
**Information technology — Open Systems
Interconnection — Conformance test suite
for the FTAM Protocol —**

Part 1:

Test suite structure and test purposes

*Technologies de l'information — Interconnexion de systèmes ouverts —
Suite de tests de conformité pour FTAM —*

Partie 1: Structure de la suite de tests et objets des tests



Reference number
ISO/IEC 10170-1:1993(E)



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Foreword

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

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. 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.

International Standard ISO/IEC 10170-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Sub-Committee SC 21, *Information retrieval, transfer and management for open systems interconnection (OSI)*.

ISO/IEC 10170 consists of the following parts, under the general title *Information technology — Open Systems Interconnection — Conformance test suite for the FTAM Protocol*:

— *Part 1: Test suite structure and test purposes*

Annexes A and B of this part of ISO/IEC 10170 are for information only.

Introduction

This part of ISO/IEC 10170 specifies a test suite structure and a set of test purposes for use by test suite specifiers as the basis for all standardised conformance test suites needed to evaluate conformance to ISO 8571, the File Transfer Access and Management (FTAM) protocol.

A fundamental objective of the related standardised conformance test suites is to establish uniform conformance testing and unambiguous evaluation procedures for checking the ability of an FTAM protocol implementation to operate according to ISO 8571. The standardisation of these test suites should lead to comparability and wide acceptance of the test results produced by different test laboratories, and therefore minimise repeated conformance testing of the same FTAM protocol implementation.

The conformance test suites based on this International Standard are designed for use by:

- a) test laboratories which provide a conformance testing service for the FTAM protocol;
- b) test realisers which provide a means of testing to be used by such test laboratories;
- c) implementors of the FTAM protocol.

The purpose of conformance testing is to increase the probability that different implementations are able to interwork, although conformance testing alone cannot give a guarantee of interworking. Conformance testing increases the confidence that each implementation conforms to the protocol specification, by establishing that it has the required capabilities and that its behaviour conforms to the protocol specification in representative instances of communication.

Information technology - Open Systems Interconnection - Conformance test suite for the FTAM Protocol - Part 1: Test suite structure and test purposes

1 Scope

This part of ISO/IEC 10170 specifies a test suite structure and test purposes for the whole of the FTAM protocol, as defined in ISO 8571. This part of ISO/IEC 10170 does not specify how conformance test are to be realised or used, nor how the test results are to be presented or used.

This part of ISO/IEC 10170 specifies the relationship, between the elements of the test suite structure (test groups and test cases) and the Protocol Implementation Conformance Statement (PICS) proforma ISO 8571-5, which is to be used in test case selection.

This part of ISO/IEC 10170 applies to conformance test suites for testing FTAM protocol implementations which operate over a connection-oriented Association Control Service Element (ACSE) and Presentation services (ISO 8649 and ISO 8822) and which claims conformance to ISO 8650 and ISO 8823 respectively.

This part of ISO/IEC 10170 does not include a general assessment of performance, reliability or robustness of relevant protocol implementations, nor an assessment of the design of the protocol itself.

NOTE — The choice of test method may restrict the test purposes which can be realised.

This part of ISO/IEC 10170 does not address the testing of document types nor contents types of files.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 10170. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 10170 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8571-1:1988, *Information processing systems – Open Systems Interconnection – File Transfer, Access and Management – Part 1: General Introduction.*

ISO 8571-2:1988, *Information processing systems – Open Systems Interconnection – File Transfer, Access and Management – Part 2: Virtual Filestore Definition.*

ISO 8571-3:1988, *Information processing systems – Open Systems Interconnection – File Transfer, Access and Management – Part 3: File Service Definition.*

ISO 8571-4:1988, *Information processing systems – Open Systems Interconnection – File Transfer, Access and Management – Part 4: File Protocol Specification.*

ISO/IEC 8571-5:1990, *Information processing systems – Open Systems Interconnection – File Transfer, Access and Management – Part 5: Protocol Implementation Conformance Statement Proforma.*

ISO 8649:1988, *Information processing systems – Open Systems Interconnection – Service definition for the Association Control Service Element.*

ISO 8650:1988, *Information processing systems – Open Systems Interconnection – Protocol specification for the Association Control Service Element.*

ISO 8822:1988, *Information processing systems – Open Systems Interconnection – Connection oriented Presentation service definition.*

ISO/IEC 9646-1:1990, *Information technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 1: General concepts.*

ISO/IEC 9646-2:1990, *Information technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 2: Abstract test suite specification.*

3 Definitions

For the purposes of this part of ISO/IEC 10170 the following definitions apply.

3.1 FTAM definitions

This part of ISO/IEC 10170 makes use of the following terms defined in ISO 8571:

- a) file access;
- b) file management;
- c) file transfer;
- d) virtual filestore;
- e) initiator;
- f) responder;
- g) activity attributes;
- h) attribute;
- i) file attributes;

3.2 Conformance testing methodology and framework definitions

This part of ISO/IEC 10170 makes use of the following terms defined in ISO/IEC 9646-1.

- a) basic interconnection testing;
- b) behaviour testing;
- c) capability testing;
- d) conformance testing;
- e) conformance test suite;
- f) dynamic conformance requirements;
- g) implementation under test;
- h) inopportune test event;
- i) protocol implementation conformance statement (PICS);
- j) PICS proforma;
- k) static conformance requirement;
- l) syntactically invalid test event;
- m) semantically invalid test event;
- n) system under test;
- o) test group;
- p) test purpose;
- q) test suite;

3.3 FTAM Test Purpose definitions

This part of ISO/IEC 10170 makes use of the following terms defined to have specific meanings throughout.

3.3.1 invalid value : A value that violates at least one conformance requirement for ISO 8571.

3.3.2 valid value : A value allowed by the ISO 8571, being both syntactically and semantically correct.

4 Abbreviations

FTAM	File Transfer, Access and Management
IFS	Internal File Service
IUT	Implementation Under Test
TSS&TP	Test Suite Structure and Test Purposes
PICS	Protocol Implementation Conformance Statement

5 Compliance

A generic or abstract test suite which complies with this part of ISO/IEC 10170 shall

- a) consist of a set of test cases corresponding to the set or a subset of the test purposes specified in clauses 11 to 12;
- b) identify clearly the test purposes used;
- c) cover all the relevant test purposes specified in clauses 11 to 12, as appropriate to the coverage and test method chosen for that test suite (see also 6.2);
- d) use a test suite structure which is an appropriate subset (or the whole) of the test suite structure specified in clause 7;
- e) name its test groups and test cases using the naming conventions specified in clause 8 in such a way that the test group and test case names used in clauses 11 to 12 are used whenever relevant;
- f) maintain the relationships specified in clauses 11 to 12 between the chosen test purposes and the entries in the PICS proforma to be used for test case selection;
- g) comply with ISO/IEC 9646-2

6 Testing methodology

6.1 Introduction

The testing methodology used in this part of ISO/IEC 10170 complies with the requirements of the OSI Conformance Testing Methodology and Framework - Part 2: Abstract Test Suite Specification (ISO/IEC 9646-2).

6.2 Relationship between the TSS&TP and abstract test suites

The test purposes in this part of ISO/IEC 10170 are derived from ISO 8571, the FTAM protocol standard. This derivation has focused on identifying test purposes to test conformance aspects of the protocol. However, no consideration has been given to any testing method, how such test purposes may be realised, or any practical or economic constraints that may be placed on testing.

It is intended that all abstract test suites for the FTAM protocol shall include tests for all the test purposes in this part of ISO/IEC 10170 . However, an abstract test suite specifier may subset the test purposes given in this part of ISO/IEC 10170 provided adequate coverage is maintained and provided also that this is in compliance with ISO/IEC 9646-2 clause 13.

It should be remembered that ISO/IEC 9646 allows the concatenation of valid parameter variation test purposes into a single abstract test case.

6.3 Test selection

It is intended that test purposes will be selected resulting in corresponding abstract test cases giving appropriate cover-

age to test claims made in the PICS. The rules for test case selection using information from the PICS shall form part of the standardized abstract test suite.

6.4 Verdicts

Verdicts assigned by each abstract test case are determined, on the basis of the IUT's ability to behave in accordance with the requirements of the FTAM protocol, and to support the capabilities and parameter values listed in the PICS. Conformance assessment is based on the individual verdicts, the FTAM protocol standard, and the IUT's PICS.

6.5 Test suite coverage

Test purposes are specified and structured according to subclause 10.2 (test group structure) and 10.3 (test purposes) of ISO/IEC 9646-2, to obtain the appropriate coverage of the possible event/state, parameter values, and valid/syntactically invalid/inopportune variations.

7 Test suite structure

The test suite for the FTAM protocol consists of test groups and test cases. Each test case has a narrowly defined purpose. Within the test suite, nested test groups are used to provide a logical ordering of the test cases. Test groups may be nested to an arbitrary depth. They may be used to aid planning, development, understanding or execution of the test suite.

The test suite consists of two main test groups:

- a) Capability Tests, which are used to verify that the observable capabilities of FTAM protocol implementations are valid with respect to the static conformance requirements stated in subclause 22.2 of ISO 8571-4, and with respect to the PICS.
- b) Behaviour Tests, which test the extent to which the implementation meets the dynamic conformance requirements specified in subclause 22.3 of ISO 8571-4. Particular attention is drawn to subclause c, which places conformance requirements on the operation of the virtual filestore. The behaviour group of tests is further divided into tests that check the IUT's response to
 - 1) valid protocol interactions,
 - 2) parameter variations,
 - 3) parameter combinations,
 - 4) virtual filestore integrity.

These tests provide a detailed evaluation of the features which are claimed to be supported in the PICS.

The test suite contains two further test groups:

- d) Semantically Invalid Behaviour Tests, which test the ability of the IUT to detect instances of semantically invalid protocol behaviour and take the specified action.

- e) Inopportune Behaviour Tests, which test the response of the IUT to valid FTAM protocol data units which are inopportune either because of the prevailing state of the IUT or as a result of earlier negotiations.

These tests provide a detailed evaluation of the detection and response to behaviour which is not valid protocol.

Each of these test groups is further divided into a number of lower level test groups.

The structure of the major test groups is shown in figures 1 to 7.

