International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.770

Amendment 2

(09/2010)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

IPTV multimedia services and applications for IPTV – IPTV service discovery up to consumption

---

Mechanisms for service discovery and selection for IPTV services

Amendment 2: Support of service discovery using Broadband Forum TR-069

Recommendation ITU-T H.770 (2009) – Amendment 2

ITU-T H-SERIES RECOMMENDATIONS

AUDIOVISUAL AND MULTIMEDIA SYSTEMS

CHARACTERISTICS OF VISUAL TELEPHONE SYSTEMS	H.100–H.199
INFRASTRUCTURE OF AUDIOVISUAL SERVICES	
General	H.200–H.219
Transmission multiplexing and synchronization	H.220–H.229
Systems aspects	H.230–H.239
Communication procedures	H.240–H.259
Coding of moving video	H.260–H.279
Related systems aspects	H.280–H.299
Systems and terminal equipment for audiovisual services	H.300–H.349
Directory services architecture for audiovisual and multimedia services	H.350–H.359
Quality of service architecture for audiovisual and multimedia services	H.360–H.369
Supplementary services for multimedia	H.450–H.499
MOBILITY AND COLLABORATION PROCEDURES	
Overview of Mobility and Collaboration, definitions, protocols and procedures	H.500–H.509
Mobility for H-Series multimedia systems and services	H.510–H.519
Mobile multimedia collaboration applications and services	H.520–H.529
Security for mobile multimedia systems and services	H.530–H.539
Security for mobile multimedia collaboration applications and services	H.540–H.549
Mobility interworking procedures	H.550–H.559
Mobile multimedia collaboration inter-working procedures	H.560–H.569
BROADBAND, TRIPLE-PLAY AND ADVANCED MULTIMEDIA SERVICES	
Broadband multimedia services over VDSL	H.610–H.619
Advanced multimedia services and applications	H.620–H.629
IPTV MULTIMEDIA SERVICES AND APPLICATIONS FOR IPTV	
General aspects	H.700–H.719
IPTV terminal devices	H.720–H.729
IPTV middleware	H.730–H.739
IPTV application event handling	H.740–H.749
IPTV metadata	H.750–H.759
IPTV multimedia application frameworks	H.760–H.769
IPTV service discovery up to consumption	**H.770–H.779**

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

Recommendation ITU-T H.770

Mechanisms for service discovery and selection for IPTV services

Amendment 2

Support of service discovery using Broadband Forum TR-069

Summary

Recommendation ITU-T H.770 describes the mechanisms for service provider discovery, service discovery and selection for IPTV services. The mechanisms enable IPTV terminal devices to provide the end-users with effective ways for consuming IPTV services. The expected types of IPTV services using service discovery information include linear TV and video-on-demand, etc.

This Recommendation identifies service discovery metadata elements and attributes providing information concerning service providers and contents/services, and its delivery protocols covering both unicast and multicast transport mechanisms.

Amendment 1 (11/2009) adds descriptive texts concerning service provider discovery to Appendix I and corrects errors identified in Appendix II.

Amendment 2 (09/2010) to Recommendation ITU-T H.770 adds new Appendix V on information for service discovery using Broadband Forum TR-069 and introduces changes in the main body of the Recommendation concerning its use.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.770	2009-08-22	16
1.1	ITU-T H.770 (2009) Amend.1	2009-11-06	16
1.2	ITU-T H.770 (2009) Amend.2	2010-09-13	16

Keywords

Delivery protocol, IPTV services, linear TV, metadata, service discovery, service discovery information, service provider, service provider discovery, service provider information.

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/.

Table of Contents

Recommendation ITU-T H.770

Mechanisms for service discovery and selection for IPTV services

Amendment 2

Support of service discovery using Broadband Forum TR-069

Modifications introduced by this amendment are shown in revision marks. Unchanged text is replaced by ellipsis (…). Some parts of unchanged text (clause numbers, etc.) may be kept to indicate the correct insertion points.

• • •

2 References

• • •

[ATIS-0800022] ATIS standard ATIS-0800022 (2008), *IPTV Consumer Domain Decide Configuration Metadata*.

[BBF TR-069] Broadband Forum TR-069 (2007), *CPE WAN Management Protocol v1.1*, plus Amendment 2.

[BBF TR-135] Broadband Forum TR-135 (2007), *Data Model for a TR-069 enabled STB.*

• • •

3 Definitions

• • •

3.1.29 user device [b-ATIS-0800002]: Also known as home network end-device (HNED), home network device (HND), consumer equipment (CE), terminal and physical device. A piece of hardware equipment running its software and attached to a home network and being identified by a GUID, e.g., a MAC address. A single device can be used by one or more end-users.

