

# **Skype for Business<sup>®</sup>HD IP Phone Auto Provision Guide**



Version 9.26 Apr.2018

## **Table of Contents**

Table of Contents	iii
Introduction	1
Getting Started	3
Obtaining Configuration Files	3
Obtaining Phone Information	3
Provisioning Yealink Skype for Business Phones	5
Auto Provisioning Process	5
Major Tasks for Auto Provisioning	5
An Instance of Auto Provision Configuration	6
Managing Configuration Files	11
Editing Common CFG File	11
Editing MAC-Oriented CFG File	
Creating a New CFG File	
Encrypting Configuration Files	
Customizing Resource Files	
Configuring a Provisioning Server	17
Preparing a Root Directory	
Configuring a TFTP Server	
Obtaining the Provisioning Server Address	21
DHCP Options	21
Phone Flash	
Triggering the Phone to Perform the Auto Provisioning	25
Power On	
Repeatedly	
Weekly	
Auto Provision Now	
Multi-mode Mixed	29

Auto Provisioning via Activation Code	
Downloading and Verifying Configurations .	
Downloading Configuration Files	
Resolving and Updating Configurations	
Verifying Configurations	
Troubleshooting	37
Glossary	
Appendix	41
Configuring an FTP Server	
Preparing a Root Directory	41
Configuring an FTP Server	
Configuring an HTTP Server	
Preparing a Root Directory	
Configuring an HTTP Server	
Configuring a DHCP Server	
Configuring the DHCP Turbo	
Add the Option 66 via DHCP Turbo	53
Add the Option 43 via DHCP Turbo	

### Introduction

Yealink IP phones with Skype for Business firmware enable a new era in unified communications. It is designed to work with Microsoft<sup>®</sup> Skype for Business Server.

Yealink Skype for Business 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 configure Yealink Skype for Business phones with the minimum settings required. Yealink Skype for Business phones support FTP, TFTP, HTTP, and HTTPS protocols for auto provisioning and are configured to use the TFTP protocol by default.

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

- Yealink T48S
- Yealink T46S
- Yealink T42S
- Yealink T41S

The auto provisioning process outlined in this guide applies to Yealink T48S/T46S/T42S/T41S Skype for Business phones running firmware version 9 or later. We recommend that Skype for Business 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 Configuration Files
- Obtaining Phone Information

#### **Obtaining Configuration Files**

Before beginning provisioning, you need to obtain 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. The Skype for Business phones phone tries to download these CFG files from the server during auto provisioning.

You can ask the distributor or Yealink FAE for Common CFG and MAC-Oriented files. You can also obtain the Common CFG file and MAC-Oriented file online:

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

#### To download Common CFG and MAC-Oriented files:

- 1. Go to Yealink Microsoft Skype for Business page.
- 2. Download and extract the combined configuration files to your local system.

Other	Yealink BToE Connector for Lync(3.0.0.29).zip
Documents	CFG_Templates.zip Resource Files.zip

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

#### **Obtaining Phone Information**

Before beginning provisioning, you also need the phone information. For example: MAC address, hardware version and account information of the Skype for Business phone.

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

**Hardware version**: The current hardware version of the Skype for Business phone. You can view it via phone user interface or web user interface.

Account Information: Ask your system administrator Skype for Business account information.

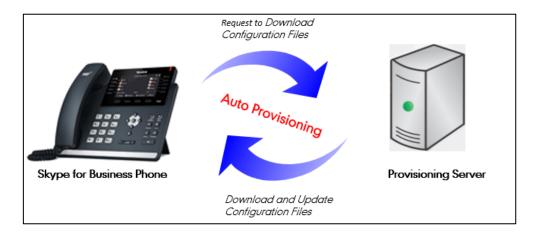
### **Provisioning Yealink Skype for Business Phones**

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

#### **Auto Provisioning Process**

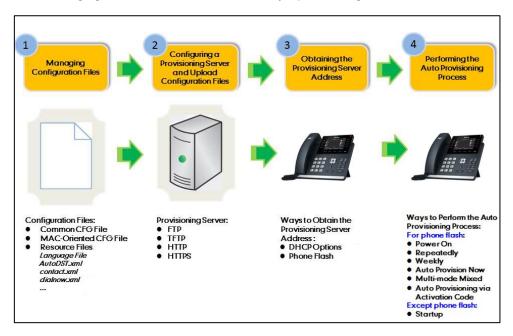
When Skype for Business phones are triggered to perform auto provisioning, it will request to download the configuration files from the provisioning server. During the auto provisioning process, the Skype for Business phone will download and update configuration files to the phone flash.

The following figure shows how the Skype for Business phone interoperates with the provisioning server:



### **Major Tasks for Auto Provisioning**

You need to complete four major tasks to congifure Yealink Skype for Business phones.



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

For more information on how to manage configuration files, refer to Managing Configuration Files on page 11.

For more information on how to configure a provisioning server, refer to Configuring a Provisioning Server on page 17.

For more information on how to obtain the provisioning server address, refer to Obtaining the Provisioning Server Address on page 21.

For more information on how to perform the auto provisioning process, refer to Triggering the Phone to Perform the Auto Provisioning on page 25.

If you are not familiar with auto provisioning process on Yealink Skype for Business phones, you can refer to An Instance of Auto Provision Configuration on page 6.

#### **An Instance of Auto Provision Configuration**

This section shows an instance of auto provision configuration.

**1.** Manage configuration files.

Add/Edit the desired configuration parameters in the CFG file (e.g., y00000000066.cfg) you want the Skype for Business phone to download. For more information on how to manage configuration files, refer to Managing Configuration Files on page 11.

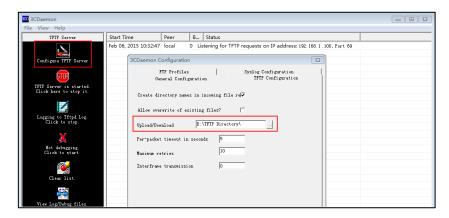
- **2.** Configure the TFTP server.
  - **1)** Place configuration files to TFTP root directory (e.g., D:\TFTP Directory).

er ► D (D:) ► TFTP Directory	▼ 4 <sub>7</sub>	TFTP 🔎
Share with 🔻 Burn New folder		
Customring.wav y0000000066.cfg CFG file		

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

🚥 3CDaemon				
File View Help				
TFTP Server	Start Time	Peer	Bytes	Status
1	Feb 05, 2015 17:37:25	local	0	Listening for TFTP requests on IP address 192. 168. 1 . 100., Port 69
Configure TFTP Server				
Legging to Tftpå leg. Click to stop. Not debugging. Click to start.				The server URL where the Skype for Business phone downloads configuration files from is tftp://192.168.1.100/
Clear list. Diew Log/Debug files.				

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 17.

- Log Out Yealink 1466 Account Network Features Status Settings Directory Security Auto Provision NOTE Preference PNP Active ● On ○ Off Auto Provision The auto provision parameters for administrator. Time & Date • on O off DHCP Active 160,161 Upgrade Custom Option(128~254) 0 🛄 You can click here to get MS-UC-Client Auto Provision DHCP Option Value 0 ore guid Server URL tftp://192.168.1.100/ Configuration User Name Dial Plan Password ..... Enter the access URL of the Voice Common AES Key ..... provisioning server in the MAC-Oriented AES Key ..... Server URL field Tones Zero Active Disabled v Phone Lock Wait Time(0~100s) s 0 Location ● On © Off @ Power On EXP Module 🗢 On 🔍 Off 🕜 Repeatedly Interval(Minutes) 1440 BTOE 0 🗢 On 🖲 Off 🕜 Weekly Time 00 : 00 - 00 : 00 0 Sunday Monday Tuesday Wednesday Day of Week 0 I Thursday Friday Autoprovision Now
- **3.** Configure the provisioning server address on the Skype for Business phone.

