

Technical Bulletin 36033

Using a Static DNS Cache with SoundPoint® IP and SoundStation®
IP Phones



This technical bulletin provides detailed information for system administrators on how to set up a static DNS cache and provide for negative caching.

This information applies to SoundPoint IP phones running SIP application version 2.1.3 . It will also apply to SIP 3.1 (scheduled for Q3 of 2008), but will not apply to any 2.2.x or 3.0.x releases.

Introduction

Starting with SIP 2.1.0, failover redundancy can only be utilized when the configured IP server hostname resolves (through SRV or A record) to multiple IP addresses. Unfortunately, some customer's are unable to configure the DNS to take advantage of failover redundancy.

The solution in SIP 2.1.3 is to provide the ability to statically configure a set of DNS NAPTR SRV and/or A records into the phone.

When a phone is configured with a DNS server, it will behave as follows by default:

- An initial attempt to resolve a hostname that is within the static DNS cache, for example to register with its SIP registrar, results in a query to the DNS.
- If the initial DNS query returns no results for the hostname or cannot be contacted, then the values in the static cache are used for their configured time interval.
- After the configured time interval has elapsed, a resolution attempt of the hostname will again result in a query to the DNS.
- If a DNS query for a hostname that is in the static cache returns a result, the values from the DNS are used and the statically cached values are ignored.

When a phone is not configured with a DNS server, it will behave as follows

- An attempt to resolve a hostname that is within the static DNS cache will always return the results from the static cache.

Support for negative DNS caching as described in RFC 2308 is also provided to allow faster failover when prior DNS queries have returned no results from the DNS server. For more information, go to

<http://tools.ietf.org/html/rfc2308> .

Configuration file changes for SIP 2.1.3 are described in the next section, [Configuration File Changes](#).

Configuration file examples are shown in [Examples](#) on page 4.

Configuration File Changes

Configuration changes can be performed centrally at the boot server:

Central (boot server)	Configuration file: sip.cfg	Specify DNS NAPTR, SRV, and A records for use when the phone is not configured to use a DNS server. <ul style="list-style-type: none"> For more information, refer to the next section, DNS Cache <dns/>.
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DNS Cache <dns/>

In the tables below, a maximum of 12 entries of NAPTR, SRV, and A record can be added.

This attribute includes:

- [NAPTR <NAPTR/>](#) attribute
- [SRV <SRV/>](#)
- [A <A/>](#)

NAPTR <NAPTR/>

This configuration attribute is defined as follows:

Attribute	Permitted Values	Default	Interpretation
dns.cache.NAPTR.x.name	domain name string	Null	The domain name to which this resource record refers.
dns.cache.NAPTR.x.ttl	0 to 65535, seconds	300	Specifies the time interval that the resource record may be cached before the source of the information should again be consulted.
dns.cache.NAPTR.x.order	0 to 65535	0	A 16-bit unsigned integer specifying the order in which the NAPTR records must be processed to ensure the correct ordering of rules.
dns.cache.NAPTR.x.preference	0 to 65535	0	A 16-bit unsigned integer that specifies the order in which NAPTR records with equal "order" values should be processed, low numbers being processed before high numbers.

Attribute	Permitted Values	Default	Interpretation
dns.cache.NAPTR.x.flags	string		Flags to control aspects of the rewriting and interpretation of the fields in the record. Flags are single characters from the set [A-Z, 0-9]. The alphabetic characters are case insensitive. At this time only four flag, "S", "A", "U", and "P" are defined. For more information, go to http://tools.ietf.org/html/rfc2915 .
dns.cache.NAPTR.x.service	string		Specifies the service(s) available down this rewrite path. For more information, go to http://tools.ietf.org/html/rfc2915 .
dns.cache.NAPTR.x.regex	string	Null	A string containing a substitution expression that is applied to the original string held by the client in order to construct the next domain name to lookup. The grammar of the substitution expression is given in RFC 2915. Note: This attribute is currently not used.
dns.cache.NAPTR.x.replacement	domain name string with SRV prefix	Null	The next name to query for NAPTR, SRV, or address records depending on the value of the flags field. It must be a fully qualified domain-name.

