



**SIF-011-1998**  
**(SIF Document #SIF-95-002)**

**SIF APPROVED DOCUMENT**

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**WORK GROUP:**

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**TITLE:** FTAM Profile for SONET Operations Communications

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**DATE:** April 18, 1997

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**ABSTRACT:** This document provides a profile for the FTAM protocol to be used by SONET NEs across the SONET OS/NE and NE/NE interfaces. This profile is intended to be used together with SONET Upper Layers Profile that is compatible with this FTAM profile and is described in the Bellcore document GR-253-CORE (Issue 1 Dec/94).

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**April 18, 1997**



## **Table of Contents**

1 Introduction.....	1
2 Source Documents .....	1
2.1 Base Standards.....	1
2.2 International Standardized Profiles .....	1
2.3 American National Standards for Telecommunications .....	1
2.4 Bellcore Requirements .....	1
3 Notations Used in the SONET File Transfer Profile.....	2
3.1 Abbreviations.....	2
3.2 D - column.....	2
3.3 I - column (Initiator) .....	2
3.4 R- column (Responder) .....	2
3.5 Profile Column.....	3
3.6 Support column.....	3
4 Differences Between this Profile and ISO/IEC ISP 10607-3 .....	3
Annex A - SONET File Transfer Profile .....	7
Section 1: (void) .....	7
Section 2: General ISO 8571 Detail .....	8
A.3 ISO 8571 Protocol versions.....	8
A.6 Global statement of conformance.....	8
A.7 Initiator / Responder capability .....	8
A.8 Application context name details .....	8
Section 3 : Syntax Detail.....	9
A.9 Abstract Syntaxes .....	9
Section 4 : Virtual Filestore Detail.....	10
A.10 Virtual filestore .....	10
A.10.1 File model.....	10
A.10.2 Attributes.....	10
A.10.2.1 Attribute groups .....	10
A.10.2.2 Attribute values.....	10
A.10.2.3 Filename detail .....	11
A.10.3 File structures .....	11
A.10.3.1 Constraint sets .....	11
A.10.3.2 File and filestore actions.....	11

---

**This document has received the approval of the SONET Interoperability Forum (SIF).**  
**April 18, 1997**

**SIF-011-1998**

**(SIF Document #SIF-95-002)**

A.10.3.2.1 Filestore actions..... 11

A.10.3.2.2 File Actions..... 12

A.10.3.2.3 Access contexts supported ..... 12

A.10.4 Additional Information ..... 12

A.10.5 Override ..... 12

Section 5 : File Protocol Detail..... 13

A.11 File protocol ..... 13

A.11.1 GraphicString support..... 14

A.11.2 FTAM regime establishment..... 14

A.11.3 FTAM regime termination (orderly) ..... 14

A.11.4 FTAM regime termination (abrupt) by service user ..... 15

A.11.5 FTAM regime termination (abrupt) by service provider ..... 15

A.11.6 File selection..... 15

A.11.7 File deselection ..... 15

A.11.8 File creation..... 16

A.11.9 File deletion..... 16

A.11.10 Read attributes ..... 16

A.11.11 Change attributes ..... 16

A.11.12 File open..... 17

A.11.13 File close..... 17

A.11.14 Beginning of grouping ..... 17

A.11.15 End of grouping ..... 18

A.11.16 Regime recovery ..... 18

A.11.17 Locate file access data unit..... 18

A.11.18 Erase file access data unit ..... 18

A.11.19 Read bulk data ..... 18

A.11.20 Write bulk data ..... 18

A.11.21 End of data transfer..... 19

A.11.22 End of transfer ..... 19

A.11.23 Cancel data transfer ..... 19

A.11.23.1 F-CANCEL mapping ..... 19

A.11.24 Restart data transfer ..... 19

A.12 Expanded PDU filed and filestore detail ..... 19

A.12.1 Implementation information detail ..... 20

A.12.2 Access control detail ..... 20

---

**This document has received the approval of the SONET Interoperability Forum (SIF).  
April 18, 1997**

A.12.3 Access control element detail .....	20
A.12.4 Service class field detail .....	20
A.12.5 Functional unit field detail .....	20
A.12.6 Diagnostic field detail .....	21
A.12.7 Contents type detail .....	21
A.12.7.1 Contents type list parameter .....	21
A.12.7.2 Contents type parameter .....	21
A.12.8 FTAM Quality of service details .....	21
A.12.9 Details of shared ASE information .....	21
A.12.10 Details of charging .....	21
A.12.11 Filestore password detail .....	22
A.12.12 Create password detail .....	22
A.12.13 Concurrency control .....	22
A.12.13.1 Supported values .....	22
A.12.13.2 Responder default values .....	22
A.12.14 FADU locking .....	22
A.12.15 Initiator override .....	23
A.12.16 Requested access .....	23
A.12.17 Processing mode .....	23
A.12.18 Recovery mode .....	23
Section 6 : Document Types .....	24
A.13 Document types .....	24
A.13.1 FTAM-1 .....	25
A.13.2 FTAM-2 .....	25
A.13.3 FTAM-3 .....	25
A.13.4 FTAM-4 .....	25
A.13.5 INTAP-1 .....	25
Annex B - SONET File Transfer PICS .....	26
Section 1: (void) .....	26
Section 2: General ISO 8571 Detail .....	27
B.3 ISO 8571 Protocol versions .....	27
B.6 Global statement of conformance .....	27
B.7 Initiator / Responder capability .....	27
B.8 Application context name details .....	27
Section 3 : Syntax Detail .....	28

---

**This document has received the approval of the SONET Interoperability Forum (SIF).  
April 18, 1997**

**SIF-011-1998**

**(SIF Document #SIF-95-002)**

B.9 Abstract Syntaxes ..... 28

Section 4 : Virtual Filestore Detail ..... 29

B.10 Virtual filestore..... 29

    B.10.1 File model..... 29

    B.10.2 Attributes ..... 29

        B.10.2.1 Attribute groups ..... 29

        B.10.2.2 Attribute values ..... 29

        B.10.2.3 Filename detail..... 31

    B.10.3 File structures ..... 31

        B.10.3.1 Constraint sets..... 31

        B.10.3.2 File and filestore actions..... 31

            B.10.3.2.1 Filestore actions..... 31

            B.10.3.2.2 File Actions ..... 32

            B.10.3.2.3 Access contexts supported..... 32

    B.10.4 Additional Information ..... 32

    B.10.5 Override..... 32

Section 5 : File Protocol Detail..... 33

B.11 File protocol..... 33

    B.11.1 GraphicString support..... 34

    B.11.2 FTAM regime establishment ..... 34

    B.11.3 FTAM regime termination (orderly)..... 34

    B.11.4 FTAM regime termination (abrupt) by service user ..... 35

    B.11.5 FTAM regime termination (abrupt) by service provider..... 35

    B.11.6 File selection..... 35

    B.11.7 File deselection ..... 35

    B.11.8 File creation ..... 36

    B.11.9 File deletion ..... 36

    B.11.10 Read attributes ..... 36

    B.11.11 Change attributes ..... 37

    B.11.12 File open..... 37

    B.11.13 File close..... 37

    B.11.14 Beginning of grouping ..... 38

    B.11.15 End of grouping ..... 38

    B.11.16 Regime recovery..... 38

    B.11.17 Locate file access data unit ..... 38

---

**This document has received the approval of the SONET Interoperability Forum (SIF).  
April 18, 1997**

B.11.18 Erase file access data unit.....	38
B.11.19 Read bulk data .....	38
B.11.20 Write bulk data .....	39
B.11.21 End of data transfer.....	39
B.11.22 End of transfer .....	39
B.11.23 Cancel data transfer .....	39
B.11.23.1 F-CANCEL mapping.....	39
B.11.24 Restart data transfer .....	40
B.12 Expanded PDU filed and filestore detail.....	40
B.12.1 Implementation information detail .....	40
B.12.2 Access control detail .....	40
B.12.3 Access control element detail .....	40
B.12.4 Service class field detail .....	40
B.12.5 Functional unit field detail .....	41
B.12.6 Diagnostic field detail .....	41
B.12.7 Contents type detail.....	41
B.12.7.1 Contents type list parameter .....	41
B.12.7.2 Contents type parameter .....	42
B.12.8 FTAM Quality of service details.....	42
B.12.9 Details of shared ASE information .....	42
B.12.10 Details of charging.....	42
B.12.11 Filestore password detail .....	42
B.12.12 Create password detail.....	42
B.12.13 Concurrency control.....	43
B.12.13.1 Supported values .....	43
B.12.13.2 Responder default values .....	43
B.12.14 FADU locking.....	43
B.12.15 Initiator override .....	43
B.12.16 Requested access .....	44
B.12.17 Processing mode.....	44
B.12.18 Recovery mode.....	44
Section 6 : Document Types.....	45
B.13 Document types .....	45
B.13.1 FTAM-1.....	46
B.13.1.1 Universal class number parameter .....	46

---

**This document has received the approval of the SONET Interoperability Forum (SIF).  
April 18, 1997**

**SIF-011-1998**

**(SIF Document #SIF-95-002)**

B.13.1.2 String length parameter and string significance parameter combinations..... 46

B.13.1.3 G sets supported ..... 47

B.13.1.4 G and C sets supported ..... 47

B.13.2 FTAM-2..... 47

B.13.3 FTAM-3..... 47

    A.13.3.1 String length parameter and string significance parameter combinations..... 47

B.13.4 FTAM-4..... 48

B.13.5 INTAP-1 ..... 48

    B.13.5.1 Maximum record length parameter..... 48

    B.13.5.2 Record significance parameter ..... 48

## **1 Introduction**

This document provides a profile for the FTAM protocol to be used by SONET NEs across the SONET OS/NE and NE/NE interfaces. This profile is intended to be used together with SONET Upper Layers Profile that is compatible with this FTAM profile and is described in the Bellcore document GR-253-CORE (Issue 1 Dec/94).