For more information on how to obtain the provisioning server address, refer to Obtaining the Provisioning Server Address on page 21.

4. Trigger the Skype for Business phone to perform the auto provisioning.

a antica la l				Log
ealink   1466	atus Account Network	Features Setti	ings Directory	Security
Preference	Auto Provision			NOTE
	PNP Active	🖲 On 💿 Off 🕜		
Time&Date	DHCP Active	🖲 On 🗇 Off 🕜		Auto Provision The auto provision paramete
Upgrade	Custom Option(128~254)	160,161 🕜		for administrator.
Auto Provision	DHCP Option Value	MS-UC-Client		You can click here to ge more guides.
Configuration	Server URL	tftp://192.168.1.100/	0	more guides.
and a second	User Name		0	
Dial Plan	Password		0	
Voice	Common AES Key		0	
Tones	MAC-Oriented AES Key		0	
Phone Lock	Zero Active	Disabled •	0	
Phone Lock	Wait Time(0~100s)	5	0	
Location	Power On	🖲 On 🗇 Off 🕜		
EXP Module	Repeatedly	🔍 On 🖲 Off 🕜		
BTOE	Interval(Minutes)	1440	0	
	Weekly	🗢 On 😐 Off 🕜		
	Time	00 : 00 - 00 : 00 Sunday Monday Tuesday	Click the Auto to perform the	oprovision Now
	Day of Week		provisioning p immediately	process

For more information on how to trigger the phone to perform the auto provisioning, refer to Triggering the Phone to Perform the Auto Provisioning on page 25.

### **Managing Configuration Files**

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

You can edit the template 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\_Skype\_for\_Business\_Edition\_HD\_IP\_Phones\_Description\_of\_Configuration\_Parameters\_in \_CFG\_Files.* 

### **Editing Common CFG File**

The Common CFG file is effectual for all phones of the same model. It uses a fixed name "y000000000XX.cfg" as the file name, where "XX" equals to the first two digits of the hardware version of the Skype for Business phone model.

Phone Model	Common CFG file
T48S	y0000000065.cfg
T46S	y0000000066.cfg
T42S	y0000000067.cfg
T41S	y0000000068.cfg
CP960	y0000000073.cfg

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

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:

<pre>#!version:1.0.0.1</pre>		
	*****	
##	lvnc	**
************************************	*****	*****
##It is used for importing license.		
lync_license_dat.url =		
		******
##	Hostname	**
	******	*****
##It configures the DHCP option 12 h	ostname on the IP phone.	
<pre>static.network.dhcp_host_name =</pre>		
**	Network Advanced	**
##It enables or disables the PC port		****
##The default value is 1.It takes ef		
<pre>static.network.pc_port.enable =</pre>		
##The default value is 0.It takes ef	fast after a rebeat	
static.network.internet port.speed d		
static.network.pc port.speed duplex		
		en Internet (WAN) port type for IPv4 is configured as DHCP.
<pre>##0-Disabled (use the IPv4 DNS obtai ##The default value is 0.It takes ef</pre>		
static.network.static dns enable =	ress drott d repost.	
static.network.ipv6_static_dns_enabl	e =	

#### 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 files are only effectual for the specific phone. They use the 12-digit MAC address of the phone as the file name. For example, if the MAC address of the phone is 0015651130F9, the MAC-Oriented CFG file has to be named as 0015651130f9.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:

#!version:1.0.0.1	
## Account ##	
<pre>##Username account.1.sign_in.server_address = account.1.sign_in.user_name = account.1.sign_in.password =</pre>	
<pre>###PIN account.1.sign_in.pin_number = account.1.sign_in.pin_password =</pre>	
<pre>##It configures the login authentication method. account.1.auth_method=</pre>	
<pre>####################################</pre>	

#### 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.

#### **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 11 or Editing MAC-Oriented CFG File on page 12.

**2.** Copy configuration parameters from the template configuration files and set the valid values for them.

```
#!version:1.0.0.1
*****
               Call Waiting
##
                                 ********
call waiting.enable = 1
call_waiting.tone = 1
Key Lock
####
          ***
sfb.phone_lock.time_out = 10
sfb.phone_lock_with_pc.enable = 1
sfb.phone_lock.max_attempts = 5
```

3. Save the changes and close the CFG file.

#### **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:  $0 \sim 9$ ,  $A \sim Z$ ,  $a \sim z$  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 Skype for Business phones, such as personalized ring tone file and language package file. Yealink supplies the following resource file templates:

Template File	File Name
AutoDST Template	AutoDST.xml
Language Packs	For example, 000.GUI.English.lang 1.English.js
Keypad Input Method File	ime.txt
Dial-now Template	dialnow.xml
Contact File	contact.xml

Ask the distributor or Yealink FAE for resource file templates. For more information on

explanations of the configuration parameters, refer to Yealink\_Skype\_for\_Business\_HD\_IP\_Phones\_Administrator\_Guide.

### **Configuring a Provisioning Server**

Yealink Skype for Business phones support using FTP, TFTP, HTTP and HTTPS protocols to download 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. 3CDaemon 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 41 and Configuring an HTTP Server on page 44.

### **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 configuration files to this root directory.

		, • 💌
er > D (D:) > TFTP Directory	▼ 4 <sub>j</sub>	TFTP 🔎
Share with 🔻 Burn New folder	•	
<ul> <li>☑ 0015657ffb82.cfg</li> <li>☑ y0000000066.cfg</li> </ul>		

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.

Administrators (VANS		strators)	^
2 Everyone			
😰 Hill, James (jahill@m	yservername.	.com]	
SYSTEM			~
<			>
	4	\dd	Remove
Permissions for Everyone		Allow	Deny
Full Control			_ ^
Modify			
Read & Execute			
List Folder Contents			
Read			
Write			
Consist Dermissions			
For special permissions or	for advanced	settings.	Advanced

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:

3CDaemon					
<u>File V</u> iew <u>H</u> elp					
TFTP Server	Start Time	Peer	Bytes	Status	
Configure TFTP Server	Feb 06, 2015 10:32:47	local	0	Listening for TFTP requests on IP address: 192, 168, 1 , 100, Port	69
TFTP Server is started. Click here to stop it.					
Logging to Tftpd log. Click to stop.					
Not debugging. Click to start.					
Clear list.					
View Log/Debug files.					

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

300 3CDaemon		
File View Help		
TFTP Server	Start Time Peer B Status	
Configure TFTP Server	Feb 06, 2015 10:32:47 local 0 Listening for TFTP requests on IP address: 192. 188. 1 .100, Port 69 3CDaemon Configuration	
5TP	FTF Profiles Syslog Configuration General Configuration TFTP Configuration	
TFTP Server is started. Click here to stop it.	Create directory names in incoming file rev	
Logging to Tftpd.log. Click to stop.	Allow overwrite of existing files?	
X	Upload/Download D:\TFTP Directory\	
Not debugging. Click to start.	Maximum retries 10	
Clear list.	Interframe transmission 0	
View Log/Debug files.		

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://192.168.1.100/") is where the Skype for Business phone downloads configuration files from.

