H.323 FORUM

Open Community Specification

Registration Priority and Pre-emption in H.323 Systems

4 October 2009

IMTC

International Multimedia Communications Consortium

Summary

In most H.323 systems, endpoints require a unique set of aliases and any endpoints wishing to register with a gatekeeper with the same aliases as an existing registered endpoint are automatically rejected. In general to allow this new endpoint to successfully register, the existing registered endpoint must first be deregistered at the endpoint, which may be in a different physical location. This greatly limits mobility of registrations. It would be advantageous to allow the registration to move from endpoint to endpoint and provide some form of "follow me" services or to assign higher registration priority to certain endpoints over others, for example mobile endpoints would have precedence over fixed endpoints.

Author(s)

Simon Horne, Spranto Australia Pty. Ltd.

Acknowledgements

Table of Contents

Registration Priority and Pre-emption in H.323 Systems

1 Scope

This Recommendation defines the capability and procedures for enabling endpoints to share the same registration credentials and the endpoint with the higher priority acquires the registration. If both endpoints share the same priority than the user on the newly registering endpoint may be prompted to pre-empt the previous registration.

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 (2006), *Packet-based multimedia communications systems*.

[2] ITU-T Recommendation H.225.0 (2006), *Call signalling protocols and media stream packetization for packet-based multimedia communication systems*.

[3] ITU-T Recommendation H.235.1 (2006), *Baseline security profile*.

[4] ITU-T Recommendation H.460.1 (2002), *Guidelines for the Use of the Generic Extensible Framework*.

3 Terms and Definitions

Endpoint: An H.323 terminal, gateway or MCU. An endpoint can call and be called. It generates and/or terminates information streams.

4 Abbreviations

For the purpose of this Recommendation the following abbreviations are used.

RRQ	Registration Request
RCF	Registration Confirm
RRJ	Registration Reject
UCF	Unregistration Confirm
RPP	Registration Priority and Pre-emption Feature

5 Feature Definition

The registration priority and pre-emption feature (RPP) allows endpoints to share the same registration credentials and devices with higher or the same priority to automatically acquire registration and pre-empt lower priority devices.

6 Security Considerations

When using the **RPP feature**, it is strongly recommended for security reasons and to reduce any possible points of vulnerability, all registrations be secured via the H.235 security framework. In particular that endpoints and gatekeepers, at a minimum, support H.235.1 clause 8 (Procedure 1A) and all RRQ messages be authenticated prior to processing any elements of this feature.

7 Capability Advertisement

Endpoints capable of supporting RPP shall advertise this capability via the Generic Extensibility Framework defined in Recommendations H.323 and H.460.1.

An endpoint, which performs gatekeeper discovery, shall set the **supportedFeatures** field of its GRQ to include **RPP Feature** as defined in Table 1. If the Gatekeeper responds with a GCF, it shall include the **RPP Feature** in the s**upportedFeatures** field.

Endpoints when registering with a gatekeeeper shall advertise support for the **RRP Feature** via the RRQ message and contained in the **supportedFeatures** of the **featureSet** Field. Endpoints shall omit **RPP Feature** from the **supportedFeatures** of the **featureSet** field of lightweight RRQ's. Gatekeepers that support this feature shall advertise to the endpoint via the **supportedFeatures** of the **featureSet** field in the responding RCF or RRJ.

Table 1 below defines the RPP feature in this recommendation.

Table 1 - Indication of the RPP Feature

Feature name:	RPP Feature
Feature Description:	This feature allows
Feature identifier type:	OID
Feature identifier value:	iso(1) org(3) dod(6) internet(1) private(4) enterprise(1) packetizer(17090) gef (0) rpp (6)

Parameters associated with the advertisement of this capability are specified in the following sections. In consideration of backward compatibility with further revisions to this recommendation, the recipient shall simply ignore any parameters received other than those specified in this document.

8 Registration Procedure

When registering with a gatekeeper using this feature, the endpoint shall indicate the priority allocated to the registration via the **priority parameter** as detailed in Table 2 in the RRQ. The Number shall be from 0-9 with 9 having the highest priority.

Table 2 –Priority Parameter

Parameter name:	PriorityIndicator
Parameter description:	Indicators the registration priority of the endpoint
Parameter identifier type:	standard
Parameter identifier value:	1
Parameter type:	Integer 8
Parameter cardinality:	One and only one

Endpoints that do not support this feature shall be assigned the default value of 0 when registering with the gatekeeper for backwards interoperability and allow pre-emption of legacy endpoints.

