

International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

F.746

(06/2012)

SERIES F: NON-TELEPHONE TELECOMMUNICATION
SERVICES

Audiovisual services

Requirements of multimedia optimization control components

Recommendation ITU-T F.746



International
Telecommunication
Union

Documents
Document Sharing Hub

ITU-T F-SERIES RECOMMENDATIONS
NON-TELEPHONE TELECOMMUNICATION SERVICES

TELEGRAPH SERVICE	
Operating methods for the international public telegram service	F.1–F.19
The gentex network	F.20–F.29
Message switching	F.30–F.39
The international telemessage service	F.40–F.58
The international telex service	F.59–F.89
Statistics and publications on international telegraph services	F.90–F.99
Scheduled and leased communication services	F.100–F.104
Phototelegraph service	F.105–F.109
MOBILE SERVICE	
Mobile services and multideestination satellite services	F.110–F.159
TELEMATIC SERVICES	
Public facsimile service	F.160–F.199
Teletex service	F.200–F.299
Videotex service	F.300–F.349
General provisions for telematic services	F.350–F.399
MESSAGE HANDLING SERVICES	F.400–F.499
DIRECTORY SERVICES	F.500–F.549
DOCUMENT COMMUNICATION	
Document communication	F.550–F.579
Programming communication interfaces	F.580–F.599
DATA TRANSMISSION SERVICES	F.600–F.699
AUDIOVISUAL SERVICES	F.700–F.799
ISDN SERVICES	F.800–F.849
UNIVERSAL PERSONAL TELECOMMUNICATION	F.850–F.899
HUMAN FACTORS	F.900–F.999

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

Recommendation ITU-T F.746

Requirements of multimedia optimization control components

Summary

Recommendation ITU-T F.746 defines multimedia optimization control components (MOCCs), which can provide guidance services to multimedia applications and services in the process of service node selection, traffic optimization, performance enhancement, etc. This Recommendation specifies the MOCC requirements and defines a MOCC functional model. Some typical MOCC deployment scenarios are also described.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T F.746	2012-06-29	16

Keywords

Control component, multimedia applications, multimedia services, optimization.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. 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 Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 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.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2013

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Table of Contents

		Page
1	Scope	1
2	References.....	1
3	Definitions	1
	3.1 Terms defined elsewhere	1
	3.2 Terms defined in this Recommendation.....	1
4	Abbreviations.....	2
5	Overview	2
6	Functional architecture	2
7	Requirements	4
	7.1 General requirements.....	4
	7.2 MOCC service discovery requirements.....	4
	7.3 Transport information collection requirements	5
	7.4 Interaction and information exchange requirements	5
	7.5 Security requirements.....	5
	Appendix I – MOCC deployment scenarios	6
	I.1 MOCC deployment in distributed file share services systems.....	6
	I.2 MOCC deployment in the streaming services systems	10
	I.3 MOCC deployment in NAT traversal and media relay	14

Copyright International Telecommunication Union/ITU Telecommunication Sector

Recommendation ITU-T F.746

Requirements of multimedia optimization control components

1 Scope

The multimedia optimization control components (MOCCs) defined in this Recommendation are assistance entities which can obtain reliable information from the underlying network. This sort of information can be fed to multimedia applications and services and used as guidance services in the process of service node selection, data traffic optimization and performance enhancement. The MOCC component is located between the multimedia applications and services layer and the network layer. MOCC entities will not be involved in actual data relay and transmission.

The MOCC components can be deployed either in distributed multimedia systems or traditional client-server systems. They can be used in various networks such as NGN [ITU-T Y.2012], internet and other distributed systems.

This Recommendation specifies requirements according to some typical scenarios.

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; 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. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- | | |
|----------------|--|
| [ITU-T F.700] | Recommendation ITU-T F.700 (2000), <i>Framework Recommendation for multimedia services</i> . |
| [ITU-T F.701] | Recommendation ITU-T F.701 (2000), <i>Guideline Recommendation for identifying multimedia service requirements</i> . |
| [ITU-T Y.2012] | Recommendation ITU-T Y.2012 (2010), <i>Functional requirements and architecture of next generation networks</i> . |

3 Definitions

3.1 Terms defined elsewhere

This Recommendation does not use any terms defined elsewhere.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 supernode: A peer in the overlay network that offers services, including message routing, to other members or clients of the overlay network.

3.2.2 tracker: An index server that can assist in the communication between peers in some peer-to-peer file sharing and multimedia systems by collecting information of file replicas and then providing the corresponding information to the resource demanders to initiate a download.

1

4 Abbreviations

This Recommendation uses the following abbreviations and acronyms:

AS	Autonomous System
CDN	Content Delivery Network
DOS	Denial of Service
ID	Identity
IP	Internet Protocol
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISP	Internet Service Provider
MOCC	Multimedia Optimization Control Component
NAT	Network Address Translation
NGN	Next Generation Network
NLRF	Node Location Resolution Function
P2P	Peer to Peer
PoP	Point of Presence
RASF	Resource Awareness and Statistics Function
TCP	Transmission Control Protocol
VoIP	Voice over Internet Protocol

5 Overview

Due to the evolution of network and multimedia technologies, multimedia services are developing rapidly both on the system scale and on the volume of users, especially for services on the Internet. In contrast with traditional centralized service provision models, more and more services and applications tend to be deployed as distributed models, meaning that the data are transmitted along the paths established among nodes distributed across the whole network. Web content distribution, P2P streaming and P2P file sharing are typical examples of distributed models. For most distributed networks, each node should select one or more service providing nodes from a set of candidates to acquire the desired resources. However, under the end-to-end principle, applications and underlying networks are separated except on the end nodes. Therefore, the "selection" might be random, since the applications may not have the reliable information from transport networks such as topology, congestion status and network address translation (NAT) installation. Sometimes, nodes may cross several network boundaries to fetch the desired resources, thus generating a large amount of costly cross-ISP traffic.

MOCCs defined in this Recommendation are complementary entities that can collect reliable information from the underlying network, analyse it and provide guidance services to the multimedia applications and services (see [ITU-T F.700] and [ITU-T F.701]) in the process of service node selection, data traffic optimization and performance enhancement.

6 Functional architecture

Conceptually, multimedia optimization control components are located between the application and service layer and the network layer. The MOCC functional model is illustrated in Figure 1. It is composed of an MOCC server and MOCC clients.