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SERIES T: TERMINALS FOR TELEMATIC SERVICES

Cooperative Document Handling – Complex services: Joint synchronous editing and joint document presentation/viewing

ITU-T Recommendation T.192

ITU-T T-SERIES RECOMMENDATIONS

TERMINALS FOR TELEMATIC SERVICES

For further details, please refer to ITU-T List of Recommendations.

ITU-T RECOMMENDATION T.192

COOPERATIVE DOCUMENT HANDLING – COMPLEX SERVICES: JOINT SYNCHRONOUS EDITING AND JOINT DOCUMENT PRESENTATION/VIEWING

Summary

This Recommendation specifies document communication services to be provided on top of existing base standards or profiles, giving constraints on them and rules on how to use and combine them.

Recommendation T.190 specifies basic services, such as storing, retrieval, manipulation, pointing or token-interchange. Some of these basic services can be used as stand-alone services, but all of them are candidates to build more complex services, such as joint synchronous editing and joint document presentation/viewing.

This Recommendation specifies complex document communication services that are built on top of the basic ones.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

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

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As of the date of approval of this Recommendation, the ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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Recommendation T.192

COOPERATIVE DOCUMENT HANDLING – COMPLEX SERVICES: JOINT SYNCHRONOUS EDITING AND JOINT DOCUMENT PRESENTATION/VIEWING

(Geneva, 1998)

1 Scope

The Open Document Architecture (ODA) base Recommendations | International Standards and associated profiles specify the means to represent and interchange complex documents.

Communication base Recommendations | International Standards and associated profiles, specifying interchange, remote manipulation and management of documents at the application layer of the Open Systems Interconnection (OSI) Reference Model, have also been specified, as Document Transfer And Manipulation (DTAM) and Document Filing and Retrieval (DFR).

Standards concerning multipoint communication and multimedia conferencing applications (see T.120 series of Recommendations) are being specified to support the needs of a rapidly growing telecommunication market.

Standardizing document communication services will help implementors and service providers to extend the use and acceptance of these services in Europe. Furthermore, the standardization of document communication service profiles will facilitate interworking.

This Recommendation specifies document communication services to be provided on top of existing base standards or profiles, giving constraints on them and rules on how to use and combine them.

Recommendation T.190 specifies basic services, such as storing, retrieval, manipulation, pointing or token-interchange. Some of these basic services can be used as stand-alone services, but all of them are candidates to build more complex services, such as joint synchronous editing and joint document presentation/viewing.

This Recommendation specifies complex document communication services that are built on top of the basic ones.

2 References

The following ITU-T Recommendations, and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

2.1 ITU-T Recommendations

– ITU-T Recommendation T.122 (1998), *Multipoint communication service – Service definition.*

– ITU-T Recommendation T.124 (1998), *Generic Conference Control.*

– ITU-T Recommendation T.125 (1994), *Multipoint communication service protocol specification.*

– ITU-T Recommendation T.190 (1995), *Cooperative Document Handling (CDH) – Framework and basic services.*

2.2 Additional references

– ISO/IEC 9594:1995, *The Directory.*

– ISO/IEC 10031-2:1991, *Information technology – Text and office systems – Distributed-office-applications model – Part 2: Distinguished-object-reference and associated procedures.*

– ETS 300 498-1 (1996), *Open Document Architecture (ODA) – ODA communication services – Part 1: Basic services.*

3 Definitions

For the purposes of this Recommendation, all the definitions in Recommendation T.190 apply. In addition, this Recommendation defines the following terms.

3.1 central service server: A server that controls the complex service token and centralizes the distribution of the document updates for a specific complex service. It is used to simplify the communication mechanism, since only one communication link between a user and the server is needed.

3.2 complex service session: The whole of the processes and events in the time interval between initialization and termination of an application implementing a complex service.

3.3 initiator: The user that initiates a complex service session.

3.4 master copy: The copy of a document that is used as a reference. It is updated at the end of a complex service session.

3.5 moderator: The user that is in charge of distributing the complex service token. It may be the initiator, a specific user, or the holder of the complex service token (in this case, the moderator role is changing during the complex service session).

3.6 presenter: A user who presents the content and the structure of a document to other users (the viewers).

3.7 joint document Presentation/Viewing (PV) session: A complex service session with the PV complex service.

3.8 PV token: A token used in the PV session to indicate which user is in turn to access and present a document.

3.9 joint Synchronous Editing (SE) session: A complex service session with the SE complex service.

3.10 SE token: A token used in the SE session to indicate which user is in turn to access and manipulate a document.

3.11 viewer: A user who follows the presentation of the content and the structure of a document provided by another user (the presenter).

4 Abbreviations

For the purposes of this Recommendation, all the abbreviations in Recommendation T.190 apply. In addition, this Recommendation uses the following abbreviations:

AEE	Associations Establishment End step
AEI	Associations Establishment Initiation step
AP	Asynchronous document Production complex service
AR	Associations Release step
CDH	Cooperative Document Handling
CS	Complex Service

CSS	Central Service Server
DTAM-DM/TK	Combined Document Transfer And Manipulation – Document Manipulation/Token exchange
DTAM-DM-SYM	Document Transfer and Manipulation – Document Manipulation – Symmetric
EWOS	European Workshop for Open Systems
FDS	Final Document Synchronization step
GC	GCC conference Creation step
GCC	Generic Conference Control
GE	GCC conference invitation End step
GI	GCC conference Invitation step
GT	GCC conference Termination step
IDS	Initial Document Synchronization step
ISSS	Information Society Standardization System
MCJ	MCS Channel Joining step
MCR	MCS Channel Release step
MCS	Multipoint Communication Service
MCU	Multipoint Control Unit
MDE	MCS Domain Establishment step
MDR	MCS Domain Release step
M-DTAM-DM	Multipoint – Document Transfer And Manipulation – Document Manipulation
M-RPC	Multipoint – Remote Procedure Call
MUA	MCS Users Attachment step
MUD	MCS Users Detachment step
O	Operation step
PV	Joint document Presentation/Viewing complex service
PV1	PV with 1 presenter
PVn	PV with n presenters
SE	Joint Synchronous Editing complex service
SM	Selection/Management step
SP	Sequential document Production complex service
SP1	SP with 1 document server
SPn	SP with n document servers

5 Introduction to document communication complex services

This Recommendation specifies services for document communication. Basic services are specified in Recommendation T.190. This Recommendation specifies Complex Services (CS) with clause 5 providing an introduction and clauses 9, 10 and 11 providing the formal definition of the complex services.

Complex services are built on top of basic services and make use of existing document and communication base Recommendations | International Standards and profiles.

Six CS in four categories are considered, and a number is assigned to each CS:

– Category 1: Joint Synchronous Editing (SE), which consists of:

- SE, joint synchronous editing (CS1).

– Category 2: Joint document Presentation/Viewing (PV), which consists of:

- PV1, joint document presentation/viewing with 1 presenter (CS2);

- PVn, joint document presentation/viewing with n presenters (CS3).

– Category 3: Sequential document Production (SP), which consists of:

- SP1, sequential document production with 1 document server (CS4);

- SPn, sequential document production with n document servers (CS5).

– Category 4: Asynchronous document Production (AP), which consists of:

- AP, asynchronous document production (CS6).

The complex services of category 1 (SE) and category 2 (PV) are specified in this Recommendation. The complex services of categories 3 (SP) and 4 (AP), both introduced in Recommendation T.190, are left for further study.

5.1 Classification of complex services

Table 1 classifies the complex services taking into account the following characteristics:

– Granularity: Complex services working on:

- full documents; and/or

- document fragments.

– Altering, or type of operations provided:

- Altering: Information in the document is modified.

- Non-altering: Information in the document is not modified.

– Connectivity, or communicating entities relationships:

- one communicating entity associated to several communicating entities;

- several communicating entities associated to one communicating entity;

- several communicating entities associated to several communicating entities.

– Synchronization:

- Synchronous: User access to the document(s) is controlled (and serialized) by means of the complex service (normally using a token handling mechanism).

- Asynchronous: User access to the document(s) may occur in random order (and is normally managed by an application).

– Document production:

- Sequential production: A document is generated in a sequential manner, following certain rules.

- Non-sequential production: No rules are defined for the order in which different parts of a document need to be generated.

- No production: Documents are not produced with the complex service.

– Use of the Multipoint Communication Service (MCS) (see Recommendations T.122 and T.125):

- No need: There is no need for MCS.

- Possible: MCS is useful, although other alternatives exist.

Table 1/T.192 – Classification of complex services

Characteristics		Complex services					
		SE	PV1	PVn	SP1	SPn	AP
Granularity	Works on full documents				✓	✓	
	Works on document fragments	✓	✓	✓	✓	✓	✓
Altering	Altering operations	✓			✓	✓	✓
	Non-altering operations		✓	✓			
Connectivity	One to several comm. Entities		✓				
	Several to one comm. Entities				✓		✓
	Several to several comm. Entities	✓		✓		✓	
Synchronization	Synchronous	✓	✓	✓	✓	✓	
	Asynchronous						✓
Document production	Sequential production				✓	✓	
	Non-sequential production	✓					✓
	No production		✓	✓			
MCS use	No need for MCS				✓	✓	✓
	MCS may be used	✓	✓	✓			

5.2 Joint Synchronous Editing (SE)

For the SE complex service, the following subclauses give a description and some service construction rules, that highlight the basic services on which the complex service is founded and how these basic services are combined together. Figures 1 and 2 are used for this purpose. Let n be the number of users participating in a SE session, n > 1.

5.2.1 Description

The SE complex service consists of the remote editing of one or more documents by several users in an interactive and synchronous manner.

The basic principles which constitute the SE complex service are:

– Several pre-determined users cooperate to jointly edit one or more pre-determined documents. Although every user may have a full or partial copy of a document, only one copy is designated the master copy, in which the result of the joint editing is stored. The master copy may be stored in one of the user servers. Local copies of a document can be useful to avoid data transfer overheads when some users view a document.

– One user will initiate the SE session. This user is called the initiator.

– Optionally, the initiator, or another user, may take the role of moderator of the SE session. The moderator is in charge of distributing the SE token, introduced below.

– Users communicate to a Central Service Server (CSS) or to all the other users.

– If users communicate to a CSS, the CSS is in charge of coordinating the whole process of joint synchronous editing. The CSS takes the role of moderator of the SE session. One-to-one symmetric associations will be established between the users and the CSS. All the updates will be sent from a user to the CSS, that, in turn, will send the updates to the other users.

– If users communicate to all the other users, two communication alternatives are possible:

- Use of MCS – MCS provides interactive multipoint communication functions to the users. One one-to-several association (one MCS channel) will be established between all users. All the updates will be sent from a user to all the other users.

- Use of the Generic Conference Control (GCC) facilities (see Recommendation T.124) – GCC provides, together with MCS, interactive multipoint conferencing functions to the users.

  NOTE – A third possible communication alternative could be the use of one-to-one associations without any CSS. Then n * (n – 1)/2 one-to-one associations need to be established in order to allow for communication between all users. This is not specified as a solution in this Recommendation because of the high costs (e.g. a SE session with 10 users requires 45 associations with a very complicated token handling procedure). Nevertheless, some further information for this case is given in I.1.6.

– Before manipulation starts, an Initial Document Synchronization (IDS) phase is necessary, where all users get, if not yet available, the document(s) or document fragment(s) which are to be jointly edited during the SE session.

– There is no specific pre-established order in which the users access and manipulate the documents.

– A SE token exists. The SE token is used to indicate which user is next in line to manipulate a document. Only the holder of the SE token can manipulate a document at any one time, while the others optionally view. The moderator controls the SE token and distributes it according to requests of users. The moderator can be the initiator, a pre-defined specific user, the user holding the SE token (i. e. the moderator role may change during the complex service session), or the CSS, if any.

– When a user manipulates a document fragment, this operation is sent to all other users.

– Before the SE session terminates, a Final Document Synchronization (FDS) phase is necessary, where the final version of the master copy of the document(s) is validated.

5.2.2 Service construction rules

Depending on the association type, two variants of the SE complex service are considered:

– several one-to-one associations, i.e. SE with CSS;

– one one-to-several association, i.e. SE without CSS.

The two variants are illustrated in Figures 1 and 2 respectively. Let n be the number of users participating in a SE session, n > 1.

Figure 1 gives an overview of the SE complex service using a CSS.

In this case, the SE complex service consists of the remote editing of one or more documents by several users in an interactive and synchronous manner, where n – 1 users communicate with an intermediate CSS, located at user 1.

One-to-one associations are established between the n – 1 users and the CSS. The CSS receives the manipulation operations and sends up-dates to the rest of the users. The CSS has the moderator role, meaning that it is responsible for assigning the SE token during the SE session.

Figure 2 gives an overview of the SE complex service without CSS.

In this case, the SE complex service consists of the remote editing of one or more documents by several users in an interactive and synchronous manner, without any intermediate CSS, so all users intercommunicate between themselves.

```
    SE token
    Document manipulation
    [, storing, retrieval]
    Master copy of the document
    Optional local copy of the document
```

T0827770-97/d01
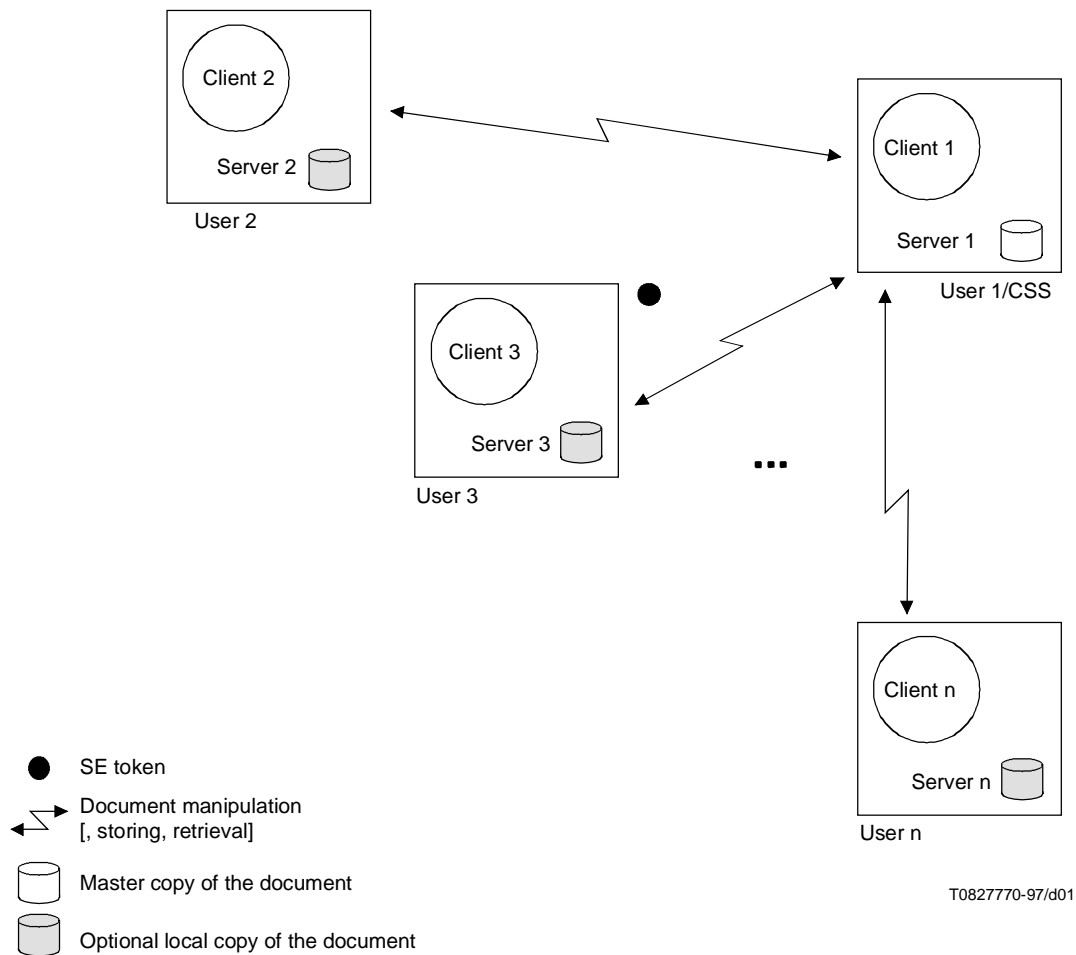
**Figure 1/T.192 – Joint Synchronous Editing (SE) with Central Service Server (CSS),
when CSS has the master copy of the document**

One one-to-several association (MCS channel) is established between all users. No CSS exists. The role of moderator, i.e. the user responsible for assigning the SE token during the SE session, needs to be agreed.

