Server Redundancy on Yealink IP Phones

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 VP-T49G, SIP-T48G, SIP-T46G, SIP-T42G, SIP-T41P, SIP-T40P, SIP-T29G, SIP-T27P, SIP-T23P, SIP-T23G, SIP-T21(P) E2, SIP-T19(P) E2, CP860 and W56P IP phones running firmware version 80 or later
- SIP-T48S, SIP-T46S, SIP-T42S, SIP-T41S and SIP-T27G IP phones running firmware version 81 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 the 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 on page 3.

Glossary

The following terms may assist in understanding server redundancy feature:

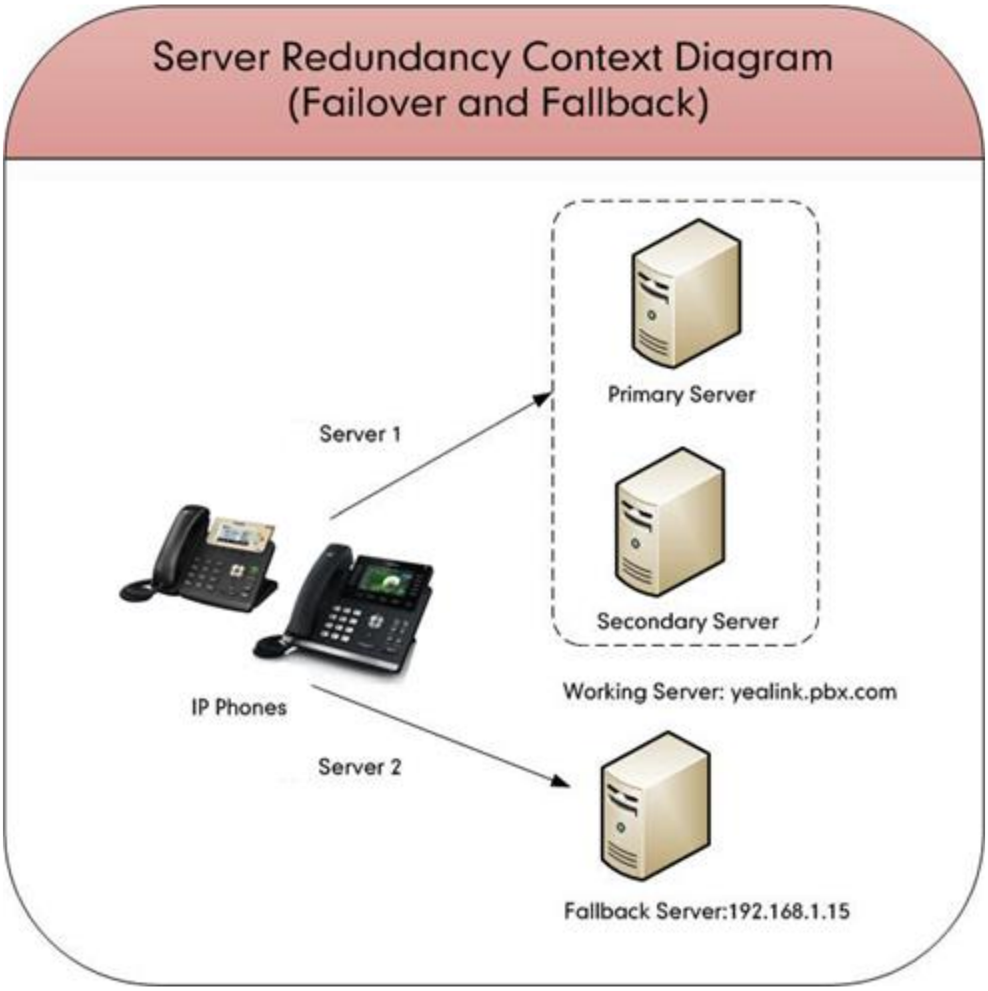
Working and Fallback Servers: The working and fallback servers are two separate servers used for per line registration.

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 is not applicable 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 on page 18.

