



# Dolby Conferencing Console Version 2.3

## Administrator's Guide

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- *Dolby Conferencing Console open source software guide*

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# 1

## Introduction to this guide

The Dolby Conferencing Console software provides an interface for IT administrators to use in managing Dolby Voice Devices.

As an administrator, you can use the Dolby Conferencing Console software to provision devices, assemble them into device pools for ease of management, obtain analytic information about them, and monitor device status on both an individual and group level.

- [About this documentation](#)
- [New in this version](#)
- [Related documentation](#)
- [Accessing API documentation](#)
- [Problem reports](#)
- [Documentation feedback](#)

## 1.1 About this documentation

IT administrators can use this documentation as a guide for setting up and provisioning the Dolby Conferencing Console software.

We assume that users of this guide are IT administrators or equivalent and are familiar with:

- Basics of computer networking and Linux administration
- IP private branch exchange (PBX) call controls used by your organization
- Conferencing service provider functionality used by your organization

This guide provides details on: using the Dolby Conferencing Console software to manage individual devices or groups of devices

## 1.2 New in this version

This release of the Dolby Conferencing Console includes new and updated features.

- New topic for *Copying profiles*
- New topic for *Profile ordering*
- New topic for *Provider profiles*
- New topic for *Adding provider profiles*
- New topic for *Enabling Session Initiation Protocol (SIP) parameters for new devices*
- New topic for *Specifying IP subnets on a device pool*
- New topic for *Deleting device configurations*
- Updates to *Importing and updating device configurations*

## 1.3 Related documentation

The documentation for the Dolby Voice product family consists of software documentation, release notes, and guides. Several of these guides are especially useful for users of the Dolby Conferencing Console software.

The Dolby Conferencing Console Installation Guide describes how to install Dolby Conferencing Console.

The *Dolby Conferencing Console Open Source Software Guide* describes third-party open-source software that is incorporated into the Dolby Conferencing Console software.

The *Dolby Conference Phone Administrator's Guide* describes how to install and administer the Dolby Conference Phone.

The *Dolby Conference Phone User's Guide* describes how to use the basic and advanced phone features, and how to customize the phone.

The *Dolby Voice Room Quick Start Guide* describes the contents of the Dolby Voice Room package, how to assemble the Dolby Conference Phone, the Dolby Voice Camera, Dolby Voice Hub, and how to connect Dolby Voice Room to the network. The quick start guide is included in the Dolby Voice Room package. It is also available from the Dolby Voice Room support pages.

The *Dolby Voice Room Administrator's Guide* describes how to install and administer the Dolby Voice Room system.

The *Dolby Voice Room Third-Party Software Guide* describes the open source software used in the Dolby Voice Room software.

The *Dolby Voice Product Compatibility Guide* describes the compatibility relationships between the various Dolby Voice Devices.

## 1.4 Accessing API documentation

You can access application programming interface (API) documentation for the Dolby Conferencing Console software from the user interface.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. Click the **References** tab.
3. Click the **Web API reference** link and it will open in a new tab.

## 1.5 Problem reports

When escalating issues to Dolby, please provide answers to these questions.

- Which version of the product is affected?
- When did the problem occur? How often does it occur? Is there any pattern or trend to the occurrence?
- What was the scope of the problem? How many users did it affect? Was there any pattern or trend to the affected users?
- Have you been able to reproduce the problem? If so, please detail how.
- Is there anything that you think might be relevant in the log? Did anything unusual occur? Did the system generate any high-severity log messages? If so, please attach an extract.
- What operating system and version are being used by the user? What browser and version are being used by the client?
- What other observations have you made? Is there anything else you think might assist us in identifying the root cause of the problem?

## 1.6 Documentation feedback

If you have comments or feedback about this documentation, send us an email at [dolbyvoicedocs@dolby.com](mailto:dolbyvoicedocs@dolby.com).

# 2

## Architectural overview

This chapter describes the Dolby Conferencing Console product architecture.

- [Dolby Conferencing Console](#)
- [Security features](#)

## 2.1 Dolby Conferencing Console

The Dolby Conferencing Console software allows IT administrators to provision, configure, and administer devices.

Using the Dolby Conferencing Console software, you can:

- Bulk provision and configure devices
- Establish secure network communications between devices and the Dolby Conferencing Console software
- Remotely access device status information, make changes, and restart devices
- Obtain statistical status usage information for devices
- Manage inventory

## 2.2 Security features

The Dolby Conferencing Console software allows you to secure all components, communications, and devices.

### **User authentication with Lightweight Directory Access Protocol (LDAP)**

You can use LDAP for user authentication. Once configured, LDAP users can log in with their corporate user name and password.

### **User authentication with SAML**

You can use SAML for single sign-on. SAML authentication can be used with any SAML 2.0 identity provider, such as Okta.

### **Retrieve passwords with Simple Mail Transfer Protocol (SMTP)**

You can use SMTP to allow non-LDAP/SAML users to retrieve passwords on their own.

### **Device access**

You can choose to use Hypertext Transfer Protocol (HTTP) or Hypertext Transfer Protocol Secure (HTTPS) from the Dolby Conferencing Console software.

You can use the utility provided in the Dolby Conferencing Console software to generate a self-signed certificate, or you can provide a certificate authority (CA) certificate.

### **Access password encryption**

All Dolby Conferencing Console account passwords are encrypted when stored on the server.

### **Rogue device access prevention**

You can specify device access restrictions for each device pool to help protect against botnets and other threats.

### **Password fields**

Passwords are obfuscated upon entry so that the password values cannot be hijacked.

### **Network ports**

Upon install, the default port 80 allows initial access for the web user interface (UI). Root user access through port 22 (SSH) is disabled.

# 3

## Requirements

This chapter describes the Dolby Conferencing Console supported hardware, software, and installation requirements.

- [Supported browsers](#)
- [Supported devices and device numbers](#)

## 3.1 Supported browsers

Accessing the Dolby Conferencing Console web interface requires a supported web browser.

You can access the Dolby Conferencing Console web interface by using any of these web browsers:

- Apple Safari 11 or later
- Google Chrome 65 or later
- Microsoft Internet Explorer 11 or later
- Mozilla Firefox 59 or later

## 3.2 Supported devices and device numbers

The Dolby Conferencing Console software supports Dolby Voice Devices.

If you installed with open virtual appliance (OVA) file, up to 500 devices per customer site are supported per each instance of the Dolby Conferencing Console software.

If you installed with the RPM Package Manager (RPM) package, up to 10,000 devices per customer site are supported when multiple Dolby Conferencing Console nodes are installed.

# 4

## Basic system usage

This chapter provides information on some basic tasks and a brief description of interactions between devices and the system.






















- [Screen elements and their meanings](#)
- [Search](#)
- [Logging in and logging out](#)
- [Editing system settings](#)
- [Provisioned parameters and locked devices](#)







## 4.1 Screen elements and their meanings

This section shows and describes the basic user-interface elements.

This table explains the Dolby Conferencing Console user interface.

Button	Name	Description
	Device edit	Edit device details.
	Device information	Display device information.
	Device list	Display list of devices in a pool.
	Home	Return to home screen.
	Logs	View system logs or device logs.
	Search	Search for string across all pools and devices.
	Settings	Display setting for selected device or pool.
	Status	Display server and reference information and device pool call usage.
	System settings	View/edit system settings.
	Upload	Upload a file or files.
	Users	Display information about users and controls for adding and editing users.
	Copy profile	Copy an existing profile.
	Add	Add a new pool or device.
	Cancel	Cancel process.
	Confirm	Confirm an action.
	Download	Download information or certificate.
	Edit	Edit profile or other settings.
	File	Access to a certificate or other file.
	Help	View context-sensitive help.
	Move	Move devices between pools.
	Next	Next step of a task.

Button	Name	Description
	Push configuration	Push configuration from the Dolby Conferencing Console software to devices.
	Reboot	Reboot a device or pool of devices.
	Remove	Remove a device or pool of devices.
	Trash	Delete.

## 4.2 Search

To avoid clicking through pages to find the information, use the search feature to find the information that you need about your conference devices.

Search behaves the same way on every page. Predictive results display while you are typing. Type criteria associated with specific devices, device pools, or profiles, such as:

- Device display name
- Serial number
- Media access control (MAC) address
- IP address
- Firmware version number
- Profile name
- Device pool name
- CA certificate

The search results box is divided into six sections:

- Certificates
- Device pools
- Dolby Conference Phones
- Dolby Voice Rooms
- Firmwares
- Profiles

You click on the entries listed under the section name, not the section name itself.

## 4.3 Logging in and logging out

Use the Dolby Conferencing Console web interface to log in.

### Prerequisites

Before you can log in, you must have the IP address or host name of the Dolby Conferencing Console server. You can use the **ifconfig** command to obtain the IP address.


### Procedure

1. From an Internet browser, enter the IP address or host name of the Dolby Conferencing Console server.

#### Note:

If you have configured secure access, use an *https://* URL to access the server.

2. Log in with the default user name and password or your assigned user name and password.

 **Note:** User names and passwords are case sensitive. By default, the admin/admin login is enabled. We recommend that you change the default password as soon as possible for security reasons.

3. Click **Log out**.

#### What to do next

Non-LDAP users can retrieve passwords on their own with the **Forgot Password** link. However, this link displays only if SMTP has been configured.

