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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication procedures

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Gateway control protocol: IP domain connection package

Recommendation ITU-T H.248.41

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Recommendation ITU-T H.248.41

Gateway control protocol: IP domain connection package

Summary

Recommendation ITU-T H.248.41 defines certain parameters and mechanisms for supporting the interconnection of a packet network with another network. It is only applicable to the IP-based ITU-T H.248 termination and provides such information as the IP Realm Identifier used to indicate to which packet network the media represented by the termination belongs.

Amendment 1 to the first edition introduced mechanisms that allow the media gateway controller to discover the IP realms that are available at the media gateway at a certain time. It also introduced a length limitation in the IP realm property.

This revision removes the package extension in the IP Realm Availability package in order to resolve a property identity conflict.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.248.41	2006-05-29	16
1.1	ITU-T H.248.41 (2006) Amd. 1	2008-06-13	16
2.0	ITU-T H.248.41	2013-03-16	16

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.

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As of the date of approval of this Recommendation, ITU had 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/.

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Gateway control protocol: IP domain connection package

1 Scope

This Recommendation defines packages and mechanisms for supporting the interconnection of a packet network with another network. The packages defined by this Recommendation are only applicable to IP-based ITU-T H.248 terminations. The packages are therefore applicable for:

- IP-to-IP ITU-T H.248 media gateways, and
- IP-to-non-IP ITU-T H.248 media gateways.

1.1 Specifying the IP realm of an ITU-T H.248 stream

The media gateway controller (MGC) may specify the IP realm that a stream of a particular ITU-T H.248 termination belongs to. This is accomplished through the IP Realm Identifier property of the IP Domain Connection package.

1.2 Auditing the MG supported realms and their availability

1.2.1 Auditing all supported realms

The MGC can audit the realms supported by the MG (i.e., all realms that the MG is aware of) by using an AuditCapabilities on the IP Realm Identifier property of the IP Domain Connection package.

1.2.2 Understanding the availability of realms

The IP Realm Availability package extends the IP Domain Connection package. Through an AuditValue of this package's Available Realms property, the MGC is able to learn which of the supported realms is currently available (i.e., over which realms the MG can currently send and receive traffic). Similarly, the MGC may request to be notified of changes to the list of available realms through the Available Realms Changed event of the same package.

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 H.248.1] Recommendation ITU-T H.248.1 (2013), *Gateway control protocol: Version 3.*

[IETF RFC 1123] IETF RFC 1123 (1989), *Requirements for Internet Hosts – Application and Support*.
<http://www.ietf.org/rfc/rfc1123.txt>

[IETF RFC 2663] IETF RFC 2663 (1999), *IP Network Address Translator (NAT) Terminology and Considerations*.
<http://www.ietf.org/rfc/rfc2663.txt>

3 Terms and definitions

This Recommendation defines the following terms:

3.1 IP address realm or IP realm: Is defined in [IETF RFC 2663], clause 2.1, as a network domain in which the network addresses are uniquely assigned to entities such that datagrams can be routed to them. Routing protocols used within the network domain are responsible for finding routes to entities given their network addresses.

3.2 realm availability (from MG perspective): Realm availability means connectivity on the IP layer to a particular realm. Connectivity implies that the MG joins the realm (i.e., network address(es) from that realm are used for ITU-T H.248 IP stream/terminations) and that at least one IP route is available towards another IP node (e.g., IP router, IP host, ITU-T H.248 media gateway) of that realm.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

IP Internet Protocol

MG Media Gateway

MGC Media Gateway Controller

5 IP Domain Connection Package

Package name:	IP Domain Connection Package
Package ID:	ipdc (0x009d)
Description:	This package defines certain parameters and mechanisms for supporting the interconnection of a packet network with another network.
Version:	1
Extends:	None

5.1 Properties

5.1.1 IP Realm Identifier

Property name:	IP Realm Identifier
Property ID:	realm (0x0001)
Description:	This property is used to indicate to which packet network the media represented by the termination belongs.
Type:	String

Possible values: String

Length limitation: Where the IP Realm Identifier property uses a domain name format, it shall handle domain names of up to 63 characters and should handle domain names of up to 255 characters in accordance with clause 2.1 of [IETF RFC 1123].

Default: Provisioned between the MGC and the MG.

Defined in: LocalControl

Characteristics: Read/Write

5.2 Events

None.

5.3 Signals

None.

5.4 Statistics

None.

5.5 Error Codes

None.

