

DNS SRV and Redundancy

All Mediatrix Units

DGW 49.2.2941

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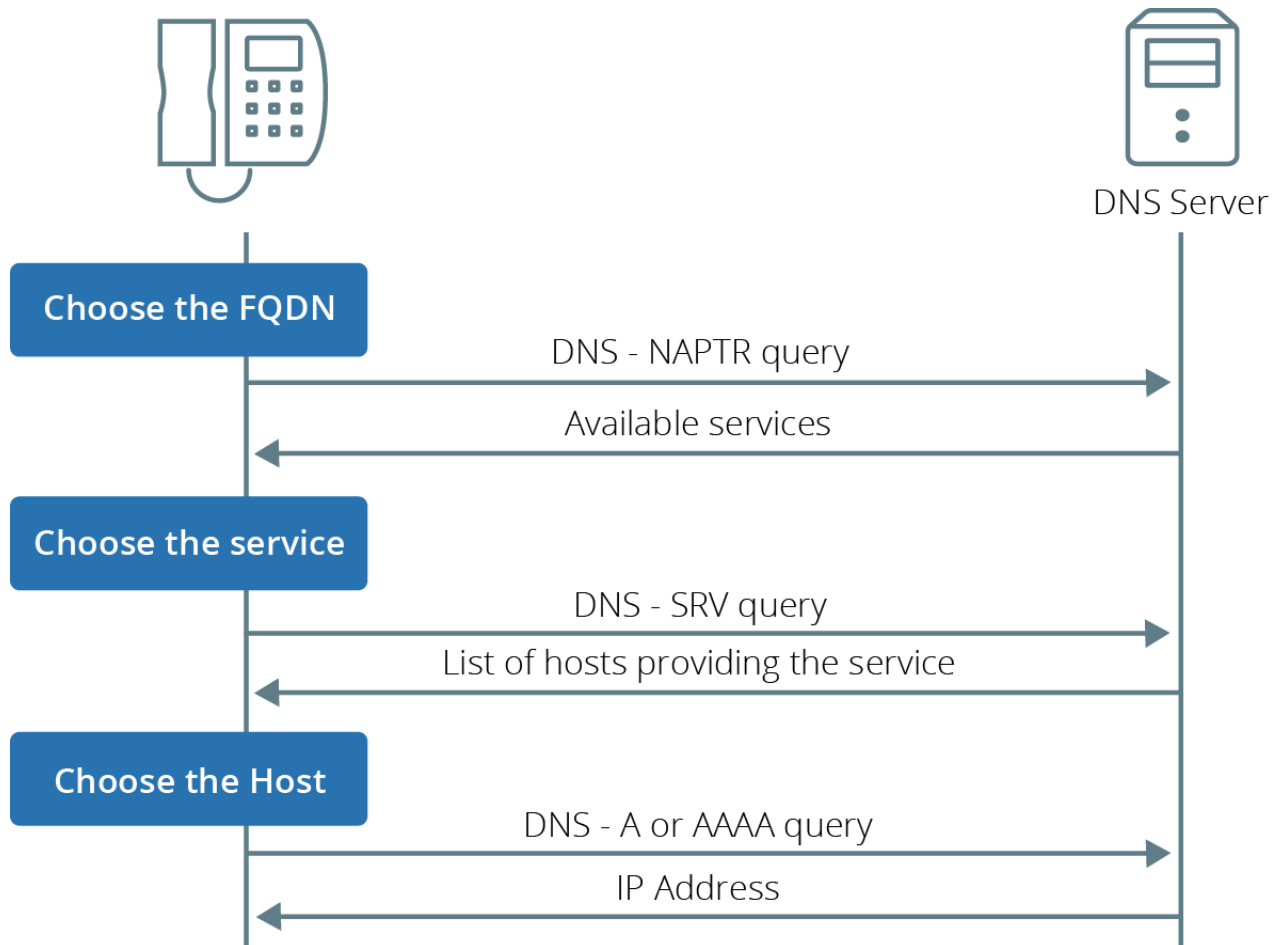
DNS SRV Redundancy

This configuration note will help you use DNS queries to configure a Mediatrix gateway for:

- Redundancy Failover, or
- Load Balancing

Note that DNS SRV type is not mandatory for Redundancy Failover, as it can be achieved with DNS A or AAAA types where multiple IP addresses are received in a single A or AAAA response.