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 attempts 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 on page 20.

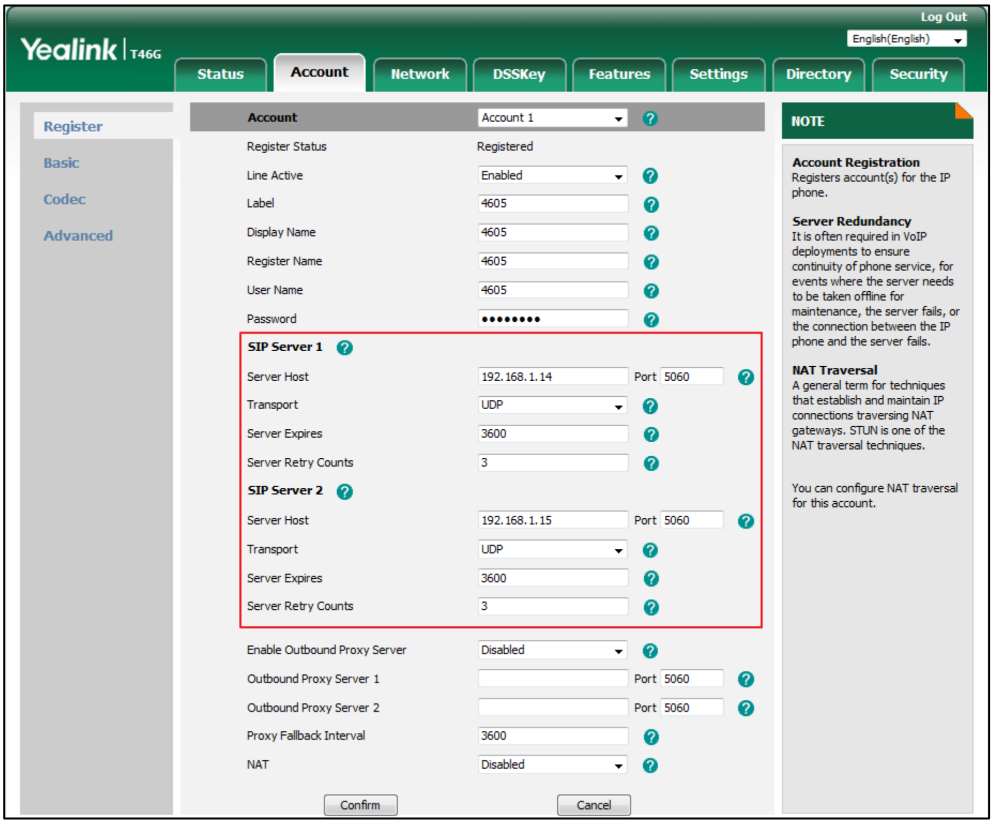
Configuring Yealink IP Phones

Configuring Server Redundancy via Web User Interface

The followings take configurations of a SIP-T46G IP phone running firmware 81 as examples.

