

Cisco TelePresence TelePresence Server 8710 and 7010 2.3

Printable Online Help

D14955

September 2012

Contents

Introduction	4
Logging into the web interface	5
Failing to log into the web interface	7
System status	8
Displaying system status	9
Displaying hardware health status	12
Displaying cluster status for a master blade	13
Displaying cluster status for a slave blade	16
Network settings	17
Configuring network settings	18
Configuring DNS settings	22
Configuring IP routes settings	23
Configuring IP services	25
Configuring QoS settings	27
Configuring SSL certificates	29
Testing network connectivity	32
Configuration	33
Configuring system settings	34
Configuring H.323 settings	37
Configuring SIP settings	38
Configuring default conference settings	41
Configuring default endpoint settings	42
Displaying and resetting system time	45
Backing up and upgrading the TelePresence Server	46
Shutting down and restarting the TelePresence Server	50
Changing the administrator password	51
Backing up and restoring the configuration via FTP	52
Conferences	53
Adding and updating conferences	54
Displaying the conference list	59
Displaying conference status	61
Calling participants to join a conference	68
Sending a message to participants	69
Endpoints and endpoint groups	70
Displaying the list of endpoints	71
Displaying endpoint and group status	72
Adding an endpoint	75
Adding an endpoint group	76
Adding a Legacy TIP endpoint	77
Editing an endpoint's configuration	78
Configuring endpoints and groups advanced settings	84
Users	88

Displaying the user list.....	89
Adding and updating users.....	90
Logs.....	92
Working with the event logs.....	93
Event capture filter.....	94
Event display filter.....	95
Logging H.323 or SIP messages.....	96
Logging using syslog.....	97
Working with Call Detail Records.....	99
Feedback receivers.....	101
Reference.....	102
Content channel support.....	103
Understanding how participants display in layout views.....	105
Port allocations.....	111
Endpoint types.....	112
Endpoint interoperability.....	113
Understanding clustering.....	114
Understanding screen licenses.....	116
Getting help.....	117
License information.....	118
Software licenses.....	118

Introduction

Welcome to the Cisco TelePresence Server product printable online Help.

This document accompanies version 2.3 of the TelePresence Server software. This software is used on the following Cisco TelePresence hardware:

- Cisco TelePresence Server 7010
- Cisco TelePresence Server MSE 8710 blade

The contents of this document are organized in a similar way to the product's user interface, and replicate the contents of its online help system.

There is a chapter for each of the main interface pages and each chapter's title page contains a list of topics in the chapter.

Logging into the web interface

Why do I need to log in to the web interface?

The TelePresence Server restricts user access by holding a set of pre-configured accounts and denying access to anyone who does not have an account. Each account has a username and password that enables the account owner to gain access to their associated privileges.

There are two types of user account, each with different privileges:

- Administrators—may access all functionality
- API access—can only access the API, not the web interface

Tasks

Logging in to the web interface:

1. Enter the host name or IP address of the TelePresence Server into the address bar of a web browser.
The log in page displays.
2. Enter your assigned **Username** and **Password**.
3. Click **OK**.

Failing to log into the web interface

Why am I seeing the **Access denied** page?

You have not been able to log in for one of the following reasons:

- **Invalid username/password:** you have typed the incorrect username and/or password.
If Advanced account security mode is enabled and you incorrectly enter an account's credentials three times, then the TelePresence Server disables the account. The account is disabled for 30 minutes if it is an administrator account. The account is disabled indefinitely if it is another type of account. Administrators can re-enable accounts on the **User** page.
- **No free sessions:** the maximum number of sessions allowed simultaneously on the TelePresence Server has been reached.
- **Your IP address does not match that of the browser cookie you supplied:** try deleting your cookies and log in again
- **You do not have access rights to view this page:** you do not have the access rights necessary to view the page that you attempted to see
- **Page expired:** the **Change password** page can expire if the TelePresence Server detects that the user who requested to change password, may not actually be the user submitting the change password request. (This may happen if you use a new browser tab to submit the request.)

System status

- Displaying system status..... 9
- Displaying hardware health status..... 12
- Displaying cluster status for a master blade..... 13
- Displaying cluster status for a slave blade..... 16

Displaying system status

The **Status** page displays an overview of the TelePresence Server's status. To access this information, go to **Status**.

Refer to the table below for details of the information displayed.

System status

Field	Field Description	Usage tips
Model	The specific TelePresence Server model.	
Serial number	The unique serial number of the TelePresence Server.	You will need to provide this information when speaking to customer support.
Software version	The installed software version.	
Build	The build version of installed software.	
Uptime	The time since the last restart of the TelePresence Server.	
Host name	The host name assigned to the TelePresence Server.	
IP address	The IP address assigned to the TelePresence Server.	
IPv6 address	The IPv6 address of this TelePresence Server.	
H.323 gatekeeper status	Whether the TelePresence Server is registered to an H.323 gatekeeper, and whether the registration has been made to the primary or an alternate gatekeeper.	This field is only displayed on the master blade in a TelePresence Server cluster.
SIP registrar status	Whether the TelePresence Server is registered to a SIP registrar.	This field is only displayed on the master blade in a TelePresence Server cluster.
Enhanced font	Indicates whether the TelePresence Server is using a TrueType font file to render text.	<i>In use</i> or <i>Not in use</i> , depending on whether you have uploaded the font file. If it is <i>Not in use</i> , the TelePresence Server falls back on the default text rendering method.

Activated features

Field	Field description	Usage tips
TelePresence Server activation	Whether or not the unit is enabled.	The TelePresence Server will not operate without activation. This feature and key are installed before shipping.

Field	Field description	Usage tips
Encryption	Whether or not encryption is enabled.	The encryption feature key allows encrypted conferences and HTTPS web management on this blade. Feature keys are installed in the Configuration > Upgrade page. See Upgrading and backing up the TelePresence Server .
Third party interop	This feature allows the TelePresence Server to interoperate with third party multi-screen endpoints. (Note that only some third party multi-screen endpoints require this key.) It also activates the grouped endpoints features.	This field is only displayed if you have the appropriate key installed. Feature keys are installed in the Configuration > Upgrade page. See Upgrading and backing up the TelePresence Server Calls to general third party endpoints will work without this key. It is required to support multi-screen third party endpoints, such as the Polycom RPX and endpoint groups.
Cluster support	This feature allows blades configured on the same Cisco TelePresence MSE 8000 chassis to be linked together to behave as a single unit.	Up to four blades can form a cluster. See Understanding clustering . If you want to cluster a blade, the blade must have the cluster support feature key installed. Feature keys are installed in the Configuration > Upgrade page. See Upgrading and backing up the TelePresence Server
Screen licenses	The number of screen licenses in use across all active conferences. The total number of screen licenses may be less than the total number that the TelePresence Server can support.	You need to install a screen license key to enable screen licenses. For more information about licenses, see Understanding screen licenses .

Conference status

Field	Field description	Usage tips
Active conferences	The number of active conferences on this TelePresence Server.	A conference is active if it has participants.
Active participants	The number of participants (of all types) that are currently in conferences on this TelePresence Server.	
Previous participants	The number of participants who were previously participating in a conference (since the last time the TelePresence Server restarted).	
Video ports	The number of video ports in use on this TelePresence Server.	The numbers are those supported by the number of screen licenses available on the TelePresence Server and dependent upon whether the TelePresence Server is configured to run in HD or Full HD mode. See Content channel video support and Understanding screen licenses
Audio ports	The number of audio-only ports in use on this TelePresence Server.	
Content ports	The number of content channel ports in use on this TelePresence Server.	

System log

Field	Field description	Usage tips
	The system log displays the most recent shutdown and upgrade events, with the most recent shown first.	The log will display "unknown" if there has been an unexpected reboot or power failure or after an upgrade. If this occurs frequently, report the issues to customer support.

Diagnostic information

Field	Field description	Usage tips
Diagnostic information	Diagnostic files are provided in .zip archive format that contain a text document. To download a diagnostic file, click Download file .	Diagnostic information is provided to aid in troubleshooting problems that may occur with the TelePresence Server. In the event of an issue with the TelePresence Server, the support team may ask you for these diagnostic files.
Network capture file	To download a network capture, click Download file .	
System logs	To download the logs, click Download file .	An archive containing several useful log files.

Displaying hardware health status

The **Health status** page (**Status > Health status**) displays information about the hardware components of the TelePresence Server.

Note: The **Worst status seen** conditions are those since the last time the TelePresence Server was restarted.

To reset these values, click **Clear**. Refer to the table below for assistance in interpreting the information displayed.

Device health details

Field	Field description	Usage tips
Fans (7010 only) Voltages RTC battery	Displays two possible states: <ul style="list-style-type: none"> ■ OK ■ Out of spec States indicate both <i>Current status</i> and <i>Worst status seen</i> conditions.	The states indicate the following: <ul style="list-style-type: none"> ■ <i>OK</i> – component is functioning properly ■ <i>Out of spec</i> – Check with your support provider; component might require service If the <i>Worst status seen</i> column displays <i>Out of spec</i> , but <i>Current status</i> is <i>OK</i> , monitor the status regularly to verify that it was only a temporary condition.
Temperature	Displays three possible states: <ul style="list-style-type: none"> ■ OK ■ Out of spec ■ Critical States indicate both <i>Current status</i> and <i>Worst status seen</i> conditions.	The states indicate the following: <ul style="list-style-type: none"> ■ <i>OK</i> – temperature of the TelePresence Server is within the appropriate range ■ <i>Out of spec</i> – Check the ambient temperature (should be less than 34 degrees Celsius) and verify that the air vents are not blocked ■ <i>Critical</i> – temperature of TelePresence Server is too high. An error also appears in the event log indicating that the system will shutdown in 60 seconds if the condition persists If the Worst status seen column displays <i>Out of spec</i> , but Current status is <i>OK</i> monitor the status regularly to verify that it was only a temporary condition.

Displaying cluster status for a master blade

To display cluster status, go to **Status > Cluster**.

Cluster status is only available for blades that are configured on the Cisco TelePresence Supervisor MSE 8050 to be part of a cluster. For more information about clustering, refer to [Understanding clustering](#).

The table below describes the **Status > Cluster** page that displays for the master blade in a cluster. For details about slave blades, see [Displaying cluster status for a slave blade](#).

Cluster status

Field	Field description	Usage tips
Slot	The number of the slot in the Cisco TelePresence MSE 8000 chassis that corresponds to this row in the table.	To configure a blade as a master or a slave in a cluster, log in to the Supervisor.
IP	The IP address of the blade in this slot, or <i>Master blade</i> (if this is the master).	

Field	Field description	Usage tips
Status	<p>The status of the master blade can only be OK which means that this blade is operating correctly in the cluster.</p> <p>Possible statuses for a slave blade are:</p> <ul style="list-style-type: none"> ■ <i>OK</i>: The master and slave are communicating correctly. ■ <i>OK (last seen <number> seconds ago)</i>: The master has lost contact with the slave. The slave will restart itself and in this way it will rejoin the cluster. Wait a few minutes and then refresh the Status > Cluster page. ■ <i>Still starting up</i>: The slave blade is in the process of starting up. Wait a few minutes and then refresh the Status > Cluster page. ■ <i>Lost contact <number> secs ago</i>: The master has lost contact with the slave. The slave will restart itself and in this way it will rejoin the cluster. Wait a few minutes and then refresh the Status > Cluster page. ■ <i>Cluster support not enabled</i>: There is no Cluster support feature key on this blade. ■ <i>Failed, version mismatch</i>: All blades in the cluster must be running the same version of software. This status message indicates that this blade is running different software to the master blade. This blade is not part of the cluster. Update all blades in the cluster to the same version of software. ■ <i>Blade not configured as slave</i>: The Supervisor has told the master that the blade is a slave, but the blade is not a slave. Possibly the slave blade was replaced. ■ <i>Blade incorrect type</i>: Possibly the slave blade was replaced with a different blade type after the cluster was configured. 	<p>If the status of the slave is OK, it is currently functioning in the cluster. For any of the other statuses, the slave blade is not currently functioning as part of the cluster.</p> <p>If a slave blade has a problem that causes it to no longer be part of the cluster, the cluster can continue to operate without that slave. For example, in a cluster of three blades if one slave fails, the master and the other slave can continue to operate and accept calls. There will just be fewer video ports available. Similarly, in a cluster of two blades, if the slave fails, the master continues to operate.</p> <p>If a slave blade fails, participants in conferences will not be disconnected: if there are sufficient resources on another blade in the cluster, they will continue to receive audio and video. In the worst case, the video will disappear, but the audio will continue because all audio is processed by the master blade.</p> <p>If the master loses contact with a slave, the slave will automatically restart itself. In this way, it can rejoin the cluster.</p>
Media processing load	<p>An overview of the current media loading of each blade in the cluster. The load may increase during periods of peak conference use.</p>	<p>Conferences are distributed between the blades in the cluster. The loads on the blades depend on the number of conferences running on each blade and the sizes of those conferences.</p> <p>On a slave blade, the audio load will always be zero: the master is responsible for all the audio.</p>

Field	Field description	Usage tips
Screen licenses	The number of screen licenses on each blade in this cluster.	All screen licenses on slave blades are controlled by the master blade. Depending on how you use the blades in the MSE chassis, you might want to allocate all screen licenses to the slot that houses the master blade or you might distribute them between the slots in the cluster. It does not matter to the cluster how you have allocated the screen licenses—the master controls all screen licenses and even if a blade has failed in the cluster, the master will continue to have access to any screen licenses allocated to the failed blade's slot.

Displaying cluster status for a slave blade

To display cluster status, go to **Status > Cluster**. When you look at the **Status > Cluster** page on a slave blade, it shows the status of the master blade.

The table below describes the **Status > Cluster** page that displays for slave blades in a cluster. For information about the master blade, see [Displaying cluster status for a master blade](#).

Slave blades have restricted user interfaces; not all settings are available. You must configure the cluster from the master blade.

Cluster status

Field	Field description	Usage tips
Status	<p>Possible statuses for the master blade are:</p> <ul style="list-style-type: none"> ■ <i>Still starting up</i>: the master blade is in the process of starting up. Wait a few minutes and then refresh the Status > Cluster page. ■ <i>OK</i>: The master and slave are communicating correctly. ■ <i>Lost contact</i>: The slave blade has lost contact with the master blade. This status will only be momentarily visible because the slave blade will quickly restart itself in this case. 	<p>If a slave blade loses contact with the master blade, it will restart itself. This is the only way that the slave blade can correctly rejoin the cluster.</p> <p>A common reason for a slave blade to lose contact with the master is because the master blade has restarted.</p>
Last seen	This field is only visible if the master has not been seen for 11 seconds. The slave blade will automatically restart itself very soon after it loses contact with the master.	
IP address	The IP address of the master blade.	

Network settings

Configuring network settings.....	18
Configuring DNS settings.....	22
Configuring IP routes settings.....	23
Configuring IP services.....	25
Configuring QoS settings.....	27
Configuring SSL certificates.....	29
Testing network connectivity.....	32

Configuring network settings

To configure the network settings on the TelePresence Server and check the network status, go to [Network > Network settings](#).

On this page:

- [IP configuration settings](#)
- [IP status](#)
- [Ethernet configuration](#)
- [Ethernet status](#)

IP configuration settings

These settings determine the IP configuration for the appropriate Ethernet port of the TelePresence Server. When you have finished, click **Update IP configuration** and then reboot the TelePresence Server.

IPv4 configuration

Field	Field description	Usage tips
IP configuration	Specifies whether the port should be configured manually or automatically. If set to <i>Automatic via DHCP</i> the TelePresence Server obtains its own IP address for this port automatically via DHCP (Dynamic Host Configuration Protocol). If set to <i>Manual</i> the TelePresence Server will use the values that you specify in the Manual configuration fields below.	Click Renew DHCP to request a new IP address if you have selected automatic configuration. You can disable IPv4 on the TelePresence Server port but only if logged in using IPv6.
IP address	The dot-separated IPv4 address for this port, for example 192.168.4.45.	You only need to specify this option if you have chosen <i>Manual</i> IP configuration, as described above. For Port A, if the IP configuration setting is set to <i>Automatic by DHCP</i> this setting will be ignored.
Subnet mask	The subnet mask required for the IP address you wish to use, for example 255.255.255.0	
Default gateway	The IP address of the default gateway on this subnet, for example 192.168.4.1	

IPv6 configuration

Field	Field description	Usage tips
IP configuration	<p>Select <i>Disabled</i>, <i>Automatic via SLAAC/DHCPv6</i> or <i>Manual</i>.</p> <p>If you select <i>Manual</i>, you must also supply the IPv6 address, prefix length and default gateway.</p> <p>If you select <i>Automatic via SLAAC/DHCPv6</i>, the TelePresence Server automatically gets an IPv6 address. It uses SLAAC, Stateful DHCPv6 or Stateless DHCPv6 as indicated by the ICMPv6 Router Advertisement (RA) messages (see Automatic IPv6 address preferences below).</p>	<p>Disable IPv6 on the port if the network does not support IPv6.</p> <p>You can disable IPv6 on the TelePresence Server port but only if logged in using IPv4.</p>
IPv6 address	<p>If you chose <i>Manual</i> configuration, supply the IPv6 address in CIDR format. Enclose the address in square brackets, for example <code>[fe80::202:b3ff:fe1e:8329]</code>, in the user interface.</p>	<p>You only need to enter an address if you chose <i>Manual</i> IP configuration. If you chose <i>Automatic via SLAAC/DHCPv6</i>, a manually entered setting is ignored.</p>
Prefix length	<p>If you chose <i>Manual</i> configuration, supply the prefix length.</p>	<p>The prefix length is the (decimal) number of bits that are fixed for this address.</p>
Default gateway	<p>(Optional) Supply the IPv6 address of the default gateway on this subnet.</p>	<p>The address may be global or link-local</p>

IP status

The IP status section shows the current IP settings for this Ethernet port of the TelePresence Server, as follows, whether they were automatically or manually configured.

