

# INTERNATIONAL STANDARD

**Multimedia home network configuration – Basic reference model  
Part 2: Operational model**

IECNORM.COM : Click to view the full PDF of IEC 62608-2:2017



**THIS PUBLICATION IS COPYRIGHT PROTECTED**  
**Copyright © 2017 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

**About the IEC**

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

**About IEC publications**

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

**IEC Catalogue - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)**

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

**IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)**

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

**IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)**

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

**Electropedia - [www.electropedia.org](http://www.electropedia.org)**

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

**IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)**

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

**IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)**

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [csc@iec.ch](mailto:csc@iec.ch).

IECNORM.COM : Click to view the PDF of IEC 6008-2:2017

# INTERNATIONAL STANDARD

---

**Multimedia home network configuration – Basic reference model  
Part 2: Operational model**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

---

ICS 33.160.60; 35.110

ISBN 978-2-8322-4481-4

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references .....	6
3 Terms and definitions .....	6
4 Sequences .....	7
4.1 General.....	7
4.2 Sequence 1: new device connection .....	7
4.3 Sequence 2: IP network configuration when device connection is changed .....	8
4.4 Sequence 3: access from a mobile device to CE device on the home network .....	10
4.5 Sequence 4: access with other home network .....	11
4.6 Troubleshooting for IP network .....	12
4.6.1 General .....	12
4.6.2 CE device configuration trouble .....	13
4.6.3 Sequence 5: network-level connection trouble .....	13
4.6.4 Sequence 6: application-level connection trouble.....	14
5 Architecture of the configurator and the configured agent .....	15
6 Protocol.....	16
6.1 CE device to configurator.....	16
6.2 Configurator to home gateway .....	16
6.3 Configurator to configurator .....	16
Bibliography.....	17
Figure 1 – Sequence 1: new device connection.....	8
Figure 2 – Sequence 2: device connection change.....	9
Figure 3 – Sequence 3: access from a mobile device to CE device .....	11
Figure 4 – Sequence 4: access with other home network .....	12
Figure 5 – Sequence 5: network-level troubleshooting in the home network .....	14
Figure 6 – Sequence 6: application-level troubleshooting outside the home network.....	15

IECNORM.COM: Click to view the full PDF of IEC 62608-2:2017

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MULTIMEDIA HOME NETWORK CONFIGURATION –  
BASIC REFERENCE MODEL****Part 2: Operational model**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62608-2 has been prepared by technical area 8: Multimedia home systems and applications for end-user network, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this International Standard is based on the following documents:

CDV	Report on voting
100/2812/CDV	100/2902/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62608 series, published under the general title *Multimedia home network configuration*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IECNORM.COM : Click to view the full PDF of IEC 62608-2:2017

## INTRODUCTION

Network connectivity is necessary for using electronic devices at home as well as electronic power. Some applications running on the devices do not work without a home network and the Internet. When a device connects to the home network, it is required that an appropriate network service be already provided. Sometimes, applications need to change the configuration of the device, the gateway, and so on. Since it is too difficult to change the configuration of the device manually, an automatic configuration mechanism is needed for home networks.

This document specifies the basic reference model to configure the devices connected to the home network. The purpose of this document is to provide the configuration framework for network applications running on the devices.

Part 1 specifies the basic reference model. Part 2 specifies the protocol between each component. Part 3 specifies the metadata and data model exchanged on the protocol. Part 4 provides security guidelines for the reference model.

The reference model is structured by existing protocols and web technologies.

The network service designed as a distributed system works in a coordinated manner with each system. It is difficult to manage whole systems because each system operates independently with different managers. The configurator manages the home network to provide a stable network service for consumer electronics.

Various protocols for cable, data link, and IP networks are specified by each standards organization. This document adopts existing protocols to manage configurations for consumer electronics.

# MULTIMEDIA HOME NETWORK CONFIGURATION – BASIC REFERENCE MODEL

## Part 2: Operational model

### 1 Scope

This document specifies the operational model for home network configuration.

In the home network, various CE devices that have distinctive functions are connected on a shared network. However, there is no manager in the home network. Thus, a standardized network management procedure is required for suitable network operation.

This document specifies the management procedure as sequences. The sequences are typical procedures of management. This document also describes implementation requirements, and the protocols between each component.

### 2 Normative references

There are no normative references in this document.

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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 <http://www.iso.org/obp>

#### 3.1

##### **home network**

network that connects equipment to be configured in the model; the network is built mainly in a home

#### 3.2

##### **home gateway**

equipment that relays communication from target equipment to the outside of the home network

#### 3.3

##### **configurator**

entity that configures equipment

#### 3.4

##### **configured agent**

entity that sends configuration information to the configurator

### 3.5

#### cloud server

server that collaborates with the configurator to accomplish the required function located outside of the home

Note 1 to entry: Cloud servers include a service server, a quality check server, a service failure information server and a diagnosis server.

