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CONSULTATIVE COMMITTEE

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TERMINAL EQUIPMENT AND PROTOCOLS FOR TELEMATIC SERVICES

COMMUNICATION APPLICATION PROFILE BT0 FOR DOCUMENT BULK TRANSFER BASED ON THE SESSION SERVICE

Recommendation T.521

FOREWORD

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Recommendation T.521 was revised by Study Group VIII and was approved under the Resolution No. 2 procedure on the 18th of September 1992.

CCITT NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized private operating agency.

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INTRODUCTION

The T.400-Series Recommendations define the Open Document Architecture (T.410-Series) and the DTAM Services and Protocols (T.430-Series) for the purpose of the document transfer and manipulation. In order to apply the T.400-Series Recommendations to various Telematic services, it is necessary to specify the DTAM application profile for each service that consists of a document application profile and a communication application profile.

According to this requirement, the T.500-Series Recommendations define the document application profiles and the T.520-Series Recommendations define the communication application profiles.

Recommendation T.521 is one of a set of T.520-Series Recommendations to define the communication application profile for the document bulk transfer based on the session service according to the rules defined in Recommendation T.62 *bis*.

Recommendation T.521

COMMUNICATION APPLICATION PROFILE BT0 FOR DOCUMENT BULK TRANSFER BASED ON THE SESSION SERVICE

(revised 1992)

1 Scope and field of application

This Recommendation defines the communication application profile for the document bulk transfer using the session service defined in Recommendation T.62 *bis* in terms of:

a) DTAM functional units used;

b) DTAM service primitives and parameters used;

c) lower layer X.215 session service mapping according to the rules of Recommendation T.62 *bis*.

2 References

The following references are required in order to implement the communication profile defined in this Recommendation.

– Recommendation T.431, "Document Transfer and Manipulation (DTAM) – Services and Protocol – Introduction and General Principles";

– Recommendation T.432, "Document Transfer and Manipulation (DTAM) – Services and Protocol – Service Definition";

– Recommendation T.433, "Document Transfer and Manipulation (DTAM) – Services and Protocol – Protocol Specification";

– Recommendation T.62, "Control Procedures for Teletex and Group 4 Facsimile Services";

– Recommendation T.62 *bis*, "Telematic control procedure based on Recommendations X.215 and X.225";

– Recommendation X.215, "Session Service Definition for Open Systems Interconnection for CCITT Application".

3 Definitions

The definitions in the T.400-Series Recommendations and Recommendation T.62 *bis* also apply to this Recommendation.

4 Abbreviations and conventions

The abbreviations and conventions defined in the T.400-Series Recommendations and Recommendation T.62 *bis* also apply to this Recommendation.

5 Definition of communication application profile BT0

5.1 *Overview of BT0*

This Recommendation defines functional units and communication support functions in accordance with Recommendation T.431. BT0 uses the document bulk transfer in transparent mode (mapping to session service as defined in the T.430-Series Recommendations).

5.2 *DTAM functional units*

The following functional units defined in Recommendation T.432 are used for BT0:

– association use control (Kernel);

– capability;

– document bulk transfer;

– token control.

Note – The capability functional unit must be supported in this profile, but it is not required to use this service prior to every document transfer (D-TRANSFER).

5.3 *DTAM service primitives and lower layer mapping*

5.3.1 *DTAM service primitives and parameters*

The general DTAM service definition and parameters are defined in Recommendation T.432. This section specifies the parameters of the DTAM service for BT0.

5.3.1.1 *D-INITIATE service parameters*

The following parameters of this service are used as follows:

– transparent mode;

– telematic requirements;

– application capabilities;

– result.

Table 1-A/T.521 lists the D-INITIATE service parameters.

1) *Transparent mode*

This parameter shall be present in the D-INITIATE request service primitive.

2) *Telematic requirements*

The following functional units defined in Recommendation T.432 are used for BT0 as mandatory functional units:

– association use control (Kernel);

– capability;

– document bulk transfer;

– token control.

3) *Application capabilities*

This "Application capabilities" parameter is defined in Recommendation T.432 and the following sub-parameter is used:

ODA Application capabilities:

a) Document application profile

The value of this parameter indicates the document application profile being used. Its value is specified in Recommendations that define terminal characteristics for particular Telematic services.

b) Document architecture class

The value of this parameter indicates the document architecture class used in the entire association. The use of this parameter and its possible value is specified in the Recommendations that define terminal characteristics for particular Telematic services.

4) *Result*

This result field can take the values defined in Recommendation T.432.

