

TE 4.0 Software  
MARCH 2011

# E20

## Administrator guide



## What's in this guide?

The top menu bar and the entries in the Table of Contents are all hyperlinks. Just click on them to go to the topic.

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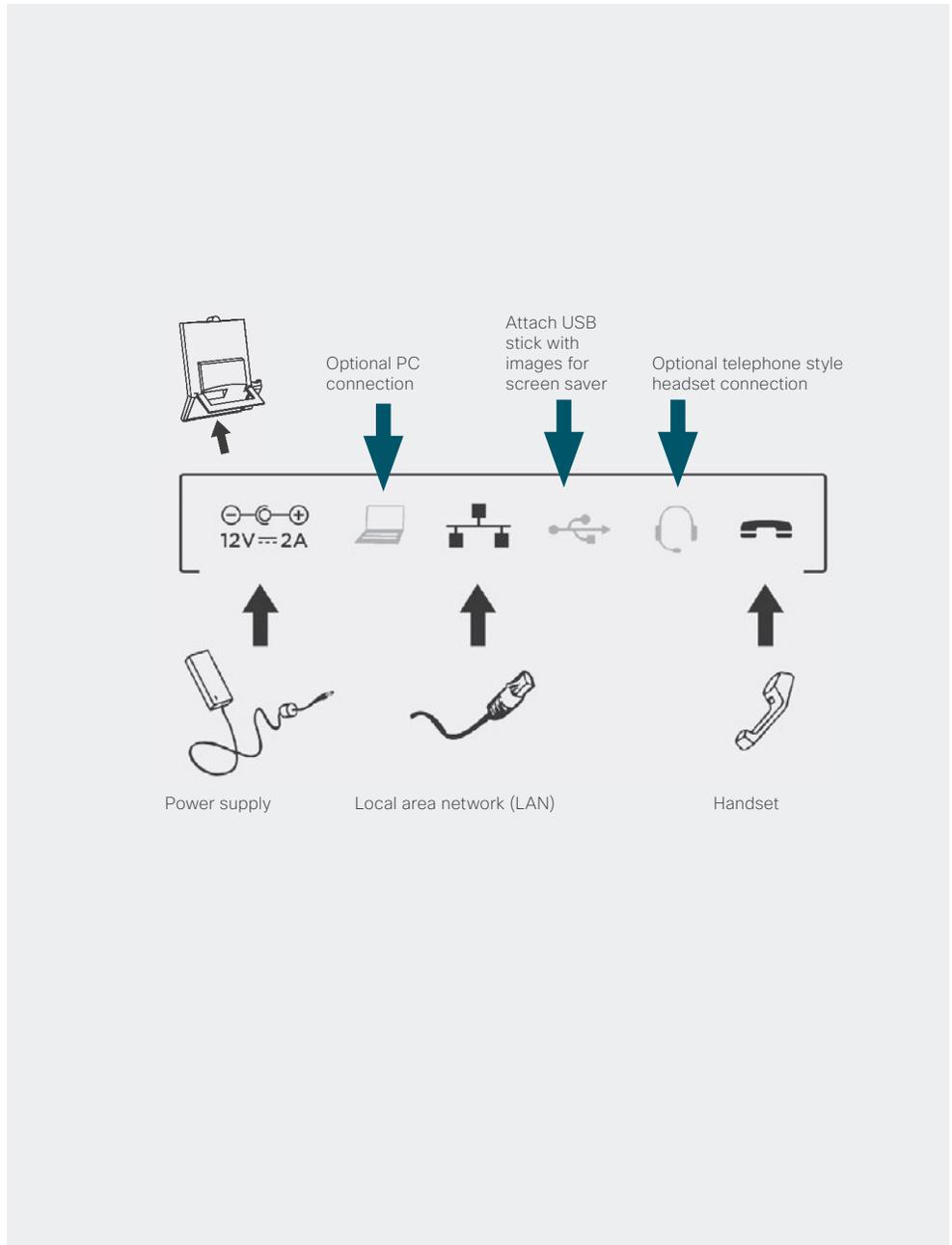


# Chapter 1

## Introduction

## Connecting the E20

Connect the cables as shown. If you have one LAN connection only, and need that for your PC, the E20 has a built in Gigabit ethernet switch that enables you to connect your PC to the E20 to access the LAN through the E20.





## Chapter 2

# Deploying E20

## Deploying the E20

There are four ways of deploying the E20:

- By use of automatic provisioning.
- By use of the keypad.
- By logging into the unit from a remote PC.
- By use of Provisioning.

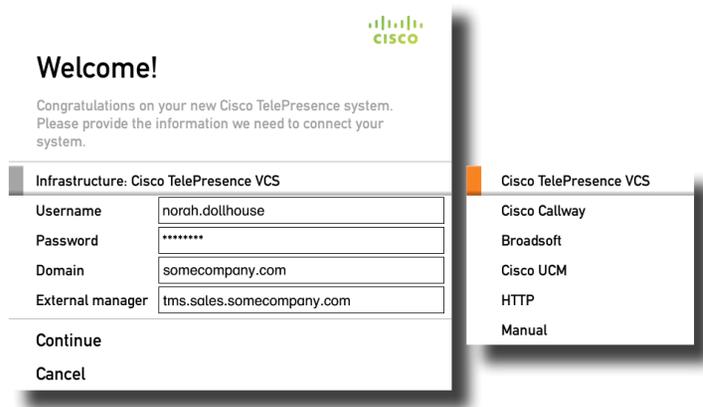
### Automatic provisioning

When you start the E20 the first time you will be prompted to choose the language to be used in the menus and dialog boxes.

Once the language has been selected, the E20 will configure the correct language and a provisioning assistant will pop up.

The wizard will help you configure the E20 with the correct parameters. Observe that Cisco has defined a set of DHCP options. The E20 will pick up these settings if they have been set by your *network administrator*.

The wizard supports different provisioning or configuration schemes. The Cisco VCS (TMS 12.5) is the default scheme and is the recommended provisioning scheme for the E20. The other schemes will only allow the E20 to be easily configured using a core set of configuration parameters. The E20 supports VCS, Broadsoft, Cisco Callway, Cisco UCM and HTTP. Callway is a subscription based service. Contact your Callway representative for more on this. Depending on the infrastructure you will be prompted to supply information like username and passwords.



Once you have completed the fields and selected the register button, the E20 will contact the external manager and try to provision the device. You will be notified whether the registration process succeeds or fails. Note that even if provisioning or registration fails the system may keep trying in background

In case of failure to connect successfully, you may rectify the parameters and try again. If you don't have provisioning set up in your network you can choose **Manual** to configure basic SIP settings manually. You can run the Startup wizard later using the menu.

The final step of the wizard will be to adjust the camera. Note that camera adjustment is optional at this stage—you may choose to do this later.

### Using the keypad to configure the E20

1. Navigate from the **Home** menu to the **Menu** tab. Use the **Down arrow** key to navigate down to **Advanced settings**. Press **✓**.
2. Navigate down to **System configuration** and press **✓**.
3. Navigate to **SystemUnit > Name** and press **✓**.  
Select a name that is unique to avoid conflicts. We recommend that you use your name or initials, eg. AliceWonderland. This name will be seen as you by the others.
4. In most cases DHCP will be used for assignment, this is the default setting.  
To set to static, go one step back and up to **IP Settings > IP Assignment**. Set to **Static**. Enter the **IP address**, **Subnet Mask** and **Gateway IP address**.
5. To set provisional parameters go to **Provisioning > External manager**.  
In most cases when you change settings in the **Provisioning** submenu, the E20 will send a provisioning request to the external manager. More on this can be found in the "Auto provisioning" on page 8.
6. In case you are not going to use an external manager, there are things that need to be configured manually:
  - a. To be able to dial, you need to configure the SIP settings. In the **NetworkServices > SIP**, set **SIP Mode** to **Off** before doing anything else.
  - b. Go to **SIP > Profile1**. Set **Default Transport** to **Auto** (which is the same as default), **Proxy1 Discovery** to **Manual**, You must also enter the IP address of the Proxy (Proxy is your PBX/VCS or OCS) and you must enter the URI of your E20. Set the **SIP Mode** back to **On**.
  - c. If your SIP Server / PBX uses user authorization you need to supply a user-id and password. This is done in **SIP > Profile1 > Authentication 1**.
  - d. You may want to use a TMS phonebook. If you have this and no entries are displayed after configuring, you must make sure that your unit is registered in TMS and that a phonebook is assigned to your system.

Your E20 comes with no default administrator password set! This means that anyone with network access to the E20 can easily log onto the device with SSH. We strongly recommend that you set up an administrator password by using the menu in **Settings > Advanced > Change password**.

## Setting up the E20 from a remote PC

Log onto the system using Telnet or a SSH client. When using SSH log in with username "admin".

First you should choose a name for your unit. Use a name that is unique to avoid conflicts. The recommendation would be to incorporate your name or initials, eg. AliceWonderland.

```
xConfiguration SystemUnit Name: "AliceWonderland"
```

Note that in most most cases DHCP will be used for assignment:

```
xConfiguration Network 1 Protocol: "IPv4"
```

```
xConfiguration Network 1 Assignment: "DHCP"
```

If not, you may want to set your IP network settings manually:

```
xConfiguration Network 1 IPv4 Address: "<Your-IP-Address>"
```

```
xConfiguration Network 1 IPv4 Gateway: "<Network-Gateway-IP-Address>"
```

```
xConfiguration Network 1 IPv4 Subnetmask: "<SubNet-mask>"
```

```
xConfiguration Network 1 DNS Domain Name: "<local domain names>"
```

```
xConfiguration Network 1 DNS Server 1 Address: "<DNS Server IP Address>"
```

For remote administration the following settings are recommended. This should also make the system visible in TMS.

```
xConfiguration Provisioning Mode: Tms
```

```
xConfiguration Provisioning ExternalManager Address: "<hostname of your tms server>"
```

```
xConfiguration Provisioning ExternalManager Protocol: Http
```

```
xConfiguration Provisioning ExternalManager Path: "tms/public/external/management/systemmanagementservice.asmx"
```

To be able to dial, you need to configure the SIP settings.

```
xConfiguration NetworkServices SIP Mode: On
```

```
xConfiguration SIP Profile 1 DefaultTransport: Auto
```

```
xConfiguration SIP Profile 1 Type: Auto
```

```
xConfiguration SIP Profile 1 Proxy 1 Discovery: Manual
```

```
xConfiguration SIP Profile 1 Proxy 1 Address: "<ip of your SIP server>"
```

```
xConfiguration SIP Profile 1 URI: "<your SIP URI>"
```

If your SIP Server/PBX uses user authorization you need to supply a user-id and password

```
xConfiguration SIP Profile 1 Authentication 1 LoginName: <your user-name>
```

```
xConfiguration SIP Profile 1 Authentication 1 Password: <password>
```

You may want to use a corporate TMS phonebook. If you have this and no entries are displayed after configuring, you must make sure that your unit is registered in TMS and a phonebook is assigned to your system.

```
xConfiguration Phonebook Server 1 ID: "default"
```

```
xConfiguration Phonebook Server 1 Type: "TMS"
```

```
xConfiguration Phonebook Server 1 URL: "<URL to your phonebook service>"
```

Should the system fail to respond to incoming calls, make sure that:

- The system is connected to line voltage
- The LAN cable is properly connected—see Connecting the E20 for details.