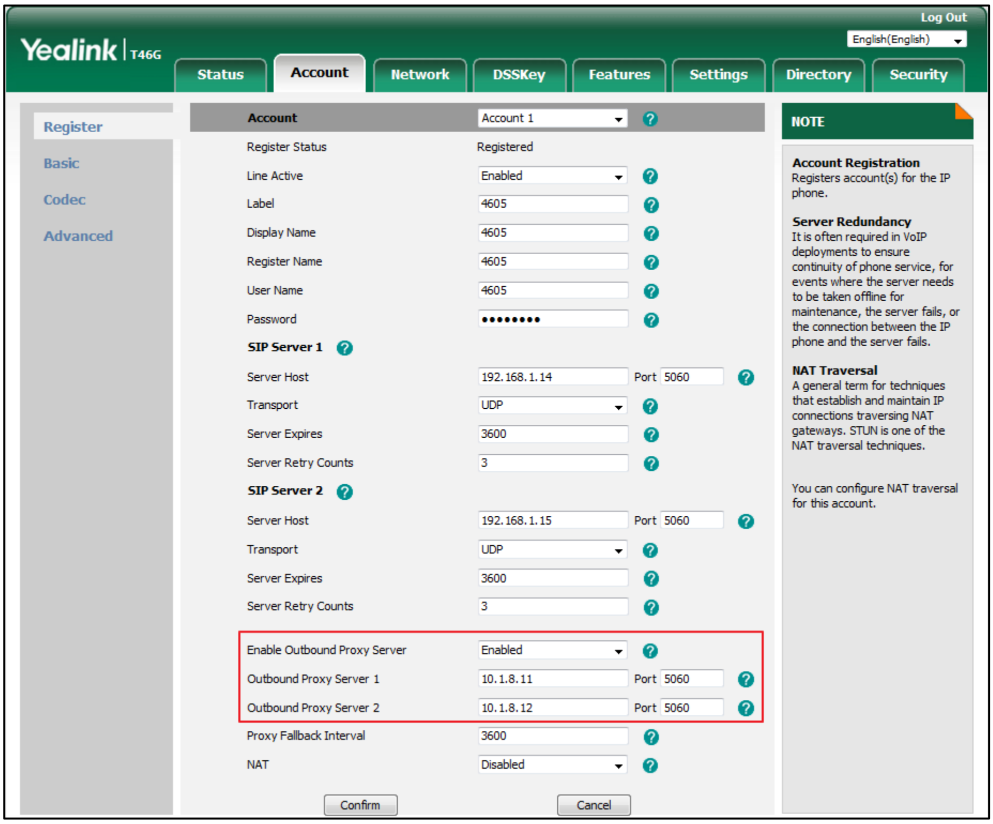
To configure server redundancy for fallback purpose via web user interface:

1. Click on **Account**->**Register**.
2. Select the desired account from the pull-down list of **Account**.
3. Configure 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.



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

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



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

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

1. Click on **Account**->**Register**.

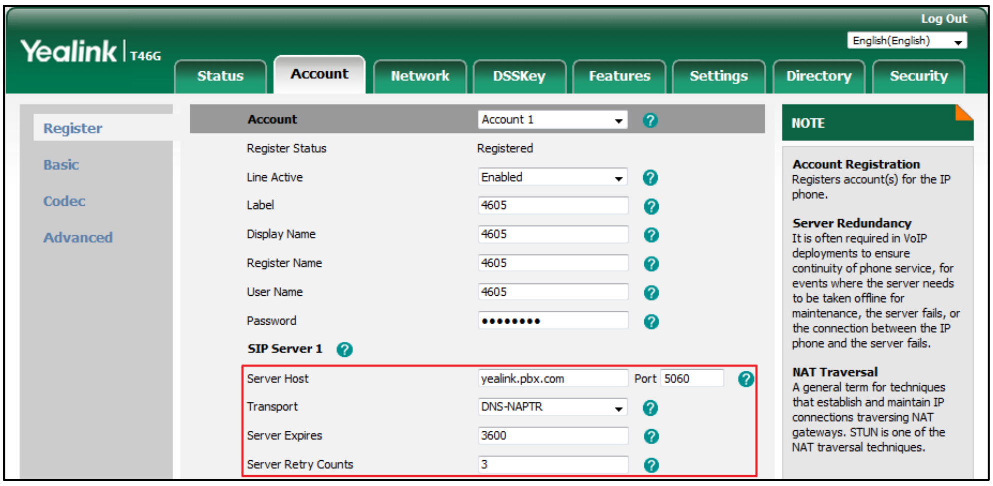
2. Select the desired account from the pull-down list of **Account**.