TABLE 1-A/T.521

D-INITIATE service parameters

	D-INITIATE request	D-INITIATE indication	D-INITIATE response	D-INITIATE confirm
Transparent mode	M			
Telematic requirements	M	M(=)	C[a)]	C(=)
ODA Application capabilities	M	M(=)	C[a)]	C(=)
| Document application profile	M	M(=)	C[a)]	C(=)
| Document architecture class	M	M(=)	C[a)]	C(=)
Result			M	M(=)

a) This parameter is mandatory in case the responder returns the "accepted" result parameter to the proposed requirements.

5.3.1.2 *D-TERMINATE service parameters*

This service has no parameter for BT0. Only the initiator can issue D-TERMINATE service. In addition, the initiator can issue D-TERMINATE service only if he has the data token.

5.3.1.3 *D-U-ABORT service parameters*

This service has no parameter.

5.3.1.4 *D-P-ABORT service parameter*

This service has no parameter.

5.3.1.5 *D-CAPABILITY service parameters*

This service has the sub-parameter "ODA Application capabilities" which consists of the following parameters:

– document application profile;
– document architecture class;
– non-basic document characteristics.

Table 1-B/T.521 lists the D-CAPABILITY service parameters.

1) *Application capabilities*

See § 5.3.1.1.

ODA Application capabilities:

a) Document application profile

See § 5.3.1.1.

b) Document architecture class

See § 5.3.1.1.

c) Non-basic document characteristics

This is the parameter “Non-basic document characteristics” defined in Recommendation T.432.

TABLE 1-B/T.521

D-CAPABILITY service parameters

	D-CAPABILITY request	D-CAPABILITY indication	D-CAPABILITY response	D-CAPABILITY confirm
ODA Application capabilities				
Document application profile	M	M(=)	M	M(=)
Document architecture class	M	M(=)	M	M(=)
Non-basic document characteristics	U	C(=)	U	C(=)

5.3.1.6 *D-TRANSFER service parameters*

This service has the following parameters:

1) *Document information*

This parameter consists of the interchange data elements representing the document. The “Document characteristics” from the document profile are transferred using S-ACT-START service.

All interchange data elements, except the document profile descriptor, are transferred using S-DATA services. The document profile is reconstructed by the received DTAM-PM, on the basis of the “Document characteristics” transferred in the S-ACT-START service.

2) *Document information type*

This parameter has the value “transfer of a document from its beginning” in the request primitive (see Recommendation T.432). For the indication and confirm primitive, the value is either “transfer completed” or “transfer not completed”.

3) *Document reference information*

The value of this parameter is to be provided by the DTAM user in accordance with the rules specified in Recommendation T.432.

4) *Result*

This parameter has one of the values “document information transferred” or “document information not completely transferred”, as defined in Recommendation T.432.

Note – The parameter value “document-information-continuation not possible” is for further study.

5) *Checkpoint value*

This parameter is used as defined in Recommendation T.432. The number of IDE per segment is integer 2. However, the document profile and the document root are not counted (see Figure 1/T.521).

The following restriction is applied to the transfer syntax coding rules defined in Recommendation X.209 for the interchange of the document application profile defined in Recommendation T.503:

– Length fields longer than three octets shall not be used. A length field of three octets allows for the representation of a length of up to 65 535. A data element with a length exceeding 65 535 shall have a length field of the indefinite form.

