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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Supplementary services for multimedia

Querying for alternate routes within H.323 systems

ITU-T Recommendation H.460.8

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ITU-T Recommendation H.460.8

Querying for alternate routes within H.323 systems

Summary

This Recommendation specifies a mechanism that allows endpoints to query a Gatekeeper or Border Element for routes and alternate routes multiple times for a single call. While querying the Gatekeeper or Border Element multiple times may increase the time required to establish the call, it is expected that most calls will establish with a single query. However, this expectation does not always prove to be the case. This Recommendation is focused on the cases where the call cannot complete to the first provided route to a destination. In such cases, the endpoint may query for alternate routes. The alternate routes may also include different source or destination alias information, different security tokens, or other information that may have been expensive or too time consuming to produce and/or provide in the initial query.

Source

ITU-T Recommendation H.460.8 was prepared by ITU-T Study Group 16 (2001-2004) and approved under the WTSA Resolution 1 procedure on 29 November 2002.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. 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.

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, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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ITU-T Recommendation H.460.8

Querying for alternate routes within H.323 systems

1 Scope

Due to the dynamic nature of most packet-based networks and resources on those networks, it is entirely possible that resources that are available at the time that an endpoint queries a Gatekeeper, or that a Border Element is consulted in order to determine a route to a particular destination that the destination (or route to reach said destination), is no longer acceptable or reachable. It is also possible that, due to conditions on the network that are outside the view of the Gatekeeper or Border Element, a particular destination is not reachable, or is out of service, at the time that the route was initially provided to the calling endpoint.

To address this issue, this Recommendation provides a means for an entity to query a Gatekeeper or Border Element multiple times in order to get alternate routes to destinations. This Recommendation does not replace the "alternate endpoint" facilities within H.323, or the ability to provide multiple routes as part of the route information provided by the Border Element, but is intended to supplement those facilities.

There are a number of reasons why an entity may wish to take advantage of the ability to perform multiple queries when attempting to establish communication between the calling and called entities. As examples, different destinations may require different source or destination information to appear in the Setup message. In addition, it is possible that unique security information may be required for each destination and generating that security information for each alternate destination upon the initial query may be considered too expensive, especially if calls are expected to usually succeed upon the first query.

The mechanisms described in this Recommendation are suitable for Gatekeeper or Border Element communication as defined in ITU-T Recs H.323 and H.225.0, respectively.

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.

[1] ITU-T Recommendation H.323 (2000), *Packet-based multimedia communications systems*.

[2] ITU-T Recommendation H.225.0 (2000), *Call signalling protocols and media stream packetization for packet-based multimedia communication systems*.

3 Abbreviations

This Recommendation uses the following abbreviations:

ACF Admission Confirm

ARQ Admission Request

CRV Call Reference Value

DRQ Disengage Request

LCF Location Confirm

LRQ Location Request

RCF Registration Confirm

RRQ Registration Request

4 Capability advertisement

Endpoints capable of querying the Gatekeeper for alternate routes shall advertise that capability in all RRQ messages sent to the Gatekeeper, except lightweight RRQ messages. The capability shall not be advertised in lightweight RRQ messages.

A Gatekeeper may signal support for this capability within the LRQ message when sending LRQs to remote Gatekeepers. A Gatekeeper using the direct call model for a particular call should only advertise this capability to its peer Gatekeeper if the endpoint originating that call had indicated support for querying for alternate routes and provided the Call Identifier in the ARQ message. If a Gatekeeper is simply forwarding an LRQ received from another Gatekeeper, it may also include the advertisement of this feature if present in the received LRQ. Advertising this capability in the LRQ when the endpoint does not have a means of querying for alternate routes may result in a smaller route set being returned by the remote Gatekeeper, whereas perhaps alternate endpoint information would have otherwise been provided.

