User's and Administrator's Manual

AudioCodes 400HD IP Phone Series

C435HD IP Phones

Microsoft Teams Application

Version 2.7



audiocodes

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Related Documentation

Document Name
Release Notes
C470HD-C455HD-C436HD-C435HD-C430HD IP Phones for Microsoft Teams Release Notes
Quick Guides
C435HD IP Phone for Microsoft Teams Quick Guide
Video Tutorials
IP Phones How To Video Tutorials
Miscellaneous
Security Guidelines for AudioCodes' Android-based Devices
Android Device Utility User's Manual
Device Manager Administrator's Manual
Device Manager Deployment Guide
https://docs.microsoft.com/en-us/MicrosoftTeams/phones-for-teams

Document Revision Record

LTRT	Description
13457	Initial document release for Version 2.7; ISED warning added; SIP fallback (emergency calling) feature when Teams unavailable; line key assignment; mandatory change of lock PIN; minimum and maximum ring volume; logging Application Not Responding (ANR) error / core dumps; disabling speakerphone; return to previous version; added note to Call Transfer
13463	Updated to Ver. 2.7.M2; AudioCodes Smart button configure for redial. Dim screen functionality updated; 802.1x authentication parameters added
13468	Updated to Ver. 2.7.M3; revised Specifications section; lock PIN change enforcement via TAC
13476	Updated to Ver. 2.7.M4; general manual revision and restructure

Notes and Warnings

FCC Caution

Part 15.21

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Part 15.19

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Part 15.105

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC RF Radiation Exposure Statement

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment.
3. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

User manuals for license-exempt radio apparatus shall contain the following or equivalent notice in a conspicuous location in the user manual or alternatively on the device or both.

[EN] This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

[FR] Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil nedoit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

[EN] Radio apparatus containing digital circuitry which can function separately from the operation of a transmitter or an associated transmitter, shall comply with ICES-003. In such cases, the labelling requirements of the applicable RSS apply, rather than the labelling requirements in ICES-003. This Class B digital apparatus complies with Canadian ICES-003.

[FR] Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

IC SAR Warning

[EN] This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

[FR] Lors de l' installation et de l' exploitation de ce dispositif, la distance entre le radiateur et le corps est d 'au moins 20 cm.

ISED Warning

[EN] Operation of 5150-5250 MHz is restricted to indoor use only.

This device complies with Innovation, Science, and Economic Development Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Privacy of communications may not be ensured when using this phone.

[FR] Le fonctionnement de 5150-5250 MHz est limité à une utilisation en intérieur uniquement.

Le présent appareil est conforme aux CNR d' Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil nedoit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

La confidentialité des communications peut ne pas être garantie lors de l'utilisation de ce téléphone

Radiation Exposure Statement

[EN] The device is compliance with RF exposure guidelines, users can obtain Canadian information on RF exposure and compliance. The minimum distance from body to use the device is 20cm.

[FR] Le présent appareil est conforme Après examen de ce matériel aux conformité ou aux limites d'intensité de champ RF, les utilisateurs peuvent sur l'exposition aux radiofréquences et la conformité and compliance d'acquérir les informations correspondantes. La distance minimale du corps à utiliser le dispositif est de 20cm.

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1 Overview

The AudioCodes C435HD IP phones are Microsoft Teams-native entry level/common area phones designed to support the next generation of enterprise collaboration technologies with a large LCD screen and full UC integration for the Native Microsoft Teams Online market.

The phones can be managed by the Microsoft Teams Admin Center. For more information, see here.

Feature highlights:

- Native support for Microsoft Teams
- Color screen 4.3": Graphic, 480x272 resolution
- Multi-lingual support
- Full duplex speakerphone and headset connectivity
- Dual GbE support
- USB headset support
- PoE or external power supply
- Calendar and click-to-join support
- Power-saving mode for MWI LED and LCD is automatically activated during non-working hours. The phone's uppermost-right LED is switched off and the LCD is dimmed. This conserves energy and minimizes light disturbance, providing a seamless and efficient user experience.



AudioCodes Teams phones can operate in a Survivable Branch Appliance (SBA) environment. Branch office survivability is aimed at providing limited calling functionality when a phone no longer has connectivity with the Teams cloud. Basic functionalities are:

- Making PSTN calls
- Receiving PSTN calls
- Hold & Resume of PSTN calls

If a user attempts to make a Teams call and the internet connection is down, they'll be notified that they can try calling a phone number instead. A 'No internet connection' indication is displayed suggesting that calling a phone number is available.

See here for video blogs and blogs about AudioCodes' Teams phones.

See here for videos and webinars about AudioCodes' Teams phones.

See here marketing material related to all AudioCodes' Teams phones.

Teams Features Supported

The following table lists Teams features supported by the C435HD IP phone.

Teams Feature	C435HD
Mute	√
Hold/Resume	√
Call Transfer	√
Consultative Transfer	√
End call	√
Escalate P2P call to Teams Meeting / Conference (Add-hoc Conference)	Not supported
Call Queue	√
Contacts / People	√
Speed Dials dedicated keys	√
Auto-dialing to call an extension	√
Favorites list for speed dial	√
Distinctive ringtone per call type	√
Hot Desking	Not supported
Survival Branch Appliance	√
Talkback	√
Meeting details: Exchange calendar, contact pictures, Corporate Directory access	Not supported
Meeting actions: Meet Now, one-click join, meeting call controls (mute/unmute, hold/resume, hang up, add/remove participant, raise hand, live captions)	Not supported
Common Area Phone (CAP)	√
CAP: Advanced calling	√
CAP: Voice Mail (only applicable when 'CAP: Advanced calling' is enabled)	√
Visual VM (when C435HD is used as a CAP, it's supported only after enabling 'Advanced calling')	√

Teams Feature	C435HD
Music on Hold (MoH)	√
Call Park	√
Call Merge	Not supported as CAP
Delegation	Supported, but configured from Teams client
E911	√
Better Together (over wireless)	Not supported
Talkback	√
Call Group Pickup	Supported, but configured from Teams client

Specifications

The following table summarizes the phone's specifications.

Table 1-1: Specifications

Feature	Details
Media Processing	■ Voice Coders: G.711 codec PCMA (A-Law), G.711 codec PCMU (µ-Law), G.722 ■ Acoustic Echo Cancelation: G.168-2004 compliant, 64-msec tail length ■ Adaptive Jitter Buffer ■ Voice Activity Detection ■ Comfort Noise Generation ■ Packet Lost Concealment ■ RTP/RTCP Packetization (RFC 3550, RFC 3551), SRTP (RFC 3711)
Microsoft Teams phones feature set	■ Authentication and security: ✓ Sign in with user credentials and based on IP phone policies ✓ Sign in using PC/Smartphone

Feature	Details
	✓ Modern Authentication ✓ Phone lock/unlock; unlock with smart PIN ✓ 802.1x Authentication ✓ SSH access ✓ HTTP/HTTPS Proxy Server ✓ VLAN (LLDP/CDP/manual) ■ Incoming/Outgoing P2P and PSTN calls ■ In-call controls via UI ■ Survivable Branch Appliance (SBA) For a detailed list of features, see Teams Features Supported on page 1.
Configuration and Management	■ Teams Admin Center (TAC) for provisioning and logging ■ AudioCodes OVOC / Device Manager ■ AudioCodes Redirect Server
Debugging Tools	■ AudioCodes' Android Device Utility (see Android Device Utility on page 97) ■ Log upload to Microsoft server ■ Remote logging via Syslog ■ Diagnostic data ■ SSH Access ■ Phone screen capture ■ TCPdump ■ Audio Debug recording logs ■ Media logs (*.blog) ■ Port mirroring network monitoring ■ Remote Packet Capture network sniffer application
Localization Support	■ Multi-lingual support; the language pack list is not yet final and is subject to modification. ■ Virtual Keyboard: QWERTY | Numeric ■ Global Network Banner ■ Dark Theme

Feature	Details
Hardware	■ Graphic 4.3" color screen, 480x272 resolution ■ Wired connectivity: ✓ Two RJ-45 [Gigabit Ethernet (GbE)] (10/100/1000BaseT Ethernet) ports: LAN and PC port ✓ RJ-9 port (jack) for headset ✓ USB port for USB headset. Note that the phone is a PoE Class 2 device (also when connecting a standard USB headset). If used with a loud USB speakerphone, an external power supply must be used. For more information, contact AudioCodes. ■ RJ-11 interface ■ Hearing Aid Compatibility (HAC) support ■ Mounting: ✓ Wall and desktop mounting options ✓ One angle for desktop mount, another angle for wall mount ■ Power: ✓ 12V DC jack ✓ Power supply AC 100 ~ 240V ✓ PoE Class 2: IEEE802.3af (optional) ■ Keys: ✓ Illuminated VOICE MAIL message hotkey ✓ 4 softkeys below the main LCD, enabling the user view the screen specified above the key on the LCD (Calls, Voicemail, People, Lock) or perform the specified action ✓ 6 function/programmable keys left and right to the main LCD; programmed for selecting speed dials and indicating the presence status of the destination with red/green/orange backlight ✓ 4-way navigation button with OK key ✓ MENU ✓ HOLD ✓ Illuminated MUTE hotkey ✓ TRANSFER

Feature	Details
	✓ VOLUME control keys ✓ Illuminated HEADSET hotkey ✓ Illuminated SPEAKER hotkey ✓ BACK ✓ CONTACTS ✓ Teams home key

See also here for related Microsoft documentation.

Migration to Android Open Source Project (AOSP)

Migration to Android Open Source Project (AOSP) is supported. Intune offers an AOSP mobile device management (MDM) solution referred to as AOSP Device Management. This MDM platform is used for Teams Android-based devices that enroll in Intune, replacing Android Device Administrator. AOSP Device Management leverages a new agent and Authenticator app, eliminating dependencies on the Company Portal app.

An *AOSP Migration Guide* for Android AOSP Management for Microsoft Teams Android devices can now be obtained on Microsoft Learn here.

The guide provides customers with detailed instructions and best practices for a smooth migration. It also shows how to migrate Teams Android devices to AOSP Device Management.

All migration actions are performed in the Microsoft Intune Company Portal. Phone firmware has been upgraded with the Authenticator app.

URLs and Ports (Security) to Allow

This section shows network administrators which URLs/Ports to allow when deploying Teams phones (security).

From the device point of view, the following table summaries the ports the phone uses.

Table 1-2: URLs / Ports to Allow when Deploying Teams Phones (Security)

Server Role	Service Name	Port	Protocol	Notes
DNS Server	All	53	DNS	-
AudioCodes Device Manager	AudioCodes DM	443	HTTPS	AudioCodes device management server
AudioCodes Redirect	AudioCodes DM	443	HTTPS	AudioCodes redirect service redirect.audiocodes.com

Server Role	Service Name	Port	Protocol	Notes
service				
NTP timeserver	Android NTP	123	UDP	-
Time Zone Database	Time Zones	443	HTTPS	Time Zone Database (often called tz or zoneinfo)
Microsoft Apps Artifacts server	Package manager	-	-	Microsoft will be requested for the protocol and port and FQDN. These URLs are provided by the Admin agent.

Security Guidelines for Android-based Native Teams Devices

For security guidelines for AudioCodes native Teams Android-based devices, refer to the document Security Guidelines for AudioCodes Native Teams Android-based Devices.

2 Set up the Phone

The following instructions show how to set up the phone:

- Unpack the Device below
- Explore the Device on the next page
- Connect Cables on page 14
- Mount the Phone on page 14
- Clean the Phone Screen on page 14

Unpack the Device

When unpacking, make sure the items listed in the phone's *Quick Guide* are present and undamaged.

If anything appears to be missing or broken, contact the distributor from whom you purchased the phone for assistance.

For detailed information, refer to the phone's *Quick Guide* (scan the barcode on the box in which the phone was shipped or see Related Documentation on page iii).

Explore the Device

Use the following graphics to identify and familiarize yourself with the device's hardware functions:

- Front View below
- Rear View on page 13

Front View

The front view of the phone is shown in the figure and described in the table.

Figure 2-1: Front View

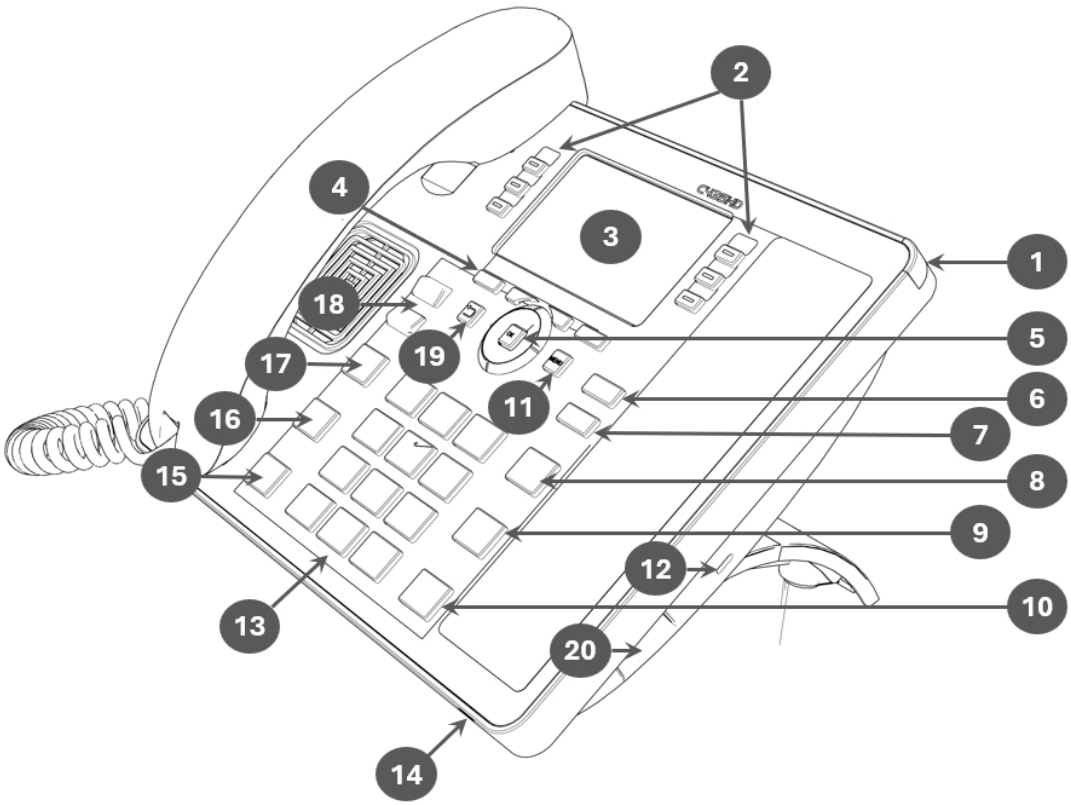


Table 2-1: Font View Description

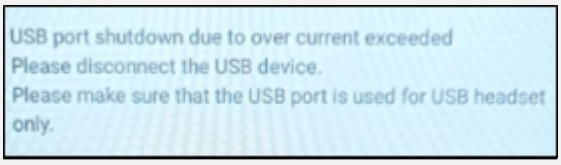
Item #	Label Name	Description
1	Ring LED	Indicates phone status: ■ Green: Idle state ■ Flashing red: Incoming call (ringing) ■ Red: Answered call

Item #	Label Name	Description
2	Six programmable keys	Press a key to perform the programmed function. Used for selecting speed dials, indicating the presence status of the destination with red / green / orange backlight.
3	LCD screen	Liquid Crystal Display interactive screen which displays calling information.
4	Four softkeys	Press a softkey to view the screen specified above the key on the LCD, or perform the specified action.
5	Navigation Control / OK	■ Press the button's upper rim to scroll up menus / items. ■ Press the button's lower rim to scroll down. ■ Press the button's left or right rim to move the cursor left or right (when editing a contact number for example). ■ Press **OK** to select a menu/item/option.
6	Voicemail	Retrieves voicemail messages.
7	CONTACTS	Accesses the People screen.
8	Smart Button	By default, returns you to the home (idle) screen

Item #	Label Name	Description
		from any screen. Can be configured to function as a redial button (see Enable the AudioCodes Smart Button for Redial Functionality on page 78).
9	TRANSFER	Transfers a call to another party.
10	HOLD	Places an active call on hold.
11	MENU	Accesses the Settings screen.
12	Kensington lock	Allows locking the device.
13	Alphanumerical Keypad	Keys for entering numbers, alphabetical letters and symbols (e.g., colons).
14	Microphone	Allows talking and listening. The network administrator can disable it if necessary.
15	Speaker	Activates the speaker, allowing a hands-free conversation.
16	Headset	Activates a call using an external headset.
17	Mute	Mutes a call.
18	▲ VOL ▼ VOL	Increases or decreases the volume of the handset, headset, speaker, ring tone and call progress tones.

Item #	Label Name	Description
19	'Back' key	Returns you back to the previous screen.
20	USB port	For a USB headset. See also the note below.

A USB delimiter enables the phone to identify when the USB port is overloaded and to then display an alert on the screen. An alert is also sent to the OVOC. The feature helps to deter users from using the USB port for purposes other than for a USB headset, e.g., for charging devices. If users use the USB port for a headset, the alert will not be sent.



Navigate to menus and select menu items by:

- Pressing the rim of the control button (upper, lower, left or right)
- Pressing the **OK** key on the control button

Rear View

Figure 2-2: Rear View



The ports located on the rear of the phone are described from right to left in the table below.

Table 2-2: Rear View Description

Ports (from right to left)	Description
	RJ-45 port to connect to the Ethernet LAN cable for the LAN connection (uplink - 10/100/1000 Mbps). If you're using Power over Ethernet (PoE), power to the phone is supplied from the Ethernet cable (draws power from either a spare line or a signal line).
	RJ-45 port to connect the phone to a PC (10/100/1000 Mbps downlink).
DC12V	12V DC power jack that connects to the AC power adapter.
AUX	[RJ-11 port] Used as a serial console port to access the phone's terminal.
	Headset jack, i.e., RJ-9 port that connects to an external headset.
(Not seen in the image – located at the bottom of the device)	RJ-9 port used to connect the phone's handset.

Connect Cables

For detailed information on how to cable the phone, refer to the phone's *Quick Guide* (scan the barcode on the box in which the phone was shipped or see Related Documentation on page iii).



Please use only the supplied Ethernet (LAN) cable, which is shorter than 3 meters, to connect the IP Phone's LAN port to the PC.

Mount the Phone

You can desktop or wall mount the phone. For detailed information on how to mount the phone, refer to the phone's *Quick Guide* (scan the barcode on the box in which the phone was shipped or see Related Documentation on page iii).

To a view a video showing *the principle* of how to mount an AudioCodes IP phone, click here. The principle is the same across all AudioCodes IP phone models.

Clean the Phone Screen

AudioCodes recommends frequently cleaning devices' screens especially screens on devices in common use areas such as conference rooms and lobbies.

➢ **To clean a device's screen:**

1. Disconnect all cables.
2. Spray onto a clean, dry, microfiber duster a medicinal isopropyl alcohol and water solution of 70:30. Don't oversaturate the duster. If it's wet, squeeze it out.
3. Lightly wipe the screen of the device.
4. Wait for the screen to dry before reconnecting cables.

3 Start up the Phone

Before users can start up their phones, the network administrator must have set them up for automatic provisioning (see Set up Automatic Provisioning on page 65).

To start up your phone:

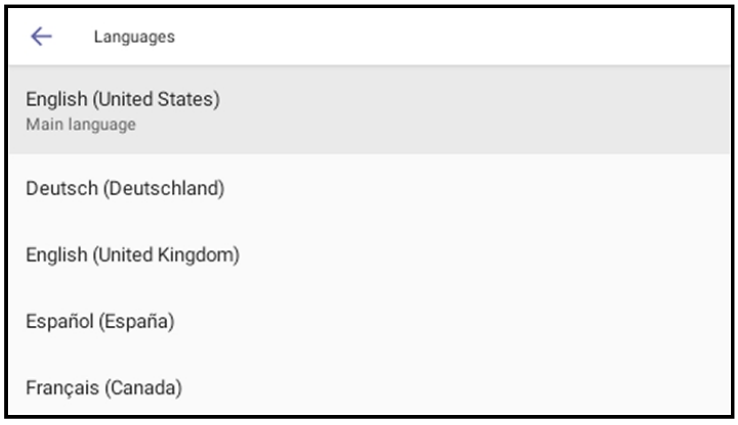
1. Sign In to Your Teams Phone below.
2. Configure Device Settings on page 21.
3. Set up Accessibility on page 30.
4. Configure VLAN via DHCP Option when CDP-LLDP is Not Allowed on page 31 (performed by your network administrator as required).
5. Lock or Unlock the Phone on page 32.
6. Enable Power Saving on page 34.

It will be necessary to repeat this only if the phone is restored to default settings (see Restore the Phone to Default Settings on page 35).

Sign In to Your Teams Phone

➢ **To sign in:**

1. Connect the device to the network; the language selection screen is displayed.



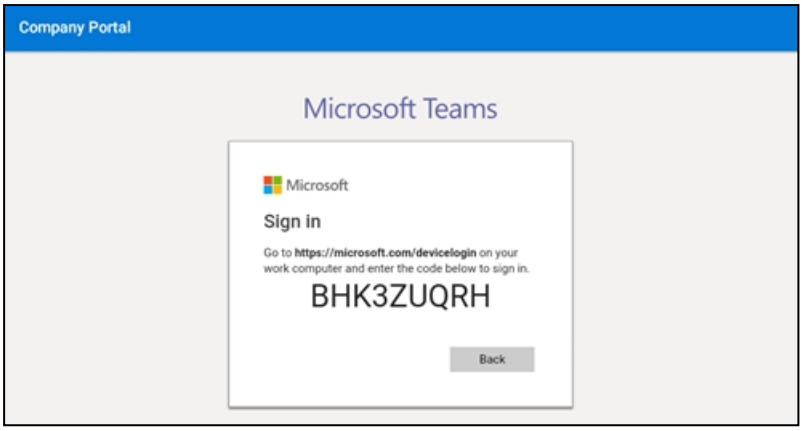
2. Select the preferred language; the Sign-in screen is displayed:



3. Open your browser and point it to **https://microsoft.com/devicelogin** as instructed in the screen; you are prompted to enter the displayed code.
4. Enter the code and then click **Next**.
5. Click your account, enter your password (which is the same password as the Windows password on your PC) and then click **Sign in**. You may close the window after successful sign-in.
6. Observe that the phone returns to the initial code screen. In that screen, select **Sign in on this device**.
7. Select the 'Email, phone or username' field; a virtual keyboard pops up. Enter one of them and then select **Sign in**. The home screen opens.
   - If you opt to **Sign in from another device**, complete authentication from your PC or smart phone (see below). This is recommended if you're using Multi Factor Authentication (MFA).

➢ **To sign in from your PC or Smartphone (recommended when MFA is used):**

■ In the browser on your PC or smart phone, enter the URL indicated in the Microsoft Teams Sign-in page and then in the phone's Web interface that opens, perform sign-in.



LLDP-MED (Link Layer Discovery Protocol – Media Endpoint Discovery) is a standard link layer protocol used by network devices to advertise their identity, capabilities, and neighbors on a local area network based on IEEE802 technology, principally wired Ethernet. Teams devices connected to the network via Ethernet will dynamically update location information for emergency calling services based on changes to network attributes including chassis ID and port ID.

If the internet connectivity check fails, a 'No Internet Access' warning pops up on the phone screen. This can point to a problem that is preventing the phone from fully functioning in a Teams environment. The user can ignore the message if the Teams application is fully functioning or can report a problem.

Remote Provisioning and Sign-in from Teams Admin Center (TAC)

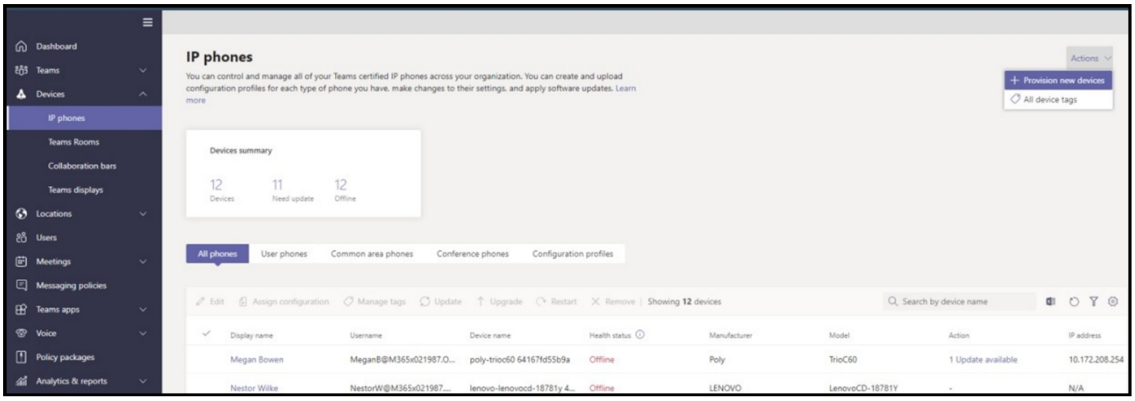
Network administrators can remotely provision and sign in to a Teams device. To provision a device remotely, the administrator needs to upload the MAC IDs of the devices being provisioned and create a verification code. The entire process can be completed remotely from the Teams Admin Center (TAC). For details and instructions, click here.

Remote provisioning sign-in makes it possible for a technician to access and set up the phone by entering a TAC generated code, without having to provide user credentials.

➢ Step 1: Add a device MAC address

Provision the device by imprinting a MAC address on it.

1. Sign in to the Teams Admin Center.
2. Expand **Devices**.
3. Select **Provision new device** from the **Actions** tab.



In the 'Provision new devices' window, you can either add the MAC address manually or upload a file.

Manually add a device MAC address

1. From the **Awaiting Activation** tab, select **Add MAC ID**.
2. Enter the MAC ID.
3. Enter a location, which helps technicians identify where to install the devices.
4. Select **Apply** when finished.

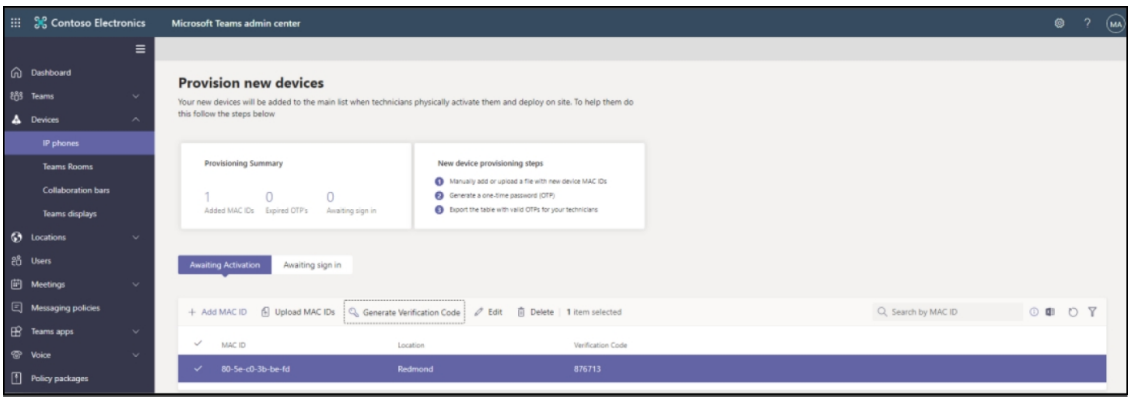
Upload a file to add a device MAC address

1. From the **Awaiting Activation** tab, select **Upload MAC IDs**.
2. Download the file template.
3. Enter the MAC ID and location, and then save the file.
4. Select the file, and then select **Upload**.

➢ Step 2: Generate a verification code

You need to generate a verification code for the devices. The verification code is generated in bulk or at the device level and is valid for 24 hours.

From the **Awaiting Activation** tab, select an existing MAC ID. A password is created for the MAC address and is shown in the **Verification Code** column.



You need to provide the list of MAC IDs and verification codes to the field technicians. You can export the details directly in a file and share the file with the technician who is doing the actual installation work.

Step 3: Provisioning on the device

Once the device is powered up and connected to the network, the technician provisions the device:

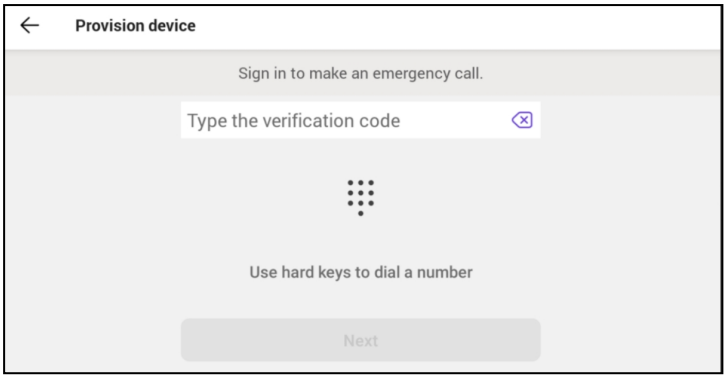
1. Selects the 'Settings' gear icon on the top right of the 'Sign in' screen



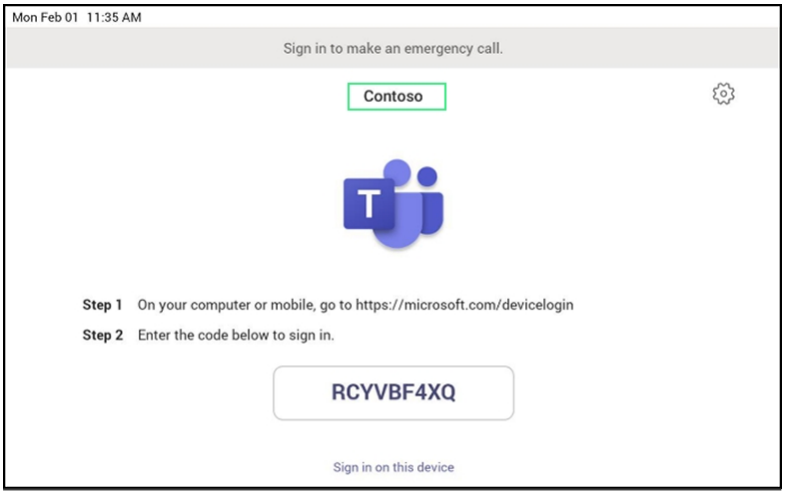
2. On the Settings screen, selects **Provision phone**.



3. Types the device-specific verification code that was provided in the Teams Admin Center on the phone's user interface.



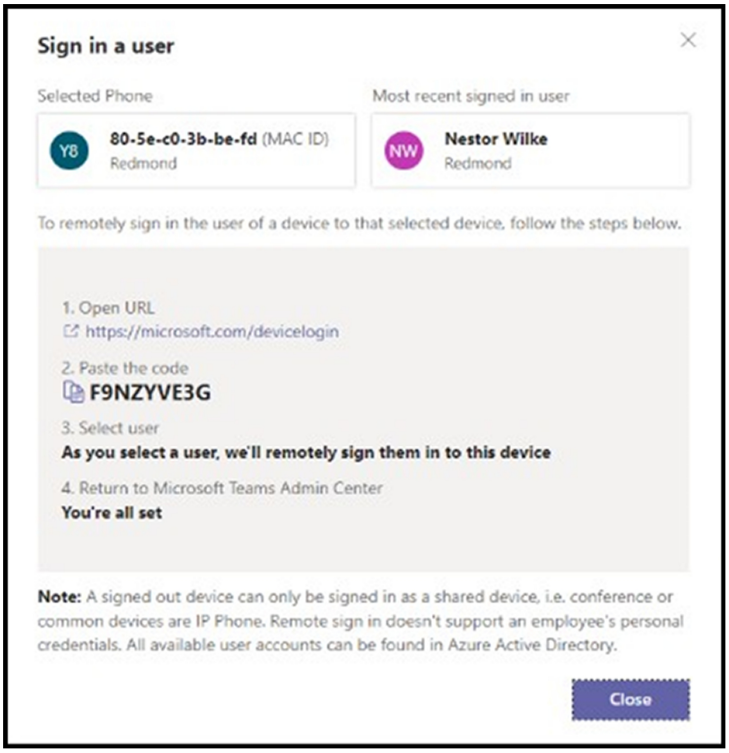
Once the device is provisioned successfully, the tenant name is available on the sign in page.



