

---

---

**Information technology — Relayed  
Multicast Control Protocol (RMCP) —  
Framework**

*Technologies de l'information -- Protocole de multidiffusion relayé  
(RMCP) — Cadre général*



**COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2016

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

This second edition cancels and replaces first edition of ISO/IEC 16512-1:2005 which has been technically revised.

ISO/IEC 16512-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in collaboration with ITU-T. The identical text is published as ITU-T X.603 (03/2012).

ISO/IEC 16512 consists of the following parts, under the general title *Information technology — Relayed multicast protocol*:

- *Part 1: Framework*
- *Part 2: Specification for simplex group applications*

## CONTENTS

	<i>Page</i>
1 Scope .....	1
2 Normative references.....	1
3 Definitions .....	1
3.1 Terms defined elsewhere.....	1
3.2 Terms defined in this Recommendation   International Standard.....	1
4 Abbreviations .....	2
5 Conventions .....	2
6 Framework of RMCP .....	2
6.1 Introduction .....	2
6.2 Basic concept of RMCP .....	3
6.3 RMCP data delivery model .....	5
6.4 Security consideration in RMCP.....	8
7 RMCP functions .....	8
7.1 Session initiation .....	8
7.2 Session subscription and join .....	9
7.3 Session leave .....	9
7.4 Session termination .....	9
7.5 Session maintenance .....	9
7.6 Session monitoring.....	9
8 Messages .....	10
8.1 Basic message structure .....	10
8.2 Control format.....	10
8.3 Sub-control format .....	10
Bibliography .....	12

## Introduction

This Recommendation | International Standard specifies the relayed multicast protocol (RMCP) used for realizing relayed multicast. Relayed multicast, also known as an overlay multicast or an application-layer multicast, is a data-delivery scheme for group communications applications over an IP-based network environment. RMCP employs intermediate multicast agents for relaying application data from one or more senders to many receivers.

The design of RMCP has been motivated from the following observations:

In the marketplace, diverse group applications and services have been provisioned commercially all over the world. Some of the examples include Internet TV, remote education, real-time media streaming applications, live broadcasting of special events such as the Victoria's Secret Fashion Show, stock-tickers, etc.

At present, most of the group applications mentioned above use a replicated IP unicast method to realize group services. As a result, those applications have scalability problems due to the limitation in supporting a number of simultaneous users. In terms of a business model, it would mean less revenue or profit.

IP multicast has been known as an effective transport technology for providing group communication services. Nevertheless, the IP multicast has not been deployed widely over the Internet due to several reasons, including the following:

- high deployment cost along with an uncertainty of return-on-investment (ROI)
- IP multicast alone cannot support all kinds of group applications.

Network services such as group file transfer or network games, need a reliable multicast transport mechanism. However, even current reliable multicast transport mechanisms still have unresolved problems including scalability, flow control, congestion control, etc. Until an appropriate multicast transport mechanism is laid down, group communication applications requiring reliable data transfer will continue to depend on the server-based replicated unicast method.

Although IP multicast is not deployed globally, various local networks have already been equipped with IP multicast capability. For example, Ethernet-based LANs and private networks, such as corporate and campus networks, substantially provide the multicast transport capability within their local subnet or administrative domains.

Recognizing these observations, there is a crucial need to develop an alternative group delivery scheme. RMCP is one such scheme to realize group delivery over the IP-based network. RMCP utilizes existing unicast, multicast, and/or multicast tunnelling schemes. In addition, RMCP is designed in separate forms to support any kind of group service type. RMCP is expected to provide a substantial solution for group services over the IP-based network.

**INTERNATIONAL STANDARD  
ITU-T RECOMMENDATION****Information technology – Relayed multicast protocol: Framework****1 Scope**

Relayed multicast protocol (RMCP) is a protocol which is used to realize a relayed multicast data transport scheme. Different from the conventional IP multicast, RMCP can configure a relayed multicast path that multicast traffic flows by using intermediate end-hosts. RMCP can be applied to the current unicast based IP network where IP multicast is not fully deployed.

This Recommendation | International Standard addresses the basic concepts needed to specify RMCP for relayed multicast. It defines the related terminology and proposes a framework for the future development of subsequent protocols. The framework covers network topology including network entities and the relationship among them, service scenarios, basic operations, and message format.

**2 Normative references**

None.