## 4.4 Editing system settings

Many Dolby Conferencing Console settings are accessible from the Dolby Conferencing Console web interface.

#### About this task

You can edit certain settings that affect all users and devices, such as LDAP, and SMTP settings.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. On the left side, click the other settings button.



Submenus for LDAP and SMTP settings display.

3. From the menu, choose the type of setting that you would like to edit.  
The chosen screen displays.

#### What to do next

After you set up the system, consider how to organize your devices and set up your device pools.

## 4.5 Provisioned parameters and locked devices

Users cannot change provisioned parameters. Performing a Dolby Voice Device configuration by using the Dolby Conferencing Console software triggers a lock on the configured device. This prevents the device from being modified from its user interface.

When unlocked, the device itself does allow for local changes of more parameters than are available from the Dolby Conferencing Console software, including the device static IP address and provisioning server connection information. These parameters cannot be changed from the Dolby Conferencing Console software, because performing those changes will cause the device to lose connectivity with the Dolby Conferencing Console software.

# 5


## Managing devices

The Dolby Conferencing Console software streamlines many of your management tasks with its simple user interface. With it, you can view status information for your entire system, manage devices, and manage pools of devices by using profiles.

- [Setting up devices](#)
- [Device pool management](#)
- [Device profile management](#)
- [Provider profiles](#)
- [Device management](#)
- [Contact directory management](#)
- [Monitoring device status](#)

## 5.1 Setting up devices

After you install the Dolby Conferencing Console software and deploy it on your network, the next step is to complete some initial setup tasks so that you can start using the Dolby Conferencing Console software to manage Dolby Voice Devices.

 **Note:** By default, the Dolby Voice device username/password is admin/1739. We recommend that you change the default password as soon as possible for security reasons.

Typically, initial setup includes performing these tasks:

1. [Device pool management](#) on page 21
2. [Updating device firmware](#) on page 47
3. [Adding profiles](#) on page 27
4. [Uploading certificates for use with devices](#) on page 24
5. [Adding a device](#) on page 33

## 5.2 Device pool management

You can group devices together for the purpose of sharing profile attributes in a single pool, called a device pool. You can also create device pools to separate out devices that require different attributes.


When you install the Dolby Conferencing Console software, it creates a default device pool. The default device pool cannot be deleted or renamed.

You can provision a connected device to a device pool or reassign it to another device pool.

Each device pool can have a single, specific device firmware version for each hardware type.

A device pool can contain numerous CA certificates.

You cannot delete a device pool if it contains any devices. Before deleting, you must first move all devices to another pool or delete them.

 **Note:** Any change in a trusted CA certificate that is already associated with a device results in an automatic device reboot.

### 5.2.1 Adding device pools

Add new device pools to group devices in ways that make them easy to manage.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the add button adjacent to **Device Pools**.



The **Create New Device Pool** screen displays.

2. Enter a unique device pool name (for example, *DPI\_Sydney*).



**Note:** The device pool name cannot have the same name as an existing device pool.

3. (Optional) Enter a description for the device pool (for example, *Sydney Office Area 1 device pool*).
4. (Optional) Enter the device pool location (for example, *Sydney, Australia*).
5. (Optional) Enter the IT administrator name (for example, *jdoe*).
6. (Optional) Enter an email address (for example, *jdoe@yourcompany.com*).
7. (Optional) Enter a phone number (for example, *+61 02 5555 1111*).
8. (Optional) If you need to restrict access to the device pool, enable the restriction:

- a) Enter a device access ID and password.
  - b) Verify the password by entering it again.
9. (Optional) Enter your email address in the **Alert email address** field, if you want to receive an email when alerts are triggered in this pool.
- The email is sent 15 minutes after the change in status occurs, because the change may be only transient. For example, a device may go off-line due to an update request and is back online within 15 minutes. In this case, no email is sent. However, if the off-line state persists, an email is sent.
- The SMTP server must be configured in **System Settings > SMTP Settings** before emails can be sent. You can send a test email once the SMTP server has been configured.
10. Click the confirm button to save your changes.


### Results

The home screen redisplay with the new device pool at the bottom of the list.

## 5.2.2 Editing device pools

You can edit device pool settings.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select a device pool to edit. The device pool list displays. You can expand the column widths to the size you want and the system will remember the width to which it was resized. In addition, you can hover over a device and a tooltip provides the device information.
2. On the left side, click the settings button.
 
3. From the settings menu, click **Edit pool settings**. The **Device pool settings** screen displays.
4. Make the desired changes.
5. (Optional) Enter your email address in the **Alert email address** field, if you want to receive an email when alerts are triggered in this pool.
 

The email is sent 15 minutes after the change in status occurs, because the change may be only transient. For example, a device may go off-line due to an update request and is back online within 15 minutes. In this case, no email is sent. However, if the off-line state persists, an email is sent.
6. To save your changes, click the confirm button.


## 5.2.3 Deleting device pools

Any empty device pool (except for the default pool) can be deleted.

### Prerequisites

Before you delete a device pool, you must either delete or move all devices from the pool.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool from the list.
2. On the left side, click the settings button.
 
3. From the settings menu, select **Edit pool settings**. The **Device pool settings** screen displays.

4. Click the trash button to delete.


### Results

The home screen displays the updated list.

## 5.2.4 Enabling device access restriction

Enabling device access restriction requires you to enter an ID and password in order to obtain provisioning information for any device in this pool. We highly recommend enabling device access restriction to prevent unauthorized users from having unrestricted access to your device pool configurations, including passwords and instances.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool from the list.
2. On the left side, click the settings button.  

3. From the settings menu, select **Edit pool settings**.  
The **Device pool settings** screen displays.
4. To enable **Device access restriction**, toggle the **ON/OFF** button..  
The **ON/OFF** button not only enables and disables **Device access restriction**, it also displays the state in which it's in.
5. Enter the **Device access ID**.
6. Enter the **Device access password**.  
You must enter the password twice to confirm that it is correct.
7. Click the confirm button to save your changes.

## 5.2.5 Specifying IP subnets on a device pool

You can automatically add new devices to a specific pool, based on its IP address subnet. This feature can be enabled and disabled individually for each pool. By default, this feature is disabled in all pools.

### About this task

The IP address subnet is not restrictive and does not prevent you from manually adding devices to the pool because the IP address is only considered when the device is automatically added.

IP subnets must be unique. However, an IP subnet can be contained within another subnet. New devices that match both subnets are assigned to the pool with the most specific subnet (the one with more mask bits).

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool from the list.
2. Select the device pool for which you want to specify an IP address subnet.
3. Click **Settings > Edit pool settings**.
4. Enable **Add new devices in this subnet**.
5. Enter the **Subnet base IP address**.
6. Enter the **Subnet mask bits**.
7. Click the confirm button to save your changes.

## 5.2.6 Setting SIP parameters for new devices

You can automatically set standard SIP parameters on new devices that are manually created in a specified device pool, or new devices provisioned against Dolby Conferencing Console. By default, this feature is enabled.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool from the list.
2. Select the device for which you want to set SIP parameters.
3. Click **Settings > Edit pool settings**.
4. Enable or disable **Add SIP parameters to new devices**.
5. Click the confirm button to save your changes.


Once you have enabled SIP parameters to new devices, these SIP parameters will be added to new devices:

- **Sip.Account.DisplayName**
- **Sip.Account.UserName**
- **Sip.Account.Name**
- **Sip.Account.Password**

## 5.2.7 Uploading certificates for use with devices

The Dolby Conferencing Console software allows you to upload certificates for later use, as needed.

### Prerequisites

 **Note:** The certificates that you upload must be in Privacy-Enhanced Electronic Mail (Privacy-Enhanced Electronic Mail (PEM)) or Distinguished Encoding Rules (DER) format with the *.pem*, *.crt*, or *.cer* file-name extension.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. On the left side, click the upload button.



3. From the **System upload** screen, perform one of these steps:
  - Drag and drop the certificate file to the system upload screen.
  - Click the select file button to browse the computer to find the CA certificate, and then click the upload button to upload the file to the Dolby Conferencing Console server.



If the file format is invalid or not recognized, this error message displays:

*The file <filename> has an invalid file extension.*

## 5.2.8 Trusting certificates

You can add certificates to use for devices within a pool.



**Procedure**

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool from the list.

The device list displays.

2. On the left side, click the settings button.



3. From the settings menu, select **Certificates**.  
The **System certificate store** screen displays.

4. Perform one of these steps:

- Select only the certificates in the list that you want to trust.
- Check **Select all**.

This message displays:

*You are about to change the CA certificate settings for this device pool. Do you wish to continue?*

5. Click the confirm button.  
An update confirmation displays.
6. To download the system certificate store to all devices in the device pool, click the confirm button in the pop-up window.  
A change in the trusted CA certificate results in a device reboot.

## 5.2.9 Adding inventory information to device pools

Add inventory information to device pools so that you can then search devices based on city, state, country, department, or company. You can also add custom inventory information based on the needs or your organization.

**Procedure**

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool from the list.

The device list displays.

2. On the left side, click the settings button.



3. From the settings menu, select **Inventory**.
4. Enter your information, and click the confirm button.

**What to do next**

You can override inventory settings at the device level, if needed. For example, if there is a specific device that requires different inventory information, open the configuration page for that device, and then click the **Inventory** tab. From there, add or edit inventory information, and it will apply only to that one device.

