

Using DNS SRV Feature on Yealink SIP-T3XG Phones

1. Feature Introduction

The Yealink Phone DNS-SRV Feature is to ensure continuity of phone service for events where the call server needs to be taken offline for maintenance, the server fails, or the connection from the phone to the server fails.

Two types of redundancy are possible:

- **Fail-over:** In this mode, the full phone system functionality is preserved by having a second equivalent capability call server take over from the one that has gone down/off-line. This mode of operation should be done using DNS mechanisms or "IP Address Moving" from the primary to the back-up server.
- **Fallback:** In this mode, a second less featured call server (router or gateway device) with SIP capability takes over call control to provide basic calling capability, but without some of the richer features offered by the primary call server (for example, shared lines, presence, and Message Waiting Indicator). Yealink phones support configuration of multiple servers per SIP registration for this purpose.

In some cases, a combination of the two may be deployed.

With DNS-SRV feature, Yealink phones are able to perform the following redundancy scenarios:

- **DNS SRV Lookup**
Take the DN onsip.com for example, before registration, phone will do NAPTR lookup for onsip.com, and get the result below:

	order	pref	flags	service	regexp	replacement
IN NAPTR	50	50	"s"	"SIPS+D2T"	""	_sips._tcp.example.com
IN NAPTR	90	50	"s"	"SIP+D2T"	""	_sip._tcp.example.com
IN NAPTR	100	50	"s"	"SIP+D2U"	""	_sip._udp.example.com

Then phone will do SRV lookup according to the NAPTR lookup result, and get the SRV lookup result below:

	Priority	Weight	Port	Target
IN SRV	0	1	5060	server1.example.com
IN SRV	0	2	5060	server1.example.com

Finally, do the A record lookup according to the SRV lookup result and get two IP addresses which are associated with the DN onsip.com, also the IP addressed will ordered by the priority which returned from DNS server, for example first server is 69.57.179.234 and second sever is 69.57.179.235.

```

Domain Name System (response)
  [Request In: 881]
  [Time: 0.617004000 seconds]
  Transaction ID: 0x0005
  Flags: 0x8180 (Standard query response, No error)
  Questions: 1
  Answer RRs: 1
  Authority RRs: 2
  Additional RRs: 2
  Queries
    + onsip.com: type A, class IN
  Answers
    + onsip.com: type A, class IN, addr 69.57.179.234
  Authoritative nameservers
  Additional records
    
```

- REGISTER Failover/Failback
If phone fail to register to the first server 69.57.179.234, it will try to register to second server 69.57.179.235 automatically.
- INVITE Failover/Failback
If the INVITE message does not correct response from the first server 69.57.179.234, it will try the second server 69.57.179.235 automatically.
- BYE Failover
If the BYE message does not correct response from the first server 69.57.179.234, it will try the second server 69.57.179.235 automatically.

2. Phone Configuration

Browse to Account→Basic page, give a DNS name to SIP server and select “DNS-SRV” for transport option.

Account Account 1

Basic >>

Register Status	Registered
Account Active	<input checked="" type="checkbox"/> On <input type="checkbox"/> Off
Label	888 ?
Display Name	888 ?
Register Name	
User Name	
Password ?
SIP Server	www.yealink.com Port 5060 ?
Enable Outbound Proxy Server	Disabled ?
Outbound Proxy Server	Port 5060 ?
Transport	DNS-SRV ?
Backup Outbound Proxy Server	Port 5060 ?
NAT Traversal	Dis ?
STUN Server	Port 178 ?
Voice Mail	23 ?
Proxy Require	? ?

NOTE

Display Name
SIP service subscriber's name which will be used for Caller ID display.

Register Name
SIP service subscriber's ID used for authentication.

User Name
User account, provided by VoIP service provider.

NAT Traversal
Defines the STUN server will be active or not.

Proxy Require
A special parameter just for Nortel server. If you login to Nortel server, the value should be: com.nortelnetworks.firewall

Codexes
Choose the codexes you want to use.

Advanced
The Advanced parameters for administrator.