### **Obtaining the Provisioning Server Address**

Yealink Skype for Business phones support obtaining the provisioning server address in following ways:

- DHCP Options
- Phone Flash

The priority of obtaining the provisioning server address is as follows: DHCP Options (Custom option-->option 66-->option 43)-->Phone Flash.

The following sections detail the process of each way (take the T46S Skype for Business phone as an example).

#### **DHCP Options**

Yealink Skype for Business 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.

If DHCP option 66 and 43 are not available, you can configure the phone to obtain the provisioning server address via a custom DHCP option 160 or 161. 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 49.

#### 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.

alink   1466	Status	Account	Network	Features	Settin	gs	Directory	Security
Preference	,	Auto Provision						NOTE
	F	PNP Active		◉ On © Off	0			Auto Provision
ime&Date	ſ	DHCP Active		🖲 On 🔘 Off	0			The auto provision paramet
Ipgrade	c	Custom Option(128	~254)	160,161	0			for administrator.
uto Provision		OHCP Option Value		MS-UC-Client	0			You can click here to g more guides.
Configuration	5	Server URL					0	more guideor
5	L. L.	User Name					0	
Dial Plan	F	Password		•••••			0	
/oice	(	Common AES Key		•••••		?		
ones	, i	MAC-Oriented AES K	(ey	•••••		0		
hone Lock	2	Zero Active		Disabled	•	0		
	N	Wait Time(0~100s)		5		0		
ocation	F	Power On		🖲 On 🔘 Off	0			
XP Module	F	Repeatedly		🔘 On 🔍 Off	0			
ЗТОЕ	1	(nterval(Minutes)		1440		0		
	١	Weekly		🔘 On 🖲 Off	0			
		Time		00 : 00 - 00	: 00	?		
				Sunday Monday				
				Tuesday				
	(	Day of Week		Wednesday Hursday	0			
				Friday				

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 Skype for Business 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\_Skype\_for\_Business\_HD\_IP\_Phones\_Administrator\_Guide. The following figure shows the example messages of obtaining the TFTP server address from a custom DHCP option 128:

DHCPserver-tftp.pcap [Wireshark 1.)	an a fair an	
<u>Eile E</u> dit <u>V</u> iew <u>Go</u> <u>C</u> apture <u>A</u> nalyze	<u>Statistics</u> Telephon <u>y</u> <u>T</u> ools Internals <u>H</u> elp	
El Ma Di 🔬 💓 📄 🖪 X 🗟	🗛   Q, 🗢 🔿 🛜 👱 🗐 🖬   Q, Q, Q, 🖭   羅 🗹 🖪	N 🖗   🛱
Filter: sip    bootp	<ul> <li>Expression Clear Apply</li> </ul>	
Jo, Time Source	Destination Protocol Length Info	
14 17.967476 0.0.0.0	255.255.255.255 DHCP 590 DHCP Discover - Transactio	on ID 0x88e96872
15 18.137781 10.2.8.105	10.2.8.106 DHCP 342 DHCP Offer - Transactio	
16 18.177701 0.0.0.0	255.255.255.255 DHCP 590 DHCP Request - Transactio	
17 18.178902 10.2.8.105	10.2.8.106 DHCP 342 DHCP ACK - Transactio	on ID 0x88e96872
<ul> <li>User Datagram Protocol, Src</li> <li>Bootstrap Protocol</li> <li>Message type: Boot Reply</li> <li>Hardware type: Ethernet</li> <li>Hardware address length:</li> <li>Hops: 0</li> <li>Transaction ID: 0x88e9687.</li> <li>Seconds elapsed: 100</li> <li>Bootp flags: 0x0000 (Unic Client IP address: 0.0.0.)</li> <li>Your (client) IP address: 10</li> <li>Relay agent IP address: 11</li> <li>Relay agent IP address: 11</li> <li>Boot file name not given Magic cookie: DHCP</li> <li>Option: (t=3,1=1) DHCP M</li> <li>Option: (t=5,1=4) Subnet:</li> <li>Option: (t=5,1=4) Rehwa</li> <li>Option: (t=5,1=4) Rehwa</li> <li>Option: (t=5,1=4) Rehwa</li> <li>Option: (t=12,1=4) PAdd</li> <li>Option: (t=12,1=4) DHA</li> <li>Option: (t=12,1=4) DHA</li> </ul>	sst) (0.0.0.0) 10.2.8.106 (10.2.8.106) 10.2.8.105 (10.2.8.105) 0.0.0 (0.0.0.0) Ye_38:28:d8 (00:15:65:38:28:d8) udding: 00000000000000000 for3xon ssage Type = DHCP ACK issage Type = DHCP ACK issage Type = DHCP ACK issage Type = DHCP ACK issage Type = 6 hours rime value = 3 hours issage Time = 6 hours issage Time value = 1 hours issage Time = 6 hours	(6)

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

To configure the phone flash via web user interface:

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

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

	Status	Account	Network	Features	Settii	ngs	Directory	Security	
мон	4	Auto Provision						NOTE	
Preference		NP Active		○ On ⑧ Off ● On ○ Off				Auto Provisio The auto provi	on ision parameters
Fime&Date	c	Custom Option(128~	254)	160,161	้อ			for administrat	or.
Jpgrade	C	OHCP Option Value		MS-UC-Client	0			You can cl more guides.	ick here to get
Auto Provision	s	Server URL		ttfp://192.168.1	.100/y00000	000066.cf	0		
Configuration	U	Jser Name					0		
5	F	Password		•••••			0		
Dial Plan	C	Common AES Key		•••••		0			
/oice	Ν	AC-Oriented AES Key	y	•••••		0			
Tones	z	ero Active		Disabled	•	0			
Phone Lock	v	Vait Time(1~100s)		5		0			
	P	ower On		🖲 On 🔍 Off	0				
Location	F	Repeatedly		🔍 On 🖲 Off	0				
EXP Module	I	nterval(Minutes)		1440		0			
BToE		Veekly		🔍 On 🖲 Off	~				

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

After the above configuration is completed, the phone will connect to the configured provisioning server and perform the auto provisioning process by one of the following methods: Power On, Repeatedly, Weekly, Auto Provision Now and Multi-mode Mixed. For more information on these methods, refer to Triggering the Phone to Perform the Auto Provisioning on Page 25.

Note You can also enter "M7:configuration parameter" (for example: M7:local\_time.manual\_time\_enable = 1) in the Server URL field, and then trigger the phone to perform the auto provisioning directly.

# **Triggering the Phone to Perform the Auto Provisioning**

This chapter introduces the following methods to trigger the Skype for Business phone to perform the auto provisioning process:

- Power On
- Repeatedly
- Weekly
- Auto Provision Now
- Multi-mode Mixed
- Auto Provisioning via Activation Code

When there is an active call on the 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 Skype for Business phone performs the auto provisioning process when the 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.

ealink 1465				Log O
	Status Account Netwo	rk Features Settings	Directory	Security
МОН	Auto Provision			NOTE
Preference	PNP Active	○ On ◎ Off 🕜 ● On ○ Off 🕜		Auto Provision The auto provision parameters
Time&Date	Custom Option(128~254)	160,161 <b>(</b>		for administrator.
Upgrade	DHCP Option Value	MS-UC-Client		You can click here to get more guides.
Auto Provision	Server URL	ttfp://192.168.1.100/y0000000066.	cf 🕜	
Configuration	User Name		0	
5	Password	•••••	0	
Dial Plan	Common AES Key	•••••• 🕜		
Voice	MAC-Oriented AES Key	•••••• 🕜		
Tones	Zero Active	Disabled 🔹 🕜		
Phone Lock	Wait Time(1~100s)	5		
	Power On	🖲 On 🗌 Off 🕜		
Location	Repeatedly	🔍 On 🖲 Off 🕜		
EXP Module	Interval(Minutes)	1440		
BTOE	Weekly	🔍 On 🖲 Off 🕜		
Power Saving	Time	00 : 00 00 : 00 🕜		

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

### Repeatedly

The Skype for Business 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.