DNS SRV Usage



Note: The Mediatrix unit will keep the DNS responses it has received in cache for the remainder of the TTL field specified in the DNS response. If you make modifications to your DNS server configuration and want the Mediatrix unit to reissue DNS requests before the end of the TTL, you will need to enter the following command in the CLI or SNMP: **Hoc.ClearDnsCache**

If any of the SIP server parameters corresponds to a FQDN that is bound to a SRV record, the corresponding port must be set to **0** for the unit to perform DNS requests of type SRV (as per RFC 3263). Otherwise, the unit will not use DNS SRV requests, but will rather use type A requests because it does not need to have a specified port. We now look at the two types of DNS queries.

DNS SRV (RFC 2782)

DNS SRV is an extension of the standard DNS server specification (independent from SIP, as per RFC 2782). SRV (Service Record) is a type of entry a network administrator may put into the DNS server. A DNS SRV request is used to get one or more IP addresses of servers, each one having its own weight, priority and possible port.

Each entry received when using DNS SRV, depending on its weight and priority, can be used as a primary or backup server or can be part of a load balancing system.

For instance, the client requests the SRV for SIP servers in some domain. The DNS server may return the A, B, and C addresses, which are all SIP servers. Each address has a weight and the client must choose one of those three addresses by using an algorithm that considers the weight.

To use DNS SRV, an administrator must set a service records (SRV) into the DNS servers available on the network.

Type A Query

If you specify a SIP port for the registrar and proxy, the Mediatrix unit will issue a type A query. In this example the requests are sent to server1.media5berlin.com for both the Registrar and Proxy, with the SIP port being 5060 for both.



■ System ■ Network ■ ISDN ■ R2 ■ SIP ■

Gateways Servers Registrations Endpoints

✚ Servers

SIP Default Servers	
Registrar Host:	server1.media5berlin.com:5060
Proxy Host:	server1.media5berlin.com:5060
Outbound Proxy Host:	

No.	Time	Source	Destination	Protocol	Info
205	1	192.168.120.12	192.168.120.11	DNS	Standard query A server1.media5berlin.com
206	1	192.168.120.11	192.168.120.12	DNS	Standard query response A 192.168.120.11

Frame 205 (84 bytes on wire, 84 bytes captured)
Ethernet II, Src: 00:90:f8:02:ff:35 (00:90:f8:02:ff:35), Dst: 00:0c:29:d5:8d:78 (00:0c:29:d5:8d:78)
Internet Protocol, Src: 192.168.120.12 (192.168.120.12), Dst: 192.168.120.11 (192.168.120.11)
User Datagram Protocol, Src Port: 3145 (3145), Dst Port: 53 (53)
Domain Name System (query)
Transaction ID: 0x355f
Flags: 0x0100 (Standard query)
Questions: 1
Answer RRs: 0
Authority RRs: 0
Additional RRs: 0
Queries
server1.media5berlin.com: type A, class IN

Filter: `ip.addr == 192.168.120.11 && ( dns )` Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Info
205	1	192.168.120.12	192.168.120.11	DNS	Standard query A server1.media5berlin.com
206	1	192.168.120.11	192.168.120.12	DNS	Standard query response A 192.168.120.11

[Time: 0.000912000 seconds]
Transaction ID: 0x355f
Flags: 0x8580 (standard query response, No error)
Questions: 1
Answer RRs: 1
Authority RRs: 1
Additional RRs: 0
Queries
server1.media5berlin.com: type A, class IN
Answers
server1.media5berlin.com: type A, class IN, addr 192.168.120.11
Authoritative nameservers
media5berlin.com: type NS, class IN, ns dns1.media5berlin.com

Wireshark displays the answer to the query as a “type A” answer, which contains the IP address for server1.media5berlin.com. The Mediatrix unit then attempts to register itself to that IP address.