Sample introduction of how Yealink Phones use TCP as transport type after DNS-SRV

1. Configure Yealink SIP Phone

The screenshot shows the configuration page for 'Account 2' in the 'Basic >>' section. The following settings are highlighted with red boxes and callouts:

- ① Active a line:** The 'Account Active' field is set to 'On'.
- ② Fill in the account settings:** The 'Label', 'Display Name', 'Register Name', 'User Name', and 'Password' fields are all filled with '6903'.
- ③ Fill in the sip server domain:** The 'SIP Server' field is filled with 'airties.com'.
- ④ Select the Transport type as DNS-SRV:** The 'Transport' dropdown menu is set to 'DNS-SRV'.
- ⑤ Click to save setting:** The 'Confirm' button at the bottom of the page is highlighted.

Other visible settings include: Register Status: Unknown; Enable Outbound Proxy Server: Disabled; Outbound Proxy Server: (empty); Backup Outbound Proxy Server: (empty); NAT Traversal: Disabled; STUN Server: (empty); Voice Mail: (empty); Proxy Require: (empty); Anonymous Call: Off; On Code: (empty); Off Code: (empty); Anonymous Call Rejection: Off; On Code: (empty); Off Code: (empty); Missed call log: Enabled; Auto Answer: Disabled; Ring Type: common.

2. DNS-SRV Process

- ◆ Refer to session 2.1 when click "Configm" after setting, Yealink SIP Phone performs a NAPTR lookup, and gets the NAPTR records.

	order	pref	flags	service	regexp	replacement
IN NAPTR	2	0	"s"	"SIP+D2T"	""	_sip._tcp.airties.com
IN NAPTR	2	0	"s"	"SIP+D2U"	""	_sip._udp.airties.com

17	193.944356	10.12.0.1	10.12.2.1	DNS	Standard query response NAPTR 2 0 s NAPTR 2 0 s
18	194.011848	10.12.2.1	10.12.0.1	DNS	Standard query SRV _sip._tcp.airties.com
19	194.013156	10.12.0.1	10.12.2.1	DNS	Standard query response SRV 1 0 5060 uc2.airties.com SRV 2 0 5060 uc1.airties.com
20	194.017134	10.12.2.1	10.12.0.1	DNS	Standard query A uc2.airties.com
21	194.017758	10.12.0.1	10.12.2.1	DNS	Standard query response A 91.220.65.27
22	194.026062	10.12.2.1	10.12.0.1	DNS	Standard query A uc1.airties.com
23	194.026618	10.12.0.1	10.12.2.1	DNS	Standard query response A 91.220.65.26
24	194.040169	10.12.2.1	10.12.0.1	DNS	Standard query SRV _sip._udp.airties.com
25	194.041494	10.12.0.1	10.12.2.1	DNS	Standard query response SRV 2 0 5060 uc1.airties.com SRV 1 0 5060 uc2.airties.com
26	194.192043	10.12.2.1	91.220.65.27	SIP	Request: REGISTER sip:airties.com
27	194.197000	91.220.65.27	10.12.2.1	SIP	Status: 401 Unauthorized (0 bindings)
28	195.696335	10.12.2.1	91.220.65.27	SIP	Request: REGISTER sip:airties.com
29	195.701767	91.220.65.27	10.12.2.1	SIP	Status: 423 Registration Too Brief (0 bindings)
30	195.845413	10.12.2.1	224.0.1.75	SIP	Request: SUBSCRIBE sip:MAC0015651a108b0224.0.1.75
31	195.901397	10.12.2.1	91.220.65.27	SIP	Request: REGISTER sip:airties.com
32	195.909072	91.220.65.27	10.12.2.1	SIP	Status: 200 OK (1 bindings)

```

Answer RRs: 2
Authority RRs: 0
Additional RRs: 0
Queries
Answers
= airties.com: type NAPTR, class IN, order 2, preference 0, flags s
  Name: airties.com
  Type: NAPTR (Naming authority pointer)
  Class: IN (0x0001)
  Time to live: 1 hour
  Data length: 38
  order: 2
  Preference: 0
  Flags length: 1
  Flags: "s"
  Service length: 7
  Service: "SIP+D2T"
  Regexp length: 0
  Regexp: ""
  Replacement length: 23
  Replacement: _sip._tcp.airties.com
= airties.com: type NAPTR, class IN, order 2, preference 0, flags s
  Name: airties.com
  Type: NAPTR (Naming authority pointer)
  Class: IN (0x0001)
  Time to live: 1 hour
  Data length: 38
  order: 2
  Preference: 0
  Flags length: 1
  Flags: "s"
  Service length: 7
  Service: "SIP+D2U"
  Regexp length: 0
  Regexp: ""
  Replacement length: 23
  Replacement: _sip._udp.airties.com

