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## Server Redundancy on Yealink IP Phones

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This guide provides detailed information on how to configure and use server redundancy on Yealink IP phones.

This information applies to the following Yealink IP phones:

- SIP-T58A, SIP VP-T49G, SIP-T48G, SIP-T46G, SIP-T42G, SIP-T41P, SIP-T40P, SIP-T29G, SIP-T23P, SIP-T23G, SIP-T21(P) E2, SIP-T19(P) E2, CP860, CP960 and W56P IP phones running firmware version 80 or later.
- SIP-T48S, SIP-T46S, SIP-T42S, SIP-T41S, SIP-T40G, SIP-T27G, W52P, CP920 and W60P IP phones running firmware version 81 or later.
- VP59, W53P and CP930W-Base IP phones running firmware version 83 or later.
- SIP-T57W, SIP-T54W, SIP-T53W, SIP-T53, SIP-T48U, SIP-T46U, SIP-T43U and SIP-T42U IP phones running firmware version 84 or later
- SIP-T33P, SIP-T33G, SIP-T31P, SIP-T31G, SIP-T31, SIP-T30P and SIP-T30 IP phones running firmware version 85 or later

## Introduction

Server redundancy is often required in VoIP deployments to ensure continuity of phone service, for events where the server needs to be taken offline for maintenance, the server fails, or the connection between the IP phone and the server fails.

Two types of server redundancy are possible. In some cases, a combination of the two may be used:

- **Failover:** 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 or off-line. This mode of operation should be done using the DNS mechanism from the primary to the secondary server.
- **Fallback:** In this mode, there are two types of registration modes: Concurrent registration and Successive registration. IP phones support configurations of two servers per SIP registration for this purpose. For more information on two registration modes, refer to [Phone Registration](#).

## Glossary

The following terms may assist in understanding server redundancy feature:

**Working and Fallback Servers:** The working and fallback servers are two separate servers used for per line registration.

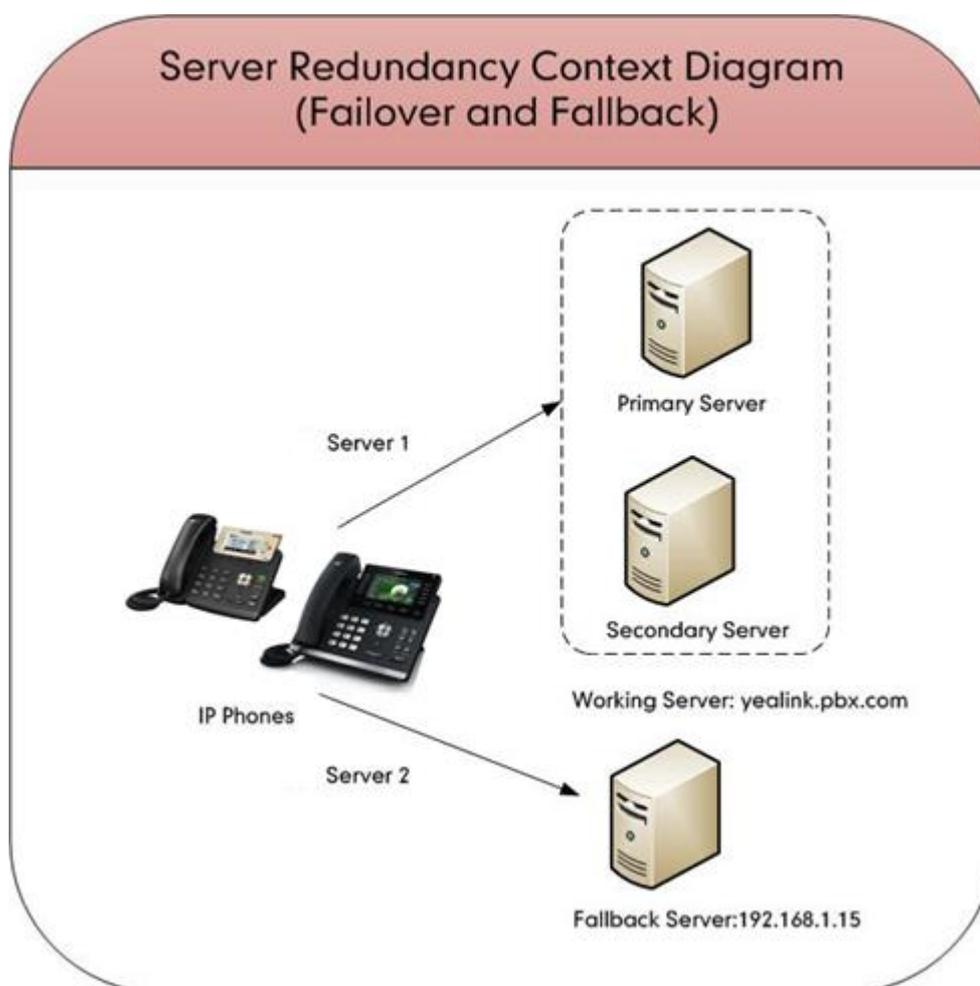
**Primary Server:** The primary server has the highest priority in a group of servers gained from

the DNS server.

**Secondary Server:** The secondary server backs up a primary server when the primary server fails. A secondary server may offer the same or less functionality than the primary server.

## Server Redundancy Implementation

To assist in explaining the server redundancy behavior, an illustrative example of how an IP phone may be configured is shown as below. In the example, server redundancy for fallback and failover purposes is deployed. Two separate servers (a working server and a fallback server) are configured for per line registration.



**Working Server:** Server 1 is configured with the domain name of the working server. For example, yealink.pbx.com. DNS mechanism is used such that the working server is resolved to multiple servers for failover purpose. The working server is deployed in redundant pairs, designated as primary and secondary servers. The primary server has the highest priority in a cluster of servers resolved by the DNS server. The secondary server backs up a primary server when the primary server fails and offers the same functionality as the primary server.

**Fallback Server:** Server 2 is configured with the IP address of the fallback server. For example, 192.168.1.15. A fallback server offers less functionality than the working server.

## Phone Registration

Registration method of the failover mode:

The IP phone must always register to the primary server first except in failover conditions. If this is unsuccessful, the phone will re-register as many times as configured until the registration is successful. When the primary server registration is unavailable, the secondary server will serve as the working server.

Registration methods of the fallback mode include:

- **Concurrent registration (default):** The IP phone registers to two SIP servers (working server and fallback server) at the same time. In a failure situation, a fallback server can take over the basic calling capability, but without some advanced features (for example, shared lines, call recording and MWI) offered by the working server. It does not apply to outbound proxy servers.
- **Successive registration:** The IP phone only registers to one server at a time. The IP phone first registers to the working server. In a failure situation, the IP phone registers to the fallback server.

## Server Domain Name Resolution

If a domain name is configured for a server, the IP address(es) associated with that domain name will be resolved through DNS as specified by RFC 3263. The DNS query involves NAPTR, SRV and A queries, which allows the IP phone to adapt to various deployment environments. The IP phone performs NAPTR query for the NAPTR pointer and transport protocol (UDP, TCP, and TLS), the SRV query on the record returned from the NAPTR for the target domain name and the port number, and the A query for the IP addresses.

