Yealink

SIP-T2 Series/T19(P) E2/T4 Series/T5 Series/W5 Series/CP Series

IP Phones Auto Provisioning Guide

Version 81.72

June. 2017

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Summary of Changes

This section describes the changes to this guide for each release and guide version.

Changes for Release 81, Guide Version 81.72

Documentations of the newly released CP960 IP phones have also been added.

Changes for Release 81, Guide Version 81.71

Documentations of the newly released CP860/SIP-T54S/T52S IP phones have also been added.

Changes for Release 81, Guide Version 81.70

Documentations of the newly released W56P/W52P/SIP-T58V/T58A/T56A/T40G IP phones have also been added.

Introduction

Yealink IP phones are full-featured telephones that can be plugged directly into an IP network and can be used easily without manual configuration.

This guide provides instructions on how to provision Yealink IP phones with the minimum settings required. Yealink IP phones support FTP, TFTP, HTTP, and HTTPS protocols for auto provisioning and are configured by default to use the TFTP protocol.

The purpose of this guide is to serve as a basic guidance for provisioning Yealink IP phones, including:

- Yealink SIP-T58V/A
- Yealink SIP-T56A
- Yealink SIP-T54S
- Yealink SIP-T52S
- Yealink SIP-T48G/S
- Yealink SIP-T46G/S
- Yealink SIP-T42G/S
- Yealink SIP-T41P/S
- Yealink SIP-T40P/G
- Yealink SIP-T29G
- Yealink SIP-T27P/G
- Yealink SIP-T23P/G
- Yealink SIP-T21(P) E2
- Yealink SIP-T19(P) E2
- Yealink CP860
- Yealink CP960
- Yealink W52P/W56P

The auto provisioning process outlined in this guide applies to Yealink SIP-T54S/T52S/46G/T46S/T42G/T42S/T41P/T41S/T40P/T40G/T29G/T27P/T27G/T23P/T23G/T21(P) E2/T19(P) E2/CP860, W52P and W56P IP phones running firmware version 81 or later and CP960/SIP-T58V/T58A/T56A IP phones running firmware version 80 or later. We recommend that IP phones running the latest firmware CANNOT be downgraded to an earlier firmware version. The new firmware is compatible with old configuration parameters, but not vice versa.

Getting Started

This section provides instructions on how to get ready for auto provisioning. To begin the auto provisioning process, the following steps are required:

- Obtaining the Boot File
- Obtaining Configuration Files
- Obtaining Phone Information

Obtaining the Boot File

You can use a boot file to customize the download sequence of configuration files. The configuration files are flexible: you can rearrange the configuration parameters within the Yealink-supplied template configuration files or create your own configuration files from configuration parameters you want. You can create and name as many configuration files as you want and your own configuration files can contain any combination of configuration parameters. It is efficiently for you to provision your IP phones in different deployment scenarios, especially when you want to apply a set of features or settings to a group of phones.

Before beginning provisioning, you need to obtain the Yealink-supplied template boot file named as "y000000000000.boot". The IP phone tries to download the boot file first, and then download the configuration files referenced in the boot file in sequence during auto provisioning.

Yealink supports the following two types of boot files:

- MAC-Oriented boot file (e.g., 00156574b150.boot)
- Common boot file (y000000000000.boot)

You can ask the distributor or Yealink FAE for the template boot file.

Obtaining Configuration Files

Before beginning provisioning, you also need to obtain template configuration files. There are two configuration files both of which are CFG-formatted. We call these two files Common CFG file and MAC-Oriented CFG file. You can also create and name as many configuration files as you want (e.g., account.cfg, sip.cfg, features.cfg) by using the template configuration files. The custom configuration files can contain the configuration parameters of the same feature modules for all phones.

If boot file is found on the provisioning server, the IP phones download the boot file first, and then download the configuration files referenced in the boot file in sequence during auto provisioning. You can customize the download sequence of configuration files in the boot file as

required. If boot file is not found on the provisioning server, IP phones download the common CFG file first, and then the MAC-Oriented CFG file during auto provisioning - i.e., the old mechanism for auto provisioning. You can select whether to use the boot file or not for auto provisioning according to your deployment scenario.

IP phones also support local configuration files named as <MAC>-local.cfg. When a user modifies configurations via web user interface or phone user interface, the non-static settings will be automatically saved to the MAC-local CFG file on the IP phone.

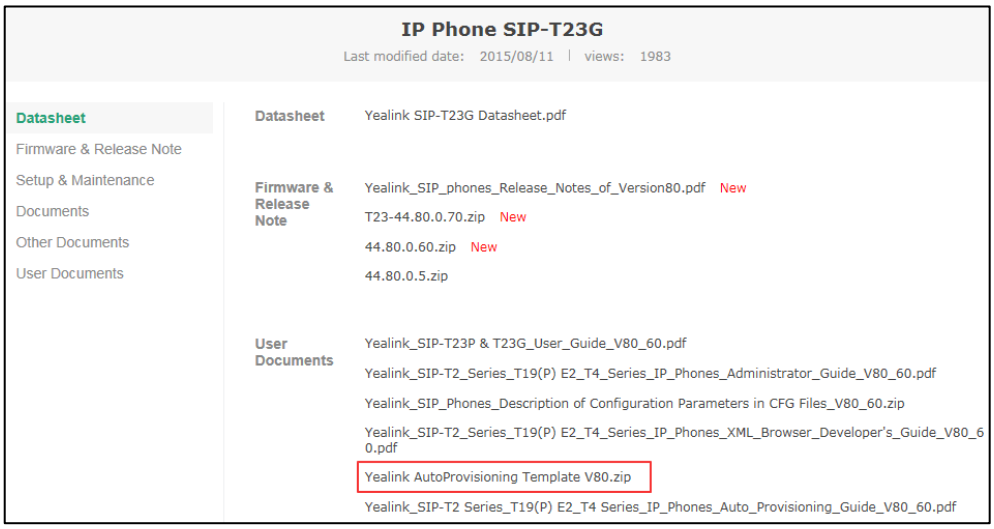
You can ask the distributor or Yealink FAE for template configuration files. You can also obtain the template configuration files online:

http://support.yealink.com/documentFront/forwardToDocumentFrontDisplayPage.

To download template configuration files:

1. Go to Yealink Document Download page and select the desired phone model.
2. Download and extract the combined configuration files to your local system.

   For example, the following illustration shows the template files available for SIP-T23G IP phones running firmware version 80.



3. Open the folder you extracted and identify the files you will edit.

Obtaining Phone Information

Before beginning provisioning, you also need the IP phone information. For example, MAC address and the SIP account information of the IP phone.

MAC Address: The unique 12-digit serial number of the IP phone. You can obtain it from the bar code on the back of the IP phone.

SIP Account Information: This may include SIP credentials such as user name, password and IP address of the SIP server. Ask your system administrator for SIP account information.

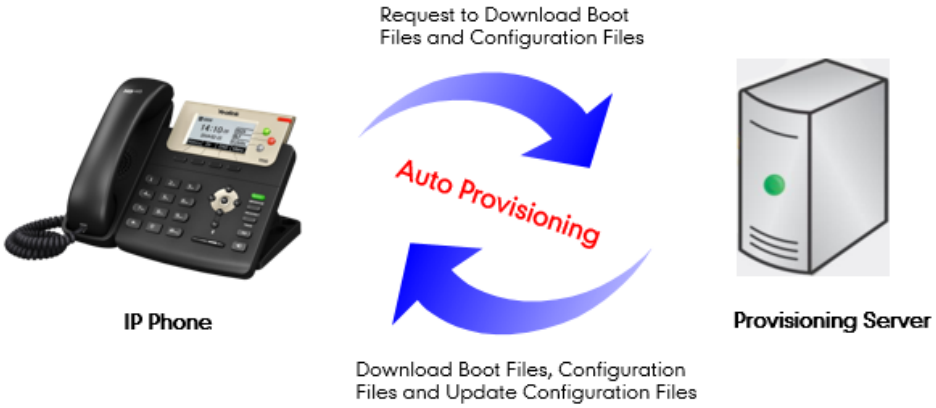
Provisioning Yealink IP Phones

This section provides instructions on how IP phones interoperate with provisioning server for auto provisioning, and shows you four major tasks to provision the phones. It will help users who are not familiar with auto provisioning to understand this process more easily and quickly.

Auto Provisioning Process

When IP phones are triggered to perform auto provisioning, they will request to download the boot files and configuration files from the provisioning server. During the auto provisioning process, the IP phone will download and update configuration files to the phone flash.

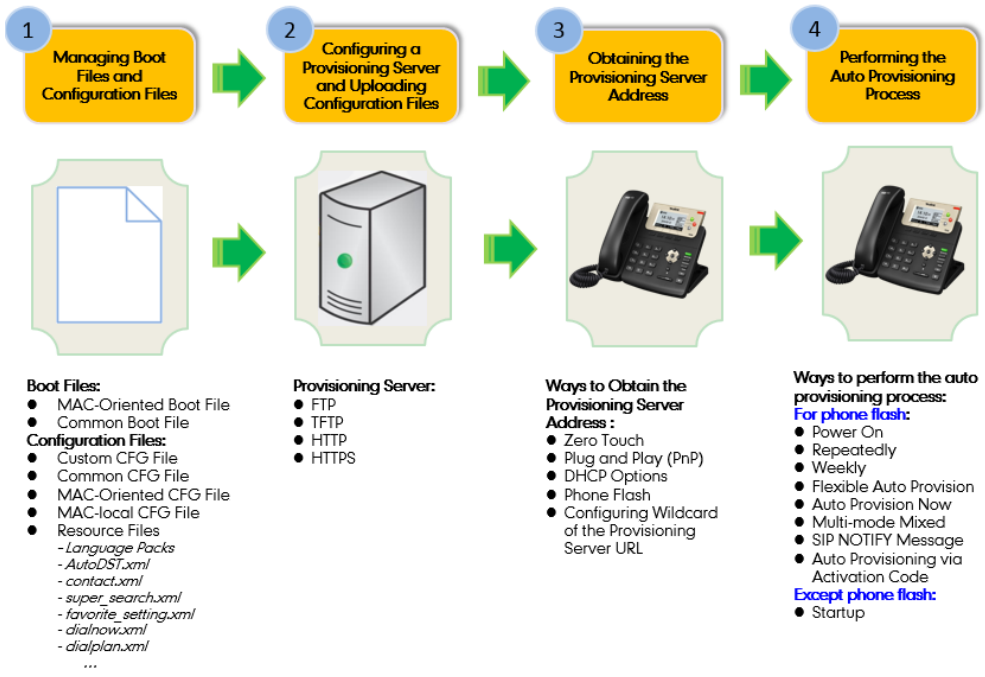
The following figure shows how the IP phone interoperates with the provisioning server:



Major Tasks for Auto Provisioning

You need to complete four major tasks to provision Yealink IP phones.

The following figure shows an overview of four major provisioning tasks:



For more information on how to manage boot files, refer to Managing Boot Files on page 11.

For more information on how to manage configuration files, refer to Managing Configuration Files on page 15.

For more information on how to configure a provisioning server, refer to Configuring a Provisioning Server on page 21.

For more information on how to obtain the provisioning server address, refer to Obtaining the Provisioning Server Address on page 25.

For more information on how to perform the auto provisioning process, refer to Triggering the IP Phone to Perform the Auto Provisioning on page 33.

If you are not familiar with auto provisioning process on Yealink IP phones, you can refer to An Instance of Auto Provision Configuration on page 7.

An Instance of Auto Provision Configuration

This section shows an instance of auto provision configuration.

1. Manage boot files.

   Specify the desired download path (e.g., tftp://10.2.5.193/network.cfg) of the configuration files in the boot file (e.g., y000000000000.boot). For more information, refer to Managing Boot Files on page 11.

```
#!version:1.0.0.1
## The header above must appear as-is in the first line

   include:config <tftp://10.2.5.193/network.cfg>
   include:config <../sip.cfg>
   include:config "features.cfg"

overwrite_mode  = 1
```

2. Manage configuration files.

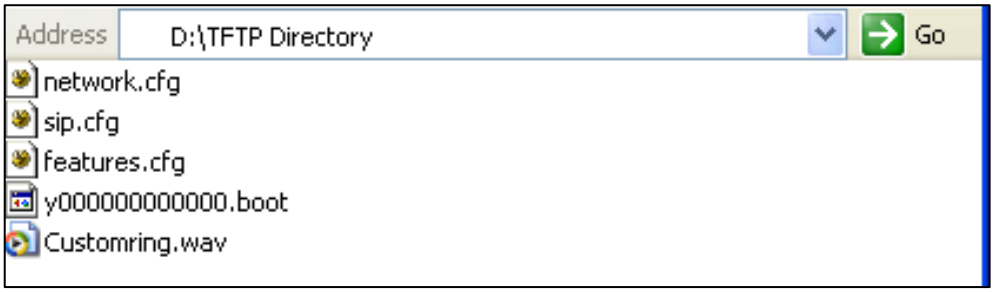
   Add/Edit the desired configuration parameters in the CFG file (e.g., features.cfg) you want the IP phone to download. For more information on how to manage configuration files, refer to Managing Configuration Files on page 15.

features.cfg

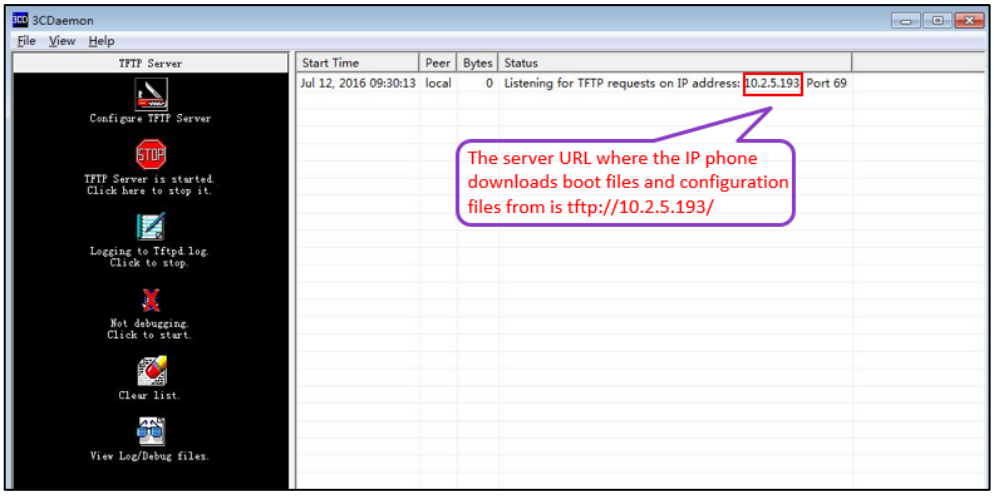
```
#!version:1.0.0.1
features.dnd_mode = 0
features.dnd.enable = 1
ringtone.url = tftp://10.2.5.193/Customring.wav
```

3. Configure the TFTP server.

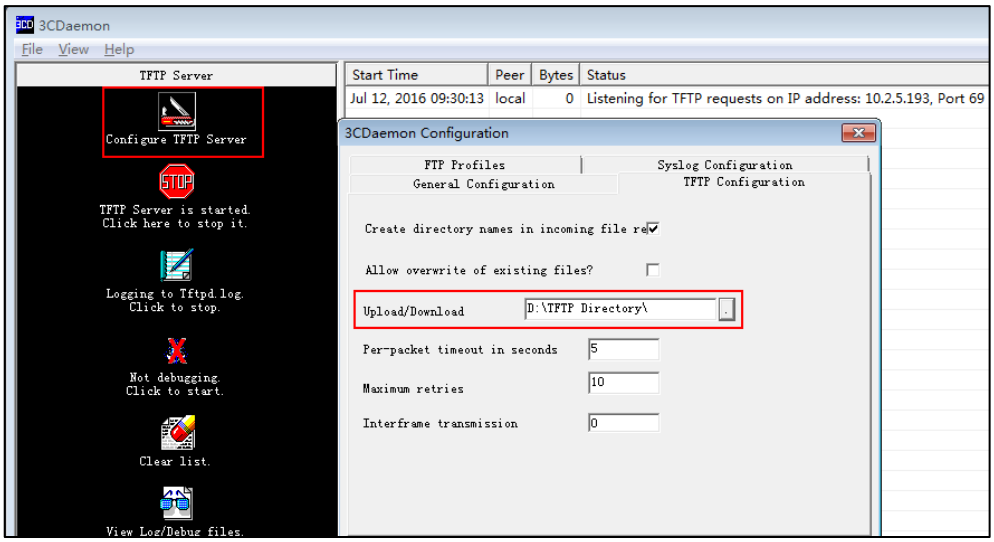
   1) Place boot files and configuration files to TFTP root directory (e.g., D:\TFTP Directory).



2) Start the TFTP sever. The IP address of the TFTP server is shown as below:

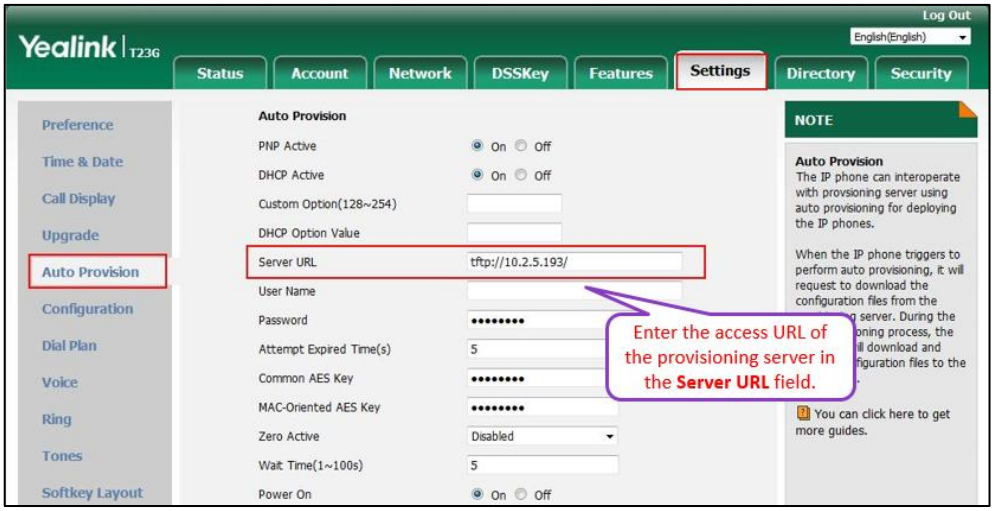


3) Select **Configure TFTP Server**. Click the ... button to locate the TFTP root directory from your local system.



