

# H.323 Numeric Address Translation Mode

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## Summary

This document specifies a method by which H.323 gatekeepers can use H.323 URLs to effect inter-zone dialing by direct DNS resolution. It specifies the use of ENUM and other lookup mechanisms to translate numeric dial strings into H.323 URLs. This mode of operation allows for full support of ITU-T E.164 telephony addressing without limiting the H.323 network to the E.164 address space. The use of this method is called 'H.323 Numeric Address Translation Mode.' It is anticipated that this addressing mode will be used for global-scale multi-domain H.323 networks, such as the Internet.

## Terminology

This document follows the ITU language conventions for 'should,' 'may,' 'must' and related terms.

## Discussion

It is highly desirable to create an environment in which H.323 endpoints can use E.164 and private telephone numbers for dialing to ensure smooth interoperability with the GSTN and to preserve user dialing habits. However, numeric dialing of telephone and telephone-like numbers has the undesirable characteristic of not being directly resolvable to an IP address. H.323 system operators may want access to a larger address space than that provided by E.164. They may want to implement H.323 endpoints without having to also obtain E.164 addresses for those endpoints. H.323 URL solves many of those problems by allowing endpoint and target gatekeeper address resolution to happen in a peer to peer mode using DNS. Unfortunately, many endpoints (such as telephones and IP telephones) cannot dial the alphanumeric characters necessary to form H.323 URLs. In that case, it is necessary to have some mechanism in place to translate these numeric addresses into H.323 URLs.

## Numeric Translation Methods

Several different mechanisms can be used to identify a dialed endpoint. These mechanisms are defined as Numeric Translation Methods. A gatekeeper in Numeric Address Translation Mode must allow the gatekeeper administrator to establish which Methods will be used for translation and the order in which each Method will be invoked. Once established this ordered set of Methods is referred to as the Numeric Address Translation Sequence. A Numeric Address Translation Sequence allows a gatekeeper administrator to make decisions about how best to resolve addresses. For example, a public voice carrier might choose to exclusively use ENUM queries to e164.arpa for address resolution. A small business workgroup might choose to resolve addresses exclusively using an internal LDAP directory. An enterprise may choose to first attempt to resolve addresses to an internal LDAP directory, then to an LDAP meta-directory and finally to e164.arpa allowing private dialing with GSTN compatibility.

If call setup is to a numeric value in the H.225 E.164 field, then the gatekeeper must first translate that numeric value into an H.323 URL using the Numeric Address Translation Sequence specified by the gatekeeper administrator. Once a valid H.323 URL is returned, call signaling proceeds via DNS as specified in H.323 Annex O.

### Local

This Method is the normal h.225 signaling process used in h323 to obtain the IP address of an endpoint registered with a gatekeeper. No address translation is performed.

### ENUM Primary

This Method performs a DNS lookup on the numeric address in the h.225 E164 field using the process described by ENUM. This lookup is typically configured by the gatekeeper administrator to point to the e164.arpa domain and will resolve any international telephone number on the GSTN for which a DNS record exists. Only the H.323 URL value returned will be used. SIP, mailto and other URI values returned will be ignored. If no H.323 URL is returned, then the call will fail.

### **ENUM Secondary**

This Method performs a DNS lookup on the numeric address in the h.225 E164 field using the process described by ENUM. This lookup is to a user specified domain and will typically be used to resolve private numbers for which DNS records exist. Only the H.323 URL value returned will be used. SIP, mailto and other URI values returned will be ignored. If no H.323 URL is returned, then the call will fail.

### **LDAP Primary**

This Method performs an LDAP lookup on the numeric address in the h.225 E164 field. The LDAP lookup syntax and target directory is specified by the gatekeeper administrator. In general, this lookup will be to an LDAP enabled directory of users that is specific to the local gatekeeper, i.e. a local directory.