If an explicit port (except 0) is specified and the transport type is set to DNS-NAPTR, A query will be performed only. If a server port is set to 0 and the transport type is set to DNS-NAPTR, NAPTR and SRV queries will be tried before falling to A query. If no port is found through the DNS query, 5060 will be used.

For more information, refer to [Appendix A: DNS SRV](#).

If your phone is not configured with a DNS server, or the DNS query returns no result from a DNS server, you can configure static DNS cache for the IP phone. The IP phone will attempt to resolve the domain name of the server with static DNS cache. For more information on static DNS cache, refer to [Appendix B: Static DNS Cache](#).

# Configuring Yealink IP Phones

## Configuring Server Redundancy via Web User Interface

The following takes configurations of a SIP-T46G IP phone running firmware 82 as examples.

**To configure server redundancy for fallback purpose via web user interface:**

1. Click on **Account->Register**.
2. Select the desired account from the **Account** drop-down menu.
3. Configure the registration parameters of the selected account in the corresponding fields.
4. Configure parameters of SIP server 1 and SIP server 2 in the corresponding fields.

The screenshot displays the Yealink T46G web interface for configuring an account. The 'Account' tab is selected, and the 'Register' sub-tab is active. The 'Account' dropdown menu is set to 'Account 1'. The configuration fields are as follows:

Field	Value
Register Status	Registered
Line Active	Enabled
Label	4605
Display Name	4605
Register Name	4605
User Name	4605
Password	*****
<b>SIP Server 1</b>	
Server Host	192.168.1.14 Port: 5060
Transport	UDP
Server Expires	3600
Server Retry Counts	3
<b>SIP Server 2</b>	
Server Host	192.168.1.15 Port: 5060
Transport	UDP
Server Expires	3600
Server Retry Counts	3
Enable Outbound Proxy Server	Disabled
Outbound Proxy Server 1	Port: 5060
Outbound Proxy Server 2	Port: 5060
Proxy Fallback Interval	3600
NAT	Disabled

The 'NOTE' section on the right contains the following information:

- Account Registration:** Registers account(s) for the IP phone.
- Server Redundancy:** It is often required in VoIP deployments to ensure continuity of phone service, for events where the server needs to be taken offline for maintenance, the server fails, or the connection between the IP phone and the server fails.
- NAT Traversal:** A general term for techniques that establish and maintain IP connections traversing NAT gateways. STUN is one of the NAT traversal techniques. You can configure NAT traversal for this account.

5. If you use outbound proxy servers, do the following:
  - 1) Select **Enabled** from the **Enable Outbound Proxy Server** drop-down menu.

- 2) Configure parameters of the outbound proxy server 1 and outbound proxy server 2 in the corresponding fields.

The screenshot shows the Yealink T46G web interface for configuring an account. The 'Account' tab is selected, and the 'Account 1' dropdown is visible. The configuration fields are as follows:

Field	Value	Port
Register Status	Registered	
Line Active	Enabled	
Label	4605	
Display Name	4605	
Register Name	4605	
User Name	4605	
Password	*****	
<b>SIP Server 1</b>		
Server Host	192.168.1.14	Port: 5060
Transport	UDP	
Server Expires	3600	
Server Retry Counts	3	
<b>SIP Server 2</b>		
Server Host	192.168.1.15	Port: 5060
Transport	UDP	
Server Expires	3600	
Server Retry Counts	3	
Enable Outbound Proxy Server	Enabled	
Outbound Proxy Server 1	10.1.8.11	Port: 5060
Outbound Proxy Server 2	10.1.8.12	Port: 5060
Proxy Fallback Interval	3600	
NAT	Disabled	

The 'NOTE' section on the right contains the following information:

**Account Registration**  
Registers account(s) for the IP phone.

**Server Redundancy**  
It is often required in VoIP deployments to ensure continuity of phone service, for events where the server needs to be taken offline for maintenance, the server fails, or the connection between the IP phone and the server fails.

**NAT Traversal**  
A general term for techniques that establish and maintain IP connections traversing NAT gateways. STUN is one of the NAT traversal techniques.

You can configure NAT traversal for this account.

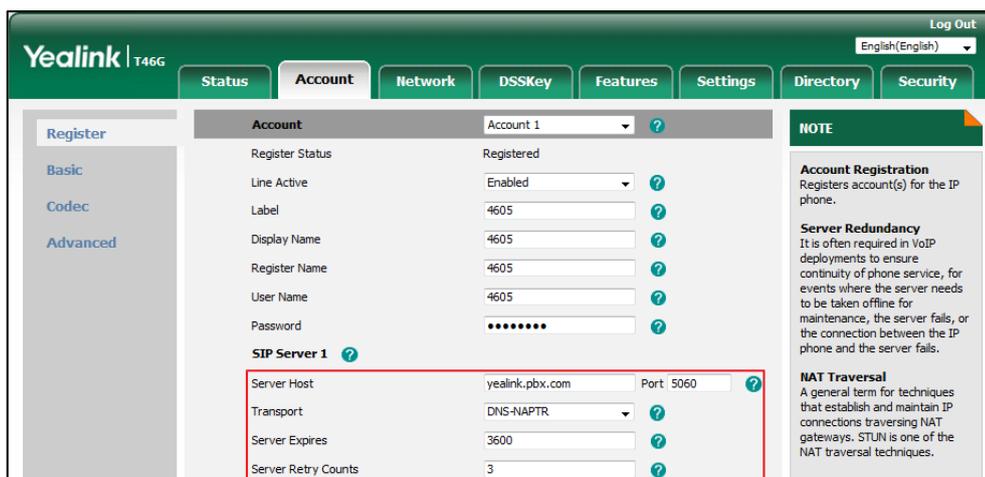
6. Click **Confirm** to accept the change.

**To configure server redundancy for failover purpose via web user interface:**

1. Click on **Account->Register**.
2. Select the desired account from the **Account** drop-down menu.
3. Configure the registration parameters of the selected account in the corresponding fields.
4. Configure parameters of the SIP server 1 or SIP server 2 in the corresponding fields.

You must set the port of SIP server to 0 for NAPTR, SRV and A queries.

