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AMENDMENT 1
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Information processing systems – Open Systems Interconnection – File Transfer, Access and Management –

Part 4 :
File Protocol Specification

AMENDMENT 1 : Filestore Management

Technologies de l'information – Interconnexion de systèmes ouverts (OSI) – Transfert, accès et gestion de fichiers –

Partie 4 : Spécification du protocole de fichiers

AMENDEMENT 1 : Gestion du système de fichiers

Reference number
ISO 8571-4:1988/Amd.1:1992 (E)

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. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Amendment 1 to International Standard ISO 8571-4:1988 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology.*

ISO 8571-4 consists of the following parts, under the general title *Information processing systems – Open Systems Interconnection – File Transfer, Access and Management*

- *Part 1 : General introduction*
- *Part 2 : Virtual Filestore Definition*
- *Part 3 : File Service Definition*
- *Part 4 : File Protocol Specification*
- *Part 5 : Protocol Implementation Conformance Statement Proforma*

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Information processing systems – Open Systems Interconnection – File Transfer, Access and Management –

Part 4 :
File Protocol Specification

AMENDMENT 1 : Filestore Management

NOTE – This amendment has additional subclauses and tables to ISO 8571 which are indicated by the use of lower case Roman letters beginning with "a" and imply ordering alphabetically, following the clause with the same numerical value in ISO 8571. These and all subsequent subclauses, tables, and cross references will be renumbered in subsequent editions.

0 Introduction

(amend 3rd paragraph, page 1)

ISO 8571 defines services for file transfer, access and management. It also specifies a protocol available within the application layer of the Reference Model. The service defined is of the category Application Service Element (ASE). It is concerned with identifiable bodies of information which can be treated as files, stored and managed within open systems, or passed between application processes.

(amend 4th paragraph, page 1)

ISO 8571 defines a basic file service. It provides sufficient facilities to support file transfer, file access, and management of files stored on open systems. ISO 8571 does not specify the interfaces to a file transfer, access or management facility within the local system.

(append after subclause 8.2, page 8)

NOTE – This amendment adds the following file initiating entity actions. The detailed actions are listed below and detailed in the state table (Annex A).

8.2a Group Selection (Group Manipulation)

The initiating entity actions for Group Selection are described in Annex a.

8.2b Change Current Name Prefix (Limited Filestore Management)

The initiating entity actions for Change Current Name Prefix are described in Annex a.

8.2c List File Directory (Limited Filestore Management)

The initiating entity actions for List File Directory are described in Annex a.

8.2d Group Deletion (Group Manipulation)

The initiating entity actions for Group Deletion are described in Annex a.

8.2e Group Move (Group Manipulation)

The initiating entity actions for Group Move are described in Annex a.

8.2f Group Copy (Group Manipulation)

The initiating entity actions for Group Copy are described in Annex a.

8.2g Group List (Group Manipulation)

The initiating entity actions for Group List are described in Annex a.

8.2h Group Change Attributes (Enhanced Filestore Management)

The initiating entity actions for Group Change Attributes are described in Annex a.

8.2i Select-Another Object (group Manipulation)

The initiating entity actions for Select-Another Object are described in Annex a.

8.2j Move Object (Object Manipulation)

The initiating entity actions for Move Object are described in Annex a.

8.2k Copy Object (Object Manipulation)

The initiating entity actions for Copy Object are described in Annex a.

8.2l File-Directory Creation (Enhanced Filestore Management)

The initiating entity actions for File-Directory Creation are described in Annex a.

8.2m Reference Creation (Enhanced Filestore Management)

The initiating entity actions for Reference Creation are described in Annex a.

8.2n Reference Deletion (Enhanced Filestore Management)

The initiating entity actions for Reference Deletion are described in Annex a.

8.2o Read Reference Attributes (Enhanced Filestore Management)

The initiating entity actions for Read Reference Attributes are described in Annex a.

8.2p Change Reference Attributes (Enhanced Filestore Management)

The initiating entity actions for Change Reference Attributes are described in Annex a.

(append after subclause 9.2, page 15)

NOTE – This amendment adds the following file responding entity actions. The detailed actions are listed below and detailed in the state table (Annex A).

9.2a Group Selection (Group Manipulation)

The responding entity actions for Group Selection are described in Annex a.

9.2b Change Current Name Prefix (Limited Filestore Management)

The responding entity actions for Change Current Name Prefix are described in Annex a.

9.2c List File Directory (Limited Filestore Management)

The responding entity actions for List File Directory are described in Annex a.

9.2d Group Deletion (Group Manipulation)

The responding entity actions for Group Deletion are described in Annex a.

9.2e Group Move (Group Manipulation)

The responding entity actions for Group Move are described in Annex a.

9.2f Group Copy (Group Manipulation)

The responding entity actions for Group Copy are described in Annex a.

9.2g Group List (Group Manipulation)

The responding entity actions for Group List are described in Annex a.

9.2h Group Change Attributes (Enhanced Filestore Management)

The responding entity actions for Group Change Attributes are described in Annex a.

9.2i Select-Another Object (Group Manipulation)

The responding entity actions for Select-Another Object are described in Annex a.

9.2j Move Object (Object Manipulation)

The responding entity actions for Move Object are described in Annex a.

9.2k Copy Object (Object Manipulation)

The responding entity actions for Copy Object are described in Annex a.

9.2l File-Directory Creation (Enhanced Filestore Management)

The responding entity actions for File-Directory Creation are described in Annex a.

9.2m Reference Creation (Enhanced Filestore Management)

The responding entity actions for Reference Creation are described in Annex a.

9.2n Reference Deletion (Enhanced Filestore Management)

The responding entity actions for Reference Deletion are described in Annex a.

9.2o Read Reference Attributes (Enhanced Filestore Management)

The responding entity actions for Read Reference Attributes are described in Annex a.

9.2p Change Reference Attributes (Enhanced Filestore Management)

The responding entity actions for Change Reference Attributes are described in Annex a.

