTilt       |             | The vertical position of the hair from the top of the head (m)                   |
| HairMiddlePart |             | How much the hair is parted at the middle front (low, high)                      |
| HairRightPart  |             | How much the hair is parted at the right side (low, high)                        |
| HairLeftPart   |             | How much the hair is parted at the left side (low, high)                         |
| HairPartBangs  |             | How much the hair is parted at the middle (low, high)                            |

| Name | Description |   |
|------|-------------|---|
|      | NumExtra    | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the HairType. |
|      | Extra       | Describes any other descriptions of hair.   |
|      | hapticIDRef | Identifier that refers to the haptic properties of the hair.  |

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| Name        | Description   |  |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|-------------|---|--|-------------|---------------|--|-----------------|--|--------------------|---|-------------------|--|----------------|---|-------------------|--|-----------|--|-----------------|--|-------------|---|----------------|-----------------------------------|---------------|---|------------|--|---------------|--|----------|--|-------|---|-------------|--|
| Eyebrows    | Set of descriptions for eyebrows.of the avatar.   |  |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | <table border="1"> <thead> <tr> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Eyebrows Type</td> <td>A type that describes avatar eyebrows.</td> </tr> <tr> <td>EyebrowsizeFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the Eyebrowsize element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>EyebrowDensityFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the EyebrowDensity element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>EyebrowHeightFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the EyebrowHeight element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>EyebrowArcFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the EyebrowArc element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>EyebrowPointsFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the EyebrowPoints element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>ExtraFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>hapticIDRefFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used.</td> </tr> <tr> <td>Eyebrowsize</td> <td>The length of the eyebrow (short, medium, long)</td> </tr> <tr> <td>EyebrowDensity</td> <td>The density (low, moderate, high)</td> </tr> <tr> <td>EyebrowHeight</td> <td>The vertical eyebrow position on the face (low, middle, high)</td> </tr> <tr> <td>EyebrowArc</td> <td>The curvature of the Eyebrow. It can be low (flat), middle or high (arced)</td> </tr> <tr> <td>EyebrowPoints</td> <td>The direction of the eyebrows, towards up or down (down, middle, up)</td> </tr> <tr> <td>NumExtra</td> <td>This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the EyebrowType.</td> </tr> <tr> <td>Extra</td> <td>Describes any other descriptions of eyebrows.</td> </tr> <tr> <td>hapticIDRef</td> <td>Identifier that refers to the haptic properties of the eyebrows.</td> </tr> </tbody> </table> | Name   | Description | Eyebrows Type | A type that describes avatar eyebrows. | EyebrowsizeFlag | This field, which is only present in the binary representation, signals the presence of the Eyebrowsize element. "1" means that the element shall be used. "0" means that the element shall not be used. | EyebrowDensityFlag | This field, which is only present in the binary representation, signals the presence of the EyebrowDensity element. "1" means that the element shall be used. "0" means that the element shall not be used. | EyebrowHeightFlag | This field, which is only present in the binary representation, signals the presence of the EyebrowHeight element. "1" means that the element shall be used. "0" means that the element shall not be used. | EyebrowArcFlag | This field, which is only present in the binary representation, signals the presence of the EyebrowArc element. "1" means that the element shall be used. "0" means that the element shall not be used. | EyebrowPointsFlag | This field, which is only present in the binary representation, signals the presence of the EyebrowPoints element. "1" means that the element shall be used. "0" means that the element shall not be used. | ExtraFlag | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used. | hapticIDRefFlag | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. | Eyebrowsize | The length of the eyebrow (short, medium, long) | EyebrowDensity | The density (low, moderate, high) | EyebrowHeight | The vertical eyebrow position on the face (low, middle, high) | EyebrowArc | The curvature of the Eyebrow. It can be low (flat), middle or high (arced) | EyebrowPoints | The direction of the eyebrows, towards up or down (down, middle, up) | NumExtra | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the EyebrowType. | Extra | Describes any other descriptions of eyebrows. | hapticIDRef | Identifier that refers to the haptic properties of the eyebrows. |
|             | Name  | Description  |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | Eyebrows Type   | A type that describes avatar eyebrows.   |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | EyebrowsizeFlag   | This field, which is only present in the binary representation, signals the presence of the Eyebrowsize element. "1" means that the element shall be used. "0" means that the element shall not be used.       |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | EyebrowDensityFlag  | This field, which is only present in the binary representation, signals the presence of the EyebrowDensity element. "1" means that the element shall be used. "0" means that the element shall not be used.    |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | EyebrowHeightFlag   | This field, which is only present in the binary representation, signals the presence of the EyebrowHeight element. "1" means that the element shall be used. "0" means that the element shall not be used.     |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | EyebrowArcFlag  | This field, which is only present in the binary representation, signals the presence of the EyebrowArc element. "1" means that the element shall be used. "0" means that the element shall not be used.        |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | EyebrowPointsFlag   | This field, which is only present in the binary representation, signals the presence of the EyebrowPoints element. "1" means that the element shall be used. "0" means that the element shall not be used.     |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | ExtraFlag   | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.         |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | hapticIDRefFlag   | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | Eyebrowsize   | The length of the eyebrow (short, medium, long)  |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | EyebrowDensity  | The density (low, moderate, high)  |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | EyebrowHeight   | The vertical eyebrow position on the face (low, middle, high)  |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | EyebrowArc  | The curvature of the Eyebrow. It can be low (flat), middle or high (arced)   |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | EyebrowPoints   | The direction of the eyebrows, towards up or down (down, middle, up)   |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
|             | NumExtra  | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the EyebrowType.   |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
| Extra       | Describes any other descriptions of eyebrows.   |  |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |
| hapticIDRef | Identifier that refers to the haptic properties of the eyebrows.  |  |             |               |  |                 |  |                    |   |                   |  |                |   |                   |  |           |  |                 |  |             |   |                |                                   |               |   |            |  |               |  |          |  |       |   |             |  |

| Name       | Description  |  |
|------------|--|--|
| FacialHair | Set of descriptions for facial hair of the avatar. |  |
|            | <b>Name</b>  | <b>Description</b>   |
|            | FacialHairType                                     | A type that describes avatar facial hair.  |
|            | FacialHairThicknessFlag                            | This field, which is only present in the binary representation, signals the presence of the FacialHairThickness element. "1" means that the element shall be used. "0" means that the element shall not be used. |
|            | FacialSideburnsFlag                                | This field, which is only present in the binary representation, signals the presence of the FacialSideburns element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|            | FacialMustacheFlag                                 | This field, which is only present in the binary representation, signals the presence of the FacialMustache element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|            | FacialChinCurtainsFlag                             | This field, which is only present in the binary representation, signals the presence of the FacialChinCurtains element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
|            | FacialSoulPatchFlag                                | This field, which is only present in the binary representation, signals the presence of the FacialSoulPatch element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
|            | ExtraFlag  | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.           |
|            | hapticIDRefFlag                                    | This field, which is only present in the binary representation, signals the presence of the hapticIDRef attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used.   |
|            | FacialHairThickness                                | The thick of the facial hair (low, middle, high)   |
|            | FacialSideBurns                                    | The color type defined in ISO/IEC 23005-6 shall be used for the color of the facial side.  |
|            | FacialMoustache                                    | The facial moustache (yes or no)   |
|            | FacialChinCurtains                                 | Facial chin curtains (yes or no)   |
|            | FacialSoulPatch                                    | Facial soul patch (yes or no)  |
|            | NumExtra   | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the FacialHairType.  |
|            | Extra  | Describes any other descriptions of facial hair.   |
|            | hapticIDRef  | Identifier that refers to the haptic properties of the facial hair.  |

| Name                      | Description   |   |
|---------------------------|---|---|
| BodyHair                  | Set of descriptions for body hair of the avatar.                          |   |
|                           | <b>Name</b>   | <b>Description</b>  |
|                           | BodyHairType  | A type that describes avatar body hair.   |
|                           | HairColorFlag   | This field, which is only present in the binary representation, signals the presence of the HairColor element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|                           | HairThicknessFlag   | This field, which is only present in the binary representation, signals the presence of the HairThickness element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
|                           | ExtraFlag   | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
|                           | HairColor   | The color type defined in ISO/IEC 23005-6 shall be used for avatar body hair.   |
|                           | HairThickness   | The thick of the body hair (low, middle, high)  |
|                           | NumExtra  | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the BodyHairType.   |
| Extra                     | Describes any other descriptions of body hair.                            |   |
| Facial Calibration Points | Set of elements that are calibration points for the face feature control. |   |
|                           | <b>Name</b>   | <b>Description</b>  |
|                           | FacialCalibrationPointsType   | A type that describes calibration points for face feature control.  |
|                           | SellionFlag   | This field, which is only present in the binary representation, signals the presence of the Sellion element. "1" means that the element shall be used. "0" means that the element shall not be used.        |
|                           | RInfraorbitaleFlag  | This field, which is only present in the binary representation, signals the presence of the RInfraorbitale element. "1" means that the element shall be used. "0" means that the element shall not be used. |
|                           | LinfraorbitaleFlag  | This field, which is only present in the binary representation, signals the presence of the Linfraorbitale element. "1" means that the element shall be used. "0" means that the element shall not be used. |
|                           | SupramentonFlag   | This field, which is only present in the binary representation, signals the presence of the Supramenton element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
|                           | RtragionFlag  | This field, which is only present in the binary representation, signals the presence of the Rtragion element. "1" means that the element shall be used. "0" means that the element shall not be used.       |

| Name           | Description |   |
|----------------|-------------|---|
| RgonionFlag    |             | This field, which is only present in the binary representation, signals the presence of the Rgonion element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
| LtragonionFlag |             | This field, which is only present in the binary representation, signals the presence of the Ltragonion element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| LgonionFlag    |             | This field, which is only present in the binary representation, signals the presence of the Lgonion element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
| ExtraFlag      |             | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| Sellion        |             | 3D position (metres), point 1 in the figure below   |
| RInfraorbitale |             | 3D position (metres), point 2 in the figure below   |
| LInfraorbitale |             | 3D position (metres), point 3 in the figure below   |
| Supramenton    |             | 3D position (metres), point 4 in the figure below   |
| RTragonion     |             | 3D position (metres), point 5 in the figure below   |
| RGonion        |             | 3D position (metres), point 6 in the figure below   |
| LTragonion     |             | 3D position (metres), point 7 in the figure below   |
| LGonion        |             | 3D position (metres), point 8 in the figure below   |
| NumExtra       |             | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the FacialCalibrationPointsType.  |
| Extra          |             | Describes any other descriptions of facial calibration points.  |

NOTE The calibration points are used for mapping captured face feature points onto an arbitrary face of an avatar.

| Name                  | Description  |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
|-----------------------|--|------|-------------|-----------------------|---|------------------|---|---------------------|--|-----------|--|--------------|---|-----------------|---|----------|--|-------|---|
| Physical Condition    | This element contains a set of elements for describing the physical condition of the avatar. <table border="1"> <thead> <tr> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>PhysicalConditionType</td> <td>A type that describes the physical condition of the avatar.</td> </tr> <tr> <td>BodyStrengthFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the BodyStrength element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>BodyFlexibilityFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the BodyFlexibility element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>ExtraFlag</td> <td>This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.</td> </tr> <tr> <td>BodyStrength</td> <td>Avatar body strength (unlimited percentage (%))</td> </tr> <tr> <td>BodyFlexibility</td> <td>Avatar body flexibility with descriptive scale of low, medium, and high</td> </tr> <tr> <td>NumExtra</td> <td>This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the PhysicalConditionType.</td> </tr> <tr> <td>Extra</td> <td>Describes any other descriptions of physical condition.</td> </tr> </tbody> </table> | Name | Description | PhysicalConditionType | A type that describes the physical condition of the avatar. | BodyStrengthFlag | This field, which is only present in the binary representation, signals the presence of the BodyStrength element. "1" means that the element shall be used. "0" means that the element shall not be used. | BodyFlexibilityFlag | This field, which is only present in the binary representation, signals the presence of the BodyFlexibility element. "1" means that the element shall be used. "0" means that the element shall not be used. | ExtraFlag | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used. | BodyStrength | Avatar body strength (unlimited percentage (%)) | BodyFlexibility | Avatar body flexibility with descriptive scale of low, medium, and high | NumExtra | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the PhysicalConditionType. | Extra | Describes any other descriptions of physical condition. |
| Name                  | Description  |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| PhysicalConditionType | A type that describes the physical condition of the avatar.  |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| BodyStrengthFlag      | This field, which is only present in the binary representation, signals the presence of the BodyStrength element. "1" means that the element shall be used. "0" means that the element shall not be used.  |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| BodyFlexibilityFlag   | This field, which is only present in the binary representation, signals the presence of the BodyFlexibility element. "1" means that the element shall be used. "0" means that the element shall not be used.   |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| ExtraFlag             | This field, which is only present in the binary representation, signals the presence of the ExtraType element. "1" means that the element shall be used. "0" means that the element shall not be used.   |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| BodyStrength          | Avatar body strength (unlimited percentage (%))  |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| BodyFlexibility       | Avatar body flexibility with descriptive scale of low, medium, and high  |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| NumExtra              | This field, which is only present in the binary representation, specifies the number of ExtraType elements contained in the PhysicalConditionType.   |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| Extra                 | Describes any other descriptions of physical condition.  |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| Clothes               | A list of virtual clothes associated to the avatar. The type of this element is VirtualObjectType.   |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| Shoes                 | A list of virtual shoes associated to the avatar. The type of this element is VirtualObjectType.   |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| Accessories           | A list of objects (ring, glasses, ...) associated to the avatar. The type of this element is VirtualObjectType.  |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| SkinMarks             | A list of skin marks (birthmarks, scars, tattoos..., ...) associated to the avatar. The type of this element is VirtualObjectType.   |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| AppearanceResources   | URL to file or streaming, containing the avatar visual representation. The avatar can be represented as 3D animated model, time-sequenced 3D model, 2D image, 2D video, 3D image, and 3D video, usually MP4 file.  |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |
| Extra                 | Describes any other descriptions of avatar appearance.   |      |             |                       |   |                  |   |                     |  |           |  |              |   |                 |   |          |  |       |   |

### 5.3.4 Examples

This example shows the description of avatar appearance with the following semantics.

```
<vwoc:Appearance>
  <vwoc:Body>
    <vwoc:BodyHeight>5.2</vwoc:BodyHeight>
    <vwoc:BodyThickness>4.4</vwoc:BodyThickness>
    <vwoc:BodyFat>low</vwoc:BodyFat>
    <vwoc:TorsoMuscles>low</vwoc:TorsoMuscles>
    <vwoc:NeckThickness>2.1</vwoc:NeckThickness>
```

```

    <vwoc:NeckLength>1.8</vwoc:NeckLength>
    <vwoc:Package>small</vwoc:Package>
    <vwoc:SaddleBags>medium</vwoc:SaddleBags>
    <vwoc:KneeAngle>300</vwoc:KneeAngle>
    <vwoc:FootSize>3.1</vwoc:FootSize>
</vwoc:Body>
<vwoc:Head>
    <vwoc:HeadSize>small</vwoc:HeadSize>
    <vwoc:HeadStretch>1.1</vwoc:HeadStretch>
    <vwoc:HeadShape>square</vwoc:HeadShape>
    <vwoc:EggHead>true</vwoc:EggHead>
</vwoc:Head>
<vwoc:Eyes>
    <vwoc:EyeSize>1.1</vwoc:EyeSize>
</vwoc:Eyes>
<vwoc:Ears>
    <vwoc:EarSize>2.1</vwoc:EarSize>
</vwoc:Ears>
<vwoc:Nose>
    <vwoc:NoseSize>0.8</vwoc:NoseSize>
</vwoc:Nose>
<vwoc:FacialSkin>
    <vwoc:SkinRainbowColor>#FF8F69</vwoc:SkinRainbowColor>
</vwoc:FacialSkin>
<vwoc:ToeNails>
    <vwoc:NailPolish>true</vwoc:NailPolish>
    <vwoc:NailPolishColor>#CF8F69</vwoc:NailPolishColor>
</vwoc:ToeNails>
<vwoc:BodyLook>
    <vwoc:BodyDefinition>short</vwoc:BodyDefinition>
</vwoc:BodyLook>
<vwoc:Hair>
    <vwoc:HairSize>short</vwoc:HairSize>
    <vwoc:HairStyle>urn:mpeg:mpeg-v:01-VWOC-HairStyleCS-
NS:crewcut</vwoc:HairStyle>
</vwoc:Hair>
<vwoc:FacialCalibrationPoints>
    <vwoc:Sellion xsi:type="vwoc:Physical3DPointType" x="1.1" y="1.2"
z="1.2"/>
    <vwoc:RInfraorbitale xsi:type="vwoc:Physical3DPointType" x="1.1" y="1.2"
z="1.3"/>
</vwoc:FacialCalibrationPoints>
<vwoc:PhysicalCondition>
    <vwoc:BodyFlexibility>low</vwoc:BodyFlexibility>
</vwoc:PhysicalCondition>
<vwoc:Clothes id="vo_clothes_001">
    <vwoc:VirtualObjectComponents>
    <vwoc:VirtualObject xsi:type="vwoc:VirtualObjectType"
id="clothe_part_001">
        <vwoc:Appearance id="virtualObject_001"</vwoc:Appearance>
    </vwoc:VirtualObject>
    </vwoc:VirtualObjectComponents>
</vwoc:Clothes>
</vwoc:Appearance>

```

5.4 AvatarAnimationType

5.4.1 XML representation syntax

|                |   |
|----------------|---|
| <p>Diagram</p> |   |
| <p>Source</p>  | <pre>&lt;complexType name="AvatarAnimationType"&gt;   &lt;sequence&gt;     &lt;element name="Idle" type="vwoc:AnimationDescriptionType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="Greeting" type="vwoc:AnimationDescriptionType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="Dance" type="vwoc:AnimationDescriptionType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="Walk" type="vwoc:AnimationDescriptionType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="Moves" type="vwoc:AnimationDescriptionType" minOccurs="0" maxOccurs="unbounded"/&gt; </pre> |

```

maxOccurs="unbounded"/>
  <element name="Fighting" type="vwoc:AnimationDescriptionType" minOccurs="0"
maxOccurs="unbounded"/>
  <element name="Hearing" type="vwoc:AnimationDescriptionType" minOccurs="0"
maxOccurs="unbounded"/>
  <element name="Smoke" type="vwoc:AnimationDescriptionType" minOccurs="0"
maxOccurs="unbounded"/>
  <element name="Congratulations" type="vwoc:AnimationDescriptionType" minOccurs="0"
maxOccurs="unbounded"/>
  <element name="CommonActions" type="vwoc:AnimationDescriptionType" minOccurs="0"
maxOccurs="unbounded"/>
  <element name="SpecificActions" type="vwoc:AnimationDescriptionType" minOccurs="0"
maxOccurs="unbounded"/>
  <element name="FacialExpression" type="vwoc:AnimationDescriptionType" minOccurs="0"
maxOccurs="unbounded"/>
  <element name="BodyExpression" type="vwoc:AnimationDescriptionType" minOccurs="0"
maxOccurs="unbounded"/>
  <element name="AnimationResources" type="vwoc:AnimationResourcesDescriptionType"
minOccurs="0" maxOccurs="unbounded"/>
  <element name="Extra" type="vwoc:ExtraType" minOccurs="0" maxOccurs="unbounded"/>
</sequence>
</complexType>

```

5.4.2 Binary representation syntax

| AvatarAnimationType{   | Number of bits | Mnemonic |
|------------------------|----------------|----------|
| IdleFlag               | 1              | bslbf    |
| GreetingFlag           | 1              | bslbf    |
| DanceFlag              | 1              | bslbf    |
| WalkFlag               | 1              | bslbf    |
| MovesFlag              | 1              | bslbf    |
| FightingFlag           | 1              | bslbf    |
| HearingFlag            | 1              | bslbf    |
| SmokeFlag              | 1              | bslbf    |
| CongratulationFlag     | 1              | bslbf    |
| CommonActionsFlag      | 1              | bslbf    |
| SpecificActionsFlag    | 1              | bslbf    |
| FacialExpressionFlag   | 1              | bslbf    |
| BodyExpressionFlag     | 1              | bslbf    |
| AnimationResourcesFlag | 1              | bslbf    |
| ExtraFlag              | 1              | bslbf    |

| AvatarAnimationType{           | Number of bits | Mnemonic                 |
|--------------------------------|----------------|--------------------------|
| if(IdleFlag){                  |                |                          |
| NumIdle                        |                | vluimsbf5                |
| for(k=0; k< NumIdle; k++){     |                |                          |
| Idle[k]                        |                | AnimationDescriptionType |
| }                              |                |                          |
| }                              |                |                          |
| if(GreetingFlag){              |                |                          |
| NumGreeting                    |                | vluimsbf5                |
| for(k=0; k< NumGreeting; k++){ |                |                          |
| Greeting[k]                    |                | AnimationDescriptionType |
| }                              |                |                          |
| }                              |                |                          |
| if(DanceFlag){                 |                |                          |
| NumDance                       |                | vluimsbf5                |
| for(k=0; k< NumDance; k++){    |                |                          |
| Dance[k]                       |                | AnimationDescriptionType |
| }                              |                |                          |
| }                              |                |                          |
| if(WalkFlag){                  |                |                          |
| NumWalk                        |                | vluimsbf5                |
| for(k=0; k< NumWalk; k++){     |                |                          |
| Walk[k]                        |                | AnimationDescriptionType |
| }                              |                |                          |
| }                              |                |                          |
| if(MovesFlag){                 |                |                          |

| AvatarAnimationType{           | Number of bits | Mnemonic                 |
|--------------------------------|----------------|--------------------------|
| NumMoves                       |                | vluimsbf5                |
| for(k=0; k< NumMoves; k++){    |                |                          |
| Moves[k]                       |                | AnimationDescriptionType |
| }                              |                |                          |
| }                              |                |                          |
| if(FightingFlag){              |                |                          |
| NumFighting                    |                | vluimsbf5                |
| for(k=0; k< NumFighting; k++){ |                |                          |
| Fighting[k]                    |                | AnimationDescriptionType |
| }                              |                |                          |
| }                              |                |                          |
| if(HearingFlag){               |                |                          |
| NumHearing                     |                | vluimsbf5                |
| for(k=0; k< NumHearing; k++){  |                |                          |
| Hearing[k]                     |                | AnimationDescriptionType |
| }                              |                |                          |
| }                              |                |                          |
| if(SmokeFlag){                 |                |                          |
| NumSmoke                       |                | vluimsbf5                |
| for(k=0; k< NumSmoke; k++){    |                |                          |
| Smoke[k]                       |                | AnimationDescriptionType |
| }                              |                |                          |
| }                              |                |                          |
| if(CongratulationsFlag){       |                |                          |
| NumCongratulations             |                | vluimsbf5                |

| AvatarAnimationType{                   | Number of bits | Mnemonic                 |
|--|----------------|--------------------------|
| for(k=0; k< NumCongratulations; k++){  |                |                          |
| Congratulations[k]                     |                | AnimationDescriptionType |
| }                                      |                |                          |
| }                                      |                |                          |
| if(CommonActionsFlag){                 |                |                          |
| NumCommonActions                       |                | vluimsbf5                |
| for(k=0; k< NumCommonActions; k++){    |                |                          |
| CommonActions[k]                       |                | AnimationDescriptionType |
| }                                      |                |                          |
| }                                      |                |                          |
| if(SpecificActionsFlag){               |                |                          |
| NumSpecificActions                     |                | vluimsbf5                |
| for(k=0; k< NumSpecificActions; k++){  |                |                          |
| SpecificActions[k]                     |                | AnimationDescriptionType |
| }                                      |                |                          |
| }                                      |                |                          |
| if(FacialExpressionFlag){              |                |                          |
| NumFacialExpression                    |                | vluimsbf5                |
| for(k=0; k< NumFacialExpression; k++){ |                |                          |
| FacialExpression[k]                    |                | AnimationDescriptionType |
| }                                      |                |                          |
| }                                      |                |                          |
| if(BodyExpressionFlag){                |                |                          |
| NumBodyExpression                      |                | vluimsbf5                |
| for(k=0; k< NumBodyExpression; k++){   |                |                          |

| AvatarAnimationType{                     | Number of bits | Mnemonic                          |
|--|----------------|-----------------------------------|
| BodyExpression[k]                        |                | AnimationDescriptionType          |
| }  |                |                                   |
| }  |                |                                   |
| if(AnimationResourcesFlag){              |                |                                   |
| NumAnimationResources                    |                | vluimsbf5                         |
| for(k=0; k< NumAnimationResources; k++){ |                |                                   |
| AnimationResources[k]                    |                | AnimationResourcesDescriptionType |
| }  |                |                                   |
| }  |                |                                   |
| if(ExtraFlag){                           |                |                                   |
| NumExtra                                 |                | vluimsbf5                         |
| for(k=0; k< NumExtra; k++){              |                |                                   |
| Extra[k]                                 |                | ExtraType                         |
| }  |                |                                   |
| }  |                |                                   |
| }  |                |                                   |

