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**Information technology —  
Telecommunications and information  
exchange between systems — Multicast  
Session Management Protocol (MSMP)**

*Technologies de l'information — Téléinformatique — Protocole de  
gestion de session de multidiffusion (MSMP)*

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Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
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# Contents

Page

Foreword .....	iv
Introduction.....	v
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms and definitions .....</b>	<b>1</b>
3.1 Terms defined in ITU-T Rec. X.601 .....	1
3.2 Terms defined in ITU-T Rec. X.602   ISO/IEC 16513 .....	1
3.3 Terms defined in ITU-T Rec. X.605   ISO/IEC 13252 .....	2
3.4 Terms defined in ITU-T Rec. X.606   ISO/IEC 14476-1 .....	2
3.5 Terms defined in ITU-T Rec. X.606.1   ISO/IEC 14476-2 .....	2
3.6 Terms defined in this International Standard .....	2
<b>4 Abbreviated terms .....</b>	<b>3</b>
4.1 Message types .....	3
4.1.1 Session Management message types .....	3
4.1.2 QoS Management message types .....	4
4.2 Miscellaneous .....	4
<b>5 Conventions .....</b>	<b>5</b>
<b>6 Overview .....</b>	<b>5</b>
6.1 General MSMP .....	5
6.2 Session Management .....	5
6.3 QoS Management .....	6
<b>7 Protocol operations .....</b>	<b>8</b>
7.1 Session Management .....	8
7.1.1 Session creation .....	8
7.1.2 Session registration .....	8
7.1.3 Session enrollment .....	9
7.2 QoS Management .....	9
7.2.1 General QM .....	9
7.2.2 QoS reporting request and response .....	10
7.2.3 QoS setting request and response .....	11
7.2.4 QoS updating request and response .....	12
7.2.5 QoS value request and response .....	15
7.2.6 QoS termination request and indication .....	15
<b>8 MSMP messages .....</b>	<b>16</b>
8.1 Session Management message types and the format .....	16
8.2 QoS Management message types .....	16
8.3 QoS management message format .....	17
<b>9 MSMP variables .....</b>	<b>20</b>
9.1 Variables .....	20
9.2 Timer .....	20
<b>Annex A (informative) Relationship between MSMP, GMP, and ECTP .....</b>	<b>21</b>
<b>Annex B (informative) Messages exchange between MSMP server and GMP server .....</b>	<b>22</b>

## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 24792 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

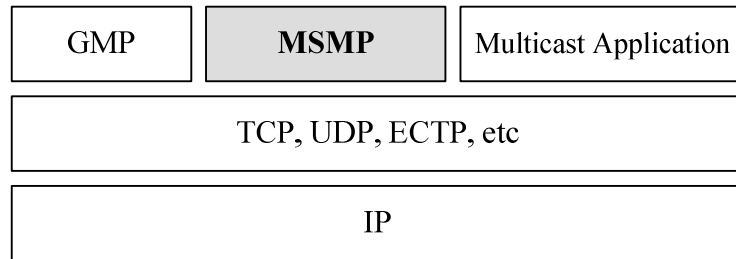
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## Introduction

Multicast Session Management Protocol (MSMP) will operate over the conventional transport protocols and/or Enhanced Communications Transport Protocol (ECTP), as shown in Figure 1.



**Figure 1 — MSMP Model (MSMP Protocol Stack)**

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# Information technology — Telecommunications and information exchange between systems — Multicast Session Management Protocol (MSMP)

## 1 Scope

This International Standard provides a specification of a Multicast Session Management Protocol (MSMP), which is an application-layer control protocol for managing quality of service for group communication. MSMP consists of QoS management (QM) functions.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ITU-T Rec. X.601 (2000), *Information technology — Multi-Peer Communications Framework*

ITU-T Rec. X.602 (2004) | ISO/IEC 16513: 2005, *Information technology — Group management protocol*

ITU-T Rec. X.605 (1998) | ISO/IEC 13252:1999, *Information technology — Enhanced communications transport service definition*

ITU-T Rec. X.606 (2001) | ISO/IEC 14476-1:2002, *Information technology — Enhanced communications transport protocol: Specification of simplex multicast transport*

ITU-T Rec. X.606.1 (2002) | ISO/IEC 14476-2:2003, *Information technology — Enhanced communications transport protocol: Specification of QoS management for simplex multicast transport*

## 3 Terms and definitions

### 3.1 Terms defined in ITU-T Rec. X.601

For the purposes of this document, the following terms defined in ITU-T Rec. X.601 apply:

- a) multi-peer;
- b) multi-peer communication;
- c) multicast transmission.

### 3.2 Terms defined in ITU-T Rec. X.602 | ISO/IEC 16513

For the purposes of this document, the following terms defined in ITU-T Rec. X.602 | ISO/IEC 16513 apply:

- a) GMP client;

## ISO/IEC 24792:2010(E)

- b) GMP server;
- c) session creator;
- d) session client;
- e) session participant.