Section five: Abstract Syntax

20.3 ASN.1 Module Definition

(amend Figure 7, page 33)

```
1
2
3   ISO8571-FTAM DEFINITIONS ::=
4   BEGIN
5       PDU ::= CHOICE { FTAM-Regime-PDU, File-PDU, Bulk-Data-PDU, FSM-PDU }
6
7       FTAM-Regime-PDU ::= CHOICE {
8             f-initialize-request              [0] IMPLICIT F-INITIALIZE-request,
9             f-initialize-response             [1] IMPLICIT F-INITIALIZE-response,
10            f-terminate-request               [2] IMPLICIT F-TERMINATE-request,
11            f-terminate-response              [3] IMPLICIT F-TERMINATE-response,
12            f-u-abort-request                 [4] IMPLICIT F-U-ABORT-request,
13            f-p-abort-request                 [5] IMPLICIT F-P-ABORT-request }
14
15      F-INITIALIZE-request ::= SEQUENCE {
16            protocol-version                  Protocol-Version  DEFAULT { version-1 },
17            implementation-information        Implementation-Information OPTIONAL,
18            presentation-context-management   [2] IMPLICIT BOOLEAN DEFAULT FALSE,
19            service-class                     Service-Class DEFAULT { transfer-class },
20            -- Only the valid combinations as specified in ISO 8571-3 are allowed.
21            functional-units                  Functional-Units,
22            attribute-groups                  Attribute-Groups DEFAULT {},
23            shared-ASE-information            Shared-ASE-Information OPTIONAL,
24            ftam-quality-of-service           FTAM-Quality-of-Service,
25            contents-type-list                Contents-Type-List OPTIONAL,
26            initiator-identity                User-Identity OPTIONAL,
27            account                           Account OPTIONAL,
28            filestore-password                Password OPTIONAL,
29            checkpoint-window                 [8] IMPLICIT INTEGER DEFAULT 1 }
30            -- If the recovery or restart data transfer functional units are
31            -- not available, the checkpoint-window parameter shall not be sent.
32
33      F-INITIALIZE-response ::= SEQUENCE {
34            state-result                      State-Result DEFAULT success,
35            action-result                     Action-Result DEFAULT success,
36            protocol-version                  Protocol-Version  DEFAULT { version-1 },
37            implementation-information        Implementation-Information OPTIONAL,
38            presentation-context-management   [2] IMPLICIT BOOLEAN DEFAULT FALSE,
39            service-class                     Service-Class DEFAULT { transfer-class },
40            -- Only the valid combinations as specified in ISO 8571-3 are allowed.
41            functional-units                  Functional-Units,
42            attribute-groups                  Attribute-Groups DEFAULT {},
43            shared-ASE-information            Shared-ASE-Information OPTIONAL,
44            ftam-quality-of-service           FTAM-Quality-of-Service,
45            contents-type-list                Contents-Type-List OPTIONAL,
```

```
46          diagnostic                          Diagnostic OPTIONAL,
47          checkpoint-window                   [8] IMPLICIT INTEGER DEFAULT 1 }
48          -- If the recovery or restart data transfer functional units are
49          -- not available, the checkpoint-window parameter shall not be sent.
50
51      Protocol-Version ::= [0] IMPLICIT BIT STRING
52                                  { version-1     (0),
53                                  version-2     (1) }
54
55      Implementation-Information ::= [1] IMPLICIT GraphicString
56      -- This parameter is provided solely for the convenience of implementors
57      -- needing to distinguish between implementations of a specific version number
58      -- of different equipment, it shall not be the subject of conformance test.
59
60      Service-Class ::= [3] IMPLICIT BIT STRING
61                                  { unconstrained-class     (0),
62                                  management-class     (1),
63                                  transfer-class     (2),
64                                  transfer-and-management-class     (3),
65                                  access-class     (4) }
66
67      Functional-Units ::= [4] IMPLICIT BIT STRING
68                                  { read     ( 2),
69                                  write     ( 3),
70                                  file-access     ( 4),
71                                  limited-file-management     ( 5),
72                                  enhanced-file-management     ( 6),
73                                  grouping     ( 7),
74                                  fadu-locking     ( 8),
75                                  recovery     ( 9),
76                                  restart-data-transfer     (10),
77                                  limited-filestore-management     (11),
78                                  enhanced-filestore-management     (12),
79                                  object-manipulation     (13),
80                                  group-manipulation     (14) }
81      -- Values 2 to 14 are chosen to align with numbering scheme used in ISO 8571-3.
82
83      Attribute-Groups ::= [5] IMPLICIT BIT STRING
84                                  { storage     (0),
85                                  security     (1),
86                                  private     (2),
87                                  extension     (3) }
88      -- The extension bit is defined if and only if the limited-filestore-management
89      -- or the group-manipulation functional units are available.
90
91      FTAM-Quality-of-Service ::= [6] IMPLICIT INTEGER
92                                  { no-recovery     (0),
93                                  class-1-recovery     (1),
94                                  class-2-recovery     (2),
95                                  class-3-recovery     (3) }
96
97      Contents-Type-List ::= [7] IMPLICIT SEQUENCE OF CHOICE
98          { document-type-name            Document-Type-Name,
99          abstract-syntax-name            Abstract-Syntax-Name }
```

```
100
101 F-TERMINATE-request ::= SEQUENCE {
102     shared-ASE-information              Shared-ASE-Information OPTIONAL }
103
104 F-TERMINATE-response ::= SEQUENCE {
105     shared-ASE-information              Shared-ASE-Information OPTIONAL,
106     charging                            Charging OPTIONAL }
107
108 F-U-ABORT-request ::= SEQUENCE {
109     action-result                       Action-Result DEFAULT success,
110     diagnostic                          Diagnostic OPTIONAL }
111
112 F-P-ABORT-request ::= SEQUENCE {
113     action-result                       Action-Result DEFAULT success,
114     diagnostic                          Diagnostic OPTIONAL }
115
116 File-PDU ::= CHOICE {
117     f-select-request                    [ 6] IMPLICIT F-SELECT-request,
118     f-select-response                   [ 7] IMPLICIT F-SELECT-response,
119     f-deselect-request                  [ 8] IMPLICIT F-DESELECT-request,
120     f-deselect-response                 [ 9] IMPLICIT F-DESELECT-response,
121     f-create-request                    [10] IMPLICIT F-CREATE-request,
122     f-create-response                   [11] IMPLICIT F-CREATE-response,
123     f-delete-request                    [12] IMPLICIT F-DELETE-request,
124     f-delete-response                   [13] IMPLICIT F-DELETE-response,
125     f-read-attrib-request               [14] IMPLICIT F-READ-ATTRIB-request,
126     f-read-attrib-response              [15] IMPLICIT F-READ-ATTRIB-response,
127     f-change-attrib-request             [16] IMPLICIT F-CHANGE-ATTRIB-request,
128     f-change-attrib-response            [17] IMPLICIT F-CHANGE-ATTRIB-response,
129     f-open-request                      [18] IMPLICIT F-OPEN-request,
130     f-open-response                     [19] IMPLICIT F-OPEN-response,
131     f-close-request                     [20] IMPLICIT F-CLOSE-request,
132     f-close-response                    [21] IMPLICIT F-CLOSE-response,
133     f-begin-group-request               [22] IMPLICIT F-BEGIN-GROUP-request,
134     f-begin-group-response              [23] IMPLICIT F-BEGIN-GROUP-response,
135     f-end-group-request                 [24] IMPLICIT F-END-GROUP-request,
136     f-end-group-response                [25] IMPLICIT F-END-GROUP-response,
137     f-recover-request                   [26] IMPLICIT F-RECOVER-request,
138     f-recover-response                  [27] IMPLICIT F-RECOVER-response,
139     f-locate-request                    [28] IMPLICIT F-LOCATE-request,
140     f-locate-response                   [29] IMPLICIT F-LOCATE-response,
141     f-erase-request                     [30] IMPLICIT F-ERASE-request,
142     f-erase-response                    [31] IMPLICIT F-ERASE-response  }
143
144 F-SELECT-request ::= SEQUENCE {
145     attributes                          Select-Attributes,
146     requested-access                    Access-Request,
147     access-passwords                    Access-Passwords OPTIONAL,
148     path-access-passwords               Path-Access-Passwords OPTIONAL,
149     -- This parameter can only be sent when the
150     -- limited-filestore-management or the object-manipulation or
151     -- the group-manipulation functional units are available.
152     concurrency-control                 Concurrency-Control OPTIONAL,
153     shared-ASE-information              Shared-ASE-Information OPTIONAL,
```

```
154       account                                Account OPTIONAL }
155
156  F-SELECT-response ::= SEQUENCE {
157       state-result                           State-Result DEFAULT success,
158       action-result                          Action-Result DEFAULT success,
159       attributes                             Select-Attributes,
160       referent-indicator                     Referent-Indicator OPTIONAL,
161       -- This parameter can only be sent when the
162       -- limited-filestore-management functional unit is available.
163       shared-ASE-information                 Shared-ASE-Information OPTIONAL,
164       diagnostic                             Diagnostic OPTIONAL }
165
166  F-DESELECT-request ::= SEQUENCE {
167       shared-ASE-information                 Shared-ASE-Information OPTIONAL }
168
169  F-DESELECT-response ::= SEQUENCE {
170       action-result                          Action-Result DEFAULT success,
171       charging                               Charging OPTIONAL,
172       -- Present if and only if the account field was present on
173       -- the PDU which established the selection regime.
174       shared-ASE-information                 Shared-ASE-Information OPTIONAL,
175       diagnostic                             Diagnostic OPTIONAL }
176
177  F-CREATE-request ::= SEQUENCE {
178       override          [0] IMPLICIT Override DEFAULT create-failure,
179       initial-attributes                     Create-Attributes,
180       create-password                        Password OPTIONAL,
181       requested-access                       Access-Request,
182       access-passwords                       Access-Passwords OPTIONAL,
183       path-access-passwords   Path-Access-Passwords OPTIONAL,
184       -- This parameter can only be sent when the
185       -- limited-filestore-management or the object-manipulation or
186       -- the group-manipulation functional units are available.
187        concurrency-control                   Concurrency-Control OPTIONAL,
188       shared-ASE-information                 Shared-ASE-Information OPTIONAL,
189       account                                Account OPTIONAL }
190
191  F-CREATE-response ::= SEQUENCE {
192       state-result                           State-Result DEFAULT success,
193       action-result                          Action-Result DEFAULT success,
194       initial-attributes                     Create-Attributes,
195       shared-ASE-information                 Shared-ASE-Information OPTIONAL,
196       diagnostic                             Diagnostic OPTIONAL }
197
198  F-DELETE-request ::= SEQUENCE {
199       shared-ASE-information                 Shared-ASE-Information OPTIONAL }
200
201  F-DELETE-response ::= SEQUENCE {
202       action-result                          Action-Result DEFAULT success,
203       shared-ASE-information                 Shared-ASE-Information OPTIONAL,
204       charging                               Charging OPTIONAL,
205       diagnostic                             Diagnostic OPTIONAL }
206
207  F-READ-ATTRIB-request ::= SEQUENCE {
```

```
208      attribute-names                    [0] IMPLICIT Attribute-Names,
209      attribute-extension-names          [1] IMPLICIT Attribute-Extension-Names
210                                                        OPTIONAL }
211      -- This parameter can only be sent when the
212      -- limited-filestore-management functional unit is available.
213
214  F-READ-ATTRIB-response ::= SEQUENCE {
215      action-result                      Action-Result DEFAULT success,
216      attributes                         Read-Attributes OPTIONAL,
217      -- Password values within the access control can not be read by means
218      -- of the read attribute action.  Whether other parts of the access
219      -- control object attribute can be read by means of the read
220      -- attribute action is decided locally by the responding entity, and
221      -- it shall not be the subject of conformance test.
222      diagnostic                         Diagnostic OPTIONAL }
223
224  F-CHANGE-ATTRIB-request ::= SEQUENCE {
225      attributes                         Change-Attributes }
226
227  F-CHANGE-ATTRIB-response ::= SEQUENCE {
228      action-result                      Action-Result DEFAULT success,
229      attributes                         Change-Attributes OPTIONAL,
230      -- Password values within access control attribute are never returned.
231      -- Other attributes are returned as an implementation choice.
232      diagnostic                         Diagnostic OPTIONAL }
233
234  F-OPEN-request ::= SEQUENCE {
235      processing-mode                    [0] IMPLICIT BIT STRING
236                                     { f-read    (0),
237                                     f-insert    (1),
238                                     f-replace   (2),
239                                     f-extend    (3),
240                                     f-erase     (4) } DEFAULT { f-read },
241  contents-type                      [1] CHOICE {
242                                     unknown         [0] IMPLICIT NULL,
243                                     proposed        [1] Contents-Type-Attribute },
244      concurrency-control            Concurrency-Control OPTIONAL,
245      shared-ASE-information         Shared-ASE-Information OPTIONAL,
246      enable-fadu-locking            [2] IMPLICIT BOOLEAN DEFAULT FALSE,
247      -- If the fadu-locking functional unit is not available, the
248      -- enable-fadu-locking parameter shall not be sent.
249      activity-identifier            Activity-Identifier OPTIONAL,
250      -- Only used in the recovery functional unit.
251      recovery-mode                  [3] IMPLICIT INTEGER
252                                     { none    (0),
253                                     at-start-of-file    (1),
254                                     at-any-active-checkpoint    (2) }
255                                                DEFAULT none,
256      -- If the recovery or restart data transfer functional units are not
257      -- available, the recovery-mode parameter shall not be sent.
258      remove-contexts                [4] IMPLICIT SET OF Abstract-Syntax-Name OPTIONAL,
259      define-contexts                [5] IMPLICIT SET OF Abstract-Syntax-Name OPTIONAL}
260
261  F-OPEN-response ::= SEQUENCE {
```

```
262     state-result                        State-Result DEFAULT success,
263     action-result                       Action-Result DEFAULT success,
264     contents-type                       [1] Contents-Type-Attribute,
265     concurrency-control                 Concurrency-Control OPTIONAL,
266     shared-ASE-information               Shared-ASE-Information OPTIONAL,
267     diagnostic                          Diagnostic OPTIONAL,
268     recovery-mode                       [3] IMPLICIT INTEGER
269                                 { none    (0),
270                                 at-start-of-file    (1),
271                                 at-any-active-checkpoint    (2) }
272                                                 DEFAULT none,
273     -- If the recovery or restart data transfer functional units are not
274     -- available, the recovery-mode parameter shall not be sent.
275     presentation-action                 [6] IMPLICIT BOOLEAN DEFAULT FALSE }
276     -- This flag is set if the responder is going to follow this response
277     -- by a P-ALTER-CONTEXT exchange.
278
279 F-CLOSE-request ::= SEQUENCE {
280     action-result                       Action-Result DEFAULT success,
281     shared-ASE-information              Shared-ASE-Information OPTIONAL,
282     diagnostic                          Diagnostic OPTIONAL }
283
284 F-CLOSE-response ::= SEQUENCE {
285     action-result                       Action-Result DEFAULT success,
286     shared-ASE-information              Shared-ASE-Information OPTIONAL,
287     diagnostic                          Diagnostic OPTIONAL }
288
289 F-BEGIN-GROUP-request ::= SEQUENCE {
290     threshold                           [0] IMPLICIT INTEGER }
291
292 F-BEGIN-GROUP-response ::= SEQUENCE { }
293     -- No elements defined, shall be empty.
294
295 F-END-GROUP-request ::= SEQUENCE { }
296     -- No elements defined, shall be empty.
297
298 F-END-GROUP-response ::= SEQUENCE { }
299     -- No elements defined, shall be empty.
300
301 F-RECOVER-request ::= SEQUENCE {
302     activity-identifier                 Activity-Identifier,
303     bulk-transfer-number                [0] IMPLICIT INTEGER,
304     requested-access                    Access-Request,
305     access-passwords                    Access-Passwords OPTIONAL,
306     path-access-passwords               Path-Access-Passwords OPTIONAL,
307     -- This parameter can only be sent when the
308     -- limited-filestore-management or the object-manipulation or
309     -- the group-manipulation functional units are available.
310     recovery-point                      [2] IMPLICIT INTEGER DEFAULT 0,
311     -- Zero indicates beginning of file
312     -- Point after last checkpoint indicates end of file
313     -- The recovery-point parameter shall only be sent by the entity that
314     -- was receiving data at the time of failure.
315     remove-contexts                     [3] IMPLICIT SET OF Abstract-Syntax-Name OPTIONAL,
```

```
316     define-contexts                 [4] IMPLICIT SET OF Abstract-Syntax-Name OPTIONAL }
317
318 F-RECOVER-response ::= SEQUENCE {
319     state-result                    State-Result DEFAULT success,
320     action-result                   Action-Result DEFAULT success,
321     contents-type                   [1] Contents-Type-Attribute,
322     recovery-point                  [2] IMPLICIT INTEGER DEFAULT 0,
323     -- Zero indicates beginning of file.
324     -- Point after last checkpoint indicates end of file.
325     -- The recovery-point parameter shall only be sent by the entity that
326     -- was receiving data at the time of failure.
327     diagnostic                      Diagnostic OPTIONAL,
328     presentation-action             [6] IMPLICIT BOOLEAN DEFAULT FALSE }
329     -- This flag is set if the responder is going to follow this response
330     -- by a P-ALTER-CONTEXT exchange.
331
332 F-LOCATE-request ::= SEQUENCE {
333     file-access-data-unit-identity      FADU-Identity,
334     fadu-lock                           FADU-Lock OPTIONAL }
335
336 F-LOCATE-response ::= SEQUENCE {
337     action-result                       Action-Result DEFAULT success,
338     file-access-data-unit-identity      FADU-Identity OPTIONAL,
339     diagnostic                          Diagnostic OPTIONAL }
340
341 F-ERASE-request ::= SEQUENCE {
342     file-access-data-unit-identity      FADU-Identity }
343
344 F-ERASE-response ::= SEQUENCE {
345     action-result                   Action-Result DEFAULT success,
346     diagnostic                      Diagnostic OPTIONAL }
347
348 Bulk-Data-PDU ::= CHOICE {
349     f-read-request                  [32] IMPLICIT F-READ-request,
350     f-write-request                 [33] IMPLICIT F-WRITE-request,
351     -- There is no F-DATA FPDU, the contents of a file
352     -- are transferred in a different presentation context
353     -- and there is therefore no need to define the types
354     -- of file contents in the FTAM PCI abstract syntax.
355     -- File contents data are carried in values of the
356     -- data type Data-Element as defined in ISO 8571-2.
357     f-data-end-request              [34] IMPLICIT F-DATA-END-request,
358     f-transfer-end-request          [35] IMPLICIT F-TRANSFER-END-request,
359     f-transfer-end-response         [36] IMPLICIT F-TRANSFER-END-response,
360     f-cancel-request                [37] IMPLICIT F-CANCEL-request,
361     f-cancel-response               [38] IMPLICIT F-CANCEL-response,
362     -- There is no F-CHECK PDU.
363     f-restart-request               [39] IMPLICIT F-RESTART-request,
364     f-restart-response              [40] IMPLICIT F-RESTART-response }
365
366 F-READ-request ::= SEQUENCE {
367     file-access-data-unit-identity      FADU-Identity,
368     access-context                      Access-Context,
369     fadu-lock                           FADU-Lock OPTIONAL }
```

```
370
371 F-WRITE-request ::= SEQUENCE {
372     file-access-data-unit-operation                 [0] IMPLICIT INTEGER
373                                     { insert    (0),
374                                       replace   (1),
375                                       extend    (2) },
376     file-access-data-unit-identity                  FADU-Identity,
377     fadu-lock                                       FADU-Lock OPTIONAL }
378
379 F-DATA-END-request ::= SEQUENCE {
380     action-result                   Action-Result DEFAULT success,
381     diagnostic                      Diagnostic OPTIONAL }
382
383 F-TRANSFER-END-request ::= SEQUENCE {
384     shared-ASE-information          Shared-ASE-Information OPTIONAL }
385
386 F-TRANSFER-END-response ::= SEQUENCE {
387     action-result                   Action-Result DEFAULT success,
388     shared-ASE-information          Shared-ASE-Information OPTIONAL,
389     diagnostic                      Diagnostic OPTIONAL }
390
391 F-CANCEL-request ::= SEQUENCE {
392     action-result                   Action-Result DEFAULT success,
393     shared-ASE-information          Shared-ASE-Information OPTIONAL,
394     diagnostic                      Diagnostic OPTIONAL }
395
396 F-CANCEL-response ::= SEQUENCE {
397     action-result                   Action-Result DEFAULT success,
398     shared-ASE-information          Shared-ASE-Information OPTIONAL,
399     diagnostic                      Diagnostic OPTIONAL }
400
401 F-RESTART-request ::= SEQUENCE {
402     checkpoint-identifier           [0] IMPLICIT INTEGER }
403
404 F-RESTART-response ::= SEQUENCE {
405     checkpoint-identifier           [0] IMPLICIT INTEGER }
406
407 Abstract-Syntax-Name ::= [APPLICATION 0] IMPLICIT OBJECT IDENTIFIER
408
409 Access-Context ::= [APPLICATION 1] IMPLICIT SEQUENCE {
410     access-context                  [0] IMPLICIT INTEGER
411         { hierarchical-all-data-units   (0),                    -- HA
412           hierarchical-no-data-units    (1),                    -- HN
413           flat-all-data-units   (2),          -- FA
414           flat-one-level-data-units     (3),                    -- FL
415           flat-single-data-unit     (4),      -- FS
416           unstructured-all-data-units   (5),                    -- UA
417           unstructured-single-data-unit     (6) },              -- US
418     level-number        [1] IMPLICIT INTEGER OPTIONAL }
419     -- Present if and  only if flat-one-level-data-units
420     -- (access context FL) is selected.
421     -- As defined in ISO 8571-2.
422
423 Access-Passwords ::= [APPLICATION 2] IMPLICIT SEQUENCE {
```

```
424      read-password                    [0] IMPLICIT Password,
425      insert-password                  [1] IMPLICIT Password,
426      replace-password                 [2] IMPLICIT Password,
427      extend-password                  [3] IMPLICIT Password,
428      erase-password                   [4] IMPLICIT Password,
429      read-attribute-password          [5] IMPLICIT Password,
430      change-attribute-password        [6] IMPLICIT Password,
431      delete-password                  [7] IMPLICIT Password,
432      pass-passwords                   [8] IMPLICIT Pass-Passwords OPTIONAL,
433      link-password                    [9] IMPLICIT Password OPTIONAL }
434      -- The pass-passwords and the link-password must be included in the
435      -- access-passwords if and only if the limited-filestore-management
436      -- or the object-manipulation or the group-manipulation functional
437      -- units are available.
438
439  Access-Request ::= [APPLICATION 3] IMPLICIT BIT STRING
440                                     { read     (0),
441                                     insert     (1),
442                                     replace    (2),
443                                     extend     (3),
444                                     erase      (4),
445                                     read-attribute     (5),
446                                     change-attribute   (6),
447                                     delete-object      (7) }
448
449  Account ::= [APPLICATION 4] IMPLICIT GraphicString
450
451  Action-Result ::= [APPLICATION 5] IMPLICIT INTEGER
452                                     { success     (0),
453                                     transient-error    (1),
454                                     permanent-error    (2) }
455
456  Activity-Identifier ::= [APPLICATION 6] IMPLICIT INTEGER
457
458  Application-Entity-Title ::= [APPLICATION 7] ACSE-1.AE-title
459  -- As defined in ISO 8650.
460
461  Change-Attributes ::= [APPLICATION 8] IMPLICIT SEQUENCE {
462  -- Kernel Group
463      pathname                         Pathname-Attribute OPTIONAL,
464  -- Storage group
465      storage-account                  [ 3] Account-Attribute OPTIONAL,
466      object-availability              [12] Object-Availability-Attribute OPTIONAL,
467      future-object-size               [14] Object-Size-Attribute OPTIONAL,
468  -- Security group
469      access-control                   [15] Access-Control-Change-Attribute OPTIONAL,
470      path-access-control              [21] Access-Control-Change-Attribute OPTIONAL,
471      -- This parameter can only be sent when the
472      -- enhanced-filestore-management functional unit is available.
473      legal-qualification              [16] Legal-Qualification-Attribute OPTIONAL,
474  -- Private group
475      private-use                      [17] Private-Use-Attribute OPTIONAL,
476  -- Attribute Extensions group
477      attribute-extensions             [22] IMPLICIT Attribute-Extensions OPTIONAL }
```

```
478       -- This parameter can only be sent when the
479       -- enhanced-filestore-management functional unit is available.
480  -- Atleast one attribute shall be present in the Change-Attributes
481  -- parameter on the request PDU.
482
483  Charging ::= [APPLICATION 9] IMPLICIT SEQUENCE OF SEQUENCE {
484       resource-identifier                [0] IMPLICIT GraphicString,
485       charging-unit                      [1] IMPLICIT GraphicString,
486       charging-value                     [2] IMPLICIT INTEGER }
487
488  Concurrency-Control ::= [APPLICATION 10] IMPLICIT SEQUENCE
489       { read                        [0] IMPLICIT Lock,
490       insert                        [1] IMPLICIT Lock,
491       replace                       [2] IMPLICIT Lock,
492       extend                        [3] IMPLICIT Lock,
493       erase                         [4] IMPLICIT Lock,
494       read-attribute                [5] IMPLICIT Lock,
495       change-attribute              [6] IMPLICIT Lock,
496       delete-object                 [7] IMPLICIT Lock }
497
498  Lock ::= INTEGER
499            { not-required    (0),
500            shared    (1),
501            exclusive    (2),
502            no-access    (3) }
503
504  Constraint-Set-Name ::= [APPLICATION 11] IMPLICIT OBJECT IDENTIFIER
505
506  Create-Attributes ::= [APPLICATION 12] IMPLICIT SEQUENCE {
507  -- Kernel Group
508       pathname                           Pathname-Attribute,
509       object-type                        [18] IMPLICIT Object-Type-Attribute DEFAULT file,
510       -- This parameter can be sent if and only if the
511       -- limited-filestore-management functional unit is available.
512       permitted-actions                  [ 1] IMPLICIT Permitted-Actions-Attribute,
513       contents-type                      [ 2] Contents-Type-Attribute,
514  -- Storage group
515       storage-account                    [ 3] Account-Attribute OPTIONAL,
516       object-availability                [12] Object-Availability-Attribute OPTIONAL,
517       future-object-size                 [14] Object-Size-Attribute OPTIONAL,
518  -- Security group
519       access-control                     [15] Access-Control-Attribute OPTIONAL,
520       path-access-control                [21] Access-Control-Attribute OPTIONAL,
521       -- This parameter can be sent if and only if the
522       -- enhanced-filestore-management functional unit is available.
523       legal-qualification                [16] Legal-Qualification-Attribute OPTIONAL,
524  -- Private group
525       private-use                        [17] Private-Use-Attribute OPTIONAL,
526  -- Attribute Extensions group
527       attribute-extensions               [22] IMPLICIT Attribute-Extensions OPTIONAL }
528       -- This parameter can only be sent when the
529       -- limited-filestore-management functional unit is available.
530
531  Diagnostic ::= [APPLICATION 13] IMPLICIT SEQUENCE OF SEQUENCE {
```

```
532     diagnostic-type                 [0] IMPLICIT INTEGER
533                                             { informative    (0),
534                                             transient    (1),
535                                             permanent    (2) },
536     error-identifier                [1] IMPLICIT INTEGER,
537     -- As defined in ISO 8571-3.
538     error-observer                  [2] IMPLICIT Entity-Reference,
539     error-source                    [3] IMPLICIT Entity-Reference,
540     suggested-delay                 [4] IMPLICIT INTEGER OPTIONAL,
541     further-details                 [5] IMPLICIT GraphicString OPTIONAL }
542
543 Entity-Reference ::= INTEGER
544                                     { no-categorization-possible    (0),
545                                     initiating-file-service-user    (1),
546                                     initiating-file-protocol-machine    (2),
547                                     service-supporting-the-file-protocol-machine    (3),
548                                     responding-file-protocol-machine    (4),
549                                     responding-file-service-user    (5) }
550 -- NOTE
551 -- 1. The values 0 and 3 are only valid as values in error-source.
552 -- 2. The value 5 corresponds to the virtual filestore.
553
554 Document-Type-Name ::= [APPLICATION 14] IMPLICIT OBJECT IDENTIFIER
555
556 FADU-Identity ::= [APPLICATION 15] CHOICE {
557     first-last                  [0] IMPLICIT INTEGER { first (0), last (1) },
558     relative                    [1] IMPLICIT INTEGER { previous (0), current (1), next (2) },
559     begin-end                   [2] IMPLICIT INTEGER { begin (0), end (1) },
560     single-name                 [3] IMPLICIT Node-Name,
561     name-list                   [4] IMPLICIT SEQUENCE OF Node-Name,
562     fadu-number                 [5] IMPLICIT INTEGER }
563     -- As defined in ISO 8571-2.
564
565 Node-Name ::= EXTERNAL
566 -- The type to be used for Node-Name is defined in ISO8571-FADU.
567
568 FADU-Lock ::= [APPLICATION 16] IMPLICIT INTEGER
569             { off (0), on (1) }
570
571 Password  ::= [APPLICATION 17] CHOICE { GraphicString, OCTET STRING }
572
573 Read-Attributes ::= [APPLICATION 18] IMPLICIT SEQUENCE {
574 -- Kernel Group
575     pathname                        Pathname-Attribute OPTIONAL,
576     object-type                     [18] IMPLICIT Object-Type-Attribute OPTIONAL,
577     -- This parameter can be sent if and only if
578     -- the limited-filestore-management functional unit is available.
579     permitted-actions               [ 1] IMPLICIT Permitted-Actions-Attribute
580                                                     OPTIONAL,
581     contents-type                   [ 2] Contents-Type-Attribute OPTIONAL,
582     linked-object                   [19] Pathname-Attribute OPTIONAL,
583     -- This parameter can be sent if and only if
584     -- the limited-filestore-management functional unit is available.
585     child-objects                   [23] Child-Objects-Attribute OPTIONAL,
```

```
586       -- This parameter can be sent if and only if
587       -- the limited-filestore-management functional unit is available.
588   -- Storage group
589       primary-pathname                    [20] Pathname-Attribute OPTIONAL,
590       storage-account                     [ 3] Account-Attribute OPTIONAL,
591       date-and-time-of-creation           [ 4] Date-and-Time-Attribute OPTIONAL,
592       date-and-time-of-last-modification
593                                           [ 5] Date-and-Time-Attribute OPTIONAL,
594       date-and-time-of-last-read-access
595                                           [ 6] Date-and-Time-Attribute OPTIONAL,
596       date-and-time-of-last-attribute-modification
597                                           [ 7] Date-and-Time-Attribute OPTIONAL,
598       identity-of-creator                 [ 8] User-Identity-Attribute OPTIONAL,
599       identity-of-last-modifier           [ 9] User-Identity-Attribute OPTIONAL,