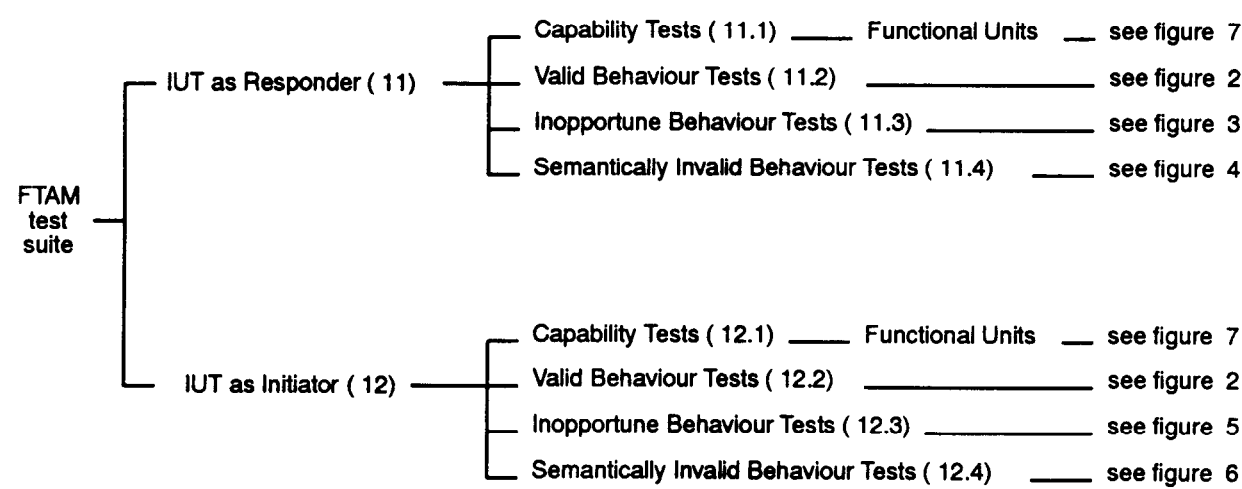


Figure 1 — FTAM Test Suite Structure

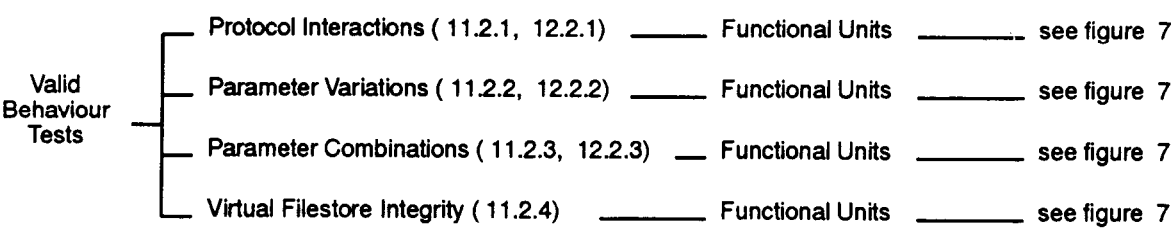


Figure 2 — Valid Behaviour Test Group Structure

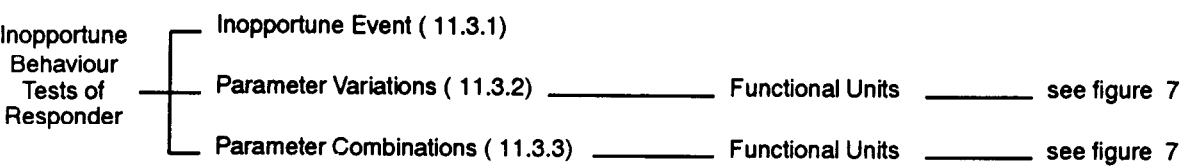


Figure 3 — Inopportune Behaviour Test Group Structure (Responder)

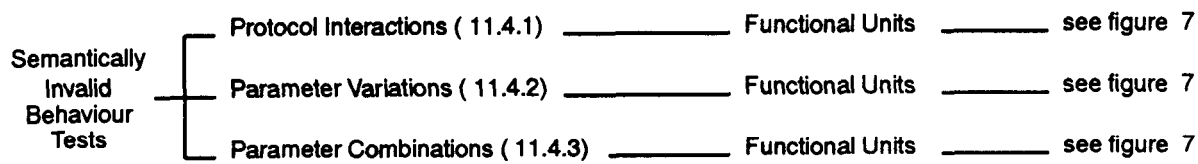


Figure 4 — Semantically Invalid Behaviour Test Group Structure (Responder)

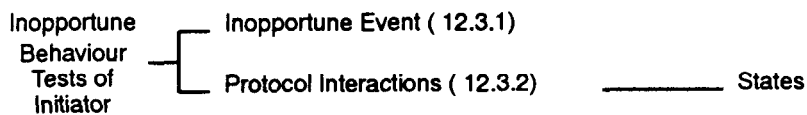


Figure 5 — Inopportune Behaviour Test Group Structure (Initiator)

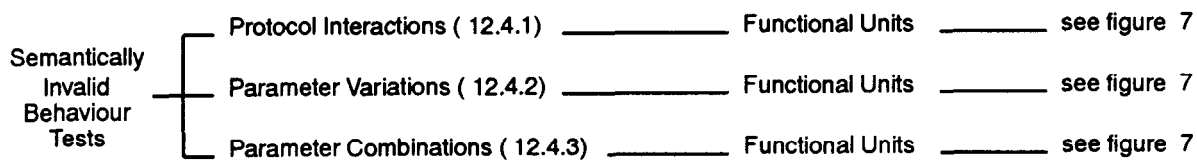


Figure 6 — Semantically Invalid Behaviour Test Group Structure (Initiator)

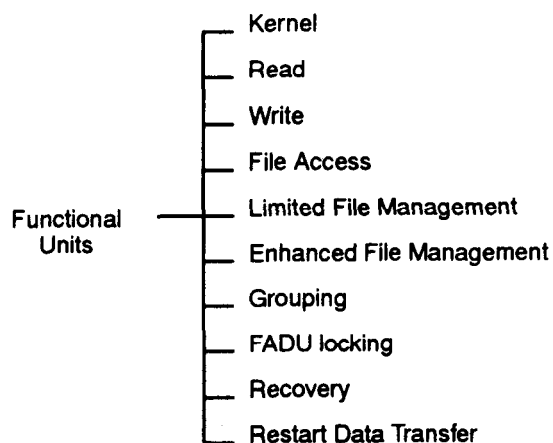


Figure 7 — Functional Units.

8 Naming conventions

8.1 Proformas

This clause describes the proformas that are used for test group objectives and test purposes. Two proformas are described below:

- a) The first proforma is used for a test group which has other test groups below it. It describes the objectives of the group and lists the subgroups below it. The proforma takes the form:

V.W.X.Y AA/BB/FUNCTION (FN)

[Reference: ISO 8571]

Test group objectives:

Subgroups:

1. Function One (F1).
2. Function Two (F2).
- n. Function n (Fn).

The first item (V.W.X.Y) is mandatory and is the formal clause number of the test group in this part of ISO/IEC 10170.

The second item (AA/BB/FUNCTION (FN)) is mandatory and is the symbolic name of the test group. Note that the final component of the name is given in full, followed by an abbreviation.

The third item is an optional reference to the relevant clause in the base part of ISO/IEC 10170. If no such reference is appropriate for the test group this item is omitted.

The fourth item is a mandatory natural language statement of the test group objectives.

The fifth item consists of references to the subgroups contained within the group at the next level down.

- b) The second proforma is used for a test group which has only test cases below it. It describes the objectives of the group and then lists the test case purposes that make up the group. The proforma takes the form

V.W.X.Y AA/BB/FUNCTION (FN)

[Reference: ISO 8571]

Test group objectives:

Test purposes:

1.
2.
- n.

The first item (V.W.X.Y) is mandatory and is the formal clause number of the test group in this part of ISO/IEC 10170.

The second item (AA/BB/FUNCTION (FN)) is mandatory and is the symbolic name of the test group. Note that the final component of the name is given in full, followed by an

abbreviation.

The third item is an optional reference to the relevant clause in the base standard. If no such reference is appropriate for the test group this item is omitted.

The fourth item is a mandatory natural language statement of the test group objective.

The fifth item is a list of test case purposes in natural language that are part of the test group.

8.2 Extensions to naming

This part of ISO/IEC 10170 provides basic test purposes which may be qualified, as necessary, to permit the unique name mapping to abstract test cases as required by ISO 9646. Such cases arise when the objective of the test purpose is clear and is a single concept, but in the abstract test suite several test cases may be needed according to one of several pre-ambls being used. Such qualifications are reflected in the naming structure by an extension suffix to the basic test purpose name. Two areas for use of extension suffixes have been identified to generate new abstract test cases, one according to service class and one according to the mode of write being used.

As an example of the influence of the service class pre-ambble consider a test purpose to confirm the state transition involved in opening a virtual file. The preamble will be different if the service class is File Transfer to when it is File Access, so needing a new abstract test case. The basic test purpose is R/BV/PI/RD/OP/1; with the File Transfer class pre-ambble the Abstract Test Purpose name becomes R/BV/PI/RD/OP/1/FT and for the File Access class pre-ambble the name becomes R/BV/PI/RD/OP/1/FA. The defined suffixes are: /FT, /FA, /FM, /FTM and /U, representing Transfer, Access, Management, Transfer with Management and Unconstrained service classes.

As an example of the influence of the mode of write pre-ambble, consider a test purpose to confirm the service of restarting a data transfer while writing to the virtual file-store. The particular method of writing will be dependent on the implementation concerned but is of little interest to the test purpose. The basic test purpose for restarting a write operation is R/BV/PI/RT/RT/3; with the Replacement mode of write pre-ambble the abstract test case name becomes R/BV/PI/RT/RT/3/RP, and for the Extension mode of write pre-ambble the abstract test case name becomes R/BV/PI/RT/RT/3/EX. The defined suffixes are: /IN, /RP and /EX, representing Insert, Replace and Extend.

When two suffixes are needed to describe the required abstract test case name, the type of the write suffix takes precedence over the service class suffix. Should other suffixes be needed, those described above take precedence.

9 Precedence

This part of ISO/IEC 10170 defines test purposes for the FTAM protocol (ISO 8571). It is not intended that this part of ISO/IEC 10170 should contradict or provide an interpretation of ISO 8571. In the case that there is a contradiction between this part of ISO/IEC 10170 and ISO 8571, this is an error and ISO

8571 takes precedence.