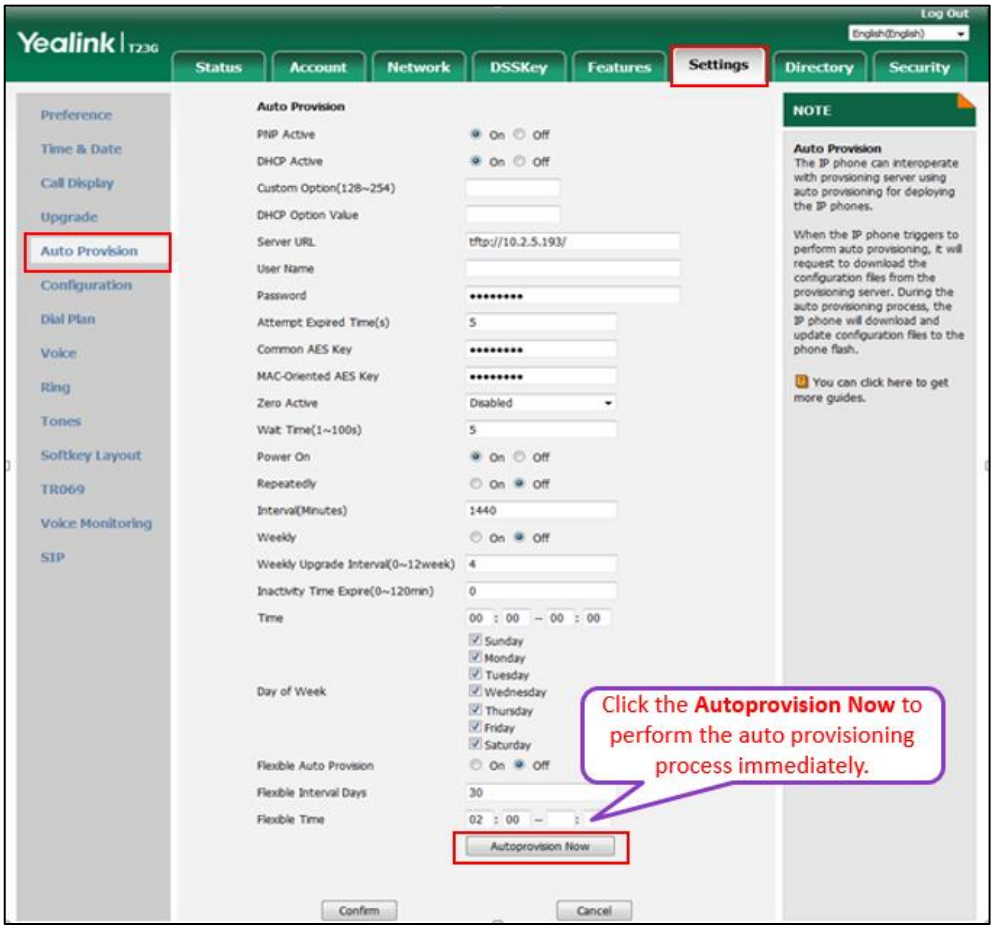
For more information on how to configure a provisioning server, refer to Configuring a Provisioning Server on page 21.

4. Configure the provisioning server address on the IP phone.



For more information on how to obtain the provisioning server address, refer to Obtaining the Provisioning Server Address on page 25.

5. Trigger the IP phone to perform the auto provisioning.



For more information on how to trigger the phone to perform the auto provisioning, refer to Triggering the IP Phone to Perform the Auto Provisioning on page 33.

Managing Boot Files

Yealink IP phones support downloading CFG files referenced in the boot files in sequence. Before beginning provisioning, you may need to edit and customize your boot files.

You can edit the template boot file directly or create a new boot file as required. Open each boot file with a text editor such as UltraEdit.

Editing Common Boot File

The common boot file is effectual for all phones. It uses a fixed name "y000000000000.boot" as the file name.

The following figure shows the contents of the common boot file:

```
#!version:1.0.0.1
## The header above must appear as-is in the first line

include:config <xxx.cfg>
include:config "xxx.cfg"

overwrite_mode = 1
```

When editing the boot file, learn the following:

- The line beginning with "#" is considered to be a comment.
- The file header "#!version:1.0.0.1" is not a comment and must be placed in the first line. It cannot be edited or deleted.
- The file format must be *.boot.
- Each "include" statement can reference a configuration file. The referenced configuration file format must be *.cfg. The "include" statement can be repeated as many times as needed. It means one or more CFG files can be referenced in the boot file.
- Each "include" statement must use the following format:

  include:config <*download path of the CFG file*> or include:config "*download path of the CFG file*"

  The download path of the CFG file must point to a specific CFG file. It supports the following path forms:

  - Relative path (relative to the boot file):

    For example, sip.cfg, HTTP Directory/sip.cfg, ../sip.cfg, etc.

  - Absolute path (or URL):

    For example, http://10.2.5.258/HTTP Directory/sip.cfg.

- The CFG files are downloaded in the order listed (top to bottom). The parameters in the

new downloaded configuration files will override the duplicate parameters in files downloaded earlier.

- "overwrite_mode = 1" means overwrite mode is enabled. The overwrite mode will be applied to the configuration files specified to download. This parameter can only be used in boot files. Overwrite mode includes the following features:
  - The NULL values take effect (if the value of a parameter in configuration files is left blank, the factory default value can take effect.)

    For example, the label for account 1 is "abc", and the value of the parameter "account.1.label" is left blank in the configuration files (e.g., account.1.label = or account.1.label = ""). The factory default value Blank takes effect after auto provisioning. So the label for account 1 will be deleted.
  - The deletions of the configuration parameters take effect (if a parameter in configuration files is deleted, the factory default value can take effect immediately.)

    For example, account.1.enable = 1 is deleted or commented out in the configuration files. The factory default value 0 takes effect after auto provisioning. So account 1 is disabled.
- Note that if a boot file is used but the value of the parameter "overwrite_mode" is not configured, the default value 1 will take effect. If you want to disable the overwrite mode, configure "overwrite_mode = 0" in the boot file.

Note Overwrite mode only affects the non-static settings configured using configuration files.
If you do not use the boot file for auto provisioning, overwrite mode is disabled by default and you are not allowed to enable it.

Creating MAC-Oriented Boot File

The MAC-Oriented boot file is only effectual for the specific phone. It use the 12-digit MAC address of the IP phone as the file name. For example, if the MAC address of the IP phone is 00156574B150, the MAC-Oriented boot file has to be named as 00156574b150.boot (case-sensitive) respectively.

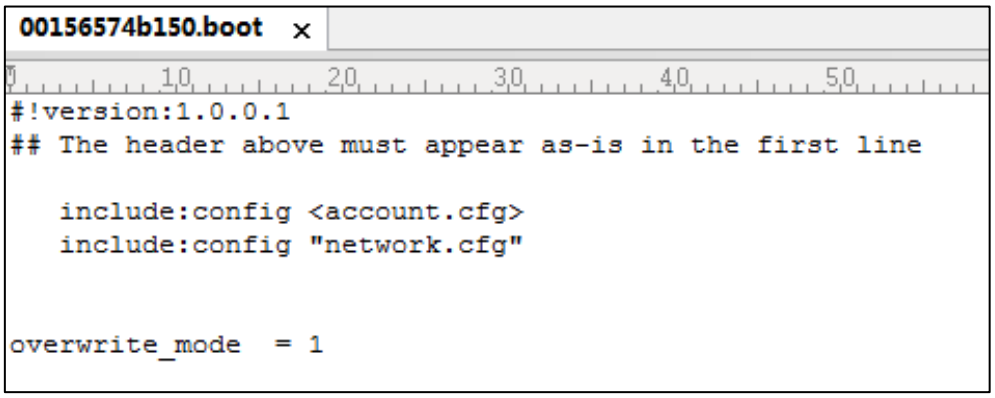
The IP phones try to download the MAC-Oriented boot file first from the server during auto provisioning first. If no matched MAC-Oriented boot file is found on the server, the IP phones try to download the common boot file.

If you want to create a MAC-Oriented boot file for your phone, follow these steps:

To create a MAC-Oriented boot file:

1. Create a boot file for your phone. Ensure the file complies with the guidelines that are listed in Editing Common Boot File on page 11.
2. Copy the contents from the common boot file and specify the configuration files to be downloaded.

   One or more configuration files can be referenced in the boot file. The following takes two configuration files for example:



3. Save the changes and close the MAC-Oriented boot file.

You can also make a copy of the common boot file, rename it and then edit it.

Managing Configuration Files

Auto provisioning enables Yealink IP phones to update themselves automatically via downloading Common CFG, MAC-Oriented CFG, custom CFG and MAC-local CFG files. Before beginning provisioning, you may need to edit and customize your configuration files.

You can edit the template configuration files directly or create a new CFG file as required. Open each configuration file with a text editor such as UltraEdit.

For more information on description of all configuration parameters in configuration files, refer to *Yealink_SIP-T2_Series_T19(P) E2_T4_Series_T5_Series_CP860_IP_Phones_Description of Configuration Parameters in CFG Files_V81.xlsx*, *Yealink IP DECT Phones Description of Configuration Parameters in CFG Files.xlsx* or *Yealink_SIP-T5_Series_CP960_IP_Phones_Description of Configuration Parameters in CFG Files.xlsx*.

Editing Common CFG File

The Common CFG file is effectual for all phones of the same model. It uses a fixed name "y0000000000XX.cfg" as the file name, where "XX" equals to the first two digits of the hardware version of the IP phone model.

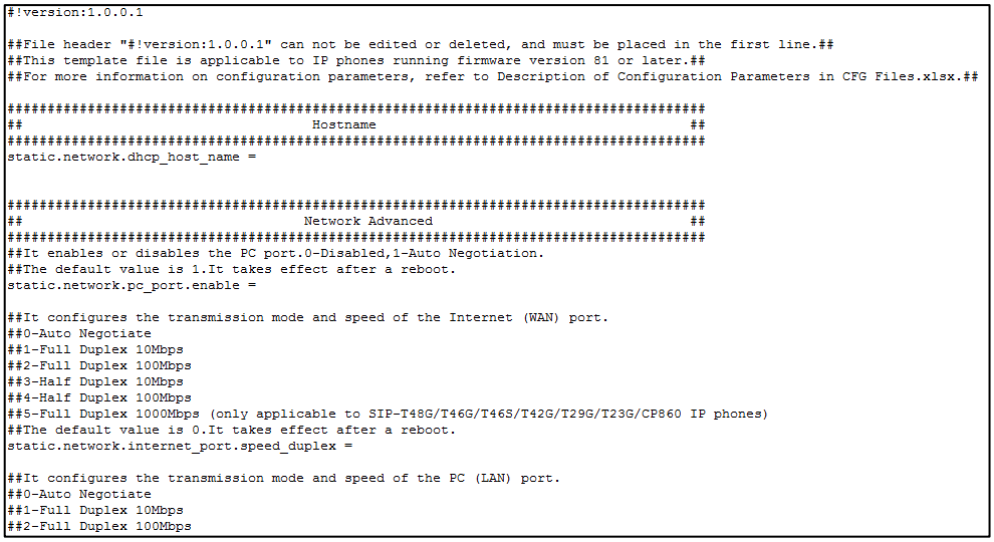
The names of the common CFG file requirements for the phone model are:

Phone Model	Common CFG File
CP960	y000000000073.cfg
SIP-T58V/A	y000000000058.cfg
SIP-T56A	y000000000056.cfg
SIP-T54S	y000000000070.cfg
SIP-T52S	y000000000074.cfg
SIP-T48S	y000000000065.cfg
SIP-T46S	y000000000066.cfg
SIP-T42S	y000000000067.cfg
SIP-T41S	y000000000068.cfg
SIP-T48G	y000000000035.cfg
SIP-T46G	y000000000028.cfg
SIP-T42G	y000000000029.cfg
SIP-T41P	y000000000036.cfg

Phone Model	Common CFG File
SIP-T40P	y000000000054.cfg
SIP-T40G	y000000000076.cfg
SIP-T29G	y000000000046.cfg
SIP-T27P	y000000000045.cfg
SIP-T27G	y000000000069.cfg
SIP-T23P/G	y000000000044.cfg
SIP-T21(P) E2	y000000000052.cfg
SIP-T19(P) E2	y000000000053.cfg
CP860	y000000000037.cfg
W52P/W56P	y000000000025.cfg

Common CFG file contains configuration parameters which apply to phones with the same model, such as language and volume.

The following figure shows a portion of the common CFG file:



```
#!version:1.0.0.1

##File header "#!version:1.0.0.1" can not be edited or deleted, and must be placed in the first line.##
##This template file is applicable to IP phones running firmware version 81 or later.##
##For more information on configuration parameters, refer to Description of Configuration Parameters in CFG Files.xlsx.##

######################################################################################
##                                  Hostname                                        ##
######################################################################################
static.network.dhcp_host_name =


######################################################################################
##                                Network Advanced                                  ##
######################################################################################
##It enables or disables the PC port.0-Disabled,1-Auto Negotiation.
##The default value is 1.It takes effect after a reboot.
static.network.pc_port.enable =

##It configures the transmission mode and speed of the Internet (WAN) port.
##0-Auto Negotiate
##1-Full Duplex 10Mbps
##2-Full Duplex 100Mbps
##3-Half Duplex 10Mbps
##4-Half Duplex 100Mbps
##5-Full Duplex 1000Mbps (only applicable to SIP-T48G/T46G/T46S/T42G/T29G/T23G/CP860 IP phones)
##The default value is 0.It takes effect after a reboot.
static.network.internet_port.speed_duplex =

##It configures the transmission mode and speed of the PC (LAN) port.
##0-Auto Negotiate
##1-Full Duplex 10Mbps
##2-Full Duplex 100Mbps
```

When editing the common CFG file, learn the following:

- The line beginning with "#" is considered to be a comment.
- The file header "#!version:1.0.0.1" is not a comment and must be placed in the first line. It cannot be edited or deleted.
- The file format must be *.cfg.
- The filename complies with the requirements that are listed in the above table.
- Each line must use the following format and adhere to the following rules:

  Configuration Parameter= Valid Value

  - Separate each configuration parameter and value with an equal sign.

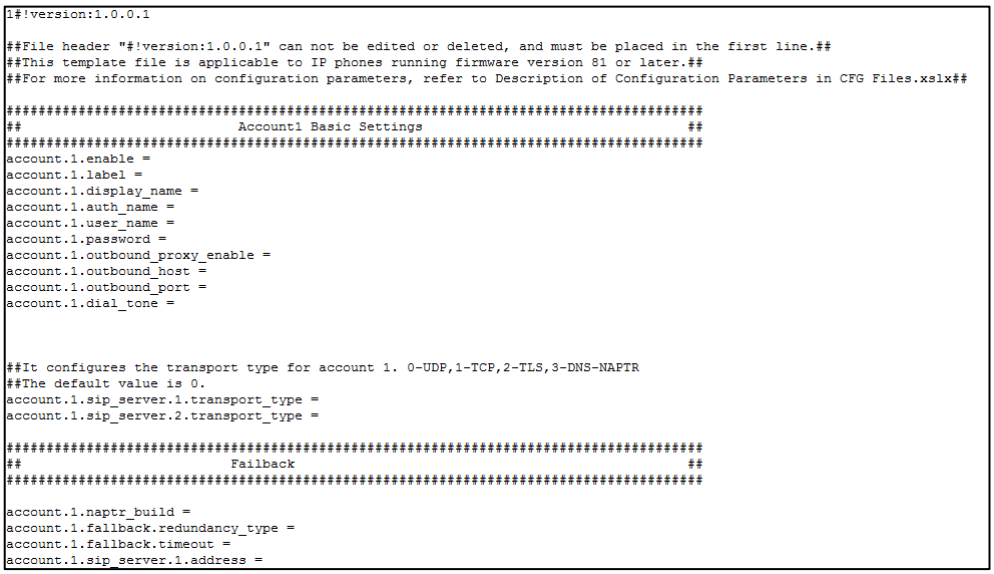
- Set only one configuration parameter per line.
- Put the configuration parameter and value on the same line, and do not break the line.

Editing MAC-Oriented CFG File

The MAC-Oriented CFG file is only effectual for the specific phone. It use the 12-digit MAC address of the IP phone as the file name. For example, if the MAC address of the IP phone is 00156574B150, the MAC-Oriented CFG file has to be named as 00156574b150.cfg (case-sensitive) respectively.

MAC-Oriented CFG file contains configuration parameters which are expected to be updated per phone, such as the registration information.

The following figure shows a portion of the MAC-Oriented CFG file:



```
1#!version:1.0.0.1

##File header "#!version:1.0.0.1" can not be edited or deleted, and must be placed in the first line.##
##This template file is applicable to IP phones running firmware version 81 or later.##
##For more information on configuration parameters, refer to Description of Configuration Parameters in CFG Files.xslx##

##############################################################################################
##                                Account1 Basic Settings                                   ##
##############################################################################################
account.1.enable =
account.1.label =
account.1.display_name =
account.1.auth_name =
account.1.user_name =
account.1.password =
account.1.outbound_proxy_enable =
account.1.outbound_host =
account.1.outbound_port =
account.1.dial_tone =


##It configures the transport type for account 1. 0-UDP,1-TCP,2-TLS,3-DNS-NAPTR
##The default value is 0.
account.1.sip_server.1.transport_type =
account.1.sip_server.2.transport_type =

##############################################################################################
##                                Failback                                                  ##
##############################################################################################

account.1.naptr_build =
account.1.fallback.redundancy_type =
account.1.fallback.timeout =
account.1.sip_server.1.address =
```

When editing the MAC-Oriented CFG file, learn the following:

- The line beginning with "#" is considered to be a comment.
- The file header "#!version:1.0.0.1" is not a comment and must be placed in the first line. It cannot be edited or deleted.
- The file format must be *.cfg.
- The filename matches the MAC address of your phone.
- Each line must use the following format and adhere to the following rules:

  Configuration Parameter= Valid Value

  - Separate each configuration parameter and value with an equal sign.
  - Set only one configuration parameter per line.
  - Put the configuration parameter and value on the same line, and do not break the line.

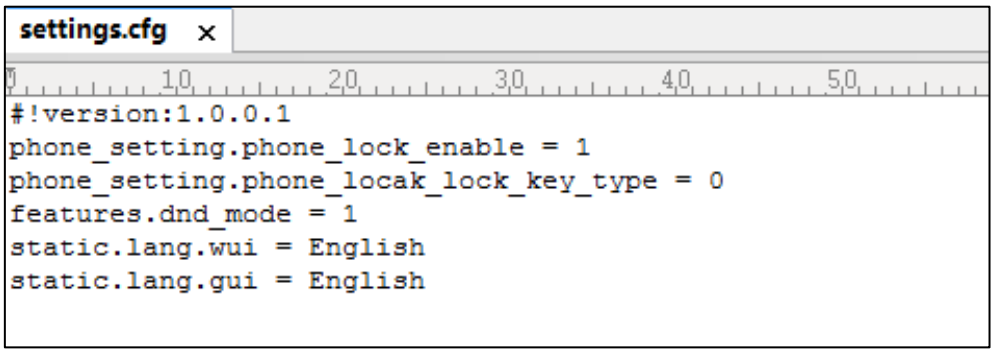
SIP-T58V/T58A/T56A/T54S/T48G/T48S/T46G/T46S/T29G IP phones support 16 accounts, SIP-T52S/T42G/T42S IP phones support 12 accounts, SIP-T41P/T41S/T27P/T27G IP phones support 6 accounts, W52P/W56P IP DECT phones support 5 accounts; SIP-T40P/T40G/T23P/T23G IP phones support 3 accounts, SIP-T21(P) E2 IP phones support 2 accounts, CP960/CP860/SIP-T19 (P) E2 IP phones support only one account.

Creating a New CFG File

If you want to create a new CFG file for your phone, follow these steps:

To create a new CFG file:

1. Create a CFG file for your phone. Ensure the file complies with the guidelines that are listed in Editing Common CFG File on page 15 or Editing MAC-Oriented CFG File on page 17.
2. Copy configuration parameters from the template configuration files and set the valid values for them.



3. Save the changes and close the CFG file.

You can also make a copy of the template configuration file, rename it and then edit it.