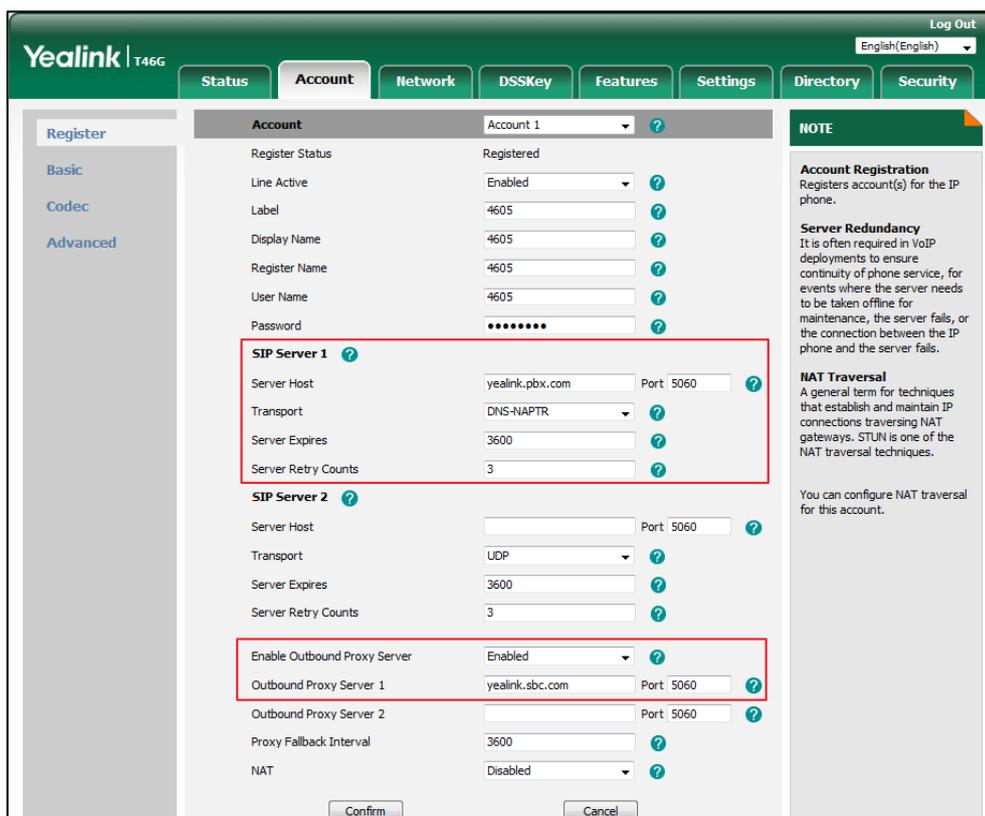
5. Select **DNS-NAPTR** from the **Transport** drop-down menu.



6. If you use outbound proxy servers, do the following:

- 1) Select **Enabled** from the **Enable Outbound Proxy Server** drop-down menu.
- 2) Configure parameters of the outbound proxy server 1 or outbound proxy server 2 in the corresponding fields.

You must set the port of outbound proxy to 0 for NAPTR, SRV and A queries.



7. Click **Confirm** to accept the change.

# Configuring Server Redundancy Using Configuration Files

## To configure server redundancy feature using configuration files:

1. Add/Edit server redundancy parameters in configuration files.

The following table lists the information of parameters:

(For VP59/SIP

VP-T49G/SIP-T58A/T57W/T54W/T48U/T48G/T48S/T46U/T46G/T46S/T29G: X ranges from 1 to 16;

For SIP-T53W/T53/T43U/T42G/T42S: X ranges from 1 to 12;

For W53P/W60P/CP930W-Base: X ranges from 1 to 8.

For SIP-T42U/T41P/T41S/T27G: X ranges from 1 to 6;

For W52P/W56P: X ranges from 1 to 5;

For SIP-T33P/T33G: X ranges from 1 to 4;

For SIP-T40P/T40G/T23P/T23G: X ranges from 1 to 3;

For SIP-T31P/T31G/T31/T21(P) E2: X ranges from 1 to 2;

For SIP-T30P/T30/T19(P) E2/CP860/CP920/CP960: X is equal to 1;

Y ranges from 1 to 2)

Parameters	Permitted Values	Default
<b>account.X.enable</b>	<b>0 or 1</b>	<b>0</b>
<p><b>Description:</b> Enables or disables the account X.</p> <p><b>0</b>-Disabled <b>1</b>-Enabled</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;Line Active</p> <p><b>Phone User Interface:</b> Menu-&gt;Advanced (default password: admin) -&gt;Account-&gt;Activation</p>		
<b>account.X.label</b>	<b>String</b>	<b>Blank</b>

Parameters	Permitted Values	Default
<p><b>Description:</b> Configures the label displayed on the LCD screen for a specific account.</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;Label</p> <p><b>Phone User Interface:</b> Menu-&gt;Advanced (default password: admin) -&gt;Account-&gt;Label</p>		
<b>account.X.display_name</b>	<b>String</b>	<b>Blank</b>
<p><b>Description:</b> Configures the display name for a specific account.</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;Display Name</p> <p><b>Phone User Interface:</b> Menu-&gt;Advanced (default password: admin) -&gt;Account-&gt;Display Name</p>		
<b>account.X.auth_name</b>	<b>String</b>	<b>Blank</b>
<p><b>Description:</b> Configures the user name for register authentication for a specific account.</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;Register Name</p> <p><b>Phone User Interface:</b> Menu-&gt;Advanced (default password: admin) -&gt;Account-&gt;Register Name</p>		
<b>account.X.user_name</b>	<b>String</b>	<b>Blank</b>
<p><b>Description:</b> Configures the register user name for a specific account.</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;User Name</p> <p><b>Phone User Interface:</b> Menu-&gt;Advanced (default password: admin) -&gt;Account-&gt;User Name</p>		
<b>account.X.password</b>	<b>String</b>	<b>Blank</b>
<p><b>Description:</b> Configures the password for register authentication for a specific account.</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;Password</p>		

Parameters	Permitted Values	Default
<b>Phone User Interface:</b> Menu->Advanced (default password: admin) ->Account->Password		
<b>account.X.sip_server.Y.address</b>	<b>String within 256 characters</b>	<b>Blank</b>
<b>Description:</b> Configures the IP address or domain name of the SIP server Y that accepts registrations a specific account.  <b>Web User Interface:</b> Account->Register->SIP Server Y->Server Host  <b>Phone User Interface:</b> Menu->Advanced (default password: admin) ->Accounts->SIP ServerY		
<b>account.X.sip_server.Y.port</b>	<b>Integer from 0 to 65535</b>	<b>5060</b>
<b>Description:</b> Configures the port of the SIP server Y that specifies registrations for a specific account.  <b>Web User Interface:</b> Account->Register->SIP Server Y->Port		
<b>account.X.sip_server.Y.transport_type</b>	<b>0, 1, 2 or 3</b>	<b>0</b>
<b>Description:</b> Configures the transport method the IP phone uses to communicate with the SIP server for a specific account.  <b>0-UDP</b> <b>1-TCP</b> <b>2-TLS</b> <b>3-DNS-NAPTR</b>  <b>Web User Interface:</b> Account->Register->SIP Server Y->Transport		
<b>account.X.sip_server.Y.expires</b>	<b>Integer from 30 to 2147483647</b>	<b>3600</b>
<b>Description:</b> Configures the registration expires (in seconds) of the SIP server Y a specific account.  <b>Web User Interface:</b>		