## **2 Source Documents**

### **2.1 Base Standards**

ISO 8571-1:1988/Amd.1:1992/Amd.2:1993, *Information processing systems - Open Systems Interconnection - File Transfer, Access and Management - Part 1 : General Introduction*

ISO 8571-2:1988/Amd.1:1992/Amd.2:1993, *Information processing systems - Open Systems Interconnection - File Transfer, Access and Management - Part 2 : Virtual Filestore Definition*

ISO 8571-3:1988/Amd.1:1992/Amd.2:1993, *Information processing systems - Open Systems Interconnection - File Transfer, Access and Management - Part 3 : File Service Definition*

ISO 8571-4:1988/Amd.1:1992/Amd.2:1993, *Information processing systems - Open Systems Interconnection - File Transfer, Access and Management - Part 4 : File Protocol Specification*

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

### **2.2 International Standardized Profiles**

ISO/IEC ISP 10607-1:1990, *Information technology - International Standardized Profiles AFTnn - File Transfer, Access and Management - Part 1 : Specification of ACSE, Presentation and Session Protocols for the use by FTAM.*

ISO/IEC ISP 10607-3:1990, *Information technology - International Standardized Profiles AFTnn - File Transfer, Access and Management - Part 3 : AFT11 - Simple File Transfer Service (unstructured)*

### **2.3 American National Standards for Telecommunications**

ANSI T1.208-1993, *Operations, Administration, Maintenance, and Provisioning (OAM&P) - Upper-Layer Protocols for Telecommunications Management Network (TMN) Interfaces between Operations Systems and Network Elements*

### **2.4 Bellcore Requirements**

GR-253-CORE, Issue 1: Synchronous Optical Network (SONET) Transport Systems: Common Generic Criteria

TA-NWT-001250, Issue 2: Generic Requirements for Synchronous Optical Network (SONET) File Transfer

## **SIF-011-1998**

(SIF Document #SIF-95-002)

### **3 Notations Used in the SONET File Transfer Profile**

The notations used by the SONET File Transfer Profile are essentially the same as those that are used in the ISO PICS Proforma document for FTAM (ISO 8571-5). The following is taken directly from ISO 8571-5 (except for the "profile" column which is not present in the PICS proforma).

#### **3.1 Abbreviations**

D	Defined in ISO 8571
I	Initiator column
R	Responder column
Pfl	Profile column
Spt	Support column

#### **3.2 D - column**

'D' is defined in ISO 8571. This column indicates the level of support required for conformance to ISO 8571. It has three distinct sets of values, one for attribute support, one for PDU support, and one for parameter support. These are detailed below:

For attributes:

- 'f' - full support of the attribute is required, as defined in ISO 8571-2.
- 'p' - partial support of the attribute is permitted, as defined in ISO 8571-2.

For PDUs:

- 'm' - mandatory support is required for this protocol data unit.
- 'c' - support for this protocol data unit is conditional upon the implementation of particular functional units. If the relevant functional unit is implemented the support level of the PDU is mandatory.

For parameters:

- 'm' - mandatory support is required for this protocol data unit.
- 'o' - optional support is permitted for conformance to ISO 8571. Although if implemented it must conform to the specifications and restrictions contained in ISO 8571. These restrictions may affect the optionality of other parameters.
- '-' - a dash indicates that the item is not applicable.

#### **3.3 I - column (Initiator)**

The Initiator is that file service user which requests FTAM regime establishment. The 'Spt' column of the 'I' column shall be completed by the supplier or implementor to indicate the level of implementation of each feature in the role of initiator. Where the 'Pfl' column of the 'I' column is pre printed with dashes, representing a non applicable entry, no entry shall be inserted in the adjoining 'Spt' column.

#### **3.4 R- column (Responder)**

The Responder is that file service user which accepts an FTAM regime establishment requested by the initiator. The 'Spt' column of the 'R' column shall be completed by the supplier or implementor to indicate the level of implementation for each feature in the role of the responder. Where the 'Pfl' column of the 'R' column is preprinted with dashes, no entry shall be inserted in the 'R' column.

### 3.5 Profile Column

This column indicates the level of support required for conformance to the SONET FTAM Profile. The values are as follows:

- 'm' - mandatory support of the feature is required.
- 'c(n)' - the item is conditional (where n is the footnote number which identifies the condition which is applicable).
- 'o' - the item is optional. If implemented it must conform to the specifications and restrictions contained in the base standard. These restrictions may affect the optionality of other items.
- 'i' - the item is out of scope of the profile, however, implementation of that item is not precluded; for the purposes of this profile, the implementation or non-implementation of that item is ignored.
- 'x' - the item is excluded (i.e. prohibited) for the profile.

### 3.6 Support column

The 'Support' column can be completed by the supplier or implementor to indicate the level of implementation of each feature. The proforma has been designed such that the only entries required in the 'Support' column are:

- 'Y' - yes, the feature has been implemented
- 'N' - no, the feature has not been implemented
- '-' - not applicable

## 4 Differences Between this Profile and ISO/IEC ISP 10607-3

To facilitate the interoperability of FTAM implementations, several refinements to the ISO/IEC ISP 10607-3 document were made to comply with SONET requirements and to address areas where interoperability problems might occur. As a consequence of these modifications, other changes to the profile were needed to maintain consistency within the SIF FTAM Profile. For example, since the 'Security' attribute group is not required for FTAM implementations used by SONET, the specification of parameters related to access control was not necessary.

The differences between the SONET FTAM Profile and ISO/IEC ISP 10607-3 are presented the tables below. Table 1 presents the refinements that were made to meet SIF's interoperability requirements related to file transfer. Table 2 identifies the sections removed due to overall SIF requirements or the refinements presented in Table 1.

**Table 1 - SIF Refinements to ISP 10607-3**

Section Id	Section Name	Description of Refinement
A.7	Initiator / Responder capability	Support of the Initiator role as both Sender and Receiver is mandatory in this profile and optional for both in the ISP.
A.9	Abstract syntaxes	<ol style="list-style-type: none"> <li>1) Support of the 'NBS file directory entry abstract syntax' is 'out of scope' for both an Initiator and Responder in this profile and conditional for both in the ISP.</li> <li>2) Support of the 'INTAP abstract syntax AS1' is 'out of scope' for both an Initiator and Responder in this profile and conditional for both in the ISP.</li> </ol>

**SIF-011-1998****(SIF Document #SIF-95-002)**

<b>Section Id</b>	<b>Section Name</b>	<b>Description of Refinement</b>
A.10.2.1	Attribute groups	<ol style="list-style-type: none"> <li>1) Support of the 'Storage Attribute Group' is mandatory for both an Initiator and Responder in this profile and optional for both in the ISP.</li> <li>2) Support of the 'Security Attribute Group' is 'out of scope' for both an Initiator and Responder in this profile and optional for both in the ISP.</li> </ol>
A.10.2.2	Attribute values	<ol style="list-style-type: none"> <li>1) Within the Storage Group (Responder), support of the 'Date and Time of last modification' and 'Identity of creator' attributes is mandatory in this profile for both full and partial Responder implementations and optional in the ISP.</li> <li>2) Within the Storage Group (Responder), support of the 'Storage Account', 'Date and time of creation', 'Date and time of last read access', 'Date and time of last attribute modification', 'Identity of last modifier', 'Identity of last reader', 'Identity of last attribute modifier', and 'Future filesize' attributes is 'out of scope' in this profile for both full and partial Responder implementations and optional in the ISP.</li> <li>3) Within the Security Group (Initiator), support of the 'Access control' and 'Legal qualifications' attributes is 'out of scope' in this profile for Initiator implementations and mandatory in the ISP.</li> <li>4) Within the Security Group (Responder), support of the 'Access control' attribute is 'out of scope' in this profile for full Responder implementations and mandatory in the ISP.</li> <li>5) Within the Security Group (Responder), support of the 'Legal qualifications' attribute is 'out of scope' in this profile for both full and partial Responder implementations and optional in the ISP.</li> </ol>
A.10.3.2.2	File actions	<ol style="list-style-type: none"> <li>1) Support of the 'Read' and 'Replace' actions is mandatory in this profile for a Responder and optional in the ISP.</li> <li>2) Support of the 'Extend' actions is 'out of scope' in this profile for a Responder and optional in the ISP.</li> </ol>
A.10.5	Override	Support of the 'Delete and create with old attributes' value is 'out of scope' for a Responder in this profile and optional in the ISP.
A.11.2	FTAM regime establishment	<ol style="list-style-type: none"> <li>1) Support of the 'Implementation information' parameter is 'out of scope' for both an Initiator and Responder in this profile and optional in the ISP.</li> <li>2) Support of the 'Account' parameter is 'out of scope' for an Initiator in this profile and optional in the ISP.</li> </ol>
A.11.3	FTAM regime establishment (orderly)	Support of the 'Charging' parameter is 'out of scope' for a Responder in this profile and optional in the ISP.
A.11.6	File selection	<ol style="list-style-type: none"> <li>1) Support of the 'Access passwords' parameter is 'out of scope' for an Initiator in this profile and mandatory in the ISP.</li> <li>2) Support of the 'Concurrency control' and 'Account' parameters is 'out of scope' for both an Initiator and Responder in this profile and mandatory in the ISP.</li> </ol>