## Auto provisioning

There are situations where service providers prefer that users need not enter any information at all. Instead, they want the E20 to retrieve all the information necessary by itself—through pro-active behavior using HTTP or HTTPS.

When provisioning mode is set to **Auto** (default), we try the following:

1. HTTP provisioning towards `http://tandbergprovisioning/getconfig`
2. If PROVISIONINGSERVER and PROVISIONINGDOMAIN is set in `/etc/dhcpinfo`, use VCS provisioning
3. If TMSSERVER is set in `/etc/dhcpinfo`, use TMS provisioning
4. For TE4.0 and newer: If TFTPSEVERADDRESS (option 150) is set in `/etc/dhcpinfo`, use Cisco UCM provisioning.
5. If TFTPSEVER (option 66) is set in `/etc/dhcpinfo`, try tftp
6. HTTP provisioning towards `http://globalprovisioning.tandberg.com/getconfig` (see examples right).

If all of the above steps fail, the GUI will show the startup wizard.

With TE4.0.0 the E20 supports provisioning and basic call functionality with Cisco Unified Communications Manager (CUCM) version 8.5 and above. The E20 also supports Cisco Discovery Protocol (CDP) for easy deployment in CUCM environments. Voice VLAN and Data VLAN are VLAN tags used by Cisco switches. When provisioning mode is set to CUCM the E20 will try to use Voice VLAN if available in your network. When in other provisioning modes the E20 will try to use Data VLAN. See also the appendix for more on this.

**HTTP provisioning**  
 The E20 will send an HTTP/HTTPS request containing E20 parameter information that will uniquely identify the E20 using Get/Post. The E20 will provide its serial No. and MAC address.

HTTP Provisioning examples

Redirect

```
<Provisioning>
  <Redirect><URL>http://myProvisioningServer</URL><Method>GET</
    Method></Redirect>
</Provisioning>
```

Software upgrade

```
<Provisioning>
  <Software>
    <URL>http://myProvisioningServer/download</URL>
    <Version>TE4.0</Version>
    <UpgradeIfLessThan>TE1.8</UpgradeIfLessThan>
    <UpgradeIfGreaterThan>TE4.0</UpgradeIfGreaterThan>
  </Software>
</Provisioning>
```

Server settings

```
<Provisioning>
  <ServerSettings>
    <Mode>VCS</Mode>
    <Username>336835</Username>
    <Password>222</Password>
    <Domain>example.com</Domain>
    <Address>MyExternalManager</Address>
    <HTTPProtocol>HTTPS</HTTPProtocol>
    <HTTPMethod>GET</HTTPMethod>
  </ServerSettings>
</Provisioning>
```

Configuration

```
<Provisioning>
  <Heartbeat>1</Heartbeat>
  <Configuration>
    <Audio item="1">
      <SoundsAndAlerts item="1">
        <RingTone item="1">Nordic</RingTone>
      </SoundsAndAlerts>
    </Audio>
  </Configuration>
</Provisioning>
```



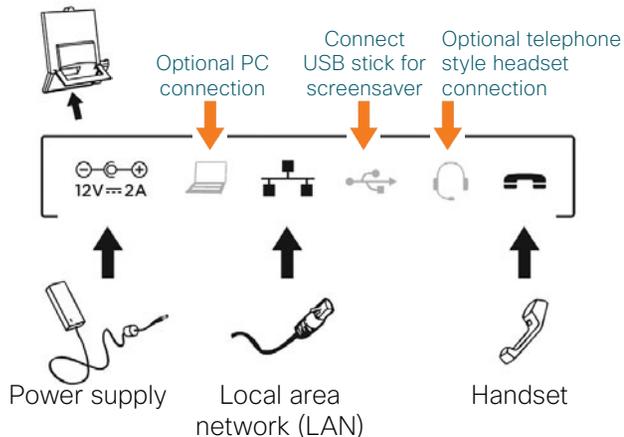
## Chapter 3

### Using E20

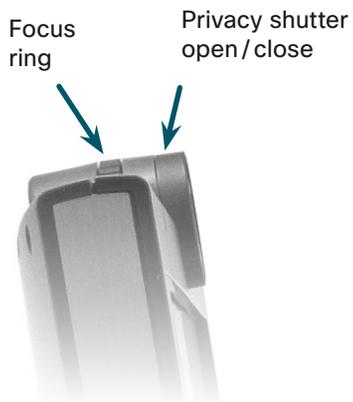
## Connecting the E20 to the LAN

**Optional PC connection:** If you have a single LAN wall outlet only, you may connect your PC to the PC-socket of the E20.

Your PC and the E20 will then share the LAN connection.



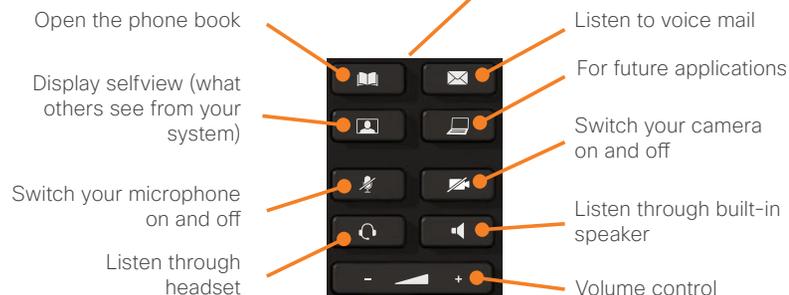
## Adjusting the E20 camera



**Before you start making video calls, make sure that your picture is displayed properly.**

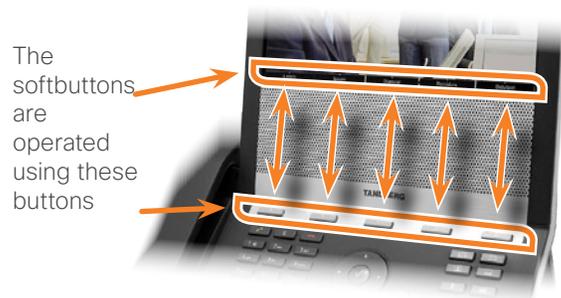
1. Open the privacy shutter by turning the front ring of the camera.
2. Display your own picture by pressing the key.
3. Adjust your picture vertically by using the **up** and **down** key.
4. Adjust sharpness by turning the focus ring on the camera.

## The E20 keyboard



## Operating the softbuttons

In the lower line of the display, context sensitive softbuttons will appear to give you choices when operating the unit. Observe that these buttons are operated by means of the upper row of keypad buttons as shown below.



## Navigation principles

### The following navigation principles apply:

- Press the button to show the **Home** menu whenever no menu is shown. Press again to remove the menu.
- Use the up and down keys to navigate inside a menu.
- Open a submenu by pressing or the right button.
- Repeat, if needed, if there are more submenu levels.
- Inside a submenu, press left button to go one level back.
- Inside a menu, use the button to close all submenus and go directly back to Main menu.
- When entering information in a text or number field, use the **C** button to delete inputs to the left of the current cursor position.
- To switch between numeric and alphanumeric setting use the **# (abc/123)** softbutton.
- The softbuttons along the bottom of the screen are controlled by the corresponding buttons of the keypad.

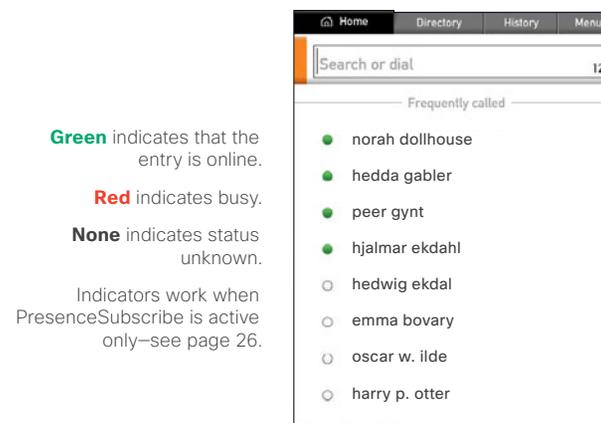
## Selfview

- Outside a call, press the button to see what others see of you.
- Use this image to see whether you need to adjust the camera tilt (described on the previous page), your distance to the phone and/or the lightning if required.
- Press again to remove the selfview image. Any wallpaper chosen will now be displayed.
- In a call, the selfview will appear as a picture-in-picture image.

## Calling someone by dialing their number

Key in the number or URI directly and press . You can lift off the handset both before and after dialing.

Alternatively, just press to show the **Home** menu, if needed:



Key in the number or URI to call and press twice to start calling.

While doing this you may need to switch to alphanumeric setting by means of the **# (abc/123)** key. Activate **Special Characters**, if needed.

The E20 will search for matches as you key in a number or URI. Matches found will be presented according to categories; **Recent calls**, **My contacts** and **Phone book**.

Below the **Dial** field is the list of those you have called frequently and your Favorites (see later for more on this). To call one of these entries use the buttons to navigate down to the entry to call and press the button to place the call.

If you need to browse through the call history to locate whom to call, navigate to **History** and look there.

## Answering an incoming call

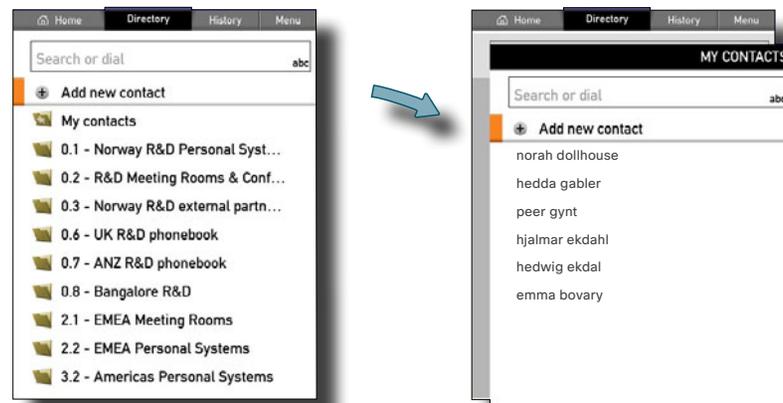
- Lift the handset to answer the incoming call. Put the handset back in its cradle to terminate the call.
- Alternatively, press to answer an incoming call. The call will then use the built-in loudspeaker or your headset (if attached and selected).
- To reject an incoming call press .