IPv4 settings:

- DHCP
- IP address
- Subnet mask
- Default gateway

IPv6 settings:

- DHCPv6
- IPv6 address
- IPv6 default gateway
- IPv6 link-local address

Ethernet configuration

Configure the Ethernet settings for this port of the TelePresence Server, and then click **Update Ethernet configuration**.

Ethernet configuration

Field	Field description	Usage tips
Ethernet settings	Select <i>Automatic</i> or <i>Manual</i> . If you select <i>Manual</i> , you must also supply the speed and duplex settings. Select <i>Automatic</i> if you want this Ethernet port to automatically negotiate its Ethernet settings with the connected device.	It is important that the devices at either end of the Ethernet connection have the same settings. That is, configure both devices to use automatic negotiation, or configure them both with the same fixed speed and duplex settings.
Speed	Set the connection's speed to <i>10 Mbit/s</i> or <i>100 Mbit/s</i> . Select automatic negotiation if you require a connection speed of <i>1000 Mbit/s</i> .	The connection speed setting must be the same for the ports at both ends of this connection.
Duplex	Set the connection's duplex mode to <i>Full duplex</i> or <i>Half duplex</i> .	The connection duplex setting must be the same for the ports at both ends of this connection. Full duplex mode allows simultaneous bidirectional transmission, while half duplex mode only allows bidirectional transmission that is not simultaneous.

Ethernet status

Ethernet status

Field	Field description	Usage tips
Link status	Indicates whether or not this Ethernet link is connected.	
Speed	The speed (<i>10/100/1000 Mbit/s</i>) of this Ethernet link.	This value is negotiated with the device to which this port is connected or based on your manual configuration.
Duplex	The duplex mode (<i>Full duplex</i> or <i>Half duplex</i>) of the network connection to this port.	This value is negotiated with the device to which this port is connected or based on your Manual configuration selected above.
MAC address	The fixed hardware MAC (Media Access Control) address of this port.	This value can not be changed, it is for information only.
Packets sent	The total number of packets sent from this port (all TCP and UDP traffic).	This information can help you confirm that the TelePresence Server is transmitting packets into the network.
Packets received	The total number of packets received by this port (all TCP and UDP traffic).	This information can help you confirm that the TelePresence Server is receiving packets from the network.
Statistics:	<p>More statistics for this port.</p> <ul style="list-style-type: none"> ■ Multicast packets sent ■ Multicast packets received ■ Total bytes sent ■ Total bytes received ■ Receive queue drops ■ Collisions ■ Transmit errors ■ Receive errors 	This information can assist you with diagnosing network issues, such as link speed and duplex negotiation issues.

Configuring DNS settings

Go to **Network > DNS** to check and change the DNS settings of the TelePresence Server.

Click **Update DNS configuration** to apply the new settings.

DNS settings

Field	Field description	Usage tips
DNS configuration	<p>Select how you want the TelePresence Server to get its name server address.</p> <p>For example, if you select <i>Via Port A DHCPv6</i>, the device will automatically get a name server address using DHCP over the IPv6 network connected to Ethernet port A.</p> <p>If you select <i>Manual</i>, you must provide a name server address. You may also want to provide a secondary name server or domain name (DNS suffix).</p>	<p>The TelePresence Server does not allow you to automatically configure the name server address if you have set a static IP address on the selected interface.</p> <p>For example, if you select <i>Via Port A DHCPv4</i> here but have also selected <i>Manual</i> in the IPv4 configuration section of the Port A settings page, the TelePresence Server will warn you that no DNS servers will be configured.</p>
Host name	Specifies a name for the TelePresence Server.	Depending on your network configuration, you may be able to use this host name to communicate with the TelePresence Server, without needing to know its IP address.
Name server	The IP address of the name server.	Required if you select the <i>Manual</i> name server preference.
Secondary name server	Identifies an optional second name server.	If an optional second name server is configured, the TelePresence Server may send DNS queries to either name server.
Domain name (DNS suffix)	Specifies an optional suffix to add when performing DNS lookups.	<p>Add a suffix if you want to use unqualified host names to refer to devices (instead of using IP addresses).</p> <p>For example, if the domain name (suffix) is set to <i>cisco.com</i>, then a request to the name server to look up the IP address of host <i>endpoint</i> will actually look up <i>endpoint.cisco.com</i>.</p>

View DNS status

Use the DNS status fields to verify the current DNS settings for the TelePresence Server, including:

- Host name
- Name server
- Secondary name server
- Domain name (DNS suffix)

Configuring IP routes settings

You may need to set up one or more routes to control how IP traffic flows in and out of the TelePresence Server.

It is important that you create these routes correctly, or you may be unable to make calls or access the web interface.

To configure the route settings, go to [Network > Routes](#).

On this page:

- [IP routes configuration](#)
- [Current routes tables](#)

IP routes configuration

In this section you can control how IP packets should be directed out of the TelePresence Server. You should only change this configuration if you have a good understanding of the topology of the network(s) to which the TelePresence Server is connected.

Add a new IP route

To add a new route:

1. Enter the IP address of the target network, and the mask length that defines the range of addresses.
2. Select whether the traffic to those addresses will be routed via **Port A's** default gateway or a **Gateway** that you specify.
3. Click **Add IP route**.
The new route is added to the list. If the route already exists, or aliases (overlaps) an existing route, the interface prompts you to correct the route.

Use the following table for reference:

IP route configuration

Field	Field description	Usage tips
IP address / mask length	<p>Use these fields to define the range of IP addresses to which this route applies.</p> <p>IPv4 addressing: Enter the IP address of the target network in dotted quad format, setting any unfixed bits of the address to 0. Use the mask length field to specify how many bits are fixed (and thus how many are unfixed, giving the range of addresses).</p> <p>IPv6 addressing: Enter the IP address of the target network in CIDR format, setting any unfixed bits of the address to 0. Use the mask length field to specify how many bits are fixed (and thus how many are unfixed, giving the range of addresses). Enclose any IPv6 addresses in square brackets.</p>	<p>IPv4 example: To route all IPv4 addresses in the range 192.168.4.128 to 192.168.4.255, specify the IP address as 192.168.4.128 and the mask length as 25. The first 25 bits are fixed, which means that the last seven bits determine the range of addresses.</p> <p>IPv6 example: To route all IPv6 addresses in the range 2001:db8::0000 to 2001:db8::ffff, enter the IP address 2001:db8:: and the mask length as 112. The first 112 bits are fixed, which means that the last 16 bits determine the range of addresses.</p>
Route	Use this field to control how packets destined for addresses matching the specified pattern are routed.	<p>You may select <i>Port A</i>, or <i>Gateway</i>. If you select <i>Gateway</i>, enter the IP address of the gateway to which you want packets to be directed.</p> <p>If you select <i>Port A</i>, matching packets will be routed to Port A's default gateway (see Configuring network settings).</p>

To view or delete an existing IP route

The page displays the following details for each route:

- The IP address pattern and mask
- Where matching packets will be routed, with the possibilities being:
 - Port A—meaning the default gateway configured for Port A
 - <IP address>—a specific address has been chosen
- Whether the route has been configured automatically as a consequence of other settings, or manually added by you.

The *default* routes are configured automatically by your choice of *Default gateway preferences* for IPv4 and IPv6 (see [Port preferences](#)) and cannot be deleted. Any packets destined for addresses that are not matched by your manually configured routes will be routed via the default gateway.

You can delete manually configured routes. Select the check boxes next to the routes then click **Delete selected**.

Current routes tables

Each table shows all configured routes (both manual and automatic) for IPv4 and IPv6 for the TelePresence Server's Ethernet port. If you want to change the IP configuration for the Ethernet port, go to [Network > Network settings](#).

Configuring IP services

To configure IP services, go to **Network > Services**.

Use this page to allow or deny access to the listed web services on the TelePresence Server. Refer to the table below for more details.

The TelePresence Server offers web services, such as HTTP for the web interface and H.323 for making and receiving calls. You can control which services may be accessed on the unit's Ethernet interfaces and the TCP/UDP ports through which those services are available.

Check the boxes next to the service names, edit the port numbers if necessary, and then click **Apply changes**.

If you want to reset the values to their default settings, click **Reset to default** and then click **Apply changes**.

Note: the options shown on this page will be for IPv4 and/or IPv6 depending on which IP versions are enabled on the **Network > Network settings** page.

TCP service

Field	Field description	Usage tips
Web	Enable/disable web access on the appropriate port.	Web access is required to view and change the TelePresence Server web pages and read online help files. If you disable web access on Port A you will need to use the serial console interface to re-enable it.
Secure web	Enable/disable secure (HTTPS) web access on the specified interface or change the port that is used for this service.	This field is only visible if the TelePresence Server has the <i>Encryption</i> feature key installed. For more information about installing feature keys, refer to Upgrading and backing up the TelePresence Server . By default, the TelePresence Server has its own SSL certificate and private key. However, you can upload a new private key and certificates if required. For more information about SSL certificates, refer to Configuring SSL certificates .
Incoming H.323	Enable/disable the ability to receive incoming calls to the TelePresence Server using H.323 or change the port that is used for this service.	Disabling this option will not prevent outgoing calls to H.323 devices being made by the TelePresence Server.
SIP (TCP)	Allow/reject incoming calls to the TelePresence Server using SIP over TCP or change the port that is used for this service.	Disabling this option will not prevent outgoing calls to SIP devices being made by the TelePresence Server.
Encrypted SIP (TLS)	Allow/reject incoming encrypted SIP calls to the TelePresence Server using SIP over TLS or change the port that is used for this service.	Disabling this option will not prevent outgoing calls to SIP devices being made by the TelePresence Server.

Field	Field description	Usage tips
FTP	Enable/disable FTP access on the specified interface or change the port that is used for this service.	FTP can be used to upload and download TelePresence Server configuration. You should consider disabling FTP access on any port that is outside your organization's firewall. If you require advanced security for the TelePresence Server, disable FTP access.

UDP service

Field	Field description	Usage tips
SIP (UDP)	Allow/reject incoming and outgoing calls to the TelePresence Server using SIP over UDP or change the port that is used for this service.	Disabling this option will prevent calls using SIP over UDP.

Configuring QoS settings

To configure Quality of Service (QoS) on the TelePresence Server for audio and video, go to **Network > QoS**.

QoS is a term that refers to a network's ability to customize the treatment of specific classes of data. For example, QoS can be used to prioritize audio transmissions and video transmissions over HTTP traffic. These settings affect all outgoing audio and video packets. All other packets are sent with a QoS of 0.

The TelePresence Server allows you to set a 6-bit value for Type of Service (IPv4) or Traffic Class (IPv6), which can be interpreted by networks as either Type of Service (ToS) or Differentiated Services (DiffServ). Note that in terms of functionality, IPv6 QoS is identical to IPv4 QoS.

CAUTION: Do not alter the QoS settings unless you need to do so.

To configure the QoS settings you need to enter a 6-bit binary value.

Further information about QoS, including values for ToS and DiffServ, can be found in the following RFCs, available on the Internet Engineering Task Force web site www.ietf.org:

- RFC 791
- RFC 2474
- RFC 2597
- RFC 3246

On this page:

- [About QoS configuration settings](#)
- [ToS configuration](#)
- [DiffServ configuration](#)
- [Default settings](#)

About QoS configuration settings

The tables below describe the settings on the **Network > QoS** page.

Click **Update QoS settings** after making any changes.

IPv4 configuration

Field	Field description	Usage tips
Audio	Six bit binary field for prioritizing audio data packets on the network.	Do not alter this setting unless you need to.
Video	Six bit binary field for prioritizing video data packets on the network.	Do not alter this setting unless you need to.

IPv6 configuration

Field	Field description	Usage tips
Audio	Six bit binary field for prioritizing audio data packets on the network.	Do not alter this setting unless you need to.
Video	Six bit binary field for prioritizing video data packets on the network.	Do not alter this setting unless you need to.

ToS configuration

ToS configuration represents a tradeoff between the abstract parameters of precedence, delay, throughput, and reliability.

ToS uses six out of a possible eight bits. The TelePresence Server allows you to set bits 0 to 5, and will place zeros for bits 6 and 7.

- Bits 0-2 set IP precedence (the priority of the packet).
- Bit 3 sets delay: 0 = normal delay, 1 = low delay.
- Bit 4 sets throughput: 0 = normal throughput, 1 = high throughput.
- Bit 5 sets reliability: 0 = normal reliability, 1 = high reliability.
- Bits 6-7 are reserved for future use and cannot be set using the TelePresence Server interface.

You need to create a balance by assigning priority to audio and video packets whilst not causing undue delay to other packets on the network. For example, do not set every value to 1.

DiffServ configuration

DiffServ uses six out of a possible eight bits to set a codepoint. (There are 64 possible codepoints.) The TelePresence Server allows you to set bits 0 to 5, and will place zeros for bits 6 and 7. The codepoint is interpreted by DiffServ nodes to determine how the packet is treated.

Default settings

The default settings for QoS are:

- **Audio 101110:**
 - For ToS, this means IP precedence is set to 5 giving relatively high priority. Delay is set to low, throughput is set to high, and reliability is set to normal.
 - For Diff Serv, this means expedited forwarding.
- **Video 100010:**
 - For ToS, this means IP precedence is set to 4 giving quite high priority (but not quite as high as the audio precedence). Delay is set to normal, throughput is set to high, and reliability is set to normal.
 - For DiffServ, this means assured forwarding (codepoint 41).

To return the settings to the default settings, click **Reset to default**.

Configuring SSL certificates

If the Cisco TelePresence Server has the *Secure management (HTTPS)* or *Encryption* feature key installed, and you enable *Secure web* on the [Network > Services](#) page, you will be able to access the web interface of the TelePresence Server using HTTPS.

Note: A certificate and key are also required if you select to use the SIP TLS service in [Network > Services](#).

The Cisco TelePresence Server has a local certificate and private key pre-installed and it uses this to authenticate itself to the browser when you access the unit using HTTPS. However, Cisco recommends that you upload your own certificate and private key to ensure security because all Cisco TelePresence Server's have identical default certificates and keys.

The TelePresence Server uses DTLS to negotiate encryption parameters with TIP endpoints—this requires a certificate to be used. The TelePresence Server's implementation of DTLS handles customer-supplied certificates in the following way:

- Opportunistic DTLS always uses the default certificate for DTLS negotiation, even if a customer-supplied certificate is uploaded.
- Negotiated DTLS uses the customer-supplied certificate if one is uploaded (this is the preferred procedure).

Negotiated DTLS will be used if the endpoint supports RFC 5763; otherwise, in a TIP call, opportunistic DTLS will be attempted.

To upload your own certificate and key, go to [Network > SSL certificates](#). Complete the fields using the table below for help and click **Upload certificate and key**. Note that you must upload a certificate and key simultaneously. You must restart the Cisco TelePresence Server after uploading a new certificate and key.

Note: A certificate and private key must be in PEM format.

You can remove your own certificate and key, if necessary, by clicking **Delete custom certificate and key**.

The following table details the fields on the [Network > SSL certificates](#) page:

Local certificate

Field	Field description	Usage tips
Subject	The details of the business to which the certificate has been issued: <ul style="list-style-type: none"> ■ C: the country where the business is registered. ■ ST: the state or province where the business is located. ■ L: the locality or city where the business is located. ■ O: the legal name of the business. ■ OU: the organizational unit or department. ■ CN: the common name for the certificate, or the domain name. 	
Issuer	The details of the issuer of the certificate.	Where the certificate has been self-issued, these details are the same as for the Subject .

Field	Field description	Usage tips
Issued	The date on which the local certificate was issued.	
Expires	The date on which the local certificate will expire.	
Private key	Whether the private key matches the certificate.	Your web browser uses the SSL certificate's public key to encrypt the data that it sends back to the Cisco TelePresence Server. The private key is used by the Cisco TelePresence Server to decrypt that data. If the Private key field shows 'Key matches certificate' then the data is securely encrypted in both directions.

Local certificate configuration

Field	Field description	Usage tips
Certificate	If your organization has bought a certificate, or you have your own way of generating certificates, you can upload it. Click Choose File to find and select the certificate file.	A certificate and private key must be in PEM format.
Private key	Click Choose File to find and select the private key file that accompanies your certificate.	A certificate and private key must be in PEM format.
Private key encryption password	If your private key is stored in an encrypted format, you must enter the password here so that you can upload the key to the Cisco TelePresence Server.	

Trust store

Field	Field description	Usage tips
Subject	The details of the trust store certificate; usually a certificate issued by the authority that is used to verify the local certificate.	
Issuer	The details of the issuer of the trust store certificate.	These are the details of the trusted certification authority.
Issued	The date on which the trust store certificate was issued.	
Expires	The date on which the trust store certificate will expire.	