• • •

7 Service provider information

• • •

Table 7.1-1 – Service provider information record

Element/ Attribute	Description	M/O/C	Example(s) of values
Record type	Type of this set of data (See Table 7.1-4).	M	Service provider information
Record version	Version of this record. It is incremented with any change to the service provider information record.	M	1
Record provider identifier	The unique identifier given to the IPTV service provider description provider described in clause 6 (e.g., an Internet DNS domain name, an URI, etc.)	O	itu-t.int <scheme>:// <authority>/
Individual service provider information (one per service provider)	Complex element containing basic information about service providers (see Table 7.1-2). Several individual service provider information entries are possible, each of them for a specific service provider.	M	–

• • •

Table 7.1-3 – Service offer summary elements/attributes

Element/ Attribute	Description	M/O/C	Example(s)
Push address	Multicast location of the "detailed service offer" record described in clause 10. For details of address description, see Table 10.1-3 (e.g., Port number, IP address, Source).	C (Note 1)	–
Pull URL	Unicast location of the "detailed service offer" records described in clause 10.	C (Note 1)	<scheme>://<authority> [:<port>]/<path>
Web portal URL	URL for the portal to discover the service details using a Web-based solution. This portal may provide the direct path to several detailed IPTV services.	C (Note 1)	<scheme>://<authority> [:<port>]/<path>
CS location	Location of the IPTV configuration server, which is shown in clause 8, to be used to get the "Detailed Service Offer" records described in clause 10.	C (Note 1)	<scheme>:// <authority> [:<port>]/<path>
Offer type	Type of service discovery offered by a service provider (see Table 7.1-4).	O	Linear TV discovery
• • •			

• • •

8 Service provider information delivery protocol(s)

The recommended transport mechanisms for the delivery of the descriptions of IPTV service providers over IP are as follows:

• • •

– DVBSTP [ETSI TS 102 034]: a light protocol specified by DVB, used for delivery over multicast (push mode)~~.~~;

– TR-069 [BBF TR-069]: CPE WAN Management Protocol v1.1, Issue 1, Amendment 2, 2007. Appendix V describes how TR-069 is to be used to acquire service provider information and specifies extensions to TR-135 [BBF TR-135] STB data model to store this kind of information.

• • •

In the case of Figure 8-2, the service provider description provider periodically sends the set of metadata containing the description of the available service providers.

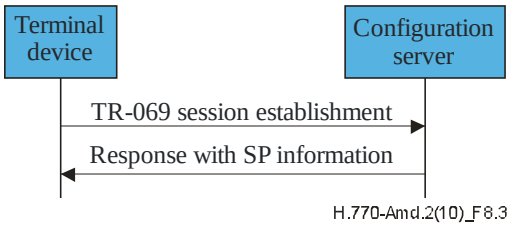

Figure 8-3 – Using TR-069 to receive the description of the available IPTV service providers

In the case of Figure 8-3, IPTV terminal devices acquire the set of metadata containing the description of the available service providers by using TR-069 protocol. Configuration server in this diagram is a component in the broadband network responsible for auto-configuration of the IPTV terminal devices.

• • •

11 Detailed service offer information delivery protocol

The recommended transport mechanisms for the delivery of the descriptions of IPTV services offered by an IPTV service provider are:

• • •

– FLUTE [ETSI TS 102 472] for "Detailed Service Offer" delivery over IPv4/IPv6 multicast (push mode)~~.~~;

– TR-069 [BBF TR-069]: CPE WAN Management Protocol v1.1, Issue 1, Amendment 2, 2007. Appendix V describes how TR-069 is to be used to acquire detailed service offer information and specifies extensions to TR-135 [BBF TR-135] STB data model to store this kind of information.

• • •

For multicast, the service provider description provider periodically sends the set of metadata containing the description of the available services.

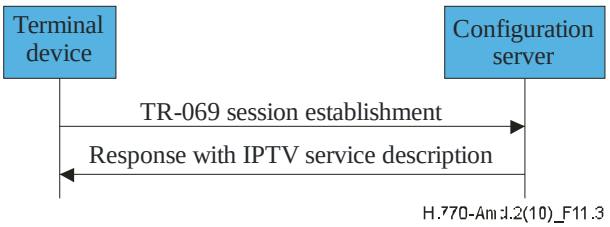

Figure 11-3 – Using TR-069 to receive the description of the IPTV services

In the case of Figure 11-3, IPTV terminal devices acquire the set of metadata containing the description of the available IPTV services by using TR-069 protocol.