600       identity-of-last-reader             [10] User-Identity-Attribute OPTIONAL,
601       identity-last-attribute-modifier
602                                           [11] User-Identity-Attribute OPTIONAL,
603       object-availability                 [12] Object-Availability-Attribute OPTIONAL,
604       object-size                         [13] Object-Size-Attribute OPTIONAL,
605       future-object-size                  [14] Object-Size-Attribute OPTIONAL,
606   -- Security group
607       access-control                      [15] Access-Control-Attribute OPTIONAL,
608       path-access-control                 [21] Access-Control-Attribute OPTIONAL,
609       -- This parameter can be sent if and only if
610       -- the limited-filestore-management functional unit is available.
611       legal-qualification                 [16] Legal-Qualification-Attribute OPTIONAL,
612   -- Private group
613       private-use                         [17] Private-Use-Attribute OPTIONAL,
614   --  Attribute Extensions group
615       attribute-extensions                [22] IMPLICIT Attribute-Extensions OPTIONAL }
616       -- This parameter can be sent if and only if
617       -- the limited-filestore-management functional unit is available.
618
619   Select-Attributes ::= [APPLICATION 19] IMPLICIT SEQUENCE {
620   -- Kernel Group
621       pathname                            Pathname-Attribute }
622
623   Shared-ASE-Information ::= [APPLICATION 20] IMPLICIT EXTERNAL
624   -- This field may be used to convey commitment control as described
625   -- in ISO 8571-3.
626
627   State-Result ::= [APPLICATION 21] IMPLICIT INTEGER
628                       { success (0),
629                       failure (1) }
630
631   User-Identity ::= [APPLICATION 22] IMPLICIT GraphicString
632
633   Access-Control-Attribute ::= CHOICE {
634       no-value-available                  [0] IMPLICIT NULL,
635       -- Indicates partial support of this attribute.
636       -- This value shall only appear in response PDUs.
637       actual-values                       [1] IMPLICIT SET OF Access-Control-Element }
638       --  The semantics of this attribute is described in ISO 8571-2.
639
```

```
Access-Control-Change-Attribute ::= CHOICE {
    no-value-available                  [0] IMPLICIT NULL,
    -- Indicates partial support of this attribute.
    -- This value shall only appear in response PDUs.
    actual-values                       [1] IMPLICIT SEQUENCE {
        insert-values                   [0] IMPLICIT SET OF Access-Control-Element OPTIONAL,
        -- This field is used by the change attribute actions to indicate
        -- new values to be inserted in the access control object attribute.
        delete-values                   [1] IMPLICIT SET OF Access-Control-Element OPTIONAL}}
        -- This field is used by the change attribute action to indicate
        -- old values to be removed from the access control object
        -- attribute.
    -- The semantics of this attribute is described in ISO 8571-2.

Access-Control-Element ::= SEQUENCE {
        action-list     [0] IMPLICIT Access-Request,
        concurrency-access                  [1] IMPLICIT Concurrency-Access OPTIONAL,
        identity        [2] IMPLICIT User-Identity OPTIONAL,
        passwords                           [3] IMPLICIT Access-Passwords OPTIONAL,
        location        [4] IMPLICIT Application-Entity-Title OPTIONAL }

Concurrency-Access ::= SEQUENCE {
        read            [0] IMPLICIT Concurrency-Key,
        insert          [1] IMPLICIT Concurrency-Key,
        replace         [2] IMPLICIT Concurrency-Key,
        extend          [3] IMPLICIT Concurrency-Key,
        erase           [4] IMPLICIT Concurrency-Key,
        read-attribute                      [5] IMPLICIT Concurrency-Key,
        change-attribute                    [6] IMPLICIT Concurrency-Key,
        delete-object                       [7] IMPLICIT Concurrency-Key }

Concurrency-Key ::= BIT STRING
                    { not-required  (0),
                    shared      (1),
                    exclusive   (2),
                    no-access   (3) }

Account-Attribute ::= CHOICE {
    no-value-available                  [0] IMPLICIT NULL,
    -- Indicates partial support of this attribute.
    -- This value shall only appear in response PDUs.
    actual-values                       Account }

Contents-Type-Attribute ::= CHOICE {
    document-type                               [0] IMPLICIT SEQUENCE {
        document-type-name                      Document-Type-Name,
        parameter                               [0] ANY OPTIONAL },
    -- The actual types to be used for values of the parameter field
    -- are defined in the named document type.
    constraint-set-and-abstract-syntax          [1] IMPLICIT SEQUENCE {
        constraint-set-name                     Constraint-Set-Name,
        abstract-syntax-name                    Abstract-Syntax-Name } }

Date-and-Time-Attribute ::= CHOICE {
```

```
694       no-value-available                    [0] IMPLICIT NULL,
695       -- Indicates partial support of this attribute.
696       -- This value shall only appear in response PDUs.
697       actual-values                         [1] IMPLICIT GeneralizedTime }
698
699  Object-Availability-Attribute ::= CHOICE {
700       no-value-available                    [0] IMPLICIT NULL,
701       -- Indicates partial support of this attribute.
702       -- This value shall only appear in response PDUs.
703       actual-values                         [1] IMPLICIT INTEGER
704                        { immediate-availability    (0),
705                          deferred-availability     (1) } }
706
707  Pathname-Attribute ::= CHOICE {
708       incomplete-pathname                   [0] IMPLICIT Pathname,
709       complete-pathname                     [APPLICATION 23] IMPLICIT Pathname }
710
711  Object-Size-Attribute ::= CHOICE {
712       no-value-available                    [0] IMPLICIT NULL,
713       -- Indicates partial support of this attribute.
714       -- This value shall only appear in response PDUs.
715       actual-values                         [1] IMPLICIT INTEGER }
716
717  Legal-Qualification-Attribute ::= CHOICE {
718       no-value-available                    [0] IMPLICIT NULL,
719       -- Indicates partial support of this attribute.
720       -- This value shall only appear in response PDUs.
721       actual-values                         [1] IMPLICIT GraphicString }
722
723  Permitted-Actions-Attribute ::=  BIT STRING
724              -- Actions available
725              { read     ( 0),
726                         insert     ( 1),
727                         replace    ( 2),
728                         extend     ( 3),
729                         erase      ( 4),
730                         read-attribute     ( 5),
731                         change-attribute   ( 6),
732                         delete-object      ( 7),
733                         pass       (11),
734                         link       (12),
735       -- FADU-Identity groups available
736                         traversal      ( 8),
737                         reverse-traversal      ( 9),
738                         random-order       (10) }
739
740  Private-Use-Attribute ::= CHOICE {
741       no-value-available                              [0] IMPLICIT NULL,
742       -- Indicates partial support of this attribute.
743       -- This value shall only appear in response PDUs.
744       abstract-syntax-not-supported                   [1] IMPLICIT NULL,
745       -- Indicates that abstract syntax is not available.
746       actual-values                                   [2] IMPLICIT EXTERNAL }
747
```

```
748 Object-Type-Attribute ::= INTEGER
749                           { file     (0),
750                           file-directory     (1),
751                           reference     (2) }
752
753 User-Identity-Attribute ::= CHOICE {
754     no-value-available                    [0] IMPLICIT NULL,
755     -- Indicates partial support of this attribute.
756     -- This value shall only appear in response PDUs.
757     actual-values                         User-Identity }
758
759 Child-Objects-Attribute ::= SET OF GraphicString
760
761 FSM-PDU ::= CHOICE {
762     f-change-prefix-request               [41] IMPLICIT F-CHANGE-PREFIX-request,
763     f-change-prefix-response              [42] IMPLICIT F-CHANGE-PREFIX-response,
764     f-list-request                        [43] IMPLICIT F-LIST-request,
765     f-list-response                       [44] IMPLICIT F-LIST-response,
766     f-group-select-request                [45] IMPLICIT F-GROUP-SELECT-request,
767     f-group-select-response               [46] IMPLICIT F-GROUP-SELECT-response,
768     f-group-delete-request                [47] IMPLICIT F-GROUP-DELETE-request,
769     f-group-delete-response               [48] IMPLICIT F-GROUP-DELETE-response,
770     f-group-move-request                  [49] IMPLICIT F-GROUP-MOVE-request,
771     f-group-move-response                 [50] IMPLICIT F-GROUP-MOVE-response,
772     f-group-copy-request                  [51] IMPLICIT F-GROUP-COPY-request,
773     f-group-copy-response                 [52] IMPLICIT F-GROUP-COPY-response,
774     f-group-list-request                  [53] IMPLICIT F-GROUP-LIST-request,
775     f-group-list-response                 [54] IMPLICIT F-GROUP-LIST-response,
776     f-group-change-attrib-request         [55] IMPLICIT F-GROUP-CHANGE-ATTRIB-request,
777     f-group-change-attrib-response        [56] IMPLICIT F-GROUP-CHANGE-ATTRIB-response,
778     f-select-another-request              [57] IMPLICIT F-SELECT-ANOTHER-request,
779     f-select-another-response             [58] IMPLICIT F-SELECT-ANOTHER-response,
780     f-create-directory-request            [59] IMPLICIT F-CREATE-DIRECTORY-request,
781     f-create-directory-response           [60] IMPLICIT F-CREATE-DIRECTORY-response,
782     f-link-request                        [61] IMPLICIT F-LINK-request,
783     f-link-response                       [62] IMPLICIT F-LINK-response,
784     f-unlink-request                      [63] IMPLICIT F-UNLINK-request,
785     f-unlink-response                     [64] IMPLICIT F-UNLINK-response,
786     f-read-link-attrib-request            [65] IMPLICIT F-READ-LINK-ATTRIB-request,
787     f-read-link-attrib-response           [66] IMPLICIT F-READ-LINK-ATTRIB-response,
788     f-change-link-attrib-request          [67] IMPLICIT F-CHANGE-LINK-ATTRIB-request,
789     f-change-link-attrib-response         [68] IMPLICIT F-CHANGE-LINK-ATTRIB-response,
790     f-move-request                        [69] IMPLICIT F-MOVE-request,
791     f-move-response                       [70] IMPLICIT F-MOVE-response,
792     f-copy-request                        [71] IMPLICIT F-COPY-request,
793     f-copy-response                       [72] IMPLICIT F-COPY-response }
794
795 F-CHANGE-PREFIX-request ::= SEQUENCE {
796     reset                                 [0] IMPLICIT BOOLEAN DEFAULT FALSE,
797     destination-file-directory            Destination-File-Directory,
798     access-passwords                      Access-Passwords OPTIONAL,
799     path-access-passwords                 Path-Access-Passwords OPTIONAL }
800
801 F-CHANGE-PREFIX-response ::= SEQUENCE {
```

```
802     action-result                   Action-Result DEFAULT success,
803     destination-file-directory      Destination-File-Directory OPTIONAL,
804     diagnostic                      Diagnostic OPTIONAL }
805
806 F-LIST-request ::= SEQUENCE {
807     attribute-value-assertions      Attribute-Value-Assertions,
808     scope                           Scope,
809     access-passwords                Access-Passwords OPTIONAL,
810     path-access-passwords           Path-Access-Passwords OPTIONAL,
811     attribute-names                 [0] IMPLICIT Attribute-Names,
812     attribute-extension-names       [1] IMPLICIT Attribute-Extension-Names
813                                             OPTIONAL }
814
815 F-LIST-response ::= SEQUENCE {
816     action-result                   Action-Result DEFAULT success,
817     objects-attributes-list         Objects-Attributes-List OPTIONAL,
818     diagnostic                      Diagnostic OPTIONAL }
819
820 F-GROUP-SELECT-request ::= SEQUENCE {
821     attribute-value-assertions      Attribute-Value-Assertions,
822     requested-access                Access-Request,
823     access-passwords                Access-Passwords OPTIONAL,
824     path-access-passwords           Path-Access-Passwords OPTIONAL,
825     concurrency-control             Concurrency-Control OPTIONAL,
826     maximum-set-size                [0] IMPLICIT INTEGER DEFAULT 0,
827     -- 0 implies no limit.
828     scope                           Scope,
829     account                         Account OPTIONAL,
830     shared-ASE-information          Shared-ASE-Information OPTIONAL }
831
832 F-GROUP-SELECT-response ::= SEQUENCE {
833     action-result                   Action-Result DEFAULT success,
834     shared-ASE-information          Shared-ASE-Information OPTIONAL,
835     diagnostic                      Diagnostic OPTIONAL }
836
837 F-GROUP-DELETE-request ::= SEQUENCE {
838     request-operation-result        Request-Operation-Result OPTIONAL,
839     shared-ASE-information          Shared-ASE-Information OPTIONAL }
840
841 F-GROUP-DELETE-response ::= SEQUENCE {
842     action-result                   Action-Result DEFAULT success,
843     charging                        Charging OPTIONAL,
844     operation-result                 Operation-Result OPTIONAL,
845     shared-ASE-information          Shared-ASE-Information OPTIONAL,
846     diagnostic                      Diagnostic OPTIONAL }
847
848 F-GROUP-MOVE-request ::= SEQUENCE {
849     destination-file-directory      Destination-File-Directory,
850     override                        [0] IMPLICIT Override DEFAULT create-failure,
851     -- Only the values create-failure (0)
852     -- and delete-and-create-with-new-attributes (3) are allowed.
853     error-action                    [1] IMPLICIT Error-Action,
854     create-password                 Password OPTIONAL,
855     access-passwords                Access-Passwords OPTIONAL,
```

```
856       path-access-passwords                 Path-Access-Passwords OPTIONAL,
857       request-operation-result              Request-Operation-Result OPTIONAL,
858       attributes                            Change-Attributes OPTIONAL }
859
860  F-GROUP-MOVE-response ::= SEQUENCE {
861       action-result                         Action-Result DEFAULT success,
862       destination-file-directory            Destination-File-Directory OPTIONAL,
863       operation-result                      Operation-Result OPTIONAL,
864       diagnostic                            Diagnostic OPTIONAL }
865
866  F-GROUP-COPY-request ::= SEQUENCE {
867       destination-file-directory            Destination-File-Directory,
868       override                              [0] IMPLICIT Override DEFAULT create-failure,
869       -- Only the values create-failure (0)
870       -- and delete-and-create-with-new-attributes (3) are allowed.
871       error-action                          [1] IMPLICIT Error-Action,
872       create-password                       Password OPTIONAL,
873       access-passwords                      Access-Passwords OPTIONAL,
874       path-access-passwords                 Path-Access-Passwords OPTIONAL,
875       request-operation-result              Request-Operation-Result OPTIONAL,
876       attributes                            Change-Attributes OPTIONAL }
877
878  F-GROUP-COPY-response ::= SEQUENCE {
879       action-result                         Action-Result DEFAULT success,
880       destination-file-directory            Destination-File-Directory OPTIONAL,
881       operation-result                      Operation-Result OPTIONAL,
882       diagnostic                            Diagnostic OPTIONAL }
883
884  F-GROUP-LIST-request ::= SEQUENCE {
885       attribute-names                       [0] IMPLICIT Attribute-Names,
886       attribute-extension-names             [2] IMPLICIT Attribute-Extension-Names
887                                                 OPTIONAL }
888
889  F-GROUP-LIST-response ::= SEQUENCE {
890   action-result                            Action-Result DEFAULT success,
891       objects-attributes-list               Objects-Attributes-List OPTIONAL,
892       diagnostic                            Diagnostic OPTIONAL }
893
894  F-GROUP-CHANGE-ATTRIB-request ::= SEQUENCE {
895       attributes                            Change-Attributes,
896       error-action                          [1] IMPLICIT Error-Action,
897       request-operation-result              Request-Operation-Result OPTIONAL,
898       shared-ASE-information                Shared-ASE-Information OPTIONAL }
899
900  F-GROUP-CHANGE-ATTRIB-response ::= SEQUENCE {
901       action-result                         Action-Result DEFAULT success,
902       operation-result                      Operation-Result OPTIONAL,
903       shared-ASE-information                Shared-ASE-Information OPTIONAL,
904       diagnostic                            Diagnostic OPTIONAL }
905
906  F-SELECT-ANOTHER-request ::= SEQUENCE {
907       shared-ASE-information                Shared-ASE-Information OPTIONAL }
908
909  F-SELECT-ANOTHER-response ::= SEQUENCE {
```

```
910      state-result                    State-Result DEFAULT success,
911       action-result                  Action-Result DEFAULT success,
912      last-member-indicator           [0] IMPLICIT BOOLEAN DEFAULT FALSE,
913      referent-indicator              Referent-Indicator OPTIONAL,
914      shared-ASE-information          Shared-ASE-Information OPTIONAL,
915      diagnostic                      Diagnostic OPTIONAL }
916
917  F-CREATE-DIRECTORY-request ::= SEQUENCE {
918      initial-attributes              Create-Attributes,
919      create-password                 Password OPTIONAL,
920      requested-access                Access-Request,
921      shared-ASE-information          Shared-ASE-Information OPTIONAL,
922      account                         Account OPTIONAL }
923
924  F-CREATE-DIRECTORY-response ::= SEQUENCE {
925      state-result                    State-Result DEFAULT success,
926      action-result                   Action-Result DEFAULT success,
927      initial-attributes              Create-Attributes,
928      shared-ASE-information          Shared-ASE-Information OPTIONAL,
929      diagnostic                      Diagnostic OPTIONAL }
930
931  F-LINK-request ::= SEQUENCE {
932      initial-attributes              Create-Attributes,
933      target-object                   Pathname-Attribute,
934      create-password                 Password OPTIONAL,
935      requested-access                Access-Request,
936      access-passwords                Access-Passwords OPTIONAL,
937      path-access-passwords           Path-Access-Passwords OPTIONAL,
938      concurrency-control             Concurrency-Control OPTIONAL,
939      shared-ASE-information          Shared-ASE-Information OPTIONAL,
940      account                         Account OPTIONAL }
941
942  F-LINK-response ::= SEQUENCE {
943      state-result                    State-Result DEFAULT success,
944      action-result                   Action-Result DEFAULT success,
945      initial-attributes              Create-Attributes,
946      target-object                   Pathname-Attribute,
947      shared-ASE-information          Shared-ASE-Information OPTIONAL,
948      diagnostic                      Diagnostic OPTIONAL }
949
950  F-UNLINK-request ::= SEQUENCE {
951      shared-ASE-information          Shared-ASE-Information OPTIONAL }
952
953  F-UNLINK-response ::= SEQUENCE {
954      action-result                   Action-Result DEFAULT success,
955      shared-ASE-information          Shared-ASE-Information OPTIONAL,
956      charging                        Charging OPTIONAL,
957      diagnostic                      Diagnostic OPTIONAL }
958
959  F-READ-LINK-ATTRIB-request ::= SEQUENCE {
960      attribute-names                 [0] IMPLICIT Attribute-Names,
961       attribute-extension-names      [1] IMPLICIT Attribute-Extension-Names
962                                          OPTIONAL }
963
```

```
964 F-READ-LINK-ATTRIB-response ::= SEQUENCE {
965     action-result                   Action-Result DEFAULT success,
966     attributes                      Read-Attributes OPTIONAL,
967     diagnostic                      Diagnostic OPTIONAL }
968
969 F-CHANGE-LINK-ATTRIB-request ::= SEQUENCE {
970     attributes                      Change-Attributes }
971
972 F-CHANGE-LINK-ATTRIB-response ::= SEQUENCE {
973     action-result                   Action-Result DEFAULT success,
974     attributes                      Change-Attributes OPTIONAL,
975     diagnostic                      Diagnostic OPTIONAL }
976
977 F-MOVE-request ::= SEQUENCE {
978     destination-file-directory      Destination-File-Directory,
979     override                        [0] IMPLICIT Override DEFAULT create-failure,
980     -- Only the values create-failure (0)
981     -- and delete-and-create-with-new-attributes (3) are allowed.
982     create-password                 Password OPTIONAL,
983     access-passwords                Access-Passwords OPTIONAL,
984     path-access-passwords           Path-Access-Passwords OPTIONAL,
985     attributes                      Change-Attributes OPTIONAL }
986
987 F-MOVE-response ::= SEQUENCE {
988     action-result                   Action-Result DEFAULT success,
989     destination-file-directory      Destination-File-Directory OPTIONAL,
990     attributes                      Change-Attributes OPTIONAL,
991     diagnostic                      Diagnostic OPTIONAL }
992
993 F-COPY-request ::= SEQUENCE {
994     destination-file-directory      Destination-File-Directory,
995     override                        [0] IMPLICIT Override DEFAULT create-failure,
996     -- Only the values create-failure (0)
997     -- and delete-and-create-with-new-attributes (3) are allowed.
998     create-password                 Password OPTIONAL,
999     access-passwords                Access-Passwords OPTIONAL,
1000    path-access-passwords           Path-Access-Passwords OPTIONAL,
1001    attributes                      Change-Attributes OPTIONAL }
1002
1003 F-COPY-response  ::= SEQUENCE {
1004    action-result                   Action-Result DEFAULT success,
1005    destination-file-directory      Destination-File-Directory OPTIONAL,
1006    attributes                      Change-Attributes OPTIONAL,
1007    diagnostic                      Diagnostic OPTIONAL }
1008
1009 Attribute-Extension-Names ::= SEQUENCE OF Attribute-Extension-Set-Name
1010
1011 Attribute-Extension-Set-Name ::= SEQUENCE {
1012    extension-set-identifier        [0] IMPLICIT Extension-Set-Identifier,
1013    extension-attribute-names       [1] SEQUENCE OF Extension-Attribute-Identifier }
1014
1015 Attribute-Extensions ::= SEQUENCE OF Attribute-Extension-Set
1016
1017 Attribute-Extension-Set ::= SEQUENCE {
```

```
1018      extension-set-identifier                [0] IMPLICIT Extension-Set-Identifier,
1019      extension-set-attributes                [1] SEQUENCE OF Extension-Attribute }
1020
1021  Extension-Attribute ::= SEQUENCE {
1022      extension-attribute-identifier                Extension-Attribute-Identifier,
1023      extension-attribute                           ANY DEFINED BY extension-attribute-identifier }
1024
1025 Extension-Set-Identifier ::= OBJECT IDENTIFIER
1026
1027 Extension-Attribute-Identifier ::= OBJECT IDENTIFIER
1028
1029 Attribute-Value-Assertions ::= [APPLICATION 26] IMPLICIT OR-Set
1030
1031  Scope ::= [APPLICATION 28] IMPLICIT SEQUENCE OF SEQUENCE {
1032      root-directory                          [0] Pathname-Attribute OPTIONAL,
1033      retrieval-scope                         [1] IMPLICIT INTEGER {child (0), all (1)} }
1034
1035  OR-Set ::= SEQUENCE OF AND-Set
1036
1037  AND-Set ::= SEQUENCE OF CHOICE {
1038 -- Kernel group
1039      pathname-pattern                        [ 0] IMPLICIT Pathname-Pattern,
1040      object-type-pattern                     [18] IMPLICIT Integer-Pattern,
1041      permitted-actions-pattern               [ 1] IMPLICIT Bitstring-Pattern,
1042      contents-type-pattern                   [ 2] Contents-Type-Pattern,
1043      linked-object-pattern                   [19] IMPLICIT Pathname-Pattern,
1044      child-objects-pattern                   [23] IMPLICIT Pathname-Pattern,
1045 -- Storage group
1046      primary-pathname-pattern                [20] IMPLICIT Pathname-Pattern,
1047      storage-account-pattern                 [ 3] IMPLICIT String-Pattern,
1048      date-and-time-of-creation-pattern
1049                                              [ 4] IMPLICIT Date-and-Time-Pattern,
1050      date-and-time-of-last-modification-pattern
1051                                              [ 5] IMPLICIT Date-and-Time-Pattern,
1052      date-and-time-of-last-read-access-pattern
1053                                              [ 6] IMPLICIT Date-and-Time-Pattern,
1054      date-and-time-of-last-attribute-modification-pattern
1055                                              [ 7] IMPLICIT Date-and-Time-Pattern,
1056      identity-of-creator-pattern             [ 8] IMPLICIT User-Identity-Pattern,
1057      identity-of-last-modifier-pattern
1058                                              [ 9] IMPLICIT User-Identity-Pattern,
1059      identity-of-last-reader-pattern         [10] IMPLICIT User-Identity-Pattern,
1060      identity-of-last-attribute-modifier-pattern
1061                                              [11] IMPLICIT User-Identity-Pattern,
1062      object-availability-pattern             [12] IMPLICIT Boolean-Pattern,
1063      object-size-pattern                     [13] IMPLICIT Integer-Pattern,
1064      future-object-size-pattern              [14] IMPLICIT Integer-Pattern,
1065 -- Security group
1066      -- Access control searches are disallowed.
1067      legal-qualification-pattern             [16] IMPLICIT String-Pattern,
1068 -- Private group
1069      -- Private use searches are disallowed.
1070 -- Attribute Extensions group
1071      attribute-extensions-pattern            [22] IMPLICIT Attribute-Extensions-Pattern }
```

```
1072
1073 User-Identity-Pattern ::= String-Pattern
1074
1075  Equality-Comparision ::= BIT STRING
1076       { no-value-available-matches          (0),
1077       -- Set imples "No Value Available" matches the test.
1078       -- Clear implies "No Value Available" fails the test.
1079       equals-matches                        (1)
1080       -- Set implies equal items match the test.
1081       -- Clear implies equal items fail the test.
1082       }
1083
1084 Relational-Comparision ::= BIT STRING
1085       { no-value-available-matches          (0),
1086       -- Set imples "No Value Available" matches the test.
1087       -- Clear implies "No Value Available" fails the test.
1088       equals-matches                        (1),
1089       -- Set implies equal items match the test.
1090       -- Clear implies equal items fail the test.
1091       less-than-matches                     (2),
1092       -- Set implies a value less than the test case matches.
1093       -- Clear implies a value less than the test case fails.
1094       greater-than-matches                  (3)
1095       -- Set implies a value greater than the test case matches.
1096       -- Clear implies a value greater than the test case fails.
1097       }
1098       -- Bits 1 through 3 shall not all have the same value.
1099
1100 Pathname-Pattern ::= SEQUENCE {
1101       equality-comparision                  [0] IMPLICIT Equality-Comparision,
1102       pathname-value                        [1] IMPLICIT SEQUENCE OF CHOICE {
1103       string-match                          [2] IMPLICIT String-Pattern,
1104       any-match                             [3] IMPLICIT NULL } }
1105
1106  String-Pattern ::= SEQUENCE {
1107       equality-comparision                  [0] IMPLICIT Equality-Comparision,
1108       string-value                          [1] IMPLICIT SEQUENCE OF CHOICE {
1109       substring-match                       [2] IMPLICIT GraphicString,
1110       any-match                             [3] IMPLICIT NULL,
1111       number-of-characters-match            [4] IMPLICIT INTEGER } }
1112
1113 Bitstring-Pattern ::= SEQUENCE {
1114       equality-comparision                  [0] IMPLICIT Equality-Comparision,
1115       match-bitstring                       [1] IMPLICIT BIT STRING,
1116       significance-bitstring                [2] IMPLICIT BIT STRING }
1117
1118 Date-and-Time-Pattern ::= SEQUENCE {
1119       relational-comparision                [0] IMPLICIT Relational-Comparision,
1120       time-and-date-value                   [1] IMPLICIT GeneralizedTime }
1121
1122 Integer-Pattern ::= SEQUENCE {
1123       relational-comparision                [0] IMPLICIT Relational-Comparision,
1124       integer-value                         [1] IMPLICIT INTEGER }
1125
```

```
1126 Object-Identifier-Pattern ::= SEQUENCE {
1127      equality-comparision                [0] IMPLICIT Equality-Comparision,
1128      object-identifier-value             [1] IMPLICIT OBJECT IDENTIFIER }
1129
1130 Boolean-Pattern ::= SEQUENCE {
1131      equality-comparision                [0] IMPLICIT Equality-Comparision,
1132      boolean-value                       [1] IMPLICIT BOOLEAN }
1133
1134 Other-Pattern ::= Equality-Comparision
1135 --  Matches against "No Value Available".
1136
1137 Contents-Type-Pattern ::= CHOICE {
1138      document-type-pattern               [0] IMPLICIT Object-Identifier-Pattern,
1139      constraint-set-abstract-syntax-pattern
1140                                          [1] IMPLICIT SEQUENCE {
1141      constraint-set-pattern              [2] IMPLICIT Object-Identifier-Pattern OPTIONAL,
1142      --  Absent implies any Object Identifier is equal.
1143      abstract-syntax-pattern             [3] IMPLICIT Object-Identifier-Pattern OPTIONAL
1144      --  Absent implies any Object Identifier is equal.
1145      } }
1146
1147  Attribute-Extensions-Pattern ::= SEQUENCE OF SEQUENCE {
1148      extension-set-identifier                    [0] IMPLICIT Extension-Set-Identifier,
1149      extension-set-attribute-patterns            [1] IMPLICIT SEQUENCE OF SEQUENCE {
1150      extension-attribute-identifier              Extension-Attribute-Identifier,
1151      extension-attribute-pattern                 ANY DEFINED BY extension-attribute-identifier }
1152      --  The extention-attribute-pattern must be defined in
1153      --  conjunction with the extention attribute in order to
1154      --  perform pattern matching operations on it.  It may be
1155      --  defined in terms of other patterns within this
1156      --  standard.
1157      }
1158
1159 Destination-File-Directory ::= [APPLICATION 24] Pathname-Attribute
1160
1161 Objects-Attributes-List ::= [APPLICATION 25] IMPLICIT SEQUENCE OF
1162                                             Read-Attributes
1163
1164  Override ::= INTEGER
1165           { create-failure     (0),
1166           select-old-object    (1),
1167           delete-and-create-with-old-attributes    (2),
1168           delete-and-create-with-new-attributes    (3) }
1169
1170 Error-Action ::= INTEGER
1171           { terminate          (0),
1172           continue             (1) }
1173
1174 Operation-Result ::= [APPLICATION 30] CHOICE {
1175           success-object-count                [0] IMPLICIT INTEGER,
1176           success-object-names                [1] IMPLICIT SEQUENCE OF Pathname }
1177
1178 Pathname ::= SEQUENCE OF GraphicString
1179
```

```
Pass-Passwords ::= SEQUENCE OF Password
-- There is a one-to-one correspondence between the elements of
-- Pass-Passwords and the non-terminal elements of the specified
- Pathname.

Path-Access-Passwords ::= [APPLICATION 27] IMPLICIT SEQUENCE OF SEQUENCE {
    read-password                   [0] IMPLICIT Password,
    insert-password                 [1] IMPLICIT Password,
    replace-password                [2] IMPLICIT Password,
    extend-password                 [3] IMPLICIT Password,
    erase-password                  [4] IMPLICIT Password,
    read-attribute-password         [5] IMPLICIT Password,
    change-attribute-password       [6] IMPLICIT Password,
    delete-password                 [7] IMPLICIT Password,
    pass-passwords                  [8] IMPLICIT Pass-Passwords,
    link-password                   [9] IMPLICIT Password }
    -- There is a one-to-one correspondence between the elements of
    -- Path-Access-Passwords and the non-terminal elements of the
    -- specified Pathname.

Request-Operation-Result ::= [APPLICATION 31] IMPLICIT INTEGER {
                summary     (0),
                fill-list   (1) }

Attribute-Names ::= BIT STRING
-- Kernel group
            { read-pathname     ( 0),
            read-object-type    (18),
            read-permitted-actions      ( 1),
            read-contents-type  ( 2),
            read-linked-object  (19),
            read-child-objects  (23),
-- Storage group
            read-primary-pathname   (20),
            read-storage-account    ( 3),
            read-date-and-time-of-creation      ( 4),
            read-date-and-time-of-last-modification     ( 5),
            read-date-and-time-of-last-read-access      ( 6),
            read-date-and-time-of-last-attribute-modification   ( 7),
            read-identity-of-creator    ( 8),
            read-identity-of-last-modifier      ( 9),
            read-identity-of-last-reader    (10),
            read-identity-of-last-attribute-modifier    (11),
            read-object-availability    (12),
            read-object-size    (13),
            read-future-object-size     (14),
-- Security group
            read-access-control     (15),
            read-path-access-control    (21),
            read-legal-qualifications   (16),
-- Private group
            read-private-use    (17) }
-- Bits 19 through 23 are defined if and only if the limited-filestore-management
-- or group-manipulation functional units are available.
```

```
1234
1235 Referent-Indicator ::= [APPLICATION 29] IMPLICIT BOOLEAN
1236
1237 END
1238
1239
```