NOTE — Any person who, when making use of an International Standard, encounters an inaccuracy or ambiguity, is requested to notify their National Member Body of ISO without delay in order that the matter may be investigated and appropriate action taken.

10 Basic Interconnection tests

No basic interconnection tests are explicitly identified for the testing of ISO 8571. If tests are required the following test purposes may be used: R/CA/KE/ or I/CA/KE/

11 IUT as a Responder (R)

Reference : ISO 8571-4 clause 9

Test group objective : This test group is to test the action of an IUT when in the role on a responder .

Subgroups :

1. Capability Tests (CA)
2. Valid Behaviour Tests by the Tester (BV)
3. Inopportune Behaviour Tests by the Tester (BO)
4. Semantically Invalid Behaviour Tests by the Tester (BI)

11.1 R/Capability Tests (CA)

Test group objective : To test functional capability of the IUT and is structured according to the functional units. The purpose of these tests is to establish whether a functional unit is available and, if so, a representative sample of each of the service elements is exercised. Noting that service element are unlikely to be testable in isolation a given test may exercise several elements .

Subgroups :

1. Kernel (KE).
2. Read (RD).
3. Write (WR).
4. File Access (FA).
5. Limited File Management (LM)
6. Enhanced File Management (EM).
7. Grouping (GP).
8. FADU Locking (FL).
9. Recovery (RC).
10. Restart Data Transfer (RT).

11.1.1 R/CA/Kernel (KE)

Reference : ISO 8571-4 subclause 9.1 to 9.4

Test group objective : Checking the capability of the IUT to support services of Functional Unit Kernel.

Test purposes :

1. An association is to be established by the Tester, an existing file selected and later deselected and an orderly termination to be initiated The IUT is to respond with the expected valid PDU sequence.
2. The Tester sends an F-INITIALIZE-request parameterised so that it should succeed. It is expected that the IUT will respond with an F-INITIALIZE-confirm with a state result indicating success.
3. The Tester sends an F-SELECT-request when an FTAM regime has been established, grouped if necessary, parameterised so that it should succeed. It is expected that the IUT will respond with an F-SELECT-confirm with a state result indicating success.
4. The Tester sends an F-DESELECT-request when an file selection regime has been established, grouped if necessary, parameterised so that it should succeed. It is expected that the IUT will respond with an F-DESELECT-confirm with a state result indicating success.

essary, parameterised so that it should succeed. It is expected that the IUT will respond with an F-DESELECT-confirm with a state result indicating success.

5. The Tester sends an F-TERMINATE-request when an FTAM regime has been established, grouped if necessary, parameterised so that it should succeed. It is expected that the IUT will respond with an F-TERMINATE-confirm with a state result indicating success.

6. An association is to be established by the Tester, the Tester will issue an F-U-ABORT-request. The IUT is to respond with the expected valid PDU sequence.

7. An association is to be established by the Tester, the Tester will cause an F-P-ABORT-request to be issued. The IUT is to respond with the expected valid PDU sequence.

11.1.2 R/CA/Read (RD)

Reference : ISO 8571-4 subclause 9.9 to 9.10

Test group objective : Checking the capability of the IUT to support services of Functional Unit Read.

Test purposes :

1. The Tester sends an F-OPEN-request when an file selection regime has been established, grouped if necessary, parameterised so that it should succeed. It is expected that the IUT will respond with an F-OPEN-confirm with a state result indicating success.

2. The Tester sends an F-CLOSE-request when an file open regime has been established, grouped if necessary, parameterised so that it should succeed. It is expected that the IUT will respond with an F-CLOSE-confirm with a state result indicating success.

3. The Tester sends an F-READ-request when an file open regime has been established parameterised so that it should succeed. The IUT is to respond with the expected valid PDU sequence.

4. An existing file is to be opened by the Tester and a read initiated during which the Tester issues an F-CANCEL-request. The IUT is to respond with the expected valid PDU sequence.

11.1.3 R/CA/Write (WR)

Reference : ISO 8571-4 subclause 9.9 to 9.10

Test group objective : Checking the capability of the IUT to support services of Functional Unit Write.

Test purposes :

1. The Tester sends an F-OPEN-request when an file selection regime has been established, grouped if necessary, parameterised so that it should succeed. It is expected that the IUT will respond with an F-OPEN-confirm with a state result indicating success.

2. The Tester sends an F-CLOSE-request when an file open regime has been established, grouped if necessary, parameterised so that it should succeed. It is expected that the IUT will respond with an F-CLOSE-confirm with a state result indicating success.

3. The Tester sends an F-WRITE-request when an file open regime has been established parameterised so that it should succeed. The IUT is to respond with the expected valid PDU sequence.

4. An existing file is to be opened by the Tester and a write initiated during which the Tester issues an F-CANCEL-request. The IUT is to respond with the expected valid PDU sequence.

5. An existing file is to be opened for insertion by the Tester and a complete file written. The IUT is to respond with the expected valid PDU sequence.

6. An existing file is to be opened for replacement by the Tester and a complete file written. The IUT is to respond with the expected valid PDU sequence.

7. An existing file is to be opened for extension by the Tester and a complete file written. The IUT is to respond with the expected valid PDU sequence.

11.1.4 R/CA/File Access (FA)

Reference : ISO 8571-4 subclause 9.14 to 9.15

Test group objective : Checking the capability of the IUT to support services of Functional Unit File Access.

Test purposes :

1. The Tester sends an F-LOCATE-request when an file open regime has been established parameterised so that it should succeed. It is expected that the IUT will respond with an F-LOCATE-confirm with a action result indicating success.

2. The Tester sends an F-ERASE-request when an file open regime has been established parameterised so that it should succeed. It is expected that the IUT will respond with an F-ERASE-confirm with a action result indicating success.

11.1.5 R/CA/Limited File Management (LM)

Reference : ISO 8571-4 subclause 9.5 to 9.7

Test group objective : Checking the capability of the IUT to support services of Functional Unit Limited File Management.

Test purposes :

1. The Tester sends an F-CREATE-request when an FTAM regime has been established, grouped if necessary, parameterised so that it should succeed. It is expected that the IUT will respond with an F-CREATE-confirm with a state result indicating success.

2. The Tester sends an F-DELETE-request when an file selection regime has been established, grouped if necessary, parameterised so that it should succeed. It is expected that the IUT will respond with an F-DELETE-confirm with a state result indicating success.

3. The Tester sends an F-READ-ATTRIB-request when an file selection regime has been established, grouped if necessary, parameterised so that it should succeed. It is expected that the IUT will respond with an F-READ-ATTRIB-confirm with a action result indicating success.

11.1.6 R/CA/Enhanced File Management (EM)

Reference : ISO 8571-4 subclause 9.8

Test group objective : Checking the capability of the IUT to support services of Functional Unit Enhanced File Management.

Test purposes :

1. The Tester issues an F-CHANGE-ATTRIB-request. The IUT should change the attributes.

11.1.7 R/CA/Grouping (GP)

Reference : ISO 8571-4 subclause 9.11 to 9.12

Test group objective : Checking the capability of the IUT to support services of Functional Unit Grouping.

Test purposes :

1. The Tester sends an grouped sequence appropriate to the service class negotiated when an FTAM regime has been established parameterised so that it should succeed. The IUT expected to respond with the expected valid PDU sequence with a state result indicating success.

11.1.8 R/CA/FADU Locking (FL)

Reference : ISO 8571-3 subclause 13.9

Test group objective : Checking the capability of the IUT to support services of Functional Unit FADU Locking.

Test purposes :

1. A file is to be opened with the FADU locking functional unit and a FADU is locked. Confirm that an access to that FADU is rejected, while an access to another, unlocked FADU succeeds.

11.1.9 R/CA/Recovery (RC)

Reference : ISO 8571-4 subclause 9.13, 19.2

Test group objective : Checking the capability of the IUT to support services of Functional Unit Recovery.

Test purposes :

1. A regime is to be established for using the recovery functional unit whereby a file is written and checkpointing is not being used. An F-CANCEL-request is issued by the Tester at an appropriate point and recovery action taken. The IUT is to respond with the expected valid PDU sequence for recovery.

2. A regime is to be established for using the recovery functional unit whereby a file is written and checkpointing is not being used. An F-P-ABORT-request is issued by the Tester at an appropriate point and recovery action taken in a new connection. The IUT is to respond with the expected valid PDU sequence for recovery.

3. A regime is to be established for using the recovery functional unit whereby a file is written. Checkpointing is to be used and multiple instances observed before an F-CANCEL-request is issued by the Tester then recovery action taken. The IUT is to respond with the expected valid PDU sequence for recovery from a given check point.

4. A regime is to be established for using the recovery functional unit whereby a file is written. Checkpointing is to be used and multiple instances observed before an F-P-ABORT-request is issued by the Tester then recovery action taken. The IUT is to respond with the expected valid PDU sequence for recovery from a given check point.

5. A regime is to be established for using the recovery functional unit whereby a file is read and checkpointing is not being used. An F-CANCEL-request is issued by the Tester at an appropriate point and recovery action taken. The IUT is to respond with the expected valid PDU sequence for recovery.

6. A regime is to be established for using the recovery functional unit whereby a file is read and checkpointing is not being used. An F-P-ABORT-request is issued by the Tester at an appropriate point and recovery action taken in a new connection. The IUT is to respond with the expected valid PDU sequence for recovery.

7. A regime is to be established for using the recovery functional unit whereby a file is read. Checkpointing is to be used and multiple instances observed before an F-CANCEL-request is issued by the Tester then recovery action taken. The IUT is to respond with the expected valid PDU sequence for recovery from a given check point.

8. A regime is to be established for using the recovery functional unit whereby a file is read. Checkpointing is to be used and multiple instances observed before an F-P-ABORT-request is issued by the Tester then recovery action taken. The IUT is to respond with the expected valid PDU sequence for recovery from a given check point.

11.1.10 R/CA/Restart Data Transfer (RT)

Reference : ISO 8571-4 subclause 19.2

Test group objective : Checking the capability of the IUT to support services of Functional Unit Restart Data Transfer.