## 5.2.10 Searching inventory

You can search devices based on pools, hardware type, device status, alarm state, call state, city, state, country, department, company, or custom inventory information.

**About this task**

This task explains how to search inventory from the Dolby Conferencing Console web interface.

### Procedure

1. From the Dolby Conferencing Console web interface, on any screen, click the search button in the upper-right corner.



The search field displays.

2. Below the search field, click the **Inventory Search** link.



The **Inventory Search** page displays. You can expand the column widths to the size you want and the system will remember the width to which it was resized. In addition, you can hover over a device and a tooltip provides the device information.

3. Use the drop-down lists and check boxes on the left side of the screen to further refine the results of your search.

### What to do next

Export the results of your inventory search, if desired.

## 5.2.11 Exporting information from an inventory search

You can export the results of an inventory search to a `.csv` file.

### About this task

The report includes the same information that you see onscreen:

- Name
- Serial number
- Mac address
- IP address
- VLAN ID
- Software version number
- Alarm status
- Call state
- Uptime (in seconds)
- Pool name
- Hardware type

### Procedure

From the **Inventory Search** page, click **Export CSV**.

## 5.3 Device profile management

Profiles provide you with a convenient way to group configuration parameters and apply them to groups of devices.

When you create a profile, it can be shared by multiple pools. Profiles can exist in the system even when it is no longer used by any pool. If a profile is removed from all pools but not explicitly deleted from the system, it appears in the list of available profiles each time you begin the procedure for assigning a profile to a device pool. To completely remove a profile from the system, you can delete it by clicking on the delete button in the **All profiles** page.

### 5.3.1 Adding profiles

Use the web interface to create new profiles, create a profile within an existing pool, or create a stand-alone profile. Profiles can also be assigned to more pools at a later time.

#### Prerequisites

Before creating a new profile for a pool, make sure either that you have created a suitable pool for the profile, or that it makes sense to create the profile within the default pool. Also make sure that your Dolby Conference Phone firmware version is 2.1.x or later.

#### About this task

Some information on configuration parameters is provided in context-sensitive help and can be viewed by hovering the mouse. For more detailed information, see the *Dolby Conference Phone Administrator's Guide*.

These steps explain how to add a profile to an existing pool. To create a new profile outside the existing pools, begin from the **System: All profiles** page and skip to step 3.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the pool where you want to create the new profile.  
A screen displays the pool with a listing of all its devices.
2. From the **Settings** menu, select **Profiles**.  
The **Current profiles** screen displays.
3. Create a new profile by clicking the add button.  
The **Create new profile** screen displays.
4. (Optional) If you are creating a profile outside an existing pool, the newest firmware gets selected automatically. You can choose an older version from the **Firmware version** list box.  
If you are creating a profile in an existing pool, the new profile uses the same firmware as the pool.
5. Enter a profile name and continue editing as needed, until you have the desired configuration:
  - Drag any desired configuration parameters defined on the left side to the entry area on the right.
  - Delete any added parameter by clicking the remove button.
6. To save your changes, click the confirm button.  
If you want to update all devices in pools using this profile, click the confirm button in the update-confirmation pop-up. Otherwise, click the cancel button and perform the update at a later time.

#### Results

If you created the profile in an existing pool, the profile list screen displays all profiles in the indicated device pool. If you created the profile from the **System: All profiles** page, the **Update profile** page for the new profile displays.

### 5.3.2 Editing profiles

Use the web interface to edit an existing profile.

#### About this task

These steps explain how to edit a profile in an existing pool. To edit a profile outside the existing pools, begin from the **System: All profiles** page and skip to step 3.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool with the profile you want to edit.

A screen displays the device pool with a listing of all its devices.

2. On the left side, click the settings button.



3. From the settings menu, select **Profiles**.

The **Current profiles** screen displays.

4. Select the profile you wish to edit from the list.

The list of parameters for the profile appears on the right side of the screen.

5. Click the modify selected profile button.



The **Update profile** screen displays.

6. Edit as needed, until you have the desired configuration:

- Drag any desired configuration parameters defined on the left side to the entry area on the right.
- Delete any added parameter by clicking the remove button.

7. To save your changes, click the confirm button.

### Results

The **Current profiles** screen displays again.

## 5.3.3 Copying profiles

You can copy an existing profile using the web interface. Only regular profiles can be copied. Provider profiles cannot be copied.

### About this task

When you copy an existing profile, you can change the hardware type. If you change the hardware type, some existing parameters may become invalid because they do not apply to the hardware type. A profile with invalid parameters cannot be saved. Invalid parameters are grayed out and the save button is disabled until the invalid parameters are removed.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool.  
A screen displays the pool with a listing of all its devices.
2. Click **Settings > Profiles**.  
The **Current profiles** screen displays.
3. Click on the profile you want to copy.
4. Click the copy profile button.  
The **Update profile** screen displays with the newly copied profile. The copied profile will have “copy” appended to the profile name.
5. (Optional) Rename the the file and change the hardware type.
6. To save your changes, click the confirm button.  
The profile is saved under the new name and the original profile remains unchanged.

### Results

The **Current profiles** screen displays with both the original and the copy profiles. If the copy was made within a pool, it is the lowest priority profile.


## 5.3.4 Profile pool ordering

Use the web interface to prioritize the order in which pool profiles are arranged within a pool.

**About this task**

If more than one pool profile defines the same configuration parameters, the pool profile with the highest priority determines the value sent to the devices.



**Procedure**

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool from the list.  
The device list displays.
2. On the left side, click the settings button.  

3. From the settings menu, select **Profiles**.  
The **Current profiles** screen displays.
4. To the right of the profile, click and hold the button with the three lines and drag it to change the order.  
The page displays the resulting parameters that are delivered to the devices. and this page is updated when the order is changed.

**5.3.5 Removing a profile from a pool**

Removing a profile from a pool does not remove the profile from the system,.

**Procedure**

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool from the list.  
The device list displays.
2. On the left side, click the settings button.  

3. From the settings menu, select **Profiles**.  
The **Current profiles** screen displays.
4. From the list, highlight the profile that you want to delete.
5. Click the remove button.  
  
The message *The profile <name> is about to be removed from this device pool. Do you wish to proceed?* displays.
6. Click the confirm button.  
The profile notification screen displays.
7. Choose from these options:
  - If you want to update all devices in the device pool now, click the confirm button in the update-confirmation pop-up.
  - To update all devices at a later time, click the cancel button.

**Results**

The profile list screen displays. All profiles in this device pool are shown.

**5.3.6 Deleting profiles**

Use the web interface to delete a profile that does not belong to any pools.

### Prerequisites

If you need to delete a profile from the Dolby Conferencing Console software, you must first remove it from all pools. Only then will you be able to delete the profile from the system.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. On the left side, click the other settings button.



3. From the settings menu, select **Profiles**.

The **All profiles** screen displays a comprehensive list of profiles and the pools to which they are assigned.

4. Click the delete button to the right of the profile you want to delete.

The delete button only visible for profiles that are not assigned to any pools.

The message *Are you sure you want to remove the profile<name>?* displays.

5. Click the confirm button.

### Results

The profile no longer displays on the screen.

## 5.3.7 Viewing all profiles

You can use the web interface to view all profiles in the system.

### About this task

Although you typically want to view profiles within the context of a pool, you can also view a list of all profiles in the system.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. On the left side, click the other settings button.



3. From the settings menu, select **Profiles**.

### Results

The **All profiles** screen displays a comprehensive list of profiles and the pools to which they are assigned.

## 5.4 Provider profiles

Provider profiles allow service providers to make configuration and firmware updates available to customers.

Provider profiles can define certificates, configuration parameters, directory entries, and firmware for each device type. When a provider profile is assigned to a pool, the pool:

- Sets the firmware used by the pool to what is specified in the provider profile

- Provisions the devices in the pool with the provider profile configurations
- Provisions the endpoints with certificates and directory entries in the provider profile

Firmware listed on a provider profile revision is automatically downloaded from the service provider and added to Dolby Conferencing Console. This firmware can be assigned to any pool, even if it does not use the provider profile.

When a provider profile sets the firmware used by the pool, it cannot be changed within Dolby Conferencing Console. The provider profile must be removed from the pool in order to set the firmware manually.

If a pool has more than one provider profile specifying which firmware to use, the provider profile with the higher priority sets the firmware.

When a provider profile is added to the pool, the most recent revision is used. When a provider profile is updated, the update is not automatically applied. You have to choose to update a pool with that revision. Provider profiles can also be reverted to the previous version, if needed.

Provider profiles can include announcements from the service provider, which notifies customers when provider profiles are added or updated. You can view these announcements on the Dolby Conferencing Console dashboard by clicking on the Provider Profile announcements link on top of the right most column of the page.

### 5.4.1 Adding provider profiles

Use the web interface to create new provider profiles. You can create a profile within an existing pool, or you can create a stand-alone profile and assign it to a pool later.

#### About this task

These steps explain how to add a profile to an existing pool. To create a new profile outside the existing pools, begin from the **System: All profiles** page and skip to step 3.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the pool where you want to create the provider profile.  
A screen displays the pool with a listing of all its devices.
2. From the **Settings** menu, select **Profiles**.  
The **Current profiles** screen displays.
3. Create a new profile by clicking the add button.  
The **New profile** screen displays.
4. Click **Add Provider Profile**.
5. Enter a provider profile name.
6. Enter the URL of the provider profile.
7. (Optional) To add a certificate file, you can click the file button or use the drag and drop method.
8. To save your changes, click the confirm button.