Annex A
Protocol state tables

(This annex forms part of the standard.)

NOTE – This amendment supersedes the whole of annex A. Subclauses A.1.2 and A.1.7 in ISO 8571-4: 1988/Amd.4:1992, Annex A supersedes this amendment. All other parts of ISO 8571-4:1988/Amd.4:1992, Annex A are replaced by this annex.

A.1 Introduction

In the event of a discrepancy becoming apparent in the protocol described in the body of this standard and the protocol described in this Annex, this Annex is to take precedence.

These tables describe the operation of the basic file protocol machine (FPM) and error recovery protocol machine (FERPM).

The basic protocol tables are divided into three groups, covering:

a) the FTAM regime management protocol machine;

b) the file regime management protocol machine;

c) the bulk data transfer protocol machine.

The initial and final states of the file regime management protocol machine are also states of FTAM regime management protocol machine. The initial and final states of the bulk data transfer protocol machine are also states of the file regime management protocol machine.

To provide formally complete and consistent description of the FTAM protocol sequences of events are considered indivisible in the model. That indivisibility ensures both that the states used in the description are well defined and that they are sufficient to describe the protocol.

The reception of a service primitive and the generation of dependent actions are considered to be an indivisible action. The reception of an FPDU and the generation of dependent actions are considered to be an indivisible action.

The indivisibility of actions may, in some implementations, cause certain events from file service users to be invalid at some service interface.

The conventions adopted in this Annex are described below.

A.1.1 System model used for protocol description

There are four types of receivers and sources of incoming and outgoing events (see figure 12):

a) The internal file service user, which is the file error recovery protocol machine (FERPM);

b) The external file service user — initiator or responder;

c) The local system environment;

d) the underlying presentation and ACSE service providers.

All primitives to/from the external file service user are passed through as primitives to/from the internal file service user to the basic FPM.

If the FERPM is not null — that is, either the RESTART or the RECOVER functional unit is available — parameters needed for error control and recovery may be added to these primitives.

Signals to/from the local environment group together events signalling errors and events signalling interactions amongst the FERPM, its docket and its local system. These local signals are

e) L-ERRABT — local signal indicating protocol or other local errors leading to F-P-ABORT, with a permanent error value in the action result parameter;

f) L-PABORT — local signal indicating that a F-P-ABORT request PDU with a transient error value in the action result should be issued;

g) L-ERROR1, L-ERROR2 and L-ERROR3 — local signals indicating class I, class II and class III errors respectively;

h) L-SUSPND — a local signal sent by the sender in

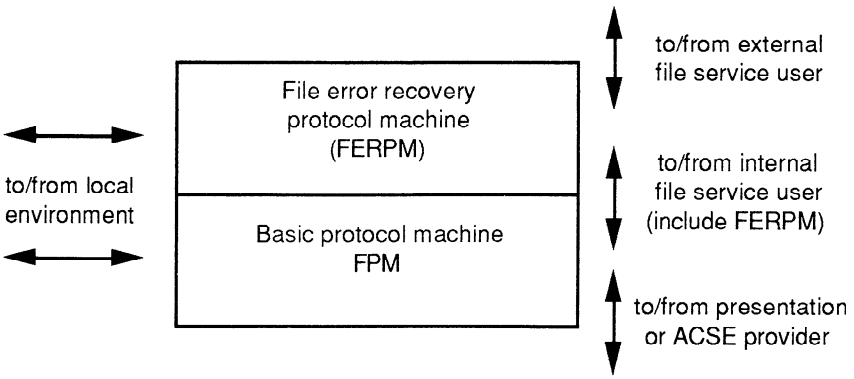

Figure 12 — State machine system model

the RESTART state to the local system to suspend the issuing of F-DATA request and F-DATA-END request primitives;

i) L-RESUME — a local signal to the local system to resume the issuing of F-DATA request and F-DATA-END request primitives when a sender has completed its recovery from RESTART and is now back in DATA-XFER state;

j) L-RESEND — a local signal from the FERPM to the sending local system. This signal includes the negotiated restart checkpoint and eliminates the need to store data values in the docket. Upon receipt of this local signal the local system can either

1) resend data from the checkpoint if the local system is aware of the algorithm used by the FERPM to generate the checkpoint; or

2) resend data from the start of the file if it has no knowledge of the checkpoint generating algorithm. The FERPM in the RESTART state will discard all data from the local system that occurs before the negotiated checkpoint. The FERPM will only forward data past the negotiated checkpoint to the FPM;

k) L-DATRQ — signal representing a re-issued F-DATA request primitive from the local system;

l) L-DAERQ — signal representing a re-issued F-DATA-END request primitive when a "data-end" marker becomes available from the docket;

m) L-CHKRQ — signal representing a re-issued F-CHECK request primitive when a checkpoint identifier becomes available from the docket;

n) L-EORIN — end of restart indication signal indicating that all checkpoint identifiers, "data-end" markers are all data to be resent have been sent;

o) L-GIVEUP — signal indicating that the responding FERPM should abandon the recovery process. This is introduced so that if the initiating FERPM is unable to re-establish the association then the responding FERPM can inform its users of the irrecoverable error.

p) L-ERRCTX — signal indicating that the P-ALTER-CONTEXT negotiation is unsuccessful. The error is to be processed following the F-OPEN or F-RECOVER confirm as applicable.

q) L-HOLD — signal to FERPM to hold any primitive from the external user for later processing.

r) L-UNHOLD — signal to FERPM to process any previously held primitives.

s) L-STPSND --- a local signal from the FERPM to the sending local system to stop the resending of data and checkpoints.

A.1.2 Incoming Events

Events in the tables are depicted by abbreviated names. A list of these abbreviations, arranged alphabetically within categories, precedes each table. Wherever possible, these events have been arranged in the order in which a normal error-free sequence of events would occur.

It is assumed that incoming PDUs have been extracted from the user data fields of Presentation or ACSE indication or confirm primitives prior to being considered as incoming events.

The following naming conventions are used:

a) The prefix "F-" (as in F-INIRQ) indicates a primitive issued by the external file service (EFS) user or issued by the FERPM to the EFS user;

b) The prefix "P-" (as in P-ALTRQ) indicates a primitive issued by the Presentation Service (PS) provider.

c) The prefix "A-" (as in A-PABIN) indicates a primitive issued by the ACSE provider;

d) The prefix "L-" (as in L-ERRABT) indicates a local signal from the FPM or the FERPM to the local system or from the local system environment to the FPM or the FERPM;

e) The prefix "I-" (as in I-OPNRQ) indicates a primitive issued by the FERPM to the FPM or vice-versa;

f) Where no prefix is used, the event is the receipt of an FTAM PDU or, in the case of GRPRQ and GRPRP, a grouped sequence of PDUs. The only exception is "DATIN" which indicates a data value in user context in the data transfer state.

g) The following suffices indicate the basic types of primitives and PDUs:

"RQ"	request
"IN"	indication
"RP"	response
"CF"	confirm

A.1.3 Outgoing Events

The same naming conventions are used for outgoing events as for incoming events. Where the outgoing event is the issue of a PDU, it will normally give rise to the similarly named incoming event for the other protocol entity. For example, the outgoing event SELRP of the responding entity will become the incoming event SELRP for the initiating entity.

A.1.4 States

The suffix "-PD" indicates a pending state, waiting for some known primitive or PDU type. The suffix "-EX" indicates an expectant state in FERPM, waiting for some expected primitive.

The prefix "P-" normally indicates waiting for a primitive from the Presentation Service provider. Similarly, the prefix "F-" indicates waiting for a primitive from the EFS user. If neither of the above prefixes is used, the state normally indicates waiting for a PDU, or a non-pending state.

A.1.5 Predicates

The following symbols used in predicates have their normal Boolean algebraic meanings:

&	AND
|	OR
~	NOT

An incoming event may satisfy more than one predicate, in which case the conditional actions for satisfied predicates will be executed.

Some actions may be conditional upon the negotiation of particular service functional units;

those in the FPM are:

U1: Kernel functional unit
U2: Read functional unit
U3: Write functional unit
U4: File access functional unit
U5: Limited management functional unit
U6: Enhanced management functional unit
U6a: Limited filestore management functional unit
U6b: Enhanced filestore management functional unit
U6c: Object manipulation functional unit
U6d: Group manipulation functional unit
U7: Grouping functional unit
U8: FADU locking functional unit

those in the FERPM are:

U9: Recovery functional unit
U10: Restart data transfer functional unit

A.1.6 Actions

Actions may be conditional on specified predicates, or they may be unconditional. When a line in a "detailed entries" specification commences with a predicate specifier followed by a colon, this indicates that all actions on that line are conditional upon the indicated predicate. An action may consist of one or more of the following:

a) an outgoing event, indicated by its abbreviated name;

b) a specified action, indicated by a number in square brackets [ ] and separated from any preceding items by a comma;

c) a specified qualifier, indicated by a number in square brackets [ ] following a preceding item without an intervening comma;

Actions and qualifiers are described in a single list preceding the table.

The next state which the protocol entity will enter is indicated by an arrow preceding a state name, e.g. "⇒ SELECTED". For the null transition back to the current state, the notation "⇒ *same state*" is used.

Once a state change occurs, all subsequent actions in that entry are ignored.

A.1.7 Implicit Action

The following entity actions have not been explicitly specified in the State tables, but constitute part of the entity behaviour:

a) A blank square in the table indicates an invalid event.

b) Unless otherwise stated in the tables, an invalid event would cause the action specified in 10.2 to be executed.

c) The Presentation Service is used throughout to identify "active" FTAM PCI from data with an equivalent encoding, but in a "passive" use data context.

d) For each incoming PDU, a check is made that the appropriate functional unit has been negotiated for the connection. If the check fails, the procedures for protocol violation specified in 10.2 are followed.

A.1.8 Additional State Information

The tables make use of the indicators and other state variables defined in 6.2 and 11.2. In addition, the file regime management tables for the initiator make use of a threshold indicator and an expected response list, as a means of specifying the entity state when a concatenated PDU group is outstanding.

The symbol NSPN is used to denote the Next Synchronization Point Number state variable.

A.2 FTAM regime management protocol machine

A.2.1 States — FTAM regime management

UNINITIALIZED	FTAM regime ended.
INITIALIZE-PD	Initialize pending; wait for initialize response PDU.
INITIALIZED	FTAM regime started.
TERMINATE-PD	Terminate pending; wait for terminate response PDU.
I-INITIALIZE-PD	Initialize pending; wait for F-INITIALIZE response primitive from the internal file service user.
I-TERMINATE-PD	Terminate pending; wait for F-TERMINATE response primitive from the internal file service user.
CHG-PRE-PD	Change prefix pending, wait for change prefix response PDU
I-CHG-PRE-PD	Change prefix pending, wait for F-CHANGE-PREFIX response primitive from the internal file service user
LIST-PD	List pending, wait for list response PDU
I-LIST-PD	List pending, wait for F-LIST response primitive from the internal file service user
ANY-OTHER	Any other state of the file regime management protocol machine or the bulk data transfer protocol machine.
GRP-SELECT-PD	Group select pending, wait for group select response PDU
I-GRP-SELECT-PD	Group select pending, wait for F-GROUP-SELECT response primitive from the internal file service user
GRP-DELETE-PD	Group delete pending, wait for group delete response PDU
I-GRP-DELETE-PD	Group delete pending, wait for F-GROUP-DELETE response primitive from the internal file service user
GRP-COPY-PD	Group copy pending, wait for group copy response PDU
I-GRP-COPY-PD	Group copy pending, wait for F-GROUP-COPY response primitive from the internal file service user
GRP-MOVE-PD	Group move pending, wait for group move response PDU
I-GRP-MOVE-PD	Group move pending, wait for F-GROUP-MOVE response primitive from the internal file service user
GRP-LIST-PD	Group list pending, wait for group list response PDU
I-GRP-LIST-PD	Group list pending, wait for F-GROUP-LIST response primitive from the internal file service user
GRP-CATR-PD	Group change attribute pending, wait for group change attribute response PDU
I-GRP-CATR-PD	Group change attribute pending, wait for F-GROUP-CHANGE-ATTRIBUTE response primitive from the internal file service user

A.2.2 Incoming events — FTAM regime management

In the following lists, the functional unit in which the event occurs is included after the name, where applicable.

A.2.2.1 Incoming events — PDUs

UABRQ	U-Abort request PDU (on A-ABORT indication primitive)	U1
PABRQ	P-Abort request PDU (on A-ABORT indication primitive)	"
INIRQ	Initialize request PDU	"
INIRP	Initialize response PDU	"
TERRQ	Terminate request PDU	"
TERRP	Terminate response PDU	"

CPRRQ	Change prefix request PDU	U6a
CPRRP	Change prefix response PDU	U6a
LISRQ	List request PDU	U6a
LISRP	List response PDU	U6a
GCPRQ	Group copy request PDU	U6d
GCPRP	Group copy response PDU	U6d
GDLRQ	Group delete request PDU	U6d
GDLRP	Group delete response PDU	U6d
GLSRQ	Group list request PDU	U6d
GLSRP	Group list response PDU	U6d
GCARQ	Group change attribute request PDU	U6d
GCARP	Group change attribute response PDU	U6d
GMVRQ	Group move request PDU	U6d
GMVRP	Group move response PDU	U6d
GSLRQ	Group select request PDU	U6d
GSLRP	Group select response PDU	U6d

A.2.2.2 Incoming events from the internal file service user

I-UABRQ	F-U-ABORT request primitive
I-INIRQ	F-INITIALIZE request primitive
I-INIRP	F-INITIALIZE response primitive
I-TERRQ	F-TERMINATE request primitive
I-TERRP	F-TERMINATE response primitive
I-CPRRQ	F-CHANGE-PREFIX request primitive
I-CPRRP	F-CHANGE-PREFIX response primitive
I-LISRQ	F-LIST request primitive
I-LISRP	F-LIST response primitive
I-GCPRQ	F-GROUP-COPY request primitive
I-GCPRP	F-GROUP-COPY response primitive
I-GDLRQ	F-GROUP-DELETE request primitive
I-GDLRP	F-GROUP-DELETE response primitive
I-GLSRQ	F-GROUP-LIST request primitive
I-GLSRP	F-GROUP-LIST response primitive
I-GCARQ	F-GROUP-CHANGE-ATTRIBUTE request primitive
I-GCARP	F-GROUP-CHANGE-ATTRIBUTE response primitive
I-GMVRQ	F-GROUP-MOVE request primitive
I-GMVRP	F-GROUP-MOVE response primitive
I-GSLRQ	F-GROUP-SELECT request primitive
I-GSLRP	F-GROUP-SELECT response primitive

A.2.2.3 Incoming events from the ACSE provider

A-PABIN	A-P-ABORT indication primitive

A-ABIN	A-ABORT indication primitive without user data
A-ASSCF	A-ASSOCIATE confirm primitive without user data (with result indicating reject by ACSE or presentation service provider)

A.2.2.4 Incoming events from the local system

L-ERRABT	Local signal indicating error leading to abort
L-PABORT	Local signal indicating that a F-P-ABORT request PDU and a F-P-ABORT indication primitive to the internal file service user, both with a transient error value.

A.2.3 Outgoing events — FTAM regime management

A.2.3.1 Outgoing events — PDUs

UABRQ	U-Abort request PDU
PABRQ	P-Abort request PDU
INIRQ	Initialize request PDU
INIRP	Initialize response PDU
TERRQ	Terminate request PDU
TERRP	Terminate response PDU
CPRRQ	Change prefix request PDU
CPRRP	Change prefix response PDU
LISRQ	List request PDU
LISRP	List response PDU
GCPRQ	Group copy request PDU
GCPRP	Group copy response PDU
GDLRQ	Group delete request PDU
GDLRP	Group delete response PDU
GLSRQ	Group list request PDU
GLSRP	Group list response PDU
GCARQ	Group change attribute request PDU
GCARP	Group change attribute response PDU
GMVRQ	Group move request PDU
GMVRP	Group move response PDU
GSLRQ	Group select request PDU
GSLRP	Group select response PDU

A.2.3.2 Outgoing events to the internal file service user

I-UABIN	F-U-ABORT indication primitive
I-PABIN	F-P-ABORT indication primitive
I-INIIN	F-INITIALIZE indication primitive
I-INICF	F-INITIALIZE confirm primitive
I-TERIN	F-TERMINATE indication primitive
I-TERCF	F-TERMINATE confirm primitive
I-CPRIN	F-CHANGE-PREFIX indication primitive
I-CPRCF	F-CHANGE-PREFIX confirm primitive
I-LISIN	F-LIST indication primitive
I-LISCF	F-LIST confirm primitive

I-GCPIN	F-GROUP-COPY indication primitive
I-GCPCF	F-GROUP-COPY confirm primitive
I-GDLIN	F-GROUP-DELETE indication primitive
I-GDLCF	F-GROUP-DELETE confirm primitive
I-GLSIN	F-GROUP-LIST indication primitive
I-GLSCF	F-GROUP-LIST confirm primitive
I-GCAIN	F-GROUP-CHANGE-ATTRIBUTE indication primitive
I-GCACF	F-GROUP-CHANGE-ATTRIBUTE confirm primitive
I-GMVIN	F-GROUP-MOVE indication primitive
I-GMVCF	F-GROUP-MOVE confirm primitive
I-GSLIN	F-GROUP-SELECT indication primitive
I-GSLCF	F-GROUP-SELECT confirm primitive

A.2.4 Specific actions — FTAM regime management

[1] Send the PDU constructed as user data and map parameters on the appropriate ACSE form.

[2] Add a pdu to the current PSDU and terminate the current PSDU

[3] Initialize state information - unset all additional state information indicators, set outstanding checkpoint counter to zero, NSPN to one.

[4] Set state result parameters to "success".

[5] In case of ACSE provider abort, if any diagnostic indicates communications failure then set the action result to transient error.

[6] Set state result parameter to "failure".

[7] Record the FQOS required and select the restart and/or recovery functional units if necessary.

[12] Establish the list of presentation contexts needed to support FTAM PCI and ACSE PCI abstract syntaxes. If necessary, determine, on the basis of the abstract syntaxes derived from the contents type list supplied by the external file service user, the list of presentation contexts needed to support the file contents, and add it to the previous list. The resultant list is used to construct the presentation context definition list parameter.

[13] Update the value of the contents type list parameter in the F-INITIALIZE indication primitive issued to the internal file service user, according to the abstract syntaxes rejected by the presentation service provider, if necessary.

[14] According to the value of the contents type list on the F-INITIALIZE response primitive received from the internal file service user, construct the presentation context definition result parameter.

[20] Set the action result parameter according to the result parameter of the A-ASSOCIATE confirm service primitive.

[62] Record the peer entity's checkpoint window.

[80] Set action result to permanent error

[81] Set action result to transient error

A.2.5 Predicates — FTAM regime management

P1: I-INITIALIZE request primitive is acceptable.

P2: Result parameter of the ACSE confirm primitive indicates success of the operation.

P3: State result parameter of the incoming response primitive indicates success of the operation.

P5: Initialize request PDU is acceptable.

P25: Negotiable parameters have values consistent with request.

P310: The group manipulation functional unit is selected.

P312: The limited filestore management functional unit is negotiated.

A.2.6 Initiating entity state table — FTAM regime management

EVENT \ STATE	UNINITIALIZED	INITIALIZE-PD	INITIALIZED	TERMINATE-PD	CHG-PREF-PD	LIST-PD	ANY-OTHER	GRP-SELECT-PD	GRP-DELETE-PD	GRP-COPY-PD	GRP-MOVE-PD	GRP-LIST-PD	GRP-CATR-PD
I-INITRQ	1												
A-ASSCF		10											
INIRP		2											
I-TERRQ			3										
TERRP				4									
I-CPRRQ			12										
CPRRP					13								
I-LISRQ			14										
LISRP						15							
A-PABIN		5	5	5	5	5	5						
A-ABIN		7	7	7	7	7	7						
UABRQ		6	6	6	6	6	6						
PABRQ		7	7	7	7	7	7						
I-UABRQ		8	8	8	8	8	8						
L-ERRABT		9	9	9	9	9	9						
L-PABORT		11	11	11	11	11	11						
I-GSLRQ			21										
GSLRP								22					
I-GDLRQ			23										
GDLRP									24				
I-GCPRQ			25										
GCPRP										26			
I-GMVRQ			27										
GMVRP											28		
I-GLSRQ			29										
GLSRP												30	
I-GCARQ			31										
GCARP													32

A.2.7 Initiating entity state table: detailed entries

1:	P1:	[3],[12],INIRQ[1]	⇒ INITIALIZE-PD
	~P1:	I-INICF[6]	⇒ *same state*
2:	P3&P2 & P25:	[62],I-INICF[4],[7]	⇒ INITIALIZED
	P3&P2 & ~P25:	I-INICF[6],PABRQ[1]	⇒ UNINITIALIZED
	~P2:	I-INICF[6]	⇒ UNINITIALIZED
	~P3:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
3:		TERRQ[1]	⇒ TERMINATE-PD
4:		I-TERCF	⇒ UNINITIALIZED
5:		I-PABIN[81]	⇒ UNINITIALIZED
6:		I-UABIN	⇒ UNINITIALIZED

7:	I-PABIN	⇒ UNINITIALIZED
8:	UABRQ[1]	⇒ UNINITIALIZED
9:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
10:	I-INITCF[6],I-PABIN[20]	⇒ UNINITIALIZED
11:	PABRQ[1],I-PABIN[81]	⇒ UNINITIALIZED
12:	CPRRQ[2]	⇒ CHG-PRE-PD
13:	I-CPRCF	⇒ INITIALIZED
14:	LISRQ[2]	⇒ LIST-PD
15:	I-LISCF	⇒ INITIALIZED
21:	GSLRQ[2]	⇒ GRP-SELECT-PD
22:	I-GSLCF	⇒ INITIALIZED
23:	GDLRQ[2]	⇒ GRP-DELETE-PD
24:	I-GDLCF	⇒ INITIALIZED
25:	GCPRQ[2]	⇒ GRP-COPY-PD
26:	I-GCPCF	⇒ INITIALIZED
27:	GMVRQ[2]	⇒ GRP-MOVE-PD
28:	I-GMVCF	⇒ INITIALIZED
29:	GLSRQ[2]	⇒ GRP-LIST-PD
30:	I-GLSCF	⇒ INITIALIZED
31:	GCARQ[2]	⇒ GRP-CATR-PD
32:	I-GCACF	⇒ INITIALIZED

A.2.8 Responding entity state table — FTAM regime management

STATE / EVENT	UNINITIALIZED	I-INITIALIZE-PD	INITIALIZED	I-TERMINATE-PD	I-CHG-PRE-PD	I-LIST-PD	ANY-OTHER	I-GRP-SELECT-PD	I-GRP-DELETE-PD	I-GRP-COPY-PD	I-GRP-MOVE-PD	I-GRP-LIST-PD	I-GRP-CATR-PD
INIRQ	1												
I-INIRP		2											
TERRQ			3										
I-TERRP				4									
CPRRQ			12										
I-CPRRP					13								
LISRQ			14										
I-LISRP						15							
A-PABIN		5	5	5	5	5	5						
A-ABIN		7	7	7	7	7	7						
UABRQ		6	6	6	6	6	6						
PABRQ		7	7	7	7	7	7						
I-UABRQ		8	8	8	8	8	8						
L-ERRABT		9	9	9	9	9	9						
L-PABORT		11	11	11	11	11	11						
GSLRQ			21										
I-GSLRP								22					
GDLRQ			23										
I-GDLRP									24				
GCPRQ			25										
I-GCPRP										26			
GMVRQ			27										
I-GMVRP											28		
GLSRQ			29										
I-GLSRP												30	
GCARQ			31										
I-GCARP													32