Test purposes :

1. A regime is to be established for using the restart functional unit whereby a file is read and checkpointing is not being used. An F-RESTART-request is issued by the Tester at an appropriate point and restart action taken. The IUT is to respond with the expected valid PDU sequence for restart.
2. A regime is to be established for using the restart functional unit whereby a file is written and checkpointing is not being used. An F-RESTART-request is issued by the Tester at an appropriate point and restart action taken. The IUT is to respond with the expected valid PDU sequence for restart.
3. A regime is to be established for using the restart functional unit whereby a file is read. Checkpointing is to be used and multiple instances observed before an F-RESTART-request is issued by the Tester then restart action is taken. The IUT is to respond with the expected valid PDU sequence for restart from a checkpoint.
4. A regime is to be established for using the restart functional unit whereby a file is written. Checkpointing is to be used and multiple instances observed before an F-RESTART-request is issued by the Tester then restart action is taken. The IUT is to respond with the expected valid PDU sequence for restart from a checkpoint.

11.2 R/Valid Behaviour Tests by the Tester (BV)

Reference : ISO 8571-4

Test group objective : Checking the following conformance areas .

Subgroups :

1. Protocol Interactions (PI)
2. Parameter Variation (PV)
3. Parameter combinations (PC)
4. Virtual Filestore Integrity (VFI)

11.2.1 R/BV/Protocol Interactions (PI)

Reference : ISO 8571-4 subclause 9

Test group objective : Checking the valid protocol behaviour by the IUT subgrouped by Functional Units .

Subgroups :

1. Kernel (KE)
2. Read (RD)
3. Write (WR)
4. File Access (FA)
5. Limited File Management (LM)
6. Enhanced File Management (EM)
7. Grouping (GP)
8. FADU Locking (FL)
9. Recovery (RC)
10. Restart Data Transfer (RT)

11.2.1.1 R/BV/PI/Kernel (KE)

Reference : ISO 8571-3 Table 1, U1

Test group objective : Checking the following services of the Functional Unit Kernel.

Subgroups :

1. Connection Establishment (CE)
2. Select (SL)
3. Deselect (DS)
4. Terminate (TR)
5. Terminate Abrupt (AB)

11.2.1.1.1 R/BV/PI/KE/Connection Establishment (CE)

Reference : ISO 8571-4 subclause 9.1 + A.2.8 UNINITIALIZED

Test group objective : Checking the kernel service element Connection Establishment.

Test purposes :

1. The IUT is to accept an F-INITIALIZE-request from the Tester on an F-INITIALIZE-response.
2. IUT is to reject an F-INITIALIZE-request from the Tester on an F-INITIALIZE-response with result parameter set to "reject", due to the PDU being unacceptable to the responding protocol machine.
3. The IUT is to reject an F-INITIALIZE-request from the Tester on an F-INITIALIZE-response with result parameter set to "reject" due to rejection by the responding file service.

11.2.1.1.2 R/BV/PI/KE/Select (SL)

Reference : ISO 8571-4 subclause 9.3 + A.3.8 INITIALIZED

Test group objective : Checking the kernel service element Select.

Test purposes :

1. The IUT is to accept an F-SELECT-request from the Tester when there has been no other select in the current initialise regime and succeed in selecting the file.
2. The IUT is to reject an F-SELECT-request from the Tester when there has been no other select in the current initialise regime and remain in the Initialised state.
3. The IUT is to accept an F-SELECT-request from the Tester when there has been at least one select in the current initialise regime and succeed in selecting the file.
4. The IUT is to reject an F-SELECT-request from the Tester when there has been at least one select in the current initialise regime and remain in the Initialised state.

11.2.1.1.3 R/BV/PI/KE/Deselect (DS)

Reference : ISO 8571-4 subclause 9.4 + A.3.8 SELECTED

Test group objective : Checking the kernel service element Deselect.

Test purposes :

1. To check the action of deselection at the IUT, with an F-DESELECT-request from the Tester.

11.2.1.1.4 R/BV/PI/KE/Terminate (TR)

Reference : ISO 8571-4 subclause 9.2 + A.2.8 INITIALIZED

Test group objective : Checking the kernel service element Terminate.

Test purposes :

1. To check the action of termination at the IUT, with an F-TERMINATE-request from the Tester.

11.2.1.1.5 R/BV/PI/KE/Terminate Abrupt (AB)

Reference : ISO 8571-4 subclause 10.1

Test group objective : Checking the kernel service element Terminate Abrupt.

Subgroups :

1. IUT requested (I)
2. Tester requested (R)

11.2.1.1.5.1 R/BV/PI/KE/AB/IUT requested (I)

Reference : ISO 8571-4 subclause 10.1

Test group objective : Checking the kernel service element Terminate Abrupt.

Subgroups :

1. F-U-ABORT (UAB)
2. F-P-ABORT (PAB)

11.2.1.1.5.1.1 R/BV/PI/KE/AB/F-U-ABORT (UAB)

Test group objective : To check the ability of the IUT to send an F-U-ABORT-request when in the following states

Test purposes :

1. INITIALIZED
2. I-SELECT-PD
3. SELECTED
4. I-DESELECT-PD
5. I-CREATE-PD
6. I-DELETE-PD
7. I-READ-ATT-PD
8. I-CHG-ATT-PD
9. I-OPEN-PD
10. P-ALTCF-PD
11. DXFRIDLE
12. DXFRIDLE-REC
13. I-CLOSE-PD
14. I-RECOVER-PD
15. P-ALTCF-REC-PD
16. I-LOCATE-PD
17. I-ERASE-PD
18. I-GROUPING
19. GROUPING
20. P-TOKEN-PD
21. REA-SYMCf-PD
22. RES-SYMCf-PD
23. CAN-SYMCf-PD
24. READ
25. READ-ENDING
26. I-R-XFER-ENDING
27. WRT-SYMIN-PD
28. RES-SYMIN-PD
29. CAN-SYMIN-PD
30. WRITE
31. I-W-XFER-ENDING
32. CANCEL-PD
33. I-CANCEL-PD
34. RRESTART-PD
35. WRESTART-PD
36. I-RRESTART-PD
37. I-WRESTART-PD
38. RESTART-CAN-PD

11.2.1.1.5.1.2 R/BV/PI/KE/AB/F-P-ABORT (PAB)

Test group objective : To check the ability of the IUT to send an F-P-ABORT-request when in the following states

Test purposes :

1. INITIALIZED
2. I-SELECT-PD
3. SELECTED
4. I-DESELECT-PD
5. I-CREATE-PD
6. I-DELETE-PD
7. I-READ-ATT-PD
8. I-CHG-ATT-PD
9. I-OPEN-PD
10. P-ALTCF-PD
11. DXFRIDLE

12. DXFRIDLE-REC
13. I-CLOSE-PD
14. I-RECOVER-PD
15. P-ALTCF-REC-PD
16. I-LOCATE-PD
17. I-ERASE-PD
18. I-GROUPING
19. GROUPING
20. P-TOKEN-PD
21. REA-SYMCf-PD
22. RES-SYMCf-PD
23. CAN-SYMCf-PD
24. READ
25. READ-ENDING
26. I-R-XFER-ENDING
27. WRT-SYMIN-PD
28. RES-SYMIN-PD
29. CAN-SYMIN-PD
30. WRITE
31. I-W-XFER-ENDING
32. CANCEL-PD
33. I-CANCEL-PD
34. RRESTART-PD
35. WRESTART-PD
36. I-RRESTART-PD
37. I-WRESTART-PD
38. RESTART-CAN-PD

11.2.1.1.5.2 R/BV/PI/KE/AB/Tester requested (R)

Reference : ISO 8571-4 subclause 10.1

Test group objective : Checking the kernel service element Terminate Abrupt.

Subgroups :

1. F-U-ABORT (UAB)
2. F-P-ABORT (PAB)

11.2.1.1.5.2.1 R/BV/PI/KE/AB/R/F-U-ABORT (UAB)

Test group objective : To check the reaction of the IUT to an F-U-ABORT-request from the Tester when in the following states

Test purposes :

1. INITIALIZED
2. I-SELECT-PD
3. SELECTED
4. I-DESELECT-PD
5. I-CREATE-PD
6. I-DELETE-PD
7. I-READ-ATT-PD
8. I-CHG-ATT-PD
9. I-OPEN-PD
10. P-ALTCF-PD
11. DXFRIDLE
12. DXFRIDLE-REC
13. I-CLOSE-PD
14. I-RECOVER-PD
15. P-ALTCF-REC-PD
16. I-LOCATE-PD
17. I-ERASE-PD
18. I-GROUPING
19. GROUPING
20. P-TOKEN-PD
21. REA-SYMCf-PD
22. RES-SYMCf-PD
23. CAN-SYMCf-PD
24. READ
25. READ-ENDING

26. I-R-XFER-ENDING
27. WRT-SYMIN-PD
28. RES-SYMIN-PD
29. CAN-SYMIN-PD
30. WRITE
31. I-W-XFER-ENDING
32. CANCEL-PD
33. I-CANCEL-PD
34. RRESTART-PD
35. WRESTART-PD
36. I-RRESTART-PD
37. I-WRESTART-PD
38. RESTART-CAN-PD

11.2.1.1.5.2.2 R/BV/PI/KE/AB/R/F-P-ABORT (PAB)

Test group objective : To check the reaction of the IUT to an F-P-ABORT-request from the Tester when in the following states .

Test purposes :

1. INITIALIZED
2. I-SELECT-PD
3. SELECTED
4. I-DESELECT-PD
5. I-CREATE-PD
6. I-DELETE-PD
7. I-READ-ATT-PD
8. I-CHG-ATT-PD
9. I-OPEN-PD
10. P-ALTCF-PD
11. DXFRIDLE
12. DXFRIDLE-REC
13. I-CLOSE-PD
14. I-RECOVER-PD
15. P-ALTCF-REC-PD
16. I-LOCATE-PD
17. I-ERASE-PD
18. I-GROUPING
19. GROUPING
20. P-TOKEN-PD
21. REA-SYMCF-PD
22. RES-SYMCF-PD
23. CAN-SYMCF-PD
24. READ
25. READ-ENDING
26. I-R-XFER-ENDING
27. WRT-SYMIN-PD
28. RES-SYMIN-PD
29. CAN-SYMIN-PD
30. WRITE
31. I-W-XFER-ENDING
32. CANCEL-PD
33. I-CANCEL-PD
34. RRESTART-PD
35. WRESTART-PD
36. I-RRESTART-PD
37. I-WRESTART-PD
38. RESTART-CAN-PD

4. Data End (DTE)
5. Transfer End (TRE)
6. Close (CL)
7. Cancel (CN)

11.2.1.2.1 R/BV/PI/RD/Open (OP)

Reference : ISO 8571-4 subclause 9.9 + A.3.8 SELECTED

Test group objective : Checking the read service element Open.