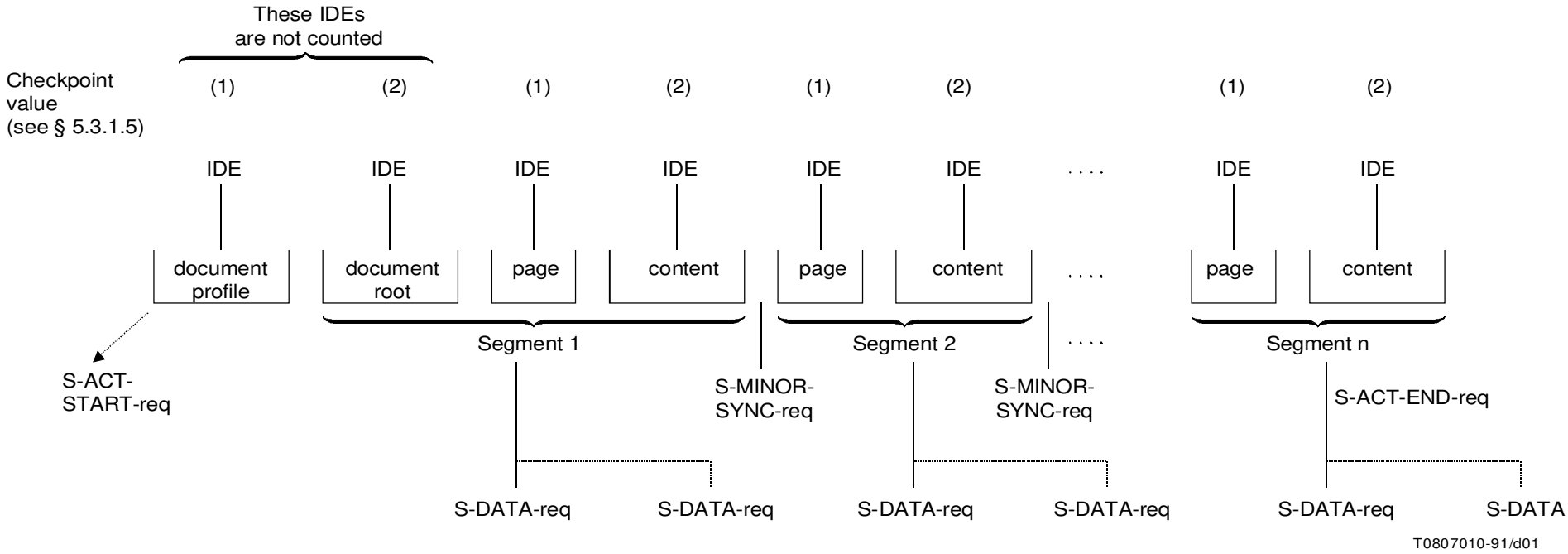


FIGURE 1/T.521

Application of the segmenting mechanism as defined in Figure 2/T.433

Table 1-C/T.521 lists the D-TRANSFER service parameters.

TABLE 1-C/T.521

D-TRANSFER service parameters

Parameter	D-TRANSFER request	D-TRANSFER indication	D-TRANSFER confirm
Document information	M	M(=)	
Document information type	M	M	M
Document reference information	M	M(=)	M(=)
Result			M
Checkpoint value	M		

Note – The document information is transferred using the type of normal document.

5.3.1.7 *D-CONTROL GIVE service parameters*

The D-CONTROL GIVE service surrenders all available tokens and has no parameter.

5.3.1.8 *D-TOKEN PLEASE service parameters*

The D-TOKEN PLEASE service is used to request the data token and has no parameter.

5.3.2 *Use of session service and parameter mapping*

5.3.2.1 *DTAM protocol mapping to X.215 session service*

This mapping rule is defined in § 7.3 of Recommendation T.433.

Note – D-TRANSFER confirm is implicitly formed by receipt of S-ACT END confirm, S-ACT INT confirm and S-ACT DCAD confirm.

5.3.2.2 *DTAM parameter mapping to session service parameters*

Table 2-A/T.521 shows the mapping rule between DTAM service parameters and basic and additional session service parameters.

The category of parameters is defined as follows:

– 1: parameters are generated by DTAM user;

– 2: parameters are generated by DTAM provider;

– 3: parameters provided by other means than DTAM-user or DTAM-provider.

Appendix I illustrates the example of protocol sequences for BT0.

TABLE 2-A/T.521

D-INITIATE

DTAM service parameters	Basic and additional session service parameters	Presence in session protocol	Category
Telematic requirements	Session requirements	m (defaultable)	1
ODA – Application capabilities - - - - - - - - - - - - - - - - - - | Document application profile |- - - - - - - - - - - - - - - - - - | Document architecture class	Session user data	m	1
None	Session reference Window size Service identifier Inactivity timer	m m m nm	2
None	Private use Non-standardized capabilities	nm nm	3

TABLE 2-B/T.521

D-TERMINATE

DTAM service parameters	Basic and additional session service parameters	Presence in session protocol	Category
None	Session termination parameter	nm	3

TABLE 2-C/T.521

D-U-ABORT

DTAM service parameters	Basic and additional session service parameters	Presence in session protocol	Category
None	Session termination parameter (Transport disconnect)	m	3

TABLE 2-D/T.521

D-CAPABILITY

DTAM service parameters	Basic and additional session service parameters	Presence in session protocol	Category
ODA Application capabilities | Document application profile | Document architecture class | Non-basic document characteristics	Session user data	m m m nm	1
None	Inactivity timer Storage capacity	nm nm	2
None	Private use (Note) Non-standardized capabilities	nm nm	3

Note – In case of file transfer, this parameter is used in accordance with the rules defined in Recommendation T.571. The use for facsimile Group 4 is for further study.