A.2.9 Responding entity state table: detailed entries

1:	P5:	I-ININ,[3],[62],[13]	⇒ I-INITIALIZED-PD
	~P5:	INIRP[6][1]	⇒ *same state*
2:	P3:	[7],[14],INIRP[1]	⇒ INITIALIZED
	~P3:	INIRP[6][1]	⇒ UNINITIALIZED
3:		I-TERIN	⇒ I-TERMINATE-PD
4:		TERRP[1]	⇒ UNINITIALIZED
5:		I-PABIN[81]	⇒ UNINITIALIZED
6:		I-UABIN	⇒ UNINITIALIZED
7:		I-PABIN	⇒ UNINITIALIZED
8:		UABRQ[1]	⇒ UNINITIALIZED

9:		PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
11:		PABRQ[1],I-PABIN[81]	⇒ UNINITIALIZED
12:	P312:	I-CPRIN	⇒ I–CHG-PRE-PD
	~P312:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
13:		CPRRP[2]	⇒ INITIALIZED
14:	P312:	I-LISIN	⇒ I–LIST-PD
	~P312:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
15:		LISRP[2]	⇒ INITIALIZED
21:	P310:	I-GSLIN	⇒ I-GRP-SELECT-PD
	~P310:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
22:	P4:	GSLRP[2]	⇒ INITIALIZED
	~P4:	GSLRP[8][2]	⇒ INITIALIZED
23:	P310:	I-GDLIN	⇒ I-GRP-DELETE-PD
	~P310:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
24:		GDLRP[2]	⇒ INITIALIZED
25:	P310:	I-GCPIN	⇒ I-GRP-COPY-PD
	~P310:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
26:		GCPRP[2]	⇒ INITIALIZED
27:	P310:	I-GMVIN	⇒ I-GRP-MOVE-PD
	~P310:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
28:		GMVRP[2]	⇒ INITIALIZED
29:	P310:	I-GLSIN	⇒ I-GRP-LIST-PD
	~P310:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
30:		GLSRP[2]	⇒ INITIALIZED
31:	P310:	I-GCAIN	⇒ I-GRP-CATR-PD
	~P310:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
32:		GCARP[2]	⇒ INITIALIZED

A.3 Object regime management protocol machine

A.3.1 States — object regime management

In the FPM:

INITIALIZED	FTAM regime started
SELECT-PD	Select pending, wait for select response PDU
I-SELECT-PD	Select pending, wait for F-SELECT response primitive from the internal file service user
SELECTED	Selected
DESELECT-PD	Deselect pending, wait for deselect response PDU
I-DESELECT-PD	Deselect pending, wait for F-DESELECT response primitive from the internal file service user
CREAT-PD	Create pending, wait for create response PDU
I-CREATE-PD	Create pending, wait for F-CREATE response primitive from the internal file service user
DELETE-PD	delete pending, wait for delete response PDU
I-DELETE-PD	Delete pending, wait for F-DELETE response primitive from the internal file service user
READ-ATT-PD	Read attribute pending, wait for read attribute response PDU
I-READ-ATT-PD	Read attribute pending, wait for F-READ-ATTRIB response primitive from the internal file service user
CHG-ATT-PD	Change attribute pending, wait for change attribute response PDU.
I-CHG-ATT-PD	Change attribute pending, wait for F-CHANGE-ATTRIB response primitive from the internal file service user
OPEN-PD	Open pending, wait for open response PDU
I-OPEN-PD	Open pending, wait for F-OPEN response primitive from the internal file service user
P-ALTIN-PD	Presentation alter context pending, wait for P-ALTER-CONTEXT indication primitive.
P-ALTCF-PD	Presentation alter context pending, wait for P-ALTER-CONTEXT confirm primitive.
CLOSE-PD	Close pending, wait for close response PDU
I-CLOSE PD	Close pending, wait for F-CLOSE response primitive from the internal file service user
DXFRIDLE	Data transfer idle
LOCATE-PD	Locate pending, wait for locate response PDU
I-LOCATE-PD	Locate pending, wait for F-LOCATE response primitive from the internal file service user
ERASE-PD	Erase pending, wait for erase response PDU
I-ERASE-PD	Erase pending, wait for F-ERASE response primitive from the internal file service user
GROUPING	Building PDU group, wait for required primitives
GROUP-PD	Group pending, wait for response PDU group
I-GROUP-PD	Group pending, wait for F-BEGIN-GROUP response primitive from the internal file service user
CREATE-DIR-PD	Create directory pending, wait for create directory response PDU
I-CREATE-DIR-PD	Create directory pending, wait for F-CREATE-DIRECTORY response primitive from the internal file service user
LINK-PD	Link pending, wait for link response PDU
I-LINK-PD	Link pending, wait for F-LINK response primitive from the internal file service user
UNLINK-PD	Unlink pending, wait for unlink response PDU
I-UNLINK-PD	Unlink pending, wait for F-UNLINK response primitive from the internal file service user
SELECT-ANTR-PD	Select another pending, wait for select another response PDU
I-SELECT-ANTR-PD	Select another pending, wait for F-SELECT-ANOTHER response primitive from the internal file service user

READ-LINK-ATT-PD	Read link attribute pending, wait for read link attribute response PDU
I-READ-LINK-ATT-PD	Read link attribute pending, wait for F-READ-LINK-ATTRIB response primitive from the internal file service user
CHG-LINK-ATT-PD	Change link attribute pending, wait for change link attribute response PDU
I-CHG-LINK-ATT-PD	Change link attribute pending, wait for F-CHANGE-LINK-ATTRIB response primitive from the internal file service user
COPY-PD	Copy pending, wait for copy response PDU
I-COPY-PD	Copy pending, wait for F-COPY response primitive from the internal file service user
MOVE-PD	Move pending, wait for move response PDU
I-MOVE-PD	Move pending, wait for F-MOVE response primitive from the internal file service user

In the FERPM:

RECOVER-PD	Recover pending, wait for recover response PDU
I-RECOVER-PD	Recover pending, wait for F-RECOVER response primitive from the internal file service user
P-ALTIN-REC-PD	Presentation alter context pending, wait for P-ALTER-CONTEXT indication primitive during recovery.
P-ALTCF-REC-PD	Presentation alter context pending, wait for P-ALTER-CONTEXT confirm primitive during recovery.
DXFRIDLE-REC	Data transfer idle during recovery

A.3.2 Incoming events — object regime management

A.3.2.1 Incoming events — PDUs

CATRQ	Change-attrib request PDU	U6
CATRP	Change-attrib response PDU	U6
CLORQ	Close request PDU	U2, U3
CLORP	Close response PDU	U2, U3
CRERQ	Create request PDU	U5
CRERP	Create response PDU	U5
DELRQ	Delete request PDU	U5
DELRP	Delete request PDU	U5
DESRQ	Deselect request PDU	U1
DESRP	Deselect response PDU	U1
ERARQ	Erase request PDU	U4
ERARP	Erase response PDU	U4
LOCRQ	Locate request PDU	U4
LOCRP	Locate response PDU	U4
OPNRQ	Open request PDU	U2, U3
OPNRP	Open response PDU	U2, U3
RATRQ	Read-attrib request PDU	U5
RATRP	Read-attrib response PDU	U5
RECRQ	Recover request PDU	U9
RECRP	Recover response PDU	U9
SELRQ	Select request PDU	U1
SELRP	Select response PDU	U1
GRPRQ	A sequence of request PDUs (PDU-Group) preceded by an F-BEGIN-GROUP request PDU and followed by a F-END-GROUP request PDU.	U7

GRPRP	A sequence of response PDUs (PDU-Group) preceded by an F-BEGIN-GROUP response PDU and followed by a F-END-GROUP response PDU.	U7
CDRRQ	Create directory request PDU	U6b
CDRRP	Create directory response PDU	U6b
CLARQ	Change link attribute request PDU	U6b
CLARP	Change link attribute response PDU	U6b
CPYRQ	Copy request PDU	U6c
CPYRP	Copy response PDU	U6c
LNKRQ	Link request PDU	U6b
LNKRP	Link response PDU	U6b
MOVRQ	Move request PDU	U6c
MOVRP	Move response PDU	U6c
RLARQ	Read link attribute request PDU	U6b
RLARP	Read link attribute response PDU	U6b
SANRQ	Select another request PDU	U6d
SANRP	Select another response PDU	U6d

A.3.2.2 Incoming events from the internal file service user

I-CATRQ	F-CHANGE-ATTRIB request primitive
I-CATRP	F-CHANGE-ATTRIB response primitive
I-CLORQ	F-CLOSE request primitive
I-CLORP	F-CLOSE response primitive
I-CRERQ	F-CREATE request primitive
I-CRERP	F-CREATE response primitive
I-DELRQ	F-DELETE request primitive
I-DELRP	F-DELETE response primitive
I-DESRQ	F-DESELECT request primitive
I-DESRP	F-DESELECT response primitive
I-ERARQ	F-ERASE request primitive
I-ERARP	F-ERASE response primitive
I-LOCRQ	F-LOCATE request primitive
I-LOCRP	F-LOCATE response primitive
I-OPNRQ	F-OPEN request primitive
I-OPNRP	F-OPEN response primitive
I-RATRQ	F-READ-ATTRIB request primitive
I-RATRP	F-READ-ATTRIB response primitive
I-RECRQ	F-RECOVER request primitive
I-RECRP	F-RECOVER response primitive
I-SELRQ	F-SELECT request primitive
I-SELRP	F-SELECT response primitive
I-BGPRQ	F-BEGIN-GROUP request primitive
I-BGPRP	F-BEGIN-GROUP response primitive
I-EGPRQ	I-END-GROUP request primitive

I-EGPRP	I-END-GROUP response primitive
I-CDRRQ	F-CREATE-DIRECTORY request primitive
I-CDRRP	F-CREATE-DIRECTORY response primitive
I-CLARQ	F-CHANGE-LINK-ATTRIB request primitive
I-CLARP	F-CHANGE-LINK-ATTRIB response primitive
I-CPYRQ	F-COPY request primitive
I-CPYRP	F-COPY response primitive
I-LNKRQ	F-LINK request primitive
I-LNKRP	F-LINK response primitive
I-MOVRQ	F-MOVE request primitive
I-MOVRP	F-MOVE response primitive
I-RLARQ	F-READ-LINK-ATTRIB request primitive
I-RLARP	F-READ-LINK-ATTRIB response primitive
I-SANRQ	F-SELECT-ANOTHER request primitive
I-SANRP	F-SELECT-ANOTHERsponse primitive

A.3.2.3 Incoming events from the presentation service provider

P-ALTIN	P-ALTER-CONTEXT indication primitive
P-ALTCF	P-ALTER-CONTEXT confirm primitive

A.3.3 Outgoing events — file regime management

A.3.3.1 Outgoing events — PDUs

CATRQ	Change-attrib request PDU
CATRP	Change-attrib response PDU
CLORQ	Close request PDU
CLORP	Close response PDU
CRERQ	Create request PDU
CRERP	Create response PDU
DELRQ	Delete request PDU
DELRP	Delete response PDU
DESRQ	Deselect request PDU
DESRP	Deselect response PDU
ERARQ	Erase request PDU
ERARP	Erase response PDU
LOCRQ	Locate request PDU
LOCRP	Locate response PDU
OPNRQ	Open request PDU
OPNRP	Open response PDU
PABRQ	P-Abort request PDU
RATRQ	Read-attrib request PDU
RATRP	Read-attrib response PDU
RECRQ	Recover request PDU
RECRP	Recover response PDU

SELRQ	Select request PDU
SELRP	Select response PDU
CDRRQ	Create directory request PDU
CDRRP	Create directory response PDU
CLARQ	Change link attribute request PDU
CLARP	Change link attribute response PDU
CPYRQ	Copy request PDU
CPYRP	Copy response PDU
LNKRQ	Link request PDU
LNKRP	Link response PDU
MOVRQ	Move request PDU
MOVRP	Move response PDU
RLARQ	Read link attribute request PDU
RLARP	Read link attribute response PDU
SANRQ	Select another request PDU
SANRP	Select another response PDU

A.3.3.2 Outgoing events to the internal file service user

I-CATIN	F-CHANGE-ATTRIB indication primitive
I-CATCF	F-CHANGE-ATTRIB confirm primitive
I-CLOIN	F-CLOSE indication primitive
I-CLOCF	F-CLOSE confirm primitive
I-CREIN	F-CREATE indication primitive
I-CRECF	F-CREATE confirm primitive
I-DELIN	F-DELETE indication primitive
I-DELCF	F-DELETE confirm primitive
I-DESIN	F-DESELECT indication primitive
I-DESCF	F-DESELECT confirm primitive
I-ERAIN	F-ERASE indication primitive
I-ERACF	F-ERASE confirm primitive
I-LOCIN	F-LOCATE indication primitive
I-LOCCF	F-LOCATE confirm primitive
I-OPNIN	F-OPEN indication primitive
I-OPNCF	F-OPEN confirm primitive
I-PABIN	F-P-ABORT indication primitive
I-RATIN	F-READ-ATTRIB indication primitive
I-RATCF	F-READ-ATTRIB confirm primitive
I-RECIN	F-RECOVER indication primitive
I-RECCF	F-RECOVER confirm primitive
I-SELIN	F-SELECT indication primitive
I-SELCF	F-SELECT confirm primitive
I-CDRIN	F-CREATE-DIRECTORY indication primitive
I-CDRCF	F-CREATE-DIRECTORY confirm primitive

I-CLAIN	F-CHANGE-LINK-ATTRIB indication primitive
I-CLACF	F-CHANGE-LINK-ATTRIB confirm primitive
I-CPYIN	F-COPY indication primitive
I-CPYCF	F-COPY confirm primitive
I-LNKIN	F-LINK indication primitive
I-LNKCF	F-LINK confirm primitive
I-MOVIN	F-MOVE indication primitive
I-MOVCF	F-MOVE confirm primitive
I-RLAIN	F-READ-LINK-ATTRIB indication primitive
I-RLACF	F-READ-LINK-ATTRIB confirm primitive
I-SANIN	F-SELECT-ANOTHER indication primitive
I-SANCF	F-SELECT-ANOTHER confirm primitive

A.3.3.3 Outgoing events to the presentation service provider

P-ALTRQ	P-ALTER-CONTEXT request primitive
P-ALTRP	P-ALTER-CONTEXT response primitive

A.3.3.4 Outgoing events to the local system

L-ERRCTX	Local signal indicating P-ALTER-CONTEXT error

A.3.4 Specific actions — file regime management

[1] Send the PDU constructed as user data and map parameters on the appropriate ACSE form.

[2] Add a PDU to the current PSDU and terminate the current PSDU.

[8] Includes a state result parameter indicating failure.

[9] Set the remove contexts parameter of the F-OPEN or the F-RECOVER request PDU.

[10] Determine, on the basis of the abstract syntax derived from the contents type supplied by the external file service user, the set of presentation contexts necessary to support the file contents. All contexts identified in the remove context parameter of the OPNRQ or RECRQ PDUs shall be deleted unless required in the new open regime; optionally, the responder may elect to delete any other contexts in the defined context set which are not required. Inform the user if contexts need to be defined but the functional unit is unavailable

[11] Set the presentation-action parameter of the OPNRP or RECRP PDU if a P-ALTER-CONTEXT exchange is needed.

[15] Preserve the PDU or PDUs for further processing.

[28] Set the bulk data transfer number to that specified in the F-RECOVER request primitive or PDU.

[31] Set the bulk data transfer number to zero.

[32] Erase the expected response list. Set the threshold indicator to the value given by the primitive parameter. Add an F-BEGIN-GROUP request PDU to the current PSDU.

[33] Add a request PDU corresponding to the primitive function to the current PSDU, and add the corresponding element to the expected response list.

[34] Add an F-END-GROUP request PDU to the current PSDU and terminate the PSDU.

[35] Check that every PDU in the PDU-Group is one of SELRP, CRERP, CLORP, RATRP, CATRP, DESRP, DELRP, or OPNRP; and that the composition and ordering of the PDUs is consistent with the group specified by the expected response list (recognizing that the response group may be truncated because of a detected error).

[36] Check that the number of PDUs in the PDU-Group is consistent with the value of the threshold parameter and that the other parameter values are consistent with negotiation.

[37] Considering each PDU in the PDU-Group, issue the corresponding confirm primitive to the IFS user with parameters derived from the PDU.

[38] Add a response PDU corresponding to the primitive function to the current PSDU.

[39] Add an F-END-GROUP response PDU to the current PSDU and terminate the PSDU.

[40] Check that the composition and ordering of the PDU-Group is consistent with one of the concatenated sequences "A", "C", or "D", as defined in Part 3, Annex E.

[41] Check that the composition and ordering of the PDU-Group is consistent with the concatenated sequence "E" as defined in Part 3, Annex E.

[42] Check that the composition and ordering of the PDU-Group is consistent with the concatenated sequence "B" as defined in Part 3, Annex E.

[43] Considering in turn each PDU in the PDU-Group, issue the corresponding indication primitive to the IFS user with parameters derived from the PDU.

[45] Set the checkpoint identifier expected to the value negotiated plus one.

A.3.5 Predicates — object regime management

P4: The state result parameter on the incoming response PDU or response primitive indicates successful execution of operation.

P6: The P-ALTER-CONTEXT negotiation fails.

P7: A group of PDUs is preserved.

P9: The presentation context management functional unit is available and there are presentation contexts to be deleted or defined.

P10: The presentation-action parameter in the OPNRP PDU or in the RECRP PDU is TRUE, in which case the presentation context management functional unit should be available.

P17: The PDU-Group contains a SELRP or CRERP PDU with a state result parameter indicating failure, or a DESRP or DELRP PDU.

P18: Checking the PDU-Group reveals a protocol error.

P19: The PDU-Group contains an OPNRP PDU with a state result parameter indicating success.

P43: The recovery procedure is in progress.

P310: The group manipulation functional unit is selected.

P311: The object manipulation functional unit is selected

P313: The enhanced filestore management functional unit is selected.

A.3.6 Initiating entity state table — object regime management

STATE / EVENT	I-INITIALIZED	SELECT-PD	SELECTED	DESELECT-PD	CREATE-PD	DELETE-PD	READ-ATT-PD	CHG-ATT-PD	OPEN-PD	P-ALTIN-PD	DXFRIDLE-REC	DXFRIDLE-RES	CLOSE-PD	RECOVER-PD	P-ALTIN-RES-PD	LOCATE-PD	ERASE-PD	CREATE-DIR-PD	LINK-PD	UNLINK-PD	SELECT-ANTR-PD	READ-LINK-ATT-PD	CHG-LINK-ATT-PD	COPY-PD	MOVE-PD	GROUPING	GROUP-PD
I-SELRQ	1																									28	
SELRP		2																									
I-DESRQ			3																							28	
DESRP				4																							
I-CRERQ	5																									28	
CRERP					6																						
I-DELRQ			7																							28	
DELRP						8																					
I-RATRQ			9																							28	
RATRP							10																				
I-CATRQ			11																							28	
CATRP								12																			
I-OPNRQ			13																							22	
OPNRP									14																		
P-ALTIN										15					21												
I-CLORQ											17	17														28	
CLORP													18														
I-RECRQ	19																									28	
RECRP														20													
I-LOCRQ											23	23														28	
LOCRP																24											
I-ERARQ											25	25														28	
ERARP																	26										
I-CDRRQ	31																									28	
CDRRP																		32									
I-LNKRQ	33																									28	
LNKRP																			34								
I-ULNRQ			35																							28	
ULNRP																				36							
I-SANRQ	37																									28	
SANRP																					38						
I-RLARQ			39																							28	
RLARP																						40					
I-CLARQ			41																							28	
CLARP																							42				
I-CPYRQ			43																							28	
CPYRP																								44			
I-MOVRQ			45																							28	
MOVRP																									46		
I-BGPRQ	27		27								27	27															
I-EGPRQ																										29	
GRPRP																											30

A.3.7 Initiating entity state table (Part 2) — detailed entries

1:		SELRQ[2]	⇒ SELECT-PD
2:	P4: ~P4:	I-SELCF I-SELCF[8]	⇒ SELECTED ⇒ INITIALIZED
3:		DESRQ[2]	⇒ DESELECT-PD
4:		I-DESCF	⇒ INITIALIZED
5:		CRERQ[2]	⇒ CREATE-PD
6:		I-CRECF	⇒ SELECTED
7:		DELRQ[2]	⇒ DELETE-PD
8:		I-DELCF	⇒ INITIALIZED
9:		RATRQ[2]	⇒ READ-ATT-PD
10:		I-RATCF	⇒ SELECTED
11:		CATRQ[2]	⇒ CHG-ATT-PD
12:		I-CATCF	⇒ SELECTED
13:	P9:	[9], OPNRQ[2],[31]	⇒ OPEN-PD
14:	~P4: P4 & ~P10: P4 & P10:	I-OPNCF[8] I-OPNCF [15]	⇒ SELECTED ⇒ DXFRIDLE ⇒ P-ALTIN-PD
15:	P6: P7: ~P7:	L-ERRCTX, P-ALTRP, [37] I-OPNCF	 ⇒ DXFRIDLE ⇒ DXFRIDLE
17:		CLORQ[2]	⇒ CLOSE-PD
18:		I-CLOCF	⇒ SELECTED
19:	P9:	[9], RECRQ[2],[28]	⇒ RECOVER-PD
20:	~P4: P4 & ~P10: P4 & P10:	I-RECCF[8] [45],I-RECCF [15]	⇒ INITIALIZED ⇒ DXFRIDLE-REC ⇒ P-ALTIN-REC-PD
21:	P6:	L-ERRCTX, P-ALTRP, [45],I-RECCF	⇒ DXFRIDLE-REC
22:	P9:	[9], [31],[33]	⇒ *same state*
23:		LOCRQ[2]	⇒ LOCATE-PD
24:	~P43: P43:	I-LOCCF I-LOCCF	⇒ DXFRIDLE ⇒ DXFRIDLE-REC
25:		ERARQ[2]	⇒ ERASE-PD
26:	~P43: P43:	IERACF IERACF	⇒ DXFRIDLE ⇒ DXFRIDLE-REC
27:		[32]	⇒ GROUPING
28:		[33]	⇒ *same state*
29:		[34]	⇒ GROUP-PD

30:		[35],[36],	
	P18:	I-PABIN, PABRQ[1]	⇒UNINITIALIZED
	P17 & ~P18:	[37]	⇒ INITIALIZED
	~P17 & ~P18 & P19 & ~P10:	[37]	⇒ DXFRIDLE
	~P17 & ~P18 & P19 & P10:	[15]	⇒ P-ALTIN-PD
	~P17 & ~P18 & ~P19:	[37]	⇒ SELECTED
31:		CDRRQ[2]	⇒ CREATE-DIR-PD
32:	P4:	I-CDRCF	⇒ SELECTED
	~P4 :	I-CDRCF[8]	⇒ INITIALIZED
33:		LNKRQ[2]	⇒ LINK-PD
34:	P4:	I-LNKCF	⇒ SELECTED
	~P4 :	I-LNKCF[8]	⇒ INITIALIZED
35:		ULNRQ[2]	⇒ UNLINK-PD
36:		I-ULNCF	⇒ INITIALIZED
37:		SANRQ[2]	⇒ SELECT-ANTR-PD
38:	P4:	I-SANCF	⇒ SELECTED
	~P4:	I-SANCF[8]	⇒ INITIALIZED
39:		RLARQ[2]	⇒ READ-LINK-ATT-PD
40:		I-RLACF	⇒ SELECTED
41:		CLARQ[2]	⇒ CHG-LINK-ATT-PD
41:		I-CLACF	⇒ SELECTED
42:		CPYRQ[2]	⇒ COPY-PD
43:		I-CPYCF	⇒ SELECTED
44:		MOVRQ[2]	⇒ MOVE-PD
45:		I-MOVCF	⇒ SELECTED