5.4.3 Semantics

| Name                | Description  |
|---------------------|--|
| AvatarAnimationType | A type that contains the description of a set of animation sequences that the avatar is able to perform and may refer to several medias containing the exact (geometric transformations) animation parameters. |
| IdleFlag            | This field, which is only present in the binary representation, signals the presence of the Idle elements. "1" means that the element shall be used. "0" means that the element shall not be used.             |
| GreetingFlag        | This field, which is only present in the binary representation, signals the presence of the Greeting elements. "1" means that the element shall be used. "0" means that the element shall not be used.         |
| DanceFlag           | This field, which is only present in the binary representation, signals the presence of the Dance elements. "1" means that the element shall be used. "0" means that the element shall not be used.            |

| Name                   | Description   |
|------------------------|---|
| WalkFlag               | This field, which is only present in the binary representation, signals the presence of the <code>Walk</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used.               |
| MovesFlag              | This field, which is only present in the binary representation, signals the presence of the <code>Moves</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used.              |
| FightingFlag           | This field, which is only present in the binary representation, signals the presence of the <code>Fighting</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used.           |
| HearingFlag            | This field, which is only present in the binary representation, signals the presence of the <code>Hearing</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used.            |
| SmokeFlag              | This field, which is only present in the binary representation, signals the presence of the <code>Smoke</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used.              |
| CongratulationsFlag    | This field, which is only present in the binary representation, signals the presence of the <code>Congratulations</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used.    |
| CommonActionsFlag      | This field, which is only present in the binary representation, signals the presence of the <code>CommonActions</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used.      |
| SpecificActionsFlag    | This field, which is only present in the binary representation, signals the presence of the <code>SpecificActions</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used.    |
| FacialExpressionFlag   | This field, which is only present in the binary representation, signals the presence of the <code>FacialExpression</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used.   |
| BodyExpressionFlag     | This field, which is only present in the binary representation, signals the presence of the <code>BodyExpression</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| AnimationResourcesFlag | This field, which is only present in the binary representation, signals the presence of the <code>AnimationResources</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used. |
| ExtraFlag              | This field, which is only present in the binary representation, signals the presence of the <code>ExtraType</code> elements. "1" means that the element shall be used. "0" means that the element shall not be used.          |
| NumIdle                | This field, which is only present in the binary representation, signals the number of the <code>Idle</code> elements.   |
| NumGreeting            | This field, which is only present in the binary representation, signals the number of the <code>Greeting</code> elements.   |
| NumDance               | This field, which is only present in the binary representation, signals the number of the <code>Dance</code> elements.  |
| NumWalk                | This field, which is only present in the binary representation, signals the number of the <code>Walk</code> elements.   |
| NumMoves               | This field, which is only present in the binary representation, signals the number of the <code>Moves</code> elements.  |
| NumFighting            | This field, which is only present in the binary representation, signals the number of the <code>Fighting</code> elements.   |
| NumHearing             | This field, which is only present in the binary representation, signals the number of the <code>Hearing</code> elements.  |

| Name                  | Description   |              |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
|-----------------------|---|--------------|--------------------------------|-------------|-------------|---|--------------|----------|---|-----------|---------|---|---------|-----------|---|------------|--|--------|----------|
| NumSmoke              | This field, which is only present in the binary representation, signals the number of the <code>Smoke</code> elements.  |              |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
| NumCongratulations    | This field, which is only present in the binary representation, signals the number of the <code>Congratulations</code> elements.  |              |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
| NumCommonActions      | This field, which is only present in the binary representation, signals the number of the <code>CommonActions</code> elements.  |              |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
| NumSpecificActions    | This field, which is only present in the binary representation, signals the number of the <code>SpecificActions</code> elements.  |              |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
| NumFacialExpression   | This field, which is only present in the binary representation, signals the number of the <code>FacialExpression</code> elements.   |              |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
| NumBodyExpression     | This field, which is only present in the binary representation, signals the number of the <code>BodyExpression</code> elements.   |              |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
| NumAnimationResources | This field, which is only present in the binary representation, signals the number of the <code>AnimationResources</code> elements.   |              |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
| Idle                  | <p>Describes an <code>idle</code> type of animations as a reference to a classification scheme (CS) term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the <code>IdleAnimationCS</code> defined in A.4.2.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Binary representation (4 bits)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>defaultIdle</td> <td>1</td> <td>default idle</td> </tr> <tr> <td>restPose</td> <td>2</td> <td>rest pose</td> </tr> <tr> <td>breathe</td> <td>3</td> <td>breathe</td> </tr> <tr> <td>bodyNoise</td> <td>4</td> <td>body noise</td> </tr> <tr> <td></td> <td>0,5-15</td> <td>reserved</td> </tr> </tbody> </table> | Name         | Binary representation (4 bits) | Description | defaultIdle | 1 | default idle | restPose | 2 | rest pose | breathe | 3 | breathe | bodyNoise | 4 | body noise |  | 0,5-15 | reserved |
| Name                  | Binary representation (4 bits)  | Description  |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
| defaultIdle           | 1   | default idle |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
| restPose              | 2   | rest pose    |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
| breathe               | 3   | breathe      |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
| bodyNoise             | 4   | body noise   |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |
|                       | 0,5-15  | reserved     |                                |             |             |   |              |          |   |           |         |   |         |           |   |            |  |        |          |

| Name     | Description   |                                       |                    |
|----------|---|---------------------------------------|--------------------|
| Greeting | Describes a greeting type of animations as a reference to a classification scheme (CS) term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the <code>GreetingAnimationCS</code> defined in A.4.3. |                                       |                    |
|          | <b>Name</b>   | <b>Binary representation (4 bits)</b> | <b>Description</b> |
|          | salute  | 1                                     | salute             |
|          | cheer   | 2                                     | cheer              |
|          | greet   | 3                                     | greet              |
|          | wave  | 4                                     | wave               |
|          | hello   | 5                                     | hello              |
|          | bow   | 6                                     | bow                |
|          | courtBow  | 7                                     | court bow          |
|          | flourish  | 8                                     | flourish           |
|          |   | 0,8-15                                | reserved           |

| Name  | Description   |                                       |                     |
|-------|---|---------------------------------------|---------------------|
| Dance | Describes a dance type of animations as a reference to a classification scheme (CS) term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the <code>DanceAnimationCS</code> defined in A.4.4. |                                       |                     |
|       | <b>Name</b>   | <b>Binary representation (5 bits)</b> | <b>Description</b>  |
|       | bodyPopDance  | 1                                     | body pop dance      |
|       | breakDance  | 2                                     | break dance         |
|       | cabbagePatchDance   | 3                                     | cabbage patch dance |
|       | casualDance   | 4                                     | casual dance        |
|       | dance   | 5                                     | dance               |
|       | raveDance   | 6                                     | rave dance          |
|       | robotDance  | 7                                     | robot dance         |
|       | rockDance   | 8                                     | rock dance          |
|       | rockRollDance   | 9                                     | rock and roll dance |
|       | runningManDance   | 10                                    | running man dance   |
|       | salsaDance  | 11                                    | salsa dance         |
|       | 0,12-31   | reserved                              |                     |

| Name        | Description  |                                       |                    |
|-------------|--|---------------------------------------|--------------------|
| Walk        | <p>Describes a Walk type of animations as a reference to a classification scheme (CS) term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the <code>WalkAnimationCS</code> defined in A.4.5.</p>   |                                       |                    |
|             | <b>Name</b>  | <b>Binary representation (5 bits)</b> | <b>Description</b> |
| slowWalk    | 1  | slow walk                             | defaultWalk        |
| defaultWalk | 2  | default walk                          | fastWalk           |
| fastWalk    | 3  | fast walk                             | slowRun            |
| slowRun     | 4  | slow run                              | defaultRun         |
| defaultRun  | 5  | default run                           | fastRun            |
| fastRun     | 6  | fast run                              | crouch             |
| crouch      | 7  | crouch                                | crouchWalk         |
| crouchWalk  | 8  | crouch walk                           |                    |
|             | 0,9-31   | reserved                              |                    |
| Moves       | <p>Describes a moves type of animations as a reference to a classification scheme (CS) term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the <code>MovesAnimationCS</code> defined in A.4.6.</p> |                                       |                    |
|             | <b>Name</b>  | <b>Binary representation (5 bits)</b> | <b>Description</b> |
| moveDown    | 1  | move down                             | moveLeft           |
| moveLeft    | 2  | move left                             | moveRight          |
| moveRight   | 3  | move right                            | moveUp             |
| moveUp      | 4  | move up                               | pointMe            |
| pointMe     | 5  | point me                              | pointYou           |
| pointYou    | 6  | point you                             | turn180            |
| turn180     | 7  | turn 180                              |                    |
| turnBack180 | 8  | turn back 180                         |                    |
| turnLeft    | 9  | turn left                             |                    |

| Name            | Description  |                   |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
|-----------------|--|-------------------|----------------|------|--------------------------------|-------------|-----|---|-----|---------|---|----------|----------|---|-----------|--------|---|---------|------------|---|--------------|-------------|---|---------------|--------------|---|----------------|---------------|---|-----------------|------------|---|-------------|----------------|----|------------------|-----------------|----|-------------------|------------|----|-------------|----------------|----|------------------|-----------------|----|-------------------|------------|----|-------------|----------------|----|------------------|-----------------|----|-------------------|
|                 | turnRight  | 10                | turn right     |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
|                 | turn360  | 11                | turn 360       |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
|                 | turnBack360  | 12                | turn back 360  |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
|                 | freeDirection  | 13                | free direction |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
|                 |  | 0,14-31           | reserved       |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| Fighting        | <p>Describes a Fighting type of animations as a reference to a classification scheme (CS) term that shall be using the mpeg7:termReferenceType defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the FightingAnimationCS defined in A.4.7.</p>   |                   |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
|                 | <table border="1"> <thead> <tr> <th>Name</th> <th>Binary representation (7 bits)</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>Aim</td><td>1</td><td>aim</td></tr> <tr><td>aimLeft</td><td>2</td><td>aim left</td></tr> <tr><td>aimRight</td><td>3</td><td>aim right</td></tr> <tr><td>aimBow</td><td>4</td><td>aim bow</td></tr> <tr><td>aimLeftBow</td><td>5</td><td>aim left bow</td></tr> <tr><td>aimRightBow</td><td>6</td><td>aim right bow</td></tr> <tr><td>aimLeftRifle</td><td>7</td><td>aim left rifle</td></tr> <tr><td>aimRightRifle</td><td>8</td><td>aim right rifle</td></tr> <tr><td>aimBazooka</td><td>9</td><td>aim bazooka</td></tr> <tr><td>aimLeftBazooka</td><td>10</td><td>aim left bazooka</td></tr> <tr><td>aimRightBazooka</td><td>11</td><td>aim right bazooka</td></tr> <tr><td>aimHandgun</td><td>12</td><td>aim handgun</td></tr> <tr><td>aimLeftHandgun</td><td>13</td><td>aim left handgun</td></tr> <tr><td>aimRightHandgun</td><td>14</td><td>aim right handgun</td></tr> <tr><td>holdWeapon</td><td>15</td><td>hold weapon</td></tr> <tr><td>holdWeaponLeft</td><td>16</td><td>hold weapon left</td></tr> <tr><td>holdWeaponRight</td><td>17</td><td>hold weapon right</td></tr> </tbody> </table> |                   |                | Name | Binary representation (7 bits) | Description | Aim | 1 | aim | aimLeft | 2 | aim left | aimRight | 3 | aim right | aimBow | 4 | aim bow | aimLeftBow | 5 | aim left bow | aimRightBow | 6 | aim right bow | aimLeftRifle | 7 | aim left rifle | aimRightRifle | 8 | aim right rifle | aimBazooka | 9 | aim bazooka | aimLeftBazooka | 10 | aim left bazooka | aimRightBazooka | 11 | aim right bazooka | aimHandgun | 12 | aim handgun | aimLeftHandgun | 13 | aim left handgun | aimRightHandgun | 14 | aim right handgun | holdWeapon | 15 | hold weapon | holdWeaponLeft | 16 | hold weapon left | holdWeaponRight | 17 | hold weapon right |
| Name            | Binary representation (7 bits)   | Description       |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| Aim             | 1  | aim               |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimLeft         | 2  | aim left          |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimRight        | 3  | aim right         |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimBow          | 4  | aim bow           |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimLeftBow      | 5  | aim left bow      |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimRightBow     | 6  | aim right bow     |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimLeftRifle    | 7  | aim left rifle    |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimRightRifle   | 8  | aim right rifle   |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimBazooka      | 9  | aim bazooka       |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimLeftBazooka  | 10   | aim left bazooka  |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimRightBazooka | 11   | aim right bazooka |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimHandgun      | 12   | aim handgun       |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimLeftHandgun  | 13   | aim left handgun  |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| aimRightHandgun | 14   | aim right handgun |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| holdWeapon      | 15   | hold weapon       |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| holdWeaponLeft  | 16   | hold weapon left  |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |
| holdWeaponRight | 17   | hold weapon right |                |      |                                |             |     |   |     |         |   |          |          |   |           |        |   |         |            |   |              |             |   |               |              |   |                |               |   |                 |            |   |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |            |    |             |                |    |                  |                 |    |                   |

| Name | Description          |    |                         |
|------|----------------------|----|-------------------------|
|      | holdBow              | 18 | hold bow                |
|      | holdBowLeft          | 19 | hold bow left           |
|      | holdBowRight         | 20 | hold bow right          |
|      | holdRifle            | 21 | hold rifle              |
|      | holdRifleLeft        | 22 | hold rifle left         |
|      | holdRifleRight       | 23 | hold rifle right        |
|      | holdBazooka          | 24 | hold bazooka            |
|      | holdBazookaLeft      | 25 | hold bazooka left       |
|      | holdBazookaRight     | 26 | hold bazooka right      |
|      | holdHandgun          | 27 | hold handgun            |
|      | holdHandgunLeft      | 28 | hold handgun left       |
|      | holdHandgunRight     | 29 | hold handgun right      |
|      | holdWeaponThrow      | 30 | hold weapon throw       |
|      | holdWeaponThrowLeft  | 31 | hold weapon throw left  |
|      | holdWeaponThrowRight | 32 | hold weapon throw right |
|      | Shoot                | 33 | shoot                   |
|      | shootLeft            | 34 | shoot left              |
|      | shootRight           | 35 | shoot right             |
|      | shootBow             | 36 | shoot bow               |
|      | shootBowLeft         | 37 | shoot bow left          |
|      | shootBowRight        | 38 | shoot bow right         |
|      | shootRifle           | 39 | shoot rifle             |
|      | shootRifleLeft       | 40 | shoot rifle left        |
|      | shootRifleRight      | 41 | shoot rifle right       |
|      | shootBazooka         | 42 | shoot bazooka           |

| Name           | Description   |                  |                                |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|----------------|---|------------------|--------------------------------|-------------|--------------|---|---------------|-------------|---|--------------|------------|---|-------------|---------------|---|-----------------|----------------|---|------------------|-------------|---|---------------|--|--|
|                | shootBazookaLeft  | 43               | shoot bazooka left             |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | shootBazookaRight   | 44               | shoot bazooka right            |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | shootHandgun  | 45               | shoot handgun                  |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | shootHandgunLeft  | 46               | shoot handgun left             |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | shootHandgunRight   | 47               | shoot handgun right            |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | Strike  | 48               | strike                         |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | strikeSword   | 49               | strike sword                   |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | strikeSwordLeft   | 50               | strike sword left              |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | strikeSwordRight  | 51               | strike sword right             |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | Punch   | 52               | punch                          |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | punchLeft   | 53               | punch left                     |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | punchRight  | 54               | punch right                    |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | Throwing  | 55               | throwing                       |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | throwWeaponLeft   | 56               | throw weapon left              |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | throwWeaponRight  | 57               | throw weapon right             |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                |   | 0, 58-127        | reserved                       |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
| Hearing        | <p>Describes a Hearing type of animations as a reference to a classification scheme (CS) term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the <code>HearingAnimationCS</code> defined in A.4.8.</p>  |                  |                                |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
|                | <table border="1"> <thead> <tr> <th>Name</th> <th>Binary representation (5 bits)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>startHearing</td> <td>1</td> <td>start hearing</td> </tr> <tr> <td>stopHearing</td> <td>2</td> <td>stop hearing</td> </tr> <tr> <td>earsExtend</td> <td>3</td> <td>ears extend</td> </tr> <tr> <td>turnsHeadLeft</td> <td>4</td> <td>turns head left</td> </tr> <tr> <td>turnsHeadRight</td> <td>5</td> <td>turns head right</td> </tr> <tr> <td>holdsUpHand</td> <td>6</td> <td>holds up hand</td> </tr> </tbody> </table> | Name             | Binary representation (5 bits) | Description | startHearing | 1 | start hearing | stopHearing | 2 | stop hearing | earsExtend | 3 | ears extend | turnsHeadLeft | 4 | turns head left | turnsHeadRight | 5 | turns head right | holdsUpHand | 6 | holds up hand |  |  |
| Name           | Binary representation (5 bits)  | Description      |                                |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
| startHearing   | 1   | start hearing    |                                |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
| stopHearing    | 2   | stop hearing     |                                |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
| earsExtend     | 3   | ears extend      |                                |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
| turnsHeadLeft  | 4   | turns head left  |                                |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
| turnsHeadRight | 5   | turns head right |                                |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |
| holdsUpHand    | 6   | holds up hand    |                                |             |              |   |               |             |   |              |            |   |             |               |   |                 |                |   |                  |             |   |               |  |  |

| Name            | Description   |                  |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
|-----------------|---|------------------|------------------|------|--------------------------------|-------------|-----------|---|------------|-------------|---|--------------|----------------|---------|------------------|--|---------|----------|
|                 | tiltsHeadRight  | 7                | tilts head right |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
|                 | tiltsHeadLeft   | 8                | tilts head left  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
|                 | cocksHeadLeft   | 9                | cocks head left  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
|                 | defaultHear   | 10               | default hear     |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
|                 |   | 0,11-31          | reserved         |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
| Smoke           | <p>Describes a Smoke type of animations as a reference to a classification scheme (CS) term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the <code>SmokeAnimationCS</code> defined in A.4.9.</p>  |                  |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
|                 | <table border="1"> <thead> <tr> <th>Name</th> <th>Binary representation (4 bits)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>smokeIdle</td> <td>1</td> <td>smoke idle</td> </tr> <tr> <td>smokeInhale</td> <td>2</td> <td>smoke inhale</td> </tr> <tr> <td>smokeThrowDown</td> <td>3</td> <td>smoke throw down</td> </tr> <tr> <td></td> <td>0, 4-15</td> <td>reserved</td> </tr> </tbody> </table> |                  |                  | Name | Binary representation (4 bits) | Description | smokeIdle | 1 | smoke idle | smokeInhale | 2 | smoke inhale | smokeThrowDown | 3       | smoke throw down |  | 0, 4-15 | reserved |
| Name            | Binary representation (4 bits)  | Description      |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
| smokeIdle       | 1   | smoke idle       |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
| smokeInhale     | 2   | smoke inhale     |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
| smokeThrowDown  | 3   | smoke throw down |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
|                 | 0, 4-15   | reserved         |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
| Congratulations | <p>Describes a Congratulations type of animations as a reference to a classification scheme (CS) term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the <code>CongratulationsAnimationCS</code> defined in A.4.10.</p>   |                  |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
|                 | <table border="1"> <thead> <tr> <th>Name</th> <th>Binary representation (4 bits)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>applaud</td> <td>1</td> <td>applaud</td> </tr> <tr> <td>clap</td> <td>2</td> <td>clap</td> </tr> <tr> <td></td> <td>0, 3-15</td> <td>reserved</td> </tr> </tbody> </table>   |                  |                  | Name | Binary representation (4 bits) | Description | applaud   | 1 | applaud    | clap        | 2 | clap         |                | 0, 3-15 | reserved         |  |         |          |
| Name            | Binary representation (4 bits)  | Description      |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
| applaud         | 1   | applaud          |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
| clap            | 2   | clap             |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |
|                 | 0, 3-15   | reserved         |                  |      |                                |             |           |   |            |             |   |              |                |         |                  |  |         |          |

| Name          | Description  |               |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|---------------|--|---------------|--------------------------------|-------------|--------|---|--------|------|---|------|----------|---|-----------|-------|---|-------|------|---|------|-------|---|-------|------|---|------|-----------|---|-----------|-------|---|-------|-----|----|-----|---------|----|---------|----------|----|-----------|------|----|------|-----|----|-----|-----|----|-----|--------------|----|---------------|-----------|----|-----------|------|----|------|------|----|------|------|----|------|---------|----|---------|------|----|------|--|--|
| CommonActions | <p>Describes a CommonActions type of animations as a reference to a classification scheme (CS) term that shall be using the mpeg7:termReferenceType defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the CommonActionsAnimationCS defined in A.4.11.</p>  |               |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | <table border="1"> <thead> <tr> <th>Name</th> <th>Binary representation (7 bits)</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>appear</td><td>1</td><td>appear</td></tr> <tr><td>away</td><td>2</td><td>away</td></tr> <tr><td>blowKiss</td><td>3</td><td>blow kiss</td></tr> <tr><td>brush</td><td>4</td><td>brush</td></tr> <tr><td>busy</td><td>5</td><td>busy</td></tr> <tr><td>crazy</td><td>6</td><td>crazy</td></tr> <tr><td>dead</td><td>7</td><td>dead</td></tr> <tr><td>disappear</td><td>8</td><td>disappear</td></tr> <tr><td>drink</td><td>9</td><td>drink</td></tr> <tr><td>eat</td><td>10</td><td>eat</td></tr> <tr><td>explain</td><td>11</td><td>explain</td></tr> <tr><td>fallDown</td><td>12</td><td>fall down</td></tr> <tr><td>flip</td><td>13</td><td>flip</td></tr> <tr><td>fly</td><td>14</td><td>fly</td></tr> <tr><td>gag</td><td>15</td><td>gag</td></tr> <tr><td>getAttention</td><td>16</td><td>get attention</td></tr> <tr><td>impatient</td><td>17</td><td>impatient</td></tr> <tr><td>jump</td><td>18</td><td>jump</td></tr> <tr><td>kick</td><td>19</td><td>kick</td></tr> <tr><td>land</td><td>20</td><td>land</td></tr> <tr><td>prejump</td><td>21</td><td>prejump</td></tr> <tr><td>puke</td><td>22</td><td>puke</td></tr> </tbody> </table> | Name          | Binary representation (7 bits) | Description | appear | 1 | appear | away | 2 | away | blowKiss | 3 | blow kiss | brush | 4 | brush | busy | 5 | busy | crazy | 6 | crazy | dead | 7 | dead | disappear | 8 | disappear | drink | 9 | drink | eat | 10 | eat | explain | 11 | explain | fallDown | 12 | fall down | flip | 13 | flip | fly | 14 | fly | gag | 15 | gag | getAttention | 16 | get attention | impatient | 17 | impatient | jump | 18 | jump | kick | 19 | kick | land | 20 | land | prejump | 21 | prejump | puke | 22 | puke |  |  |
| Name          | Binary representation (7 bits)   | Description   |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| appear        | 1  | appear        |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| away          | 2  | away          |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| blowKiss      | 3  | blow kiss     |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| brush         | 4  | brush         |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| busy          | 5  | busy          |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| crazy         | 6  | crazy         |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| dead          | 7  | dead          |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| disappear     | 8  | disappear     |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| drink         | 9  | drink         |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| eat           | 10   | eat           |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| explain       | 11   | explain       |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| fallDown      | 12   | fall down     |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| flip          | 13   | flip          |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| fly           | 14   | fly           |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| gag           | 15   | gag           |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| getAttention  | 16   | get attention |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| impatient     | 17   | impatient     |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| jump          | 18   | jump          |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| kick          | 19   | kick          |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| land          | 20   | land          |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| prejump       | 21   | prejump       |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
| puke          | 22   | puke          |                                |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | appear   | 1             | appear                         |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | away   | 2             | away                           |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | blowKiss   | 3             | blow kiss                      |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | brush  | 4             | brush                          |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | busy   | 5             | busy                           |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | crazy  | 6             | crazy                          |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | dead   | 7             | dead                           |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | disappear  | 8             | disappear                      |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | drink  | 9             | drink                          |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | eat  | 10            | eat                            |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | explain  | 11            | explain                        |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | fallDown   | 12            | fall down                      |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | flip   | 13            | flip                           |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | fly  | 14            | fly                            |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | gag  | 15            | gag                            |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | getAttention   | 16            | get attention                  |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | impatient  | 17            | impatient                      |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | jump   | 18            | jump                           |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | kick   | 19            | kick                           |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | land   | 20            | land                           |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | prejump  | 21            | prejump                        |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |
|               | puke   | 22            | puke                           |             |        |   |        |      |   |      |          |   |           |       |   |       |      |   |      |       |   |       |      |   |      |           |   |           |       |   |       |     |    |     |         |    |         |          |    |           |      |    |      |     |    |     |     |    |     |              |    |               |           |    |           |      |    |      |      |    |      |      |    |      |         |    |         |      |    |      |  |  |

| Name            | Description  |                 |          |      |                                |             |           |   |            |                |   |                 |              |   |               |
|-----------------|--|-----------------|----------|------|--------------------------------|-------------|-----------|---|------------|----------------|---|-----------------|--------------|---|---------------|
|                 | read   | 23              | read     |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | sit  | 24              | sit      |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | sleep  | 25              | sleep    |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | stand  | 26              | stand    |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | standUp  | 27              | stand up |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | stretch  | 28              | stretch  |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | stride   | 29              | stride   |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | suggest  | 30              | suggest  |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | surf   | 31              | surf     |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | talk   | 32              | talk     |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | think  | 33              | think    |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | type   | 34              | type     |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | whisper  | 35              | whisper  |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | whistle  | 36              | whistle  |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | write  | 37              | write    |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | yawn   | 38              | yawn     |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | yeah   | 39              | yeah     |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | yoga   | 40              | yoga     |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 |  | 0, 41-127       | reserved |      |                                |             |           |   |            |                |   |                 |              |   |               |
| SpecificActions | <p>Describes a SpecificActions type of animations as a reference to a classification scheme (CS) term that shall be using the mpeg7 : termReferenceType defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the SpecificActionsAnimationCS defined in A.4.12.</p>  |                 |          |      |                                |             |           |   |            |                |   |                 |              |   |               |
|                 | <table border="1"> <thead> <tr> <th>Name</th> <th>Binary representation (8 bits)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>airGuitar</td> <td>1</td> <td>air guitar</td> </tr> <tr> <td>angryFingerWag</td> <td>2</td> <td>angry_fingerwag</td> </tr> <tr> <td>angryTantrum</td> <td>3</td> <td>angry_tantrum</td> </tr> </tbody> </table> |                 |          | Name | Binary representation (8 bits) | Description | airGuitar | 1 | air guitar | angryFingerWag | 2 | angry_fingerwag | angryTantrum | 3 | angry_tantrum |
| Name            | Binary representation (8 bits)   | Description     |          |      |                                |             |           |   |            |                |   |                 |              |   |               |
| airGuitar       | 1  | air guitar      |          |      |                                |             |           |   |            |                |   |                 |              |   |               |
| angryFingerWag  | 2  | angry_fingerwag |          |      |                                |             |           |   |            |                |   |                 |              |   |               |
| angryTantrum    | 3  | angry_tantrum   |          |      |                                |             |           |   |            |                |   |                 |              |   |               |

| Name | Description    |    |                 |
|------|----------------|----|-----------------|
|      | backFlip       | 4  | back flip       |
|      | beckOn         | 5  | beck on         |
|      | bigYawn        | 6  | big yawn        |
|      | boo            | 7  | boo             |
|      | burp           | 8  | burp            |
|      | candleStick    | 9  | candle Stick    |
|      | comeAgain      | 10 | come again      |
|      | decline        | 11 | decline         |
|      | dismissive     | 12 | Dismissive      |
|      | dontRecognize  | 13 | don't recognize |
|      | fartArm        | 14 | fart arm        |
|      | fistPump       | 15 | fist pump       |
|      | flySlow        | 16 | fly slow        |
|      | guns           | 17 | guns            |
|      | ha             | 18 | ha              |
|      | hide           | 19 | hide            |
|      | hmmm           | 20 | hmmm            |
|      | hover          | 21 | hover           |
|      | hoverDown      | 22 | hover down      |
|      | hoverUp        | 23 | hover up        |
|      | huh            | 24 | Huh             |
|      | jumpForJoy     | 25 | jump for joy    |
|      | kickRoundHouse | 26 | kick roundhouse |
|      | kissMyButt     | 27 | kiss my butt    |
|      | laughtShort    | 28 | laught short    |
|      | lol            | 29 | lol             |