Step 4: Sign in remotely

The provisioned device appears in the **Awaiting sign in** tab. Initiate the remote sign-in process by selecting the individual device.

1. Select a device from the **Awaiting sign in** tab.
2. Follow the instructions in **Sign in a user**, and then select **Close**.



The tenant administrator then completes authentication on the device from any browser or smartphone.

When the tenant administrator is signing in from Teams Admin Center, the user interface on the device is blocked to prevent other actions on the phone:



Configure Device Settings

The section familiarizes you with the phone's settings. Phones are delivered to customers configured with their default settings. Customers can customize these settings to suit specific personal or enterprise requirements.

➢ To access device settings:

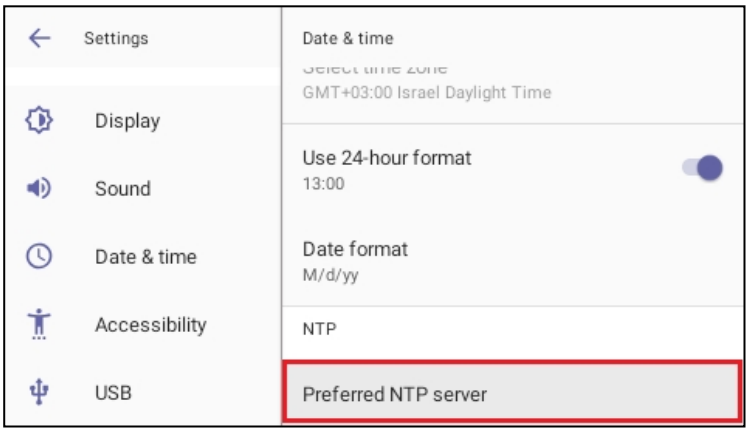
1. In the home screen, select ☰, select **Settings** and then press the **Settings** softkey.



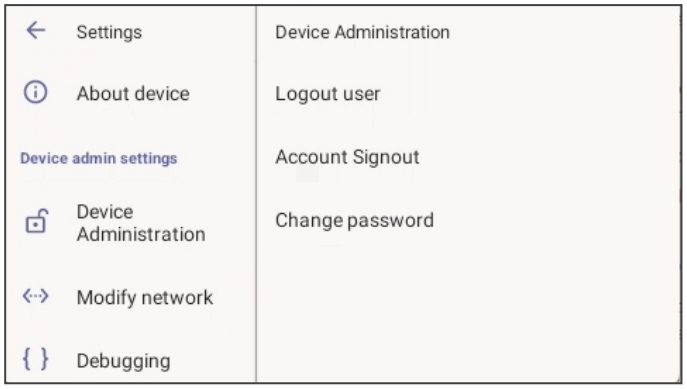
2. View the settings under 'User'. Select a setting to open it. Use the following table as reference. [To view settings related to the network administrator, scroll down and open 'Device Administration'].

Table 3-1: Device Settings

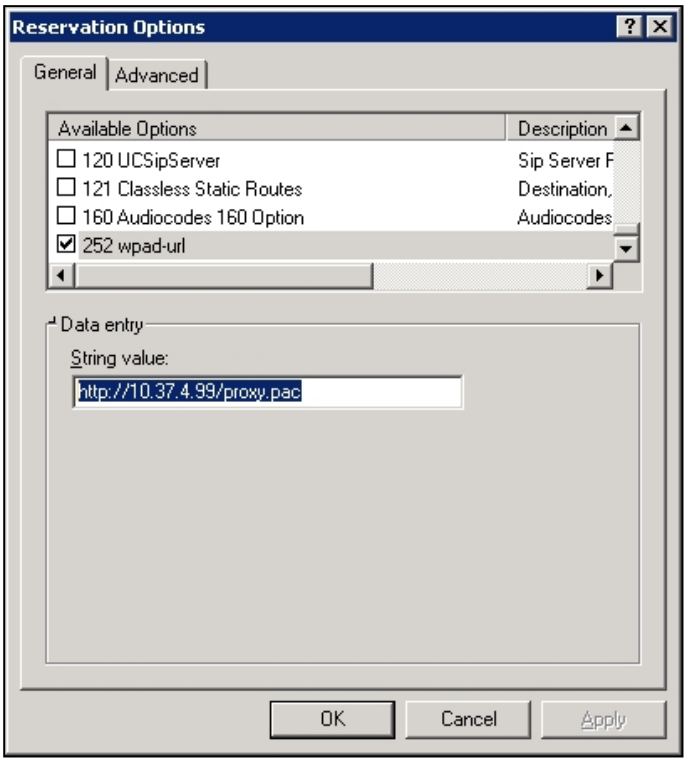
Setting	Description
User	
Sound	Allows you to customize the phone volume for a friendlier user experience: ■ Media volume ■ Ring & notification volume
Display	Opens the 'Display' screen, where you can adjust: ■ Brightness level ■ Screen timeout ■ Screen saver
Date & time	■ Automatic date & time: If enabled, date and time are automatically retrieved from the deployed Network Time Protocol (NTP) server. ■ Time zone ■ 24-hour format

Setting	Description
	■ Date format Also supported is a simplified version of NTP called Simple Network Time Protocol (SNTP). Both can be used to synchronize device clocks. SNTP is typically used if full implementation of NTP is not required.
NTP Preferred NTP server	Administrators can use this parameter to *manually* define the NTP server, to comply with enterprise security requirements if those requirements preclude using DHCP Option 42. Manual configuration takes precedence over DHCP Option 42 and the time servers. Two ways to manually define the NTP server are available: ■ Administrators can define it in the phone's GUI.  ■ Administrators can alternatively use the parameter 'date_ time/ntp/server_address' in the phone's .cfg configuration file. See also Sign In to Your Teams Phone on page 15.
Accessibility	Allows making the screen reader-friendlier: ■ Font size ■ High contrast text ■ Color correction
USB	If enabled, allows the phone to be used as an audio device (see Enable a Phone to be used as an Audio Device).
Speaker Mode	Use to enable or disable the speaker. If disabled, the user needs to speak into the handset during calls.
Power Saving	Allows users to contribute to power saving in the enterprise. Set: ■ **Enable power saving**.

Setting	Description
	■ **Start time** – only relevant if power saving is enabled. The device consumes minimal energy before the user arrives at the office. ■ **End time** – only relevant if power saving is enabled. The device consumes minimal energy after the user leaves the office.
Reboot	Enables users to reboot the device. Log in as Administrator for more debugging settings to be available.
Security	Helps secure the enterprise telephony network against breaches. ■ **Show passwords** – if turned on, the screen displays characters briefly when you type the PIN. See also 'Lock Screen & PIN' under Configure Teams Application Settings on page 42.
Languages & input	Allows users to customize inputting to suit personal requirements.
AudioCodes pairing	Displays the name of the phone and allows you to pair it to a nearby connected PC.
About device	Provides users with device information. ■ To determine the device's IP address, select the **Status** option. ■ To get information about the Android version, select **Android version**. ■ To get information about the version, select **Version info**.
Device Administration	
Device administration	Allows the user to log in as Administrator (see Log in as Administrator on page 66), necessary for some network configuration and debugging options. It is password protected. The default password is 1234 (or 1111 in early versions) and must be changed at the first login. After logging in as an Administrator, the user can log out or change the password.

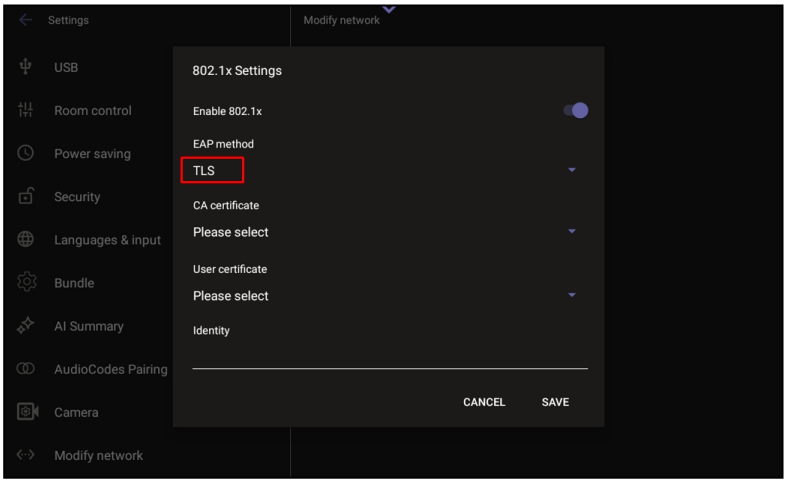
Setting	Description
	
Modify network	Enables the Admin user to determine network information and to modify network settings. ■ **IP Address** [Read Only] ■ **IP Settings** [DHCP or Static IP] ■ **Network state** [Read Only] ■ **Enable PC port** ■ **Enable PC port mirror** ■ Proxy (see below) ■ 802.1x Settings on the next page ■ VLAN Settings on page 29 Note that **LLDP** switch information is retrieved (for location purposes) when the parameter 'network/lan/lldp/enabled'=1 (even when VLAN is retrieved from **CDP** or VLAN is disabled or VLAN is **Manual**). In versions prior to 1.19, if network VLAN mode 'network/lan/vlan/mode' was set to **LLDP**, the phone retrieved the VLAN and LLDP switch information (for location purposes) from LLDP.
Proxy	The phone can be configured with an HTTP (or HTTPS) Proxy server by an Admin user in two ways: ■ **Manually**. The Admin user can use this method to configure HTTP proxy server parameters through the Teams application: a. Log in as Administrator and select **Modify network**. b. Select the **Proxy** option and then configure the proxy host name and port: ■ **Over DHCP with Option 252**. It's recommended that the Admin user uses this method when provisioning multiple phones. Option

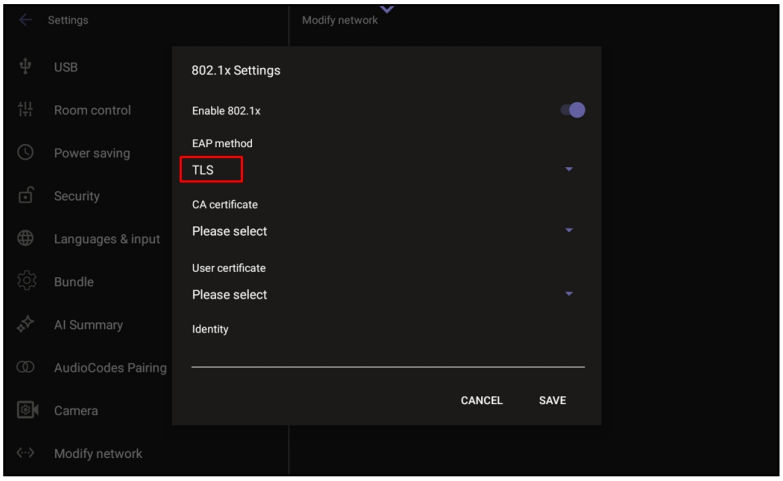
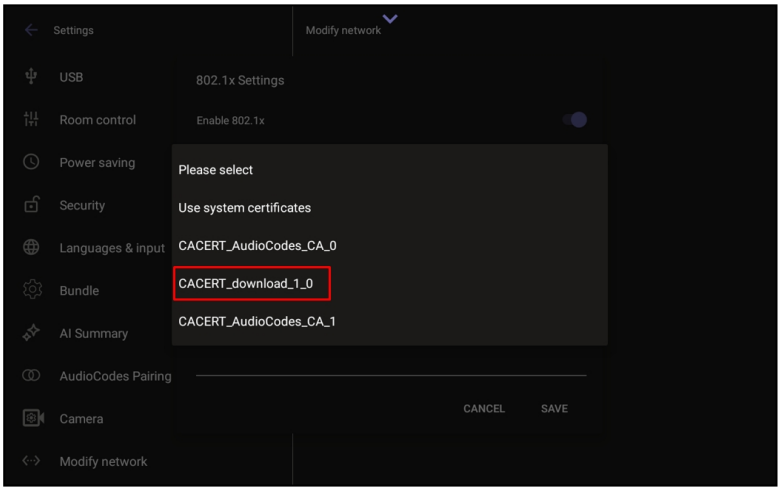
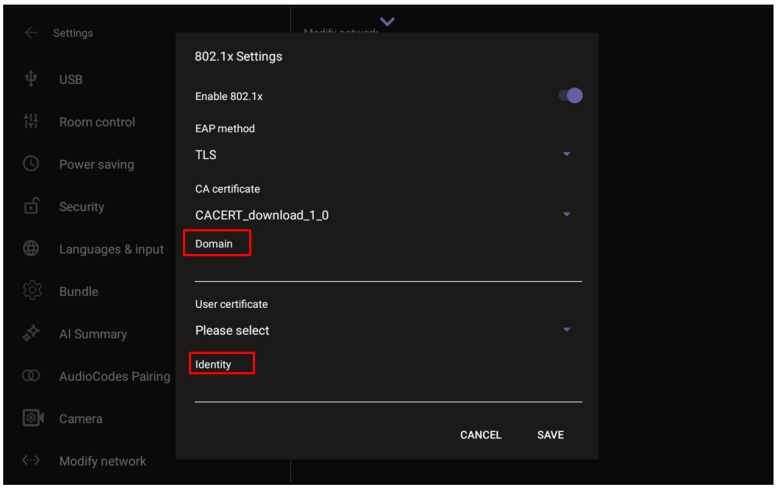
Setting	Description

	252 provides a DHCP client with a URL to use to configure its proxy settings:
	
	
	The proxy setting is provided in a Proxy Auto-Configuration (PAC) file that contains a set of rules coded in JavaScript which allows a web browser to determine whether to send web traffic directly to the Internet or to be sent via a proxy server. PAC files control how the phone handles HTTP, HTTPS and FTP traffic.
	Example of a basic PAC file:
	`function FindProxyForURL(url, host)`
	`{`
	`return "PROXY 10.13.2.40:3128";`
	`}`
	If the enterprise features a proxy server that requires user authentication, the network administrator can use the PAC file and DHCP Option 252 to configure it. Alternatively, the administrator can configure it using the following parameters:
	`http_client/fwd_proxy/ip=0.0.0.0`
	`http_client/fwd_proxy/password=`
	`http_client/fwd_proxy/port=8080`
	`http_client/fwd_proxy/username=`

802.1x Settings	802.1x Authentication is the IEEE Standard for Port-based Network

Setting	Description

	Access Control (PNAC). See https://1.ieee802.org/security/802-1x/ for more information.
	
	Instead of performing the following steps, 802.1x Authentication can be enabled and predefined via provisioning, by setting the following parameters:
	`network/lan/_802_1x/status=true` or `false`
	`network/lan/_802_1x/eap_tls/ca_cert=<CA FILE NAME>`
	`network/lan/_802_1x/eap_tls/client_cert=<Client certificate file name>`
	`network/lan/_802_1x/eap_tls/identity=<identity name>`
	`network/lan/_802_1x/eap_type=eap_tls`
	
	To configure an 802.1x Authentication method:
	1. After logging in as administrator, go to the 'Modify Network' screen and access the 802.1x Settings screen.
	2. Select the **Enable 802.1x** toggle switch and then select **Save**.
	3. Once enabled - the administrator needs to choose the security method and strength. Commonly used is EAP-TLS.
	
	4. Next is to choose which certificates to use:
	a. The device can use the system certificates -

Setting	Description
	 **b.** Or a certificate that has been loaded by the administrator, which will look as follows:  **5.** After choosing which certificate file to use, the administrator needs to set the **Identity** and the **Domain** the device is intended to enter: 

Setting	Description
	6. Select **Save** after defining all the above. 7. From the 'EAP method' drop-down, select the method: **MD5** or **TLS** (for example). In version 2.3, the option for non-validating a CA certificate was removed. 8. Enter this information: ✓ **Identity**: User ID ✓ **Password** ✓ **Root certificate** (not required for every method) ✓ **Device certificate** (not required for every method) 9. Press the **Save** softkey. The 802.1x settings are not only available via the phone screen, they are also supported in the device Configuration File, enabling network administrators to perform pre-staging configuration for 802.1x. The 802.1x settings available in the Configuration File are: ■ Enable/Disable ■ EAP method ■ Identity ■ Password
VLAN Settings	Navigate to **VLAN Settings > VLAN Discovery mode.** Select the mode you require as per the following guidelines, and then select **OK.** ■ Cisco Discovery Protocol (**CDP**) is a Cisco proprietary Data Link Layer protocol. ■ Link Layer Discovery Protocol (**LLDP**) is a standard, layer two discovery protocol. ■ If you select **Automatic configuration** (DCP, LLDP or both), you need to specify the **VLAN Interval** or leave it at its default value (30 seconds). The VLAN interval refers to CDP/LLDP advertisements' periodic interval. You can increase or decrease the intervals between the CDP/LLDP packets that are sent, based on network traffic and topology ■ If you select **Manual configuration**, you need to specify the **VLAN**

Setting	Description
	ID and **VLAN Priority**. Changes will only be applied after these fields have been set.
Debugging	Allows the Admin user to perform debugging for troubleshooting purposes. Available after logging in as administrator. ■ Log settings ■ Remote logging (see Perform Remote Logging (Syslog) on page 103 for more information) ■ Diagnostic data (see Get Diagnostics on page 104 for more information) ■ Reset configuration (see Perform User Data Reset on page 36 for more information) ■ Restart Teams app ■ Debug recording (for Media/DSP debugging) (see Activate and Deactivate DSP Recording on page 107 for more information) ■ Erase all data (factory reset) (the equivalent of restore to defaults; including logout and device reboot) ■ **SSH** – if enabled, allows remote connection via SSH. This option must be enabled to use the **rpcapd** (Remote Packet Capture) network sniffer application for capturing screenshots and traffic packages from a desktop PC using the app's integral SSH server. ■ **Screen capture** – enabled by default. If disabled, the phone won't allow its screens to be captured. ■ **Remote packet capture** – enables capturing traffic packages using **rpcapd**. ■ **Advanced > Rediscover provisioning server** – use to let the device detect the applicable provisioning server and retrieve configuration settings.

Set up Accessibility

As part of our ongoing commitment to inclusive design, AudioCodes Teams phones incorporate a range of accessibility features to support users with diverse physical, visual, auditory, and cognitive needs. These features are designed to enhance usability, promote independence, and ensure that all users can interact effectively with their communication devices. From high contrast displays and large touchscreens to headset compatibility and personalized settings, the following tools and options help create a more accessible experience for every user:

- **High Contrast Text, Font Size, and Color Correction**

Teams phones support high contrast display modes, adjustable font size, and color correction options to improve readability for users with visual impairments.

- **Large Touchscreen Displays**

  Models like the C455HD, C456HD, and C470HD offer large, high-resolution touchscreens (up to 5") that enhance visibility and ease of interaction.

- **Hard Button Mapping**

  Phones support customizable hard button mapping, which can be helpful for users who rely on tactile feedback.

- **USB Headset Support**

  Support for USB headsets allows users with hearing aids or specialized audio devices to connect easily.

- **Real-Time Text (RTT) Support**

  RTT enables users to view real-time text input from others during calls and meetings. Notifications appear on incoming call screens and banners, and RTT can be viewed simultaneously with live captions. Users can disable RTT from the in-call menu if needed.

  Note: Phone devices support view-only RTT; sending text input is not supported.

- **Localization and Language Support**

  Phones support multiple languages and regional settings, which is essential for users with language-related accessibility needs.

Configure VLAN via DHCP Option when CDP-LLDP is Not Allowed

AudioCodes Android devices can configure VLAN via a DHCP Option when CDP/LLDP is not allowed in the organization. The following DHCP Options offer a VLAN ID: Option 43, 132, 128, 129, 144, 157, 191. If the device gets more than one of these DHCP Options, it will apply only one according to the aforementioned order of priority.

Administrators can automatically configure **VLAN Discovery Mode** to CDP/LLDP/CDP+LLDP to get VLAN via a DHCP Option, or manually as described below. If VLAN Discovery Mode is disabled, the devices will not get VLAN via a DHCP Option.



- When CDP/LLDP is allowed in the organization, devices will get VLAN via CDP/LLDP Discovery; they will not get it from a DHCP Option. LLDP/CDP Discovery takes precedence over a DHCP Option.
- Valid range of VLAN ID values: 0~4094.

The following table specifies the syntax to use for the different DHCP options.

Table 3-2: DHCP Option Syntax

DHCP Option	Syntax
DHCP Option 43 (vendor-encapsulated-options)	DHCP Server, for MSCPEClient Vendor Class, 010 VLANID (VLAN identifier) has two types: ■ VLANID=544(string), packet: 0a0400353434, VLANID=544 ■ VLANID=0x10(Hex), packet: 0x0a 0x02 0x00 0x10, VLANID=16
DHCP Option 128/129/144/157/191	Syntax: VLAN-A=<value>;(value=hex, octal or decimal). Examples: ■ VLAN-A=12 VLAN ID is decimal 12. ■ VLAN-A=0xc VLAN ID is Hex 0xc (i.e., decimal 12). ■ VLAN-A=014 VLAN ID is octal 014 (i.e., decimal 12).
DHCP Option 132	Syntax: <value>; only supports a decimal value. ■ Example: 5 VLAN ID is 5.

Lock or Unlock the Phone

As a security precaution, the phone can be locked and unlocked:

- Automatic lock (see Automatic Lock below)
- Unlock (see Unlock on the next page)

Automatic Lock

Users can lock their phones as a security precaution. To configure the lock PIN and timeout, see the 'Lock Screen & PIN' option in Configure Teams Application Settings on page 42.



You cannot lock the phone if the lock PIN is not configured.

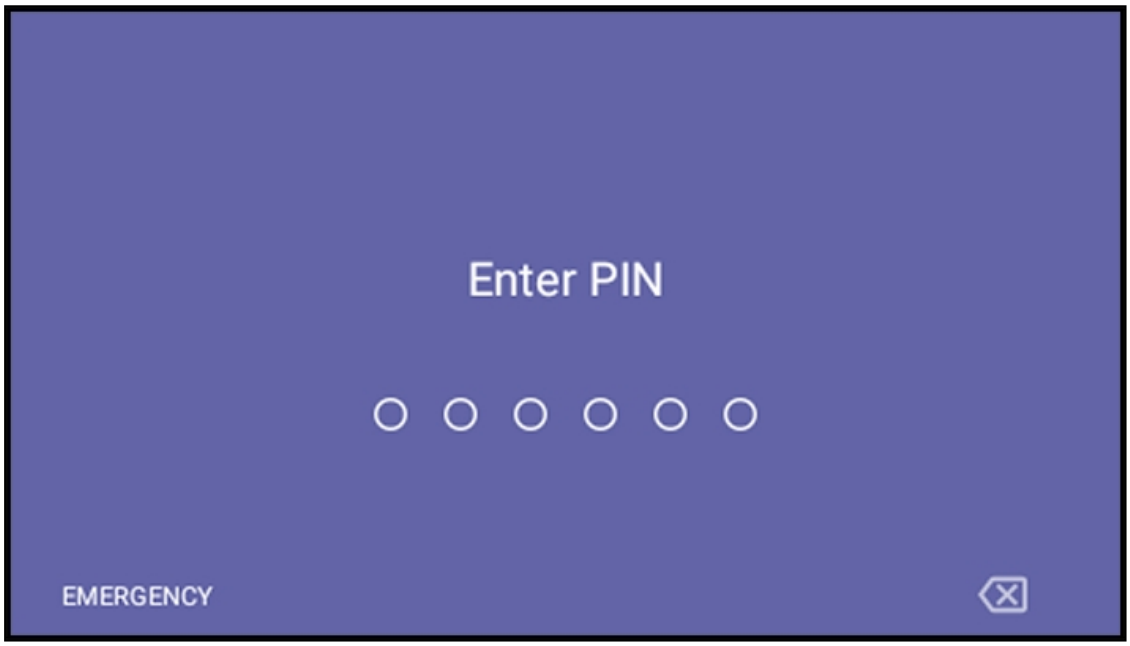
➢ **To lock the phone:**

- Press the back key on the phone for at least three seconds for the device to automatically lock.

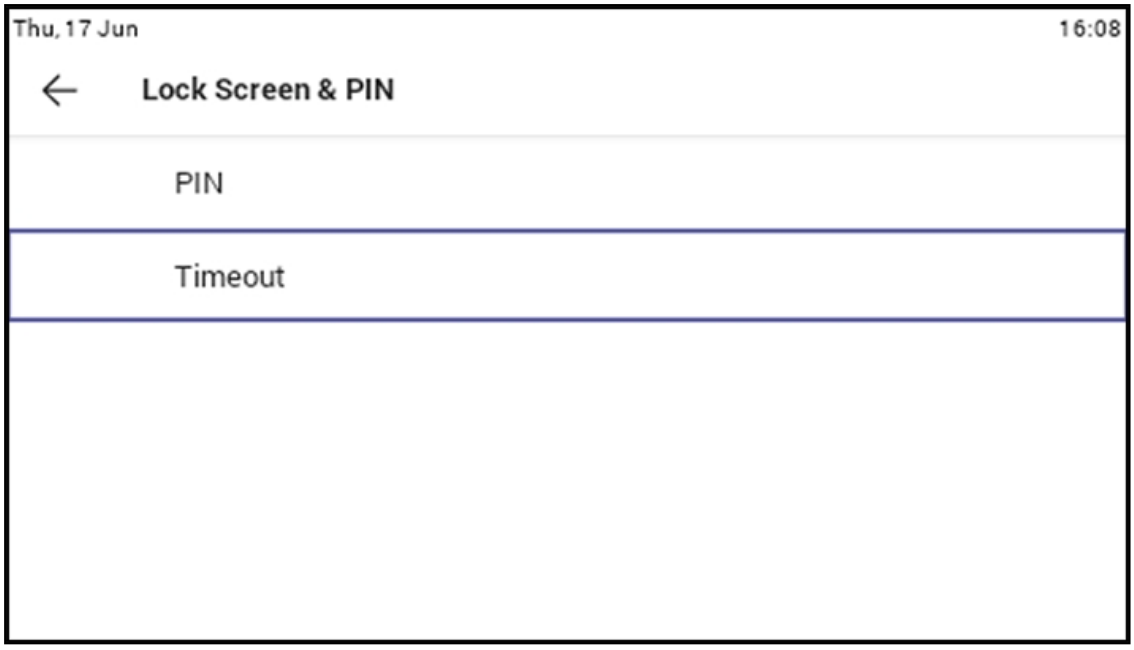
Unlock

➢ **To unlock the phone:**

1. When you interact with the phone, the screen shown in the figure below is displayed.



2. Press the hard keys on the phone to enter the PIN. When the phone detects the unlock code, it unlocks and displays the 'Lock Screen & PIN' screen.



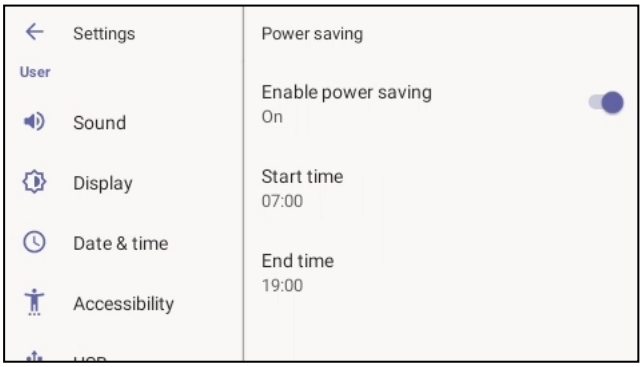
3. Optionally reconfigure the 'Timeout' if it's too short (or too long). Optionally redefine the PIN.

Enable Power Saving

This feature automatically activates power-saving mode during non-working hours. By default, during off hours, the phone's uppermost-right Presence LED is switched off. This conserves energy and minimizes light disturbance, providing a seamless and efficient user experience.

➢ **To enable this feature:**

■ In the phone screen, navigate to **Device Settings** > **Power saving**.



- By default, the feature is enabled.
- The feature is based on off work hours.

The Configuration File parameters below also support the feature. They can be synchronized with the settings in the phone screen.

- general/power_saving (Used to enable or disable power saving) (Default: 1)

- office_hours/end
- office_hours/start

> The **Enable power saving** setting does not control the screen saver or dim the LCD. To configure these settings, see **Device Settings > Display** in Configuring Device Settings.

Restore the Phone to Default Settings

Users can restore the device to factory default settings at any time.

Click here to view a video clip showing how to reset the AudioCodes Teams phone to its factory default settings. The principle is similar across all AudioCodes Teams phones.

The feature can be used if the Admin user has forgotten their password, for example.

> Restoring the phone to factory default settings brings up the phone with its original bundled Teams application.

Two kinds of restore are available:

- Perform a Hard Restore below
- Perform a Soft Restore on the next page

You can also:

- Perform User Data Reset on the next page
- Start up the Phone from Recovery Mode on the next page
- Perform Manual Recovery Operations on page 37

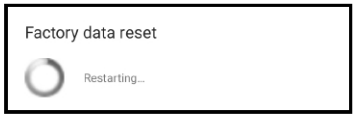
Perform a Hard Restore

You can either:

- perform a hard restore while the phone is up and running (see below)
- restore the phone's settings to their defaults when the phone is not connected (see below)

➢ To perform a hard restore while the phone is up and running:

1. Long-press the **HOLD** key on the phone (30 seconds); the screen shown below is displayed and the device performs a restore to default factory settings.



After the restore, the phone automatically reboots and goes through the Wizard and sign-in process.

2. Select **OK**; the sign-in screen is displayed (see Sign In to Your Teams Phone on page 15 for more information).

➢ **To restore the phone's settings to their defaults when the phone is not connected:**

1. Press the **OK** and **MENU** keys simultaneously and keeping them pressed, unplug the power cable.
2. Plug the power cable back into the phone continuing to press the **OK** + **MENU** keys for +-5 seconds.
3. Release the **OK** + **MENU** keys; the phone' settings are restored to their defaults.

Perform a Soft Restore

Users must log in as Administrator to perform a soft restore.

➢ **To perform a soft restore:**

1. Log in as Administrator on page 66.
2. On the phone's Device Settings screen, scroll down and select **Debugging**, then **Reset configuration**.A

Perform User Data Reset

AudioCodes Teams devices provide a **User data reset** option that is similar to factory reset except that it preserves predefined data after firmware upgrade. The option enables the data to be retained to handle devices more efficiently in scenarios where the factory reset option is inappropriate.

➢ **To access the functionality:**

1. Log in as Administrator on page 66.
2. On the phone's Device Settings screen, scroll down and select **Debugging**, then **User data reset**.



After 'User data reset', network settings are preserved.

Start up the Phone from Recovery Mode

If a phone goes into recovery mode, you can boot it using its hard keys as shown in Perform a Hard Restore on the previous page.

Perform Manual Recovery Operations

Besides manual recovery options, the Android phones also feature an independent, automatic problem detection and recovery attempt capability that can culminate in recovery mode or in switching image slots. Android phones also feature a 'hardware watchdog'. This feature resets the phone if Android is stacked and doesn't respond (though Android stacking is unlikely). There's no recovery process; the phone is only reset.

All AudioCodes devices have a reset key or a combination of keys on the keypad to reset it.