5.6 Procedures

The value of the IP Realm Identifier property is a string, which may be in a domain name format, e.g., "mynet.net", or any other string format. In case the MGC uses an *ipdc/realm* property exceeding the above defined length limitation, the MG shall reply with an error descriptor using error code #449: "Unsupported or Unknown Parameter or Property Value".

The IP Realm Identifier should be provisioned between the MGC and the MG. Each of the different IP realms possibly interconnecting with an MG should have a different identifier. The MGC and the MG can provision a default IP realm and configure it on the MG. If the MGC sends a command to the MG to create an IP-based ITU-T H.248 termination without the IP Realm Identifier property, the MG will consider it as indicating the default realm.

If the value of the IP Realm Identifier property sent by the MGC cannot be recognized by the MG, the MG will fail to create the IP-based ITU-T H.248 termination and return the corresponding error code to the MGC, e.g., 449 (Unsupported or Unknown Parameter or Property Value).

Performing an AuditCapabilities of the *ipdc/realm* property on the root termination returns all realms defined in the MG, being available or not. Performing an AuditValue of the *ipdc/realm* property on an IP termination returns the IP realm that the termination is currently connected to.

6 IP Realm Availability package

Package name: IP Realm Availability

Package ID: ipra (0x00e0)

Description: This package defines a new root property and a new root event to enable a discovery mechanism for IP realm availability.

Version: 1

Extends: None.

6.1 Properties

6.1.1 Available Realms

Property name: Available Realms

Property ID: ar (0x0001)

Description: This property lists the IP realms which are currently available for usage on request by the MGC. It is applicable on Root terminations only.

Type: Sub-list of String

Possible values: Strings mutually understood by MG and MGC and which are also addressable through the *ipdc/realm* property.

Default: None

Defined in: TerminationState

Characteristics: ReadOnly

6.2 Events

6.2.1 Available Realms Changed

Event name: Available Realms Changed

Event ID: arc (0x0001)

Description: This event indicates that the availability of realms in the MG has changed. It is applicable on Root terminations only.

6.2.1.1 EventsDescriptor parameters

None.

6.2.1.2 ObservedEventsDescriptor parameters

6.2.1.2.1 Newly Available Realms

Parameter name: Newly Available Realms

Parameter ID: nar (0x0001)

Description: This parameter gives the list of realms that were previously unavailable and are now available.

Type: Sub-list of String

Optional: Yes

Possible values: Strings mutually understood by MG and MGC and which are also addressable through the *ipdc/realm* property.

Default: None

6.2.1.2.2 Newly Unavailable Realms

Parameter name: Newly Unavailable Realms

Parameter ID: nur (0x0002)

Description: This parameter gives the list of realms that were previously available and are now unavailable.

Type: Sub-list of String

Optional: Yes

Possible values: Strings mutually understood by MG and MGC and which are also addressable through the *ipdc/realm* property.

Default: None

6.3 Signals

None.

6.4 Statistics

None.

6.5 Error codes

None.

6.6 Procedures

6.6.1 Auditing available realms

For MGs supporting the package, an MGC can discover the available realms in an MG by auditing the root property "Available realms" *(ipra/ar)* with the AuditValue command. The audit can be performed after Control Association (re-)establishment and provides the information about available realms.

An MGC that wishes to discover all realms defined in the MG should perform an AuditCapabilities of the *ipdc/realm* property on the root termination. An AuditCapabilities of the *ipra/ar* property should be avoided since in theory it would return all possible subsets of the set of realms defined in the MG, as each subset is a possible value of the *ipra/ar* property. An MG receiving an AuditCapabilities command on the *ipra/ar* property may send an error reply, e.g., 501 "Not implemented".

6.6.2 Notification of realm changes

To enable an MG to inform an MGC about changes to the set of available realms, the MGC may arm the "Available Realms Changed" event *(ipra/arc)* on root. This allows the MG to dynamically inform the MGC about changes which occur in the set of available realms, e.g., due to management actions or network interruptions.

Each "Available Realms Changed" notification may include two ObservedEvents parameters:

– "Newly Available Realms", which lists the realms that have become available.

– "Newly Unavailable Realms", which lists the realms that have become unavailable.

Each of these parameters may be omitted only if the relevant list is empty (hence, an *ipra/arc* notification must always include at least one parameter). The change reported by these two lists relates to the realms' availability at the time of the last *ipra/arc* notification or the time when the *ipra/arc* event was last armed (whichever is later).

The MGC must know the realms initially available in order for it to make use of the information provided by the *ipra/arc* event. A possible way of doing so is by auditing the current value of the *ipra/ar* property using the same Modify request that arms the *ipra/arc* event.

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