SRV <SRV/>

This configuration attribute is defined as follows:

Attribute	Permitted Values	Default	Interpretation
dns.cache.SRV.x.name	domain name string	Null	The domain name string with SRV prefix.
dns.cache.SRV.x.ttl	0 to 65535, seconds	300	Specifies the time interval that the resource record may be cached before the source of the information should again be consulted.
dns.cache.SRV.x.priority	0 to 65535	0	The priority of this target host. For more information, go to http://tools.ietf.org/html/rfc2782 .
dns.cache.SRV.x.weight	0 to 65535	0	A server selection mechanism. For more information, go to http://tools.ietf.org/html/rfc2782 .
dns.cache.SRV.x.port	0 to 65535	0	The port on this target host of this service. For more information, go to http://tools.ietf.org/html/rfc2782 .
dns.cache.SRV.x.target	domain name string	Null	The domain name of the target host. For more information, go to http://tools.ietf.org/html/rfc2782 .

A <A/>

This configuration attribute is defined as follows:

Attribute	Permitted Values	Default	Interpretation
dns.cache.A.x.name	valid hostname	Null	Hostname ***
dns.cache.A.x.ttl	0 to 65535	300	Specifies the time interval that the resource record may be cached before the source of the information should again be consulted.
dns.cache.A.x.address	dotted-decimal IP version 4 address	Null	IP address that hostname dns.cache.A.x.name maps to.

Examples



Polycom recommends that you create another file with your organization's modifications. If you must change any Polycom templates, back them up first. For more information, refer to the "Configuration File Management on SoundPoint IP Phones" whitepaper at www.polycom.com/support/voice/.

Example 1

This example shows how to configure static DNS cache using A records IP addresses in SIP server address fields.

When the static DNS cache is not used, the **sip.cfg** configuration would look as follows:

```
reg.1.address="1001"  
reg.1.server.1.address="172.23.0.140"  
reg.1.server.1.port="5075"  
reg.1.server.1.transport="UDPOnly"  
reg.1.server.2.address="172.23.0.150"  
reg.1.server.2.port="5075"  
reg.1.server.2.transport="UDPOnly"
```

When the static DNS cache is used, the **sip.cfg** configuration would look as follows:

```
reg.1.address="1001"  
reg.1.server.1.address="sipservers.example.com"  
reg.1.server.1.port="5075"  
reg.1.server.1.transport="UDPOnly"  
reg.1.server.2.address=""  
reg.1.server.2.port=""  
reg.1.server.2.transport=""
```

```
dns.cache.A.1.name="sipserver.example.com"  
dns.cache.A.1.ttl="3600"  
dns.cache.A.1.address="172.23.0.140"  
dns.cache.A.2.name="sipserver.example.com"  
dns.cache.A.2.ttl="3600"  
dns.cache.A.2.address="172.23.0.150"
```

Note

Above addresses are presented to SIP application in order, for example, dns.cache.A.1, dns.cache.A.2, and so on.

Example 2

This example shows how to configure static DNS cache where your DNS provides A records for server.X.address but not SRV. In this case, the static DNS cache on the phone provides SRV records. For more information, go to <http://tools.ietf.org/html/rfc3263>.