```

- ◆ Then Yealink Phone performs a SRV lookup, and gets the SRV records, and gets the SRV records as follows:

NAPTR record : _sip._tcp.airties.com

	Priority	Weight	Port	Target
IN SRV	1	0	5060	uc2.airties.com
IN SRV	2	0	5060	Uc1.airties.com

```

16 193.942190      10.12.2.1      10.12.0.1      DNS      Standard query NAPTR airties.com
17 193.944356      10.12.0.1      10.12.2.1      DNS      Standard query response NAPTR 2 0 s NAPTR 2 0 s
18 194.011848      10.12.2.1      10.12.0.1      DNS      Standard query SRV _sip._tcp.airties.com
19 194.013156      10.12.0.1      10.12.2.1      DNS      Standard query response SRV 1 0 5060 uc2.airties.com SRV 2 0 5060 uc1.airties.com
20 194.017134      10.12.2.1      10.12.0.1      DNS      Standard query A uc2.airties.com
21 194.017758      10.12.0.1      10.12.2.1      DNS      Standard query response A 91.220.65.27
22 194.026062      10.12.2.1      10.12.0.1      DNS      Standard query A uc1.airties.com
23 194.026618      10.12.0.1      10.12.2.1      DNS      Standard query response A 91.220.65.26
24 194.040169      10.12.2.1      10.12.0.1      DNS      Standard query SRV _sip._udp.airties.com
25 194.041494      10.12.0.1      10.12.2.1      DNS      Standard query response SRV 2 0 5060 uc1.airties.com SRV 1 0 5060 uc2.airties.com
26 194.192043      10.12.2.1      91.220.65.27   SIP      Request: REGISTER sip:airties.com
27 194.197000      91.220.65.27   10.12.2.1      SIP      Status: 401 Unauthorized (0 bindings)
28 195.696335      10.12.2.1      91.220.65.27   SIP      Request: REGISTER sip:airties.com
29 195.701767      91.220.65.27   10.12.2.1      SIP      Status: 423 Registration Too Brief (0 bindings)
30 195.845413      10.12.2.1      224.0.1.75     SIP      Request: SUBSCRIBE sip:MAC0015651a108b@224.0.1.75
31 195.901397      10.12.2.1      91.220.65.27   SIP      Request: REGISTER sip:airties.com
32 195.909072      91.220.65.27   10.12.2.1      SIP      Status: 200 OK (1 bindings)
33 196.706830      10.12.2.1      91.220.65.27   SIP      Request: SUBSCRIBE sip:6903@airties.com
34 196.711394      91.220.65.27   10.12.2.1      SIP      Status: 401 Unauthorized
35 196.727002      10.12.2.1      91.220.65.27   SIP      Request: SUBSCRIBE sip:6903@airties.com

Frame 19 (151 bytes on wire, 151 bytes captured)
Ethernet II, Src: JuniperN_17:68:8a (00:21:59:17:68:8a), Dst: XiamenYe_1a:10:8b (00:15:65:1a:10:8b)
Internet Protocol, Src: 10.12.0.1 (10.12.0.1), Dst: 10.12.2.1 (10.12.2.1)
User Datagram Protocol, Src Port: domain (53), Dst Port: blackjack (1025)
Domain Name System (response)
  [Request In: 24]
  [Time: -0.027013000 seconds]
  Transaction ID: 0x0002
  # Flags: 0x8500 (Standard query response, No error)
  Questions: 1
  Answer RRs: 2
  Authority RRs: 0
  Additional RRs: 0
  # Queries
  # Answers
  # _sip._tcp.airties.com: type SRV, class IN, priority 1, weight 0, port 5060, target uc2.airties.com
    Name: _sip._tcp.airties.com
    Type: SRV (Service location)
    Class: IN (0x0001)
    Time to live: 1 hour
    Data length: 23
    Priority: 1
    Weight: 0
    Port: 5060
    Target: uc2.airties.com
  # _sip._tcp.airties.com: type SRV, class IN, priority 2, weight 0, port 5060, target uc1.airties.com
    Name: _sip._tcp.airties.com
    Type: SRV (Service location)
    Class: IN (0x0001)
    Time to live: 1 hour
    Data length: 23
    Priority: 2
    Weight: 0
    Port: 5060
    Target: uc1.airties.com
  