### 3.3 Terms defined in ITU-T Rec. X.605 | ISO/IEC 13252

For the purposes of this document, the following terms defined in ITU-T Rec. X.605 | ISO/IEC 13252 apply:

- a) enrolled group;
- b) active group;
- c) TC-owner.

### 3.4 Terms defined in ITU-T Rec. X.606 | ISO/IEC 14476-1

For the purposes of this document, the following terms defined in ITU-T Rec. X.606 | ISO/IEC 14476-1 apply:

- a) TO (top owner);
- b) LO (local owner);
- c) LE (leaf entity).

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### 3.5 Terms defined in ITU-T Rec. X.606.1 | ISO/IEC 14476-2

For the purposes of this document, the following terms defined in ITU-T Rec. X.606.1 | ISO/IEC 14476-2 apply:

- a) QoS monitoring;
- b) QoS maintenance.

### 3.6 Terms defined in this International Standard

For the purposes of this document, the following terms and definitions apply.

#### 3.6.1

##### **MSMP server**

application program that is responsible for QoS management

**NOTE** The MSMP server will aggregate the QoS parameter values from all session participants and arbitrate the QoS parameter values. After arbitration, the MSMP server will announce the arbitrated QoS parameter values to all session participants. The MSMP server will keep and update the QoS parameter values.

#### 3.6.2

##### **MSMP client**

application program that sends and receives MSMP messages

**NOTE** Clients store and acquire information through a MSMP server. All clients need to log in to the server to acquire information from the server. Clients are largely divided between a session creator and session participants.



**3.6.3****session creator**

client who creates and who may terminate a session

NOTE 1 The session creator is defined in ITU-T Rec. X.602 | ISO/IEC 16513.

NOTE 2 The session creator is the sender and sends the QoS parameter values for the traffic characteristics of the data that the sender will transmit to receivers.

**3.6.4****session participant**

client who registers for a session intending to participate in that session, and who, after registration, will join the session to be an active member

NOTE 1 A session participant may be a sender in the session.

NOTE 2 The session participant has to respond to a QoS Reporting Request message, QRREQ, via a QoS Reporting Response message, QRRES.

NOTE 3 A session participant may be a TC-participant defined in ITU-T Rec. X.605 | ISO/IEC 13252, ECTS.

**4 Abbreviated terms****4.1 Message types****4.1.1 Session Management message types**

The session management message types are defined in ITU-T Rec. X.602 | ISO/IEC 16513.

SCREQ	Session Creation Request message
SCACC	Session Creation Acceptance message
SCREJ	Session Creation Reject message
SDREQ	Session Deletion Request message
SDRES	Session Deletion Response message
SCINF	Session Creation Information message
SCCON	Session Creation Confirm message
SRREQ	Session Registration Request message
SRACC	Session Registration Acceptance message
SRREJ	Session Registration Reject message
SRRES	Session Registration Response message
SJREQ	Session Join Request message
SJRES	Session Join Response message
SAREQ	Session Activation Request message

4.1.2 QoS Management message types

- QRREQ QoS Reporting Request message
- QRRES QoS Reporting Response message
- QSREQ QoS Setting Request message
- QSRES QoS Setting Response message
- QSREP QoS Setting Report message
- QUIREQ QoS Updating Request message
- QUIRES QoS Updating Response message
- QVREQ QoS Value Request message
- QVRES QoS Value Response message
- QTREQ QoS Termination Request message
- QTIND QoS Termination Indication message
- QSCREQ QoS Session Creation Request message
- QSCACC QoS Session Creation Acceptance message
- QSCCON QoS Session Creation Confirm message
- QSJIND QoS Session Join Indication message

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4.2 Miscellaneous

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- ECTP Enhanced Communications Transport Protocol
- ECTS Enhanced Communications Transport Service
- GMP Group Management Protocol
- SM Session Management
- MM Membership Management
- RMT Reliable Multicast Transport
- SAP Session Announcement Protocol
- SDP Session Description Protocol
- IP Internet Protocol
- CHQ Controlled Highest Quality
- OT Operating Target
- LQA Lowest Quality Allowed
- MSS Maximum Segment Size
- QoS Quality of Service
- RSVP Resource Reservation Protocol

## 5 Conventions

In this International Standard, the key words “MUST”, “REQUIRED”, “SHALL”, “MUST NOT”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “MAY”, and “OPTIONAL” are to be interpreted as described in IETF RFC 2119, and indicate requirement levels for compliant MSMP implementations. Those key words are case-sensitive.

## 6 Overview

### 6.1 General MSMP

The MSMP is an application-layer control protocol for managing a quality of service for a group session. The MSMP would be designed to provide the IP multicast-based multimedia applications with a QoS management required for the group multicasting such as QoS monitoring and reporting. The MSMP will operate over the conventional transport protocols and/or ECTP, and can be used as a control protocol together with the GMP.

Generally it is assumed that there are one MSMP server, one GMP server, one session creating client (or Session Creator), and one or more session participating clients (or Session Participants) as shown in Figure 2.