Click here to view a video clip demonstrating how to recover the phone and reboot it to its original out-of-the-box state. The principle is similar across AudioCodes Teams phones.

While a device is powering up, you can perform recovery operations by using a two-key combination.
When using a two-key combination, the device's main LED changes color after every *n* seconds; each color is aligned with a recovery operation option.

When?	Action	Press key combination	LED flashes 3x after release
Start pressing immediately after power up (on U-Boot / Universal Boot Loader)	Switch slots A / B	**4** key + **6** key (3 seconds)	Green
	Loader	**1** key + **3** key (3 seconds)	Blue / Yellow
	Restore defaults	**OK** key + **MENU** key (3 seconds)	Green + blue / Green + yellow
When successfully booted (on Android)	Reboot	From the 'Admin' menu	-
	Restore defaults	Long-press **Hold** key for ~15 seconds	Flashes white once after release

4 Use Your Phone

Your phone allows you to perform a multitude of operations, including:

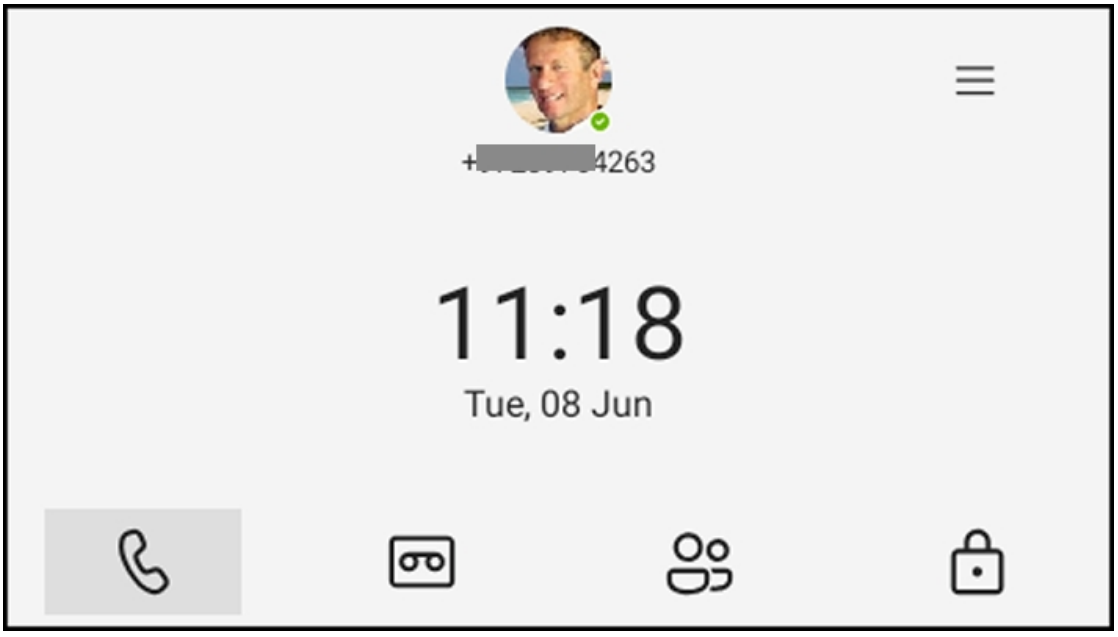
- Get Acquainted with the Phone Screen below
- Change Your Presence Status on page 41
- Configure Teams Application Settings on page 42
- Make and Manage Calls on page 45
- Answer Calls on page 50
- Create and Manage Contacts from the People Screen on page 55
- Manage Speed Dial and Line Keys on page 55
- Manage Voicemail on page 61
- Sign Out on page 63



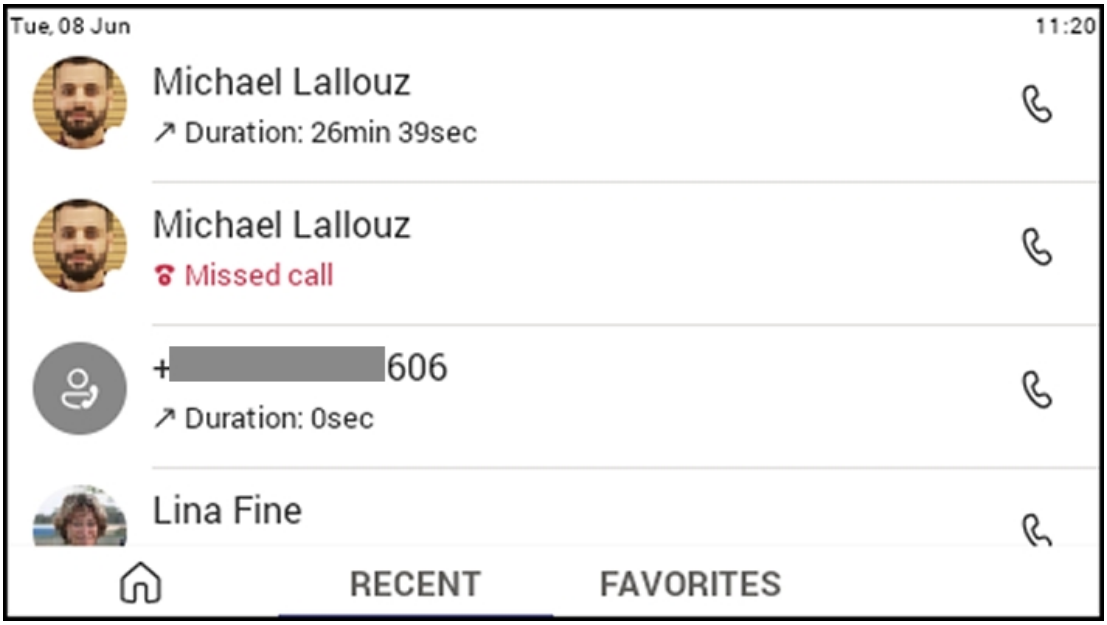
This manual describes a Microsoft Teams IP phone. The above phone operations are implemented Microsoft Teams functions.

Get Acquainted with the Phone Screen

The following gets you acquainted with the phone's user interface. The figure below shows the phone's home screen, aka the phone's idle screen.



The following figure shows the phone's Calls screen.



The following table describes the phone's home screen.

Item	Description
	The phone menu. Select it to open the menu shown in the figure following this table.
Calls	Select the tab to open the Calls screen. The screen shown in the figure preceding this table opens.
People	Select the tab to open the People, shown under Create and Manage Contacts from the People Screen on page 55. Allows you to easily connect and collaborate with teammates, colleagues, friends and family. Through this screen, you can see all your contacts and create and manage contact groups to organize your contacts. The screen provides a simple user experience and aligns with the contacts on the Teams desktop client. If a contact has multiple numbers, the phone screen allows the user to select from a drop-down menu the intended contact method.
Voicemail	Select the tab to open the Voicemail screen (see View and Play Voicemail Messages on page 62).
Lock	Select the tab to lock the phone. This works only if a PIN has been set up (see Configure Teams Application Settings on page 42).

The following figure shows the user's presence status screen. To access this screen, select your avatar.



Use this table as reference.

Item	Description
Presence status	See Change Your Presence Status on the next page.
Settings	See Configure Teams Application Settings on page 42.

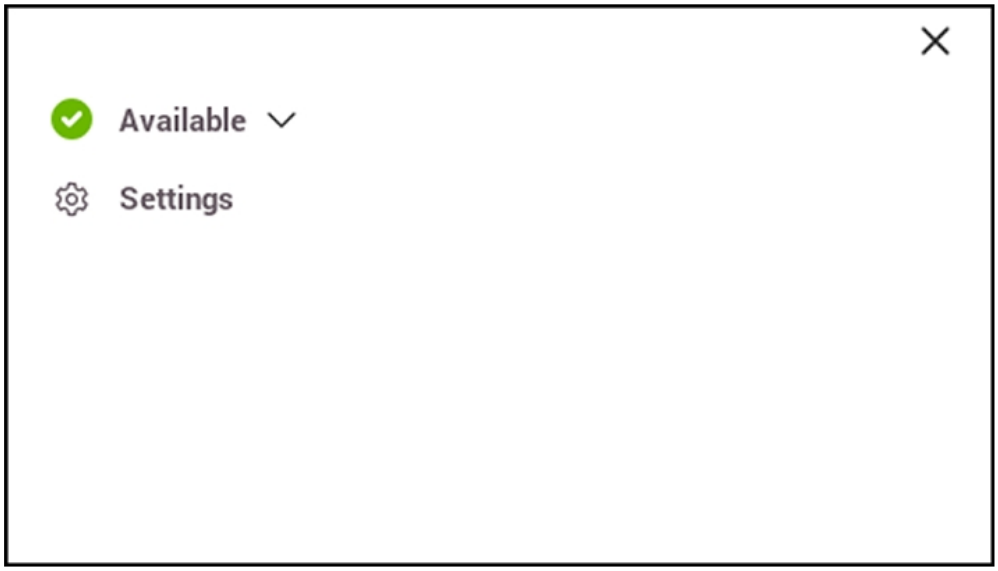
Change Your Presence Status

You can assign a presence status to control whether you want people to contact you or not. By default, your status is based on your Microsoft Teams server.

- After *n* minutes (configured in the Teams server by your administrator), presence status automatically changes to 'Inactive'.
- *n* minutes after this (also configured in the Teams server by your administrator), presence status automatically changes to 'Away'; all calls are then automatically forwarded to the Response Group Service (RGS) if it is configured.

To change your presence status:

1. In the home screen, select .



2. Select the current status displayed and from the drop-down list of statuses then displayed, select the status to change to. Use this table as reference.

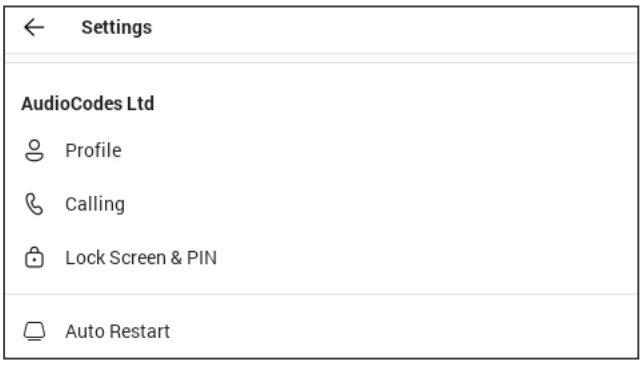
Table 4-1: Presence Statuses

Icon	Presence Status	Description
	Available	You're online and available for other contacts to call.
	Busy	You're busy and don't want to be interrupted.
	Do not disturb	You don't want to be disturbed. Stops the phone from ringing when others call you. If DnD is activated, callers hear a tone indicating that your phone is busy; the call is blocked and your

Icon	Presence Status	Description
		phone's screen indicates 'Missed Calls'.
	Be Right Back	You'll be away briefly and you'll return shortly.
	Away	You want to hide your status and appear to others you're currently away.
	Offline	You're going on vacation (for example).
	Reset status	Resets the status.

Configure Teams Application Settings

The following describes the Teams application's settings. To access them, select the avatar and then select **Settings**, or select the MENU key in the home screen.

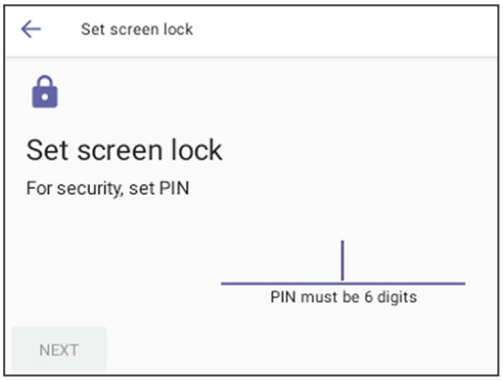
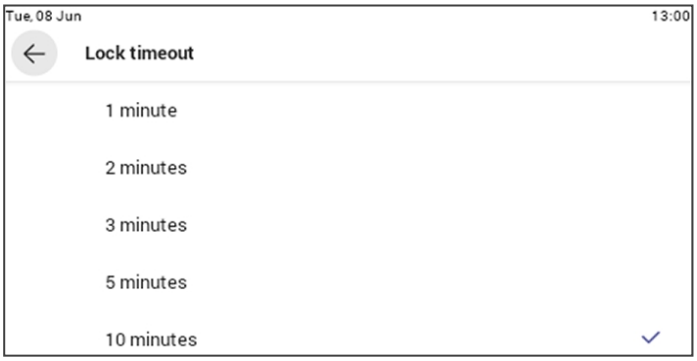


Use this table as reference:

Table 4-2: Idle Screen Description

Item	Description
Profile	Opens the user's email address and photo / avatar picture.
Calling	Opens the Calls screen.

Item	Description
	 ■ **Incoming Calls** ✓ **Call forwarding**. Enables automatically redirecting an incoming call to another destination. ✓ **Forward to**. Only displayed if 'Call forwarding' (the previous setting) is enabled. Defines the destination to which to forward incoming calls. ✓ **Also ring**. Only displayed if 'Call forwarding' is disabled. Select either **Off**, **Contact or number**, or **Call group**. ✓ **If unanswered**. Only displayed if 'Call forwarding' is disabled. Defines the destination to which to forward unanswered incoming calls. Select either **Off**, **Voicemail**, **Contact or number**, or **Call group**. ✓ **Display call forward on home-screen**. If enabled, displays a dropdown on the home screen, allowing you to specify the requested call forward action (**Don't forward calls**, **Forward to voicemail**, or **Forward to contact or number**). ■ **Voicemail > Change voicemail greetings**. Lets you record a message for voicemail, before the caller's message is recorded. ■ **Ringtones**: Set the requested ringtones for personal calls, forwarded calls, and delegated calls. ■ **Call Views > Default view**. Specify if the Calls screen should display the Speed Dial list or the recent call history. ■ **Line Keys > Line keys settings**. Manage line keys and set line key behavior. ■ **Enable voice quality recording**. Activate to attach a recording of the call when you report a problem to Microsoft Support. ■ **Emergency location**. Set a location where responders can reach you in the case of an emergency. ■ **Accessibility**

Item	Description
	✓ **Enable Teletypewriter mode.** Enable to communicate over the phone line using text. ✓ **Answer on Pickup.** Automatic answer of calls when the handset is lifted or the speaker button is pressed.
Lock Screen & PIN	You can lock your phone as a security precaution.  Configure a lock option before attempting to lock the phone.   If a lock option isn't configured, the lock action will not work. To unlock a locked phone, see Unlock on page 33.
What's new	Links to the 'What's new' page of Microsoft Teams devices.
About	Opens the About screen of Microsoft Teams.
Sign out	Lets you sign out of the phone application as one user and optionally sign in again as another user. See Sign Out on page 63 for detailed information.

Item	Description
Device Settings	Opens the [Device] Settings screen. See Configure Device Settings on page 21 for detailed information.

Make and Manage Calls

You can:

- Make a Call below
- Make an Emergency Call on the next page
- End an Established Call on page 47
- Manage Call History on page 47
- Park a Call on the next page
- Page to a Group of Phones (Multicast) on page 48

Make a Call

Calls can be made in multiple ways, for example, you can press the digit keys on the phone's dial pad to enter the phone number.

Alternatively, in the home screen you can press the softkey under the handset icon, then navigate to a recent call and press the **OK** key. After dialing a destination number, the phone displays the Calling screen while playing a ring-back tone.

Or, you can make a call using a speed dial from the People screen or from the 'Search people' feature in the People screen.

Redial



The **AudioCodes Smart** button can be configured to function as a redial button (see Enable the AudioCodes Smart Button for Redial Functionality on page 78).

You can redial a number you previously dialled.

➢ **To redial:**

- Press the REDIAL hard key on the phone; the first call listed in the Calls screen is redialled.

Dial a Missed Call

The phone logs all missed calls. The screen in idle state displays the number of missed calls adjacent to the Calls softkey.

➢ **To dial a missed call:**

- On the home screen, select the icon and then in the 'Recent' screen that opens navigate to and select the missed call.

Select to Dial

All phone numbers that are part of meeting invites or user contact cards can be dialed out directly by selecting them via the phone screen.

Park a Call

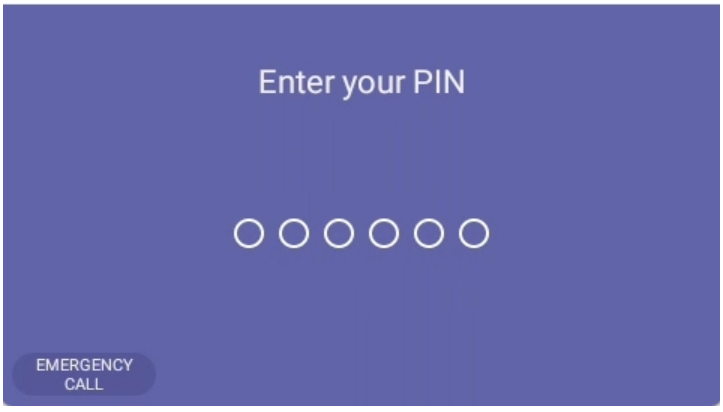
The phone allows a user to park a call, i.e., transfer a call to a "parking lot" for it to be picked up on any other phone in the enterprise by a party who must enter a code to retrieve it.

➢ **To park a call:**

1. Put the call on hold and park it; you'll receive a unique code from the Teams application.
2. Communicate the code to another user who can then pick up the call on their device. The user on the other device selects the call park icon displayed in their device's Calls screen.
3. The user on the other device enters the code communicated to them and then selects the **Pick up** button to pick up the call.

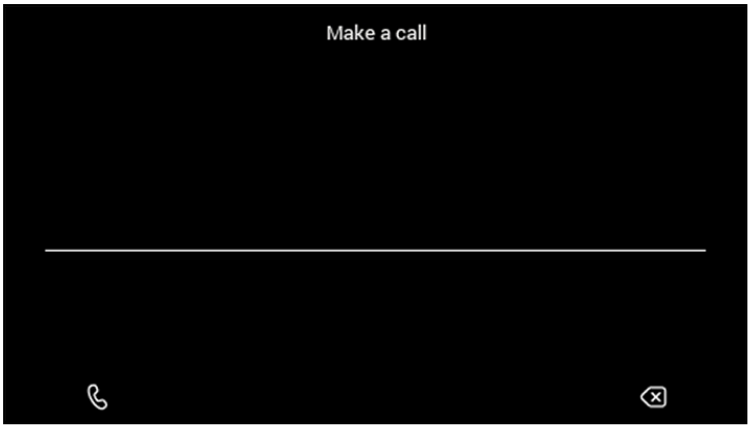
Make an Emergency Call

If your user is assigned an emergency calling policy (configured from the Teams Admin Center), the phone allows you to make an emergency call without unlocking the phone first. The idle lock screen displays an **EMERGENCY CALL** button.



➢ **To dial the service from the locked idle screen:**

- Select the **EMERGENCY CALL** softkey in the locked idle screen and then enter the emergency number.



- When the phone detects that 911 has been entered or dialed, it automatically calls that number.
- If you enter or dial a number that is not an emergency number, a message is displayed indicating that only emergency numbers can be called.

End an Established Call

You can end an established call in a few ways.

➢ **To end an established call:**

- Return the handset to the phone cradle if it was used to take the call -or- activate the headset key on the phone -or - activate the speaker key on the phone -or- select the **End** softkey.

Manage Call History

You can view a history of missed, received and dialed calls.

Each device reports every call from or to that user to the server. All devices that a user signs into and the Calls screen are synchronized with the server.

➢ **To manage calls:**

1. Select **Calls** and in the Calls screen, select **Recent**.

- Calls are listed from newest to oldest.
- Missed call indicates a call that was not answered.
- Incoming and outgoing calls are differentiated by their icon.

2. Select a call in the list and then select to call someone back.

Page to a Group of Phones (Multicast)

AudioCodes Android-based phones support multicast paging (including barge-in). The feature allows a call to be paged to a group of phones to notify a team about (for example) the time and place at which a meeting will commence. The paging call is multicast via a designated group IP address, in real time, on all phones in the group.

Barge-in enables paging to interrupt (barge in on) phone conversations that are in progress. The feature is configured in the phone's cfg configuration file. Default: Disabled. When enabled, a paging call overrides an ongoing regular call/meeting due to emergency. When disabled, those who are in regular calls when a paging call comes in are prompted in the phone screen to accept or reject the paging call. If it's accepted, the regular call is put on hold and the paging is heard.

Related paging parameters in the cfg configuration file are:

```
/voip/services/group_paging/enabled
/voip/services/group_paging/codec
/voip/services/group_paging/group/*/activated
/voip/services/group_paging/group/*/multicast_addr
/voip/services/group_paging/group/*/port
/voip/services/group_paging/allow_barge_in/enabled
```



The values of these parameters can be changed on the fly. Paging behavior is immediately affected.

Use the following table as reference.

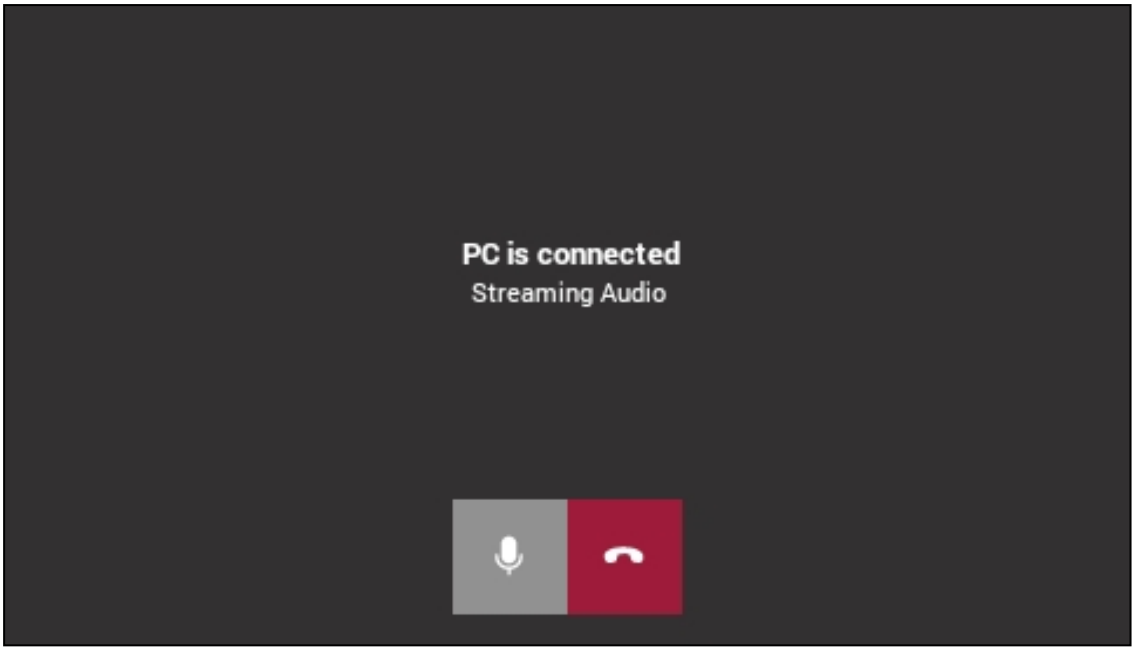
Parameter	Description
voip/services/group_ paging/allow_barge_ in/enabled=0	Allows | disallows the barge-in feature. ■ 0 = disabled ■ 1 = enabled
voip/services/group_ paging/codec=PCMU	Defines the codec. Three available options: ■ PCMU (default) ■ PCMA ■ G722
voip/services/group_ paging/enabled=0	Enables | disables the group paging feature. ■ 0 = disabled ■ 1 = enabled

Parameter	Description
voip/services/group_ paging/group/0-4/activated=0	Activates| deactivates a group. ■ 0 = deactivated ■ 1 = activated Five groups labeled 0-4 are available.
voip/services/group_ paging/group/0-4/multicast_ addr=224.0.1.0	Defines the paging group's multicast IP address. Must be in the range: 224.0.0.0 - 239.255.255.255 Default: 224.0.1.0. **Important**: For phones to be in a group, all must be configured with the identical multicast address and port. The following three IP addresses (for example) denote three different paging groups: ■ 224.0.1.1:8888 ■ 224.0.1.1:2222 ■ 233.2.2.2:8888
voip/services/group_ paging/group/0-4/port=8888	Defines the port through which paging is received. Must be in range: 1-65535 Default: 8888 **Important**: For phones to be in a group, all must be configured with the identical multicast address and port. Port 9998 and 9999 should not be used as they are used by the application.

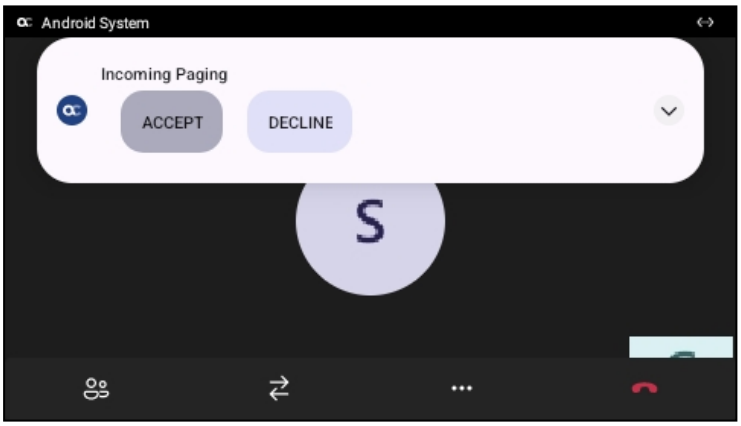


- AudioCodes Android-based phones currently support incoming paging calls (listening).
- Outgoing paging calls (broadcasting) will be supported in the future.

- When an incoming call is received on a phone that is in idle state, the phone *immediately and automatically* answers it, irrespective of whether barge-in is enabled or not.
- When the phone is in a Teams call/meeting (active or on-hold):
  - If barge-in is enabled, i.e., if the cfg configuration file parameter 'voip/services/group_ paging/allow_barge_in/enabled'=**1**, then the phone will *automatically immediately* display the **Audio announcement in progress** screen with an option to END the announcement.



- If barge-in is *disabled*, i.e., if the cfg configuration file parameter 'voip/services/group_paging/allow_barge_in/enabled'=**0**, then the phone will display the **Incoming audio announcement** screen with an option to ACCEPT or DECLINE it.



Answer Calls

You can answer or manage incoming calls and configure related settings:

- Answer a Call on the next page
- Transfer a Call on the next page
- Reject an Incoming Call and Send It Directly to Voicemail on page 52
- Adjust Volume on page 52
- Play Incoming Call Ringing through USB Headset on page 54
- Play Incoming Call Ringing through RJ-9 Headset on page 54

Answer a Call

The phone indicates an incoming call by ringing and displaying **Caller X is calling you**. The LED located in the upper right corner of the phone flashes red, alerting you to the incoming call.

➢ **To answer:**

- Pick up the handset -OR - activate the headset key on the phone (make sure the headset is connected to the phone) -OR- activate the speaker key on the phone -OR- select the **Accept** softkey (the speaker is automatically activated).

Transfer a Call

When an incoming call arrives or during a call, you can transfer the call using the device's physical **Transfer** button:

- Short press – opens a dialog to select a contact to transfer the call immediately.
- Long press – opens a dialog to select a contact for consultation before completing the transfer.

See here for a video clip demonstrating how to use the call transfer feature while checking with the intended recipient that they want to take the call. The principle is similar across AudioCodes Teams phones.

See here for a video clip demonstrating how to immediately transfer a call without verifying with the intended recipient that they want to take the call. The principle is similar across AudioCodes Teams phones.

➢ **To transfer a call received for another person:**

1. When the incoming call arrives, choose whether to transfer it immediately or not; you can transfer it directly right away, or you can decide to consult the intended recipient of the call to verify that they want to receive it.
2. To consult the intended recipient, select **Consult first** and search for the contact you want to transfer the call to. While you consult with the intended recipient about whether they want to take the incoming call, the caller will hear hold music and will not be a party to your discussion.
3. If the recipient decides to take the call, click the phone icon on the top-right of the screen and then confirm the transfer; the call is then transferred smoothly to the intended recipient.



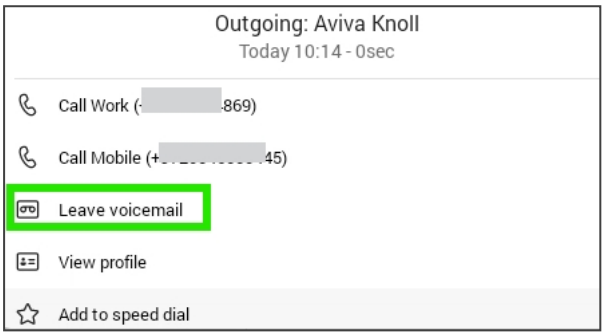
If the recipient does not answer the call, turn on the Safe Transfer toggle button to have Teams ring you back and transfer the call to someone else.

Transfer a Call to Frequent Contacts

To transfer your calls efficiently to frequent contacts, the phone presents frequent contacts in the transfer screen for a single operation transfer. Contacts not shown in the list can be searched for using the search bar.

Transfer a Call to Work Voicemail

Users can directly transfer a call into someone's work voicemail without needing to ring the far-end user. This allows them to discreetly leave voicemails for users without interrupting them.



Reject an Incoming Call and Send It Directly to Voicemail

You can send an incoming call directly to voicemail if time constraints (for example) prevent you from answering it. The caller hears a busy tone from your phone.

➢ **To send an incoming call directly to voicemail:**

- When the phone rings to alert to a call, select **Decline**; if you have voicemail, the call will go into voicemail. The Microsoft Teams server performs this functionality.

Adjust Volume

The phone allows the following volume adjustment actions:

- Adjust Ring Volume below
- Adjust Tones Volume on the next page (e.g., dial tone)
- Adjust Handset Volume on the next page
- Adjust Speaker Volume on the next page
- Adjust Headset Volume on the next page

For more information about sound and volume, see here.

Adjust Ring Volume

The volume of the phone's ring alerting you to an incoming call can be adjusted to suit personal preference.

➢ **To adjust ring volume:**

1. When the phone is in idle state, select the VOL▲ or VOL▼ key on the phone..
2. After adjusting, the volume bar disappears from the screen.

Adjust Tones Volume

The phone's tones, including dial tone, ring-back tone and all other call progress tones, can be adjusted to suit personal preference.

➢ **To adjust tones volume:**

1. Off-hook the phone (using handset, speaker or headset).
2. Select the VOL▲ or VOL▼ key to adjust the volume.
3. After adjusting, the volume bar disappears from the screen.

Adjust Handset Volume

Handset volume can be adjusted to suit personal preference. The adjustment is performed during a call or when making a call. The newly adjusted level applies to all subsequent handset use.

➢ **To adjust handset volume:**

1. During a call or when making a call, make sure the handset is off the cradle.
2. Select the VOL▲ or VOL▼ key; the volume bar is displayed on the screen. After adjusting, the volume bar disappears from the screen.

Adjust Speaker Volume

The volume of the speaker can be adjusted to suit personal preference. It can only be adjusted *during a call*.

➢ **To adjust the speaker volume:**

1. During a call, activate the speaker key on the phone.
2. Select the VOL▲ or VOL▼ key; the volume bar is displayed on the screen. After adjusting the volume, the volume bar disappears from the screen.

Adjust Headset Volume

Headset volume can be adjusted *during a call* to suit personal preference.

➢ **To adjust the headset volume:**

1. During a call, activate the headset key on the phone.

2. Press the VOL ▲ or VOL ▼ key; the volume bar is displayed on the screen.

Play Incoming Call Ringing through USB Headset

The phone features the capability to ring via a USB headset in addition to via the phone speaker.