A.3.8 Responding entity state table — object regime management

STATE / EVENT	INITIALIZED	I-SELECT-PD	SELECTED	I-DESELECT-PD	I-CREATE-PD	I-DELETE-PD	I-READ-ATT-PD	I-CHG-ATT-PD	I-OPEN-PD	P-ALTIN-PD	DXFRIDLE	DXFRIDLE-REC	I-CLOSE-PD	I-RECOVER-PD	P-ALTCF-REC-PD	I-LOCATE-PD	I-ERASE-PD	I-CREATE-DIR-PD	I-LINK-PD	I-UNLINK-PD	I-SELECT-ANTR-PD	I-READ-LINK-ATT-PD	I-CHG-LINK-ATT-PD	I-COPY-PD	I-MOVE-PD	I-GROUP-PD	GROUPING
SELRQ	1																										
I-SELRP		2																									32
DESRQ			3																								
I-DESRP				4																							32
CRERQ	5																										
I-CRERP					6																						32
DELRQ			7																								
I-DELRP						8																					32
RATRQ			9																								
I-RATRP							10																				32
CATRQ			11																								
ICATRP								12																			32
OPNRQ			13																								
I-OPNRP									14																		22
P-ALTCF										15					21												
CLORQ											17	17															
I-CLORP													18														32
RECRQ	19																										
I-RECRP														20													
LOCRQ											24	24															
I-LOCRP																25											
ERARQ											26	26															
I-ERARP																	27										
CDRRQ	34																										
I-CDRRP																		35									32
LNKRQ	36																										
I-LNKRP																			37								32
ULNRQ			38																								
I-ULNRP																				39							32
SANRQ	40																										
I-SANRP																					41						32
RLARQ			42																								
I-RLARP																						43					32
CLARQ			44																								
I-CLARP																							45				32
CPYRQ			46																								
I-CPYRP																								47			32
MOVRQ			48																								
I-MOVRP																									49		32
I-BGPRP																										31	
I-EGPRP																											33
GRPRQ	28		29								30	30															

A.3.9 Responding entity state table (Part 2) — detail entries

1:		I-SELIN	⇒ I-SELECT-PD
2:	P4:	SELRP[2]	⇒ SELECTED
	~P4:	SELRP[8][2]	⇒ INITIALIZED
3:		I-DESIN	⇒ I-DESELECT-PD
4:		DESRP[2]	⇒ INITIALIZED
5:		I-CREIN	⇒ I-CREATE-PD
6:	P4:	CRERP[2]	⇒ SELECTED
	~P4:	CRERP[8][2]	⇒ INITIALIZED
7:		I-DELIN	⇒ I-DELETE-PD
8:		DELRP[2]	⇒ INITIALIZED
9:		I-RATIN	⇒ I-READ-ATT-PD
10:		RATRP[2]	⇒ SELECTED
11:		I-CATIN	⇒ I-CHG-ATT-PD
12:		CATRP[2]	⇒ SELECTED
13:		I-OPNIN,[31]	⇒ I-OPEN-PD
14:	~P4:	OPNRP[8][2]	⇒ SELECTED
	P4:	[10]	
	P4 & ~P9:	OPNRP[2]	⇒ DXFRIDLE
	P4 & P9:	[11],OPNRP[2],P-ALTRQ	⇒ P-ALTCF-PD
15:	P6:	L-ERRCTX,	⇒ DXFRIDLE
17:		I-CLOIN	⇒ I-CLOSE-PD
18:		CLORP[2]	⇒ SELECTED
19:		I-RECIN,[28]	⇒ I-RECOVER-PD
20:	~P4:	RECRP[8][2]	⇒ INITIALIZED
	P4:	[10],[45],	
	P4 & ~ P9:	RECRP[2]	⇒ DXFRIDLE-REC
	P4 & P9:	[11],RECRP[2],P-ALTRQ	⇒ P-ALTCF-REC-PD
21:	P6:	L-ERRCTX,	⇒ DXFRIDLE-REC
22:		[38],[31]	⇒ *same state*
24:		I-LOCIN	⇒ I-LOCATE-PD
25:	~P43:	LOCRP[2]	⇒ DXFRIDLE
	P43:	LOCRP[2]	⇒ DXFRIDLE-REC
26:		I-ERAIN	⇒ I-ERASE-PD
27:	~P43:	ERARP[2]	⇒ DXFRIDLE
	P43:	ERARP[2]	⇒ DXFRIDLE-REC
28:		[40],	
	P18:	I-PABIN,PABRQ[1]	⇒ UNINITIALIZED
	~P18:	[43]	⇒ I-GROUP-PD

29:		[41],	
	P18:	I-PABIN,PABRQ[1]	⇒ UNINITIALIZED
	~P18:	[43]	⇒ I-GROUP-PD
30:		[42],	
	P18:	I-PABIN,PABRQ[1]	⇒ UNINITIALIZED
	~P18:	[43]	⇒ I-GROUP-PD
31:		[38]	⇒ GROUPING
32:		[38]	⇒ *same state*
33:		[39],	
	P17:		⇒ INITIALIZED
	~P17 & P19:	[10],	
	~P17 & P19 & ~P9:		⇒ DXFRIDLE
	~P17 & P19 & P9	P-ALTRQ	⇒ P-ALTCF-PD
	~P17 & ~P19:		⇒ SELECTED
34:	P313:	I-CDRIN	⇒ I-CREATE-DIR-PD
	~P313:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
35:	P4:	CDRRP[2]	⇒ SELECTED
	~P4 :	CDRRP[8][2]	⇒ INITIALIZED
36:	P313;	I-LNKIN	⇒ I-LINK-PD
	~P313:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
37:	P4:	LNKRP[2]	⇒ SELECTED
	~P4	LNKRP[8][2]	⇒ INITIALIZED
38:	P313:	I-ULNIN	⇒ I-UNLINK-PD
	~P313:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
39:		ULNRP[2]	⇒ INITIALIZED
40:	P310:	I-SANIN	⇒ I-SELECT-ANTR-PD
	~P310:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
41:	P4:	SANRP[2]	⇒ SELECTED
	~P4 :	SANRP[8][2]	⇒ INITIALIZED
42:	P313:	I-RLAIN	⇒ I-READ-LINK-ATT-PD
	~P313:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
43:		RLARP[2]	⇒ SELECTED
44:	P313:	I-CLAIN	⇒ I-CHG-LINK-ATT-PD
	~P313:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
45:		CLARP[2]	⇒SELECTED
46:	P311:	I-CPYIN	⇒I-COPY-PD
	~P311:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
47:		CPYRP[2]	⇒ SELECTED
48:	P311:	I-MOVIN	⇒ I-MOVE-PD
	~P311:	PABRQ[1],I-PABIN[80]	⇒ UNINITIALIZED
49:		MOVRP[2]	⇒ SELECTED

NOTE: L-ERRCTX provides information to the responder's environment.

A.4 Bulk data transfer protocol machine

A.4.1 States — bulk data transfer

DXFRIDLE	Data transfer idle
READ	Read data transfer
I-READ-ENDING	Read transfer end, wait for F-TRANSFER-END request primitive from the internal file service user
READ-ENDING	Read transfer ending, wait for transfer end request PDU
I-R-XFR-ENDING	Wait for F-TRANSFER-END response primitive after READ from the internal file service user
R-XFER-ENDING	Wait Wait for transfer-end response PDU after READ
WRITE	Write data transfer
I-WRITE-ENDING	Write transfer-end, wait for F-TRANSFER-END request primitive from the internal file service user
WRITE-ENDING	Write transfer-end, wait for transfer end request PDU
I-W-XFR-ENDING	Wait for F-TRANSFER-END response primitive after WRITE from the internal file service user
W-XFER-ENDING	Wait for transfer-end response PDU after WRITE
CANCEL-PD	Cancel pending, wait for cancel response PDU
I-CANCEL-PD	Cancel pending, wait for F-CANCEL response primitive from the internal file service user
RRESTART-PD	Read restart pending, wait for restart response PDU in read operation
I-RRESTART-PD	Read restart pending, wait for F-RESTART response primitive in read operation from the internal file service user
WRESTART-PD	Write restart pending, wait for restart response PDU in write operation
I-WRESTART-PD	Write restart pending, wait for F-RESTART response primitive in write operation from the internal file service user
P-TOKEN-PD	Wait for sync-minor token
DXFRIDLE-REC	Data transfer idle during recovery
REA-SYMIN-PD	Wait for first P-SYNC-MINOR indication primitive after READ
RES-SYMIN-PD	Wait for first P-SYNC-MINOR indication primitive, restart requested
CAN-SYMIN-PD	Wait for first P-SYNC-MINOR indication primitive, cancel requested
WRT-SYMIN-PD	Wait for first P-SYNC-MINOR indication primitive after WRITE
REA-SYMCF-PD	Wait for first P-SYNC-MINOR confirm primitive after READ
RES-SYMCF-PD	Wait for first P-SYNC-MINOR confirm primitive, restart requested
CAN-SYMCF-PD	Wait for first P-SYNC-MINOR confirm primitive, cancel requested
WRT-SYMCF-PD	Wait for first P-SYNC-MINOR confirm primitive after WRITE
RESTART-CAN-PD	Restart cancel pending, wait for cancel or restart response PDU

A.4.2 Incoming events — bulk data transfer

A.4.2.1 Incoming events — PDUs

CANRP	Cancel response PDU (in user data of P-RESYNC(abandon) confirm if resync functional unit has been negotiated).	U2, U3
CANRQ	Cancel request PDU (in user data of P-RESYNC(abandon) indication if resync functional unit has been negotiated).	U2, U3
DAERQ	Data end request PDU.	U2, U3
TRERP	Transfer end response PDU.	U2, U3
TRERQ	Transfer end request PDU.	U2, U3

RESRQ	Restart request PDU, in user data of P-RESYNC (restart) indication.	U10
RESRP	Restart response PDU, in user data of P-RESYNC (restart) confirm.	U10
REARQ	Read request PDU.	U2
WRTRQ	Write request PDU.	U3
DATIN	data value in user context (not syntactically classed as a PDU).	U2, U3

A.4.2.2 Incoming events from the internal file service user

I-CANRP	F-CANCEL response primitive.
I-CANRQ	F-CANCEL request primitive.
I-CHKRQ	F-CHECK request primitive.
I-CHKRP	F-CHECK response primitive
I-DATRQ	F-DATA request primitive.
I-DAERQ	F-DATA-END request primitive.
I-REARQ	F-READ request primitive.
I-RESRQ	F-RESTART request primitive.
I-RESRP	F-RESTART response primitive
I-TRERQ	F-TRANSFER-END request primitive.
I-TRERP	F-TRANSFER-END response primitive
I-WRTRQ	F-WRITE request primitive.

A.4.2.3 Incoming events from the presentation service provider

P-SYMIN	P-SYNC-MINOR indication primitive.
P-SYMCF	P-SYNC-MINOR confirm primitive.
P-TOKIN	P-TOKEN-GIVE indication with minor-sync. token.

A.4.3 Outgoing events — bulk data transfer

A.4.3.1 Outgoing events — PDUs

CANRP	Cancel response PDU (in user data of P-RESYNC(abandon) response if resync functional unit has been negotiated)
CANRQ	Cancel request PDU (in user data of P-RESYNC(abandon) request if resync functional unit has been negotiated)
DAERQ	Data end request PDU
TRERP	Transfer end response PDU
TRERQ	Transfer end request PDU
RESRQ	Restart request PDU, in user data of P-RESYNC(restart) request
RESRP	Restart response PDU, in user data of P-RESYNC(restart) response
REARQ	Read request PDU
WRTRQ	Write request PDU

A.4.3.2 Outgoing events to the internal file service user

I-CANCF	F-CANCEL confirm primitive
I-CANIN	F-CANCEL indication primitive
I-CHKIN	F-CHECK indication primitive
I-CHKCF	F-CHECK confirm primitive
I-DATIN	F-DATA indication primitive

I-DAEIN	F-DATA-END indication primitive
I-REAIN	F-READ indication primitive
I-RESIN	F-RESTART indication primitive
I-RESCF	F-RESTART confirm primitive
I-TREIN	F-TRANSFER-END indication primitive
I-TRECF	F-TRANSFER-END confirm primitive
I-WRTIN	F-WRITE indication primitive

A.4.3.3 Outgoing events to the presentation service provider

P-SYMRQ	P-SYNC-MINOR request primitive
P-SYMRP	P-SYNC-MINOR response primitive
P-DATRQ	P-DATA request primitive
P-TOKRQ	P-TOKEN-GIVE request primitive with minor-synch token

A.4.3.4 Outgoing events to the local system

L-ERRABT	Local signal indicating an error leading to abort

A.4.4 Specific actions — bulk data transfer

[2] Add a PDU to the current PSDU and terminate the current PSDU.

[15] Preserve the PDU for further processing

[16] Add a PDU to the current PSDU and optionally terminate the current PSDU, according to local decision.

[17] Use for the sync point serial number, the checkpoint received plus the offset.

[18] Add the data given on the F-DATA request to the current PSDU. Optionally (depending upon local system considerations) terminate the PSDU.

[19] Use for the checkpoint, the sync point serial number received minus the offset.

[21] Unset discard indicator.

[22] Set discard indicator and set the outstanding checkpoint counter to zero.

[23] Discard any user data not yet delivered and set outstanding checkpoint counter to zero.

[24] Add 1 to the NSPN.

[25] Terminate the current PSDU.

[26] If Presentation resynchronize functional unit is available, send PDU as user data on a P-RESYNC(abandon) request or response primitive; otherwise add PDU to the current PSDU and terminate the current PSDU.

[27] Increment the checkpoint identifier expected.

[29] Increment the outstanding checkpoint counter.

[30] Decrement the outstanding checkpoint counter according to the checkpoint number confirmed (see 15.3.2).

[44] Increment the bulk data transfer number.

[45] Set the checkpoint identifier expected to the value negotiated plus one.

[46] PDU with the checkpoint identifier is sent as user data on a P-RESYNC(restart) response primitive with sync point serial number equal to those received on the P-RESYNC indication.

[47] Preserve the primitive parameters for subsequent precessing. In some states, it happens that when F-CANCEL primitive is preserved, there is already an F-RESTART primitive preserved: in this case, the F-RESTART primitive shall be discarded.

[48] Set the checkpoint identifier expected to 1.

[49] Set the synchronization offset to the value of the NSPN minus the checkpoint identifier expected. ((In a bulk data transfer that does not involve recovery, the checkpoint identifier is zero, at this point in the protocol).

[50] PDU is sent as user data on a P-RESYNCH (restart) request, with a synchronization point serial number equal to the sum of the checkpoint identifier, on the F-RESTART primitive, and the synchronization offset plus 1.

[51] The checkpoint identifier shall be equal to the value received on the PDU.

[52] Set the NSPN equal to the synch point serial number negotiated with the presentation service provider.

[53] Store the synchronization point serial number provided by the presentation service provider as NSPN.

A.4.5 Predicates — bulk data transfer

P8: The context is not within the defined context set.

P13: The transfer service class has been negotiated and the bulk data transfer number is greater than 1.

P14: The synchronization point exceeds 999 998, exceeding the session service limitation.

P15: Discard indicator is set.

P20: The resync functional unit has been negotiated.

P21: The sync-minor functional unit has been negotiated.

P22: The entity possesses the sync-minor token.

P27: The outstanding checkpoint counter exceeds the agreed maximum.

P41: The expected checkpoint identifier equals the sync point serial number received minus the offset.

A.4.6 Initiating state table — bulk data transfer

STATE / EVENT	DXFRIDLE	DXFRIDLE-REC	REA-SYMIN-PD	RES-SYMIN-PD	CAN-SYMIN-PD	READ	I-READ-ENDING	R-XFER-ENDING	P-TOKEN-PD	WRT-SYMCF-PD	RES-SYMCF-PD	CAN-SYMCF-PD	WRITE	I-WRITE-ENDING	W-XFER-ENDING	CANCEL-PD	I-CANCEL-PD	RRESTART-PD	WRESTART-PD	I-RRESTART-PD	I-WRESTART-PD	RESTART-CAN-PD
I-REARQ	1	35																				
I-WRTRQ	2	36																				
P-TOKIN	42								3							42						
I-DATRQ										4			4									
I-DAERQ										5			5									
DATIN						6										41		41				
DAERQ						8										41		41				
I-TRERQ							9							10								
TRERP								11							3							
I-CANRQ			31	31		12	12			34	34		12					38	38	12	12	
CANRP																13						
CANRQ						14				14			14	14	14	15		14	14	14	14	39
I-CANRP																	16					
I-CHKRQ										17			17									
P-SYMCF										32	22	12	18	37	37	41						
P-SYMIN			29	21	12	19										41						
I-CHKRP						20	20															
I-RESRQ			30			21	21			33			22									
RESRP																		23	24			40
RESRQ						25				26			26	26	26			43	44			
I-RESRP																				27	28	

A.4.7 Initiating entity state table (Part 3) — detailed entries

1:		[44],	
	~P13 & P21:	REARQ[2],P-TOKRQ,[48],[49]	⇒ REA-SYMIN-PD
	~P13 & ~P21:	REARQ[2]	⇒ READ
	P13:	L-ERRABT	⇒ *same state*
2:		[44],	
	P13:	L-ERRABT	⇒ *same state*
	~P13 & ~P21:	WRTRQ[16]	⇒ WRITE
	~P13 & P21:	WRTRQ[2],[24],	
	~P13 & P14 & P21:	L-ERRABT	⇒ *same state*
	~P13 & ~P14 & P21	P-SYMRQ,[48],[49]	⇒ WRT-SYMCF-PD
3:		I-TRECF	⇒ DXFRIDLE
4:	~P8:	P-DATRQ[18]	⇒ *same state*
	P8:	L-ERRABT	⇒ *same state*
5:		DAERQ[16]	⇒ I-WRITE-ENDING
6:	P15:		⇒ *same state*
	~P15:	I-DATIN	⇒ *same state*
8:	P15:		⇒ *same state*
	~P15:	I-DAEIN	⇒ I-READ-ENDING
9:		TRERQ[2]	⇒ R-XFER-ENDING

10:		TRERQ[2]	⇒ W-XFER-ENDING
11:	P21: ~P21:	[15] I-TRECF	⇒ P-TOKEN-PD ⇒ DXFRIDLE
12:		[22],[23],CANRQ[26]	=CANCEL-PD
13:	P20:	[53], [21],I-CANCF	⇒ DXFRIDLE
14:	P20:	[53], [22],[23], I-CANIN	⇒ I-CANCEL-PD
15:	P20:	CANRP[26],[53], [21],I-CANCF	⇒ DXFRIDLE
16:	P20:	[53], CANRP[26],[21]	⇒ DXFRIDLE
17:	 ~P14: P14:	[25],[27],[24], P-SYMRQ L-ERRABT	 ⇒ *same state* ⇒ *same state*
18:		I-CHKCF[19]	⇒ *same state*
19:	 ~P27 & P41: P27 | ~P41:	[29], I-CHKIN,[24],[27] L-ERRABT	 ⇒ *same state* ⇒ *same state*
20:		[30],P-SYMRP[17]	⇒ *same state*
21:		[22],RESRQ[50]	⇒ RRESTART-PD
22:		[22],RESRQ[50]	⇒ WRESTART-PD
23:		[52],[45],[49],[21],I-RESCF	⇒ READ
24:		[52],[45],[49],[21],I-RESCF	⇒ WRITE
25:		[23],I-RESIN	⇒ I-RRESTART-PD
26:		I-RESIN	⇒ I-WRESTART-PD
27:		[52],[45],[49],RESRP[46]	⇒ READ
28:		[52],[45],[49],RESRP[46]	⇒ WRITE
29:		[24],[49],P-SYMRP	⇒ READ
30:		[47],[22]	⇒ RES-SYMIN-PD
31:		[47],[22]	⇒ CAN-SYMIN-PD
32:		[49]	⇒ WRITE
33		[47],[22]	⇒ RES-SYMCF-PD
34:		[47],[22]	⇒ CAN-SYMCF-PD
35:		REARQ[2],P-TOKRQ,[49]	⇒ REA-SYMIN-PD
36:	 P14: ~P14:	WRTRQ[2],[24], L-ERRABT P-SYMRQ,[49]	 ⇒ *same state* ⇒ WRT-SYMCF-PD
37:		I-CHKCF[19]	⇒ *same state*
38:		[47]	⇒ RESTART-CAN-PD
39:	P20:	[52], [21],I-CANCF,CANRP[26]	⇒ DXFRIDLE
40:		CANRQ[26]	⇒ CANCEL-PD

41:		⇒ *same state*
42:		⇒ *same state*
43:	[52],[45],[49],[21],I-RESCF,RESRP[46]	⇒ READ
44:	[52],[45],[49],[21],I-RESCF,RESRP[46]	⇒ WRITE

NOTE – The entries 38, 39, 40 are due to the Session service behaviour in the resynchronize management, in collision cases.