When the static DNS cache is not used, the **sip.cfg** configuration would look as follows:

```
reg.1.address="1002@sipserver.example.com"  
reg.1.server.1.address="primary.sipserver.example.com"  
reg.1.server.1.port="5075"  
reg.1.server.1.transport="UDPOnly"  
reg.1.server.2.address="secondary.sipserver.example.com"  
reg.1.server.2.port="5075"  
reg.1.server.2.transport="UDPOnly"
```

When the static DNS cache is used, the **sip.cfg** configuration would look as follows:

```
reg.1.address="1002"  
reg.1.server.1.address="sipserver.example.com"  
reg.1.server.1.port=""  
reg.1.server.1.transport="UDPOnly"  
reg.1.server.2.address=""  
reg.1.server.2.port=""  
reg.1.server.2.transport=""  
  
dns.cache.SRV.1.name="_sip._udp.sipserver.example.com "  
dns.cache.SRV.1.ttl="3600"  
dns.cache.SRV.1.priority="1"  
dns.cache.SRV.1.weight="1"  
dns.cache.SRV.1.port="5075"  
dns.cache.SRV.1.target="primary.sipserver.example.com"  
  
dns.cache.SRV.2.name="_sip._udp.sipserver.example.com "  
dns.cache.SRV.2.ttl="3600"  
dns.cache.SRV.2.priority="2"  
dns.cache.SRV.2.weight="1"
```

```
dns.cache.SRV.2.port="5075"  
dns.cache.SRV.2.target="secondary.sipservers.example.com
```

Note

The `reg.1.server.1.port` and `reg.1.server.2.port` values in this example are set to null to force SRV lookups.

Example 3

This example shows how to configure static DNS cache where your DNS provides NAPTR and SRV records for `server.X.address`.

When the static DNS cache is not used, the `sip.cfg` configuration would look as follows:

```
reg.1.address="1002@sipservers.example.com"  
reg.1.server.1.address="172.23.0.140"  
reg.1.server.1.port="5075"  
reg.1.server.1.transport="UDPOnly"  
reg.1.server.2.address="172.23.0.150"  
reg.1.server.2.port="5075"  
reg.1.server.2.transport="UDPOnly"
```

When the static DNS cache is used, the `sip.cfg` configuration would look as follows:

```
reg.1.address="1002"  
reg.1.server.1.address="sipservers.example.com"  
reg.1.server.1.port=""  
reg.1.server.1.transport=""  
reg.1.server.2.address=""  
reg.1.server.2.port=""  
reg.1.server.2.transport=""  
  
dns.cache.NAPTR.1.name="sipservers.example.com"  
dns.cache.NAPTR.1.ttl="3600"  
dns.cache.NAPTR.1.order="1"  
dns.cache.NAPTR.1.preference="1"  
dns.cache.NAPTR.1.flag="s"  
dns.cache.NAPTR.1.service="SIP+D2U"  
dns.cache.NAPTR.1.regex=""  
dns.cache.NAPTR.1.replacement="_sip._udp.sipservers.example.com"  
  
dns.cache.SRV.1.name="_sip._udp.sipservers.example.com "  
dns.cache.SRV.1.ttl="3600"  
dns.cache.SRV.1.priority="1"  
dns.cache.SRV.1.weight="1"  
dns.cache.SRV.1.port="5075"  
dns.cache.SRV.1.target="primary.sipservers.example.com"
```

```
dns.cache.SRV.2.name="_sip._udp.sipserver.example.com "  
dns.cache.SRV.2.ttl= "3600"  
dns.cache.SRV.2.priority="2"  
dns.cache.SRV.2.weight="1"  
dns.cache.SRV.2.port="5075"  
dns.cache.SRV.2.target="secondary.sipserver.example.com  
  
dns.cache.A.1.name="primary.sipserver.example.com"  
dns.cache.A.1.ttl="3600"  
dns.cache.A.1.address="172.23.0.140"  
  
dns.cache.A.2.name="secondary.sipserver.example.com"  
dns.cache.A.2.ttl="3600"  
dns.cache.A.2.address="172.23.0.150"
```

Note

The `reg.1.server.1.port`, `reg.1.server.2.port`, `reg.1.server.1.transport`, and `reg.1.server.2.transport` values in this example are set to null to force NAPTR lookups.

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