The SE complex service is based on the following basic services:

–   manipulation;

–   token-interchange;

–   retrieval (optional);

–   storing (optional).

The manipulation basic service is used to manipulate the document remotely and to send up-dates to other users. The purpose of the SE token is to know which user is in turn to access and manipulate a document. The token-interchange basic service is used to interchange the SE token. The retrieval basic service may be used for the IDS phase. The storing basic service may be used for the FDS phase.

5.3   Joint document Presentation/Viewing (PV)

The PV complex services category consists of the remote presentation or joint viewing of a document, where a user (the presenter) presents the content of a document to other users (the viewers).

Client 1

Server 1

User 1

SE token

Client 2

Server 2

User 2

Document server

Client n

Server n

User n

T0827780-97/d02

● SE token

→ [Document storing]

⌐ Document manipulation
[, storing, retrieval]

▢ Master copy of the document

▢ Optional local copy of the document

**Figure 2/T.192 – Joint Synchronous Editing (SE) without Central Service Server (CSS),
when the master copy of the document is not on any of the user servers**

The basic principles which constitute the PV complex services are:

– Several pre-determined users cooperate to jointly present/view one or more pre-determined documents. Every user has a full copy of the document(s).

– One user will initiate the PV session. This user is called the initiator.

– Optionally, the initiator, or another user, may take the role of moderator of the PV session. The moderator is in charge of distributing the PV token, introduced below, if any.

– The user who presents (at a given time) the content of a document is called presenter.

– Users who do not present (at a given time) are called viewers.

– The presenter communicates to all viewers.

– Users may establish several one-to-one associations or one one-to-several association.

– If one-to-one associations are used, several one-to-one associations need to be established in order to allow for communication between all users through a CSS (see 5.2.1).

–   MCS may be used. Then, the establishment of one one-to-several association (one MCS channel) is enough (see 5.2.1).

–   GCC may also be used (see 5.2.1).

–   Before presentation starts, an IDS phase is necessary, where all users get, if not yet available, the document(s) which are subject to the PV session.

–   When a presenter points to a document fragment, this operation is sent to all viewers.

–   A PV token may exist. Only the holder of the PV token can present a document. The moderator controls the PV token and distributes it according to requests of viewers. The moderator can be the initiator, a pre-defined specific user, the user holding the PV token (i.e. the moderator role is changing during the PV session).

The PV complex services are classified according to the number of users who can present a document to the other users, the two following cases are considered:

–   PV1, i.e. a joint document presentation/viewing with 1 presenter;

–   PVn, i.e. a joint document presentation/viewing with n presenters.

For each of these PV complex services, the following subclauses give a description and some service construction rules, that highlight the basic services on which the complex service is founded and how these basic services are combined together. Figures 3 and 4 are used for this purpose. Let n be the number of users participating in a PV session, $n > 1$.
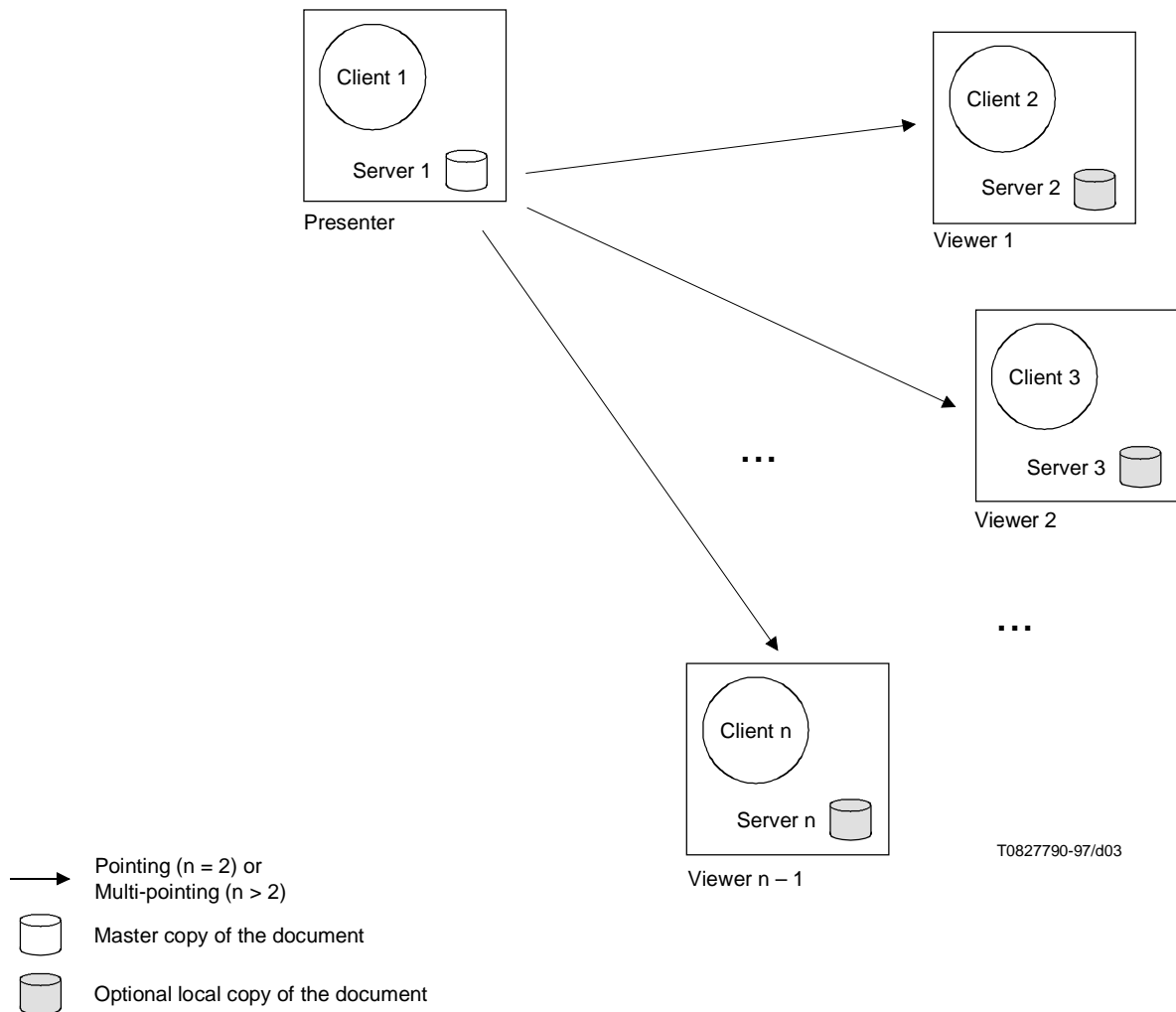
Figure 3/T.192 – Joint document Presentation/Viewing with 1 presenter (PV1), when the master copy of the document is on the presenter's server

PV token

Pointing (n = 2) or
Multi-pointing (n > 2)

Master copy of the document

Optional local copy of the document

T0827800-97/d04
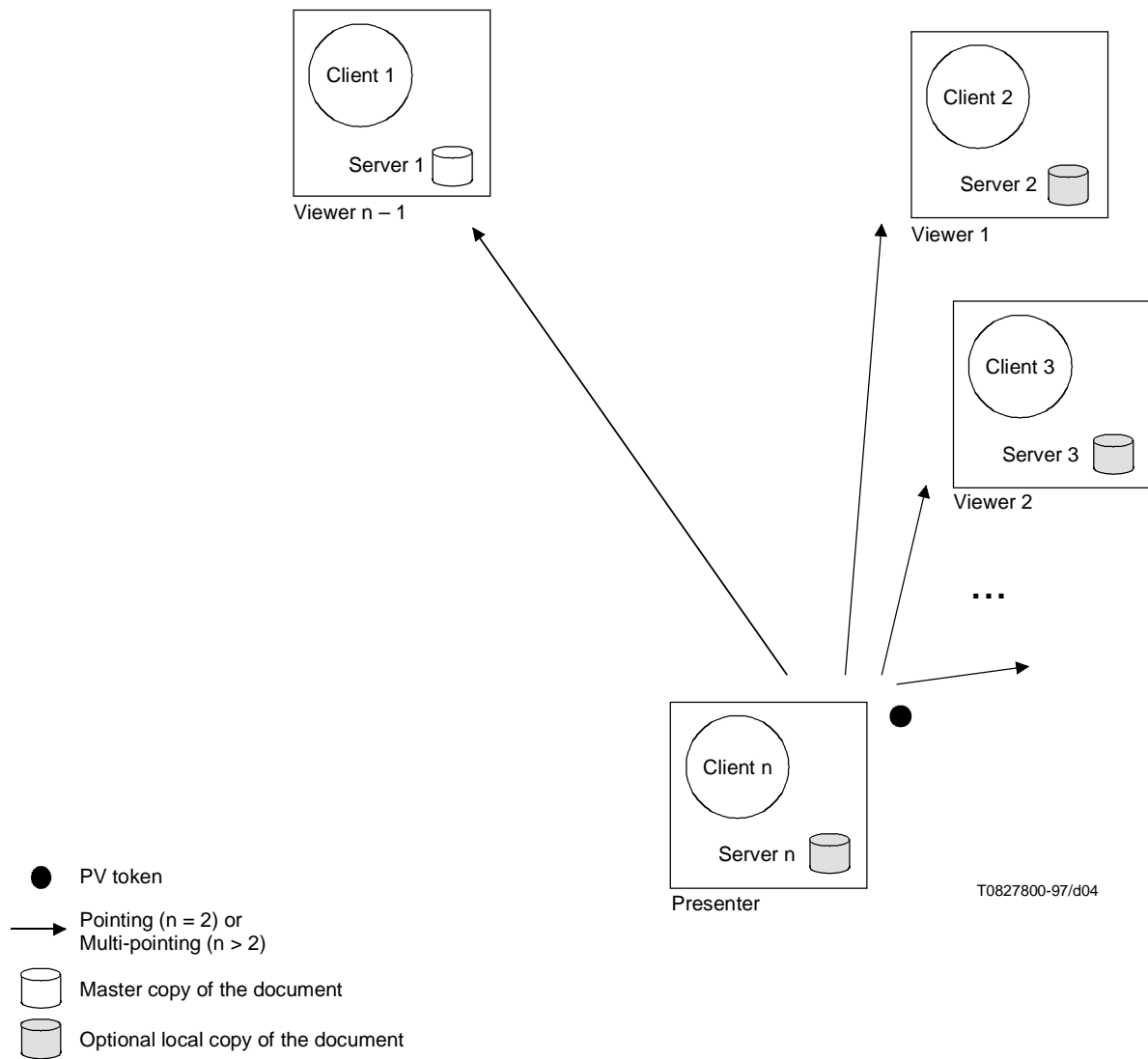
**Figure 4/T.192 – Joint document Presentation/Viewing with n presenters (PVn),
when the master copy of the document is on one of the user servers**

5.3.1 Joint document Presentation/Viewing with 1 presenter (PV1)

5.3.1.1 Description

The PV1 complex service consists of the remote presentation or joint viewing of one or more documents, where one user (the presenter) presents the content and structure of a document to the other users (the viewers).

No PV token is needed.

5.3.1.2 Service construction rules

Figure 3 gives an overview of the PV1 complex service.

The PV1 complex service is based on the following basic services:

– pointing (if there is only one viewer) or multi-pointing (if there are more than one viewer);

– retrieval (optional).

The pointing or multi-pointing basic services are used because the presenter needs to identify document fragments to one or several viewers, respectively. The retrieval basic service may be used for the IDS phase.

5.3.2 Joint document Presentation/Viewing with n presenters (PVn)

5.3.2.1 Description

The PVn complex service consists of the remote presentation or joint viewing of one or more documents, where several users (the presenters) present the content of a document to the other users (the viewers).
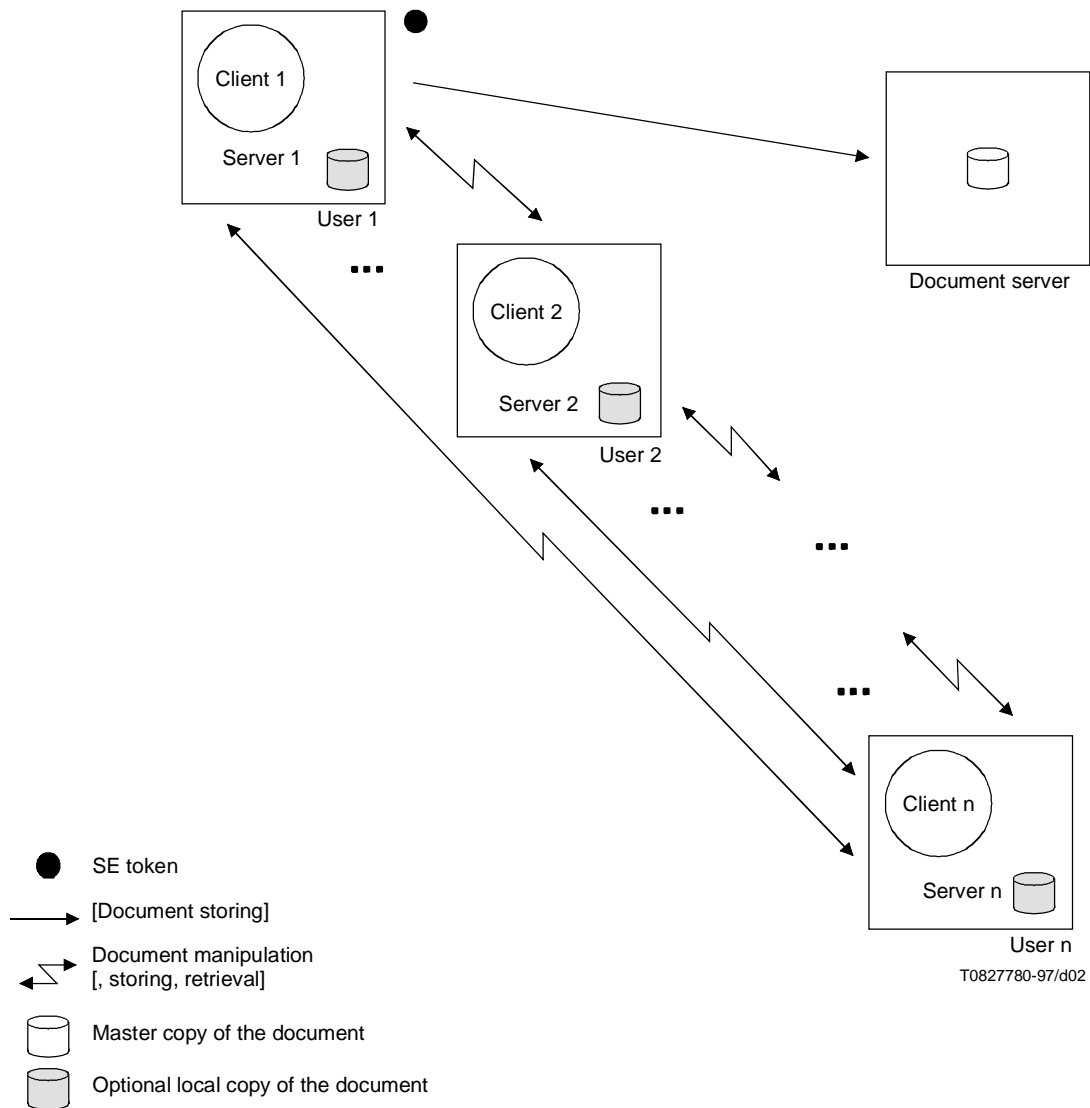
In the PVn complex service, all users are provided with the ability to present the content of a document to the other users, but at a given time only one user presents, while the others view.