A.4.8 Responding entity state table — bulk data transfer

STATE / EVENT	DXFR IDLE	DXFR IDLE-REC	P-TOKEN-PD	REA-SYMCF-PD	RES-SYMCF-PD	CAN-SYMCF-PD	READ	READ-ENDING	I-R-XFR-ENDING	WRT-SYMIN-PD	RES-SYMIN-PD	CAN-SYMIN-PD	WRITE	WRITE-ENDING	I-W-XFR-ENDING	CANCEL-PD	I-CANCEL-PD	RRESTART-PD	WRESTART-PD	I-RRESTART-PD	I-WRESTART-PD	RESTART-CAN-PD
REARQ	1	36																				
WRTRQ	2	37																				
P-TOKIN			3																			
I-DATRQ				4			4															
I-DAERQ				5			5															
DATIN													6			42			42			
DAERQ													8			42			42			
TRERQ								9						10		42			42			
I-TRERP									11						43							
I-CANRQ				30	30		12			33	33		12	12	12			39	39	12	12	
CANRP																13						
CANRQ				14	14		14	14					14			44		14	14	14	14	40
I-CANRP																	15					
I-CHKRQ				16			16															
P-SYMCF				28	20	12	18	38								42						
P-SYMIN										31	34	35	17			42						
I-CHKRP													19	19								
I-RESRQ				29			29			32			21	21	21							
RESRP																		22	23			41
RESRQ				24			24	24	24				25					45	46			
I-RESRP																				26	27	

A.4.9 Responding entity state table (Part 3) — detailed entries

1:		[44],	
	~P13 & P21:	[15],[48],[49]	⇒ P-TOKEN-PD
	~P13 & ~P21:	I-REAIN	⇒ READ
	P13:	L-ERRABT	⇒ *same state*
2:		[44],	
	~P13 & P21:	I-WRTIN,[48],[49]	⇒ WRT-SYMIN-PD
	~P13 & ~P21:	I-WRTIN	⇒ WRITE
	P13:	L-ERRABT	⇒ *same state*
3:		I-REAIN,[24],	
	~P14:	P-SYMRQ	⇒ READ-SYMCF-PD
	P14:	L-ERRABT	⇒ *same state*
4:	~P8:	P-DATRQ[18]	⇒ *same state*
	P8:	L-ERRABT	⇒ *same state*
5:		DAERQ[2]	⇒ READ-ENDING
6:	P15:		⇒ *same state*
	~P15:	I-DATIN	⇒ *same state*
8:	P15:		⇒ *same state*
	~P15:	I-DAEIN	⇒ WRITE-ENDING

9:	P15:		⇒ *same state*
	~P15:	I-TREIN	⇒ I-R-XFR-ENDING
10:	P15:		⇒ *same state*
	~P15:	I-TREIN	⇒ I-W-XFR-ENDING
11:	P21:	TRERP[2],P-TOKRQ	⇒ DXFRIDLE
	~P21:	TRERP[2]	⇒ DXFRIDLE
12:		[22],[23],CANRQ[26]	⇒ CANCEL-PD
13:	P21 & P22 & ~P20:	P-TOKRQ,	
	P20:	[53], [21],I-CANCF	⇒ DXFRIDLE
14:	P20:	[53], [22],[23],I-CANIN	⇒ I-CANCEL-PD
15:	P21 & P22 & ~P20:	P-TOKRQ,	
	P20:	[53], CANRP[26],[21]	⇒ DXFRIDLE
16:		[25],[27],[24]	
	~P14:	P-SYMRQ	⇒ *same state*
	P14:	L-ERRABT	⇒ *same state*
17:		[29],	
	~P27 & P41:	I-CHKIN,[24],[27]	⇒ *same state*
	P27 | ~P41:	L-ERRABT	⇒ *same state*
18:		I-CHKCF[19]	⇒ *same state*
19:		[30],P-SYMRP[17]	⇒ *same state*
20:		[22],RESRQ[50]	⇒ RRESTART-PD
21:		[22],RESRQ[50]	⇒ WRESTART-PD
22:		[52],[45],[49],[21],I-RESCF	⇒ READ
23:		[52],[45],[49],[21],I-RESCF	⇒ WRITE
24:		I-RESIN	⇒ I-RRESTART-PD
25:		[23],I-RESIN	⇒ I-WRESTART-PD
26:		[52],[45],[49],RESRP[46]	⇒ READ
27:		[52],[45],[49],RESRP[46]	⇒ WRITE
28:		[49]	⇒ READ
29:		[22],[47]	⇒ RES-SYMCF-PD
30:		[22],[47]	⇒ CAN-SYMCF-PD
31:		[24],[49],P-SYMRP	⇒ WRITE
32:		[22],[47]	⇒ RES-SYMIN-PD
33:		[22],[47]	⇒ CAN-SYMIN-PD
34:		[24],P-SYMRP,[22],RESRQ[50]	⇒ WRESTART-PD
35:		[24],P-SYMRP,[22],CANRQ[26]	⇒ CANCEL-PD
36:		[15],[49]	⇒ P-TOKEN-PD
37:		I-WRTIN,[49]	⇒ WRT-SYMIN-PD
38:		I-CHKCF[19]	⇒ *same state*
39:		[22],[47]	⇒ RESTART-CAN-PD

40:	P21 & P22 & ~P20: P20:	P-TOKRQ, [53], [21],I-CANCF,CANRP[26]	⇒ DXFRIDLE
41:		CANRQ[26]	⇒ CANCEL-PD
42:			⇒ *same state*
43:		TRERP[2]	⇒ DXFRIDLE
44:	P21 & P22&~P20: P20:	P-TOKRQ, [53],CANRP[26], [21],I-CANCF	⇒ DXFRIDLE
45:		[52],[45],[49],[21],I-RESCF[51],RESRP[46]	⇒ READ
46:		[52],[45],[49],[21],I-RESCF,RESRP[46]	⇒ WRITE

NOTE – The entries 14, 39, 40, 41, 45, and 46 are due to the Session service behaviour in the resynchronize management, in collision cases.

A.5 File error recovery protocol machine (FERPM)

NOTE – The description of the file error recovery protocol machine given here omits the description of grouping, which does not materially affect the recovery behaviour. The transitions for the grouped cases can be derived from those in the basic protocol machine.

A.5.1 States — file error recovery

INIT-PD	Initialize pending, wait for an I-INICF event as an F-INITIALIZE confirm primitive from the IFS.
PASSIVE	The basic file protocol is currently in operation but no transfer of file contents is in progress. It is used when the FERPM becomes inactive in normal error free activity, or when it cannot provide its services any more after issuing an L-ERRABT signal.
XFER-IDLE	Data transfer idle.
XFER	Normal transfer of file contents has been established.
RESTART-PD	Restart pending, wait for an I-RESCF event as an F-RESTART confirm primitive from the IFS.
RESTART	A restart of a data transfer is in progress. A checkpoint identifier has been negotiated, and data following that checkpoint, but prior to the error, is being retransmitted.
CANCEL-PD	Cancel pending, wait for an I-CANCF event as an F-CANCEL confirm primitive from the IFS.
CLOSE-EX	Close expected, wait for an I-CLOIN event as an F-CLOSE indication primitive from the IFS.
DESELECT-EX	Deselect expected, wait for an I-DESIN event as an F-DESELECT indication primitive from the IFS.
RECOVER-PD	Recover pending, wait for an I-RECCF event as an F-RECOVER confirm primitive from the IFS.
SEL-PD	SELECT pending, wait for an I-SELCF event as an F-SELECT confirm primitive from the IFS.
OPN-PD	OPEN pending, wait for an I-OPNCF event as an F-OPEN confirm primitive from the IFS.
SEL-EX	SELECT expected, wait for an I-SELIN event as an F-SELECT indication primitive from the IFS.
OPN-EX	OPEN expected, wait for an I-OPNIN event as an F-OPEN indication primitive from the IFS.
XFER-EX	Data transfer expected, wait for an I-REAIN/I-WRTIN as an F-READ/F-WRITE indication primitive from the IFS.
INIT-EX	Initiation expected, wait for an I-ININ event as an F-INITIALIZE indication primitive from the IFS.
CLOSE-PD	Close pending, wait for an I-CLOCF event as an F-CLOSE confirm primitive from the IFS.
DESELECT-PD	Deselect pending, wait for an I-DESCF event as an F-DESELECT confirm primitive from the IFS.

A.5.2 Incoming events — file error recovery

A.5.2.1 Incoming events from the external file service user

F-OPNRQ	F-OPEN request primitive
F-CLORQ	F-CLOSE request primitive
F-REARQ	F-READ request primitive
F-WRTRQ	F-WRITE request primitive
F-DATRQ	F-DATA request primitive
F-DAERQ	F-DATA-END request primitive
F-TRERQ	F-TRANSFER-END request primitive
F-ANYRQ	F-INITIALIZE, F-READ-ATTRIBUTE, F-CHANGE-ATTRIBUTE, F-SELECT, F-CREATE, F-DESELECT, F-LOCATE, F-ERASE, F-BEGIN-GROUP, F-END-GROUP, F-TERMINATE, F-LIST, F-CHANGE-PREFIX, F-GROUP-SELECT, F-GROUP-COPY, F-GROUP-MOVE, F-GROUP-LIST, F-LINK, F-CREATE-DIRECTORY, F-SELECT-ANOTHER, F-UNLINK, F-GROUP-DELETE and F-U-ABORT request primitives
F-OPNRP	F-OPEN response primitive
F-CLORP	F-CLOSE response primitive

F-TRERP	F-TRASNSFER-END response primitive
F-ANYRP	F-INITIALIZE, F-READ-ATTRIBUTE, F-CHANGE-ATTRIBUTE, F-SELECT, F-CREATE, F-DESELECT, F-LOCATE, F-ERASE, F-BEGIN-GROUP, F-TERMINATE, F-LIST, F-CHANGE-PREFIX, F-GROUP-SELECT, F-GROUP-COPY, F-GROUP-MOVE, F-GROUP-LIST, F-LINK, F-CREATE-DIRECTORY, F-SELECT-ANOTHER, F-UNLINK, F-GROUP-DELETE and F-END-GROUP response primitives
F-CANRQ	F-CANCEL request primitive
F-CANRP	F-CANCEL response primitive

A.5.2.2 Incoming events from the internal file service

I-INICF	F-INITIALIZE confirm primitive
I-OPNCF	F-OPEN confirm primitive
I-CLOCF	F-CLOSE confirm primitive
I-DATIN	F-DATA indication primitive
I-DAEIN	F-DATA-END indication primitive
I-CHKIN	F-CHECK indication primitive
I-CHKCF	F-CHECK confirm primitive
I-TRECF	F-TRANSFER-END confirm primitive
I-ANYCF	F-INITIALIZE, F-READ-ATTRIBUTE, F-CHANGE-ATTRIBUTE, F-SELECT, F-CREATE, F-DELESELECT, F-LOCATE, F-ERASE, F-BEGIN-GROUP, F-TERMINATE, F-LIST, F-CHANGE-PREFIX, F-GROUP-SELECT, F-GROUP-COPY, F-GROUP-MOVE, F-GROUP-LIST, F-LINK, F-CREATE-DIRECTORY, F-SELECT-ANOTHER, F-UNLINK, F-GROUP-DELETE and F-END-GROUP confirm primitive
I-SELCF	F-SELECT confirm primitive
I-DESCF	F-DESELECT confirm primitive
I-INIIN	F-INITIALIZE indication primitive
I-SELIN	F-SELECT indication primitive
I-DESIN	F-DESELECT indication primitive
I-OPNIN	F-OPEN indication primitive
I-CLOIN	F-CLOSE indication primitive
I-TREIN	F-TRANSFER-END indication primitive
I-CANIN	F-CANCEL indication primitive
I-CANCF	F-CANCEL confirm primitive
I-PABIN	F-P-ABORT indication primitive
I-RECCF	F-RECOVER confirm primitive
I-RESCF	F-RESTART confirm primitive
I-RECIN	F-RECOVER indication primitive
I-RESIN	F-RESTART indication primitive
I-ANYIN	F-INITIALIZE, F-READ-ATTRIBUTE, F-CHANGE-ATTRIBUTE, F-SELECT, F-CREATE, F-DESELECT, F-LOCATE, F-ERASE, F-BEGIN-GROUP, F-END-GROUP, F-TERMINATE, F-LIST, F-CHANGE-PREFIX, F-GROUP-SELECT, F-GROUP-COPY, F-GROUP-MOVE, F-GROUP-LIST, F-LINK, F-CREATE-DIRECTORY, F-SELECT-ANOTHER, F-UNLINK, F-GROUP-DELETE, F-U-ABORT and F-P-ABORT indication primitives
I-REAIN	F-READ indication primitive
I-WRTIN	F-WRITE indication primitive

A.5.2.3 Incoming events from the Local System Environment

L-ERROR1	Class I error (as defined in 18.1)

L-ERROR2	Class II error (as defined in 18.1)
L-ERROR3	Class III error (as defined in 18.1)
L-GIVEUP	Signal to give up recovery process
L-DATRQ	Reissued F-DATA request primitive
L-CHKRQ	Reissued F-CHECK request primitive
L-DAERQ	Reissued F-DATA-END request primitive
L-EORIN	Indicates that all checkpoint identifiers and "data end" markers in the docket have been used, and all data to be resent have been sent.
L-HOLD	Signal to the FERPM to hold any primitive from the external user for later processing
L-UNHOLD	Signal to FERPM to process any previous held primitives

A.5.3 Outgoing events — file error recovery

A.5.3.1 Outgoing events to the external file service user

F-OPNCF	F-OPEN confirm primitive
F-ANYCF	F-INITIALIZE, F-READ-ATTRIBUTE, F-CHANGE-ATTRIBUTE, F-SELECT, F-CREATE, F-DESELECT, F-LOCATE, F-ERASE, F-TERMINATE, F-LIST, F-CHANGE-PREFIX, F-GROUP-SELECT, F-GROUP-COPY, F-GROUP-MOVE, F-GROUP-LIST, F-LINK, F-CREATE-DIRECTORY, F-SELECT-ANOTHER, F-UNLINK, F-GROUP-DELETE, F-BEGIN-GROUP and F-END-GROUP confirm primitives
F-CLOCF	F-CLOSE confirm primitive
F-DATIN	F-DATA indication primitive
F-DAEIN	F-DATA-END indication primitive
F-TRECF	F-TRANSFER-END confirm primitive
F-OPNIN	F-OPEN indication primitive
F-WRTIN	F-WRITE indication primitive
F-CLOIN	F-CLOSE indication primitive
F-REAIN	F-READ indication primitive
F-TREIN	F-TREANSFER-END indication primitive
F-ANYIN	F-INITIALIZE, F-READ-ATTRIBUTE, F-CHANGE-ATTRIBUTE, F-SELECT, F-CREATE, F-DESELECT, F-LOCATE, F-ERASE, F-TERMINATE, F-LIST, F-CHANGE-PREFIX, F-GROUP-SELECT, F-GROUP-COPY, F-GROUP-MOVE, F-GROUP-LIST, F-LINK, F-CREATE-DIRECTORY, F-SELECT-ANOTHER, F-UNLINK, F-GROUP-DELETE, F-BEGIN-GROUP, F-END-GROUP, F-U-ABORT and F-P-ABORT indication primitives
F-PABIN	F-P-ABORT indication primitive
F-CANIN	F-CANCEL indication primitive
F-CANCF	F-CANCEL confirm primitive

A.5.3.2 Outgoing events to the internal file service

I-SELRQ	F-SELECT request primitive
I-OPNRQ	F-OPEN request primitive
I-CLORQ	F-CLOSE request primitive
I-DATRQ	F-DATA request primitive
I-DAERQ	F-DATA-END request primitive
I-CHKRQ	F-CHECK request primitive
I-TRERQ	F-TRANSFER-END request primitive
I-REARQ	F-READ request primitive
I-WRTRQ	F-WRITE request primitive

I-ANYRQ	F-INITIALIZE, F-READ-ATTRIBUTE, F-CHANGE-ATTRIBUTE, F-SELECT, F-CREATE, F-DESELECT, F-LOCATE, F-ERASE, F-TERMINATE, F-LIST, F-CHANGE-PREFIX, F-GROUP-SELECT, F-GROUP-COPY, F-GROUP-MOVE, F-GROUP-LIST, F-LINK, F-CREATE-DIRECTORY, F-SELECT-ANOTHER, F-UNLINK, F-GROUP-DELETE , F-BEGIN-GROUP, F-END-GROUP and F-U-ABORT request primitives
I-INIRP	F-INITIALIZE response primitive
I-OPNRP	F-OPEN response primitive
I-SELRP	F-SELECT response primitive
I-CLORP	F-CLOSE response primitive
I-TRERP	F-TRANSFER-END response primitive
I-ANYRP	F-INITIALIZE, F-READ-ATTRIBUTE, F-CHANGE-ATTRIBUTE, F-SELECT, F-CREATE, F-DESELECT, F-LOCATE, F-ERASE, F-TERMINATE, F-LIST, F-CHANGE-PREFIX, F-GROUP-SELECT, F-GROUP-COPY, F-GROUP-MOVE, F-GROUP-LIST, F-LINK, F-CREATE-DIRECTORY, F-SELECT-ANOTHER, F-UNLINK, F-GROUP-DELETE, F-BEGIN-GROUP and F-END-GROUP response primitives
I-CHKRP	F-CHECK response primitive
I-RESRQ	F-RESTART request primitive
I-RESRP	F-RESTART response primitive
I-CANRQ	F-CANCEL request primitive
I-CANRP	F-CANCEL response primitive
I-DESRQ	F-DESELECT request primitive
I-RECRQ	F-RECOVER request primitive
I-INIRQ	F-INITIALIZE request primitive
I-RECRP	F-RECOVER response primitive
I-DESRP	F-DESELECT response primitive

A.5.3.3 Outgoing events to the local system environment

L-ERROR2	Signal indicating class II error
L-ERROR3	Signal indicating class III error
L-RESEND	Resend data request to the local system
L-STPSND	Stop resending data and checkpoint requests to the local system
L-SUSPND	Suspend issuing of F-DATRQ, F-DAERQ by the local system
L-RESUME	Resume issuing of F-DATRQ, F-DAERQ by the local system
L-ERRABT	Signal FPM to issue an F-P-ABORT request PDU, with permanent error value.
L-PABORT	Signal FPM to issue a F-P-ABORT request PDU, and a F-P-ABORT indication primitive to the FERPM, both with transient error value.
L-HOLD	Hold primitives from external user
L-UNHOLD	Process any held primitives

A.5.4 Specific actions — file error recovery

[54] Mark the checkpoint identifiers to be reissued.

[55] Delete the docket.

[56] Set the activity state indicator to "finished".

[57] Set the activity state indicator to "in-progress".

[58] Set the activity type indicator to "read".

[59] Set the activity type indicator to "write".

[60] Add the checkpoint identifier to the list in the docket. Increment the count of outstanding checkpoints by one.

[61] Delete from the docket all checkpoint identifiers smaller than the parameter in the primitive received or issued. Decrement the count of outstanding checkpoints by the number of the deleted identifiers.

[63] Set the activity state indicator to "starting".

[64] Set the activity state indicator to "data transfer finished".

[66] Use the last checkpoint identifier in the docket as the parameter.

[67] Increment the checkpoint identifier count.

[68] Set the checkpoint identifier count to zero.

[69] Record the bulk data transfer number in the docket (the number is maintained by the FPM).

[70] Record which data values have been already delivered to the user.

[71] Use as the parameter the checkpoint identifier available in the docket that is both

a) after the checkpoint identifier negotiated, and
b) not yet reissued during this restart of the BDT.

[72] Use as parameter the checkpoint identifier.

[73] Use as the parameter the oldest (first) checkpoint identifier in the list in the docket.

[74] Use as the parameter the checkpoint identifier of the primitive received.

[75] Use as the diagnostics parameter "activity identifier unknown".

[76] Record which data values have been sent.

[77] Create a docket and record in it the activity identifier, the information needed to issue or check an I-INIRQ (including the locations of the initiator and responder), the recovery mode, the access context, the presentation context, a null checkpoint list and set the activity state indicator to "starting".

[78] The issuer of the I-RESRQ or I-RECRQ primitive identifies a checkpoint identifier which is

a) for the sender, the last point acknowledged,
b) for the receiver, the last point received and secured.

[79] The issuer of the I-RESRP primitive identifies a checkpoint identifier which is

c) for the sender, equal to the value provided by the issuer of the request, and
d) for the receiver, the last point received and secured.

[200] Wait for $2^{\text{Recommended retry time}}$ seconds.

[201] Include a state result indicating failure.

[202] Use the data value specified by the L-DATRQ signal, representing previous F-DATA request primitives, as the parameter.

[203] Use as the parameter the checkpoint identifier negotiated.

[204] Store "data end" marker in the docket.

[206] Delete "data end" marker in the docket.

[207] Include an action result indicating transient error.

[209] Recreate select and open regimes.

[210] Include a action result indicating failure on next response with diagnostic of damage to open/select regime.

[211] Include a diagnostic of damage to open/select regime.

[212] Use as the parameter the bulk data transfer number recorded in the docket.

[213] Store "transfer end" marker (reflecting information on the PDU) in the docket.

[214] Delete "transfer end" marker from docket.

[215] Clear activity type indicator.

[216] Clear the activity state indicator.

A.5.5 Predicates — file error recovery

P23: The incoming response or confirm primitive has a state result indicating success.

P24: There are checkpoints that must be confirmed.

P26: An F-DATA indication primitive corresponding to the incoming I-DATIN has already been issued to the user.

P28: The data value available is after the negotiated checkpoint.

P29: The activity state indicator is set to "in-progress" and the activity type indicator to "read".

P30: The activity state indicator is set to "in-progress" and the activity type indicator to "write".

P31: The activity type indicator is set to "read".

P32: The activity type indicator is set to "write".

P33: The activity state indicator is set to "starting".

P34: The activity state indicator is set to "finished".

P37: A checkpoint identifier is to be inserted in the data stream.

P39: The entity has the docket for the activity identifier recovered, the current initiator matches the location, and the activity can be resumed.

P40: The entity is sender of data.

P99: The transfer service class has been negotiated.

P100: The recommended retry time field is present on the diagnostic parameter.

P101: The specified recovery is possible and is required.

P102: The specified association is possible.

P103: The incoming request or indication primitive has an action result indicating transient error.

P104: The "transfer end" marker is stored in the docket.

P105: The activity state indicator is set to "data transfer finished".

P106: The "data end" marker is stored in the docket.

A.5.6 Initiating entity state table — FERPM — (normal procedure)

STATE / EVENT	PASSIVE	XFER-IDLE	XFER
F-OPNRQ	1		
I-OPNCF	2		
F-ANYRQ	3	3	
I-ANYCF	4	4	
F-CLORQ		5	
I-CLOCF		6	
F-REARQ		7	
F-WRTRQ		8	
F-DATRQ			9
I-DATIN			10
I-CHKCF			11
I-CHKIN			12
F-DAERQ			13
I-DAEIN			14
F-TRERQ			15
I-TRECF			16
F-CANRQ			17
I-CANCF			18
I-CANIN			19
F-CANRP			20

A.5.7 Initiating entity state table — FERPM — detailed entries (normal procedure)

1:		[77],I-OPNRQ	⇒ *same state*
2:	P23:	F-OPNCF	⇒ XFER-IDLE
	~P23:	[55],F-OPNCF[201]	⇒ *same state*
3:		I-ANYRQ	⇒ *same state*
4:		F-ANYCF	⇒ *same state*
5:		[56],I-CLORQ	⇒ *same state*
6:		[55],F-CLOCF	⇒ PASSIVE
7:		[57],[58],[68],I-REARQ,[69]	⇒ XFER
8:		[57],[59],[68],I-WRTRQ,[69]	⇒ XFER
9:	P37:	[67],[60],I-CHKRQ[72], [76],I-DATRQ	⇒ *same state*
10:		[70],F-DATIN	⇒ *same state*
11:		[61]	⇒ *same state*
12:	P24:	[60], I-CHKRP,[61],	⇒ *same state*
13:		[204],I-DAERQ	⇒ *same state*
14:	P24:	I-CHKRP[66],[61], [204],F-DAEIN	⇒ *same state*

15:	P29:	[64], [213],I-TRERQ	⇒ *same state*
16:	~P99: P99:	[63], [64], [215],[206],[214],F-TRECF	⇒ XFER-IDLE
17:		I-CANRQ	⇒ *same state*
18:		[215],[216],[206],[214],F-CANCF	⇒ XFER-IDLE
19:		F-CANIN	⇒ *same state*
20:		[215],[216],[206],[214],I-CANRP	⇒ XFER-IDLE

A.5.8 Responding entity state table — FERPM — (normal procedure)

STATE / EVENT	PASSIVE	XFER-IDLE	XFER
I-OPNIN	1		
F-OPNRP	2		
F-ANYRP	3	3	
I-ANYIN	4	4	
I-CLOIN		5	
F-CLORP		6	
I-REAIN		7	
I-WRTIN		8	
F-DATRQ			9
I-DATIN			10
I-CHKCF			11
I-CHKIN			12
F-DAERQ			13
I-DAEIN			14
I-TREIN			15
F-TRERP			16
F-CANRQ			17
I-CANCF			18
I-CANIN			19
F-CANRP			20

A.5.9 Responding entity state table — FERPM — detailed entries (normal procedure)

1:		[77],F-OPNIN	⇒ *same state*
2:	P23:	I-OPNRP	⇒ XFER-IDLE
	~P23:	[55],I-OPNRP[201]	⇒ *same state*
3:		I-ANYRP	⇒ *same state*
4:		F-ANYIN	⇒ *same state*
5:	~P103:	[56],F-CLOIN	⇒ *same state*
6:		[55],I-CLORP	⇒ PASSIVE
7:		[57],[58],[68],F-REAIN,[69]	⇒ XFER
8:		[57],[59],[68],F-WRTIN,[69]	⇒ XFER
9:	P37:	[67],[60],I-CHKRQ[72], [76],I-DATRQ	⇒ *same state*
10:		[70],F-DATIN	⇒ *same state*
11:		[61]	⇒ *same state*
12:	P24:	[60], I-CHKRP,[61],	⇒ *same state*
13:		[204],I-DAERQ	⇒ *same state*
14:	P24:	I-CHKRP[66],[61], [204],F-DAEIN	⇒ *same state*

15:	P29:	[64], [213],F-TREIN	⇒ *same state*
16:	~P99: P99:	[63], [64], [213],[214],[206],I-TRERP	⇒ XFER-IDLE
17:		I-CANRQ	⇒ *same state*
18:		[215],[216],[206],[214],F-CANCF	⇒ XFER-IDLE
19:		F-CANIN	⇒ *same state*
20:		[215],[216],[206],[214],I-CANRP	⇒ XFER-IDLE

NOTE – The condition P103 in entry 6 is handled in A.5.17 (in entry 16).