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April 18, 1997**

Section Id	Section Name	Description of Refinement
A.11.7	File deselection	Support of the 'Charging' parameter is 'out of scope' for a Responder in this profile and optional in the ISP.
A.11.8	File creation	<ol style="list-style-type: none"> <li>1) Support of the 'F-CREATE-PDU' primitive is mandatory for both an Initiator and Responder in this profile and conditional in the ISP.</li> <li>2) Support of the 'Create password' and 'Access passwords' parameters is 'out of scope' for an Initiator in this profile and mandatory in the ISP.</li> <li>3) Support of the 'Concurrency control' and 'Account' parameters is 'out of scope' for an Initiator in this profile and optional in the ISP.</li> </ol>
A.11.9	File deletion	<ol style="list-style-type: none"> <li>1) Support of the 'F-DELETE-PDU' primitive is mandatory for both an Initiator and Responder in this profile and conditional in the ISP.</li> <li>2) Support of the 'Charging' parameter is 'out of scope' for a Responder in this profile and mandatory in the ISP.</li> </ol>
A.11.10	Read attributes	Support of the 'F-READ-ATTRIB-PDU' primitive is mandatory for both an Initiator and Responder in this profile and conditional in the ISP.
A.11.12	File open	<ol style="list-style-type: none"> <li>1) Support of the 'Concurrency control' parameter is 'out of scope' for both an Initiator and Responder in this profile and optional in the ISP.</li> <li>2) Support of the 'Activity identifier' parameter is 'out of scope' for an Initiator in this profile and optional in the ISP.</li> </ol>
A.11.16	Regime recovery	Support of the 'F-RECOVER-PDU' primitive is 'out of scope' for both an Initiator and Responder in this profile and conditional in the ISP.
A.11.19	Read bulk data	Support of the 'F-READ-PDU' primitive is mandatory for an Initiator in this profile and conditional in the ISP.
A.11.20	Write bulk data	Support of the 'F-WRITE-PDU' primitive is mandatory for an Initiator in this profile and conditional in the ISP.
A.11.21	End of data transfer	Support of the 'F-DATA-END-PDU' primitive is mandatory for both an Initiator and Responder in this profile and conditional in the ISP.
A.11.24	Restart data transfer	Support of the 'F-RESTART-PDU' primitive is 'out of scope' for both an Initiator and Responder in this profile and conditional in the ISP.
A.12.4	Service class field detail	Support of the 'Transfer and management class' value is 'out of scope' for both an Initiator and Responder in this profile and optional in the ISP.
A.12.5	Functional unit field detail	<ol style="list-style-type: none"> <li>1) Support of the 'Read' and 'Write' functional units are mandatory for both an Initiator and Responder in this profile and optional in the ISP. Note that the ISP requires that at least one of these functional units must be supported.</li> <li>2) Support of the 'Limited File Management' functional unit by an Initiator is mandatory in this profile and optional in the ISP.</li> <li>3) Support of the 'Recovery' and 'Restart data transfer' functional units are 'out of scope' for both an Initiator and Responder in this profile and optional in the ISP.</li> </ol>
A.12.6	Diagnostic field detail	<ol style="list-style-type: none"> <li>1) Support of the 'Suggested delay' parameter is 'out of scope' for both an Initiator and Responder in this profile and conditional in the ISP.</li> <li>2) Support of the 'Further details' parameter is 'out of scope' for both an Initiator and Responder in this profile and mandatory in the ISP.</li> </ol>

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Section Id	Section Name	Description of Refinement
A.12.7.1	Contents type list parameter	<ol style="list-style-type: none"> <li>1) Support of the 'document type specifications' parameter is mandatory for an Initiator in this profile and optional in the ISP</li> <li>2) Support of the 'abstract syntax specifications' parameter is 'out of scope' for a Initiator in this profile and optional in the ISP.</li> <li>3) Support of the 'abstract syntax specifications' parameter is 'out of scope' for a Responder in this profile and mandatory in the ISP.</li> </ol>
A.12.11	Filestore password detail	Support of the 'OctetString', and 'GraphicString' options is 'out of scope' for both an Initiator and Responder in this profile and optional in the ISP.
A.12.12	Create password detail	Support of the 'OctetString', and 'GraphicString' options is 'out of scope' for both an Initiator and Responder in this profile and optional in the ISP.
A.12.15	Initiator override	<ol style="list-style-type: none"> <li>1) Support of the 'Create failure', 'Select old file', and 'Delete and create with new attributes' options are mandatory for an Initiator in this profile and optional in the ISP.</li> <li>2) Support of the 'Delete and create with old attributes' option is 'out of scope' for an Initiator in this profile and optional in the ISP.</li> </ol>
A.12.16	Requested access	<ol style="list-style-type: none"> <li>1) Support of the 'Read', 'Replace', 'Read attribute', and 'Delete file' actions are mandatory for both an Initiator and Responder in this profile and optional in the ISP.</li> <li>2) Support of the 'Extend' action is 'out of scope' for both an Initiator and Responder in this profile and optional in the ISP.</li> </ol>
A.12.17	Processing mode	<ol style="list-style-type: none"> <li>1) Support of the 'Read' and 'Replace' modes are mandatory for both an Initiator and Responder in this profile and optional in the ISP.</li> <li>2) Support of the 'Extend' mode is 'out of scope' for both an Initiator and Responder in this profile and optional in the ISP.</li> </ol>
A.12.18	Recovery mode	Support of the 'At start of transfer' mode is 'out of scope' for both an Initiator and Responder in this profile and mandatory in the ISP.
A.13	Document types	Support of the 'NBS-9', and 'INTAP-1' document types is 'out of scope' for both an Initiator and Responder in this profile and optional in the ISP.

**Table 2 - List of Removed Sections**

Section Id	Section Name	Reason for Removal
A.12.2	Access control detail	Support for the Security Attribute Group is not required.
A.12.3.3	Concurrency access term	Support for the Security Attribute Group is not required.
A.12.3.5	Initiator access passwords	Support for the Security Attribute Group is not required.
A.12.3.6	Responder access passwords	Support for the Security Attribute Group is not required.
A.12.3.8	Access control element combinations	Support for the Security Attribute Group is not required.
A.12.10	Details of charging	Support for 'Charging' capability is not required.
A.12.13.1	Supported values	Support for 'Concurrency Control' is not required.
A.13.5	INTAP-1	Support for the 'INTAP-1' document type is not required.

## **Annex A - SONET File Transfer Profile**

(normative)

### **Requirements List**

#### **for SONET File Transfer Profile**

Section 1: (void)

## Section 2: General ISO 8571 Detail

### A.3 ISO 8571 Protocol versions

The implementation shall support FTAM protocol version number 1.

### A.6 Global statement of conformance

The implementation shall conform to ISO 8571.

### A.7 Initiator / Responder capability

	ROLES	Initiator	Responder
1	Sender	m <sup>1</sup>	o
2	Receiver	m <sup>2</sup>	o

### A.8 Application context name details

Support of the *{ISO Standard 8571 application-context (1) iso-ftam (1)}* Application Context Name is mandatory for SONET implementations.

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<sup>1</sup> All SONET NE's are expected to support the initiator role

<sup>2</sup> All SONET NE's are expected to support the initiator role

## Section 3 : Syntax Detail

## A.9 Abstract Syntaxes

	Object Descriptor	Object Identifier	Initiator	Responder
1	FTAM PCI	{iso standard 8571 abstract-syntax(2) ftam-pci(1)}	<b>m</b>	<b>m</b>
2	FTAM FADU	{iso standard 8571 abstract-syntax(2) ftam-fadu(2)}	<b>i</b>	<b>i</b>
3		{joint-iso-ccitt association-control(2) abstract-syntax(1) apdus(0) version1(1)}	<b>m</b>	<b>m</b>
4	FTAM unstructured text abstract syntax	{iso standard 8571 abstract-syntax(2) unstructured-text(3)}	<b>m</b>	<b>m</b>
5	FTAM unstructured binary abstract syntax	{iso standard 8571 abstract-syntax(2) unstructured-binary(4)}	<b>m</b>	<b>m</b>
6	NBS file directory entry abstract syntax	{iso identified-organization oiw(14) ftamsig(5) abstract-syntax(2) nbs-as2(2) }	<b>i</b>	<b>i</b>
7	INTAP abstract syntax AS1	{iso member-body 392 ftam(10) abstract-syntax(3) intap-as(1) }	<b>i</b>	<b>i</b>

## NOTES:

ISO 8571 requires the presence of the transfer syntax derived from the "Basic Encoding of a single ASN.1 type" {joint-iso-ccitt asn1(1) basic-encoding(1)} encoding rules for transfer of the "FTAM PCI" abstract syntax. Implementation detail of this transfer syntax, and other transfer syntaxes supported, is specified in the PICS of ISO 8823.

## Section 4 : Virtual Filestore Detail

### A.10 Virtual filestore

This clause details the conformance to the file model, file attribute support and to file structure support.

#### A.10.1 File model

Support of the *Hierarchical* File Model is mandatory for Responder implementations. Support for all other File Models is out of scope for SONET.

#### A.10.2 Attributes

##### A.10.2.1 Attribute groups

The level of support within each group is stated in A.10.2.2.