Trust store configuration

Field	Field description	Usage tips
Trust store	<p>The trust store is required for two reasons:</p> <ul style="list-style-type: none"> to verify the identity of the remote end of a SIP TLS connection (incoming call or outgoing call or registration) to verify the identity of the remote end of an outgoing HTTPS connection (e.g. feedback receivers or API applications calling <code>participant.diagnostics</code>) 	<p>Browse to and select the trust store certificate file, then click Upload trust store.</p> <p>The store may contain multiple certificates.</p> <p>When verification is required (see following setting) the certificate of the remote party is verified against the trust store: the remote certificate must either be in the trust store or in the trust chain of one of its certificates.</p> <p>Click Delete trust store if you need to remove it or replace it with an updated file.</p>
Certificate verification settings	<p>Determines the circumstances in which the remote certificate must be verified with the trust store.</p>	<p>Select one of the drop-down options below and click Apply changes.</p> <ul style="list-style-type: none"> <i>No verification</i>: The remote certificate is never verified against the trust store (remote end always trusted). <i>Outgoing connections only</i>: The TelePresence Server attempts to verify the remote certificate for all outgoing SIP TLS and HTTPS connections. <i>Outgoing connections and incoming calls</i>: The TelePresence Server attempts to verify the remote certificate for all incoming and outgoing SIP TLS connections, and for outgoing HTTPS connections.

Testing network connectivity

You can use the [Network connectivity](#) page to troubleshoot network issues between the TelePresence Server and a remote video conferencing device (host).

On this page you can ping another device from the TelePresence Server's web interface and trace the route to that device. The results show whether or not you have network connectivity between the TelePresence Server and the remote host.

To test connectivity with a remote device, go to [Network > Connectivity](#). In the text box, enter the IP address or hostname of the device to which you want to test connectivity and click **Test connectivity**.

The results show the outbound interface for the query and the IP address of the remote host.

The ping results show the roundtrip time in milliseconds and the TTL (Time To Live) value on the echo reply.

For each intermediate host (typically routers) between the TelePresence Server and the remote host, the host's IP address and response time are shown.

Not all devices will respond to the messages from the TelePresence Server. Routing entries for non-responding devices are shown as *<unknown>*. Some devices are known to send invalid ICMP response packets (for example, with invalid ICMP checksums). Invalid ICMP responses are also not recognized by the TelePresence Server so these responses are also shown as *<unknown>*.

Note: The ping message is sent from the TelePresence Server to the IP address of the remote host. Therefore, if the TelePresence Server has an IP route to the given host, the ping will be successful. This feature allows the TelePresence Server's IP routing configuration to be tested, and it has no security implications.

Note: If you are unable to ping the remote host, then check your network configuration—especially any firewalls using NAT.

Configuration

Configuring system settings.....	34
Configuring H.323 settings.....	37
Configuring SIP settings.....	38
Configuring default conference settings.....	41
Configuring default endpoint settings.....	42
Displaying and resetting system time.....	45
Backing up and upgrading the TelePresence Server.....	46
Shutting down and restarting the TelePresence Server.....	50
Changing the administrator password.....	51
Backing up and restoring the configuration via FTP.....	52

Configuring system settings

The **System settings** page allows you to control a number of aspects of the TelePresence Server configured conference settings.

To access this information, go to **Configuration > System settings**.

To update the defaults, or change the configuration at any time, edit the fields referring to the table below for details and click **Apply changes**.

Note Endpoints and conferences assume the values you provide here. These settings apply to all calls and conferences on the unit and are not configurable elsewhere.

Settings for all configured conferences

Field	Field description	Usage tips
Voice switching sensitivity	Determines how easy it is for a participant to replace the active speaker for a conference based on how loudly they are speaking.	A value of 0 means that it is very difficult for the active speaker to be replaced; a value of 100 means the active speaker can be replaced very easily. The default value is 50%.
Packet loss threshold	Enter the threshold level for packet loss as a percentage. (Note that the setting is 10x the percentage, for example, a setting of '1' will trigger at 0.1% packet loss.) If greater packet loss occurs than this threshold, it will be reported: <ul style="list-style-type: none"> in the Status page for the conference in the Statistics page for the endpoint whose call is experiencing the packet loss 	The most suitable setting will depend on your network and its packet loss characteristics. The default value is 0.
ClearVision	When selected, the TelePresence Server will upscale video streams from participants who are sending low resolution video with the purpose of making best use of the TelePresence Server's HD video capabilities.	The TelePresence Server uses intelligent resolution upscaling technology to improve the clarity of low-resolution video. The default is enabled.
Enable 60 fps	Allows the TelePresence Server to support 60 frames per second video streams.	<i>HD</i> mode supports 60 fps at a maximum resolution of w448p. <i>Full HD</i> mode supports 60 fps at a maximum resolution of 720p. Lower resolution streams may also have 60 fps. The default is disabled.

Field	Field description	Usage tips
HD mode	<p>Defines the maximum video definition that the TelePresence Server will support.</p> <p>One of <i>HD</i> or <i>Full HD</i>.</p> <p>If you change this setting, your change will take effect as soon as there are no participants connected to the TelePresence Server.</p>	<p><i>HD</i> mode supports a maximum definition of 720p at 30fps, or w448p at 60 fps.</p> <p><i>Full HD</i> mode supports a maximum definition of 1080p at 30 fps, or 720p at 60 fps.</p> <p>The HD mode selection affects the maximum number of participants; see ports allocation for more details.</p> <p>The default is <i>HD</i>.</p>
Call out using conference name	Allows the TelePresence Server to display the conference name to identify itself when calling out to participants.	The default is disabled (unchecked). May not be displayed by all endpoints.
Call out to grouped endpoints if one calls in	If this option is checked, if a call is received from an endpoint which forms part of a manually-configured group the TelePresence Server will call out to the other endpoints in that group.	<p>You should make sure this option is unchecked if the endpoints which make up manually-configured groups are set to call in together - in this case the TelePresence Server will recognize the separate calls and group them automatically.</p> <p>The default is disabled (unchecked).</p>
Automatic content handover	Whether a participant is allowed to interrupt another participant's presentation in a conference by starting one of their own.	<p>The default is disabled (unchecked).</p> <p>When checked, if an endpoint attempts to send content when another participant is already sending content, the endpoint will override or cancel any existing presentation.</p>
Indicate presence of audio-only participants	Whether an overlaid icon is shown on video participants' screens to show the presence of audio-only participants in the conference.	<p>The default is disabled (unchecked).</p> <p>When checked, a telephone icon is displayed in the top left-hand corner of the screen with a number next to it showing the number of audio-only participants present. For grouped endpoints, the icon is shown on just one of the screens:</p> <ul style="list-style-type: none"> ■ the middle screen on T3s ■ for manually-configured groups, on the screen configured as the Screen to receive content / audio in the group's Advanced settings.
Display video preview images	When checked, thumbnail preview images of conference participants' video streams are shown on the TelePresence Server user interface.	The default is enabled (checked).
Display icon when any participants are not encrypted	The encrypted participants in a conference, where encryption is optional, see an icon indicating that there are other participants who are not encrypted.	The default is enabled (checked).

Field	Field description	Usage tips
Lobby screen date format	Select one of the date/time formats to display start and end times on the lobby screen.	Conference start and end times only display for scheduled conferences that you create via the TelePresence Server's web interface. The default format is <i>hh:mm MM/DD/YYYY</i> .
Use custom conference ending notification text	Allows the TelePresence Server to use a custom message to warn participants that the conference is ending.	The TelePresence Server uses a default message unless you enable and enter a custom message. The default message is This conference is about to end. Does not apply to Cisco CTS endpoints. See the endpoint interoperability reference for details. The default is disabled (unchecked).
Custom conference ending notification text	Enter a message that the TelePresence Server will use instead of the default message.	This message can be a maximum of 100 characters. The default is blank.

Configuring H.323 settings

The H.323 settings page allows you to enable the TelePresence Server to use an H.323 gatekeeper.

To access this information, go to [Configuration > H.323 settings](#).

To update the defaults, or change the configuration at any time, edit the fields referring to the table below for details and click **Apply changes**.

H.323 gatekeeper

Field	Field description	Usage tips
Use gatekeeper	<p>Enables the TelePresence Server to register numeric IDs for its conferences with an H.323 gatekeeper.</p> <p>Check the box to enable this feature.</p>	<p>When disabled, no gatekeeper registrations are attempted (and existing registrations are removed), regardless of other gatekeeper or per-conference settings.</p> <p>When enabled, registrations with the gatekeeper are attempted, and the gatekeeper is contacted for incoming and outgoing calls. If the gatekeeper does not respond, calls are still connected if possible.</p>
Address	<p>The network address of the gatekeeper to which TelePresence Server registrations should be made.</p>	<p>Can be specified either as a host name or as an IP address.</p> <p>This field will have no effect if Use gatekeeper is disabled.</p>
H.323 ID to register	<p>Specifies a server-wide identifier that the TelePresence Server can use to register itself with the H.323 gatekeeper.</p>	<p>The TelePresence Server must make a server-wide registration before it can register any IDs with the H.323 gatekeeper.</p> <p>This field is required for the gatekeeper registration, but has no effect if Use gatekeeper is disabled.</p>
Password	<p>If the configured gatekeeper requires password authentication from registrants, enter the password.</p>	<p>The password is used, in association with the H.323 ID to register as the username, to authenticate the TelePresence Server to the gatekeeper (only if the gatekeeper is configured to require authentication).</p>

Configuring SIP settings

The SIP settings page allows you to control the TelePresence Server SIP settings.

To access this information, go to [Configuration > SIP settings](#).

To update the defaults, or change the configuration at any time, edit the fields referring to the table below for details and click **Apply changes**.

SIP

Field	Field description	Usage tips
Outbound call configuration	<p>This setting affects outgoing SIP calls and registration. There are three options:</p> <p><i>Use registrar</i> enables SIP registration and routes outbound SIP calls via the registrar.</p> <p><i>Use trunk</i> disables SIP registration and tears down existing registrations. Routes outbound calls to the trunk destination, e.g. VCS or CUCM.</p> <p><i>Call direct</i> disables SIP registration and tears down existing registrations. Outbound SIP calls go directly (not via registrar or trunk).</p>	<p><i>Use registrar:</i></p> <ul style="list-style-type: none"> Enables SIP registrations, on a system-wide basis, with the registrar address you provide. Outgoing calls always go through the registrar, unless you explicitly choose Call direct for a pre-configured endpoint or ad hoc call. An outbound call will fail if the registrar does not respond. Incoming calls should come through the registrar and will fail if the registrar does not respond. <p><i>Use trunk:</i></p> <ul style="list-style-type: none"> Directs outbound SIP calls via the trunk to the SIP server address you provide. The SIP server, for example Cisco Video Communication Server (VCS) or Cisco Unified Call Manager (CUCM), is responsible for the onward routing of outbound SIP calls from the TelePresence Server. <p><i>Call direct:</i></p> <ul style="list-style-type: none"> The TelePresence Server will connect SIP calls directly if possible. It does not use the Outbound address or Outbound domain parameters. The TelePresence Server does not attempt to use either the registrar or trunk.
Outbound address	The hostname or IP address of the SIP registrar or trunk destination.	The TelePresence Server ignores this field if Outbound call configuration is set to <i>Call direct</i> .

Field	Field description	Usage tips
Outbound domain	The domain of the SIP registrar or trunk destination.	<p>The TelePresence Server ignores this field if Outbound call configuration is set to <i>Call direct</i>.</p> <p>The TelePresence Server uses this value in the following ways:</p> <ul style="list-style-type: none"> ■ username@outbounddomain to register a user with a SIP registrar (if SIP registration is enabled) ■ numericId@outbounddomain to register a conference's numeric ID with a SIP registrar (if conference has SIP registration enabled) ■ Any outbound SIP calls where the supplied address does not contain an @ symbol. <p>If you do not specify an outbound domain, the TelePresence Server uses the outbound address instead.</p>
Username	<p>The TelePresence Server uses this name if it registers with a SIP registrar.</p> <p>The TelePresence Server uses this name to authenticate with the SIP device (registrar, trunk destination, or endpoint) if that device requires authentication.</p>	<p>The TelePresence Server will use this name to register itself with the SIP registrar if you have enabled SIP registration. It will not register itself if you do not provide this, but it will still be able to register individual conferences (assuming they are enabled to register and have numeric IDs).</p> <p>If a conference does not have a numeric ID, then it cannot register. Calls out from such a conference will appear to come from the TelePresence Server's own SIP registration (this_username@outbounddomain). It is impossible for a participant to call into such a conference because it does not have a numeric ID.</p> <p>If you enter a full URI here (e.g. host@domain), then the TelePresence Server will ignore the Outbound domain setting.</p>
Password	The TelePresence Server uses this password to authenticate with the SIP device (registrar, trunk destination, or endpoint) if that device requires authentication.	The SIP destination may not require authentication; if it does, you need to configure it to accept a log in from this username and password combination.

Field	Field description	Usage tips
Outbound transport	<p>Select the protocol that the TelePresence Server will use for outbound calls (and registrations, if enabled).</p> <p>One of <i>TCP</i>, <i>UDP</i>, or <i>TLS</i>.</p>	<p>The TelePresence Server uses this protocol for communicating with the SIP registrar or trunk destination.</p> <p>If you have the encryption feature key installed and want to encrypt signaling, select <i>TLS</i>.</p> <p>The TelePresence Server accepts incoming connections on whichever protocol the connection uses (TCP, UDP or TLS), and will respond using the same protocol, irrespective of this Outbound transport setting. Make sure that you enable those services on the Network > Services page.</p>
Negotiate SRTP using SDDES	<p>Select whether the TelePresence Server will negotiate SRTP using SDDES either:</p> <p><i>for secure transports (TLS) only</i> or <i>for all transports</i>.</p> <p>(Note this parameter only displays with the encryption feature key.)</p>	<p>The TelePresence Server supports the use of encryption with SIP. When encryption is in use with SIP, the audio and video media are encrypted using Secure Real-time Transport Protocol (SRTP). When using SRTP, the default mechanism for exchanging keys is Session Description Protocol Security Description (SDDES). SDDES exchanges keys in clear text, so it is a good idea to use SRTP in conjunction with a secure transport for call control messages. You can configure the TelePresence Server to also use Transport Layer Security (TLS) which is a secure transport mechanism that can be used for SIP call control messages.</p> <p>The default setting is <i>for secure transports (TLS) only</i>.</p>
Use local certificate for outgoing connections and registrations	<p>Check this option to allow the TelePresence Server to present its local certificate when registering with the SIP registrar (via TLS) or making outgoing TLS calls. With this option unchecked, the TelePresence Server will never present its local certificate, even if requested to do so.</p>	<p>This option should be checked if TLS is in use.</p>

Configuring default conference settings

The **Default conference settings** page allows you to configure the TelePresence Server default conference settings.

To access this information, go to **Configuration > Default conference settings**.

To update the defaults, or change the configuration at any time, edit the fields referring to the table below for details and click **Apply changes**.

Note: Configuration changes in the Default conference settings page affect active calls unless the call or conference has already been manually changed via the [Advanced settings](#) and [Configuration](#) pages for the appropriate conference.

Default conference settings

Field	Field description	Usage tips
Show lobby screen	<p>Enable the TelePresence Server to display lobby screens to participants.</p> <p>Participants see this screen when they join a conference or when there is no video to display (all other participants are either audio-only or have video muted, and self-view is disabled.)</p>	<p>The lobby screen shows the conference name, start and end times (if applicable), and an optional lobby message. The message is set on a per conference basis.</p>
Conference ending notification	<p>Check so the TelePresence Server warns participants that the conference is ending soon.</p>	<p>Participants see a notification, two minutes prior to the end of the conference, that the conference is ending soon.</p> <p>Cisco CTS endpoints display an icon instead of a notification message. Other endpoints see the message overlaid on their displays. See the endpoint interoperability reference for details.</p>

Configuring default endpoint settings

The **Default endpoint settings** page allows you to configure the TelePresence Server settings for the default endpoint.

To access this information, go to **Configuration > Default endpoint settings**.

To update the defaults, or change the configuration, edit the fields referring to the table below for details and click **Apply changes**.

Note: Configuration changes in the Default endpoint settings page affect active calls unless the call or conference has already been manually changed via the [Advanced settings](#) and [Configuration](#) pages for the appropriate endpoint.

Default endpoint settings

Field	Field description	Usage tips
Allow stereo audio	This option enables stereo audio in calls with compatible endpoints.	The default is enabled. However, some endpoints do not support stereo echo cancellation and in some circumstances this can cause echo. If necessary, disable this option to prevent the use of stereo audio, either for a specific endpoint or by default.
Full screen view of single-screen endpoints	This option determines where and how single-screen endpoints are placed in full screen panes of video displays sent to conference participants. Select a setting from the drop-down list to set as the default: <ul style="list-style-type: none"> ■ <i>Allowed</i>: Single-screen endpoints will display in full screen panes. ■ <i>Dynamic</i>: Single-screen endpoints will display in full screen panes if there are no grouped endpoints to show. However, when there are grouped endpoints to show, single-screen endpoints will then be restricted to the smaller continuous presence panes. ■ <i>Disabled</i>: Single-screen endpoints will never be shown in full screen panes. 	This setting can be overridden by the equivalent Full screen view setting in single-screen endpoints' Configuration page. The default is <i>Allowed</i> .
Show borders around endpoints	Check this option to show borders around participants displayed in the conference view sent to new endpoints/endpoint groups by default.	For more information, see Understanding how participants display in layout views . The default is enabled.
Active speaker display	Check this option to show a red border around the active speaker.	This setting is only available if <i>Show borders around endpoints</i> (detailed above) is selected. The default is enabled.

