nrenum.net queries on Cisco Systems with ENUM

Summary

(NRENum.net, s.d.) is a global ENUM service for academia (i.e. the research and education community). The most important benefit of NRENum.net is that it enables (NRENs, s.d.)(and their stakeholders) with a VoIP system to locate other (NRENs, s.d.) with VoIP systems and call them directly across the Internet.

ENUM is a standard protocol that is the result of work of the Internet Engineering Task Force's (IETF's) Telephone Number Mapping working group. ENUM combines telephone numbers and the Domain Name System to simplify the way that VoIP calls (telephone calls made over the Internet) work. It allows more VoIP calls to be connected directly over the Internet, for no charge, rather than via the traditional PSTN network. ENUM translates a telephone number into a domain name. This allows users to continue to use the existing phone number formats they are familiar with, whilst allowing the call to be routed using DNS. This makes ENUM a quick, stable and cheap link between telecommunications systems and the Internet.

(RFC 6116, s.d.) discusses the use of the Domain Name System (DNS) for storage of E.164 numbers. More specifically, how DNS can be used for identifying available services connected to one E.164 number. RIPE NCC provides DNS operations for "e164.arpa" zone (known as Golden ENUM tree) in accordance with the Instructions from the Internet Architecture Board.

Among the (NRENs, s.d.) stakeholders (Universities, laboratories, schools, etc) several VoIP systems are used with nrenum.net and .arpa trees and therefore using ENUM protocol according to (RFC3761, s.d.). Cisco's voice equipment is widely used among the academia community, and they need to be enabled and configured to interoperate with (nrenum.net, s.d.) through ENUM protocol.

Cisco ENUM Queries

Several academia institutions uses "Cisco CUBE ENT" or "Cisco CUBE Enterprise" as a frontend for their VoIP telephony system. In order to interconnect with other peers within the academic network, the system must be configured to route calls using nrenum.net and ENUM. Currently, telephone numbers are stored in .arpa and nrenum.net trees as (NAPTR, s.d.) according to (RFC3761, s.d.).

(Example for number +123456789):

```
9.8.7.6.5.4.3.2.1.nrenum.net. IN NAPTR 100 10 "u" "E2U+sip"
"!^.*$!sip:user789@sample.edu\!" .
9.8.7.6.5.4.3.2.1.nrenum.net. IN NAPTR 100 10 "u" "E2U+h323"
"!^.*$!h323:789@sample.edu\!" .
```

Please note that the NAPTR reference "E2U+sip" and "E2U+h323" as Service Type.

On the other hand, Cisco IOS Gateways follows (RFC 2916, s.d.) according to: http://www.cisco.com/en/US/products/sw/voicesw/ps5640/products_configuration_example09186a0080ad7b94.shtml

Where, the same number is represented using the following references:

```
9.8.7.6.5.4.3.2.1.nrenum.net. IN NAPTR 100 10 "u" "sip+E2U"
"!^.*$!sip:user789@sample.edu\!" .
9.8.7.6.5.4.3.2.1.nrenum.net. IN NAPTR 100 10 "u" "h323+E2U"
"!^.*$!h323:789@sample.edu\!" .
```

Please note that NAPTR reference to "sip+E2U" and "h323+E2U" as Service Type.

On the referenced document, at Point 7, one can read that: "The Cisco IOS Gateways do not support "E2U+sip" ((RFC3761, s.d.)Service Type)."

Due to this lack of compliance with the latest RFC, many academic institutions must implement 3rd party solutions to enable ENUM routing according to (RFC3761, s.d.). This produces unwanted costs, adds complexity to the solutions and produces extra risk to the all communication infra-structure based on the Cisco Voice equipment.

Conclusion

As a feature request, it is desirable that Cisco VoIP systems are able to route ENUM calls according to both (RFC3761, s.d.) **and** (RFC 2916, s.d.)**, being possible to specify it through its configuration. This feature enables academia institutions to use their Cisco equipment without interoperate them with a 3rd party VoIP system, reducing the risk of misconfigurations on the Cisco Voice Systems and therefore to maintain the Cisco IP phones and systems working without flaws.**

References

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