How to use NAPTR and SRV records for H.323 or SIP with nrenum.net

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Introduction

The following is an example of how NAPTR and SRV records can be used with nrenum.net for SIP and H.323.
The NAPTR / SRV records for SIP and H.323 redirect all SIP / H.323 for one domain (sample.edu) to the institutional SIP Server / H.323 Gatekeeper.

ENUM NAPTR records for SIP and H.323 (RFC 3764, RFC 3762)

In the section we show how the ENUM can be used for mapping E.164 numbers to SIP URIs and H.323 URLs.

The example NAPTR records below show a translation from the number range +123456* to sip:123456*@sample.edu in the SIP case. For H.323 the NAPTR records map h323:123456* to h323:123456*@sample.edu.

```
*.6.5.4.3.2.1.nrenum.net. IN NAPTR 100 10 "u" "E2U+sip"
"!^(.*)$!sip:\\1@sample.edu!" .
*.6.5.4.3.2.1.nrenum.net. IN NAPTR 100 10 "u" "E2U+h323"
"!^+12(3456.*)$!h323:\\1@sample.edu!" .
```

The above example uses the wildcard mechanism for ENUM. Wildcards can be problematic depending on your setup.
You can also insert the numbers one by one instead (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\!" .
```

SRV/NAPTR records for locating servers

Once you have found the SIP URI / H323 URL, your system need to find the server in charge. The mechanism described in this section uses the domain part of the SIP URI / H.323. URL to locate the correct server.

NAPTR records for locating SIP servers (RFC 3263)

The NAPTR entries (TLS/TCP/UDP) for the domain sample.edu point to DNS SRV records (see also below):

```
sample.edu. IN NAPTR 50 50 "s" "SIPS+D2T" "" _sips._tcp.sample.edu.
sample.edu. IN NAPTR 90 50 "s" "SIP+D2T" "" _sip._tcp.sample.edu.
sample.edu. IN NAPTR 100 50 "s" "SIP+D2U" "" _sip._udp.sample.edu.
```

Note: Although this is standard behavior according to RCF 3263, not all SIP Servers lookup the NAPTR records before SRV records (yet).

SRV records for locating SIP servers (RFC 3263, RFC 2782)

The SRV entries below direct SIP requests (TLS/TCP/UDP) for a the domain sample.edu towards the institutional SIP server.

If you use more than one SRV entry in the same zone, you can use the SRV mechanism for high availability or for load balancing (not implemented correctly in all SIP servers yet).

```
_sips._tcp.sample.edu. IN SRV 0 0 5061 voip.sample.edu.
_sip._tcp.sample.edu. IN SRV 0 0 5060 voip.sample.edu.
_sip._udp.sample.edu. IN SRV 1 0 5060 voip.sample.edu.
_sip._udp.sample.edu. IN SRV 2 0 5060 voip-standby.sample.edu.
```

The last line - a 2nd record in the zone _sip._udp.sample.edu. - is only needed if you use redundancy or load balancing. In this example there would be a standby server to take over SIP UDP requests.

SRV records for locating H.323 servers (ITU-T H.323 Annex 0)

The H.323 SRV entries below show how H.323 requests are directed to the institutional Gatekeeper. Hereby _h323cs.*[...] specifies the call signaling port of the H.323 Gatekeeper, and _h323ls.*[...] specifies the system a calling Gatekeeper has to query (using LRQ) to identify if a Gatekeeper is routing the number or not.

```
_h323cs._tcp.sample.edu. 172800 IN SRV 0 0 1720 gk.sample.edu
_h323ls._udp.sample.edu 172800 IN SRV 0 0 1719 gk.sample.edu
```

Further information

- Voip-info.org about ENUM
- Wikipedia about ENUM

Credits

- Dimitris Daskopoulos
- Jan Ruzicka
- Bernie Hoeneisen
- Kewin Stoeckigt
- Mihály Mészáros