| Name | Description          |    |                        |
|------|----------------------|----|------------------------|
|      | loser                | 30 | loser                  |
|      | motorcycleSit        | 31 | motorcycle sit         |
|      | muscleBeach          | 32 | muscle beach           |
|      | noWay                | 33 | no way                 |
|      | noHead               | 34 | no head                |
|      | noUnhappy            | 35 | no unhappy             |
|      | nod                  | 36 | nod                    |
|      | nope                 | 37 | nope                   |
|      | nyanya               | 38 | nyanya                 |
|      | okay                 | 39 | okay                   |
|      | oooh                 | 40 | oooh                   |
|      | peace                | 41 | peace                  |
|      | point                | 42 | point                  |
|      | pose                 | 43 | pose                   |
|      | punchOneTwo          | 44 | punch one two          |
|      | rpsCountDown         | 45 | rps countdown          |
|      | rpsPaper             | 46 | rps paper              |
|      | rpsRock              | 47 | rps rock               |
|      | rpsScissors          | 48 | rps scissors           |
|      | score                | 49 | score                  |
|      | shakeFists           | 50 | shake fists            |
|      | show                 | 51 | show                   |
|      | sitGeneric           | 52 | sit generic            |
|      | sitGround            | 53 | sit ground             |
|      | sitGroundConstrained | 54 | sit ground constrained |
|      | sitToStand           | 55 | sit to stand           |

| Name             | Description  |                |             |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|------------------|--|----------------|-------------|------|--------------------------------|-------------|-----------|---|---------------|--------|---|-------------|-------|---|------------|-----------|---|-------------|-------|---|------------|-----------|---|----------------|
|                  | slowFly  | 56             | slow fly    |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | snapshot   | 57             | snapshot    |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | softLand   | 58             | soft land   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | spin   | 59             | spin        |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | tantrum  | 60             | tantrum     |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | thumbsDown   | 61             | thumbs down |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | thumbsUp   | 62             | thumbs up   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | tongue   | 63             | tongue      |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | tryonShirt   | 64             | tryon shirt |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | uncertain  | 65             | uncertain   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | wassamatta   | 66             | wassamatta  |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | what   | 67             | what        |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | yay  | 68             | yay         |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | yesHappy   | 69             | yes happy   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | yesHead  | 70             | yes head    |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  |  | 0, 71-255      | reserved    |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
| FacialExpression | <p>Describes a FacialExpression type of animations as a reference to a classification scheme (CS) term that shall be using the mpeg7::termReferenceType defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the FacialExpressionAnimationCS defined in A.4.13.</p>   |                |             |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
|                  | <table border="1"> <thead> <tr> <th>Name</th> <th>Binary representation (8 bits)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>affection</td> <td>1</td> <td>affected face</td> </tr> <tr> <td>afraid</td> <td>2</td> <td>afraid face</td> </tr> <tr> <td>agree</td> <td>3</td> <td>agree face</td> </tr> <tr> <td>amusement</td> <td>4</td> <td>amused face</td> </tr> <tr> <td>angry</td> <td>5</td> <td>angry face</td> </tr> <tr> <td>annoyance</td> <td>6</td> <td>annoyance face</td> </tr> </tbody> </table> |                |             | Name | Binary representation (8 bits) | Description | affection | 1 | affected face | afraid | 2 | afraid face | agree | 3 | agree face | amusement | 4 | amused face | angry | 5 | angry face | annoyance | 6 | annoyance face |
| Name             | Binary representation (8 bits)   | Description    |             |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
| affection        | 1  | affected face  |             |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
| afraid           | 2  | afraid face    |             |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
| agree            | 3  | agree face     |             |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
| amusement        | 4  | amused face    |             |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
| angry            | 5  | angry face     |             |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |
| annoyance        | 6  | annoyance face |             |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |             |       |   |            |           |   |                |

| Name | Description    |    |                      |
|------|----------------|----|----------------------|
|      | anxiety        | 7  | anxiety face         |
|      | bigSmile       | 8  | big smile face       |
|      | blink          | 9  | blink face           |
|      | bored          | 10 | bored face           |
|      | calm           | 11 | calm face            |
|      | concentrate    | 12 | concentrate face     |
|      | confused       | 13 | confused face        |
|      | contempt       | 14 | contempt face        |
|      | content        | 15 | content face         |
|      | courage        | 16 | courage face         |
|      | cry            | 17 | cry face             |
|      | dazed          | 18 | dazed face           |
|      | defaultEmotion | 19 | default emotion face |
|      | delight        | 20 | delight face         |
|      | despair        | 21 | despair face         |
|      | disagree       | 22 | disagree face        |
|      | disappointment | 23 | disappointment face  |
|      | disdain        | 24 | disdain face         |
|      | disgusted      | 25 | disgusted face       |
|      | doubt          | 26 | doubt face           |
|      | elation        | 27 | elation face         |
|      | embarrassed    | 28 | embarrassed face     |
|      | empathy        | 29 | empathy face         |
|      | envy           | 30 | envy face            |
|      | excitement     | 31 | excitement face      |

| Name | Description        |    |                            |
|------|--------------------|----|----------------------------|
|      | fear               | 32 | fear face                  |
|      | friendliness       | 33 | friendliness face          |
|      | frown              | 34 | frown face                 |
|      | frustration        | 35 | frustration face           |
|      | grin               | 36 | grin face                  |
|      | guilt              | 37 | guilt face                 |
|      | happy              | 38 | happy face                 |
|      | helplessness       | 39 | helpless face              |
|      | hope               | 40 | hoping face                |
|      | hurt               | 41 | hurt face                  |
|      | interest           | 42 | interested face            |
|      | irritation         | 43 | irritated face             |
|      | joy                | 44 | joy face                   |
|      | kiss               | 45 | kiss face                  |
|      | laugh              | 46 | laughing face              |
|      | lookDown           | 47 | look down face             |
|      | lookDownBlink      | 48 | look down blink face       |
|      | lookDownLeft       | 49 | look down left face        |
|      | lookDownLeftBlink  | 50 | look down left blink face  |
|      | lookDownLeftReturn | 51 | look down left return face |
|      | lookDownReturn     | 52 | look down return face      |
|      | lookDownRight      | 53 | look down right face       |
|      | lookDownRightBlink | 54 | look down right blink face |

| Name | Description         |    |                             |
|------|---------------------|----|-----------------------------|
|      | lookDownRightReturn | 55 | look down right return face |
|      | lookLeft            | 56 | look left face              |
|      | lookLeftBlink       | 57 | look left blink face        |
|      | lookLeftReturn      | 58 | look left return face       |
|      | lookRight           | 59 | look right face             |
|      | lookRightBlink      | 60 | look right blink face       |
|      | lookRightReturn     | 61 | look right return face      |
|      | lookUp              | 62 | look up face                |
|      | lookUpBlink         | 63 | look up blink face          |
|      | lookUpLeft          | 64 | look up left face           |
|      | lookUpLeftBlink     | 65 | look up left blink face     |
|      | lookUpLeftReturn    | 66 | look up left return face    |
|      | lookUpReturn        | 67 | look up return face         |
|      | lookUpRight         | 68 | look up right face          |
|      | lookUpRightBlink    | 69 | look up right blink face    |
|      | lookUpRightReturn   | 70 | look up left return face    |
|      | love                | 71 | love face                   |
|      | mad                 | 72 | mad face                    |
|      | neutral             | 73 | neutral face                |
|      | openMouth           | 74 | open mouth face             |
|      | pleasure            | 75 | pleased face                |
|      | politeness          | 76 | polite face                 |
|      | powerlessness       | 77 | powerlessness face          |

| Name | Description  |     |                    |
|------|--------------|-----|--------------------|
|      | pride        | 78  | pride face         |
|      | pucker       | 79  | puckering          |
|      | relaxed      | 80  | relaxed face       |
|      | relieved     | 81  | relieved face      |
|      | repulsed     | 82  | repulsed face      |
|      | sad          | 83  | sad face           |
|      | satisfaction | 84  | satisfied face     |
|      | scream       | 85  | screaming          |
|      | serene       | 86  | serene face        |
|      | shame        | 87  | shame face         |
|      | shock        | 88  | shocked face       |
|      | shrug        | 89  | shrug face         |
|      | sigh         | 90  | sigh face          |
|      | smile        | 91  | smiling face       |
|      | stress       | 92  | stressed face      |
|      | surprise     | 93  | surprised face     |
|      | tension      | 94  | tension face       |
|      | tongueOut    | 95  | tongue out face    |
|      | toothSmile   | 96  | tooth smile face   |
|      | tired        | 97  | tired face         |
|      | trust        | 98  | trust face         |
|      | wink         | 99  | wink face          |
|      | worry        | 100 | worried face       |
|      | gestureRight | 101 | gesture right face |
|      | gestureLeft  | 102 | gesture left face  |
|      | gestureUp    | 103 | gesture up face    |

| Name           | Description  |                   |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
|----------------|--|-------------------|-------------------|------|--------------------------------|-------------|-----------|---|---------------|--------|---|-------------|-------|---|------------|-----------|---|------------|-------|---|------------|-----------|---|----------------|---------|---|--------------|-------|---|------------|------|---|-----------|-------------|----|------------------|----------|----|---------------|----------|----|---------------|---------|----|--------------|---------|----|--------------|-----|----|----------|-------|----|------------|---------|----|--------------|---------|----|--------------|----------|----|---------------|----------------|----|-------------------|
|                | gestureDown  | 104               | gesture down face |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
|                |  | 0, 105-255        | reserved          |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| BodyExpression | <p>Describes a BodyExpression type of animations as a reference to a classification scheme (CS) term that shall be using the mpeg7:termReferenceType defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the BodyExpressionAnimationCS defined in A.4.14.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Binary representation (8 bits)</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>affection</td><td>1</td><td>affected pose</td></tr> <tr><td>afraid</td><td>2</td><td>afraid pose</td></tr> <tr><td>agree</td><td>3</td><td>agree pose</td></tr> <tr><td>amusement</td><td>4</td><td>amuse pose</td></tr> <tr><td>angry</td><td>5</td><td>angry pose</td></tr> <tr><td>annoyance</td><td>6</td><td>annoyance pose</td></tr> <tr><td>anxiety</td><td>7</td><td>anxiety pose</td></tr> <tr><td>bored</td><td>8</td><td>bored pose</td></tr> <tr><td>calm</td><td>9</td><td>calm pose</td></tr> <tr><td>concentrate</td><td>10</td><td>concentrate pose</td></tr> <tr><td>confused</td><td>11</td><td>confused pose</td></tr> <tr><td>contempt</td><td>12</td><td>contempt pose</td></tr> <tr><td>content</td><td>13</td><td>content pose</td></tr> <tr><td>courage</td><td>14</td><td>courage pose</td></tr> <tr><td>cry</td><td>15</td><td>cry pose</td></tr> <tr><td>dazed</td><td>16</td><td>dazed pose</td></tr> <tr><td>delight</td><td>17</td><td>delight pose</td></tr> <tr><td>despair</td><td>18</td><td>despair pose</td></tr> <tr><td>disagree</td><td>19</td><td>disagree pose</td></tr> <tr><td>disappointment</td><td>20</td><td>disappointed pose</td></tr> </tbody> </table> |                   |                   | Name | Binary representation (8 bits) | Description | affection | 1 | affected pose | afraid | 2 | afraid pose | agree | 3 | agree pose | amusement | 4 | amuse pose | angry | 5 | angry pose | annoyance | 6 | annoyance pose | anxiety | 7 | anxiety pose | bored | 8 | bored pose | calm | 9 | calm pose | concentrate | 10 | concentrate pose | confused | 11 | confused pose | contempt | 12 | contempt pose | content | 13 | content pose | courage | 14 | courage pose | cry | 15 | cry pose | dazed | 16 | dazed pose | delight | 17 | delight pose | despair | 18 | despair pose | disagree | 19 | disagree pose | disappointment | 20 | disappointed pose |
| Name           | Binary representation (8 bits)   | Description       |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| affection      | 1  | affected pose     |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| afraid         | 2  | afraid pose       |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| agree          | 3  | agree pose        |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| amusement      | 4  | amuse pose        |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| angry          | 5  | angry pose        |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| annoyance      | 6  | annoyance pose    |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| anxiety        | 7  | anxiety pose      |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| bored          | 8  | bored pose        |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| calm           | 9  | calm pose         |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| concentrate    | 10   | concentrate pose  |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| confused       | 11   | confused pose     |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| contempt       | 12   | contempt pose     |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| content        | 13   | content pose      |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| courage        | 14   | courage pose      |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| cry            | 15   | cry pose          |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| dazed          | 16   | dazed pose        |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| delight        | 17   | delight pose      |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| despair        | 18   | despair pose      |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| disagree       | 19   | disagree pose     |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |
| disappointment | 20   | disappointed pose |                   |      |                                |             |           |   |               |        |   |             |       |   |            |           |   |            |       |   |            |           |   |                |         |   |              |       |   |            |      |   |           |             |    |                  |          |    |               |          |    |               |         |    |              |         |    |              |     |    |          |       |    |            |         |    |              |         |    |              |          |    |               |                |    |                   |

| Name | Description  |    |                   |
|------|--------------|----|-------------------|
|      | disdain      | 21 | disdain pose      |
|      | disgusted    | 22 | disgusted pose    |
|      | doubt        | 23 | doubt pose        |
|      | elation      | 24 | elation pose      |
|      | embarrassed  | 25 | embarrassed pose  |
|      | empathy      | 26 | empathy pose      |
|      | envy         | 27 | envy pose         |
|      | excitement   | 28 | excitement pose   |
|      | fear         | 29 | fear pose         |
|      | friendliness | 30 | friendliness pose |
|      | frown        | 31 | frown pose        |
|      | frustration  | 32 | frustrated pose   |
|      | grin         | 33 | grin pose         |
|      | guilt        | 34 | guilt pose        |
|      | happy        | 35 | happy pose        |
|      | helplessness | 36 | helplessness pose |
|      | hope         | 37 | hoping pose       |
|      | hurt         | 38 | hurt pose         |
|      | interest     | 39 | interested pose   |
|      | irritation   | 40 | irritated pose    |
|      | joy          | 41 | joy pose          |
|      | laugh        | 42 | laughing pose     |
|      | love         | 43 | love pose         |
|      | mad          | 44 | mad pose          |
|      | neutral      | 45 | neutral pose      |
|      | pleasure     | 46 | pleasure pose     |

| Name               | Description   |              |                    |
|--------------------|---|--------------|--------------------|
|                    | politeness  | 47           | politeness pose    |
|                    | powerlessness   | 48           | powerlessness pose |
|                    | pride   | 49           | pride pose         |
|                    | pucker  | 50           | puckering          |
|                    | relaxed   | 51           | relaxed pose       |
|                    | relieved  | 52           | relieved pose      |
|                    | repulsed  | 53           | repulsed pose      |
|                    | sad   | 54           | sad pose           |
|                    | satisfied   | 55           | satisfied pose     |
|                    | scream  | 56           | screaming          |
|                    | serene  | 57           | serene pose        |
|                    | shame   | 58           | shame pose         |
|                    | shock   | 59           | shocked pose       |
|                    | shrug   | 60           | shrug pose         |
|                    | sigh  | 61           | sigh pose          |
|                    | smile   | 62           | smiling pose       |
|                    | stress  | 63           | stressed pose      |
|                    | surprise  | 64           | surprised pose     |
|                    | tension   | 65           | tension pose       |
|                    | tired   | 66           | tired pose         |
| worry              | 67  | worried pose |                    |
|                    | 0, 68-255   | Reserved     |                    |
| AnimationResources | Element that contains a link to animation file.   |              |                    |
| NumExtra           | This field, which is only present in the binary representation, specifies the number of <code>ExtraType</code> elements contained in the <code>AnimationType</code> . |              |                    |
| Extra              | Describes any other categories of animations.   |              |                    |

### 5.4.4 Examples

This example shows the description of avatar animation information with the following semantics. Among all animations, idle at default, saluting greeting, bow, dance, and salsa dance are given. The animation resources are saved at "[http://avatarAnimationdb.com/default\\_idle.bvh](http://avatarAnimationdb.com/default_idle.bvh)", "<http://avatarAnimationdb.com/salutes.bvh>", "<http://avatarAnimationdb.com/bowing.bvh>", "<http://avatarAnimationdb.com/dancing.bvh>", and "<http://avatarAnimationdb.com/salsa.bvh>".

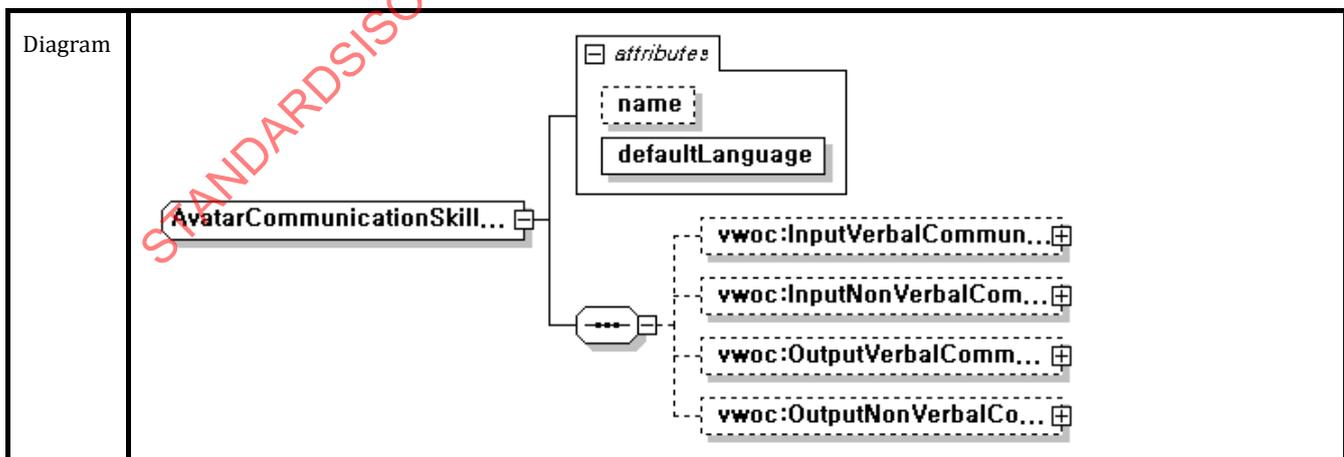
```

<vwoc:Animation>
  <vwoc:Idle>
    <vwoc:Name>urn:mpeg:mpeg-v:01-VWOC-IdleAnimationCS-
NS:defaultIdle</vwoc:Name>
    <vwoc:Uri>http://avatarAnimationdb.com/default\_idle.bvh</vwoc:Uri>
  </vwoc:Idle>
  <vwoc:Greeting>
    <vwoc:Name>urn:mpeg:mpeg-v:01-VWOC-GreetingAnimationCS-
NS:salute</vwoc:Name>
    <vwoc:Uri>http://avatarAnimationdb.com/salutes.bvh</vwoc:Uri>
  </vwoc:Greeting>
  <vwoc:Greeting>
    <vwoc:Name>urn:mpeg:mpeg-v:01-VWOC-GreetingAnimationCS-NS:bow</vwoc:Name>
    <vwoc:Uri>http://avatarAnimationdb.com/bowing.bvh</vwoc:Uri>
  </vwoc:Greeting>
  <vwoc:Dance>
    <vwoc:Name>urn:mpeg:mpeg-v:01-VWOC-DanceAnimationCS-NS:dance</vwoc:Name>
    <vwoc:Uri>http://avatarAnimationdb.com/dancing.bvh</vwoc:Uri>
  </vwoc:Dance>
  <vwoc:Dance>
    <vwoc:Name>urn:mpeg:mpeg-v:01-VWOC-DanceAnimationCS-
NS:salsaDance</vwoc:Name>
    <vwoc:Uri>http://avatarAnimationdb.com/salsa.bvh</vwoc:Uri>
  </vwoc:Dance>
</vwoc:Animation>
    
```

### 5.5 AvatarCommunicationSkillsType

NOTE This element defines the communication skills<sup>[3]</sup> of the avatar in relation to other avatars.

#### 5.5.1 XML representation syntax



|        |   |
|--------|---|
| Source | <pre> &lt;complexType name="AvatarCommunicationSkillsType"&gt;   &lt;sequence&gt;     &lt;element name="InputVerbalCommunication" type="vwoc:VerbalCommunicationType" minOccurs="0"/&gt;     &lt;element name="InputNonVerbalCommunication" type="vwoc:NonVerbalCommunicationType" minOccurs="0"/&gt;     &lt;element name="OutputVerbalCommunication" type="vwoc:VerbalCommunicationType" minOccurs="0"/&gt;     &lt;element name="OutputNonVerbalCommunication" type="vwoc:NonVerbalCommunicationType" minOccurs="0"/&gt;   &lt;/sequence&gt;   &lt;attribute name="name" type="string"/&gt;   &lt;attribute name="defaultLanguage" type="language" use="required"/&gt; &lt;/complexType&gt; </pre> |
|--------|---|

**5.5.2 Binary representation syntax**

| AvatarCommunicationSkillsType{         | Number of bits | Mnemonic                        |
|--|----------------|---------------------------------|
| InputVerbalCommunicationFlag           | 1              | bslbf                           |
| InputNonVerbalCommunicationFlag        | 1              | bslbf                           |
| OutputVerbalCommunicationFlag          | 1              | bslbf                           |
| OutputNonVerbalCommaunicationFlag      | 1              | bslbf                           |
| NameFlag                               | 1              | bslbf                           |
| if(InputVerbalCommunicationFlag){      |                |                                 |
| InputVerbalCommunication               |                | VerbalCommunic<br>ationType     |
| }                                      |                |                                 |
| if(InputNonVerbalCommunicationFlag){   |                |                                 |
| InputNonVerbalCommunication            |                | NonVerbalComm<br>unicationType  |
| }                                      |                |                                 |
| if(OutputVerbalCommunicationFlag){     |                |                                 |
| OutputVerbalCommunication              |                | VerbalCommunic<br>ationType     |
| }                                      |                |                                 |
| if(OutputNonVerbalCommaunicationFlag){ |                |                                 |
| OutputNonVerbalCommaunication          |                | NonVerbalComma<br>unicationType |
| }                                      |                |                                 |

| AvatarCommunicationSkillsType{ | Number of bits                      | Mnemonic |
|--------------------------------|-------------------------------------|----------|
| if(NameFlag){                  |                                     |          |
| name                           | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                              |                                     |          |
| DefaultLanguage                | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                              |                                     |          |

### 5.5.3 Semantics

The objective of the type is that the virtual world and the rest of avatars can adapt their inputs and outputs to these preferences (having a balance with their own preferences too). All inputs and outputs will be individually adapted for each avatar.

The communication preferences are defined by means of two input and two output channels that guarantee multimodality. They are the verbal and non-verbal recognition as input, and the verbal and non-verbal performance as output. These channels can be specified as either enabled or disabled. All channels enabled imply that an avatar is able to speak, to perform gestures and to recognize speak and gestures.

In verbal performance and verbal recognition channels the preference for using the channel either via text or via voice can be specified.

The non-verbal and non-verbal recognition channels specify the types of gesturing: "Nonverbal language", "sign language" and "cued speech communication"<sup>[2]</sup>.

All the features dependent on the language (speaking via text or voice, speaking recognition via text or voice, and sign/cued language use/recognition) use a language attribute for defining the concrete language skills.

| Name                            | Definition   |
|---------------------------------|--|
| AvatarCommunicationSkillsType   | A type that contains a set of descriptors providing information on the different modalities an avatar is able to communicate.  |
| InputVerbalCommunicationFlag    | This field, which is only present in the binary representation, signals the presence of the InputVerbalCommunication element. "1" means that the element shall be used. "0" means that the element shall not be used.    |
| InputNonVerbalCommunicationFlag | This field, which is only present in the binary representation, signals the presence of the InputNonVerbalCommunication element. "1" means that the element shall be used. "0" means that the element shall not be used. |

| Name                             | Definition  |
|----------------------------------|---|
| OutputVerbalCommunicationFlag    | This field, which is only present in the binary representation, signals the presence of the OutputVerbalCommunication element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| OutputNonVerbalCommunicationFlag | This field, which is only present in the binary representation, signals the presence of the OutputNonVerbalCommunication element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
| NameFlag                         | This field, which is only present in the binary representation, signals the presence of the Name element. "1" means that the element shall be used. "0" means that the element shall not be used.   |
| VerbalCommunicationType          | Defines the verbal (voice and text) communication skills of the avatar.   |
| NonVerbalCommunicationType       | Defines the non-verbal (body gesture) communication skills of the avatar.   |
| name                             | A user defined chain of characters used for addressing the CommunicationType element.   |
| defaultLanguage                  | The native language of the avatar (ex. en for English, es for Spanish. The language shall be written according to the ISO 639 series which lists short codes for language names.)<br>NOTE defaultLanguage attribute specifies the avatar's preferred language for all the communication channels (it will be generally its native language). For each communication channel other languages that override this preference can be specified. |

NOTE The ISO 639 series lists short codes for language names. A good reference to short codes for language names is [http://en.wikipedia.org/wiki/ISO\\_639](http://en.wikipedia.org/wiki/ISO_639). In addition, another good reference is <http://www.sil.org>. The ISO 639 code tables can be found at <http://www.sil.org/iso639-3/codes.asp>.