Most of the characteristics of the PV1 complex service are still valid. The main differences with the PV1 complex service are:

– more than one user may present;

– a PV token is needed to control who is presenting.

5.3.2.2 Service construction rules

Figure 4 gives an overview of the PVn complex service.

The PVn complex service is based on the following basic services:

– pointing (if there is only one viewer) or multi-pointing (if there are more than one viewer);

– token-interchange;

– retrieval (optional).

The pointing or multi-pointing basic services are used because the presenter needs to identify document fragments to one or several viewers, respectively. The purpose of the PV token is to know which user is next in line to present the document. The token-interchange basic service is used to interchange the PV token. The retrieval basic service may be used for the IDS phase.

6 Document aspects concerning the SE and PV complex services

In clause 7/T.190, document aspects of the basic services are specified. The ODA Recommendations and International Standard, ITU-T Rec. T.410 series | ISO/IEC 8613, are considered as the method for representing and interchanging documents.

This Recommendation specifies another document aspect, i.e. the use of non-ODA documents.

6.1 Non-ODA documents

Complex services specified in this Recommendation shall be applicable to non-ODA documents.

There are two cases of handling documents:

– Handling of full documents: In this case, since the operations are independent from the document structure, all basic and complex services shall apply to both ODA documents and non-ODA documents.

– Handling of document fragments: In this case, a method to identify document fragments is needed in order to apply basic and complex services to non-ODA documents.

NOTE – It is outside the scope of this Recommendation to specify such an identification mechanism. The European Workshop for Open Systems (EWOS), that is planned to be replaced by the ISSS (Information Society Standardization System), a CEN division, in September 1997, is working on the definition of a Generic Abstract Interface allowing manipulation of any kind of document.

In case of working on non-ODA documents, the document format shall be specified following the rules given in 8.1.5, 8.3.2 and Annex A. More information is given in I.1.3.

7 Communication aspects concerning the SE and PV complex services

In addition to the communication modules described in clause 8/T.190, the following communication modules are needed to specify document communication complex services:

– combined DTAM-DM and DTAM-TK (DTAM-DM/TK);

– Multipoint Communication Service (MCS);

– Generic Conference Control (GCC).

7.1 Combined DTAM-DM and DTAM-TK (DTAM-DM/TK)

7.1.1 Description

The DTAM-DM communication module is described in 8.4/T.190. The DTAM-TK communication module is described in 8.5/T.190.

In addition to this, a combined DTAM-DM/DTAM-TK communication module exists, that allows a symmetric communication for remote document manipulation of documents, combined with a token interchange capability in order to synchronize the communicating entities.

All the features of DTAM-DM and DTAM-TK apply.

7.1.2 Services, protocols and profiles

The DTAM-DM symmetric abstract services are contained in the DTAM-DM-SYM application service element. The DTAM-TK abstract services are contained in the DTAM-TK application service element. Both application service elements and their combined use are specified in Recommendation T.435.

The combined DTAM-DM/DTAM-TK protocol is specified in Recommendation T.436. This protocol makes use of the Association Control Service Element (ACSE), the Remote Operations Service Element (ROSE) and the presentation service.

The profiles AOD11, AOD12 and AOD13, as specified in 8.4.2/T.190, also apply to this communication module.

The basicReadOnlyLevel is one of the manipulation levels which can be indicated in the arguments of the abstract DTAM bind operation, as specified in 8.1/T.435.

7.1.3 Use for document communication

DTAM-DM/TK is used for the remote interactive symmetric manipulation of documents where a token is needed to synchronize communicating entities.

7.2 Multipoint Communication Service (MCS)

7.2.1 Description

Multipoint Communication Service (MCS) provides a general multipoint connection-oriented data service. It collects point-to-point transport connections and combines them to form a multipoint domain. Within that domain, a large number of logical channels can provide one-to-one, one-to-many and many-to-one data delivery. Nodes within an MCS domain are hierarchically organized in a tree structure. Data delivery normally follows the most efficient path to the nodes that are to receive the data, but a mechanism is also provided to guarantee that data from multiple source nodes is received in the same sequence at all nodes. MCS acts as a resource provider to the layers above, providing channels and token resources on demand. A large number of tokens are provided for applications to use for coordinating events and processes.

7.2.2 Services, protocols and profiles

The MCS service and protocol are specified in Recommendations T.122 and T.125, respectively.

Although the MCS is located at the OSI application layer, in the case of the basic mode profile, it works directly on top of the transport layer.

No profile for MCS is fully specified for the moment.

NOTE – Although no profile for MCS has still been approved, work for the definition of profiles for MCS is progressing very fast in ITU-T SG 16. Furthermore, EWOS (ISSS after September 1997) has started work on the definition of a taxonomy of profiles for MCS, taking into account the requirements of this Recommendation.

7.2.3 Use for document communication

The MCS communication module is used to provide, when needed, the multipoint communication function to other interactive document communication modules, such as DTAM-DM or DFR modules. For this reason, it is different from the others.

In order to incorporate MCS into the interactive document communication modules based on one-to-one associations, those modules need some extensions.

The basic idea of the extensions is to change or remove the bind and unbind operations in order to handle MCS instead of ACSE, and to use Multipoint Remote Procedure Call (M-RPC), introduced later, instead of ROSE.

NOTE 1 – These extensions are not yet specified. There is a first proposal from ITU-T SG 8 for Multipoint DTAM-DM (M-DTAM-DM) (see II.2.3).

M-RPC is a new application service element that consists of the current ROSE with the added capability to send the data to multiple recipients through the use of MCS. Basically, the only change is to use MCS-SEND-DATA primitives instead of P-DATA ones.

NOTE 2 – The M-RPC service and protocol are not yet specified. There is a first proposal from ITU-T SG 8 (see II.2.3).

7.3 Generic Conference Control (GCC)

7.3.1 Description

Generic Conference Control (GCC) provides a set of services for setting up and managing multipoint conferences. It provides access control and arbitration of capabilities. GCC facilities are used by applications to coordinate independent use of the MCS channels and tokens within the same multipoint domain. Nodes can join and leave meetings at any time and GCC facilities can be used to query a node to find a desired meeting. GCC also makes a centralized registry facility available to applications in order to identify dynamically assigned channels and tokens.

7.3.2 Services, protocols and profiles

The GCC service and protocol are specified in Recommendation T.124.

GCC defines a service on top of MCS, and is intended to be used by specific applications, such as:

– still image conferencing;

– multipoint binary file transfer;

– other private applications.

These applications using GCC may also make direct use of MCS at the same time. The GCC Recommendation details how the MCS primitives are used.

No profile for GCC is fully specified for the moment.

NOTE – Although no profile for GCC has still been approved, work for the definition of profiles for GCC is progressing very fast in ITU-T SG 16. Furthermore, EWOS (ISSS after September 1997) is studying the possibility to develop a taxonomy of profiles for GCC, taking into account the requirements of this Recommendation.

7.3.3   Use for document communication

The GCC communication module is used to provide, when needed, conferencing functions to other interactive document communication modules, such as DTAM-DM or DFR modules. For this reason, it is, as MCS, different from the others.

In order to combine GCC with interactive document communication modules based on one-to-one associations, those modules need some extensions similar to those described in 7.2.3.

8   Components and design rules for the SE and PV complex services

This clause provides a common base for the formal definition of complex services. It provides the rules to make such a formal definition.

Complex services perform operations on service objects by using communication modules. Service objects are document stores, documents, document fragments, communicating entities and communication links. Some objects are more related to document aspects, others are related to communication aspects, and others are related to implementation aspects.

Services are specified in terms of attributes, which describe their features. Attributes take values from a well-defined set of attribute values.

Three service attribute sets are defined:

–   document related service attributes;

–   communication related service attributes;

–   implementation related service attributes.

For each attribute set, all attributes and their values are described. Throughout the text of this Recommendation, the names of service attributes are embedded in quotation marks, i.e. "attribute-name", and the values of service attributes are embedded in apostrophes, i.e. 'attribute-value'.

If the attribute "example-attribute" takes the value 'example-value', the following notation is used:

"example-attribute" equals 'example-value'.

Subclause 8.4 defines the way in which the attribute values are assigned to the document, communication and implementation related attributes for the specification of complex services.

Rules for the selection and restriction of the communication modules, which shall be used by the complex services, are also specified.

Finally, application rules are provided, which may include further dynamic constraints on operations of the selected and restricted communication module when applying the complex services in communication applications.

8.1   Definition of document related service attributes

This subclause defines the document related service attribute set.

The document related service attributes are:

–   "document location";

–   "document copies";

–   "document access rights";

–   "store access rights";

–   "document format";

–   "functionality level";

–   "document access order".

Some of these document related attributes are the same as in 9.1/T.190. Other attributes are modified or new. Table 2 gives an overview.

The following subclauses describe the meaning of the modified or new document related service attributes, their values and the meaning of those values.

For unchanged attributes a reference to the Recommendation T.190 is given.

Table 2/T.192 – Comparison of document related attributes for basic and complex services

Attribute	Basic services Values	Complex services Changes to Attribute	Complex services Values
"document location"	'local' 'remote'	**Modified**	'local' 'remote' 'moving' 'duplicated'
"document copies"	'one' 'several'	**Unchanged**	'one' 'several'
"document access rights"	'no-access' 'read-only' 'extended-read' 'add-only' 'delete-only' 'modify' 'full-access'	**Unchanged**	'no-access' 'read-only' 'extended-read' 'add-only' 'delete-only' 'modify' 'full-access'
"store access rights"	'no-access' 'read-only' 'extended-read' 'add-only' 'delete-only' 'modify' 'full-access'	**Unchanged**	'no-access' 'read-only' 'extended-read' 'add-only' 'delete-only' 'modify' 'full-access'
"document format"	'FOD011' 'FOD026' 'FOD036'	**Modified**	'FOD011' 'FOD026' 'FOD036' 'non-ODA'
"functionality level"	'I' 'D' 'F' 'F-SF' 'DS-F-SF' 'DM-F-SF' 'D-F-SF'	**Modified**	'D' 'F' 'F-SF' 'DS-F-SF' 'DM-F-SF' 'D-F-SF'
"document access order"	–	**New**	'sequential' 'random'

8.1.1   The service attribute "document location"

This service attribute determines where the information, which is subject of the communication application, is located.

The service attribute "document location" may take one of the following values:

–   'local';

–   'remote';

–   'moving';

–   'duplicated'.

The values 'local' and 'remote' are defined as in 9.1/T.190.

If access to the information is changing between 'local' and 'remote', the attribute has the value 'moving'. If access to the information is possible in different locations at the same time, the attribute has the value 'duplicated'.

8.1.2 The service attribute "document copies"

This service attribute is defined as in 9.1/T.190.

8.1.3 The service attribute "document access rights"

This service attribute is defined as in 9.1/T.190.

8.1.4 The service attribute "store access rights"

This service attribute is defined as in 9.1/T.190.

8.1.5 The service attribute "document format"

This service attribute determines the structure of the document which is subject of the communication application.

The service attribute "document format" may take one of the following values:

– 'FOD011';
– 'FOD026';
– 'FOD036';
– 'non-ODA'.

The values 'FOD011', 'FOD026' and 'FOD036' are defined as in 9.1/T.190.

If the document is not in ODA format, then the attribute has the value 'non-ODA'.

Clause 6 gives further information about the value 'non-ODA'.

8.1.6 The service attribute "functionality level"

A service may deal with service objects like document stores, documents or document fragments, on which operations may be performed. The service attribute "functionality level" determines a set of service objects and operations.

The service attribute "functionality level" may take one of the following values:

– 'D';
– 'F';
– 'F-SF';
– 'DS-F-SF';
– 'DM-F-SF';
– 'D-F-SF'.

The value 'I' has been deleted because no complex service is independent of documents, while all other values are defined as in 9.1/T.190.

The operations on service objects provided by the selected communication module may be restricted by rules given in the "Application rules" subclauses of the formal definitions of document communication complex services in clauses 9, 10 and 11.

8.1.7 The service attribute "document access order"

This service attribute determines the access order to service objects.

The service attribute "document access order" may take one of the following values:

– 'sequential';
– 'random'.

If access to the service objects is performed in a strictly sequential order, the attribute has the value 'sequential', otherwise it has the value 'random'.

8.2 Definition of communication related service attributes

This subclause defines the communication related service attribute set.

The communication related service attributes are:

– "number of communicating entities";

– "communication type";

– "communication module";

– "association";

– "synchronization";

– "conference type".

Some of these communication related attributes are the same as in 9.2/T.190. Other attributes are modified or new. Table 3 gives an overview.

The following subclauses describe the meaning of the modified or new communication related service attributes, their values and the meaning of those values.

For unchanged attributes a reference to Recommendation T.190 is given.

Table 3/T.192 – Comparison of communication related attributes for basic and complex services

| Attribute | Basic services | | Complex services |
	Values	Changes to Attribute	Values
"number of communicating entities"	'one-to-one' 'one-to-several'	**Modified**	'one-to-several' 'several-to-one' 'several-to-several'
"communication type"	'end-to-end' 'store-and-forward'	**Unchanged**	'end-to-end' 'store-and-forward'
"communication module"	'DFR' 'DTAM-BT-NM' 'DTAM-DM' 'DTAM-TK' 'DFR/DTAM-DM' 'MHS'	**Modified**	'DFR' 'DTAM-BT-NM' 'DTAM-DM' 'DTAM-DM/TK' 'DFR/DTAM-DM' 'MHS' 'MCS' 'GCC'
"association"	–	**New**	'one-to-one' 'one-to-several'
"synchronization"	–	**New**	'synchronous' 'asynchronous'
"conference type"	–	**New**	'fixed' 'flexible'

8.2.1 The service attribute "number of communicating entities"

This service attribute gives the number of communicating entities, in a communication application, on both sides of the communication links.

The service attribute "number of communicating entities" may take one of the following values:

– 'one-to-several';

– 'several-to-one';

– 'several-to-several'.

The value 'one-to-one' has been deleted because no complex service contemplates the case where one communicating entity accesses only one communicating entity. The value 'one-to-several' is defined as in 9.2/T.190. The value 'several-to-one' means that several communicating entities are accessing only one communicating entity. The value 'several-to-several' means that several communicating entities are accessing more than one communicating entity.

8.2.2 The service attribute "communication type"

This service attribute is defined as in 9.2/T.190.