## 4 Sequences

### 4.1 General

This document defines basic sequences based on IEC 62608-1. Detailed use cases and sequences are addressed under TTC TR-1062.

The configurator serves to configure the IP network environment when device applications need to use the IP network. Clause 4 describes configurator use cases and sequences.

### 4.2 Sequence 1: new device connection

Sequence 1 shown in Figure 1 is the IP network configuration when new device is connected to the home network. This sequence is 1-1.A in TTC TR-1062:2016.

Actors:

- CE: consumer electronics device,
- HG: home gateway,
- configurator,
- service server (equipment and configuration management server).

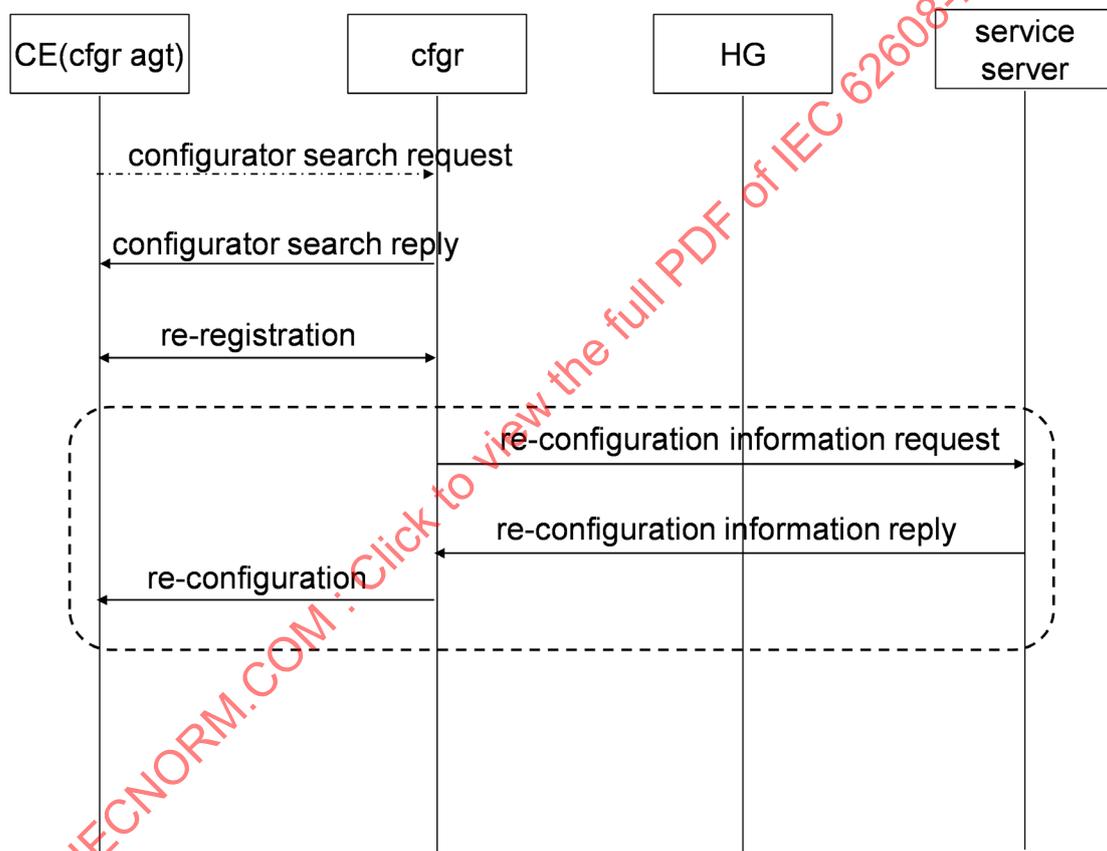
Sequences:

- 1) The configured agent on the device discovers the configurator.
- 2) The configurator replies its ID to the configured agent.
- 3) The configured agent registers its information to the configurator.
- 4) If needed, the configurator registers the configured agent information to the service server.
- 5) If needed, the configurator requests the configuration information to the service server.
- 6) If requested, the service server replies the configuration information to the configurator.
- 7) If needed, the configurator configures the device running on the configured agent.