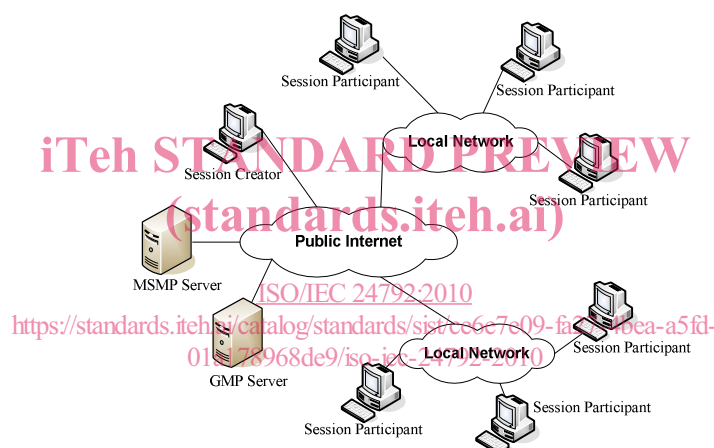


Figure 2 — Network Configuration for MSMP

### 6.2 Session Management

Session Management (SM) is a part defined in the session management (section 6.1) of ITU-T Rec. X.602 | ISO/IEC 16513, GMP.

SM may be achieved in eight distinct phases: creation, announcement, registration, enrollment, activation, de-registration, de-enrollment, and de-activation.

A particular client, called a session creator, creates a session. Then, SM updates the session list.

The session creator will send a Session Creation Request message, SCREQ to the GMP server with initial QoS parameter values for a session creation. The GMP server sends the MSMP server a QoS Session Creation Request message, QSCREQ, which includes session creation information and QoS parameter values for a session creation. QSCREQ is to ask whether the QoS parameter values are available or not for a session creation. Considering the network environment and its application, the MSMP server may allow the request from the GMP server by replying with a QoS Session Creation Acceptance message, QSCACC. After receiving QSCACC, if the session creation is possible, the GMP server sends a Session Creation Acceptance message, SCACC. Then the session creator will send the detailed session information to the server and receive the confirmation message with a modified and more specified QoS parameter values. The GMP

server reply with a Session Creation Confirm message, SCCON and then the server notifies the MSMP server of a session creation via a QoS Session Creation Confirm message, QSCCON. If the session can not be created or the session creator does not have the necessary rights, then a Session Creation Reject message, SCREJ will be returned.

After successful session creation, the server will announce the new session to the clients with the more specified QoS parameter values. The announcement may be done by e-mail, web posting, and so on. From this point on, those clients may register in multicast groups.

A client may register for the session, considering those QoS parameter values. After successful registration, the client belongs to the registered group.

When the session starts, the session's registered members will start a group application to send and receive session data. At this time, all preparations for the data transfer and group management are accomplished. The session's registered group member belongs to the enrolled group. After that, the GMP server sends the MSMP server a QoS Session Join Indication message, QSJIND. The MSMP server starts the QoS Reporting Request and Response.

### 6.3 QoS Management

The MSMP server aggregates the QoS parameter values such as throughput, delay, delay jitter, and loss from all participants. After aggregation of the QoS parameter values, the MSMP server arbitrates them and will send the QoS parameter values to the session creator via a QoS Setting Request message, QSREQ. The session creator will acknowledge with the final arbitrated the QoS parameter values to the MSMP server via a QoS Setting Response message, QSRES. After receiving QSRES, the MSMP server announces the final arbitrated QoS parameter values to all session participants via QoS Setting Report message, QSREP.

The QoS reporting is performed to maintain and update the QoS parameter values. The MSMP server will send periodically a QoS Reporting Request message, QRREQ, to all participants to gather the QoS parameter values. Each participant will acknowledge with own QoS parameter values for receiving a data via a QoS Reporting Response message, QRRES. If the session participant is a session creator or a sender, the participant will reply with own QoS parameter values for sending and receiving data via QRRES. After receiving QRRES, the MSMP server arbitrates them and will send the QoS parameter values to the session creator via QSREQ. The session creator will reply with the final arbitrated the QoS parameter values to the MSMP server via QSRES. After receiving QSRES, the MSMP server will update and keep the QoS parameter values and announces the values to all session participants.

Figure 3 shows an example of MSMP operations. After a session is created and announced, four session participants, A, B, C, and D register for a session in the session registration phase. The session creator and clients send a session join request to the GMP server to be ready to communicate with each other in the session enrollment phased. After that, the session creator and the clients belong to the enrolled group. A session creator and three participants, A, B and D enter the active state by sending a session activation request message to the GMP server. In Figure 3, the participant C who is a late-joiner will send a session activation request message to the GMP server after the session activation. In the late join case, the late-joiner comes to send a QoS Value Request message, QVREQ, to the MSMP server in order to get QoS parameter values of the on-going session. Now, the participant D comes to be a troublemaker who reports QoS parameter values lower than the QoS parameter values of the on-going session. If a troublemaker could not maintain the QoS parameter values at a desired level in the on-going session, the troublemaker may be ejected from the on-going session as shown in Figure 3. For some reason there may be a case that the troublemaker does not leave the session( see subsection 7.2.4).