Test purposes :

1. To correctly open a file at the IUT for read.
2. To correctly open a file at the IUT for read using default mode.
3. To check the operation of presentation context management in opening a file at the IUT for read by the Tester.
4. To correctly fail to open a file at the IUT for read.

11.2.1.2.2 R/BV/PI/RD/Read Bulk Data (RDB)

Reference : ISO 8571-4 subclause 14.1 + A.4.8 DXFRIDLE

Test group objective : Checking the read service element Read.

Test purposes :

1. Read data from the IUT, not using checkpointing.
2. To correctly fail to read a file from the IUT.

11.2.1.2.3 R/BV/PI/RD/Data Unit Transfer (DUT)

Reference : ISO 8571-4 subclause 16.1 + A.4.8 READ

Test group objective : Checking the read service element Data Unit Transfer.

Test purposes :

1. Check data values from the IUT in user context.

11.2.1.2.4 R/BV/PI/RD/Data End (DTE)

Reference : ISO 8571-4 subclause 15.2 + A.4.8 READ

Test group objective : Checking the read service element Data End.

Test purposes :

1. To check the action of F-DATA-END-request, from the IUT, when reading from the IUT.

11.2.1.2.5 R/BV/PI/RD/Transfer End (TRE)

Reference : ISO 8571-4 subclause 14.3 + A.4.8 READ-ENDING

Test group objective : Checking the read service element Transfer End.

Test purposes :

1. To check the reaction to F-TRANSFER-END-request, from the Tester, when reading from the IUT.

11.2.1.2.6 R/BV/PI/RD/Close (CL)

Reference : ISO 8571-4 subclause 9.10 + A.3.8 DXFRIDLE

Test group objective : Checking the read service element Close.

Test purposes :

1. To check the reaction of the IUT to F-CLOSE-request, from the Tester, when reading from the IUT.

11.2.1.2 R/BV/PI/Read (RD)

Reference : ISO 8571-3 Table 1, U2

Test group objective : Checking the following services of the Functional Unit Read.

Subgroups :

1. Open (OP)
2. Read Bulk Data (RDB)
3. Data Unit Transfer (DUT)

11.2.1.2.7 R/BV/PI/RD/Cancel (CN)

Reference : ISO 8571-4 subclause 17.2 + A.4.8 READ

Test group objective : Checking the read service element Bulk Data Transfer.

Test purposes :

1. To check the reaction of the IUT to an F-CANCEL-request, from the Tester, carried on P-DATA-request.
2. To check the reaction of the IUT to an F-CANCEL-request, from the Tester, carried on P-RESYNCHRONISE-request.

11.2.1.3 R/BV/PI/Write (WR)

Reference : ISO 8571-3 Table 1, U3

Test group objective : Checking the following services of the Functional Unit Write.

Subgroups :

1. Open (OP)
2. Write Bulk Data (WRB)
3. Data Unit Transfer (DUT)
4. Data End (DTE)
5. Transfer End (TRE)
6. Close (CL)
7. Cancel (CN)

11.2.1.3.1 R/BV/PI/WR/Open (OP)

Reference : ISO 8571-4 subclause 9.9 + A.3.8 SELECTED

Test group objective : Checking the write service element Open.

Test purposes :

1. To correctly open a file at the IUT for write.
2. To correctly fail to open a file at the IUT for write.

11.2.1.3.2 R/BV/PI/WR/Write Bulk Data (WRB)

Reference : ISO 8571-4 subclause 14.2 + A.4.8 DXFRI-DLE

Test group objective : Checking the write service element Write.

Test purposes :

1. Write data to the IUT, not using check pointing.
2. To correctly fail to write a file to the IUT.

11.2.1.3.3 R/BV/PI/WR/Data Unit Transfer (DUT)

Reference : ISO 8571-4 subclause 16.1 + A.4.8 WRITE

Test group objective : Checking the write service element Data Unit Transfer.

Test purposes :

1. Check the reaction of the IUT to data values in user context.

11.2.1.3.4 R/BV/PI/WR/Data End (DTE)

Reference : ISO 8571-4 subclause 15.2 + A.4.8 WRITE

Test group objective : Checking the write service element Data End.

Test purposes :

1. To check the reaction of the IUT to F-DATA-END-request, at the IUT, from the Tester when writing.

11.2.1.3.5 R/BV/PI/WR/Transfer End (TRE)

Reference : ISO 8571-4 subclause 14.3 + A.4.8 WRITE-ENDING

Test group objective : Checking the write service element Transfer End.

Test purposes :

1. To check the reaction of the IUT to F-TRANSFER-END-request, from the Tester, when writing, checkpointing not being used. An F-TRANSFER-END-confirm is expected.

11.2.1.3.6 R/BV/PI/WR/Close (CL)

Reference : ISO 8571-4 subclause 9.10 + A.3.8 DXFRI-DLE

Test group objective : Checking the write service element Close.

Test purposes :

1. To check the reaction of the IUT to F-CLOSE-request, from the Tester, when writing.

11.2.1.3.7 R/BV/PI/WR/Cancel (CN)

Reference : ISO 8571-4 subclause 17.2 + A.4.8 WRITE

Test group objective : Checking the write service element Cancel.

Test purposes :

1. To check the reaction of the IUT to an F-CANCEL-request, by the Tester, carried on P-DATA-request.
2. To check the reaction of the IUT to an F-CANCEL-request, by the Tester, carried on P-RESYNCHRONISE-request.

11.2.1.4 R/BV/PI/File Access (FA)

Reference : ISO 8571-3 Table 1, U4

Test group objective : Checking the following services of the Functional Unit File Access.

Subgroups :

1. Locate (LC)
2. Erase (ER)

11.2.1.4.1 R/BV/PI/FA/Locate (LC)

Reference : ISO 8571-4 subclause 9.14 + A.3.8 DXFRI-DLE

Test group objective : Checking the file access service element Locate.

Test purposes :

1. To correctly perform a Locate at the IUT.
2. To correctly fail to perform a Locate at the IUT.

11.2.1.4.2 R/BV/PI/FA/Erase (ER)

Reference : ISO 8571-4 subclause 9.15 + A.3.8 DXFRI-DLE

Test group objective : Checking the file access service element Erase.

Test purposes :

1. To correctly perform an Erase at the IUT.
2. To correctly fail to perform an Erase at the IUT.

11.2.1.5 R/BV/PI/Limited File Management (LM)

Reference : ISO 8571-3 Table 1, U5

Test group objective : Checking the following services of the Functional Unit Limited File Management.

Subgroups :

1. Create a File (CR)
2. Delete a File (DL)
3. Read Attributes (RDA)

11.2.1.5.1 R/BV/PV/LM/Create a File (CR)

Reference : ISO 8571-4 subclause 9.5 + A.3.8 INITIALIZED

Test group objective : Checking the limited file management element Create.

Test purposes :

1. To correctly create a virtual file at the IUT.
2. To correctly fail to create a virtual file at the IUT.

11.2.1.5.2 R/BV/PV/LM/Delete a File (DL)

Reference : ISO 8571-4 subclause 9.6 + A.3.8 SELECTED

Test group objective : Checking the limited file management element Delete.

Test purposes :

1. To correctly delete a virtual file at the IUT.
2. To correctly fail to delete a virtual file at the IUT.

11.2.1.5.3 R/BV/PV/LM/Read Attributes (RDA)

Reference : ISO 8571-4 subclause 9.7 + A.3.8 SELECTED

Test group objective : Checking the limited file management element Read Attribute.

Test purposes :

1. To correctly read the attributes of a virtual file from the IUT.
2. To correctly fail to read the attributes of a virtual file from the IUT.

11.2.1.6 R/BV/PV/Enhanced File Management (EM)

Reference : ISO 8571-3 Table 1, U6

Test group objective : Checking the following services of the Functional Unit Enhanced File Management.

Subgroups :

1. Change Attributes (CHA)

11.2.1.6.1 R/BV/PV/EM/Change Attributes (CHA)

Reference : ISO 8571-4 subclause 9.8 + A.3.8 SELECTED

Test group objective : Checking the enhanced file management service element Change Attribute.

Test purposes :

1. To correctly change the attributes of a virtual file at the IUT.
2. To correctly fail to change the attributes of a virtual file at the IUT.

11.2.1.7 R/BV/PV/Grouping (GP)

Reference : ISO 8571-3 Table 1, U7

Test group objective : Checking the services of the Functional Unit Grouping by service class, confirming that the response to a grouped sequence are on a single TD PDU.

Subgroups :

1. File transfer class (FT)
2. File management class (FM)
3. File transfer and management class (FTM)
4. File access class (FAC)
5. Unconstrained class (U)

11.2.1.7.1 R/BV/PV/GP/File Transfer Class (FT)

Reference : ISO 8571-3 subclause 8.2.1

Test group objective : Checking the permitted grouped class sequences for File Transfer Class.

Subgroups :

1. Group A successful (GA+)
2. Group B successful (GB+)
3. Group A unsuccessful (GA-)

11.2.1.7.1.1 R/BV/PV/GP/FT/Group A Successful (GA+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group A Successful.

Test purposes :

1. The sequence F-SELECT, F-OPEN is correctly sent, by the Tester under Grouping. Confirm that the IUT entered the data transfer idle state.
2. The sequence F-CREATE, F-OPEN is correctly sent, by the Tester under Grouping. Confirm that the IUT entered the data transfer idle state.
3. The sequence F-SELECT, F-READ-ATTRIB, F-OPEN is correctly sent, by the Tester under Grouping. Confirm that the IUT entered the data transfer idle state.
4. The sequence F-CREATE, F-READ-ATTRIB, F-OPEN is correctly sent, by the Tester under Grouping. Confirm that the IUT entered the data transfer idle state.
5. The sequence F-SELECT, F-CHANGE-ATTRIB, F-OPEN is correctly sent, by the Tester under Grouping. Confirm that the IUT entered the data transfer idle state.
6. The sequence F-CREATE, F-CHANGE-ATTRIB, F-OPEN is correctly sent, by the Tester under Grouping. Confirm that the IUT entered the data transfer idle state.
7. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-OPEN is correctly sent, by the Tester under Grouping. Confirm that the IUT entered the data transfer idle state.
8. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-OPEN is correctly sent, by the Tester under Grouping. Confirm that the IUT entered the data transfer idle state.