	Status	Account	Network	Features	Settings	Directory	Security
ИОН	ļ	Auto Provision					NOTE
Preference		NP Active		○ On ● Off ● On ○ Off	·		Auto Provision The auto provision parameter
ime&Date	-	Custom Option(128~	254)	160,161	้ด		for administrator.
Jpgrade	C	HCP Option Value		MS-UC-Client	0		You can click here to get more guides.
uto Provision	Server URL			ttfp://192.168.1.	100/y0000000066		
Configuration	User Name						
<u> </u>	F	assword		•••••		0	
Dial Plan	C	Common AES Key		•••••	0		
/oice	Ν	IAC-Oriented AES Ke	y	•••••	0		
ones	Z	ero Active		Disabled	• 🕜		
Phone Lock	v	Vait Time(1~100s)		5	0		
	F	ower On		🖲 On 🔍 Off	0		
ocation	F	tepeatedly		🖲 On 🔍 Off	0		
XP Module		nterval(Minutes)		1440	0		

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

### Weekly

The Skype for Business phone performs the auto provisioning process at the fixed time every week. You can configure what time of the day and which day of the week to trigger the Skype for Business phone to perform the auto provisioning process. For example, you can configure the Skype for Business phone to check and update new configuration between 2 to 3 o'clock every Friday and Sunday.

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 time in the Time field.

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

	Status	Account	Network	Features	Settings	Directory	Security	
мон		Auto Provision					NOTE	
Preference		PNP Active		🔍 On 🖲 Off	·		Auto Provisio	n
		DHCP Active		🖲 On 🔍 Off	0		The auto provi for administrate	sion parameter
Time&Date		Custom Option(128-	-254)	160,161	0			
Upgrade		DHCP Option Value		MS-UC-Client	0		You can cli more guides.	ick here to get
Auto Provision		Server URL		ttfp://192.168.1.	100/y000000000	6.cf 🕜		
Con Connection		User Name				0		
Configuration		Password		•••••		0		
Dial Plan		Common AES Key		•••••	0			
Voice		MAC-Oriented AES Ke	₽y	•••••	0			
Tones		Zero Active		Disabled	• 🕜			
		Wait Time(1~100s)		5	0			
Phone Lock		Power On		● On ○ Off	0			
Location		Repeatedly		🔍 On 🖲 Off	õ			
EXP Module		Interval(Minutes)		1440				
ВТоЕ		Weekly		🖲 On 🔍 Off	0			
Power Saving		Time		00 : 00 00	0:00 🕜			
Power Saving				Sunday				
				Monday				
		Day of Week		Tuesday	0			
		Day of week		Wednesday Thursday	0			

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

### **Auto Provision Now**

You can use auto provision now mode to manually trigger the 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.

	Status	Account	Network	Features	Settings	Directory	Security
ион		Auto Provision					NOTE
Preference		PNP Active DHCP Active		○ On ● Off	·		Auto Provision The auto provision parameter
ime&Date		Custom Option(128~	254)	160,161	0		for administrator.
Jpgrade	1	DHCP Option Value		MS-UC-Client	0		You can click here to get more guides.
Auto Provision	1	Server URL		ttfp://192.168.1.1	.00/y0000000066	5.cf 🕜	
Configuration	1	User Name				0	
Dial Plan		Password Common AES Key		•••••	0	0	
/oice	1	MAC-Oriented AES Ke	Ŷ	•••••	0		
Fones		Zero Active		Disabled	• 0		
hone Lock		Wait Time(1~100s)		5	0		
ocation		Power On		● On ○ Off (	·		
XP Module		Repeatedly Interval(Minutes)		○ On ◎ Off ( 1440	0		
3ToE		Weekly		○ On ● Off (			
Power Saving		Time		00 : 00 00 Sunday Monday Tuesday	: 00 🕜		
	1	Day of Week			0		

#### 2. Click Autoprovision Now.

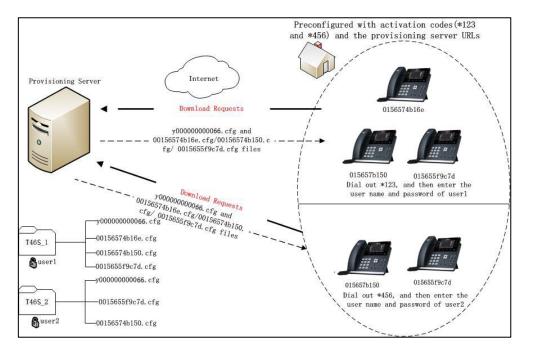
The Skype for Business phone will perform the auto provisioning process immediately.

#### **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 Skype for Business phone will perform the auto provisioning process when it is powered on and at a specified interval.

#### **Auto Provisioning via Activation Code**

In addition to the updating modes introduced above, users can trigger Skype for Business phones to perform auto provisioning by dialing an activation code. To use this method, the activation code and the provisioning server address need to be pre-configured on the Skype for Business phones. This method is normally used for Skype for Business phones distributed by retail sales. It has the advantage that the Skype for Business 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., T46S\_1 and T46S\_2) on the provisioning server.
- Store a common CFG file and multiple <MAC>.cfg files to each directory on the provisioning server.
- 3. (Optional) Configure a user name and password for each directory.

The user name and password provides a means of conveniently partitioning the configuration files for different phones. To access the specified directory, you need to provide the correct user name and password configured for the directory. For more information on how to configure a user name and password using HTTP server, refer to Configuring an HTTP Server on page 45.

**4.** Configure unique activation codes and the provisioning server URLs on Skype for Business 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 Skype for Business phones:

static.autoprovision.1.code = \*123

static.autoprovision.1.url = http://192.168.1.30/T46S\_1/

static.autoprovision.2.code = \*456

static.autoprovision.2.url = http://192.168.1.30/T46S\_2/

5. Send the specified activation code, associated user name and password to each end-user.

**6.** The user can set up the Skype for Business phone, and then input the activation code (for example: \*123) after the phone startup (make sure no one has signed in).

10 36 Tue Sep 26
S
AutoP to
Provision now?
SS
Cancel OK

The LCD screen will prompt the following dialog box:

 Press the **OK** soft key to trigger the Skype for Business phone to perform auto provisioning.

The LCD screen will prompt the following input box:

Autop Authority								
1. User Name:								
2. Password:								
Cancel	2aB	Delete	OK					

**8.** Enter the user name and password of the directory in the **User Name** and **Password** fields respectively.

The entered user name and password must correspond to the directory where the configuration files of the 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 Skype for Business phone downloads the Common CFG file and the corresponding <MAC>.cfg files from the provisioning server to complete phone configurations.

The entered user name and password will be saved to the Skype for Business phones 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 Skype for Business phones.

