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Odprta arhitektura dokumentov (ODA) – Komunikacijske storitve ODA – 2. del: Združeno sinhronizirano urejanje, združeno prikazovanje in gledanje dokumentov

Open Document Architecture (ODA); ODA communication services; Part 2: Joint synchronous editing, joint document presentation/viewing

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Multimedia Terminals and Applications (MTA) Project of the European Telecommunications Standards Institute (ETSI).

This ETS consists of 2 parts as follows:

Part 1: "Basic services";

Part 2: "Joint synchronous editing, joint document presentation/viewing".

Transposition dates	
Date of adoption of this ETS:	20 March 1998
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Introduction

This ETS 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.

ETSI Technical Report (ETR) ETR 081 [7] has been taken into consideration as one of the sources for this ETS. The purpose of ETR 081 [7] was to define the scope and priorities for the initialization of standardization in the area of Open Document Architecture (ODA) communication services.

1 Scope

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

Communication base 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 (ITU-T T.120 series of recommendations, see bibliography) 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 ETS 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.

The first part of this ETS 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 second part of the ETS specifies complex document communication services that are built on top of the basic ones.

2 Normative references

This ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

For the purposes of this part of the ETS, all the references in ETS 300 498-1 [1] apply. In addition, the following references apply:

[1] ETS 300 498-1 (1996): "Open Document Architecture (ODA); ODA communication services; Part 1: Basic services".

[2] ITU-T Recommendation T.122 (1993): "Multipoint communication service for audiographics and audiovisual conferencing service definition".

[3] ITU-T Recommendation T.125 (1994): "Multipoint communication service protocol specification".

[4] ITU-T Recommendation T.124 (1995): "Generic Conference Control".

[5] ISO/IEC 10031-2 (1991): "Information technology - Text and office systems - Distributed-office-applications model - Part 2: Distinguished-object-reference and associated procedures".

[6] ISO/IEC 9594 (1988): "The Directory".

[7] ETR 081 (1993): "Open Document Architecture (ODA); Identification of characteristics Integrated Services Digital Networks (ISDN) for ODA applications".

[8] ITU-T Recommendation T.435 (1995): "Document Transfer And Manipulation (DTAM) - Services and protocols - Abstract service definition and procedures for confirmed document manipulation".

[9] ITU-T Recommendation T.436 (1995): "Document Transfer and Manipulation (DTAM) - Services and protocols - Protocol specifications for confirmed document manipulation".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, all the definitions in ETS 300 498-1 [1] apply. In addition, the following definitions apply:

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.

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.

initiator: The user that initiates a complex service session.

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

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

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

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

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

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

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

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

3.2 Abbreviations

For the purposes of this ETS, all the abbreviations in ETS 300 498-1 [1] apply. In addition, the following abbreviations apply:

ACSE	Association Control Service Element
AEE	Associations Establishment End step
AEI	Associations Establishment Initiation step
AP	Asynchronous document Production complex service
AR	Associations Release step
CDH	Co-operative 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
GAI	Generic Abstract Interface
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
M-DTAM-DM	Multipoint - Document Transfer And Manipulation - Document Manipulation
MDE	MCS Domain Establishment step
MDR	MCS Domain Release step
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
ROSE	Remote Operations Service Element
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

4 Introduction to document communication complex services

This ETS specifies services for document communication. Basic services are specified in ETS 300 498-1 [1]. This part of the ETS specifies Complex Services (CS) with clause 4 providing an introduction and clauses 8, 9 and 10 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 standards and profiles.

Six CS in four categories are considered, a number in the range 1 to 6 is assigned to each CS:

a) category 1: joint Synchronous Editing (SE), which consists of:

- SE, Joint Synchronous Editing (CS 1).

b) category 2: joint document Presentation/Viewing (PV), which consists of:

- PV1, joint document presentation/viewing with 1 presenter (CS 2);
- PVn, joint document presentation/viewing with n presenters (CS 3).

c) category 3: Sequential document Production (SP), which consists of:

- SP1, sequential document production with 1 document server (CS 4);
- SPn, sequential document production with n document servers (CS 5).

d) category 4: Asynchronous document Production (AP), which consists of:

- AP, Asynchronous document Production (CS 6).

The complex services of category 1 (SE) and category 2 (PV) are specified in this ETS. The complex services of categories 3 (SP) and 4 (AP), both introduced in ETS 300 498-1 [1], are left for further study.

4.1 Classification of complex services

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

a) granularity: complex services working on:

- full documents; and/or
- document fragments.

b) altering, or type of operations provided:

- altering: information in the document is modified;
- non-altering: information in the document is not modified.

c) 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.

d) 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).

e) 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.

f) use of the Multipoint Communication Service (MCS) (ITU-T Recommendation T.122 [2] and ITU-T Recommendation T.125 [3]):

- no need: there is no need for MCS;
- possible: MCS is useful, although other alternatives exist.

Table 1: Classification of complex services

Characteristic		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 pro-	sequential production				✓	✓	
duction	non-sequential production	✓					✓
	no production		✓	✓			
MCS use	no need for MCS				✓	✓	✓
	MCS may be used	✓	✓	✓			

4.2 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.

4.2.1 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 co-operate 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 may establish several one-to-one associations or one one-to-several association to other communicating entities;

- 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 co-ordinating 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 (ITU-T Recommendation T.124 [4]). 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 ETS 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 annex B, subclause B.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.

4.2.2 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.

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