## Switching between handset, loudspeaker and headset

- To switch from handset to loudspeaker without terminating an ongoing call, press the button before putting the handset back in its cradle.
- To switch from loudspeaker to handset, just lift the handset.
- To switch between loudspeaker and headset, press the corresponding button ( and .

## Calling someone using the Directory

1. Press to show the **Directory** tab or use the buttons to navigate to the **Directory** tab.
2. Use the buttons to navigate to the folder required and press to open it.
3. You may have to repeat this to open any subfolders.



4. Inside the folder, use the buttons to locate whom to call and press to place the call. If you do not know where the entry resides, you may instead search for an entry in the directory. To locate a specific entry, just type in the first letter as with a mobile phone. There is no need to press .

**Note!** The search will take place within the current folder and any subfolders existing, but not within folders higher up than your current location.

## Adding entries to My contacts

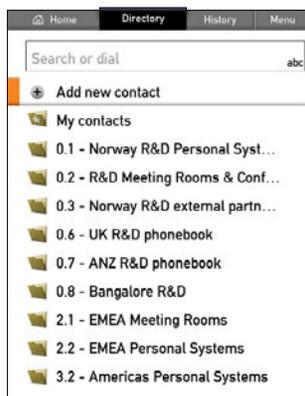
You may add new contacts to **My Contacts**. Entries in other folders, such as the corporate directory must be made by your system administrator.

### Adding entries manually

It may happen that the list of My contacts grows large on your system. You may therefore promote those entries you call the most to a shortlist to make them easier to locate. This shortlist is called **Favorites**. The Favorites list is a subset of My contacts—you cannot be someone’s favorite without being a member of that person’s My contacts already.

#### Do as follows:

1. Navigate to the **Directory** tab.
2. Navigate to **Add new contact** and press √.



3. Press √ again:



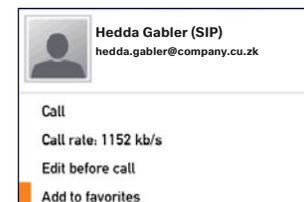
4. Enter **Name** and **Number/URI** of the new contact. If you want the entry to also appear on the Favorites short list, make sure **Favorite** is set to **Yes**.
5. Navigate down to **Save** and press √ to save the the new contact, or navigate to **Cancel** and press √ to leave the menu without saving the new contact.  
**Save** will appear ghosted until there is something to save.

### Copying entries from the corporate directory

You may also copy entries to My contacts from the corporate directory. Note that once copied to My contacts, these entries will loose their connection to the corporate directory. This means that any updates of the corporate directory will not be reflected in My contacts. You will have to update the My contacts manually.

#### Do as follows:

1. Locate the entry in the corporate directory and press √. This will produce the following dialog box:



2. Navigate down to **Add to favorites** to add this entry. The entry will become member of My contacts, since it is now among the favorites.

If you want this entry to be just a common member of My contacts and not among the favorites, you may remove the entry from the Favorite list (while still retaining it in My contacts)—see the following page for details on this.

## Removing an entry from the list of Favorites

You may remove an entry from the Favorites list without removing the entry from My contacts.

### Do as follows:

1. In the **Home** menu navigate down to the entry to be removed and press  $\checkmark$ . The below dialog box will now be displayed.



2. Navigate down to **Remove from favorites** as shown and press  $\checkmark$ . The entry will now be removed from the Favorites list, but it will remain in the list of My contacts.

## Removing an entry from My contacts

You may remove entries from the My contacts list. These will then be removed permanently.

### Do as follows:

1. Use the  $\odot$  buttons to navigate to the **Directory** tab and then down to **My contacts**. Press  $\checkmark$ .
2. Locate the entry to be permanently deleted and press the **C** button. The following dialog will appear:



3. Select **OK** and press  $\checkmark$  to exit the menu putting changes into effect or **Cancel** to exit menu undoing any changes.

## Switching between two calls

When you are in a call you may put the other party on hold while you call someone else. You will then be in call with two parties, but only one at a time.

### Do as follows:

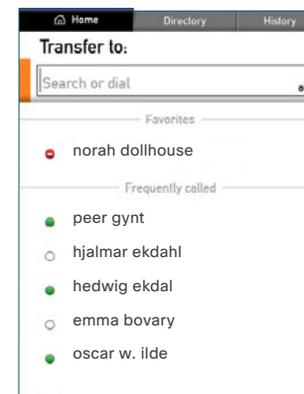
1. While in a call, press the softkey **Hold**. The softbuttons will now change to show you two options:
  - **Resume** to go back the call you were in.
  - **New call** to let you call someone else, while at the same time keeping the first party on hold.
2. By using the softbutton that will toggle between **Hold** and **Resume** you may switch between talking to either party.

## Blind transfer

When you are in a call, you may transfer the other party to someone else, to let them communicate without your participation.

### Do as follows:

1. While in a call, press the softbutton **Transfer**. The Softbutton menu will give you two options, viz. to transfer the one on hold or This will bring up the following menu:



2. You may now key in the number/URI to which the other party shall be transferred. Alternatively, you may use the **Favorites** or **Frequently called**. Or you may navigate to the **Directory** tab and place your call from there.

3. After the number/URI has been located, proceed as if you were placing a call from the phone book in the usual way. The only difference is that the other party will be connected to the one you just called and you will be disconnected.

## Consultative transfer

You may also combine the two above options. Instead of just transferring the other party to someone else without consulting the one to receive the call, you may call this person first and then do the transfer.

### Do as follows:

1. While in a call, press the softkey **Hold**.
2. Press the softbutton **New call** and place a new call in the usual way.
3. Press **Transfer**. You will now be prompted to decide whether this new call shall be transferred to the one you have on Hold or as a blind transfer to someone else (the option **Other**).

## Video conferencing using MultiWay™

The E20 supports MultiWay™ as a means to call more than one. Successful use of MultiWay requires the presence of certain infrastructure products.

**Note! MultiWayConference of Profile1** (see “Profile 1-3” on page 27) must have been set to the correct address of the MultiWay server to make this work. This must be set for Profile 1 regardless of which Profile(s) that actually are in use. The other Profiles need not be specified for MultiWay to make this work.

**Case 1:** Assume that you already are in a call and that you would like to expand the call to include someone else.

### Do as follows:

1. Start calling someone else by pressing the . This will produce the menus allowing you to place a call as described earlier.
2. Placing a new call will put the current call on Hold. When the new participant replies, select **Join Calls**.
3. Repeat, if needed, to include more participants.

Each participant may leave the conference at all times by terminating the call in the usual manner. This will disconnect the participant, but the rest of the conference will go on.

If the one who initiated the conference terminates his or her call, the conference may be brought to an end (all participants will be disconnected) or the conference may go on without the initiator. This will depend on the actual setup of the MultiWay server. Consult your System Administrator, if needed, to find out more about this,

**Case 2:** Someone calls you while you are in a call. You will need to decide whether the calling party shall be invited to join the current call or not.

1. Someone calls you while you are in a call. A dialog box giving you three options will be shown. The options are:
  - **Accept (put current call on hold)**
  - **Accept (disconnect current call)**
  - **Reject**

2. Select **Accept (put current call on hold)**.

3. When you are ready to create the conference, select **Join Calls**.

**Case 2 options:** If you do not want to set up a MultiWay conference, you have the following choices in 2. above:

- If you want to accept the incoming call instead of the current call, select **Accept (disconnect current call)**.
- If you do not want to respond to the incoming call, select **Reject**.

**Note!** The maximum number of participants in a MultiWay call is limited by the capabilities of the infrastructure of your network only. The two cases described on this page may be combined as much as you want.

**Note!** You may not invite an ongoing conference to the Multiway. If one of your participants is a conference or a multisite call the **Join** button will be disabled.

## Adding the screensaver of your choice

You may add the screensaver of your choice to the E20. You will need a USB disk containing the picture(s) you want to use as screensaver. If the USB stick contains multiple pictures, the contents will be shown as a gallery, one picture at a time.

### A few things to observe:

- Once you have plugged in the USB disk, the E20 will produce a dialog asking you whether the pictures on the USB disk should be displayed by the USB picture frame. TE 4 will read xcif data and even rotate images when necessary. The prompt will let you specify the time interval between the last time you operated (used) the E20 and when the screensaver should start to appear.
- The USB disk must remain connected to the E20 to make this work.
- The following file formats are supported: \*.jpg, \*.png, \*.gif.  
The E20 uses Exif information to scale the picture.

## Avoiding conflict with the standby function

There is a standby function in the E20. When activated, the standby function makes the screen go black after a time interval (delay) specified by you. This setting will override the screensaver feature.

To continuously display the screensaver, the standby function must be disabled.

You may, however, combine the two. Consider the following:

Assume that you specify the screensaver to start after 10 minutes and that you specify the standby to start after one hour. Five minutes after the last time you used your E20 (or pushed any button), the screensaver will start and it will then run for 55 minutes until the standby function starts.

## Multiple lines

TE 4 supports multiple lines. This means that it supports registration of multiple concurrent SIP profiles on the E20. Consequently, it is possible to be registered with more than one Address-Of-Record at the same time. The user can be reached through several SIP URIs at the same time and it is possible to call using a specified SIP profile. One example would be the use of a work (SIP-) profile for the home office and a private (SIP-)profile. Another example would be a secretary using both a personal (SIP-)profile and the (SIP-)profile for his/her boss.

### Limitations:

- In general, it is not possible to use different lines to different types of SIP servers (for example Cisco VCS vs Broadsoft Broadworks).
- Multiple lines is not currently supported when registered to Cisco UCM as a native device.

When dialing out from a system configured with multiple lines, you will need to select a line before making the call. The available lines will be shown in a multiple-line selection widget on the screen. The right-most softkey makes it possible to put focus on the multiple-line widget enabling you to select the preferred line.

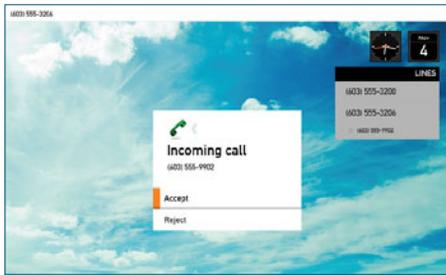
## Example

TE 4 supports BroadWorks which is a software-based IP-PBX. You may provision the E20 using the BroadWorks provisioning system. In addition to supporting the BroadWorks provisioning scheme, TE 4 supports Shared Call Appearance, Click-to-dial, Push-to-talk. The former is a concept based on support for private and shared lines. Private lines are regular SIP-profiles similar to the line concept in TE 2.0 and earlier versions.