Field	Field description	Usage tips
Show endpoint names as panel labels	If you check this option, the TelePresence Server will label panes in the conference layout sent to new endpoints/endpoint groups by default with the names of the participants shown in those panes.	The default is disabled.
Self view	If you uncheck this option, the TelePresence Server will never show the video stream sent from this endpoint or endpoint group to the participants using this endpoint or endpoint group by default i.e. they will not see themselves.	For more information, see Understanding how participants display in layout views . The default is disabled.
Default layout type for single-screen endpoints	<p>This option controls the default layout single-screen endpoints see when they connect. Select a setting from the drop-down list to be used as the default:</p> <ul style="list-style-type: none"> ■ <i>Single</i>: Endpoints will be shown in one full screen pane. ■ <i>ActivePresence</i>: Endpoints will be shown in one full screen pane with additional participants appearing in up to nine equally sized overlaid panes at the bottom of the screen. ■ <i>Prominent</i>: Endpoints will be shown in one large pane with additional participants appearing in up to four equally sized panes at the bottom of the screen. ■ <i>Equal</i>: Endpoints will be shown in a grid pattern of equally sized panes on the screen, up to 4x4. 	<p><i>Equal</i> is automatically used if the multi-screen system in the conference does not send the TelePresence Server a loudest panel/screen indication.</p> <p>The default setting is <i>ActivePresence</i>.</p> <p>Participants can change their layout using Far End Camera Control or via DTMF keys 2 and 8.</p> <p>See the endpoint interoperability reference for a list of the multi-screen systems that reveal the loudest panel information.</p>
Default layout type for multi-screen endpoints	<p>This option controls the default layout multi-screen endpoints see when they connect. Select a setting from the drop-down list to be used as the default:</p> <ul style="list-style-type: none"> ■ <i>Single (Full screen)</i>: Endpoints will be shown in full screen panes. A single participant displays per screen. ■ <i>ActivePresence</i>: Endpoints will always be shown in full screen panes with additional participants appearing in up to six equally sized overlaid panes at the bottom of each screen (up to four panes for 2 and 4 screen endpoints). 	<p>Participants can change their layout using Far End Camera Control or via DTMF keys 2 and 8.</p> <p>The default is <i>ActivePresence</i>.</p>

Field	Field description	Usage tips
Allow content in main video	<p>This option allows the TelePresence Server to send a conference's content channel in the main video channel of endpoints that do not support the extra channel.</p> <p>Endpoints that would otherwise be unable to see the content channel can see it if you enable this feature.</p> <p>In these cases, the content channel video is shown in the largest pane of a composed layout. The content layout replaces the main video while the content channel is active (audio is unaffected).</p>	<p>Content does not entirely replace the main video; the content displays in the largest pane of a composed layout that also shows the other participants' streams across the bottom of the screen (more about layouts).</p> <p>The default is enabled.</p> <p>For more information about the content channel, see Content channel video support.</p>

Displaying and resetting system time

You can manually set the system date and time for the TelePresence Server or let it use the Network Time Protocol (NTP) to synchronize its time.

To configure Time settings, go to [Configuration > Time](#).

System time

Current time displays the time according to the TelePresence Server.

To manually set the system date and time, type the new values and click **Change system time**.

NTP

The TelePresence Server supports the NTP protocol. If you want the TelePresence Server to automatically synchronize with an NTP server, enter the NTP settings and then click **Update NTP settings**.

The TelePresence Server synchronizes with the NTP server every hour.

If the NTP server is local to either of the TelePresence Server's enabled Ethernet interfaces, the TelePresence Server automatically uses the port to communicate with the NTP server.

If the NTP server is not local, the TelePresence Server will use the port that is configured as the default gateway to communicate with the NTP server, unless a specific IP route to the NTP server's network/IP address is specified (see [Network > Routes](#)).

If there is a firewall between the TelePresence Server and the NTP server, configure the firewall to allow NTP traffic to UDP port 123.

Device time settings

Field	Field description	Usage tips
Enable NTP	Check the box to enable NTP protocol on the TelePresence Server.	
UTC offset	The offset of the time zone that you are in from UTC.	You must manually update this offset to account for regional changes to time zone, such as British Summer Time and other daylight saving schemes.
NTP host	The IP address or hostname of the server that is acting as the time keeper for the network.	

Using NTP over NAT (Network Address Translation)

No extra configuration is required if the NAT is local to the TelePresence Server's network.

If NAT is used on the NTP server's local network, you must configure the NAT forwarding table to forward NTP data from the TelePresence Server to UDP port 123 on the NTP server.

Backing up and upgrading the TelePresence Server

On this page:

- [Upgrading the main TelePresence Server software image](#)
- [Upgrading the loader software image](#)
- [Backing up and restoring the configuration](#)
- [Enabling TelePresence Server features](#)

Upgrading the main TelePresence Server software image

The main TelePresence Server software image is the only firmware component that you will need to upgrade.

To upgrade the main TelePresence Server software image:

1. Go to **Configuration > Upgrade**.
2. Check the **Current version** of the main software image to verify the currently installed version.
3. Log onto the [support pages](#) to identify whether a more recent image is available.
4. Download the latest available image and save it to a local hard drive.
5. Unzip the image file.
6. Log on to the TelePresence Server web browser interface.
7. Go to **Configuration > Upgrade**.
8. Click **Browse** to locate the unzipped file on your hard drive.
9. Click **Upload software image**. The browser begins uploading the file to the TelePresence Server, and a new browser window opens to indicate the progress of the upload. When finished, the browser window refreshes and indicates that the "Main image upgrade completed."
10. The upgrade status displays in the **TelePresence Server software upgrade status** field.
11. [Shut down and restart the TelePresence Server](#).

Upgrading the loader software image

Typically, upgrades for the loader software image are not available as often as upgrades to the main software image.

Note: You should not do this unless you are advised by customer support.

To upgrade the loader software image:

1. Go to **Configuration > Upgrade**.
2. Check the **Current version** of the loader software to verify the currently installed version.
3. Go to the software download pages of the web site to identify whether a more recent image is available.
4. Download the latest available image and save it to a local hard drive.
5. Unzip the image file.

6. In the web interface, click the button to locate and select the unzipped file on your hard drive.
7. Click **Upload software image**. The browser begins uploading the file to the TelePresence Server, and a new browser window opens to indicate the progress of the upload. When finished, the browser window refreshes and indicates that the "Loader image upgrade completed."
8. The upgrade status displays in the **Loader upgrade status** field.
9. [Shut down and restart the TelePresence Server](#).

Backing up and restoring the configuration

The Back up and restore section of the [Configuration > Upgrade](#) page allows you to back up and restore the configuration of the TelePresence Server using the web interface. This enables you to either go back to a previous configuration after making changes or to effectively clone a unit by copying its configuration to another.

To back up the configuration, click **Save backup file** and save the resulting configuration.xml file to a secure location.

To restore configuration at a later date:

1. Click **Browse** to locate and select a previously-saved configuration.xml file.
2. Select whether you want the saved configuration to overwrite the current *Network settings*, *User settings*, or both.
The overwrite controls are not selected by default; the software assumes you want to preserve existing network settings and user accounts.
3. Click **Restore backup file**.

When restoring a new configuration file to a TelePresence Server you can control which parts of the configuration are overwritten:

- If you check **Network settings**, the network configuration will be overwritten with the network settings in the supplied file.
Typically, you would only select this check box if you are restoring from a file backed up from the same TelePresence Server or if you are intending to replace an out of service TelePresence Server.
If you copy the network settings from a different, active, TelePresence Server and there is a clash (for instance, both are now configured to use the same fixed IP address) one or both devices may become unreachable via IP. If you do not check **Network settings**, the restore operation will not overwrite the existing network settings, with the one exception of the QoS settings. QoS settings are overwritten regardless of the **Network settings** check box.
- If you check **User settings**, the current user accounts and passwords will be overwritten with those in the supplied file.
- If you overwrite the user settings and there is no user account in the restored file corresponding to your current login, you will need to log in again after the file has been uploaded.

Enabling TelePresence Server features

The TelePresence Server requires activation before most of its features can be used. (If the TelePresence Server has not been activated, the banner at the top of the web interface will show a prominent warning; in every other respect the web interface will look and behave normally.)

If this is a new TelePresence Server it should already be activated; if it is not, or if you have upgraded to a newer firmware version, or if you are enabling a new feature, contact your supplier to obtain the appropriate activation code.

Each activation code is unique to a particular TelePresence Server. Ensure that you know the blade's serial number when you request the code, so that the supplier can give you the correct code.

Regardless of whether you are activating the TelePresence Server or enabling an advanced feature, the process is the same.

Additionally, if it is a Cisco TelePresence Server 7010, then the port licence key is also entered here.

To activate the TelePresence Server or enable an advanced feature:

1. Read the **Activated features** list to check whether the feature you require is already activated. Product activation is also in this list, which shows feature names and activation keys.
2. Enter the code given to you by your supplier into the **Activation code** field *exactly as you received it*, including any dashes.
3. Click **Update features**.
The browser window refreshes to list the newly activated feature and the code you entered.
If the activation code is not valid, you are prompted to re-enter it.
Activation codes may be time-limited. If this is the case, an expiry date will be displayed, or a warning that the feature has already expired. Expired activation codes remain in the list but the corresponding features are not activated.
4. Record the activation code in case you need to re-enter it in the future.

Successful TelePresence Server or feature activation has immediate effect and will persist even if the TelePresence Server is restarted.

Note that you can remove some types of features. Click **remove**, next to the feature key, to remove a feature.

Upgrading the font

Your TelePresence Server may be shipped with the TrueType font pre-installed. You can check this on the [Status](#) or [Configuration > Upgrade](#) pages.

If the font is not present, and you want to use TrueType text rendering on your TelePresence Server instead of the default text rendering method, you must upload the font file which is supplied by your TelePresence Server vendor:

Note: You should do this when the TelePresence Server is not heavily loaded. Also, you must use the supplied font; do not attempt to load a different font file.

1. Click **Browse** to locate and select your font file.
2. Click **Upload font**.
The **Font file status** changes to *Present*.

Downgrade the font

1. If you want to revert to the default text rendering, click **Delete font**.
2. Confirm that you want to remove the font file.

The **Font file status** changes to *Not present*.

Shutting down and restarting the TelePresence Server

You may need to shut down the TelePresence Server to restart it as part of an upgrade or to switch off its power.

Caution: Shutting down the TelePresence Server will disconnect all active calls.

To shut down the TelePresence Server:

1. Go to **Configuration > Shutdown**.
2. Click **Shut down TelePresence Server**.
The button changes to **Confirm TelePresence Server shutdown**.
3. Click the button again to confirm.
The TelePresence Server will begin to shut down. The banner at the top of the page will change to indicate this.
When the shutdown is complete, the button changes to **Restart TelePresence Server**.
4. Click this button a final time to restart the TelePresence Server.

Changing the administrator password

This page allows you to change the administrator password used to log in to this TelePresence Server. This applies to the current user who needs to be an 'administrator'. To access this page, go to [Configuration > Change password](#).

We recommend that you change the administrator password regularly. You may want to make a note of the password and store it in a secure location.

To change the password, type in the new password twice and click **Change password**.

Backing up and restoring the configuration via FTP

You can back up and restore the configuration via the web interface of the TelePresence Server or via FTP. You need to have the FTP service enabled on the TelePresence Server (on the [Network > Services](#) page) before you can connect to it using FTP.

To back up the configuration via FTP:

1. Connect to the TelePresence Server using an FTP client and the administrator credentials you use to log in to the web interface.
You will see a file called **configuration.xml** that contains the configuration of your TelePresence Server.
2. Download this file and store it somewhere safe.

To restore the configuration using FTP:

1. Locate the copy of **configuration.xml** that you want to restore.
2. Connect to the TelePresence Server using an FTP client and the administrator credentials you use to log in to the web interface.
3. Upload your **configuration.xml** file to the TelePresence Server, overwriting the existing version of the file.

Note: The same process can be used to transfer a configuration from one TelePresence Server blade to another. However, before doing this, be sure to keep a copy of the original feature keys from the blade whose configuration is being replaced.

If you are using the configuration file to configure a duplicate blade, be aware that you will need to reconfigure any static IP addresses on the duplicate blade(s).

Conferences

Adding and updating conferences.....	54
Displaying the conference list.....	59
Displaying conference status.....	61
Calling participants to join a conference.....	68
Sending a message to participants.....	69

Adding and updating conferences

There are a two ways to start a conference with the TelePresence Server:

- Using the TelePresence Server's web interface, as described in this topic.
- Calling directly into a conference from an endpoint. This is only possible if the conference has a numeric ID. If the numeric ID is registered with the gatekeeper/SIP registrar, you can dial the numeric ID on its own; if not, you can dial by TelePresence Server IP address plus numeric ID.

Adding a conference

To add a conference:

1. Go to **Conferences > Add new conference**.
2. Complete the fields, referring to the [table below](#) for more information.
3. Click **Add new conference**.

Notes:

- You can add pre-configured endpoints to a conference to be automatically invited into the conference by the TelePresence Server. This is useful if you regularly invite the same participants into a conference This is done on the conference configuration page after the conference has been created - see [Updating a conference](#) for more information.
- If a pre-configured endpoint is busy when the conference starts, the TelePresence Server will retry the endpoint five times and connect it if it becomes available.
- You can schedule the conference timing, or return to the conference configuration subsequently and start the conference as an [ad hoc conference](#) using **Start now**.

Updating a conference

When updating a conference's configuration you can select endpoints to dial and then dial out and start an ad hoc conference using an existing conference configuration.

To update an existing conference:

1. Go to **Conferences**.
2. Click a Conference name. That conference's status page is shown.
3. Go to **Configuration**.
4. Edit the fields referring to the [table below](#).
5. If required, add pre-configured endpoints to the conference configuration:
 - i. Click **Add pre-configured participants**.
 - ii. Select from the list of pre-configured participants.

Note: If you have scheduled a time for the conference, then you cannot select any endpoints or endpoint groups that are already configured for a conference during that period. This avoids clashing commitments for endpoints and endpoint groups.

- iii. Click **Update**.

The participants are displayed in the **Pre-configured participant** section.

6. Click **Update conference**.

Starting an ad hoc conference with pre-configured participants

An ad hoc conference is one that is started from the web interface with the **Start now** button. This can be:

- based on a conference that was configured without a schedule.
- an additional ad hoc instance of a scheduled conference: in this case, the conference continues to its scheduled end time, if there is one, unless you disconnect the participants manually.

1. Go to **Conferences**.
2. Click the name of the conference whose configuration you want to use for this conference.
3. Go to **Configuration**.
4. If required, select pre-configured endpoints:
 - i. Click **Add pre-configured participants**.
 - ii. Selected the endpoints to be dialed and click **Update**.
5. Click **Start now** to start the conference immediately.

Conference configuration reference

Conference

Field	Field description	Usage tips
Name	The name of the conference.	Conference names do not need to be unique.
Numeric ID	The unique identifier used for dialing in to the conference.	<p>Participants can only join a conference by dialing its numeric ID if the conference's numeric ID is registered with the H.323 gatekeeper or SIP registrar (depending on which protocol the endpoint is using).</p> <p>If the conference has a numeric ID that is not registered, you can join the conference if the TelePresence Server is receiving a call through an H.323/SIP trunk. This is the method Cisco recommends.</p> <p>It is possible to call into a non-registered conference by dialing the IP address of the TelePresence Server that is running the conference plus the numeric ID, however, this method is not recommended.</p> <p>Conferences do not have to have a numeric ID, but numeric IDs must be unique.</p>

Field	Field description	Usage tips
PIN	Enter the unique PIN for the conference.	<p>Setting a PIN allows you to restrict access to the conference. Up to 40 digits are supported for a PIN. When entering the conference participants will be presented with a PIN entry screen and an audio prompt. The PIN can be entered via DTMF.</p> <p>Press * to delete the entire PIN.</p> <p>A PIN is only valid for incoming calls—no outgoing calls will ever need to enter it. As a result of this, a conference PIN can only be set when the conference has a numeric ID. Trying to set a PIN without a numeric ID will return a fault, and clearing a conference's numeric ID will also clear that conference's PIN.</p>
Register numeric ID with H.323 gatekeeper	Whether to register the conference with the Numeric ID as the H.323 ID.	Select this check box to register the conference's numeric ID with the gatekeeper (if H.323 registration is enabled on the Configuration > H.323 Settings page).
Register numeric ID with SIP registrar	Whether to register the conference's Numeric ID with the SIP registrar.	Check the box to register the conference's numeric ID with the registrar (if SIP registration is enabled on the Configuration > SIP Settings page)
Conference locked	Locks a conference.	<p>Check the box to lock the conference. You can still add pre-configured participants before the conference starts, but no participants will be able to join (call in) when the conference is active.</p> <p>You can call out to invite participants in to a locked conference.</p>
Encryption	Whether encryption is optional or required for this conference.	<p>If encryption is <i>Required</i>, only endpoints that support encryption can join this conference.</p> <p>Encryption requires a feature key. Feature keys are installed in the Configuration > Upgrade page. See Upgrading and backing up the TelePresence Server.</p>

Field	Field description	Usage tips
Use OneTable mode when appropriate	<p>If your multi-screen endpoints support the OneTable feature you can select whether to use OneTable mode automatically when the correct combination of endpoints or endpoint groups is in a conference (three or four OneTable endpoints plus less than six other endpoints or endpoint groups).</p> <p>Choose from:</p> <p><i>Disabled</i></p> <p>or</p> <p><i>4 person mode</i></p>	<p>In OneTable mode each screen shows an entire view of a single remote site (as opposed to one third of the remote site in a normal, point-to-point TelePresence setting). This allows the center four participants in three remote TelePresence rooms to be seen simultaneously, as if they were seated at one table if <i>4 person mode</i> is selected.</p> <p>For more information, see Understanding how participants display in layout views.</p> <p>Not all multi-screen endpoints support OneTable mode. See the endpoint interoperability reference for a list of supporting endpoints.</p>
Content channel	<p>If <i>Enabled</i>, this conference is able to support an additional video stream, sent potentially to all connected endpoints, intended for showing content video.</p> <p>This content video is typically high resolution, low frame rate data such as a presentation formed of a set of slides. Such presentation data can be sourced by an endpoint specifically contributing a separate content video stream.</p>	<p>For more information, see Content channel video support.</p>

Port limits and lobby settings

Field	Field description	Usage tips
Video	<p>Enable a limit on the video ports allowed for this conference</p>	<p>Check the box and enter the maximum number of video ports you want this conference to use.</p> <p>The TelePresence Server cannot guarantee to provide this number of ports. However, if more than this number are requested and available, the TelePresence Server will supply ports until the limit is reached.</p>
Audio only	<p>Enable a limit on the number of audio-only ports allowed for this conference</p>	<p>Check the box and enter the maximum number of audio-only ports you want this conference to use.</p> <p>The TelePresence Server can not guarantee to provide this number of ports. However, if more than this number are requested and available, the TelePresence Server will supply ports until the limit is reached.</p>

Field	Field description	Usage tips
Show lobby screen	Enable a lobby screen for this conference.	The lobby screen can be enabled/disabled on a server-wide basis. If you select <i><Use default></i> here, the conference will inherit the setting from the Configuration > System settings page. Otherwise, you can select <i>Enable</i> or <i>Disable</i> to override the server-wide setting.
Lobby message	Display a custom message on the lobby screen.	Enter some text to display on the lobby screen. If Show lobby screen is enabled—either because it is enabled by the server-wide setting or enabled for this conference only—participants will see this text when they see the lobby screen.