8.2.3 The service attribute "communication module"

This service attribute specifies the communication module which is used by the service to carry out the communication process.

The service attribute "communication module" may take one of the following values, with the exceptions given below:

– 'DFR';

– 'DTAM-BT-NM';

– 'DTAM-DM';

– 'DTAM-DM/TK';

– 'DFR/DTAM-DM';

– 'MHS';

– 'MCS';

– 'GCC'.

The value 'DTAM-TK' has been deleted because, in complex services, the DTAM-TK module is always used in combination with other modules.

The values 'DFR', 'DTAM-BT-NM', 'DTAM-DM', 'DFR/DTAM-DM' and 'MHS' are defined as in 9.2/T.190.

In case of "communication module" equals 'DTAM-DM/TK', the communication module DTAM-DM/TK shall be used.

In case of "communication module" equals 'MCS' or 'GCC', a second value from the rest of possible values is needed.

In case of "communication module" equals 'MCS', the communication module MCS shall be used in combination with a module from any other value except 'GCC'.

In case of "communication module" equals 'GCC', the communication module GCC shall be used in combination with a module from any other value except 'MCS'.

NOTE – Although the GCC communication module is always used in combination with the MCS module (see 7.3), this is assumed in this Specification. Then, the combination of values 'MCS' and 'GCC' is not relevant.

Characteristics of the DTAM-DM/TK, MCS and GCC communication modules are summarized in clause 7.

Complex services may need the use of stand-alone basic services. In this case, the communication modules used by those basic services are not included in the list of values.

8.2.4 The service attribute "association"

This service attribute specifies the kind of association to be used.

The service attribute "association" may take one of the following values:

– 'one-to-one';

– 'one-to-several'.

The value 'one-to-one' shall be used if a communicating entity is connected with only one other entity, otherwise the value 'one-to-several' shall be used.

8.2.5 The service attribute "synchronization"

This service attribute specifies if the complex service is synchronous or not.

The service attribute "synchronization" may take one of the following values:

– 'synchronous';

– 'asynchronous'.

The value 'synchronous' shall be used if user access to the document(s) is controlled (and serialized) by means of the complex service, normally using a token handling mechanism. Otherwise, i.e. if user access to the document(s) may occur in random order, the value 'asynchronous' shall be used.

8.2.6 The service attribute "conference type"

This service attribute specifies the type of conference that the complex service will follow, in relation to the use of special conferencing capabilities, like those provided by GCC (see 7.3).

The service attribute "conference type" may take one of the following values:

– 'fixed';

– 'flexible'.

If special conferencing capabilities are used, then the attribute value shall equal 'flexible'. If not, the value 'fixed' shall be used.

8.3 Definition of implementation related service attributes

This subclause defines the implementation related service attribute set.

The implementation related service attributes are:

– "basic services";

– "static information".

All these attributes are specific for complex services.

The following subclauses describe the meaning of the attributes, their values and the meaning of those values.

8.3.1 The service attribute "basic services"

This service attribute gives a list of the basic services used for the implementation of the complex service, if any.

The service attribute "basic services" may take zero or more of the following values:

– 'STR';

– 'DST';

– 'RTR';

– 'SAR';

– 'MNP';

– 'PNT';

– 'MPT';

– 'TKI'.

The value 'STR' shall be used when the storing basic service is needed for the implementation of the complex service; the value 'DST' shall be used when the distribution basic service is needed for the implementation of the complex service; the value 'RTR' shall be used when the retrieval basic service is needed for the implementation of the complex service; the value 'SAR' shall be used when the storing-and-retrieval basic service is needed for the implementation of the complex service; the value 'MNP' shall be used when the manipulation basic service is needed for the implementation of the complex service; the value 'PNT' shall be used when the pointing basic service is needed for the implementation of the complex service; the value 'MPT' shall be used when the multi-pointing basic service is needed for the implementation of the complex service; the value 'TKI' shall be used when the token-interchange basic service is needed for the implementation of the complex service.

This is a multi-valued attribute.

The basic services are specified in Recommendation T.190.

8.3.2 The service attribute "static information"

This service attribute identifies the static information that an implementation of the complex service needs. This static information is interchanged during the establishment of the complex service session.

The service attribute "static information" may take zero or more of the following values:

– 'user-ids';

– 'doc-ids';

– 'non-ODA-format';

– 'moderator-id'.

The value 'user-ids' shall be used when identification of the users is needed to perform the complex service; the value 'doc-ids' shall be used when identification of one or more documents (and identification of the sites in which their corresponding master copies are) in which to work is needed to perform the complex service; the value 'non-ODA-format' shall be used when the value of the attribute "document format" equals 'non-ODA' in order to identify the document format used; the value 'moderator-id' shall be used when identification of the user that will take the role of moderator is needed to perform the complex service. The mechanism to provide the actual identifications is specified later.

This is a multi-valued attribute.

8.4 Rules for the formal definition of complex services

For the formal definition of complex services, as given in clauses 9, 10 and 11, five steps are followed:

– assignment of values to the document related service attributes;

– assignment of values to the communication related service attributes;

– assignment of values to the implementation related service attributes;

– selection of the communication modules;

– specification of application rules.

Rules and notation to follow these steps are given in the following subclauses.

8.4.1 Rules and notation for the assignment of values to the document related service attributes

The assignment of values to the document related service attributes is done using the notation depicted in Table 4.

In the "Service attribute" column, names of document related service attributes are given.

In the "Attribute value(s)" column, all possible values of all service attributes are given for reference.

For each document related service attribute, tables in clauses 9, 10 and 11 (Tables 8 to 28) (formal definition of complex services) provide, in the "Attribute value(s)" column, either a unique value or a list of values. In the first case, the unique value is the one that the attribute shall take. In the second case, one and only one value shall be selected, as specified in the last column of the tables.

For some complex services, attributes may be not applicable. In this case, 'N/A' is given in the "Attribute value(s)" column of the tables.

In the tables shown in clauses 9, 10 and 11 (Tables 8 to 28), the "Value description" column is used to explain the choice of the values and the possible dependencies the chosen value may have on values of other service attributes.

Table 4/T.192 – Values for document related service attributes for a complex service

Service attribute	Attribute value(s)	Value description
"document location"	'local' 'remote' 'moving' 'duplicated'	
"document copies"	'one' 'several'	
"document access rights"	'no-access' 'read-only' 'extended-read' 'add-only' 'delete-only' 'modify' 'full-access'	
"store access rights"	'no-access' 'read-only' 'extended-read' 'add-only' 'delete-only' 'modify' 'full-access'	
"document format"	'FOD011' 'FOD026' 'FOD036' 'non-ODA'	
"functionality level"	'D' 'F' 'F-SF' 'DS-F-SF' 'DM-F-SF' 'D-F-SF'	
"document access order"	'sequential' 'random'	

8.4.2   Rules and notation for the assignment of values to the communication related service attributes

The assignment of values to the communication related service attributes is done using the notation depicted in Table 5.

In the "Service attribute" column, names of communication related service attributes are given.

In the "Attribute value(s)" column, all possible values of all service attributes are given for reference.

For each communication related service attribute, tables in clauses 9, 10 and 11 (Tables 8 to 28) (formal definition of complex services) provide, in the "Attribute value(s)" column, either a unique value or a list of values. In the first case, the unique value is the one that the attribute shall take. In the second case, one and only one value shall be selected, when no exception to this rule is given, as specified in the last column of the tables.

In the Tables 8 to 28 shown in clauses 9, 10 and 11, the "Value description" column is used to explain the choice of the values and the possible dependencies the chosen value may have on values of other service attributes.

Table 5/T.192 – Values for communication related service attributes for a complex service

Service attribute	Attribute value(s)	Value description
"number of communicating entities"	'one-to-several' 'several-to-one' 'several-to-several'	
"communication type"	'end-to-end' 'store-and-forward'	
"communication module"	'DFR' 'DTAM-BT-NM' 'DTAM-DM' 'DTAM-DM/TK' 'DFR/DTAM-DM' 'MHS' 'MCS' 'GCC'	
"association"	'one-to-one' 'one-to-several'	
"synchronization"	'synchronous' 'asynchronous'	
"conference type"	'fixed' 'flexible'	

8.4.3 Rules and notation for the assignment of values to the implementation related service attributes

The assignment of values to the implementation related service attributes is done using the notation depicted in Table 6.

In the "Service attribute" column, names of implementation related service attributes are given.

In the "Attribute value(s)" column, all possible values of all service attributes are given for reference.

For each implementation related service attribute, tables in clauses 9, 10 and 11 (Tables 8 to 28) (formal definition of complex services) provide, in the "Attribute value(s)" column, either zero values or a list of values. In the first case, the attribute has no value. In the second case, all the values shall apply.

In the Tables 8 to 28 shown in clauses 9, 10 and 11, the "Value description" column is used to explain the choice of the values and the possible dependencies the chosen value(s) may have on values of other service attributes.

8.4.4 Rules and notation for the selection of the communication modules

The selection of the communication modules and their possible restrictions (e.g. profiles) is done using the notation depicted in Table 7, using the selection mechanism described hereafter.

The selection mechanism consists of a sequence of the following steps, that are to be followed to select a communication module and its restrictions (e.g. profiles) from Table 7:

– Step 1: Choice of one item from the "functionality level" column; this item selects a row of the table.

– Step 2: Choice of one or two values (see 8.2.3) of the service attribute "communication module"; this choice selects one or two columns of the table.

– Step 3: Choice of the table entry or entries at the cross point of the selected row from step 1 and the selected column or columns from step 2.

– Step 4: If the table entry (entries) is (are) empty, the service cannot be performed with the chosen combination of "functionality level" and "communication module" attribute values; otherwise, the table entry (entries) contains (contain) the restrictions that shall be applied to the selected communication module. In case 'MCS' or 'GCC' are one of the selected values of the "communication module" attribute, then the corresponding table indicates that they are possible, and the text accompanying the table specifies how to combine the communication modules. Further dynamic constraints on operations of the selected and restricted communication module(s) may be specified in 8.4.5.

As specified in 8.2.3, complex services may need the use of stand-alone basic services. In this case, the communication modules used by those basic services are not included in the table.

Table 6/T.192 – Values for implementation related service attributes for a complex service

Service attribute	Attribute value(s)	Value description
"basic services"	'STR' 'DST' 'RTR' 'SAR' 'MNP' 'PNT' 'MPT' 'TKI'	
"static information"	'user-ids' 'doc-ids' 'non-ODA-format' 'moderator-id'	

Table 7/T.192 – Selection of communication modules for a complex service

"functionality level"	"communication module"							
	'DFR'	'DTAM-BT-NM'	'DTAM-DM'	'DTAM-DM/TK'	'DFR/DTAM-DM'	'MHS'	'MCS'	'GCC'
'D'								
'F'								
'F-SF'								
'DS-F-SF'								
'DM-F-SF'								
'D-F-SF'								

8.4.5 Application rules

Application rules specify further dynamic constraints on operations of the selected and restricted communication module when applying a complex service in communication applications.

The application rules may, in relation to the operations in the communication modules:

– prohibit the performance of some operations;

– allow some operations only under certain conditions;

– allow some operations only with specific arguments;

– prescribe a certain order of operations.

Application rules are given as a sequence of steps, that fall into one of the following categories, that, in turn, may have sub-steps identified by sequential numbers:

– Associations Establishment Initiation step (AEI);

– Associations Establishment End step (AEE);

– Associations Release step (AR);

– Initial Document Synchronization step (IDS);

– Final Document Synchronization step (FDS);

– Selection/Management step (SM);

– Operations step (O);

– MCS Domain Establishment step (MDE);

– MCS Domain Release step (MDR);

– MCS Users Attachment step (MUA);

– MCS Users Detachment step (MUD);

– MCS Channel Joining step (MCJ);

– MCS Channel Release step (MCR);

– GCC conference Creation step (GC);

– GCC conference Termination step (GT);

– GCC conference Invitation step (GI);

– GCC conference invitation End step (GE).

Steps or sub-steps may be equivalent to steps of basic services. In this case, they are identified by the corresponding basic service abbreviation and step number, as specified in clause 10/T.190.

9 Formal definition of the SE complex service

This clause defines the joint Synchronous Editing (SE) complex service, introduced in 5.1, using the rules given in clause 8.

9.1 Document related service attributes

For each document related service attribute, Table 8 provides attribute value(s) and value description, following the rules and notation specified in 8.4.1.

Table 8/T.192 – Values for document related service attributes for the SE complex service

Service attribute	Attribute value(s)	Value description
"document location"	'duplicated'	Nevertheless, a master copy of the document(s) exists (exist).
"document copies"	'several'	
"document access rights"	'full-access'	
"store access rights"	N/A	The document store is not manipulated (see "functionality level" attribute).
"document format"	'FOD011' 'FOD026' 'FOD036' 'non-ODA'	This attribute shall take only one of the possible values, depending on the document format desired.
"functionality level"	'F-SF'	
"document access order"	'random'	

9.2 Communication related service attributes

For each communication related service attribute, Table 9 provides attribute value(s) and value description, following the rules and notation specified in 8.4.2.

Table 9/T.192 – Values for communication related service attributes for the SE complex service

Service attribute	Attribute value(s)	Value description
"number of communicating entities"	'several-to-one' 'several-to-several'	This attribute shall take only one of the possible values, depending on the value of the "association" attribute. The value 'several-to-one' corresponds to the value 'one-to-one' of the "association" attribute, while the value 'several-to-several' corresponds to the other one.
"communication type"	'end-to-end'	
"communication module"	'DTAM-DM/TK'	
"association"	'one-to-one' 'one-to-several'	This attribute shall take only one of the possible values, depending on the topology desired.
"synchronization"	'synchronous'	
"conference type"	'fixed' 'flexible'	This attribute shall take only one of the possible values, depending on the conferencing facilities desired.

9.3 Implementation related service attributes

For each implementation related service attribute, Table 10 provides attribute value(s) and value description, following the rules and notation specified in 8.4.3.

Table 10/T.192 – Values for implementation related service attributes for the SE complex service

Service attribute	Attribute value(s)	Value description
"basic services"	'STR' 'RTR' 'MNP' 'TKI'	All the basic services associated to these values are needed, in a mandatory or optional manner, for the implementation of the complex service.
"static information"	'user-ids' 'doc-ids' 'non-ODA-format' 'moderator-id'	The value 'moderator-id' is only needed when the "association" attribute has the value 'one-to-several'. The value 'non-ODA-format' is only needed when the "document format" attribute has the value 'non-ODA'. The other values are always needed.

9.4 Selection of communication modules

Depending on the chosen values of the attributes "functionality level", "association" and "conference type", the following communication module restrictions shall apply:

– For "functionality level" equals 'F-SF', one communication module shall be possible (DTAM-DM/TK).

– For "association" equals 'one-to-one', the communication module selected, with the restrictions specified in Table 11 (AOD13 profile), shall be used.

– For "association" equals 'one-to-several' and "conference type" equals 'fixed', the use of MCS is possible. Then, the communication module selected, with the restrictions specified in Table 11, shall be combined with MCS.

– For "association" equals 'one-to-several' and "conference type" equals 'flexible', the use of GCC is possible. Then, the communication module selected, with the restrictions specified in Table 11, shall be combined with GCC.

The communication module restrictions presented in Table 11 are defined in clause 8.

Table 11/T.192 – Selection of communication modules for the SE complex service

"functionality level"	"communication module"							
	'DFR'	'DTAM-BT-NM'	'DTAM-DM'	'DTAM-DM/TK'	'DFR/DTAM-DM'	'MHS'	'MCS'	'GCC'
'D'								
'F'								
'F-SF'				AOD13			Possible	Possible
'DS-F-SF'								
'DM-F-SF'								
'D-F-SF'								

9.5 Application rules

This subclause specifies the rules the SE complex service shall follow when using communication module.