Once you have added a provider profile to Dolby Conferencing Console, you can assign it to a pool.

### 5.4.2 Editing provider profiles

Use the web interface to edit an existing provider profile.

#### About this task

These steps explain how to edit a profile in an existing pool. To edit a profile outside the existing pools, begin from the **System: All profiles** page and skip to step 3.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool with the profile you want to edit.  
A screen displays the device pool with a listing of all its devices.

2. On the left side, click the settings button.



3. From the settings menu, select **Profiles**.  
The **Current profiles** screen displays.

4. Select the provider profile you want to edit from the list.  
The provider profile is shown.

5. Click the modify profile button.



The **Update profile** screen displays.

6. Edit as needed. If you want to remove the certificate from the provider profile, use the **Remove Certificate** button.
7. To save your changes, click the confirm button.

### Results

The **Current profiles** screen displays again.

## 5.4.3 Deleting provider profiles

Use the web interface to delete a provider profile that does not belong to any pools. When you delete a provider profile from a pool and the firmware was set using the provider profile, the firmware selected for the pool is not changed but can be modified.

### Prerequisites

If you need to delete a provider profile from the Dolby Conferencing Console software, you must first remove it from all pools. Only then will you be able to delete the profile from the system.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. On the left side, click the other settings button.



3. From the settings menu, select **Profiles**.

The **All profiles** screen displays a comprehensive list of profiles and the pools to which they are assigned.

4. Click the delete button to the right of the profile you want to delete.

The delete button only visible for profiles that are not assigned to any pools.

The message *Are you sure you want to remove the profile<name>?* displays.

5. Click the confirm button.

### Results

The profile no longer displays on the screen.



## 5.5 Device management

You can add devices, edit device parameters, delete devices, and move devices to other pools.

### 5.5.1 Adding a device

It is possible to add a device by simply plugging it in (as long as the system is properly set up); however, you can also add devices explicitly in the Dolby Conferencing Console software.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool to which you want to add a device:
  - If the pool contains no devices, the **Initial configuration** screen displays and prompts you to add devices to the device pool.
  - If the pool does contain devices, the device list displays.
2. Click the add button.  
The **Add a new device** screen displays.
3. Choose the device hardware type from the popup menu.  
If a device hardware type is not chosen, an error message displays.
4. Enter the MAC address of the Dolby Conference Phone that you want to add.
  - If the value that you enter is not a valid MAC address, an error message displays. Try again.
  - If the media access control address you entered has already been configured for another device, the message `mac_addr: Phone with this Mac addr already exists` displays.
5. Click the arrow button to navigate to the next step.  
Once the device is added and is ready to configure, the **Phone configuration** screen displays.
6. To immediately proceed with configuration, continue with these steps. Otherwise, click the cancel button and perform the configurations from the profile page:
7. To save your changes, click the confirm button, and to update, click the confirm button again. Otherwise, click the cancel button.

#### Results

The device information page displays.

### 5.5.2 Editing device parameters

Device parameters allow you to set parameters and apply them to a specific device. You can edit device parameters by using the web interface.

#### About this task

Once applied to a device, device parameters overwrite any profile settings. Typical device parameters are SIP registration credentials and device display name.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool that contains the devices for which you want to edit parameters.  
The device list displays.
2. Select the device you want to edit.
3. In the left navigation bar, click the edit button.  
The **Device information** screen displays.
4. Drag any desired parameters from the list of those available (in the left pane) to the right entry pane.

Details of all added parameters immediately display.

5. To remove a configuration parameter from a profile, click the **X** next to the text entry box for that parameter.
6. To save your changes, click the confirm button.
7. To update the device immediately, click the confirm button. Otherwise, click the cancel button and update the device at a later time.

### 5.5.3 Deleting a device

You can delete devices from a device pool.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool from the list.  
The device list within the selected device pool displays.
2. Select the devices that you want to remove by checking the boxes on the left side of the screen.  
You can select all the devices by:
  - Checking the top check box.
  - Clicking the triangle and choosing **All devices**.
3. Click **Actions > Delete**.  
The **Confirm device deletion** screen displays.
4. Confirm that you want to delete this device.

#### Results

The device list displays with the deleted device removed from the list.

### 5.5.4 Moving multiple devices between pools

Working from the device list of a device pool, you can move multiple devices to another pool.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool from which you want to move devices.  
The device list displays.
2. Select the devices that you want to move by checking the boxes on the left side of the screen. To select all the devices at once, check the top check box or click the triangle and choose **All devices**.
3. Click **Actions > Move**.
4. Make a selection from the **Select a device pool** drop-down list, and click the confirm button.
5. Click the confirm button in the **Push Configuration Changes** pop-up screen.

### 5.5.5 Moving one device to another pool

Use the device information page to move a device to a different pool.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, select the device pool from the list.  
The device list displays.
2. Click on a device.

The device information page displays.

3. Below the screen shot of the phone display, click **Move**.



4. Make a selection from the **Select a device Pool** drop-down list box, and click the confirm button.
5. Click the confirm button in the **Push Configuration Changes** pop-up to move the device.

## 5.6 Contact directory management

You can provision a local contract directory of up to 1,000 names and numbers on the devices in a pool. You can upload directory files, edit contact directories, and assign directories to pools.

Each pool may have zero or more contact directories assigned, totaling up to 1,000 contacts. If the total number of contacts exceeds 1,000, the directory that the Dolby Conferencing Console server downloads to the devices in the pool gets truncated to the first 1,000 entries.

You can assign a contact directory to multiple pools. If a contact directory is not assigned to any pools, you can delete it.

To see a list of all directories on the **System: All directories** screen, from the **Dashboard** select **Settings > Settings > Directories**.

Phone numbers may be extension numbers in your PBX, external numbers, or SIP URLs.

Contact directory files are *json* text files that contain one or more contact entries in this format:

```
{
  "entries": [{
    "firstName": "Ben",
    "lastName": "Kennedy",
    "number": "2222"
  },
  {
    "firstName": "Leslie",
    "lastName": "Stewart",
    "number": "2324"
  }
]
```

The `firstName` and `lastName` fields may each contain up to 32 characters. The `number` field may contain up to 255 characters.

### 5.6.1 Creating a contact directory for the current pool

When you create a contact directory, you can assign it to the current pool or to multiple pools. Contact directories are initially empty.

#### About this task

##### Note:

You can also create a contact directory from the **System: All directories** screen.

#### Procedure

1. Navigate to the page for a pool to which you want to assign the new contact directory.
2. Select **Settings > Directories**.  
The **All directories** screen appears.
3. Click **Add directory**.  
The **Create a new directory** screen appears.

4. Enter a **Name** and **Description** for the contact directory.
5. Optionally, select additional pools to which to assign the new directory.
6. Click **Save**.

#### What to do next

Click **View Entries** to begin creating contacts or to upload a file that contains contacts.

## 5.6.2 Adding contacts to a directory

You can add individual contacts to an existing contact directory, or upload a file that contains multiple contacts and add them to a directory.

#### Procedure

1. Select **Settings > Directories**.  
The **All directories** screen for the pool appears.
2. Click the directory to which you want to add contacts.
3. Click **View Entries**.
4. Perform one of these steps:
  - To upload a contacts file, click the select file button and browse to the file on your local computer.



- To create a single new contact, click add directory entry button and enter the **First Name**, **Last Name**, and **Number**.



#### Results

After you upload the file or enter the new contact, the updated directory is pushed to the devices in the current pool and the devices in any other pools that use this contact directory.

## 5.6.3 Assigning an existing contact directory to a pool

All contact directories on the system are available for assignment to any pool.

#### Prerequisites

Navigate to the screen for the pool to which you want to add the contact directory.

#### Procedure

1. Select **Settings > Directories**.  
The **All directories** screen appears.
2. Click **Add directory**.  
The **Create a new directory** screen appears.
3. Click **Assign from system directories**, and select one or more directories.
4. Click **Save**.

## 5.7 Monitoring device status

You can view and download a variety of status information about the Dolby Voice Device from Dolby Conferencing Console, especially if the statistics feature is enabled on the device.

 **Note:**

While you are viewing a list of devices, you can click a device to see its **Device information** screen in the current browser tab, or use the right-click menu to open the **Device information** screen in a new tab. If you are investigating problems that affect multiple devices, opening a separate tab for each **Device information** screen can often be helpful.

## 5.7.1 Enabling call statistics

You can enable call audio statistics and view WebRTC logs through Dolby Conferencing Console.

### About this task

If you want to be able to review call records in the future, you must first enable the call audio statistics feature. Call audio statistics can be enabled for a pool or a single device.

Call records are recorded only after call audio statistics is enabled. For example, if you enable call audio statistics, the system does not provide call records of past calls.

Call audio statistics and WebRTC logs can be enabled from Dolby Conferencing Console or from the phone web interface. By default, these are both disabled.

For video conference calls, if enabled the WebRTC logs are shown beneath the audio statistics when viewing the call record.