11.2.1.7.1.2 R/BV/PV/GP/FT/Group B Successful (GB+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group B Successful.

Test purposes :

1. The sequence F-CLOSE, F-DESELECT is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
2. The sequence F-CLOSE, F-DELETE is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
3. The sequence F-CLOSE, F-READ-ATTRIB, F-DESELECT is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
4. The sequence F-CLOSE, F-READ-ATTRIB, F-DELETE is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
5. The sequence F-CLOSE, F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
6. The sequence F-CLOSE, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
7. The sequence F-CLOSE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
8. The sequence F-CLOSE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

initialised state.

11.2.1.7.1.3 R/BV/PI/GP/FT/Group A Unsuccessful (GA-)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group A Unsuccessful.

Test purposes :

1. The sequence F-SELECT, F-OPEN is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.
2. The sequence F-SELECT, F-OPEN is sent by the Tester under Grouping so that the open will result in failure. Confirm that the IUT returned to the initialised state.
3. The sequence F-CREATE, F-OPEN is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.
4. The sequence F-CREATE, F-OPEN is sent by the Tester under Grouping so that the open will result in failure. Confirm that the IUT returned to the initialised state.
5. The sequence F-SELECT, F-READ-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.
6. The sequence F-SELECT, F-READ-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the open will result in failure. Confirm that the IUT returned to the initialised state.
7. The sequence F-CREATE, F-READ-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.
8. The sequence F-CREATE, F-READ-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the open will result in failure. Confirm that the IUT returned to the initialised state.
9. The sequence F-SELECT, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.
10. The sequence F-SELECT, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.
11. The sequence F-SELECT, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the open will result in failure. Confirm that the IUT returned to the initialised state.
12. The sequence F-CREATE, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.
13. The sequence F-CREATE, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.
14. The sequence F-CREATE, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the open will result in failure. Confirm that the IUT returned to the initialised state.
15. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.
16. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under

Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.

17. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the open will result in failure. Confirm that the IUT returned to the initialised state.
18. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.
19. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.
20. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-OPEN is sent by the Tester under Grouping so that the open will result in failure. Confirm that the IUT returned to the initialised state.
21. The sequence F-SELECT, F-OPEN, F-CLOSE, F-DESELECT of individually valid PDU's is sent. As this is not a valid sequence the IUT will treat the whole of the group sequence as a single syntactically invalid PDU and signal a protocol error with an F-P-ABORT.

11.2.1.7.2 R/BV/PI/GP/File Management Class (FM)

Reference : ISO 8571-3 subclause 8.2.3

Test group objective : Checking the permitted grouped class sequences for File Management Class.

Subgroups :

1. Group C successful (GC+)
2. Group C unsuccessful (GC-)

11.2.1.7.2.1 R/BV/PI/GP/FM/Group C Successful (GC+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group C Successful.

Test purposes :

1. The sequence F-SELECT, F-DESELECT is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
2. The sequence F-CREATE, F-DESELECT is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
3. The sequence F-SELECT, F-DELETE is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
4. The sequence F-CREATE, F-DELETE is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
5. The sequence F-SELECT, F-READ-ATTRIB, F-DESELECT is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
6. The sequence F-CREATE, F-READ-ATTRIB, F-DESELECT is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
7. The sequence F-SELECT, F-READ-ATTRIB, F-DELETE is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
8. The sequence F-CREATE, F-READ-ATTRIB, F-DELETE is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
9. The sequence F-SELECT, F-CHANGE-ATTRIB, F-DESELECT is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised

state.

10. The sequence F-CREATE, F-CHANGE-ATTRIB, F-DESELECT is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

11. The sequence F-SELECT, F-CHANGE-ATTRIB, F-DELETE is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

12. The sequence F-CREATE, F-CHANGE-ATTRIB, F-DELETE is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

13. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DESELECT is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

14. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DESELECT is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

15. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DELETE is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

16. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DELETE is correctly sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

9. The sequence F-SELECT, F-READ-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.

10. The sequence F-SELECT, F-READ-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the delete will result in failure. Confirm that the IUT returned to the initialised state.

11. The sequence F-CREATE, F-READ-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.

12. The sequence F-CREATE, F-READ-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the delete will result in failure. Confirm that the IUT returned to the initialised state.

13. The sequence F-SELECT, F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.

14. The sequence F-SELECT, F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.

15. The sequence F-CREATE, F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.

16. The sequence F-CREATE, F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.

17. The sequence F-SELECT, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.

18. The sequence F-SELECT, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.

19. The sequence F-SELECT, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the delete will result in failure. Confirm that the IUT returned to the initialised state.

20. The sequence F-CREATE, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.

21. The sequence F-CREATE, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.

22. The sequence F-CREATE, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the delete will result in failure. Confirm that the IUT returned to the initialised state.

23. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.

24. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.

25. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping so that the create will result in failure.

11.2.1.7.2.2 R/BV/PI/GP/FM/Group C Unsuccessful (GC-)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group C Unsuccessful.

Test purposes :

1. The sequence F-SELECT, F-DESELECT is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.

2. The sequence F-CREATE, F-DESELECT is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.

3. The sequence F-SELECT, F-DELETE is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.

4. The sequence F-SELECT, F-DELETE is sent by the Tester under Grouping so that the delete will result in failure. Confirm that the IUT returned to the initialised state.

5. The sequence F-CREATE, F-DELETE is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.

6. The sequence F-CREATE, F-DELETE is sent by the Tester under Grouping so that the delete will result in failure. Confirm that the IUT returned to the initialised state.

7. The sequence F-SELECT, F-READ-ATTRIB, F-DESELECT is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.

8. The sequence F-CREATE, F-READ-ATTRIB, F-DESELECT is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.

Confirm that the IUT returned to the initialised state.

26. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.

27. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the delete will result in failure. Confirm that the IUT returned to the initialised state.

28. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.

29. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the delete will result in failure. Confirm that the IUT returned to the initialised state.

30. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.

31. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.

32. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping so that the delete will result in failure. Confirm that the IUT returned to the initialised state.

33. The sequence F-SELECT, F-DESELECT, F-SELECT, F-DELETE of individually valid PDU's is sent by the Tester under Grouping. As this is not a valid sequence the IUT will treat the whole of the group sequence as a single invalid PDU and signal a protocol error with an F-P-ABORT.

11.2.1.7.3 R/BV/PI/GP/File Transfer and Management Class (FTM)

Reference : ISO 8571-3 subclause 8.2.4

Test group objective : Checking the permitted grouped sequences for File Transfer and Management Class.

Subgroups :

1. Group A successful (GA+)
2. Group B successful (GB+)
3. Group A unsuccessful (GA-)
4. Group C successful (GC+)
5. Group C unsuccessful (GC-)

11.2.1.7.3.1 R/BV/PI/GP/FTM/Group A Successful (GA+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group A Successful.

Test purposes :

1. See R/BV/PI/GP/FT/GA+/-

11.2.1.7.3.2 R/BV/PI/GP/FTM/Group B Successful (GB+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group B Successful.

Test purposes :

1. See R/BV/PI/GP/FT/GB+/-

11.2.1.7.3.3 R/BV/PI/GP/FTM/Group A Unsuccessful (GA-)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group A Unsuccessful.

Test purposes :

1. See R/BV/PI/GP/FT/GA-/-

11.2.1.7.3.4 R/BV/PI/GP/FTM/Group C Successful (GC+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group C Successful.

Test purposes :

1. See R/BV/PI/GP/FT/GC+/-

11.2.1.7.3.5 R/BV/PI/GP/FTM/Group C Unsuccessful (GC-)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group C Unsuccessful.

Test purposes :

1. See R/BV/PI/GP/FT/GC-/-

11.2.1.7.4 R/BV/PI/GP/File Access Class (FAC)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped class sequences for File Access Class.

Subgroups :

1. Group A successful (GA+)
2. Group B successful (GB+)
3. Group A unsuccessful (GA-)
4. Group C successful (GC+)
5. Group C unsuccessful (GC-)
6. Group D successful (GD+)
7. Group E successful (GE+)
8. Group D unsuccessful (GD-)

11.2.1.7.4.1 R/BV/PI/GP/FAC/Group A Successful (GA+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group A Successful.

Test purposes :

1. See R/BV/PI/GP/FT/GA+/-

11.2.1.7.4.2 R/BV/PI/GP/FAC/Group B Successful (GB+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group B Successful.

Test purposes :

1. See R/BV/PI/GP/FT/GB+/-

11.2.1.7.4.3 R/BV/PI/GP/FAC/Group A Unsuccessful (GA-)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group A Unsuccessful.

Test purposes :

1. See R/BV/PI/GP/FT/GA-/-

11.2.1.7.4.4 R/BV/PI/GP/FAC/Group C Successful (GC+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group C Successful.

Test purposes :

1. See R/BV/PI/GP/FM/GC+/

11.2.1.7.4.5 R/BV/PI/GP/FAC/Group C Unsuccessful (GC-)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group C Unsuccessful.

Test purposes :

1. See R/BV/PI/GP/FM/GC-/

11.2.1.7.4.6 R/BV/PI/GP/FAC/Group D Successful (GD+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group D Successful.

Test purposes :

1. The sequence F-SELECT is correctly sent by the Tester under Grouping. Confirm that the IUT expects the virtual file to be selected but closed.
2. The sequence F-CREATE is correctly sent by the Tester under Grouping. Confirm that the IUT expects the virtual file to be selected but closed.
3. The sequence F-SELECT, F-READ-ATTRIB is correctly sent by the Tester under Grouping. Confirm that the IUT expects the virtual file to be selected but closed.
4. The sequence F-CREATE, F-READ-ATTRIB is correctly sent by the Tester under Grouping. Confirm that the IUT expects the virtual file to be selected but closed.
5. The sequence F-SELECT, F-CHANGE-ATTRIB is correctly sent by the Tester under Grouping. Confirm that the IUT expects the virtual file to be selected but closed.
6. The sequence F-CREATE, F-CHANGE-ATTRIB is correctly sent by the Tester under Grouping. Confirm that the IUT expects the virtual file to be selected but closed.
7. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB is correctly sent by the Tester under Grouping. Confirm that the IUT expects the virtual file to be selected but closed.
8. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB is correctly sent by the Tester under Grouping. Confirm that the IUT expects the virtual file to be selected but closed.