9.5.1 Application rules when using DTAM-DM/TK

The SE complex service is only applicable to document fragments. DTAM-DM/TK, restricted to the AOD13 profile, shall be used.

There are three possible cases depending on the values of the "association" and "conference type" attributes:

– Case 1: "association" = 'one-to-one' and "conference type" = 'fixed'.

– Case 2: "association" = 'one-to-several' and "conference type" = 'fixed'.

– Case 3: "association" = 'one-to-several' and "conference type" = 'flexible'.

9.5.1.1 Case 1: "association" = 'one-to-one' and "conference type" = 'fixed'

In this case, one-to-one DTAM-DM/TK associations shall be used.

Before the service is requested, the following information, identified in the "static information" attribute (see 8.3.2) shall be known for later distribution:

– Users identifiers: A list of the n users (U1 to Un, U1 being the initiator, moderator and holder of the central service server) that will participate in the complex service session; they are identified according to the ASN.1 definition given in Annex A.

– Document(s) identifier(s): A list of the documents (if any), with their corresponding document sites, that will be used in the complex service session; they are identified according to the ASN.1 definition given in Annex A.

– Non-ODA format: The format of the document(s) in case they are not in ODA; it is identified according to the ASN.1 definition given in Annex A.

User U1 will manage a central service server in charge of establishing n – 1 associations with the rest of users (U2 to Un) and distributing the SE token.

When the service is requested (user U1 initiates a SE session with users U2 to Un on the document(s) previously identified, located in identified document sites), a series of steps shall be followed.

This sequence of steps is summarized in Table 12.

**Table 12/T.192 – Summary of application rules steps for the SE complex service,
when using DTAM-DM/TK communication module
and when "association" = 'one-to-one' and "conference type" = 'fixed'**

Steps	Sub-steps	Description
AEI		Associations Establishment Initiation
IDS		Optionally, Initial Document Synchronization
AEE		Associations Establishment End
O		Manipulation of the document(s) by the Ui users and token interchange (repeated until the moderator wants to close the session, when the moderator holds the SE token)
FDS		Optionally, Final Document Synchronization
AR		Associations Release

A detailed description of the steps follows:

– **Step AEI**: Associations establishment initiation, starting with the connection of user U1 (initiator, central service server) to the users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

- user U1 issues a DTAMBind operation (DTAM-DM/TK application context) to the user Ui, with the following restrictions in the following parameters of the Bind argument:

  a) the value of the "dtamManipulationCapabilities" parameter shall correspond to the AOD13 profile (see 7.1.2);

  b) the value of the "applicationRequirements" parameter shall contain the ASN.1 data structure defined in Annex A, containing:

     i) the identification of the complex service (CS1);

     ii) the information identified by the "static information" implementation related attribute.

– **Step IDS**: Optionally, initial document synchronization:

- retrieval of the identified document(s) from the identified document site, by all Ui users that need it; the RTR basic service, as specified in Recommendation T.190, shall be used.

– **Step AEE**: Associations establishment end, finishing with the connection of user U1 (central service server) to the users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

- the DTAM Bind results are returned.

– **Step O**: Manipulation of the document(s) by the Ui users and token interchange (repeated until the moderator wants to close the session, when the moderator holds the SE token):

- optionally, the moderator starts AOD13 operations for manipulation (MNP basic service with DTAM-DM steps 2, 3 and 4) (see 10.5.4.2/T.190);

- the moderator gives the SE token to another user with the TK-TOKEN-GIVE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

- in parallel, any user may request the SE token to the moderator with the TK-TOKEN-PLEASE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

- the user holding the SE token issues AOD13 operations for manipulation (see above);

- the user holding the SE token gives it back to the moderator with the TK-TOKEN-GIVE primitive (see above).

–   **Step FDS**: Optionally, final document synchronization:

  •   if the master copy of the document(s) is not on any of the user servers (i.e. the master copy has not been directly manipulated during the SE session), and if the document(s) have been modified, then the moderator stores the actually updated document (the copy that was manipulated on all the user servers during the session) where it was initially retrieved in step IDS. The STR basic service, as specified in Recommendation T.190, shall be used.

–   **Step AR**: Associations release (the following steps are repeated for all the users U2 to Un, identified as Ui):

  •   user U1 (the initiator) issues a DTAMUnbind operation to the user Ui.

9.5.1.2   Case 2: "association" = 'one-to-several' and "conference type" = 'fixed'

In this case, MCS shall be used, with the restrictions specified hereafter.

NOTE – MCS profiles, under development in ITU-T SG 16 and under study in EWOS (ISSS after September 1997), may comply in the future with these restrictions.

Before the service is requested, the information identified in the "static information" attribute (see 8.3.2) shall be known for later distribution. This information is described in 9.5.1.1. Furthermore, the following information, not described in 9.5.1.1, shall be known:

–   Moderator identifier: Identification of the user that will take the role of moderator during the complex service session; it is identified according to the ASN.1 definition given in Annex A.

Furthermore, a MCU shall be available.

When the service is requested [user U1 initiates a SE session with users U2 to Un on the document(s) previously identified, located in the identified document site], a series of steps shall be followed.

This sequence of steps is summarized in Table 13.

Table 13/T.192 – Summary of application rules steps for the SE complex service, when using DTAM-DM/TK communication module and when "association" = 'one-to-several' and "conference type" = 'fixed'

Steps	Sub-steps	Description
MDE		MCS Domain Establishment
	MDE.1	Connection of user U1 and the MCU
	MDE.2	Connection of users U2 to Un
MUA		MCS Attachment of users U1 to Un
MCJ		Joining of a specified MCS static channel by all users U1 to Un
IDS		Optionally, Initial Document Synchronization
O		Manipulation of the document(s) by the Ui users
	O.1	Optionally, initial assignment of the SE token
	O.2	Manipulation operations and token interchange (repeated until the moderator wants to close the session, when the moderator holds the SE token)
FDS		Optionally, Final Document Synchronization
MCR		MCS Channel Release
MUD		MCS Users Detachment
MDR		MCS Domain Release

A detailed description of the steps follows:

– **Step MDE**: MCS domain establishment, this consists of the following sub-steps:

- **Sub-step MDE.1**: Connection of user U1 and the MCU:

    a) User U1 (the initiator) issues a MCS-CONNECT-PROVIDER req primitive to the MCU, with the following restrictions in the following parameters:

    i) the value of the "called domain selector" parameter shall be the OCTET STRING "CS1" (identification of the complex service);

    ii) the value of the "upward/downward flag" parameter shall be 'up';

    iii) the following restrictions apply to the following parameters of the "domain parameters" parameter:

    1) "number of data transfer priorities" shall be 1;

    2) the "user data" parameter shall contain the ASN.1 data structure defined in Annex A, containing:

    – the identification of the complex service (CS1);

    – the information identified by the "static information" implementation related attribute.

    b) At the reception of the corresponding MCS-CONNECT-PROVIDER ind primitive, the MCU shall answer with a MCS-CONNECT-PROVIDER resp primitive, with the following restrictions in the following parameters:

    i) the value of the "domain parameters" parameter shall be the same as that received in the corresponding indication primitive.

    c) The corresponding MCS-CONNECT-PROVIDER conf primitive arrives at user U1.

- **Sub-step MDE.2**: Connection of users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

    a) The MCU issues a MCS-CONNECT-PROVIDER req primitive to Ui, with the following restrictions in the following parameters:

    i) the value of the "upward/downward flag" parameter shall be 'down';

    ii) the values of the "called domain selector" and "domain parameters" parameters shall be the same as those sent in the MCS-CONNECT-PROVIDER req primitive previously issued by user U1.

    b) At the reception of the corresponding MCS-CONNECT-PROVIDER ind primitive, user Ui shall answer with a MCS-CONNECT-PROVIDER resp primitive, with the following restrictions in the following parameters:

    i) the value of the "domain parameters" parameter shall be the same as that received in the corresponding indication primitive.

    c) the corresponding MCS-CONNECT-PROVIDER conf primitive arrives at the MCU.

– **Step MUA**: MCS attachment of users U1 to Un (the following steps are repeated for all the users U1 to Un, identified as Ui):

- user Ui issues a MCS-ATTACH-USER req primitive to the MCU, with the following restrictions in the following parameters:

    a) the value of the "domain selector" parameter shall be the OCTET STRING "CS1" (identification of the complex service);

- the corresponding MCS-ATTACH-USER conf primitive arrives at user Ui, conveying the MCS User Id for Ui.

– **Step MCJ**: Joining of an specified MCS static channel by all users U1 to Un (the following steps are repeated for all the users U1 to Un, identified as Ui):

- user Ui issues a MCS-CHANNEL-JOIN req primitive, with the following restrictions in the following parameters:

  a) the value of the "channel to join" parameter shall be 1;

  b) the corresponding MCS-CHANNEL-JOIN conf primitive arrives at user Ui.

– **Step IDS**: Optionally, initial document synchronization:

- retrieval of the identified document(s) from the identified document site, by all Ui users that need it; the RTR basic service, as specified in Recommendation T.190, shall be used.

– **Step O**: Manipulation of the document(s) by the Ui users, this consists of the following sub-steps (all DTAM operations are transported by MCS-SEND-DATA services):

- **Sub-step O.1**: Optionally, initial assignment of the token; user U1 gives the SE token to the moderator (previously identified) with the TK-TOKEN-GIVE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190).

- **Sub-step O.2**: Manipulation operations and token interchange (repeated until the moderator wants to close the session, when the moderator holds the SE token):

  a) optionally, the moderator starts AOD13 operations for manipulation (MNP basic service with DTAM-DM steps 2, 3 and 4) (see 10.5.4.2/T.190);

  b) the moderator gives the SE token to another user with the TK-TOKEN-GIVE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

  c) in parallel, any user may request the SE token from the moderator with the TK-TOKEN-PLEASE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

  d) the user holding the SE token issues AOD13 operations for manipulation (see above);

  e) the user holding the SE token gives it back to the moderator with the TK-TOKEN-GIVE primitive (see above).

– **Step FDS**: Optionally, final document synchronization:

- if the master copy of the document(s) is not on any of the user servers (i.e. the master copy has not been directly manipulated during the SE session), and if the document(s) have been modified, then the moderator stores the actually updated document (the copy that was manipulated on all the user servers during the session) where it was initially retrieved in step IDS. The STR basic service, as specified in Recommendation T.190, shall be used.

– **Step MCR**: MCS channel release:

- users U1 to Un issue a MCS-CHANNEL-LEAVE req primitive, with the following restrictions in the following parameters:

  a) the value of the "channel" parameter shall be 1;

- the corresponding MCS-CHANNEL-LEAVE ind primitives arrive at all U1 to Un users.

– **Step MUD**: MCS users detachment:

- users U1 to Un issue a MCS-DETACH-USER req primitive;

- users still attached receive the corresponding MCS-DETACH-USER ind primitive.

– **Step MDR**: MCS domain release:

- users U1 to Un issue a MCS-DISCONNECT-PROVIDER req primitive;

- the corresponding MCS-DISCONNECT-PROVIDER ind primitives arrive at the MCU.

9.5.1.3 Case 3: "association" = 'one-to-several' and "conference type" = 'flexible'

In this case, GCC shall be used, with the restrictions specified here.

NOTE – GCC profiles, under development in ITU-T SG 16 and under consideration in EWOS (ISSS after September 1997), may comply in the future with these restrictions.

Before the service is requested, the information identified in the "static information" attribute (see 8.3.2) shall be known for later distribution. This information is described in 9.5.1.2.

Furthermore, a MCU shall be available.

When the service is requested [user U1 initiates a SE session with users U2 to Un on the document(s) previously identified, located in the identified document site], a series of steps shall be followed.

This sequence of steps is summarized in Table 14.

**Table 14/T.192 – Summary of application rules steps for the SE complex service,
when using DTAM-DM/TK communication module
and when "association" = 'one-to-several' and "conference type" = 'flexible'**

Steps	Sub-steps	Description
GC		GCC conference Creation
GI		GCC conference Invitation to users U2 to Un
IDS		Optionally, Initial Document Synchronization
GE		GCC conference invitation End
O		Manipulation of the document(s) by the Ui users
	O.1	Optionally, initial assignment of the SE token
	O.2	Manipulation operations and token interchange (repeated until the moderator wants to close the SE session, when the moderator holds the SE token)
FDS		Optionally, Final Document Synchronization
GT		GCC conference termination

A detailed description of the steps follows:

– **Step GC**: GCC conference creation:

• user U1 (the initiator) issues a GCC-CONFERENCE-CREATE req primitive to the MCU, with the following restrictions in the following parameters:

a) the value of the "conference name" parameter shall be the OCTET STRING "CS1" (identification of the complex service);

b) the value of the "conference locked flag" parameter shall be 'TRUE';

c) the value of the "conference conducted flag" parameter shall be 'FALSE';

d) the value of the "termination method" parameter shall be 'manually';

e) the "user data" parameter shall contain the ASN.1 data structure defined in Annex A, containing:

i) the identification of the complex service (CS1);

ii) the information identified by the "static information" implementation related attribute;

• the corresponding GCC-CONFERENCE-CREATE conf primitive arrives at user U1.

–   **Step GI**: GCC conference invitation to users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

- user U1 issues a GCC-CONFERENCE-INVITE req primitive to the Ui users, with the following restrictions in the following parameters:

  a)   the value of the "conference id" parameter shall be the same as that previously received by user U1 in the GCC-CONFERENCE-CREATE conf primitive;

  b)   the value of the "user data" parameter shall be the same as that sent in the GCC-CONFERENCE-CREATE req primitive previously issued by user U1;

  c)   the value of the "called address" parameter shall contain the address of user Ui;

- the corresponding GCC-CONFERENCE-INVITE ind primitive arrives at users Ui.

–   **Step IDS**: Optionally, initial document synchronization:

- retrieval of the identified document(s) from the identified document site, by all Ui users that need it; the RTR basic service, as specified in Recommendation T.190, shall be used.

–   **Step GE**: GCC conference invitation end (the following steps are repeated for all the users U2 to Un, identified as Ui):

- user Ui issues a GCC-CONFERENCE-INVITE resp primitive to user U1;

- the corresponding GCC-CONFERENCE-INVITE conf primitive arrives at user U1.

–   **Step O**: Manipulation of the document(s) by the Ui users, this consists of the following sub-steps (all DTAM operations are transported by MCS-SEND-DATA services):

- **Sub-step O.1**: Optionally, initial assignment of the SE token; user U1 gives the token to the moderator (previously identified) with the TK-TOKEN-GIVE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190).

- **Sub-step O.2**: Manipulation operations and token interchange (repeated until the moderator wants to close the SE session, when the moderator holds the SE token):

  a)   optionally, the moderator starts AOD13 operations for manipulation (MNP basic service with DTAM-DM steps 2, 3 and 4) (see 10.5.4.2/T.190);

  b)   the moderator gives the SE token to another user with the TK-TOKEN-GIVE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

  c)   in parallel, any user may request the SE token from the moderator with the TK-TOKEN-PLEASE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

  d)   the user holding the SE token issues AOD13 operations for manipulation (see above);

  e)   the user holding the SE token gives it back to the moderator with the TK-TOKEN-GIVE primitive (see above).