### Procedure

1. To enable call audio statistics from the Dolby Conferencing Console:
  - a) Click **Logging > Audio**, and then drag **Audio Logging Level** to the device configuration.
  - b) Set `Logging.Audio.Mode` to `Statistics`.
2. To enable audio call statistics from the phone web interface:
  - a) From the **Settings** tab, navigate to **Logging > Audio**.
  - b) Set `Audio Logging Level` to `Statistics`.
3. To enable WebRTC statistics from the Dolby Conferencing Console:
  - a) Click **Logging > WebRTC**, and then drag **Debug Trace** to the device configuration.
  - b) Set `Logging.WebRTC.DebugTrace` to `On`.
4. To enable WebRTC statistics from the phone web interface:
  - a) From the **Settings** tab, navigate to **Logging > WebRTC**.
  - b) Set `Debug Trace` to `On`.

### Results

Each time a new call is placed from a device, call audio statistics and WebRTC statistics become available when viewing the call, if they are enabled and appropriate.

## 5.7.2 Viewing recent calls

The recent calls list provides a high-level overview of all recent calls on a particular Dolby Conference Phone. It includes general information about calls such as call type, start time, duration, and number of participants.

### About this task

The recent calls list is always available. However, if you want to view detailed diagnostic information about calls, then you must enable call statistics.

**Procedure**

From the Dolby Conferencing Console web interface, choose a device and then click the **Logs** button.



The recent calls list displays.

**5.7.3 Viewing call records**

If audio statistics is enabled, information about calls are recorded in call detail records (CDRs). You can view or download these records that contain statistics about calls, including information on jitter, packet loss, and audio level. Video conference calls can also have WebRTC statistics. These are displayed below the audio stats.

**About this task**

Audio and WebRTC statistics for a particular call are available only if the audio statistics or WebRTC Debug Trace features were enabled on the phone before the call was made.

**Procedure**

1. From the Dolby Conferencing Console web interface, choose device and then click the logs button.



The recent calls list displays.

2. Choose a call, and then click the more information button.



The call statistics screen displays.

If the audio statistics feature is enabled, this information displays. If not, no audio statistics are available.

**jitter**

Variations in the amount of time required for audio packets to flow from one point to another on the network, resulting in sound disruptions. Measure in milliseconds (ms).

**packet loss**

The percentage of lost packets.

**audio level**

The **In level** shows the input level coming from the microphone on the Dolby Conference Phone.

The **Out level** shows the output level coming from the speaker on the phone.

You can use this information to understand when a speaker in the room talked and where they were speaking from (for example, the far end of the room).

If WebRTC statistics are available for the call, this information is also displayed.

3. From the drop-down list, choose from these types of statistics:

- **To and from the phone**
- **To the phone**
- **From the phone**

4. Click the download button.



A raw data file downloads. This is a *.zip* file that includes *.json* files.

If WebRTC statistics are available, these will also be in the *.zip* file.

If you submit a support request to Dolby for an audio problem, include this file in your support request, if possible.

## 5.7.4 Viewing event logs

If statistics is enabled, events on the Dolby Voice Device are recorded. You can then view and download events logs from Dolby Conferencing Console.

### About this task

The event log captures a wide range of events that happened on the phone. For example:

- When calls were placed
- When calls ended
- When a problem occurred
- When the device rebooted

### Procedure

1. From the Dolby Conferencing Console web interface, navigate to a device.
2. Click the logs button.



The recent calls list displays.

3. Click the **Event logs** tab.  
A list of event logs displays.
4. Click the download button.



### Results

The event log downloads as a `.txt` file.

## 5.7.5 Viewing core dump logs

If statistics is enabled, core dumps on the Dolby Voice Device are recorded. You can then view, but not download, core dump logs from Dolby Conferencing Console.

### About this task

If the device unexpectedly reboots and generates a core dump, contact Dolby for support and analysis of the problem. You may need to specify when the core dump occurred, and you can get this information from the log.

### Procedure

1. From the Dolby Conferencing Console web interface, choose device and then click the logs button.



The recent calls list displays.

2. Click the **Core dumps** tab.  
A list of core dump logs displays.

## 5.7.6 Responding to device alarms

From Dolby Conferencing Console, you can get a quick view of how many devices have issues. Look for red device alarms to help you know when there is a problem and to troubleshoot the problem.

## Procedure

1. From the Dolby Conferencing Console web interface, navigate to the device pool with alarms.

The alarms number represents the number of devices with alarms. For example, if **2** appears in red next to the name of a device pool, two devices in the device pool have alarms.

Alarms	Name	Total	In a call	Offline
<b>2</b>	San Jose Office	2	0	0

2. From the device pool, select a device with an alarm.

The **Device information** screen displays.

A red alarm displays next to **System Health** along with a basic description of the problem.

**System health** ● One or more problems have been detected [More](#)

3. Click **More** to get more information about the problem and troubleshooting suggestions.
4. Review the categories below **System Health** for any other subalarms and additional information about problems.

## What to do next

If you cannot find enough information about the problem from Dolby Conferencing Console, you can alternatively go to the device web interface.

For example, click the phone IP address and, when the device web interface displays, log in, if prompted. Then click the **Status** tab, expand the sections on the screen, and review them for red alarms.

For example, the alarms look like this:

System Warning	<span style="color: red;">!</span>
Network - Primary VLAN	<span style="color: green;">✓</span>
Network - Secondary VLAN	<span style="color: red;">!</span>



## Import device configurations in bulk

You can import device configurations individually or in bulk.

For bulk uploads, a downloadable template is provided that contains required and optional columns. This template is not required for individual uploads.

Required columns are MAC address and hardware type. Optional columns can be device configuration parameters, such as SIP, DisplayName, Device, etc.

For each upload, you must import all the devices into one pool. If you want to upload the devices to other pools, you have to perform a separate upload for each pool.

Once the file has been uploaded, you can click on a link to see the list of devices created or that are invalid.

To add, update, or delete configurations, you must upload a .comma-separated values (CSV) file. The system distinguishes which action to make based on the number of columns in the file.

If you upload a .CSV file containing only the MAC addresses, then the file is interpreted as a list of devices to delete.

If you upload a .CSV file with multiple columns, then the file is interpreted as a list of devices to add or update and set configuration parameters.

Once the .CSV file is uploaded, a confirmation page shows what will happen if you continue with the action. This confirmation page makes the distinction between adding/updating and deleting, and allows you to confirm the required action.

Validation errors that can occur once the devices have been uploaded

Validation Errors
Duplicate MAC address in rows <i>&lt;row numbers&gt;</i> .
Incorrect MAC address format.
Configuration parameter <i>&lt;parameter name&gt;</i> (parameter value) must be one of the following values: <i>&lt;list of possible values&gt;</i> .
Device with this MAC address already exists.

List of errors when a file is rejected

Rejection Errors
Multiple lines in the uploaded file have column headers.
Incorrect file extension, expected CSV.
Duplicate column headers found in the uploaded file: <i>&lt;names of duplicate column headers&gt;</i> .
One or more required column headers missing: MAC address, Hardware Type.

Rejection Errors
Some rows in the uploaded file are missing required information: MAC address, Hardware Type.
Some rows in the uploaded file are missing information corresponding to column headers.

- [Importing and updating device configurations](#)
- [Delete device configurations](#)



## 6.1 Importing and updating device configurations

You can import and update device configurations one at a time or in bulk.

### About this task

To import or update device configurations, a downloadable template is provided that contains required and optional columns. Required columns are and hardware type. Optional columns can be device configuration parameters, such as `Sip.Account.DisplayName`, `Sip.Credential.Name`, and so on. For bulk uploads, you must import all of the devices into one pool. If you want to upload the devices to different pools, you have to perform a separate upload for each pool. Exported inventory files cannot be uploaded to as device configuration files.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button  in the upper-right corner.
2. On the left side, click the upload button.
3. Perform one of these steps:
  - Drag your configuration file to the page.
  - Click the select file button  to select a file, and click the upload button. \*

Once the files are uploaded, you can view the summary of devices imported into Dolby Conferencing Console.

The file may be rejected if it has an incorrect file extension, duplicate column headers, or missing required columns. If this happens, you must make the appropriate corrections before reuploading the file.

4. Select a device pool from the drop-down list.
 

You can choose only one. If needed, you can move certain devices to different pools after you import.
5. Review the information, and click **Next**.

### Results

The device information page displays.



## 6.2 Delete device configurations

You can delete device configurations individually or in bulk.

### About this task

To delete configurations, you must upload a .CSV file, containing only the MAC addresses so the file is interpreted as a list of devices to delete.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button  in the upper-right corner.
2. On the left side, click the upload button.
3. Perform one of these steps:
  - Drag your configuration file to the page.
  - Click the select file button  to select a file, and click the upload button. \*

Once the file is uploaded, you can view the summary of devices deleted from Dolby Conferencing Console.

4. Review the information, and click **Next**.

## System maintenance

System maintenance involves upgrading and downgrading the Dolby Conferencing Console software, updating device firmware, and database management.

- [Backing up the database](#)
- [Restoring the database](#)
- [Upgrading the Dolby Conferencing Console software](#)
- [Updating device firmware](#)
- [Managing corporate authentication](#)
- [Managing Dolby Conferencing Console users](#)
- [Using SNMP](#)
- [Using Webmin](#)

## 7.1 Backing up the database

Periodically back up your database in case you encounter a problem and need to restore data. It is particularly important to back up the database as a precaution before you install an upgrade.