Managing MAC-local CFG File

By default, MAC-local CFG file automatically stores non-static settings modified via web user interface or phone user interface. This file is stored locally on the IP phone, but a copy can also be uploaded to the provisioning server (or a specified URL configured by "static.auto_provision.custom.sync.path"). This file enables the phone to keep user personalization settings, even after auto provision. As with the MAC-Oriented CFG files, MAC-local CFG files are only effectual for the specific phone too. They use the 12-digit MAC address of the IP phone as the file name. For example, if the MAC address of the IP phone is 00156574B150, MAC-local CFG file has to be named as 00156574b150-local.cfg (case-sensitive).

If your IP phone's current firmware version doesn't support generating a <MAC>-local.cfg file, the IP phone will automatically generate a MAC-local CFG file after it is upgraded to the latest firmware.

For more information on how to keep user personalization settings, refer to *Yealink_SIP-T2_Series_T19(P) E2_T4_Series_T5_Series_CP860_IP_Phones_Description of Configuration Parameters in CFG Files_V81.xlsx*, *Yealink IP DECT Phone Administrator Guide_V81* or *Yealink_SIP-T5_Series_CP960_IP_Phones_Administrator_Guide*.

We recommend you do not edit the MAC-local CFG file. If you really want to edit MAC-local CFG file, you can export and then edit it.
For more information on how to export CFG files, refer to *Yealink_SIP-T2_Series_T19(P) E2_T4_Series_T5_Series_CP860_IP_Phones_Administrator_Guide_V81*, *Yealink IP DECT Phone Administrator Guide_V81* or *Yealink_SIP-T5_Series_CP960_IP_Phones_Administrator_Guide*.

Encrypting Configuration Files

To protect against unauthorized access and tampering of sensitive information (e.g., login password, registration information), you can encrypt configuration files using Yealink Configuration Encryption Tool. AES keys must be 16 characters and the supported characters contain: 0 ~ 9, A ~ Z, a ~ z and the following special characters are also supported: # $ % * + , - . : = ? @ [ ] ^ _ { } ~. For more information on how to encrypt configuration files, refer to *Yealink Configuration Encryption Tool User Guide*.

Customizing Resource Files

When configuring some particular features, you may need to upload resource files to IP phones, such as personalized ring tone file, language package file and logo file. Yealink supplies the following resource file templates:

Feature	Template File Name
DST	AutoDST.xml
Language Packs	For example, 000.GUI.English.lang 1.English_note.xml 1.English.js
Replace Rule	dialplan.xml
Dial-now	dialnow.xml (not applicable to W56P IP DECT phones)
Softkey Layout (not applicable to CP960/W52P/W56P IP DECT phones)	CallFailed.xml CallIn.xml Connecting.xml Dialing.xml (not applicable to SIP-T58V/T58A/T56A/T48G/T48S IP phones) RingBack.xml Talking.xml

Feature	Template File Name
Directory (not applicable to SIP-T58V/T58A/T56A/ CP960 IP phones)	favorite_setting.xml
Super Search in dialing	super_search.xml
Local Contact File	contact.xml
Remote XML Phone Book	Department.xml Menu.xml
Ring Tone (not applicable to W56P IP DECT phones)	None
Logo customization (not applicable to W56P IP DECT phones)	None
Wallpaper (not applicable to W56P IP DECT phones)	None
Firmware	For SIP-T54S/T52S/T48G/T48S/T46G/T46S/T42/T42S/T41P/T41S/T40P /T29G/T27P/T27G/T23P/T23G/T21(P) E2/T19(P) E2: X.81.0.XX.rom For example, 44.81.0.15.rom For SIP-T58V/T58A/T56A/CP960: X.80.0.XX.rom For example, 58.80.0.10.rom

Ask the distributor or Yealink FAE for resource file templates. For more information on an explanation of the configuration parameters that relate to these features, refer to *Yealink_SIP-T2_Series_T19(P) E2_T4_Series_T5_Series_CP860_IP_Phones_Administrator_Guide_V81*, *Yealink IP DECT Phone Administrator Guide_V81* or *Yealink_SIP-T5_Series_CP960_IP_Phones_Administrator_Guide*.

Configuring a Provisioning Server

Yealink IP phones support using FTP, TFTP, HTTP and HTTPS protocols to download boot files and configuration files. You can use one of these protocols for provisioning. The TFTP protocol is used by default. The following section provides instructions on how to configure a TFTP server.

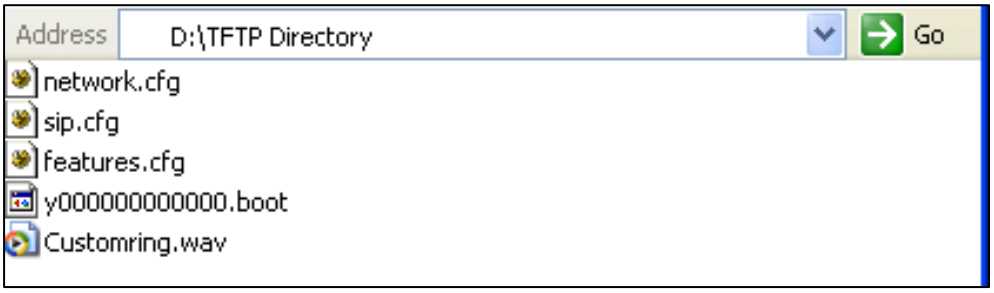
We recommend that you use 3CDaemon or TFTPD32 as a TFTP server. 3CDaemo and TFTPD32 are free applications for Windows. You can download 3CDaemon online: http://www.oldversion.com/3Com-Daemon.html and TFTPD32 online: http://tftpd32.jounin.net/.

For more information on how to configure FTP and HTTP servers, refer to Configuring an FTP Server on page 51 and Configuring an HTTP Server on page 54.

Preparing a Root Directory

To prepare a root directory:

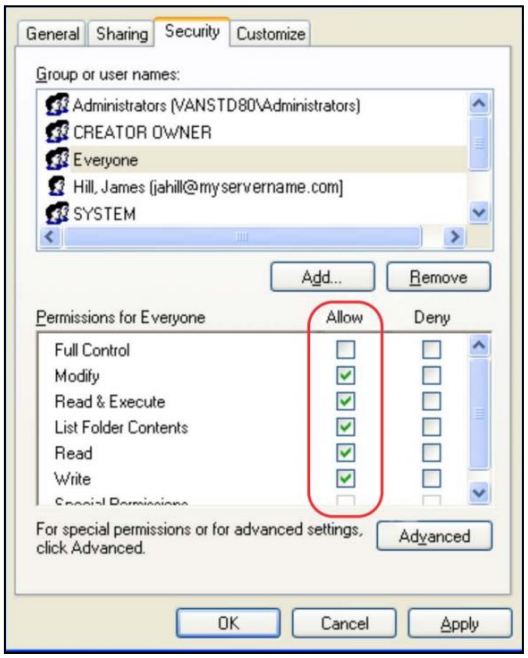
1. Create a TFTP root directory on the local system (e.g., D:\TFTP Directory).
2. Place the boot files and configuration files to this root directory.



3. (Optional.) Set security permissions for the TFTP directory folder.

   You need to define a user or a group name, and set the permissions: read, write or modify. Security permissions vary by organizations.

An example of configuration on the Windows platform is shown as below:



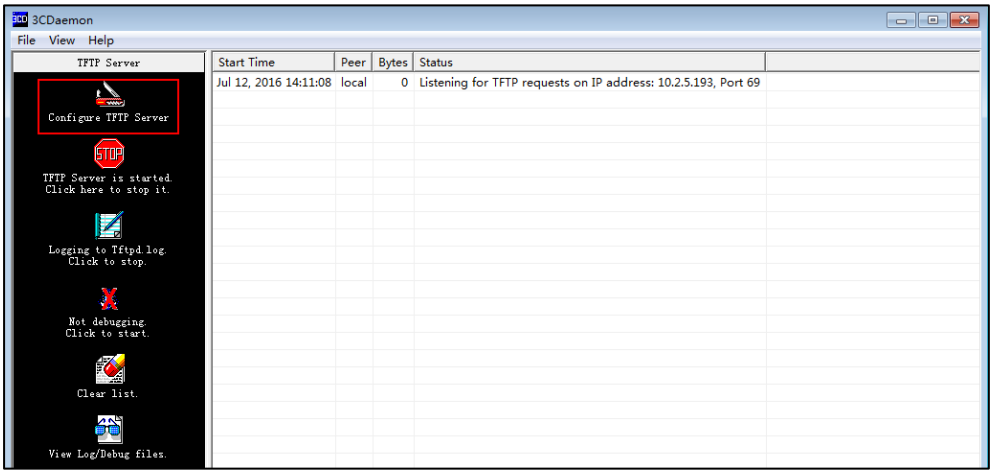
Configuring a TFTP Server

If you have a 3CDaemon application installed on your local system, use it directly. Otherwise, download and install it.

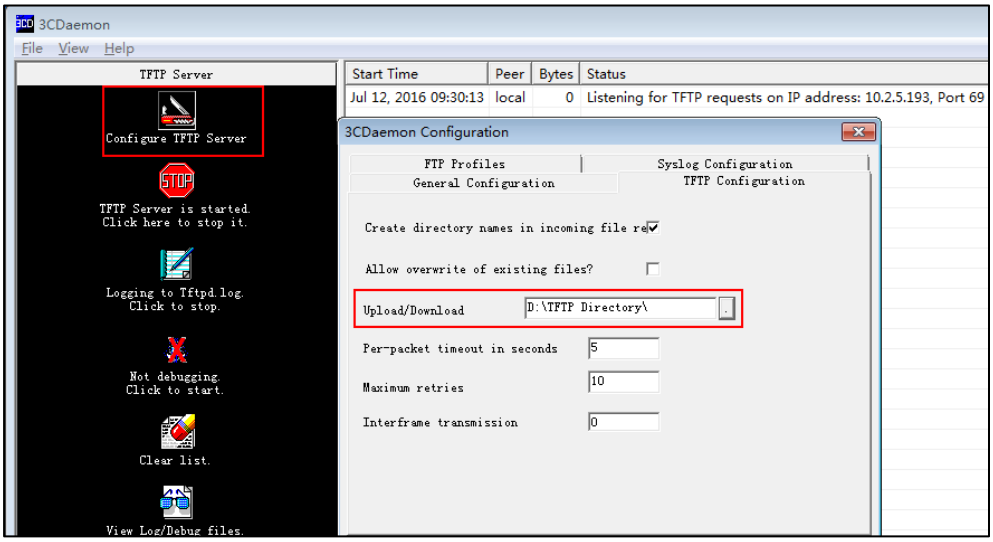
To configure a TFTP server:

1. Double click **3CDaemon.exe** to start the application.

   A configuration page is shown as below:



2. Select **Configure TFTP Server**. Click the ... button to locate the TFTP root directory from your local system:



3. Click the **Confirm** button to finish configuring the TFTP server.

The server URL "tftp://IP/" (Here "IP" means the IP address of the provisioning server, for example, "tftp://10.2.5.193/") is where the IP phone downloads configuration files from.

Obtaining the Provisioning Server Address

Yealink IP phones support obtaining the provisioning server address in the following ways:

- Zero Touch
- Plug and Play (PnP) Server
- DHCP Options
- Phone Flash
- Configuring Wildcard of the Provisioning Server URL

The priority of obtaining the provisioning server address is as follows: Zero Touch-->PnP Server-->DHCP Options (Custom option-->option 66-->option 43) -->Phone Flash. The following sections detail the process of each way (take the SIP-T23G IP phone as an example).

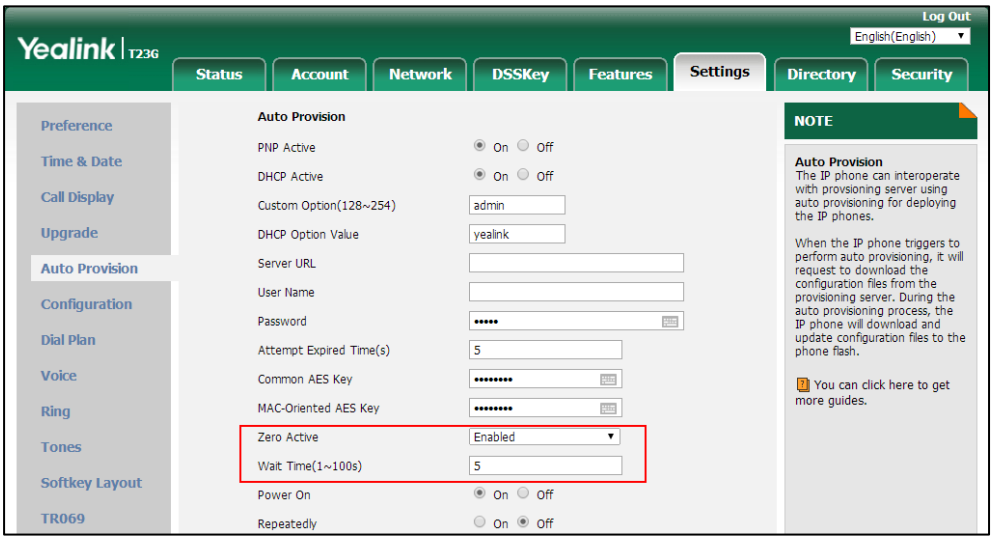
Zero Touch

Zero Touch allows you to configure the network parameters and provisioning server address via phone user interface during startup. This feature is helpful when there is a system failure on the IP phone. To use Zero Touch, make sure this feature is enabled. This feature is not applicable to W52P/W56P IP phones.

To configure zero touch via web user interface:

1. Click on **Settings**->**Auto Provision**.
2. Select **Enabled** from the pull-down list of **Zero Active**.
3. Enter the desired wait time in the **Wait Time(1~100s)** field.

   The default value is 5.



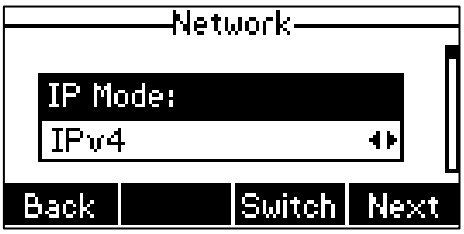
4. Click **Confirm** to accept the change.

When Zero Touch is enabled, there will be a configuration wizard during startup:



Press the **OK** soft key.

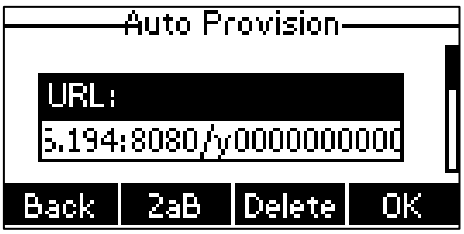
The network parameters are configurable via phone user interface:



Press the **Next** soft key after finishing network settings.

Configure the provisioning server address, authentication user name (optional) and password (optional) in the **Auto Provision** screen.

An example of screenshot is shown as below:



Press the **OK** soft key.

After the above configuration is completed, the IP phone will connect to the configured provisioning server and perform the auto provisioning process during startup.

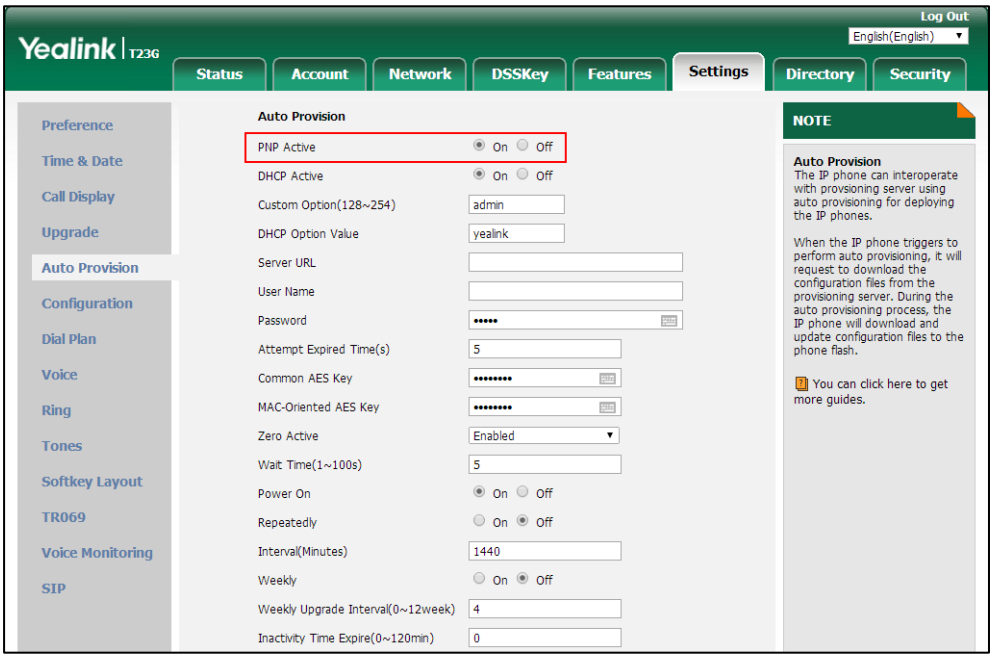
Plug and Play (PnP) Server

Yealink IP phones support obtaining the provisioning server address from the PnP server. The IP phone broadcasts the PnP SUBSCRIBE message to obtain the provisioning server address during startup. To use Plug and Play, make sure this feature is enabled.

To configure PnP via web user interface:

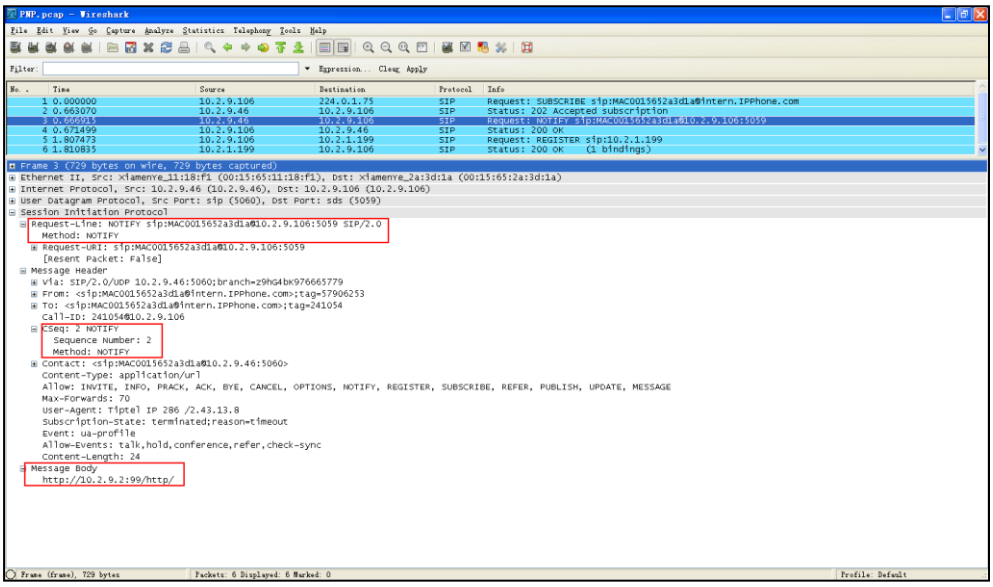
1. Click on **Settings**->**Auto Provision**.

2. Mark the **On** radio box in the **PNP Active** field.



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

   Any PnP server activated in the network responses with a **SIP NOTIFY** message, and an address of the provisioning server is contained in the message body.