Click here to view a video clip demonstrating how to connect a USB headset to the phone. The principle is similar across AudioCodes Teams phones.

➢ **To play the ringing of incoming calls via the USB headset:**

- Configure the following parameter:

  `audio/stream/ringer/0/audio_device=`**BOTH** (default), **BUILTIN_SPEAKER** or **TYPE_USB**

  - **BOTH**: Incoming calls play through both the USB headset and the phone's speaker.
  - **BUILTIN_SPEAKER**: Incoming calls play through the phone's speaker.
  - **TYPE_USB**: Incoming calls play through the USB headset.

Play Incoming Call Ringing through RJ-9 Headset

Only the C435HD phone is currently supported.

Support has been added for ringing via an RJ-9 headset on the C435HD phone.

The figure below shows the RJ9 headset port:



Administrators will use theparameter 'audio/stream/ringer/0/audio_device' to specify which device will ring when a call comes in.

Two new configuration values have been added:

TYPE_HEADSET (regular headset)
TYPE_RJ9_HEADSET

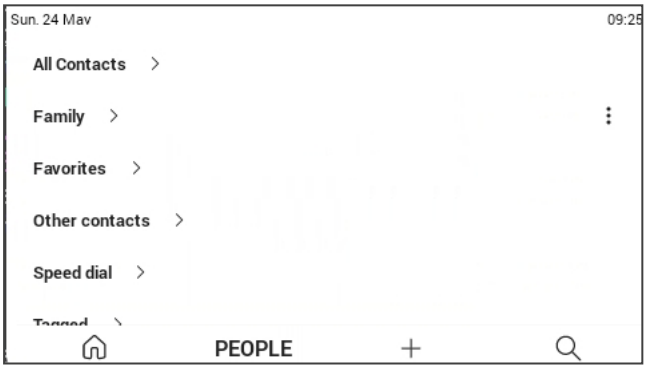
The parameter can be configured via the Device Manager as well as via SSH command. The parameter is also available in the template which can be applied to multiple phones via the Device Manager.

Create and Manage Contacts from the People Screen

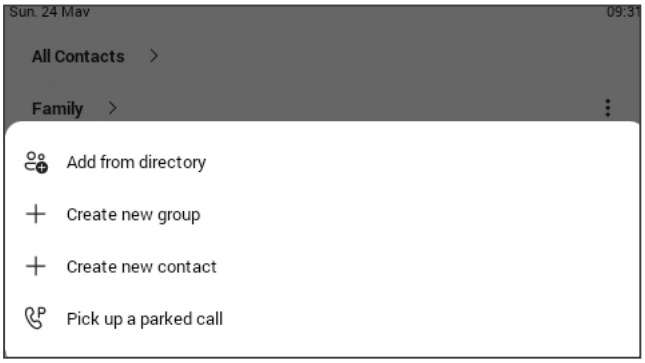
The 'People' screen allows users to easily connect and collaborate with teammates, colleagues, friends and family. Through the screen, users can see all their contacts and create and manage contact groups to organize their contacts. The screen provides a simple user experience and aligns with the contacts on the Teams desktop client. In addition to accessing the People screen from the menu, the screen can also be accessed from the hard CONTACTS button on the phone.

➢ **To access the 'People' screen:**

- On the home screen, tap **More**, then press the softkey under the People icon .



To add a contact or create a new contact group, press the softkey under the + icon +.



Manage Speed Dial and Line Keys

This section describes how to make calling and handling incoming calls more efficient using Speed Dial and Line Keys.

Speed Dial is a feature that allows you to call a specific contact by pressing a dedicated button, such as a line key. *Line Keys* are programmable buttons that can be assigned functions, such as speed dialing a contact or transferring incoming calls to a specific person.

- Add a Speed Dial on the next page

- Add a Speed Dial Group on the next page
- Assign a Line Key for Speed Dial or Feature on page 58

Add a Speed Dial

The feature expands the phone's functional capabilities and increases user productivity in the workplace:

- Speed-dial users are listed in a Favorites list for easy access.
- The feature also allows the user to easily transfer a call to a speed dial contact.

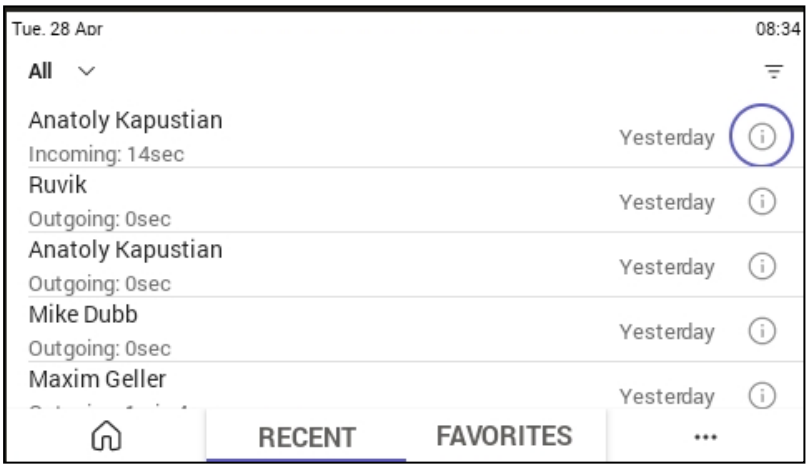
To add a speed dial:

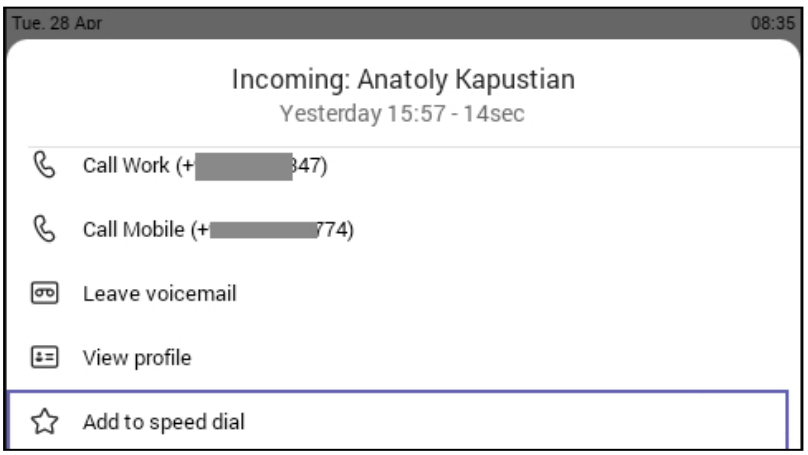
- Add it from the Teams PC client; adding a speed dial from the PC client will be reflected on the sidecar as well.

  -OR-

- Add it from the phone using one of the following options:

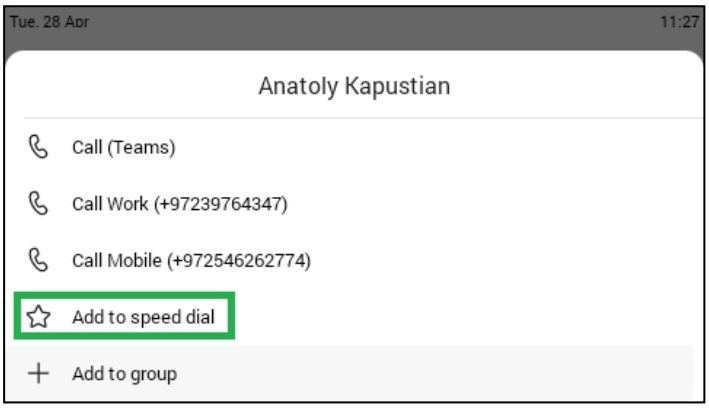
  a. Via the **Calls** > **RECENT** tab. Select the information icon of the relevant user and then select 'Add to speed dial'. The user is added to the **FAVORITES** tab.





  b. Via the **People** tab.





c. On the Line Key screen, by assigning speed dial to a free line key:

   i. Press the softkey next to a free line key.

   ii. **Assign line key**, then **Speed dial**.

   iii. the requested contact from the list.

Remove a Speed Dial

You can remove an assigned speed dial from a favorite contact or a line key.

➢ **To remove a speed dial from a favorite contact:**

1. Access the 'Calls' screen or the 'People' screen.
2. In the 'Speed dial' list, locate the relevant contact and select the three dots next to this contact, then select **Remove from speed dial**.

➢ **To remove a speed dial from a line key:**

1. On the 'Line Keys' screen, press the softkey next to any unassigned line key, then select **Manage line keys**.
2. Navigate to the relevant **Line Key** and select the Delete icon next to it.

Add a Speed Dial Group

Administrators can create a speed dial group and add contacts to the new group.

See here for a video clip demonstrating how to create a speed dial group.

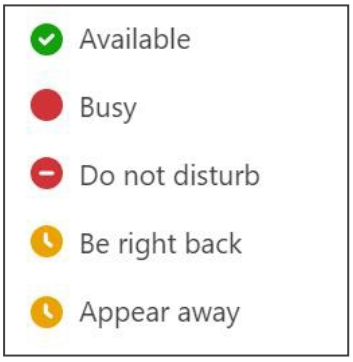
➢ **To create a speed dial group:**

1. Navigate to the **People**screen.
2. From the list, select the contact you want to add to your new group.
3. Select **Add to group**.
4. In the 'Select a group to edit' screen, select **Speed dial**.
5. After adding the new contact, view them displayed.

Assign a Line Key for Speed Dial or Feature

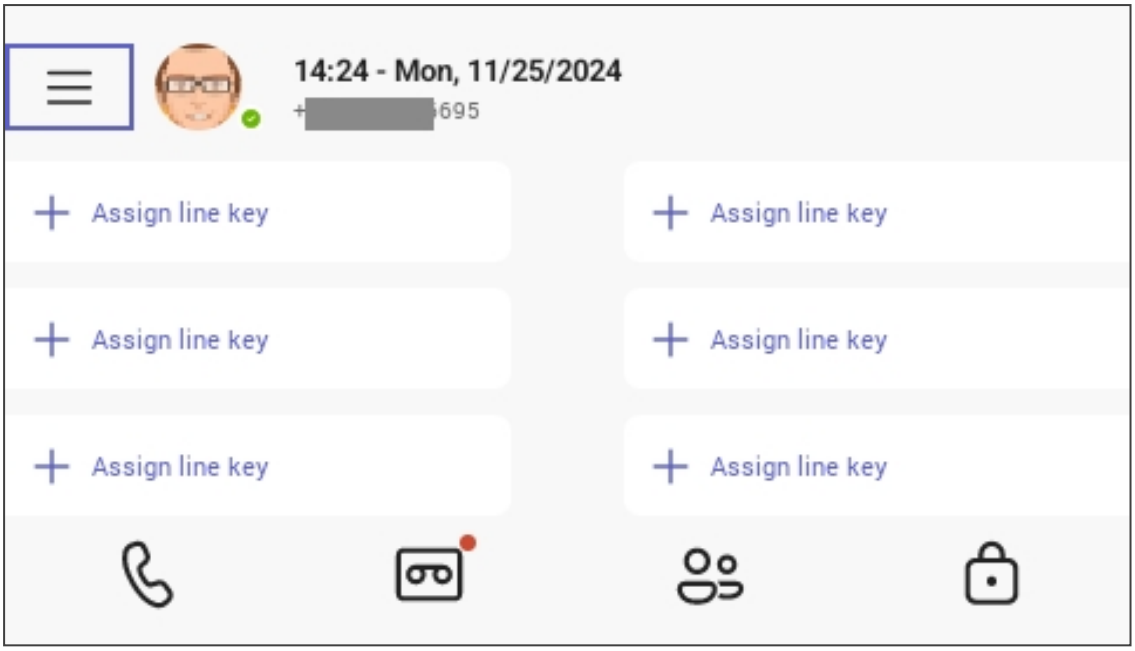
Line keys provide quick access to features like redial and voicemail. You can also assign predefined functions or people to line keys and label them for speed dial. See here for a detailed description.

The presence/ status of an assigned contact displays by their name (account avatar) on the phone's home screen:



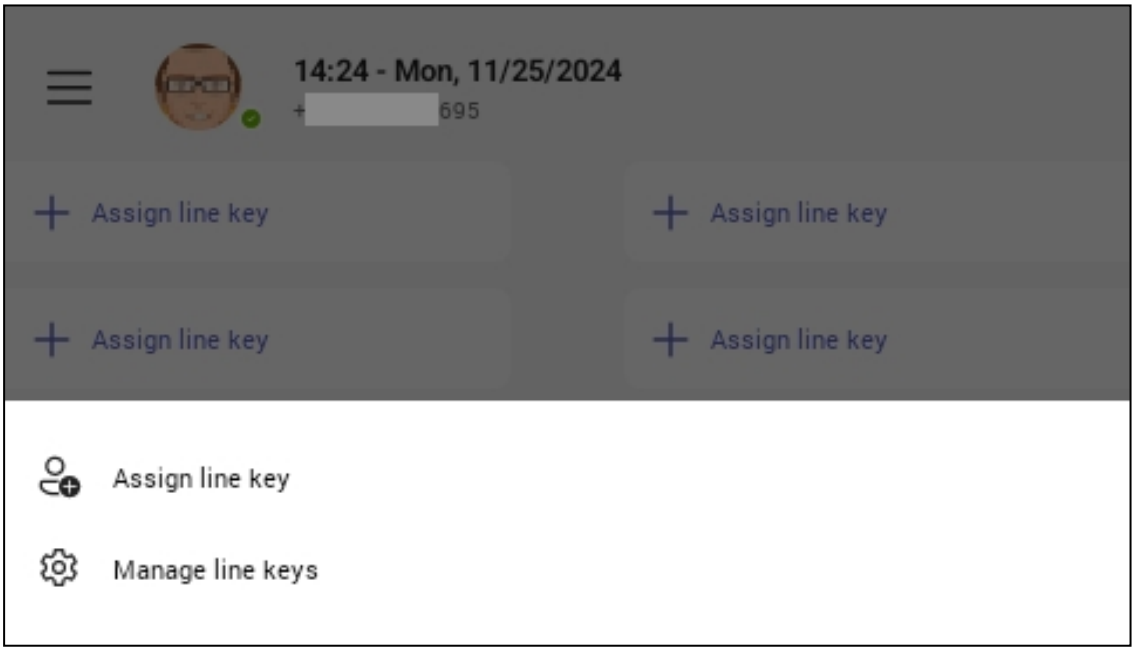
The LEDs in the sidecar also light up to reflect the status of the assigned line is; Busy-red, Available-green or Away-yellow.

The LCD home screen displays an 'Assign line key' option:

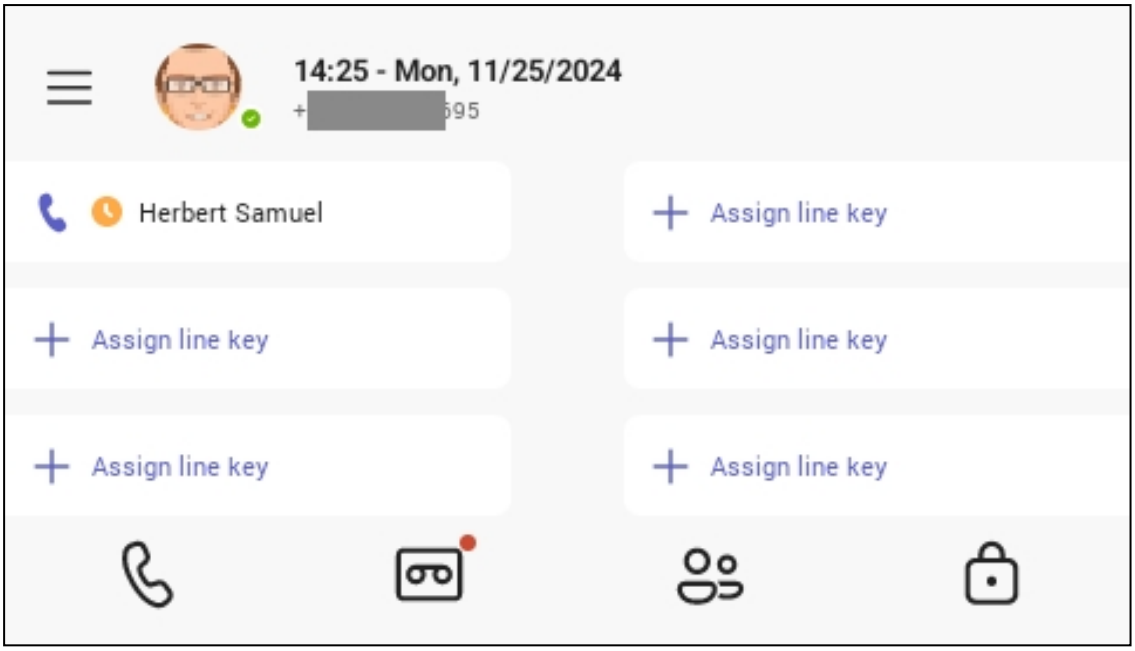


To assign a line key:

1. Navigate to the **Assign line key** you want to associate with a named person
2. Press the tick button on the navigation control to select; the assign key menu displays:

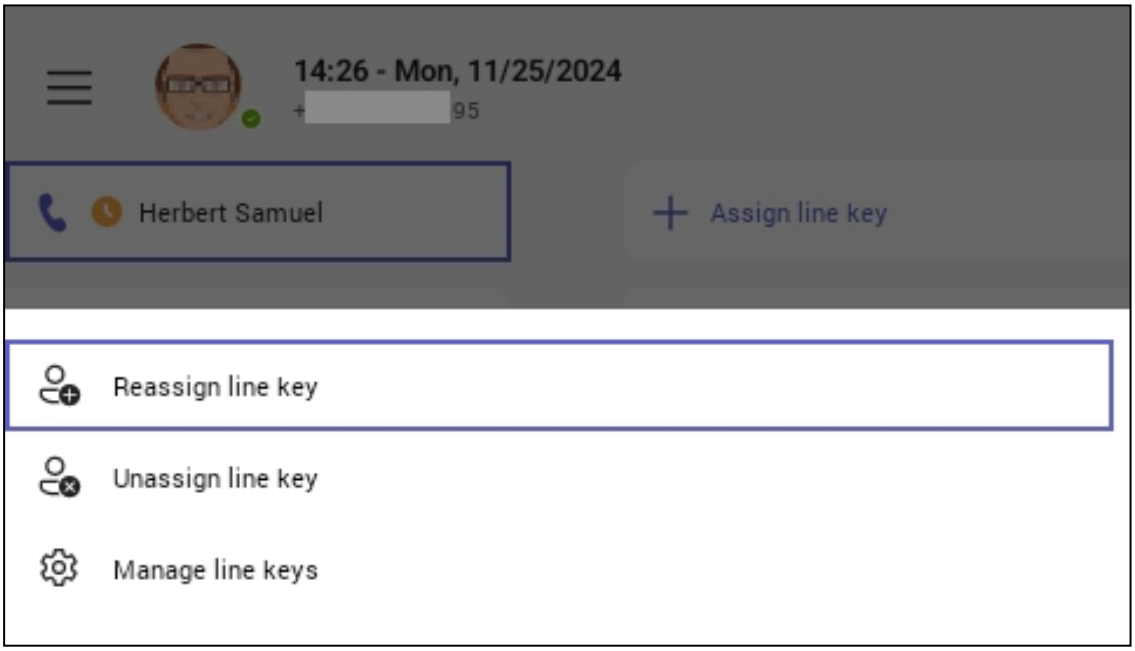


3. Press the tick button again and use the dial pad to spell out the first couple of letters to 'Search for people'.
4. Navigate to and select the contact you wish to select. The searched name displays in full.
5. Press the navigation control tick button to confirm. The screen displays the assigned line:



➢ **To reassign or unassign a line:**

1. Navigate to and select the assigned line key to display the line key menu:



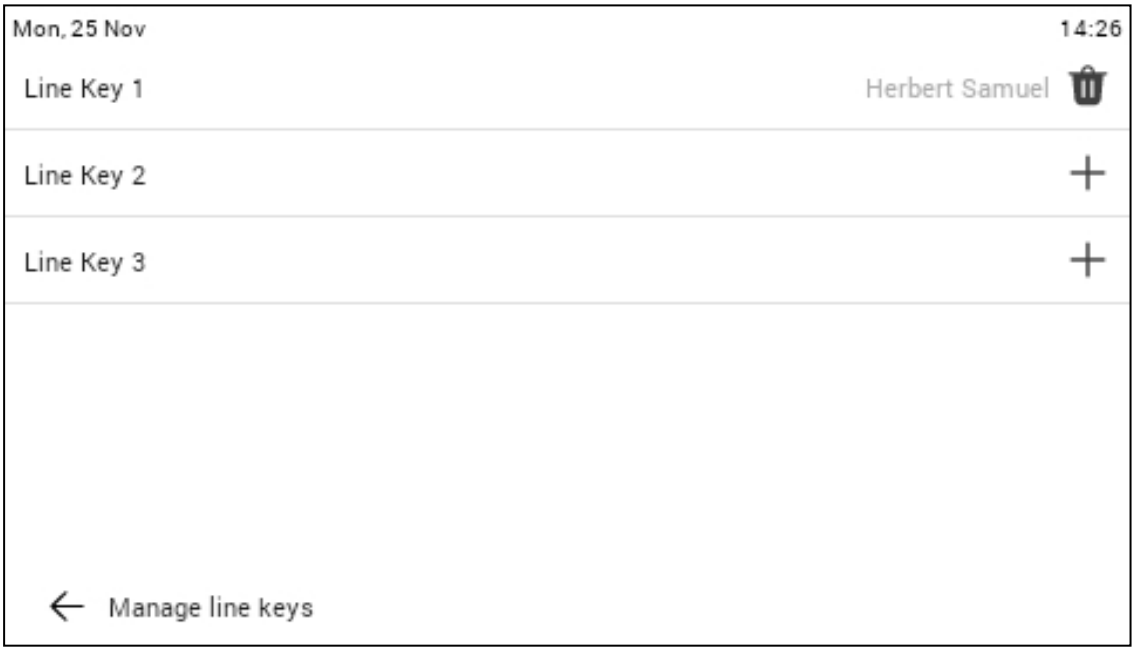
2. Navigate and select 'Reassign line key' or 'Unassign line key'. If you select 'Reassign line key', assign the line key to a different contact, as described above.

➢ **To manage the LED assign screen:**

1. Navigate to and select the assigned line key to display the line key menu, then navigate to and select 'Manage line keys'.

2. Navigate to the **column > Line Key** you wish to manage. You can assign a line or delete a contact from a line.





Manage Voicemail

To use voicemail:

- View and Play Voicemail Messages on the next page
- Enable Voicemail Support on CAP Users on the next page

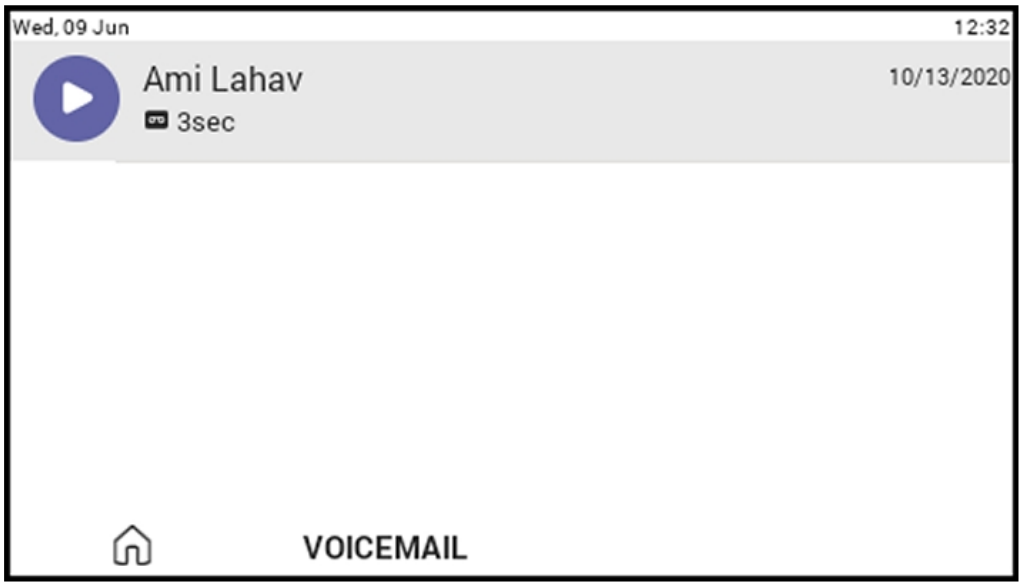
View and Play Voicemail Messages

If you hear a stutter dial tone when you pick up the handset, new messages are in your voicemail box. The phone also provides a visual indication of voicemail messages.

See here for a video clip demonstrating how to view and play voicemail messages.

➢ **To view a list of your voicemail messages:**

1. Press the voicemail key on the phone (indicated by the icon of an envelope) which will be illuminated if you have voicemail, or on the home screen, select the Voicemail softkey .



2. Scroll down to select from the list of messages (if there are voicemail messages in your box) which message to **Play**, **Call** or **Delete**.

   For more information, see here.

Enable Voicemail Support on CAP Users

The instructions here show how to enable voicemail on common area phone users. Voicemail can be enabled from the phone or from the TAC. The **Advanced calling** setting must be enabled.

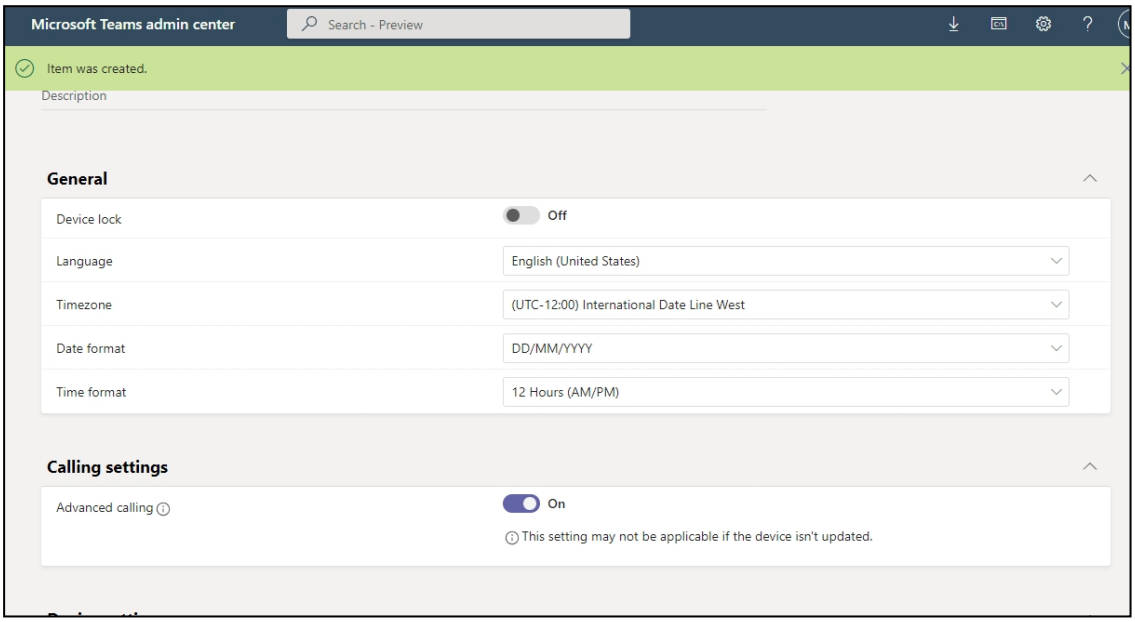
➢ **To enable voicemail from the phone:**

1. In the phone screen, select the avatar, then select **Settings**.
2. Navigate to **Device Settings** > **Device administration**.
3. Enter the password (default is **1234**).
4. Access 'Teams Admin Settings' and select **Calling**.
5. Enable **Advanced calling**.

6. Restart the Teams app as prompted.

➢ To enable voicemail from the TAC:

1. Under 'Teams Devices' in the Microsoft Teams Admin Center, select **Phones**.
2. Go to **Configuration Profiles**; in the profiles there is an option under 'Calling settings' to enable **Advanced calling**.

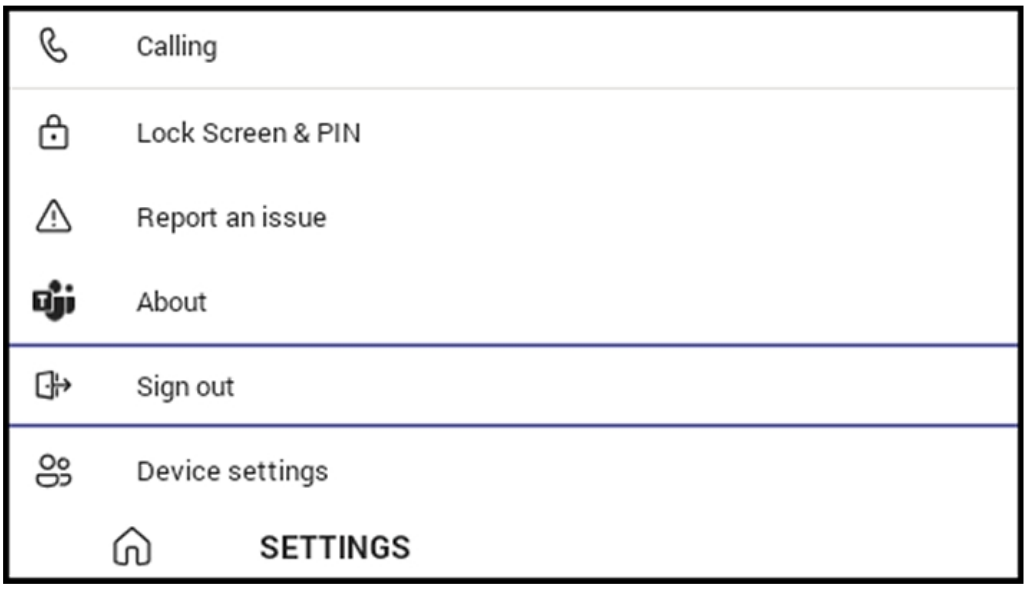


Sign Out

You can sign out of the phone application and optionally sign in as another user.

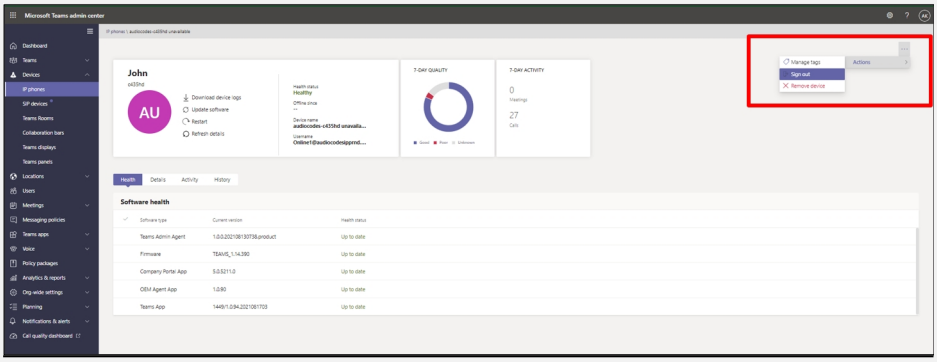
➢ To sign out:

1. Press your avatar, then navigate press **Settings**.



2. Press **Sign out** and confirm. You are signed out and returned to the **Sign in** screen.

Network administrators can alternatively sign out from devices using Microsoft Teams Admin Center (TAC). Network administrators can also remotely sign in and provision devices from Microsoft's TAC.