	Attribute Group Name	Initiator	Responder
1	Kernel	m	m
2	Storage	m	m
3	Security	i	i
4	Private	i	i

##### A.10.2.2 Attribute values

	Kernel Group	Initiator full	Responder full
1	Filename	m (see <sup>1</sup> )	m (see <sup>2</sup> )
2	Permitted Actions (see <sup>3</sup> )	m	m
3	Contents Type (see A.12.7)	m	m

<sup>1</sup> Apart from the minimum conformance requirements specified in ISO 8571-2, filenames have to be specified in the naming convention of the responding FTAM implementation.

<sup>2</sup> A Responder shall not require an initiator to use multiple component GraphicString filenames. Requests using a single-component filename value with a sequence of one GraphicString shall be responded to using a single-component filename value. Use of multiple-component sequences of GraphicString is outside the scope of this profile.

<sup>3</sup> The values for the "permitted actions" attribute are not restricted by this part of ISO/IEC ISP 10607 (see also ISO 8571-1 figure 5 and ISO 8571-2, 12.2).

	Storage Group	Initiator full	Responder full	Responder partial
10	Storage account	m	i	i
11	Date and time of creation	-	i	i
12	Date and time of last modification	-	m	m
13	Date and time of last read access	-	i	i
14	Date and time of last attribute modification	-	i	i
15	Identity of creator	-	m	m
16	Identity of last modifier	-	i	i
17	Identity of last reader	-	i	i
18	Identity of last attribute modifier	-	i	i
19	File availability	m	m	x
20	Filesize	-	m	x
21	Future filesize	m	i	i

	Security Group	Initiator full	Responder full	Responder partial
10	Access control (see A.12.2)	i	i	x
21	Legal qualifications	i	i	i

### A.10.2.3 Filename detail

If the responder role has been implemented, the use of multiple component GraphicString filenames is not required by an Initiator. Requests using a single-component filename value with a sequence of one GraphicString shall be responded to using a single-component filename value.

## A.10.3 File structures

### A.10.3.1 Constraint sets

Support of the *Unstructured* Constraint Set Name is mandatory for both Initiator and Responder implementations. Support for all other Constraint Set Names is out of scope for SONET.

### A.10.3.2 File and filestore actions

#### A.10.3.2.1 Filestore actions

Support for filestore actions is dependent upon the functional units implemented (see A.12.4 and A.12.5)

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**This document has received the approval of the SONET Interoperability Forum (SIF).  
April 18, 1997**

**A.10.3.2.2 File Actions**

Support of the *Read*<sup>1</sup> and *Replace*<sup>2</sup> Actions for the *Unstructured* Constraint Set is mandatory for Responder implementations. Support for all other Access Contexts is out of scope for SONET.

**A.10.3.2.3 Access contexts supported**

Support of the *UA* Access Context for the *Unstructured* Constraint Set is mandatory for Responder implementations. Support for all other Access Contexts is out of scope for SONET.

**A.10.4 Additional Information**

This section is void as per ISO/IEC ISP 10607-3.

**A.10.5 Override**

	<b>RESPONDER OVERRIDE</b>	<b>Responder</b>
1	Create failure	<b>m</b>
2	Select old file	<b>m</b>
3	Delete and create with old attributes	<b>i</b>
4	Delete and create with new attributes	<b>m</b>

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<sup>1</sup> Read is used for software download.

<sup>2</sup> Replace is used for remote memory backup.

## Section 5 : File Protocol Detail

**A.11 File protocol**

PDUs	Clause	Functional Units			
		Read	Write	LFM	Grouping
F-CREATE	A.11.8			m	
F-DELETE	A.11.9			m	
F-READ-ATTRIB	A.11.10			m	
F-OPEN	A.11.12	m	m		
F-CLOSE	A.11.13	m	m		
F-BEGIN-GROUP	A.11.14				m
F-END-GROUP	A.11.15				m
F-READ	A.11.19	m			
F-WRITE	A.11.20		m		
F-DATA-END	A.11.21	m	m		
F-TRANSFER-END	A.11.22	m	m		
F-CANCEL	A.11.23	m	m		

### A.11.1 GraphicString support

This section is void as per ISO/IEC ISP 10607-3.

### A.11.2 FTAM regime establishment

Support of the F-INITIALIZE-PDU is mandatory for both Initiator and Responder implementations.

	Field Name	Initiator	Responder	Comment
2	State result	-	m	all values defined in ISO 8571
3	Action result	-	m	all values defined in ISO 8571
4	Protocol version	m	m	1
5	Implementation Information	i	i	see A.12.1
6	Presentation context management	m	m	Not used during Open and Recovery
7	Service class	m	m	see A.12.4
8	Functional units	m	m	Read, Write, LFM, Grouping
9	Attribute groups	m	m	storage
10	Shared ASE Information	i	i	
11	FTAM Quality of Service	m	m	0
12	Contents type list	m	m	FTAM-3 or FTAM-1
13	Initiator identity	m	-	calling user
14	Account	i	-	
15	Filestore password	m	-	authenticate initiator
16	Diagnostic	-	m	see A.12.6
17	Checkpoint window	m	m	see note

**NOTE:**

Checkpoint window field is indicated as mandatory in accordance with ISO 8571-4. The field is defaulted to the value 1.

### A.11.3 FTAM regime termination (orderly)

Support of the F-TERMINATE-PDU is mandatory for both Initiator and Responder implementations.

	Field Name	Initiator	Responder	Comment
2	Shared ASE Information	i	i	
3	Charging	-	i	see A.12.10

**A.11.4 FTAM regime termination (abrupt) by service user**

Support of the F-U-ABORT-PDU is mandatory for both Initiator and Responder implementations.

	Field Name	Initiator	Responder	Comment
2	Action result	m	m	all values defined in ISO 8571
3	Diagnostic	m	m	see A.12.6

**A.11.5 FTAM regime termination (abrupt) by service provider**

Support of the F-P-ABORT-PDU is mandatory for both Initiator and Responder implementations.

	Field Name	Initiator	Responder	Comment
2	Action result	m	m	all values defined in ISO 8571
3	Diagnostic	m	m	see A.12.6

**A.11.6 File selection**

Support of the F-SELECT-PDU is mandatory for both Initiator and Responder implementations.

	Field Name	Initiator	Responder	Comment
2	State result	-	m	all values defined in ISO 8571
3	Action result	-	m	all values defined in ISO 8571
4	Attributes	m	m	see A.10.2
5	Requested access	m	-	see A.12.16
6	Access passwords	i	-	
7	Concurrency control	i	-	see A.12.13
8	Shared ASE information	i	i	
9	Account	i	-	
10	Diagnostic	-	m	see A.12.6

**A.11.7 File deselection**

Support of the F-DESELECT-PDU is mandatory for both Initiator and Responder implementations.

	Field Name	Initiator	Responder	Comment
2	Action result	-	m	all values defined in ISO 8571
3	Charging	-	i	see A.12.10
4	Shared ASE Information	i	i	
5	Diagnostic	-	m	see A.12.6

**A.11.8 File creation**

Support of the F-CREATE-PDU is mandatory for both Initiator and Responder implementations.

	<b>Field Name</b>	<b>Initiator</b>	<b>Responder</b>	<b>Comment</b>
2	State result	-	<b>m</b>	all values defined in ISO 8571
3	Action result	-	<b>m</b>	all values defined in ISO 8571
4	Override	<b>m</b>	-	see A.12.15
5	Initial attributes	<b>m</b>	<b>m</b>	see A.10.2
6	Create password	<b>i</b>	-	
7	Requested access	<b>m</b>	-	see A.12.16
8	Access passwords	<b>i</b>	-	
9	Concurrency control	<b>i</b>	-	see A.12.13
10	Shared ASE Information	<b>i</b>	<b>i</b>	
11	Account	<b>i</b>	-	
12	Diagnostic	-	<b>m</b>	see A.12.6

**A.11.9 File deletion**

Support of the F-DELETE-PDU is mandatory for both Initiator and Responder implementations.

	<b>Field Name</b>	<b>Initiator</b>	<b>Responder</b>	<b>Comment</b>
2	Action result	-	<b>m</b>	all values defined in ISO 8571
3	Shared ASE Information	<b>i</b>	<b>i</b>	
4	Charging	-	<b>i</b>	see A.12.10
5	Diagnostic	-	<b>m</b>	see A.12.6

**A.11.10 Read attributes**

Support of the F-READ-ATTRIB-PDU is mandatory for both Initiator and Responder implementations.

	<b>Field Name</b>	<b>Initiator</b>	<b>Responder</b>	<b>Comment</b>
2	Action result	-	<b>m</b>	all values defined in ISO 8571
3	Attribute names	<b>m</b>	-	
4	Attributes	-	<b>m</b>	see A.10.2
5	Diagnostic	-	<b>m</b>	see A.12.6

**A.11.11 Change attributes**

This section is void as per ISO/IEC ISP 10607-3.

**A.11.12 File open**

Support of the F-OPEN-PDU is mandatory for both Initiator and Responder implementations.

	Field Name	Initiator	Responder	Comment
2	State result	-	m	all values defined in ISO 8571
3	Action result	-	m	all values defined in ISO 8571
4	Processing mode	m	-	see A.12.17
5	Contents type	m	m	FTAM-3 and FTAM-1
6	Concurrency control	i	i	see A.12.13
7	Shared ASE Information	i	i	
8	Enable FADU locking	m	-	"false" for this part of the profile
9	Activity identifier	i	-	
10	Diagnostic	-	m	see A.12.6
11	Recovery mode	m	m	see A.12.18
12	Remove contexts	i	-	
13	Define contexts	i	-	
14	Presentation action	-	m	see notes

**NOTES:**

- I. The values available for the presentation action field depend upon the functional units implemented in ISO 8823.
- II. Presentation action field is indicated as mandatory in accordance with ISO 8571-4. The field is defaulted to "no action".