## Sequences:

- 1) If needed, configuration information is registered with the service server.
- 2) Configured agent on the device requests re-registration on the configurator.
- 3) The configurator replies its ID to the configured agent.
- 4) The configured agent re-registers its information to the configurator.
- 5) If needed, the configurator re-registers the configured agent information to the service server.
- 6) If needed, the configurator requests the configuration information to the service server.
- 7) If requested, the service server replies the configuration information to the configurator.
- 8) If needed, the configurator re-configures the device running on the configured agent.

**Key**

Arrow	function from source to destination
Double-headed arrow	function with source and destination
An area enclosed in a dashed outline	optional sequence
Long-dashed short-dashed line	broadcast sequence
CE (cfgr agt)	consumer electronics device (configured agent)
cfgr	configurator
HG	home gateway

IEC

**Figure 2 – Sequence 2: device connection change**

#### 4.4 Sequence 3: access from a mobile device to CE device on the home network

Sequence 3 shown in Figure 3 is the establishment, through the configurator, of a connection between a mobile device outside the home network and a CE device on the home network. This sequence is 2-1.B in TTC TR-1062:2016.

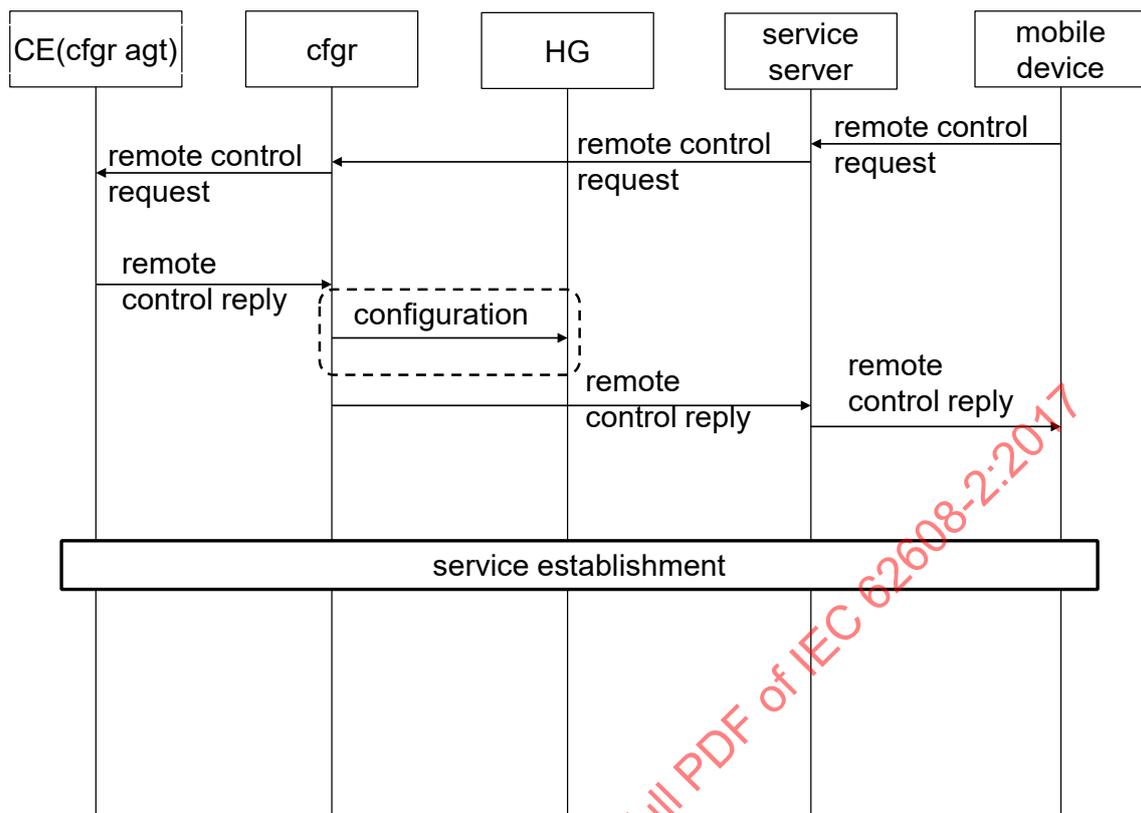
Actors:

- CE: consumer electronics device,
- HG: home gateway,
- configurator,
- service server: equipment and configuration management server,
- mobile device: mobile device and application to access the configurator.

Sequences:

- 1) The mobile device requests to the service server to establish a connection with the configurator.
- 2) The service server requests to control to configurator.
- 3) The configured agent replies to the configurator.
- 4) If needed, the configurator configures the home gateway.
- 5) The configurator replies to the service server.
- 6) The service server replies to the mobile device.
- 7) The connection is established between the mobile device and the CE device.