3. Configure 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 pull-down list of **Transport**.

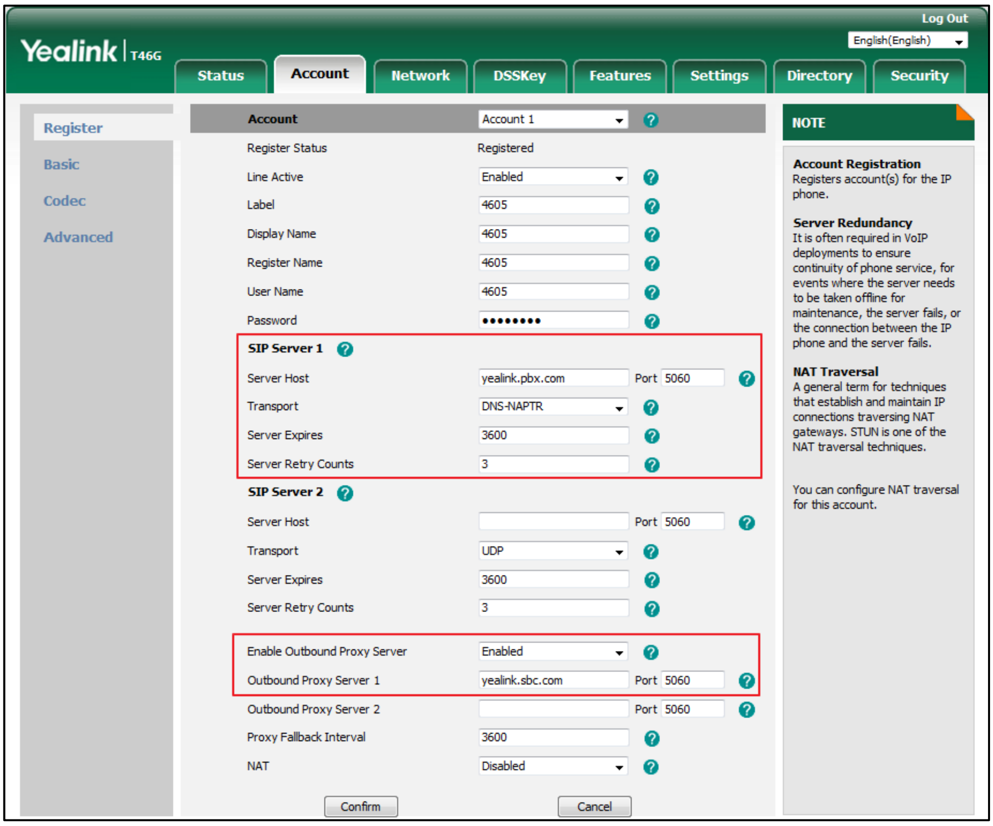


6. If you use outbound proxy servers, do the following:

   1) Select **Enabled** from the pull-down list of **Enable Outbound Proxy Server**.

   2) Configure parameters of 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 SIP VP-T49G/SIP-T48G/T48S/T46G/T46S/T29G: X ranges from 1 to 16;

   For SIP-T42G/S: X ranges from 1 to 12;

   For SIP-T41P/T41S/T27P/T27G: X ranges from 1 to 6;

   For W56P: X ranges from 1 to 5;

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

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

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

   Y ranges from 1 to 2)

Parameters	Permitted Values	Default
account.X.enable	**0 or 1**	**0**
Description: Enables or disables the account X. **0**-Disabled **1**-Enabled **Web User Interface:** Account->Register->Line Active **Phone User Interface:** Menu->Advanced (default password: admin) ->Account->Activation		
account.X.label	**String**	**Blank**
Description: Configures the label displayed on the LCD screen for account X. **Web User Interface:** Account->Register->Label **Phone User Interface:** Menu->Advanced (default password: admin) ->Account->Label		
account.X.display_name	**String**	**Blank**