The endpoint may also include the **pre-emption parameter** as detailed in Table 3 to indicate whether or not to pre-empt registrations with the same priority. When first registering with the gatekeeper, the **pre-emption parameter** shall be set to FALSE. When advised by the gatekeeper that a registration exists with the same priority then the pre-emption parameter may be set to TRUE to indicate the pre-emption of that registration. (refer clause 11 and 12)

Table 3 –Pre-empt Parameter

Parameter name:	Pre-empt Indicator
Parameter description:	Indicators that a previous registration is to be pre-empted
Parameter identifier type:	standard
Parameter identifier value:	2
Parameter type:	bool
Parameter cardinality:	One and only one

Upon successful registration, where there is no previous registration with the same credentials, the gatekeeper shall store the priority value received from the endpoint with the registration information in the gatekeeper. The endpoint shall be notified, in the normal manner, by an RCF message the registration was successful.

When receiving an RRQ from an endpoint matching an existing registration however without a **endpointIdentifier** parameter (indicating a new registration) and that endpoint supports the RPP feature, the **priority parameter** value received in the RRQ shall be compared to the stored priority value of the existing registration. If the new value is lower than the existing stored value than the new registration shall be rejected (refer clause 9). If the value is higher, then the previous registration shall be pre-empted. (refer clause 10). If the values are equal and the **Pre-empt Parameter** is set to false then the new RRQ shall be rejected (refer clause 11). If the **Pre-empt Parameter** is true then the previous registration shall be pre-empted. (refer clause 12).

9 Rejecting registration due to an existing higher priority registration

Where an endpoint attempts to register for the first time with a gatekeeper supporting the RPP feature and a registration already exists with a higher priority, the new registration shall be treated as a failed registration with registration reject reason **duplicateAlias**. The endpoint may attempt from time to time to gain registration however will fail until the higher priority registration un-registers from the gatekeeper.

10 Pre-empting an existing registration due to a new higher priority registration

When an endpoint attempts to register for the first time with a gatekeeper supporting the RPP feature and a registration already exists, however, has a lower priority, the existing registration shall be unregistered with un-registration reason **maintenance**. The Generic Data field of the UCF shall contain the **PriorityNotificationIndicator** (refer table 4) set to TRUE.

Table 4 –Priority Notification Parameter

Parameter name:	PriorityNotificationIndicator
Parameter description:	Indicators to the endpoint that its registration has been pre-empted by other registration.
Parameter identifier type:	standard
Parameter identifier value:	3
Parameter type:	bool
Parameter cardinality:	One and only one

This indicates to the endpoint that the registration was pre-empted by a higher priority device. The pre-empted endpoint may advise the user that the registration has been pre-empted due to a higher priority device. The endpoint may, from time to time, attempt to regain registration however will not be successful until the higher priority endpoint has first deregistered. Upon regaining registration the user notification may be removed.

11 Prompting for Pre-emption

When an endpoint attempts to register for the first time with a gatekeeper supporting the RPP feature and a registration already exists and the existing registration priority is equal to the newly registering endpoint. The registration shall be rejected with reason **duplicateAlias**. The RCF shall contain in the **genericData** field the **pre-empt indicator** (table 3) set to FALSE. This will indicate to the endpoint that an existing registration exists with the same priority. As this time the endpoint user may be prompted to un-register the existing registration. If approved the endpoint shall attempt to reregister with the gatekeeper with the **pre-empt indicator** set to TRUE. This will indicate to the gatekeeper to pre-empt the previous registration.

12 Pre-empting an existing registration due to a pre-emption notification

When an endpoint attempts to register for the first time with a gatekeeper supporting the RPP feature and a registration already exists and the existing registration priority is equal to the newly registering endpoint and the **pre-empt indicator** (table 3) is set to TRUE, the existing registration shall be unregistered with un-registration reason **maintenance**. The genericData field of the UCF shall contain the **PreEmptionNotificationIndicator** set to TRUE. This will indicate to the endpoint that the registration was pre-empted by another user.

Table 5 –Pre-Emption Notification Parameter

Parameter name:	PreEmptionNotificationIndicator
Parameter description:	Indicators if TRUE the current registration has been pre-empted by another registration or FALSE to indicate another registration holds the registration and to alert the endpoint to pre-empt that registration
Parameter identifier type:	standard
Parameter identifier value:	4
Parameter type:	bool
Parameter cardinality:	One and only one

The pre-empted endpoint may advise the user that the registration has been pre-empted by another user. The endpoint may, from time to time, attempt to regain registration however will not be successful until the pre-empting endpoint has first deregistered. Upon regaining registration the user notification may be removed.