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 the directory where the configuration files are

located. 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 Configuration Files**

After obtaining the provisioning server address in one of the ways introduced above, the phone will request to download the configuration files from the provisioning server when it is triggered to perform auto provisioning. During the auto provisioning process, the Skype for Business 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 phone will reboot to make the configurations effective after the auto provisioning process is completed.

The Skype for Business 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 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 phone will update configurations.

The latest values applied to the phones are the values that take effect.

The phone will reboot when there is at least a specific configuration requiring a reboot after auto provisioning.

For more information on the specific configuration which require a reboot during auto provisioning, refer to *Yealink Skype for Business Edition HD IP Phones Description of Configuration Parameters in* 

CFG\_Files.

If configuration files have been AES encrypted, the 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 phone decrypts configuration files, refer to *Yealink Configuration Encryption Tool User 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 T46S Skype for Business phone downloads configuration files from the TFTP server.

_								
4	28.8.254.131_17_21_51.pcap [Wireshark 1.12.4 (v1.12.4-0-gb4861da from master-1.12)]							
Eile	Elle Edit View <u>Go Capture Analyze Statistics Telephony T</u> ools Internals <u>H</u> elp							
	\$							
Filter	Filter: tfp Expression Clear Apply							
No.	1	Time	Source	Destination	Protocol Length Info			
	110	3.741095	10.3.20.9	10.3.6.110	TFTP 81 Read Request, File: y00000000066.cfg, Transfer type: octet, blksize\000=1432\000			
	111	3.764718	10.3.6.110	10.3.20.9	TFTP 60 Option Acknowledgement, blksize\000=1432\000			
			10.3.20.9	10.3.6.110	TFTP 46 Acknowledgement, Block: 0			
	113	3.768823	10.3.6.110	10.3.20.9	TFTP 210 Data Packet, Block: 1 (last)			
			10.3.20.9	10.3.6.110	TFTP 46 Acknowledgement, Block: 1			
			10.3.20.9	10.3.6.110	TFTP 80 Read Request, File: 00156574b16e.cfg, Transfer type: octet, blksize\000=1432\000			
			10.3.6.110	10.3.20.9	TFTP 60 Option Acknowledgement, blksize\000=1432\000			
			10.3.20.9	10.3.6.110	TFTP 46 Acknowledgement, Block: 0			
			10.3.6.110	10.3.20.9	TFTP 210 Data Packet, Block: 1 (last)			
1	153	5.860029	10.3.20.9	10.3.6.110	TFTP 46 Acknowledgement, Block: 1			
it Et it In it Us	© Frame 110: 81 bytes on wire (648 bits), 81 bytes captured (648 bits) © Ethernet II, Src: xiamenve_74:bliGe (00:15:65:74:bliGe), DSt: 24:b6:57:1e:47:54 (24:b6:57:1e:47:54) © Internet Protocol Version 4, Src: 10:3.20,9 (10:3:20,9), DSt: 10:3.6.110 (10:3.6.110) © User Datagram Protocol, Src Port: 20901 (20901), DSt Port: tftp (69) © Irvival File Transfer Protocol							
0000 0010 0020 0030 0040 0050	00 06 30 74	43 00 00 6e 51 a5 30 30 30 65 74 00	40 00 40 11 00 45 00 2f 30 30 30 34	55 74 b1 6e 08 00 45 00 Oc 2e 0a 03 14 09 0a 03 Od e3 00 01 79 30 30 30 34 2e 63 66 67 00 6f 63 59 7a 65 00 31 34 33 32	)3 .C@.@ 30 .nqE./y000 3 .00000004 4.cfa.oc			

**Example 2:** Yealink T46S Skype for Business phone downloads configuration files from the FTP server.

28.8.2	28.8.254.131_17.21_51.pcap [Wireshark 1.12.4 (v1.12.4-0-gb4861da from master-1.12)]						
Elle Ed	Elle Edit View Go Çapture Analyze Statistics Telephony Tools Internals Help						
		🖹 🔀 🗶 🍠	≞∣©、⇔⇔⊋77;		· · · · · · · · · · · · · · · · · · ·		
Filter: f	tp			Expression	n Clear Apply		
No.	Time	Source	Destination	Protocol	Length Info		
		10.3.6.110	10.3.20.9	FTP	108 Response: 220 3Com 3CDaemon FTP Server Version 2.0		
		10.3.20.9	10.3.6.110	FTP	82 Request: USER anonymous		
		10.3.6.110	10.3.20.9	FTP	99 Response: 331 User name ok, need password		
		10.3.20.9	10.3.6.110	FTP	72 Request: PASS		
		10.3.6.110	10.3.20.9	FTP	101 Response: 230-The response '' is not valid.		
		10.3.6.110	10.3.20.9	FTP	145 Response: 230-Next time, please use your email address as password.		
		10.3.20.9	10.3.6.110	FTP	74 Request: TYPE I		
		10.3.6.110	10.3.20.9	FTP	86 Response: 200 Type set to I.		
		10.3.20.9	10.3.6.110	FTP	72 Request: PASV		
		10.3.6.110	10.3.20.9 10.3.6.110	FTP	114 Response: 227 Entering passive mode (10,3,6,110,255,104) 90 Request: SIZE v00000000066.cfg		
		10.3.6.110	10.3.20.9		74 Response: 213 96		
		10.3.20.9	10.3.6.110	FTP	90 Request: RETR y00000000066.cfg		
		10.3.6.110	10.3.20.9	FTP	102 Response: 125 Using existing data connection		
		10.3.6.110	10.3.20.9	FTP	122 Response: 226 Closing data connection; File transfer successful.		
		10.3.6.110	10.3.20.9	FTP	108 Response: 220 Closing data connection, File charster successful.		
		10.3.20.9	10.3.6.110	FTP	82 Request: USER anonymous		
		10.3.6.110	10.3.20.9	FTP	99 Response: 331 User name ok. need password		
		10.3.20.9	10.3.6.110	FTP	72 Request: PASS		
		10.3.6.110	10.3.20.9	FTP	101 Response: 230-The response '' is not valid.		
		10.3.6.110	10.3.20.9	FTP	145 Response: 230-Next time, please use your email address as password.		
		10.3.20.9	10.3.6.110	FTP	74 Request: TYPE I		
		10.3.6.110	10.3.20.9	FTP	86 Response: 200 Type set to I.		
		10.3.20.9	10.3.6.110	FTP	72 Request: PASV		
		10.3.6.110	10.3.20.9	FTP	114 Response: 227 Entering passive mode (10,3,6,110,255,105)		
		10.3.20.9	10.3.6.110	FTP	89 Request: SIZE 00156574b16e.cfg		
158	3.213747	10.3.6.110	10.3.20.9	FTP	75 Response: 213 164		
159	3.214340	10.3.20.9	10.3.6.110	FTP	89 Request: RETR 00156574b16e.cfg		
160	3.215550	10.3.6.110	10.3.20.9	FTP	102 Response: 125 Using existing data connection		
	- 157, 00 b		710 hite) 00 hiters -				
			712 bits), 89 bytes c		2 bits) 24:b6:57:1e:47:54 (24:b6:57:1e:47:54)		
					24:06:5/:10:4/:54 (24:06:5/:10:4/:54) 10.3.6.110 (10.3.6.110)		
			65 74 b1 6e 08 00 45 0		. et.nE.		
			c7 c2 0a 03 14 09 0a 0 Da 55 84 10 6c 6d 80 1		8 U]m		
			08 0a 00 00 4e 5c 00 4		N\.B		
0040 b	04 93 53 49	5a 45 20 30	30 31 35 36 35 37 34 6	52SIZE	0 0156574b		