5 Perform Administrator-Related Operations

The following is a list of operations performed by network administrators:

- Set up Automatic Provisioning below
- Log in as Administrator on the next page
- Perform Password and Security Related Actions on page 67
- Manage Phones with the Device Manager on page 74
- Configure Phone Behavior on page 78
- Set up Emergency Handling on page 88

Set up Automatic Provisioning

Phones can be directed to a provisioning server using DHCP Option 160 or AudioCodes' HTTPS Redirect Server, to automatically load configuration (cfg) and firmware (img) files.

After the phone is powered up and network connectivity established, it automatically requests provisioning information; if it doesn't get via DHCP Option 160 provisioning method, it sends an HTTPS Request to the Redirect Server which responds with an HTTPS Redirect Response containing the URL of the provisioning server where the firmware and configuration files are located. When the phone successfully connects to the provisioning server's URL, an Automatic Update mechanism begins.

➢ **To set up DHCP Option 160, use this syntax:**

- `<protocol>://<server IP address or host name>/<firmware file name>;<configuration file name>`
- `<protocol>://<server IP address or host name>`
- `<protocol>://<server IP address or host name>/<firmware file name>`
- `<protocol>://<server IP address or host name>/;<configuration file name>`

Where `<protocol>` can be **ftp**, **tftp**, **http** or **https**

➢ **To set up AudioCodes' HTTPS Redirect Server, use this syntax:**

- `<protocol>://<server IP address or host name>`
- `<protocol>://<server IP address or host name>/<firmware file name>`
- `<protocol>://<server IP address or host name>/<firmware file name>;<configuration file name>`

- `<protocol>://<server IP address or host name>/;<configuration file name>`



The Redirect Server's default URL is:
provisioning/redirect_server_url=https://redirect.audiocodes.com
It can be reconfigured if required.

Configure the Model Name in DHCP Option 60

For devices using DHCP Option 60 (Vendor Class Identifier), the model name can be configured, using the `network/model_name_as_venid` parameter. This parameter can receive either of the following values:

- `1` (default) – uses the device's Model Name in DHCP Option 60.
- `2` – uses the fixed string **CPE-OCPHONE** in DHCP Option 60.

Log in as Administrator

You need to be logged in as Administrator to:

- Set up and modify networking parameters
- Troubleshoot (except for basic troubleshooting actions that are also available to regular users)

For details see the Device Administration section in Configure Device Settings on page 21.

➢ **To log in as Administrator:**

1. Navigate to the phone's Device Settings screen:
   a. On the phone's home screen, tap the avatar, then select **Settings**.
   b. On the 'Settings' screen, scroll down and select **Device Settings**.
2. Scroll down and select **Device Administration**.
3. Select **Login** and then in the Login screen that opens, select the **Enter password** field and use the virtual keyboard to enter the password. Note that the virtual keyboard pops up for all 'Settings' fields to allow inputting characters and / or numbers. Two virtual keyboard types can be displayed: Numeric or QWERTY.

- For enhanced security, the phone supports a strong password check for Administrator login. Note that the default password:
  - ✓ can be changed per device from the phone screen (the user first enters the default password and is then prompted to modify it to a more complete password) or via bulk configuration of multiple devices using Microsoft's TAC or AudioCodes' Device Manager.
  - ✓ must be changed before accessing the device via SSH
- Criteria required for a strong password are provided. The password must:
  - ✓ be greater than or equal to 8 characters in length.
  - ✓ contain one or more uppercase characters.
  - ✓ contain one or more lowercase characters.
  - ✓ contain one or more numeric values.
  - ✓ contain one or more special characters.

Perform Password and Security Related Actions

Define Password Complexity below

Configure Admin Login Timeout on the next page

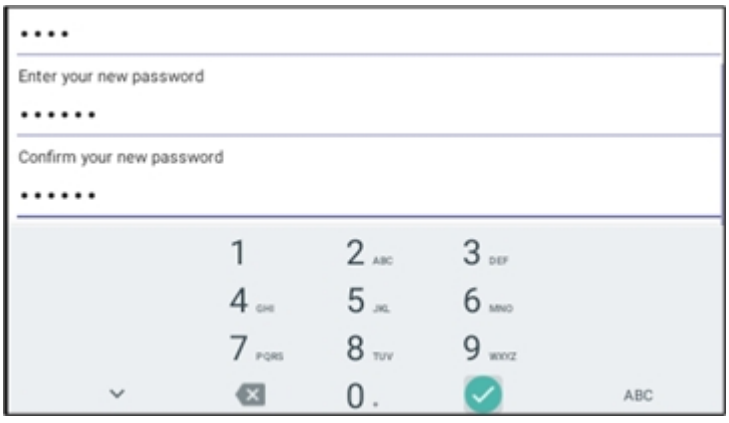
Force Users to Change their Device Lock PIN Using TAC Configuration Profile on the next page

Load Certificates to Phones on page 69

Disable a Device's USB Port on page 74

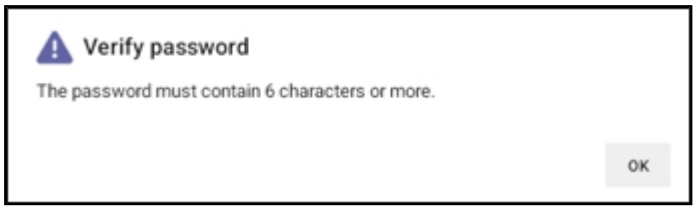
Define Password Complexity

Admin-defined password complexity is designed mainly for non-touch screen phones but it can also be applied to touch-screen phones. The feature provides administrators with the capability to finely adjust password complexity, ensuring that customers using low-cost phones (LCPs) can easily input passwords using the phone's hard keys.

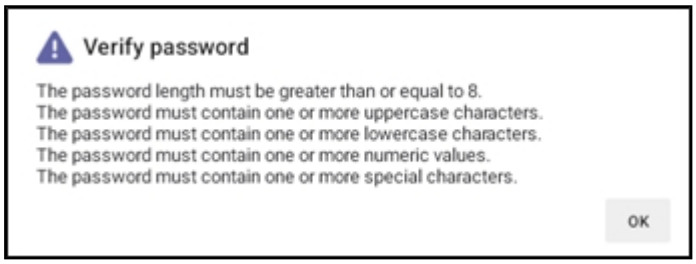


The administrator can set password complexity using the cfg configuration file parameter 'system/admin_password/strength'.

- When updating LCPs to the current version, the parameter is by default set to COMPLEXITY_MEDIUM. Password complexity rule: At least six characters and/or digits must be used.



- When updating non-LCP touch-screen phones to the current version, the parameter default is COMPLEXITY_HIGH. Password complexity rules are as follows:



- If a phone was configured with a *complex* password in earlier versions, it *preserves* that password.
- The administrator can optionally change it to a *non-complex* password.

Configure Admin Login Timeout

The administrator login can be configured to time out. The timeout's value can be configured using a cfg configuration file parameter:

```
settings/admin_logout_timeout,values=3
```

- Default value: 3 (minutes)
- Valid values: 1-10 (minutes)

- The cfg file can be loaded to the device using Device Manager.
- Timing begins when exiting the 'Device Settings' menu.
- When the timeout expires, the device logs out automatically.
- The functionality works for both registered and unregistered devices.

Force Users to Change their Device Lock PIN Using TAC Configuration Profile

Historically, users have always been provided with an option to lock their device, but in addition, the *administrator* can configure an option to *force users to change their device lock PIN*.

➢ **The workflow for forcing users to update their device lock PIN admin is as follows:**

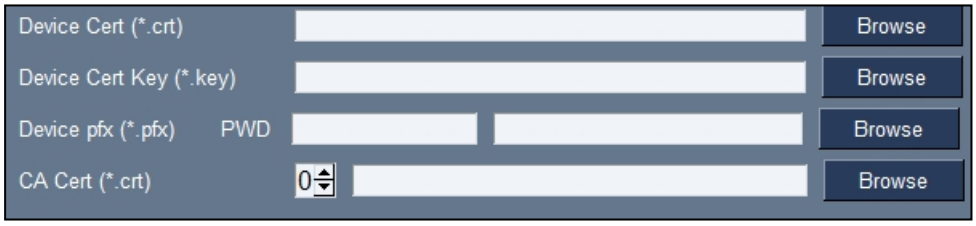
1. Set up **Enforce Device Lock** in the Microsoft Teams Admin Center (TAC) Configuration Profile.
2. When the Teams app detects a PIN lock configuration where a force PIN configuration is toggled, a popup is displayed instructing the user to navigate to device lock settings to change the PIN.
3. If the user selects **CHANGE PIN**, they can navigate to Device Settings to reset the PIN.
4. If the reset PIN configuration times out and the user has not changed their PIN, the device is locked by the Teams app and the user is restricted to emergency calls along with the set PIN notification.

Load Certificates to Phones

The following shows how to load user certificates to a single device and to multiple devices. Before loading certificates, put the certificate files in a designated folder.

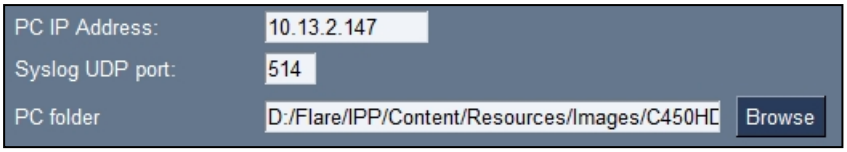
Certificates can be downloaded using:

- Device Manager (see the *Device Manager Administrator's Manual*)
- Android Device Utility as shown here:



Guidelines:

- The extension of the device certificate file must be **.crt**
- The extension of the private key must be **.key**
- Device certificates can be provisioned in **.pfx** file format (combining **.crt** and **.key**). The following parameter values can be configured in the devices' Configuration File:
  - `/security/device_certificate_url = <url>/certificate.pfx`
  - `/security/device_private_key_url = NULL`
  - `security/device_certificate/password=<pfx password>`
- The extension of the CA certificate file must be .crt. It's possible to load up to 5 CA certificates to the phone using the placement selector (0-4) (Default: 0).
- The IP address of the PC on which the certificate files are stored must be entered as shown here:



- The loaded certificate's file name must be without spaces. Spaces between words can be created using an underscore _

> - The CA certificate (ca_cert) can also be loaded to devices using AudioCodes' Device Manager, in the 'Template' screen.
> - Certificate loading is performed using HTTP. Prior to version 1.19, it was performed using SCP. The HTTP port is 8000. Make sure the port is not blocked by the organization's firewall.

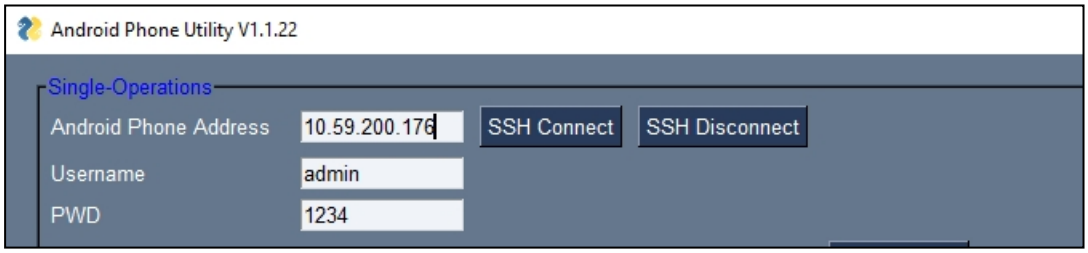
Load Certificates using AudioCodes Android Device Utility

Certificates can be loaded to a phone or to multiple phones using AudioCodes' Android Device Utility.

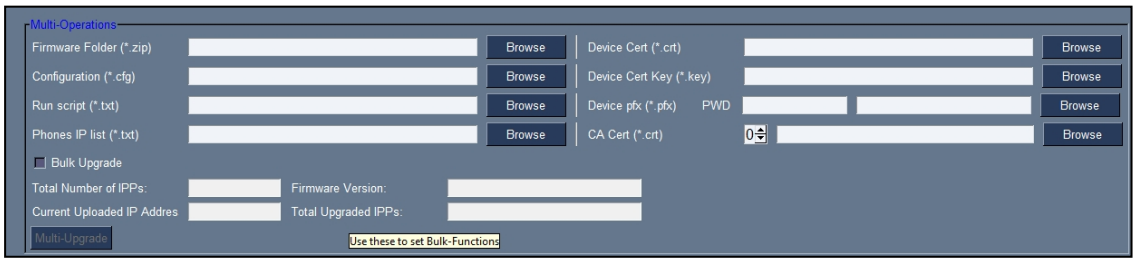
> See Android Device Utility on page 97 for detailed information about the application.

➢ **To load certificates to a single device:**

1. In the Android Device Utility, enter the phone's IP address and click **SSH Connect**.

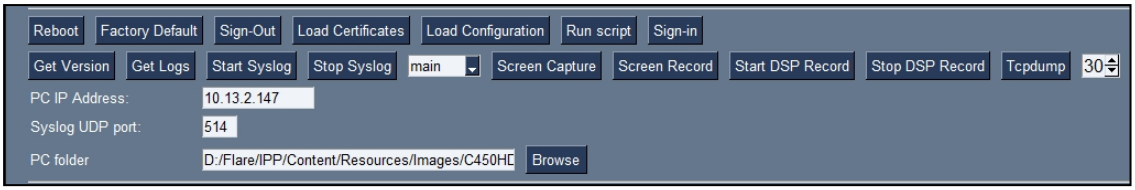


2. Click the**Browse** button next to the field **Device Cert** and then navigate to and select the certificate file to download.



> The loaded certificate's file name must be without spaces. Spaces between words can be created using an underscore _

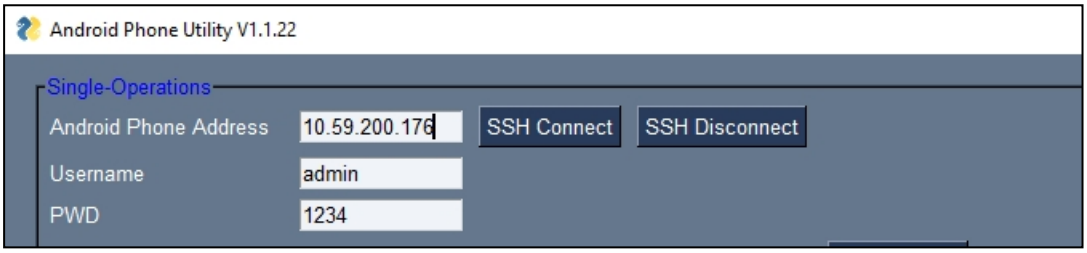
3. Click the **Load Certificates** button to add the certificate.



4. After a short period, view in the results pane "Cert Successfully Installed".

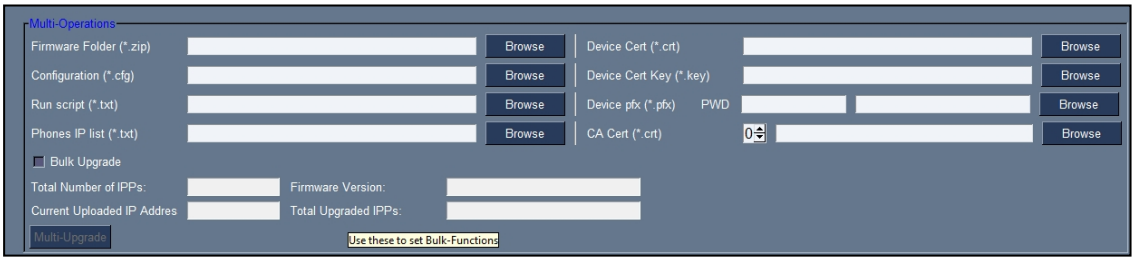
➢ To load certificates to multiple devices:

1. In the Android Device Utility (see Android Device Utility on page 97 for more information), enter the phone's IP address and click **SSH Connect**.



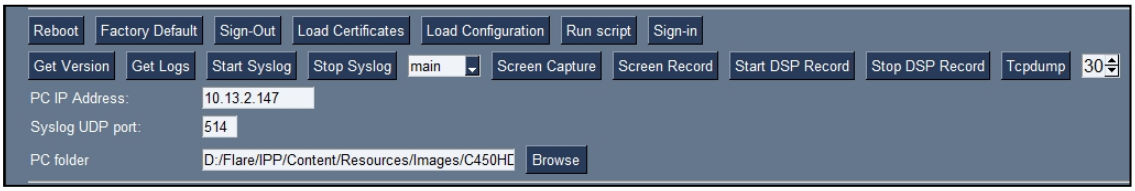
The loaded certificate's file name must be without spaces. Spaces between words can be created using an underscore _

2. Click the **Browse** button next to the field **Device Cert** under 'Multi Operations' and then navigate to and select the certificate file to download.



3. Adjacent to the field **Phones IP list** under 'Multi Operations', click the **Browse** button and then navigate to and select the txt file listing the IP addresses of the phones to which to download the certificates. The IP addresses are listed one under the other. Each occupies its own line. No notation between them is required.

4. Click the now activated **Load Certificates** button shown in the next figure, to add the certificates to the phones.



5. After a short period, view in the results pane "Certs Successfully Installed".

Certificate Enrollment using SCEP

[Available from version 1.19] The device supports certificate enrollment using Simple Certificate Enrollment Protocol (SCEP) using Microsoft's Network Device Enrollment Service (NDES) server, thereby allowing device certificates and CA certificate provisioning to be scaled to multiple devices.

After devices are provisioned with a SCEP-related configuration, they receive a CA certificate from the NDES, issue a Certificate Signing Request (CSR) to the NDES and receive a device certificate signed by the CA certificate (the one that the device received from NDES).

Configure the following three parameters:

- security/SCEPEnroll/ca_fingerprint
- security/SCEPEnroll/password_challenge
- security/SCEPServerURL

The next table shows the descriptions of the SCEP parameters.

Parameter	Description
security/SCEPEnroll/ca_fingerprint	Define the thumbprint (hash value) for the CA certificate. Default value: NULL. The network administrator must set its value to (for example): 3EBE50003ABF1DF5E6B5A3230B02B856
security/SCEPEnroll/password_ challenge	Define the enrollment challenge password. Default value: NULL. The network administrator must set its value to (for example): 7A7F9FC4BB7625F0935E67EA6D6322ED
security/SCEPServerURL	Define the SCEP server URL. Default: NULL. If you use Microsoft NDES server, use: https://<NDES server IP address/Hostname>/certsrv/mscep/mscep.dll/pkiclient.exe
security/SCEPEnroll/renewal/advancethreshold	Define the renewal advance threshold of the device certificate. Configure between 50 and 100 (in units of percentage) Default: 80 This indicates that a renewal of the certificate (device.crt) will be initiated when 80 percent of its validity is reached.

Parameter	Description
security/SCEPEnroll/rollover/advancethreshold	Specify the threshold of the CA Root certificate's validity at which to initiate a renewal. Configure between 50 and 100 (in units of percentage). Default: 90 This indicates a renewal of the certificate (CAROOT.crt.) will be initiated when 90 percent of its validity is reached.
security/CSR/CommonName	Define a value according to the following 'wild-card' format: {mac} – the device's MAC address {IP} – the device's IP address {model} – the device model
security/CSR/Country	Define the name of the country used to generate the certificate signing request (CSR). Use the ISO (International Organization for Standardization) code of the country / region in which the organization is located.
security/CSR/Email	Optionally, define the email address used to generate the CSR.
security/CSR/Organization	Optionally, define the legal name of the organization used to generate the CSR.
security/CSR/State	Optionally, define the name of the state / province used to generate the CSR.
security/SCEPEnroll/otp_server_url	Optionally, set the One-Time Password and Certificate server URL
security/SCEPEnroll/otp_password	Optionally, set the One-Time Password and Certificate Thumbprint
security/SCEPEnroll/otp_username	Optionally, set the One-Time Password and Certificate server username

Disable a Device's USB Port

Applies to all AudioCodes' Teams phones.

This functionality complies with the physical security requirements of some customers, specifically, customers who are in the government space.

Customer administrators can enable or disable a phone's USB port with the following parameter available in the phone's .cfg configuration file:

```
admin/usb_enabled=1
admin/usb_enabled=0
```

The parameter can be configured via the AudioCodes One Voice Operations Center (OVOC) Device Manager module used to manage AudioCodes' Teams phones, as well as via SSH command.

The parameter is also available in the template which can be applied to multiple phones via the Device Manager.

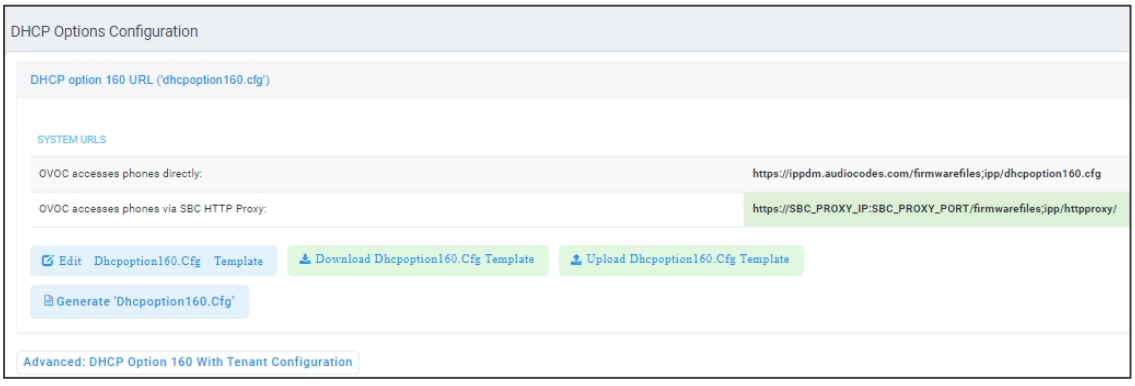
- After setting the parameter to 0, the phone cannot under any circumstances detect a plugged-in USB device.
- Additionally, all USB-related settings are removed from the phone's user interface.

Manage Phones with the Device Manager

AudioCodes' Device Manager manages Android-based Teams phones in a similar way to UC-type phones. Teams phones' configuration parameters are in the same format as UC phones. A .cfg configuration file is defined for each device. Device Manager version 7.8.2000 and later supports Android-based Teams devices.

Zero Touch Provisioning is supported in a non-tenant aware manner; each local DHCP Option 160 must be configured with a fully-specified URL pointing to **dhcpoption160.cfg** as shown here:

Table 5-1: DHCP Option 160 URL



This URL is displayed in the Device Manager page under **Setup** > **DHCP Options Configuration**. After devices are added to the Device Manager (which allocates them to the default tenant), they can be re-allocated by selecting **Change Tenant** in the 'Actions' menu. The above URL can also be configured in AudioCodes' Redirect Server. Android-based Teams devices currently support:

- Provisioning of configuration
- Provisioning of firmware
- Switching to UC / Teams
- Monitoring (based on periodic Keep-Alive messages sent from devices)
- Resetting the device

The Device Manager's 'internal' functions (which don't involve devices) are:

- Change tenant
- Change template
- Show info
- Generate Configuration
- Delete device status
- Nickname



- To change a device's configuration, see the *Device Manager Administrator's Manual*. Changing a device's configuration using the Device Manager is the same for Android-based Teams devices as for UC devices.
- To commit a change made at the template/tenant/site/group/user level, perform **Generate Configuration**. The change can be validated in the device's .cfg file. The Android-based endpoint pulls the updated configuration when the next periodic provisioning cycle occurs.

Configure a Periodic Provisioning Cycle

Network administrators can configure how often periodic provisioning cycles will occur, to suit enterprise management preference.

➢ **To configure how often periodic provisioning cycles will occur:**

- Use the following table as reference.

Table 5-2: Periodic Provisioning Cycle

Parameter	Description
provisioning/period/type	Defines the frequency of the periodic provisioning cycle. Valid values are:

Parameter	Description
	■ HOURLY ■ DAILY (default) ■ WEEKLY ■ POWERUP ■ EVERY5MIN ■ EVERY15MIN Each value type is accompanied by additional parameters (see Supported Parameters on the next page) that further defines the selected frequency.

Manage Devices with HTTPS

Android-based Teams devices support an HTTPS connection.

➢ **To establish an HTTPS connection:**

- The server certificate must be signed by a well-known Certificate Authority .

  -OR-

- A root/intermediate CA certificate must be loaded to the device's trust store via Configuration File parameter '/security/ca_certificate/[0-4]/uri'.

➢ **To maintain backward compatibility with devices previously running UC versions:**

- Configure parameter '/security/SSLCertificateErrorsMode' to **Ignore**

Configure QoS on PC Port

QoS settings for the PC port are supported (VLAN for PC port). Administrators can configure PC port QoS via the device's cfg configuration file which can be loaded to the device via AudiocCodes' Device Manager. The following three cfg configuration file parameters are available configuring the feature:

Parameter	Description
network/lan/vlan/pc_port_ tagging/enable=0	Defines the PC port VLAN as enabled / disabled. ■ 0 = PC port VLAN disabled ■ 1 = PC port VLAN enabled Default: 0

Parameter	Description
network/lan/vlan/pc_port_id=0	Defines the PC port VLAN ID. Range: 0-4096 Default: 0
network/lan/vlan/pc_port_priority=0	Defines PC port VLAN priority. Range: 0-7 Default: 0

The feature provides PC port QoS for AudioCodes' Android-based phones which feature settings for VLAN *and* VLAN Priority (802.1p) for the PC port.

Supported Parameters

Listed here are the Configuration File parameters currently supported by Android-based Teams devices. They're in AudioCodes' UC version format. The parameters are comprised of Microsoft configuration profile settings and AudioCodes' device-specific parameters.

- general/silent_mode = 0 (default)/1
- general/power_saving = 0 (default)/1
- phone_lock/enabled = 0 (default)/1
- phone_lock/timeout = 900 (default) (in units of seconds)
- phone_lock/lock_pin = 123456
- display/language = English (default)
- display/screensaver_enabled = 0/1
- display/screensaver_timeout = 1800 (seconds)
- display/backlight = 80 (0-100)
- display/high_contrast = 0 (default) /1
- date_time/timezone = Asia/Jerusalem
- date_time/time_format = 12 (default) / 24
- network/dhcp_enabled = 0/1
- network/ip_address =
- network/subnet_mask =
- network/default_gateway =
- network/primary_dns =
- network/pecondary_dns =
- network/pc_port = 0/1

- office_hours/start = 08:00
- office_hours/end = 17:00
- logging/enabled = 0/1
- logging/levels = VERBOSE, DEBUG, INFO, WARN, ERROR, ASSERT, SILENT
- admin/default_password = 1234
- admin/ssh_enabled=0/1 (default)
- security/SSLCertificateErrorsMode = IGNORE, NOTIFICATION, DISALLOW (default)
- security/ca_certificate/[0-4]/uri
- provisioning/period/daily/time
- provisioning/period/hourly/hours_interval
- provisioning/period/type = HOURLY, DAILY (default), WEEKLY, POWERUP, EVERY5MIN, EVERY15MIN
- provisioning/period/weekly/day
- provisioning/period/weekly/time
- provisioning/random_provisioning_time

Configure Phone Behavior

- Enable the AudioCodes Smart Button for Redial Functionality below
- Configure Minimum and Maximum Ringer Volumes via the Phone's Configuration File on the next page
- Disable the Phone's Speaker Hard Key on the next page
- Update Phone Firmware Manually on page 80
- Update Microsoft Teams Devices Remotely on page 83
- Apply a Partial Configuration Profile on page 83
- Enroll a Device with Intune Policies on page 83
- Configure Time on Teams Devices on page 87
- Restore the Phone to Default Settings on page 35

Enable the AudioCodes Smart Button for Redial Functionality

The phone's **AudioCodes** Smart Button is programmable to function as a redial button.

Enabling this functionality is done through SSH, using the following command:

```
personal_settings/audiocodes_key_to_redial/enabled=1
```

Configure Minimum and Maximum Ringer Volumes via the Phone's Configuration File

Android phones feature a capability enabling administrators to configure minimum and maximum ringer volumes via the phone's configuration file. The feature complies with industrial customers' requirements for phone ringers to be louder and for administrators to be able to stop users from reducing ringer volume to too low.

➢ **To configure maximum and minimum volume:**

1. Set the configuration file parameter 'audio/ringer/volume_max' to **10**.
2. Set the configuration file parameter 'audio/ringer/volume_min' to **0**.

- Ringer volume by default has a range of **0-10**, where **0** is mute.
- The capability allows administrators to define a *new minimum* | *maximum range* of **3-7** so that the user will be able to reach a minimum of **30%** and a maximum of **70%** of the original **0-100%** range as shown in the figures below. The same principle applies to all phone models. Only screen dimensions vary.

Disable the Phone's Speaker Hard Key

The speaker hard key on the phone can be configured to be disabled so that in an office environment, the user won't have the option to use the speaker. Speaker functionality will then be disabled during calls. Pressing the hard key will have no impact and its light will not illuminate. Only use of the handset and headset will be enabled.

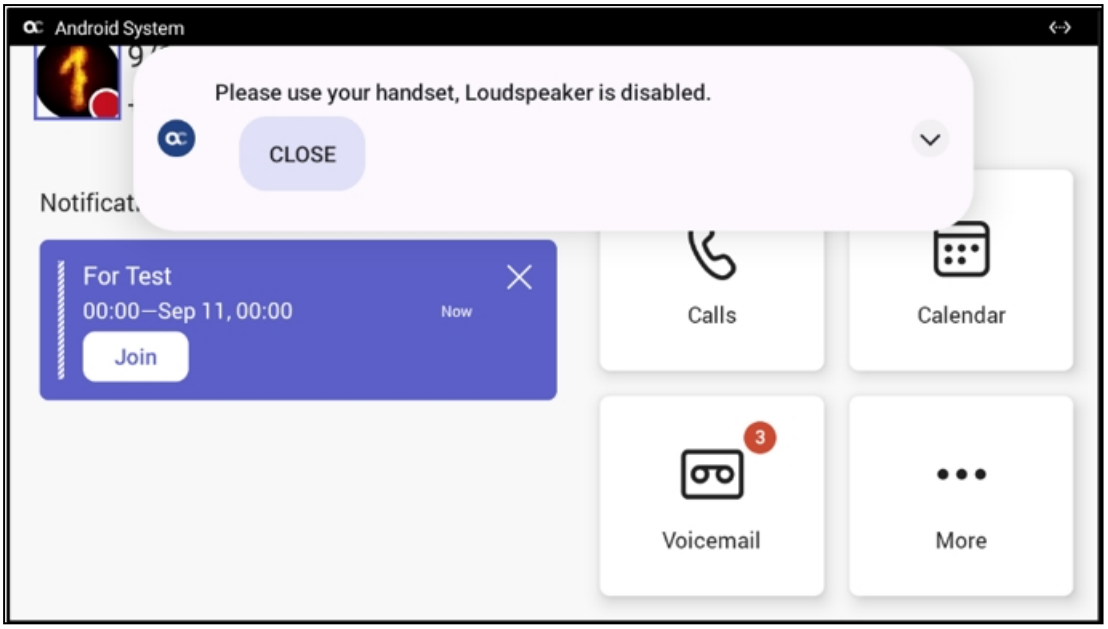
The feature complies with requests from customers in whose offices discretion is important (e.g., government).