A Border Element may signal support for this capability in each **AccessRequest** message sent to another Border Element. A Border Element should only advertise this capability if it knows, by some means, that the endpoint that originated the call indicated support for this feature. Support for this capability by the endpoint may be assumed, for example, if the Border Element also has Gatekeeper functionality and/or receives an LRQ that contains this capability. Advertising this capability in the **AccessRequest** message, when the source endpoint does not have a means of querying for alternate routes, may result in smaller routing information being returned by the remote Border Element, whereas more complete route information would have been returned had the capability not been advertised.

An endpoint signals support by advertising the capability in the **featureSet.supportedFeatures** field of the RRQ message. A Border Element signals support for this capability by advertising this capability in the **common.featureSet.supportedFeatures** field. A Gatekeeper signals support for this capability to another Gatekeeper by advertising the capability in the **featureSet.supportedFeatures** field of the LRQ message. The capability is indicated with the feature identifier shown in Table 1 as a **supportedFeatures** element and without **parameters**.

Table 1/H.460.8 – Indication of the ability to Query for Alternate Routes

Feature name:	Querying for Alternate Routes
Feature Description:	This feature allows an H.323 entity to query a Gatekeeper or Border Element for alternate routes in the event that the previously provided route is not usable.
Feature identifier type:	Standard
Feature identifier value:	8

5 Indication of alternate routes

A Gatekeeper or Border Element that wishes to signal the availability of alternate routes for a call to another Gatekeeper, Border Element, or endpoint, as appropriate, and having learned that the peer entity supports the capability of querying for alternate routes, may do so by signalling the capability shown in Table 1 in the ACF, LCF, or **AccessConfirmation** message. The capability shall be signalled in the **genericData** field of the aforementioned messages, not in the **featureSet** field.

If this capability value is not contained within the **genericData** structure, it indicates that either there are no additional alternate routes, or that the entity does not support the ability to query for alternate routes. In either case, the requesting entity shall not submit new queries for the same call if the route returned cannot be reached for any reason.

6 Querying for alternate routes

An entity, having learned that its peer may provide an alternate set of routes, and having need to submit a new query, shall send a new request message to its peer. This new request message shall not have the same request sequence number as the previous query. The request shall contain a **genericData** element advertising the capability shown in Table 1 and shall include a **parameters** value, as shown in Table 2.

Table 2/H.460.8 – Parameter to indicate Query Count

Parameter name:	Query Count
Parameter description:	This value indicates the number of queries performed thus far
Parameter identifier type:	Standard
Parameter identifier value:	1
Parameter type:	number8
Parameter cardinality:	Once and only once

When an entity queries a peer for a route for a call the first time, this parameter shall not be present, but an internal value of 0 shall be maintained for the request. In addition, the Call Identifier for the call shall be present. In case the Call Identifier is not available to the Gatekeeper or Border Element, the said entity shall not attempt to utilize the functionality defined within this Recommendation, as the Call Identifier is the key used for associating subsequent queries.

When an entity issues a subsequent query for a call, the value of the query count shall be incremented by one and shall be present. Thus, the second time a request is made for a call, this parameter shall be included with a value of 1. This value may be used by the recipient as an index value into a table of alternate routes. The requesting entity shall also include the same Call Identifier and, in the case of an ARQ, the same CRV as used in the initial request.

An endpoint that queries for alternate routes for a call shall not send a DRQ message prior to transmitting subsequent ARQ message(s). A DRQ shall only be transmitted once the call has been completed or once all attempts to establish the call have failed. Additionally, the subsequent ARQ message(s) shall contain, whenever the information is available, a **CallTerminationCause** structure containing the reason for the Release Complete message of the previously failed call attempt. That information may be utilized by the entity providing the routes and should be propagated between Gatekeepers and Border Elements where possible. The Call Termination Cause shall be carried as an element of **parameters** as shown in Table 3.

Table 3/H.460.8 – Parameter to contain the Call Termination Cause

Parameter name:	Call Termination Cause
Parameter description:	The **CallTerminationCause** structure contains the reason for the previously failed call attempt
Parameter identifier type:	Standard
Parameter identifier value:	2
Parameter type:	raw
Parameter cardinality:	Zero or one

All other parameters present, but not listed in this clause, shall be ignored and shall not be treated as errors.

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