IECNORM.COM : Click to view the full PDF of IEC 62608-2:2017

**Key**

Arrow	function from source to destination
An area enclosed in a dashed outline	optional sequence
CE (cfgr agt)	consumer electronics device (configured agent)
cfgr	configurator
HG	home gateway

IEC

**Figure 3 – Sequence 3: access from a mobile device to CE device**

#### 4.5 Sequence 4: access with other home network

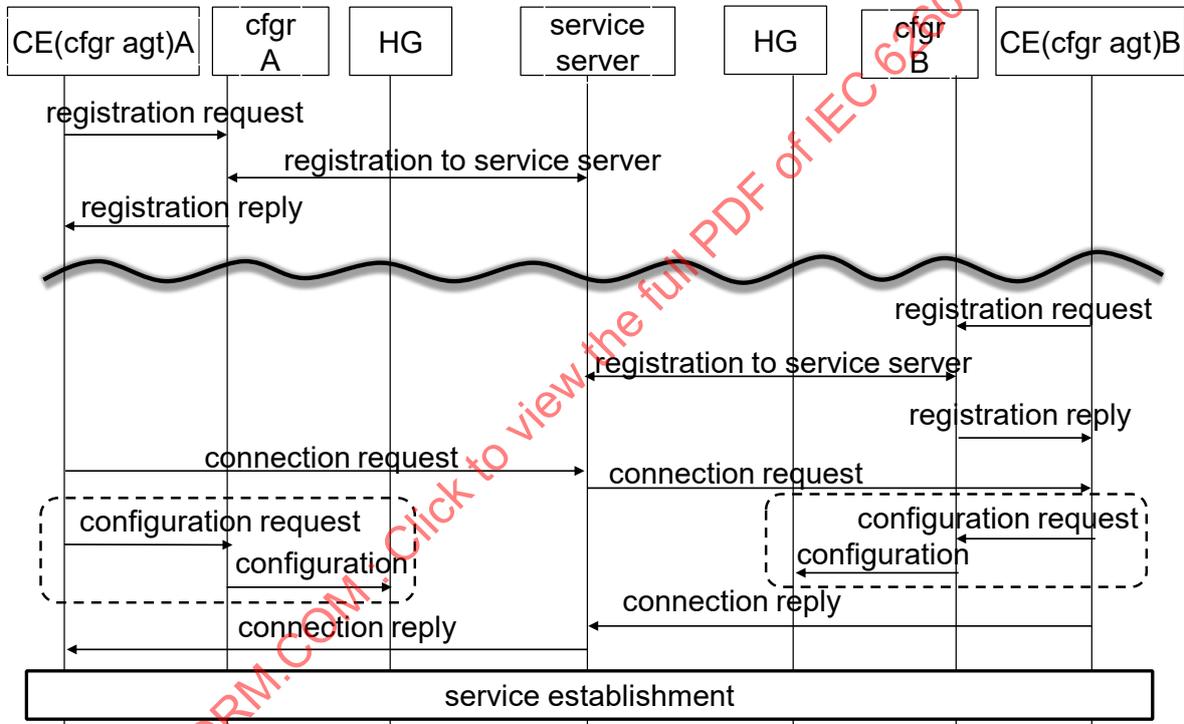
Sequence 4 shown in Figure 4 is the connection being established between a CE device A on a home network and a CE device B on the other home network through the configurator. This sequence is 2-2.B in TTC TR-1062:2016.

Actors:

- CE: consumer electronics device,
- HG: home gateway,
- configurator,
- service server: configuration and connection management server.

Sequences:

- 1) The configured agent on CE device A requests to configurator A the establishment of a connection with CE device B.
- 2) Configurator A negotiates with the service server.
- 3) Configured agent on CE device B requests to configurator B the establishment of a connection with CE device A.
- 4) Configurator B negotiates with the service server.
- 5) Configured agent A and configured agent B request the establishment of a connection to the service server.
- 6) If needed, configurator A configures CE device A, configurator B configures CE device B.
- 7) Configured agent A and configured agent B establish a connection.



**Key**

- Arrow: function from source to destination
- Double-headed arrow: function with source and destination
- An area enclosed in a dashed outline: optional sequence
- CE (cfgr agt): consumer electronics device (configured agent)
- cfgr: configurator
- HG: home gateway

IEC

**Figure 4 – Sequence 4: access with other home network**

**4.6 Troubleshooting for IP network**

**4.6.1 General**

The configurator provides support for fixing the IP network configuration when an application on the CE device does not work because of network trouble.

There are three types of trouble on the IP network.