Scheduling

Field	Field description	Usage tips
Schedule	Select the check box to enable the settings in this section.	Conferences can be scheduled using the fields in this section, but you may also want to create a conference without a set start time (in this case, leave this setting unselected). Subsequently, when you want the conference to start, open the conference configuration, add endpoints and click Start now . You can also create an unscheduled conference by going to the Conference > Status page and select the endpoint(s) you wish to add to the conference and click Call endpoint .
Start time	The date and time at which the conference will begin.	The default start time is 10 minutes from the current time.
Permanent	Allows you to schedule a conference with no specified end time.	Select this option if you want a meeting to go on indefinitely.
End time	The date and time at which the conference will finish.	These fields are not available or necessary for permanent conferences.
Conference ending notification	Send a message to all participants when the conference is coming to an end.	This notification can be enabled/disabled on a server-wide basis. If you select <i><Use default></i> here, the conference will inherit the setting from the Configuration > Default conference settings page. Otherwise, you can select <i>Enable</i> or <i>Disable</i> to override the server-wide setting. You can edit the message on a server-wide basis on the Configuration > System settings page.

Displaying the conference list

The **Conferences** page lists all the conferences that are configured on this TelePresence Server, regardless of their status (e.g. *Active* or *Inactive*).

Go to **Conferences** to access this list.

Conferences are sorted alphabetically by name by default. To change sort order, or sort the list by Status or Numeric ID instead, click the relevant column heading.

On this page you can:

- Add or delete pre-configured conferences.
- Click a conference name to display its status (for a pre-configured conference, you can also edit its configuration).
- Click the cog icon  next to a conference name to display its configuration.

The list contains the following information for each conference:

Conference list details

Field	Field description	Usage tips
Name	The name of the pre-configured conference.	Click the conference name to display conference status and participants.
Numeric ID	The numeric ID assigned to the conference.	<p>This is the ID that the TelePresence Server uses to register the conference with a gatekeeper or registrar.</p> <p>The TelePresence Server will not attempt to register the ID with the gatekeeper unless the Use gatekeeper option is selected. This setting is on the Configuration > H.323 settings page.</p> <p>It will not try to register with a SIP registrar unless Outbound call configuration is set to <i>Use registrar</i>. This setting is on the Configuration > SIP settings page.</p>

Field	Field description	Usage tips
Status	<p>The status of the conference:</p> <ul style="list-style-type: none"> ■ <i>Scheduled</i> ■ <i>Enabled</i> ■ <i>Active</i> ■ <i>Permanent</i> ■ <i>Inactive</i> ■ <i>Completed</i> <p>This field may also display warnings about the conference's configuration.</p>	<p>Conferences can be:</p> <ul style="list-style-type: none"> ■ A <i>Scheduled</i> conference shows the scheduled start and end times. ■ An <i>Enabled</i> conference has no start or end time but it does have a numeric ID. An endpoint user can call the TelePresence Server with this numeric ID to start the conference. Its status will change to <i>Active</i> (<X> endpoints, <N> screens) while there are active participants (or <i>Active</i> (<X> endpoints) if all endpoints are audio-only). ■ An <i>Active</i> conference may also display the number of participants and the scheduled end time. ■ If a status is appended with <i>Permanent</i> it means the conference has no configured end time. ■ An <i>Inactive</i> conference has no start or end time and does not have a numeric ID. You can only start the conference from its Status or Configuration page. ■ A <i>Completed</i> conference had a scheduled end time which has passed. <p>The status may have additional information about the conference duration, and whether it is locked and for how long. For example, <i>Inactive - Due to end in 5 hours and 27 minutes</i> [<i>Locked - will be unlocked in 2 hours and 7 minutes</i>].</p> <p>Conference configuration warnings examples that may display are: <i>[No participants allowed - all port limits 0]</i>, <i>[Requires encryption, but encryption not supported]</i>, and so on.</p>

Displaying conference status

A conference's **Status** page displays the live status of the conference. Go to **Conferences** then click a conference name to see the **Status** page.

From this page you can tell whether the conference:

- is active and how many endpoints are in the conference
- is registered to an H.323 gatekeeper or SIP registrar
- is locked
- has port limits, and what they are
- includes a content channel
- has participants and the status of each
- had previous participants and who they were

On the Conference > *Conference Name* > Status page you can:

- Click **Call endpoint** to [invite participants to join this conference](#)
- Click an endpoint name to [see the endpoint's status](#) or [configure its individual settings](#).

For active conferences you can also:

- Select and then **Disconnect selected** participants
- **Disconnect all** participants, effectively ending the conference
- [Send a message to one or all endpoints](#)
- Click **More...** to see additional status information for a participating endpoint, or click **Expand all** to see this information for all active endpoints (see the following table for more details)

Conference status reference

Status

Field	Field description	Usage tips
Status	<p>The status of the conference:</p> <ul style="list-style-type: none"> ■ <i>Scheduled</i> ■ <i>Enabled</i> ■ <i>Active</i> ■ <i>Inactive</i> ■ <i>Completed</i> <p>This field may also display warnings about the conference's configuration.</p>	<p>Conferences can be:</p> <ul style="list-style-type: none"> ■ <i>Active (<X> endpoints) - due to end <time></i>: this conference is in progress and has a scheduled end time. ■ <i>Active - permanent</i>: this is a permanent conference which has past its start time but may or may not have any active participants. ■ <i>Inactive</i>: this conference does not have a scheduled start or end time, nor a numeric ID. It can only be started from the conference's status or configuration pages. ■ <i>Enabled</i>: this conference does not have a scheduled start or end time but has a numeric ID, therefore an endpoint can call to the TelePresence Server with this numeric ID and start the conference. It will then be shown as <i>Active (<X> endpoints)</i> while there are active participants. ■ <i>Completed</i>: this conference had a scheduled end time which has passed. <p>The status may have additional information about the conference duration, and whether it is locked and for how long. For example, <i>Inactive - Due to end in 5 hours and 27 minutes</i> [<i>Locked - will be unlocked in 2 hours and 7 minutes</i>].</p> <p>Conference configuration warnings examples that may display are: [<i>Duplicate numeric ID - not registered</i>], [<i>No participants allowed - all port limits 0</i>], [<i>Requires encryption, but encryption not supported</i>], and so on.</p>
Numeric ID	<p>The numeric ID assigned to this conference and an indication if it is PIN protected.</p>	

Field	Field description	Usage tips
H.323 gatekeeper status	The status of a conference with respect to its H.323 gatekeeper.	<p>One of:</p> <ul style="list-style-type: none"> ■ <i>Numeric ID registered</i> ■ <i>Numeric ID failed to register</i> ■ <i>Not registered</i>: conference is not configured to register with the gatekeeper ■ <i>Registering</i>: conference is in the process of registering <p>If the TelePresence Server can connect to an H.323 gatekeeper, the name and numeric ID of a conference can be registered with that gatekeeper as a different directory number (i.e. different to the one that the TelePresence Server is registered with). This allows H.323 users to dial directly into a particular conference.</p> <p>To configure a H.323 gatekeeper, go to Configuration > H.323 settings.</p>
SIP registrar status	The status of a conference with respect to its SIP registrar.	<p>One of:</p> <ul style="list-style-type: none"> ■ <i>Numeric ID registered</i> ■ <i>Numeric ID failed to register</i> ■ <i>Numeric ID unable to register (registration settings not configured)</i> conference is configured to try and register but it cannot because the system's SIP call configuration is set to <i>Use trunk</i> or <i>Call direct</i> instead of <i>Use registrar</i> ■ <i>Not registered</i>: conference is not configured to register with the registrar ■ <i>Registering</i>: conference is in the process of registering <p>If the TelePresence Server can connect to a SIP registrar, the name and numeric ID of a conference can be registered with that registrar as a different directory number (i.e. different to the one that the TelePresence Server is registered with). This allows users to dial directly into a particular conference.</p> <p>To configure a SIP registrar, go to Configuration > SIP settings.</p>
Conference lock status	Indicates whether the conference is locked.	
Port limits	Indicates whether the conference has port limits, and what those limits are.	

Field	Field description	Usage tips
Content	Whether the content channel is currently in use.	<p>One of:</p> <ul style="list-style-type: none"> ■ <i>Disabled</i>: content sharing is disabled for the conference. To enable content for this conference, go to Conferences > conference name > Configuration ■ <i>No current presentation</i>: content sharing is enabled for the conference but there is no active contributor ■ <i>Presentation from <endpoint display name></i>: there is an active contributor of content <p>For more information, see Content channel support.</p>
Enter/Leave OneTable mode	Allows you to force the conference's layout into or out of OneTable mode.	<p>This option displays if there are three or four multi-screen endpoints in the conference supporting OneTable mode. It displays (with different options) for both values of Use OneTable mode when appropriate.</p> <p>Not all multi-screen endpoints support OneTable mode. See the endpoint interoperability reference for a list of supporting endpoints.</p>

All participants

Field	Field description	Usage tips
Endpoint	The names of the endpoints currently participating in the active conference.	<p>If the conference is not active, this section shows <i>No endpoints</i>.</p> <p>To remove a participant from the conference: select the appropriate check box and select Disconnect selected</p> <p>Click on the endpoint's name to go to its Status page.</p>
Type	The endpoint type.	

Field	Field description	Usage tips
Status	The status of the endpoint.	<p>One of:</p> <ul style="list-style-type: none"> ■ <i>Joining conference</i> - the endpoint is joining this conference ■ <i>In conference</i> - the endpoint is currently participating in this conference. ■ <i>Attempting to re-establish call</i> - the endpoint is busy and a retry is occurring. <p>Additional status information may be displayed, for example, <i>xx failed to join</i>.(grouped endpoints), <i>packet loss detected</i>, <i>video to muted</i>, <i>video from muted</i>, <i>video muted</i> (and the equivalent for audio), <i>important</i> and <i>audio-only</i>.</p> <p>If a pre-configured endpoint is busy when the conference starts, the TelePresence Server will retry the endpoint up to five times throughout the conference and connect it if it becomes free. The retry intervals are 5, 15, 30, 60 and 120 seconds.</p>
More...	<p>Click More... to see previews of the transmit and receive streams. You can also control the endpoint's contribution to the conference.</p> <p>Click [Expand / Collapse All] to show more status information for all endpoints in the list.</p>	<p>You can:</p> <p>mute  and unmute  audio</p> <p>mute  and unmute  video</p> <p>make a participant important (transmit stream only)  or unimportant </p>

Previous participants

Field	Field description	Usage tips
Endpoint	The names of endpoints that were previously in this conference.	<p>To reconnect participants to the conference: select the appropriate check boxes and select Retry connection.</p> <p>Click on the endpoint's name to go to its Status page.</p>
Type	The endpoint type.	

Field	Field description	Usage tips
Reason for disconnection	Why the endpoint is no longer part of the conference.	<p>The TelePresence Server may have disconnected the endpoint for one of the following example reasons:</p> <ul style="list-style-type: none"> ■ <i>requested by administrator</i>: the endpoint has been disconnected by an administrator ■ <i>call rejected</i>: the far end rejected the call. ■ <i>left conference</i>: the endpoint has been disconnected at the end of a conference ■ <i>requested via API</i>: the endpoint has been disconnected via the API ■ <i>no answer</i>: the endpoint did not answer the call ■ <i>busy</i>: the endpoint has failed to connect because it was busy (for SIP calls this could also mean that the endpoint rejected the call). ■ <i>gatekeeper error</i>: a gatekeeper error occurred whilst trying to establish call. ■ <i>destination unreachable</i>: The endpoint was unreachable. ■ <i>DNS failure</i>: DNS lookup failed, or the H.323 gatekeeper could not find the alias requested. ■ <i>Encryption not supported by far end</i>: encryption required for the call but the far end does not support it or encryption forbidden for this call but far end can not do unencrypted [to be updated] ■ <i>timeout</i>: Connection timed out. ■ <i>insufficient free ports</i>: the endpoint has been disconnected because there are insufficient free ports ■ <i>conference port limit reached</i>: the endpoint has been disconnected because the conference port limit has been reached ■ <i>Conference locked</i>: the call could not connect to the conference as it is locked. ■ <i>Product not activated</i>: the call could not be made/accepted as there is no activation key installed on the TelePresence Server. ■ <i>Protocol error</i>: the endpoint has been disconnected due to a protocol error ■ <i>Network error</i>: the endpoint has been disconnected due to a network error ■ <i>Unavailable</i>: the endpoint is unavailable ■ <i>Capability negotiation error</i>: the endpoint and the TelePresence Server are unable to negotiate a mutually compatible call set up.

Field	Field description	Usage tips
		<ul style="list-style-type: none">■ <i>Insufficient token allocation</i>: the token specification/allocation was not sufficient for TIP/MUX call.■ <i>TIP/MUX negotiation failure</i>: the endpoint has been disconnected because TIP/MUX negotiation failed to complete successfully.■ <i>unspecified error</i>: the endpoint has disconnected, but the TelePresence Server does not know the reason

Calling participants to join a conference

1. Go to the **Conference > Conference name > Status** page.
2. Click **Call endpoint** if you want to invite one or more participants to join.
3. The **Call endpoint** page displays.
Here you can call endpoints that the TelePresence Server knows about as well as unknown endpoints.

Call known endpoints

The **Endpoints** list contains all the endpoints that are known to the TelePresence Server. This list may span more than one page, in which case there are links to all the pages near the bottom of each page.

1. Select the endpoints you want to call by checking the boxes next to the endpoint names.
You can select all or clear all by checking the box in the heading row.
2. Click **Call selected**.

Call an unknown endpoint

If an endpoint you want to invite is not in the **Endpoints** list:

1. Enter its IP address, URI, or E.164 number in the **Address** field.
2. Select the **Call protocol** to use.
3. Check **Call direct** if necessary.
You will have to enter the full IP address if you check this option. You should only need to do this if the endpoint is not registered with either the gatekeeper or registrar.
4. Select the **Bandwidth** you want to allow for this call, from 64 kbps up to 6 Mbps.
5. Enter a **Send DTMF** sequence if necessary.
This is usually unnecessary. However, a DTMF sequence may be required by the endpoint, for example a numeric PIN, if so, enter the keypress sequence here.
6. Click **Call endpoint**.

Sending a message to participants

You can send a message to all endpoints in an active conference or to just one of the endpoints. The instructions to send the message are the same but you can access different pages to send the message:

- To send a message to one participant, go to [Conferences > Conference Name > Status](#) and click on the endpoint name under **All participants** to bring up the Endpoint status page. Then click **Send message**. (This method works on configured endpoints and unknown endpoints that are dialed directly by address.)
- To send a message to all participants: Go to [Conferences > Conference Name > Status](#) and click **Send message**.

The **Send message** page displays.

Note: Very long messages might not display properly on some screens so you should consider limiting your messages to a maximum of a few hundred characters.

On the **Send message** page:

1. Type your message in the **Message** field.
2. Click one of the nine radio buttons (the three by three grid labeled **Position**) to select where the message will display on the target system(s).
3. Enter a **Duration** (in seconds) for the message to stay on the endpoint screen(s).
4. Click **Send message**.
The TelePresence Server displays your message on the screen(s) of the endpoint(s).

Endpoints and endpoint groups

Displaying the list of endpoints.....	71
Displaying endpoint and group status.....	72
Adding an endpoint.....	75
Adding an endpoint group.....	76
Adding a Legacy TIP endpoint.....	77
Editing an endpoint's configuration.....	78
Configuring endpoints and groups advanced settings.....	84

Displaying the list of endpoints

Go to [Endpoints](#) to display the list of endpoints. On this page you can view the list of pre-configured endpoints and endpoint groups. You can also [edit endpoints](#) and [add new ones](#).