A.5.10 Initiating entity state table — FERPM — (class I errors)

STATE / EVENT	XFER	RESTART-PD	RESTART
L-ERROR1	1		1
I-RESCF		2	
I-RESIN	3		
I-DATIN			4
I-CHKCF			6
I-DAEIN			7
L-DATRQ			9
L-CHKRQ			10
L-DAERQ			11
L-EORIN			12
I-CANIN		13	13
I-CANCF		14	14
F-CANRQ		15	15
F-CANRP		16	16

A.5.11 Initiating entity state table — FERPM — detailed entries (class I errors)

1:	P101 & P40:	L-SUSPND,I-RESRQ[78]	⇒ RESTART-PD
	P101 & ~P40:	I-RESRQ[78]	⇒ RESTART-PD
	~P101:	L-ERROR2	⇒ XFER
2:	~P40:	[61]	⇒ RESTART
	P40:	[54],[61],L-RESEND[74]	⇒ RESTART
3:	~P40:	I-RESRP[79]	⇒ RESTART
	P40:	L-SUSPND,[54],[61],I-RESRP[79],L-RESEND[203]	⇒ RESTART
4:	P26:		⇒ *same state*
	~P26:	F-DATIN	⇒ XFER
6:		[61]	⇒ *same state*
7:	P24:	I-CHKRP[66],[61],	
	~P106:	F-DAEIN	⇒ XFER
	P106 & ~P104:	L-UNHOLD	⇒ XFER
	P106 & P104:	L-UNHOLD, I-TRERQ	⇒ XFER
9:	P28:	I-DATRQ[202]	⇒ *same state*
	~P28:		⇒ *same state*
10:		I-CHKRQ[71]	⇒ *same state*
11:		I-DAERQ, L-UNHOLD	⇒ *same state*
12:	~P104:	L-RESUME	⇒ XFER
	P104:	I-TRERQ, L-RESUME	⇒ XFER
13:	~P103&~P40:	F-CANIN	⇒ *same state*
	~P103&P40:	L-STPSND,FCANIN	⇒ *same state*
14:	~P103:	[215],[216],[206],[214],F-CANCF	⇒ XFER-IDLE
15:	~P40:	I-CANRQ	⇒ *same state*
	P40:	L-STPSND,I-CANRQ	⇒ *same state*

16:	[215],[216],[206],[214],I-CANRP	⇒ XFER-IDLE

NOTE – The condition P103 in entries 13 and 14 is handled in entries 2 and 3 of A.5.14.

A.5.12 Responding entity state table — FERPM — (class I errors)

STATE / EVENT	XFER	RESTART-PD	RESTART
L-ERROR1	1		1
I-RESCF		2	
I-RESIN	3		
I-DATIN			4
I-CHKCF			6
I-DAEIN			7
L-DATRQ			9
L-CHKRQ			10
L-DAERQ			11
L-EORIN			12
I-TREIN			13
I-CANIN		14	14
I-CANCF		15	15
F-CANRQ		16	16
F-CANRP		17	17

A.5.13 Responding entity state table — FERPM — detailed entries (class I errors)

1:	P101 & P40:	L-SUSPND,I-RESRQ[78]	⇒ RESTART-PD
	P101 & ~P40:	I-RESRQ[78]	⇒ RESTART-PD
	~P101:	L-ERROR2	⇒ XFER
2:	~P40:	[61]	⇒ RESTART
	P40:	[54],[61],L-RESEND[74]	⇒ RESTART
3:	~P40:	I-RESRP[79]	⇒ RESTART
	P40:	L-SUSPND,[54],[61],I-RESRP[79],L-RESEND[203]	⇒ RESTART
4:	P26:		⇒ *same state*
	~P26:	F-DATIN	⇒ XFER
6:		[61]	⇒ *same state*
7:	P24:	I-CHKRP[66],[61],	
	~P106:	F-DAEIN	⇒ XFER
	P106 & P104:		⇒ *same state*
	P106 & ~P104:		⇒ XFER
9:	P28:	I-DATRQ[202]	⇒ *same state*
	~P28:		⇒ *same state*
10:		I-CHKRQ[71]	⇒ *same state*
11:		I-DAERQ[206]	⇒ *same state*
12:	~P104:	L-RESUME	⇒ XFER
	P104:	L-RESUME	⇒ *same state*
13:		L-UNHOLD	⇒ XFER
14:	~P103&~P40:	F-CANIN	⇒ *same state*
	~P103&P40:	L-STPSND,FCANIN	⇒ *same state*
15:	~P103:	[215],[216],[206],[214],F-CANCF	⇒ XFER-IDLE

16:	~P40:	I-CANRQ	⇒ *same state*
	P40:	L-STPSND,I-CANRQ	⇒ *same state*
17:		[215],[216],[206],[214],I-CANRP	⇒ XFER-IDLE

NOTE – The condition P103 in entries 13 and 14 is handled in entries 2 and 3 of A.5.16

A.5.14 Initiating entity state table — FERPM — detailed entries — (class II and III errors)

STATE / EVENT	XFER	RESTART-PD	RESTART	CANCEL-PD	CLOSE-PD	DESELECT-PD	RECOVER-PD	INIT-PD	PASSIVE	SEL-PD	OPN-PD	XFER-IDLE
L-ERROR2	1	1	1									11
I-CANIN	2	2	2									
I-CANCF				3								
I-CLOCF					4							
I-DESCF						5						
I-RECCF							6					
L-ERROR3	7	7	7	7	7	7	7		7	7	7	7
I-PABIN	12	12	12	12	12	12	12		12	12	12	12
I-SELCF										9		
I-OPNCF											10	
I-INICF								8				

A.5.15 Initiating entity state table — FERPM — detailed entries (class II and III errors)

1:	~P101 & P104:	L-ERROR3	⇒ *same state*
	~P101:	[55],L-ERRABT	⇒ PASSIVE
	P101 & ~P40 & ~P106:	I-CANRQ[207]	⇒ CANCEL-PD
	P101 & P40:	L-SUSPND,I-CANRQ[207]	⇒ CANCEL-PD
	P101 & ~P40 & P106:	I-CANRQ[207],L-HOLD	⇒ CANCEL-PD
2:	P103 & ~P40:	I-CANRP,I-CLORQ	⇒ CLOSE-PD
	P103 & P40:	L-SUSPND,I-CANRP,I-CLORQ	⇒ CLOSE-PD
3:		I-CLORQ	⇒ CLOSE-PD
4:		I-DESRQ	⇒ DESELECT-PD
5:		I-RECRQ[212][78]	⇒ RECOVER-PD
6:	P23 & (P29 | P31) & ~(P30 | P32):	[209],I-REARQ	⇒ RESTART
	P23 & (P30 | P32) & ~(P29 | P31):	[209],I-WRTRQ,L-RESEND[74]	⇒ RESTART
	~P23 & ~P33 & P34:	[55],F-CLOCF[211],L-ERRABT	⇒ PASSIVE
	~P23 & P33 & ~P34:	L-HOLD,I-SELRQ	⇒ SEL-PD
	~P23 & P101 & ~(P34 | P33) & (P29 | P30 | P31 | P32):	I-RECRQ[212][78]	⇒ *same state*
	~P23 & ~P101 & ~(P34 | P33 | P105) & (P29 | P30 | P31 | P32):	[55],L-ERRABT	⇒ PASSIVE
	~P23 & ~P33 & ~P34 & P105 & P99:	[55],F-TRECF[211],L-ERRABT	⇒ PASSIVE
	~P23 & ~P33 & ~P34 & P105 & ~P99:	F-TRECF,I-SELRQ,[215],[206],[214]	⇒ SEL-PD
7:	P106:	L-HOLD,	
	P40:	L-SUSPND,	
	P100 & P101:	L-PABORT,[200],I-ININQ	⇒ INIT-PD
	~P100 & P101:	L-PABORT,I-ININQ	⇒ INIT-PD
	~P101:	[55],L-ERRABT	⇒ PASSIVE
8:	P23 & ~P31 & P32:	I-RECRQ[73][212]	⇒ RECOVER-PD
	P23 & P31 & ~P32:	I-RECRQ[66][212]	⇒ RECOVER-PD
	~P23 & P102:	[200],I-ININQ	⇒ *same state*
	~P23 & ~P102:	[55],L-ERRABT	⇒ PASSIVE
9:	P23:	I-OPNRQ	⇒ OPN-PD
	~P23:	[55],L-ERRABT	⇒ PASSIVE

10:	P23:	L-UNHOLD	⇒ XFER-IDLE
	~P23:	[55],L-ERRABT	⇒ PASSIVE
11:	~P101:	[55],L-ERRABT	⇒ PASSIVE
	P101:	L-HOLD,I-CLORQ[211]	⇒ CLOSE-PD
12:	P106:	L-HOLD,	
	P40 & P103 & P100 & P101:	L-SUSPND,[200],I-INIRQ	⇒ INIT-PD
	~P40 & P103 & P100 & P101:	[200],I-INIRQ	⇒ INIT-PD
	P40 & P103 & ~P100 & P101:	L-SUSPND,I-INIRQ	⇒ INIT-PD
	~P40 & P103 & ~P100 & P101:	I-INIRQ	⇒ INIT-PD
	~P103 | ~P101:	[55],F-PABIN	⇒ PASSIVE

NOTES

1 To avoid recovery procedures that never terminate the action in entry 6 by the condition P101 or ~P101 effectively allowing the local system to determine the number of times a recovery from any one error will be attempted.

2 The condition P101 in entries 12 and 7 includes the test when FQOS is zero but the FERPM is not null.

3 The condition ~P103 in entry 2 implies that this event is not relevant to the FERPM and that normal actions take over.

4 The predicates which model the activity state indicator are mutually exclusive, so that combinations of them cannot occur. These combinations are not included in the state table entries.

A.5.16 Responding entity state table — FERPM — (class II and III errors)

STATE / EVENT	XFER	RESTART-PD	RESTART	CANCEL-PD	CLOSE-EX	DESELECT-EX	PASSIVE	XFER-EX	INIT-EX	SEL-EX	OPN-EX	XFER-IDLE
L-ERROR2	1	1	1				14					
I-CANIN	2	2	2									
I-CANCF				3								
I-CLOIN					4							16
I-DESIN						5						
I-RECIN							6					
L-ERROR3	7	7	7	7	7	7	7	7		7	7	7
I-PABIN	17	17	17	17	17	17	17	17		17	17	17
L-GIVEUP							12					
I-INIIN									8			
I-REAIN								13				
I-WRTIN								9				
I-SELIN										10		
I-OPNIN											11	

A.5.17 Responding entity state table — FERPM — detailed entries (class II and III errors)

1:	~P101 & P104:	L-ERROR3	⇒ *same state*
	~P101:	[55],L-ERRABT	⇒ PASSIVE
	P101 & P40:	L-SUSPND,I-CANRQ[207]	⇒ CANCEL-PD
	P101 & ~P40 & ~P104:	I-CANRQ[207]	⇒ CANCEL-PD
	P101 & ~P40 & P104:	I-CANRQ[207],L-HOLD	⇒ CANCEL-PD
2:	P103 & P40:	L-SUSPND,I-CANRP	⇒ CLOSE-EX
	P103 & ~P40:	I-CANRP	⇒ CLOSE-EX
3:			⇒ CLOSE-EX
4:		I-CLORP	⇒ DESELECT-EX
5:		I-DESRP	⇒ PASSIVE
6:	P101 & P31 & ~P32 & ~P33 & P39:	[209],I-RECRP[74]	⇒ XFER-EX
	P101 & ~P31 & P32 & ~P33 & P39:	[209],I-RECRP[66]	⇒ XFER-EX
	P101 & ~P31 & ~P32 & P33 & P39:	I-RECRP[201]	⇒ SEL-EX
	P101 & ~P31 & ~P32 & ~P33 & P39:	I-RECRP[201]	⇒ *same state*
	P101 & ~P39:	I-RECRP[75][201]	⇒ *same state*
	~P101:	I-RECRP[201]	⇒ *same state*
7:	P104:	L-HOLD,	
	P101 & ~P40:	L-PABORT	⇒ INIT-EX
	P101 & P40:	L-PABORT,L-SUSPND	⇒ INIT-EX
	~P101:	[55],L-ERRABT	⇒ PASSIVE
8:	P102:	I-INIRP	⇒ PASSIVE
	~P102:	I-INIRP[201]	⇒ PASSIVE
9:	P30:		⇒ RESTART
	~P30:	[55],L-ERRABT	⇒ PASSIVE
10:		L-SELRP	⇒ OPN-EX
11:		L-UNHOLD,I-OPNRP	⇒ XFER-IDLE

12:		[55],L-ERRABT	⇒ *same state*
13:	P29:	L-RESEND[203]	⇒ RESTART
	~P29:	[55],L-ERRABT	⇒ PASSIVE
14:	P101:	[210],L-HOLD	⇒ *same state*
	~P101:	[55],L-ERRABT	⇒ *same state*
16:	P103	I-CLORP,L-HOLD	⇒ DESELECT-EX
17:	P104:	L-HOLD,	
	P103 & P101 & P40:	L-SUSPND	⇒ INIT-EX
	P103 & P101 & ~P40:		⇒ INIT-EX
	~P103 | ~P101:	[55],F-PABIN	⇒ PASSIVE

NOTES

1 The condition P101 in entries 7 and 17 includes the test when FQOS is zero but the FERPM is not null.

2 The condition ~P103 in entries 2 and 16 implies that this event is not relevant to the FERPM and that normal actions take over.

3 The predicates which model the activity state indicator are mutually exclusive, so that combinations of them cannot occur. These combinations are not included in the state table entries.

Replace clause C.1 in annex C with the following:

AND-Set	Declared at line:	1023 (TYP),
	referenced at:	1021,
		1023
Abstract-Syntax-Name	Declared at line:	407 (TYP),
	referenced at:	99,
		258,
		259,
		315,
		316,
		407,
		691
Access-Context	Declared at line:	409 (TYP),
	referenced at:	368,
		409
Access-Control-Attribute	Declared at line:	633 (TYP),
	referenced at:	519,
		520,
		607,
		608,
		633
Access-Control-Change-Attribute	Declared at line:	640 (TYP),
	referenced at:	469,
		470,
		640
Access-Control-Element	Declared at line:	654 (TYP),
	referenced at:	637,
		645,
		648,
		654
Access-Passwords	Declared at line:	423 (TYP),
	referenced at:	147,
		182,
		305,
		423,
		658,
		796,
		807,
		821,
		853,
		871,
		922,
		969,
		985
Access-Request	Declared at line:	439 (TYP),
	referenced at:	146,
		181,
		304,
		439,

		655, 820, 906, 921
Account	Declared at line: referenced at:	449 (TYP), 27, 154, 189, 449, 681, 827, 908, 926
Account-Attribute	Declared at line: referenced at:	677 (TYP), 465, 515, 590, 677
Action-Result	Declared at line: referenced at:	451 (TYP), 35, 109, 113, 158, 170, 193, 202, 215, 228, 263, 280, 285, 320, 337, 345, 380, 387, 392, 397, 451, 800, 814, 831, 840, 859, 877, 888, 897, 912, 930, 940, 951, 959, 974, 990

Activity-Identifier	Declared at line:	456 (TYP),
	referenced at:	249,
		302,
		456
Application-Entity-Title	Declared at line:	458 (TYP),
	referenced at:	458,
		659
Attribute-Extension-Names	Declared at line:	995 (TYP),
	referenced at:	209,
		810,
		884,
		947,
		995
Attribute-Extension-Set	Declared at line:	1003 (TYP),
	referenced at:	1001,
		1003
Attribute-Extension-Set-Name	Declared at line:	997 (TYP),
	referenced at:	995,
		997
Attribute-Extensions	Declared at line:	1001 (TYP),
	referenced at:	477,
		527,
		615,
		1001
Attribute-Extensions-Pattern	Declared at line:	1133 (TYP),
	referenced at:	1057,
		1133
Attribute-Groups	Declared at line:	83 (TYP),
	referenced at:	22,
		42,
		83
Attribute-Names	Declared at line:	1190 (TYP),
	referenced at:	208,
		809,
		883,
		946,
		1190
Attribute-Value-Assertions	Declared at line:	1015 (TYP),
	referenced at:	805,
		819,
		1015
Bitstring-Pattern	Declared at line:	1099 (TYP),
	referenced at:	1027,
		1099
Boolean-Pattern	Declared at line:	1116 (TYP),
	referenced at:	1048,
		1116
Bulk-Data-PDU	Declared at line:	348 (TYP),
	referenced at:	5,
		348
Change-Attributes	Declared at line:	461 (TYP),
	referenced at:	225,
		229,
		461,

		856, 874, 956, 960, 971, 976, 987, 992
Charging	Declared at line: referenced at:	483 (TYP), 106, 171, 204, 483, 841, 942
Child-Objects-Attribute	Declared at line: referenced at:	759 (TYP), 585, 759
Concurrency-Access	Declared at line: referenced at:	661 (TYP), 656, 661
Concurrency-Control	Declared at line: referenced at:	488 (TYP), 152, 187, 244, 265, 488, 823, 924
Concurrency-Key	Declared at line: referenced at:	671 (TYP), 662, 663, 664, 665, 666, 667, 668, 669, 671
Constraint-Set-Name	Declared at line: referenced at:	504 (TYP), 504, 690
Contents-Type-Attribute	Declared at line: referenced at:	683 (TYP), 243, 264, 321, 513, 581, 683
Contents-Type-List	Declared at line: referenced at:	97 (TYP), 25, 45, 97
Contents-Type-Pattern	Declared at line:	1123 (TYP),

		531, 802, 816, 833, 844, 862, 880, 890, 901, 915, 934, 943, 953, 961, 977, 993
Document-Type-Name	Declared at line: referenced at:	554 (TYP), 98, 554, 685
Entity-Reference	Declared at line: referenced at:	543 (TYP), 538, 539, 543
Equality-Comparision	Declared at line: referenced at:	1061 (TYP), 1061, 1087, 1093, 1100, 1113, 1117, 1120
Error-Action	Declared at line: referenced at:	1156 (TYP), 851, 869, 1156
Extension-Attribute	Declared at line: referenced at:	1007 (TYP), 1005, 1007
Extension-Attribute-Identifier	Declared at line: referenced at:	1013 (TYP), 999, 1008, 1013, 1136
Extension-Set-Identifier	Declared at line: referenced at:	1011 (TYP), 998, 1004, 1011, 1134
F-BEGIN-GROUP-request	Declared at line: referenced at:	289 (TYP), 133, 289
F-BEGIN-GROUP-response	Declared at line: referenced at:	292 (TYP), 134,

		292
F-CANCEL-request	Declared at line:	391 (TYP),
	referenced at:	360,
		391
F-CANCEL-response	Declared at line:	396 (TYP),
	referenced at:	361,
		396
F-CHANGE-ATTRIB-request	Declared at line:	224 (TYP),
	referenced at:	127,
		224
F-CHANGE-ATTRIB-response	Declared at line:	227 (TYP),
	referenced at:	128,
		227
F-CHANGE-LINK-ATTRIB-request	Declared at line:	955 (TYP),
	referenced at:	786,
		955
F-CHANGE-LINK-ATTRIB-response	Declared at line:	958 (TYP),
	referenced at:	787,
		958
F-CHANGE-PREFIX-request	Declared at line:	793 (TYP),
	referenced at:	762,
		793
F-CHANGE-PREFIX-response	Declared at line:	799 (TYP),
	referenced at:	763,
		799
F-CLOSE-request	Declared at line:	279 (TYP),
	referenced at:	131,
		279
F-CLOSE-response	Declared at line:	284 (TYP),
	referenced at:	132,
		284
F-COPY-request	Declared at line:	979 (TYP),
	referenced at:	790,
		979
F-COPY-response	Declared at line:	989 (TYP),
	referenced at:	791,
		989
F-CREATE-DIRECTORY-request	Declared at line:	903 (TYP),
	referenced at:	778,
		903
F-CREATE-DIRECTORY-response	Declared at line:	910 (TYP),
	referenced at:	779,
		910
F-CREATE-request	Declared at line:	177 (TYP),
	referenced at:	121,
		177
F-CREATE-response	Declared at line:	191 (TYP),
	referenced at:	122,
		191
F-DATA-END-request	Declared at line:	379 (TYP),
	referenced at:	357,
		379
F-DELETE-request	Declared at line:	198 (TYP),
	referenced at:	123,

		198
F-DELETE-response	Declared at line:	201 (TYP),
	referenced at:	124,
		201
F-DESELECT-request	Declared at line:	166 (TYP),
	referenced at:	119,
		166
F-DESELECT-response	Declared at line:	169 (TYP),
	referenced at:	120,
		169
F-END-GROUP-request	Declared at line:	295 (TYP),
	referenced at:	135,
		295
F-END-GROUP-response	Declared at line:	298 (TYP),
	referenced at:	136,
		298
F-ERASE-request	Declared at line:	341 (TYP),
	referenced at:	141,
		341
F-ERASE-response	Declared at line:	344 (TYP),
	referenced at:	142,
		344
F-GROUP-COPY-request	Declared at line:	864 (TYP),
	referenced at:	772,
		864
F-GROUP-COPY-response	Declared at line:	876 (TYP),
	referenced at:	773,
		876
F-GROUP-DELETE-request	Declared at line:	835 (TYP),
	referenced at:	768,
		835
F-GROUP-DELETE-response	Declared at line:	839 (TYP),
	referenced at:	769,
		839
F-GROUP-LIST-request	Declared at line:	882 (TYP),
	referenced at:	774,
		882
F-GROUP-LIST-response	Declared at line:	887 (TYP),
	referenced at:	775,
		887
F-GROUP-MOVE-request	Declared at line:	846 (TYP),
	referenced at:	770,
		846
F-GROUP-MOVE-response	Declared at line:	858 (TYP),
	referenced at:	771,
		858
F-GROUP-SELECT-request	Declared at line:	818 (TYP),
	referenced at:	766,
		818
F-GROUP-SELECT-response	Declared at line:	830 (TYP),
	referenced at:	767,
		830
F-INITIALIZE-request	Declared at line:	15 (TYP),
	referenced at:	8,