#### 5.5.4 Examples

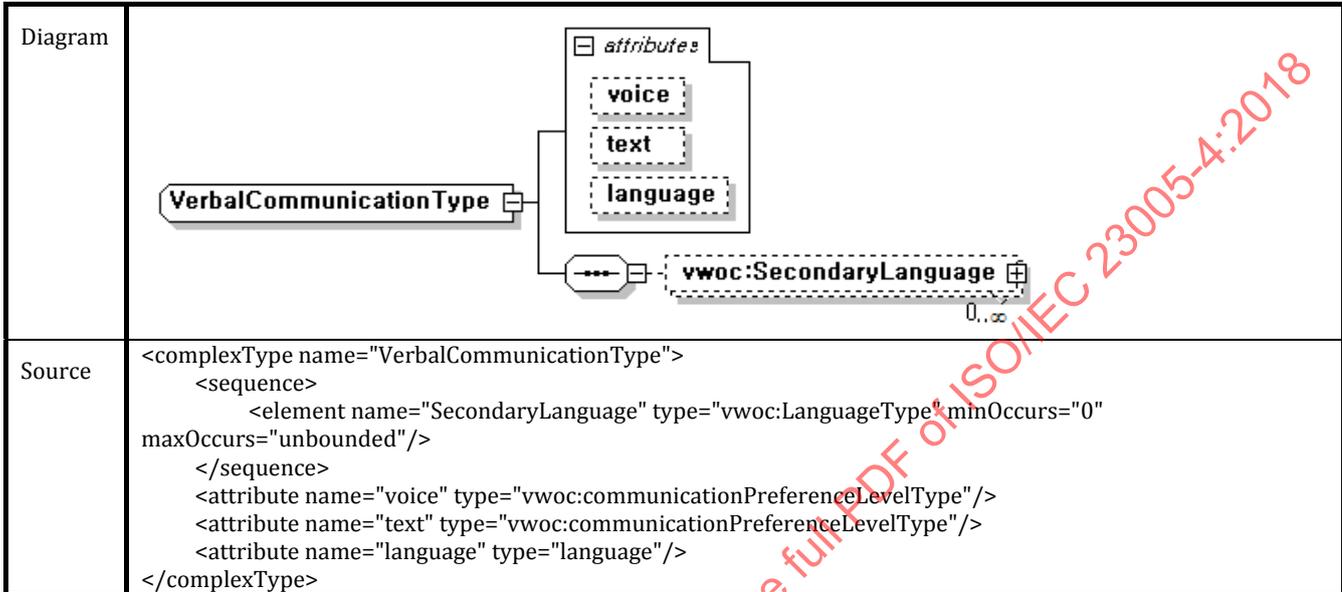
This example shows the description of avatar communication skills with the following semantics. The communication skills have a name of "Korean" which has the default language as "Korean". The preference of the primary input verbal communication is "Korean" as a language preferred for both voice and text. In addition, the secondary input verbal communication is English as a language with the preference of voice. As for the input non-verbal communication, "nod" is chosen for the complementary gesture. The preference of the primary output verbal communication is "Korean" as a language preferred for both voice and text. The secondary output verbal communication is "English" as a language with the preference of "voice". As for the output non-verbal communication, "nod" is chosen for the complementary gesture.

```
<vwoc:CommunicationSkills defaultLanguage="Korean" name="Korean">
  <vwoc:InputVerbalCommunication voice="preferred" text="preferred"
language="Korean">
    <vwoc:SecondaryLanguage preference="voice" name="English"/>
  </vwoc:InputVerbalCommunication>
  <vwoc:InputNonVerbalCommunication complementaryGesture="nod"/>
  <vwoc:OutputVerbalCommunication voice="preferred" text="preferred"
language="Korean">
```

```
<vwoc:SecondaryLanguage preference="voice" name="English"/>
</vwoc:OutputVerbalCommunication>
<vwoc:OutputNonVerbalCommunication complementaryGesture="nod"/>
</vwoc:CommunicationSkills>
```

5.6 VerbalCommunicationType

5.6.1 XML representation syntax



5.6.2 Binary representation syntax

| VerbalCommunicationType{ | Number of bits | Mnemonic                         |
|--------------------------|----------------|----------------------------------|
| VoiceFlag                | 1              | bslbf                            |
| TextFlag                 | 1              | bslbf                            |
| LanguageFlag             | 1              | bslbf                            |
| SecondaryLanguageFlag    | 1              | bslbf                            |
| if(VoiceFlag){           |                |                                  |
| voice                    |                | communicationPreferenceLevelType |
| }                        |                |                                  |
| if(TextFlag){            |                |                                  |
| text                     |                | communicationPreferenceLevelType |
| }                        |                |                                  |
| if(LanguageFlag){        |                |                                  |

| VerbalCommunicationType{                | Number of bits                      | Mnemonic     |
|---|-------------------------------------|--------------|
| language                                | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8        |
| }                                       |                                     |              |
| if(SecondaryLanguageFlag){              |                                     |              |
| NumSecondaryLanguage                    |                                     |              |
| for(k=0; k<NumSecondaryLanguage; k++) { |                                     | vluimsbf5    |
| SecondaryLanguage[k]                    |                                     | LanguageType |
| }                                       |                                     |              |
| }                                       |                                     |              |
| }                                       |                                     |              |

### 5.6.3 Semantics

| Name                    | Definition  |
|-------------------------|---|
| VerbalCommunicationType | Specifies the avatar's verbal communication skills. Voice and text can be defined as enabled, disabled or preferred in order to specify what the preferred verbal mode is and the availability of the other.                |
| VoiceFlag               | This field, which is only present in the binary representation, signals the presence of the <code>Voice</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.             |
| TextFlag                | This field, which is only present in the binary representation, signals the presence of the <code>Text</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.              |
| PreferredLanguageFlag   | This field, which is only present in the binary representation, signals the presence of the <code>PreferredLanguage</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| LanguageFlag            | This field, which is only present in the binary representation, signals the presence of the <code>Language</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.          |
| PreferredLanguageLength | This field, which is only present in the binary representation, specifies the length of the following <code>PreferredLanguage</code> element.   |
| SecondaryLanguage       | Defines the preferred language for verbal communication according to the ISO 639 series which lists short codes for language names.   |
| voice                   | Defines if the avatar is able or prefers to speak when used for <code>OutputVerbalCommunication</code> and understand when used for <code>InputVerbalCommunication</code> .   |
| text                    | Defines if the avatar is able or prefers to write when used for <code>OutputVerbalCommunication</code> and read when used for <code>InputVerbalCommunication</code> .   |
| language                | Defines the preferred language for verbal communication. If it is not specified, the value of the attribute <code>defaultLanguage</code> defined in the <code>CommunicationSkills</code> type will be applied.              |

5.7 LanguageType

5.7.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre>&lt;complexType name="LanguageType"&gt;   &lt;attribute name="name" type="language" use="required"/&gt;   &lt;attribute name="preference" type="vwoc:communicationPreferenceType" use="required"/&gt; &lt;/complexType&gt;</pre> |

5.7.2 Binary representation syntax

| LanguageType { | Number of bits                   | Mnemonic                    |
|----------------|----------------------------------|-----------------------------|
| name           | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8                       |
| preference     |                                  | communicationPreferenceType |
| }              |                                  |                             |

5.7.3 Semantics

| Name         | Definition   |
|--------------|--|
| LanguageType | Defines secondary communication skills for VerbalCommunication. In case it is not possible to use the preferred language (or the default language) defined for communicating with other avatar, these secondary languages will be applied. |
| name         | String that specifies the name of the language (ex. en for English, es for Spanish...) according to the ISO 639 series which lists short codes for language names.   |
| preference   | Define the preference for using the language in verbal communication: voice or text.   |

5.8 communicationPreferenceType

5.8.1 XML representation syntax

|        |  |
|--------|--|
| Source | <pre>&lt;simpleType name="communicationPreferenceType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="voice"/&gt;     &lt;enumeration value="text"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|--|

5.8.2 Binary representation syntax

| communicationPreferenceType { | Number of bits | Mnemonic |
|-------------------------------|----------------|----------|
| communicationPreference       | 1              | bslbf    |
| }                             |                |          |

5.8.3 Semantics

| Name                        | Definition  |
|-----------------------------|---|
| communicationPreferenceType | Defines the preferred level of communication of the avatar: voice or text.<br>The binary representation of the type is defined as follows.<br>(0: voice, 1: text) |

5.9 communicationPreferenceLevelType

5.9.1 XML representation syntax

|        |  |
|--------|--|
| Source | <pre>&lt;simpleType name="communicationPreferenceLevelType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="preferred"/&gt;     &lt;enumeration value="enabled"/&gt;     &lt;enumeration value="disabled"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;</pre> |
|--------|--|

5.9.2 Binary representation syntax

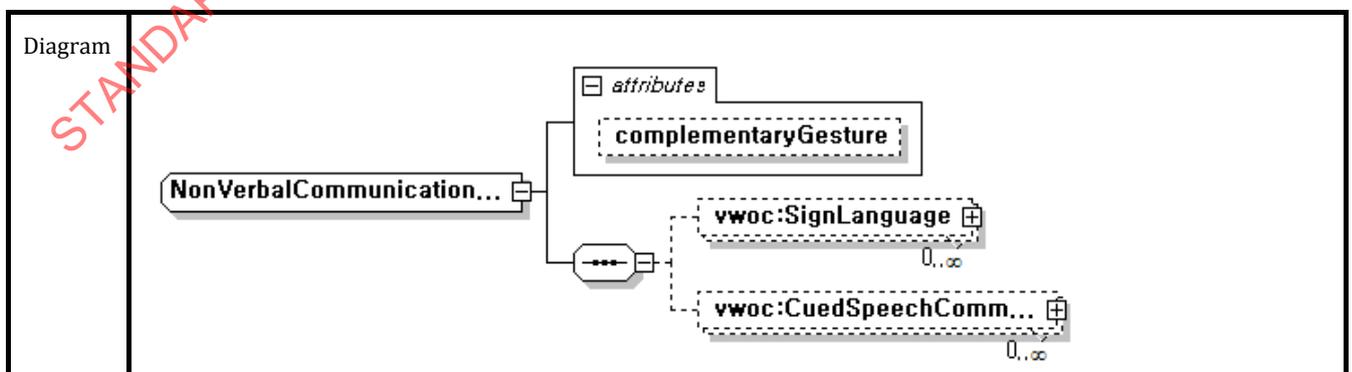
| communicationPreferenceLevelType { | Number of bits | Mnemonic |
|------------------------------------|----------------|----------|
| communicationPreferenceLevel       | 2              | bslbf    |
| }                                  |                |          |

5.9.3 Semantics

| Name                             | Definition  |
|----------------------------------|---|
| communicationPreferenceLevelType | Defined the level of preference for each language that the avatar can speak/understand. This level can be: preferred, enabled or disabled.<br>The binary representation of the type is defined as follows.<br>(0: preferred, 1: enabled, 2: disabled, or 3: reserved) |

5.10 NonVerbalCommunicationType

5.10.1 XML representation syntax



|        |   |
|--------|---|
| Source | <pre> &lt;complexType name="NonVerbalCommunicationType"&gt;   &lt;sequence&gt;     &lt;element name="SignLanguage" type="vwoc:SignLanguageType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="CuedSpeechCommunication" type="vwoc:SignLanguageType" minOccurs="0" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt;   &lt;attribute name="complementaryGesture" type="string" use="optional"/&gt; &lt;/complexType&gt; </pre> |
|--------|---|

**5.10.2 Binary representation syntax**

| NonVerbalCommunicationType {                  | Number of bits                   | Mnemonic         |
|---|----------------------------------|------------------|
| SignLanguageFlag                              | 1                                | bslbf            |
| CuedSpeechCommunicationFlag                   | 1                                | bslbf            |
| complementaryGestureFlag                      | 1                                | bslbf            |
| if(SignLanguageFlag) {                        |                                  |                  |
| NumSignLanguage                               |                                  | vluimsbf5        |
| for(k=0; k<NumSignLanguage; k++){             |                                  |                  |
| SignLanguage[k]                               |                                  | SignLanguageType |
| }   |                                  |                  |
| }   |                                  |                  |
| if(CuedSpeechCommunicationFlag) {             |                                  |                  |
| NumCuedSpeechCommunication                    |                                  | vluimsbf5        |
| for(k=0; k< NumCuedSpeechCommunication; k++){ |                                  |                  |
| CuedSpeechCommunication[k]                    |                                  | SignLanguageType |
| }   |                                  |                  |
| }   |                                  |                  |
| if(complementaryGestureFlag) {                |                                  |                  |
| complementaryGesture                          | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8            |
| }   |                                  |                  |
| }   |                                  |                  |

5.10.3 Semantics

| Name                        | Definition  |
|-----------------------------|---|
| NonVerbalCommunicationType  | Specifies the avatar's non-verbal communication skills.   |
| SignLanguageFlag            | This field, which is only present in the binary representation, signals the presence of the SignLanguage elements. "1" means that the elements shall be used. "0" means that the elements shall not be used.            |
| CuedSpeechCommunicationFlag | This field, which is only present in the binary representation, signals the presence of the CuedSpeechCommunication elements. "1" means that the elements shall be used. "0" means that the elements shall not be used. |
| complementaryGestureFlag    | This field, which is only present in the binary representation, signals the presence of the complementaryGeature attribute. "1" means that the attribute shall be used. "0" means that the attribute shall not be used. |
| NumSingLanguage             | This field, which is only present in the binary representation, specifies the number of SignLanguage elements contained in the SignLanguage.  |
| SignLanguage                | Defines the sign languages that the avatar is able to perform when used for OutputVerbalCommunication and interpret when used for InputVerbalCommunication.   |
| NumCuedSpeechCommunication  | This field, which is only present in the binary representation, specifies the number of CuedSpeechCommunication elements contained in the CuedSpeechCommunication.  |
| CuedSpeechCommunication     | Defines the cued speech communications that the avatar is able to perform when used for OutputVerbalCommunication and interpret when used for InputVerbalCommunication.   |
| complementaryGesture        | Defines if the avatar is able to perform complementary gesture during output verbal communication.  |

5.11 SignLanguageType

5.11.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre>&lt;complexType name="SignLanguageType"&gt;   &lt;attribute name="name" type="language" use="required"/&gt; &lt;/complexType&gt;</pre> |

5.11.2 Binary representation syntax

| SignLanguageType { | Number of bits                   | Mnemonic |
|--------------------|----------------------------------|----------|
| name               | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                  |                                  |          |

5.11.3 Semantics

| Name             | Definition   |
|------------------|--|
| SignLanguageType | Defines secondary communication skills for NonVerbalCommunication (sign or cued communication). In case it is not possible to use the preferred language (or the default language), these secondary languages will be applied. |
| name             | Specifies the name of the language (ex. en for English, es for Spanish...) according to the ISO 639 series which lists short codes for language names.   |

5.12 AvatarPersonalityType

5.12.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre> &lt;complexType name="AvatarPersonalityType"&gt;   &lt;sequence&gt;     &lt;element name="Openness" type="mpeg7:minusOneToOneType" minOccurs="0"/&gt;     &lt;element name="Agreeableness" type="mpeg7:minusOneToOneType" minOccurs="0"/&gt;     &lt;element name="Neuroticism" type="mpeg7:minusOneToOneType" minOccurs="0"/&gt;     &lt;element name="Extraversion" type="mpeg7:minusOneToOneType" minOccurs="0"/&gt;     &lt;element name="Conscientiousness" type="mpeg7:minusOneToOneType" minOccurs="0"/&gt;   &lt;/sequence&gt;   &lt;attribute name="name" type="string"/&gt; &lt;/complexType&gt; </pre> |

5.12.2 Binary representation syntax

| AvatarPersonalityType{ | Number of bits | Mnemonic |
|------------------------|----------------|----------|
| OpennessFlag           | 1              | bslbf    |
| AgreeablenessFlag      | 1              | bslbf    |
| NeuroticismFlag        | 1              | bslbf    |
| ExtraversionFlag       | 1              | bslbf    |
| ConscientiousnessFlag  | 1              | bslbf    |
| NameFlag               | 1              | bslbf    |
| if(OpennessFlag){      |                |          |

| AvatarPersonalityType{     | Number of bits                      | Mnemonic |
|----------------------------|-------------------------------------|----------|
| Openness                   | 32                                  | fsbf     |
| }                          |                                     |          |
| if(AgreeablenessFlag){     |                                     |          |
| Agreeableness              | 32                                  | fsbf     |
| }                          |                                     |          |
| if(NeuroticismFlag){       |                                     |          |
| Neuroticism                | 32                                  | fsbf     |
| }                          |                                     |          |
| if(ExtraversionFlag){      |                                     |          |
| Extraversion               | 32                                  | fsbf     |
| }                          |                                     |          |
| if(ConscientiousnessFlag){ |                                     |          |
| Conscientiousness          | 32                                  | fsbf     |
| }                          |                                     |          |
| if(NameFlag){              |                                     |          |
| name                       | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                          |                                     |          |
| }                          |                                     |          |

### 5.12.3 Semantics

This tag<sup>[3]</sup> defines the personality of the avatar. This definition is based on the OCEAN model<sup>[1]</sup>, consisting in a set of characteristics that personality is composed of. A combination of these characteristics is a specific personality. Therefore, an avatar contains a subtag for each attribute defined in OCEAN's model. They are: openness, conscientiousness, extraversion, agreeableness and neuroticism.

The purpose of this tag is to provide the possibility to define the avatar personality that is desired, and that the architecture of the virtual world can interpret as the inhabitant wishes. It would be able to adapt the avatar's verbal and non-verbal communication to this personality. Moreover, emotions and moods that could be provoked by virtual world events, avatar-avatar communication or the real time flow, will be modulated by this base personality.

| Name                  | Definition  |
|-----------------------|---|
| AvatarPersonalityType | A type that contains a set of descriptors defining the personality of the avatar.   |
| OpennessFlag          | This field, which is only present in the binary representation, signals the presence of the <code>Openness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.          |
| AgreeablenessFlag     | This field, which is only present in the binary representation, signals the presence of the <code>Agreeableness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| NeuroticismFlag       | This field, which is only present in the binary representation, signals the presence of the <code>Neuroticism</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.       |
| ExtraversionFlag      | This field, which is only present in the binary representation, signals the presence of the <code>Extraversion</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
| ConscientiousnessFlag | This field, which is only present in the binary representation, signals the presence of the <code>Conscientiousness</code> element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| NameFlag              | This field, which is only present in the binary representation, signals the presence of the <code>name</code> element. "1" means that the element shall be used. "0" means that the element shall not be used.              |
| Openness              | A value between -1 and 1 specifying the openness level of the personality   |
| Agreeableness         | A value between -1 and 1 specifying the agreeableness level of the personality  |
| Neuroticism           | A value between -1 and 1 specifying the neuroticism level of the personality  |
| Extraversion          | A value between -1 and 1 specifying the extraversion level of the personality   |
| Conscientiousness     | A value between -1 and 1 specifying the conscientiousness level of the personality  |
| name                  | A string value that specifies the name of personality.  |

5.13 AvatarControlFeaturesType

5.13.1 XML representation syntax

|         |  |
|---------|--|
| Diagram |  |
| Source  | <pre> &lt;complexType name="AvatarControlFeaturesType"&gt;   &lt;sequence&gt;     &lt;element name="ControlBodyFeatures" type="vwoc:ControlBodyFeaturesType" minOccurs="0"/&gt;     &lt;element name="ControlFaceFeatures" type="vwoc:ControlFaceFeaturesType" minOccurs="0"/&gt;   &lt;/sequence&gt;   &lt;attribute name="name" type="string"/&gt; &lt;/complexType&gt; </pre> |

## 5.13.2 Binary representation syntax

| AvatarControlFeaturesType {  | Number of bits                      | Mnemonic                |
|------------------------------|-------------------------------------|-------------------------|
| ControlBodyFeaturesFlag      | 1                                   | bslbf                   |
| ControlFaceFeaturesFlag      | 1                                   | bslbf                   |
| if(ControlBodyFeaturesFlag){ |                                     |                         |
| ControlBodyFeatures          |                                     | ControlBodyFeaturesType |
| }                            |                                     |                         |
| if(ControlFaceFeaturesFlag){ |                                     |                         |
| ControlFaceFeatures          |                                     | ControlFaceFeaturesType |
| }                            |                                     |                         |
| if(NameFlag){                |                                     |                         |
| name                         | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8                   |
| }                            |                                     |                         |
| }                            |                                     |                         |

## 5.13.3 Semantics

| Name                      | Description  |
|---------------------------|--|
| AvatarControlFeaturesType | A type that contains a set of descriptors defining possible placeholders for sensors on body skeleton and face feature points.   |
| ControlBodyFeaturesFlag   | This field, which is only present in the binary representation, signals the presence of the ControlBodyFeatures element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| ControlFaceFeaturesFlag   | This field, which is only present in the binary representation, signals the presence of the ControlFaceFeatures element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| NameFlag                  | This field, which is only present in the binary representation, signals the presence of the name element. "1" means that the element shall be used. "0" means that the element shall not be used.                |
| ControlBodyFeatures       | Set of elements that control moves of the body (bones)   |
| ControlFaceFeatures       | Set of elements that control moves of the face   |
| name                      | A string value that specifies the name of control features.  |

5.13.4 Examples

This example shows the description of controlling body and face features with the following semantics. The features control is given and works as a container.

```

<vwoc:ControlFeatures>
  <vwoc:ControlBodyFeatures>
    <vwoc:HeadBones name="urn:mpeg:mpeg-v:01-VWOC-HeadBonesCS-NS:skull"
alias="Head"/>
    ...
  </vwoc:ControlBodyFeatures>
  <vwoc:ControlFaceFeatures>
    <vwoc:HeadOutline>
      ...
    </vwoc:HeadOutline>
    ...
  </vwoc:ControlFaceFeatures>
</vwoc:ControlFeatures>
    
```

5.14 ControlBodyFeaturesType

5.14.1 XML representation syntax

|         |  |
|---------|--|
| Diagram |  |
| Source  | <pre> &lt;complexType name="ControlBodyFeaturesType"&gt;   &lt;sequence&gt;     &lt;element name="HeadBones" type="vwoc:ControlBodyFeaturesDescriptionType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="UpperBodyBones" type="vwoc:ControlBodyFeaturesDescriptionType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="DownBodyBones" type="vwoc:ControlBodyFeaturesDescriptionType" minOccurs="0" maxOccurs="unbounded"/&gt;     &lt;element name="MiddleBodyBones" type="vwoc:ControlBodyFeaturesDescriptionType" minOccurs="0" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt;     </pre> |

## 5.14.2 Binary representation syntax

| ControlBodyFeaturesType{            | Number of bits | Mnemonic                            |
|-------------------------------------|----------------|-------------------------------------|
| HeadBonesFlag                       | 1              | bslbf                               |
| UpperBodyBonesFlag                  | 1              | bslbf                               |
| DownBodyBonesFlag                   | 1              | bslbf                               |
| MiddleBodyBonesFlag                 | 1              | bslbf                               |
| if(HeadBonesFlag){                  |                |                                     |
| NumHeadBones                        |                | vluimsbf5                           |
| for(k=0; k<HeadBones; k++){         |                |                                     |
| HeadBones[k]                        |                | ControlBodyFeaturesDescription Type |
| }                                   |                |                                     |
| }                                   |                |                                     |
| if(UpperBodyBonesFlag){             |                |                                     |
| NumUpperBodyBones                   |                | vluimsbf5                           |
| for(k=0; k<NumUpperBodyBones; k++){ |                |                                     |
| UpperBodyBones[k]                   |                | ControlBodyFeaturesDescription Type |
| }                                   |                |                                     |
| }                                   |                |                                     |
| if(DownBodyBonesFlag){              |                |                                     |
| NumDownBodyBones                    |                | vluimsbf5                           |
| for(k=0; k<NumDownBodyBones; k++){  |                |                                     |
| DownBodyBones[k]                    |                | ControlBodyFeaturesDescription Type |
| }                                   |                |                                     |
| }                                   |                |                                     |
| if(MiddleBodyBonesFlag){            |                |                                     |

| ControlBodyFeaturesType{             | Number of bits | Mnemonic                            |
|--------------------------------------|----------------|-------------------------------------|
| NumMiddleBodyBones                   |                | vluimsbf5                           |
| for(k=0; k<NumMiddleBodyBones; k++){ |                |                                     |
| MiddleBodyBones[k]                   |                | ControlBodyFeaturesDescription Type |
| }                                    |                |                                     |
| }                                    |                |                                     |
| }                                    |                |                                     |