**A.11.13 File close**

Support of the F-CLOSE-PDU is mandatory for both Initiator and Responder implementations.

	Field Name	Initiator	Responder	Comment
2	Action result	m	m	all values defined in ISO 8571
3	Shared ASE Information	i	i	
4	Diagnostic	m	m	see A.12.6

**A.11.14 Beginning of grouping**

Support of the F-BEGIN-GROUP-PDU is mandatory for both Initiator and Responder implementations.

	Field Name	Initiator	Responder	Comment
2	Threshold	m	-	

**A.11.15 End of grouping**

Support of the F-INITIALIZE-PDU is mandatory for both Initiator and Responder implementations. Note that the F-END-GROUP-PDU carries no fields.

**A.11.16 Regime recovery**

Support of the F-RECOVER-PDU is 'out of scope' for both Initiator and Responder implementations.

	Field Name	Initiator	Responder	Comment
1	F-RECOVER PDU	i	i	see A.11, A.12.5

**A.11.17 Locate file access data unit**

This section is void as per ISO/IEC ISP 10607-3.

**A.11.18 Erase file access data unit**

This section is void as per ISO/IEC ISP 10607-3.

**A.11.19 Read bulk data**

Support of the F-READ-PDU is mandatory for both Initiator and Responder implementations.

	Field Name	Initiator	Responder
2	FADU identity	m	m
3	Access context (see A.10.3.2.3)	m	m
4	FADU lock	i	i

**A.11.20 Write bulk data**

Support of the F-WRITE-PDU is mandatory for both Initiator and Responder implementations.

	Field Name	Initiator	Responder
2	FADU operation	m	m
3	FADU identity	m	m
4	FADU lock	i	i

**A.11.21 End of data transfer**

Support of the F-DATA-END-PDU is mandatory for both Initiator and Responder implementations.

	<b>Field Name</b>	<b>Initiator</b>	<b>Responder</b>	<b>Comment</b>
2	Action result	<b>m</b>	<b>m</b>	all values defined in ISO 8571
3	Diagnostic	<b>m</b>	<b>m</b>	see A.12.6

**A.11.22 End of transfer**

Support of the F-TRANSFER-END-PDU is mandatory for both Initiator and Responder implementations.

	<b>Field Name</b>	<b>Initiator</b>	<b>Responder</b>	<b>Comment</b>
2	Action result	-	<b>m</b>	all values defined in ISO 8571
3	Shared ASE Information	<b>i</b>	<b>i</b>	
4	Diagnostic	-	<b>m</b>	see A.12.6

**A.11.23 Cancel data transfer**

Support of the F-CANCEL-PDU is mandatory for both Initiator and Responder implementations.

	<b>Field Name</b>	<b>Initiator</b>	<b>Responder</b>	<b>Comment</b>
2	Action result	<b>m</b>	<b>m</b>	all values defined in ISO 8571
3	Shared ASE Information	<b>i</b>	<b>i</b>	
4	Diagnostic	<b>m</b>	<b>m</b>	see A.12.6

**A.11.23.1 F-CANCEL mapping**

The F-CANCEL request should be mapped onto P-DATA requests.

**A.11.24 Restart data transfer**

Support of the F-RESTART-PDU is 'out of scope' for both Initiator and Responder implementations.

**A.12 Expanded PDU filed and filestore detail**

This clause identifies further PDU and filestore details to expand on that given in clauses A.10 and A.11.

**A.12.1 Implementation information detail**

This section is not specified since this information is not required for SONET.

**A.12.2 Access control detail**

This section is not specified since the Security Attribute Group is out of scope for SONET.

**A.12.3 Access control element detail**

This section is not specified since the Security Attribute Group is out of scope for SONET.

**A.12.4 Service class field detail**

	<b>Class Name</b>	<b>Initiator</b>	<b>Responder</b>
1	Transfer class (see <sup>1</sup> )	<b>m</b>	<b>m</b>
2	Access class	<b>i</b>	<b>i</b>
3	Management class	<b>i</b>	<b>i</b>
4	Transfer and management class (see <sup>2</sup> )	<b>i</b>	<b>i</b>
5	Unconstrained class	<b>i</b>	<b>i</b>

**A.12.5 Functional unit field detail**

The following table shows the functional unit requirements for the Transfer Service Class as they relate to SONET implementations.

	<b>Functional Unit</b>	<b>Initiator</b>	<b>Responder</b>
1	Kernel	<b>m</b>	<b>m</b>
2	Read	<b>m</b>	<b>m</b>
3	Write	<b>m</b>	<b>m</b>
4	File Access	-	-
5	Limited File Management	<b>m</b>	<b>m</b>
6	Enhanced File Management	<b>i</b>	<b>i</b>
7	Grouping	<b>m</b>	<b>m</b>
8	FADU Locking	-	-
9	Recovery	<b>i</b>	<b>i</b>
10	Restart data transfer	<b>i</b>	<b>i</b>

<sup>1</sup> An Initiator implementation shall specify the "transfer" class in the F-INITIALIZE request PDU.

<sup>2</sup> An Initiator implementation shall specify the "transfer" class in the F-INITIALIZE request PDU.

**A.12.6 Diagnostic field detail**

	Field Name	Initiator	Responder
1	Diagnostic type	m	m
2	Error identifier	m	m
3	Error observer	m	m
4	Error source	m	m
5	Suggested delay	i	i
6	Further details	i	i
7	For values of the "further details" term only the support of character strings of the ISO 646 IRV (G0) character set is required.		

**A.12.7 Contents type detail****A.12.7.1 Contents type list parameter**

Support of the *document type specifications* form of the Contents Type List parameter is mandatory for both Initiator and Responder implementations. The value for this parameter must be either 'FTAM-3' or 'FTAM-1'. Support of the *abstract syntax specifications* form of the Contents Type List parameter is out of scope for SONET.

**A.12.7.2 Contents type parameter**

Support of the *document type specifications* form of the Contents Type parameter is mandatory for both Initiator and Responder implementations. The value for this parameter must be either 'FTAM-3' or 'FTAM-1'. Support of the *abstract syntax / constraint set pair specifications* form of the Contents Type parameter is out of scope for SONET.

**A.12.8 FTAM Quality of service details**

This profile makes no requirements for the details of FTAM Quality of Service parameters.

**A.12.9 Details of shared ASE information**

This section is void as per ISO/IEC ISP 10607-3.

**A.12.10 Details of charging**

This section is not specified since 'Charging' is out of scope for SONET.

**A.12.11 Filestore password detail**

This specification of the string type to be used for the Filestore Password for both Initiators and Responders is out of scope for SONET. Thus, either the OctetString or GraphicString form may be used.

**A.12.12 Create password detail**

This specification of the string type to be used for the Create Password for both Initiators and Responders is out of scope for SONET. Thus, either the OctetString or GraphicString form may be used.

**A.12.13 Concurrency control****A.12.13.1 Supported values**

This section is not specified since 'Concurrency Control' is out of scope for SONET.

**A.12.13.2 Responder default values**

Functionality/Description
1 If the current Concurrency Control activity attribute is not supported and the "requested-access" parameter includes only the "read" or "read attribute" action, then the requested action should be either 'shared' or 'exclusive' (local choice).
2 If the current Concurrency Control activity attribute is not supported and the "requested-access" parameter includes only the "read" or "read attribute" action, then the "not requested read attribute action" is not required.
3 If the current Concurrency Control activity attribute is not supported and the "requested-access" parameter includes only the "read" or "read attribute" action, then all other write actions should be "no access".
4 If the current Concurrency Control activity attribute is not supported and the "requested access" parameter includes at least one of the "replace", "extend" or "delete file" actions, then the requested actions should be "exclusive".
5 If the current Concurrency Control activity attribute is not supported and the "requested access" parameter includes at least one of the "replace", "extend" or "delete file" actions, then all other actions should be "no access".

**A.12.14 FADU locking**

This section is void as per ISO/IEC ISP 10607-3.

**A.12.15 Initiator override**

	<b>Initiator override</b>	<b>Initiator</b>
1	Create failure	<b>m</b>
2	Select old file	<b>m</b>
3	Delete and create with old attributes	<b>i</b>
4	Delete and create with new attributes	<b>m</b>

**A.12.16 Requested access**

	<b>Action</b>	<b>Initiator</b>	<b>Responder</b>
1	Read	<b>m</b>	<b>m</b>
2	Insert	<b>i</b>	<b>i</b>
3	Replace	<b>m</b>	<b>m</b>
4	Extend	<b>i</b>	<b>i</b>
5	Erase	<b>i</b>	<b>i</b>
6	Read attribute	<b>m</b>	<b>m</b>
7	Change attribute	<b>i</b>	<b>i</b>
8	Delete file	<b>m</b>	<b>m</b>

**A.12.17 Processing mode**

	<b>Processing mode</b>	<b>Initiator</b>	<b>Responder</b>
1	Read	<b>m</b>	<b>m</b>
2	Insert	<b>i</b>	<b>i</b>
3	Replace	<b>m</b>	<b>m</b>
4	Extend	<b>i</b>	<b>i</b>
5	Erase	<b>i</b>	<b>i</b>

**A.12.18 Recovery mode**

	<b>Recovery mode</b>	<b>Initiator</b>	<b>Responder</b>
1	None	<b>m</b>	<b>m</b>
2	At start of transfer	<b>i</b>	<b>i</b>
3	Any active checkpoint	<b>i</b>	<b>i</b>

## Section 6 : Document Types

### A.13 Document types

Conformance to the document types is given at two levels. The following table indicates which document types have some level of support. The detail of that level of support is stated in the subclauses that follow. Document types not listed here are out of scope for SONET.