Parameters	Permitted Values	Default
Account->Register->SIP Server Y->Server Expires		
<b>account.X.sip_server.Y.retry_counts</b>	<b>Integer from 0 to 20</b>	<b>3</b>
<p><b>Description:</b> Configures the retry times for the IP phone to resend requests when the SIP server Y is unavailable or there is no response from the SIP server Y for a specific account.</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;SIP Server Y-&gt;Server Retry Counts</p>		
<b>account.X.outbound_proxy_enable</b>	<b>0 or 1</b>	<b>0</b>
<p><b>Description:</b> Enables or disables the phone to use the outbound proxy server for a specific account. <b>0</b>-Disabled <b>1</b>-Enabled</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;Enable Outbound Proxy Server</p> <p><b>Phone User Interface:</b> Menu-&gt;Advanced (default password: admin) -&gt;Account-&gt;Outbound Status</p>		
<b>account.X.outbound_host</b>	<b>IP address or domain name</b>	<b>Blank</b>
<p><b>Description:</b> Configures the IP address or domain name of the outbound proxy server 1 a specific account.</p> <p><b>Note:</b> It is only applicable to IP phones (except SIP-T58A/CP960 IP phones) running firmware version 80 or prior.</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;Outbound Proxy Server 1</p> <p><b>Phone User Interface:</b> Menu-&gt;Advanced (default password: admin) -&gt;Account-&gt;Outbound Proxy1</p>		
<b>account.X.outbound_port</b>	<b>Integer from 0 to 65535</b>	<b>5060</b>
<p><b>Description:</b> Configures the port of the outbound proxy server 1 a specific account.</p> <p><b>Note:</b> It is only applicable to IP phones (except SIP-T58A/CP960 IP phones) running</p>		

Parameters	Permitted Values	Default
firmware version 80 or prior. <b>Web User Interface:</b> Account->Register->Outbound Proxy Server 1->Port		
<b>account.X.backup_outbound_host</b>	<b>IP Address or Domain Name</b>	<b>Blank</b>
<p><b>Description:</b> Configures the IP address or domain name of the outbound proxy server 2 for a specific account.</p> <p><b>Note:</b> It is only applicable to IP phones (except SIP-T58A/CP960 IP phones) running firmware version 80 or prior.</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;Outbound Proxy Server 2</p> <p><b>Phone User Interface:</b> Menu-&gt;Advanced (default password: admin) -&gt;Account-&gt;Outbound Proxy2</p>		
<b>account.X.backup_outbound_port</b>	<b>Integer from 0 to 65535</b>	<b>5060</b>
<p><b>Description:</b> Configures the port of the outbound proxy server 2 for a specific account.</p> <p><b>Note:</b> It is only applicable to IP phones (except SIP-T58A/CP960 IP phones) running firmware version 80 or prior.</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;Outbound Proxy Server 2-&gt;Port</p>		
<b>account.X.outbound_proxy.Y.address</b>	<b>IP Address or Domain Name</b>	<b>Blank</b>
<p><b>Description:</b> Configures the IP address or domain name of the outbound proxy server Y for a specific account.</p> <p><b>Note:</b> It is only applicable to VP59/SIP-T58A/CP960 IP phones and other IP phones running firmware version 81 or later.</p> <p><b>Web User Interface:</b> Account-&gt;Register-&gt;Outbound Proxy Server Y</p> <p><b>Phone User Interface:</b> Menu-&gt;Advanced (default password: admin) -&gt;Account-&gt;Outbound ProxyY</p>		
<b>account.X.outbound_proxy.Y.port</b>	<b>Integer</b>	<b>5060</b>

Parameters	Permitted Values	Default
	from 0 to 65535	
<p><b>Description:</b></p> <p>Configures the port of the outbound proxy server Y for a specific account.</p> <p><b>Note:</b> It is only applicable to VP59/SIP-T58A/CP960 IP phones and other IP phones running firmware version 81 or later.</p> <p><b>Web User Interface:</b></p> <p>Account-&gt;Register-&gt;Outbound Proxy Server Y-&gt;Port</p>		
<b>account.X.outbound_proxy.Y.retry_counts</b>	<b>Integer from 0 to 20</b>	<b>-1</b>
<p><b>Description:</b></p> <p>Configures the retry times for the IP phone to resend requests when the outbound proxy server Y is unavailable or there is no response from the outbound proxy server Y for a specific account.</p> <p>If it is set to <b>-1</b>, the IP phone will invoke the value of the parameter "account.X.sip_server.Y.retry_counts" to take effect.</p> <p><b>Example:</b></p> <p>account.1.outbound_proxy.1.retry_counts = 3</p> <p>The IP phone moves to the next available outbound proxy server after three failed attempts.</p> <p><b>Note:</b> It is only applicable to IP phones running firmware version 82 or later.</p>		
<b>Fallback Mode</b>		
<b>account.X.fallback.redundancy_type</b>	<b>0 or 1</b>	<b>0</b>
<p><b>Description:</b></p> <p>Configures the registration mode for the IP phone in fallback mode.</p> <p><b>0</b>-Concurrent Registration</p> <p><b>1</b>-Successive Registration</p> <p><b>Note:</b> It does not apply to outbound proxy servers.</p>		
<b>account.X.fallback.timeout</b>	<b>Integer from 10 to 2147483647</b>	<b>120</b>
<p><b>Description:</b></p> <p>Configures the time interval (in seconds) for the IP phone to detect whether the working server is available by sending the registration request after the fallback server takes over call control.</p> <p><b>Note:</b> It works only if the value of the parameter "account.X.fallback.redundancy_type" is set</p>		

Parameters	Permitted Values	Default
to 1 (Successive Registration). It does not apply to outbound proxy servers.		
<b>account.X.outbound_proxy_fallback_interval</b>	<b>Integer</b>	<b>3600</b>
<p><b>Description:</b></p> <p>Configures the time interval (in seconds) for the IP phone to detect whether the working outbound proxy server is available by sending the registration request after the fallback server takes over call control.</p> <p><b>Note:</b> It is only applicable to outbound proxy servers.</p> <p><b>Web User Interface:</b></p> <p>Account-&gt;Register-&gt;Proxy Fallback Interval</p> <p><b>Phone User Interface:</b></p> <p>Menu-&gt;Advanced (default password: admin) -&gt;Account-&gt;Proxy Fallback Interval</p>		
<b>Failover Mode for SIP server</b>		
<b>account.X.sip_server.Y.register_on_enable</b>	<b>0 or 1</b>	<b>0</b>
<p><b>Description:</b></p> <p>Enables or disables the IP phone to register to the secondary server before sending requests to it for a specific account when encountering a failover.</p> <p><b>0</b>-Disabled</p> <p><b>1</b>-Enabled</p> <p>If it is set to 0 (Disabled), the IP phone won't attempt to register to the secondary server, since the phone assumes that the primary and secondary servers share registration information. So the IP phone will directly send the requests to the secondary server.</p> <p>If it is set to 1 (Enabled), the IP phone will register to the secondary server first, and then send the requests to it.</p>		
<b>account.X.sip_server.Y.only_signal_with_registered</b>	<b>0 or 1</b>	<b>0</b>
<p><b>Description:</b></p> <p>Enables or disables the IP phone to only send requests to the registered server for a specific account when encountering a failover.</p> <p><b>0</b>-Disabled</p> <p><b>1</b>-Enabled</p> <p><b>Note:</b> It is only applicable to IP phones running firmware version 81 or later.</p>		
<b>account.X.sip_server.Y.invite_retry_counts</b>	<b>Integer from 1 to 10</b>	<b>3</b>