5.14.3 Semantics

| Name                    | Description (compare with human bones)   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
|-------------------------|--|------|-------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|-------|-------|---------|-------------|
| ControlBodyFeaturesType | A type that contains a set of descriptors defining possible place-holders for sensors on body skeleton.  |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| HeadBonesFlag           | This field, which is only present in the binary representation, signals the presence of the HeadBones element. "1" means that the element shall be used. "0" means that the element shall not be used.   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| UpperBodyBonesFlag      | This field, which is only present in the binary representation, signals the presence of the UpperBodyBones element. "1" means that the element shall be used. "0" means that the element shall not be used.  |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| DownBodyBonesFlag       | This field, which is only present in the binary representation, signals the presence of the DownBodyBones element. "1" means that the element shall be used. "0" means that the element shall not be used.   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| MiddleBodyBonesFlag     | This field, which is only present in the binary representation, signals the presence of the MiddleBodyBones element. "1" means that the element shall be used. "0" means that the element shall not be used.   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| NumHeadBones            | This field, which is only present in the binary representation, specifies the number of HeadBones elements contained in the ControlBodyFeaturesType.   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| HeadBones               | Set of bones on the head: a list of the head bones is included in a classification scheme (CS) term that shall be using the mpeg7:termReferenceType defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the HeadBonesCS defined in ISO/IEC 23005-6: —, A.2.12.1. The binary representation of the HeadBonesCS is also defined in the same Annex. <table border="1"> <thead> <tr> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>cervicalVertebrae7</td> <td>cervical vertebrae 7</td> </tr> <tr> <td>cervicalVertebrae6</td> <td>cervical vertebrae 6</td> </tr> <tr> <td>cervicalVertebrae5</td> <td>cervical vertebrae 5</td> </tr> <tr> <td>cervicalVertebrae4</td> <td>cervical vertebrae 4</td> </tr> <tr> <td>cervicalVertebrae3</td> <td>cervical vertebrae 3</td> </tr> <tr> <td>cervicalVertebrae2</td> <td>cervical vertebrae 2</td> </tr> <tr> <td>cervicalVertebrae1</td> <td>cervical vertebrae 1</td> </tr> <tr> <td>skull</td> <td>skull</td> </tr> <tr> <td>lEyelid</td> <td>left eyelid</td> </tr> </tbody> </table> | Name | Description | cervicalVertebrae7 | cervical vertebrae 7 | cervicalVertebrae6 | cervical vertebrae 6 | cervicalVertebrae5 | cervical vertebrae 5 | cervicalVertebrae4 | cervical vertebrae 4 | cervicalVertebrae3 | cervical vertebrae 3 | cervicalVertebrae2 | cervical vertebrae 2 | cervicalVertebrae1 | cervical vertebrae 1 | skull | skull | lEyelid | left eyelid |
| Name                    | Description  |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| cervicalVertebrae7      | cervical vertebrae 7   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| cervicalVertebrae6      | cervical vertebrae 6   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| cervicalVertebrae5      | cervical vertebrae 5   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| cervicalVertebrae4      | cervical vertebrae 4   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| cervicalVertebrae3      | cervical vertebrae 3   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| cervicalVertebrae2      | cervical vertebrae 2   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| cervicalVertebrae1      | cervical vertebrae 1   |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| skull                   | skull  |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |
| lEyelid                 | left eyelid  |      |             |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |       |       |         |             |

| Name              | Description (compare with human bones)  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
|-------------------|---|---------------|------|-------------|-----------|---------------|-----------|---------------|----------|--------------|---------|-------------|--------|------------|-------|-----------|--------|-----------------------|-------------|-----------------|---------|------------|-------------|-----------------|--------|-----------------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|---------|------------------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------|----------------------|-------------|-----------------|--------------|------------------|--------------|------------------|--------|-----------------------|--------------|------------------|--------------|------------------|--------------|------------------|-----------|----------------|-----------|----------------|----------|---------------|---------|--------------|--------|-------------|-------|------------|--------|------------------------|
|                   | rEyelid   | right eyelid  |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
|                   | lEyeball  | left eyeball  |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
|                   | rEyeball  | right eyeball |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
|                   | lEyebrow  | left eyebrow  |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
|                   | rEyebrow  | right eyebrow |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
|                   | jaw   | jaw           |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| NumUpperBodyBones | This field, which is only present in the binary representation, specifies the number of UpperBodyBones elements contained in the ControlBodyFeaturesType.   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| UpperBodyBones    | Set of bones on the upper part of the body, mainly arms and hands bones: a list of the upper body bones is included in a classification scheme (CS) term that shall be using the mpeg7 : termReferenceType defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the UpperBodyBonesCS defined in ISO/IEC 23005-6:—, A.2.12.2. The binary representation of the UpperBodyBonesCS is also defined in the same Annex.  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
|                   | <table border="1"> <thead> <tr> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>lClavicle</td><td>left clavicle</td></tr> <tr><td>lScapulae</td><td>left scapulae</td></tr> <tr><td>lHumerus</td><td>left humerus</td></tr> <tr><td>lRadius</td><td>left radius</td></tr> <tr><td>lWrist</td><td>left wrist</td></tr> <tr><td>lHand</td><td>left hand</td></tr> <tr><td>lThumb</td><td>left thumb metacarpal</td></tr> <tr><td>lPhalanges1</td><td>left phalanges1</td></tr> <tr><td>lThumb2</td><td>left thumb</td></tr> <tr><td>lPhalanges2</td><td>left phalanges2</td></tr> <tr><td>lIndex</td><td>left index metacarpal</td></tr> <tr><td>lPhalanges3</td><td>left phalanges3</td></tr> <tr><td>lPhalanges4</td><td>left phalanges4</td></tr> <tr><td>lPhalanges5</td><td>left phalanges5</td></tr> <tr><td>lMiddle</td><td>left middle metacarpal</td></tr> <tr><td>lPhalanges6</td><td>left phalanges6</td></tr> <tr><td>lPhalanges7</td><td>left phalanges7</td></tr> <tr><td>lPhalanges8</td><td>left phalanges8</td></tr> <tr><td>lRing</td><td>left ring metacarpal</td></tr> <tr><td>lPhalanges9</td><td>left phalanges9</td></tr> <tr><td>lPhalanges10</td><td>left phalanges10</td></tr> <tr><td>lPhalanges11</td><td>left phalanges11</td></tr> <tr><td>lPinky</td><td>left pinky metacarpal</td></tr> <tr><td>lPhalanges12</td><td>left phalanges12</td></tr> <tr><td>lPhalanges13</td><td>left phalanges13</td></tr> <tr><td>lPhalanges14</td><td>left phalanges14</td></tr> <tr><td>rClavicle</td><td>right clavicle</td></tr> <tr><td>rScapulae</td><td>right scapulae</td></tr> <tr><td>rHumerus</td><td>right humerus</td></tr> <tr><td>rRadius</td><td>right radius</td></tr> <tr><td>rWrist</td><td>right wrist</td></tr> <tr><td>rHand</td><td>right hand</td></tr> <tr><td>rThumb</td><td>right thumb metacarpal</td></tr> </tbody> </table> |               | Name | Description | lClavicle | left clavicle | lScapulae | left scapulae | lHumerus | left humerus | lRadius | left radius | lWrist | left wrist | lHand | left hand | lThumb | left thumb metacarpal | lPhalanges1 | left phalanges1 | lThumb2 | left thumb | lPhalanges2 | left phalanges2 | lIndex | left index metacarpal | lPhalanges3 | left phalanges3 | lPhalanges4 | left phalanges4 | lPhalanges5 | left phalanges5 | lMiddle | left middle metacarpal | lPhalanges6 | left phalanges6 | lPhalanges7 | left phalanges7 | lPhalanges8 | left phalanges8 | lRing | left ring metacarpal | lPhalanges9 | left phalanges9 | lPhalanges10 | left phalanges10 | lPhalanges11 | left phalanges11 | lPinky | left pinky metacarpal | lPhalanges12 | left phalanges12 | lPhalanges13 | left phalanges13 | lPhalanges14 | left phalanges14 | rClavicle | right clavicle | rScapulae | right scapulae | rHumerus | right humerus | rRadius | right radius | rWrist | right wrist | rHand | right hand | rThumb | right thumb metacarpal |
| Name              | Description   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lClavicle         | left clavicle   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lScapulae         | left scapulae   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lHumerus          | left humerus  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lRadius           | left radius   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lWrist            | left wrist  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lHand             | left hand   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lThumb            | left thumb metacarpal   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges1       | left phalanges1   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lThumb2           | left thumb  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges2       | left phalanges2   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lIndex            | left index metacarpal   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges3       | left phalanges3   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges4       | left phalanges4   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges5       | left phalanges5   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lMiddle           | left middle metacarpal  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges6       | left phalanges6   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges7       | left phalanges7   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges8       | left phalanges8   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lRing             | left ring metacarpal  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges9       | left phalanges9   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges10      | left phalanges10  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges11      | left phalanges11  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPinky            | left pinky metacarpal   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges12      | left phalanges12  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges13      | left phalanges13  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| lPhalanges14      | left phalanges14  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| rClavicle         | right clavicle  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| rScapulae         | right scapulae  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| rHumerus          | right humerus   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| rRadius           | right radius  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| rWrist            | right wrist   |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| rHand             | right hand  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |
| rThumb            | right thumb metacarpal  |               |      |             |           |               |           |               |          |              |         |             |        |            |       |           |        |                       |             |                 |         |            |             |                 |        |                       |             |                 |             |                 |             |                 |         |                        |             |                 |             |                 |             |                 |       |                      |             |                 |              |                  |              |                  |        |                       |              |                  |              |                  |              |                  |           |                |           |                |          |               |         |              |        |             |       |            |        |                        |

| Name               | Description (compare with human bones)  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
|--------------------|---|-------------|------------------|---------|-------------|-------------|--------------------------|--------|-----------------------------|-------------|------------------|-------------|------------------|-------------|---------------------------|--------------|-----------------------------------|-------------|--------------------------------------|-------------|------------------|-------------|---------------------------|--------|------------------------------|-------------|------------------|--------------|---------------------------------|--------------|----------------------------|--------------|------------------------------------|--------------|---------------------------------------|--------------|-------------------|--------------|-------------------|
|                    | <table border="1"> <tr><td>rPhalanges1</td><td>right phalanges1</td></tr> <tr><td>rThumb2</td><td>right thumb</td></tr> <tr><td>rPhalanges2</td><td>right phalanges2</td></tr> <tr><td>rIndex</td><td>right index metacarpal</td></tr> <tr><td>rPhalanges3</td><td>right phalanges3</td></tr> <tr><td>rPhalanges4</td><td>right phalanges4</td></tr> <tr><td>rPhalanges5</td><td>right phalanges5</td></tr> <tr><td>rMiddle</td><td>right middle metacarpal</td></tr> <tr><td>rPhalanges6</td><td>right phalanges6</td></tr> <tr><td>rPhalanges7</td><td>right phalanges7</td></tr> <tr><td>rPhalanges8</td><td>right phalanges8</td></tr> <tr><td>rRing</td><td>right ring metacarpal</td></tr> <tr><td>rPhalanges9</td><td>right phalanges9</td></tr> <tr><td>rPhalanges10</td><td>right phalanges10</td></tr> <tr><td>rPhalanges11</td><td>right phalanges11</td></tr> <tr><td>rPinky</td><td>right pinky metacarpal</td></tr> <tr><td>rPhalanges12</td><td>right phalanges12</td></tr> <tr><td>rPhalanges13</td><td>right phalanges13</td></tr> <tr><td>rPhalanges14</td><td>right phalanges14</td></tr> </table>   | rPhalanges1 | right phalanges1 | rThumb2 | right thumb | rPhalanges2 | right phalanges2         | rIndex | right index metacarpal      | rPhalanges3 | right phalanges3 | rPhalanges4 | right phalanges4 | rPhalanges5 | right phalanges5          | rMiddle      | right middle metacarpal           | rPhalanges6 | right phalanges6                     | rPhalanges7 | right phalanges7 | rPhalanges8 | right phalanges8          | rRing  | right ring metacarpal        | rPhalanges9 | right phalanges9 | rPhalanges10 | right phalanges10               | rPhalanges11 | right phalanges11          | rPinky       | right pinky metacarpal             | rPhalanges12 | right phalanges12                     | rPhalanges13 | right phalanges13 | rPhalanges14 | right phalanges14 |
| rPhalanges1        | right phalanges1  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rThumb2            | right thumb   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges2        | right phalanges2  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rIndex             | right index metacarpal  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges3        | right phalanges3  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges4        | right phalanges4  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges5        | right phalanges5  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rMiddle            | right middle metacarpal   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges6        | right phalanges6  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges7        | right phalanges7  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges8        | right phalanges8  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rRing              | right ring metacarpal   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges9        | right phalanges9  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges10       | right phalanges10   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges11       | right phalanges11   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPinky             | right pinky metacarpal  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges12       | right phalanges12   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges13       | right phalanges13   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges14       | right phalanges14   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| NumDownBodyBones   | This field, which is only present in the binary representation, specifies the number of DownBodyBones elements contained in the ControlBodyFeaturesType.  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| DownBodyBones      | <p>Set of bones on the down part of the body, mainly legs and foot bones: a list of the down body bones is included in a classification scheme (CS) term that shall be using the mpeg7 : termReferenceType defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the DownBodyBonesCS defined in ISO/IEC 23005-6: —, A.2.12.3. The binary representation of the DownBodyBonesCS is also defined in the same Annex.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>lFemur</td><td>left femur</td></tr> <tr><td>lPatella</td><td>left patella (knee bone)</td></tr> <tr><td>lTibia</td><td>left tibia (femur in front)</td></tr> <tr><td>lFibulae</td><td>left fibulae</td></tr> <tr><td>lTarsals1</td><td>left tarsals1</td></tr> <tr><td>lTarsals2</td><td>left tarsals2 (7 are all)</td></tr> <tr><td>lMetaTarsals</td><td>left metatarsals (5) (foot parts)</td></tr> <tr><td>lPhalanges</td><td>left phalanges (1 - 14) (foot parts)</td></tr> <tr><td>rFemur</td><td>right femur</td></tr> <tr><td>rPatella</td><td>right patella (knee bone)</td></tr> <tr><td>rTibia</td><td>right tibia (femur in front)</td></tr> <tr><td>rFibulae</td><td>right fibulae</td></tr> <tr><td>rTarsals1</td><td>right tarsals1 (parts of ankle)</td></tr> <tr><td>rTarsals2</td><td>right tarsals2 (7 are all)</td></tr> <tr><td>rMetaTarsals</td><td>right metatarsals (5) (foot parts)</td></tr> <tr><td>rPhalanges</td><td>right phalanges (1 - 14) (foot parts)</td></tr> </tbody> </table> | Name        | Description      | lFemur  | left femur  | lPatella    | left patella (knee bone) | lTibia | left tibia (femur in front) | lFibulae    | left fibulae     | lTarsals1   | left tarsals1    | lTarsals2   | left tarsals2 (7 are all) | lMetaTarsals | left metatarsals (5) (foot parts) | lPhalanges  | left phalanges (1 - 14) (foot parts) | rFemur      | right femur      | rPatella    | right patella (knee bone) | rTibia | right tibia (femur in front) | rFibulae    | right fibulae    | rTarsals1    | right tarsals1 (parts of ankle) | rTarsals2    | right tarsals2 (7 are all) | rMetaTarsals | right metatarsals (5) (foot parts) | rPhalanges   | right phalanges (1 - 14) (foot parts) |              |                   |              |                   |
| Name               | Description   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| lFemur             | left femur  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| lPatella           | left patella (knee bone)  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| lTibia             | left tibia (femur in front)   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| lFibulae           | left fibulae  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| lTarsals1          | left tarsals1   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| lTarsals2          | left tarsals2 (7 are all)   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| lMetaTarsals       | left metatarsals (5) (foot parts)   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| lPhalanges         | left phalanges (1 - 14) (foot parts)  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rFemur             | right femur   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPatella           | right patella (knee bone)   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rTibia             | right tibia (femur in front)  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rFibulae           | right fibulae   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rTarsals1          | right tarsals1 (parts of ankle)   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rTarsals2          | right tarsals2 (7 are all)  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rMetaTarsals       | right metatarsals (5) (foot parts)  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| rPhalanges         | right phalanges (1 - 14) (foot parts)   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| NumMiddleBodyBones | This field, which is only present in the binary representation, specifies the number of MiddleBodyBones elements contained in the ControlBodyFeaturesType.  |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |
| MiddleBodyBones    | Set of bones on the middle part of the body, torso: a list of the middle body   |             |                  |         |             |             |                          |        |                             |             |                  |             |                  |             |                           |              |                                   |             |                                      |             |                  |             |                           |        |                              |             |                  |              |                                 |              |                            |              |                                    |              |                                       |              |                   |              |                   |

| Name                | Description (compare with human bones)  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
|---------------------|---|------|-------------|--------|--------|--------|--------|------------------|--------------------|------------------|--------------------|------------------|--------------------|------------------|--------------------|------------------|--------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|
|                     | <p>bones is included in a classification scheme (CS) term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. A CS that may be used for this purpose is the <code>MiddleBodyBonesCS</code> defined in ISO/IEC 23005-6: —, A.2.12.4. The binary representation of the <code>MiddleBodyBonesCS</code> is also defined in the same Annex.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>sacrum</td><td>sacrum</td></tr> <tr><td>pelvis</td><td>pelvis</td></tr> <tr><td>lumbarVertebrae5</td><td>lumbar vertebrae 5</td></tr> <tr><td>lumbarVertebrae4</td><td>lumbar vertebrae 4</td></tr> <tr><td>lumbarVertebrae3</td><td>lumbar vertebrae 3</td></tr> <tr><td>lumbarVertebrae2</td><td>lumbar vertebrae 2</td></tr> <tr><td>lumbarVertebrae1</td><td>lumbar vertebrae 1</td></tr> <tr><td>thoracicVertebrae12</td><td>thoracic vertebrae 12</td></tr> <tr><td>thoracicVertebrae11</td><td>thoracic vertebrae 11</td></tr> <tr><td>thoracicVertebrae10</td><td>thoracic vertebrae 10</td></tr> <tr><td>thoracicVertebrae9</td><td>thoracic vertebrae 9</td></tr> <tr><td>thoracicVertebrae8</td><td>thoracic vertebrae 8</td></tr> <tr><td>thoracicVertebrae7</td><td>thoracic vertebrae 7</td></tr> <tr><td>thoracicVertebrae6</td><td>thoracic vertebrae 6</td></tr> <tr><td>thoracicVertebrae5</td><td>thoracic vertebrae 5</td></tr> <tr><td>thoracicVertebrae4</td><td>thoracic vertebrae 4</td></tr> <tr><td>thoracicVertebrae3</td><td>thoracic vertebrae 3</td></tr> <tr><td>thoracicVertebrae2</td><td>thoracic vertebrae 2</td></tr> <tr><td>thoracicVertebrae1</td><td>thoracic vertebrae 1</td></tr> </tbody> </table> | Name | Description | sacrum | sacrum | pelvis | pelvis | lumbarVertebrae5 | lumbar vertebrae 5 | lumbarVertebrae4 | lumbar vertebrae 4 | lumbarVertebrae3 | lumbar vertebrae 3 | lumbarVertebrae2 | lumbar vertebrae 2 | lumbarVertebrae1 | lumbar vertebrae 1 | thoracicVertebrae12 | thoracic vertebrae 12 | thoracicVertebrae11 | thoracic vertebrae 11 | thoracicVertebrae10 | thoracic vertebrae 10 | thoracicVertebrae9 | thoracic vertebrae 9 | thoracicVertebrae8 | thoracic vertebrae 8 | thoracicVertebrae7 | thoracic vertebrae 7 | thoracicVertebrae6 | thoracic vertebrae 6 | thoracicVertebrae5 | thoracic vertebrae 5 | thoracicVertebrae4 | thoracic vertebrae 4 | thoracicVertebrae3 | thoracic vertebrae 3 | thoracicVertebrae2 | thoracic vertebrae 2 | thoracicVertebrae1 | thoracic vertebrae 1 |
| Name                | Description   |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| sacrum              | sacrum  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| pelvis              | pelvis  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| lumbarVertebrae5    | lumbar vertebrae 5  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| lumbarVertebrae4    | lumbar vertebrae 4  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| lumbarVertebrae3    | lumbar vertebrae 3  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| lumbarVertebrae2    | lumbar vertebrae 2  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| lumbarVertebrae1    | lumbar vertebrae 1  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae12 | thoracic vertebrae 12   |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae11 | thoracic vertebrae 11   |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae10 | thoracic vertebrae 10   |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae9  | thoracic vertebrae 9  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae8  | thoracic vertebrae 8  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae7  | thoracic vertebrae 7  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae6  | thoracic vertebrae 6  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae5  | thoracic vertebrae 5  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae4  | thoracic vertebrae 4  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae3  | thoracic vertebrae 3  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae2  | thoracic vertebrae 2  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |
| thoracicVertebrae1  | thoracic vertebrae 1  |      |             |        |        |        |        |                  |                    |                  |                    |                  |                    |                  |                    |                  |                    |                     |                       |                     |                       |                     |                       |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |                    |                      |

#### 5.14.4 Examples

This example shows the description of controlling body features with the following semantics. The body features control maps the user defined body feature points to the placeholders. The following set of the feature points are mapped to the placeholders defined in the semantics.

| Name of Placeholder       | User defined features |
|---------------------------|-----------------------|
| sacrum                    | Hip                   |
| pelvis                    | Abdomen               |
| lFemur                    | LThigh                |
| lTibia ( femur in front ) | LShin                 |
| lFibulae                  | LFoot                 |
| rFemur                    | RThigh                |
| rTibia ( femur in front ) | RShin                 |
| rFibulae                  | RFoot                 |
| thoracicVertebrae1        | Chest                 |
| cervicalVertebrae1        | Neck                  |
| skull                     | Head                  |
| lClavicle                 | LCollar               |
| lHumerus                  | LShldr                |
| lRadius                   | LForeArm              |
| lHand                     | LHand                 |
| rClavicle                 | RCollar               |
| rHumerus                  | RShldr                |

|         |          |
|---------|----------|
| rRadius | RForeArm |
| rHand   | RHand    |

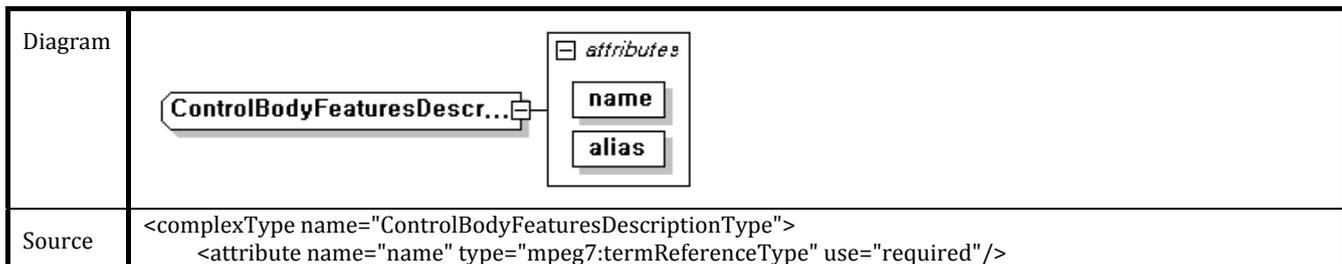
```

<vwoc:ControlFeatures>
  <vwoc:ControlBodyFeatures>
    <vwoc:HeadBones name="urn:mpeg:mpeg-v:01-VWOC-HeadBonesCS-NS:skull"
alias="Head"/>
    <vwoc:HeadBones name="urn:mpeg:mpeg-v:01-VWOC-HeadBonesCS-
NS:cervicalVerbael" alias="Neck"/>
    <vwoc:UpperBodyBones name="urn:mpeg:mpeg-v:01-VWOC-UpperBodyBonesCS-
NS:lClavicle" alias="LCollar"/>
    <vwoc:UpperBodyBones name="urn:mpeg:mpeg-v:01-VWOC-UpperBodyBonesCS-
NS:lHumerus" alias="LShldr"/>
    <vwoc:UpperBodyBones name="urn:mpeg:mpeg-v:01-VWOC-UpperBodyBonesCS-
NS:lRadius" alias="LForeArm"/>
    <vwoc:UpperBodyBones name="urn:mpeg:mpeg-v:01-VWOC-UpperBodyBonesCS-
NS:lHand" alias="LHand"/>
    <vwoc:UpperBodyBones name="urn:mpeg:mpeg-v:01-VWOC-UpperBodyBonesCS-
NS:rClavicle" alias="RCollar"/>
    <vwoc:UpperBodyBones name="urn:mpeg:mpeg-v:01-VWOC-UpperBodyBonesCS-
NS:rHumerus" alias="RShldr"/>
    <vwoc:UpperBodyBones name="urn:mpeg:mpeg-v:01-VWOC-UpperBodyBonesCS-
NS:rRadius" alias="RForeArm"/>
    <vwoc:UpperBodyBones name="urn:mpeg:mpeg-v:01-VWOC-UpperBodyBonesCS-
NS:rHand" alias="RHand"/>
    <vwoc:DownBodyBones name="urn:mpeg:mpeg-v:01-VWOC-DownBodyBonesCS-
NS:lFemur" alias="LThigh"/>
    <vwoc:DownBodyBones name="urn:mpeg:mpeg-v:01-VWOC-DownBodyBonesCS-
NS:lTibia" alias="LShin"/>
    <vwoc:DownBodyBones name="urn:mpeg:mpeg-v:01-VWOC-DownBodyBonesCS-
NS:lFibulae" alias="LFoot"/>
    <vwoc:DownBodyBones name="urn:mpeg:mpeg-v:01-VWOC-DownBodyBonesCS-
NS:rFemur" alias="RThigh"/>
    <vwoc:DownBodyBones name="urn:mpeg:mpeg-v:01-VWOC-DownBodyBonesCS-
NS:rTibia" alias="RShin"/>
    <vwoc:DownBodyBones name="urn:mpeg:mpeg-v:01-VWOC-DownBodyBonesCS-
NS:rFibulae" alias="RFoot"/>
    <vwoc:MiddleBodyBones name="urn:mpeg:mpeg-v:01-VWOC-MiddleBodyBonesCS-
NS:sacrum" alias="Hip"/>
    <vwoc:MiddleBodyBones name="urn:mpeg:mpeg-v:01-VWOC-MiddleBodyBonesCS-
NS:pelvis" alias="Abdomen"/>
    <vwoc:MiddleBodyBones name="urn:mpeg:mpeg-v:01-VWOC-MiddleBodyBonesCS-
NS:thoracicVertebrael" alias="Chest"/>
  </vwoc:ControlBodyFeatures>
</vwoc:ControlFeatures>

```

5.15 ControlBodyFeaturesDescriptionType

5.15.1 XML representation syntax



```
<attribute name="alias" type="string" use="required"/>
</complexType>
```

### 5.15.2 Binary representation syntax

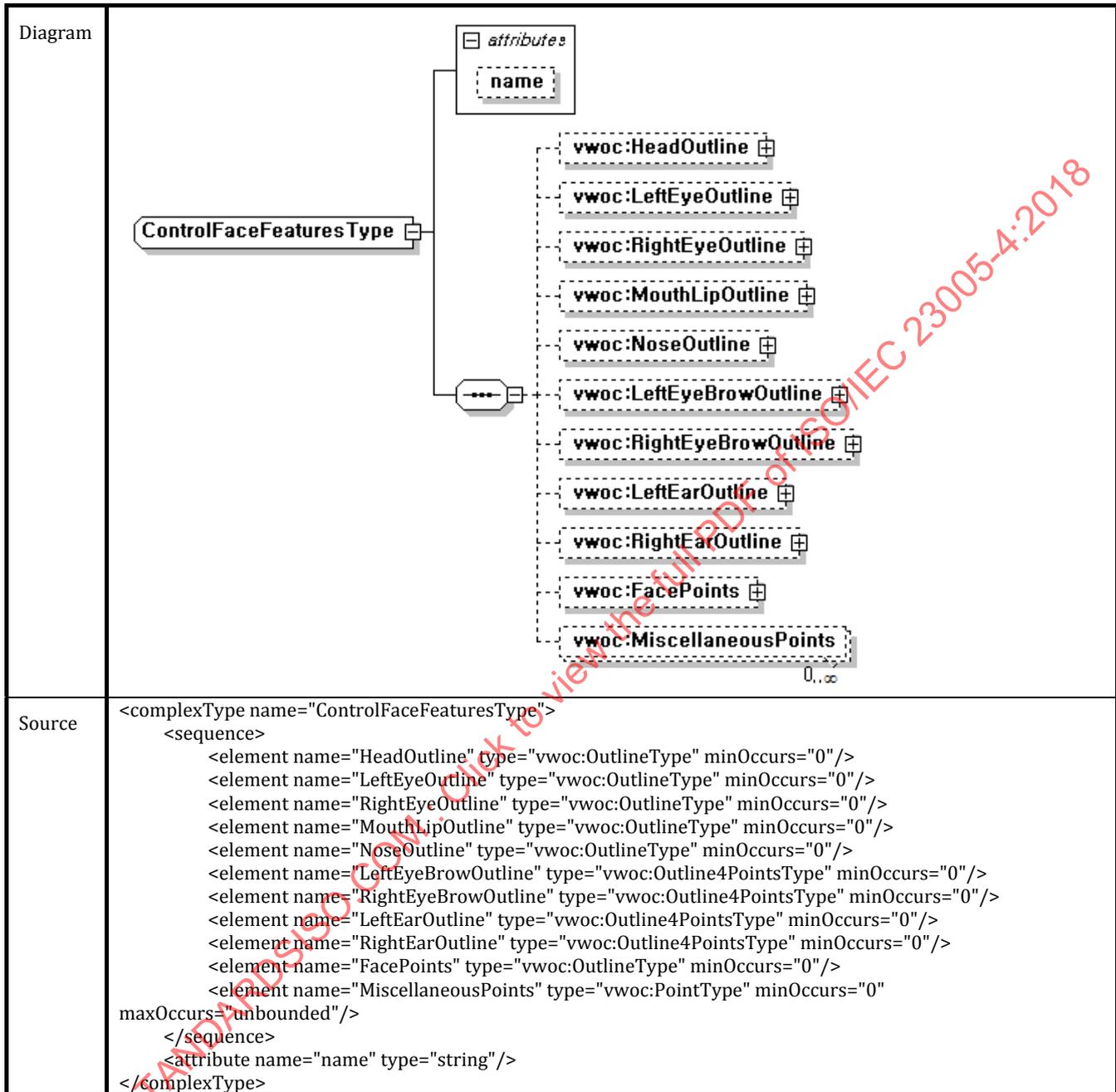
| ControlBodyFeaturesDescriptionType { | Number of bits                   | Mnemonic   |
|--------------------------------------|----------------------------------|--|
| TypeOfBodyFeature                    | 3                                | bslbf  |
| name                                 | 8                                | Number of bits are defined by the type of body feature as a reference to classification scheme |
| alias                                | See ISO/IEC 10646 <sup>[8]</sup> | UTF-8  |
| }                                    |                                  |  |