No.	Time	Source	Destination	Protocol	Info
205	1	192.168.120.12	192.168.120.11	DNS	Standard query A server1.media5berlin.com
206	1	192.168.120.11	192.168.120.12	DNS	Standard query response A 192.168.120.11
207	1	192.168.120.12	192.168.120.11	SIP	Request: REGISTER sip:server1.media5berlin.com:5060
208	1	192.168.120.11	192.168.120.12	SIP	Status: 100 Trying (1 bindings)
209	1	192.168.120.11	192.168.120.12	SIP	Status: 401 Unauthorized (0 bindings)
249	1	192.168.120.12	192.168.120.11	SIP	Request: REGISTER sip:server1.media5berlin.com:5060
250	1	192.168.120.11	192.168.120.12	SIP	Status: 100 Trying (1 bindings)
251	1	192.168.120.11	192.168.120.12	SIP	Status: 200 OK (0 bindings)

Type A Query to a SRV Record

In the following example, the Mediatix unit administrator is told to use “media5berlin.com” as FQDN for his registrar and proxy, but is unaware that he should use SRV for his DNS queries. Consequently he does not configure his registrar and proxy ports to 0.

The screenshot shows the Mediatix configuration interface and a Wireshark network capture. In the Mediatix 'Servers' configuration, the Registrar Host and Proxy Host are both set to 'media5berlin.com:5060'. The Wireshark capture shows a DNS query from 192.168.120.30 to 192.168.120.11 for 'Standard query A media5berlin.com'. The response is a 'Standard query response A 213.133.108.253'. The 'Queries' pane in Wireshark shows the query as 'media5berlin.com: type A, class IN'.

SIP Default Servers					
Registrar Host:	media5berlin.com:5060				
Proxy Host:	media5berlin.com:5060				
Outbound Proxy Host:					

No.	Time	Source	Destination	Protocol	Info
2830	18	192.168.120.30	192.168.120.11	DNS	Standard query A 2.de.pool.ntp.org
2832	18	192.168.120.11	192.168.120.30	DNS	Standard query response A 213.133.108.253
3620	18	192.168.120.30	192.168.120.11	DNS	Standard query A media5berlin.com
3621	18	192.168.120.11	192.168.120.30	DNS	Standard query response

```

Queries
  media5berlin.com: type A, class IN
    Name: media5berlin.com
    Type: A (Host address)
    Class: IN (0x0001)
  Authoritative nameservers
    media5berlin.com: type SOA, class IN, mname dns1.media5berlin.com
  
```

The Wireshark capture shows no additional SRV query and no registration, why?

By specifying the SIP port to 5060, the unit makes a standard A query, and since media5berlin.com is configured as a SRV record, no address is returned. The symptom will be a failed registration with the message “Registrar Unreachable”.

The screenshot shows the Mediatix 'Registrations' configuration. The Registrar is set to 'media5berlin.com:5060' and the Status is 'Unreachable'.

Endpoints Registration Status				
Endpoint	User Name	Gateway Name	Registrar	Status
Phone-Fax1	100		media5berlin.com:5060	Unreachable

Type SRV Query

As previously stated, setting proxy and registrar ports to 0 will make the Mediatix unit issue a DNS request of type SRV.

The screenshot shows the Mediatix configuration interface. The 'SIP' tab is selected, and the 'Servers' sub-tab is active. The 'SIP Default Servers' section shows the Registrar Host and Proxy Host both set to 'media5berlin.com:0'. Below this, a network packet capture window displays a DNS query and response. The query is for '_sip._udp.media5berlin.com'. The response contains two SRV records for priority 1 and 2, both pointing to 'server1.media5berlin.com' and 'server2.media5berlin.com' respectively. The response also includes additional records for the A records of these servers.