–   **Step FDS**: Optionally, final document synchronization:

- If the master copy of the document(s) is not on any of the user servers (i.e. the master copy has not been directly manipulated during the SE session), and if the document(s) have been modified, then the moderator stores the actually updated document (the copy that was manipulated on all the user servers during the session) where it was initially retrieved in step IDS. The STR basic service, as specified in Recommendation T.190, shall be used.

– **Step GT**: GCC conference termination:

- user U1 (the initiator) issues a GCC-CONFERENCE-TERMINATE req primitive to the users U2 to Un, with the following restrictions in the following parameters:

    a) the value of the "conference id" parameter shall be the same as that previously received by user U1 in the GCC-CONFERENCE-CREATE conf primitive;

- the corresponding GCC-CONFERENCE-TERMINATE ind primitives arrive at all U2 to Un users;

- the corresponding GCC-CONFERENCE-TERMINATE conf primitive arrives at user U1.

10 Formal definition of the PV1 complex service

This clause defines the joint document presentation/viewing with one presenter (PV1) complex service, introduced in 5.3.1, using the rules given in clause 8.

10.1 Document related service attributes

For each document related service attribute, Table 15 provides attribute value(s) and value description, following the rules and notation specified in 8.4.1.

Table 15/T.192 – Values for document related service attributes for the PV1 complex service

Service attribute	Attribute value(s)	Value description
"document location"	'remote'	
"document copies"	'several'	
"document access rights"	'read-only'	
"store access rights"	N/A	
"document format"	'FOD026' 'FOD036' 'non-ODA'	This attribute shall take only one of the possible values, depending on the document format desired.
"functionality level"	'F'	
"document access order"	'random'	

10.2 Communication related service attributes

For each communication related service attribute, Table 16 provides attribute value(s) and value description, following the rules and notation specified in 8.4.2.

Table 16/T.192 – Values for communication related service attributes for the PV1 complex service

Service attribute	Attribute value(s)	Value description
"number of communicating entities"	'one-to-several'	
"communication type"	'end-to-end'	
"communication module"	'DTAM-DM'	
"association"	'one-to-one' 'one-to-several'	This attribute shall take only one of the possible values, depending on the topology desired.
"synchronization"	'synchronous'	
"conference type"	'fixed'	

10.3 Implementation related service attributes

For each implementation related service attribute, Table 17 provides attribute value(s) and value description, following the rules and notation specified in 8.4.3.

Table 17/T.192 – Values for implementation related service attributes for the PV1 complex service

Service attribute	Attribute value(s)	Value description
"basic services"	'RTR' 'PNT' 'MPT'	All the basic services associated to these values are needed, in a mandatory or optional manner, for the implementation of the complex service.
"static information"	'user-ids' 'doc-ids' 'non-ODA-format'	The value 'non-ODA-format' is only needed when the "document format" attribute has the value 'non-ODA'. The other values are always needed.

10.4 Selection of communication modules

Depending on the chosen values of the attributes "functionality level", "association" and "conference type", the following communication module restrictions shall apply:

– For "functionality level" equals 'F', one communication module shall be possible (DTAM-DM/TK).

– For "association" equals 'one-to-one', the communication module selected, with the restrictions specified in Table 18 (basic read only level), shall be used.

– For "association" equals 'one-to-several' and "conference type" equals 'fixed', the use of MCS is possible. Then, the communication module selected, with the restrictions specified in Table 18, shall be combined with MCS.

– For "association" equals 'one-to-several' and "conference type" equals 'flexible', the use of GCC is possible. Then, the communication module selected, with the restrictions specified in Table 18, shall be combined with GCC.

The communication module restrictions presented in Table 18 are defined in clause 8.

Table 18/T.192 – Selection of communication modules for the PV1 complex service

"functionality level"	"communication module"							
	'DFR'	'DTAM-BT-NM'	'DTAM-DM'	'DTAM-DM/TK'	'DFR/DTAM-DM'	'MHS'	'MCS'	'GCC'
'D'								
'F'				Basic Read Only Level			Possible	Possible
'F-SF'								
'DS-F-SF'								
'DM-F-SF'								
'D-F-SF'								

10.5 Application rules

This subclause specifies the rules the PV1 complex service shall follow when using communication module.

10.5.1 Application rules when using DTAM-DM/TK

The PV1 complex service is only applicable to document fragments. DTAM-DM/TK, restricted to its Basic Read Only Level, shall be used.

There are three possible cases depending on the values of the "association" and "conference type" attributes:

– Case 1: "association" = 'one-to-one' and "conference type" = 'fixed'.

– Case 2: "association" = 'one-to-several' and "conference type" = 'fixed'.

– Case 3: "association" = 'one-to-several' and "conference type" = 'flexible'.

10.5.1.1 Case 1: "association" = 'one-to-one' and "conference type" = 'fixed'

In this case, one-to-one DTAM-DM/TK associations shall be used.

Before the service is requested, the information identified in the "static information" attribute (see 8.3.2) shall be known for later distribution. This information is described in 9.5.1.1.

User U1 will manage a central service server in charge of establishing n – 1 associations with the rest of users (U2 to Un).

When the service is requested [user U1 initiates a PV1 session with users U2 to Un on the document(s) previously identified, located in the identified document site], a series of steps shall be followed.

This sequence of steps is summarized in Table 19.

**Table 19/T.192 – Summary of application rules steps for the PV1 complex service,
when using DTAM-DM/TK communication module
and when "association" = 'one-to-one' and "conference type" = 'fixed'**

Steps	Sub-steps	Description
AEI		Associations Establishment Initiation
IDS		Optionally, Initial Document Synchronization
AEE		Associations Establishment End
O		Presentation of the document(s) by the user U1 (repeated until the presenter wants to close the PV session)
AR		Associations Release

A detailed description of the steps follows:

– **Step AEI**: Associations establishment initiation, starting with the connection of user U1 (initiator, central service server) to the users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

• user U1 issues a DTAMBind operation (DTAM-DM/TK application context) to the user Ui, with the following restrictions in the following parameters of the Bind argument:

a) the value of the "dtamManipulationCapabilities" parameter shall correspond to the basic read only level (see 7.1.2);

b) the value of the "applicationRequirements" parameter shall contain the ASN.1 data structure defined in Annex A, containing:

i) the identification of the complex service (CS2);

ii) the information identified by the "static information" implementation related attribute.

–   **Step IDS**: Optionally, initial document synchronization:

  •   retrieval of the identified document(s) from the identified document site, by all Ui users that need it; the RTR basic service, as specified in Recommendation T.190, shall be used.

–   **Step AEE**: Associations establishment end, finishing with the connection of user U1 (central service server) to the users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

  •   the DTAM Bind results are returned.

–   **Step O**: Presentation of the document(s) by the user U1 (repeated until the presenter wants to close the PV session):

  •   the DM-POINT operation shall be used to point to a document fragment inside the document(s) being presented (PNT or MPT basic service with DTAM-DM steps 2, 3 and 4) (see 10.6.4.1/T.190 and 10.7.4.1/T.190).

–   **Step AR**: Associations release (the following steps are repeated for all the users U2 to Un, identified as Ui):

  •   user U1 (the initiator) issues a DTAMUnbind operation to the user Ui.

10.5.1.2 Case 2: "association" = 'one-to-several' and "conference type" = 'fixed'

In this case, MCS shall be used, with the restrictions specified hereafter.

NOTE – MCS profiles, under development in ITU-T SG 16 and under study in EWOS (ISSS after September 1997), may comply in the future with these restrictions.

Before the service is requested, the information identified in the "static information" attribute (see 8.3.2) shall be known for later distribution. This information is described in 9.5.1.1.

Furthermore, a MCU shall be available.

When the service is requested [user U1 initiates a PV1 session with users U2 to Un on the document(s) previously identified, located in the identified document site], a series of steps shall be followed.

This sequence of steps is summarized in Table 20.

**Table 20/T.192 – Summary of application rules steps for the PV1 complex service,
when using DTAM-DM/TK communication module
and when "association" = 'one-to-several' and "conference type" = 'fixed'**

Steps	Sub-steps	Description
MDE		MCS Domain Establishment
	MDE.1	Connection of user U1 and the MCU
	MDE.2	Connection of users U2 to Un
MUA		MCS Attachment of Users U1 to Un
MCJ		Joining of a specified MCS static channel by all users U1 to Un
IDS		Optionally, Initial Document Synchronization
O		Presentation of the document(s) by the user U1 (repeated until the presenter wants to close the PV session)
MCR		MCS Channel Release
MUD		MCS Users Detachment
MDR		MCS Domain Release

A detailed description of the steps follows:

– **Step MDE**: MCS domain establishment, this consists of the following sub-steps:

- **Sub-step MDE.1**: Connection of user U1 and the MCU:

    a) User U1 (the initiator) issues a MCS-CONNECT-PROVIDER req primitive to the MCU, with the following restrictions in the following parameters:

        i) the value of the "called domain selector" parameter shall be the OCTET STRING "CS2" (identification of the complex service);

        ii) the value of the "upward/downward flag" parameter shall be 'up';

        iii) the following restrictions apply to the following parameters of the "domain parameters" parameter:

            1) "number of data transfer priorities" shall be 1;

            2) the "user data" parameter shall contain the ASN.1 data structure defined in Annex A, containing:

                – the identification of the complex service (CS2);

                – the information identified by the "static information" implementation related attribute.

    b) At the reception of the corresponding MCS-CONNECT-PROVIDER ind primitive, the MCU shall answer with a MCS-CONNECT-PROVIDER resp primitive, with the following restrictions in the following parameters:

        i) the value of the "domain parameters" parameter shall be the same as that received in the corresponding indication primitive.

    c) The corresponding MCS-CONNECT-PROVIDER conf primitive arrives at user U1.

- **Sub-step MDE.2**: Connection of users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

    a) The MCU issues a MCS-CONNECT-PROVIDER req primitive to Ui, with the following restrictions in the following parameters:

        i) the value of the "upward/downward flag" parameter shall be 'down';

        ii) the values of the "called domain selector" and "domain parameters" parameters shall be the same as those sent in the MCS-CONNECT-PROVIDER req primitive previously issued by user U1.

    b) At the reception of the corresponding MCS-CONNECT-PROVIDER ind primitive, user Ui shall answer with a MCS-CONNECT-PROVIDER resp primitive, with the following restrictions in the following parameters:

        i) the value of the "domain parameters" parameter shall be the same as that received in the corresponding indication primitive.

    c) The corresponding MCS-CONNECT-PROVIDER conf primitive arrives at the MCU.

– **Step MUA**: MCS attachment of users U1 to Un (the following steps are repeated for all the users U1 to Un, identified as Ui):

- user Ui issues a MCS-ATTACH-USER req primitive to the MCU, with the following restrictions in the following parameters:

    a) the value of the "domain selector" parameter shall be the OCTET STRING "CS2" (identification of the complex service);

- the corresponding MCS-ATTACH-USER conf primitive arrives at user Ui, conveying the MCS User Id for Ui.

– **Step MCJ**: Joining of an specified MCS static channel by all users U1 to Un (the following steps are repeated for all the users U1 to Un, identified as Ui):

- user Ui issues a MCS-CHANNEL-JOIN req primitive, with the following restrictions in the following parameters:

    a) the value of the "channel to join" parameter shall be 1;

- the corresponding MCS-CHANNEL-JOIN conf primitive arrives at user Ui.

– **Step IDS**: Optionally, initial document synchronization:

- retrieval of the identified document(s) from the identified document site, by all Ui users that need it; the RTR basic service, as specified in Recommendation T.190, shall be used.

– **Step O**: Presentation of the document(s) by the user U1 (repeated until the presenter wants to close the PV session):

- the DM-POINT operation (this DTAM operation is transported by MCS-SEND-DATA services) shall be used to point to a document fragment inside the document(s) being presented (PNT or MPT basic service with DTAM-DM steps 2, 3 and 4) (see 10.6.4.1/T.190 and 10.7.4.1/T.190).

– **Step MCR**: MCS channel release:

- users U1 to Un issue a MCS-CHANNEL-LEAVE req primitive, with the following restrictions in the following parameters:

  a) the value of the "channel" parameter shall be 1;

- the corresponding MCS-CHANNEL-LEAVE ind primitives arrive at all U1 to Un users.

– **Step MUD**: MCS users detachment:

- users U1 to Un issue a MCS-DETACH-USER req primitive;

- users still attached receive the corresponding MCS-DETACH-USER ind primitive.

– **Step MDR**: MCS domain release:

- users U1 to Un issue a MCS-DISCONNECT-PROVIDER req primitive;

- the corresponding MCS-DISCONNECT-PROVIDER ind primitives arrive at the MCU.

10.5.1.3 Case 3: "association" = 'one-to-several' and "conference type" = 'flexible'

In this case, GCC shall be used, with the restrictions specified hereafter.

NOTE – GCC profiles, under development in ITU-T SG 16 and under consideration in EWOS (ISSS after September 1997), may comply in the future with these restrictions.

Before the service is requested, the information identified in the "static information" attribute (see 8.3.2) shall be known for later distribution. This information is described in 9.5.1.1.

Furthermore, a MCU shall be available.

When the service is requested [user U1 initiates a PV1 session with users U2 to Un on the document(s) previously identified, located in the identified document site], a series of steps shall be followed.

This sequence of steps is summarized in Table 21.

Table 21/T.192 – Summary of application rules steps for the PV1 complex service,
when using DTAM-DM/TK communication module
and when "association" = 'one-to-several' and "conference type" = 'flexible'

Steps	Sub-steps	Description
GC		GCC conference Creation
GI		GCC conference Invitation to users U2 to Un
IDS		Optionally, Initial Document Synchronization
GE		GCC conference Invitation End
O		Presentation of the document(s) by the user U1 (repeated until the presenter wants to close the PV session)
GT		GCC conference Termination

A detailed description of the steps follows:

– **Step GC**: GCC conference creation:

  - user U1 (the initiator) issues a GCC-CONFERENCE-CREATE req primitive to the MCU, with the following restrictions in the following parameters:

    a) the value of the "conference name" parameter shall be the OCTET STRING "CS2" (identification of the complex service);

    b) the value of the "conference locked flag" parameter shall be 'TRUE';

    c) the value of the "conference conducted flag" parameter shall be 'FALSE';

    d) the value of the "termination method" parameter shall be 'manually';

    e) the "user data" parameter shall contain the ASN.1 data structure defined in Annex A, containing:

      i) the identification of the Complex Service (CS2);

      ii) the information identified by the "static information" implementation related attribute;

    f) the corresponding GCC-CONFERENCE-CREATE conf primitive arrives at user U1.

– **Step GI**: GCC conference invitation to users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

  - user U1 issues a GCC-CONFERENCE-INVITE req primitive to the Ui users, with the following restrictions in the following parameters:

    a) the value of the "conference id" parameter shall be the same as that previously received by user U1 in the GCC-CONFERENCE-CREATE conf primitive;

    b) the value of the "user data" parameter shall be the same as that sent in the GCC-CONFERENCE-CREATE req primitive previously issued by user U1;

    c) the value of the "called address" parameter shall contain the address of user Ui;

  - the corresponding GCC-CONFERENCE-INVITE ind primitive arrives at users Ui.

– **Step IDS**: Optionally, initial document synchronization:

  - retrieval of the identified document(s) from the identified document site, by all Ui users that need it; the RTR basic service, as specified in Recommendation T.190, shall be used.

– **Step GE**: GCC conference invitation end (the following steps are repeated for all the users U2 to Un, identified as Ui):

  - user Ui issues a GCC-CONFERENCE-INVITE resp primitive to user U1;

  - the corresponding GCC-CONFERENCE-INVITE conf primitive arrives at user U1.