### 5.15.3 Semantics

| Name                               | Definition   |                      |  |             |     |                  |     |                 |     |                   |     |          |         |
|------------------------------------|--|----------------------|--|-------------|-----|------------------|-----|-----------------|-----|-------------------|-----|----------|---------|
| ControlBodyFeaturesDescriptionType | A type that contains the name and its alias of a body feature.   |                      |  |             |     |                  |     |                 |     |                   |     |          |         |
| TypeOfBodyFeature                  | <p>This field, which is only present in the binary representation, describes a type of body features as one of the classification schemes (CSs). The CSs that may be used for this purpose is defined in ISO/IEC 23005-6: —, A.2.12.</p> <table border="1"> <thead> <tr> <th>Type of Body Feature</th> <th>Binary representation for sensor type (3 bits)</th> </tr> </thead> <tbody> <tr> <td>HeadBonesCS</td> <td>000</td> </tr> <tr> <td>UpperBodyBonesCS</td> <td>001</td> </tr> <tr> <td>DownBodyBonesCS</td> <td>010</td> </tr> <tr> <td>MiddleBodyBonesCS</td> <td>011</td> </tr> <tr> <td>Reserved</td> <td>100-111</td> </tr> </tbody> </table> | Type of Body Feature | Binary representation for sensor type (3 bits) | HeadBonesCS | 000 | UpperBodyBonesCS | 001 | DownBodyBonesCS | 010 | MiddleBodyBonesCS | 011 | Reserved | 100-111 |
| Type of Body Feature               | Binary representation for sensor type (3 bits)   |                      |  |             |     |                  |     |                 |     |                   |     |          |         |
| HeadBonesCS                        | 000  |                      |  |             |     |                  |     |                 |     |                   |     |          |         |
| UpperBodyBonesCS                   | 001  |                      |  |             |     |                  |     |                 |     |                   |     |          |         |
| DownBodyBonesCS                    | 010  |                      |  |             |     |                  |     |                 |     |                   |     |          |         |
| MiddleBodyBonesCS                  | 011  |                      |  |             |     |                  |     |                 |     |                   |     |          |         |
| Reserved                           | 100-111  |                      |  |             |     |                  |     |                 |     |                   |     |          |         |
| name                               | Describes a type of body features as a reference to classification scheme (CS) term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. The CSs that may be used for this purpose is defined in ISO/IEC 23005-6: —, A.2.12.   |                      |  |             |     |                  |     |                 |     |                   |     |          |         |
| alias                              | Describes the name of a specific body feature type.  |                      |  |             |     |                  |     |                 |     |                   |     |          |         |

5.16 ControlFaceFeaturesType

5.16.1 XML representation syntax



## 5.16.2 Binary representation syntax

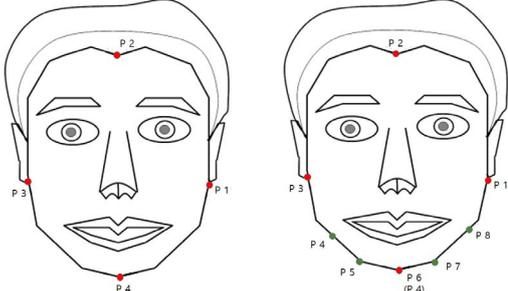
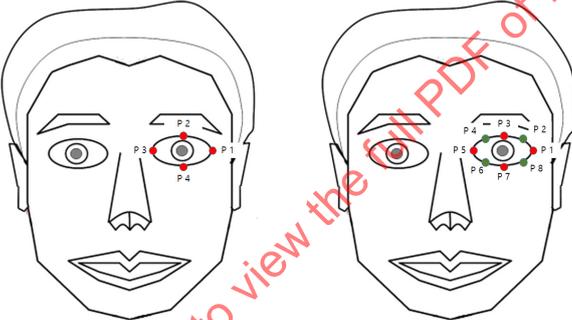
| ControlFaceFeaturesType { | Number of bits | Mnemonic    |
|---------------------------|----------------|-------------|
| HeadOutlineFlag           | 1              | bslbf       |
| LeftEyeOutlineFlag        | 1              | bslbf       |
| RightEyeOutlineFlag       | 1              | bslbf       |
| MouthLipOutlineFlag       | 1              | bslbf       |
| NoseOutlineFlag           | 1              | bslbf       |
| LeftEyeBrowOutlineFlag    | 1              | bslbf       |
| RightEyeBrowOutlineFlag   | 1              | bslbf       |
| LeftEarOutlineFlag        | 1              | bslbf       |
| RightEarOutlineFlag       | 1              | bslbf       |
| FacePointsFlag            | 1              | bslbf       |
| MiscellaneousPointsFlag   | 1              | bslbf       |
| NameFlag                  | 1              | bslbf       |
| if(HeadOutlineFlag){      |                |             |
| HeadOutline               |                | OutlineType |
| }                         |                |             |
| if(LeftEyeOutlineFlag){   |                |             |
| LeftEyeOutline            |                | OutlineType |
| }                         |                |             |
| if(RightEyeOutlineFlag){  |                |             |
| RightEyeOutline           |                | OutlineType |
| }                         |                |             |
| if(MouthLipOutlineFlag){  |                |             |
| MouthLipOutline           |                | OutlineType |
| }                         |                |             |
| if(NoseOutlineFlag){      |                |             |

| ControlFaceFeaturesType {                | Number of bits                      | Mnemonic           |
|--|-------------------------------------|--------------------|
| NoseOutline                              |                                     | OutlineType        |
| }  |                                     |                    |
| if(LeftEyeBrowOutlineFlag){              |                                     |                    |
| LeftEyeBrowOutline                       |                                     | Outline4PointsType |
| }  |                                     |                    |
| if(RightEyeBrowOutlineFlag){             |                                     |                    |
| RightEyeBrowOutline                      |                                     | Outline4PointsType |
| }  |                                     |                    |
| if(LeftEarOutlineFlag){                  |                                     |                    |
| LeftEarOutline                           |                                     | Outline4PointsType |
| }  |                                     |                    |
| if(RightEarOutlineFlag){                 |                                     |                    |
| RightEarOutline                          |                                     | Outline4PointsType |
| }  |                                     |                    |
| if(FacePointsFlag){                      |                                     |                    |
| FacePoints                               |                                     | OutlineType        |
| }  |                                     |                    |
| if(MiscellaneousPointsFlag){             |                                     |                    |
| LoopMiscellaneousPoints                  |                                     | vluidsbf5          |
| for(k=0;k< LoopMiscellaneousPoints;k++){ |                                     |                    |
| MiscellaneousPoints[k]                   |                                     | PointType          |
| }  |                                     |                    |
| }  |                                     |                    |
| if(NameFlag){                            |                                     |                    |
| name                                     | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8              |
| }  |                                     |                    |

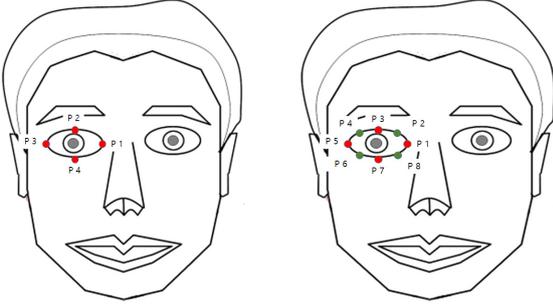
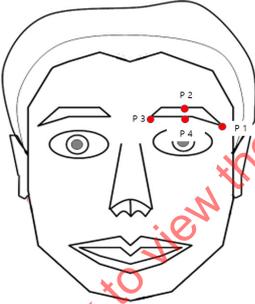
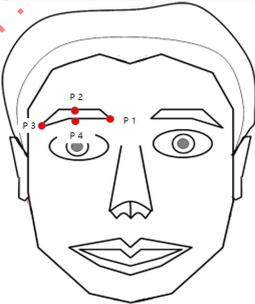
| ControlFaceFeaturesType { | Number of bits | Mnemonic |
|---------------------------|----------------|----------|
| }                         |                |          |

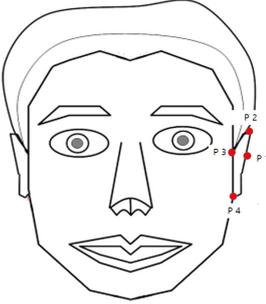
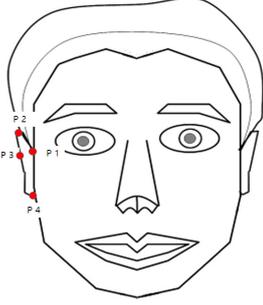
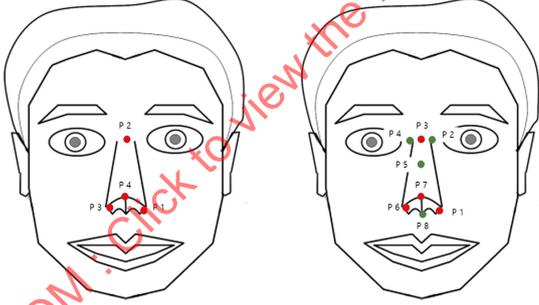
### 5.16.3 Semantics

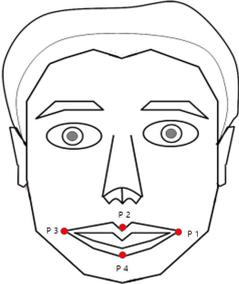
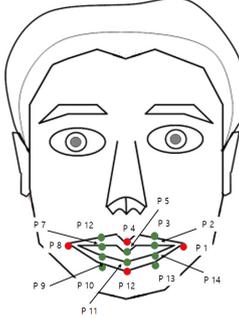
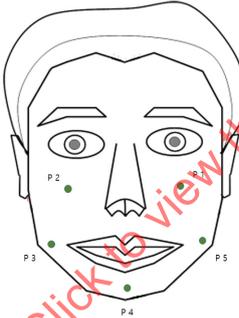
| Name                    | Description  |
|-------------------------|--|
| ControlFaceFeaturesType | A type that contains the name and its alias of a face feature.   |
| HeadOutlineFlag         | This field, which is only present in the binary representation, signals the presence of the HeadOutline element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
| LeftEyeOutlineFlag      | This field, which is only present in the binary representation, signals the presence of the LeftEyeOutline element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
| RightEyeOutlineFlag     | This field, which is only present in the binary representation, signals the presence of the RightEyeOutline element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| MouthLipOutlineFlag     | This field, which is only present in the binary representation, signals the presence of the MouthLipOutline element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| NoseOutlineFlag         | This field, which is only present in the binary representation, signals the presence of the NoseOutline element. "1" means that the element shall be used. "0" means that the element shall not be used.         |
| LeftEyeBrowOutlineFlag  | This field, which is only present in the binary representation, signals the presence of the LeftEyeBrowOutline element. "1" means that the element shall be used. "0" means that the element shall not be used.  |
| RightEyeBrowOutlineFlag | This field, which is only present in the binary representation, signals the presence of the RightEyeBrowOutline element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| LeftEarOutlineFlag      | This field, which is only present in the binary representation, signals the presence of the LeftEarOutline element. "1" means that the element shall be used. "0" means that the element shall not be used.      |
| RightEarOutlineFlag     | This field, which is only present in the binary representation, signals the presence of the RightEarOutline element. "1" means that the element shall be used. "0" means that the element shall not be used.     |
| FacePointsFlag          | This field, which is only present in the binary representation, signals the presence of the FacePoints element. "1" means that the element shall be used. "0" means that the element shall not be used.          |
| MiscellaneousPointsFlag | This field, which is only present in the binary representation, signals the presence of the MiscellaneousPoints element. "1" means that the element shall be used. "0" means that the element shall not be used. |
| NameFlag                | This field, which is only present in the binary representation, signals the presence of the Name attribute. "1" means that the element shall be used. "0" means that the element shall not be used.              |

| Name           | Description   |      |             |                |   |                |   |
|----------------|---|------|-------------|----------------|---|----------------|---|
| HeadOutline    | <div style="display: flex; justify-content: space-around; align-items: center;">  </div> <p>Describes the outline of the head. The red dots in figure on the left hand side represent the points forming the basic outline. The additional 4 green points and the red dots on the right hand side in the above figure form the high resolution outline of the head.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Outline4points</td> <td>Describes a basic outline of the head</td> </tr> <tr> <td>Outline8points</td> <td>Describes the extended outline of the head for the higher resolution outline of the head with 8 points.</td> </tr> </tbody> </table> | Name | Description | Outline4points | Describes a basic outline of the head     | Outline8points | Describes the extended outline of the head for the higher resolution outline of the head with 8 points. |
| Name           | Description   |      |             |                |   |                |   |
| Outline4points | Describes a basic outline of the head   |      |             |                |   |                |   |
| Outline8points | Describes the extended outline of the head for the higher resolution outline of the head with 8 points.   |      |             |                |   |                |   |
| LeftEyeOutline | <div style="display: flex; justify-content: space-around; align-items: center;">  </div> <p>Describes the outline of the left eye. The red dots in figure on the left hand side represent the points forming the basic outline. The additional 4 green points and the red dots in the above figure on the right hand side form the high resolution outline.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Outline4points</td> <td>Describes a basic outline of the left eye</td> </tr> <tr> <td>Outline8points</td> <td>Describes the extended outline of the left for the higher resolution outline of the head with 8 points.</td> </tr> </tbody> </table>    | Name | Description | Outline4points | Describes a basic outline of the left eye | Outline8points | Describes the extended outline of the left for the higher resolution outline of the head with 8 points. |
| Name           | Description   |      |             |                |   |                |   |
| Outline4points | Describes a basic outline of the left eye   |      |             |                |   |                |   |
| Outline8points | Describes the extended outline of the left for the higher resolution outline of the head with 8 points.   |      |             |                |   |                |   |

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| Name                | Description   |      |             |                |  |                |   |
|---------------------|---|------|-------------|----------------|--|----------------|---|
| RightEyeOutline     | <div style="display: flex; justify-content: space-around; align-items: center;">  </div> <p>Describes the outline of the right eye. The red dots in figure on the left hand side represent the points forming the basic outline. The additional 4 green points and the red dots in the above figure on the right hand side form the high resolution outline.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Name</th> <th style="width: 50%;">Description</th> </tr> </thead> <tbody> <tr> <td>Outline4points</td> <td>Describes a basic outline of the right eye</td> </tr> <tr> <td>Outline8points</td> <td>Describes the extended outline of the left for the higher resolution outline of the head with 8 points.</td> </tr> </tbody> </table> | Name | Description | Outline4points | Describes a basic outline of the right eye | Outline8points | Describes the extended outline of the left for the higher resolution outline of the head with 8 points. |
| Name                | Description   |      |             |                |  |                |   |
| Outline4points      | Describes a basic outline of the right eye  |      |             |                |  |                |   |
| Outline8points      | Describes the extended outline of the left for the higher resolution outline of the head with 8 points.   |      |             |                |  |                |   |
| LeftEyeBrowOutline  | <div style="display: flex; justify-content: center; align-items: center;">  </div> <p>Describes the outline of the left eyebrow</p>   |      |             |                |  |                |   |
| RightEyeBrowOutline | <div style="display: flex; justify-content: center; align-items: center;">  </div> <p>Describes the outline of the right eyebrow</p>   |      |             |                |  |                |   |

| Name            | Description   |      |             |                |                                       |                |   |
|-----------------|---|------|-------------|----------------|---------------------------------------|----------------|---|
| LeftEarOutline  |  <p>Describes the outline of the left ear</p>  |      |             |                |                                       |                |   |
| RightEarOutline |  <p>Describes the outline of the right ear</p>   |      |             |                |                                       |                |   |
| NoseOutline     |  <p>Describes the basic outline of the nose. The red dots represent the points forming the basic outline. The red dots in figure on the left hand side represent the points forming the basic outline. The additional 4 green points and the red dots in the above figure on the right hand side form the high resolution outline.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Outline4points</td> <td>Describes a basic outline of the nose</td> </tr> <tr> <td>Outline8points</td> <td>Describes the extended outline of the left for the higher resolution outline of the nose with 8 points.</td> </tr> </tbody> </table> | Name | Description | Outline4points | Describes a basic outline of the nose | Outline8points | Describes the extended outline of the left for the higher resolution outline of the nose with 8 points. |
| Name            | Description   |      |             |                |                                       |                |   |
| Outline4points  | Describes a basic outline of the nose   |      |             |                |                                       |                |   |
| Outline8points  | Describes the extended outline of the left for the higher resolution outline of the nose with 8 points.   |      |             |                |                                       |                |   |

| Name                    | Description   |      |             |                |   |                 |  |
|-------------------------|---|------|-------------|----------------|---|-----------------|--|
| MouthLipOutline         | <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>Describes the outline of the mouth lips. The red dots represent the points forming the basic outline. The red dots in figure on the left hand side represent the points forming the basic outline. The additional 10 green points and the red dots in the above figure on the right hand side form the high resolution outline.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Name</th> <th style="width: 50%;">Description</th> </tr> </thead> <tbody> <tr> <td>Outline4points</td> <td>Describes a basic outline of the mouth lips</td> </tr> <tr> <td>Outline14points</td> <td>Describes the extended outline of the left for the higher resolution outline of the head with 14 points.</td> </tr> </tbody> </table> | Name | Description | Outline4points | Describes a basic outline of the mouth lips | Outline14points | Describes the extended outline of the left for the higher resolution outline of the head with 14 points. |
| Name                    | Description   |      |             |                |   |                 |  |
| Outline4points          | Describes a basic outline of the mouth lips   |      |             |                |   |                 |  |
| Outline14points         | Describes the extended outline of the left for the higher resolution outline of the head with 14 points.  |      |             |                |   |                 |  |
| FacePoints              | <div style="text-align: center;">  </div> <p>The green dots form a high resolution facial expression.</p>   |      |             |                |   |                 |  |
| LoopMiscellaneousPoints | <p>This field, which is only present in the binary representation, specifies the number of miscellaneous points.</p>  |      |             |                |   |                 |  |
| MiscellaneousPoints     | <p>Describes any arbitrary feature points which can be placed and defined for an advanced facial feature control.</p>   |      |             |                |   |                 |  |
| name                    | <p>The name of the face control configuration</p>   |      |             |                |   |                 |  |
| PointType               | <p>An abstract type providing root for two different point types, which are LogicalPointType and Physical3DPointType for specifying a feature point for face feature control.</p>   |      |             |                |   |                 |  |

5.16.4 Examples

This example shows the description of controlling face features with the following semantics. The face features control maps the user defined face feature points to the placeholders. The following set of the feature points are mapped to the placeholders defined in the semantics.

| Name of Placeholder |        | User defined features |           |
|---------------------|--------|-----------------------|-----------|
| HeadOutline         | Point1 | Head                  | HeadLeft  |
|                     | Point2 |                       | HeadTop   |
|                     | Point3 |                       | HeadRight |
|                     | Point4 |                       | HeadDown  |
| LeftEyeOutline      | Point1 | Leye                  | LeyeLeft  |
|                     | Point2 |                       | LeyeTop   |
|                     | Point3 |                       | LeyeRight |
|                     | Point4 |                       | LeyeDown  |
| RightEyeOutline     | Point1 | Reye                  | ReyeLeft  |
|                     | Point2 |                       | ReyeTop   |
|                     | Point3 |                       | ReyeRight |
|                     | Point4 |                       | ReyeDown  |
| MouthLipOutline     | Point1 | Lips                  | LipsLeft  |
|                     | Point2 |                       | LipsTop   |
|                     | Point3 |                       | LipsRight |
|                     | Point4 |                       | LipsDown  |
| NoseOutline         | Point1 | Nose                  | NoseLeft  |
|                     | Point2 |                       | NoseTop   |
|                     | Point3 |                       | NoseRight |
|                     | Point4 |                       | NoseDown  |

```

<vwoc:ControlFaceFeatures name="LogicalPointBasedFace">
  <vwoc:HeadOutline>
    <vwoc:Outline4Points>
      <vwoc:Point1 xsi:type="vwoc:LogicalPointType" name="HeadLeft"/>
      <vwoc:Point2 xsi:type="vwoc:LogicalPointType" name="HeadTop"/>
      <vwoc:Point3 xsi:type="vwoc:LogicalPointType" name="HeadRight"/>
      <vwoc:Point4 xsi:type="vwoc:LogicalPointType" name="HeadDown"/>
    </vwoc:Outline4Points>
  </vwoc:HeadOutline>
  <vwoc:LeftEyeOutline>
    <vwoc:Outline4Points>
      <vwoc:Point1 xsi:type="vwoc:LogicalPointType" name="LeyeLeft"/>
      <vwoc:Point2 xsi:type="vwoc:LogicalPointType" name="LeyeTop"/>
      <vwoc:Point3 xsi:type="vwoc:LogicalPointType" name="LeyeRight"/>
      <vwoc:Point4 xsi:type="vwoc:LogicalPointType" name="LeyeDown"/>
    </vwoc:Outline4Points>
  </vwoc:LeftEyeOutline>
  <vwoc:RightEyeOutline>
    <vwoc:Outline4Points>
      <vwoc:Point1 xsi:type="vwoc:LogicalPointType" name="ReyeLeft"/>
      <vwoc:Point2 xsi:type="vwoc:LogicalPointType" name="ReyeTop"/>
      <vwoc:Point3 xsi:type="vwoc:LogicalPointType" name="ReyeRight"/>
      <vwoc:Point4 xsi:type="vwoc:LogicalPointType" name="ReyeDown"/>
    </vwoc:Outline4Points>
  </vwoc:RightEyeOutline>
  <vwoc:MouthLipOutline>
    <vwoc:Outline4Points>
      <vwoc:Point1 xsi:type="vwoc:LogicalPointType" name="LipsLeft"/>
      <vwoc:Point2 xsi:type="vwoc:LogicalPointType" name="LipsTop"/>
      <vwoc:Point3 xsi:type="vwoc:LogicalPointType" name="LipsRight"/>
      <vwoc:Point4 xsi:type="vwoc:LogicalPointType" name="LipsDown"/>
    </vwoc:Outline4Points>
  </vwoc:MouthLipOutline>
  <vwoc:NoseOutline>
    <vwoc:Outline4Points>
      <vwoc:Point1 xsi:type="vwoc:LogicalPointType" name="NoseLeft"/>
      <vwoc:Point2 xsi:type="vwoc:LogicalPointType" name="NoseTop"/>
      <vwoc:Point3 xsi:type="vwoc:LogicalPointType" name="NoseRight"/>
      <vwoc:Point4 xsi:type="vwoc:LogicalPointType" name="NoseDown"/>
    </vwoc:Outline4Points>
  </vwoc:NoseOutline>
</vwoc:ControlFaceFeatures>

```

```

</vwoc:RightEyeOutline>
<vwoc:MouthLipOutline>
  <vwoc:Outline4Points>
    <vwoc:Point1 xsi:type="vwoc:LogicalPointType" name="LipsLeft"/>
    <vwoc:Point2 xsi:type="vwoc:LogicalPointType" name="LipsTop"/>
    <vwoc:Point3 xsi:type="vwoc:LogicalPointType" name="LipsRight"/>
    <vwoc:Point4 xsi:type="vwoc:LogicalPointType" name="LipsDown"/>
  </vwoc:Outline4Points>
</vwoc:MouthLipOutline>
<vwoc:NoseOutline>
  <vwoc:Outline4Points>
    <vwoc:Point1 xsi:type="vwoc:LogicalPointType" name="NoseLeft"/>
    <vwoc:Point2 xsi:type="vwoc:LogicalPointType" name="NoseTop"/>
    <vwoc:Point3 xsi:type="vwoc:LogicalPointType" name="NoseRight"/>
    <vwoc:Point4 xsi:type="vwoc:LogicalPointType" name="NoseDown"/>
  </vwoc:Outline4Points>
</vwoc:NoseOutline>
</vwoc:ControlFaceFeatures>

```

## 5.17 OutlineType

### 5.17.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre> &lt;complexType name="OutlineType"&gt;   &lt;choice&gt;     &lt;element name="Outline4Points" type="vwoc:Outline4PointsType"/&gt;     &lt;element name="Outline5Points" type="vwoc:Outline5PointsType"/&gt;     &lt;element name="Outline8Points" type="vwoc:Outline8PointsType"/&gt;     &lt;element name="Outline14Points" type="vwoc:Outline14PointsType"/&gt;   &lt;/choice&gt; &lt;/complexType&gt; </pre> |