### **LDAP Secondary**

This Method performs an LDAP lookup on the numeric address in the h.225 E164 field. The LDAP lookup syntax and target directory is specified by the gatekeeper administrator. In general, this lookup will be to an LDAP enabled directory of directories, or meta directory. This method may be used when the LDAP Primary Method fails, or when administrative domains agree to cooperatively operate meta directories.

### **Neighbor Table**

This Method is the normal h.225 signaling process used in h323 to obtain the IP address of an endpoint registered with a gatekeeper, except that the gatekeeper will query other gatekeepers defined in a static local table about the existence of the endpoint using LRQ. No address translation is performed.

## **H.323 URL RAS Translation Mode**

Full support of H.323 URL requires that endpoints register their H.323 URL with a gatekeeper and use the H.323 URL field when establishing a call. In order to be backwards compatible with endpoints that do not support H.323 URL signaling, a gatekeeper may support H.323 URL RAS Translation Mode. When in this mode, a gatekeeper that receives RAS values in alias fields must copy those values into its internal H.323 URL field so that the endpoint will be in a state of registration with a valid H.323 URL(s), even though the actual endpoint may not support H.323 URL directly. In this mode, any call setup request to the alias field of the form user@domain will be interpreted by the gatekeeper as an H.323 URL, and the gatekeeper will insert the user@domain information into its H.323 URL signaling field.

## **Security**

This document does not describe any security mechanism. It is generally assumed that security for H.323 will be provided by h.235. It should be noted that whenever a gatekeeper is performing an external lookup, the reliability of the returned result is only as good as the data integrity of the data source accessed by that Method. Data reliability concerns for each Method are discussed below.

### **Local**

Locally stored endpoints are highly reliable if they are pre-configured by a system administrator or verified through h.235 authentication. Unauthenticated endpoints are not reliable.

### **ENUM Primary**

Because E.164 telephone number distribution is regulated by various national authorities, the accuracy of those assignments is contingent on those regulatory processes. In general, GSTN telephone number accuracy is very good. Further, since e164.arpa under ENUM by definition distributes the DNS lookup of telephone numbers to the domain authority delegated by the holder of a particular telephone number, each ENUM lookup can result in one and only one resolution target.

### **ENUM Secondary**

DNS lookups on domains other than e164.arpa are only as accurate as the administrative processes adopted for that private addressing. However, as with all ENUM, the lookup will result in one and only one resolution target.

### **LDAP Primary and Secondary**

LDAP queries to a single data source can be configured to yield one and only one result. However, meta directories, or queries to multiple directories may yield multiple results. For example, John Doe may exist in several different directories with different H.323 URLs for each. Therefore, a gatekeeper has no way of

determining which result is correct. This lookup process assumes that system administrators have taken care to only access meta directories that have reliable mechanisms in place to avoid cross-domain address collisions.

### **Neighbor Table**

Neighbor Table lookup is identical to local lookup except that it is via LRQ to another gatekeeper. Data integrity conditions on the remote gatekeeper are similar to those on the local gatekeeper.

### **References**

[1] ITU-T Recommendation H.323, "Packet-based multimedia communication systems", Adopted February 1998.

[2] Brown, A., Vaudreuil, G., "ENUM Service Reference Model", IETF draft <draft-ietf-enum-operation-02.txt>, February 23, 2001.

[3] Faltstrom, P., "E.164 number and DNS", IETF RFC 2916, September 2000.

[4] Johnson, T., Yafchack, M., "The ViDe Reference Model for Internet-Extensible H.323 Communications", IETF draft (expired), September 30, 2000.

# Sample User Interface

## Alias Translation Mode

on  off Interpret h323:x Aliases as H323 URLs

## Numeric Address Translation Method

on  off Local

on  off Neighbor Table

on  off ENUM Primary root

on  off ENUM Secondary root

on  off LDAP Primary query

on  off LDAP Secondary query

## Numeric Address Translation Sequence

Local  
Neighbor Table  
ENUM Primary  
ENUM Secondary  
LDAP Primary  
LDAP Secondary

Move