• • •

Appendix IV

Alternative methods for entry point handling

(This appendix does not form an integral part of this Recommendation)

Alternative methods for delivery and handling of entry data are as follows [b-ATIS-0800017] [b-ETSI TS 183 063]:

• • •

– TR-069 protocol-based method

  • Remote management system can provide addressing information of service providers with the TR-069 protocol ([~~b-DSL-F~~BBF TR-069]).

• • •

Appendix V

Service discovery using TR-069

(This appendix does not form an integral part of this Recommendation)

V.1 Service discovery profile for TR-069

The profiles in Table V.1 concern service discovery in IPTV services by using TR-069 specifications [BBF TR-069].

Table V.1 – Profile for TR-069

Items		Specification
Service provider discovery	Elements/Attributes	Service provider discovery information (see clause 7)
	Delivery protocols	TR-069
Service discovery	Elements/Attributes	Linear TV discovery (see clause 10.1) Package discovery record (see clause 10.2) Content guide discovery record (see clause 10.3)
	Delivery protocols	TR-069

V.2 Service provider discovery using TR-069

V.2.1 Introduction

When after the network attachment, the search for entry points for IPTV service providers delivers the location of a network provider configuration server, the dialogue between the configuration server and the configuration client in the IPTV terminal device allows to configure in the "STBService" object (defined in [BBF TR-135]) either a list of entry points to get service provider information or directly the service information.

Entry points are either:

– Multicast address to get service provider information in push mode (IGMP, MLD, etc.).

– Unicast address to get service provider information in pull mode (HTTP, etc.).

– Unicast address to get service provider information using TR-069.

If entry points are available, the IPTV terminal device will acquire the service provider information using these entry points using the corresponding acquisition methods (pull or push modes).

An extension of TR-135 is defined as follows to store the service provider information as specified in clause 7 (Service provider information).

V.2.2 TR-135 (Data Model for a TR-069 Enabled STB) extension for service provider discovery

The "STBService" object structure specified in TR-135 is represented in Figure V.1.

The TR-135 component "FrontEnd.IP" is extended by the addition of a new parameter "service discovery" as shown in Figure V.2.

The parameters in Table V.2 are added for service provider discovery.