### 5.17.2 Binary representation syntax

| OutlineType {                    | Number of bits | Mnemonic           |
|----------------------------------|----------------|--------------------|
| OutlineTypeSelect                | 3              | bslbf              |
| if(OutlineTypeSelect ==0){       |                |                    |
| Outline4Points                   |                | Outline4PointsType |
| }else if(OutlineTypeSelect ==1){ |                |                    |
| Outline5Points                   |                | Outline5PointsType |

|                                  |  |                     |
|----------------------------------|--|---------------------|
| }else if(OutlineTypeSelect ==2){ |  |                     |
| Outline8Points                   |  | Outline8PointsType  |
| }else if(OutlineTypeSelect ==3){ |  |                     |
| Outline14Points                  |  | Outline14PointsType |
| }                                |  |                     |
| }                                |  |                     |

**5.17.3 Semantics**

The OutlineType contains 4 different types of outline dependent upon the number of points forming the outline.

| Name              | Description   |
|-------------------|---|
| OutlineType       | A type that describes the outline of each facial feature.   |
| OutlineTypeSelect | This field, which is only present in the binary representation, determines the outline type with the number of points.<br>(0: Outline4Points, 1:Outline5Points, 2: Outline8Points, 3: Outline14Points, 4-7: reserved) |
| Outline4Points    | The outline with 4 points   |
| Outline5Points    | The outline with 5 points   |
| Outline8Points    | The outline with 8 points   |
| Outline14Points   | The outline with 14 points  |

**5.18 Outline4PointsType**

**5.18.1 XML representation syntax**

|         |  |
|---------|--|
| Diagram | <pre> classDiagram     class Outline4PointsType     class vwocPoint1["vwoc:Point1"]     class vwocPoint2["vwoc:Point2"]     class vwocPoint3["vwoc:Point3"]     class vwocPoint4["vwoc:Point4"]     Outline4PointsType -- vwocPoint1     Outline4PointsType -- vwocPoint2     Outline4PointsType -- vwocPoint3     Outline4PointsType -- vwocPoint4     </pre> |
| Source  | <pre> &lt;complexType name="Outline4PointsType"&gt;   &lt;sequence&gt;     &lt;element name="Point1" type="vwoc:PointType"/&gt;     &lt;element name="Point2" type="vwoc:PointType"/&gt;     &lt;element name="Point3" type="vwoc:PointType"/&gt;     &lt;element name="Point4" type="vwoc:PointType"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt; </pre>     |

5.18.2 Binary representation syntax

| Outline4PointsType{ | Number of bits | Mnemonic  |
|---------------------|----------------|-----------|
| Point1              |                | PointType |
| Point2              |                | PointType |
| Point3              |                | PointType |
| Point4              |                | PointType |
| }                   |                |           |

5.18.3 Semantics

The points are numbered from the leftmost point by the counter-clockwise. For example, if there are 4 points at the left, top, right, bottom of the outline, they are Point1, Point2, Point3, Point4, respectively.

| Name               | Description  |
|--------------------|--|
| Outline4PointsType | A type that describes the outline of each facial feature with four points. |
| Point1             | The 1st point of the outline   |
| Point2             | The 2nd point of the outline   |
| Point3             | The 3rd point of the outline   |
| Point4             | The 4th point of the outline   |

5.19 Outline5PointsType

5.19.1 XML representation syntax

|         |   |
|---------|---|
| Diagram | <pre> classDiagram     class Outline5PointsType     class vwocPoint1["vwoc:Point1"]     class vwocPoint2["vwoc:Point2"]     class vwocPoint3["vwoc:Point3"]     class vwocPoint4["vwoc:Point4"]     class vwocPoint5["vwoc:Point5"]     Outline5PointsType --&gt; vwocPoint1     Outline5PointsType --&gt; vwocPoint2     Outline5PointsType --&gt; vwocPoint3     Outline5PointsType --&gt; vwocPoint4     Outline5PointsType --&gt; vwocPoint5     </pre> |
| Source  | <pre> &lt;complexType name="Outline5PointsType"&gt;   &lt;sequence&gt;     &lt;element name="Point1" type="vwoc:PointType"/&gt;     &lt;element name="Point2" type="vwoc:PointType"/&gt;     &lt;element name="Point3" type="vwoc:PointType"/&gt;     &lt;element name="Point4" type="vwoc:PointType"/&gt;     &lt;element name="Point5" type="vwoc:PointType"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt; </pre>   |

5.19.2 Binary representation syntax

| Outline5PointsType{ | Number of bits | Mnemonic  |
|---------------------|----------------|-----------|
| Point1              |                | PointType |
| Point2              |                | PointType |
| Point3              |                | PointType |
| Point4              |                | PointType |
| Point5              |                | PointType |
| }                   |                |           |

5.19.3 Semantics

The points are numbered from the leftmost point by the counter-clockwise. For the details, refer to the figure of FacePoints in 5.16.2.

| Name               | Description  |
|--------------------|--|
| Outline5PointsType | A type that describes the outline of each facial feature with five points. |
| Point1             | The 1st point of the outline   |
| Point2             | The 2nd point of the outline   |
| Point3             | The 3rd point of the outline   |
| Point4             | The 4th point of the outline   |
| Point5             | The 5th point of the outline   |

5.20 Outline8PointsType

5.20.1 XML representation syntax

|         |  |
|---------|--|
| Diagram | <pre> classDiagram     class Outline8PointsType     class vwocPoint1["vwoc:Point1"]     class vwocPoint2["vwoc:Point2"]     class vwocPoint3["vwoc:Point3"]     class vwocPoint4["vwoc:Point4"]     class vwocPoint5["vwoc:Point5"]     class vwocPoint6["vwoc:Point6"]     class vwocPoint7["vwoc:Point7"]     class vwocPoint8["vwoc:Point8"]     Outline8PointsType -- vwocPoint1     Outline8PointsType -- vwocPoint2     Outline8PointsType -- vwocPoint3     Outline8PointsType -- vwocPoint4     Outline8PointsType -- vwocPoint5     Outline8PointsType -- vwocPoint6     Outline8PointsType -- vwocPoint7     Outline8PointsType -- vwocPoint8     </pre> |
| Source  | <pre> &lt;complexType name="Outline8PointsType"&gt;   &lt;sequence&gt;     &lt;element name="Point1" type="vwoc:PointType"/&gt;     &lt;element name="Point2" type="vwoc:PointType"/&gt;     &lt;element name="Point3" type="vwoc:PointType"/&gt;     &lt;element name="Point4" type="vwoc:PointType"/&gt;   </pre>  |

|  |   |
|--|---|
|  | <pre> &lt;element name="Point5" type="vwoc:PointType"/&gt; &lt;element name="Point6" type="vwoc:PointType"/&gt; &lt;element name="Point7" type="vwoc:PointType"/&gt; &lt;element name="Point8" type="vwoc:PointType"/&gt; &lt;/sequence&gt; &lt;/complexType&gt; </pre> |
|--|---|

### 5.20.2 Binary representation syntax

| Outline8PointsType{ | Number of bits | Mnemonic  |
|---------------------|----------------|-----------|
| Point1              |                | PointType |
| Point2              |                | PointType |
| Point3              |                | PointType |
| Point4              |                | PointType |
| Point5              |                | PointType |
| Point6              |                | PointType |
| Point7              |                | PointType |
| Point8              |                | PointType |
| }                   |                |           |

### 5.20.3 Semantics

The points are numbered from the leftmost point by the counter-clockwise. For the details, refer to the figure of LeftEye in 5.3.5.7.2.

| Name               | Description   |
|--------------------|---|
| Outline8PointsType | A type that describes the outline of each facial feature with 8 points. |
| Point1             | The 1st point of the outline  |
| Point2             | The 2nd point of the outline  |
| Point3             | The 3rd point of the outline  |
| Point4             | The 4th point of the outline  |
| Point5             | The 5th point of the outline  |
| Point6             | The 6th point of the outline  |
| Point7             | The 7th point of the outline  |
| Point8             | The 8th point of the outline  |

5.21 Outline14PointsType

5.21.1 XML representation syntax

|                |  |
|----------------|--|
| <p>Diagram</p> | <p>The diagram shows a class named 'Outline14PointsType' on the left. A line connects it to a sequence container (a circle with three horizontal dashes). From the right side of this container, 14 lines branch out to a vertical stack of boxes, each labeled 'vwoc:Point1' through 'vwoc:Point14' in order from top to bottom.</p>  |
| <p>Source</p>  | <pre> &lt;complexType name="Outline14PointsType"&gt;   &lt;sequence&gt;     &lt;element name="Point1" type="vwoc:PointType"/&gt;     &lt;element name="Point2" type="vwoc:PointType"/&gt;     &lt;element name="Point3" type="vwoc:PointType"/&gt;     &lt;element name="Point4" type="vwoc:PointType"/&gt;     &lt;element name="Point5" type="vwoc:PointType"/&gt;     &lt;element name="Point6" type="vwoc:PointType"/&gt;     &lt;element name="Point7" type="vwoc:PointType"/&gt;     &lt;element name="Point8" type="vwoc:PointType"/&gt;     &lt;element name="Point9" type="vwoc:PointType"/&gt;     &lt;element name="Point10" type="vwoc:PointType"/&gt;     &lt;element name="Point11" type="vwoc:PointType"/&gt;     &lt;element name="Point12" type="vwoc:PointType"/&gt;     &lt;element name="Point13" type="vwoc:PointType"/&gt;     &lt;element name="Point14" type="vwoc:PointType"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt; </pre> |

## 5.21.2 Binary representation syntax

| Outline14PointsType{ | Number of bits | Mnemonic  |
|----------------------|----------------|-----------|
| Point1               |                | PointType |
| Point2               |                | PointType |
| Point3               |                | PointType |
| Point4               |                | PointType |
| Point5               |                | PointType |
| Point6               |                | PointType |
| Point7               |                | PointType |
| Point8               |                | PointType |
| Point9               |                | PointType |
| Point10              |                | PointType |
| Point11              |                | PointType |
| Point12              |                | PointType |
| Point13              |                | PointType |
| Point14              |                | PointType |
| }                    |                |           |

## 5.21.3 Semantics

The points are numbered from the leftmost point by the counter-clockwise. For the details, refer to the figure of MouthLips in 5.3.5.7.2.

| Name                | Description  |
|---------------------|--|
| Outline14PointsType | A type that describes the outline of each facial feature with fourteen points. |
| Point1              | The 1st point of the outline   |
| Point2              | The 2nd point of the outline   |
| Point3              | The 3rd point of the outline   |
| Point4              | The 4th point of the outline   |
| Point5              | The 5th point of the outline   |
| Point6              | The 6th point of the outline   |
| Point7              | The 7th point of the outline   |
| Point8              | The 8th point of the outline   |
| Point9              | The 9th point of the outline   |
| Point10             | The 10th point of the outline  |
| Point11             | The 11th point of the outline  |

| Name    | Description                   |
|---------|-------------------------------|
| Point12 | The 12th point of the outline |
| Point13 | The 13th point of the outline |
| Point14 | The 14th point of the outline |

5.22 VWOHapticPropertyListType

5.22.1 XML representation syntax

|         |  |
|---------|--|
| Diagram |  |
| Source  | <pre>&lt;complexType name="VWOHapticPropertyListType"&gt;   &lt;sequence&gt;     &lt;element name="HapticProperty" type="vwoc:VWOHapticPropertyType" maxOccurs="unbounded"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt;</pre> |

5.22.2 Binary representation syntax

| VWOHapticPropertyListType {                 | Number of bits | Mnemonic              |
|---|----------------|-----------------------|
| NumVWOHapticPropertyType                    |                | vluimsbf5             |
| for(k=0; k< NumVWOHapticPropertyType; k++){ |                |                       |
| HapticProperty[k]                           |                | VWOHapticPropertyType |
| }   |                |                       |
| }   |                |                       |

5.22.3 Semantics

| Name                      | Definition  |
|---------------------------|---|
| VWOHapticPropertyListType | Wrapper element type which allows multiple occurrences of the haptic properties associated to the virtual world object.   |
| NumVWOHapticPropertyType  | This field, which is only present in the binary representation, specifies the number of haptic property information contained in the haptic property list type. |
| HapticProperty            | This element contains a set of high level descriptors of the haptic properties defined in the VWOHapticPropertyType of the virtual world object.                |

5.23 MakeupAvatarType

5.23.1 XML representation syntax

|                |   |
|----------------|---|
| <p>Diagram</p> |   |
| <p>Source</p>  | <pre> &lt;complexType name="MakeupAvatarType"&gt;   &lt;complexContent&gt;     &lt;extension base="vwoc:AvatarType"&gt;       &lt;sequence&gt;         &lt;element name="Cosmetic" type="vwoc:CosmeticType"/&gt;         &lt;element name="MakeupInfo" type="vwoc:MakeupInfoType" minOccurs="0" maxOccurs="unbounded"/&gt;       &lt;/sequence&gt;     &lt;/extension&gt;   &lt;/complexContent&gt; &lt;/complexType&gt; </pre> |

5.23.2 Binary representation syntax

| MakeupAvatarType {               | Number of bits | Mnemonic       |
|----------------------------------|----------------|----------------|
| Avatar                           |                | AvatarType     |
| MakeupInfoFlag                   | 1              | bslbf          |
| Cosmetic                         |                | CosmeticType   |
| if(MakeupInfoFlag) {             |                |                |
| numOfMakeupInfo                  |                | vluimsbf5      |
| for(k=0;k<numOfMakeupInfo;k++) { |                |                |
| MakeupInfo[k]                    |                | MakeupInfoType |
| }                                |                |                |
| }                                |                |                |
| }                                |                |                |

5.23.3 Semantics

| Name             | Definition   |
|------------------|--|
| MakeupAvatarType | Tool for describing a makeup avatar. This type is extended from the Avatar Type  |
| Cosmetic         | Describes cosmetic information.  |
| MakeupInfo       | Describes the makeup information of the makeup avatar.   |
| Avatar           | Contains the base type defined by AvatarType.  |
| MakeupInfoFlag   | This field, which is only present in the binary representation, signals the presence of the MakeupInfo elements. "1" means that the elements shall be used. "0" means that the elements shall not be used. |
| numOfMakeupInfo  | This field, which is only present in the binary representation, specifies the number of MakeupInfo information contained in the makeup information for avatar.   |

## 5.24 CosmeticType

## 5.24.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre> &lt;complexType name="CosmeticType"&gt;   &lt;sequence&gt;     &lt;element name="Color" type="vwoc:CosmeticSpectrumType"/&gt;     &lt;element name="Characteristic" type="vwoc:CosmeticCharacteristicType" minOccurs="0"/&gt;     &lt;element name="Category" type="mpeg7:termReferenceType" minOccurs="0"/&gt;   &lt;/sequence&gt;   &lt;attribute name="name" type="string" use="optional"/&gt;   &lt;attribute name="brand" type="string" use="optional"/&gt;   &lt;attribute name="modelNumber" type="string" use="optional"/&gt;   &lt;attribute name="colorNumber" type="string" use="optional"/&gt; &lt;/complexType&gt;  &lt;complexType name="CosmeticSpectrumType"&gt;   &lt;sequence&gt;     &lt;choice&gt;       &lt;element name="Spectra" type="mpeg7:DoubleMatrixType"/&gt;       &lt;element name="SpectraURI" type="anyURI"/&gt;     &lt;/choice&gt;     &lt;element name="CosmeticSpectrumTransformationModel" type="vwoc:PolynomialType"/&gt;   &lt;/sequence&gt; &lt;/complexType&gt;  &lt;complexType name="PolynomialType"&gt;   &lt;sequence&gt;     &lt;element name="Monomial" type="vwoc:MonomialType" maxOccurs="unbounded" /&gt;   &lt;/sequence&gt; &lt;/complexType&gt;  &lt;complexType name="MonomialType"&gt;   &lt;sequence&gt;     &lt;element name="Variable" type="vwoc:VariableType" minOccurs="0" maxOccurs="unbounded" /&gt;   &lt;/sequence&gt;   &lt;attribute name="coefficient" type="double" use="optional"/&gt; &lt;/complexType&gt;  &lt;complexType name="VariableType"&gt;   &lt;attribute name="literal" type="string" use="required"/&gt;   &lt;attribute name="exponent" type="positiveInteger" use="optional"/&gt; &lt;/complexType&gt;  &lt;complexType name="CosmeticCharacteristicType"&gt;   &lt;attribute name="form" type="vwoc:cosmeticFormType" use="optional"/&gt; </pre> |

```

<attribute name="glossProperty" type="vwoc:glossPropertyType" use="optional"/>
<attribute name="pearl" type="boolean" use="optional"/>
<attribute name="transmittancy" type="double" use="optional"/>
</complexType>

<simpleType name="cosmeticFormType">
  <restriction base="string">
    <enumeration value="Solid"/>
    <enumeration value="Powder"/>
    <enumeration value="Liquid"/>
    <enumeration value="Cream"/>
    <enumeration value="Gel"/>
  </restriction>
</simpleType>

<simpleType name="glossPropertyType">
  <restriction base="string">
    <enumeration value="Glossy"/>
    <enumeration value="Matt"/>
  </restriction>
</simpleType>

```

5.24.2 Binary representation

| CosmeticType {           | Number of bits                      | Mnemonic                   |
|--------------------------|-------------------------------------|----------------------------|
| CharacteristicFlag       | 1                                   | bslbf                      |
| CategoryFlag             | 1                                   | bslbf                      |
| nameFlag                 | 1                                   | bslbf                      |
| brandFlag                | 1                                   | bslbf                      |
| modelNumberFlag          | 1                                   | bslbf                      |
| colorNumberFlag          | 1                                   | bslbf                      |
| Color                    |                                     | CosmeticSpectrumType       |
| if(CharacteristicFlag) { |                                     |                            |
| Characteristic           |                                     | CosmeticCharacteristicType |
| }                        |                                     |                            |
| if(CategoryFlag) {       |                                     |                            |
| Category                 | 5                                   | bslbf                      |
| }                        |                                     |                            |
| if(nameFlag) {           |                                     |                            |
| name                     | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8                      |

| CosmeticType {                 | Number of bits                      | Mnemonic  |
|--------------------------------|-------------------------------------|-----------|
| }                              |                                     |           |
| if(brandFlag) {                |                                     |           |
| brand                          | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8     |
| }                              |                                     |           |
| if(modelNumberFlag) {          |                                     |           |
| modelNumber                    | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8     |
| }                              |                                     |           |
| if(colorNumberFlag) {          |                                     |           |
| colorNumber                    | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8     |
| }                              |                                     |           |
| }                              |                                     |           |
|                                |                                     |           |
| CosmeticSpectrumType {         |                                     |           |
| SpectraChoice                  | 1                                   | bslbf     |
| if(SpectraChoice == 0) {       |                                     |           |
| heightSize                     |                                     | vluimsbf5 |
| widthSize                      |                                     | vluimsbf5 |
| dimensionSize                  | 9                                   | uimsbf    |
| for(i=0;i<heightSize;i++) {    |                                     |           |
| for(k=0;k<widthSize;k++) {     |                                     |           |
| for(m=0;m<dimensionSize;m++) { |                                     |           |
| Spectra[i][k][m]               | 32                                  | fsfb      |
| }                              |                                     |           |
| }                              |                                     |           |
| }                              |                                     |           |
| }                              |                                     |           |

| CosmeticType {                      | Number of bits                      | Mnemonic       |
|-------------------------------------|-------------------------------------|----------------|
| }                                   |                                     |                |
| }                                   |                                     |                |
| else {                              |                                     |                |
| SpectraURI                          | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8          |
| }                                   |                                     |                |
| CosmeticSpectrumTransformationModel |                                     | PolynomialType |
| }                                   |                                     |                |
|                                     |                                     |                |
| PolynomialType {                    |                                     |                |
| numOfMonomial                       |                                     | vluimsbf5      |
| for(i=0;i<numOfMonomial;i++) {      |                                     |                |
| Monomial[i]                         |                                     | MonomialType   |
| }                                   |                                     |                |
| }                                   |                                     |                |
|                                     |                                     |                |
| MonomialType {                      |                                     |                |
| VariableFlag                        | 1                                   | bslbf          |
| coefficientFlag                     | 1                                   | bslbf          |
| if(VariableFlag) {                  |                                     |                |
| numOfVariable                       |                                     | vluimsbf5      |
| for(i=0;i<numOfVariable;i++) {      |                                     |                |
| Variable[i]                         |                                     | VariableType   |
| }                                   |                                     |                |
| }                                   |                                     |                |
| if(coefficientFlag) {               |                                     |                |
| coefficient                         | 32                                  | fsfb           |

| CosmeticType {               | Number of bits                      | Mnemonic  |
|------------------------------|-------------------------------------|-----------|
| }                            |                                     |           |
| }                            |                                     |           |
| VariableType {               |                                     |           |
| exponentFlag                 | 1                                   | bslbf     |
| literal                      | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8     |
| if(exponentFlag) {           |                                     |           |
| exponent                     |                                     | vluim5bf5 |
| }                            |                                     |           |
| }                            |                                     |           |
| CosmeticCharacteristicType { |                                     |           |
| formFlag                     | 1                                   | bslbf     |
| glossPropertyFlag            | 1                                   | bslbf     |
| pearlFlag                    | 1                                   | bslbf     |
| transmittancyFlag            | 1                                   | bslbf     |
| if(formFlag) {               |                                     |           |
| form                         | 3                                   | bslbf     |
| }                            |                                     |           |
| if(glossPropertyFlag) {      |                                     |           |
| glossProperty                | 1                                   | Bslbf     |
| }                            |                                     |           |
| if(pearlFlag) {              |                                     |           |
| pearl                        | 1                                   | bslbf     |
| }                            |                                     |           |

| CosmeticType {          | Number of bits | Mnemonic |
|-------------------------|----------------|----------|
| if(transmittancyFlag) { |                |          |
| transmittancy           | 32             | fsfb     |
| }                       |                |          |
| }                       |                |          |

5.24.3 Semantics

| Name           | Definition  |                           |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
|----------------|---|---------------------------|--------------------------------|-------------|------------|---|---------------------------|-----------|---|--------------------------|--------|---|-----------------------|---------|---|------------------------|-----------|---|--------------------------|----------|---|-------------------------|---------|---|------------------------|-----------|---|--------------------------|---------|---|------------------------|----------|----|-------------------------|----------|----|-------------------------|
| CosmeticType   | Tool for describing cosmetics.  |                           |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| Color          | Describes color information of cosmetics.   |                           |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| Characteristic | Describes characteristic information of cosmetics.  |                           |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| Category       | <p>describes kinds of cosmetics as a reference to a classification scheme term that shall be using the <code>mpeg7:termreferencetype</code> defined in iso/iec 15938-5:2003, 7.6. the cs that may be used for this purpose is the <code>cosmetictypes</code> defined in a.6.</p> <table border="1"> <thead> <tr> <th>name</th> <th>binary representation (5 bits)</th> <th>description</th> </tr> </thead> <tbody> <tr> <td>foundation</td> <td>1</td> <td>foundation type cosmetics</td> </tr> <tr> <td>concealer</td> <td>2</td> <td>concealer type cosmetics</td> </tr> <tr> <td>powder</td> <td>3</td> <td>powder type cosmetics</td> </tr> <tr> <td>eyebrow</td> <td>4</td> <td>eyebrow type cosmetics</td> </tr> <tr> <td>eyeshadow</td> <td>5</td> <td>eyeshadow type cosmetics</td> </tr> <tr> <td>eyeliner</td> <td>6</td> <td>eyeliner type cosmetics</td> </tr> <tr> <td>blusher</td> <td>7</td> <td>blusher type cosmetics</td> </tr> <tr> <td>highlight</td> <td>8</td> <td>highlight type cosmetics</td> </tr> <tr> <td>shading</td> <td>9</td> <td>shading type cosmetics</td> </tr> <tr> <td>lipliner</td> <td>10</td> <td>lipliner type cosmetics</td> </tr> <tr> <td>lipstick</td> <td>11</td> <td>lipstick type cosmetics</td> </tr> </tbody> </table> | name                      | binary representation (5 bits) | description | foundation | 1 | foundation type cosmetics | concealer | 2 | concealer type cosmetics | powder | 3 | powder type cosmetics | eyebrow | 4 | eyebrow type cosmetics | eyeshadow | 5 | eyeshadow type cosmetics | eyeliner | 6 | eyeliner type cosmetics | blusher | 7 | blusher type cosmetics | highlight | 8 | highlight type cosmetics | shading | 9 | shading type cosmetics | lipliner | 10 | lipliner type cosmetics | lipstick | 11 | lipstick type cosmetics |
| name           | binary representation (5 bits)  | description               |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| foundation     | 1   | foundation type cosmetics |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| concealer      | 2   | concealer type cosmetics  |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| powder         | 3   | powder type cosmetics     |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| eyebrow        | 4   | eyebrow type cosmetics    |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| eyeshadow      | 5   | eyeshadow type cosmetics  |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| eyeliner       | 6   | eyeliner type cosmetics   |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| blusher        | 7   | blusher type cosmetics    |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| highlight      | 8   | highlight type cosmetics  |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| shading        | 9   | shading type cosmetics    |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| lipliner       | 10  | lipliner type cosmetics   |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |
| lipstick       | 11  | lipstick type cosmetics   |                                |             |            |   |                           |           |   |                          |        |   |                       |         |   |                        |           |   |                          |          |   |                         |         |   |                        |           |   |                          |         |   |                        |          |    |                         |          |    |                         |

| Name                 | Definition  |         |                         |
|----------------------|---|---------|-------------------------|
|                      | lipgloss  | 12      | lipgloss type cosmetics |
|                      | mascara   | 13      | mascara type cosmetics  |
|                      |   | 0,14-31 | reserved                |
| Name                 | Describes the name of cosmetics.  |         |                         |
| Brand                | Describes the brand of cosmetics.   |         |                         |
| modelNumber          | Describes the model number of cosmetics.  |         |                         |
| colorNumber          | Describes the color number of cosmetics.  |         |                         |
| Characteristic Flag  | This field, which is only present in the binary representation, signals the presence of Characteristic value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used. |         |                         |
| CategoryFlag         | This field, which is only present in the binary representation, signals the presence of Category value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.       |         |                         |
| nameFlag             | This field, which is only present in the binary representation, signals the presence of name value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.           |         |                         |
| brandFlag            | This field, which is only present in the binary representation, signals the presence of brand value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.          |         |                         |
| modelNumberFlag      | This field, which is only present in the binary representation, signals the presence of modelNumber value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.    |         |                         |
| colorNumberFlag      | This field, which is only present in the binary representation, signals the presence of colorNumber value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.    |         |                         |
| CosmeticSpectrumType | Tool for describing colour of cosmetics in the spectrum data.   |         |                         |
|                      | This type includes a spectrum data and a spectrum transformation model.   |         |                         |