### About this task

Backing up your data is an important precaution. It protects you in case you encounter a problem with an upgrade. Data from newer versions is not guaranteed to be backward compatible with older versions. If you need to downgrade to an earlier version in the future, that is when you may need the backup to restore data.

### Procedure

1. From the Dolby Conferencing Console server, use the command line to log in as the root user.
2. Stop the Dolby Conferencing Console server by typing `service dcc stop`.
3. Back up your current Dolby Conferencing Console data by entering this command:

```
su -m dcc -c "/usr/bin/dcc-backup /tmp/dcc-backup-filename.dat"
```

In this example, `dcc-backup-filename.dat` represents a file name of your choosing. Choose a file name that makes sense based on your organization.

4. Copy the backup to a permanent folder:

```
mv /tmp/dcc-backup-filename.dat /backupfolder/dcc-backup-filename.dat
```

## 7.2 Restoring the database

If you have a backup, you can restore your database to an earlier point. Only restore your database if necessary.

### About this task

Implementing a database restore is potentially dangerous, because it deletes and overwrites files. We suggest that you run the restore to prevent the possibility of damage from a malicious archive.

### Procedure

Log in as root, and enter this command:

```
su -m dcc -c "/usr/bin/dcc-restore --yes dcc-backup-filename.dat"
```

## 7.3 Upgrading the Dolby Conferencing Console software

If you already installed the Dolby Conferencing Console software, you may want to upgrade from an old version to a new version.

### Prerequisites

The Redis server is a new component in Dolby Conferencing Console version 1.2. If you are upgrading from version 1.1.x, you must first install a Redis server. This requirement applies to both open virtual appliance file and RPM installations. For instructions, see *Dolby Conferencing Console Installation Guide*.

- For open virtual appliance file installations, install the Redis server on the virtual machine.
- For RPM installations, install the Redis server on a separate physical or virtual machine.

### 7.3.1 Downloading the upgrade file

Before you can upgrade Dolby Conferencing Console, you need to download a new RPM package. If you cannot download the software from your provider, use this procedure to download the software from Dolby. We also recommend that you download the latest documentation.

#### About this task

Dolby Conferencing Console software packages are available for download from your Dolby Voice Device provider and Dolby. Check with your provider first. If your provider does not provide the packages for download, the RPM package, open virtual appliance file, and documentation are all available on the Dolby Voice Device support page on [dolby.com](http://dolby.com).

You need the upgrade file only if your original installation used the RPM package. If your original installation used the open virtual appliance file virtual machine, you can skip this procedure.

#### Procedure

1. Go to the Dolby website.
2. Click the **Conferencing support** link.
3. Scroll down to **Dolby Voice Device Software and Documentation** section and click <http://download.dolbyvoice.com/>.
4. Click on the Dolby Conferencing Console link.
5. Select the RPM package for your operating system.
6. Accept the End-User License Agreement, and follow any other onscreen instructions to download your software.

#### What to do next

Download and review the *Release Notes*.

### 7.3.2 Installing the upgrade

Use the Dolby Conferencing Console command line to install the upgrade and restart the server.

#### Prerequisites

Before you upgrade the Dolby Conferencing Console software, make sure you complete all of the necessary prerequisite tasks first, such as backing up your data. See [Backing up the database](#) on page 46.

Download and review the *Release Notes* before you begin the upgrade. If the *Release Notes* provide different installation instructions than the steps below, follow the instructions in the *Release Notes* instead.

#### Procedure

1. From the Dolby Conferencing Console server, at the command line, log in as the root user.
2. Enter `yum upgrade dcc-package-name .rpm` to upgrade the server.
3. At the end of the upgrade, enter `service dcc start` to restart the server.
4. From the Dolby Conferencing Console user interface, confirm that the upgrade is complete.

## 7.4 Updating device firmware

The Dolby Conferencing Console software supports the use of multiple firmware releases, so you have the option of uploading new firmware releases and pushing these new releases out, as needed, to individual devices and to device pools. During an initial deployment, you will typically upload the latest firmware release to the Dolby Conferencing Console software and then provision that firmware on the devices.

Before you update device firmware, we recommend that you:

- Review the *Release notes* associated with the firmware to learn about any new or changed features.
- Review system settings to see if there is a need for any new or changed configuration parameters.
- Verify that all profiles are still valid.
- Review existing certificates, and create and/or upload any new ones that will be needed as you perform the updates.

### 7.4.1 Uploading device firmware

Use the Dolby Conferencing Console web page to upload firmware to the Dolby Conferencing Console server.

#### Procedure

1. From the **System information** screen, click the settings button.
2. From the **Settings** menu, select **Firmware**.
3. Click the add firmware button.
4. Click the upload button, and perform one of these steps:



- Drag and drop the device firmware file (in *.zip* format) to the system upload screen.
- Click the select file button to browse the computer to find the device firmware file, and click the upload button to upload the file to the Dolby Conferencing Console server.



These are the supported firmware types:

- Dolby Conference Phone VCP9000
- Dolby Voice Room VPU9000
- Dolby Voice Huddle VCS8000

If the file format is invalid and not recognized, the error message *The file <filename> has an invalid file extension* displays. Confirm the error, and repeat step 2. The device firmware import displays.

5. To save your changes, click the confirm button.

### 7.4.2 Provisioning firmware

You can update firmware for all devices within a device pool at once.

#### Procedure

1. From the **Settings** menu, select **Firmware**.  
Dropdown lists display, one for each hardware type. If firmware is currently selected, the current firmware screen displays showing when the firmware was built, package size, and signature.
2. From one of the drop-down lists, select a new firmware release.
3. To save the updates, click the confirm button in the confirmation pop-up. Otherwise, click the cancel button to provision the updates to the devices at a later time.

#### Results

The device list displays again. An animated firmware-update progress bar displays for each updating device until the update is complete.



## 7.5 Managing corporate authentication

You can choose to authenticate using LDAP or SAML. Use LDAP if you want users to be able to log in with their corporate credentials. Use SAML if you want your users to log in through single sign-on.

### 7.5.1 Configuring LDAP for user authentication

Configure LDAP if you want users to be able to log in with their corporate credentials.

#### Prerequisites

You must be a system administrator to complete this task.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. On the left side, click the other settings button.



3. Click **Corporate authentication**.

4. In the **Select the corporate authentication method to use** field, select **LDAP** from the drop-down.

If you are changing from SAML authentication to LDAP authentication, all SAML user login credentials will be converted to LDAP login credentials.

5. Enter information about your LDAP server into these fields:

- **Server**
- **Port**
- **Base DN**
- **Bind user name**
- **Bind user password**
- **User Filter**

For **Server**, do not include the LDAP protocol in the server URL.

6. (Optional) Select **Use Secure Socket Layer (SSL)**.

The LDAP client certificate for Secure Sockets Layer (SSL) connections on the Dolby Conferencing Console server is located in `/etc/dcc/cacerts.pem`. This file should contain the LDAP client SSL certificate.

When **Transport Layer Security (TLS)/No Option** is enabled, Dolby Conferencing Console sets the default port to 389. When SSL is enabled, Dolby Conferencing Console selects port 636.

7. (Optional) Select **Use STARTTLS**.

#### What to do next

After you complete this task, check the settings for each user account and make sure that **Use LDAP for authentication** is selected.

### 7.5.2 Configuring SAML for user authentication

Configure SAML if you want users to be able to log in using single sign-on. SAML authentication can be used with any SAML 2.0 identity provider, such as Okta.

#### Setting up Dolby Conferencing Console in Okta

You have to setup the SAML application in Okta to be able to use single sign on.

**Prerequisites**

You must have an Okta IT account and a Dolby Conferencing Console domain name to complete this task.

**Procedure**

1. Navigate to the Okta site.
2. Perform the setup according to the directions.  
[https://developer.okta.com/standards/SAML/setting\\_up\\_a\\_saml\\_application\\_in\\_okta/](https://developer.okta.com/standards/SAML/setting_up_a_saml_application_in_okta/)
3. Configure the **Single Sign On URL** and **Audience URI (SP Identity)** in the Okta application to `<DCC base URL>/saml2/acs/`.  
Use [https://dcc.your\\_domain.com/saml2/acs/](https://dcc.your_domain.com/saml2/acs/) to setup Dolby Conferencing Console with a SSL certificate.  
Use [http://dcc.your\\_domain.com/saml2/acs/](http://dcc.your_domain.com/saml2/acs/) to setup Dolby Conferencing Console without using a SSL certificate



**Note:** The HTTP or HTTPS protocol type must be correct and the URL must end with a slash.

4. Configure the **Attribute Statements** as:

*Table 1: Attribute Statements*

Name	Value
FirstName	user.firstName
LastName	user.lastName
Email	user.email
UserName	user.username

5. Complete the procedure according to the instructions.

**Configuring SAML for single sign-on****Prerequisites**

- You must be a system administrator to complete this task.
- You must configure the SAML identity provider for Dolby Conferencing Console before you can configure SAML for single sign-on.

If you are using Okta as your SAML identity provider, see [Setting up Dolby Conferencing Console in Okta](#) on page 49 for more information.

**Procedure**

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. On the left side, click the other settings button.



3. Click **Corporate authentication**.
4. In the **Select the corporate authentication method to use** field, select **SAML** from the drop-down.  
When you use SAML, all existing user passwords will be cleared, except for the user named “admin,” and all users must log in to the server using their corporate credentials.  
When SAML is enabled, the LDAP column in the user list will no longer be visible.