Parameters	Permitted Values	Default
<p><b>Description:</b></p> <p>Configures the number of retries attempted before sending requests to the next available server for a specific account when encountering a failover.</p> <p><b>Note:</b> It is only applicable to IP phones running firmware version 81 or later.</p>		
<b>account.X.sip_server.Y.failback_mode</b>	<b>0, 1, 2 or 3</b>	<b>0</b>
<p><b>Description:</b></p> <p>Configures how the phone fails back to the primary server.</p> <p><b>0</b>-newRequests: all requests are sent to the primary server first, regardless of the last server that was used.</p> <p><b>1</b>-DNSTTL: the IP phone will send requests to the last used server first. If the time defined by DNSTTL on the server expires, the phone will retry to send requests to the primary server.</p> <p><b>2</b>-registration: the IP phone will send requests to the last used server first. If the registration expires, the phone will retry to send requests to the primary server.</p> <p><b>3</b>-duration: the IP phone will send requests to the last registered server first. If the time defined by the parameter “account.X.sip_server.Y.failback_timeout” expires, the phone will retry to send requests to the primary server.</p> <p><b>Note:</b> DNSTTL, Registration and duration mode can only be processed when the IP phone is idle (that is, no incoming/outbound calls, no active calls or meetings, etc.).</p>		
<b>account.X.sip_server.Y.failback_timeout</b>	<b>0, Integer from 60 to 65535</b>	<b>3600</b>
<p><b>Description:</b></p> <p>Configures the timeout (in seconds) for the phone to retry to send requests to the primary server after failing over to the current working server for a specific account.</p> <p>If you set the parameter to 0, the IP phone will not send requests to the primary server until a failover event occurs with the current working server.</p> <p>If you set the parameter from 1 to 59, the timeout will be 60 seconds.</p> <p><b>Note:</b> It works only if the value of the parameter “account.X.sip_server.Y.failback_mode” is set to 3 (duration).</p>		
<b>account.X.sip_server.Y.failback_subscribe.enable</b>	<b>0 or 1</b>	<b>0</b>
<p><b>Description:</b></p> <p>Enables or disables the IP phone to retry to re-subscribe after registering to the secondary server with the different IP address for a specific account when encountering a failover.</p> <p><b>0</b>-Disabled</p> <p><b>1</b>-Enabled</p>		

Parameters	Permitted Values	Default
<p>If it is set to 1 (Enabled), the IP phone will immediately re-subscribe to the secondary server, for ensuring the normal use of the features associated with the subscription (e.g., BLF, SCA).</p> <p><b>Note:</b> It is only applicable to IP phones running firmware version 81 or later. It works only if the value of the parameter "account.X.sip_server.Y.failback_mode" is set to 1, 2 or 3.</p>		
<b>Failover Mode for outbound proxy server</b>		
<b>account.X.outbound_proxy.Y.register_on_enable</b>	<b>0 or 1</b>	<b>-1</b>
<p><b>Description:</b></p> <p>Enables or disables the IP phone to register to the secondary outbound proxy server before sending requests to it for a specific account when encountering a failover.</p> <p><b>0</b>-Disabled, the IP phone won't attempt to register to the secondary outbound proxy server, since the phone assumes that the primary and secondary outbound proxy servers share registration information. So the IP phone will directly send the requests to the secondary outbound proxy server.</p> <p><b>1</b>-Enabled, the IP phone will register to the secondary outbound proxy server first, and then send the requests to it.</p> <p>If it is set to <b>-1</b>, the IP phone will invoke the value of the parameter "account.X.sip_server.Y.register_on_enable" to take effect.</p> <p><b>Note:</b> It is only applicable to IP phones running firmware version 82 or later.</p>		
<b>account.X.outbound_proxy.Y.only_signal_with_registered</b>	<b>0 or 1</b>	<b>-1</b>
<p><b>Description:</b></p> <p>Enables or disables the IP phone to only send requests to the registered outbound proxy server for a specific account when encountering a failover.</p> <p><b>0</b>-Disabled</p> <p><b>1</b>-Enabled</p> <p>If it is set to <b>-1</b>, the IP phone will invoke the value of the parameter "account.X.sip_server.Y.retry_counts" to take effect.</p> <p><b>Note:</b> It works only if the value of the parameter "account.X.outbound_proxy.Y.register_on_enable" is set to 1 (Enabled) and the value of the parameter "account.X.outbound_proxy.Y.failback_mode" is set to 1, 2 or 3.</p> <p><b>Note:</b> It is only applicable to IP phones running firmware version 82 or later.</p>		
<b>account.X.outbound_proxy.Y.invite_retry_counts</b>	<b>Integer from 1 to 10</b>	<b>-1</b>
<p><b>Description:</b></p>		

Parameters	Permitted Values	Default
<p>Configures the number of retries attempted before sending requests to the next available outbound proxy server for a specific account when encountering a failover.</p> <p>If it is set to -1, the IP phone will invoke the value of the parameter “account.X.sip_server.Y.invite_retry_counts” to take effect.</p> <p><b>Note:</b> It is only applicable to IP phones running firmware version 82 or later.</p>		
<b>account.X.outbound_proxy.Y.failback_mode</b>	<b>0, 1, 2 or 3</b>	<b>-1</b>
<p><b>Description:</b></p> <p>Configures the failback mode for the IP phone to retry the primary outbound proxy server in failover for a specific account.</p> <p>If it is set to -1, the IP phone will invoke the value of the parameter “account.X.sip_server.Y.failback_mode” to take effect.</p> <p><b>0</b>-newRequests: all requests are sent to the primary outbound proxy server first, regardless of the last server that was used. If the primary outbound proxy server does not respond correctly, the IP phone will try to send requests to the secondary outbound proxy server.</p> <p><b>1</b>-DNSTTL: the IP phone will send requests to the last registered outbound proxy server first. If the TTL for the DNS A records on the registered outbound proxy server expires, the phone will retry to send requests to the primary outbound proxy server.</p> <p><b>2</b>-Registration: the IP phone will send requests to the last registered outbound proxy server first. If the registration expires, the phone will retry to send requests to the primary outbound proxy server.</p> <p><b>3</b>-duration: the IP phone will send requests to the last registered outbound proxy server first. If the time defined by the parameter “account.X.outbound_proxy.Y.failback_timeout” expires, the phone will retry to send requests to the primary outbound proxy server.</p> <p><b>Note:</b> DNSTTL, Registration and duration mode can only be processed when the IP phone is idle (that is, no incoming/outbound calls, no active calls or meetings, and so on.).</p> <p><b>Note:</b> It is only applicable to IP phones running firmware version 82 or later.</p>		
<b>account.X.outbound_proxy.Y.failback_timeout</b>	<b>0, Integer from 60 to 65535</b>	<b>-1</b>
<p><b>Description:</b></p> <p>Configures the timeout (in seconds) for the phone to retry to send requests to the primary outbound proxy server after failing over to the current working server for a specific account.</p> <p>If it is set to -1, the IP phone will invoke the value of the parameter “account.X.sip_server.Y.failback_timeout” to take effect.</p> <p>If you set the parameter to 0, the IP phone will not send requests to the primary outbound proxy server until a failover event occurs with the current working server.</p> <p>If you set the parameter from 1 to 59, the timeout will be 60 seconds.</p>		