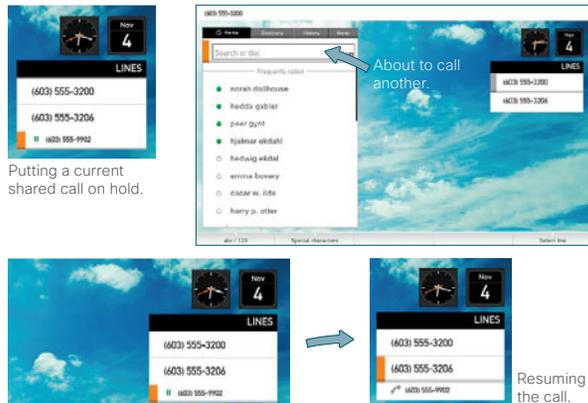
A shared line is a BroadWorks extension supported in TE 2.1 and higher. It means that several users (E20s) can share a single line.

Whenever someone calls the shared line, all of the E20s configured with this shared line will start to ring. Whoever answers first will take the call. However, it is possible for other users of the shared line to barge-in and join the call.

Since Broadworks does not support video mixing in its current version, the joined call will be audio only. As soon as one of the users disconnects from the call, the video will be resumed.



It is also possible for one operator to put a shared line on hold and let another operator resume the same shared call on another E20.



These examples apply to Broadsoft Broadworks R16 only.

**Click-to-dial** is a concept where a web-based call-control manager can be used to set up and tear down video calls between different devices. The most common use case would be for a user to call another user from his/her own E20.

**Push-to-talk** is a concept similar to a walkie-talkie where the calling user will press the call button to immediately be connected to the remote party.



## Chapter 4

### The settings

## The menu

The **Menu** contains

- Applications
- My shortcuts
- Wallpaper
- Sounds and alerts
- Standby and screensaver
- Language setting
- Camera control
- Bluetooth headset settings
- Call forward control
- Call settings control
- Date and time settings
- System information
- Startup wizard
- Reboot
- Advanced settings

The **Advanced settings** may have been password protected by your system administrator and are aimed at administrators rather than users.

### To access the Menu tab, do as follows:

1. Press the  key to produce the set of tabs, if needed. Use the  key to navigate to **Menu**.
2. The items listed in the **Menu tab** have their own submenus. Use the  key to navigate up and down and press  to display the contents of an item.
3. To go one or more steps back in the hierarchy, use the  key to navigate to the left, the required number of times.
4. To collapse all menus, press the  key.
5. To put a change into effect, press  as soon as the required setting has been selected or changed.

## The Settings

### Applications

There are a few applications not related to video communication as such included with your E20. Actual contents may be country-dependent.

### My shortcuts

With **My shortcuts** you may redefine one or more of the softbuttons appearing along the bottom line of the display. There are three sets of options to choose from:

- **Speed dial** lets you assign one of your phone book entries (including My contacts) to a softbutton.
- **Menu shortcuts** can be used to save you from menu navigation by having a menu item available at the push of a softkey. Choose between **Applications**, **Call settings**, **Move camera**, **Make a call**, **Phone book** and **System information**. The one you assign to a particular softbutton will you take you to that menu when you push the corresponding button. What these menus actually do will be explained later in this part of the guide.
- **Actions** can be **Redial** or **USB media**.

To utilize this feature, navigate to a softbutton and press  to enter the options list. If you have assigned one or more softbuttons and enter this menu again, you will see that a **Clear softbutton** item has been added to the menu.

### Wallpaper

Wallpaper is the image displayed by the system when in idle. This may be no wallpaper, i.e. dark (as if unit has been turned off), the default setting, or your own personal wallpaper. If you choose to go for the latter, you should present your wallpaper to the unit by means of a memory stick connected to the USB socket of the unit. Your E20 will examine the memory stick contents and let you choose what to use. Selected contents will be copied to the E20. Just follow its instructions.

The file formats supported are \*.jpg, \*.png, \*.gif. This is an Experimental feature and is disabled as default. See Advanced settings / Experimental for more.

### Sounds and alerts

**Ring tones** allow you to select between the ring tones available. Use the  key to navigate up and down as usual. You will hear the different ring tones as you move up and down.

**Get custom ring tones from USB.** If the ring tones offered as standard are not enough, you may add your own ring tones by means of a memory stick connected to the USB socket of the unit. Your E20 will examine the memory stick contents and let you choose what to use. Just follow its instructions. File formats supported are MPEG-4 AAC-LD and MPEG-4 AAC-LC, but not MP3.

**Ring volume** lets you set the volume of the incoming call signal. You will hear the level as you adjust.

**Key tones** let you determine whether you should hear a sound every time you press a key or not. Set to **On** to activate.

### Standby and screensaver

There is a standby function in the E20. When activated the standby function makes the screen go black after a time interval (delay) specified by you. This setting will override the screensaver feature.

You may add a screensaver of your choice to the E20. You will need a USB disk containing the photos (illustrations) you want to use as screensaver. If the USB stick contains multiple pictures, the contents will be shown as a gallery, one picture at a time.

### A few things to observe:

- To continuously display the screensaver, the standby function must be disabled.
- Once you have plugged in the USB disk, the E20 will produce a dialog asking you whether the pictures on the USB disk should be displayed by the USB picture frame. The unit will read xcif data and even rotate images when necessary. The prompt will let you specify the time interval between the last time you operated (or used) the E20 and when the screensaver should start to appear.
- The USB disk must remain connected to the E20 to make this work.
- The following file formats are supported: \*.jpg, \*.png, \*.gif.

### Language

Choose between English, Norwegian, Swedish, German, French, Korean, Italian, Dutch, Danish, Finnish, Portuguese, Japanese, Russian, Spanish, Spanish Latin, Turkish, Chinese Traditional, Chinese Simplified.

### Camera control

Camera control lets move your own camera up and down, in addition to set the exposure and whitebalance. Note that the camera will not move up and down physically, but the image will.

In a call, a softbutton for camera control will appear (the button in the middle). Pressing this will cause the unit to attempt to start moving the far end camera (Far End Camera Control—FECC). To move your own camera press the softbutton **Near end camera** (the leftmost button). Your own camera can be moved in vertical direction only.

**Exposure** and **Whitebalance** can be set manually or you can leave it up to the E20 to set it for you.

### Bluetooth™

You may connect a Bluetooth™ headset to the E20. To do that, you have to turn the Bluetooth support in the E20 to **On** and set your Bluetooth device in pairing mode.

### Call forward

**Call forward** lets you forward all calls to a defined receiver. Just key in the identity and then activate the feature.

### Call settings

**Auto answer** can be set to **Off** or **On**. When set to **Off** you must respond to an incoming call to accept it, either by lifting the handset or by pressing the  key. When set to **On**, the call is automatically accepted.

**Default bitrate** in calls can be set to 1152, 768, 512, 384, 256 or 128kbps.

**Maximum upstream bitrate:** 1152, 768, 512, 384, 256 or 128 kbps.

**Maximum downstream bitrate** 1152, 768, 512, 384, 256 or 128 kbps.

The reason for allowing different upstream and downstream bitrate is to meet the need to specify different settings in asymmetric internet connections—typically when operating the E20 from home.

### Date and time

**Date and time** can be set to either **Manual** or **Automatic**.

If set to **Automatic** the menu allows you to update **Time zone**, **Date format** and **Time format** only. When set to **Manual** you may change **Day**, **Month**, **Year**, **Time upon 12/24 hrs**, **Date format** and **Time format**.

### System information

This is an information panel only, providing information on

- |                      |                                 |
|----------------------|---------------------------------|
| ▪ System name        | ▪ SIP status                    |
| ▪ Uptime             | ▪ E20 software version          |
| ▪ Network IP address | ▪ Hardware Module serial number |
| ▪ SIP address        | ▪ MAC address                   |
| ▪ SIP proxy address  |                                 |

When in a call the following is also provided:

- Remote URI
- Call rate
- Protocol
- Video protocol
- Video resolution
- Video channel rate
- Video Packet loss (in numbers and in %)
- Video Jitter
- Audio protocol
- Audio Channel rate
- Audio Packet loss (in numbers and in %)
- Audio jitter
- Encryption type
- Encryption status

### **Startup wizard**

The **Startup wizard** is dealt with in “Deploying the E20” on page 6.

### **Reboot**

Selecting and pressing **Reboot** will cause the E20 to restart in an orderly manner.

### **Advanced settings**

The **Advanced settings** are described in detail in the next chapter.



## Chapter 5

# Advanced settings

## Description of the Advanced settings

On the following pages you will find a list of the settings available to administrators—known as the Advanced settings.

We recommend that you visit the Cisco web site regularly for updated versions of the manual. Go to: <http://www.cisco.com/go/telepresence/docs>.

### To access the Advanced settings, do as follows:

1. Press the  key to produce the menu. Use the  key to navigate to the **Menu** tab and then down to **Advanced settings** and press .
2. To navigate further down in the menu hierarchy, press the  key. **On this level do not use the right arrow  key to navigate to the right**, this will take you to the next menu tab (new in this version). However, for lower levels (further down in the menu hierarchy) using the right arrow  key to navigate to the right to expand a menu item will work as usual.
3. To go one or more steps back in the hierarchy, use the  key to navigate to the left, the required number of times.
4. To collapse all menus, press the  key.
5. To put a change into effect, press  as soon as the required setting has been selected or changed.

## IP settings

This menu lets you

- Set **IP assignment** to **Static** or **DHCP**

When set to **Static**, you should also define:

- IP address
- Subnet mask
- Gateway

## System configuration

All items in this menu are expandable whenever they have a  sign to their left. To expand a menu item press the right arrow  key to navigate to the right.

All items in a menu item are collapsible whenever they have a  sign to their left. To collapse a menu press the left arrow  key to navigate to the left.

### Audio

The settings found here let you specify ring tone, ring volume, whether key tones should be audible or not and the volume of the handset, headset and the speaker. The three latter may be set individually.

### Volume

**Handset volume** can be set to **0-100** in steps of 5.

**Headset volume** can be set to **0-100** in steps of 5.

**Speaker volume** can be set to **0-100** in steps of 5.

All these may be set individually (independent of each other).

### SoundsAndAlert

**Key tones** let you determine whether you should hear a sound every time you press a key or not. Set to **On** to activate.