TABLE 2-E/T.521

D-TRANSFER

DTAM service parameters	Basic and additional session service parameters	Presence in session protocol	Category
Document information	Session user data	(Note)	1
Document reference information	Document reference number	(Note)	1

Note – There is no direct mapping of the D-TRANSFER primitive to one single session primitive.

TABLE 2-F/T.521

D-TOKEN PLEASE

DTAM service parameters	Basic and additional session service parameters	Presence in session protocol	Category
None	Token	m	2

6 Document interchange data structures

The interchange representation of a document has to be defined in accordance with the Recommendation which specifies the relevant document application profile.

7. Document transfer

7.1 *Synchronization*

The document information is divided into segments, in accordance with § 7.3.5 of Recommendation T.433, such that each segment contains a one page descriptor and the associated content portion. A minor synchronization point is associated with each segment.

7.2 *Document recovery*

For further study.

APPENDIX I

(To Recommendation T.521)

Overall Protocol Sequence

This is an informative appendix for:

– normal procedure;

– token control procedure;

– abort procedure;

– exception report procedure.

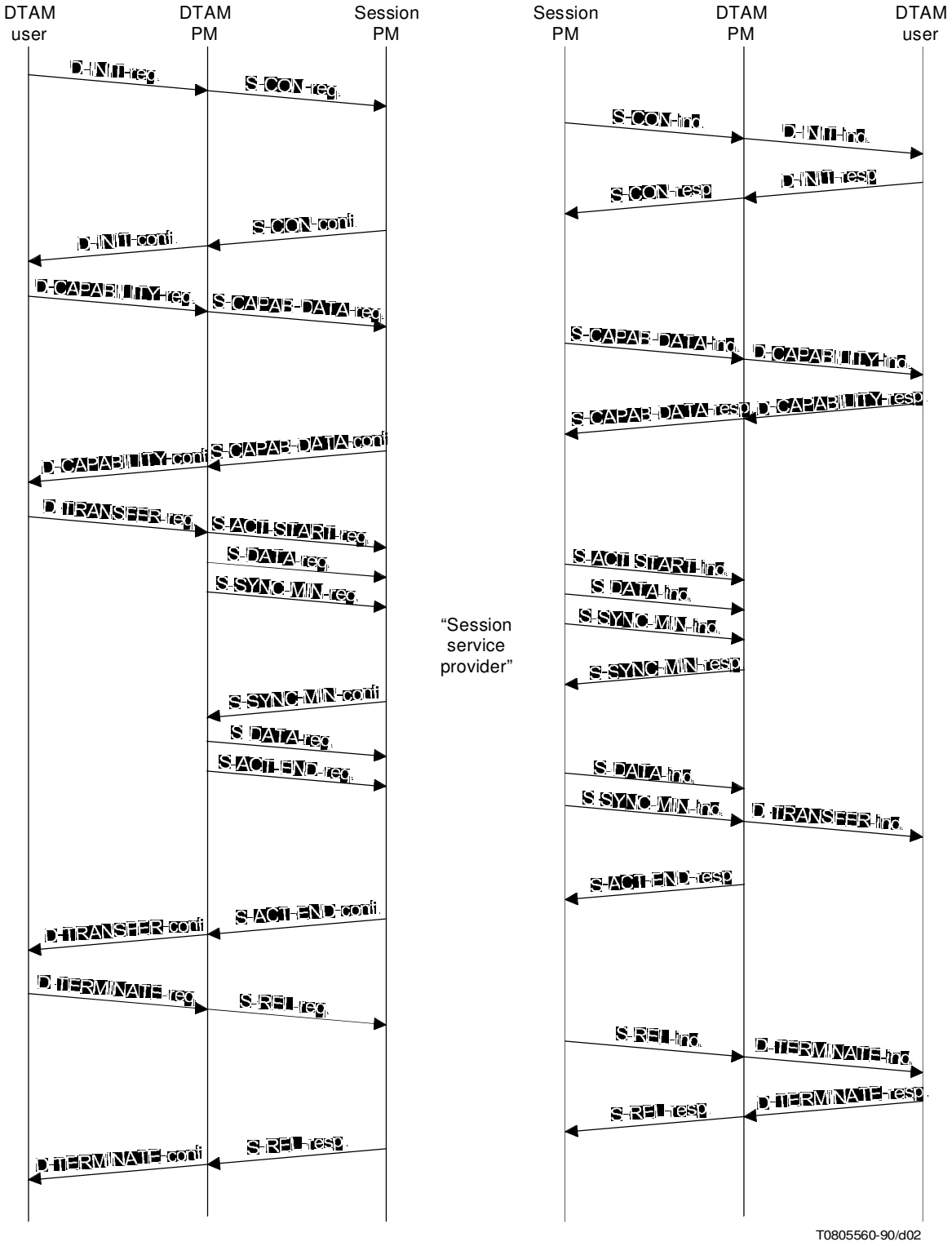
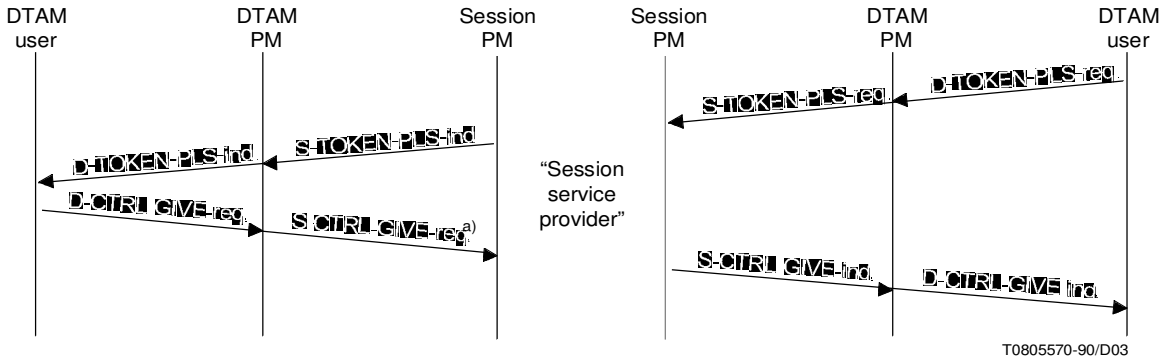