➢ **To configure the speaker hard key on the phone to be disabled:**

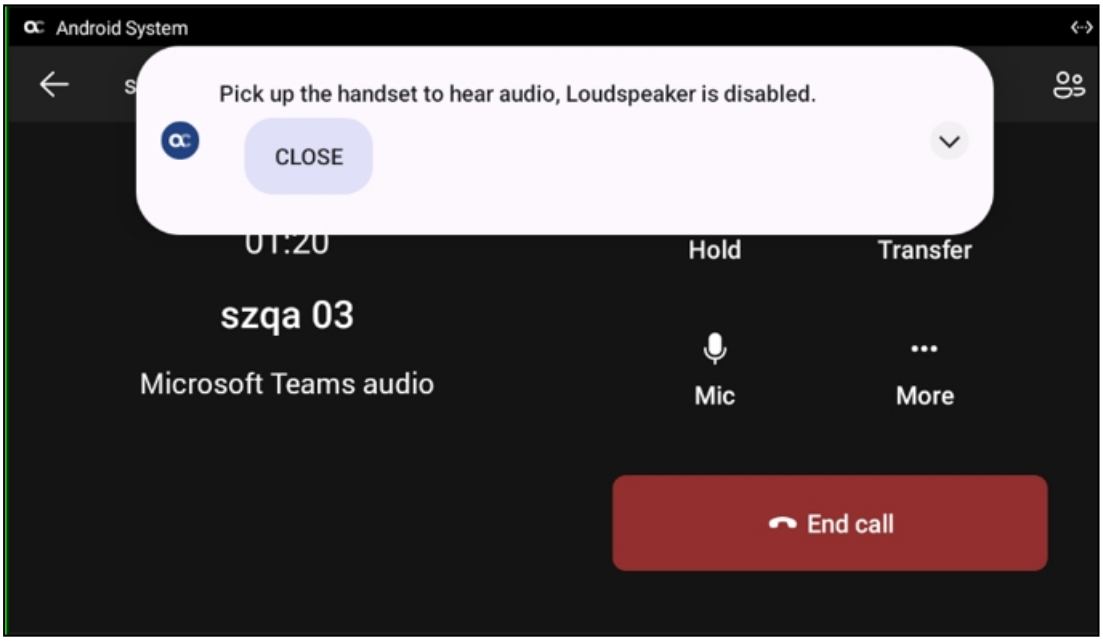
1. Configure the configuration file parameter 'audio/speakerphone/enable' to:
   - **0** = Disable (default)
   - **1** = Enable

Ring to speaker still functions.

2. If after the feature is enabled the user presses the 'Speaker' button in the idle screen, the following popup message is displayed in the phone screen:



3. If after the feature is enabled the user presses the 'Accept' softkey or the speaker hard key, the following popup message is displayed in the phone screen:



4. The user can then answer by picking up the handset or by putting on the headset if a USB headset is connected. The popup indication then disappears.

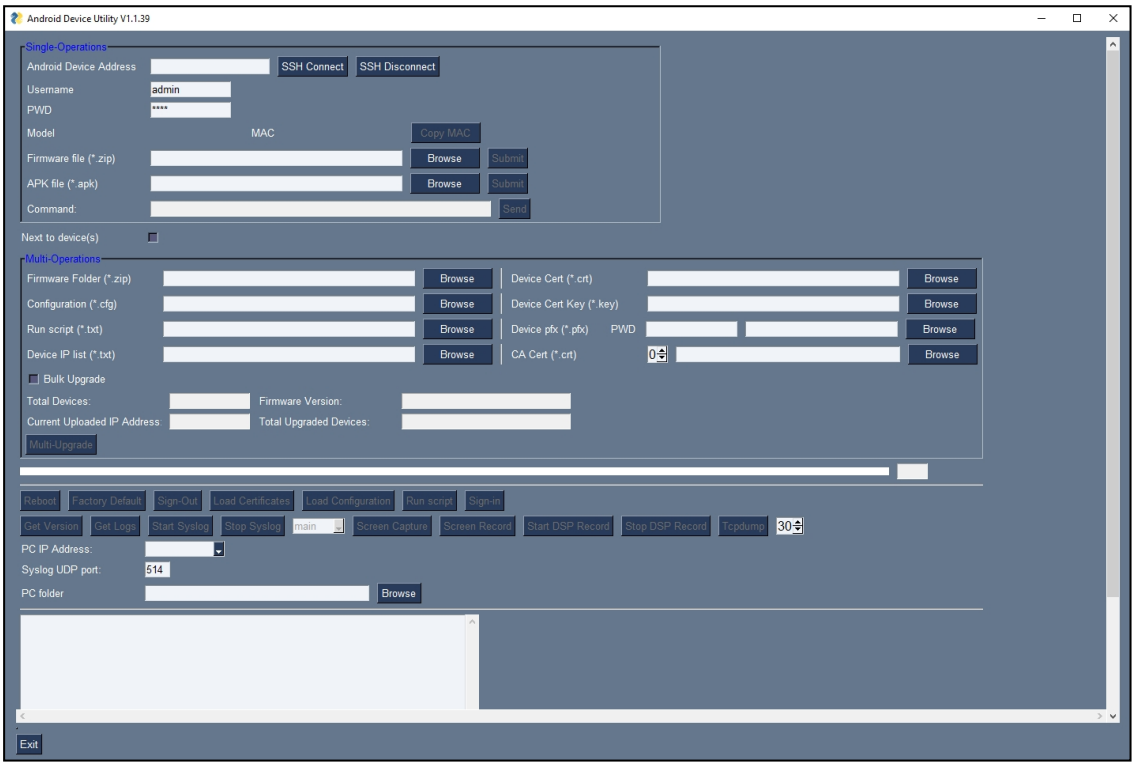
Update Phone Firmware Manually

AudioCodes' Android Device Utility allows network administrators to manually update a phone's firmware.

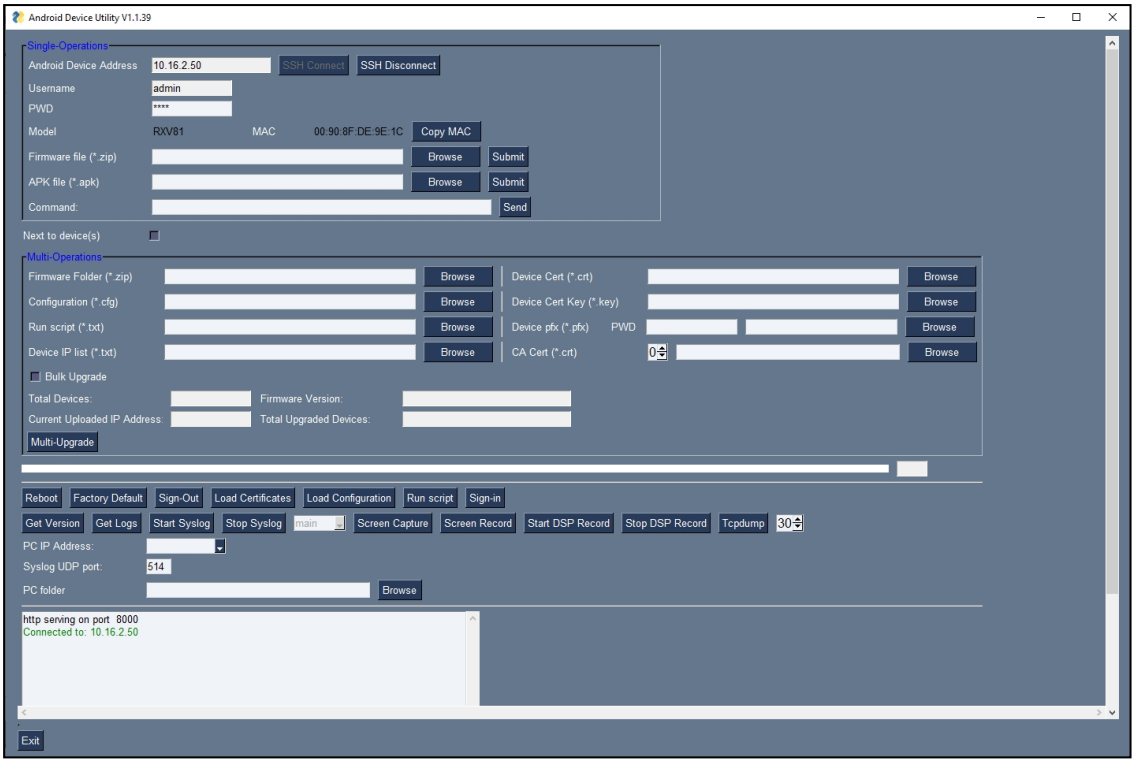
- Firmware downgrade is blocked as of version 2.3.453 to prevent a possible race condition between Microsoft TAC and AudioCodes' OVOC | Device Manager.
- After an upgrade is completed and the popup of 'Reboot now or Later' appears, wait for about 30 seconds before pressing the **Reboot** button.

To manually update a phone's firmware:

1. From the PC's **Start** menu, select the app icon or click the application's exe file in the folder in which you saved it.

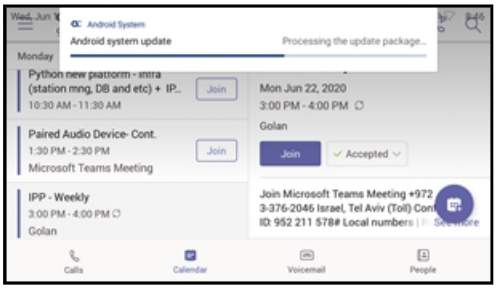


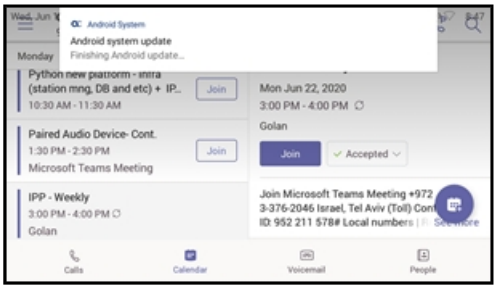
2. In the 'Android Phone Address' field, enter the IP address of the device (get it by pressing the MENU hard key > **About phone** > **Status** > **IP Address**).
3. Click **SSH Connect**; a connection with the device is established.

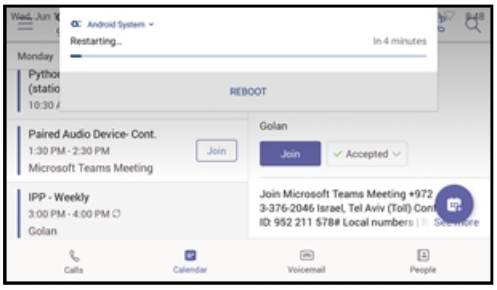


4. Under the 'Single Operations' section of the screen next to the field 'Firmware file', click the **Browse** button and navigate to and select the candidate image file.

5. Click the **Submit** button; a firmware upgrade process starts; the phone is automatically rebooted; a notification pops up when the process finishes. The phone notifies you that it's being updated and rebooted.







Upgrade notifications are also displayed when the phone is upgraded remotely from Microsoft Admin Portal or from AudioCodes' Device Manager.

Update Microsoft Teams Devices Remotely

For instructions on how to update Microsoft Teams devices remotely, see here.

Apply a Partial Configuration Profile

Configuration profiles enable administrators to simultaneously assign several settings to multiple Android devices. Different types of settings are supported, e.g., general settings, device settings, network settings applied to the device through a partner agent, and meeting settings applied on the Teams app via the Microsoft Teams Admin Center (TAC).

When the administrator assigns a configuration profile to a device, not all settings that are part of that profile are applied to the device. Settings on the device that were configured by the user are not overridden. Administrators can change a particular setting without overriding the other setting values defined by the user.

For more details and instructions, click here.

Enroll a Device with Intune Policies

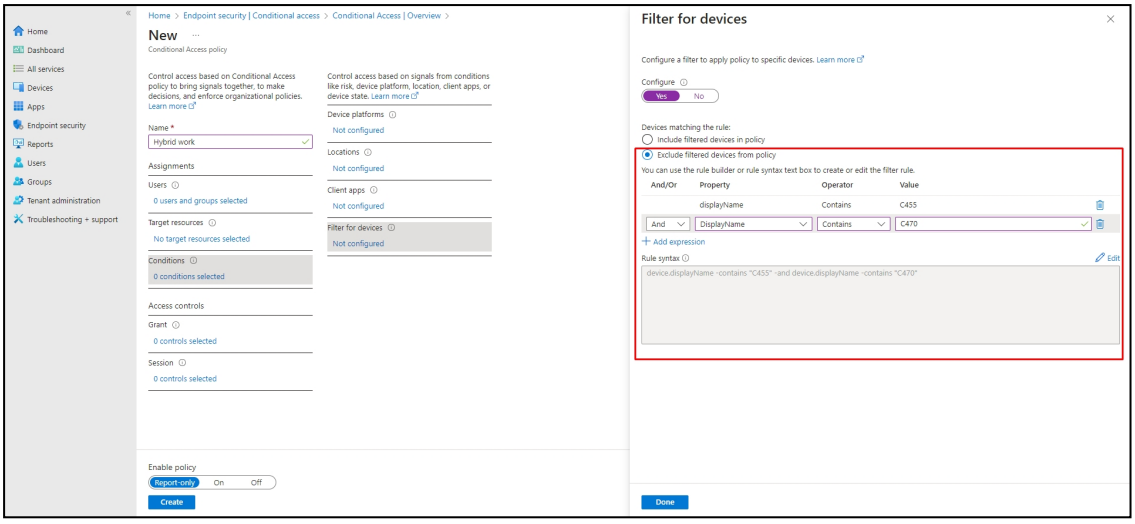
- To learn about Intune conditional access and Intune device policies for Microsoft Teams devices, click here.
- For more information about AOSP device management , refer to official MS documentation. In addition, refer to the AOSP Migration Guide.
- See also the following sections for detailed instructions:
  - Create an Exclusion Group below
  - Remove Devices from Intune Admin Center on the next page

Create an Exclusion Group

The information presented here shows how to *exclude* AudioCodes Android-based Teams devices from the organization's Intune policies.

➢ **To exclude devices from the organization's Intune policies:**

- Remove all conditions that were previous configured:
  - Access Microsoft Azure Government Portal **Home > Conditional Access Policies > Require Hybrid Joined or Intune to Access Cloud Resources Conditional Access policy** as shown in the figure below.
  - Exclude the device from Intune policies and replace **displayName -contains <C4xxHD>** where **<C4xxHD>** is the name of the device model (**device.model**).

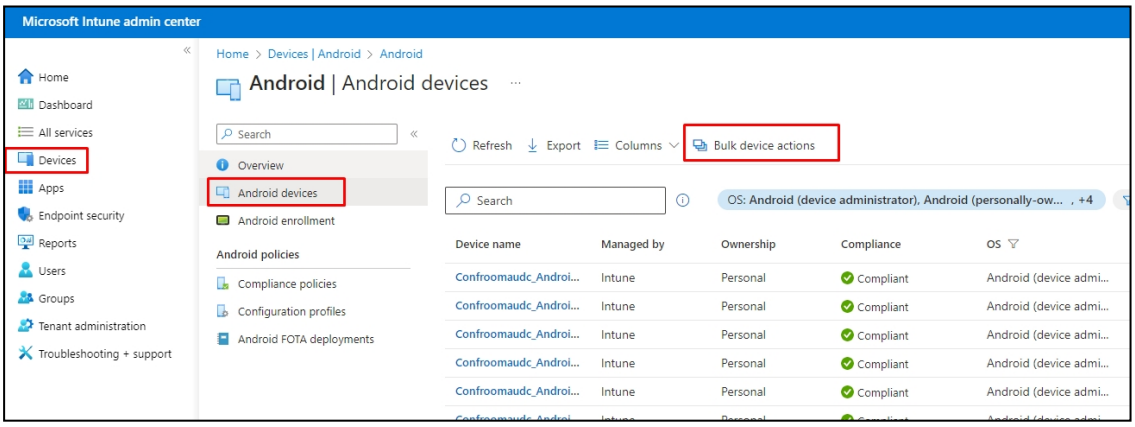


Remove Devices from Intune Admin Center

You can remove devices from Intune Admin Center when the maximum capacity of signed-in devices is reached.

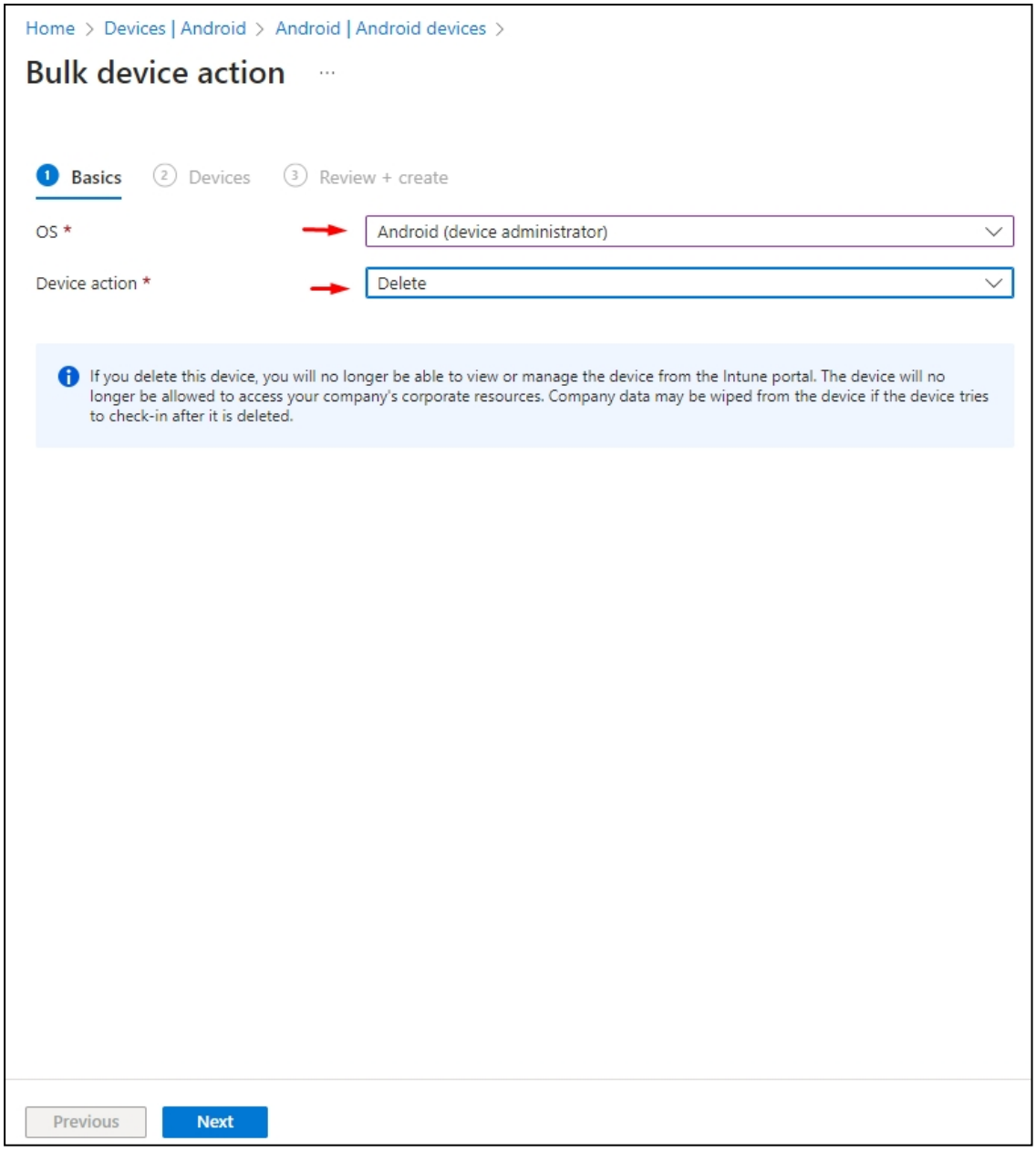
➢ To remove devices from Intune Admin Center:

1. Go to Microsoft 365 Admin Center [portal.office.com] and log in with an Administration account.
2. Navigate to **Devices** > **Android devices**.

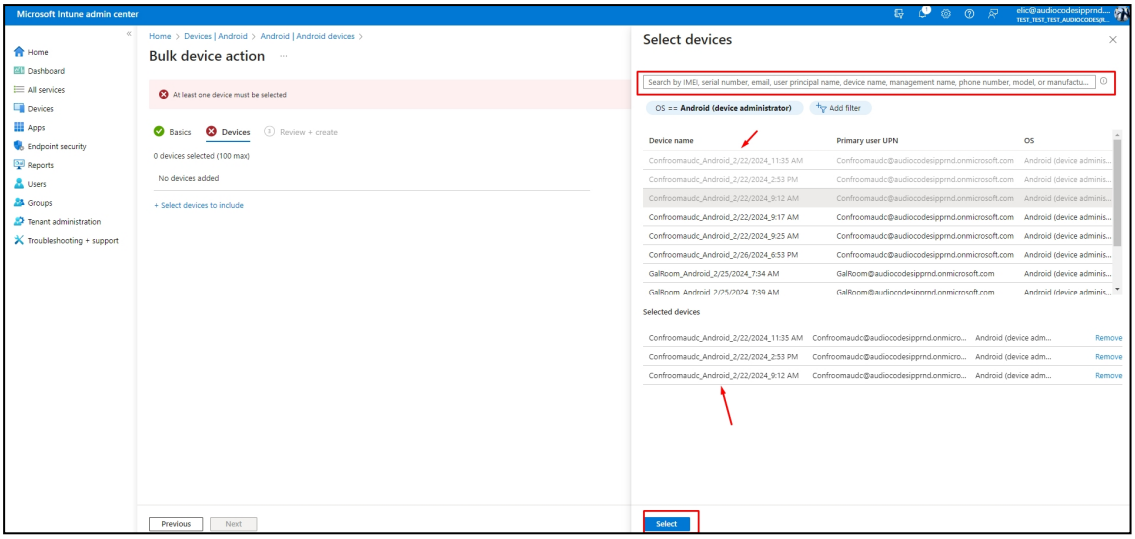


> The Intune Admin Center service is licensed according to the terms of individual licenses so not all network administrators will be able to navigate to it. Check if the license you're using includes the service or not.

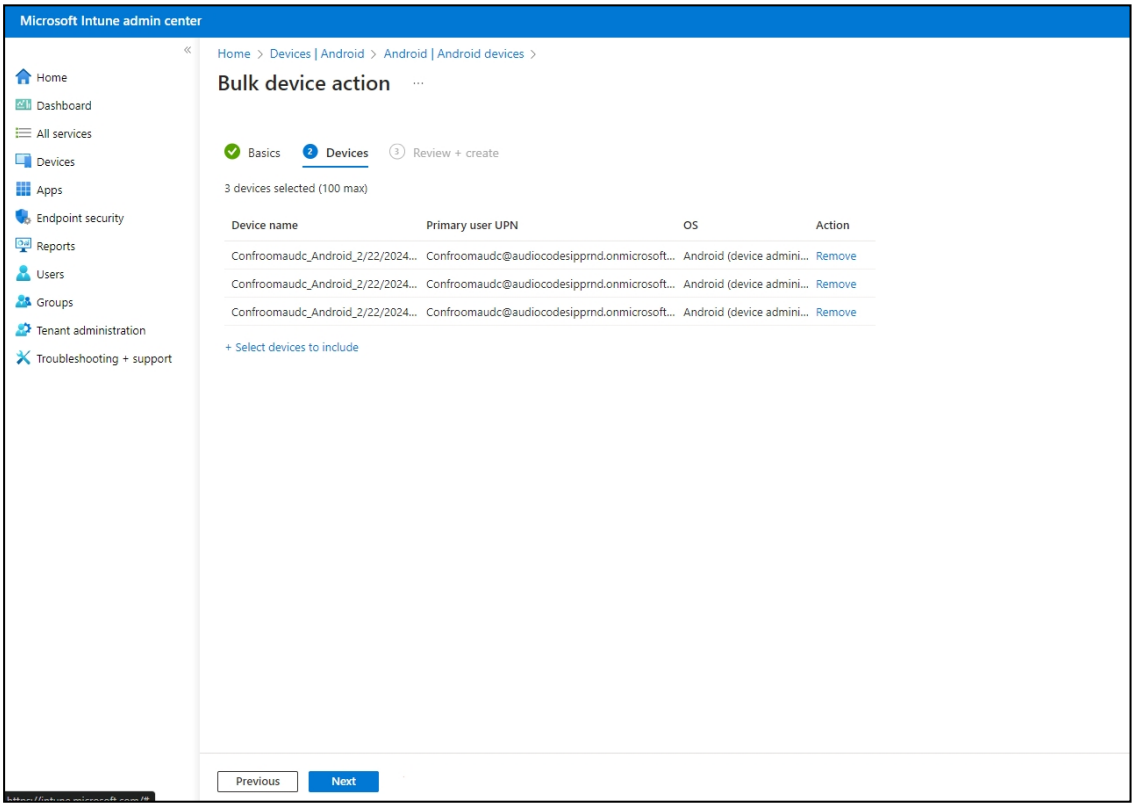
3. Click **Bulk device actions**.



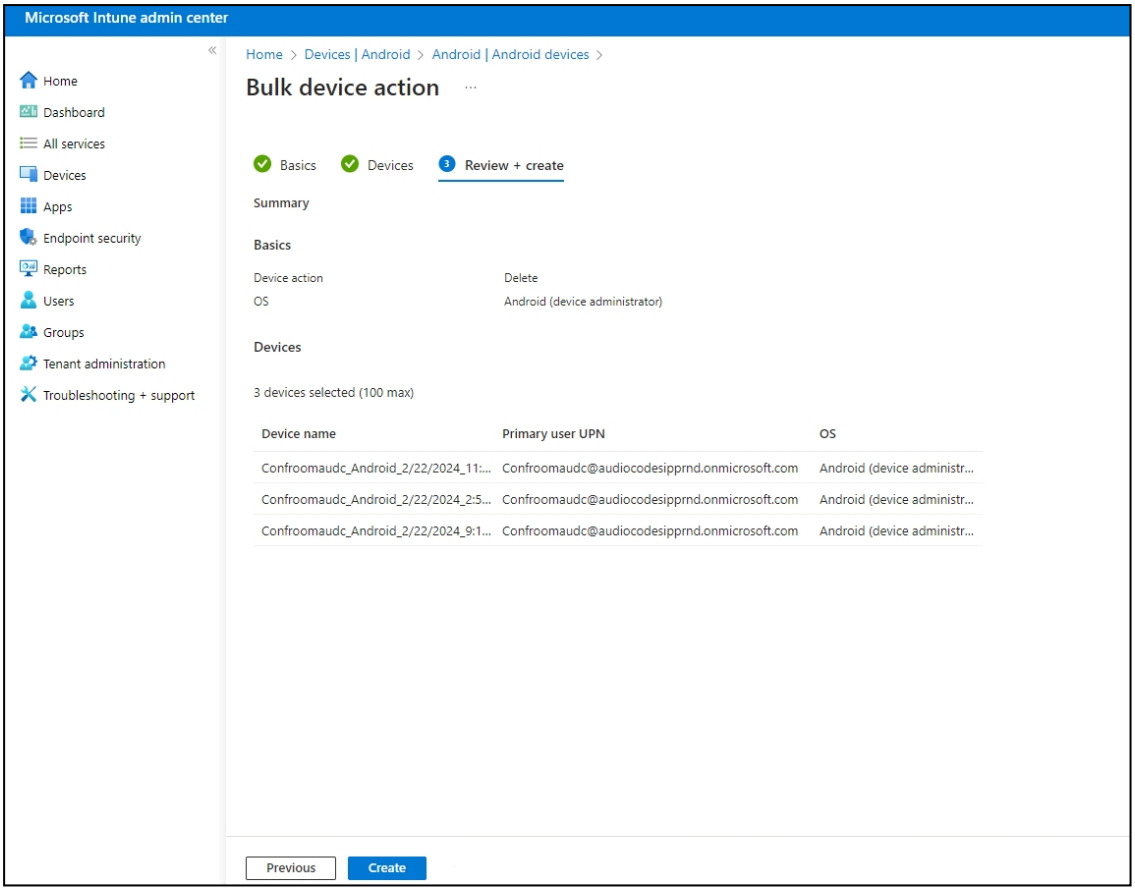
4. From the 'OS' drop-down under the ❶ **Basics** tab, select **Android (device administrator)**. From the 'Device action' drop-down, select **Delete**. Click **Next**.



5. Select the devices to delete (i.e., to remove from Intune Admin Center), and then click **Select**.



6. Under the 2 **Devices** tab, click **Next**.



7. Under the 3 **Review + Create** tab, make sure your definitions are correct and then click **Create**; the administrator receives a notification that a delete action from Intune was successfully initiated on all devices and that *n* devices were removed.

> It may take some time to completely sync the devices with the account so after deleting the devices wait for 30 minutes before signing in.

Configure Time on Teams Devices

- AudioCodes recommends using Geolocation (the default setting) as the time zone configuration method. With this configuration, if no other changes to the time zone settings are made, the device retrieves the time from it's geographical location.
- Manual time zone setting is NOT recommended. Choosing a time zone manually may cause retrieval of the incorrect time zone, and cause functionality issues.

You can configure the time zone using one of the following methods, which are listed in order of preference for best performance:

- **Geolocation (Default)**:

- The default geolocation method uses a devices public IP address to obtain it's location. If the devices are behind NAT they are using STUN server to discover their public IP addresses.
- A common STUN server example is Google's publicly accessible server: stun.l.google.com:19302 (default URL).

- **DHCP Option 100/101 (posix/tzdbx)**:
  - Configuration is obtained from DHCP server.
- **Admin Provisioning**:

  Use one of the following:
  - Teams Admin Center, created under configuration profile.
  - Device Manager, created in configuration parameters setup.

  The supported parameters for Device Manager configuration can be found in product specific Admin and User guides. For Teams Admin Center refer to **Microsoft documentation > Configuration profile**.
- Administrators can **manually define the NTP server** to comply if necessary with enterprise security requirements, if those requirements preclude using DHCP Option 42.

  Manual configuration takes precedence over DHCP Option 42 and the time servers.

  Two ways to manually define the NTP server are available:
  - in the phone's user interface
  - in the phone’s .cfg configuration file, using the parameter 'date_time/ntp/server_ address'

  See also here for more information.

In most regions, Daylight Saving Time changes the regional time twice a year. DST Validation allows maintaining accurate time. Two options for phones to get the correct time are:

- [Recommended] If the DHCP server offers Timezone Options (100/101), the phone will set the obtained time zone and display the correct time on the screen; the time will be calculated based on an embedded Time Zone database, factoring in DST.
- If the DHCP server offers Time Offset Option only (2) and if the Timezone priority mechanism is determined to be on DHCP and not on GEOLOCATION, the phone will assign the obtained time offset to the first matched region in the list but there is a good chance it won’t reflect the actual geographical location, therefore the displayed time might be incorrect in some cases. For example, if the given time offset is GMT-5 and the phone is located in Mexico, the phone will get the time (and the DST setting) from central time and not from Mexico because in GMT-5 there is also Central Daylight Time.

Set up Emergency Handling

- Set up an E911 Emergency Location on the next page

■ Enable Users to Make Calls even if Teams is Unavailable below

Set up an E911 Emergency Location

An E911 emergency location can be set up using the Microsoft Teams Admin Center (TAC). For details and instructions, click here.

After a location has been defined, make sure that:

- AudioCodes' phone runs the latest firmware released.
- E911 information is displayed on the phone screen 30-120 minutes after the location is set (time estimated under laboratory conditions).
- To trigger information to be shown before that time period, dial a 933-test call and check if the location has been accepted, displayed and vocalized by the announcer.

Enable Users to Make Calls even if Teams is Unavailable

A fallback feature enables users to make calls even if Teams is unavailable. If Teams is unavailable, the device will still have connectivity to the internet via the SBC using a SIP-based application.

For this feature to work, the SBC must be configured for WebRTC. For details, refer to the *WebRTC* section in the Mediant Software (VE-CE-SE) SBC User's Manual.