**Ring tones** allow you to select between the ring tones available. Use the  key to navigate up and down as usual. You will hear the different ring tones as you move up and down.

**Ring volume** lets you set the volume of the incoming call signal. You will hear the level as you adjust.

### Camera 1

**Brightness** can be set to **Auto** or **Manual** which can be anywhere in the range **1-20** in steps of 1.

**Whitebalance** can be set to **Auto** or **Manual** which can be anywhere in the range **1-32** in steps of 2.

### CapsetFilterDebug

Can be set to solve interoperability issues when used with non-Cisco devices. Contact your local Cisco representative.

## Conference 1

### Autoanswer

**Mode** is set to **On** to enable automatic answer and to **Off** to require manual response to an incoming call.

**Delay** can be set anywhere in the range **0-50** seconds in steps of 2 seconds.

### MicUnmuteOnDisconnect

Set **Mode** to **On** to make sure microphone is not muted the next time a call is received. Set to **Off** to disable this behavior.

### Do not disturb

**Do not disturb** can be set to **On** to disable incoming calls. The calling party will perceive your unit as being busy.

### Encryption

**Encryption** can be set to **Off** (not recommended) or **Best effort** to let the system determine the best solution.

### Default Call

**Rate** can be set in the range **64-1152** kbps.

### Call forward

**Mode** is set to **On** or **Off**. Set to **On** to forward all calls.

The **URI** specifies whom the call will be forwarded to.

### TTY

**Mode** can be set to **On** or **Off**. You may hook up a TTY (Text telephone) to the E20. The TTY is a device allowing hearing- or speech impaired people to communicate by typing and reading messages.

A successful communication requires a TTY at both ends.

To use a TTY, type the message to be sent on the TTY keyboard. As you type the message is sent over the IP connection, just like your voice would be transmitted if you were talking. You can read the other person's response on the text display of the TTY.

### FECC (Far End Camera Control)

**Mode** can be set to **On** or **Off**. Set to **On** this will enable you to control the far end camera position and zoom (provided that the far end system supports this and allows you to).

### BFCP (Binary Floor Control Protocol)

**Mode** can be set to **On** or **Off**. BFCP is a protocol to coordinate access to shared resources in a conference.

### Max upstream rate

This can be set in the range **64-1152** kbps.

### Max downstream rate

This can be set in the range **64-1152** kbps.

The downstream and upstream rates can be set independently of each other to facilitate good transmission in asymmetric connections.

### TelephonyPrefixExp

This parameter is used to set up regular expressions to force the E20 to set up an audio call when calling a peer with a number or URI that matches the regular expression given by this parameter.

## Experimental

**Video** allows you to set **PacketPacing** to **On** or **Off**. Packet pacing is an experimental mechanism to smooth out packet burstiness

**Menu** Enable **Applications** and configure an application server. Setting **Mode** to **On** enables applications in the Menu. When the **Address** field is empty the system will use a set of locally installed applications.

For more information contact your Cisco representative.

**SystemUnit** allows **CrashReporting**. When set to **On** you must specify the URI to whom the crash report will be posted to.

## Menu

### CustomSoftButtons

This configuration option includes all the configuration parameters used by the speed dial mechanism. It is possible to configure all four speed dial buttons from here.

## Screensaver

You may add a screensaver of your choice to the E20. You will need a USB disk containing the photos (illustrations) you want to use as screensaver. If the USB stick contains multiple pictures, the contents will be shown as a gallery, one picture at a time. Alternatively you can use pictures fetched from a URL.

### PictureFrame

**Available:** Indicates whether the picture frame is enabled or not.

**PictureDirectory:** Contact your Cisco representative for information on where the images reside.

**ChangePictureInterval:** Indicates how long each image will be shown.

**FillScreenMode:** Some images may not be wide enough to fill the screen. This setting is used to enlargen the image so that it fills the screen. Aspect ratio is maintained, but cropping will occur.

**OrderBy:** Defines the sorting order if a gallery is to be shown. Choose between none particular (typically sorted according to file name), date and time of the file or random (shuffle).

**Mode:** Set to **On** to activate this feature and to **Off** to deactivate.

**TimeOutValue:** Defines time before the screensaver starts counted from the last time the unit was operated (outside a call).

**CurrentScreensaver:** Set to **Cisco** to get the default Cisco setting and **Picture Frame** to use your customized settings.

**URLScreenSaver 1-5:** Alternatively you may obtain your screensaver from a URL. There are 5 presets available for definition. Each of them contain:

**Available:** Yes or No.

**DisplayName:** Helps you discriminate between them by name.

**URL:** The URL of where to get the image. The image can be a web page, but it may take considerable time to download it.

**Username:** HTTP username to use when opening URL.

**EnableUpDownScrolling:** True or False

**ZoomFactor:** Set to **1-1000%** in **1%** steps.

### A few things to observe:

When using a USB disk: Once you have plugged in the USB disk, the E20 will produce a dialogue asking you whether the pictures on the USB disk should be displayed by the USB picture frame. TE 4.0 will read Exif data and even rotate images when necessary. The prompt will let you specify

the time interval between the last time you operated (or used) the E20 and when the screensaver should start to appear.

The USB disk must remain connected to the E20 to make this work.

The following file formats are supported: \*.jpg, \*.png, \*.gif.

### EncryptionIndicator: On/Off(Default)

When set to **On** this setting will make the encryption indicator visible during call setup etc. It will slide in from the right.

It the value is **Off**, you will never see the indicator. This is the default behavior.

## Network 1

### IPV4

**IPv4** lets you specify **Address**, **Subnet Mask**, and **Gateway**.

### QoS

**Quality of Service** lets you specify **Audio**, **Data**, **Signalling**, and **Video** with **Diffserv** (Differentiated Services) **On** or **Off**.

### DNS

**DNS** allows you to specify name and the addresses of up to 5 servers.

### VLAN

**VLAN** Lets you configure Voice VLAN and Data VLAN. These settings are normally detected automatically from the network. We do not recommend to change these.

### IEEE8021x

**IEEE8021x** Allows you to set up IEEE 802.1x authentication for the E20. The 802.1x feature is by default turned off.

**Protocol** is **IPv4**.

**Assignment** can be **DHCP** or **Static**

**MTU** sets the maximum transmission unit size in bytes.

## Network services

### PresenceSubscribe

When turned **Off** the device will not send presence subscriptions and presence information will not be shown in your home menu.

### Telnet

Telnet is a network protocol used on the Internet or local area network (LAN) connections.

Select **On** to enable the Telnet protocol and **Off** to disable. This is the default factory setting.

### HTTP / HTTPS / HTTP test certificate

Determines whether or not to use secure management.

**HTTP:** Set to **HTTP** to disable secure management. Requires **HTTP** to be enabled in the **Network Services HTTP Mode** setting.

**HTTPS:** Set to **HTTPS** to enable secure management. Requires **HTTPS** to be enabled in the **Network Services HTTPS Mode** setting.

**HTTPS test certificate:** Set to **On** or **Off**.

### SNMP (Simple Network Management Protocol)

Used in network management systems to monitor network-attached devices (routers, servers, switches, projectors, etc) for conditions that warrant administrative attention. SNMP exposes management data in the form of variables on the managed systems, which describe the system configuration. These variables can then be queried (set to **ReadOnly**) and sometimes set (set to **ReadWrite**) by managing applications.

**Mode:** Set to **Off** when you want to disable the SNMP network service.

**ReadOnly:** Set to **ReadOnly** when you want to enable the SNMP network service for queries only.

**ReadWrite:** Set to **ReadWrite** when you want to enable the SNMP network service for both queries and commands.

**Community name:** Enter the name of the Network Services SNMP Community. SNMP Community names are used to authenticate SNMP requests. SNMP requests must have a 'password' (case sensitive) in order to receive a response from the SNMP Agent in the codec. The default password is "public". If you have the Cisco TelePresence Management Suite (TMS) you must make sure the same SNMP Community is configured there too. **Note!** The SNMP Community password is case sensitive.

**System contact:** Enter the name of the Network Services SNMP System Contact.

**System location:** Enter the name of the Network Services SNMP System Location.

**Host IP 1-3:** Enter the IP address of the SNMP Manager. All traps will then be sent to the host listed.

The system's SNMP Agent responds to requests from SNMP Managers (a PC program etc.). SNMP Traps are generated by the SNMP Agent to inform the SNMP Manager about important events. Can be used to send event created messages to the SNMP agent about different events like: system reboot, system dialing, system disconnecting, MCU call, packet loss etc. Traps can be sent to multiple SNMP Trap Hosts.

### SIP

Determines whether the system should be able to place and receive SIP calls.

**On:** Set to On to enable the possibility to place and receive SIP calls. This is the default setting.

**Off:** Set to Off to disable the possibility to place and receive SIP calls.

### NTP (Network Time Protocol)

The Network Time Protocol (NTP) is used to synchronize the time of the system with a reference time server. The time server will subsequently be queried every 24th hour for time updates. The time will be displayed on the top of the screen. The system will use the time to timestamp messages transmitted to Gatekeepers or Border Controllers requiring H.235 authentication. The system will use the time to timestamp messages transmitted to Gatekeepers or Border Controllers that requires H.235 authentication. It is also used for timestamping Placed Calls, Missed Calls and Received Calls.

**Auto:** The system will use the NTP server, by which address is supplied from the DHCP server in the network. If no DHCP server is used, or the DHCP server does not provide the system with a NTP server address, the system will use the static defined NTP server address specified by the user.

**Manual:** The system will always use the static defined NTP server address specified by the user.

### SSH

Enables login via SSH.

## Phonebook

### Server 1

**ID:** Enter a name for the external phonebook. Addresses the specific phonebook.

**Type:** Can be TMS (TANDBERG Management System) or VCS (Video Communication Server)

**URL:** Enter the address (URL) to the external phonebook server. Addresses the specific phonebook server.

## Provisioning

Provides the possibility of managing the E20 by using an external manager/management system.

### External Manager

**Address:** Enter the name for the provisioning server.

**Protocol:** http or https

**Path:** Enter the path within the external manager to access the provisioning information (if http-based provisioning.)

**Domain:** Enter the domain of the provisioning server

### Mode

**Off:** The system will not try to register to any management system.

**TMS:** If set to TMS the system will try to register with a TMS server as described in the address and path settings. TMS is short for TANDBERG Management System. Please contact your TANDBERG representative for more information.

**VCS:** If set to VCS the system will try to register with a VCS as described in described in the address and path settings. VCS is short for Video Communication Server. Please contact your Cisco representative for more information.