– **Step O**: Presentation of the document(s) by the user U1 (repeated until the presenter wants to close the PV session):

  - the DM-POINT operation (this DTAM operation is transported by MCS-SEND-DATA services) shall be used to point to a document fragment inside the document(s) being presented (PNT or MPT basic service with DTAM-DM steps 2, 3 and 4) (see 10.6.4.1/T.190 and 10.7.4.1/T.190).

– **Step GT**: GCC conference termination:

  - user U1 (the initiator) issues a GCC-CONFERENCE-TERMINATE req primitive to the users U2 to Un, with the following restrictions in the following parameters:

    a) the value of the "conference id" parameter shall be the same as that previously received by user U1 in the GCC-CONFERENCE-CREATE conf primitive;

- the corresponding GCC-CONFERENCE-TERMINATE ind primitives arrive at all U2 to Un users;

- the corresponding GCC-CONFERENCE-TERMINATE conf primitive arrives at user U1.

11 Formal definition of the PVn complex service

This clause defines the joint document Presentation/Viewing with n presenters (PVn) complex service, introduced in 5.3.2, using the rules given in clause 8.

11.1 Document related service attributes

For each document related service attribute, Table 22 provides attribute value(s) and value description, following the rules and notation specified in 8.4.1.

Table 22/T.192 – Values for document related service attributes for the PVn complex service

Service attribute	Attribute value(s)	Value description
"document location"	'duplicated'	
"document copies"	'several'	
"document access rights"	'read-only'	
"store access rights"	N/A	
"document format"	'FOD026' 'FOD036' 'non-ODA'	This attribute shall take only one of the possible values, depending on the document format desired.
"functionality level"	'F'	
"document access order"	'random'	

11.2 Communication related service attributes

For each communication related service attribute, Table 23 provides attribute value(s) and value description, following the rules and notation specified in 8.4.2.

Table 23/T.192 – Values for communication related service attributes for the PVn complex service

Service attribute	Attribute value(s)	Value description
"number of communicating entities"	'several-to-several'	
"communication type"	'end-to-end'	
"communication module"	'DTAM-DM/TK'	
"association"	'one-to-one' 'one-to-several'	This attribute shall take only one of the possible values, depending on the topology desired.
"synchronization"	'synchronous'	
"conference type"	'fixed'	

11.3 Implementation related service attributes

For each implementation related service attribute, Table 24 provides attribute value(s) and value description, following the rules and notation specified in 8.4.3.

Table 24/T.192 – Values for implementation related service attributes for the PVn complex service

Service attribute	Attribute value(s)	Value description
"basic services"	'RTR' 'PNT' 'MPT' 'TKI'	All the basic services associated to these values are needed, in a mandatory or optional manner, for the implementation of the complex service.
"static information"	'user-ids' 'doc-ids' 'non-ODA-format' 'moderator-id'	The value 'moderator-id' is only needed when the "association" attribute has the value 'one-to-several'. The value 'non-ODA-format' is only needed when the "document format" attribute has the value 'non-ODA'. The other values are always needed.

11.4 Selection of communication modules

Depending on the chosen values of the attributes "functionality level", "association" and "conference type", the following communication module restrictions shall apply:

– For "functionality level" equals 'F', one communication module shall be possible (DTAM-DM/TK).

– For "association" equals 'one-to-one', the communication module selected, with the restrictions specified in Table 25 (basic read only level), shall be used.

– For "association" equals 'one-to-several' and "conference type" equals 'fixed', the use of MCS is possible. Then, the communication module selected, with the restrictions specified in Table 25, shall be combined with MCS.

– For "association" equals 'one-to-several' and "conference type" equals 'flexible', the use of GCC is possible. Then, the communication module selected, with the restrictions specified in Table 25, shall be combined with GCC.

The communication module restrictions presented in Table 25 are defined in clause 8.

Table 25/T.192 – Selection of communication modules for the PVn complex service

"functionality level"	"communication module"							
	'DFR'	'DTAM-BT-NM'	'DTAM-DM'	'DTAM-DM/TK'	'DFR/ DTAM-DM'	'MHS'	'MCS'	'GCC'
'D'								
'F'				Basic Read Only Level			Possible	Possible
'F-SF'								
'DS-F-SF'								
'DM-F-SF'								
'D-F-SF'								

11.5 Application rules

This subclause specifies the rules the PVn complex service shall follow when using communication module.

11.5.1   Application rules when using DTAM-DM/TK

The PVn complex service is only applicable to document fragments. DTAM-DM/TK, restricted to the AOD13 profile, shall be used.

There are three possible cases depending on the values of the "association" and "conference type" attributes:

–   Case 1: "association" = 'one-to-one' and "conference type" = 'fixed'.

–   Case 2: "association" = 'one-to-several' and "conference type" = 'fixed'.

–   Case 3: "association" = 'one-to-several' and "conference type" = 'flexible'.

11.5.1.1   Case 1: "association" = 'one-to-one' and "conference type" = 'fixed'

In this case, one-to-one DTAM-DM/TK associations shall be used.

Before the service is requested, the information identified in the "static information" attribute (see 8.3.2) shall be known for later distribution. This information is described in 9.5.1.1.

User U1 will manage a central service server in charge of establishing n – 1 associations with the rest of users (U2 to Un) and distributing the PV token.

When the service is requested [user U1 initiates a PV session with users U2 to Un on the document(s) previously identified, located in the identified document site], a series of steps shall be followed.

This sequence of steps is summarized in Table 26.

**Table 26/T.192 – Summary of application rules steps for the PVn complex service,
when using DTAM-DM/TK communication module
and when "association" = 'one-to-one' and "conference type" = 'fixed'**

Steps	Sub-steps	Description
AEI		Associations Establishment Initiation
IDS		Optionally, Initial Document Synchronization
AEE		Associations Establishment End
O		Presentation of the document(s) by the Ui users and token interchange (repeated until the moderator wants to close the session, when the moderator holds the PV token)
AR		Associations Release

A detailed description of the steps follows:

–   **Step AEI**: Associations establishment initiation, starting with the connection of user U1 (initiator, central service server) to the users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

   •   user U1 issues a DTAMBind operation (DTAM-DM/TK application context) to the user Ui, with the following restrictions in the following parameters of the Bind argument:

      a)   the value of the "dtamManipulationCapabilities" parameter shall correspond to the basic read only level (see 7.1.2);

      b)   the value of the "applicationRequirements" parameter shall contain the ASN.1 data structure defined in Annex A, containing:

         i)   the identification of the Complex Service (CS3);

         ii)   the information identified by the "static information" implementation related attribute.

–	**Step IDS**: Optionally, initial document synchronization:

- retrieval of the identified document(s) from the identified document site, by all Ui users that need it; the RTR basic service, as specified in Recommendation T.190, shall be used.

–	**Step AEE**: Associations establishment end, finishing with the connection of user U1 (central service server) to the users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

- the DTAM Bind results are returned.

–	**Step O**: Presentation of the document(s) by the Ui users and token interchange (repeated until the moderator wants to close the session, when the moderator holds the PV token):

- optionally, the moderator starts issuing DM-POINT operations (PNT or MPT basic service with DTAM-DM steps 2, 3 and 4) (see 10.6.4.1/T.190 and 10.7.4.1/T.190);

- the moderator gives the PV token to another user with the TK-TOKEN-GIVE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

- in parallel, any user may request the PV token from the moderator with the TK-TOKEN-PLEASE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

- the user holding the PV token issues DM-POINT operations (see above);

- the user holding the PV token gives it back to the moderator with the TK-TOKEN-GIVE primitive (see above).

–	**Step AR**: Associations release (the following steps are repeated for all the users U2 to Un, identified as Ui):

- user U1 (the initiator) issues a DTAMUnbind operation to the user Ui.

### 11.5.1.2	Case 2: "association" = 'one-to-several' and "conference type" = 'fixed'

In this case, MCS shall be used, with the restrictions specified hereafter.

NOTE – MCS profiles, under development in ITU-T SG 16 and under study in EWOS (ISSS after September 1997), may comply in the future with these restrictions.

Before the service is requested, the information identified in the "static information" attribute (see 8.3.2) shall be known for later distribution. This information is described in 9.5.1.2.

Furthermore, a MCU shall be available.

When the service is requested [user U1 initiates a PV session with users U2 to Un on the document(s) previously identified, located in the identified document site], a series of steps shall be followed.

This sequence of steps is summarized in Table 27.

A detailed description of the steps follows:

–	**Step MDE**: MCS domain establishment, this consists of the following sub-steps:

- **Sub-step MDE.1**: Connection of user U1 and the MCU:

	a)	User U1 (the initiator) issues a MCS-CONNECT-PROVIDER req primitive to the MCU, with the following restrictions in the following parameters:

		i)	the value of the "called domain selector" parameter shall be the OCTET STRING "CS3" (identification of the complex service);

		ii)	the value of the "upward/downward flag" parameter shall be 'up';

		iii)	the following restrictions apply to the following parameters of the "domain parameters" parameter:

			1)	"number of data transfer priorities" shall be 1;

			2)	the "user data" parameter shall contain the ASN.1 data structure defined in Annex A, containing:

				–	the identification of the Complex Service (CS3);

				–	the information identified by the "static information" implementation related attribute.

b) At the reception of the corresponding MCS-CONNECT-PROVIDER ind primitive, the MCU shall answer with a MCS-CONNECT-PROVIDER resp primitive, with the following restrictions in the following parameters:

    i) the value of the "domain parameters" parameter shall be the same as that received in the corresponding indication primitive;

c) the corresponding MCS-CONNECT-PROVIDER conf primitive arrives at user U1.

**Table 27/T.192 – Summary of application rules steps for the PVn complex service,
when using DTAM-DM/TK communication module
and when "association" = 'one-to-several' and "conference type" = 'fixed'**

Steps	Sub-steps	Description
MDE		MCS Domain Establishment
	MDE.1	Connection of user U1 and the MCU
	MDE.2	Connection of users U2 to Un
MUA		MCS attachment of users U1 to Un
MCJ		Joining of a specified MCS static channel by all users U1 to Un
IDS		Optionally, initial document synchronization
O		Presentation of the document(s) to the Ui users
	O.1	Optionally, initial assignment of the PV token
	O.2	Presentation operations and token interchange (repeated until the moderator wants to close the session, when the moderator holds the PV token)
MCR		MCS channel release
MUD		MCS users detachment
MDR		MCS domain release

- **Sub-step MDE.2**: Connection of users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

    a) The MCU issues a MCS-CONNECT-PROVIDER req primitive to Ui, with the following restrictions in the following parameters:

        i) the value of the "upward/downward flag" parameter shall be 'down';

        ii) the values of the "called domain selector" and "domain parameters" parameters shall be the same as those sent in the MCS-CONNECT-PROVIDER req primitive previously issued by user U1.

    b) At the reception of the corresponding MCS-CONNECT-PROVIDER ind primitive, user Ui shall answer with a MCS-CONNECT-PROVIDER resp primitive, with the following restrictions in the following parameters:

        i) the value of the "domain parameters" parameter shall be the same as that received in the corresponding indication primitive.

    c) The corresponding MCS-CONNECT-PROVIDER conf primitive arrives at the MCU.

– **Step MUA**: MCS attachment of users U1 to Un (the following steps are repeated for all the users U1 to Un, identified as Ui):

- user Ui issues a MCS-ATTACH-USER req primitive to the MCU, with the following restrictions in the following parameters:

    a) the value of the "domain selector" parameter shall be the OCTET STRING "CS3" (identification of the complex service);

- the corresponding MCS-ATTACH-USER conf primitive arrives at user Ui, conveying the MCS User Id for Ui.

– **Step MCJ**: Joining of an specified MCS static channel by all users U1 to Un (the following steps are repeated for all the users U1 to Un, identified as Ui):

- user Ui issues a MCS-CHANNEL-JOIN req primitive, with the following restrictions in the following parameters:

  a) the value of the "channel to join" parameter shall be 1;

- the corresponding MCS-CHANNEL-JOIN conf primitive arrives at user Ui.

– **Step IDS**: Optionally, initial document synchronization:

- retrieval of the identified document(s) from the identified document site, by all Ui users that need it; the RTR basic service, as specified in Recommendation T.190, shall be used.

– **Step O**: Presentation of the document(s) to the Ui users, this consists of the following sub-steps (all DTAM operations are transported by MCS-SEND-DATA services):

- **Sub-step O.1**: Optionally, initial assignment of the token; user U1 gives the token to the moderator (previously identified) with the TK-TOKEN-GIVE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190).

- **Sub-step O.2**: Presentation operations and token interchange (repeated until the moderator wants to close the session, when the moderator holds the PV token):

  a) optionally, the moderator starts issuing DM-POINT operations (PNT or MPT basic service with DTAM-DM steps 2, 3 and 4) (see 10.6.4.1/T.190 and 10.7.4.1/T.190);

  b) the moderator gives the PV token to another user with the TK-TOKEN-GIVE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

  c) in parallel, any user may request the PV token from the moderator with the TK-TOKEN-PLEASE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

  d) the user holding the PV token issues DM-POINT operations (see above);

  e) the user holding the PV token gives it back to the moderator with the TK-TOKEN-GIVE primitive (see above).

– **Step MCR**: MCS channel release:

- users U1 to Un issue a MCS-CHANNEL-LEAVE req primitive, with the following restrictions in the following parameters:

  a) the value of the "channel" parameter shall be 1;

- the corresponding MCS-CHANNEL-LEAVE ind primitives arrive at all U1 to Un users.

– **Step MUD**: MCS users detachment:

- users U1 to Un issue a MCS-DETACH-USER req primitive;

- users still attached receive the corresponding MCS-DETACH-USER ind primitive.

– **Step MDR**: MCS domain release:

- users U1 to Un issue a MCS-DISCONNECT-PROVIDER req primitive;

- the corresponding MCS-DISCONNECT-PROVIDER ind primitives arrive at the MCU.

11.5.1.3 Case 3: "association" = 'one-to-several' and "conference type" = 'flexible'

In this case, GCC shall be used, with the restrictions specified hereafter.

NOTE – GCC profiles, under development in ITU-T SG 16 and under consideration in EWOS (ISSS after September 1997), may comply in the future with these restrictions.

Before the service is requested, the information identified in the "static information" attribute (see 8.3.2) shall be known for later distribution. This information is described in 9.5.1.2.

Furthermore, a MCU shall be available.

When the service is requested [user U1 initiates a PV session with users U2 to Un on the document(s) previously identified, located in the identified document site], a series of steps shall be followed.

This sequence of steps is summarized in Table 28.

Table 28/T.192 – Summary of application rules steps for the PVn complex service,
when using DTAM-DM/TK communication module
and when "association" = 'one-to-several' and "conference type" = 'flexible'

Steps	Sub-steps	Description
GC		GCC conference Creation
GI		GCC conference Invitation to users U2 to Un
IDS		Optionally, Initial Document Synchronization
GE		GCC conference invitation End
O		Presentation of the document(s) by the Ui users
	O.1	Optionally, initial assignment of the PV token
	O.2	Presentation operations and token interchange (repeated until the moderator wants to close the session, when the moderator holds the PV token)
GT		GCC conference Termination

A detailed description of the steps follows:

–   **Step GC**: GCC conference creation:

   •   user U1 (the initiator) issues a GCC-CONFERENCE-CREATE req primitive to the MCU, with the following restrictions in the following parameters:

      a)   the value of the "conference name" parameter shall be the OCTET STRING "CS3" (identification of the complex service);

      b)   the value of the "conference locked flag" parameter shall be 'TRUE';

      c)   the value of the "conference conducted flag" parameter shall be 'FALSE';

      d)   the value of the "termination method" parameter shall be 'manually';

      e)   the "user data" parameter shall contain the ASN.1 data structure defined in Annex A, containing:

         i)   the identification of the complex service (CS3);

         ii)   the information identified by the "static information" implementation related attribute;

   •   the corresponding GCC-CONFERENCE-CREATE conf primitive arrives at user U1.