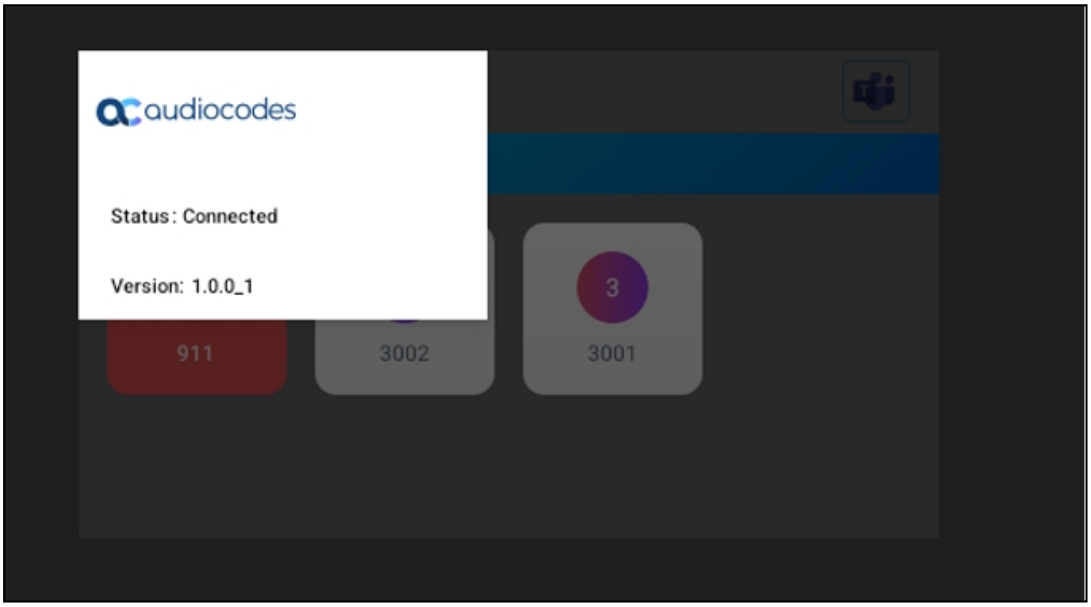
➢ **To enable it, the administrator must:**

1. Set parameter 'system/ace/shortcut_enabled' to **1** (default = **0**); an AC soft button is then displayed in the lower right corner of the phone screen (if Teams is unavailable) as shown here:



➢ To register a SIP account (sign in), the admin must:

1. Set the following parameters:
   - `personal_settings/sip/server =wss://<SBC URL>`
   - `personal_settings/sip/port =<SBC server port>`, e.g., **443**
   - `personal_settings/sip/domain =<domain name>`
   - `personal_settings/sip/username=<account name>`
   - `personal_settings/sip/password=<account password>`
2. View the account status: **Connected** if registered, **Not Connected** if not registered.



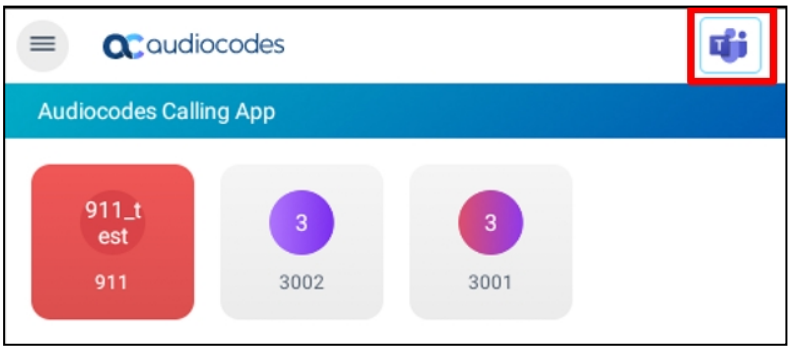
➢ To enter the app, the user must:

- Press the **AudioCodes Smart** button on the phone as shown below (only when parameter 'system/ace/minilauncher_enabled' is set to **1**) to switch between Teams and the app.



➢ **To add up to 41 speed dial keys, the administrator must:**

1. Use the following parameters:
   - `personal_settings/functional_key/[0-40]/speed_dial_number= < destination>`
   - `personal_settings/functional_key/[0-40]/type = DEFAULT` (button retains its Teams color) -or- `EMERGENCY` (button is colored red)
   - `personal_settings/functional_key/[0-40]/display_name= <destination display name>`

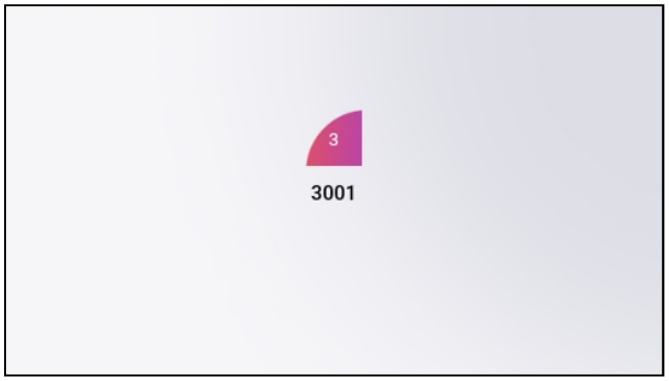


➢ **To make a call, the user must:**

1. Press the speed dial; the calling screen shows the callee's name. To end the call, on-hook the handset or press the speaker/headset button.
2. View the phone's calling screen:



3. View the phone's incoming call screen:



4. [Optionally] During the call, the user can adjust the volume, mute, unmute, DTMF, switch audio source, etc.

- The app blocks incoming calls when Teams is in the foreground.
- When Teams is available and the app is in the foreground in idle state, the phone cannot get an incoming Teams call.
- After rebooting, the device always displays the Teams home screen.

6 Troubleshooting

The information presented here shows how to troubleshoot AudioCodes devices:

- Basic Phone Troubleshooting for Users below
- Device Troubleshooting Options on the next page
- Android Device Utility on page 97
- SSH based Debugging on page 108
- Microsoft Teams Admin Center on page 108
- DSCP on page 111
- Additional Debugging Options on page 112

Basic Phone Troubleshooting for Users

Read the following if an issue with your phone occurs. Contact your network administrator if necessary. Network administrators can also use this documentation as reference.

Table 6-1: Troubleshooting

Symptom	Problem	Corrective Procedure
Phone is off (no screen displays and LEDs)	Phone is not receiving power	■ Make sure the AC/DC power adapter is attached firmly to the DC input on the rear of the phone. ■ Make sure the AC/DC power adapter is plugged into the electrical outlet. ■ Make sure the electrical outlet is functional. ■ If using Power over Ethernet (PoE), contact your network administrator to check that the switch is powering the phone.
Phone is not ringing	Ring volume is set too low	■ Increase the volume (see Adjust Ring Volume on page 52). .
Screen display is poor	Screen settings	■ Adjust the phone's screen brightness.
Headset has no audio	Headset not connected properly	■ Make sure your headset is securely plugged into the headset port located on the side of the phone. ■ Make sure the headset volume level is adjusted adequately (see Adjust Headset Volume on page 53).

Device Troubleshooting Options

The phone's Device Settings screen contains a multitude of status monitoring and debugging tools.

> You need to be logged in as Administrator to access most troubleshooting tools (see Log in as Administrator on page 66).

Debugging options include:

- Monitor Phone Process Statuses below
- Get Audio Debug Recording Logs on the next page
- Capture Traffic Using 'rpcapd' on the next page
- Restore the Phone to Default Settings on page 35
- Return to Previous Version on page 97

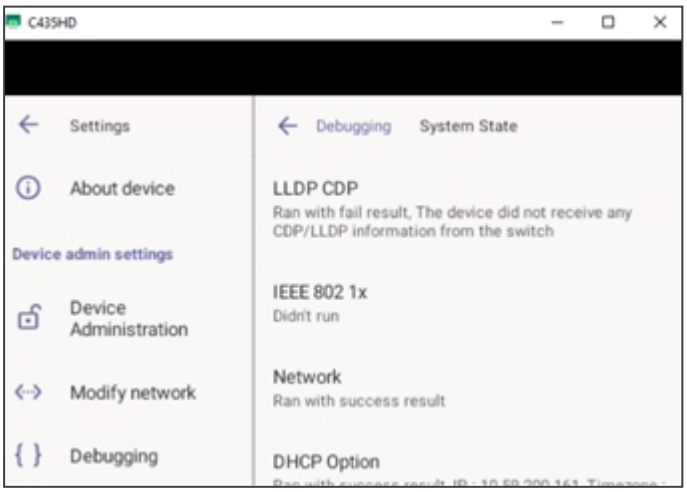
Monitor Phone Process Statuses

Administrators can monitor process statuses on the phone's System State screen.

If initial provisioning is unsuccessful or if the administrator encounters an issue related to the network / connection to Device Manager, this feature gives an indication as to why. The feature enables debugging via the phone screen without requiring external systems. The administrator can check connectivity independently of external apps.

➢ **To monitor the process statuses:**

1. Log in as Administrator on page 66.
2. On the phone's Device Settings screen, scroll down and select **Debugging**, then **System State**.

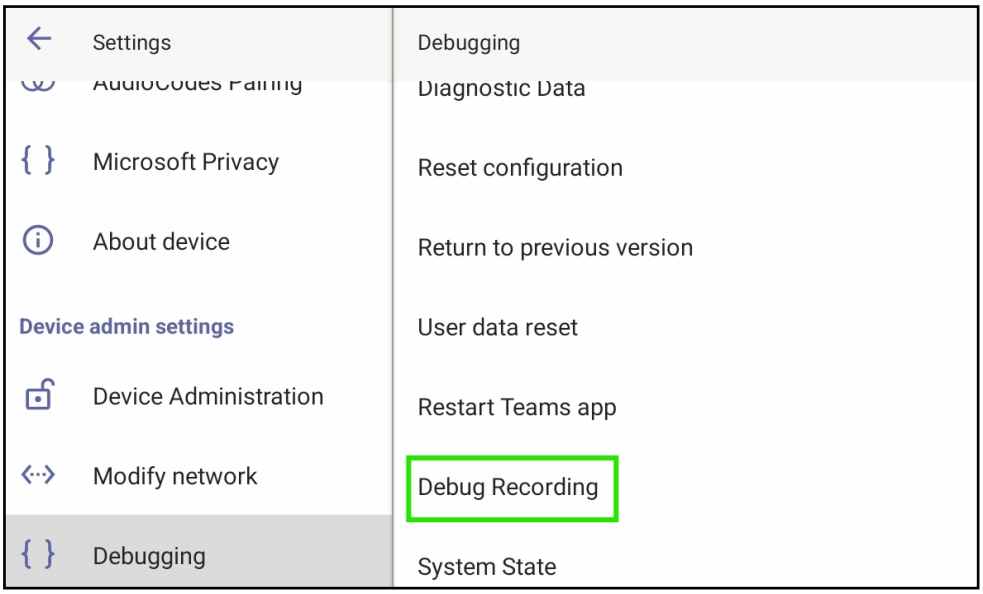


Get Audio Debug Recording Logs

Network administrators can opt to get Audio Debug Recording logs from the phone screen. The purpose of these logs is for issues related to media.

➢ To enable Audio Debug Recording logs:

1. Navigate to Device Settings and log in as Administrator.
2. Scroll down and navigate to **Debugging > Debug Recording**.



3. Configure the remote IP address and port.
4. Enable 'Voice record'.
5. Start Wireshark on your PC to capture the Audio traffic.

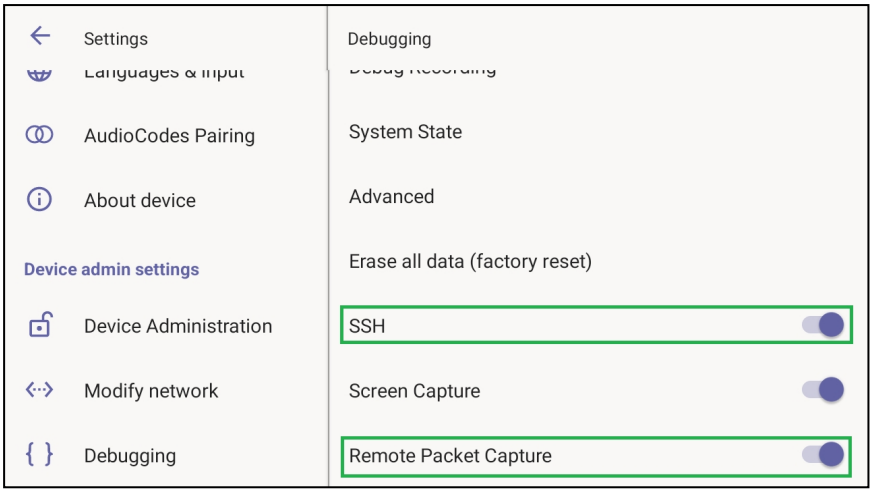
Capture Traffic Using 'rpcapd'

The 'rpcapd' (Remote Packet Capture) network sniffer application enables network administrators to analyze and debug Android traffic on their desktop PC using the app's integral SSH server.

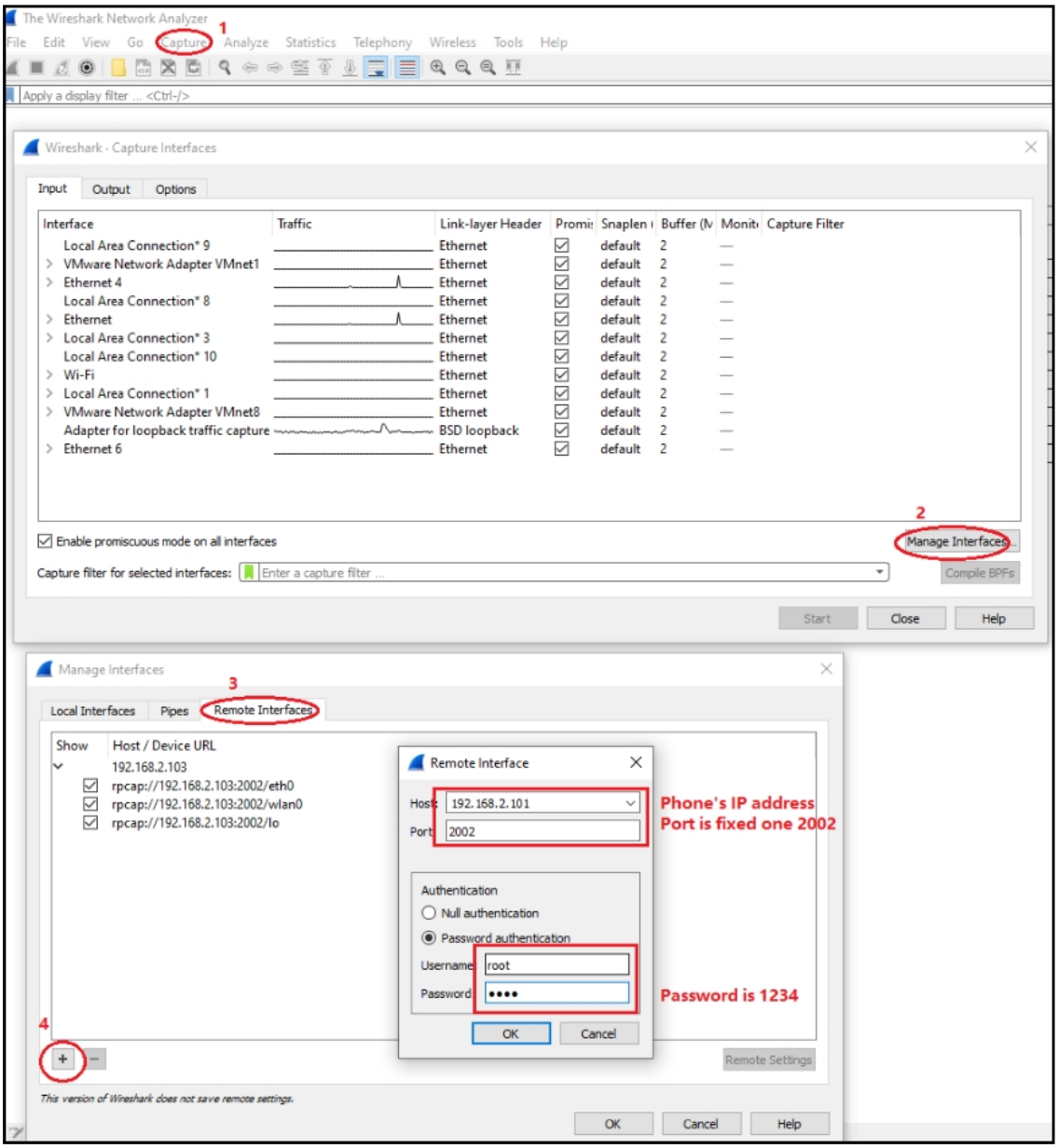
SSH is by default disabled and needs to enabled for the feature to work.

➢ To capture traffic using 'rpcapd':

1. Log in as Administrator on page 66.
2. Scroll down and select **Debugging**.
3. Turn on **SSH** and **Remote Packet Capture**.



4. After 'rpcapd' is enabled on the phone, use Wireshark to connect with it. Follow **the steps below** to connect to the phone.



5. View all the interfaces on the phone and choose your preferred interface with which to capture packets.

Enable Port Mirroring Network Monitoring

The phone supports the port mirroring network monitoring technique of copying and sending network packets transmitted as input from a phone port, to another port of a monitoring device for enhanced analysis and debugging capability.

➢ **To enable the feature:**

- Open the phone's 'Modify network' screen (**Settings** > **Device admin settings** > **Modify network**) and select parameter 'Enable PC Port Mirror' to enable it if it isn't already enabled.

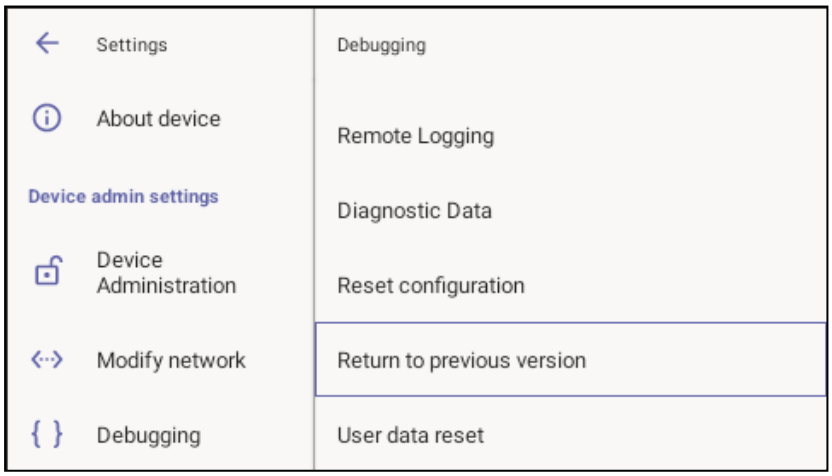
Return to Previous Version

When a customer receives a build for testing and completes the testing, they must switch back to the previous firmware version.

This version is the Global Availability (GA) build running on the device. The user needs to change the active firmware slot and perform a factory reset.

➢ **To switch back to previous firmware:**

1. Log in as Administrator on page 66.
2. On the phone's Device Settings screen, scroll down and select **Debugging**, then **Return to previous version**.



Android Device Utility

AudioCodes' IP phone is by default accessed via Secure Shell (SSH) cryptographic network protocol after the administrator signs in.

SSH is by default disabled and can be enabled with Administrator permissions in the phone screen (**Device Administration** > **Debugging** > **SSH**).

AudioCodes provides administrators with an SSH-based Android Device Utility.

➢ To sign in to the utility:

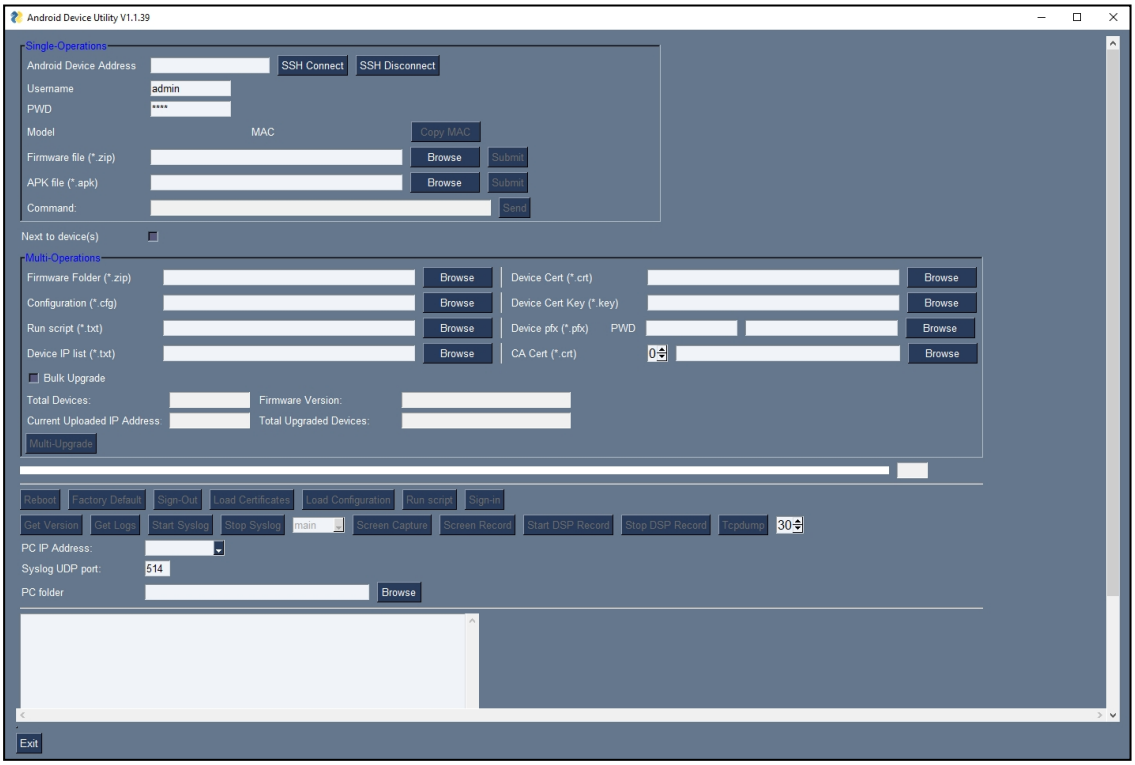
- Enter your username and password; **admin** and **1234** are the defaults.

The application gives network administrators the following debugging capabilities:

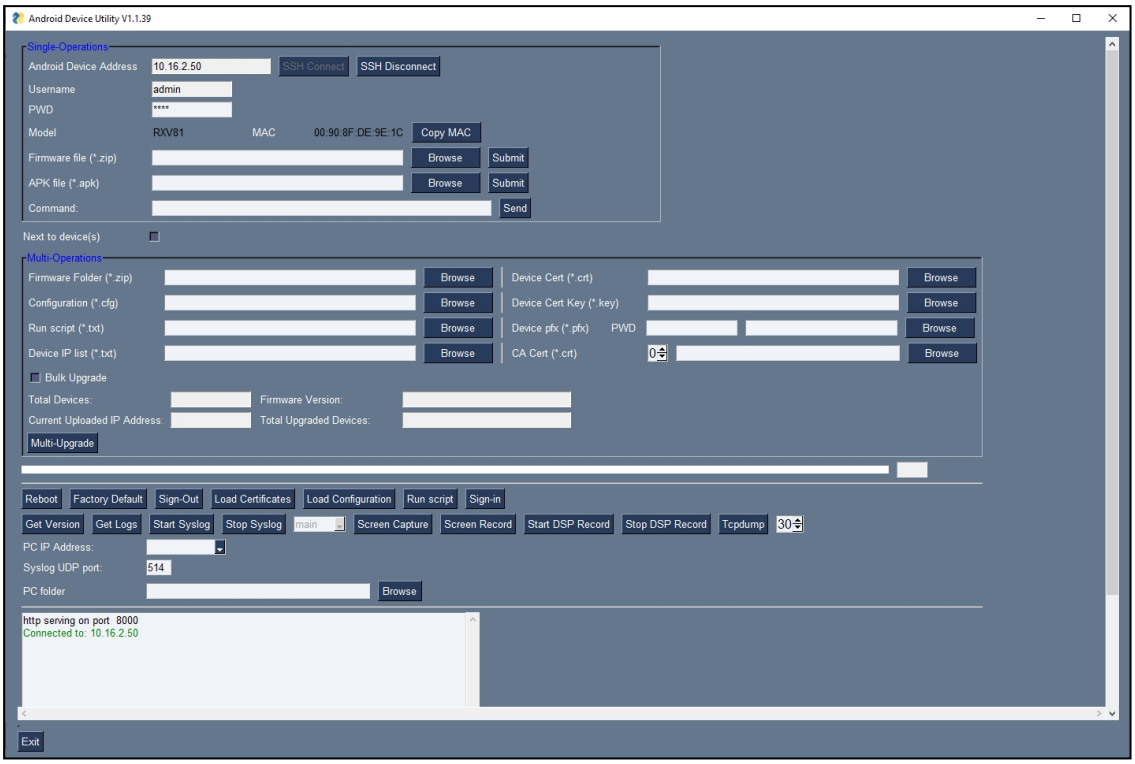
- Capture the Phone Screens on the next page
- Run Tcpdump on page 100
- Get Information about Phones on page 101
- Perform Remote Logging (Syslog) on page 103
- Get Diagnostics on page 104
- Get Logs on page 106
- Activate and Deactivate DSP Recording on page 107

➢ To open the utility:

1. From the PC's **Start** menu, select the app icon or click the application's exe file in the folder in which you saved it.



2. In the 'Android Phone Address' field, enter the IP address of the device (get it by pressing the MENU hard key > **About phone** > **Status** > **IP Address**).
3. Click **SSH Connect**; a connection with the device is established.



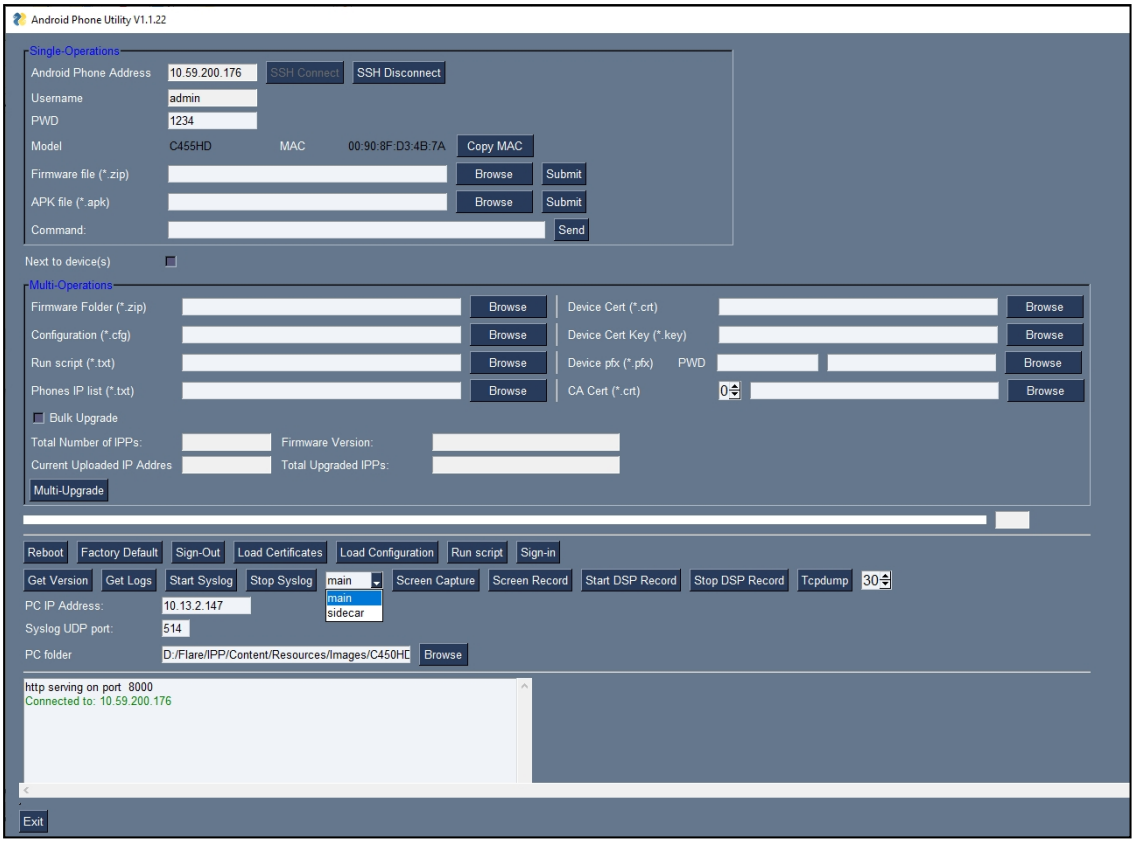
4. Next to the field 'PC folder', click the **Browse** button and navigate to and select the folder to which to send data to use for debugging.

Capture the Phone Screens

AudioCodes' Android Device Utility allows network administrators to effectively collaborate and debug issues using the screen-capturing feature. The feature enables capturing the phone's main screen.

➢ To capture the phone screen:

1. Open the Android Device Utility: From the PC's **Start** menu, select the app icon or click the application's exe file in the folder in which you saved it.
2. In the 'Android Phone Address' field, enter the IP address of the device (get it by pressing the MENU hard key > **About phone** > **Status** > **IP Address**).
3. Click **SSH Connect**; a connection with the device is established.
4. Next to the field 'PC folder', click the **Browse** button and navigate to and select the folder to which to send the screen captures.
5. Make sure that the drop-down menu next to the **Screen Capture** button shows **main**.
6. Click the **Screen Capture** button; the phone's screen is captured and the screenshot is saved and sent to the folder.



7. On your PC, navigate to the folder and retrieve the screenshot. Default file name: **screencap.png**. Rename it to a name related to the screen you captured. If you don't rename it, it will be overwritten the next time you take a screenshot.

Run Tcpdump

Tcpdump is a common packet analyzer that allows network administrators to display TCP/IP and other packets transmitted or received over the IP telephony network, for debugging purposes.

➢ To run Tcpdump:

1. In the Android Device Utility (see Android Device Utility on page 97 for more information about the application), enter the phone's IP address, click **SSH Connect** and browse to a folder on the PC to which to send the information.
2. Next to the **Tcpdump** button, set the time period or leave it at the default. Default: **30** seconds.
3. Click the **Tcpdump** button and then after the progress indicator reaches the end you'll view in the results pane a 'Finished' indication.



4. Open the folder on the PC to which you commanded the application to send the information and locate and open the file 'net.pcap'.

Alternatively, run Tcpdump *without* the utility.

➢ **To run tcpdump without the utility:**

1. Access the phone via SSH and run the following commands:

```
setprop ac.ac_tcpdump.timeout <seconds>
```

2. After defining the capturing time as shown in the preceding command, start the capture:

```
setprop ac.ac_tcpdump 1
```

3. Tcpdump capture file will appear in this location:

```
/sdcard/recording/net.pcap
```

4. After running Tcpdump, reproduce the issue.
5. Execute the following command from your PC command prompt (cmd):

```
scp -r admin@%deviceIp%:/sdcard/recording/ %FolderOnPc%
```

Get Information about Phones

Network administrators can get information about phones using AudioCodes' SSH protocol based Android Device Utility.

➢ **To get information about the phone:**

1. Open the Android Device Utility (see Android Device Utility on page 97 for more information about the application), enter the phone's IP address, click the adjacent **SSH Connect** button and browse to a folder on the PC to which to send the information.
2. Click the **Get Version** button.