The term endpoints refers to the logical ends of a video conference and includes single- or multi-screen systems, immersive telepresence systems, [Cisco CTS systems](#), [endpoint groups](#) and devices such as the Cisco TelePresence Content Server.

An endpoint group is a set of two or more endpoints that has one name and can be selected as the recipient of a call. The component endpoints are treated as one endpoint by the TelePresence Server.

Note: Multi-screen endpoints are not the same as endpoint groups.

When you pre-configure endpoints it is easier to add them to conferences; you can choose names from a list rather than manually entering names or addresses.

The interface displays the list in alphabetical order by default. Click on a column heading to order by that column instead.

On this page you can:

- [See an endpoint's status](#) or [edit its settings](#); click on the endpoint name
- [Add an endpoint](#); click **Add new endpoint**
- [Add a legacy TIP endpoint](#); click **Add legacy TIP endpoint**
- [Add an endpoint group](#) (if activated); click **Add grouped endpoints**
A feature key is required to activate the endpoint groups feature. The button only displays if the key is installed.
- Delete preconfigured endpoints; select the endpoints and click **Delete selected**.

Each item in the list has the following information:

Endpoint list details

Field	Field description
Name	The name of the endpoint.
Type	The type of endpoint, for example: 'Cisco three screen telepresence', 'Standard', or 'Group of <i>N</i> endpoints' (see Endpoint types for more details).
Status	Whether the endpoint is in a conference and, if it is, the name of the conference.

Displaying endpoint and group status

The endpoint status is most useful when the endpoint is part of an active conference. You can control the endpoint to some extent from here.

1. Go to [Endpoints](#)
2. Click on an endpoint or group name
3. Review or control the endpoint, with reference to the following table
4. Refresh the page in your browser to get the latest status.

Endpoint-supplied information

Field	Field description	Usage tips
Country code/extension	These fields display information as returned by the endpoint. The details may not be supplied in a consistent manner between manufacturers.	This information is displayed after the endpoint has been connected for the first time (regardless of whether it is currently connected or not).
Manufacturer code		
Product		
Version		

Status

Field	Field description	Usage tips
Connected to conference	Whether the endpoint is currently in a conference, and if so the name of the conference.	Click the conference name to go to the status page for that conference.
Call status	Whether the call is connected and if so, if it is an incoming or outgoing call.	
Protocol	The protocol used in this call e.g. H.323.	
Call-in IP address	The IP address of the endpoint or endpoint group on an incoming call.	
Call-in E.164	For H.323 incoming calls, the E.164 address with which the endpoint or endpoint group is registered with the gatekeeper. For SIP incoming calls, the SIP username with which the endpoint or endpoint group is registered with the SIP registrar.	
Call-in name	The name that the endpoint or endpoint group sends to the TelePresence Server for an incoming call.	

Field	Field description	Usage tips
Endpoint advertised capabilities	The capabilities that the endpoint advertised when negotiating the call.	For example: Audio, Video, Video content, Encrypted traffic, Unencrypted traffic.
Video channels	Whether receive and transmit video channels are open between the Cisco TelePresence Server and the far end.	
Audio channels	Whether receive and transmit audio channels are open between the Cisco TelePresence Server and the far end.	
Extended video channels	Whether receive and transmit extended video channels are open between the Cisco TelePresence Server and the far end.	
Far end audio mute	Whether the audio from the far end has been muted by the remote device.	This field only provides correct information for H.323 endpoints otherwise always off .
Bandwidth	The amount of network bandwidth used for this call's media in each direction.	For an endpoint group, this shows the bandwidth for each call rather than the total combined bandwidth.
Encryption check code	If encryption is in use for this call, the encryption check code is shown here.	The check code can be used in combination with information displayed by some endpoints to check that the encryption is secure.
Preview	Sample stills of the video stream(s).	The preview shows a still from each screen for both the receive stream (top row) and the transmit stream (bottom row). You can click to refresh the preview.
Endpoint X	(Endpoint groups only) The connection status of each endpoint in an endpoint group.	
Duration	The time that the endpoint/endpoint group has been in this conference.	
Disconnect	Use this control to disconnect the endpoint or endpoint group from the conference.	
Mute audio from / Unmute audio from	Use this control to start or stop muting audio from this endpoint. This changes whether other conference participants will be able to hear this endpoint.	

Field	Field description	Usage tips
Mute audio to / Unmute audio to	Use this control to start or stop muting audio to this endpoint. If audio is muted <i>to</i> an endpoint, the endpoint will hear silence.	
Mute video from / Unmute video from	Use this control to start or stop muting video from this endpoint. This changes whether other conference participants will be able to see this endpoint.	
Mute video to / Unmute video to	Use this control to start or stop muting video to this endpoint. If video is muted <i>to</i> an endpoint, that endpoint will be sent blank video.	
Tidy view	Use this control to tidy the view layout being sent to this endpoint or endpoint group.	<p>The TelePresence Server automatically centers the PIPs (pictures in picture) showing the video streams of other participants, and moves the PIPs between screens if doing so means it can display the PIPs slightly larger. This happens dynamically as participants join and leave the conference.</p> <p>Use the tidy view option if necessary to manually reset and center the participants' PIPs in the layout sent to this endpoint.</p>
Send message	Send a message to the endpoint.	<p>When you click the button, the Send message page displays:</p> <ol style="list-style-type: none"> 1. Enter your message, select its position on the target endpoint, and enter a duration (in seconds) for the message to display. 2. Click Send message.

Adding an endpoint

1. Go to **Endpoints > Add new endpoint**.
2. Configure the endpoint with reference to the [edit endpoint topic](#).

Note: If you want to be able to call out to this endpoint from a conference, you must configure its **Call-out parameters**.

3. Click **Add new endpoint**.

Adding an endpoint group

Note: A multi-screen endpoint is not the same as an endpoint group.

You can configure individual endpoints to work as a single, immersive endpoint. To use this feature you must have the "Third party interop" feature key installed. You can install feature keys on the [Configuration > Upgrade](#) page. (See [Upgrading and backing up the Cisco TelePresence Server](#).)

To add an endpoint group:

1. Go to [Endpoints > Add grouped endpoints](#).
2. Enter the **Name** of the group and the addresses of its members. See the table below.
3. Click **Add grouped endpoints**.
4. Configure the endpoint group in the same way as you would configure an individual endpoint. Refer to the [edit endpoint topic](#) for details of the settings.

Endpoint group members

Endpoint group settings

Field	Field description	Usage tips
Name	The name of the group.	
Calling out address list	The list of addresses to call out to when this group is in an active conference.	Enter a list of addresses separated by commas. Note: The order must be from left to right in terms of facing the endpoints' screens.
Call direct	Select this check box to call direct when calling this group.	

Adding a Legacy TIP endpoint

This feature only applies to a specific class of endpoints running particular versions of their operating software. Refer to the [endpoint interoperability reference](#) for details.

1. Go to **Endpoints > Add legacy TIP endpoint**.
2. Enter the **Name** and **Address** of the endpoint.
This is the call-out address; the TelePresence Server uses this to place outgoing calls to the endpoint. For example, this may be the SIP URI of the endpoint.
3. Click **Add legacy TIP endpoint**.
4. Configure the endpoint with reference to the settings in the [edit endpoint topic](#).
5. Click **Update endpoint**.

Editing an endpoint's configuration

1. Go to **Endpoints**.
2. Click the name of the endpoint or group.
3. Go to **Configuration**.
4. Edit the configuration with reference to the following table.
5. Click **Update endpoint**.
6. You may also need to [edit the advanced settings of the endpoint or group](#).

Endpoint settings reference

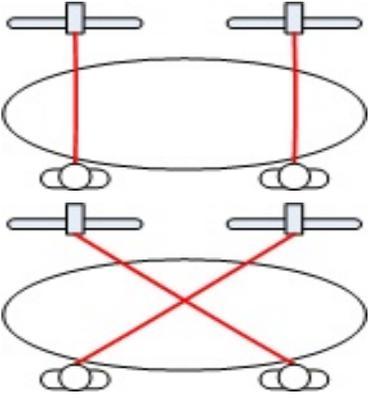
Note 1: Endpoints inherit the values for these settings from those defined in the TelePresence Server's **Configuration > Default endpoint settings** page. If you change a local setting to something other than the inherited value, the endpoint's local setting always takes precedence over the system-wide setting.

Note 2: Not all of these settings apply to all endpoint types or groups. These differences are detailed in the table.

Note 3: You can also change settings for endpoints currently in conferences by clicking the endpoint name on the conference status page, and accessing its configuration page from there.

General settings

Field	Field description	Usage tips
Name	The name of the endpoint or endpoint group.	When you are updating an existing endpoint or endpoint group's configuration, its Type is also shown.
Type	The number of endpoints in the endpoint group is displayed.	The type of endpoint is shown in all cases.
Display name override	The name that will be displayed in a conference as a label for this endpoint or group.	The name you enter here will override any default name configured on the endpoint. It will also override any other default name that might appear for an endpoint. For example, an endpoint's default name can be the name of the gateway through which the call was placed, or if the endpoint is called-in via a gatekeeper, its E.164 number.
Minimum screen layout	When choosing which conference layout to send to a participant the Cisco TelePresence Server takes into account the number of screens used by other participants in the conference.	For more information, see Understanding how participants display in layout views .
Received audio gain	Adjusts the amplification of the incoming audio signal.	A fixed audio gain of between -12 dB and +12 dB (in 3 dB steps) is applied to an endpoint's incoming audio.
Transmitted audio gain	Adjusts the amplification of the outgoing audio signal.	A fixed audio gain of between -12 dB and +12 dB (in 3 dB steps) is applied to an endpoint's outgoing audio.

Field	Field description	Usage tips
Allow stereo audio	Select from the drop-down list to <i><use default></i> , <i>disable</i> or <i>enable</i> to allow stereo audio in calls with compatible endpoints.	Allow stereo audio should be enabled by default. However, some endpoints do not support stereo echo cancellation and in some circumstances this can cause echo. If necessary, disable this option to prevent the use of stereo audio, either for a specific endpoint or by default.
Auto reconnect	Select from the drop-down list to <i>disable</i> or <i>enable</i> auto reconnect.	If Auto reconnect is enabled and you call out to an endpoint and it drops out from the conference because of a network problem the TelePresence Server will automatically try to reconnect. Note that it will not reconnect if the endpoint hangs up the call in a normal way.
Cameras are cross connected	Select this check box for endpoint groups whose outermost camera views cross. This option is only available for endpoint groups.	

Call-out parameters

Field	Field description	Usage tips
Address	The IP address, host name, E.164 address, or URI of the endpoint.	The TelePresence Server uses this information to contact the endpoint when it invites the endpoint to join a conference. For H.323 calls, you can configure this endpoint or endpoint group as needing to be reached via an H.323 gateway. To do this, set this field to be <i><gateway address>!<E.164></i> .
Call protocol	Select either H.323 or SIP from the drop-down list.	Not applicable to TIP endpoints which always use SIP.
Call direct	Select this option to allow the TelePresence Server to call this endpoint directly, via its IP address, instead of using the H.323 gatekeeper or SIP registrar (or trunk).	If the box is unchecked, which is the default setting, the TelePresence Server attempts to call the endpoint via a gatekeeper, registrar or trunk (depending on the server-wide system settings and the protocol the endpoint uses). This option does not apply to legacy TIP endpoints, which must be called via a registrar or trunk.

Field	Field description	Usage tips
Call-out DTMF	Enter a string of DTMF characters if required.	<p>If the endpoint needs a sequence of tones after connection, the TelePresence Server will send the tones matching the string you enter. The TelePresence Server supports the tones for the characters 0–9, A–D, *, , and #.</p> <p>The TelePresence Server ignores invalid characters but continues sending tones for valid characters until it reaches the end of the string.</p> <hr/> <p>Note: On an endpoint group this field displays below Transmitted audio gain.</p>

Call-in match parameters

Field	Field description	Usage tips
Name	The name that the endpoint or endpoint group sends to the TelePresence Server.	<p>These fields are used to identify incoming calls as being from the endpoint or endpoint group.</p>
Address	The IP address of the endpoint or endpoint group.	<p>The endpoint or endpoint group is recognized if any of this information matches the identification sent by the endpoint. The TelePresence Server ignores empty fields when it is trying to match the endpoint.</p>
E.164	<p>For H.323 calls, the E.164 address with which the endpoint or endpoint group is registered with the gatekeeper.</p> <p>For SIP calls, the SIP username with which the endpoint or endpoint group is registered with the SIP registrar.</p>	<p>When you configure Call-in match parameters, an endpoint or endpoint group will be recognized as this pre-configured endpoint or endpoint group and the Initial status parameters will be applied to a call from this endpoint or endpoint group.</p> <hr/> <p>Note: For CTS systems, Cisco recommends using the CTS directory number (DN) in the E.164 field.</p>

Initial status

Field	Field description	Usage tips
Audio from	Whether the initial audio from the endpoint or endpoint group is either <i>Active</i> or <i>Muted</i> .	<p>If set to <i>Muted</i>, when the endpoint or endpoint group joins a conference, it will not be able to contribute audio to the conference. For example, you can mute audio from an endpoint or endpoint group if somebody wants to be seen in the conference, but does not want to contribute verbally. You can mute both audio and video if required. This can be altered during the course of the conference either in the endpoint's or endpoint group's status page, or from the relevant conference's status page.</p>

Field	Field description	Usage tips
Audio to	Whether the initial audio to this endpoint or endpoint group is either <i>Active</i> or <i>Muted</i> .	If set to <i>Muted</i> , when the endpoint or endpoint group joins a conference, the participant using this endpoint or endpoint group will not be able to hear the other participants. This can be altered during the course of the conference either in the endpoint's or endpoint group's status page, or from the relevant conference's status page.
Video from	Whether the initial video from this endpoint or endpoint group is either <i>Active</i> or <i>Muted</i> .	If set to <i>Muted</i> , when the endpoint or endpoint group joins a conference, it will not be able to contribute video to the conference. For example, you can mute video from an endpoint or endpoint group if somebody wants to see the conference, but not be seen themselves. You can mute both audio and video if required. This can be altered during the course of the conference either in the endpoint's or endpoint group's status page, or from the relevant conference's status page.
Video to	Whether the initial video to the endpoint or endpoint group is either <i>Active</i> or <i>Muted</i> .	If set to <i>Muted</i> , when the endpoint or endpoint group joins a conference, the participant using this endpoint or endpoint group will but not see the other participants, but will be seen themselves. This can be altered during the course of the conference either in the endpoint's or endpoint group's status page, or from the relevant conference's status page.

Display parameters

Field	Field description	Usage tips
Full screen view	<p>This option controls the conditions under which this endpoint will be displayed full screen.</p> <p>Select a setting from the drop-down list:</p> <ul style="list-style-type: none"> ■ <i>Allowed</i>: This single-screen endpoint will always be allowed to be shown in full screen panes. ■ <i>Dynamic</i>: This single-screen endpoint will be allowed to be shown in full screen panes if there are no grouped endpoints to show. However, when there are grouped endpoints to show, the endpoint will then be restricted to the smaller continuous presence panes. ■ <i>Disabled</i>: This single-screen endpoint will never be shown in full screen panes. 	This option is only available for single-screen endpoints.
Show borders around endpoints	Select this option to show borders around participants displayed in the conference view on this endpoint or endpoint group.	For more information, see Understanding how participants display in layout views .

Field	Field description	Usage tips
Active speaker display	Select this option to show a red border around the active speaker on this endpoint or endpoint group.	This setting is only available if Show borders around endpoints is selected.
Show endpoint names as panel labels	If you select this option, the Cisco TelePresence Server will label view panes in the conference layout sent to this endpoint or endpoint group with the names of the participants shown in those panes.	
Self view	If this option is not selected, the Cisco TelePresence Server will never show the video stream sent from this endpoint or endpoint group to the participants using this endpoint or endpoint group i.e. they will not see themselves.	For more information, see Understanding how participants display in layout views .
Default layout type for single-screen endpoints	<p>This option controls the default layout single-screen endpoints see when they connect.</p> <p>Select a setting from the drop-down list to be used as the default:</p> <ul style="list-style-type: none"> ▪ <i>Single</i>: Endpoints will be shown in one full screen pane. ▪ <i>ActivePresence</i>: Endpoints will be shown in one full screen pane with additional participants appearing in up to nine equally sized overlaid panes at the bottom of the screen. ▪ <i>Prominent</i>: Endpoints will be shown in one large pane with additional participants appearing in up to four equally sized panes at the bottom of the screen. ▪ <i>Equal</i>: Endpoints will be shown in a grid pattern of equally sized panes on the screen, up to 4x4. 	<p><i>Equal</i> is automatically used if the multi-screen system in the conference does not send the TelePresence Server a loudest panel/screen indication.</p> <p>Participants can change their layout using Far End Camera Control or via DTMF keys 2 and 8.</p> <p>See the endpoint interoperability reference for a list of the multi-screen systems that reveal the loudest panel information.</p>
Default layout type for multi-screen endpoints	<p>This option controls the default layout multi-screen endpoints see when they connect.</p> <p>Select a setting from the drop-down list to be used as the default:</p> <ul style="list-style-type: none"> ▪ <i>Single (Full screen)</i>: Endpoints will be shown in full screen panes. A single participant displays per screen. ▪ <i>ActivePresence</i>: Endpoints will always be shown in full screen panes with additional participants appearing in up to six equally sized overlaid panes at the bottom of each screen (up to four panes for 2 and 4 screen endpoints). 	Participants can change their layout using Far End Camera Control or via DTMF keys 2 and 8.