No.	In	Source	Destination	Protocol	Info
329	1	192.168.120.12	192.168.120.11	DNS	Standard query NAPTR media5berlin.com
331	1	192.168.120.11	192.168.120.12	DNS	Standard query response
347	1	192.168.120.12	192.168.120.11	DNS	Standard query SRV _sip._udp.media5berlin.com
348	1	192.168.120.11	192.168.120.12	DNS	Standard query response SRV 1 100 5060 server1.m

Additional RRs: 2

- Queries
 - _sip._udp.media5berlin.com: type SRV, class IN
 - Name: _sip._udp.media5berlin.com
 - Type: SRV (Service location)
 - Class: IN (0x0001)
- Answers
 - _sip._udp.media5berlin.com: type SRV, class IN, priority 1, weight 100, port 5060, target serv
 - _sip._udp.media5berlin.com: type SRV, class IN, priority 2, weight 50, port 5060, target serve
- Authoritative nameservers
 - media5berlin.com: type NS, class IN, ns dns1.media5berlin.com
- Additional records
 - server1.media5berlin.com: type A, class IN, addr 192.168.120.11
 - server2.media5berlin.com: type A, class IN, addr 192.168.120.10

The response contains 2 available SIP servers with the FQDN, IP addresses, priorities, weight (for equal priority) and SIP ports.

At the bottom of the window you can see "Additional records" with server1.media5berlin.com and server2.media5berlin.com. Those are 2 valid type A FQDNs which are offered in the SRV response. If you wished to do so, you could also explicitly enter those FQDNs directly into your Mediatix proxy configuration field (as done in Scenario #1).

Please note that a NAPTR query is done before the SRV query. NAPTR is used to find Transport method, UPD – TCP – TLS. The establishment of persistent (TLS) connections will not send NAPTR since the transport is already known.

A NAPTR query is made if:

- The host is not an IP address

- And, the port is not explicitly specified in the SIP URI (the port is not present or equal to 0)
- And, the SIP URI does not contain a "maddr" with an IP address
- And, the SIP URI does not specify explicitly the transport (transport parameter)

The Effects of Priority and Weight

In some rare cases you may have a SRV response where some servers are configured with equal priority. In that case, the clients will use the weight values to determine which host to use. If the weights are also identical, then 50% of the packets will go to host 1 and the rest to host 2 (in a 2 server scenario). In this example, both proxy1 and proxy2 have the same priority, but different weights. 51% of the packets will go to proxy1 and 49% to proxy2.

This may cause an issue where the unit REGISTER is sent to host1 and, after the authentication challenge is sent by the registrar, the answer is sent to host 2 as shown in these screenshots. The initial REGISTER is sent to 192.168.120.11, and the response to the challenge sent to 192.168.120.10. If your hosts are not synchronized, you will get REGISTER or INVITE failures.

Filter: (dns || sip) && ip.addr == 192.168.120.30

No.	Time	Source	Destination	Protocol	Info
336	19	192.168.120.11	192.168.120.30	DNS	Standard query response SRV 1 51 5060 proxy1.media5berlin.com S
361	19	192.168.120.30	192.168.120.11	SIP	Request: REGISTER sip:media5berlin.com
362	19	192.168.120.11	192.168.120.30	SIP	Status: 100 Trying (1 bindings)
363	19	192.168.120.11	192.168.120.30	SIP	Status: 401 Unauthorized (0 bindings)
561	19	192.168.120.30	192.168.120.10	SIP	Request: REGISTER sip:media5berlin.com
562	19	192.168.120.10	192.168.120.30	ICMP	Destination unreachable (Port unreachable)
579	19	192.168.120.30	192.168.120.10	SIP	Request: REGISTER sip:media5berlin.com
580	19	192.168.120.10	192.168.120.30	ICMP	Destination unreachable (Port unreachable)