Entry number	FTAM-1	Initiator	Responder
1	Object descriptor Object identifier ISO FTAM unstructured text {iso standard 8571 document-type(5) unstructured-text(1)}	m	m

Entry number	FTAM-3	Initiator	Responder
3	Object descriptor Object identifier ISO FTAM unstructured binary {iso standard 8571 document-type(5) unstructured-binary(3)}	m	m

**A.13.1 FTAM-1**

Support of the FTAM-1 document type by a SONET implementation is identical to that specified in ISO/IEC ISP 10607-3.

**A.13.2 FTAM-2**

Support of the FTAM-2 document type is out of scope for a SONET implementation.

**A.13.3 FTAM-3**

Support of the FTAM-3 document type by a SONET implementation is identical to that specified in ISO/IEC ISP 10607-3.

**A.13.4 FTAM-4**

Support of the FTAM-2 document type is out of scope for a SONET implementation.

**A.13.5 INTAP-1**

Support of the INTAP-1 document type is out of scope for a SONET implementation.

## **Annex B - SONET File Transfer PICS**

(normative)

### **Protocol Implementation Conformance Statement for SONET File Transfer**

Section 1: (void)

## Section 2: General ISO 8571 Detail

**B.3 ISO 8571 Protocol versions**

	Functionality/Description	Pfl	Spt
1	Does the implementation referred to by this PICS implement FTAM protocol version number 1?	m	

**B.6 Global statement of conformance**

	Functionality/Description	Pfl	Spt
1	Does the implementation referred to by this PICS conform to ISO 8571?	m	

**B.7 Initiator / Responder capability**

	Role	D	Initiator		Responder	
			Pfl	Spt	Pfl	Spt
1	Sender	o	m <sup>1</sup>		o	
2	Receiver	o	m <sup>2</sup>		o	

**B.8 Application context name details**

	Application Context Name	Pfl	Spt
1	{ISO Standard 8571 application-context (1) iso-ftam (1)}	m	

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<sup>1</sup> All SONET NE's are expected to support the initiator role

<sup>2</sup> All SONET NE's are expected to support the initiator role

## Section 3 : Syntax Detail

## B.9 Abstract Syntaxes

	Object Descriptor	Object Identifier	D	Initiator		Responder	
				Pfl	Spt	Pfl	Spt
1	FTAM PCI	{iso standard 8571 abstract-syntax(2) ftam-pci(1)}	m	m		m	
2	FTAM FADU	{iso standard 8571 abstract-syntax(2) ftam-fadu(2)}	o	i		i	
3		{joint-iso-ccitt association-control(2) abstract-syntax(1) apdus(0) version1(1)}	m	m		m	
4	FTAM unstructured text abstract syntax	{iso standard 8571 abstract-syntax(2) unstructured-text(3)}	o	m		m	
5	FTAM unstructured binary abstract syntax	{iso standard 8571 abstract-syntax(2) unstructured-binary(4)}	o	m		m	
6	NBS file directory entry abstract syntax	{iso identified-organization oiw(14) ftamsig(5) abstract-syntax(2) nbs-as2(2) }	-	i		i	
7	INTAP abstract syntax AS1	{iso member-body 392 ftam(10) abstract-syntax(3) intap-as(1) }	-	i		i	

## NOTES:

ISO 8571 requires the presence of the transfer syntax derived from the "Basic Encoding of a single ASN.1 type" {joint-iso-ccitt asn1(1) basic-encoding(1)} encoding rules for transfer of the "FTAM PCI" abstract syntax. Implementation detail of this transfer syntax, and other transfer syntaxes supported, is specified in the PICS of ISO 8823.

## Section 4 : Virtual Filestore Detail

### B.10 Virtual filestore

This clause details the conformance to the file model, file attribute support and to file structure support.

#### B.10.1 File model

	File Model	D	Responder	
			Pfl	Spt
1	Hierarchical	o	m	
2	Other models	-	i	

#### B.10.2 Attributes

##### B.10.2.1 Attribute groups

The level of support within each group is stated in A.10.2.2.

	Attribute Group Name	D	Initiator		Responder	
			Pfl	Spt	Pfl	Spt
1	Kernel	m	m		m	
2	Storage	o	m		m	
3	Security	o	i		i	
4	Private	o	i		i	

##### B.10.2.2 Attribute values

	Kernel Group (Initiator)	D	Initiator full		Range of Values
			Pfl	Spt	
1	Filename	f	m		see <sup>1</sup>
2	Permitted Actions	f	m		see <sup>2</sup>
3	Contents Type	f	m		see B.12.7

<sup>1</sup> Apart from the minimum conformance requirements specified in ISO 8571-2, filenames have to be specified in the naming convention of the responding FTAM implementation.

<sup>2</sup> The values for the "permitted actions" attribute are not restricted by this part of ISO/IEC ISP 10607 (see also ISO 8571-1 figure 5 and ISO 8571-2, 12.2).

	Kernel Group (Responder)	D	Responder full		Range of Values
			Pfl	Spt	
4	Filename	f	m		see <sup>3</sup>
5	Permitted Actions	f	m		see <sup>4</sup>
6	Contents Type	f	m		see B.12.7

	Storage Group (Initiator)	D	Initiator full		Range of Values
			Pfl	Spt	
7	Storage account	f	m		
8	File availability	f	m		
9	Future filesize	f	m		

	Storage Group (Responder)	D	Responder full		Responder partial		Range of Values
			Pfl	Spt	Pfl	Spt	
10	Storage account	p	i		i		
11	Date and time of creation	p	i		i		
12	Date and time of last modification	p	m		m		
13	Date and time of last read access	p	i		i		
14	Date and time of last attribute modification	p	i		i		
15	Identity of creator	p	m		m		
16	Identity of last modifier	p	i		i		
17	Identity of last reader	p	i		i		
18	Identity of last attribute modifier	p	i		i		
19	File availability	p	m		x		
20	Filesize	p	m		x		
21	Future filesize	p	i		i		

	Security Group (Initiator)	D	Initiator full		Range of Values
			Pfl	Spt	
7	Access control	f	i		
9	Legal qualifications	f	i		

<sup>3</sup> A Responder shall not require an initiator to use multiple component GraphicString filenames. Requests using a single-component filename value with a sequence of one GraphicString shall be responded to using a single-component filename value. Use of multiple-component sequences of GraphicString is outside the scope of this ISP.

<sup>4</sup> The values for the "permitted actions" attribute are not restricted by this part of ISO/IEC ISP 10607 (see also ISO 8571-1 figure 5 and ISO 8571-2, 12.2).

	Security Group (Responder)	D	Responder full		Responder partial		Range of Values
			Pfl	Spt	Pfl	Spt	
			10	Access control	p	i	
21	Legal qualifications	p	i		i		

### B.10.2.3 Filename detail

Functionality/Description	Pfl	Spt
If the responder role has been implemented, is use of multiple component GraphicString filenames not required?	m	
Are requests using a single-component filename value with a sequence of one GraphicString responded to using a single-component filename value?	m	

### B.10.3 File structures

#### B.10.3.1 Constraint sets

	Constraint Set Name	D	Initiator		Responder		Depth
			Pfl	Spt	Pfl	Spt	
1	Unstructured	o	m		m		-
2	Sequential Flat	o	i		i		-
3	Ordered Flat	o	i		i		-
4	Ordered flat with unique names	o	i		i		-
5	Ordered hierarchical	o	i		i		
6	General hierarchical	o	i		i		
7	General hierarchical with unique names	o	i		i		

#### B.10.3.2 File and filestore actions

##### B.10.3.2.1 Filestore actions

Support for filestore actions is dependent upon the functional units implemented (see B.12.4 and B.12.5)

**B.10.3.2.2 File Actions**

Unstructured Constraint Set			
Action	D	Responder	
		Pfl	Spt
1 Locate	-	-	
2 Read	o	m <sup>5</sup>	
3 Insert	-	-	
4 Replace	o	m <sup>6</sup>	
5 Extend	o	l	
6 Erase	o	i	

**B.10.3.2.3 Access contexts supported**

Unstructured Constraint Set			
Access Context	D	Responder	
		Pfl	Spt
1 US	-	-	
2 UA	o	m	
3 FS	-	-	
4 FL	-	-	
5 FA	-	-	
6 HN	-	-	
7 HA	-	-	

**B.10.4 Additional Information**

This section is void as per ISO/IEC ISP 10607-3.

**B.10.5 Override**

	Responder Override	D	Responder	
			Pfl	Spt
1	Create failure	o	m	
2	Select old file	o	m	
3	Delete and create with old attributes	o	i	
4	Delete and create with new attributes	o	m	

<sup>5</sup> Read is used for software download.

<sup>6</sup> Replace is used for remote memory backup.