FIGURE I-1/T.521

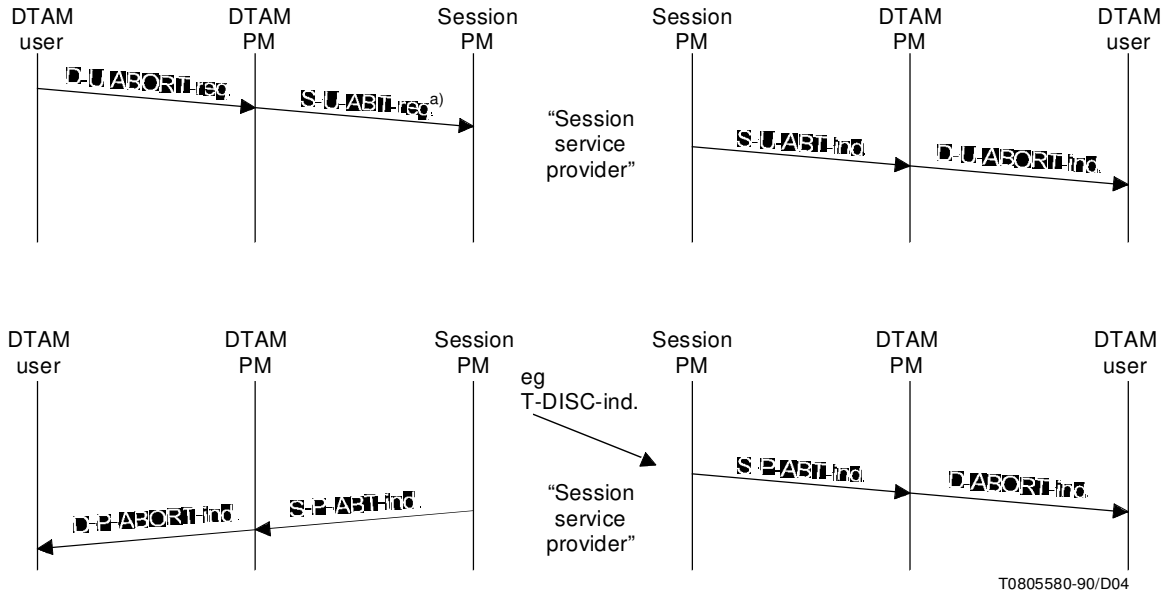
Normal procedure



a) This service is not confirmed at the service level, but at the protocol level (refer to Recommendation X.225, § 7.18.9).