```

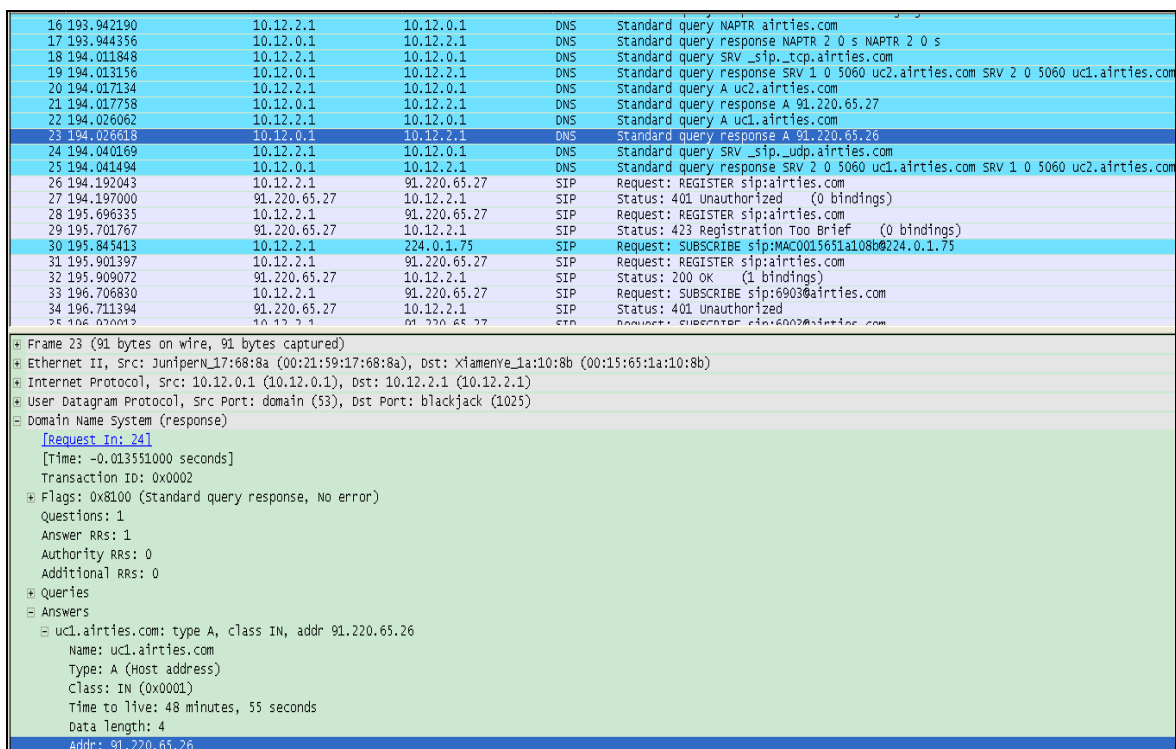
- ◆ After SRV lookup Yealink Phone performs A record lookup, and gets the IP Address of the sip server domain.