## Section 5 : File Protocol Detail

**B.11 File protocol**

PDUs	Clause	Functional Units							
		Read		Write		LFM		Grouping	
		Pfl	Spt	Pfl	Spt	Pfl	Spt	Pfl	Spt
F-CREATE	A.11.8					m			
F-DELETE	A.11.9					m			
F-READ-ATTRIB	A.11.10					m			
F-OPEN	A.11.12	m		m					
F-CLOSE	A.11.13	m		m					
F-BEGIN-GROUP	A.11.14							m	
F-END-GROUP	A.11.15							m	
F-READ	A.11.19	m							
F-WRITE	A.11.20			m					
F-DATA-END	A.11.21	m		m					
F-TRANSFER-END	A.11.22	m		m					
F-CANCEL	A.11.23	m		m					

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This document has received the approval of the SONET Interoperability Forum (SIF).  
April 18, 1997

**B.11.1 GraphicString support**

This section is void as per ISO/IEC ISP 10607-3.

**B.11.2 FTAM regime establishment**

	PDU / Field Name	D	Initiator		D	Responder		Range of Values or Reference
			Pfl	Spt		Pfl	Spt	
1	F-INITIALIZE PDU	m	m		m	m		
2	State result	-	-		m	m		all values defined in ISO 8571
3	Action result	-	-		m	m		all values defined in ISO 8571
4	Protocol version	m	m		m	m		1
5	Implementation Information	o	i		o	i		see B.12.1
6	Presentation context management	m	m		m	m		Not used during Open and Recovery
7	Service class	m	m		m	m		see B.12.4
8	Functional units	m	m		m	m		Read, Write, LFM, Grouping
9	Attribute groups	m	m		m	m		storage
10	Shared ASE Information	o	i		o	i		
11	FTAM Quality of Service	m	m		m	m		0
12	Contents type list	o	m		o	m		FTAM-3 or FTAM-1
13	Initiator identity	o	m		-	-		calling user
14	Account	o	i		-	-		
15	Filestore password	o	m		-	-		authenticate initiator
16	Diagnostic	-	-		o	m		see B.12.6
17	Checkpoint window	m	m		m	m		see note

**NOTE:**

Checkpoint window field is indicated as mandatory in accordance with ISO 8571-4. The field is defaulted to the value 1.

**B.11.3 FTAM regime termination (orderly)**

	PDU / Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	F-TERMINATE PDU	m	m		m		
2	Shared ASE Information	o	i		i		
3	Charging	-	-		i		see B.12.10

**B.11.4 FTAM regime termination (abrupt) by service user**

	PDU / Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	F-U-ABORT PDU	m	m		m		
2	Action result	m	m		m		all values defined in ISO 8571
3	Diagnostic	o	m		m		see B.12.6

**B.11.5 FTAM regime termination (abrupt) by service provider**

	PDU / Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	F-P-ABORT PDU	m	m		m		
2	Action result	m	m		m		all values defined in ISO 8571
3	Diagnostic	o	m		m		see B.12.6

**B.11.6 File selection**

	PDU / Field Name	D	Initiator		D	Responder		Range of Values or Reference
			Pfl	Spt		Pfl	Spt	
1	F-SELECT PDU	m	m		m	m		
2	State result	-	-		m	m		all values defined in ISO 8571
3	Action result	-	-		m	m		all values defined in ISO 8571
4	Attributes	m	m		m	m		see B.10.2
5	Requested access	m	m		-	-		see B.12.16
6	Access passwords	o	i		-	-		
7	Concurrency control	o	i		-	-		see B.12.13
8	Shared ASE information	o	i		o	i		
9	Account	o	i		-	-		
10	Diagnostic	-	-		o	m		see B.12.6

**B.11.7 File deselection**

	PDU / Field Name	D	Initiator		D	Responder		Range of Values or Reference
			Pfl	Spt		Pfl	Spt	
1	F-DESELECT PDU	m	m		m	m		
2	Action result	-	-		m	m		all values defined in ISO 8571
3	Charging	-	-		o	i		see B.12.10
4	Shared ASE Information	o	i		o	i		
5	Diagnostic	-	-		o	m		see B.12.6

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April 18, 1997**

**B.11.8 File creation**

	PDU / Field Name	D	Initiator		D	Responder		Range of Values or Reference
			Pfl	Spt		Pfl	Spt	
1	F-CREATE PDU	c	m		c	m		
2	State result	-	-		m	m		all values defined in ISO 8571
3	Action result	-	-		m	m		all values defined in ISO 8571
4	Override	m	m		-	-		see B.12.15
5	Initial attributes	m	m		m	m		see B.10.2
6	Create password	o	i		-	-		
7	Requested access	m	m		-	-		see B.12.16
8	Access passwords	o	i		-	-		
9	Concurrency control	o	i		-	-		see B.12.13
10	Shared ASE Information	o	i		o	i		
11	Account	o	i		-	-		
12	Diagnostic	-	-		o	m		see B.12.6

**B.11.9 File deletion**

	PDU / Field Name	D	Initiator		D	Responder		Range of Values or Reference
			Pfl	Spt		Pfl	Spt	
1	F-DELETE PDU	c	m		c	m		
2	Action result	-	-		m	m		all values defined in ISO 8571
3	Shared ASE Information	o	i		o	i		
4	Charging	-	-		o	i		see B.12.10
5	Diagnostic	-	-		o	m		see B.12.6

**B.11.10 Read attributes**

	PDU / Field Name	D	Initiator		D	Responder		Range of Values or Reference
			Pfl	Spt		Pfl	Spt	
1	F-READ ATTRIB PDU	c	m		c	m		see B.11, B.12.5
2	Action result	-	-		m	m		all values defined in ISO 8571
3	Attribute names	m	m		-	-		
4	Attributes	-	-		o	m		see B.10.2
5	Diagnostic	-	-		o	m		see B.12.6

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April 18, 1997**

**B.11.11 Change attributes**

This section is void as per ISO/IEC ISP 10607-3.

**B.11.12 File open**

	PDU / Field Name	D	Initiator		D	Responder		Range of Values or Reference
			Pfl	Spt		Pfl	Spt	
1	F-OPEN PDU	c	m		c	m		see B.11, B.12.5
2	State result	-	-		m	m		all values defined in ISO 8571
3	Action result	-	-		m	m		all values defined in ISO 8571
4	Processing mode	m	m		-	-		see B.12.17
5	Contents type	m	m		m	m		FTAM-3 and FTAM-1
6	Concurrency control	o	i		o	i		see B.12.13
7	Shared ASE Information	o	i		o	i		
8	Enable FADU locking	m	m		-	-		"false" for this part of the profile
9	Activity identifier	o	i		-	-		
10	Diagnostic	-	-		o	m		see B.12.6
11	Recovery mode	m	m		m	m		see B.12.18
12	Remove contexts	o	i		-	-		
13	Define contexts	o	i		-	-		
14	Presentation action	-	-		m	m		see notes

**NOTES:**

- I. The values available for the presentation action field depend upon the functional units implemented in ISO 8823.
- II. Presentation action field is indicated as mandatory in accordance with ISO 8571-4. The field is defaulted to "no action".

**B.11.13 File close**

	PDU / Field Name	D	Initiator		D	Responder		Range of Values or Reference
			Pfl	Spt		Pfl	Spt	
1	F-CLOSE PDU	c	m		c	m		see B.11, B.12.5
2	Action result	m	m		m	m		all values defined in ISO 8571
3	Shared ASE Information	o	i		o	i		
4	Diagnostic	o	m		o	m		see B.12.6

**B.11.14 Beginning of grouping**

	PDU / Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	F-BEGIN-GROUP PDU	c	m		m		see B.11, B.12.5
2	Threshold	m	m		-		

**B.11.15 End of grouping**

	PDU / Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	F-END-GROUP PDU	c	m		m		
The F-END-GROUP PDU carries no fields							

**B.11.16 Regime recovery**

	PDU / Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	F-RECOVER PDU	c	i		i		see B.11, B.12.5

**B.11.17 Locate file access data unit**

This section is void as per ISO/IEC ISP 10607-3.

**B.11.18 Erase file access data unit**

This section is void as per ISO/IEC ISP 10607-3.

**B.11.19 Read bulk data**

	PDU / Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	F-READ PDU	c	m		m		see B.11, B.12.5
2	FADU identity	m	m		m		
3	Access context	m	m		m		see B.10.3.2.3
4	FADU lock	o	i		i		

**B.11.20 Write bulk data**

	PDU / Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	F-WRITE PDU	c	m		m		see B.11, B.12.5
2	FADU operation	m	m		m		
3	FADU identity	m	m		m		
4	FADU lock	o	i		i		

**B.11.21 End of data transfer**

	PDU / Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	F-DATA-END PDU	c	m		m		see B.11, B.12.5
2	Action result	m	m		m		all values defined in ISO 8571
3	Diagnostic	o	m		m		see B.12.6

**B.11.22 End of transfer**

	PDU / Field Name	D	Initiator		D	Responder		Range of Values or Reference
			Pfl	Spt		Pfl	Spt	
1	F-TRANSFER-END PDU	c	m		m	m		see B.11, B.12.5
2	Action result	-	-		m	m		all values defined in ISO 8571
3	Shared ASE Information	o	i		o	i		
4	Diagnostic	-	-		o	m		see B.12.6

**B.11.23 Cancel data transfer**

	PDU / Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	F-CANCEL PDU	c	m		m		see B.11, B.12.5
2	Action result	m	m		m		all values defined in ISO 8571
3	Shared ASE Information	o	i		i		
4	Diagnostic	o	m		m		see B.12.6

**B.11.23.1 F-CANCEL mapping**

Functionality/Description	Pfl	Spt
Is the F-CANCEL request mapped onto P-DATA?	m	

**B.11.24 Restart data transfer**

	PDU / Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	F-RESTART PDU	c	i		i		see B.11, B.12.5

**B.12 Expanded PDU filed and filestore detail**

This clause identifies further PDU and filestore detail to expand on that given in clauses B.10 and B.11.