After the IP phone obtains the provisioning server address from the PNP server, it will connect to the provisioning server and perform the auto provisioning process during startup.

DHCP Options

Yealink IP phones support obtaining the provisioning server address by detecting DHCP options during startup.

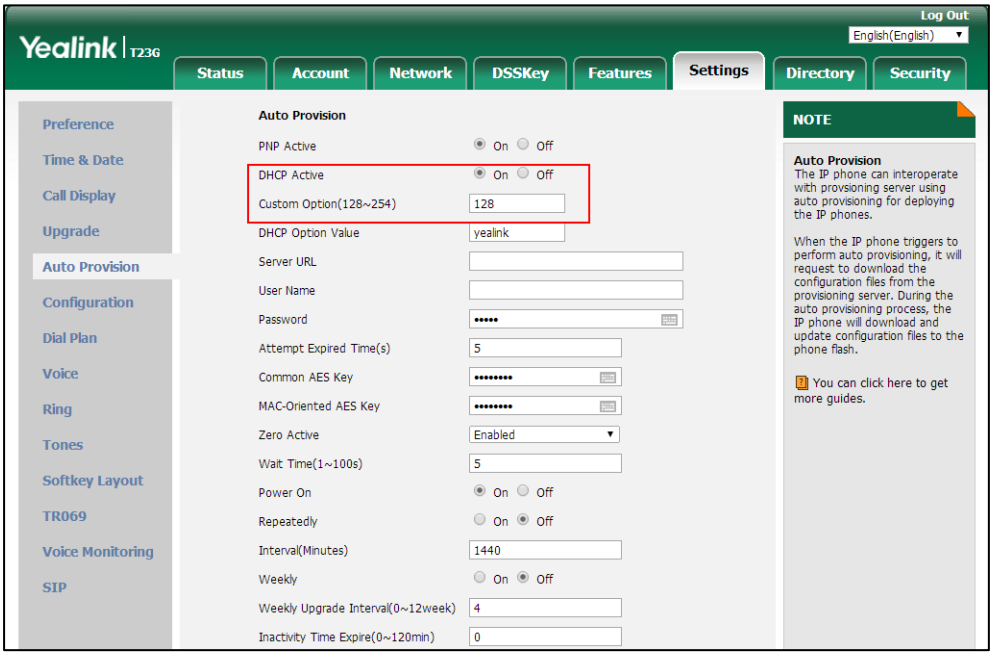
The phone will automatically detect the option 66 and option 43 for obtaining the provisioning server address. DHCP option 66 is used to identify the TFTP server. DHCP option 43 is a vendor-specific option, which is used to transfer the vendor-specific information.

You can configure the phone to obtain the provisioning server address via a custom DHCP option. To obtain the provisioning server address via a custom DHCP option, make sure the DHCP option is properly configured on the phone. The custom DHCP option must be in accordance with the one defined in the DHCP server.

For more information on how to configure a DHCP server, refer to Configuring a DHCP Server on page 58.

To configure the DHCP option via web user interface:

1. Click on **Settings**->**Auto Provision**.
2. Mark the **On** radio box in the **DHCP Active** field.
3. Enter the desired value in the **Custom Option(128~254)** field.



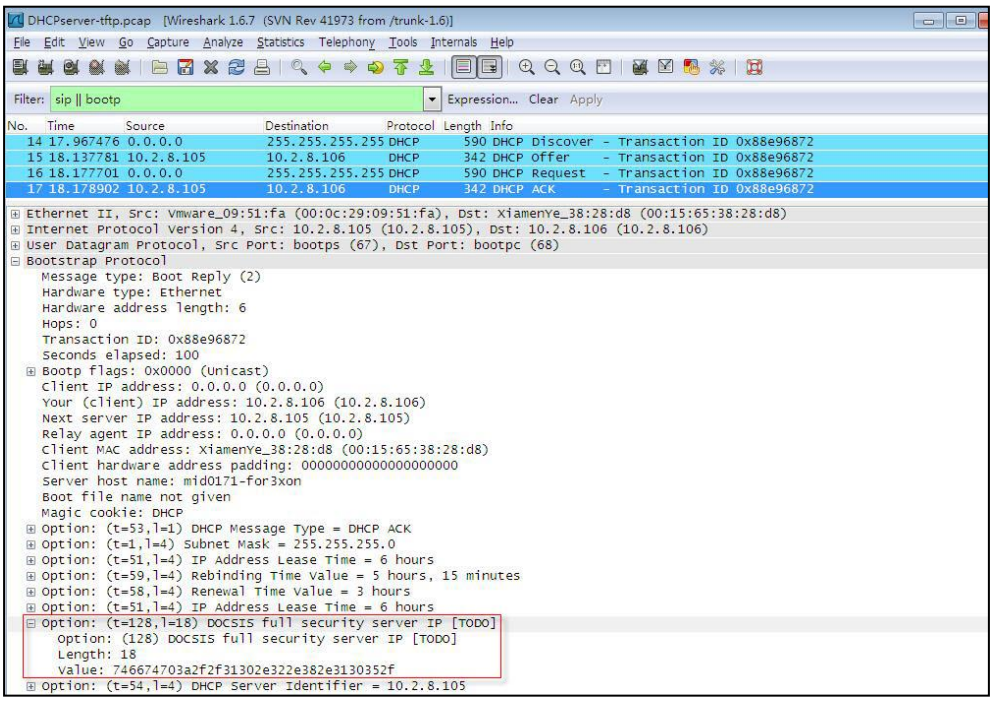
4. Click **Confirm** to accept the change.

During startup, the phone will broadcast DHCP request with DHCP options for obtaining the provisioning server address. The provisioning server address will be found in the received DHCP response message.

After the IP phone obtains the provisioning server address from the DHCP server, it will connect to the provisioning server and perform the auto provisioning process during startup.

For more information on the DHCP options, refer to *Yealink_SIP-T2_Series_T19(P)_E2_T4_Series_T5_Series_CP860_IP_Phones_Administrator_Guide_V81*, *Yealink IP DECT Phone Administrator Guide_V81* or *Yealink_SIP-T5_Series_CP960_IP_Phones_Administrator_Guide*.

The following figure shows the example messages of obtaining the TFTP server address from a custom DHCP option:



Right click the root node of the custom option (e.g., option 128) shown on the above figure, and select **Copy**->**Bytes**->**Printable Text Only**. Paste the copied text in your favorite text editor to check the address, for example, tftp://192.168.1.100/.

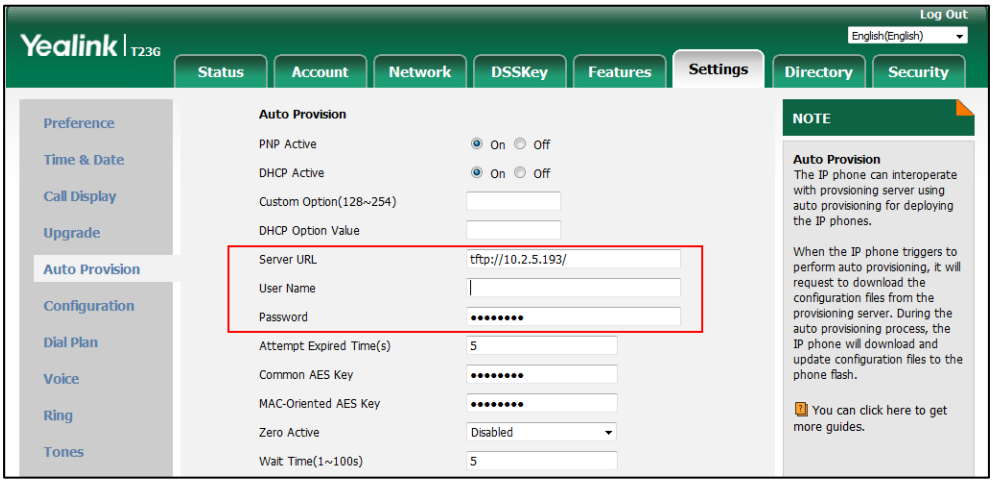
Phone Flash

Yealink IP phones support obtaining the provisioning server address from the IP phone flash. To obtain the provisioning server address by reading the IP phone flash, make sure the configuration is set properly.

To configure the IP phone flash via web user interface:

1. Click on **Settings**->**Auto Provision**.

2. Enter the URL, user name and password of the provisioning server in the **Server URL**, **User Name** and **Password** field respectively (the user name and password are optional).



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

After the above configuration is completed, the IP phone will connect to the configured provisioning server and perform the auto provisioning process by one of the following methods: Power On, Repeatedly, Weekly, Flexible Auto Provision, Auto Provision Now, SIP NOTIFY Message and Multi-mode Mixed. For more information on these methods, refer to Triggering the IP Phone to Perform the Auto Provisioning on Page 33.

Configuring Wildcard of the Provisioning Server URL

Normally, many phone models may be deployed in your environment. To deploy many phone models using a unified provisioning server, it is convenient for the administrator to configure a unified provisioning server URL for different phone models. On the provisioning server, many directories need to be configured for different phone models, each with a unique directory name. Yealink IP phones support the following wildcards in the provisioning server URL:

- **$PN**: it is used to identify the directory name of the provisioning server directory where the corresponding boot files and configuration files are located.
- **$MAC**: it is used to identify the MAC address of the IP phone.

The parameter "static.auto_provision.url_wildcard.pn" is used to configure the directory name the boot files and configuration files located. For more information on the parameter, refer to *Yealink_SIP-T2_Series_T19(P) E2_T4_Series IP Phones_Description of Configuration Parameters in CFG Files_V81.xlsx*, *Yealink IP DECT Phones Description of Configuration Parameters in CFG Files.xlsx* or *Yealink_SIP-T5_Series_CP960_IP_Phones_Description of Configuration Parameters in CFG Files.xlsx*.

When the IP phone obtains a provisioning server URL containing the wildcard $PN, it automatically replaces the character $PN with the value of the parameter "static.auto_provision.url_wildcard.pn" configured on the IP phone. When the IP phone is triggered to perform auto provisioning, it will request to download the boot files and

configuration files from the identified directory on the provisioning server.

The value of the parameter "static.auto_provision.url_wildcard.pn" must be configured in accordance with the directory name of the provisioning server directory where the boot files and configuration files of the IP phones are located.

The following example assists in explaining the wildcard feature:

You want to deploy SIP-T42G and SIP-T46G IP phones simultaneously in your environment. IP phones are configured to obtain the provisioning server URL via DHCP option 66. The following details how to deploy the SIP-T42G and SIP-T46G IP phones using wildcard feature.

1. Create two directories on the root directory of provisioning server.
2. Configure the directory names of these two directories to be "T42G" and "T46G".
3. Place the associated boot files and configuration files to the directory created above.
4. Configure the value of DHCP option 66 on the DHCP server as: tftp://192.168.1.100/$PN.
5. Configure the value of the parameter "static.auto_provision.url_wildcard.pn".

   The default value of the parameter "static.auto_provision.url_wildcard.pn" is ''T42G'' for the SIP-T42G IP phones and ''T46G'' for the SIP-T46G IP phones. If the default value is different from the directory name, you need to configure the value of this parameter to be the directory name on the IP phones in advance.

During startup, IP phones obtain the provisioning server URL "tftp://192.168.1.100/$PN" via DHCP option 66, and then replace the character "$PN" in the URL with "T42G" for the SIP-T42G IP phones and "T46G" for the SIP-T46G IP phones. When performing auto provisioning, the SIP-T42G IP phones and the SIP-T46G IP phones first request to download the MAC-Oriented boot files and configuration files referenced in MAC-Oriented boot files from the provisioning server address "tftp://192.168.1.100/T42G" and "tftp://192.168.1.100/T46G" respectively. If no matched MAC-Oriented boot files are found on the server, the SIP-T42G IP phones and the SIP-T46G IP phones request to download the common boot files and configuration files referenced in common boot files from the provisioning server address "tftp://192.168.1.100/T42G" and "tftp://192.168.1.100/T46G" respectively.

If the URL is configured as "tftp://192.168.1.100/$PN/$MAC.boot" on the DHCP server, the SIP-T42G IP phones and the SIP-T46G IP phones will replace the characters "$PN" with "T42G" and "T46G" respectively, and replace the characters "$MAC" with their MAC addresses. For example, the MAC address of one SIP-T42G IP phone is 00156543EC97. When performing auto provisioning, the IP phone will only request to download the 00156543ec97.boot file and configuration files referenced in the 00156543ec97.boot file from the provisioning server address "tftp://192.168.1.100/T42G".

For more information on boot files, refer to Managing Boot Files on page 11.

Triggering the IP Phone to Perform the Auto Provisioning

This chapter introduces the following methods to trigger the IP phone to perform the auto provisioning process:

- Power On
- Repeatedly
- Weekly
- Flexible Auto Provision
- Auto Provision Now
- Multi-mode Mixed
- SIP NOTIFY Message
- Auto Provisioning via Activation Code

When there is an active call on the IP phone during auto provisioning, the auto provisioning process will detect the call status every 30 seconds. If the call is released within 2 hours, the auto provisioning process will be performed normally. Otherwise, the process will end, due to timeout.

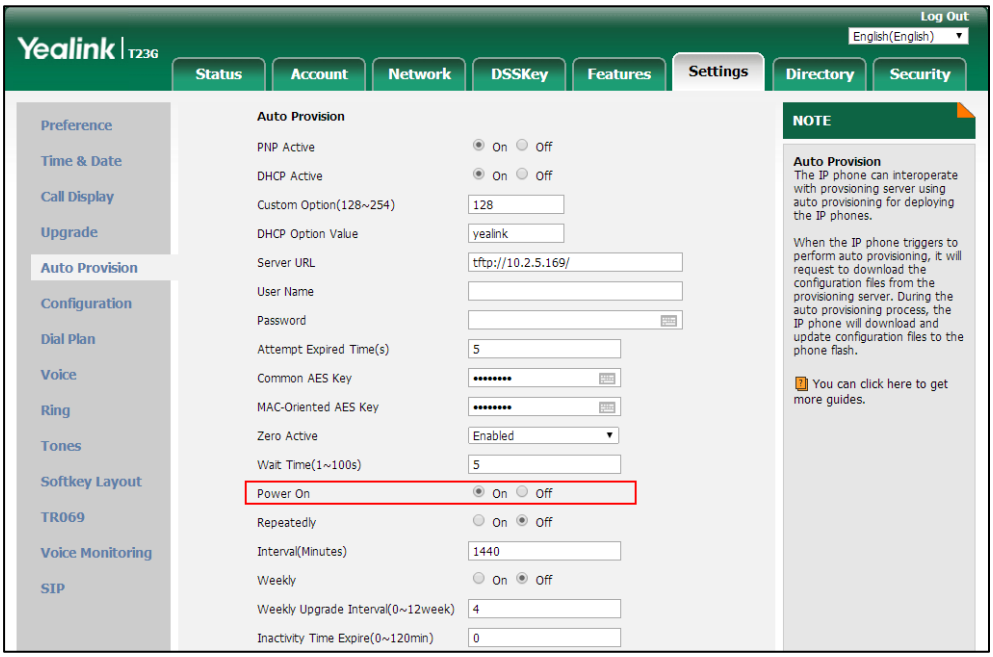
Power On

The IP phone performs the auto provisioning process when the IP phone is powered on.

To activate the power on mode via a web user interface:

1. Click on **Settings**->**Auto Provision**.

2. Mark the **On** radio box in the **Power On** field.



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

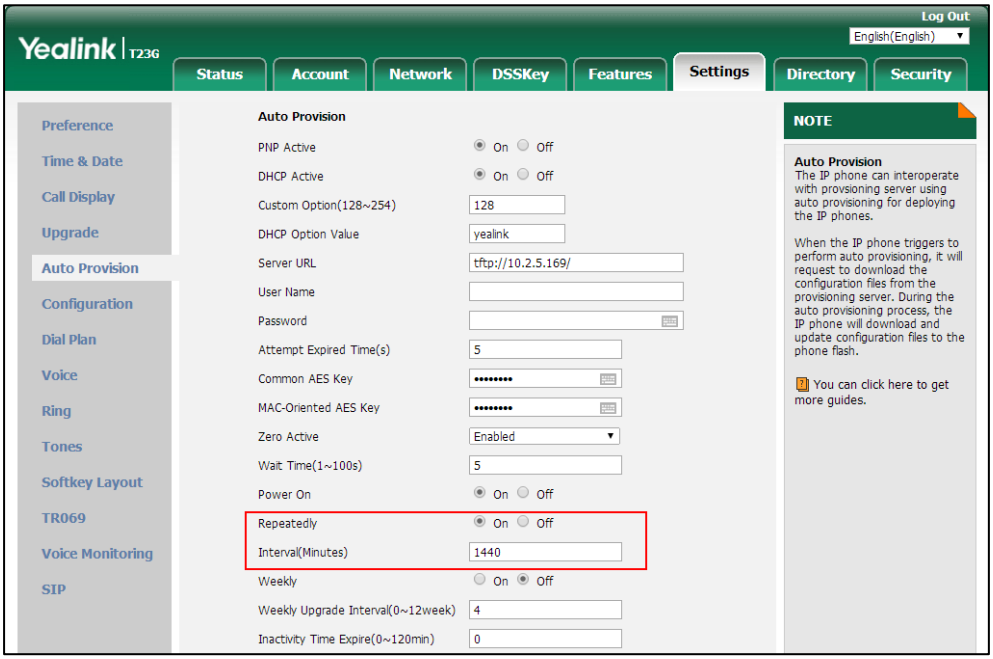
Repeatedly

The IP phone performs the auto provisioning process at regular intervals. You can configure the interval for the repeatedly mode. The default interval is 1440 minutes.

To activate the repeatedly mode via web user interface:

1. Click on **Settings**->**Auto Provision**.
2. Mark the **On** radio box in the **Repeatedly** field.

3. Enter the desired interval time (in minutes) in the **Interval(Minutes)** field.



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

Weekly

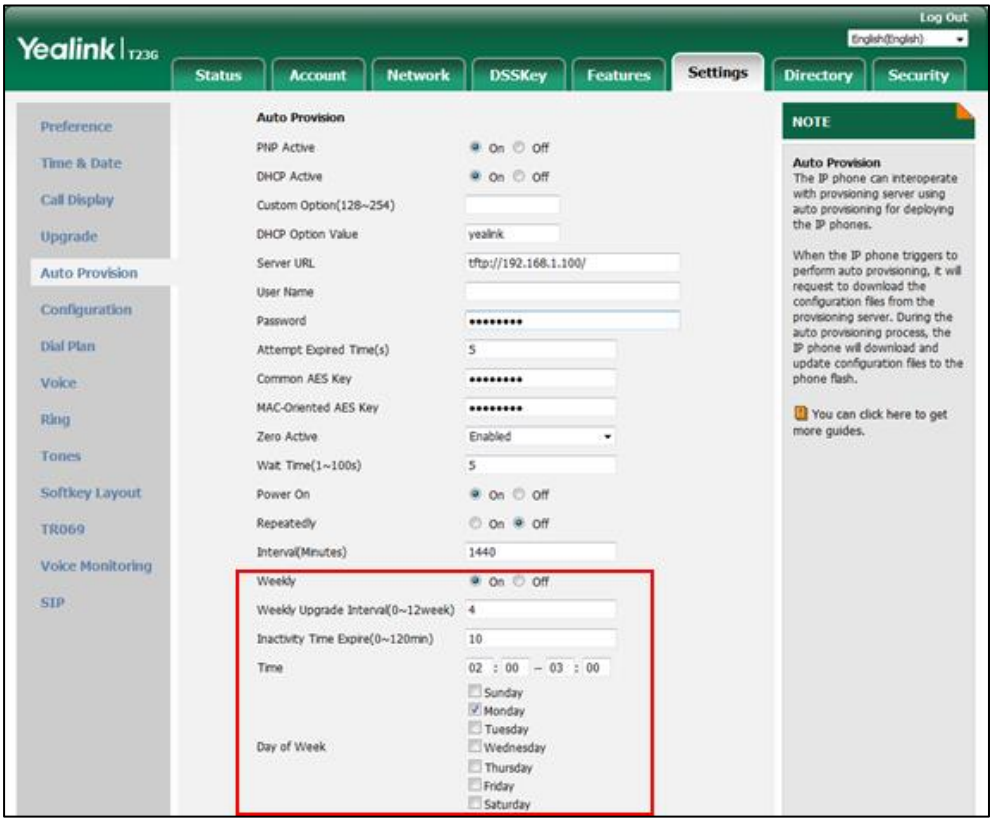
The IP phone performs the auto provisioning process at a random time every week/month/quarter. You can configure what time of the day and which day of the week to trigger the IP phone to perform the auto provisioning process. You can also configure a regular week interval to trigger the IP phone to perform the auto provisioning process. You can specify the delay time to perform an auto provisioning process when the IP phone is inactive at regular week. For example, you can configure the IP phone to check and update new configuration only when the IP phone has been inactivated for 10 minutes between 2 to 3 o'clock in the morning every Monday for a 4-week interval.