11.2.1.7.4.7 R/BV/PI/GP/FAC/Group E Successful (GE+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group E Successful.

Test purposes :

1. The sequence F-DESELECT is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
2. The sequence F-DELETE is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
3. The sequence F-READ-ATTRIB, F-DESELECT is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
4. The sequence F-READ-ATTRIB, F-DELETE is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.
5. The sequence F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

6. The sequence F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

7. The sequence F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DESELECT is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

8. The sequence F-READ-ATTRIB, F-CHANGE-ATTRIB, F-DELETE is sent by the Tester under Grouping. Confirm that the IUT returned to the initialised state.

11.2.1.7.4.8 R/BV/PI/GP/FAC/Group D Unsuccessful (GD-)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group D Unsuccessful.

Test purposes :

1. The sequence F-SELECT is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.
2. The sequence F-CREATE is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.
3. The sequence F-SELECT, F-READ-ATTRIB is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.
4. The sequence F-CREATE, F-READ-ATTRIB is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.
5. The sequence F-SELECT, F-CHANGE-ATTRIB is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.
6. The sequence F-SELECT, F-CHANGE-ATTRIB is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.
7. The sequence F-CREATE, F-CHANGE-ATTRIB is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.
8. The sequence F-CREATE, F-CHANGE-ATTRIB is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.
9. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB is sent by the Tester under Grouping so that the select will result in failure. Confirm that the IUT returned to the initialised state.
10. The sequence F-SELECT, F-READ-ATTRIB, F-CHANGE-ATTRIB is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.
11. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB is sent by the Tester under Grouping so that the create will result in failure. Confirm that the IUT returned to the initialised state.
12. The sequence F-CREATE, F-READ-ATTRIB, F-CHANGE-ATTRIB is sent by the Tester under Grouping so that the change attributes will result in failure. Confirm that the IUT returned to the initialised state.

11.2.1.7.5 R/BV/PI/GP/Unconstrained Class (U)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Unconstrained Class.

Subgroups :

1. Group A successful (GA+)
2. Group B successful (GB+)
3. Group A unsuccessful (GA-)
4. Group C successful (GC+)
5. Group C unsuccessful (GC-)
6. Group D successful (GD+)
7. Group E successful (GE+)
8. Group D unsuccessful (GD-)

11.2.1.7.5.1 R/BV/PI/GP/U/Group A Successful (GA+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group A Successful.

Test purposes :

1. See R/BV/PI/GP/FT/GA+/-

11.2.1.7.5.2 R/BV/PI/GP/U/Group B Successful (GB+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group B Successful.

Test purposes :

1. See R/BV/PI/GP/FT/GB+/-

11.2.1.7.5.3 R/BV/PI/GP/U/Group A Unsuccessful (GA-)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group A Unsuccessful.

Test purposes :

1. See R/BV/PI/GP/FT/GA-/-

11.2.1.7.5.4 R/BV/PI/GP/U/Group C Successful (GC+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group C Successful.

Test purposes :

1. See R/BV/PI/GP/FM/GC+/-

11.2.1.7.5.5 R/BV/PI/GP/U/Group C Unsuccessful (GC-)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group C Unsuccessful.

Test purposes :

1. See R/BV/PI/GP/FM/GC-/-

11.2.1.7.5.6 R/BV/PI/GP/U/Group D Successful (GD+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group D Successful.

Test purposes :

1. See R/BV/PI/GP/FAC/GD+/-

11.2.1.7.5.7 R/BV/PI/GP/U/Group E Successful (GE+)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group E Successful.

Test purposes :

1. See R/BV/PI/GP/FAC/GE+/-

11.2.1.7.5.8 R/BV/PI/GP/U/Group D Unsuccessful (GD-)

Reference : ISO 8571-3 Annex E

Test group objective : Checking the permitted grouped sequences for Group D Unsuccessful.

Test purposes :

1. See R/BV/PI/GP/FAC/GD-/-

11.2.1.8 R/BV/PI/Locking (FL)

This subclause is included for completeness only, the service may not be fully testable.

NOTE — see R/BV/VF/FL

11.2.1.9 R/BV/PI/Recovery (RC)

Reference : ISO 8571-3 Table 1, U9

Test group objective : Checking the following services of the Functional Unit Recovery.

Subgroups :

1. Checkpointing (CHK)
2. Cancel (CN)
3. Regime Recovery (RR)

11.2.1.9.1 R/BV/PI/RC/Checkpointing (CHK)

Reference : ISO 8571-4 subclause 15.3, 16.3

Test group objective : Checking the recovery service element Checkpointing.

Test purposes :

1. To check the action of checkpointing while reading from the IUT.
2. To check the action of checkpointing while writing to the IUT.

11.2.1.9.2 R/BV/PI/RC/Cancel (CN)

Reference : ISO 8571-4 subclause 17.2

Test group objective : Checking the recovery service element Cancel.

Test purposes :

1. To check the reaction of the IUT to an F-CANCEL-request, by Tester, carried on P-RESYNCHRONISE-request.
2. To check the action of an F-CANCEL-request, by the IUT, carried on P-RESYNCHRONISE-request.

11.2.1.9.3 R/BV/PI/RC/Regime Recovery (RR)

Reference : ISO 8571-4 subclause 19.2 + A.3.8 INITIALIZED

Test group objective : Checking the recovery service element Regime Recovery.

Test purposes :

1. The Tester is to be performing a read operation. It then issues an F-CANCEL-request, followed by the other procedures for a class-II-error, and proceeds to issue an F-RECOVER-request. Confirm that the IUT continues the transfer from the start of transfer.
2. The Tester is to be performing a read operation. It then issues an F-CANCEL-request, followed by the other procedures for a class-II-error, and proceeds to issue an F-RECOVER-request. Confirm that the IUT continues the transfer from the last acknowledged checkpoint.
3. The Tester is to be performing a write operation. It then issues an F-CANCEL-request, followed by the other procedures for a class-II-error, and proceeds to issue an F-RECOVER-request. The Tester continues the transfer

from the start of transfer. Confirm that the resulting file has neither gained nor lost information from the sourced file.

4. The Tester is to be performing a write operation. It then issues an F-CANCEL-request, followed by the other procedures for a class-II-error, and proceeds to issue an F-RECOVER-request. The Tester continues the transfer from the last acknowledged checkpoint. Confirm that the resulting file has neither gained nor lost information from the sourced file.

5. The Tester is to be performing a read operation and it then issues an F-P-ABORT-request. The Tester establishes a new regime and issues an F-RECOVER-request. Confirm that the IUT continues the transfer from the start of transfer.

6. The Tester is to be performing a read operation and it then issues an F-P-ABORT-request. The Tester establishes a new regime and issues an F-RECOVER-request. Confirm that the IUT continues the transfer from the last acknowledged checkpoint.

7. The Tester is to be performing a write operation and it then issues an F-P-ABORT-request. The Tester establishes a new regime and issues an F-RECOVER-request. The Tester continues the transfer from the start of transfer. Confirm that the resulting file has neither gained nor lost information from the sourced file.

8. The Tester is to be performing a write operation and it then issues an F-P-ABORT-request. The Tester establishes a new regime and issues an F-RECOVER-request. The Tester continues the transfer from the last acknowledged checkpoint. Confirm that the resulting file has neither gained nor lost information from the sourced file.

9. The Tester is to be performing a read operation and having received the F-DATA-END-indication from the IUT then issues an F-CANCEL-request followed by the other procedures for a class-II-error for retransmission from start of transfer. Confirm that the IUT continues the transfer from the start of transfer.

10. The Tester is to be performing a read operation and having received the F-DATA-END-indication from the IUT then issues an F-CANCEL-request followed by the other procedures for a class-II-error for retransmission from an active checkpoint. Confirm that the IUT continues the transfer from the last acknowledged checkpoint.

11. The Tester is to be performing a write operation and issues an F-CANCEL-request followed by the other procedures for a class-II-error for retransmission from start of transfer, before any data has been sent. Confirm that the resulting virtual file has neither gained nor lost information.

12. The Tester is to be performing a write operation and issues an F-CANCEL-request followed by the other procedures for a class-II-error for retransmission from an active checkpoint, before any data has been sent. Confirm that the resulting virtual file has neither gained nor lost information.

13. The Tester is to be performing a read operation and having received the F-DATA-END-indication from the IUT then issues an F-P-ABORT-request followed by the other procedures for a class-III-error for retransmission from start of transfer. Confirm that the IUT continues the transfer from the start of transfer.

14. The Tester is to be performing a read operation and having received the F-DATA-END-indication from the IUT then issues an F-P-ABORT-request followed by the other procedures for a class-III-error for retransmission from an active checkpoint. Confirm that the IUT continues the transfer from the last acknowledged checkpoint.

15. The Tester is to be performing a write operation and issues an F-P-ABORT-request followed by the other procedures for a class-III-error for retransmission from start of transfer, before any data has been sent. Confirm that the

resulting virtual file has neither gained nor lost information.

16. The Tester is to be performing a write operation and issues an F-P-ABORT-request followed by the other procedures for a class-III-error for retransmission from an active checkpoint, before any data has been sent. Confirm that the resulting virtual file has neither gained nor lost information.

11.2.1.10 R/BV/PI/Restart Data Transfer (RT)

Reference : ISO 8571-3 Table 1, U10

Test group objective : Checking the following services of the Functional Unit Restart.

Subgroups :

1. Checkpointing (CHK)
2. Cancel (CN)
3. Restart Data Transfer (RT)

11.2.1.10.1 R/BV/PI/RT/Checkpointing (CHK)

Reference : ISO 8571-4 subclause 15.3, 16.3

Test group objective : Checking the restart service element Checkpointing.

Test purposes :

1. See R/BV/PI/RC/CHK/1
2. See R/BV/PI/RC/CHK/2

11.2.1.10.2 R/BV/PI/RT/Cancel (CN)

Reference : ISO 8571-4 subclause 17.2

Test group objective : Checking the restart service element Cancel.