**Example 3:** Yealink T46S Skype for Business phone downloads configuration files from the HTTP server.

28.8.254.131_17_21	[28.8.254.131_17_21_51.pcap [Wireshark 1.12.4 (v1.12.4-0-gb4861da from master-1.12]]						
<u>File Edit View Go</u>	Capture Analyze	Statistics Telephony Tools	Internals He	lp			
<b>BI BI BI BI BI</b>	🖹 🖪 🗙 😂	≙   ♀ ⇔ ⇔ ₮ ;		0.0.0.10 📓 🗹 畅 % 🛙 🧱			
Filter: http			Expression	n Clear Apply			
No. Time	Source	Destination	Protocol	Length Info			
1 0.000000	10.3.20.9	10.3.6.110	HTTP	232 HTTP/1.1 302 Found			
2 0.007935	10.3.6.110	10.3.20.9	HTTP	542 GET /servlet?p=settings-config&q=load HTTP/1.1			
38 0.068955	10.3.20.9	10.3.6.110	HTTP	125 HTTP/1.1 200 OK			
41 2.576460	10.3.6.110	10.3.20.9	HTTP	515 GET /servlet?p=settings-autop&q=load HTTP/1.1			
77 2.643550	10.3.20.9	10.3.6.110	HTTP	982 HTTP/1.1 200 OK			
87 10.797870		10.3.20.9	HTTP	86 POST /servlet?p=settings-autop&q=write&now=false HTTP/1.1 (application/x-			
89 10.959182		10.3.6.110	HTTP	231 HTTP/1.1 302 Found			
90 11.030754		10.3.20.9	HTTP	540 GET /servlet?p=settings-autop&q=load HTTP/1.1			
126 11.098802		10.3.6.110	HTTP	991 НТТР/1.1 200 ОК			
134 13. 523038		10.3.20.9	HTTP	84 POST /servlet?p=settings-autop&q=write&now=true HTTP/1.1 (application/x-v			
161 13.727710		10.3.6.110	HTTP	206 НТТР/1.1 200 ОК			
166 13.755635		10.3.6.110	HTTP	218 GET /y00000000066.cfg HTTP/1.1			
169 13.796582		10.3.20.9	HTTP	205 HTTP/1.1 200 OK (application/octet-stream)			
178 13.809749		10.3.6.110	HTTP	208 GET /ime.txt HTTP/1.1			
185 13.836439		10.3.20.9	HTTP	1032 HTTP/1.1 200 OK (text/plain)			
194 13.846276		10.3.6.110	HTTP	216 GET /Russian_ime.txt HTTP/1.1			
201 13.883670		10.3.20.9	HTTP	1272 HTTP/1.1 200 OK (text/plain)			
210 13.894060		10.3.6.110	HTTP	223 GET /00156574b16e-local.cfg HTTP/1.1			
219 13.898442		10.3.20.9	нттр	66 HTTP/1.1 404 Not Found (text/html)			
224 18.779475		10.3.20.9	HTTP	493 GET /servlet?p=settings-autop&q=result&random=0.04913059249520302 HTTP/1.			
228 18.988420		10.3.6.110	HTTP	59 HTTP/1.1 200 OK [Malformed Packet]			
231 19.996891		10.3.20.9	HTTP	524 GET /servlet?p=settings-autop&q=load HTTP/1.1			
267 20.063444		10.3.6.110	HTTP	991 НТТР/1.1 200 ОК			
270 23.138206		10.3.20.9	HTTP	516 GET /servlet?p=settings-upgrade&q=load HTTP/1.1			
300 23.195348		10.3.6.110	HTTP	853 НТТР/1.1 200 ОК			
302 23.278964		10.3.20.9	HTTP	522 GET /servlet?p=common-page&q=iframe-upload HTTP/1.1			
305 23.298530		10.3.6.110	HTTP	1490 НТТР/1.1 200 ОК			
308 24.965106		10.3.20.9	HTTP	517 GET /servlet?p=settings-config&q=load HTTP/1.1			
343 25.023340		10.3.6.110	HTTP	125 НТТР/1.1 200 ОК			
346 26.271142	10.3.6.110	10.3.20.9	HTTP	644 POST /servlet?p=settings-config&q=stopcapture HTTP/1.1			

# **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 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 phone are correct.
- Ensure that configuration files exist on the provisioning server.

# Why does the 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 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 phone display "Network unavailable"?

- Ensure that the Ethernet cable is plugged into the Internet port on the 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 can't the phone obtain an IP address from the DHCP server?

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

#### Why can't the 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 not larger than that the phone supports.
- Ensure that the properties of the ring tone for the 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 can't the phone update configurations?

- Ensure that the configuration files are different from the last ones.
- Ensure that the phone has downloaded the configuration files.
- Ensure that the parameters are correctly set in the configuration files.

# 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 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:

General Sharing Security Customize						
Group or user names:						
Administrators (VANSTD80\Admin	istrators)	~				
ST CREATOR OWNER						
🕵 E veryone						
📓 Hill, James (jahill@myservername	.com]					
SYSTEM		~				
<		>				
	A <u>d</u> d	Bemove				
Permissions for Everyone	Allow	Deny				
Full Control						
Modify						
Read & Execute	~					
List Folder Contents						
Read						
Write						
Cossial Dormissions						
For special permissions or for advanced click Advanced.	settings,	Advanced				
ОК	Cancel					

### **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:

How to Register	×
In an effort to reduce the number of emails I get that ask me "How do I register?", I'd just like to note that you can find this information by opening the "Help" menu, and selecting the option "Registering".	ОК
So that you don't think this is a nag, I've given you the option to disable this dialog below, but please only do that if you feel you can remember how to register.	
Okay, I understand that - don't show me this dialog again.	

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:

E:\desktop\1.FTP - WFTPD		
File Edit View Logging	Messages Security Help	
# -001] 2015/3/20 17:39:16 # -001] 2015/3/20 17:39:18	Welcome to WFTPD - we are listening to all unused IP adding the first address assigned to your system is 127.0.0.1 But you might be reached at a number of other addresses Check with your network administrators for the address the WFTPD is listening on port 21, standard ftp Program will be killed by WM_ENDSESSION message Unregistered version - for instructions on registering,	
# -001] 2015/3/20 17:39:16	select the "Registering" option from the "Help" menu.	
<b>(#</b> -001) 2015/3/20 17:39:16	select the "Registering" option from the "Heip" menu.	,

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

E:\desktop\1.FTP - WFTPD						
File Edit View Logging Messages	Security Help					
If = Coll 2015/3/20 17:39:16 Welcome       General       ig to all unused IP addresses.         [# -001] 2015/3/20 17:39:16 He first a       Users/rights       er of other addresses.         [# -001] 2015/3/20 17:39:16 But you m       Users/rights       er of other addresses.         [# -001] 2015/3/20 17:39:16 Check wit       Host/net       ors for the addresses that is reachable from the Internet (# -001] 2015/3/20 17:39:16 Program will be killed by WM_ENDSESSION message         [# -001] 2015/3/20 17:39:16 Unregistered version - for instructions on registering,       [# -001] 2015/3/20 17:39:16 select the "Registering" option from the "Help" menu.						
•		Þ				

5. Click New User.

User / Rights Se	curity Dialog	×
User Name: User default	default Done	]
New User	Delete         Change Pass           Restrict to home directory and below	
Home [	Browse	]
Help	Rig	hts >>

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

User / Rigi	nts Securit	y Dialog					8
User Name User defau		default r	•	-	Done		
New Us	User Name	: test1		0 Car He	ncel	1	
He	elp				F	Rights :	>>>

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

User / Rigł	hts Security Dialog	23
User Name ⊢User test1	Change Password	
New Us	New Password: Concel	
Home		
He	elp	Rights >>

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

User / Rights S	Security Dialog			x
User Name: User test1	test1	•	Done	
New User	Delete Restrict to home of	Change Pass directory and below		
Home	E:\DESKTOP\CONF	IGURATION FILE	Browse	
Help			Rights	»>

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.