If you configure two or more days in a week, the auto provisioning only occurs at a random day.

To activate the weekly mode via web user interface:

1. Click on **Settings**->**Auto Provision**.
2. Mark the **On** radio box in the **Weekly** field.
3. Enter the desired upgrade interval in the **Weekly Upgrade Interval(0~12week)** field.
4. Enter the desired value in the **Inactivity Time Expire(0~120min)** field.
5. Enter the desired time in the **Time** field.

6. Check one or more checkboxes in the **Day of Week** field.



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

Flexible Auto Provision

The IP phone performs the auto provisioning process at a random time on a random day within a specific period of time. The random day is calculated on the basis of the phone's MAC address. You can specify an interval and configure what time of the day to trigger the IP phone to perform the auto provisioning process.

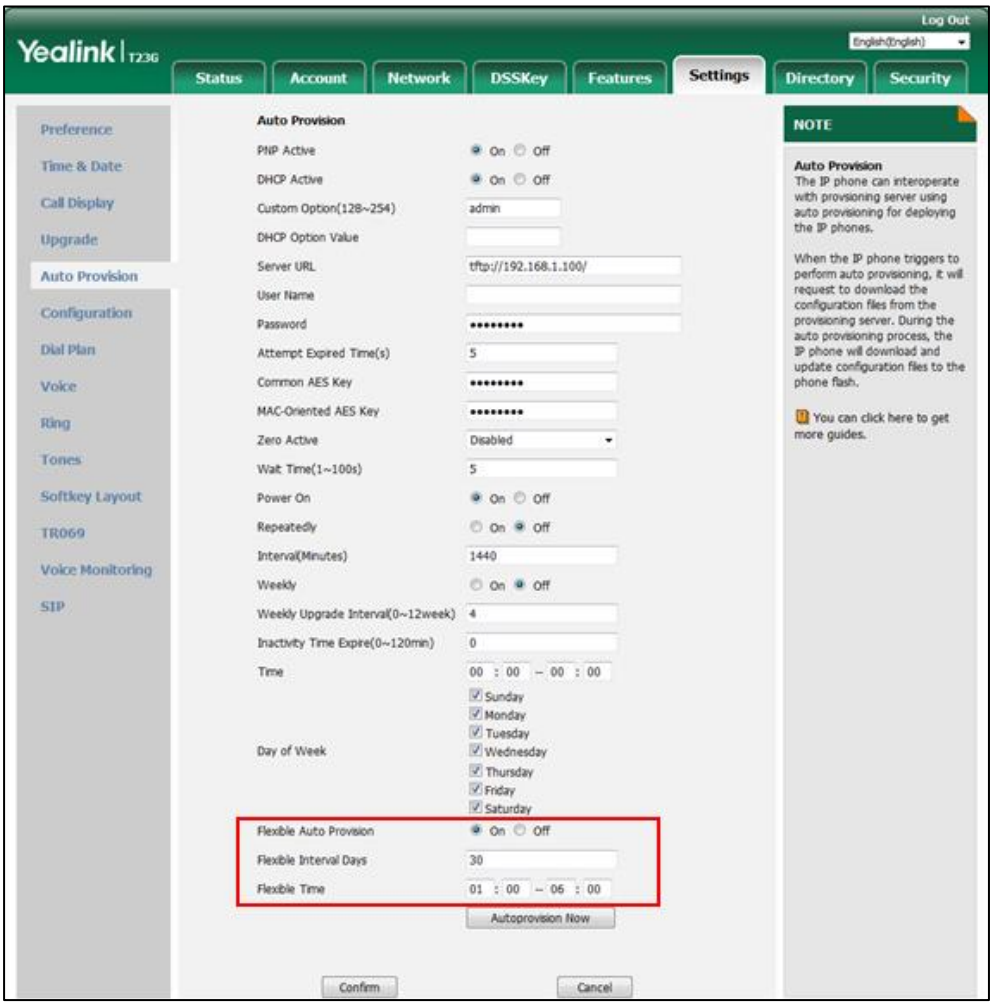
For example, you can configure the IP phone to check and update new configuration between 1 and 6 o'clock in the morning for a 30-day interval. The IP phone will perform an auto provisioning process at a random time (e.g., 03:47) on a random day (e.g., 18) based on the phone's MAC address.

Note that the update time will be recalculated if auto provisioning occurs (e.g., Auto Provision Now) during this specific period of time.

To activate the flexible auto provision mode via web user interface:

1. Click on **Settings**->**Auto Provision**.
2. Mark the **On** radio box in the **Flexible Auto Provision** field.
3. Enter the desired value in the **Flexible Interval Days** field.

4. Enter the desired start time and end time in the **Flexible Time** field.



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

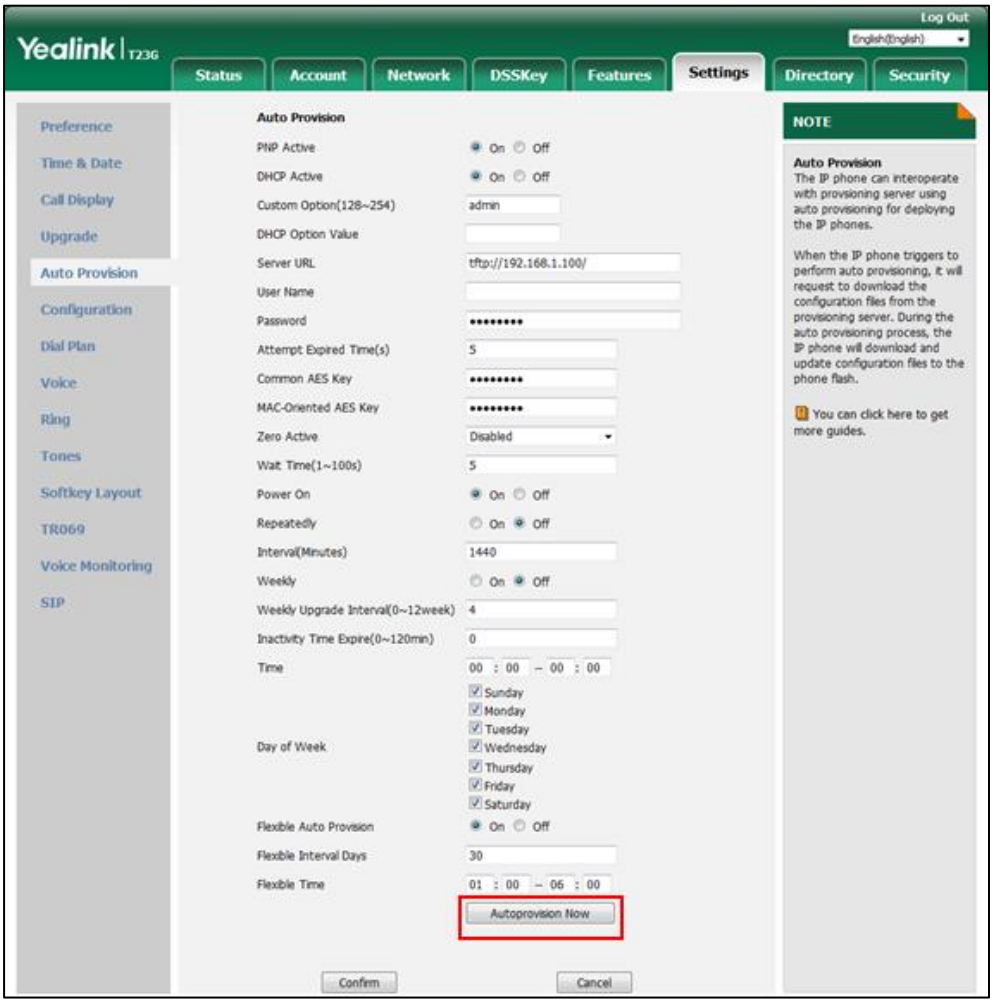
Auto Provision Now

You can use auto provision now mode to manually trigger the IP phone to perform the auto provisioning process immediately.

To use the auto provision now mode via web user interface:

1. Click on **Settings**->**Auto Provision**.

2. Click **Autoprovision Now**.



The IP phone will perform the auto provisioning process immediately.

Multi-mode Mixed

You can activate more than one method for auto provisioning. For example, you can activate the "Power On" and "Repeatedly" modes simultaneously. The IP phone will perform the auto provisioning process when it is powered on and at a specified interval.

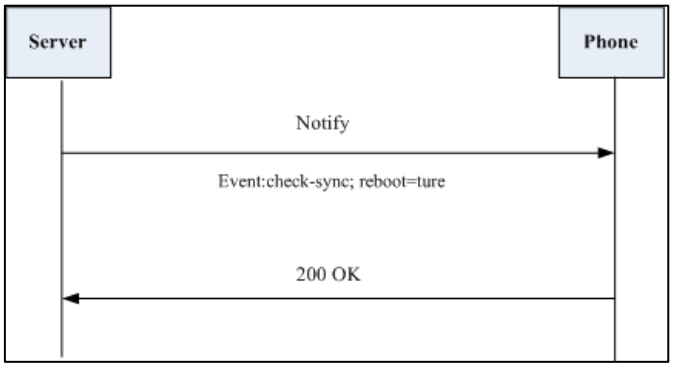
SIP NOTIFY Message

The IP phone will perform the auto provisioning process when receiving a SIP NOTIFY message which contains the header "Event: check-sync". Whether the IP phone reboots or not depends on the value of the parameter "sip.notify_reboot_enable". If the value is set to 1, or the value is set to 0 and the header of the SIP NOTIFY message contains an additional string "reboot=true", the IP phone will reboot immediately. For more information on the parameter "sip.notify_reboot_enable", refer to *Yealink_SIP-T2_Series_T19(P) E2_T4_Series IP Phones_Description of Configuration Parameters in CFG Files_V81.xlsx*, *Yealink IP DECT Phones*

Description of Configuration Parameters in CFG Files.xlsx or *Yealink_SIP-T5_Series_CP960_IP_Phones_Description of Configuration Parameters in CFG Files.xlsx*.

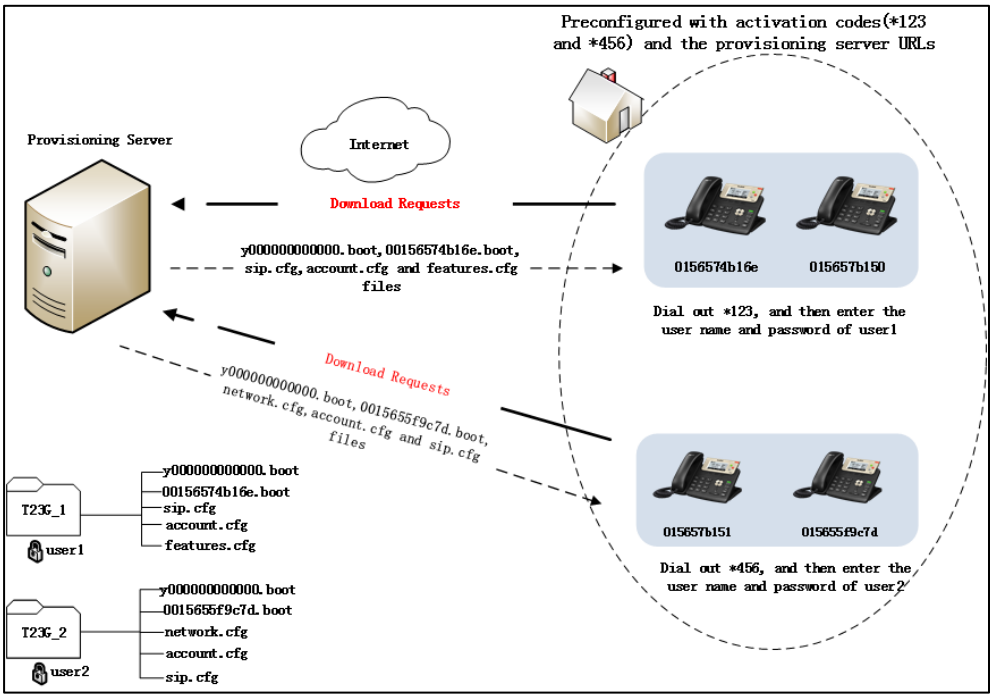
This method requires server support.

The following figure shows the message flow:



Auto Provisioning via Activation Code

In addition to the updating modes introduced above, users can trigger IP phones to perform auto provisioning by dialing an activation code. To use this method, the activation code and the provisioning server URL need to be pre-configured on the IP phones. This method works only if there is no registered account on the IP phone. It is normally used for IP phones distributed by retail sales. It has the advantage that the IP phones do not need to be handled (e.g., registering account) before sending them to end-users.



The following lists the processes for triggering auto provisioning via activation code:

1. Create multiple directories (e.g., T23G_1 and T23G_2) on the provisioning server.
2. Store boot files and configuration files to each directory on the provisioning server.
3. Configure a user name and password for each directory on the provisioning server.

   The user name and password provides a means of conveniently partitioning the boot files and configuration files for different IP phones. To access the specified directory, you need to provide the correct user name and password configured for the directory.
4. Configure unique activation codes and the provisioning server URLs on IP phones.

   The activation code can be numeric characters, special characters "#", "*" or a combination of them within 32 characters.

   The following are example configurations in the configuration file for IP phones:

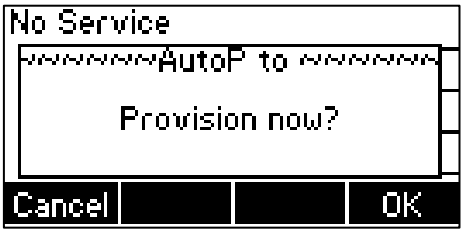
   static.autoprovision.1.code = *123

   static.autoprovision.1.url = http://192.168.1.30/T23G_1/

   static.autoprovision.2.code = *456

   static.autoprovision.2.url = http://192.168.1.30/T23G_2/
5. Send the specified activation code, associated user name and password to each end-user.
6. The user can set up the IP phone, and then input the activation code (e.g., *123) after the phone startup.

   The LCD screen will prompt the following dialog box:



7. Press the **OK** soft key to trigger the IP phone to perform auto provisioning.

   The LCD screen will prompt the following input box:



8. Enter the user name and password in the **User Name** and **Password** field respectively.

   The entered user name and password must correspond to the directory where the boot files and configuration files of the IP phone are located. If you enter invalid user name or password, the LCD screen will prompt the message "Wrong user name or password!". The prompt message will disappear in two seconds, and the LCD screen will return to the idle screen. You need to input the activation code again to trigger the auto provisioning

process.

The IP phone downloads the specified configuration files in sequence in boot files from the provisioning server to complete phone configurations. For more information on boot files and configuration files, refer to Managing Boot Files on page 11 and Managing Configuration Files on page 15.

The entered user name and password will be saved to the IP phone for next auto provisioning.

The LCD screen will not prompt for user name and password if the provisioning server does not require authentication, or the user name and password are already saved on the IP phone.

The following parameters are used to configure the auto provisioning via activation code method (X ranges from 1 to 50):

#(Optional.) Configure the code name for triggering auto provisioning.

static.autoprovision.X.name

#Configure the activation code.

static.autoprovision.X.code

#Configure the URL of the provisioning server.

static.autoprovision.X.url

#Configure the username and password for downloading boot files and configuration files. If configured, the LCD screen will not prompt for user name and password.

static.autoprovision.X.user

static.autoprovision.X.password

Downloading and Verifying Configurations

Downloading Boot Files and Configuration Files

After obtaining the provisioning server address in one of the ways introduced above, the phone will request to download the boot files and configuration files from the provisioning server when it is triggered to perform auto provisioning.

The IP phone will try to download the MAC-Oriented boot file firstly and then download the configuration files referenced in the MAC-Oriented boot file in sequence from the provisioning server during the auto provisioning process. If no MAC-Oriented boot file is found, the IP phone will try to download the common boot file and then download the configuration files referenced in the common boot file in sequence. If no common boot file is found, the IP phone will try to download the Common CFG file firstly, and then try to download the MAC-Oriented CFG file from the provisioning server.

If the access URLs of the resource files have been specified in the configuration files, the phone will try to download the resource files.

Resolving and Updating Configurations

After downloading, the phone resolves the configuration files and resource files (if specified in the configuration files), and then updates the configurations and resource files to the phone flash. Generally, updated configurations will automatically take effect after the auto provisioning process is completed. For update of some specific configurations which require a reboot before taking effect, for example, network configurations, the IP phone will reboot to make the configurations effective after the auto provisioning process is completed.

The IP phone calculates the MD5 values of the downloaded files before updating them. If the MD5 values of the Common and MAC-Oriented configuration files are the same as those of the last downloaded configuration files, this means these two configuration files on the provisioning server are not changed. The IP phone will complete the auto provisioning without repeated update. This is used to avoid unnecessary restart and impact of phone use. On the contrary, the IP phone will update configurations.

The latest values to be applied to the IP phone are the values that take effect.

The phone only reboots when there is at least a specific configuration requiring a reboot after auto provisioning. If you want to force the IP phone to perform a reboot after auto provisioning, you can configure "static.auto_provision.reboot_force.enable = 1" in the configuration file.
For more information on the specific configurations which require a reboot during auto provisioning and the parameter "static.auto_provision.reboot_force.enable", refer to *Yealink_SIP-T2_Series_T19(P) E2_T4_Series IP Phones_Description of Configuration Parameters in CFG Files_V81.xlsx*, *Yealink IP DECT Phones Description of Configuration Parameters in CFG Files.xlsx* or *Yealink_SIP-T5_Series_CP960_IP_Phones_Description of Configuration Parameters in CFG Files.xlsx*.

If configuration files have been AES encrypted, the IP phone will uses the Common AES key to decrypt the Common CFG file and the MAC-Oriented AES key to decrypt the <MAC>.cfg file after downloading the configuration files. For more information on how the IP phone decrypts configuration files, refer to *Yealink Configuration Encryption Tool User Guide*.