| Name                                | Definition   |
|-------------------------------------|--|
| Spectra                             | <p>Describes the spectrum data as a form of a matrix.</p> <p>The spectrum data is represented by an image size (i.e., a height and a width) and a spectrum dimension. The maximum size of the spectrum dimension is 301 since this covers a visible spectrum range between 400nm and 700nm for every 1nm. The spectrum dimension can be subsampled linearly. For example, if the sampling rate is every 10nm, the spectrum dimension becomes 31. Henceforth, the spectrum data can be represented by a three-dimensional matrix that the size is <i>height x width x spectrum dimension</i>.</p> <p>A spectrum data (i.e., one pixel colour) can be represented by a three dimension matrix with size of <math>1 \times 1 \times \text{spectrum dimension}</math>.</p> |
| SpectraURI                          | Describes a URI that stores the spectrum data.   |
| CosmeticSpectrumTransformationModel | A transformation model (e.g., equations) between a skin color spectrum and a cosmetic color spectrum.  |
| SpectraChoice                       | This field, which is only present in the binary representation, describes which spectrum data shall be used. "0" means that the Spectra type shall be used, "1" means that the SpectraURI type shall be used   |
| heightSize                          | Describes a height that the spectrum data.   |
| widthSize                           | Describes a width that the spectrum data.  |
| dimensionSize                       | Describes a dimension of spectrum that the spectrum data.  |
| PolynomialType                      | Tool for describing a polynomial equation.   |
| Monomial                            | Describes monomial equations, which constitute a polynomial equation.  |
| numOfMonomial                       | This field, which is only present in the binary representation, specifies the number of <code>Monomial</code> information contained in the makeup information for avatar.  |
| MonomialType                        | Tool for describing a monomial equation.   |
| Variable                            | Describes variables of the monomial equation.  |
| coefficient                         | Describes coefficients of the monomial equation. If the variable is not defined, this coefficient becomes a constant.  |
| VariableFlag                        | This field, which is only present in the binary representation, signals the presence of <code>Variable</code> value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.   |
| coefficientFlag                     | This field, which is only present in the binary representation, signals the presence of <code>coefficient</code> value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.  |

| Name                       | Definition   |                  |           |     |       |     |        |     |        |     |       |     |     |
|----------------------------|--|------------------|-----------|-----|-------|-----|--------|-----|--------|-----|-------|-----|-----|
| numOfVariable              | This field, which is only present in the binary representation, specifies the number of <code>Variable</code> information contained in the makeup information for avatar.  |                  |           |     |       |     |        |     |        |     |       |     |     |
| VariableType               | Tool for describing a variable.  |                  |           |     |       |     |        |     |        |     |       |     |     |
| exponent                   | Describes an exponent of the variable.   |                  |           |     |       |     |        |     |        |     |       |     |     |
| exponentFlag               | This field, which is only present in the binary representation, signals the presence of <code>exponent</code> value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.   |                  |           |     |       |     |        |     |        |     |       |     |     |
| literal                    | This field specifies the literal of <code>Variable</code> .  |                  |           |     |       |     |        |     |        |     |       |     |     |
| CosmeticCharacteristicType | Tool for describing the characteristic information of cosmetics.   |                  |           |     |       |     |        |     |        |     |       |     |     |
| form                       | Describes the forms of cosmetics.  |                  |           |     |       |     |        |     |        |     |       |     |     |
| glossProperty              | Describe glossiness of cosmetics.  |                  |           |     |       |     |        |     |        |     |       |     |     |
| pearl                      | Describe the existence of pearl component.   |                  |           |     |       |     |        |     |        |     |       |     |     |
| transmittancy              | Describe the transmittance of cosmetics.   |                  |           |     |       |     |        |     |        |     |       |     |     |
| formFlag                   | This field, which is only present in the binary representation, signals the presence of <code>form</code> value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.   |                  |           |     |       |     |        |     |        |     |       |     |     |
| glossPropertyFlag          | This field, which is only present in the binary representation, signals the presence of <code>glossProperty</code> value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.  |                  |           |     |       |     |        |     |        |     |       |     |     |
| pearlFlag                  | This field, which is only present in the binary representation, signals the presence of <code>pearl</code> value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.  |                  |           |     |       |     |        |     |        |     |       |     |     |
| transmittancyFlag          | This field, which is only present in the binary representation, signals the presence of <code>transmittancy</code> value attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.  |                  |           |     |       |     |        |     |        |     |       |     |     |
| cosmeticFormType           | <p>Tool for describing the forms of cosmetics. The form of cosmetics is one of solid, powder, liquid, cream, and gel.</p> <p>In the binary description, the following mapping table is used.</p> <table border="1"> <thead> <tr> <th>cosmeticFormType</th> <th>Sementics</th> </tr> </thead> <tbody> <tr> <td>000</td> <td>solid</td> </tr> <tr> <td>001</td> <td>powder</td> </tr> <tr> <td>010</td> <td>liquid</td> </tr> <tr> <td>011</td> <td>cream</td> </tr> <tr> <td>100</td> <td>gel</td> </tr> </tbody> </table> | cosmeticFormType | Sementics | 000 | solid | 001 | powder | 010 | liquid | 011 | cream | 100 | gel |
| cosmeticFormType           | Sementics  |                  |           |     |       |     |        |     |        |     |       |     |     |
| 000                        | solid  |                  |           |     |       |     |        |     |        |     |       |     |     |
| 001                        | powder   |                  |           |     |       |     |        |     |        |     |       |     |     |
| 010                        | liquid   |                  |           |     |       |     |        |     |        |     |       |     |     |
| 011                        | cream  |                  |           |     |       |     |        |     |        |     |       |     |     |
| 100                        | gel  |                  |           |     |       |     |        |     |        |     |       |     |     |

| Name              | Definition   |                   |           |   |        |   |      |
|-------------------|--|-------------------|-----------|---|--------|---|------|
| glossPropertyType | <p>Tool for describing the glossiness of cosmetics. The glossiness is either glossy or matt.</p> <p>In the binary description, the following mapping table is used.</p> <table border="1"> <thead> <tr> <th>glossPropertyType</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>glossy</td> </tr> <tr> <td>1</td> <td>matt</td> </tr> </tbody> </table> | glossPropertyType | Semantics | 0 | glossy | 1 | matt |
| glossPropertyType | Semantics  |                   |           |   |        |   |      |
| 0                 | glossy   |                   |           |   |        |   |      |
| 1                 | matt   |                   |           |   |        |   |      |

5.25 MakeupInfoType

5.25.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre> &lt;complexType name="MakeupInfoType"&gt;   &lt;sequence&gt;     &lt;element name="Tool" type="vwoc:MakeupToolType"/&gt;     &lt;element name="Region" type="vwoc:MakeupRegionType"/&gt;   &lt;/sequence&gt;   &lt;attribute name="nbrOfTouch" type="positiveInteger" use="required"/&gt; &lt;/complexType&gt; </pre> |

5.25.2 Binary Representation

| MakeupInfoType { | Number of bits | Mnemonic         |
|------------------|----------------|------------------|
| Tool             |                | MakeupToolType   |
| Region           |                | MakeupRegionType |
| nbrOfTouch       |                | vluimsbf5        |
| }                |                |                  |

5.25.3 Semantics

| Name           | Definition                              |
|----------------|---|
| MakeupInfoType | Tool for describing makeup information. |
| Tool           | Describes makeup tools.                 |
| Region         | Describes makeup regions of a face.     |
| nbrOfTouch     | Describes a number of makeup touches.   |

## 5.26 MakeupToolType

### 5.26.1 XML representation syntax

|         |   |
|---------|---|
| Diagram |   |
| Source  | <pre> &lt;complexType name="MakeupToolType"&gt;   &lt;sequence&gt;     &lt;element name="Usage" type="mpeg7:termReferenceType" minOccurs="0"/&gt;   &lt;/sequence&gt;   &lt;attribute name="toolType" type="vwoc:cosmeticToolType" use="optional"/&gt;   &lt;attribute name="name" type="string" use="optional"/&gt;   &lt;attribute name="brand" type="string" use="optional"/&gt;   &lt;attribute name="modelNumber" type="string" use="optional"/&gt;   &lt;attribute name="sizeNumber" type="string" use="optional"/&gt; &lt;/complexType&gt;  &lt;simpleType name="cosmeticToolType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="Brush"/&gt;     &lt;enumeration value="Sponge"/&gt;     &lt;enumeration value="PowderPuff"/&gt;     &lt;enumeration value="Pen"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt; </pre> |

### 5.26.2 Binary representation

| MakeupToolType { | Number of bits | Mnemonic |
|------------------|----------------|----------|
| UsageFlag        | 1              | bslbf    |
| toolTypeFlag     | 1              | bslbf    |
| nameFlag         | 1              | bslbf    |
| brandFlag        | 1              | bslbf    |
| modelNumberFlag  | 1              | bslbf    |
| sizeNumberFlag   | 1              | bslbf    |
| if(UsageFlag) {  |                |          |
| Usage            | 5              | bslbf    |

| MakeupToolType {      | Number of bits                      | Mnemonic |
|-----------------------|-------------------------------------|----------|
| }                     |                                     |          |
| if(toolTypeFlag) {    |                                     |          |
| toolType              | 2                                   | bslbf    |
| }                     |                                     |          |
| if(nameFlag) {        |                                     |          |
| name                  | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                     |                                     |          |
| if(brandFlag) {       |                                     |          |
| brand                 | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                     |                                     |          |
| if(modelNumberFlag) { |                                     |          |
| modelNumber           | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                     |                                     |          |
| if(sizeNumberFlag) {  |                                     |          |
| sizeNumber            | See<br>ISO/IEC 10646 <sup>[8]</sup> | UTF-8    |
| }                     |                                     |          |
| }                     |                                     |          |

5.26.3 Semantics

| Name           | Definition  |             |                       |             |
|----------------|---|-------------|-----------------------|-------------|
| MakeupToolType | Tool for describing makeup tool information.  |             |                       |             |
| Usage          | Describe the purpose of a makeup tool as a reference to a classification scheme term that shall be using the <code>mpeg7:termReferenceType</code> defined in ISO/IEC 15938-5:2003, 7.6. The CS that may be used for this purpose is the <code>CosmeticTypeCS</code> defined in A.6. |             |                       |             |
|                | <table border="1"> <thead> <tr> <th>Name</th> <th>Binary representation</th> <th>Description</th> </tr> </thead> <tbody> </tbody> </table>  | Name        | Binary representation | Description |
| Name           | Binary representation   | Description |                       |             |

| Name             | Definition  |                 |                      |                  |           |    |       |    |        |    |             |    |     |
|------------------|---|-----------------|----------------------|------------------|-----------|----|-------|----|--------|----|-------------|----|-----|
|                  |   | <b>(5 bits)</b> |                      |                  |           |    |       |    |        |    |             |    |     |
|                  | foundation  | 1               | usage for foundation |                  |           |    |       |    |        |    |             |    |     |
|                  | concealer   | 2               | usage for concealer  |                  |           |    |       |    |        |    |             |    |     |
|                  | powder  | 3               | usage for powder     |                  |           |    |       |    |        |    |             |    |     |
|                  | eyebrow   | 4               | usage for eyebrow    |                  |           |    |       |    |        |    |             |    |     |
|                  | eyeshadow   | 5               | usage for eyeshadow  |                  |           |    |       |    |        |    |             |    |     |
|                  | eyeliner  | 6               | usage for eyeliner   |                  |           |    |       |    |        |    |             |    |     |
|                  | blusher   | 7               | usage for blusher    |                  |           |    |       |    |        |    |             |    |     |
|                  | highlight   | 8               | usage for highlight  |                  |           |    |       |    |        |    |             |    |     |
|                  | shading   | 9               | usage for shading    |                  |           |    |       |    |        |    |             |    |     |
|                  | lipliner  | 10              | usage for lipliner   |                  |           |    |       |    |        |    |             |    |     |
|                  | lipstick  | 11              | usage for lipstick   |                  |           |    |       |    |        |    |             |    |     |
|                  | lipgloss  | 12              | usage for lipgloss   |                  |           |    |       |    |        |    |             |    |     |
|                  | mascara   | 13              | usage for mascara    |                  |           |    |       |    |        |    |             |    |     |
|                  |   | 0,14-31         | reserved             |                  |           |    |       |    |        |    |             |    |     |
| toolType         | Describe the type of a makeup tool.   |                 |                      |                  |           |    |       |    |        |    |             |    |     |
| name             | Describe the name of a makeup tool.   |                 |                      |                  |           |    |       |    |        |    |             |    |     |
| brand            | Describe the brand of a makeup tool.  |                 |                      |                  |           |    |       |    |        |    |             |    |     |
| modelNumber      | Describe the model number of a makeup tool.   |                 |                      |                  |           |    |       |    |        |    |             |    |     |
| sizeNumber       | Describe the size number of a makeup tool.  |                 |                      |                  |           |    |       |    |        |    |             |    |     |
| cosmeticToolType | <p>Tool for describing the type of a makeup tool. The type is one of brush, sponge, powder puff, and pen.</p> <p>In the binary description, the following mapping table is used.</p> <table border="1"> <thead> <tr> <th>cosmeticToolType</th> <th>Sementics</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>brush</td> </tr> <tr> <td>01</td> <td>sponge</td> </tr> <tr> <td>10</td> <td>powder puff</td> </tr> <tr> <td>11</td> <td>pen</td> </tr> </tbody> </table> |                 |                      | cosmeticToolType | Sementics | 00 | brush | 01 | sponge | 10 | powder puff | 11 | pen |
| cosmeticToolType | Sementics   |                 |                      |                  |           |    |       |    |        |    |             |    |     |
| 00               | brush   |                 |                      |                  |           |    |       |    |        |    |             |    |     |
| 01               | sponge  |                 |                      |                  |           |    |       |    |        |    |             |    |     |
| 10               | powder puff   |                 |                      |                  |           |    |       |    |        |    |             |    |     |
| 11               | pen   |                 |                      |                  |           |    |       |    |        |    |             |    |     |

| Name            | Definition   |
|-----------------|--|
| UsageFlag       | This field, which is only present in the binary representation, signals the presence of Usage value attribute. A value of “1” means the attribute shall be used and “0” means the attribute shall not be used.       |
| toolTypeFlag    | This field, which is only present in the binary representation, signals the presence of name toolType attribute. A value of “1” means the attribute shall be used and “0” means the attribute shall not be used.     |
| nameFlag        | This field, which is only present in the binary representation, signals the presence of name value attribute. A value of “1” means the attribute shall be used and “0” means the attribute shall not be used.        |
| brandFlag       | This field, which is only present in the binary representation, signals the presence of brand value attribute. A value of “1” means the attribute shall be used and “0” means the attribute shall not be used.       |
| modelNumberFlag | This field, which is only present in the binary representation, signals the presence of modelNumber value attribute. A value of “1” means the attribute shall be used and “0” means the attribute shall not be used. |
| sizeNumberFlag  | This field, which is only present in the binary representation, signals the presence of sizeNumber value attribute. A value of “1” means the attribute shall be used and “0” means the attribute shall not be used.  |

5.27 MakeupRegionType

5.27.1 XML representation syntax

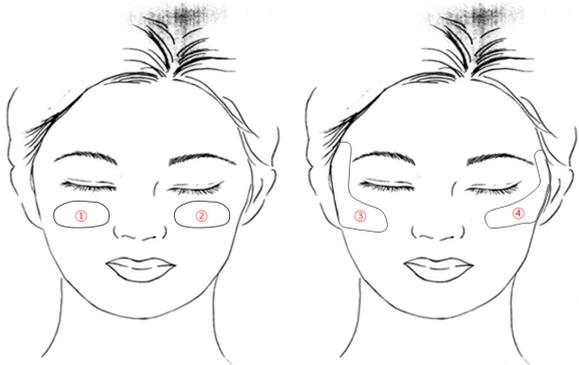
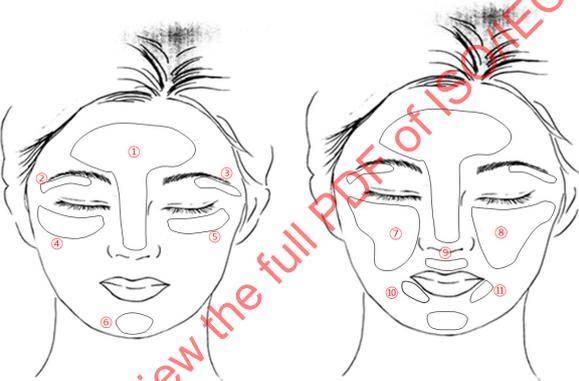
|         |  |
|---------|--|
| Diagram | <pre> classDiagram     class MakeupRegionType {         region         regionPart     }     </pre>   |
| Source  | <pre> &lt;complexType name="MakeupRegionType"&gt;   &lt;attribute name="region" type="vwoc:makeupRegionType" use="optional"/&gt;   &lt;attribute name="regionNumber" type="vwoc:unsigned4Vector" use="optional"/&gt; &lt;/complexType&gt;  &lt;simpleType name="makeupRegionType"&gt;   &lt;restriction base="string"&gt;     &lt;enumeration value="All"/&gt;     &lt;enumeration value="Lips"/&gt;     &lt;enumeration value="Eyebrow"/&gt;     &lt;enumeration value="Periocular"/&gt;     &lt;enumeration value="Cheek"/&gt;     &lt;enumeration value="Highlight"/&gt;     &lt;enumeration value="Shadow"/&gt;     &lt;enumeration value="Shading"/&gt;   &lt;/restriction&gt; &lt;/simpleType&gt;  &lt;simpleType name="unsigned4Vector"&gt;   &lt;list itemType="mpeg7:unsigned4"/&gt; &lt;/simpleType&gt;     </pre> |

## 5.27.2 Binary representation

| MakeupRegionType {                 | Number of bits | Mnemonic  |
|------------------------------------|----------------|-----------|
| regionFlag                         | 1              | bslbf     |
| regionNumberFlag                   | 1              | bslbf     |
| if(regionFlag) {                   |                |           |
| Region                             | 4              | bslbf     |
| }                                  |                |           |
| if(regionNumberFlag) {             |                |           |
| numOfRegionNumber                  |                | vluimsbf5 |
| for(k=0;k<numOfRegionNumber;k++) { |                |           |
| regionNumber[k]                    | 4              | uimsbf    |
| }                                  |                |           |
| }                                  |                |           |
| }                                  |                |           |

## 5.27.3 Semantics

| Name             | Definition   |     |        |      |                                    |         |   |            |   |
|------------------|--|-----|--------|------|------------------------------------|---------|---|------------|---|
| MakeupRegionType | Tool for describing the region information of a makeup.  |     |        |      |                                    |         |   |            |   |
| Region           | Describes the region of a makeup.  |     |        |      |                                    |         |   |            |   |
| regionNumber     | Specifies the detailed location of a makeup in a region. The detailed location is represented by a number as explained in the following table. Multiple region parts can be assigned simultaneously. <table border="1"> <tbody> <tr> <td>All</td> <td>0: all</td> </tr> <tr> <td>Lips</td> <td>0: all, 1: upper lip, 2: lower lip</td> </tr> <tr> <td>Eyebrow</td> <td>0: all, 1: right eyebrow, 2: left eyebrow</td> </tr> <tr> <td>Periocular</td> <td>0: all, 1: right periocular, 2: left periocular</td> </tr> </tbody> </table> | All | 0: all | Lips | 0: all, 1: upper lip, 2: lower lip | Eyebrow | 0: all, 1: right eyebrow, 2: left eyebrow | Periocular | 0: all, 1: right periocular, 2: left periocular |
| All              | 0: all   |     |        |      |                                    |         |   |            |   |
| Lips             | 0: all, 1: upper lip, 2: lower lip   |     |        |      |                                    |         |   |            |   |
| Eyebrow          | 0: all, 1: right eyebrow, 2: left eyebrow  |     |        |      |                                    |         |   |            |   |
| Periocular       | 0: all, 1: right periocular, 2: left periocular  |     |        |      |                                    |         |   |            |   |

|  |                  |   |  |
|--|------------------|---|--|
|  | <p>Cheek</p>     | <p>0: all,</p>    |  |
|  | <p>Highlight</p> | <p>0: all,</p>   |  |
|  | <p>Shadow</p>    | <p>0: all,</p>  |  |

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|                   | Shading   | <p>0: all,</p>  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
|-------------------|---|--|--|------------------|-----------|------|-----|------|------|------|---------|------|------------|------|-------|------|-----------|------|--------|------|---------|-------------|----------|
| makeupRegionType  | <p>Tool for describing the makeup regions. The makeup region is one of all, lips, eyebrow, periocular, cheek, highlight, shadow, and shading.</p> <p>In the binary description, the following mapping table is used.</p> <table border="1"> <thead> <tr> <th>makeupRegionType</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0000</td> <td>all</td> </tr> <tr> <td>0001</td> <td>lips</td> </tr> <tr> <td>0010</td> <td>eyebrow</td> </tr> <tr> <td>0011</td> <td>periocular</td> </tr> <tr> <td>0100</td> <td>cheek</td> </tr> <tr> <td>0101</td> <td>highlight</td> </tr> <tr> <td>0110</td> <td>shadow</td> </tr> <tr> <td>0111</td> <td>shading</td> </tr> <tr> <td>1000 - 1111</td> <td>reserved</td> </tr> </tbody> </table> |  |  | makeupRegionType | Semantics | 0000 | all | 0001 | lips | 0010 | eyebrow | 0011 | periocular | 0100 | cheek | 0101 | highlight | 0110 | shadow | 0111 | shading | 1000 - 1111 | reserved |
| makeupRegionType  | Semantics   |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| 0000              | all   |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| 0001              | lips  |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| 0010              | eyebrow   |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| 0011              | periocular  |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| 0100              | cheek   |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| 0101              | highlight   |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| 0110              | shadow  |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| 0111              | shading   |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| 1000 - 1111       | reserved  |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| regionFlag        | <p>This field, which is only present in the binary representation, signals the presence of region value attribute. A value of “1” means the attribute shall be used and “0” means the attribute shall not be used.</p>  |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| regionNumberFlag  | <p>This field, which is only present in the binary representation, signals the presence of regionNumber value attribute. A value of “1” means the attribute shall be used and “0” means the attribute shall not be used.</p>  |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |
| numOfRegionNumber | <p>This field, which is only present in the binary representation, specifies the number of regionNumber attribute values.</p>   |  |  |                  |           |      |     |      |      |      |         |      |            |      |       |      |           |      |        |      |         |             |          |

**5.27.4 Examples**

This example shows the description of makeup virtual object with the following semantics. The list of avatar contains one makeup avatar. The makeup avatar has the gender “female”, the id “MakeupAvatar001”, and information of cosmetics and makeup. The cosmetics has the name “Prorance Finish Water Gloe-skinfinish”, the brand “Prorance”, the color number “M11 Shine Pink”, the model number “P24036587”, and information of the cosmetic colors and their characteristics. The cosmetic colors have the spectra URI “http://www.etri.re.kr/makeupAvatar/cosmeticSpectrum/sample003.spt” and the cosmetic spectrum transformation model. The cosmetic spectrum transformation model is a polynomial equation of “2.1x<sup>2</sup>+1.5xy<sup>2</sup>+3.7”. The cosmetic characteristics have a “Solid” form, a pearl, glossy, and a transmittancy value of “0.1”. The makeup method has two of the number of make touch and includes information of the makeup tools and the makeup regions. The makeup tool has a name

“Bobbi Brown Blush Brush” and a brand “Bobbi Brown”, a tool type “Brush”, the size number “M2”, the model number “B02351269”, and the usage of “urn:mpeg:mpeg-v:01-VWOC-CosmeticCategoryCS-NS:Blusher”. The makeup region is “Cheek” and the region numbers in the “Cheek” are one and two.

```

<vwoc:VWOCInfo>
  <vwoc:AvatarList>
    <vwoc:Avatar xsi:type="vwoc:MakeupAvatarType" gender="female"
id="MakeupAvatar001">
      <vwoc:Cosmetic name="Prorance Finish Water Gloe-skinfinish" brand="Prorance"
colorNumber="M11 Shine Pink" modelNumber="P24036587">
        <vwoc:Color>
          <vwoc:SpectraURI>
            http://www.etri.re.kr/makeupAvatar/cosmeticSpectrum/sample003.spt
          </vwoc:SpectraURI>
          <!-- polynomial => 2.1x^2 + 1.5xy^2 + 3.7 -->
          <vwoc:CosmeticSpectrumTransformationModel>
            <vwoc:Monomial coefficient="2.1">
              <vwoc:Variable literal="x" exponent="2"/>
            </vwoc:Monomial>
            <vwoc:Monomial coefficient="1.5">
              <vwoc:Variable literal="x" exponent="1"/>
              <vwoc:Variable literal="y" exponent="2"/>
            </vwoc:Monomial>
            <vwoc:Monomial coefficient="3.7"/>
          </vwoc:CosmeticSpectrumTransformationModel>
        </vwoc:Color>
        <vwoc:Characteristic form="Solid" pearl="true" glossProperty="Glossy"
transmittancy="0.1"/>
        <vwoc:Category>urn:mpeg:mpeg-v:01-VWOC-CosmeticCategoryCS-
NS:Blusher</vwoc:Category>
      </vwoc:Cosmetic>
      <vwoc:MakeupInfo nbrOfTouch="2">
        <vwoc:Tool name="Bobbi Brown Blush Brush" brand="Bobbi Brown"
toolType="Brush" sizeNumber="M2" modelNumber="B02351269">
          <vwoc:Usage>urn:mpeg:mpeg-v:01-VWOC-CosmeticCategoryCS-
NS:Blusher</vwoc:Usage>
        </vwoc:Tool>
        <vwoc:Region region="Cheek" regionNumber="1 2"/>
      </vwoc:MakeupInfo>
    </vwoc:Avatar>
  </vwoc:AvatarList>
</vwoc:VWOCInfo>

```

## 6 Virtual object metadata

### 6.1 General

Virtual object metadata as a (visual) representation of virtual objects inside the environment serves the following purposes:

- characterizes various kinds of objects within the VE;
- provides an interaction between virtual object and avatar;
- provides an interaction with the VE.

The "virtual object" element is composed of following type of data with the extension of the base type of a virtual object.

- **Appearance:** contains the high-level description of the appearance and may refer a media containing the exact geometry, texture and haptic properties.
- **Animation:** contains the description of a set of animation sequences that the object is able to perform and may refer to several medias containing the exact (geometric transformations and deformations) animation parameters.
- **HapticProperty:** contains the description of the haptic property of the virtual object.
- **Virtual object components:** contains the list of the virtual objects which are concatenated to the virtual object as components.

### 6.2 VirtualObjectType

#### 6.2.1 XML representation syntax