Test purposes :

1. See R/BV/PI/RC/CN/1
2. See R/BV/PI/RC/CN/2

11.2.1.10.3 R/BV/PI/RT/Restart Data Transfer (RT)

Reference : ISO 8571-4 subclause 18.3 + A.4.8 READ/WRITE

Test group objective : Checking the restart service element Restart.

Test purposes :

1. The Tester is to be performing a read operation and then issues an F-RESTART-request for retransmission from start of transfer. Confirm that the IUT continues the transfer from the start of transfer file.
2. The Tester is to be performing a read operation and then issues an F-RESTART-request for retransmission from an active checkpoint. Confirm that the IUT continues the transfer from the last acknowledged checkpoint.
3. The Tester is to be performing a write operation and then issues an F-RESTART-request for retransmission from start of transfer. Confirm that the resulting virtual file has neither gained nor lost information.
4. The Tester is to be performing a write operation and then issues an F-RESTART-request for retransmission from an active checkpoint. Confirm that the resulting virtual file has neither gained nor lost information.
5. The Tester is to be performing a read operation and then issues an F-RESTART-request for retransmission from start of transfer after having received the F-DATA-request from the IUT. Confirm that the IUT continues the transfer from the start of transfer file.
6. The Tester is to be performing a read operation and then issues an F-RESTART-request for retransmission from an active checkpoint after having received the F-DATA-request from the IUT. Confirm that the IUT continues the transfer from the last acknowledged checkpoint.

7. The Tester is to be performing a write operation and then issues an F-RESTART-request for retransmission from start of transfer before sending any data. Confirm that the resulting virtual file has neither gained nor lost information.
8. The Tester is to be performing a write operation and then issues an F-RESTART-request for retransmission from an active checkpoint before sending any data. Confirm that the resulting virtual file has neither gained nor lost information.

11.2.2 R/BV/Parameter Variation (PV)

Reference : ISO 8571-4 subclause 9

Test group objective : Checking the reaction of the IUT to parameter variations, subgrouped by Functional Units .

Subgroups :

1. Kernel (KE)
2. Read (RD)
3. Write (WR)
4. File Access (FA)
5. Limited File Management (LM)
6. Enhanced File Management (EM)
7. Grouping (GP)
8. FADU Locking (FL)
9. Recovery (RC)
10. Restart Data Transfer (RT)

11.2.2.1 R/BV/PV/Kernel (KE)

Test group objective : Checking parameter variation in the following services .

Subgroups :

1. Connection Establishment (CE)
2. Select (SL)
3. Deselect (DS)
4. Terminate (TR)
5. Terminate Abrupt (AB)

11.2.2.1.1 R/BV/PV/KE/Connection Establishment (CE)

Reference : ISO 8571-4 ASN.1 Line 16-29. Note technical corrigenda ISO/IEC JTC1/SC21 N5242, new clause 20.5, rules for extensibility

Test group objective : Itemising parameters to be varied, by the Tester, on F-INITIALIZE-request.

Subgroups :

1. Protocol Version (PVN)
2. Implementation Information (INF)
3. Presentation Context Management (PCM)
4. Service Class (SC)
5. Functional Units (FU)
6. Attribute Groups (AG)
7. Shared ASE Information (SAI)
8. FTAM Quality of service (FQS)
9. Contents Type List (CTL)
10. Initiator Identity (IID)
11. Account (AC)
12. Filestore Password (FP)
13. Checkpoint Window (CW)

11.2.2.1.1.1 R/BV/PV/KE/CE/Protocol Version (PVN)

Reference : ISO 8571-4 ASN.1 Line 16

Test group objective : Testing variations on parameter Parameter Version.

Test purposes :

1. Omit this parameter on an F-INITIALIZE-request; the IUT should use the default value and establish an association.
2. A valid valued parameter is supplied; the IUT should use this value and establish an association.
3. An undefined value for this parameter is supplied; an F-INITIALIZE-reject is expected.

11.2.2.1.1.2 R/BV/PV/KE/CE/Implementation Information (INF)

Reference : ISO 8571-4 ASN.1 Line 17

Test group objective : Testing variations on parameter Implementation Information.

Test purposes :

1. Omit this parameter on an F-INITIALIZE-request; the IUT should ignore this optional parameter and establish an association.
2. A valid valued parameter is supplied; the IUT should establish a association.

11.2.2.1.1.3 R/BV/PV/KE/CE/Presentation Context Management (PCM)

Reference : ISO 8571-4 ASN.1 Line 18

Test group objective : Testing variations on parameter Presentation Context Management.

Test purposes :

1. Omit this parameter on an F-INITIALIZE-request; the IUT should use the default value and establish an association.
2. The false valued parameter is supplied; the IUT should use this value and establish an association.
3. The true valued parameter is supplied; the IUT should use this value and establish an association.

11.2.2.1.1.4 R/BV/PV/KE/CE/Service Class (SC)

Reference : ISO 8571-4 ASN.1 Line 19

Test group objective : Testing variations on parameter Service Class.

Test purposes :

1. The Tester proposes all possible service classes. The IUT should establish the association responding with the highest service class supported.
2. The unconstrained class valued parameter is supplied; the IUT should use this value and establish an association.
3. The transfer class valued parameter is supplied; the IUT should use this value and establish an association.
4. The access class valued parameter is supplied; the IUT should use this value and establish an association.
5. The management class valued parameter is supplied; the IUT should use this value and establish an association.
6. The transfer and management class valued parameter are supplied; the IUT should use this value and establish an association.
7. An undefined value for this parameter is supplied; an F-INITIALIZE-reject is expected.

11.2.2.1.1.5 R/BV/PV/KE/CE/Functional Units (FU)

Reference : ISO 8571-4 ASN.1 Line 21

Test group objective : Testing variations on parameter Functional Units.

Test purposes :

1. This parameter is present but no bits are set; the IUT should establish the association.

2. Correct valued parameters are supplied (bits 2-10); the IUT should use these values and establish an association.
3. The Tester proposes all possible functional units. The IUT should establish the association negotiating down unsupported functional units.
4. An undefined value for this parameter is supplied; an F-INITIALIZE-reject is expected.

11.2.2.1.1.6 R/BV/PV/KE/CE/Attribute Groups (AG)

Reference : ISO 8571-4 ASN.1 Line 22

Test group objective : Testing variations on parameter Attribute Groups.

Test purposes :

1. Omit this parameter on an F-INITIALIZE-request; the IUT should use the default value and establish an association.
2. This parameter is present but no bits are set; the IUT should establish the association.
3. The storage group valued parameter is supplied; the IUT should use this value and establish an association.
4. The security group valued parameter is supplied; the IUT should use this value and establish an association.
5. The private group valued parameter is supplied; the IUT should use this value and establish an association.
6. The Tester proposes all possible attribute groups. The IUT should establish the association negotiating down unsupported attribute groups.
7. An undefined value for this parameter is supplied; an F-INITIALIZE-reject is expected.

11.2.2.1.1.7 R/BV/PV/KE/CE/Shared ASE Information (SAI)

Reference : ISO 8571-4 ASN.1 Line 23

Test group objective : Testing variations on parameter Shared ASE Information.

Test purposes :

1. Omit this parameter on an F-INITIALIZE-request; the IUT should ignore this optional parameter and establish an association.
2. A valid valued parameter is supplied; the IUT should establish an association.

11.2.2.1.1.8 R/BV/PV/KE/CE/FTAM Quality of service (FQS)

Reference : ISO 8571-4 ASN.1 Line 24

Test group objective : Testing variations on parameter FTAM Quality of service.

Test purposes :

1. The no-recovery service valued parameter is supplied; the IUT should use this value and establish an association.
2. The class-1-recovery service valued parameter is supplied; the IUT should use this value and establish an association.
3. The class-2-recovery service valued parameter is supplied; the IUT should use this value and establish an association.
4. The class-3-recovery service valued parameter is supplied; the IUT should use this value and establish an association.
5. An undefined value for this parameter is supplied; an F-INITIALIZE-reject is expected.

11.2.2.1.1.9 R/BV/PV/KE/CE/Contents Type List (CTL)

Reference : ISO 8571-4 ASN.1 Line 25

Test group objective : Testing variations on parameter Contents Type List.

Test purposes :

1. Omit this parameter on an F-INITIALIZE-request; the IUT should ignore this optional parameter, if the presentation context management functional unit is being negotiated, and establish an association.
2. The document-type-name choice valued parameter is supplied; the IUT should use this value and establish an association.
3. The abstract-syntax-name choice valued parameter is supplied; the IUT should use this value and establish an association.
4. The Tester proposes all possible document types. The IUT should establish the association negotiating down unsupported document types.
5. An undefined value for this parameter is supplied; an F-INITIALIZE-reject is expected.

11.2.2.1.1.10 R/BV/PV/KE/CE/Initiator Identity (IID)

Reference : ISO 8571-4 ASN.1 Line 26

Test group objective : Testing variations on parameter Initiator Identity.

Test purposes :

1. Omit this parameter on an F-INITIALIZE-request when initiator identity is not being used; the IUT should ignore this optional parameter and establish an association.
2. A valid valued parameter is supplied; the IUT should establish an association.

11.2.2.1.1.11 R/BV/PV/KE/CE/Account (AC)

Reference : ISO 8571-4 ASN.1 Line 27

Test group objective : Testing variations on parameter Account.

Test purposes :

1. Omit this parameter on an F-INITIALIZE-request when account is not being used; the IUT should ignore this optional parameter and establish an association.
2. A valid valued parameter is supplied; the IUT should establish an association.

11.2.2.1.1.12 R/BV/PV/KE/CE/Filestore Password (FP)

Reference : ISO 8571-4 ASN.1 Line 28

Test group objective : Testing variations on parameter Filestore Password.

Test purposes :

1. Omit this parameter on an F-INITIALIZE-request when filestore password is not being used; the IUT should ignore this optional parameter and establish an association.
2. The GraphicString choice valued parameter is supplied; the IUT should use this value and establish an association.
3. The OCTET STRING choice valued parameter is supplied; the IUT should use this value and establish an association.

11.2.2.1.1.13 R/BV/PV/KE/CE/Checkpoint Window (CW)

Reference : ISO 8571-4 ASN.1 Line 29

Test group objective : Testing variations on parameter Checkpoint Window.

Test purposes :

1. Omit this parameter on an F-INITIALIZE-request; the IUT should use the default value and establish an association.