5. Enter the appropriate information for the following fields:

URL	Example
DCC server base URL	<i>mydcc.domain.com</i>
IDP SSO URL	Obtain from your Okta setup.
IDP metadata URL	Obtain from your Okta setup.
IDP issuer URL	Obtain from your Okta setup.

### Changing the SAML user identifier (optional)

By default, SAML uses the email address attribute to identify the user. You can change the *etc/dcc/settings.ini* file to use the username, instead of the email address.

#### Procedure

1. Open the *etc/dcc/settings.ini* file.
2. Add or edit the [saml] section in the *etc/dcc/settings.ini* file.
3. Change DJANGO\_USER\_MAIN\_ATTRIBUTE to the preferred user identifier.

The options are email or username. The default setting is email.

```
[saml]
DJANGO_USER_MAIN_ATTRIBUTE = username
```



**Note:** Each user must have a unique username or email.

4. Restart the Dolby Conferencing Console server for the changes to take effect.

```
service dcc restart
```

You must be a root user to restart the Dolby Conferencing Console server.

### Configuring the SAML certificate and private key pair (optional)

You can use a certificate and private key pair, generated without a pass phrase for SAML single sign-on to encrypt or as the client key.

You can specify this in the */etc/dcc/settings.ini* file.

```
[saml]
DJANGO_USER_MAIN_ATTRIBUTE = email
PRIVATE_KEY = /etc/dcc/saml_key.pem
CERTIFICATE = /etc/dcc/saml_cert.pem
```

Dolby Conferencing Console provides a tool to generate a self-signed certificate and key pair.

See the *Dolby Conferencing Console Installation Guide* for more information.

Dolby Conferencing Console does not support a private key created with a passphrase for SAML.

If the key was not encrypted using a passphrase, the self-signed certificate and private key pair can be used for serving Dolby Conferencing Console for SAML.

For existing Dolby Conferencing Console installations that already use a web certificate/key pair encrypted using a passphrase, you can preserve backwards compatibility by generating a new certificate and key pair and updating the *settings.ini* file to use the newly generated certificate and key files.

## 7.6 Managing Dolby Conferencing Console users

The default user, created when you install the Dolby Conferencing Console software, is a system administrator with superuser access. You can add any number of additional users, with system administrator or lesser permissions.

Before you create users, make sure you understand what roles you can assign and how they impact what tasks those users can perform.

You can assign these roles to users:

Role	Permissions
System administrator	Full control
Device administrator	Can change device configurations, but cannot make changes related to server setup
User	Can view status information and change password only

### 7.6.1 Adding and editing user accounts

Each user has an assigned role (system administrator, device administrator, or user), which determines privileges.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. On the left side, click the users button.



3. Perform one of these steps:

- To add a user, click the add button.
- To edit a user, select a user and then click on the edit button.

4. Enter information about the user into these fields, or update existing information:

- **User ID**



**Note:** Each user must have a unique user ID.

- **Authentication settings**

- **Use LDAP for authentication**
- **User password**
- **Confirm user password**



**Note:** **Authentication settings** is visible only when editing a user.

- **Name**
- **Description**
- **Location**
- **Department**
- **Email**



**Note:** Each user must have a unique user ID.

- **Phone**

- **User role**



**Note:** If you use LDAP or SAML for authentication, the user is required to enter their corporate password, so the **User password** field becomes unavailable. For LDAP users, ensure that the Dolby Conferencing Console user ID matches the corporate user ID. For SAML users, ensure that the Dolby Conferencing Console user's email address matches the SSO user's email address. The user named "admin" cannot have LDAP authentication.

5. Click the confirm button.

## 7.6.2 Logging into Dolby Conferencing Console using SAML

Once SAML is enabled, administrators and users have different logins. Administrators log in using a specific URL and users log in using single sign-on.

### Administrator login

If you are a user named "admin" and SAML is enabled, you must use this URL:

*DCC base URL/admin-login*

Use your Dolby Conferencing Console administrator credentials. This login is only available to users named "admin." All other users, regardless of permission, must log in through the SAML system.

You can add SAML users, update the SAML configuration, or perform any administrator task using this URL.

### User login

When SAML is enabled, users will be redirected to the single sign-on login page. They will not be able to log in to the base Dolby Conferencing Console URL.

Users must be present in the Dolby Conferencing Console system in order to log in using single sign-on.

## 7.6.3 Reviewing Dolby Conferencing Console user activity logs

The system records logs of Dolby Conferencing Console user activity that can be used for security and audit purposes. Only system administrators can view and download user activity logs.

### About this task

These logs can be accessed from two locations: one provides information about all users, and the other provides information about only a specific user.

Logs can be downloaded as a comma-separated values (.csv) file and include information such as time, user, and the type of event. You can use them to monitor how frequently Dolby Conferencing Consoles are used and by whom, or to help you troubleshoot problems, when needed.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. To view information about all users, on the left side, click the logs button.



3. To view information about specific users, perform these steps:

a) On the left side, click the users button.



b) Select a user, and notice that additional buttons display on the right side.

- c) Click the logs button.  
The log displays.
4. If desired, download the log from either page by using the download button in the upper-right corner.



## 7.6.4 Changing passwords

You can change your password from the Dolby Conferencing Console web interface.

### Procedure

1. On the home screen (in the upper-right corner), click your user name.
2. Click **Authentication settings**, and then enter your current password.
3. Enter a new password, and then enter it a second time.
4. Click the confirm button to save your changes.

## 7.6.5 Configuring SMTP to reset passwords

You can configure SMTP so that non-LDAP/SAML users can reset forgotten passwords.

### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. On the left side, click the other settings button.



3. From the settings menu, select **SMTP**.
4. Enter information about your SMTP server into these fields:

- **Sender**
- **Server**
- **Port**
- **User name**
- **User password**

5. (Optional) Select your encryption preference.

- **Use none**
- **Use SSL**
- **Use STARTSSL**

The SMTP client certificate for SSL connections on the Dolby Conferencing Console server is located in `/etc/dcc/cacerts.pem`. This file should contain the SMTP client SSL certificate.

The port number is updated based on the selected encryption type.

6. (Optional) Enter an email address if you want to test the new settings .

## 7.6.6 Resetting lost passwords for non-LDAP users

Non-LDAP users can reset forgotten passwords with the **Forgot Password** link.

### Prerequisites

SMTP must be enabled.

### About this task

**Forgot Password** is supported only for non-LDAP/SAML users.

### Procedure

1. From an Internet browser, enter the IP address for the Dolby Conferencing Console server.
2. Enter your user name and password. Click **Log in**.  
If the password is incorrect, the **Forgot Password** link displays.
3. Click **Forgot Password**.
4. Enter your email address, and then click **Reset my password**.

### Results

You will receive an email containing a link for resetting your password.

## 7.7 Using SNMP

The Dolby Conferencing Console software uses an Simple Network Management Protocol (SNMP) agent program to manage certain functions. When enabled, it can respond to queries, and the Dolby Conferencing Console software can send email notifications if there is a change in the status of a device.

### 7.7.1 Downloading the SNMP MIB file

Before you can enable SNMP, you need to download the SNMP management information base (MIB) file from the Dolby Conferencing Console software.

#### Procedure

1. From the Dolby Conferencing Console web interface, on the home screen, click the settings button in the upper-right corner.



2. Click **References**.
3. Next to **SNMP MIB file**, click the word **link**.

### 7.7.2 Enabling SNMP on open virtual appliance-based installations

Use this procedure to enable SNMP on open virtual appliance file-based installations.

#### Procedure

1. For security reasons, we recommend that you update community strings in */etc/snmp/snmpd.conf*.
2. On the server that hosts your Dolby Conferencing Console software, log in as the root user.
3. Enter this command to make the `snmpd_t` domain permissive:

```
semanage permissive -a snmpd_t
```

The command may take a few minutes to run.

4. Enter this command to start the `snmpd` service.

```
service snmpd start
```

5. Enter this command so that the `snmpd` service turns back on after every reboot.

```
chkconfig snmpd on
```

6. If you want the Dolby Conferencing Console software to send out SNMP traps, add this command to `/etc/snmp/snmpd.conf`:

```
informsink www.xxx.yyy.zzz TRAPCOMMUNITY PORT
```

Replace `www.xxx.yyy.zzz` with the IP address or host name of the Network Management Server NMS. Replace `TRAPCOMMUNITY` with the community string of NMS. Replace `PORT` with the **snmptrapd** port number.

Example: Replace 10.203.22.33 with the IP address of the Dolby Conferencing Console server.

```
informsink 10.203.22.33 public 162
```

See <http://net-snmp.sourceforge.net/> for more information on how to configure snmpd and snmptrapd.

7. As the root user, enter this command to restart the Dolby Conferencing Console server:

```
service dcc restart
```

### 7.7.3 Enabling SNMP on RPM-based installations

You can enable SNMP on RPM-based installations.

#### Procedure

1. On the server that hosts your Dolby Conferencing Console software, log in as the root user.
2. Install the SNMP agent packages and the **SELinux** policy management tool.  
Enter these commands, in the order shown, to install `net-snmp`:

```
yum install -y net-snmp
yum install -y net-snmp-utils
```

Enter this command to install the **SELinux** policy management tool:

```
yum install -y policycoreutils-python
```

3. Enter this command to make the `snmpd_t` domain permissive:

```
semanage permissive -a snmpd_t
```

The command may take a few minutes to run.