**HTTP:** If set, the E20 will try to download configuration from a web server. The URL is the concatenation of the External Manager address and the Path parameter. If the protocol is https, the E20 will use HTTPS during the download. If the HttpMethod parameter is POST, the E20 will do an HTTP post to the web server. Otherwise, it will do a HTTP Get to the web server. LoginName and password will be used if the web server requires username and password to download the configuration.

**Callway:** To use with Callway contact your Cisco representative for more information.

**CUCM:** The E20 will try to connect to a Cisco Unified Communications Manager. This requires that CUCM are version 8.5 or above and that the CUCM is aware of the E20. When provisioning mode is set to CUCM the network subsystem will switch to Voice VLAN if available.

**Auto:** If set, the E20 will enter auto provisioning mode and look for both HTTP bootstrapping servers, VCS servers etc. This is the default mode.

### Login name

This is the user name part of the credentials used to authenticate towards the HTTP server when using HTTP provisioning.

### Password

This is the password part of the credentials used to authenticate towards the HTTP server when using HTTP provisioning.

### HttpMethod

**Post/Get** This configuration parameter indicates whether the E20 should use HTTP GET or HTTP POST when contacting the HTTP server during HTTP provisioning.

## RTP

### Ports

**Range:** Start and Stop defines defines the range of RTP ports that will be used for transmitting media. Changing these values requires a reboot.

## SIP

### Profile 1-3

The SIP URI or number is used to address the system. This is the URI that is registered and used by the SIP services to route inbound calls to the system. A Uniform Resource Identifier (URI) is a compact string of characters used to identify or name a resource.

**Default transport:** Select the transport protocol to be used over the LAN.

**UDP:** The system will always use UDP as the default transport method.

**TCP:** The system will always use TCP as the default transport method.

**TLS:** The system will always use TLS as the default transport method. For TLS connections a SIP CA-list can be uploaded using the web interface. If no such CA-list is available on the system then anonymous Diffie Hellman will be used.

**Auto:** Uses TLS, if possible. If not, TCP will be tried and then UDP.

**TLS verify:** For TLS connections a CA-list can be uploaded from the web interface.

**On:** Set to **On** to verify TLS connections. Only TLS connections to servers, whom x.509 certificate is validated against the CA-list, will be allowed.

**Off:** Set to **Off** to allow TLS connections without verifying them. The TLS connections are allowed to be set up without verifying the x.509 certificate received from the server against the local CA-list. This should typically be selected if no SIP CA-list has been uploaded.

**Type:** Enables SIP extensions and special behaviour for a vendor or provider.

**Standard:** Should be used when registering to standard SIP proxy like OpenSer.

**Alcatel:** Must be used when registering to a Alcatel-Lucent OmniPCX Enterprise R7 or later.

**Avaya:** Must be used when registered to a Avaya Communication Manager.

**Cisco:** Must be used when registering to a Cisco CallManager version 5 or later.

**Microsoft:** Must be used when registering to a Microsoft LCS or OCS server.

**Nortel:** Must be used when registering to a Nortel MCS 5100 or MCS 5200 PBX.

**Siemens:** Must be used when registering to a Siemens HiPath 8000.

**Broadsoft:** Must be used when registering to a Broadsoft server.

**NonStandard DTMF.** Compatibility mode for non-standard DTMF handling.

**CallScreening:** Proxy side call management. For Incoming and outgoing call screening (RFC-5359). Default is Off.

**On:** Enable call screening. The E20 will reply with “305 Use Proxy” for

all incoming SIP invites not from one of the proxies in the SIP Profile.

**Off:** Turn off call screening.

**Outbound:** Off SIP edge proxy to use for signalling. This can be used to make the device accesible from outside a firewall.

**Mailbox:** SIP URI of media mailbox (i.e. voicemail, videomail).

**MultiWay conference:** Address of the MultiWay™ conference server. To utilize the MultiWay server the address of the server must be specified in Profile 1. There is no need for further specification (Profile 1 is enough to make it work).

**Line:** Select between **Private** and **Shared**. Private lines are regular SIP-profiles similar to the line concept in TE 2.0 and earlier versions. A shared line is a BroadWorks extension that is supported in TE 2.1 or higher. It means that several users (E20s with TE 2.1 and higher) can share a line. Whenever someone calls the shared line, all of the E20s that configured with the shared line will start ring. Whoever answers first will take the call. However, it is possible for other users of the shared line to barge-in and join the call. Since Broadworks does not support video mixing in the current version, the joined call will be audio only. Once one of the users disconnects from the call, the video is resumed.

**BusyLampField:** Your Broadsoft BLF URI. When set up correctly this will give you presence on your BLF enabled contacts. You can set speed dials to match your BLF contacts.

**URI:** Key in the URI of the E20 unit.

**DisplayName:** The name that you send to others when you call them.

#### Proxy 1-4

**Address:** The **Proxy Address** is the manually configured address for the outbound proxy. It is possible to use a fully qualified domain name, or an IP address. The default port is 5060 for TCP and UDP but another can be provided.

**Discovery:** When **Manual** is selected, the manually configured SIP Proxy address will be used. When Auto is selected, the SIP Proxy address is obtained using Dynamic Host Configuration Protocol (DHCP).

#### Authentication 1

**Login name:** This is the user name part of the credentials used to

authenticate towards the SIP proxy.

**Password:** This is the password part of the credentials used to authenticate towards the SIP proxy.

## Standby

The Standby Control setting determines whether the system should go into standby mode or not.

**Control On:** The system will go into standby mode when the **Standby Delay** has timed out. Requires the **Standby Delay** to be set to an appropriate value.

**Control Off:** The system will not go into standby.

**Delay:** Defines how long (in minutes) the system will wait before it goes into standby mode. Requires the **Standby Control** to be enabled. Range **1-480** minutes.

## System Unit

**Bluetooth™** can be set to **On** or **Off**.

**Name:** Enter a System Name to define a name of the system unit. The system name will be displayed when the E20 is acting as an SNMP Agent and towards a DHCP server. Use a readable name of the device, e.g. Joe's E20

**MenuLanguage:** Specify the language to be used in the menus. Select between **English, Norwegian, Swedish, German, French, Korean, Italian, Dutch, Danish, Finnish, Portuguese, Japanese, Russian, Spanish, Spanish Latin, Turkish, Chinese Traditional, Chinese Simplified**.

**HearingImpairedMode:** If this is set to **On**, the device will play a blinking, orange video whenever there is an incoming call, **Off** is default

## Time

Allows you to set the time zone accordingly as well as time format (12h/24h) and the date format in the usual manner.

## Video

**LCD:** Lets you adjust the brightness of the screen.

**OSD:** (On Screen Display)

**InputMethod**

**InputLanguage** can be Latin or Cyrillic

**Cyrillic** can be set to **On** or **Off**. When set to **On** Cyrillic becomes a part of the loop when selecting **abc/123**.

**BuddyList** can be set to be shown or not.

**Selfview** can be set to **On** or **Off**. Selfview is the unit's outgoing video signal (what the other side sees of you).

**Wallpaper** Specify file name. Wallpaper is the image displayed by the system when in idle. This may be no wallpaper, i.e. dark (as if unit has been turned off), the default setting or your own personal wallpaper. If you choose to go for the latter, you should present your wallpaper to the unit by means of a memory stick connected to the USB socket of the unit. Your E20 will examine the memory stick contents and let you choose what to use. Selected contents will be copied to the E20. Just follow its instructions.

The file formats supported are \*.jpg, \*.png, \*.gif.

**HZsensor:** To avoid a flickering image due to the line voltage frequency, you may select between 50 and 60Hz, or set it to auto to let the unit decide.

## Change password

This allows you to set or change the administrator password on the device. This is done by entering the password in the password field and pressing the **Save** button. You may cancel the password change by pressing the **Cancel** button.

## Restart

Use this to reboot the E20 in a controlled manner.

## Appendix: Understanding Cisco Discovery Protocol on the former TANDBERG endpoints

### Introduction

Cisco Discovery Protocol (CDP) is a proprietary layer-2 management protocol developed by Cisco in the early 1990s to provide enhanced automation of network discovery and management. It is broadly deployed on millions of existing Cisco products and provides countless benefits to network administrators for managing router and switch interfaces. With the introduction of IP Telephony in the late 1990s and early 2000s, CDP was enhanced to provide additional automation capabilities for IP-based telephones, including automatic VLAN discovery, Power over Ethernet (POE) negotiation, Quality of Service (QoS) automation, location awareness (to automate the discovery of the physical location of an

IP telephone for management and emergency services purposes), Ethernet speed and duplex mismatch detection, and more.

**Note:** The IETF, IEEE and TIA, in cooperation with Cisco and numerous other networking vendors, have since created the IEEE 802.1AB standard, known as Link-Layer Discovery Protocol (LLDP), with extensions developed for Media Endpoint Discovery (LLDP-MED) for voice and video endpoints. LLDP-MED will eventually subsume CDP, but this may take years to unfold due to the enormous installed-base and widespread use of CDP.

Cisco acquired TANDBERG in April 2010. The TANDBERG portfolio of video endpoints compliments Cisco's existing Telepresence and Unified Communications solutions. With TANDBERG now a part of Cisco, one of the first steps towards integrating the portfolios is to add CDP support to the former TANDBERG products. CDP support is introduced on the Cisco E20 IP Video Phone in release TE4.0. Similar support is planned for the Cisco Telepresence EX series, Quick Set 20, C40/C60/C90 stand-alone integrator codecs, and the C-Series based Profile Systems, in release TC4.2.

However, because there is already an installed-base of these endpoint models (prior to the Cisco acquisition) that are not running CDP, introducing CDP in a software release requires careful consideration of how the new automation functionality will affect that existing installed-base. Enabling CDP by default could cause undesired behavior for those existing deployments when they upgrade to a CDP-enabled release and the devices suddenly begin using VLAN automation, so CDP is being introduced in a phased approach.

This document briefly highlights the benefits of CDP, and the behavior of the Cisco E20 in release TE4.0. A similar approach will be taken when introducing CDP support in the TC4.2 software that runs on the EX and C-Series products.

### Benefits Provided by CDP

As mentioned in the introduction above, CDP provides numerous automation benefits for network administrators deploying IP-based voice and video endpoints on their networks. This section briefly highlights some of the most pertinent benefits for IP-based voice/video endpoints like the Cisco E20.