User / Rights Se	curity Dialog		×				
User Name: ⊢User test1	test1	•	Done				
New User Delete Change Pass							
Home	Home E:\DESKTOP\CONFIGURATION FILE Browse						
Help Rights for user test	Help Rights<<						
Directory: ×		Brows	e Remove				
Rights for Read		<ul> <li>✓ Create Files/Dir</li> <li>✓ Overwrite/Dele</li> </ul>	·				

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 phone downloads 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 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:

Administrators (VANSTD80	)\Admini:	strators)		^
Everyone				
🕵 Hill, James (jahill@myserv	ername.	com]		
SYSTEM				~
<			>	
	A	.dd	Bemov	e
Permissions for Everyone	-	Allow	Deny	
Full Control				^
Modify		~		
Read & Execute		~		
List Folder Contents		~		
Read				
Write				
Coosial Parmissions				~
For special permissions or for ad- click Advanced.	vanced	settings,	Advance	d

### **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:

HFS ~ HTTP File Server 2.2f	Build 155	- 0 <b>X</b>
📕 Menu 🛛 🖗 Port: 8080 🛛 🎎 You are in Expert mode	W	
Open in browser http://10.2.11.101:8080/		
	Top sp	ed: 0.0 KB/s
Virtual File System	Log	
	17:23:24 Check update: no new version	
🧊 IP 🗌 Filename	Status Speed Time left	%
Connections: 0 Out: 0.0 KB/s In: 0.0 KB/s Total Out: 0 B Tot	al In: 0 B VFS: 0 items	

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

HFS ~ HTTP File Server 2.2f	Build 155
📕 Menu   🖑 Port: 8080   🕵 You	are in Expert mode
+ Self Test Edit HTML template Other options Upload	8080/ Top speed.0.0 KE/s
Start/Exit  Virtual File System Limits Flash taskbutton Fingerprints Tray icons	stem Log 17:23:24 Check update: no new version
IP address     ▶       Accept connections on     ▶       Dynamic DNS updater     ▶       URL encoding     ▶       Updates     ▶       ❤ Donate!	This IP address is used only for URL building 192.168.147.1 192.168.172.1  102.111.01 Custom
<ul> <li>➢ Load file system Ctrl+O</li> <li>Gave file system Ctrl+S</li> <li>X Clear file system</li> </ul>	Don't include port in URL Find external address Constantly search for better address
Save options	Filename 🥠 Status Speed Time left %
Switch OFF F4 Exit	
Connections: 0 Out: 0.0 KB/s In:	0.0 KB/s Total Out: 0 B Total In: 0 B VFS: 0 items

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

HFS ~ HTTP File Server 2.2f	Build 155 🗖 🔲 🕱
🛓 Menu   🖑 Port: 8080   🎎 You are in Expert mode	
Open in browser http://10.2.11.101:8080/	
	Top speed: 0.0 KB/s
Virtual File System	Log
Port     Specify a port to accept connection,     or leave empty to decide automatically.     8088     OK Cance	17:23:24 Check update: no new version
	<u>↓</u>
	Status Speed Time left 2
Connections: 0 Out: 0.0 KB/s In: 0.0 KB/s Total Out: 0 B Tot	tal In: 0 B VFS: 0 items

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

₩ HFS ~ HTTP File Server 2.2f	Build 155	
🖺 Menu 🛛 📅 Port: 8088 🛛 🥵 You are in Expert mode		
Open in browser http://10.2.11.101:8088/		
	τ	op speed: 0.0 KB/s
Virtual File System Log		
Add files Add files Add folder from disk New empty folder Ins New link Advanced Copy URL address Ctrl+C Comment		
Bind root to real-folder Set user/pass Restrict access Customized realm ✓ Browsable ✓ Archivable Upload Why is upload disabled? Hide tree		
Auto-hide empty folders Hide file extention in listing	Speed Time left	%
Connections: 0 Out: 0.0 KB/s In: 0.0 KB/s Total Out: 0 B Total In: 0 B VFS: 5	51 items - not savec	

**4.** (Optional) Right-click on the directory to select **Set user/pass...** to configure a user name and password for the directory.

The user name and password provides a means of conveniently partitioning the

configuration files for different phones. To access the specified directory, you need to provide the correct user name and password configured for the directory.

 Enter a user name (e.g., test1) and password in the User Name, New Password and Verify Password fields respectively.

Insert the reques	ted user/pass	×
Username	test1	
Password	×××	
Re-type password	***	
	Ok Re	eset

6. Click Ok.

7. Locate the root directory from your local system.

🚔 HFS ~ HTTP File Server 2.3 beta		Build 275		_	
🛓 Menu   🖑 Port: 80 🌱 👥 You are in	n Easy mode				
Open in browser http://10.2.11.101:8	088/ProvisioningDir/			Already	n clipboard
Virtual File System		Log			
A /     L     B □ ProvisioningDir     B □ Pro					
🗊 IP address	🔲 File	Status	Speed	Time	Progress
Out: 0.0 KB/s In: 0.0 KB/s					.4

Check the server URL (e.g., http:// 10.2.11.101:8088/ProvisioningDir) by clicking "Open in browser".

Yealink Skype for Business 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.

The DHCP Turbo on localhost	_	23
<u>Eile Edit View B</u> indings <u>T</u> ools <u>H</u> elp		
File Edit View Bindings Iools Help     Servers     Server     Base     Description     Platform     User:     Admin     Login     Platform     Platform     DHCP Turbo     Ware bindings     Pattors     DHCP Turbo     Pattors     DHCP Turbo     Pattors     DHCP Turbo     Pattors     Patt		
Ready.		

- 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.

	BDHCP Turbo on localhost (modified) File <u>E</u> dit <u>V</u> iew <u>B</u> indings <u>T</u> ools <u>H</u> elp		
Servers Servers Servers Servers Cabbal Scope	Incelhost Database Marculations Scopes	New Scope   Scope   Address Bange   Mane   Balar Association   Balar Association   Balar Association   Unlinited   Days   Nours   Ninutes   0   6   0	

**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**.

Sa DHCP Turbo on localhos	st (modified)					- • <b>·</b> ×
<u>File Edit View Bindings</u>	<u>T</u> ools <u>H</u> elp					
		10 C S	<b>k</b> ?			
			<b>K</b> :			
Servers 🗸	Filter Standard Opt	ions		•		
	,	1		_		
	Tag \(\[-6	Option Magic cookie				
+ Named Policies		Home directory				
Dption Types		Hardware address type	N			
- Scopes		Hardware address lengt	.h 🚾	New Option Type	Ctrl+V	
DHCPServer		Boot file Pad	<u>ی</u>	<u>U</u> ndo	Ctrl+Z	
_		Fad Subnet mask	0	Redo	Ctrl+V	
		Time offset	-	-		_
		Gateways	*	Cu <u>t</u>	Ctrl+X	
		Time servers	D	<u>C</u> opy	Ctrl+C	
		IEN116 name servers Domain name servers		Paste	Ctrl+V	
		Log servers		Delete	Del	
		Cookie/Quote servers	_		Del	
		LPR servers		Select <u>A</u> ll	Ctrl+A	
		Impress servers RLP servers	Q.*	Find	Ctrl+F	
		ALF servers Hostname	h- •			
		Boot file size	*	Properties	Ctrl+P	
	🖅 14	Merit dump file				
		Domain name				
		Swap servers				
		Root path Extensions path				
		IP forwarding				
		Non-local source routi	ng			_
		D.1:				<u>.</u>
	Description					
	Specifies a device's	hardware address type.				
4 F						

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 are to save the change.