FIGURE I-2/T.521

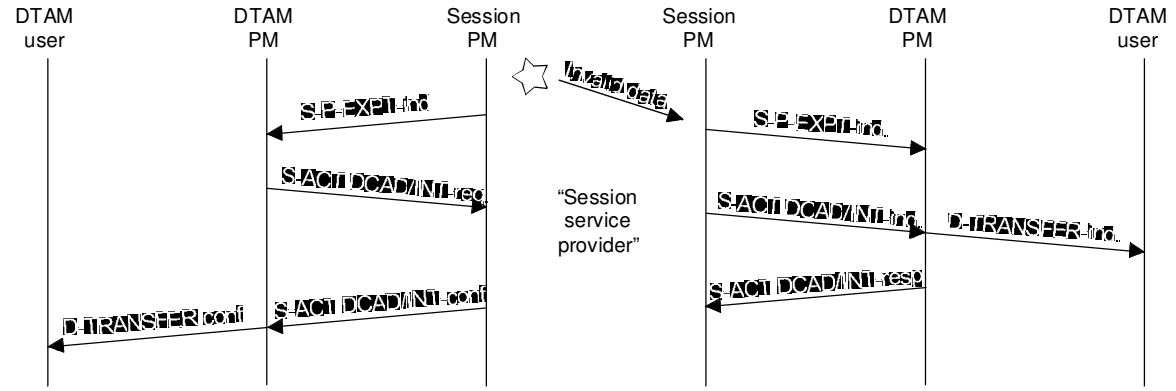
Token control procedure



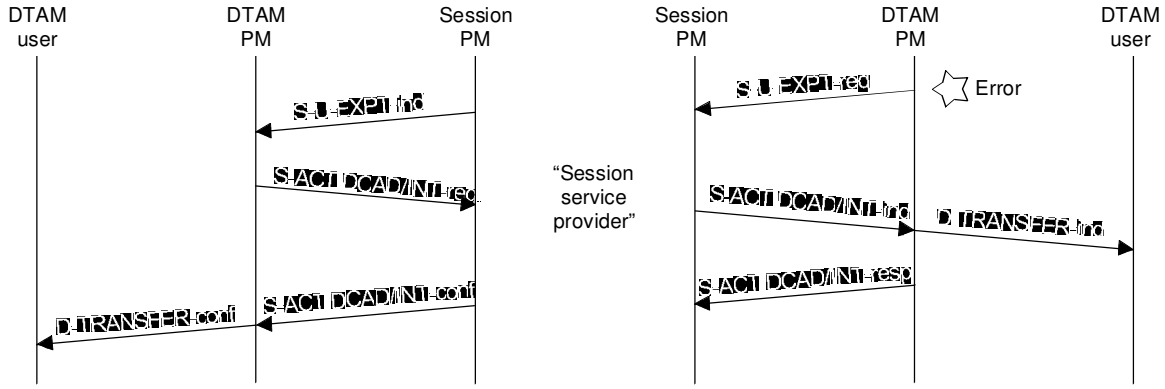
a) This service is not confirmed at the service level, but at the protocol level (refer to Recommendation X.225, § 7.9.3).

FIGURE I-3/T.521

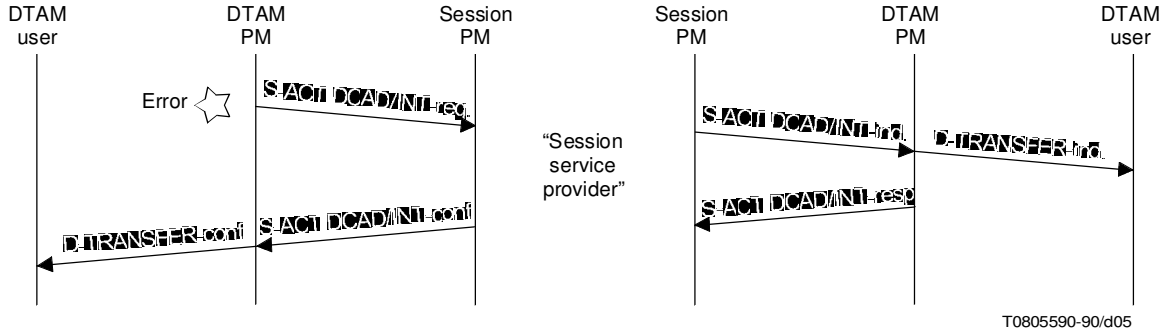
Abort procedure



Session PM Error Detection



DTAM PM Error Detection



DTAM PM Error Detection

FIGURE I-4/T.521

Exception report procedure

APPENDIX II

(To Recommendation T.521)

Guidance for mapping of DTAM to Recommendation T.62

Introduction

This appendix provides an implementor with a guideline when a mapping of a facsimile Group 4 application based on DTAM to Recommendation T.62 is intended.