### Automatic VLAN discovery

Virtual LANs (VLANs) allow a network administrator to introduce IP-based telephones and video terminals onto their network without the need for re-addressing their existing data subnets, or adding additional ethernet ports to their switches. Leveraging the 802.1Q standard, a device such as a Cisco E20 can tag its Ethernet frames with the VLAN ID that its traffic belongs to, placing its traffic into the voice/video VLAN (known as the auxiliary VLAN); while Ethernet frames sent by a PC are not tagged, and therefore end up in the data VLAN (known as the native VLAN). This allows the E20 to be inserted in between an existing PC and the Ethernet switch to which it is attached, allowing for a single Ethernet port per user, thereby eliminating the need to add additional ports in the wiring closet, and allowing the E20 to be assigned to a different (new) IP subnet rather than consuming IP addresses in the existing PC VLAN. VLANs also allow the network administrator to apply different security and Quality of Service (QoS) policies on a per-VLAN basis. Figures 1 and 2 illustrate these concepts.

Without CDP (or LLDP-MED), the user must manually configure each endpoint with the 802.1Q VLAN ID it should use. CDP automates this task, allowing the Ethernet switch to advertise to the endpoint the ID of the VLAN it should belong to.

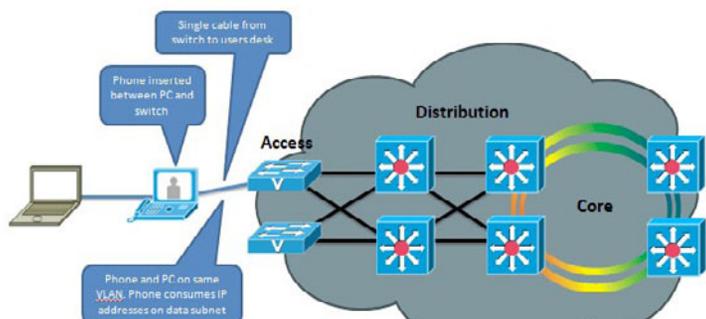


Figure 1: Without VLANs

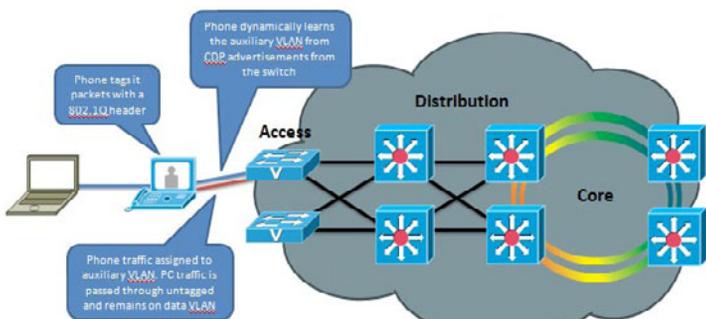


Figure 2: With VLANs

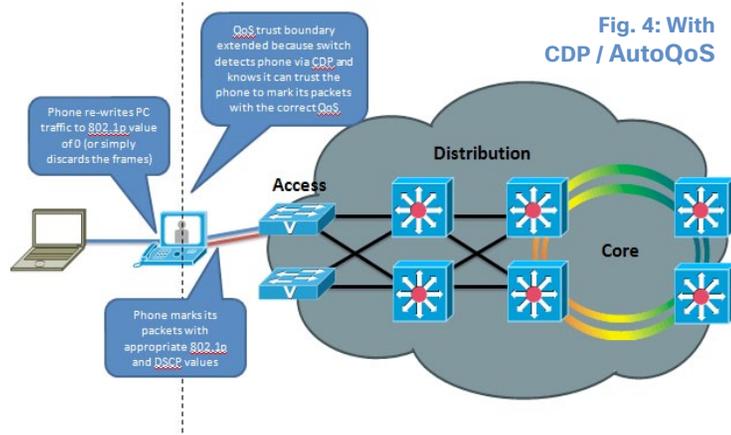
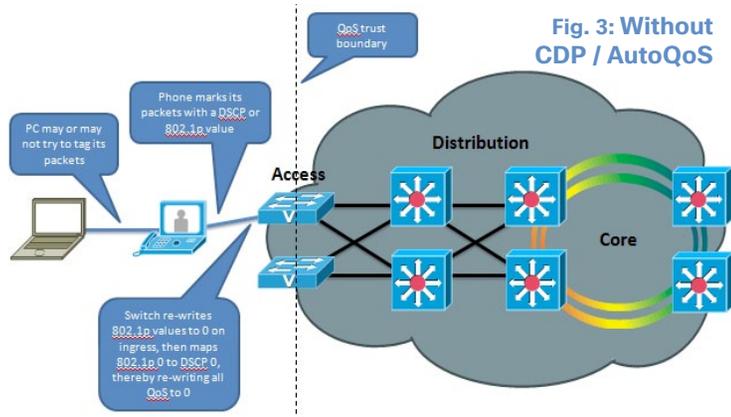
## Automatic Quality of Service

Quality of Service is essential for a well-performing network, providing preferential service to latency, jitter or loss sensitive applications like voice and video; deferential service to misbehaving applications such as viruses and other undesirable network traffic; and fair treatment to routine, non-time sensitive traffic such as email or web browsing. However, QoS can be complex to configure and manage, and the administrator needs to be assured that the traffic entering the network is marked with the correct QoS values. For user-facing devices such as PCs, IP-based telephones and video terminals, the administrator must establish a demarcation point where QoS mark-

ings coming in from these devices are either not trusted—and instead overwritten to an administratively configured value—or trusted to set their own QoS values and the Ethernet switch will honor those values. This demarcation point, or trust boundary, ensures that if the user accidentally, or intentionally, tampers with the QoS values assigned to these devices, those QoS values will be remarked by the administrator as they ingress the network.

CDP provides a method of automatically extending this trust boundary (at the administrators' discretion) so that the phone or video terminal can mark its packets with the desired QoS values, and the switch will trust the phones packets (because the administrator knows that the specific model of phone in question can be trusted to behave properly and cannot be tampered with) and forwards those packets on into the network. This functionality is known as AutoQoS on the Cisco Catalyst line of Ethernet switches. Figures 3 and 4 illustrate the concept of AutoQoS. More information on AutoQoS can be found at

[http://www.cisco.com/en/US/docs/solutions/Enterprise/WAN\\_and\\_MAN/QoS\\_SRND\\_40/QoS\\_Campus\\_40.html#wp1098057](http://www.cisco.com/en/US/docs/solutions/Enterprise/WAN_and_MAN/QoS_SRND_40/QoS_Campus_40.html#wp1098057)



IP Phones, Wireless Access Points, surveillance cameras, and myriad other devices.

## Location Awareness

With the introduction of IP-based telephones, a new level of mobility was afforded in that an IP endpoints could be plugged in anywhere in the network, obtain an IP address, and start making calls, reducing the costs associated with physically patching telephone cables when moving an employee from one office to another. However, certain management functions and emergency services rely on knowing the precise location of a telephone. CDP allows for network management applications to identify the physical location of a phone (by detecting what Ethernet port that phone is attached to, and hence, where it physically is located). This information is then leveraged by applications such as Cisco Emergency Responder to direct telephone calls made to emergency services personnel to the correct dispatch office. There are many other real and potential uses for location information.

## Ethernet Speed / Duplex Mismatch Detection

Ethernet devices use the 802.3 auto negotiation procedure to automatically negotiate their speed and duplex settings. However, a very common problem is that one side or the other is accidentally configured for the wrong settings, resulting in packet loss. For example, the network administrator has configured all the Gigabit Ethernet ports on the switch for auto negotiation, but the user accidentally sets the port on his or her PC, IP phone or video terminal to a manually configured value, such as 100Mbps / Full duplex. This can result in a mismatch between the switch and the endpoint, resulting in a large percentage of loss on that interface. CDP does not automate the resolution of such a condition, but it does detect it and cause an alarm to be generated on the switch, notifying the administrator of the condition so that he or she may take steps to resolve it.

## Power over Ethernet (POE) negotiation

The 802.3af standard provides for Power over Ethernet to devices such as IP-based telephones and video terminals. CDP provides additional benefit by allowing the endpoint to indicate to the Ethernet switch how much power it requires—and for the switch to advertise to the endpoint how much power is available—thereby allowing more granular level of negotiation between the switch and the endpoint, and allowing the Ethernet switch to more closely track its available power budget. Note that POE is not used by the Cisco E20, but is mentioned here as informational benefit to the reader since POE is widely used by many other models of Cisco Unified

## Future Medianet Applications

The above benefits of CDP have been available for years from Cisco. Medianet is a new concept aimed at further extending and automating the interactions between end-points and the network in order to deliver additional end-to-end optimization of multimedia traffic across an intelligent internetwork. CDP is one protocol, among others, that will be leveraged by future generations of Cisco IOS Software and Cisco Medianet-ready endpoints to deliver on this vision. Available Medianet applications at the time this document was written include end-to-end tracing of the path a video session takes through a network in order to pinpoint the source of packet loss, optimizing the routing of video packets over alternate paths in order to maximize the throughput of the network, enhanced Session Admission Control in order to control the amount of video sessions admitted onto the network, and more. Further information about Medianet can be found at

<http://www.cisco.com/en/US/netsol/ns1094/index.html>

More information about CDP and LLDP-MED can be found at the following references

[http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm\\_cdp\\_discover\\_ps6350\\_TSD\\_Products\\_Configuration\\_Guide\\_Chapter.html](http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_cdp_discover_ps6350_TSD_Products_Configuration_Guide_Chapter.html)

[http://www.cisco.com/en/US/products/hw/switches/ps663/products\\_tech\\_note09186a0080094713.shtml#cdp](http://www.cisco.com/en/US/products/hw/switches/ps663/products_tech_note09186a0080094713.shtml#cdp)

[http://www.cisco.com/en/US/technologies/tk652/tk701/technologies\\_white\\_paper0900aecd804cd46d.html](http://www.cisco.com/en/US/technologies/tk652/tk701/technologies_white_paper0900aecd804cd46d.html)

## CDP Behavior in Release TE4.0

When the Cisco E20 running release TE4.0 is booted for the first time, or after a factory reset has been done, the following settings are applied by default:

xConfiguration Provisioning Mode: Auto

xConfiguration Network 1 VLAN Voice Mode: Off

xConfiguration Network 1 VLAN Data Mode: Off

The E20 then displays the Provisioning Wizard screen to prompt the user for what provisioning mode they would like to use: VCS, Callway, CUCM, Broadsoft, HTTP, or Manual.

If CUCM is selected by the user, then xConfiguration Provisioning Mode is automatically set to CUCM, xConfiguration Network 1 VLAN Voice Mode and xConfiguration Network 1 VLAN Data Mode are automatically changed to Auto, and the phone begins utilizing CDP to automatically discover its VLAN and begins tagging its packets with the appropriate VLAN ID.