#### 4.6.2 CE device configuration trouble

When the CE device is misconfigured, the CE device should show the problem to the user.

#### 4.6.3 Sequence 5: network-level connection trouble

Sequence 5 shown in Figure 5 is used to troubleshoot the network-level connection. When there is a network connection problem on the home network, the configurator checks that the CE device is physically connected properly and that the networking cables are not damaged by using an HTIP protocol and checks the IP connection outside of the home network. This sequence is 3-2.A in TTC TR-1062:2016.

Actors:

- CE: consumer electronics device,
- HG: home gateway,
- configurator,
- service server: equipment and configuration management server.

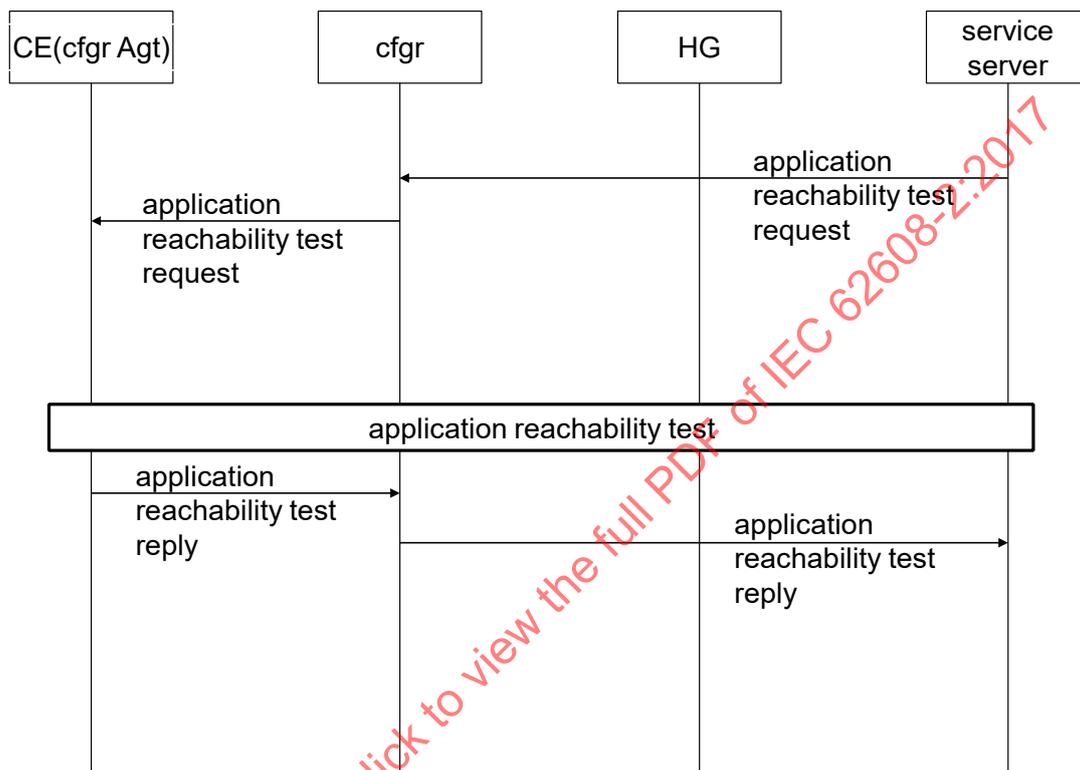
Sequences:

- 1) The service server requests to the configurator to check reachability.
- 2) The configurator requests the configured agent to check reachability.
- 3) The configurator checks reachability with the HTIP collector.
- 4) The configurator checks IP reachability in collaboration with the service server.
- 5) The configured agent checks IP reachability in collaboration with home gateway.
- 6) The configured agent checks IP reachability in collaboration with service server.
- 7) Configurator replies the result to the service server.



Sequences:

- 1) The service server requests the configurator to check reachability.
- 2) The configurator requests the configured agent to check reachability of the application.
- 3) The configurator checks application reachability in collaboration with the service server.
- 4) The configurator replies the result to the service server.



#### Key

Arrow	function from source to destination
CE (cfgr agt)	consumer electronics device (configured agent)
cfgr	configurator
HG	home gateway

IEC

**Figure 6 – Sequence 6: application-level troubleshooting outside the home network**

## 5 Architecture of the configurator and the configured agent

This specification requires the following precondition: the CE device and related devices are switched on, all cables are physically connected, and the link layer network is active. The configurator should operate as an HTIP collector because the configurator checks the link layer connection using HTIP.

NOTE HTIP is specified by Recommendation ITU-T G.9973.

The following functions should be installed in the configurator:

- an HTIP collector,
- a management database,