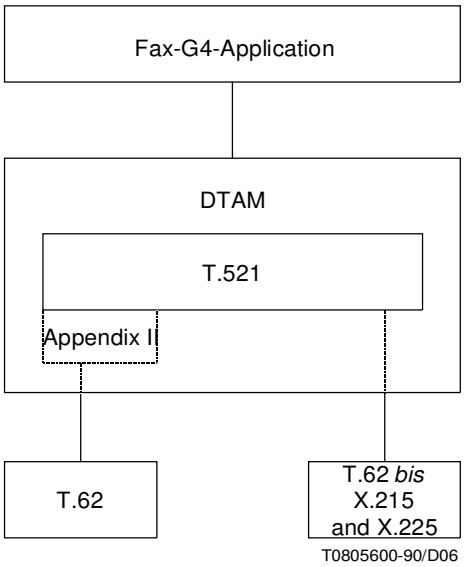
The main part of Recommendation T.521 defines the basic mapping of DTAM to the session service, described in Recommendation X.215 and Recommendation X.225 in conjunction with Recommendation T.62 *bis*.

For the mapping of DTAM onto the T.62 control procedures, further clarifications and explanations are needed.

The clarifications and explanations are considered within two parts.

Part 1 considering the DTAM to session service mapping, whereas part 2 describes the mapping of DTAM to Recommendation T.62 in terms of using the T.62 session commands and responses.

The figure below depicts the scope of this appendix.



1 Items to be considered when using DTAM on top of Recommendation T.62

1.1 *Mapping of DTAM to the session service*

The mapping of DTAM to the session service is described as the "Transparent Mode" within Recommendations T.432 and T.433.

The specific session service parameter mapping is defined in this Recommendation.

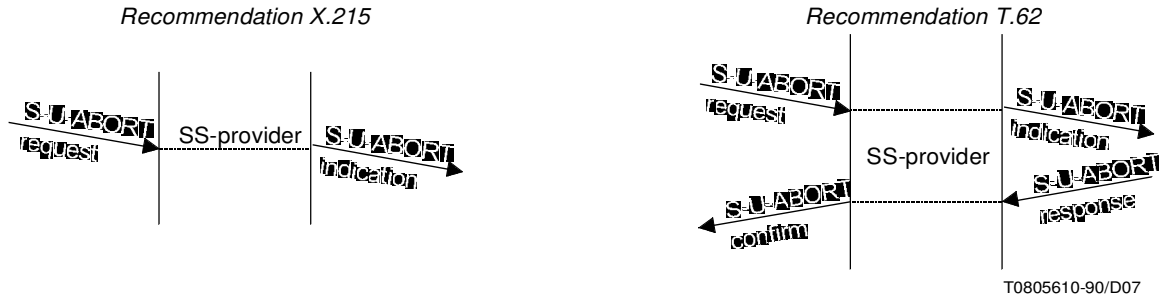
With the exception of two cases both are equivalent, the mapping of DTAM to T.62 and the mapping of DTAM to X.215 and X.225 (according to Recommendation T.62 *bis*).

The two exceptions are the S-U-ABORT and the S-CONTROL-GIVE service. Both services are confirmed services within Recommendation T.62, but unconfirmed service according to Recommendation X.215. The terminology of the session service primitives are aligned with the session service according to Recommendation X.215.

In order to guarantee a correct mapping at the DTAM and T.62 interface, an "Adaptation Management Function (AMF)" is introduced to perform this task.

1.1.1 *U-ABORT service*

The situation envisaged is as follows.



The DTAM-PM neither knows an S-U-ABORT confirm primitive nor does it issue an S-U-ABORT response primitive. Therefore, the "Adaptation Management Function (AMF)" is responsible for the mapping.

1.1.1.1 *Mapping rules*

An S-U-ABORT request from the DTAM-PM is transparently transferred through the AMF to the T.62-PM.