–   **Step GI**: GCC conference invitation to users U2 to Un (the following steps are repeated for all the users U2 to Un, identified as Ui):

   •   user U1 issues a GCC-CONFERENCE-INVITE req primitive to the Ui users, with the following restrictions in the following parameters:

      a)   the value of the "conference id" parameter shall be the same as that previously received by user U1 in the GCC-CONFERENCE-CREATE conf primitive;

b) the value of the "user data" parameter shall be the same as that sent in the GCC-CONFERENCE-CREATE req primitive previously issued by user U1;

c) the value of the "called address" parameter shall contain the address of user Ui;

- the corresponding GCC-CONFERENCE-INVITE ind primitive arrives at users Ui.

– **Step IDS**: Optionally, initial document synchronization:

- retrieval of the identified document(s) from the identified document site, by all Ui users that need it; the RTR basic service, as specified in Recommendation T.190, shall be used.

– **Step GE**: GCC conference invitation end (the following steps are repeated for all the users U2 to Un, identified as Ui):

- user Ui issues a GCC-CONFERENCE-INVITE resp primitive to user U1;

- the corresponding GCC-CONFERENCE-INVITE conf primitive arrives at user U1.

– **Step O**: Presentation of the document(s) to the Ui users, this consists of the following sub-steps (all DTAM operations are transported by MCS-SEND-DATA services):

- **Sub-step O.1**: Optionally, initial assignment of the PV token; user U1 gives the token to the moderator (previously identified) with the TK-TOKEN-GIVE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190).

- **Sub-step O.2**: Presentation operations and token interchange (repeated until the moderator wants to close the session, when the moderator holds the PV token):

  a) optionally, the moderator starts issuing DM-POINT operations (PNT or MPT basic service with DTAM-DM steps 2, 3 and 4) (see 10.6.4.1/T.190 and 10.7.4.1/T.190);

  b) the moderator gives the PV token to another user with the TK-TOKEN-GIVE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

  c) in parallel, any user may request the PV token to the moderator with the TK-TOKEN-PLEASE primitive (TKI basic service with DTAM-TK step 2) (see 10.8.4.1/T.190);

  d) the user holding the PV token issues DM-POINT operations (see above);

  e) the user holding the PV token gives it back to the moderator with the TK-TOKEN-GIVE primitive (see above).

– **Step GT**: GCC conference termination:

- user U1 (the initiator) issues a GCC-CONFERENCE-TERMINATE req primitive to the users U2 to Un, with the following restrictions in the following parameters:

  a) the value of the "conference id" parameter shall be the same as that previously received by user U1 in the GCC-CONFERENCE-CREATE conf primitive;

- the corresponding GCC-CONFERENCE-TERMINATE ind primitives arrive at all U2 to Un users;

- the corresponding GCC-CONFERENCE-TERMINATE conf primitive arrives at user U1.

Annex A

ASN.1 specification

This annex contains the specification of the necessary ASN.1 data structures.

A module is specified containing one ASN.1 data structure for representing the information that shall be interchanged at the beginning of the complex service session. When this information is interchanged, it is specified in the application rules of every complex service specification in clauses 9, 10 and 11. The information contained in this data structure is named InitialInformation, and, apart from the Complex Service identification, it contains what is called StaticInformation, that is introduced in the description of the "static information" attribute (see 8.3.2).

The ASN.1 module is the following:

MODULE Initial-Information { }

DEFINITIONS   IMPLICIT TAGS ::= BEGIN

EXPORTS   EVERYTHING;

IMPORTS   Document-Reference
          FROM Document-Profile-Descriptor { 2 8 1 5 6 }
          -- see ITU-T Rec. T.415 | ISO/IEC 8613-5

        DOR
          FROM DOR-definition { 2 11 0 }
          -- see ISO/IEC 10031-2

        DistinguishedName
          FROM InformationFramework { 2 5 1 1 }
          -- see CCITT Rec. X.500 serie | ISO/IEC 9594

InitialInformation ::= SEQUENCE {

complexServiceId	**[0]**	**OCTET STRING,**
staticInformation	**[1]**	**StaticInformation }**

StaticInformation ::= SEQUENCE {

userIds	**[0]**	**UserIds,**
docIds	**[1]**	**DocIds,**
non-ODA-format	**[2]**	**Non-ODA-format,**
moderatorId	**[3]**	**ModeratorId }**

UserIds ::= SEQUENCE OF UserId

UserId ::= Name

Name ::= CHOICE {

formal	**[0]**	**DistinguishedName,**
informal	**[1]**	**OCTET STRING }**

DocIds ::= SEQUENCE OF DocId

DocId ::= SEQUENCE {

document	**[0]**	**DocumentId,**
site	**[1]**	**SiteId }**

DocumentId ::= CHOICE {

oda	**[0]**	**Document-Reference,**
doam	**[1]**	**DOR,**
directory	**[2]**	**DistinguishedName,**
object	**[3]**	**OBJECT IDENTIFIER,**
informal	**[4]**	**OCTET STRING }**

SiteId ::= Name

Non-ODA-format ::= OCTET STRING
        -- An alternative representation may be used in the future.

ModeratorId ::= UserId

END

Appendix I

Implementation guidelines

This appendix contains guidelines for implementors of the complex services defined in this Recommendation.

In I.1, general aspects are considered which are valid for every complex service.

Subsequent subclauses give specific guidance on how to implement the complex services of this Recommendation:

– joint synchronous editing complex service SE (CS1);

– joint presentation/viewing with 1 presenter complex service PV1 (CS2);

– joint presentation/viewing with n presenters complex service PVn (CS3).

I.1 General implementation guidelines

In this subclause, general topics, valid for every complex service, are considered.

I.1.1 Quality of Service (QOS)

QOS is defined, in the context of communication applications, as the collective effect of service performance which determines the degree of satisfaction of a user of the service or communication application.

QOS is defined and measured in terms of parameters related to speed, accuracy and dependability of the normal phases of the communication between communicating entities, i.e. access, information transfer, and disengagement.

In the context of the services specified in this Recommendation, those kinds of QOS parameters are left to the communication modules used. Then, QOS is related to the services as far as it is related to the involved communication modules.

For more details see II.1.3/T.190.

I.1.2 Security

Security can be achieved by administrative, logical or physical means. Only logical means are considered by this Recommendation, and should be provided mainly by the communication modules.

The complex service session specified in this Recommendation needs some minimum security. From a logical point of view, in the case where MCS (with or without GCC) is used, the security is based on the fact that only one MCS domain is created for the closed group of users, the security mechanisms should therefore be put on that phase of the complex service session.

Additional information is contained in II.1.4/T.190.

I.1.3 Handling documents in non-ODA formats

This Recommendation clearly indicates in clause 6 that non-ODA documents can be used in the document communication services specified. For manipulating inside documents, a location model and an abstract interface for manipulation is needed. This is already available in ODA and some proprietary formats. Although the solution of mapping to ODA is always possible, standardization efforts are being made to specify a generic abstract interface for manipulation of documents able to work on any kind of document (see II.1.1).

When the documents involved in the complex service session are not in ODA format, it is necessary to know which format is used.

There are two attributes related to this concept. First, the "document format" attribute, that includes the value 'non-ODA'. In the case where this value is selected, a second attribute, "static information" includes the value 'non-ODA-format', meaning that the format of the document (the non-ODA format) needs to be specified and interchanged in the initial phases of the complex service session, as specified in the application rules.

In this annex, it is stated that the non-ODA format is represented as an OCTET STRING. This is clearly a simplification. However, an OCTET STRING can always be the coding of a different ASN.1 value giving a better representation. Nevertheless, codes to identify other standard and proprietary document formats defined elsewhere can be used here.

The minimum classification could be to distinguish between processable and final-form documents.

I.1.4 Complex services token distribution

Some of the specified complex services need a token that controls who can manipulate or present a document. The complex service token is distributed by the moderator or a Central Service Server (CSS), if any.

When no CSS is used, the moderator is selected by the initiator, and it is indicated in one of the static information values. The criteria to assign the moderator role are out of the scope of this Recommendation.

Furthermore, criteria for token distribution, that could be done by software or by human being decision, are also outside of the scope of this Recommendation.

I.1.5 Steps coordination in MCS

When using MCS, there is a need to know when all involved users have completed every step. In particular, it would be convenient to start the MUA step when all users have finished the MDE step, to start the MCJ step when all users have completed the MUA step, to start the IDS step when all users have finished the MCJ step, and, even more important, to start the O step when all users have completed the IDS step and to know when the O step has finished.

For this purpose, there are several solutions, such as use of tokens or interchange of checking messages.

As a reference, a solution based on the use of MCS tokens is outlined in the following.

After every user has completed the IDS step, the user shall inhibit a MCS token. The initiator will not start an O step until the initiator has checked that all the users have inhibited the token.

In order for the initiator to identify which user has not inhibited the token, all users may send also a MCS-SEND-DATA primitive informing about the correspondence between their MCS user id and complex service user id.

When the moderator decides to finish a complex service session, the moderator shall grab a second MCS token. The rest of users may recognize that the session has finished by checking if that token has been grabbed.

I.1.6 Alternative implementation to the CSS

For one-to-one associations, this Recommendation specifies the need of a Central Service Server (CSS) to coordinate the associations and the token, if any.

In case one-to-one associations are used without a CSS, it is necessary to establish one-to-one associations between all the pairs of users, since no user takes the role of coordinator (as the CSS did). If the number of users (n) is big, then many associations [n * (n – 1)/2] are needed.

To send up-dates or point operations when all the associations have been established is not difficult. The main problem is to handle the complex service token. All the established DTAM associations have their own DTAM token, even those not implied in a specific interchange of up-dates (when, for example, user U1 is sending up-dates to users U2 and U3, the association between user U2 and U3 is inactive, and where the token is between U2 and U3 is irrelevant, until the token is given to another user). There is no means of knowing to whom the token has been given by the moderator, unless this is explicitly informed to all the users using an external mechanism.

I.1.7   Leaving the session

This Specification assumes that all users leave the SE or PV sessions just at their end. However, it might be sensible to leave before termination. So, implementations could choose to provide this option.

There are a few cases in which simply leaving the session before it finishes should not be allowed:

– The user has any exclusive tokens.

– The user is the moderator of the service.

– The user has some modifications of the documents that have not been reported to the rest of the users.

– There are only two users left. In this case the service is meaningless with only one user.

I.1.8   Handling of error situations

This Specification does not consider the case in which an error occurs. Examples of errors are:

– waiting for a primitive that never arrives;

– disconnection of the holder of the token;

– disconnection of the moderator, etc.

Implementations should take this into account by taking the appropriate measures, like including timers, forbidding specific actions, etc.

In general, the error handling and recovery mechanisms provided in the used base standards should be followed. If they do not exist or are not enough, then the application should include them.

I.2   Specific implementation hints for the SE complex service

There are three alternatives for the implementation of the joint Synchronous Editing (SE) complex service:

– use of GCC;

– use of MCS;

– use of one-to-one associations with a Central Service Server (CSS).

If GCC is available in all users, this is the recommended implementation.

If GCC is not available and MCS is available, then the use of MCS is recommended.

The last option is to use the CSS. Nevertheless, the use of CSS is a simple solution when complex communication modules, like MCS or GCC, are not available.

I.3   Specific implementation hints for the PV1 complex service

There are three alternatives for the implementation of the joint Presentation/Viewing with one presenter (PV1) complex service:

– use of GCC;

– use of MCS;

– use of one-to-one associations with a Central Service Server (CSS).

If GCC is available in all users, this is the recommended implementation.

If GCC is not available and MCS is available, then the use of MCS is recommended.

The last option is to use the CSS. Nevertheless, the use of CSS is a simple solution when complex communication modules, like MCS or GCC, are not available.

Since no token interchange is needed, and all the process is controlled by one user, the use of CSS might be the best solution for a few users.

I.4   Specific implementation hints for the PVn complex service

There are three alternatives for the implementation of the joint Presentation/Viewing with n presenters (PVn) complex service:

– use of GCC;

– use of MCS;

– use of one-to-one associations with a Central Service Server (CSS).

If GCC is available in all users, this is the recommended implementation.

If GCC is not available and MCS is available, then the use of MCS is recommended.

The last option is to use the CSS. Nevertheless, the use of CSS is a simple solution when complex communication modules, like MCS or GCC, are not available.

Appendix II

Bibliography

For the purposes of this Recommendation, the following bibliography provides additional source information about document and communication architectures, so far as they are relevant to this Recommendation.

II.1   Document architectures

II.1.1   Generic Abstract Interface

– EWOS EG SMMI 96/085 (1996): *Contribution to the topic Generic Abstract Interface for the manipulation of documents,* J. Delgado *et al.*

– EWOS TA 96/091 (EWOS EG SMMI 96/098 rev.) (1996): *New work item for Generic Abstract Interface for the manipulation of documents,* J. Delgado.

– EWOS EG SMMI 96/180 (1996): *New Project Proposal – Generic Abstract Interface for the Manipulation of Documents (GAI),* J. Delgado.

NOTE – At the date of producing this Recommendation, the work in EWOS on the Generic Abstract Interface for the manipulation of documents was still being developed; it is very probable therefore, that newer documents exist.

II.2   Communication architectures

II.2.1   Multipoint Communication Service (MCS) and Generic Conference Control (GCC)

– ITU-T Recommendation T.123 (1996), *Network specific data protocol stacks for multimedia conferencing.*

– ITU-T Q3/16 T.120C – 162 (1997), *Lightweight Profiles for the T.120 Architecture – T-LITE,* B. Pulito.

NOTE – At the date of producing this Recommendation, the work on implementation guidelines, proflies, and new applications in the context of the ITU-T T.120 series of Recommendations was very actively being developed; it is very probable therefore, that newer documents exist.

II.2.2   Cooperative Document Handling (CDH)

–   ITU-T Recommendation T.190 (1995), *Cooperative document handling (CDH) – Framework and basic services.*

–   ITU-T Recommendation T.191 (1996), *Cooperative Document Handling (CDH) – Joint synchronous editing (Point-to-point).*

II.2.3   Multipoint DTAM-DM (M-DTAM-DM) and Multipoint Remote Procedure Call (M-RPC)

–   D309/A, ITU-T SG8 (February 1996): *ETSI PT76 contribution: Discussion of the architecture of the joint synchronous editing service.*

–   D364/G, ITU-T SG8 (February 1996): *Collaborative Document Handling in the Multi-Point Environment.*

NOTE – At the date of producing this Recommendation, the work on M-RPC and M-DTAM-DM was still being developed; it is very probable therefore, that newer documents exist.

II.2.4   Profiles

–   EWOS EG SMMI 96/143 (1996): *Proposals for profiling ITU-T T.120 Recommendations,* J. Delgado and J. J. Acebron.

–   EWOS EG SMMI 96/178 (1996): *New Project Proposal – Desktop Conferencing (DTC)'',* I. Campbell-Grant.

–   EWOS EG SMMI 97/048 (1997): *Desktop Conferencing Project Status – Relation with related work,* J. Delgado.

NOTE – At the date of producing this Recommendation, the work in EWOS on profiling Recommendation T.120 was still being developed; it is very probable therefore, that newer documents exist.

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