	Name	TTL	Addr
IN A	uc2. airties.com		91.220.65.27
IN A	Uc1. irties.com		91.220.65.26

```

16 193.942190      10.12.2.1      10.12.0.1      DNS Standard query NAPTR airties.com
17 193.944356      10.12.0.1      10.12.2.1      DNS Standard query response NAPTR 2 0 s NAPTR 2 0 s
18 194.011848      10.12.2.1      10.12.0.1      DNS Standard query SRV _sip._tcp.airties.com
19 194.013156      10.12.0.1      10.12.2.1      DNS Standard query response SRV 1 0 5060 uc2.airties.com SRV 2 0 5060 uc1.airties.com
20 194.017134      10.12.2.1      10.12.0.1      DNS Standard query A uc2.airties.com
21 194.017758      10.12.0.1      10.12.2.1      DNS Standard query response A 91.220.65.27
22 194.026062      10.12.2.1      10.12.0.1      DNS Standard query A uc1.airties.com
23 194.026618      10.12.0.1      10.12.2.1      DNS Standard query response A 91.220.65.26
24 194.040169      10.12.2.1      10.12.0.1      DNS Standard query SRV _sip._udp.airties.com
25 194.041494      10.12.0.1      10.12.2.1      DNS Standard query response SRV 2 0 5060 uc1.airties.com SRV 1 0 5060 uc2.airties.com
26 194.192043      10.12.2.1      91.220.65.27   SIP Request: REGISTER sip:airties.com
27 194.197000      91.220.65.27   10.12.2.1      SIP Status: 401 Unauthorized (0 bindings)
28 195.696335      10.12.2.1      91.220.65.27   SIP Request: REGISTER sip:airties.com
29 195.701767      91.220.65.27   10.12.2.1      SIP Status: 423 Registration Too Brief (0 bindings)
30 195.845413      10.12.2.1      224.0.1.75     SIP Request: SUBSCRIBE sip:MAC0015651a108b@224.0.1.75
31 195.901397      10.12.2.1      91.220.65.27   SIP Request: REGISTER sip:airties.com
32 195.909072      91.220.65.27   10.12.2.1      SIP Status: 200 OK (1 bindings)
33 196.706830      10.12.2.1      91.220.65.27   SIP Request: SUBSCRIBE sip:6903@airties.com
34 196.711394      91.220.65.27   10.12.2.1      SIP Status: 401 Unauthorized
35 196.820012      10.12.2.1      91.220.65.27   SIP Request: SUBSCRIBE sip:6903@airties.com

Frame 21 (91 bytes on wire, 91 bytes captured)
Ethernet II, Src: JuniperN_17:68:8a (00:21:59:17:68:8a), Dst: XiamenYe_1a:10:8b (00:15:65:1a:10:8b)
Internet Protocol, Src: 10.12.0.1 (10.12.0.1), Dst: 10.12.2.1 (10.12.2.1)
User Datagram Protocol, Src Port: domain (53), Dst Port: blackjack (1025)
Domain Name System (response)
  [Request In: 24]
  [Time: -0.022411000 seconds]
  Transaction ID: 0x0002
  Flags: 0x8100 (Standard query response, No error)
  Questions: 1
  Answer RRs: 1
  Authority RRs: 0
  Additional RRs: 0
  Queries
  Answers
    uc2.airties.com: type A, class IN, addr 91.220.65.27
      Name: uc2.airties.com
      Type: A (Host address)
      Class: IN (0x0001)
      Time to live: 48 minutes, 56 seconds
      Data length: 4
      Addr: 91.220.65.27
  
```



Then from the NAPTR record "_sip._udp. airties.com", Yealink Phone gets the same SRV records, so the DNS-SRV records should be listed as below:

SIP Server DN	NAPTR	SRV			IP Address
		Host name	priority	port	
airties.com	_sip._Tcp.	uc2.irties.com	1	5060	91.220.65.27
	airties.com	Uc1.irties.com	2	5060	91.220.65.26
	_sip._udp.	uc2.irties.com	1	5060	91.220.65.27
	airties.com	Uc1.irties.com	2	5060	91.220.65.26

So refer to RFC 3263, Yealink Phone then sends the Register Request to the first IP Address of the sip server 91.220.65.27 with the transport type of TCP. When the first server is down ,Yealink Phone will try the second sip server .