Using MAC-local CFG File

Uploading and downloading the <MAC>-local.cfg file

You can configure whether the IP phone uploads the <MAC>-local.cfg file to the provisioning server (or a specified URL configured by "static.auto_provision.custom.sync.path") once the file changes for backing up this file, and downloads the <MAC>-local.cfg file from the provisioning server (or a specified URL configured by "static.auto_provision.custom.sync.path") during auto provisioning to override the one stored on the phone. This process is controlled by the value of the parameter "static.auto_provision.custom.sync".

Updating configurations in the <MAC>-local.cfg file

You can configure whether the IP phone updates configurations in the <MAC>-local.cfg file during auto provisioning. This process is controlled by the value of the parameter "static.auto_provision.custom.protect". If the IP phone is configured to keep user personalized settings (by setting the value of the parameter "static.auto_provision.custom.protect" to 1), it will update configurations in the <MAC>-local.cfg file. If the value of the parameter "overwrite_mode" is set to 1 in the boot file, the value of the parameter "static.auto_provision.custom.protect" will be forced to set to 1.

The IP phone updates configuration files during auto provisioning in sequence: CFG files referenced in the boot file>MAC-local CFG file (if no boot file is found, Common CFG file>MAC-Oriented CFG file>MAC-local CFG file). The configurations in the <MAC>-local.cfg file take precedence over the ones in other downloaded configuration files. As a result, the personalized settings of the phone configured via the phone or web user interface can be kept after auto provisioning.

Note that if the personalized settings are static settings, they cannot be kept after auto provisioning because the static settings will never be saved in the <MAC>-local.cfg file.

For more information, refer to *Yealink_SIP-T2_Series_T19(P) E2_T4_Series_T5_Series_CP860_IP_Phones_Administrator_Guide_V81*, *Yealink IP DECT Phone Administrator Guide_V81* or *Yealink_SIP-T5_Series_CP960_IP_Phones_Administrator_Guide*.

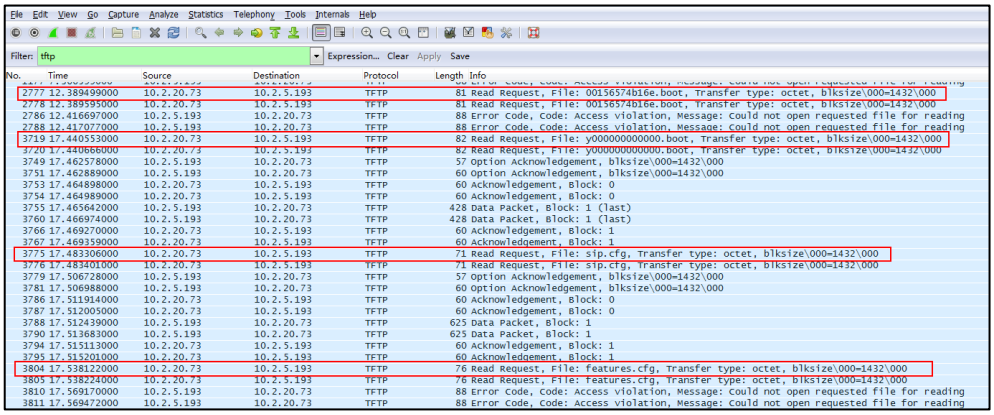
Verifying Configurations

After auto provisioning, you can then verify the update via phone user interface or web user interface of the phone. For more information, refer to *Yealink phone-specific user guide*.

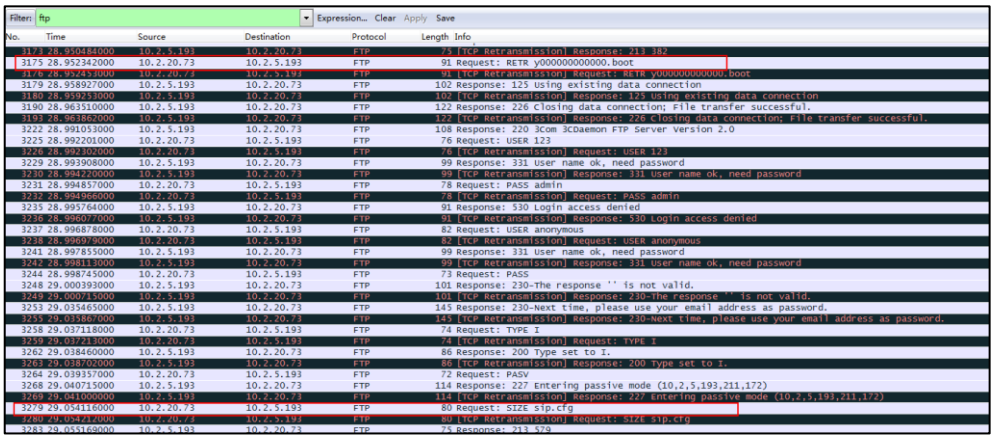
During the auto provisioning process, you can monitor the downloading requests and response

messages by a WinPcap tool. The following shows some examples.

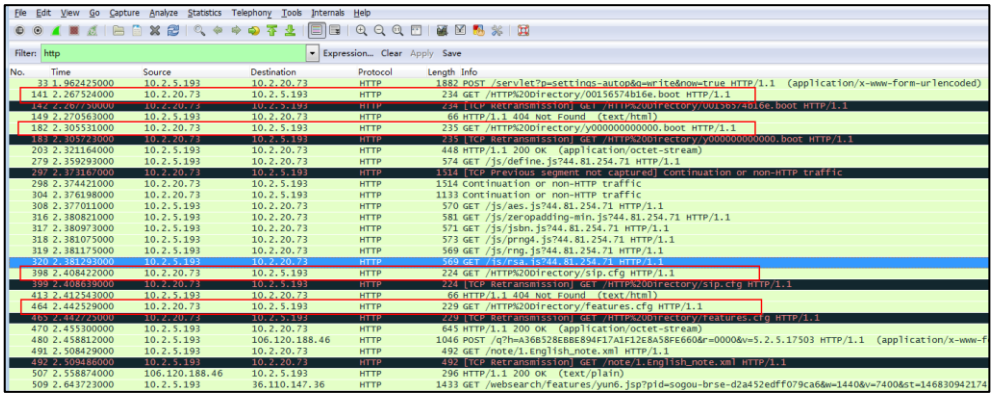
Example1: Yealink SIP-T23G IP phone downloads the boot file and configuration files from the TFTP server.



Example 2: Yealink SIP-T23G IP phone downloads the boot file and configuration files from the FTP server.



Example 3: Yealink SIP-T23G IP phone downloads boot file and configuration files from the HTTP server.



Troubleshooting

This chapter provides general troubleshooting information to help you solve problems you might encounter when deploying phones.

If you require additional information or assistance with the deployment, contact your system administrator.

Why does the IP phone fail to download configuration files?

- Ensure that auto provisioning feature is configured properly.
- Ensure that the provisioning server and network are reachable.
- Ensure that authentication credentials configured on the IP phone are correct.
- Ensure that configuration files exist on the provisioning server.
- Ensure that MAC-Oriented boot file and common boot file don't exist simultaneously on the provisioning server. If both exist, the IP phone only downloads MAC-Oriented boot file and the configuration files referenced in the MAC-Oriented boot file.

Why does the IP phone fail to authenticate the provisioning server during auto provisioning?

- Ensure that the certificate for the provisioning server has been uploaded to the phone's trusted certificates list. If not, do one of the following:
  - Import the certificate for the provisioning server to the phone's trusted certificates list (at phone's web path **Security**->**Trusted Certificates**->**Import Trusted Certificates**).
  - Disable the IP phone to only trust the server certificates in the trusted certificates list (at phone's web path **Security**->**Trusted Certificates**->**Only Accept Trusted Certificates**).

Why does the provisioning server return HTTP 404?

- Ensure that the provisioning server is properly set up.
- Ensure that the access URL is correct.
- Ensure that the requested files exist on the provisioning server.

Why does the IP phone display "Network unavailable"?

- Ensure that the Ethernet cable is plugged into the Internet port on the IP phone and the Ethernet cable is not loose.
- Ensure that the switch or hub in your network is operational.
- Ensure that the configurations of network are properly set in the configuration files.

Why is the permission denied when uploading files to the root directory of the FTP server?

- Ensure that the complete path to the root directory of the FTP server is authorized.
- Check security permissions on the root directory of the FTP server, if necessary, change the permissions.

Why doesn't the IP phone obtain the IP address from the DHCP server?

- Ensure that settings are correct on the DHCP server.
- Ensure that the IP phone is configured to obtain the IP address from the DHCP server.

Why doesn't the IP phone download the ring tone?

- Ensure that the file format of the ring tone is *.wav.
- Ensure that the size of the ring tone file is no larger than that the IP phone supports.
- Ensure that the properties of the ring tone for the IP phone are correct.
- Ensure that the network is available and the root directory is right for downloading.
- Ensure that the ring tone file exists on the provisioning server.

Why doesn't the IP phone update configurations?

- Ensure that the configuration files are different from the last ones.
- Ensure that the IP phone has downloaded the configuration files.
- Ensure that the parameters are correctly set in the configuration files.
- Ensure that the value of the parameter "static.auto_provision.custom.protect" is set to 0. If it is set to 1, the provisioning priority is as follows: phone/web user interface >central provisioning >factory defaults. A setting you make using a lower-priority method does not apply to or override a duplicate setting made using a higher-priority method.

  For more information, refer to *Yealink_SIP-T2_Series_T19(P) E2_T4_Series_T5_Series_CP860_IP_Phones_Administrator_Guide_V81*, *Yealink IP DECT Phone Administrator Guide_V81* or *Yealink_SIP-T5_Series_CP960_IP_Phones_Administrator_Guide*.

Glossary

MAC Address: A Media Access Control address (MAC address) is a unique identifier assigned to network interfaces for communications on the physical network segment.

MD5: The MD5 Message-Digest Algorithm is a widely used cryptographic hash function that produces a 128-bit (16-byte) hash value.

DHCP: Dynamic Host Configuration Protocol (DHCP) is a network configuration protocol for hosts on Internet Protocol (IP) networks. Computers that are connected to IP networks must be configured before they can communicate with other hosts.

FTP: File Transfer Protocol (FTP) is a standard network protocol used to transfer files from one host to another host over a TCP-based network, such as the Internet. It is often used to upload web pages and other documents from a private development machine to a public web-hosting server.

HTTP: The Hypertext Transfer Protocol (HTTP) is an application protocol for distributed, collaborative, hypermedia information systems. HTTP is the foundation of data communication for the World Wide Web.

HTTPS: Hypertext Transfer Protocol Secure (HTTPS) is a combination of Hypertext Transfer Protocol (HTTP) with SSL/TLS protocol. It provides encrypted communication and secure identification of a network web server.

TFTP: Trivial File Transfer Protocol (TFTP) is a simple protocol to transfer files. It has been implemented on top of the User Datagram Protocol (UDP) using port number 69.

AES: Advanced Encryption Standard (AES) is a specification for the encryption of electronic data.

URL: A uniform resource locator or universal resource locator (URL) is a specific character string that constitutes a reference to an Internet resource.

XML: Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.

Appendix

Configuring an FTP Server

Wftpd and FileZilla are free FTP application software for Windows. This section mainly provides instructions on how to configure an FTP server using wftpd for Windows. You can download wftpd online: http://www.wftpd.com/products/products.html or FileZilla online: https://filezilla-project.org.

We recommend that you use vsftpd as an FTP server for Linux platform if required.

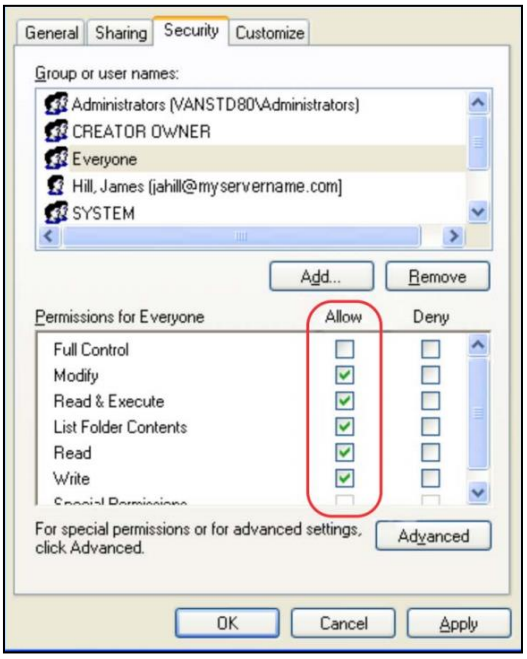
Preparing a Root Directory

To prepare a root directory:

1. Create an FTP root directory on the local system (e.g., D:\FTP Directory).
2. Place the boot files and configuration files to this root directory.
3. Set the security permissions for the FTP directory folder.

   You need to define a user or group name, and set the permissions: read, write, and modify. Security permissions vary by organizations.

   An example of configuration on the Windows platform is shown as below:

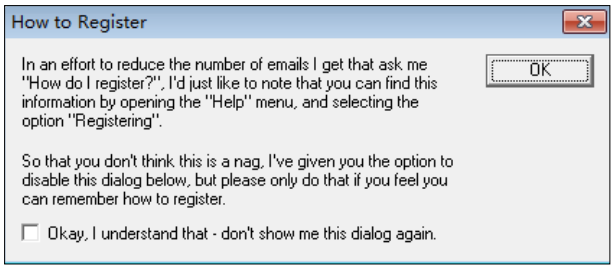


Configuring an FTP Server

To configure a wftpd server:

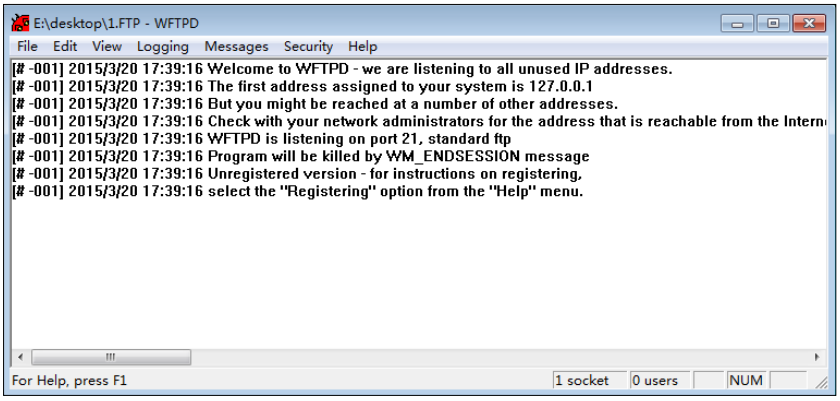
1. Download the compressed file of the wftpd application to your local directory and extract it.
2. Double click the **Wftpd.exe**.

   The dialogue box of how to register is shown as below:

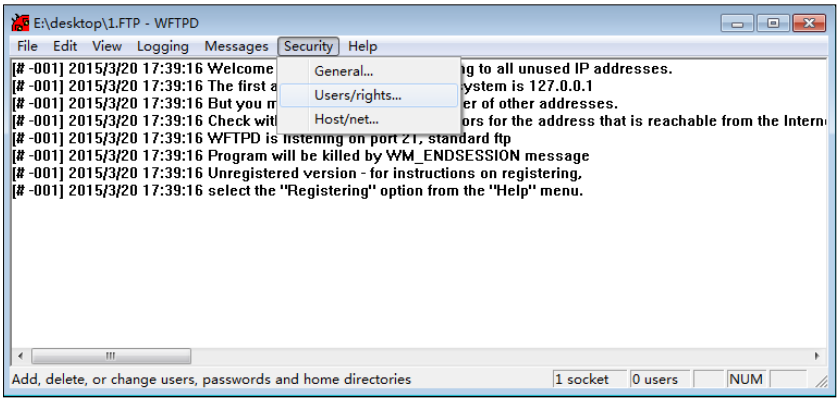


3. Check the check box and click **OK** in the pop-up dialogue box.

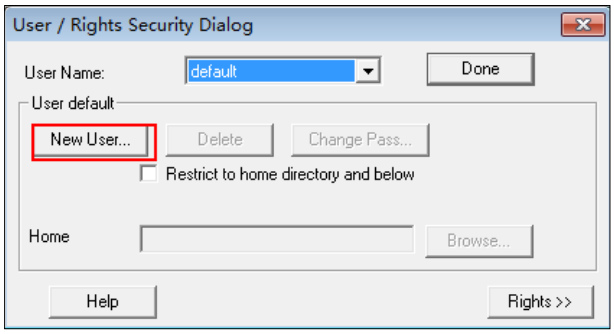
   The log file of the wftpd application is shown as below:



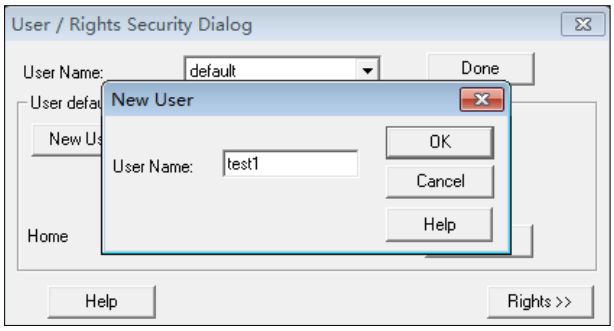
4. Click **Security**->**Users/rights**.



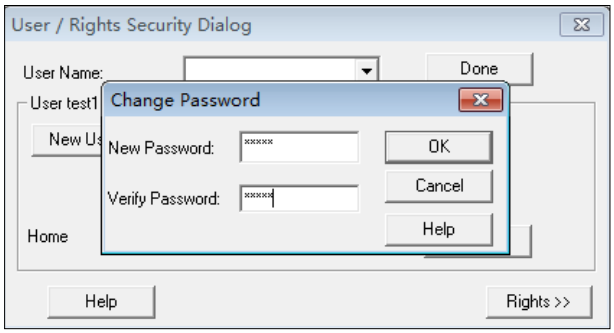
5. Click **New User**.



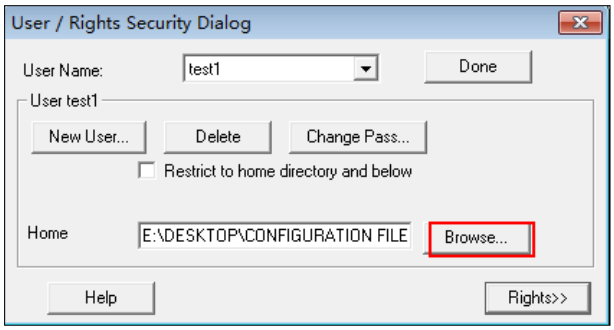
6. Enter a user name (e.g., test1) in the **User Name** field and then click **OK**.



7. Enter the password of the user (e.g., test1) created above in the **New Password** and **Verify Password** field respectively, and then click **OK**.