File Edit Yiew Bindings Tools Help	😤 DHCP Turbo on loc	alhost	
Servers / localhost     Sopes     Dytion Types     Mamed Policies     Mamed Policies     Mamed Policies     Mame IPTPServer     Type 8bit     Si 8bit     Si 8bit     Si 8bit     Jescri 32bit     ipaddress     string     time     bool     hardware_address     subencoded     dms_name	<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>B</u> indings	Tools Melp	
Film Scopes Goption Types Mamed Policies Mamed Policies Mame TFTFServer Tag 128   . Name TFTFServer Type Bbit Silbit Descri 32bit ipaddress string time bool hardware_address subencoded das_name QK Cancel Description	4 🖌 🖌	≥ ■ ■ % ∽ ~ § k?	
		Te Option Properties ? X Te Tag 128 Name TFTFServer Type Bbit Si 8bit 16bit Descri 32bit ipaddress string time bool hardware_address subencoded dns_name 	×

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

🐁 DHCP Turbo on localho	ost (modified)					
<u>Eile Edit View B</u> indings Iools <u>H</u> elp						
	è 📫 😒	×	9	Ċ.	G	▶?
Servers		Nev     Und     Nev     Und     Nev     Lind     Nev     Sele     Sele     Sele     Prop	o y e ette ct <u>A</u> ll	Ctr Ctr Ctr Ctr Ctr De Ctr Ctr	++Z ++γ ++X ++C ++V	Value
Add a new option to this	J policy					

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

State DHCP Turbo on localhost (m	nodified)	
<u>File Edit View B</u> indings <u>T</u> oo	ols <u>H</u> elp	
a a * »	🐘 🗟 🛠 🔊 🝽 🊱 🕅	
Servers Tag		×
Database	E Option Selector	
W Exclusions	Filter Standard Options	
- Named Policies		
🛃 Global	Tag √ Name	<b>▲</b>
	48 X Window system font servers	
E-BScopes		
🛃 DHCPServer		
	- 258 DHCP renewal time - 259 DHCP rebinding time	
	-464 NIS+ domain	
	POP3 servers	
	The servers	
	128 TFTFServer	
	🗄 🖅 🖅 Legacy PacketCable	-
	Description	5
		<u> </u>
۲ · · · · ·	<u>QK</u> <u>Cancel</u>	

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

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

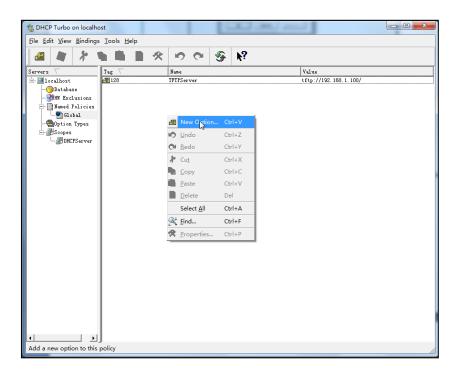
San DHCP Turbo on localho			X
Eile Edit View Bindings	<u>* 0 0 6</u>	N2	
Servers Declahost Declahost Global Global Global Global Global Global Global Global Global Global Global Global Global Global Global Global	Rane         Image: TFTPServer         Image: TFTPServer           Itftp://192.168.1.100         Image: Texpression         Image: Texpression	Velue	
۷ ۲	<u>QK</u> <u>C</u> an	cel Advanced >>	

**12.** Click **are 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.

San DHCP Turbo on localhost						
<u>File Edit View B</u> indings <u>T</u> ools <u>H</u> elp						
🛛 🖪 🔺 🔺 🐂 🖡	▲ オ 本 単 単 米 ウ マ 多 №					
Servers 🗸 Tag	Name Value					
⊢⊡localhost ∉128	2 Option Selector					
	Filter TFTP Options					
- Slobal	Tag 🗸 Name					
	-45-20 Server name -45-16 MS option 67					
DHCPServer	-42-15 MS option 66					
	-4≣-14 Next server -4≣-1 Boot file					
	Description					
	The host name of a TFTF server the device should use duping the second stage of its bost process. Waless you know your device requires this option, you should use option -14 (as IF address) or option -20 (as host name) to define the TFTF server.					
• • ]	QKQancel					

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

State DHCP Turbo on localhost	t	
<u>File Edit View Bindings</u>		
	• • • • • • • • • •	
Servers 🛆	Tag 🗸 Name Value	
- I localhost - Scopes - dhcp - dhcp - Option Types Named Policies - Clobal - WhW Exclusions - Database	I28       TFTFServer       tftp://192.168.1.10         I92.168.1.100       Inclusion         I92.168.1.100       Inclusion         Build.       Build.         QK       Cancel	0/
		11.

- 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.

A DHCP Turbo on localhost						x
<u>File Edit View Bindings Tools</u>	Help					
			<i>c</i>	10		
		50	G	<b>N</b> ?		
Servers V Tag	7	Name			Value	Ĩ
🕂 💷 localhost 🖉 🛃	Option Selector	and the second		N	8 <b>- X -</b>	
Database 🖉 🗖				6		
	ilter S	Standard Option:	s	•		
- Named Policies	Tag $ abla$	fame				
		ath MTU aging t	imeout			
		ath MTV plateau	ı table			
E- BScopes		nterface MTV				
DHCPServer		ll subnets are				
		roadcast addres				
		erform mask dis ask supplier	covery			
		ask suppiler erform router d	li saoror			
		outer solicitat				
		tatic route				
		railer encapsul	ation			
		rp cache timeou	it			
		thernet encapsu	<b>l</b> ation			
		CP default TTL				
		CP keepalive in			_	
		CP keepalive ga	urbage			
		IS domain				
		IS servers TP servers				
		endor specific	info			
		BT name servers				
		BT datagram dis		on servers	-1	
	. —	-				
De	escription				5	
1	Used by devices a	and servers to e	xchange	vendor-specific infor	mation.	
	-		-	-		
					QK <u>C</u> ancel	
						/

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

State DHCP Turbo on localhos File Edit View Bindings		
] 🖪 🔌 者 🐧	■ ■ ※ ∽ < ⊛ k?	
Servers	Tag     Nume     Value       #128     TFTPServer     tftp://192.11       -15     MS option 66     192.188.1.10         # Vendor specific info     # *       # Vendor specific info     # *       # ttp://192.186.1.100/     # *       # ttp://192.186.1.100/     # *       # ttp://192.186.1.100/     # *       # ttp://192.186.1.100/     # *	

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

# **Customer Feedback**

We are striving to improve our documentation quality and we appreciate your feedback. Email your opinions and comments to DocsFeedback@yealink.com.