16	193.942190	10.12.2.1	10.12.0.1	DNS	Standard query NAPTR airties.com
17	193.944356	10.12.0.1	10.12.2.1	DNS	Standard query response NAPTR 2 0 s NAPTR 2 0 s
18	194.011848	10.12.2.1	10.12.0.1	DNS	Standard query SRV _sip._tcp.airties.com
19	194.013156	10.12.0.1	10.12.2.1	DNS	Standard query response SRV 1 0 5060 uc2.airties.com SRV 2 0 5060 uc1.airties.com
20	194.017134	10.12.2.1	10.12.0.1	DNS	Standard query A uc2.airties.com
21	194.017758	10.12.0.1	10.12.2.1	DNS	Standard query response A 91.220.65.27
22	194.026062	10.12.2.1	10.12.0.1	DNS	Standard query A uc1.airties.com
23	194.026618	10.12.0.1	10.12.2.1	DNS	Standard query response A 91.220.65.26
24	194.040169	10.12.2.1	10.12.0.1	DNS	Standard query SRV _sip._udp.airties.com
25	194.041494	10.12.0.1	10.12.2.1	DNS	Standard query response SRV 2 0 5060 uc1.airties.com SRV 1 0 5060 uc2.airties.com
26	194.192048	10.12.2.1	91.220.65.27	SIP	Request: REGISTER sip:airties.com
27	194.197000	91.220.65.27	10.12.2.1	SIP	Status: 401 Unauthorized (0 bindings)
28	195.696335	10.12.2.1	91.220.65.27	SIP	Request: REGISTER sip:airties.com
29	195.701767	91.220.65.27	10.12.2.1	SIP	Status: 423 Registration Too Brief (0 bindings)
30	195.845413	10.12.2.1	224.0.1.75	SIP	Request: SUBSCRIBE sip:MAC0015651a108b@224.0.1.75
31	195.901397	10.12.2.1	91.220.65.27	SIP	Request: REGISTER sip:airties.com
32	195.909072	91.220.65.27	10.12.2.1	SIP	Status: 200 OK (1 bindings)
33	196.706830	10.12.2.1	91.220.65.27	SIP	Request: SUBSCRIBE sip:6903@airties.com
34	196.711394	91.220.65.27	10.12.2.1	SIP	Status: 401 Unauthorized
35	196.870012	10.12.2.1	91.220.65.27	SIP	Request: SUBSCRIBE sip:6903@airties.com

Frame 26 (549 bytes on wire, 549 bytes captured)

Ethernet II, Src: Xiamenye_1a:10:8b (00:15:65:1a:10:8b), Dst: JuniperN_17:68:8a (00:21:59:17:68:8a)

Internet Protocol, Src: 10.12.2.1 (10.12.2.1), Dst: 91.220.65.27 (91.220.65.27)

Transmission Control Protocol, Src Port: nav-port (3859), Dst Port: sip (5060), Seq: 1, Ack: 1, Len: 483

Session Initiation Protocol

Request-Line: REGISTER sip:airties.com SIP/2.0

Message Header

Via: SIP/2.0/TCP 10.12.2.1:5062;branch=29hg4bk109393139

From: "6903" <sip:6903@airties.com>;tag=1445564399

To: "6903" <sip:6903@airties.com>

Call-ID: 1730047149@10.12.2.1

CSeq: 1 REGISTER

Contact: <sip:6903@10.12.2.1:5062;transport=TCP>

Allow: INVITE, INFO, PRACK, ACK, BYE, CANCEL, OPTIONS, NOTIFY, REGISTER, SUBSCRIBE, REFER, PUBLISH, UPDATE, MESSAGE

Max-Forwards: 70

User-Agent: Yealink IP116 2.60.4.2

Expires: 180

Content-Length: 0

For more information about DNS-SRV , please refer to RFC3263.