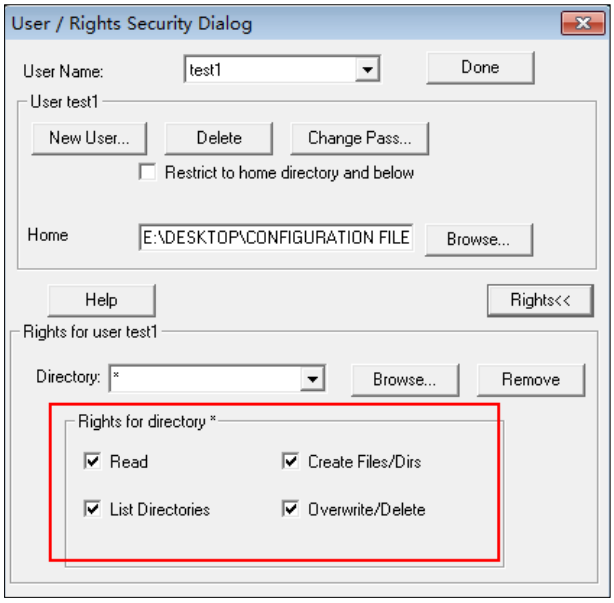


8. Click **Browse** to locate the FTP root directory from your local system.



9. Click **Rights>>** and assign the desired permission for the user (e.g., test1) created above.

10. Check the check boxes of **Read**, **Create Files/Dirs**, **List Directories** and **Overwrite/Delete** to make sure the FTP user has the read and write permission.



11. Click **Done** to save the settings and finish the configurations.

The server URL "ftp://username:password@IP/" (Here "IP" means the IP address of the provisioning server, "username" and "password" are the authentication for FTP download. For example, "ftp://test1:123456@10.3.6.234/") is where the IP phone downloads boot files and configuration files from.

Before configuring a wftpd server, ensure that no other FTP servers exist in your local system.

Configuring an HTTP Server

This section provides instructions on how to configure an HTTP server using HFS tool. You can download the HFS software online: http://www.snapfiles.com/get/hfs.html.

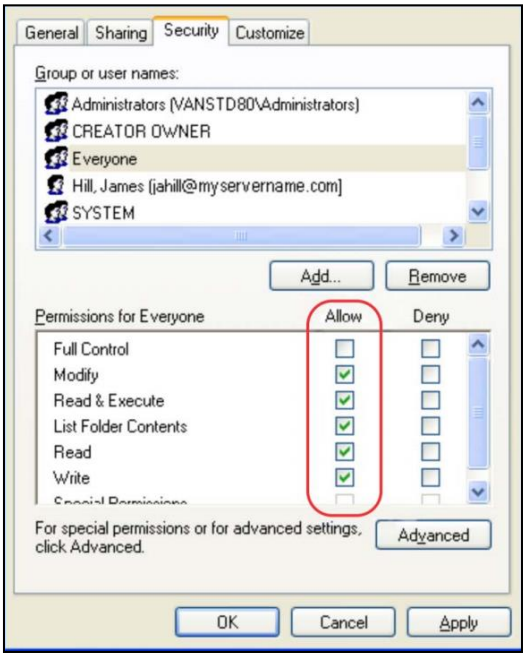
Preparing a Root Directory

To prepare a root directory:

1. Create an HTTP root directory on the local system (e.g., D:\HTTP Directory).
2. Place the boot files and configuration files to this root directory.
3. Set the security permissions for the HTTP directory folder.

You need to define a user or group name and set the permissions: read, write, and modify. Security permissions vary by organizations.

An example of configuration on the Windows platform is shown as below:



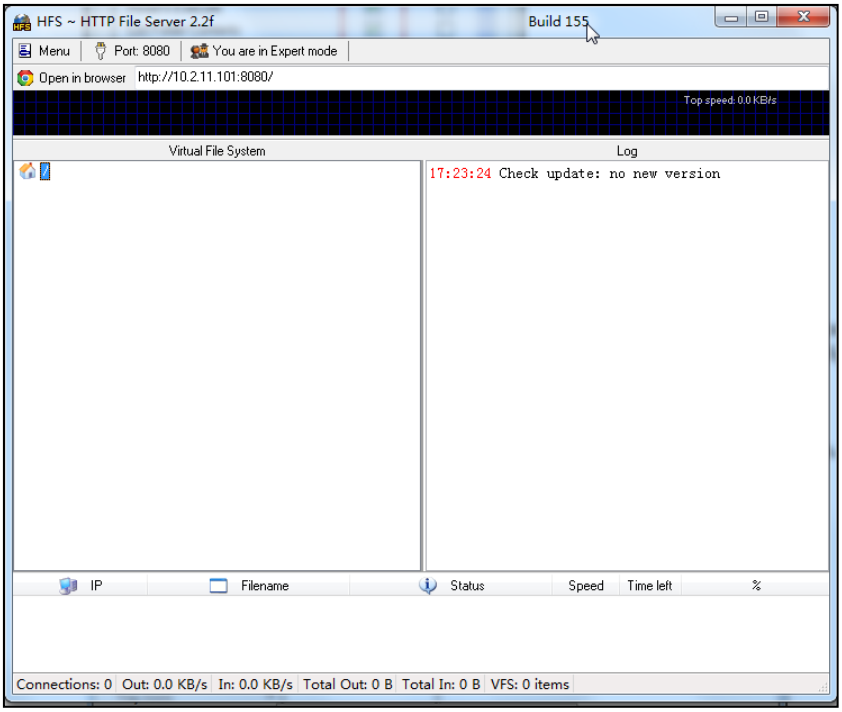
Configuring an HTTP Server

HFS tool is an executable application, so you don't need to install it.

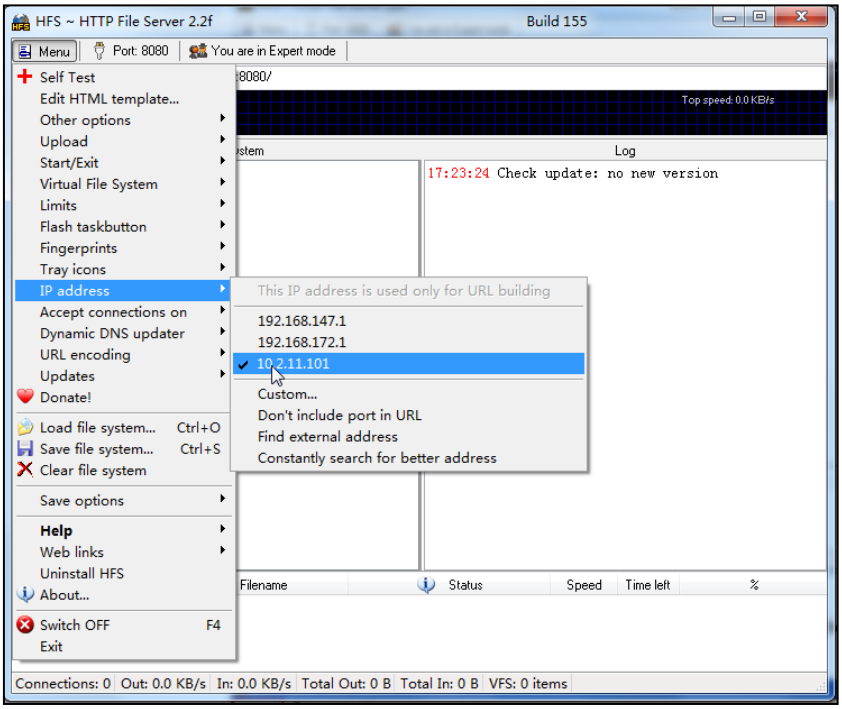
To configure an HTTP server:

1. Download the application file to your local directory, double click the **hfs.exe**.

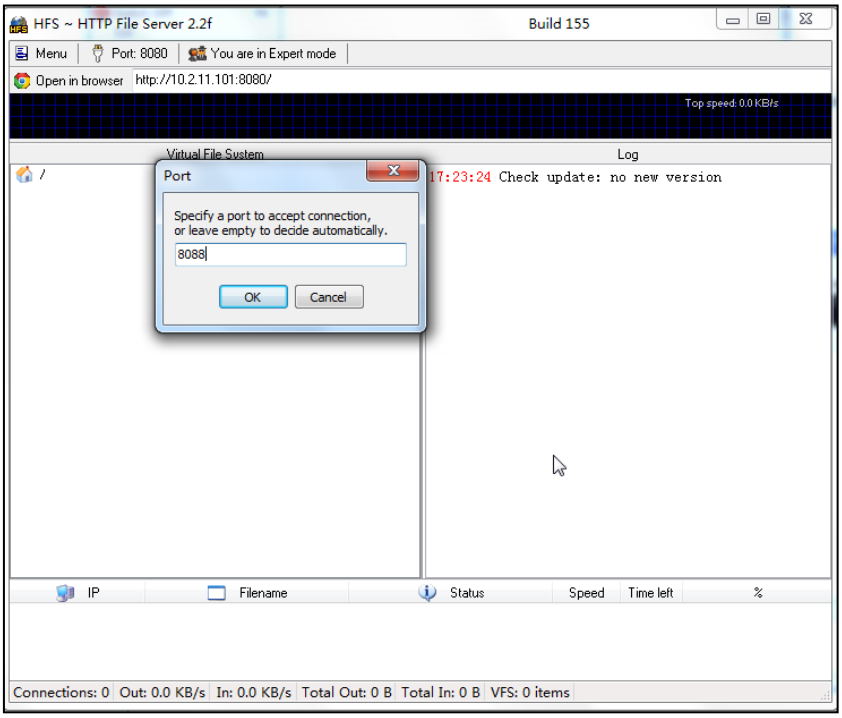
The main configuration page is shown as below:



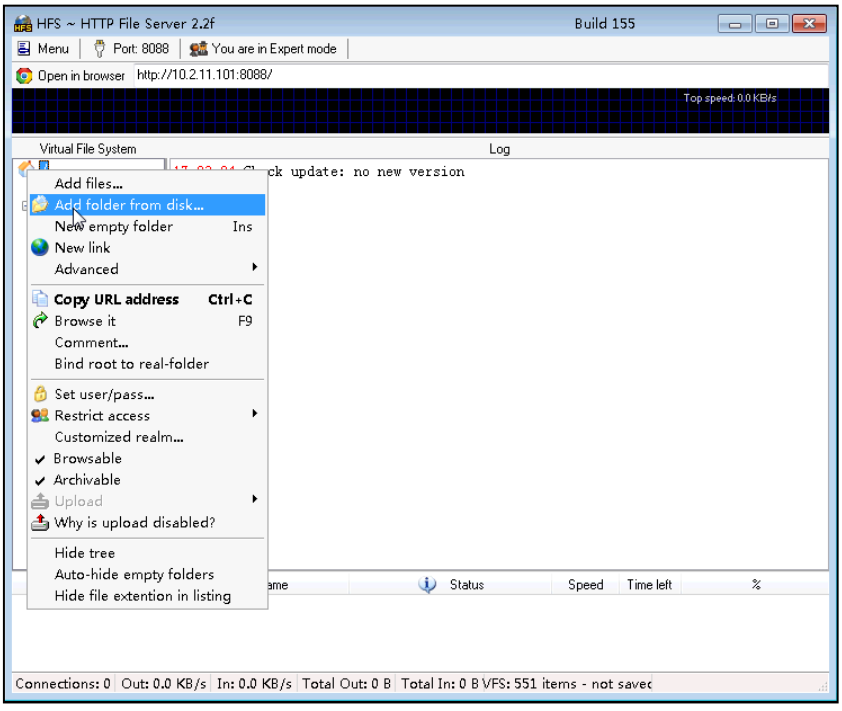
2. Click **Menu** in the main page and select the IP address of the PC from **IP address**.



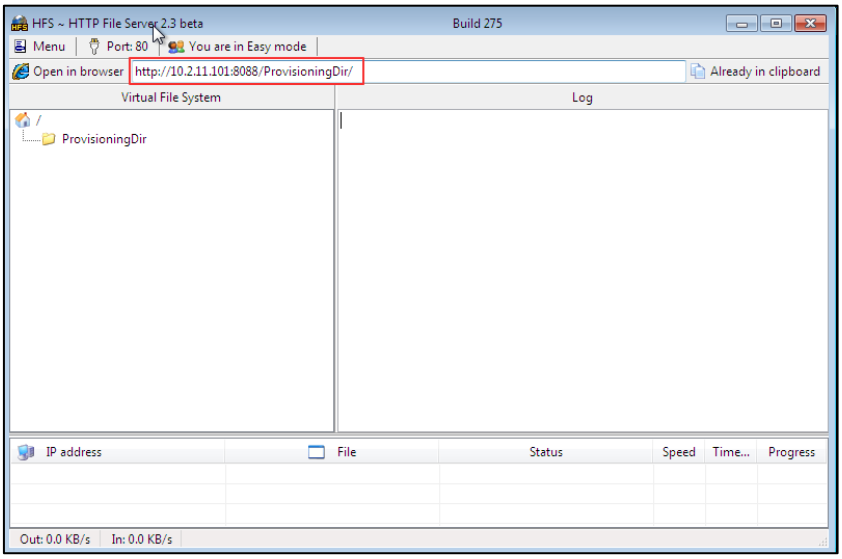
The default HTTP port is 8080. You can also reset the HTTP port (make sure there is no port conflict).



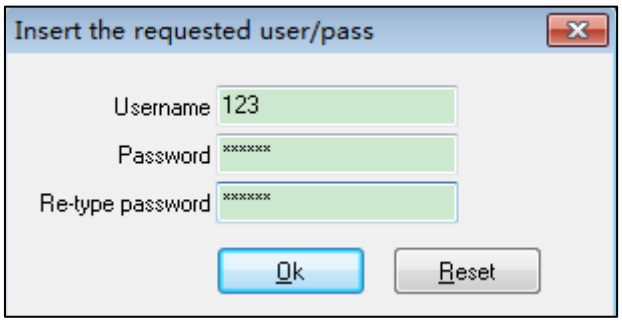
3. Right click the icon on the left of the main page, select **Add folder from disk** to add the HTTP Server root directory.



4. Locate the root directory from your local system.



5. Check the server URL (e.g., http://10.2.11.101:8088/ProvisioningDir) by clicking "**Open in browser**".
6. (Optional.) Right click the root directory name (e.g., ProvisioningDir), and then select **Set user/pass...**.
7. (Optional.) Enter the desired user name and password for the root directory in the corresponding fields and then click **OK**.



Yealink IP phones also support the Hypertext Transfer Protocol with SSL/TLS (HTTPS) protocol for auto provisioning. HTTPS protocol provides the encrypted communication and secure identification. For more information on installing and configuring an Apache HTTPS Server, refer to the network resource.

Configuring a DHCP Server

This section provides instructions on how to configure a DHCP server for Windows using DHCP Turbo. You can download this software online: http://www.tucows.com/preview/265297 and install it following the setup wizard.

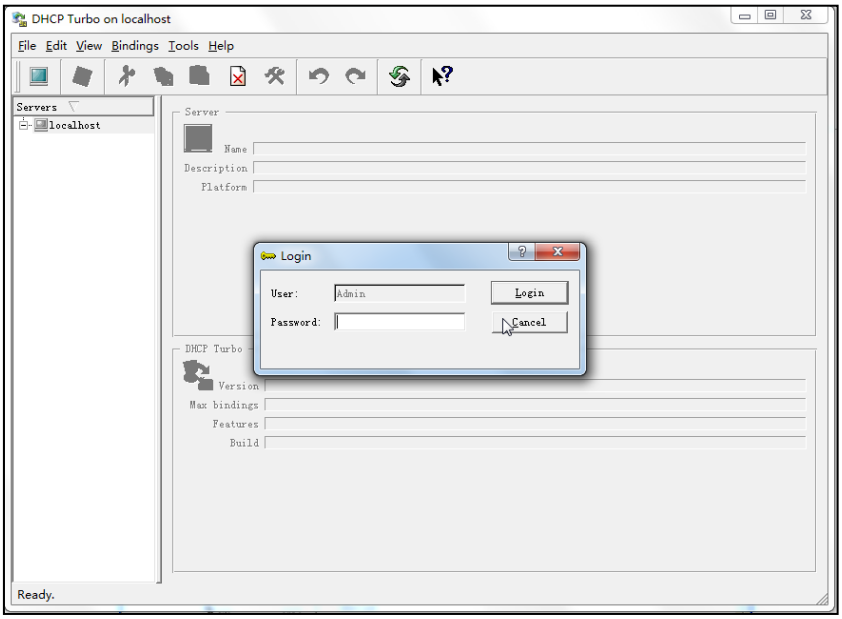
Configuring the DHCP Turbo

Before configuring the DHCP Turbo, make sure:

- The firewall on the PC is disabled.
- There is no DHCP server in your local system.

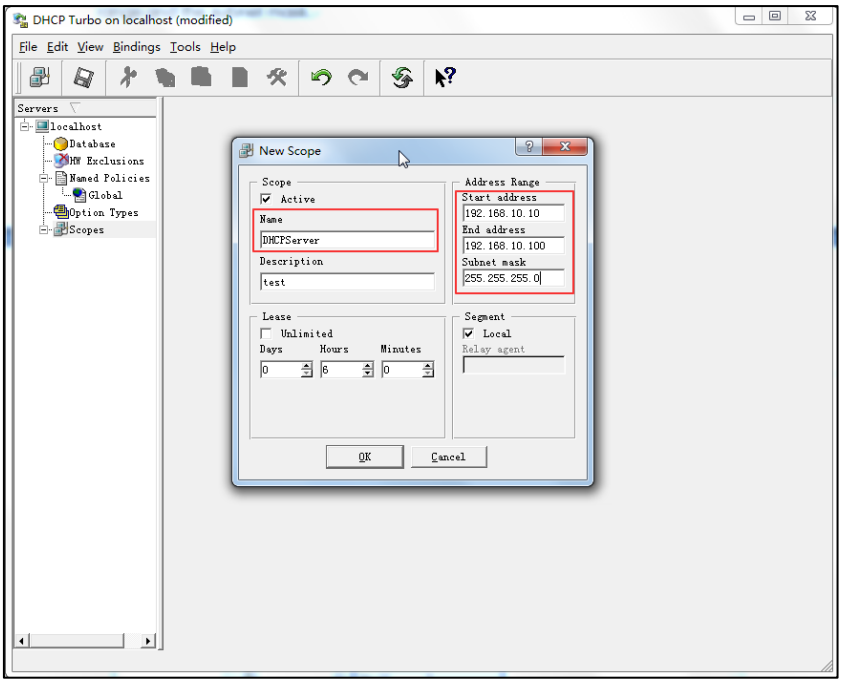
To configure the DHCP Turbo:

1. To start the DHCP Turbo application, double click **localhost**.
2. Click the **Login** button (the login password is blank) to log in.

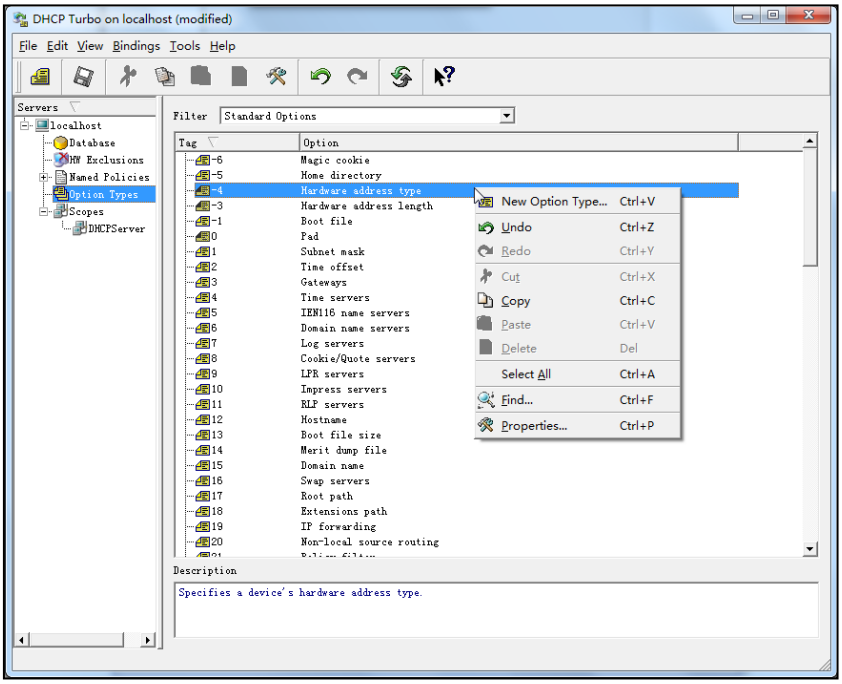


3. Right click **Scopes** and select **New Scope**.
4. Configure the DHCP server name, the DHCP IP range and the subnet mask.