<table>
<tr><th>Parameters</th><th>Permitted Values</th><th>Default</th></tr>
<tr><td colspan="3">Description:
Configures the display name for account X.
Web User Interface:
Account->Register->Display Name
Phone User Interface:
Menu->Advanced (default password: admin) ->Account->Display Name</td></tr>
<tr><td>account.X.auth_name</td><td>String</td><td>Blank</td></tr>
<tr><td colspan="3">Description:
Configures the user name for register authentication for account X.
Web User Interface:
Account->Register->Register Name
Phone User Interface:
Menu->Advanced (default password: admin) ->Account->Register Name</td></tr>
<tr><td>account.X.user_name</td><td>String</td><td>Blank</td></tr>
<tr><td colspan="3">Description:
Configures the register user name for account X.
Web User Interface:
Account->Register->User Name
Phone User Interface:
Menu->Advanced (default password: admin) ->Account->User Name</td></tr>
<tr><td>account.X.password</td><td>String</td><td>Blank</td></tr>
<tr><td colspan="3">Description:
Configures the password for register authentication for account X.
Web User Interface:
Account->Register->Password
Phone User Interface:
Menu->Advanced (default password: admin) ->Account->Password</td></tr>
<tr><td>account.X.sip_server.Y.address</td><td>String within 256 characters</td><td>Blank</td></tr>
<tr><td colspan="3">Description:
Configures the IP address or domain name of the SIP server Y that accepts registrations for account X.</td></tr>
</table>

Parameters	Permitted Values	Default
Web User Interface: Account->Register->SIP Server Y->Server Host **Phone User Interface:** Menu->Advanced (default password: admin) ->Account->SIP Server1		
account.X.sip_server.Y.port	**Integer from 0 to 65535**	**5060**
Description: Configures the port of the SIP server Y that specifies registrations for account X. **Web User Interface:** Account->Register->SIP Server Y->Port **Phone User Interface:** None		
account.X.sip_server.Y.transport_type	**0, 1, 2 or 3**	**0**
Description: Configures the transport method the IP phone uses to communicate with the SIP server for account X. **0**-UDP **1**-TCP **2**-TLS **3**-DNS-NAPTR **Web User Interface:** Account->Register->SIP Server Y->Transport **Phone User Interface:** None		
account.X.sip_server.Y.expires	**Integer from 30 to 2147483647**	**3600**
Description: Configures the registration expires (in seconds) of the SIP server Y for account X. **Web User Interface:** Account->Register->SIP Server Y->Server Expires **Phone User Interface:**		

Parameters	Permitted Values	Default
None		
account.X.sip_server.Y.retry_counts	**Integer from 0 to 20**	**3**
Description: 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 account X. **Web User Interface:** Account->Register->SIP Server Y->Server Retry Counts **Phone User Interface:** None		
account.X.outbound_proxy_enable	**0 or 1**	**0**
Description: Enables or disables the phone to use the outbound proxy server for account X. **0**-Disabled **1**-Enabled **Web User Interface:** Account->Register->Enable Outbound Proxy Server **Phone User Interface:** Menu->Advanced (default password: admin) ->Account->Outbound Status		
account.X.outbound_host	**IP address or domain name**	**Blank**
Description: Configures the IP address or domain name of the outbound proxy server 1 for account X. **Note**: It is only applicable to IP phones running firmware version 80 or prior. **Web User Interface:** Account->Register->Outbound Proxy Server 1 **Phone User Interface:** Menu->Advanced (default password: admin) ->Account->Outbound Proxy1		
account.X.outbound_port	**Integer from 0 to 65535**	**5060**
Description:		

Parameters	Permitted Values	Default
Configures the port of the outbound proxy server 1 for account X. **Note**: It is only applicable to IP phones running firmware version 80 or prior. **Web User Interface:** Account->Register->Outbound Proxy Server 1->Port **Phone User Interface:** None		
account.X.backup_outbound_host	**IP Address or Domain Name**	**Blank**
Description: Configures the IP address or domain name of the outbound proxy server 2 for account X. **Note**: It is only applicable to IP phones running firmware version 80 or prior. **Web User Interface:** Account->Register->Outbound Proxy Server 2 **Phone User Interface:** Menu->Advanced (default password: admin) ->Account->Outbound Proxy2		
account.X.backup_outbound_port	**Integer from 0 to 65535**	**5060**
Description: Configures the port of the outbound proxy server 2 for account X. **Note**: It is only applicable to IP phones running firmware version 80 or prior. **Web User Interface:** Account->Register->Outbound Proxy Server 2->Port **Phone User Interface:** None		
account.X.outbound_proxy.Y.address	**IP Address or Domain Name**	**Blank**
Description: Configures the IP address or domain name of the outbound proxy server Y for account X. **Note**: It is only applicable to IP phones running firmware version 81 or later. **Web User Interface:** Account->Register->Outbound Proxy Server Y **Phone User Interface:**		