Content parameters

Field	Field description	Usage tips
Content Video contribution	Whether this endpoint or endpoint group is permitted to contribute content to the conference via content channel.	To use the content channel, the content channel must be enabled for the conference in its configuration page.

Field	Field description	Usage tips
Allow content in main video	Whether the Cisco TelePresence Server should send content channel video to this endpoint in its main video channel if it is not able to receive a separate video channel.	<p>This option is only available for standard single-screen endpoints.</p> <p>This option can be configured to match the Cisco TelePresence Server system settings (Configuration > System settings) or to be specifically <i>Enabled</i> or <i>Disabled</i> just for this endpoint.</p>

Configuring endpoints and groups advanced settings

1. Go to **Endpoints**
2. Click the endpoint or group name
3. Go to **Advanced settings**
4. Configure the advanced settings with reference to the following table
5. Click **Update endpoint**.

Note: These settings override the settings from the **Default endpoint settings** page.

Video settings

Field	Field description	Usage tips
Video format	<p>The format to be transmitted by the TelePresence Server to an endpoint or endpoint group.</p> <p>Select a setting from the drop-down list:</p> <ul style="list-style-type: none"> ■ <i>PAL - 25fps</i>: The TelePresence Server will transmit video at 25 frames per second (or a fraction or multiple of 25, for example: 50 or 12.5fps) ■ <i>NTSC - 30 fps</i>: The TelePresence Server will transmit video at 30 frames per second (or a multiple or fraction of 30, for example: 60 or 15fps) 	<p>NTSC is typically used in North America, while PAL is typically used in the UK and Europe.</p>
Transmitted video resolutions	<p>The setting for transmitted video resolutions from the Cisco TelePresence Server to this endpoint or endpoint group.</p> <p>Select a setting from the drop-down list:</p> <ul style="list-style-type: none"> ■ <i>4:3 resolutions only</i> ■ <i>16:9 resolutions only</i> ■ <i>Allow all resolutions</i> 	<p>Endpoints advertise the resolutions that they are able to display. The TelePresence Server then chooses the resolution that it will use to transmit video from those advertised resolutions. However, some endpoints do not display widescreen resolutions optimally. Therefore, you might want to use this setting to restrict the resolutions available to the TelePresence Server for transmissions to this endpoint or endpoint group.</p> <p>(4:3 and 16:9 are the preferred options—avoid using <i>Allow all resolutions</i> if possible.)</p>

Field	Field description	Usage tips
Motion / sharpness trade off	<p>This setting controls the preference for which resolutions the TelePresence Server will transmit to the endpoint for motion (frames per second) and sharpness (frame size or resolution). The setting controls how the TelePresence Server will determine its preference of the settings to be used.</p> <p>Select a setting from the drop-down list to be used:</p> <ul style="list-style-type: none"> ■ <i>Favor motion</i>: the TelePresence Server will try and use a high frame rate. That is, the TelePresence Server will strongly favor a resolution of at least 25 frames per second ■ <i>Balanced</i>: the TelePresence Server will select settings that balance resolution and frame rate (where the frame rate will not be less than 12 frames per second) ■ <i>Favor sharpness</i>: the TelePresence Server will use the highest resolution that is appropriate for what is being viewed 	

Network settings

Field	Field description	Usage tips
Default bandwidth (both to and from the endpoint)	<p>The maximum network capacity used by the media channels established by the TelePresence Server to and from this endpoint or endpoint group.</p>	<p>When the TelePresence Server makes a call to an endpoint, it chooses the maximum bandwidth that is allowed to be used for the media channels which comprise that call. This field sets that maximum bandwidth, and is the total bandwidth of the audio, video, and content channels combined.</p> <p>The bandwidth available may also be limited by the configuration of the endpoint or other devices through which the call passes.</p> <p>This setting overwrites (for this endpoint) the Default bandwidth (both to and from the server) setting made for all endpoints on the Configuration > Default endpoint settings page.</p>

Field	Field description	Usage tips
Maximum transmitted video packet size	Sets the maximum payload size (in bytes) of the packets sent by the TelePresence Server for outgoing video streams (from the TelePresence Server to connected video endpoints).	<p>Video streams generally contain packets of different lengths. This parameter only sets the <i>maximum</i> size of a transmitted network datagram. The TelePresence Server optimally splits the video stream into packets of this size or smaller. Thus, most transmitted packets will not reach this maximum size.</p> <p>Increasing this value can cause fragmentation of packets which impairs performance and can cause packet loss.</p> <p>Decreasing this value too much can also impair performance.</p> <hr/> <p>Note: You should only modify this setting if there is a known packet size restriction in the path between the TelePresence Server and potential connected endpoints.</p>

Optimization settings

Field	Field description	Usage tips
<use default>	Check this box to override any settings in the next three fields and uses the equivalent default conference settings.	The default conference settings are on the Configuration > Default endpoint settings page.
Received video: flow control on video errors	<p>Allows the TelePresence Server to request that the endpoint or endpoint group send lower speed video if it fails to receive all the packets which comprise the far end's video stream.</p> <p>Note that flow control is only supported for some endpoints.</p>	<p>The TelePresence Server can send these messages to endpoints requesting that the bandwidth of the video that they are sending be decreased based on the quality of video received by the TelePresence Server.</p> <p>If there is a bandwidth limitation in the path between the endpoint/endpoint group and the TelePresence Server, it is better for the TelePresence Server to receive every packet of a lower rate stream than to miss some packets of a higher rate stream.</p>
Received video: flow control based on viewed size	<p>Allows the TelePresence Server to request that the endpoint or endpoint group send lower speed video if the use of the video from that endpoint does not require as high a speed as the channel allows.</p> <p>Note that flow control is only supported for some endpoints.</p>	Typically the TelePresence Server would send a flow control message because of this setting if the video from that endpoint was either not being seen at all by other conference participants or if it was being shown only in small layout panes.

Field	Field description	Usage tips
Video transmit size optimization	<p>Selecting this check box allows the TelePresence Server to vary the resolution, or resolution and codec, of the video being sent to a remote endpoint within the video channel established to that endpoint.</p> <p>Select a setting from the drop-down list:</p> <ul style="list-style-type: none"> ■ <i>None</i>: Do not allow video size to be changed during transmission ■ <i>Dynamic resolution only</i>: Allow video size to be optimized during transmission ■ <i>Dynamic codec and resolution</i>: Allow video size to be optimized during transmission and/or dynamic codec selection 	<p>With this option enabled, the TelePresence Server can, for instance, decide to send CIF video within a 4CIF channel if this will increase the viewed video quality.</p> <p>The circumstances under which decreasing the video resolution can improve the video quality include:</p> <ul style="list-style-type: none"> ■ if the original size of the viewed video is smaller than the outgoing channel ■ if the remote endpoint has used flow control commands to reduce the bandwidth of the TelePresence Server video transmission <p>Typically, lowering the resolution means that the TelePresence Server can transmit video at a higher frame-rate.</p>

Audio settings

Field	Field description	Usage tips
Screen receiving / transmitting audio	<p>Select from the drop-down list the address of the endpoint to which the audio channel will be sent when this endpoint group is in a conference. Within this endpoint group, only the endpoint specified in this field can contribute audio to a conference.</p> <p>This option is only available for endpoint groups.</p>	

Content settings

Field	Field description	Usage tips
Screen receiving / transmitting content	<p>Select from the drop-down list the address of the endpoint to which content channel video will be sent when this endpoint group is in a conference with an active content channel. Within this group, only the endpoint specified in this field can contribute content to a conference.</p> <p>This option is only available for endpoint groups.</p>	<p>For more information about the content channel, see Content channel video support.</p>

Users

Displaying the user list..... 89
Adding and updating users..... 90

Displaying the user list

The **Users** page provides an overview of all the user accounts that exist on the TelePresence Server.

User list details

Field	Field description
User ID	The user name needed to access the web interface of the TelePresence Server. You can enter text in whichever character set you require, however, note that some browsers and FTP clients do not support Unicode characters.
Name	The name of the user (optional, so may not be present).
Privilege	The access privileges associated with this user. Either <i>administrator</i> or <i>none</i> .
User attributes	Displays the access privilege level granted to this user: blank (full access) or <i>API access</i> . This field is always blank for <i>administrator</i> users, who also always have full access to the API, irrespective of the API setting. If you grant <i>API access</i> to a non-administrator account, that account can <i>only</i> access the API. This allows you to authorize applications that work with the TelePresence Server. You can create a user that has neither API access nor administrator privileges, but such a user can not log in and can not use the API.

Deleting users

Select the users and then click **Delete selected users**. You cannot delete the *admin* user.

Adding and updating users

You can add, edit and delete user accounts on the TelePresence Server by accessing the list of users (go to [Users](#).)

Most of the information that you use when adding or editing user accounts is identical; any differences are explained in the following reference table.

Adding a user

1. Go to [Users](#).
2. Click **Add new user**.
3. Supply the user account details, referring to the following table if necessary.
4. Click **Add user**.

Updating a user

1. Go to [Users](#).
2. Click a User ID.
3. Modify the user account details, referring to the following table if necessary.
4. Click **Modify user**.
5. If you need to change the password, click **Change password**.

User details reference

User details

Field	Field description	More information
User ID	Identifies the log-in name or ID number of the user. This value is the username required to access the TelePresence Server.	Although you can enter text in whichever character set you require, note that some browsers and FTP clients do not support Unicode characters.
Name	The name of the user.	Optional.
Password	The required password, if any.	Although you can enter text in whichever character set you require, note that some browsers and FTP clients do not support Unicode characters. Note that this field is only active when adding a new user. If you are updating an existing user and want to change that user's password, click Change password instead.
Administrator	Select this check box to make this user an Administrator.	Administrators have complete control of the TelePresence Server — they can change any aspect of the TelePresence Server's configuration, and can schedule and modify conferences.
API access	Select this check box to allow this user account to be used by applications that communicate with the TelePresence Server via API commands.	

Logs

Working with the event logs.....	93
Event capture filter.....	94
Event display filter.....	95
Logging H.323 or SIP messages.....	96
Logging using syslog.....	97
Working with Call Detail Records.....	99
Feedback receivers.....	101

Working with the event logs

If you are experiencing complex issues that require advanced troubleshooting, you may need to collect information from the TelePresence Server logs. Typically, you will be working with customer support who can help you obtain these logs.

Event log

The TelePresence Server stores the 2000 most recently captured messages generated by its sub-systems. It displays these on the **Event log** page (**Logs > Event log**). In general these messages are provided for information, and occasionally *Warnings* or *Errors* may be shown in the Event log.

Customer support can interpret logged messages and their significance for you if you are experiencing a specific problem with the operation or performance of your TelePresence Server.

You can:

- Click the column headers to sort the events.
- Click the page numbers to jump through the displayed log in steps of 100 events.
- Download the log as text: go to **Logs > Event log** and click **Download as text**.
- Change the parameters of the display to limit the information to your area of interest (**Logs > Event display filter**).
- Change the level of detail collected in the traces by editing the **Event capture filter** page.

Note: Only modify the event capture filter if instructed to do so by customer support. Modifying these settings can impair the performance of your TelePresence Server.

- Send the event log to one or more syslog servers on the network for storage or analysis. The servers are defined in the **Syslog** page.
- Empty the log by clicking **Clear log**.

Event capture filter

The event capture filter defines which events the TelePresence Server will keep in the log. By default this filter is configured to capture *Errors, warnings and information* from all the TelePresence Server sub-systems.

Note: Only modify this filter if doing so with advice from Customer Support.

For example, when troubleshooting a TelePresence Server issue, a support representative may ask you to capture detailed trace for the video sub-system:

1. Go to **Logs > Event capture filter**.
2. Select *Detailed trace* from the **VIDEO** drop-down list.
The TelePresence Server warns you that performance may be affected.
3. Click **OK** (this is a temporary elevation in detail that you can reverse after your issue is resolved).
4. Click **Update settings**.
The TelePresence Server will capture detailed trace information from the video sub-system, as well as the default information for all other sub-systems.

Event display filter

You can use the event display filter to view a subset of the event log or highlight particular entries. This filter works on stored entries, it does not affect [which events are captured](#).

To modify the event display filter, go to [Logs > Event display filter](#).

Text filtering

1. Enter a **Filter string** to display only the stored events that contain that string.
2. Enter a **Highlight string** if you want to easily see the string within the filtered results.
3. Click **Update display**.
The TelePresence Server displays the filtered and highlighted event log.

Display levels

There are many sub-systems of the TelePresence Server which can all log events. You can modify the level of detail you want to see for each sub-system or for all sub-systems.

For example, if you were only interested in SIP errors:

1. Scroll to the bottom of the page where you can see the **Set all to:** button and the dropdown next to it.
2. Select *None* on the dropdown.
3. Click **Set all to:**.
The display level changes to *None* for all sub-systems.
4. Select *Errors only* from the dropdown next to the SIP sub-system.
5. Click **Update settings**.
The TelePresence Server displays only SIP errors.

Logging H.323 or SIP messages

The **H.323/SIP log** page records every H.323 and SIP message received by or transmitted from the TelePresence Server.

The H.323/SIP log is disabled by default because the volume of messages affects performance, but Customer Support may ask you to enable it to assist in troubleshooting.

Click **Enable H323/SIP logging** to start recording these protocol messages. You can also **Download as XML** for further processing or to send to support.

When you are satisfied that the issue is resolved, you should **Disable H323/SIP logging** and then **Clear log** to avoid impacting the performance of the unit in future.

Logging using syslog

You can send the [Event log](#) to one or more syslog servers on the network for storage or analysis.

To configure the syslog facility, go to [Logs > Syslog](#).

Syslog settings

Refer to this table for assistance when configuring Syslog settings:

Syslog settings

Field	Field description	Usage tips
Host address 1 to 4	Enter the IP addresses of up to four Syslog receiver hosts.	The number of packets sent to each configured host will be displayed next to its IP address.
Facility value	<p>A configurable value for the purposes of identifying events from the Cisco TelePresence Server on the Syslog host. Choose from the following options:</p> <ul style="list-style-type: none"> ■ 0 - kernel messages ■ 1 - user-level messages ■ 2 - mail system ■ 3 - system daemons ■ 4 - security/authorization messages (see Note 1) ■ 5 - messages generated internally by syslogd ■ 6 - line printer subsystem ■ 7 - network news subsystem ■ 8 - UUCP subsystem ■ 9 - clock daemon (see Note 2) ■ 10 - security/authorization messages (see Note 1) ■ 11 - FTP daemon ■ 12 - NTP subsystem ■ 13 - log audit (see Note 1) ■ 14 - log alert (see Note 1) ■ 15 - clock daemon (see Note 2) ■ 16 - local use 0 (local0) ■ 17 - local use 1 (local1) ■ 18 - local use 2 (local2) ■ 19 - local use 3 (local3) ■ 20 - local use 4 (local4) ■ 21 - local use 5 (local5) ■ 22 - local use 6 (local6) ■ 23 - local use 7 (local7) 	<p>Choose a value that you will remember as being the Cisco TelePresence Server.</p> <hr/> <p>Note 1: Various operating system daemons and processes utilize Facilities 4, 10, 13 and 14 for security/authorization, audit and alert messages which seem to be similar.</p> <p>Note 2: Various operating systems utilize both Facilities 9 and 15 for clock (cron/at) messages.</p> <hr/> <p>Processes and daemons that have not been explicitly assigned a Facility value may use any of the "local use" facilities (16 to 21) or they may use the "user-level" facility (1) - and Cisco recommend that you select one of these values.</p>

Using syslog

The events that are forwarded to the syslog receiver hosts are controlled by the event log capture filter.

To define a syslog server, enter its IP address and then click **Update syslog settings**. The number of packets sent to each configured host is displayed next to its IP address.

Note: Each event will have a severity indicator as follows:

- 0 - Emergency: system is unusable (unused by the Cisco TelePresence Server)
 - 1 - Alert: action must be taken immediately (unused by the Cisco TelePresence Server)
 - 2 - Critical: critical conditions (unused by the Cisco TelePresence Server)
 - 3 - Error: error conditions (used by Cisco TelePresence Server *error* events)
 - 4 - Warning: warning conditions (used by Cisco TelePresence Server *warning* events)
 - 5 - Notice: normal but significant condition (used by Cisco TelePresence Server *info* events)
 - 6 - Informational: informational messages (used by Cisco TelePresence Server *trace* events)
 - 7 - Debug: debug-level messages (used by Cisco TelePresence Server *detailed trace* events)
-

Working with Call Detail Records

The TelePresence Server can display up to 2000 Call Detail Records. However, the TelePresence Server is not intended to provide long-term storage of Call Detail Records. If you wish to retain CDR logs, you must download them and store them elsewhere.

When the CDR log is full, the oldest logs are overwritten.

To view and control the CDR log, go to [Logs > CDR log](#). Refer to the tables below for details of the options available and a description of the information displayed.

- [Call Detail Record log controls](#)
- [Call Detail Record log](#)

Call Detail Record log controls

The CDR log can contain a lot of information. The controls in this section help you to select the information for display that you find most useful. When you have finished making changes, click **Update display** to make those changes take effect. Refer to the table below for a description of the options:

CDR log controls

Field	Field description	Usage tips
Messages logged	The current number of CDRs in the log.	
Filter records	The list of CDR record types that the TelePresence Server logs.	Leave the boxes blank to display all records, or check the boxes of the record types you are interested in.
Filter string	Use this field to limit the scope of the displayed Call Detail Records. The filter string is not case-sensitive.	The filter string applies to the Message field in the log display. If a particular record has expanded details, the filter string will apply to these as well.
Expand details	By default, the CDR log shows only brief details of each event. When available, select from the options listed to display more details.	Selecting <i>All</i> will show the greatest amount of detail for all messages, regardless of which other options are selected.