Parameters	Permitted Values	Default
<p><b>Note:</b> It works only if the value of the parameter “account.X.outbound_proxy.Y.failback_mode” is set to 3 (duration).</p> <p><b>Note:</b> It is only applicable to IP phones running firmware version 82 or later.</p>		
<b>account.X.outbound_proxy.Y.failback_subscribe.enable</b>	<b>0 or 1</b>	<b>-1</b>
<p><b>Description:</b></p> <p>Enables or disables the IP phone to retry to re-subscribe after registering to the secondary outbound proxy server with the different IP address for a specific account when encountering a failover.</p> <p><b>0</b>-Disabled</p> <p><b>1</b>-Enabled, the IP phone will immediately re-subscribe to the secondary outbound proxy server, for ensuring the normal use of the features associated with the subscription (e.g., BLF, SCA).</p> <p>If it is set to <b>-1</b>, the IP phone will invoke the value of the parameter “account.X.sip_server.Y.failback_subscribe.enable” to take effect.</p> <p><b>Note:</b> It works only if the value of the parameter “account.X.outbound_proxy.Y.failback_mode” is set to 1, 2 or 3.</p> <p><b>Note:</b> It is only applicable to IP phones running firmware version 82 or later.</p>		

The following shows an example of failover configurations for account 1 in the <y0000000000xx.cfg> configuration file:

```
##Account1 Registration
account.1.enable = 1
account.1.label = 4605
account.1.display_name = 4605
account.1.auth_name = 4605
account.1.user_name = 4605
account.1.password = 4605
account.1.sip_server.1.address = yealink.pbx.com
account.1.sip_server.1.port = 0
account.1.sip_server.1.expires = 3600
account.1.sip_server.1.retry_counts = 3
account.1.outbound_proxy_enable = 1
account.1.outbound_proxy.1.address = yealink.pbx.com
account.1.outbound_proxy.1.port = 0
account.1.outbound_proxy.Y.retry_counts = 3
```

**##DNS SRV**

```
account.1.sip_server.1.transport_type = 3
```

**##Failover Mode for SIP server**

```
account.1.sip_server.1.register_on_enable = 0
```

```
account.1.sip_server.1.only_signal_with_registered = 1
```

```
account.1.sip_server.1.invite_retry_counts = 5
```

```
account.1.sip_server.1.failback_mode = 3
```

```
account.1.sip_server.1.failback_timeout = 3600
```

```
account.1.sip_server.1.failback_subscribe.enable = 1
```

**##Failover Mode for outbound proxy server**

```
account.1.outbound_proxy.Y.register_on_enable = -1
```

```
account.1.outbound_proxy.Y.only_signal_with_registered = -1
```

```
account.1.outbound_proxy.Y.invite_retry_counts = -1
```

```
account.1.outbound_proxy.Y.failback_mode = -1
```

```
account.1.outbound_proxy.Y.failback_timeout = -1
```

```
account.1.outbound_proxy.Y.failback_subscribe.enable = -1
```

2. Upload configuration files to the root directory of the provisioning server and trigger IP phones to perform an auto provisioning for configuration update.

For more information on auto provisioning, refer to the latest Auto Provisioning Guide on [Yealink Technical Support](#).

## Using Server Redundancy on Yealink IP Phones

### Fallback Scenario

The following introduces a REGISTER fallback scenario. The SIP server 1 (working server) and SIP server 2 (fallback server) are configured with the IP address respectively for account 1. The parameter “account.1.fallback.redundancy\_type” is configured as 1 (Successive Registration). You do not use the outbound proxy servers.

#### REGISTER Fallback

The phone has the ability to failover to a fallback server when the working server has no response to a REGISTER request.

1. The phone sends a REGISTER request to the working server.
2. The phone retries to send REGISTER requests to the working server (three times by default).
3. After no response from the working server, the phone sends a REGISTER request to the fallback server after the registration time defined for the working server expires.
4. The fallback server responds with 200 OK to the REGISTER request.

The phone sends REGISTER requests to the working server to detect whether the server is available at intervals defined by the “account.1.fallback.timeout” parameter after failing over to the fallback server. When the working server recovers, the phone has the ability to fallback next REGISTER request to the working server.

The following introduces an INVITE fallback scenario. The SIP server 1 (working server) and SIP server 2 (fallback server) are configured with the IP address respectively for account 1. The parameter “account.1.fallback.redundancy\_type” is configured as 0 (Concurrent Registration).

### **INVITE Fallback**

The phone has the ability to failover to a fallback server when the working server has no response to an INVITE request.

1. Phone A places a call to Phone B.
2. Phone B answers the call.

The following SIP messages appear:

- Phone A sends an INVITE request to the working server.
- Phone A retries INVITE requests to the working server (three times by default).
- After no response from the working server, the phone sends an INVITE request to the fallback server.
- The fallback server responds with 200 OK to the INVITE request.

Phone A sends REGISTER requests to the working server to detect whether the server is available. When the working server recovers, the phone has the ability to fallback the INVITE request to the working server.

### **Failover Scenario**

The following introduces a REGISTER failover scenario. The SIP server 1 is configured with the domain name of the working server for account 1. The working server is resolved to two SIP servers (primary server and secondary server) using the DNS mechanism. The parameter “account.1.sip\_server.1.fallback\_mode” is configured as 0 (newRequests) and “account.1.sip\_server.1.register\_on\_enable” is configured as 0 (Disabled). You do not use the outbound proxy servers.

### **REGISTER Failover**

The phone has the ability to failover to a secondary server when the primary server has no response to a REGISTER request.

1. The phone sends REGISTER request to the primary server.
2. The phone retries REGISTER requests to the primary server (three times by default).
3. After no response from the primary server, the phone sends a REGISTER request to the secondary server.
4. The secondary server responds with 200 OK to the REGISTER request.

The phone waits until the next REGISTER attempt and then sends the next REGISTER request

to the primary server. When the primary server recovers, the phone has the ability to failback next REGISTER request to the primary server.

### INVITE Failover

The phone has the ability to failover to a secondary server when the primary server has no response to an INVITE request.

1. Phone A places a call to Phone B.
2. Phone B answers the call.

The following SIP messages appear:

- Phone A sends an INVITE request to the primary server.
- Phone A retries INVITE requests to the primary server (three times by default).
- After no response from the primary server, the phone sends an INVITE request to the secondary server.
- The secondary server responds with 200 OK to the INVITE request.