**B.12.1 Implementation information detail**

This section is not specified since this information is not required for SONET.

**B.12.2 Access control detail**

This section is not specified since the Security Attribute Group is out of scope for SONET.

**B.12.3 Access control element detail**

This section is not specified since the Security Attribute Group is out of scope for SONET.

**B.12.4 Service class field detail**

	Class Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	Transfer class	o	m		m		see <sup>1</sup>
2	Access class	o	i		i		
3	Management class	o	i		i		
4	Transfer and management class	o	i		i		see <sup>1</sup>
5	Unconstrained class	o	i		i		

<sup>1</sup> An Initiator implementation shall include the "transfer" class in the F-INITIALIZE request PDU.

<sup>1</sup> An Initiator implementation shall include the "transfer" class in the F-INITIALIZE request PDU.

**B.12.5 Functional unit field detail**

The following table shows the functional unit requirements for the Transfer Service Class as they relate to SONET implementations.

	Functional Units	D	Initiator		Responder	
			Pfl	Spt	Pfl	Spt
1	Kernel	m	m		m	
2	Read	c	m		m	
3	Write	c	m		m	
4	File Access	-	-		-	
5	Limited File Management	o	m		m	
6	Enhanced File Management	o	i		i	
7	Grouping	m	m		m	
8	FADU Locking	-	-		-	
9	Recovery	o	i		i	
10	Restart data transfer	o	i		i	

**B.12.6 Diagnostic field detail**

	Field Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	Diagnostic type	m	m		m		
2	Error identifier	m	m		m		
3	Error observer	m	m		m		
4	Error source	m	m		m		
5	Suggested delay	o	i		i		
6	Further details	o	i		i		
7	For values of the "further details" term only the support of character strings of the ISO 646 IRV (G0) character set is required.						

**B.12.7 Contents type detail****B.12.7.1 Contents type list parameter**

	Contents Type Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	document type specifications	o	m		m		must be FTAM-3 or FTAM-1
2	abstract syntax specifications	o	i		i		

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April 18, 1997**

**B.12.7.2 Contents type parameter**

	Contents Type Name	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	document type specifications	o	m		m		must be FTAM-3 or FTAM-1
2	abstract syntax / constraint set pair specifications	o	i		i		

**B.12.8 FTAM Quality of service details**

This section is void as per ISO/IEC ISP 10607-3.

**B.12.9 Details of shared ASE information**

This section is void as per ISO/IEC ISP 10607-3.

**B.12.10 Details of charging**

This section is not specified since 'Charging' is out of scope for SONET.

**B.12.11 Filestore password detail**

	Filestore Password	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	OctetString	o	i		i		
2	GraphicString	o	i		i		

**B.12.12 Create password detail**

	Create Password	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	OctetString	o	i		i		
2	GraphicString	o	i		i		

**B.12.13 Concurrency control****B.12.13.1 Supported values**

This section is not specified since 'Concurrency Control' is out of scope for SONET.

**B.12.13.2 Responder default values**

	Functionality/Description	Pfl	Spt
1	If the current Concurrency Control activity attribute is not supported and the "requested-access" parameter includes only the "read" or "read attribute" action, then is the requested action one of shared/exclusive (local choice)?	m	
2	If the current Concurrency Control activity attribute is not supported and the "requested-access" parameter includes only the "read" or "read attribute" action, then is the not requested read attribute action "not required"?	m	
3	If the current Concurrency Control activity attribute is not supported and the "requested-access" parameter includes only the "read" or "read attribute" action, then are all other write actions "no access"?	m	
4	If the current Concurrency Control activity attribute is not supported and the "requested access" parameter includes at least one of the "replace", "extend" or "delete file" actions, then are the requested actions "exclusive"?	m	
5	If the current Concurrency Control activity attribute is not supported and the "requested access" parameter includes at least one of the "replace", "extend" or "delete file" actions, then are all other actions "no access"?	m	

**B.12.14 FADU locking**

This section is void as per ISO/IEC ISP 10607-3.

**B.12.15 Initiator override**

	Initiator override	D	Initiator		Range of Values or Reference
			Pfl	Spt	
1	Create failure	o	m		
2	Select old file	o	m		
3	Delete and create with old attributes	o	i		
4	Delete and create with new attributes	o	m		

**B.12.16 Requested access**

	Action	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	Read	o	m		m		
2	Insert	o	i		i		
3	Replace	o	m		m		
4	Extend	o	i		i		
5	Erase	o	i		i		
6	Read attribute	o	m		m		
7	Change attribute	o	i		i		
8	Delete file	o	m		m		

**B.12.17 Processing mode**

	Processing mode	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	Read	o	m		m		
2	Insert	o	i		i		
3	Replace	o	m		m		
4	Extend	o	i		i		
5	Erase	o	i		i		

**B.12.18 Recovery mode**

	Recovery mode	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	None	o	m		m		
2	At start of transfer	o	i		i		
3	Any active checkpoint	o	i		i		

## Section 6 : Document Types

### B.13 Document types

Conformance to the document types is given at two levels. The following table indicates which document types have some level of support. The detail of that level of support is stated in the subclauses that follow.

Entry number	FTAM-1	D	Initiator		Responder	
			Pfl	Spt	Pfl	Spt
1	Object descriptor Object identifier ISO FTAM unstructured text {iso standard 8571 document-type(5) unstructured-text(1)}	o	m		m	

Entry number	FTAM-2	D	Initiator		Responder	
			Pfl	Spt	Pfl	Spt
2	Object descriptor Object identifier ISO FTAM sequential text {iso standard 8571 document-type(5) sequential-text(2)}	o	i		i	

Entry number	FTAM-3	D	Initiator		Responder	
			Pfl	Spt	Pfl	Spt
3	Object descriptor Object identifier ISO FTAM unstructured binary {iso standard 8571 document-type(5) unstructured-binary(3)}	o	m		m	

Entry number	FTAM-4	D	Initiator		Responder	
			Pfl	Spt	Pfl	Spt
4	Object descriptor Object identifier ISO FTAM sequential binary {iso standard 8571 document-type(5) sequential-binary(4)}	o	i		i	

Entry number	NBS-9	D	Initiator		Responder	
			Pfl	Spt	Pfl	Spt
5	Object descriptor Object identifier NBS-9 FTAM file directory file {iso identified-organization oiw(14) ftamsig(5) document-type(5) file-directory(9)}	-	i		i	

Entry number	INTAP-1	D	Initiator		Responder	
			Pfl	Spt	Pfl	Spt

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April 18, 1997**

6	Object descriptor Object identifier	INTAP record file {iso member-body 392 ftam(10) document- type(2) intap-record-file(1)}	-	i		i	
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### B.13.1 FTAM-1

#### B.13.1.1 Universal class number parameter

	Universal Class Number	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	Universal class number parameter supported	o	m		m		
2	PrintableString - Universal class 19	o	i		i		
3	TeletexString - Universal class 20	o	i		i		
4	VideotexString - Universal class 21	o	i		i		
5	IA5String - Universal class 22	o	m		m		
6	GraphicString - Universal class 25	o	m		m		see B.13.1.3
7	VisibleString - Universal class 26	o	m		m		
8	GeneralString - Universal class 27	o	m		m		see B.13.1.4

#### B.13.1.2 String length parameter and string significance parameter combinations

	Parameter Combination	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	Maximum string length parameter and variable length strings	o	m		m		
2	Maximum string length parameter and fixed length strings	o	m		m		
3	Maximum string length parameter and not significant strings	o	m		m		
4	Unbounded strings and variable length strings	o	m		m		
5	Unbounded strings and not significant strings	o	m		m		

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**B.13.1.3 G sets supported**

G sets which are supported in FTAM-1 GraphicString.

	Functionality/Description	Pfl	Spt
1	Does the implementation referred to by this PICS support the character strings of the ISO 646 IRV (G0) character set for values of GraphicString?	m	

**B.13.1.4 G and C sets supported**

G and C sets which are supported in FTAM-1 GeneralString

	Functionality/Description	Pfl	Spt
1	Does the implementation referred to by this PICS support the character strings of the ISO 646 IRV (G0) character set and ISO 646 IRV (C0) control character set for values of GeneralString?	m	

**B.13.2 FTAM-2**

This section is void as per ISO/IEC ISP 10607-3.

**B.13.3 FTAM-3****A.13.3.1 String length parameter and string significance parameter combinations**

	Parameter Combination	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	Maximum string length parameter and variable length strings	o	i		i		
2	Maximum string length parameter and fixed length strings	o	i		i		
3	Maximum string length parameter and not significant length strings	o	m		m		
4	Unbounded strings and variable length strings	o	i		i		
5	Unbounded strings and not significant length strings	o	m		m		

**B.13.4 FTAM-4**

This section is void as per ISO/IEC ISP 10607-3.

**B.13.5 INTAP-1****B.13.5.1 Maximum record length parameter**

	Support Level	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	Maximum record length parameter supported	-	i		i		
2	Unbounded records supported	-	i		i		

**B.13.5.2 Record significance parameter**

	Support Level	D	Initiator		Responder		Range of Values or Reference
			Pfl	Spt	Pfl	Spt	
1	Record significance parameter supported	-	i		i		
2	Variable length records supported	-	i		i		
3	Fixed length records supported	-	i		i		