Parameters	Permitted Values	Default
Menu->Advanced (default password: admin) ->Account->Outbound ProxyY		
account.X.outbound_proxy.Y.port	**Integer from 0 to 65535**	**5060**
Description: Configures the port of the outbound proxy server Y for account X. **Note**: It is only applicable to IP phones running firmware version 81 or later. **Web User Interface:** Account->Register->Outbound Proxy Server Y->Port **Phone User Interface:** None		
Fallback Mode		
account.X.fallback.redundancy_type	**0 or 1**	**0**
Description: Configures the registration mode for the IP phone in fallback mode. **0**-Concurrent Registration **1**-Successive Registration **Note:** It is not applicable to outbound proxy servers. **Web User Interface:** None **Phone User Interface:** None		
account.X.fallback.timeout	**Integer from 10 to 2147483647**	**120**
Description: 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. **Note:** It works only if the value of the parameter "account.X.fallback.redundancy_type" is set to 1 (Successive Registration). It is not applicable to outbound proxy servers. **Web User Interface:** None		

Parameters	Permitted Values	Default
Phone User Interface: None		
account.X.outbound_proxy_fallback_interval	**Integer**	**3600**
Description: 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. **Note:** It is only applicable to outbound proxy servers. **Web User Interface:** Account->Register->Proxy Fallback Interval **Phone User Interface:** Menu->Advanced (default password: admin) ->Account->Proxy Fallback Interval		
Failover Mode		
account.X.sip_server.Y.register_on_enable	**0 or 1**	**0**
Description: Enables or disables the IP phone to register to the secondary server before sending requests to it for account X when encountering a failover. **0**-Disabled **1**-Enabled 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. If it is set to 1 (Enabled), the IP phone will register to the secondary server first, and then send the requests to it. **Web User Interface:** None **Phone User Interface:** None		
account.X.sip_server.Y.only_signal_with_registered	**0 or 1**	**0**
Description: Enables or disables the IP phone to only send requests to the registered server for account X when encountering a failover.		

Parameters	Permitted Values	Default
0-Disabled **1**-Enabled **Note**: It is only applicable to IP phones running firmware version 81 or later. **Web User Interface:** None **Phone User Interface:** None		
account.X.sip_server.Y.invite_retry_counts	**Integer from 1 to 10**	**3**
Description: Configures the number of retries attempted before sending requests to the next available server for account X when encountering a failover. **Note**: It is only applicable to IP phones running firmware version 81 or later. **Web User Interface:** None **Phone User Interface:** None		
account.X.sip_server.Y.failback_mode	**0, 1, 2 or 3**	**0**
Description: Configures the way in which the phone fails back to the primary server. **0**-newRequests: all requests are sent to the primary server first, regardless of the last server that was used. **1**-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. **2**-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. **3**-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. **Note**: 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.). **Web User Interface:** None **Phone User Interface:** None		

Parameters	Permitted Values	Default
account.X.sip_server.Y.failback_timeout	**0, Integer from 60 to 65535**	**3600**
Description: 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 account X. 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. If you set the parameter from 1 to 59, the timeout will be 60 seconds. **Note:** It works only if the value of the parameter "account.X.sip_server.Y.failback_mode" is set to 3 (duration). **Web User Interface:** None **Phone User Interface:** None		
account.X.sip_server.Y.failback_subscribe.enable	**0 or 1**	**0**
Description: Enables or disables the IP phone to retry to re-subscribe after registering to the secondary server with different IP address for account X when encountering a failover. **0**-Disabled **1**-Enabled 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 subscription (e.g., BLF, SCA). **Note**: 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. **Web User Interface:** None **Phone User Interface:** None		