When phone A places a call to Phone B again, the phone sends an INVITE request to the primary server first. When the primary server recovers, the phone can immediately failback the INVITE request to the primary server after failing over to the secondary server.

## Appendix A: DNS SRV

The following details the procedures of the DNS query for the IP phone to resolve the domain name (e.g., yealink.pbx.com) of the working server into the IP address, port, and transport protocol.

### NAPTR (Naming Authority Pointer)

First, the IP phone sends the NAPTR query to get the NAPTR pointer and transport protocol.

Example of NAPTR records:

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

Parameters are explained in the following table:

Parameter	Description
order	Specifies preferential treatment for the specific record. The order is from lowest to highest, lower order is more preferred.
pref	Specifies the preference for processing multiple NAPTR records with the same order value. The lower value is more preferred.
flags	The flag "s" means to perform an SRV lookup.
service	Specify the transport protocols supported:

Parameter	Description
	SIP+D2U: SIP over UDP SIP+D2T: SIP over TCP SIP+D2S: SIP over SCTP SIPS+D2T: SIPS over TCP
regexp	Always empty for SIP services.
replacement	Specifies a domain name for the next query.

The IP phone picks the first record because its order of 90 is lower than 100. The pref parameter is unimportant as there is no other record with order 90. The flag “s” indicates performing the SRV query next. TCP will be used, targeted to a host determined by an SRV query of “\_sip.\_tcp.yealink.pbx.com”. If the flag of the NAPTR record returned is empty, the IP phone will perform the NAPTR query again according to the previous NAPTR query result.

### SRV (Service Location Record)

The IP phone performs an SRV query on the record returned from the NAPTR for the hostname and the port number. Example of SRV records:

	Priority	Weight	Port	Target
IN SRV	0	1	5060	server1.yealink.pbx.com
IN SRV	0	2	5060	server2.yealink.pbx.com

Parameters are explained in the following table:

Parameter	Description
Priority	Specifies preferential treatment for the specific host entry. Lower priority is more preferred.
Weight	When priorities are equal, weight is used to differentiate the preference. The preference is from highest to lowest. Again, keep the same to load balance.
Port	Identifies the port number to be used.
Target	Identifies the actual host for an A query.

SRV query returns two records. The two SRV records point to different hosts and have the same priority 0. The weight of the second record is higher than the first one, so the second record will be picked first. The two records also contain a port “5060”, the IP phone uses this port. If the Target is not a numeric IP address, the IP phone performs an A query. So in this case, the IP phone uses “server1.yealink.pbx.com” and “server2.yealink.pbx.com” for the A query.

### A (Host IP Address)

The IP phone performs an A query for the IP address of each target hostname. Example of A records:

Server1.yealink.pbx.com IN A 192.168.1.13

Server2.yealink.pbx.com IN A 192.168.1.14

The IP phone picks the IP address “192.168.1.14” first.

## Appendix B: Static DNS Cache

Yealink IP phones allow you to statically configure a set of NAPTR/SRV/A records. The following details the configuration parameters of the static DNS cache for the IP phone to resolve the domain name of the server.

You can specify the preference of the records used by IP phones. To use static DNS cache preferentially, set the following parameter to 1.

(For VP59/SIP VP-T49G/SIP-T58A/T57W/T54W/T48U/T48G/T48S/T46U/T46G/T46S/T29G: X ranges from 1 to 16;

For SIP-T53W/T53/T43U/T42G/T42S: X ranges from 1 to 12;

For W53P/W60P/CP930W-Base: X ranges from 1 to 8.

For SIP-T42U/T41P/T41S/T27G: X ranges from 1 to 6;

For W52P/W56P: X ranges from 1 to 5;

For SIP-T33P/T33G: X ranges from 1 to 4;

For SIP-T40P/T40G/T23P/T23G: X ranges from 1 to 3;

For SIP-T31P/T31G/T31/T21(P) E2: X ranges from 1 to 2;

For SIP-T30P/T30/T19(P) E2/CP860/CP960: X is equal to 1)

Parameters	Permitted Values	Default
<b>account.X.dns_cache_type</b>	<b>0, 1 or 2</b>	<b>1</b>
<p><b>Description:</b></p> <p>Configures whether the IP phone uses the DNS cache for domain name resolution of the server and caches the additional DNS records for a specific account.</p> <p><b>0</b>-Perform real-time DNS query rather than using DNS cache.</p> <p><b>1</b>-Use DNS cache, but do not cache the additional DNS records.</p> <p><b>2</b>-Use DNS cache and cache the additional DNS records.</p>		
<b>account.X.static_cache_pri</b>	<b>0 or 1</b>	<b>0</b>
<p><b>Description:</b></p> <p>Configures whether preferentially to use the static DNS cache for domain name resolution of the server for a specific account.</p> <p><b>0</b>-Use domain name resolution from server preferentially</p> <p><b>1</b>-Use static DNS cache preferentially</p>		

## Specifying DNS A Parameters

The following table lists the configuration parameters for specifying the domain name, IP address, and Time to Live (TTL) for A record (X ranges from 1 to 12):

Parameters	Permitted Values	Default
<b>dns_cache_a.X.name</b>	<b>Domain name</b>	<b>Blank</b>
<b>Description:</b> Configures the domain name in A record X.		
<b>dns_cache_a.X.ip</b>	<b>String</b>	<b>Blank</b>
<b>Description:</b> Configures the IP address that the domain name in A record X maps to.		
<b>dns_cache_a.X.ttl</b>	<b>Integer from 30 to 2147483647</b>	<b>300</b>
<b>Description:</b> Configures the time interval (in seconds) that A record X may be cached before the record should be consulted again.		

## Specify DNS SRV Parameters

The following table lists the configuration parameters for specifying the domain name, port, priority, target, weight and Time to Live (TTL) for SRV record (X ranges from 1 to 12):

Parameters	Permitted Values	Default
<b>dns_cache_srv.X.name</b>	<b>Domain name</b>	<b>Blank</b>
<b>Description:</b> Configures the domain name in SRV record X.		
<b>dns_cache_srv.X.port</b>	<b>Integer from 0 to 65535</b>	<b>0</b>
<b>Description:</b> Configures the port to be used in SRV record X.		
<b>dns_cache_srv.X.priority</b>	<b>Integer from 0 to 65535</b>	<b>0</b>
<b>Description:</b> Configures the priority for the target host in SRV record X. Lower priority is more preferred. For example, the SRV record with the priority value 0 is		