3. View the information in the pane.
4. Alternatively:

- To get *firmware information*, in the **Command** field enter the following and then click **Send**:

```
getprop ro.build.id
```

- To get *Bootloader information* using SSH protocol, in the utility's **Command** field enter the following and then click **Send**:

```
getprop ro.bootloader
```

- To get *DSP information* using SSH protocol, in the utility's **Command** field enter the following and then click **Send**:

```
getprop ro.ac.dsp_version
```

- To get the *Microsoft Teams version* using SSH protocol, in the utility's **Command** field enter the following and then click **Send**:

```
getprop ro.teams.version
```

- To get the *Microsoft Company Portal version* using SSH protocol, in the utility's **Command** field enter the following and then click **Send**:

```
getprop ro.portal.version
```

- To get the *Microsoft Admin version* using SSH protocol, in the utility's **Command** field enter the following and then click **Send**:

```
getprop ro.agent.version
```

Perform Remote Logging (Syslog)

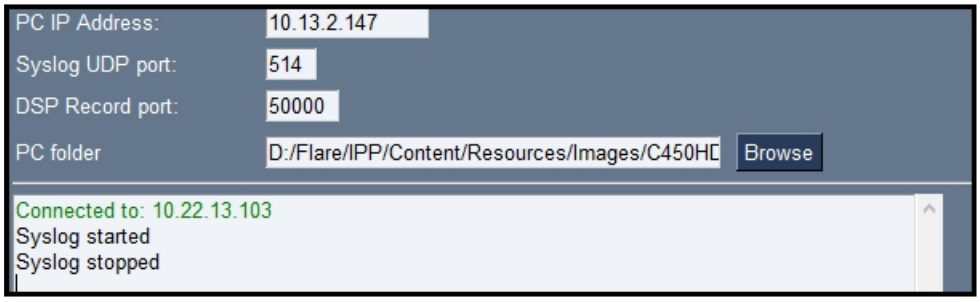
Remote Logging via Syslog provides the same log level as Device Diagnostics (performed via the Microsoft Teams Admin Center) with some additional information that may be relevant to device issues (not Teams application issues). Device Diagnostics via the Microsoft Admin Center are saved to the device sdcard and collected after the event. When performing Remote Logging via Syslog, the logs are collected in real time.

Remote Logging via Syslog can be enabled from the following (see details below):

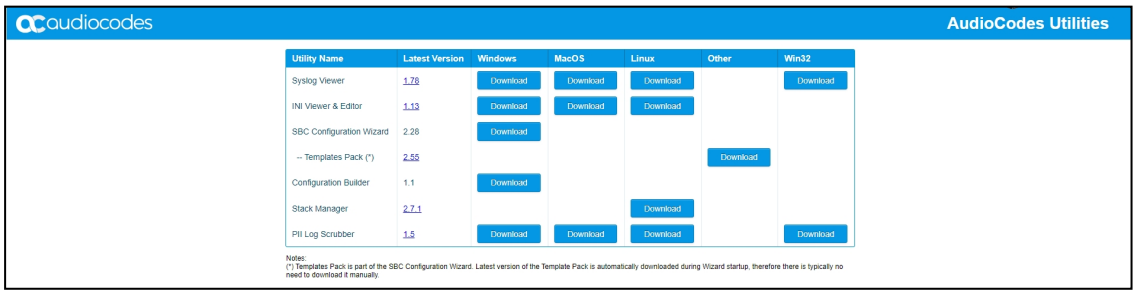
- Android Device Utility
- Phone

➢ To enable Remote Logging via Syslog from the utility:

1. In the Android Device Utility (see Android Device Utility on page 97 for more information), enter the phone's IP address, click **SSH Connect** and browse to a folder on the PC to which to send the information.
2. In the 'PC IP Address' field, enter the IP address of the PC on which the utility is installed and then click the **Start Syslog** button.



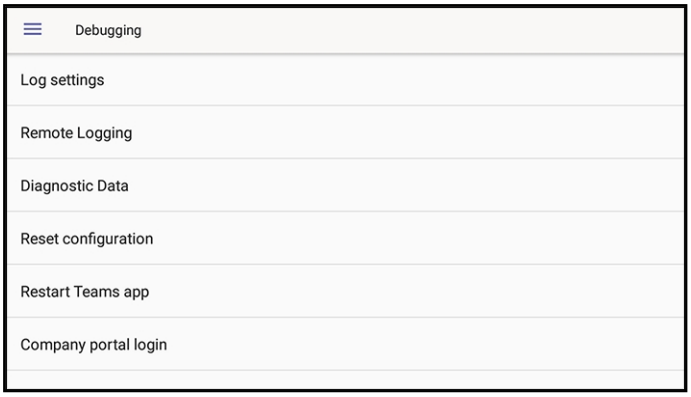
3. Open the folder on the PC to which you commanded the application to send the information, and then locate the Syslog file.
4. To view Syslog, you can optionally download the Syslog Viewer available in AudioCodes' website.



➢ To enable Remote Logging via Syslog from the phone:

1. Log in to the phone as Administrator and go back.
2. In the 'Device administration' screen, select **Debugging**.

3. Select **Remote logging**.



4. Configure the 'Remote IP address' and 'Remote port' and enable 'Remote Logging'; the device starts sending logs to the Syslog server.

Network administrators can also enable Syslog using Secure Shell (SSH) protocol.

➢ **To enable Syslog using SSH protocol, type the following command at the shell prompt:**

```
setprop persist.ac.rl_address <syslog_server_ip>:<port>.
```

➢ **To disable Syslog using SSH, type the following command at the shell prompt:**

```
setprop persist.ac.rl_address ""
```

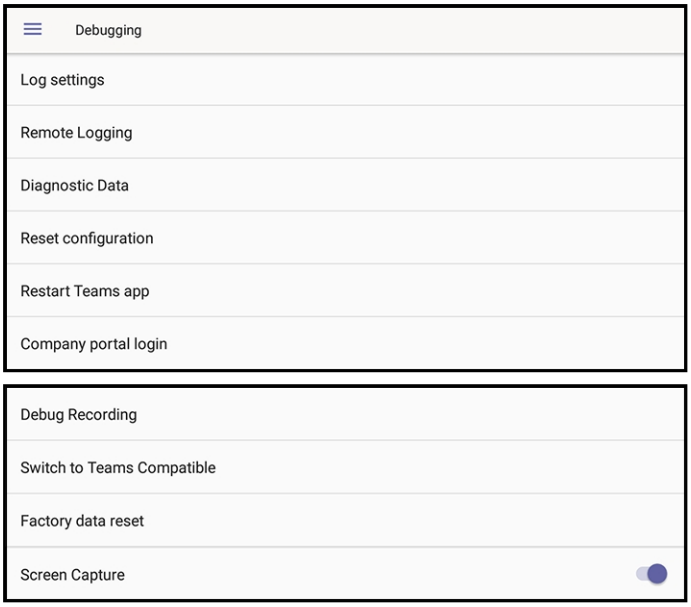
Get Diagnostics

Network administrators can get diagnostics information to facilitate debugging.

Network administrators who need to get diagnostics info from the device can dump the logs to the phone's Secure Digital (SD) Card and then later collect them using Secure Copy Protocol (SCP) based on Secure Shell (SSH) protocol. Whenever an issue occurs, the administrator can dump the logs into the SD Card.

➢ **To get diagnostics info:**

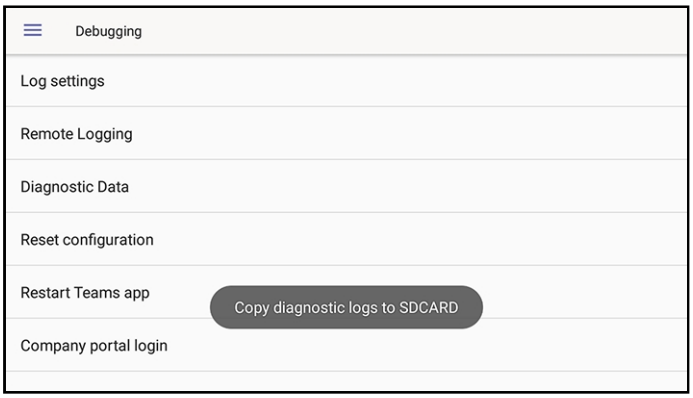
1. Log in to the phone as an Admin user.
2. Open the Debugging screen (**Device Administration** > **Debugging**).



3. Select the **Diagnostic Data** option.



4. Select **OK** to confirm.



5. Wait until the screen shown in the preceding figure disappears; the phone creates all necessary logs and copies them to the its SD Card / Logs folder.

6. Get the logs using SCP notation as follows:

```
scp -r admin@host_IP:/sdcard/logs/ .
```

The following diagnostics files are then received from the phone:

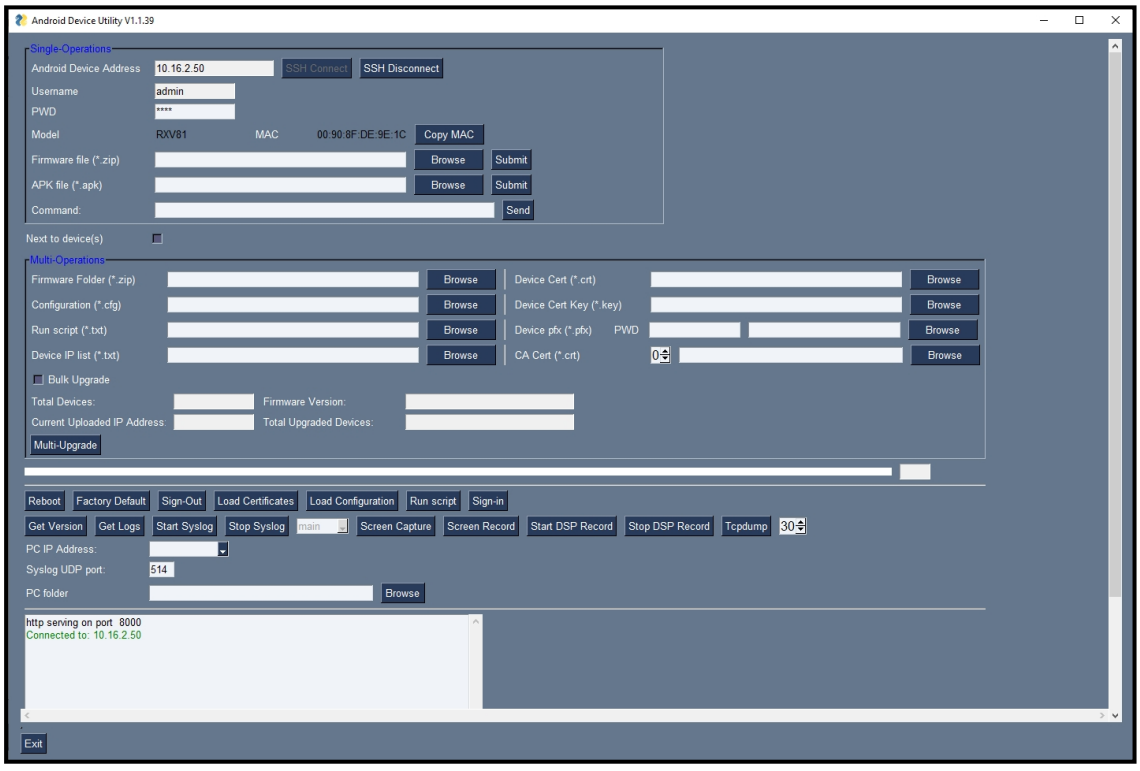
- dmesg.log
- dumpstate-c470hd-1.18.117_58793-41-undated-dumpstate_log-3458.txt
- dumpstate-c470hd-1.18.117_58793-41-undated.txt
- dumpstate-stats.txt
- logcat.log

Get Logs

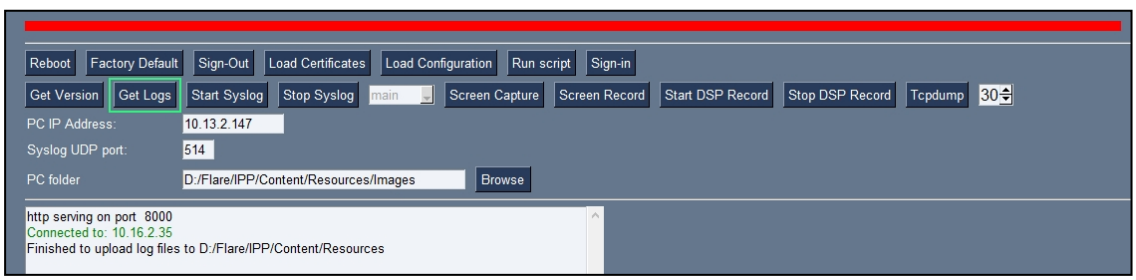
Network administrators can get bug report logs, including a logcat file and a configuration file, to expedite debugging.

To get logs:

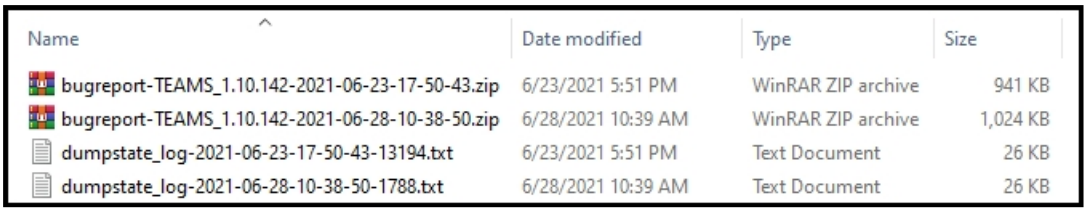
1. In the AudioCodes Android Device Utility (seeAndroid Device Utility on page 97 for more information about the application), enter the phone's IP address, click **SSH Connect** and browse to a folder on the PC to which to send the information.



2. Click **Get Logs**; after a short period, view a 'Finished' indication in the results pane.



3. Open the folder on the PC to which you commanded the application to send the information.



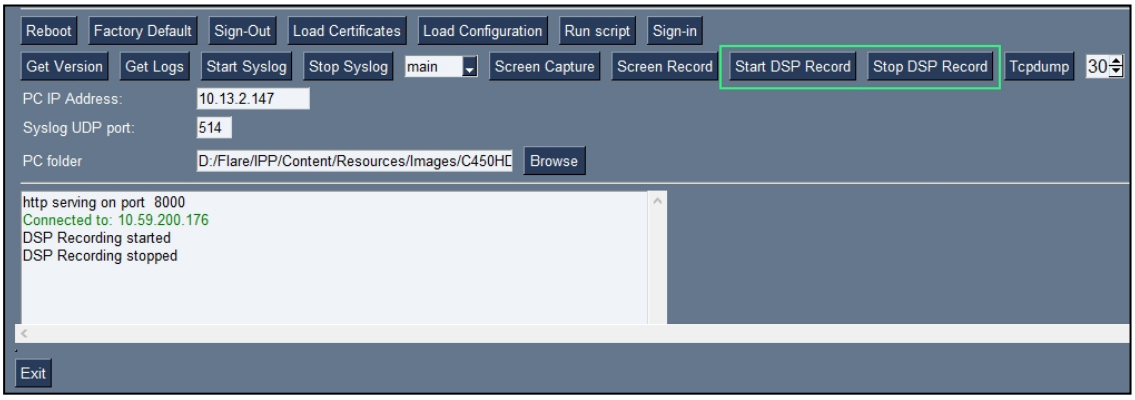
4. Unzip the zipped files and open the txt files to view the report.

Activate and Deactivate DSP Recording

Network administrators can activate DSP recording using AudioCodes' SSH protocol based Android Device Utility.

➢ To activate or deactivate DSP Recording:

1. In the AudioCodes Android Device Utility (see Android Device Utility on page 97 for more information about the application), enter the phone's IP address, click **SSH Connect** and then click the **Browse** button next to the field 'PC folder' to configure a folder on the PC to which to send the information.
2. In the 'PC IP Address' field, enter the IP address of the PC on which the utility is installed and then click the **Start DSP Record** button.
3. After a period of recording, click **Stop DSP Record**.



4. View the DSP recording in the PC folder you configured.

Network administrators can alternatively activate and deactivate a DSP recording using SSH protocol *without* the Android Device Utility, as shown next.

➢ **To activate DSP recording using SSH protocol *without* the utility, type the following at the shell prompt:**

```
setprop ac.dr_voice_enable true
setprop ac.dr_ipaddr <ip_address>
setprop ac.dr_port 50000

setprop persist.ac.dr_voice_enable true
setprop persist.ac.dr_ipaddr <local host ip address>
setprop persist.ac.dr_port <50030> //default is 50030
```

➢ **To deactivate DSP recording using SSH protocol *without* the utility, type the following at the shell prompt:**

```
setprop ac.dr_voice_enable false
```



DSP recording can be activated or deactivated on the fly without requiring the network administrator to reset the phone.

SSH based Debugging

The phone can be accessed via Secure Shell (SSH) cryptographic network protocol after the network administrator logs in (see Log in as Administrator on page 66).



SSH is by default disabled and can be enabled with Administrator permissions in the phone screen (**Device Administration** > **Debugging** > **SSH**).

SSH access allows administrators debugging capabilities such as:

- Get the phone's IP address (using the `ifconfig` command)
- Install the Teams APK (or any other APK)
- Pull files from the phone sdcard (using the `curl` command)

Microsoft Teams Admin Center

The Microsoft Teams Admin Center allows network administrators to troubleshoot issues encountered with the phone.

Collect Logs

Network administrators can download *all logs* from the Microsoft Teams Admin Center (TAC). Logs that administrators can download include device diagnostics (Logcat), dumpsys, ANRs,

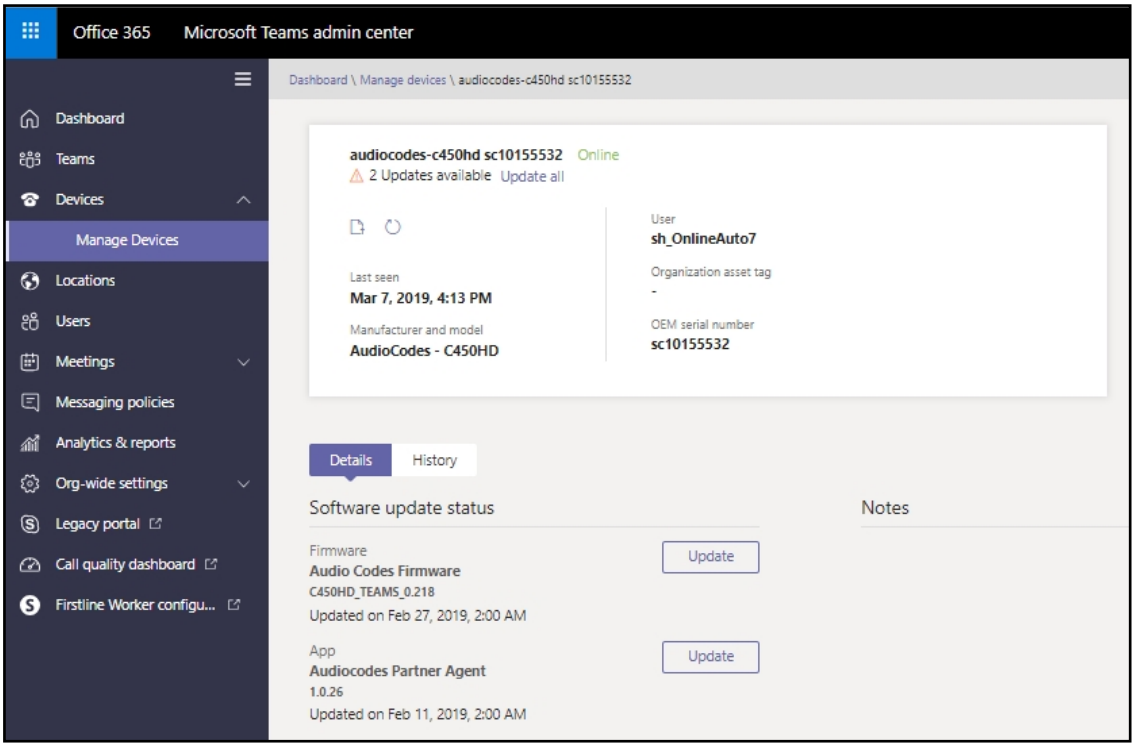
Client Log, Call Policies File, Call Log Info File, Sky lib Log Files, Media Log Files, and CP. The logs can help debug Teams application issues and also for issues related to the device.

For details click here.

➢ To collect logs:

1. Reproduce the issue.
2. Access Microsoft Admin Center and under the **Devices** tab click the **Diagnostics** icon.

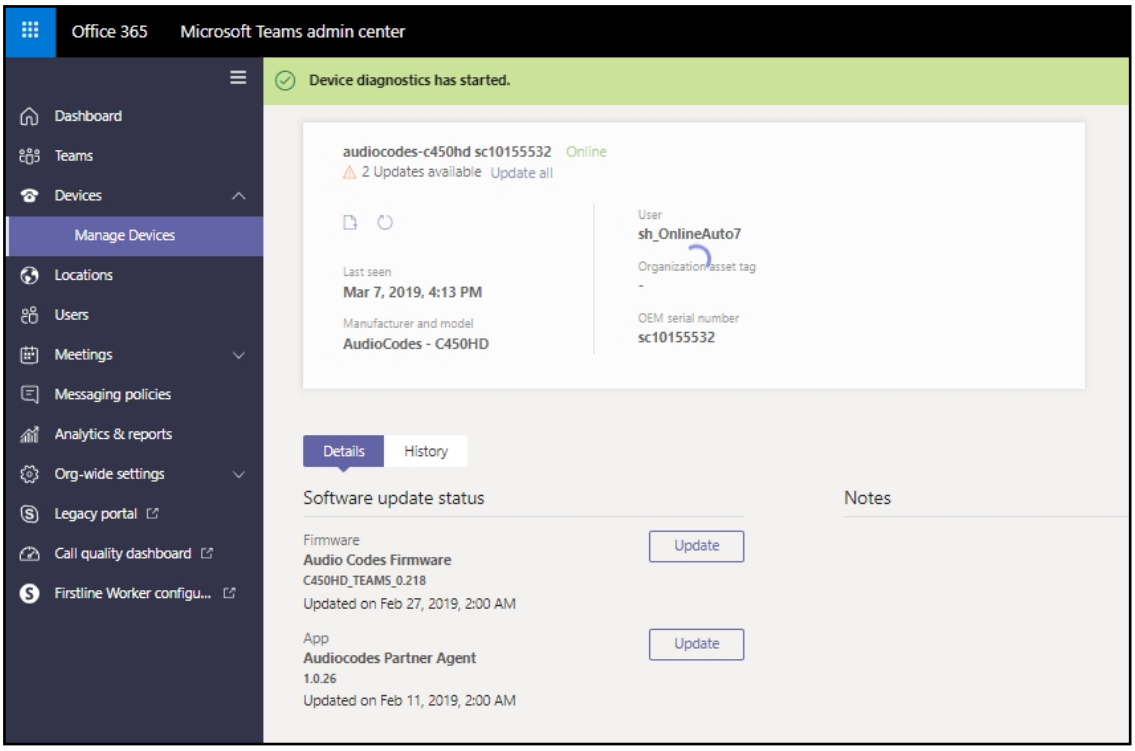
Figure 6-1: Microsoft Teams Admin Center - Diagnostics



Applies to all AudioCodes phones for Microsoft Teams even though a specific model is shown in the figures here.

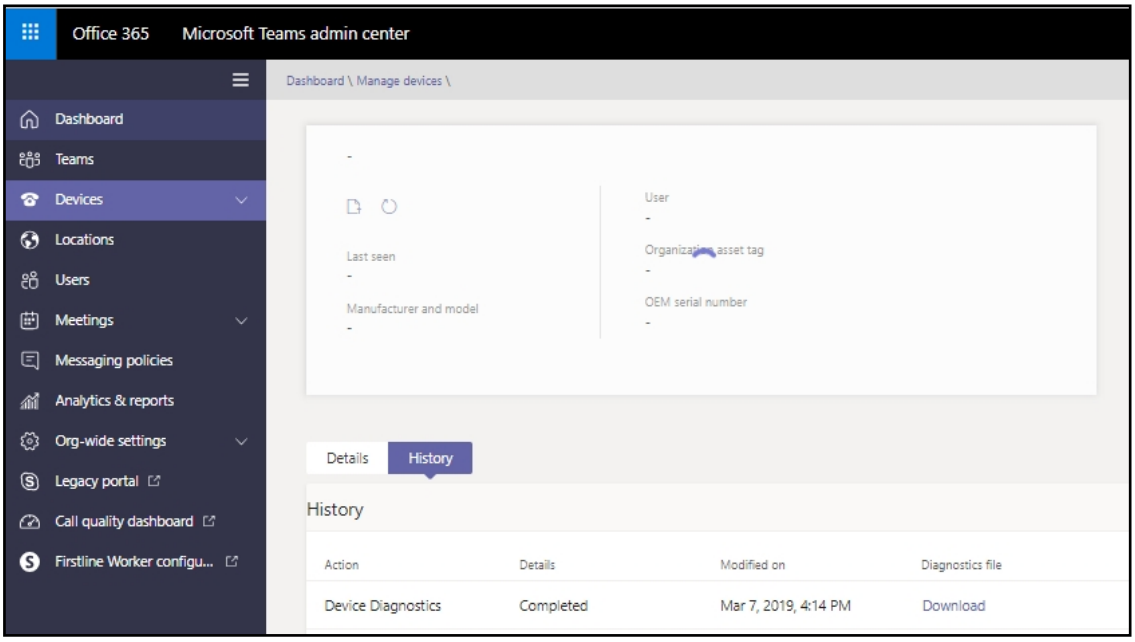
3. Click the **Diagnostics** icon and in the 'Device diagnostics' prompt that pops up, click **Proceed**; log files are retrieved from the devices and uploaded to the server.

Figure 6-2: Microsoft Teams Admin Center – Logs Upload to Server



4. Click the **History** tab.

Figure 6-3: History - Download



Click **Download** to download the logs.

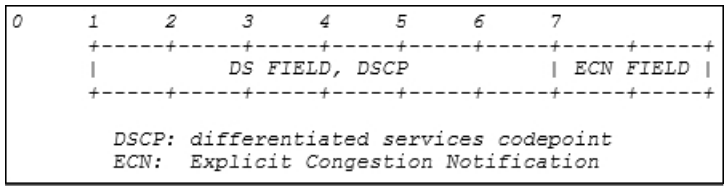
- AudioCodes Device Manager's 'Collect Logs' action also includes all information collected by Microsoft Teams Admin Center. The .zip file includes the following files:
  - ✓ Android BugReport
  - ✓ AdminAgentLogs.zip - includes logcat collected by the OVOC/Device Manager.
  - ✓ blog files (media logs)
  - ✓ Skylib-XXX.blog
  - ✓ app_process32.XXX.blog
  - ✓ config.cfg & status.cfg - Device configuration and status
  - ✓ ac_config.xml and ac_status.xml - Device configuration and status for internal use.
  - ✓ dmesg - Diagnostic messages command useful for debugging hardware-related issues.
  - ✓ SessionID_For_Company_Portal_Logs.txt (this is the CP SSDI, not the logs; the logs are sent to the OVOC / Device Manager server).
- See also the *Device Manager Administrator's Manual*.

DSCP

The phone's Teams application supports DS (Differentiated Services) containing a differentiated Services Code Point (DSCP) value and an ECN (Explicit Congestion Notification) value, for monitoring Quality of Service (QoS).

DSCP is part of the IP header that defines the type of routing service to tag outgoing voice packets originated from the phone. It informs routers that this packet must receive a specific QoS. Values can be set in decimal (e.g., 184) or hexadecimal (e.g., 0xb8). The default value is **0xb8** (184).

Figure 6-4: DS Field, DSCP



The DSCP value for audio is **0x46**.

See also Microsoft's website for more information.

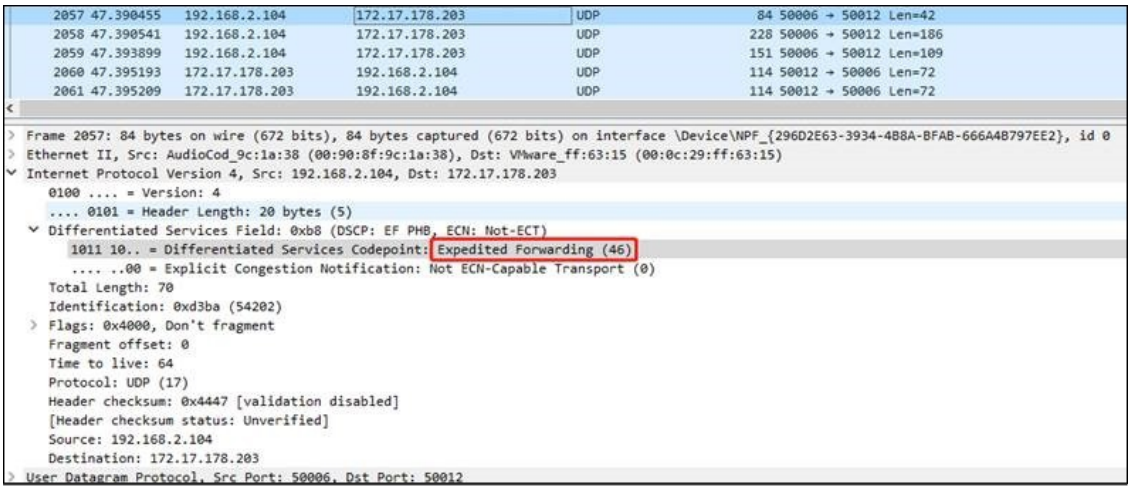
The DSCP value can be adjusted *on the server*; it cannot be adjusted on the client. See the figures below for recommended values.

Figure 6-5: Recommended Values

Table 1. Recommended initial port ranges

Media traffic type	Client source port range	Protocol	DSCP value	DSCP class
Audio	50,000–50,019	TCP/UDP	46	Expedited Forwarding (EF)
Video	50,020–50,039	TCP/UDP	34	Assured Forwarding (AF41)
Application/Screen Sharing	50,040–50,059	TCP/UDP	18	Assured Forwarding (AF21)

Figure 6-6: Audio



Additional Debugging Options

- Export Logs to USB when Phone is in Recovery Mode below
- Encounter an ANR Error - Core Dump below
- Retrieve Bug Report Automatically Produced if 'Boot Reason' is FATAL or PANIC on the next page

Export Logs to USB when Phone is in Recovery Mode

This feature empowers users to seamlessly save logs while their phone is in recovery mode. In Android recovery mode, the system automatically mounts a partition, enabling users to connect a USB stick. By simply clicking the ‘Export logs to USB disk’ option, all logs are efficiently copied to the USB stick, providing a convenient and reliable method for log management during recovery procedures.

Encounter an ANR Error - Core Dump

If an Application Not Responding (ANR) error / core dump occurs, logging capability helps administrators ensure a high level of customer experience (CX). The logging feature automatically stores the logs (as a Bugreport file) when an application or service in Android crashes (including FATAL/PANIC) or gets stuck. When this happens, it takes the logs from the event and saves them under **sdcard/logs**.

When a device does not encounter an ANR error / core dump, log files don’t appear.



- The feature is available for all devices running Android 10 or Android 12 operating system.
- Only the last 10 logs are stored on the device. If this number is exceeded, the previous logs are deleted.

Retrieve Bug Report Automatically Produced if 'Boot Reason' is FATAL or PANIC

A bug report is automatically produced if the 'boot reason' after the device is booted up is **FATAL** or **PANIC** (or anything that falls in the FATAL category). The trigger is included in the bug report.

The report is stored in the **sdcard/logs** folder.

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International Headquarters

6 Ofra Haza Street

Naimi Park

Or Yehuda, 6032303, Israel

Tel: +972-3-976-4000

Fax: +972-3-976-4040

AudioCodes Inc.

80 Kingsbridge Rd

Piscataway, NJ 08854, USA

Tel: +1-732-469-0880

Fax: +1-732-469-2298

Contact us: https://www.audiocodes.com/corporate/offices-worldwide

Website: https://www.audiocodes.com/

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