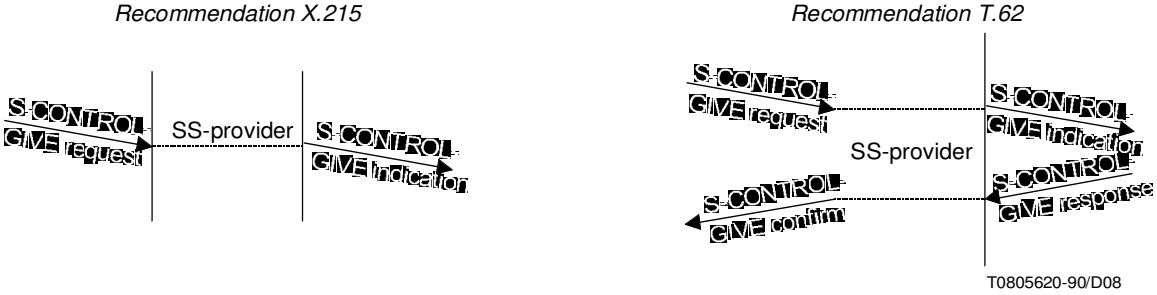
An S-U-ABORT indication generated by the T.62-PM is transparently transferred through the AMF to the DTAM-PM.

An S-U-ABORT response will not be generated by the DTAM-PM. Therefore, the AMF is in charge of generating an S-U-ABORT response primitive to the T.62-PM in the adequate situation (i.e. after the receipt of an S-U-ABORT indication).

An S-U-ABORT confirm is not known by the DTAM-PM. Therefore, the AMF is in charge of ignoring the S-U-ABORT confirm primitive which will be generated by the T.62-PM (i.e. after the receipt of an ABORT ACCEPT (RSAP) SPDU).

1.1.2 *S-CONTROL-GIVE service*

The situation envisaged is as follows.



The DTAM-PM neither knows an S-CONTROL-GIVE confirm primitive nor does it issue an S-CONTROL-GIVE response primitive. Therefore, the "Adaptation Management Function (AMF)" is responsible for the mapping.

1.1.2.1 *Mapping rules*

An S-CONTROL-GIVE request from the DTAM-PM is transparently transferred through the AMF to the T.62-PM.

An S-CONTROL-GIVE indication generated by the T.62-PM is transparently transferred through the AMF to the DTAM-PM.

An S-CONTROL-GIVE confirm is not known by the DTAM-PM. Therefore, the AMF is in charge of ignoring the S-CONTROL-GIVE. confirm primitive which will be generated by the T.62-PM (i.e. after the receipt of an S-CONTROL-GIVE indication).

An S-CONTROL-GIVE confirm is not known by the DTAM-PM. Therefore, the AMF is in charge of ignoring the S-CONTROL-GIVE confirm primitive which will be generated by the T.62-PM (i.e. after the receipt of a GIVE TOKENS ACK (RSCCP) SPDU).

1.2 *Use of T.62 commands and reponses*

This part of the appendix is related to T.62 session commands and responses in order to point out:

– in which session parameter the application dependent information is transferred;

– references to Recommendation T.433 where the application relevant information can be found;

– the use of Recommendation T.62 in relation to multifunctional equipment (e.g. TTX and G4 facsimile);

– important communication phases.

1.2.1 *Session establishment (CSS/RSSP)*

For CSS/RSSP the application capabilities within the Session User Data (SUD) parameter shall indicate the document architecture class and the document application profile T.73 which is available as receiving capability of the sender of the command/response.

1.2.2 *Capability negotiation (CDLC/RDCLP)*

For CDCL, the application capabilities indicated within the SUD, should, beside the document architecture class and document application profile T.73, include a list of optional receiving capabilities, such as non-basic document characteristics and/or non-basic structural characteristics, that may be needed at the receiver by the sender of the command.

For RDCLP, the optional application capabilities available should be indicated.

Multifunctional terminals which may support the Teletex and facsimile Group 4 application shall:

– negotiate options of the basic Teletex document transfer using the non-basic Teletex capabilities PGI and not the SUD PGI;

– not use the SUD PGI and the non-basic Teletex capabilities PGI together in a single exchange of CDCL/RDCLP (CSS/RSSP).

1.2.3 *Document transfer (CDS/CDC)*

For CDS/CDC, the application capabilities indicated within the SUD shall include the application capabilities which are required for the document.

Multifunctional terminals which may support Teletex and facsimile Group 4 application shall use the CDS/CDC command as follows:

– when a facsimile Group 4 document is to be sent, the SUD parameter is always contained in the CDS/CDC of the document;

– when a basic Teletex document is to be sent, the SUD is absent from the CDS/CDC of the document.

The coding of the application capabilities attributes conveyed in the SUD of CSS/RSSP, CDCL/RDCLP are specified in § 8.2 of Recommendation T.433; and for the SUD of CDS/CDC it is defined in Figure 3/T.433.