Parameters	Permitted Values	Default
<p>more preferred than that with the priority value 1 because 0 is lower than 1.</p> <p><b>Note:</b> For more information, refer to <a href="#">RFC 2782</a>.</p>		
<b>dns_cache_srv.X.target</b>	<b>Domain name</b>	<b>Blank</b>
<p><b>Description:</b></p> <p>Configures the domain name of the target host for an A query in SRV record X.</p> <p><b>Note:</b> For more information, refer to <a href="#">RFC 2782</a>.</p>		
<b>dns_cache_srv.X.weight</b>	<b>Integer from 0 to 65535</b>	<b>0</b>
<p><b>Description:</b></p> <p>Configures the weight of the target host in SRV record X.</p> <p>When priorities are equal, weight is used to differentiate the preference. The higher weight value is more preferred.</p> <p><b>Note:</b> For more information, refer to <a href="#">RFC 2782</a>.</p>		
<b>dns_cache_srv.X.ttl</b>	<b>Integer from 30 to 2147483647</b>	<b>300</b>
<p><b>Description:</b></p> <p>Configures the time interval (in seconds) that SRV record X may be cached before the record should be consulted again.</p>		
<b>account.X.naptr_build</b>	<b>0 or 1</b>	<b>0</b>
<p><b>Description:</b></p> <p>Configures the way of SRV query for the IP phone to be performed when no result is returned from the NAPTR query for a specific account.</p> <p><b>0</b>-SRV query using UDP only</p> <p><b>1</b>-SRV query using UDP, TCP and TLS</p>		

## Specify DNS NAPTR Parameters

The following table lists the configuration parameters for specifying the domain name, order, flags, preference, replacement, service and Time to Live (TTL) for NAPTR record (X ranges from 1 to 12):

Parameters	Permitted Values	Default
<b>dns_cache_naptr.X.name</b>	<b>Domain Name</b>	<b>Blank</b>
<p><b>Description:</b></p> <p>Configures the domain name to which NAPTR record X refers.</p>		

Parameters	Permitted Values	Default
<b>dns_cache_naptr.X.flags</b>	<b>S, A, U or P</b>	<b>Blank</b>
<p><b>Description:</b></p> <p>Configures the flag of NAPTR record X. (Always “S” for SIP, which means to do an SRV lookup on whatever is in the replacement field).</p> <p><b>S</b>-Do an SRV lookup next.</p> <p><b>A</b>-Do an A lookup next.</p> <p><b>U</b>-No need to do a DNS query next.</p> <p><b>P</b>-Service customized by the user</p> <p><b>Note:</b> For more details of the permitted flags, refer to <a href="#">RFC 2915</a>.</p>		
<b>dns_cache_naptr.X.order</b>	<b>Integer from 0 to 65535</b>	<b>0</b>
<p><b>Description:</b></p> <p>Configures the order of NAPTR record X.</p> <p>NAPTR record with lower order is more preferred. For example, the NAPTR record with the order 90 has a higher priority than that with the order 100 because 90 is lower than 100.</p>		
<b>dns_cache_naptr.X.preference</b>	<b>Integer from 0 to 65535</b>	<b>0</b>
<p><b>Description:</b></p> <p>Configures the preference of NAPTR record X.</p> <p>NAPTR record with the lower value is more preferred when the multiple NAPTR records have the same order value.</p>		
<b>dns_cache_naptr.X.replace</b>	<b>Domain name</b>	<b>Blank</b>
<p><b>Description:</b></p> <p>Configures a domain name to be used for the next SRV query in NAPTR record X.</p>		
<b>dns_cache_naptr.X.service</b>	<b>String within 32 characters</b>	<b>Blank</b>
<p><b>Description:</b></p> <p>Configures the transport protocol available for the server in NAPTR record X.</p> <p><b>SIP+D2U:</b> SIP over UDP</p> <p><b>SIP+D2T:</b> SIP over TCP</p> <p><b>SIP+D2S:</b> SIP over SCTP</p> <p><b>SIPS+D2T:</b> SIPS over TCP</p> <p><b>Note:</b> For more information, refer to <a href="#">RFC 2915</a>.</p>		
<b>dns_cache_naptr.X.ttl</b>	<b>Integer from 30 to 2147483647</b>	<b>300</b>

Parameters	Permitted Values	Default
<p><b>Description:</b> Configures the time interval (in seconds) that NAPTR record X may be cached before the record should be consulted again.</p>		

## Example Configuration

The following three examples show you how to configure the static DNS cache.

### Example 1

This example shows how to configure static DNS cache when your DNS server does not return A records. In this case, the static DNS cache on the phone provides A records.

When the static DNS cache is used, the configurations would look as below:

```
account.1.sip_server.1.address = yealink.pbx.com
account.1.sip_server.1.port = 5060
account.1.sip_server.1.transport_type = 3
dns_cache_a.1.name = yealink.pbx.com
dns_cache_a.1.ip = 192.168.1.13
dns_cache_a.1.ttl = 3600
dns_cache_a.2.name = yealink.pbx.com
dns_cache_a.2.ip = 192.168.1.14
dns_cache_a.2.ttl = 3600
```

### Example 2

This example shows how to configure static DNS cache when your DNS server returns A records but not SRV records. In this case, the static DNS cache on the phone provides SRV records.

When the static DNS cache is used, the configurations would look as below:

```
account.1.sip_server.1.address = yealink.pbx.com
account.1.sip_server.1.port = 0
account.1.sip_server.1.transport_type = 3

dns_cache_srv.1.name = _sip._tcp.yealink.pbx.com
dns_cache_srv.1.port = 5060
dns_cache_srv.1.priority = 0
dns_cache_srv.1.target = server1.yealink.pbx.com
dns_cache_srv.1.weight = 1
dns_cache_srv.1.ttl = 3600
```

```
dns_cache_srv.2.name = _sip._tcp.yealink.pbx.com
dns_cache_srv.2.port = 5060
dns_cache_srv.2.priority = 0
dns_cache_srv.2.target = server2.yealink.pbx.com
dns_cache_srv.2.weight = 2
dns_cache_srv.2.ttl = 3600
```

**Note**

The parameter "account.1.sip\_server.1.port" is set to 0 to force SRV query.

**Example 3**

This example shows how to configure static DNS cache when your DNS server returns A and SRV records but not NAPTR records. In this case, the static DNS cache on the phone provides NAPTR records.

When the static DNS cache is used, the configurations would look as below:

```
account.1.sip_server.1.address = yealink.pbx.com
account.1.sip_server.1.port = 0
account.1.sip_server.1.transport_type = 3

dns_cache_naptr.1.name = yealink.pbx.com
dns_cache_naptr.1.flags = S
dns_cache_naptr.1.order = 90
dns_cache_naptr.1.preference = 50
dns_cache_naptr.1.replace = _sip._tcp.yealink.pbx.com
dns_cache_naptr.1.service = SIP+D2T
dns_cache_naptr.1.ttl = 3600

dns_cache_naptr.2.name = yealink.pbx.com
dns_cache_naptr.2.flags = S
dns_cache_naptr.2.order = 100
dns_cache_naptr.2.preference = 50
dns_cache_naptr.2.replace = _sip._udp.yealink.pbx.com
dns_cache_naptr.2.service = SIP+D2U
dns_cache_naptr.2.ttl = 3600
```

**Note**

The parameter "account.1.sip\_server.1.port" is set to 0 to force NAPTR query.

## Customer Feedback

We are striving to improve our documentation quality and we appreciate your feedback. Email your opinions and comments to [DocsFeedback@yealink.com](mailto:DocsFeedback@yealink.com).