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
##DNS SRV
account.1.sip_server.1.transport_type = 3
##Failover Mode
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
```

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 *Yealink_SIP-T2_Series_T19(P) E2_T4_Series_CP860_W56P_IP_Phones_Auto_Provisioning_Guide*.

   Yealink IP phones running firmware version 81 or later support a new boot file for auto provisioning. For more information, refer to *Yealink_SIP-T2_Series_T19(P) E2_T4_Series_IP_Phones_Auto_Provisioning_Guide_V81*.

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 ability to fail over 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 ability to fail back 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 ability to fail over 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 ability to fail back 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.failback_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 ability to fail over 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 next REGISTER attempt and then sends next REGISTER request to the primary server. When the primary server recovers, the phone has ability to fail back next REGISTER request to the primary server.

INVITE Failover

The phone has ability to fail over 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 has ability to immediately fail back INVITE request to the primary server after failing over to the secondary server.

Appendix A: DNS SRV

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

NAPTR (Naming Authority Pointer)

First, the IP phone sends 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.pb x.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. Lower value is more preferred.
flags	The flag "s" means to perform an SRV lookup.
service	Specify the transport protocols supported: 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 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 host name 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 host name. 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 SIP VP-T49G/SIP-T48G/T48S/T46G/T46S/T29G: X ranges from 1 to 16;

For SIP-T42G/S: X ranges from 1 to 12;

For SIP-T41P/T41S/T27P/T27G: X ranges from 1 to 6;

For W56P: X ranges from 1 to 5;

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

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

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

Parameters	Permitted Values	Default
account.X.dns_cache_type	**0, 1 or 2**	**1**
Description: Configures whether the IP phone uses the DNS cache for domain name resolution of the server and caches the additional DNS records for account X. **0**-Perform real-time DNS query rather than using DNS cache. **1**-Use DNS cache, but do not cache the additional DNS records. **2**-Use DNS cache and cache the additional DNS records. **Web User Interface:** None		

<table>
<tr><th>Parameters</th><th>Permitted Values</th><th>Default</th></tr>
<tr><td colspan="3">Phone User Interface:
None</td></tr>
<tr><td>account.X.static_cache_pri</td><td>0 or 1</td><td>0</td></tr>
<tr><td colspan="3">Description:
Configures whether preferentially to use the static DNS cache for domain name resolution of the server for account X.
0-Use domain name resolution from server preferentially
1-Use static DNS cache preferentially
Web User Interface:
None
Phone User Interface:
None</td></tr>
</table>

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):

<table>
<tr><th>Parameters</th><th>Permitted Values</th><th>Default</th></tr>
<tr><td>dns_cache_a.X.name</td><td>Domain name</td><td>Blank</td></tr>
<tr><td colspan="3">Description:
Configures the domain name in A record X.
Web User Interface:
None
Phone User Interface:
None</td></tr>
<tr><td>dns_cache_a.X.ip</td><td>String</td><td>Blank</td></tr>
<tr><td colspan="3">Description:
Configures the IP address that the domain name in A record X maps to.
Web User Interface:
None
Phone User Interface:
None</td></tr>
<tr><td>dns_cache_a.X.ttl</td><td>Integer from 30 to 2147483647</td><td>300</td></tr>
</table>

Parameters	Permitted Values	Default
Description: Configures the time interval (in seconds) that A record X may be cached before the record should be consulted again. **Web User Interface:** None **Phone User Interface:** None		

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
dns_cache_srv.X.name	**Domain name**	**Blank**