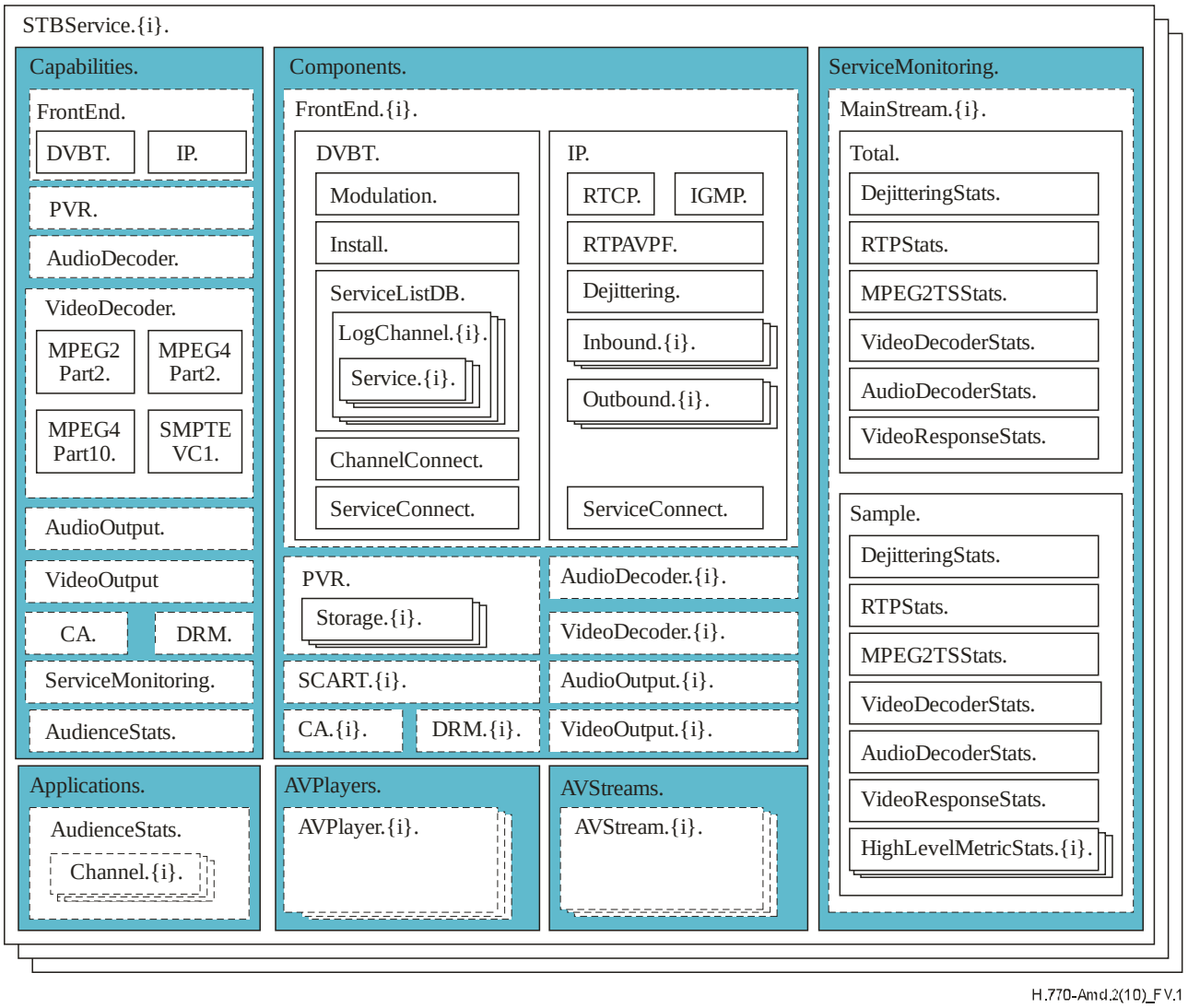

Figure V.1 – TR-135 STBService object structure

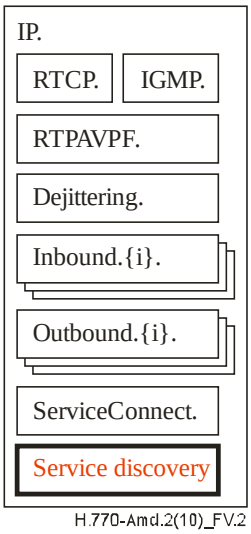

Figure V.2 – TR-135 Extension of FrontEnd.IP object structure

Table V.2 – Element/attributes for service provider discovery

Name	Type	Write	Description	Default
.STBService.{i}. Components.FrontEnd.{i}. IP.ServiceDiscovery.	object			
IptvServiceProviderInfoEntryList	string	–	List of entry points to get service provider information	Empty
.STBService.{i}. Components.FrontEnd.{i}. IP.ServiceDiscovery.ServiceProvider{i}.	object			
IptvServiceProviderInfoEntry	string	–	Entry point used to get the IptvServiceProviderInfo and to be used for updates	Empty
IptvServiceProviderInfo	string	–	Service provider information record as specified in ITU-T H.770	Empty

V.3 Detailed service offer discovery using TR-069

V.3.1 Introduction

When the entry point to get detailed service offers is the location of a configuration server, the terminal device relates with the configuration server using TR-069 to configure service provider services in the STBService object specified in TR-135 extended, as specified below.

The parameters in Table V.3 are added for detailed service offer discovery.

Table V.3 – Element/attributes for detailed service offer discovery

Name	Type	Write	Description	Default
.STBService.{i}.Components. FrontEnd.{i}.IP. ServiceDiscovery. ServiceProvider{i}.Service{i}.	object			
IptvServiceInfoEntry	string	–	Entry point used to get the IptvServiceInfo and to be used for updates	Empty
IptvServiceInfo	string	–	Service record (detailed service information) as specified in ITU-T H.770.	Empty

Bibliography

• • •

[b-ATSC A/65] ATSC Standard A/65 (2009), *Program and System Information Protocol for Terrestrial Broadcast and Cable*.

~~[b-DSL-F TR069] Broadband Forum TR-069 (2007), *CPE WAN Management Protocol V1.1*.~~

• • •

SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	**Audiovisual and multimedia systems**
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	Telecommunication management, including TMN and network maintenance
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Terminals and subjective and objective assessment methods
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks, open system communications and security
Series Y	Global information infrastructure, Internet protocol aspects and next-generation networks
Series Z	Languages and general software aspects for telecommunication systems

Printed in Switzerland
Geneva, 2011