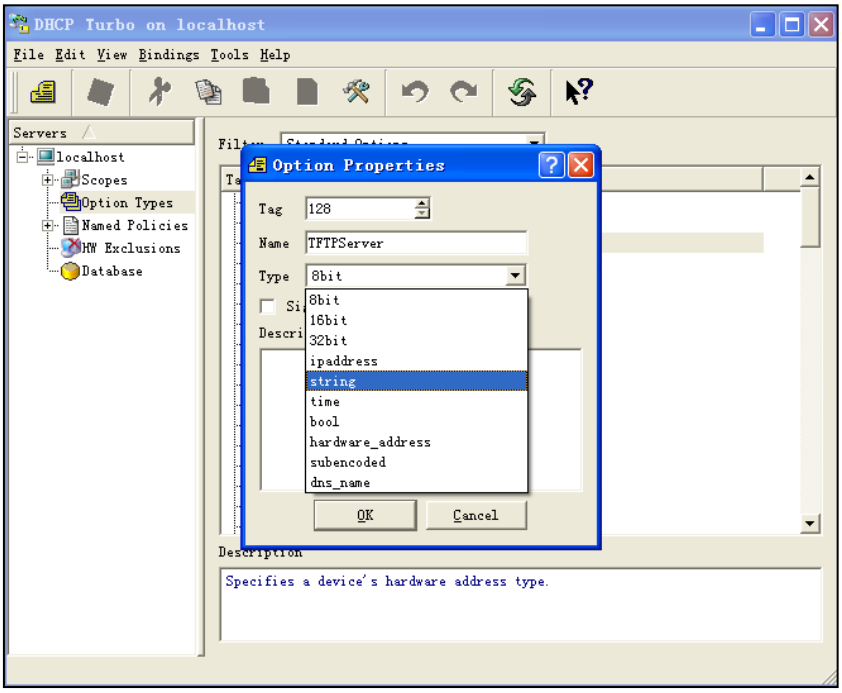
5. Click **OK** to accept the change.



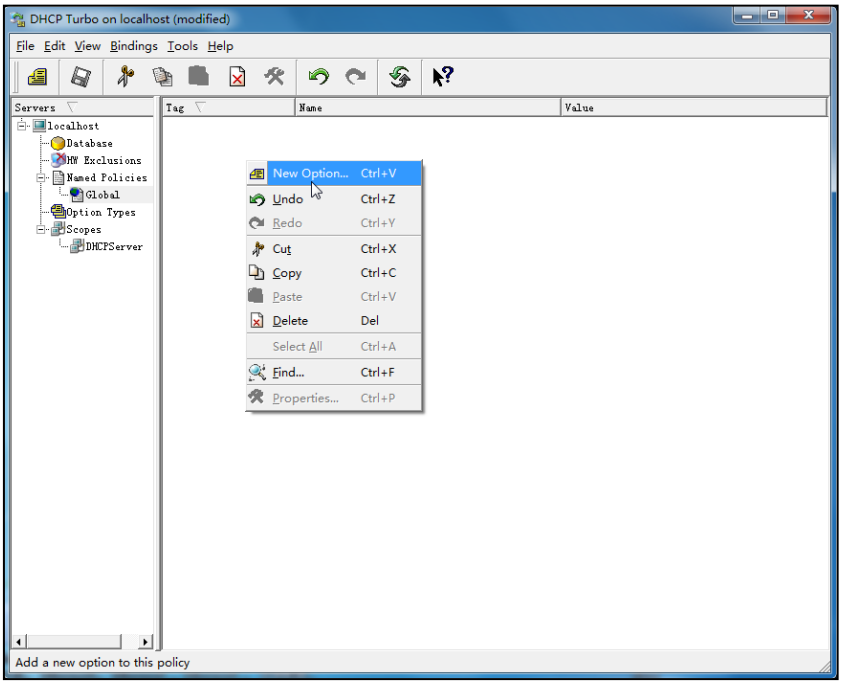
6. You can add a custom option via DHCP Turbo. Select **Option Types**, right click one of the options on the right of the main page, and then select **New Option Type**.



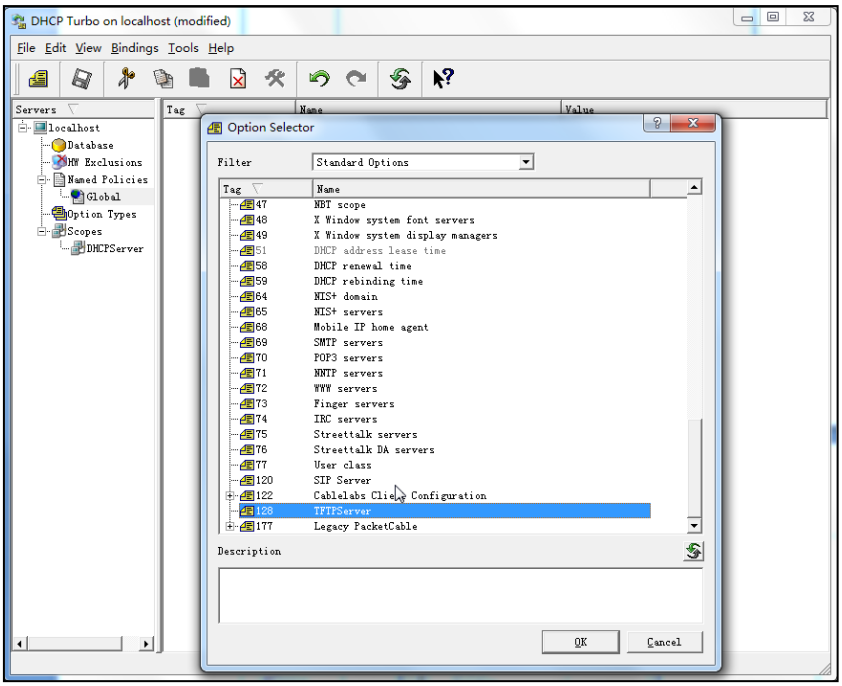
7. Set the custom DHCP option (custom DHCP option tag number ranges from 128 to 254) and select the option type (Yealink supports **string** and **ipaddress** option types only). Click the **OK** button to finish setting the option properties. Click  to save the change.



8. Click **Named Policies**-->**Global**, right click the blank area on the right of the main page and then select **New Option**.

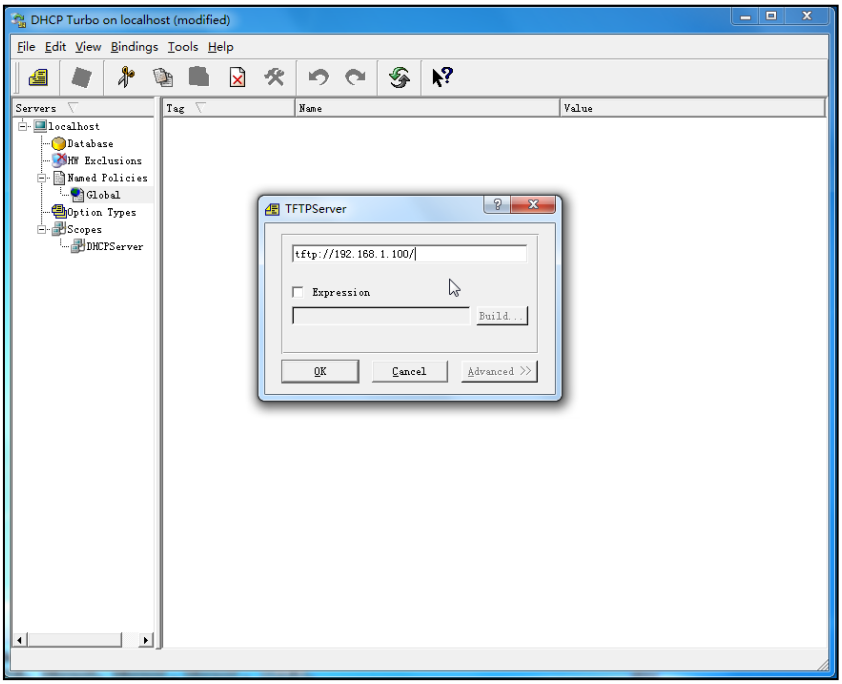


9. Scroll down and double click the custom option 128.



10. Fill the provisioning server address in the input field.

11. Click the **OK** button to finish setting a custom option.

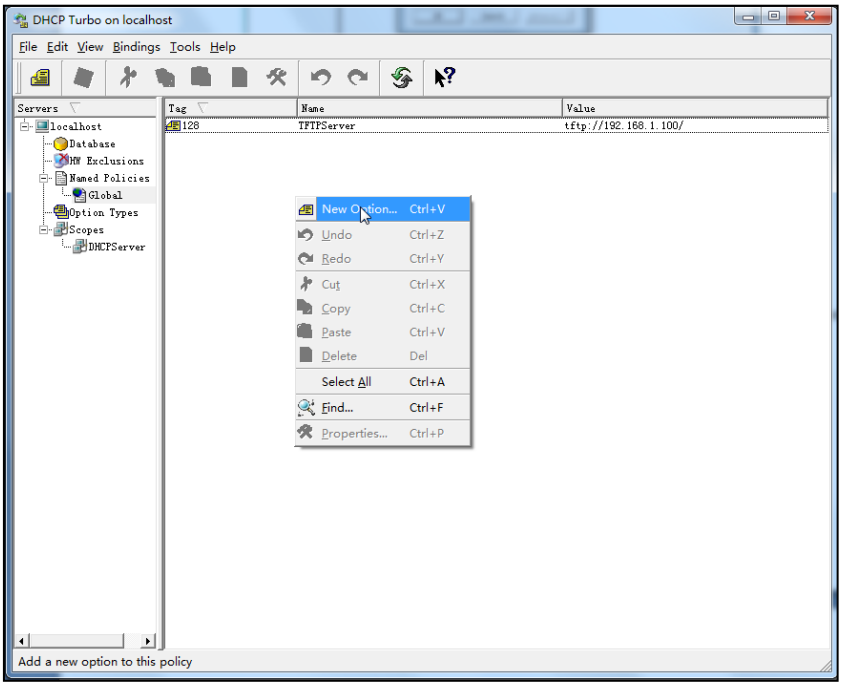


12. Click to save the change.

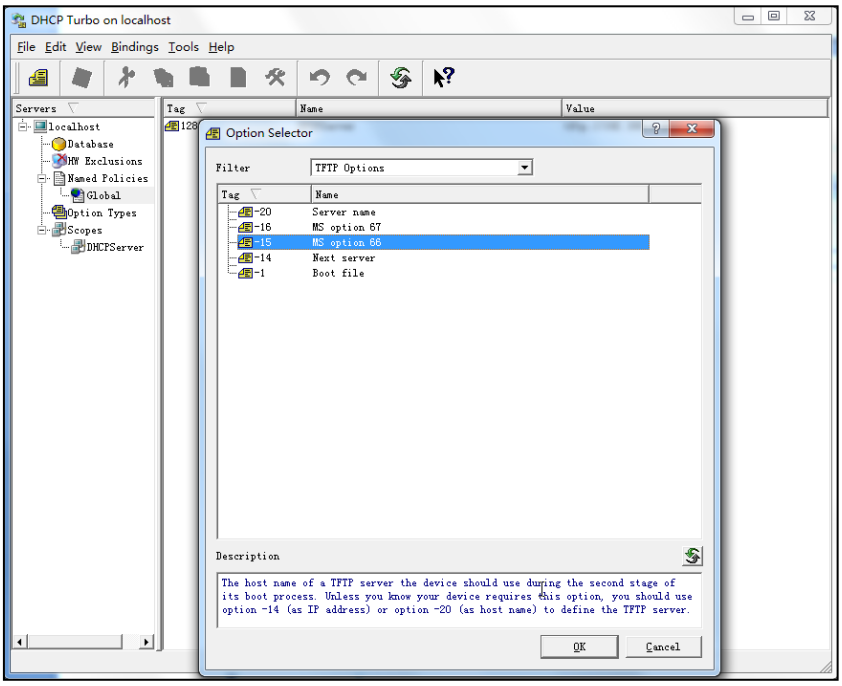
Add the Option 66 via DHCP Turbo

You can add the option 66 via DHCP Turbo. The following shows the detailed processes.

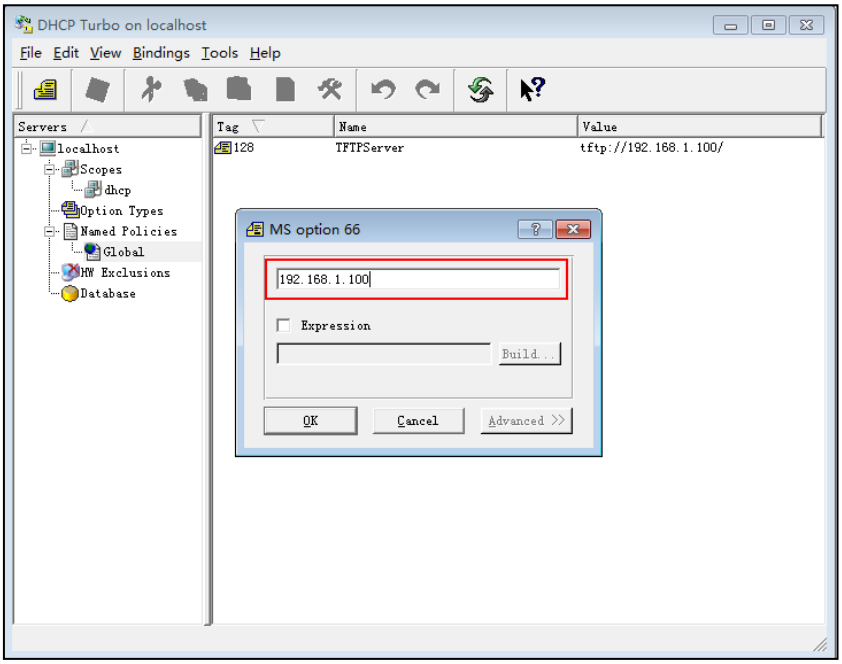
1. Click **Named Policies**-->**Global**, right click the blank area on the right of the main page and then select **New Option**.



2. Select **TFTP Options** from the pull-down list of **Filter**.
3. Scroll down and double click **MS option 66**.



4. Fill the provisioning server IP address in the input field.



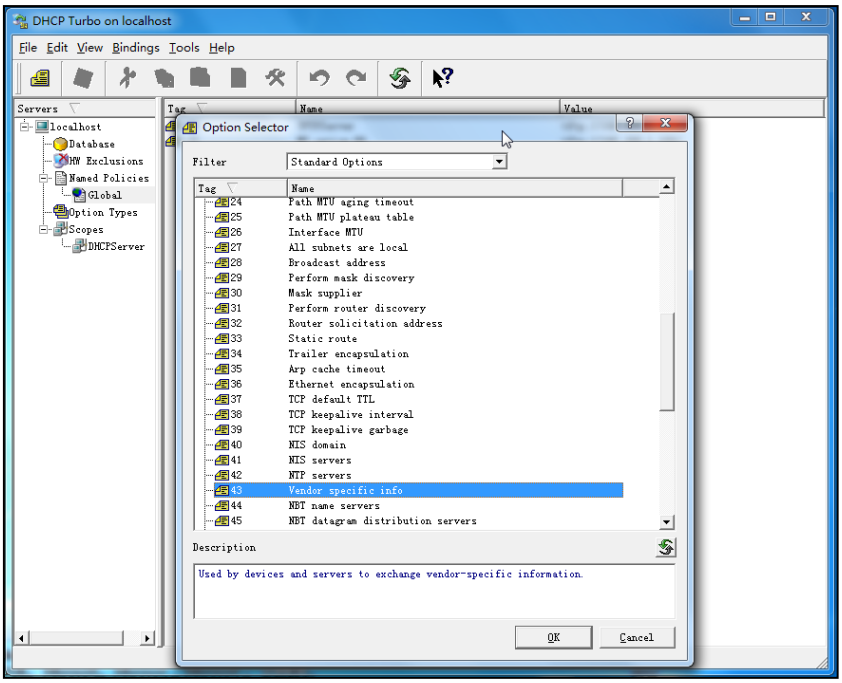
5. Click the **OK** button to finish setting a custom option.
6. Click  to save the change.

Add the Option 43 via DHCP Turbo

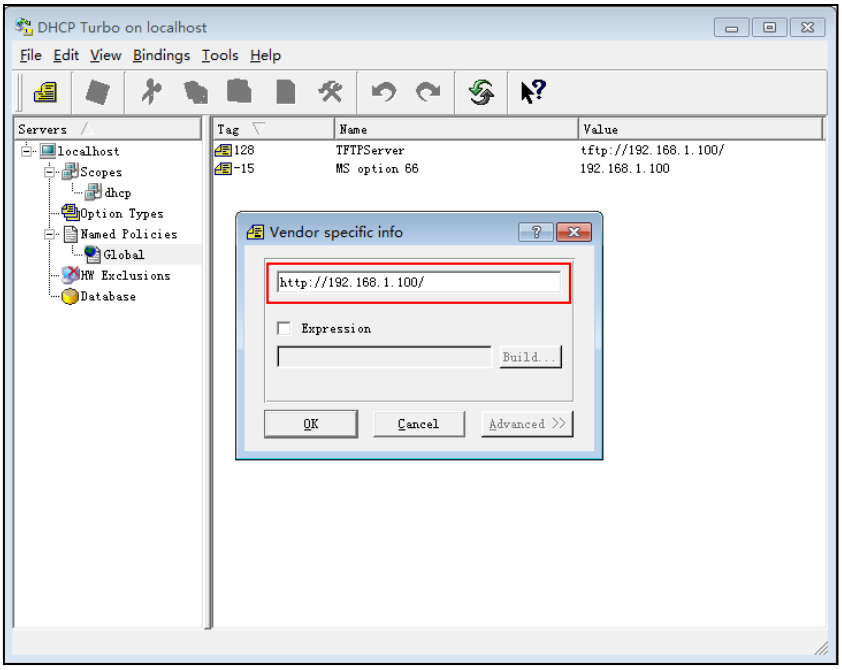
You can also add the option 43. The following shows the detailed processes.

1. Click **Named Policies**-->**Global**, right click the blank area on the right of the main page and then select **New Option**.
2. Select the **Standard Options** from the pull-down list of **Filter**.

3. Scroll down and double click **43**.



4. Fill the provisioning server address in the input field.



5. Click the **OK** button to finish setting a custom option.
6. Click  to save the change.

Customer Feedback

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