Description: Configures the domain name in SRV record X. **Web User Interface:** None **Phone User Interface:** None		
dns_cache_srv.X.port	**Integer from 0 to 65535**	**0**
Description: Configures the port to be used in SRV record X. **Web User Interface:** None **Phone User Interface:** None		
dns_cache_srv.X.priority	**Integer from 0 to 65535**	**0**
Description: Configures the priority for the target host in SRV record X. Lower priority is more preferred. For example, SRV record with the priority value 0 is more preferred than that with the priority value 1 because 0 is lower than 1. **Note**: For more information, refer to RFC 2782.		

Parameters	Permitted Values	Default
Web User Interface: None **Phone User Interface:** None		
dns_cache_srv.X.target	**Domain name**	**Blank**
Description: Configures the domain name of the target host for an A query in SRV record X. **Note**: For more information, refer to RFC 2782. **Web User Interface:** None **Phone User Interface:** None		
dns_cache_srv.X.weight	**Integer from 0 to 65535**	**0**
Description: Configures the weight of the target host in SRV record X. When priorities are equal, weight is used to differentiate the preference. Higher weight value is more preferred. **Note**: For more information, refer to RFC 2782. **Web User Interface:** None **Phone User Interface:** None		
dns_cache_srv.X.ttl	**Integer from 30 to 2147483647**	**300**
Description: Configures the time interval (in seconds) that SRV record X may be cached before the record should be consulted again. **Web User Interface:** None **Phone User Interface:** None		
account.X.naptr_build	**0 or 1**	**0**
Description: Configures the way of SRV query for the IP phone to be performed when no result is		

Parameters	Permitted Values	Default
returned from NAPTR query for account X. **0**-SRV query using UDP only **1**-SRV query using UDP, TCP and TLS **Web User Interface:** None **Phone User Interface:** None		

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
dns_cache_naptr.X.name	**Domain Name**	**Blank**
Description: Configures the domain name to which NAPTR record X refers. **Web User Interface:** None **Phone User Interface:** None		
dns_cache_naptr.X.flags	**S, A, U or P**	**Blank**
Description: 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). **S**-Do an SRV lookup next. **A**-Do an A lookup next. **U**-No need to do a DNS query next. **P**-Service customized by the user **Note**: For more details of the permitted flags, refer to RFC 2915. **Web User Interface:** None **Phone User Interface:** None		

<table>
<tr><th>Parameters</th><th>Permitted Values</th><th>Default</th></tr>
<tr><td>dns_cache_naptr.X.order</td><td>Integer from 0 to 65535</td><td>0</td></tr>
<tr><td colspan="3">Description:
Configures the order of NAPTR record X.
NAPTR record with lower order is more preferred. For example, NAPTR record with the order 90 has the higher priority than that with the order 100 because 90 is lower than 100.
Web User Interface:
None
Phone User Interface:
None</td></tr>
<tr><td>dns_cache_naptr.X.preference</td><td>Integer from 0 to 65535</td><td>0</td></tr>
<tr><td colspan="3">Description:
Configures the preference of NAPTR record X.
NAPTR record with lower value is more preferred when the multiple NAPTR records have the same order value.
Web User Interface:
None
Phone User Interface:
None</td></tr>
<tr><td>dns_cache_naptr.X.replace</td><td>Domain name</td><td>Blank</td></tr>
<tr><td colspan="3">Description:
Configures a domain name to be used for the next SRV query in NAPTR record X.
Web User Interface:
None
Phone User Interface:
None</td></tr>
<tr><td>dns_cache_naptr.X.service</td><td>String within 32 characters</td><td>Blank</td></tr>
<tr><td colspan="3">Description:
Configures the transport protocol available for the server in NAPTR record X.
SIP+D2U: SIP over UDP
SIP+D2T: SIP over TCP
SIP+D2S: SIP over SCTP
SIPS+D2T: SIPS over TCP
Note: For more information, refer to RFC 2915.</td></tr>
</table>

Parameters	Permitted Values	Default
Web User Interface: None **Phone User Interface:** None		
dns_cache_naptr.X.ttl	**Integer from 30 to 2147483647**	**300**
Description: Configures the time interval (in seconds) that NAPTR record X may be cached before the record should be consulted again. **Web User Interface:** None **Phone User Interface:** None		

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.