4. Edit the PostgreSQL client authentication configuration file at `/var/lib/pgsql/9.6/data/pg_hba.conf`. Add these lines to the beginning of the file if they do not exist already.

```
local    all     dcc      md5
host     all     dcc      127.0.0.1/32  md5
host     all     dcc      ::1/128      md5
```

If the Postgres installation is on Amazon, update the `pg_hba.conf` file to the following:

```
host     all     all      127.0.0.1/32  trust
```

5. Restart the PostgreSQL database service.

Enter these commands, in the order shown, to restart the database service:

```
service postgresql reload
service postgresql restart
```



6. Append these lines to the **snmpd** configuration file at `/etc/snmp/snmpd.conf`.

```
view systemview included .1.3.6.1.4.1.6729
pass_persist .1.3.6.1.4.1.6729.2.3.2.1 /usr/bin/dcc-snmp-agent pass_persist
```

7. For security reasons, we recommend that you update community strings in `/etc/snmp/snmpd.conf`.
8. If you want the Dolby Conferencing Console software to send out SNMP traps, add this command to `/etc/snmp/snmpd.conf`:

```
informsink www.xxx.yyy.zzz TRAPCOMMUNITY PORT
```

Replace `www.xxx.yyy.zzz` with the IP address or host name of the Network Management Server NMS. Replace `TRAPCOMMUNITY` with the community string of NMS. Replace `PORT` with the **snmptrapd** port number.

Example: Replace 10.203.22.33 with the IP address of the Dolby Conferencing Console server.

```
informsink 10.203.22.33 public 162
```

See <http://net-snmp.sourceforge.net/> for more information on how to configure `snmpd` and `snmptrapd`.

9. As the root user, enter this command to restart the Dolby Conferencing Console server:

```
service dcc restart
```

10. Enter this command to start the `snmpd` service.

```
service snmpd start
```

11. Enter this command so that the **snmpd** service turns back on after every reboot.

```
chkconfig snmpd on
```

12. Makes sure that the SNMP port (by default, User Datagram Protocol (UDP) port 161) is open on the Dolby Conferencing Console firewall. Enter this command to open the UDP port on the input chain:

```
iptables -I INPUT -p udp --dport 161 -j ACCEPT
service iptables save
service iptables status
```

For RHEL7:

1. Edit the `/etc/firewalld/services/snmp.xml` file.
2. Add these lines:

```
<?xml version="1.0" encoding="utf-8"?>
<service>
<short>SNMP</short>
<description>SNMP protocol</description>
<port protocol="udp" port="161"/>
</service>
```

3. Reload the firewall:

```
firewall-cmd --reload
```

4. Add the service to your public zone:

```
firewall-cmd --zone=public --add-service snmp --permanent
```

5. Reload the firewall again:

```
firewall-cmd --reload
```

## 7.7.4 Confirming that SNMP is enabled

Use the `snmpwalk` command to confirm that SNMP is enabled.

### Procedure

Enter these commands:

Replace the `public` string with the read-only community string of the SNMP server. Replace `10.203.22.33` with the IP address of your Dolby Conferencing Console server.

```
snmpwalk -v 2c -c public -m +DOLBY-CONFERENCING-CONSOLE-MIB -Os 10.203.22.33
.1.3.6.1.4.1.6729.2.3.2.1
```

Example output if SNMP was successfully enabled:

```


dccServerProductName.0 = INTEGER: dolbyConferencingConsole(1)
dccServerSoftwareRevision.0 = STRING: DCC 2.3.0...
dccDeviceStatisticsCountAll.0 = Gauge32: 3
dccDeviceStatisticsOk.0 = Gauge32: 0
dccDeviceStatisticsUpdate.0 = Gauge32: 3
dccDeviceStatisticsReboot.0 = Gauge32: 0
dccDeviceStatisticsOnline.0 = Gauge32: 3
dccDeviceStatisticsOffline.0 = Gauge32: 0
dccDeviceStatisticsAlarm.0 = Gauge32: 0
dccDeviceStatisticsIdle.0 = Gauge32: 3
dccDeviceStatisticsPbx.0 = Gauge32: 0
dccDeviceStatisticsConf.0 = Gauge32: 0
dccDeviceProductName.1 = INTEGER: dolbyConferencePhone(1)
dccDeviceProductName.2 = INTEGER: dolbyVoiceHuddle(3)
dccDeviceProductName.3 = INTEGER: dolbyVoiceRoom(2)
dccDeviceSoftwareRevision.1 = STRING: 1.0.0.2481
dccDeviceSoftwareRevision.2 = STRING: 1.0.0.2481
dccDeviceSoftwareRevision.3 = STRING: 1.0.0.2481
dccDeviceSerial.1 = STRING: X0000001
dccDeviceSerial.2 = STRING: X0000002
dccDeviceSerial.3 = STRING: X0000003
dccDeviceInventory.1 = STRING:
dccDeviceInventory.2 = STRING:
dccDeviceInventory.3 = STRING:
dccDeviceMacAddress.1 = STRING: xx:xx:xx:xx:xx:xx
dccDeviceMacAddress.2 = STRING: xx:xx:xx:xx:xx:xx
dccDeviceMacAddress.3 = STRING: xx:xx:xx:xx:xx:xx
dccDeviceMacAddress.3 = No more variables left in this MIB View (It is past the end
of the MIB tree)


```

## 7.8 Using Webmin

Webmin is a web-based interface for system administration.

Webmin is included in the Open Virtual Appliance (OVA) installation. It is not part of the RPM Package Manager installation. To install Webmin on existing Dolby Conferencing Console servers, see <http://www.webmin.com/rpm.html>.

 **Note:** We recommend changing your root password for security purposes.

 **Note:** For RHEL7, you may have to install the `perl-Digest-MD5` package, using the command `yum install perl-Digest-MD5` as a Webmin dependency.

Webmin is disabled by default. You can enable Webmin by running the following command as a root user:

```
service webmin start
```

 **Note:** Webmin does not automatically restart when the system is restarted.

---

After you have enabled Webmin, it can be accessed using the following URL:

```
https://<DCC-server-IP:10000>
```

# Glossary

**API**

Application programming interface. A set of functions that can be used to access the functions of an operating system or other type of software.

**AWS**

Amazon Web Services. The Amazon cloud computing services platform.

**CentOS**

Community Enterprise Operating System.

**device access service**

A server or node on a network that manages device traffic for the Dolby Conferencing Console.

**DHCP**

Dynamic Host Configuration Protocol.

**DNS**

Domain Name System. An Internet service that translates Internet domain and host names to IP addresses and conversely. DNS automatically converts between the name entered in a web browser and the IP addresses of the web server hosting the site whose URL is entered in the web browser.

**HTTP**

Hypertext Transfer Protocol. An application protocol for hypermedia information systems, and the foundation for data communication for the World Wide Web.

**HTTPS**

Hypertext Transfer Protocol Secure. An application protocol for secure communication over a network and the Internet that provides authentication of websites and keeps user information private.

**IP**

Internet Protocol.

**IP address**

Internet Protocol address. A numerical identifier assigned to a device that is a member of a network that uses the IP for communication.

**LDAP**

Lightweight Directory Access Protocol. An application protocol for querying or modifying items in corporate directories that allows sharing of information about users, devices, and applications on a network.

**MAC**

Multiply-accumulate. In digital signal processing, the multiply-accumulate operation is a common step that computes the product of two numbers and adds that product to an accumulator.

**MAC address**

Media access control address. A unique identifier assigned to a network interface for communications on a network. MAC addresses are typically assigned by the network interface manufacturer.

**MIB**

Management information base. A type of communications network management database.

**NTP**

Network Time Protocol. A network protocol for clock synchronization on computers.

**OVA file**

A single Open Virtualization Format (OVF) file packaged together with all of its supporting files. Also known as open virtual applications.

**OVF**

Open Virtualization Format. File format for the packaging and distribution of software to be run in a virtual machine.

**PBX**

Private branch exchange. A phone system that is delivered as a hosted service.

**PEM**

Privacy-Enhanced Electronic Mail. A file format for security certificates in email communication.

**RPM**

RPM Package Manager. A system for managing Linux software installation packages.

**SIP**

Session Initiation Protocol. An application-layer communications protocol used for signaling and controlling communications sessions.

**SMTP**

Simple Mail Transfer Protocol. An Internet standard for sending and receiving emails.

**SNMP**

Simple Network Management Protocol. A protocol for managing IP network devices

**SSH**

Secure Shell protocol. An encrypted network protocol for secure data communication, remote command-line login, remote command execution, and other secure network services between two networked computers.

**SSL**

Secure Sockets Layer . A security protocol that works at a socket level.

**STARTTLS**

An extension to plain text communication protocols (such as Simple Mail Transfer Protocol [SMTP] and Lightweight Directory Access Protocol [LDAP] services) that changes a plain text connection to an encrypted (Transport Layer Security [TLS] or Secure Socket Layer [SSL]) connection instead of using a separate port for encrypted communication.

**TLS**

Transport Layer Security. A cryptographic protocol designed to provide communications security over a computer network.

**UDP**

User Datagram Protocol. A communications protocol that uses no handshaking dialogues to establish a connection with the remote host. UDP is a member of the IP suite.

**UI**

User interface.

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