Answer RRs: 2
Authority RRs: 1
Additional RRs: 2

Queries

- _sip._udp.media5berlin.com: type SRV, class IN

Answers

- _sip._udp.media5berlin.com: type SRV, class IN, priority 1, weight 51, port 5060, target proxy1.media5berlin.com
- _sip._udp.media5berlin.com: type SRV, class IN, priority 1, weight 49, port 5060, target proxy2.media5berlin.com

Authoritative nameservers

- media5berlin.com: type NS, class IN, ns dns1.media5berlin.com

Additional records

- proxy2.media5berlin.com: type A, class IN, addr 192.168.120.10
- proxy1.media5berlin.com: type A, class IN, addr 192.168.120.11

Filter: (dns || sip) && ip.addr == 192.168.120.30

No.	Time	Source	Destination	Protocol	Info
336	19	192.168.120.11	192.168.120.30	DNS	Standard query response SRV 1 51 5060 proxy1.media5berlin.com S
361	19	192.168.120.30	192.168.120.11	SIP	Request: REGISTER sip:media5berlin.com
362	19	192.168.120.11	192.168.120.30	SIP	Status: 100 Trying (1 bindings)
363	19	192.168.120.11	192.168.120.30	SIP	Status: 401 Unauthorized (0 bindings)
561	19	192.168.120.30	192.168.120.10	SIP	Request: REGISTER sip:media5berlin.com
562	19	192.168.120.10	192.168.120.30	ICMP	Destination unreachable (Port unreachable)
579	19	192.168.120.30	192.168.120.10	SIP	Request: REGISTER sip:media5berlin.com

Answer RRs: 2
Authority RRs: 1

Additional Interop Parameters

SipEp.InteropLockDnsSrvRecordPerCallEnable

- DNS SRV implementation should imply a shared database between servers since a Register and an INVITE can be sent to any server, not necessarily the same one;
- For those who do not share their database, this must be enabled, allowing INVITEs to be sent to the same Registrar host, thus use the same SRV record

This parameter can be used to get around the above-mentioned issue. Setting this parameter to "enable" makes the Mediatrix unit "stick" to the IP address associated with the initial Call-Id of the REGISTER or INVITE.

SipEp.InteropLockDnsSrvRecordForRegister

This parameter can be used to control the registration refresh failback behavior; whether it "sticks" to the current target, or try to failback to a higher priority target.

Note: This parameter is ignored if **SipEp.InteropLockDnsSrvRecordPerCallEnable** is disabled.

SipEp.InteropLockDnsSrvRecordWithInviteBoundToRegisterEnable

This parameter can be used to define the behavior of INVITEs; whether they lock or not to the same target than their associated REGISTER.

Note: This parameter is ignored if **SipEp.InteropLockDnsSrvRecordPerCallEnable** is disabled.

SipEp.InteropTransmissionTimeout

If using DNS SRV and multiple entries are present, this value is the time spent waiting for answers from each entry when one server is unreachable or unresponsive. The default value of this parameter is 32 seconds. It has a dramatic effect should a server time out, since a default 32 seconds delay would be introduced at every call.

A maximum value of 2-3 seconds is recommended when using DNS SRV.

SipEp.PenaltyBoxEnable

- The penalty box feature is used when a given host address times out. When the address times out, it is put into the penalty box for a given amount of time. During that time, the address in question is considered as 'non-responding' for all requests.

Note: This parameter only applies to "Trunk Gateway" type, and not for the "Endpoint Gateway" type. Refer to the SipEp.Gateway[].Type parameter.

SipEp.PenaltyBoxtime

- A "timed out" server is considered "not responding" for this amount of time;
- Can be seen as the time it will take to retry a server that failed to respond.

SipEp.DnsIpVersion

This parameter can be used to disable AAAA requests, so only A requests are issued.

Available Documentation

For more details, refer to the [Mediatrix Documentation](#) published on the [Media5 Documentation Portal](#).

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