If the xConfiguration Provisioning Mode is set to TMS, VCS, Callway, Broadsoft or Manual, then xConfiguration Network 1 VLAN Voice Mode and xConfiguration Network 1 VLAN Data Mode are left in their default state of Off, and the phone will ignore any CDP VLAN advertisements and not tag its packets with any VLAN ID.

For TMS/VCS customers, this behavior preserves the functionality they had in previous software releases of the E20 so that the endpoint will continue to use untagged packets and remain on the VLAN it is currently using. If CDP is desired, then it may be manually enabled by setting the xConfiguration Network 1 VLAN Voice Mode and xConfiguration Network 1 VLAN Data Mode parameters to Auto.

For CUCM customers, this behavior does present an extra step in the first-time bootup process, but once CUCM mode has been chosen in the Startup Wizard, CDP will automatically kick in and the phone will join the auxiliary (voice/video) VLAN. If the customer desires the E20 to not use CDP, then it may be manually disabled by setting the xConfiguration Network 1 VLAN Voice Mode and xConfiguration Network 1 VLAN Data Mode parameters to Off.

For customers who do not have a CDP-capable Ethernet switch, but desire to use 802.1Q VLANs, the xConfiguration Network 1 VLAN Voice Mode and xConfiguration Network 1 VLAN Data Mode parameters may be set to Manual, and the associated xConfiguration Network 1 VLAN Voice ID and xConfiguration Network 1 VLAN Data ID parameters may be set to their appropriate values.

Once these parameters are set, the settings are saved and are persistent through subsequent reboots. If a user later wishes to change them, they may do so by re-running the Startup Wizard, or by manually setting the parameters individually.

## Upgrades to TE4.0 from a Previous Release

For existing customers upgrading to release TE4.0 from a previous release, the existing values for these parameters will be maintained, the Startup Wizard will not be displayed, and no change in behavior will be seen by the user. Note however that the values of the xConfiguration Network 1 VLAN Voice Mode and xConfiguration Network 1 VLAN Data Mode parameters have changed. In previous releases, the valid values for these parameters were Untagged or Tagged, with Untagged behind the default. In release TE4.0, with the introduction of CDP support, the valid values for those parameters are now [Auto|Manual|Off]. During an upgrade, the previous values are automatically mapped to the new equivalent values.

Table 1 below illustrates the relationship between the old and new values.

Prior Releases	Release TE4.0.0	Comments
	Auto	Auto mode is introduced in release TE4.0.0
Tagged	Manual	Manual is the same as Tagged in prior releases
Untagged	Off	Off is the same as Untagged in prior release

**Table 1: E20 Old and New VLAN Tagging Values**

## What Happens Next

Once a provisioning mode has been chosen by the user (or the `xConfiguration Network 1 VLAN Voice Mode` and `xConfiguration Network 1 VLAN Data Mode` parameters have been manually configured), and the E20 has decided which VLAN it belongs on, the following sequence of events occur:

1. The E20 will broadcast a DHCP DISCOVER on the VLAN to which it assigned. The DHCP server is expected to provide all the ordinary parameters—IP address, subnet mask, default router, domain name, DNS server(s), NTP server(s). In addition, it may provide one or more vendor-specific options to point the E20 to its provisioning server:
  - a. Option 42, containing specific vendor-encapsulated-options containing either of the following two methods:
    - i. PROVISIONINGSERVER and PROVISIONINGDOMAIN
    - ii. TMSSERVER
  - b. Option 242, containing a 32-bit dotted-decimal notation IP address of the Cisco Telepresence Management Suite (TMS).
  - c. Option 150, containing a 32-bit dotted-decimal notation IP address of the Cisco Unified Communications Manager (UC Manager).
  - d. Option 66, containing a 32-bit dotted-decimal notation IP address of a TFTP server.
2. The E20 then proceeds to obtain its configuration in the following sequence.
  - a. Do a DNS lookup for `tandbergprovisioning.<your_domain_name>`. If successful, attempt to use HTTP to fetch the configuration from that server.
  - b. If DHCP option 42 was received and contains the PROVISIONINGSERVER and PROVISIONINGDOMAIN parameters, attempt to use VCS mode SIP-based provisioning.
  - c. If DHCP option 42 was received and contains the TMSSERVER parameter, attempt to use TMS mode HTTP-based provisioning.

- d. If DHCP option 150 was received, containing the IP address of the Unified Communications Manager provisioning server, attempt to contact that server using CUCM mode HTTP-based provisioning.
- e. If DHCP option 66 was received, containing the IP address of a TFTP server, attempt to contact that server using TFTP.
- f. Do a DNS lookup for `provisioning.tandberg.com`. If successful, attempt to use HTTP to fetch the configuration from that server.

**Note:** The DHCP process is actually done in the background prior to the Startup Wizard being displayed. This means that during the first-time bootup, or after a factory reset has been done, the E20 will initially obtain a DHCP lease in the native VLAN. If CUCM mode is then chosen, and CDP indicates that a VLAN should be used, the E20 will release the address it received in the native VLAN, restart its IP stack, and re-DHCP a new address in the auxiliary VLAN. This may result in temporary usage of IP addresses in the native VLAN during the first-time bootup.

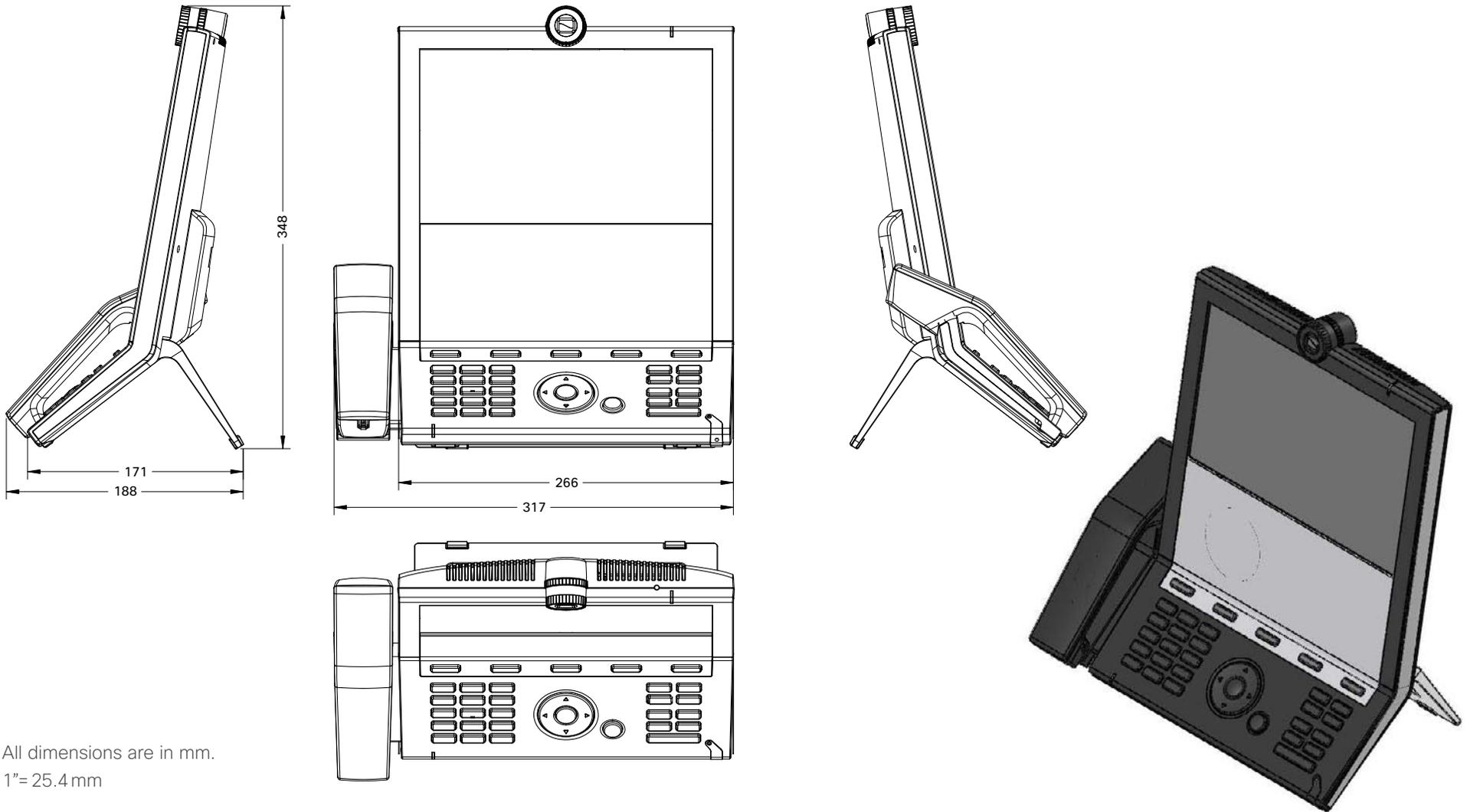
## A Note about DHCP Option 150

Some customers configure their DHCP server to process DHCP requests based on attributes contained within the request. For example, at Cisco, if a device requests DHCP Option 150 in its DHCP DISCOVER, the DHCP server will attempt to assign an address from a corresponding Auxiliary (Voice) VLAN. If the DHCP DISCOVER was sourced from a data VLAN, the DHCP server will fail to issue a DHCP OFFER for that device. This means that an E20 on Cisco's internal network, if set to use VCS (and hence the `xConfiguration Network 1 VLAN Voice Mode` and `xConfiguration Network 1 VLAN Data Mode` parameters are set to `off`), the E20 will not be issued an IP address, because the Cisco DHCP server will not OFFER an address to a device on the data VLAN which has requested DHCP Option 150 in its DISCOVER. The workaround for Cisco internal users who are using the E20 in VCS mode is to manually set the `xConfiguration Network 1 VLAN Voice Mode` and `xConfiguration Network 1 VLAN Data Mode` parameters to `Auto`. Other customers may have similar DHCP rules in place, so the user should consult their DHCP administrator to determine which VLAN they should set their E20 to use, and set the `xConfiguration Network 1 VLAN Voice Mode` and `xConfiguration Network 1 VLAN Data Mode` parameters accordingly.

## Summary

This document has briefly introduced the history and benefits of the Cisco Discovery Protocol (CDP) and its behavior on the Cisco E20 IP Video Phone release TE4.0. CDP is a powerful mechanism for automating the application of VLANs and Quality of Service for voice/video devices, and existing TANDBERG customers are strongly encouraged to begin exploring its benefits and preparing their networks so that they can begin leveraging VLANs, AutoQoS and VLAN-based security policies for the former-TANDBERG endpoints.

## Mechanical dimensions





On our web site you will find an overview of the worldwide Cisco contacts.

Go to: <http://www.cisco.com/web/siteassets/contacts/index.html>

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