Call Detail Record log

The Call Detail Record log displays as a long table which may span multiple pages and includes up to 2000 rows. In addition to the filtering described above, you can navigate the log in the following ways:

- To sort ascending or descending by any of the columns, click the column header.
- To filter the log for all records related to a particular conference or participant GUID, click the GUID (click **Show all** to reverse this filter).
- To jump to a particular page in the displayed list of records, click the page number.

Click **Download as XML** to process the log in your text editor, or archive it for future reference. This button *downloads all the records* currently stored; it ignores any display filters you have set on the web page.

Note: Avoid downloading CDR logs when the unit is under heavy load; performance may be impaired.

Click **Clear all records** to empty the log memory.

Caution: Clear all records *permanently removes all records* from the TelePresence Server. You cannot retrieve cleared records.

CDR log reference

The following table describes the fields in the CDR log:

CDR log details

Field	Field description	Usage tips
# (record number)	The unique index number for this Call Detail Record.	
Time	The time at which the Call Detail Record was created.	<p>Records are created as different conference events occur. The time the record was created is the time that the event occurred.</p> <p>Incoming CDR log events are stored with the local time stamp (not UTC).</p> <p>Changing the time (either by changing the system time or via an NTP update) causes new events in the CDR log to show the new time. No change will be made to the timestamp of existing records.</p>
Conference	The GUID of the conference to which this record applies.	<p>Each new conference is created with a globally unique identifier (GUID). All records relating to a particular conference display this identifier, which can make auditing conference events much simpler.</p> <p>Click the GUID to see only those records that relate to this conference.</p>
Participant	The GUID of the participant to which this record applies.	<p>Each participant is represented by a globally unique identifier (GUID), which can simplify your record management.</p> <p>Click the GUID to see only those records that pertain to this participant.</p>
Message	The type of the Call Detail Record, and brief details, if available.	<p>Click >> to expand the details of all messages of this type.</p> <p>You can do this for all messages by selecting <i>All</i> and clicking Update display, which can be useful in combination with the Filter string to find records where the message contains a particular word.</p>

Feedback receivers

The TelePresence Server publishes feedback events so that any receivers listening to it can take action when something changes. To see the list of feedback receivers, click [Logs > Feedback receivers](#).

You can clear all configured feedback receivers by clicking **Delete all**. You cannot undo this action.

Each receiver in the list has the following details:

Feedback receiver details

Field	Field description	Usage tips
Index	The position of the receiver in the list of receivers.	
Receiver URI	The fully qualified URI of the receiver.	The receiver may be a software application, for example Cisco TelePresence Management Suite, that can respond to the feedback events with an appropriate API call to retrieve the list of changes from the feedback source.

Reference

Content channel support	103
Understanding how participants display in layout views.....	105
Port allocations.....	111
Endpoint types.....	112
Endpoint interoperability.....	113
Understanding clustering.....	114
Understanding screen licenses.....	116
Getting help.....	117
License information.....	118

Content channel support

Most telepresence endpoints support the use of a second video channel known as the content channel. Typically this is used for presentations running alongside live video.

- H.323 systems use a protocol called H.239 to receive and send the content channel video.
- SIP systems use a protocol called BFCP for content.
- Cisco CTS systems and other TIP systems use TIP to control content sharing.

Although the content channel is enabled system-wide by default, the TelePresence Server caters for endpoints that do not support the second video channel. Go to [Configuration > Default endpoint settings](#) and under **Content** select **Allow content in main video**. With this feature selected, the TelePresence Server sends the content in the main video channel to those endpoints. The content channel is composed with the normal video while the content channel is active (content is displayed in largest pane and other participants' video streams are centered continuous presence panes across the bottom of the display).

Content sharing is enabled by default. To edit this setting for a conference, go to [Conferences > conference name > Configuration](#) and find the **Content channel** setting.

In each conference, only one participant can send a content channel video stream at a time. To enable another participant to become the presenter, either the active presenter must stop sending content or the TelePresence Server must allow participants to take over the content channel.

Content channel configuration settings

When you add a new conference or configure an existing conference, you can choose whether the content channel is allowed in that conference with the **Content channel** setting.

The **Content channel** is *Enabled* for conferences by default, which means that participants are able to contribute content channel video for the other conference participants to see.

If the conference's **Content channel** is *Disabled*, content sharing is not allowed and no participants can contribute content.

For a participant to contribute a content channel requires the following:

- That participant's endpoint must be configured to allow content channel video contribution:
 1. Go to [Endpoints](#) and then click the participant's endpoint.
 2. Click **[Configuration]**
 3. Under **Content** check **Content video contribution**.
- Either the participant must be the only active presenter or the TelePresence Server must allow automatic content handover:
 1. Go to [Configuration > System settings](#).
 2. Check **Automatic content handover**.

For a participant to see the shared content on a single-screen endpoint, the endpoint must support content sharing, or have **Allow content in main video** enabled.

The TelePresence Server sends the content channel to one endpoint in an endpoint group; that endpoint must support the content channel:

To choose which endpoint in the group receives the content channel video:

1. Go to **Endpoints** and click the endpoint group name.
2. Click **[Advanced settings]**.
3. Select the endpoint number from the drop-down labeled **Screen receiving/transmitting content**.
4. Click **Update endpoint**.

Understanding how participants display in layout views

On this page:

- [Conference layouts](#)
 - [Layouts sent to single-screen systems](#)
 - [Layouts sent to two-screen systems](#)
 - [Layouts sent to three-screen systems](#)
 - [Layout sent to four-screen systems](#)
- [OneTable mode](#)
- [Configuration options that affect view layouts](#)
 - [Self view setting](#)
 - [Show full screen in conference setting](#)
 - [Minimum screen layout setting](#)
 - [Allow content in main video](#)
 - [Show borders around endpoints setting](#)
- [Marking a participant as "important"](#)
- [Muted participants](#)

Conference layouts

The layout chosen by the TelePresence Server for a system depends on the number of screens that the system has and the characteristics of the other conference participants. Single-screen endpoints can also choose a layout with far end camera control or can be preconfigured to one of the choices below. The TelePresence Server is capable of working with one-, two-, three- and four-screen regular and immersive endpoints, and displaying any combination of those systems participating in a conference to any other type of system in the conference.

In general, the behavior of the TelePresence Server is to display the "loudest" participants in the most prominent layout panes. If there are more contributors than there are panes available, then the "quietest" participants are not shown.

Layouts sent to single-screen systems

The default layout can be configured either boxwide or per participant. This default setting can be overridden by a participant changing the layout selection using far end camera control or via DTMF keys 2 and 8.

In ActivePresence layout, the loudest participant appears full screen with additional participants appearing in up to nine equally sized overlaid panes at the bottom of the screen.

The ActivePresence layout is possible when the other participants in the conference are all single-screen endpoints, or a mixture of single-screen endpoints and multiple-screen systems that reveal which camera has the loudest audio input (the Cisco TelePresence TX9000 for example).

Only the Equal layout can be sent if there are any multi-screen systems not supporting loudest participant information. The ActivePresence, Single and Prominent layouts all rely on that information.

The TelePresence Server composes the layout for single-screen endpoints according to the setting of the **Default layout type for single-screen endpoints**:

Layouts sent to single-screen endpoints



Single: Endpoints will be shown in one full screen pane.



ActivePresence: Endpoints will be shown in one full screen pane with additional participants appearing in up to nine equally sized overlaid panes at the bottom of the screen.



Prominent: Endpoints will be shown in one large pane with additional participants appearing in up to four equally sized panes at the bottom of the screen.



Equal: Endpoints will be shown in a grid pattern of equally sized panes on the screen, up to 4x4. Each row of panes can either show screens of a remote multi-screen system or a combination of remote systems with fewer screens.

Layouts sent to two-screen systems

Layouts sent to two-screen systems



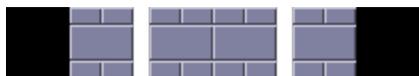
If there are any three- or four-screen TelePresence systems in a conference, the TelePresence Server sends this layout to two-screen systems in that conference. Each row of four panes can either show the four screens of a remote four-screen system or a combination of systems with fewer screens.



If there are only one- and two-screen systems in the conference, the TelePresence Server uses this layout (if all of the video streams to show fit into the available panes). The overlaid panes (maximum of four) are automatically centered if possible.

Layouts sent to three-screen systems

Layouts sent to three-screen systems



If there are any four-screen TelePresence systems in a conference, the TelePresence Server sends this layout to three-screen systems in that conference.

The central row of four large panes can either show the four screens of a remote four-screen system or a combination of one-, two- and three-screen conference participants. In order for this row to be correctly centered, the TelePresence Server shows the panes in the center of the three screens and does not use the left side of the leftmost screen or the right side of the rightmost screen.



If there are no four-screen TelePresence systems in a conference, the TelePresence Server uses this layout for three-screen systems in that conference.

The TelePresence Server uses this layout if all of the participants to be shown will fit within the available continuous presence panes. The overlaid panes are automatically centered if possible.



If there are no four-screen TelePresence systems in a conference, the TelePresence Server uses this layout for three-screen systems in that conference.

The TelePresence Server uses this layout if it needs more small continuous presence panes to show participants.

The TelePresence Server automatically switches between this layout and the previous one as participants leave and join the conference.

Layout sent to four-screen systems

The TelePresence Server sends this layout to four-screen systems in a conference:



Each row of four panes (the row consisting of the four full-screen panes or one of the rows of four small overlaid panes) can either show a four-screen system or a combination of remote systems with fewer screens. The overlaid panes are automatically centered if possible.

OneTable mode

A TelePresence Server in OneTable mode contributes three different video streams of the participants in the call, and therefore the TelePresence Server no longer displays the three streams received from these systems side by side in three adjacent panes.

To enable OneTable mode, go to the configuration page of the conference and set **Use OneTable mode when appropriate** to *4 person mode*.

4 person mode: The TelePresence Server composes the participant video streams as if there were four people sitting next to each other on one side of a table, irrespective of their physical location.

The conference must have at least three participants present that support the OneTable feature.

The conference layout sent to connected systems varies based on how many screens those systems have as follows:

OneTable mode layouts

	Layout sent to single-screen systems. The overlaid panes are automatically centered if possible.
	Layout sent to two-screen systems.
	Layout sent to three-screen systems. The overlaid panes are automatically centered if possible.
	Layout sent to four-screen systems. The overlaid panes are automatically centered if possible.

Endpoint configuration options that affect view layouts

Self view setting

The **Self view** setting for an endpoint determines whether the TelePresence Server ever displays its own video stream on that endpoint; that is, whether a participant may see himself/herself. If this setting is not selected, the endpoint will never display its own video stream.

If you do allow an endpoint to display its own video then the TelePresence Server always places the self view last when placing participants in the available view panes, even if the participant is one of the loudest in the call (i.e. even if he or she is shown prominently to the other conference participants).

Show full screen view of single-screen endpoints

When placing participants within layout panes, the TelePresence Server places the "loudest" people first, in the most prominent panes, and the quietest people in the smaller panes. However, in conferences with a mixture of TelePresence systems (which typically use large, high resolution, displays) and systems capable of much lower quality video (for example, video-capable cellphones) it is not always desirable for the lower-resolution participants to be shown in the large full screen panes.

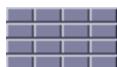
For single screen systems, the **Show full screen view of single-screen endpoints** setting determines whether an endpoint is ever allowed to be shown in a large full-screen pane.

If this option is not selected, the endpoint will never be shown full screen to other conference participants, even if it is one of the loudest speakers in the conference. If this option is selected, the endpoint will be shown full screen when it is one of the active speakers in the conference.

This setting is not displayed for multi-screen endpoints and endpoint groups.

Minimum screen layout setting

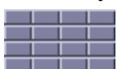
As described above, when choosing which conference layout to send to a participant the TelePresence Server takes into account the number of screens used by other participants in the conference. For example, the following layout is sent to single screen systems if there are any four screen systems in the conference:



The **Minimum screen layout** allows you to influence the layout used either because of personal preference or to avoid dynamic changes during the conference (for example, if you know that a four-screen endpoint will join the conference at some point, then using the *4 screens wide* setting tells the TelePresence Server to choose layouts based on its presence even before it has connected).

The default setting — *Auto detect* — causes the TelePresence Server to apply the choices described above based on the actual number of screens in use by the conference participants.

However, a setting of *3 screens wide* or *4 screens wide* causes the TelePresence Server to apply the layout choices described above based on the actual number of screens used by the conference participants **and** the virtual presence of a three- or four-screen endpoint. For example, *4 screens wide* would provide the following layout to all single screen endpoints in the conference even if all of the current participants are using single screen systems.



Equally, if you select a setting of *3 screens wide* and a four-screen endpoint joins the conference, the view will change to the one above.

Allow content in main video

This feature allows the TelePresence Server to send a conference's content in the main video channel of endpoints that do not support the extra channel and would otherwise be unable to see the content.



The content channel stream is given the largest pane of this composed layout, which is shown in the main video channel. The continuous presence panes of up to four other participants are composed across the bottom of the layout below the content stream. The continuous presence panes are centered.

Show borders around endpoints setting

If **Show borders around endpoints** is enabled, the TelePresence Server draws borders around participants that are displayed in small panes; it does not draw borders around participants being shown in full-screen panes.

The TelePresence Server draws a red border around the active speaker in the conference, and a white border around other participants. There may not always be an active speaker to highlight in a conference, for example if everyone is muted or no-one is talking.

Enabling this setting for an endpoint means that the video layout sent to that endpoint will use borders; it does not mean that this participant will always be shown within a border to other participants – those other participants' views will use their own **Show borders around endpoints** setting.

Marking a participant as "important"

For each conference, one active participant can be set as "important". This means that the TelePresence Server considers this participant first when deciding which contributors to show in which layout panes, rather than their position in the list being set by how loudly they are speaking. See the endpoint control settings in [Displaying conference status](#).

Muted participants

Audio mute

Participants who have had their audio muted from the web interface do not contribute audio to the conference. Additionally, muted participants are considered after participants who are not muted when the TelePresence Server places participants in view layout panes.

Note that other participants will not have an indication that a participant has been muted. They simply will no longer hear that participant speaking.

Video mute

Participants who have had their video muted from the web interface do not contribute video to the conference. They will continue to contribute audio as normal, unless it is muted separately.

Port allocations

Each TelePresence Server unit has a limited number of video ports, audio-only ports and content ports. The following tables detail how these ports are allocated for the different definition modes supported by the software.

Note that each video port is allocated a corresponding content port regardless of whether content is used.

Port allocations by hardware type in HD Mode

Hardware arrangement	Video ports	Content ports	Audio-only ports
7010	24	24	10
8710	24	24	10
Cluster of 2 8710s	48	48	20
Cluster of 3 8710s	72	72	30
Cluster of 4 8710s	96	96	8

Port allocations by hardware type in Full HD Mode

Hardware arrangement	Video ports	Content ports	Audio-only ports
7010	12	12	10
8710	12	12	10
Cluster of 2 8710s	24	24	20
Cluster of 3 8710s	36	36	30
Cluster of 4 8710s	48	48	40

Related topics

- [Understanding clustering](#)
- [Understanding screen licenses](#)

Endpoint types

Endpoint types

Endpoint type (shown in UI)	Hardware names / model numbers
Standard	<p>Standard video endpoints, for example:</p> <ul style="list-style-type: none"> ■ Cisco TelePresence Movi (software endpoint) ■ Microsoft OCS (software endpoint) ■ Cisco TelePresence System MXP Series (1700 MXP, 1000 MXP) <p>Also displays if the endpoint type is unknown to the TelePresence Server</p>
TANDBERG T1 or TANDBERG single screen TelePresence	Cisco TelePresence System T1 (formerly TANDBERG Telepresence T1)
TANDBERG T3 or TANDBERG three screen TelePresence	Cisco TelePresence System T3 (formerly TANDBERG Telepresence T3)
Group of N endpoints	A group of endpoints. The list does not contain the individual group members
TIP endpoint	An unknown type of Cisco CTS system, running legacy software (CTS 1.6 / 1.7 up to 1.7.3)
TIP endpoint	<p>A Cisco CTS single screen system, running legacy software (CTS 1.6 / 1.7 up to 1.7.3) for example:</p> <ul style="list-style-type: none"> ■ CTS 500 ■ CTS 1000 ■ CTS 1100
TIP endpoint	<p>A Cisco CTS three screen system, running legacy software (CTS 1.6 / 1.7 up to 1.7.3) for example:</p> <ul style="list-style-type: none"> ■ Cisco TelePresence System 3000 series (CTS 30x0) ■ Cisco TelePresence System 3200 series (CTS 32x0)
SIP telepresence	An unknown type of Cisco CTS or other TIP-capable system running CTS 1.7.4 or later
SIP single screen telepresence	<p>A Cisco CTS or other TIP-capable single screen system running CTS 1.7.4 or later, for example:</p> <ul style="list-style-type: none"> ■ CTS 500 ■ CTS 1000 ■ CTS 1100
SIP three screen telepresence	<p>A Cisco CTS or other TIP-capable three screen system running CTS 1.7.4 or later, for example:</p> <ul style="list-style-type: none"> ■ Cisco TelePresence System 3000 series (CTS 30x0) ■ Cisco TelePresence System 3200 series (CTS 32x0)

Endpoint interoperability

Endpoint feature support

Feature	Endpoints that support this	Notes
Reveal loudest participant for panel switched layout	T3, CTS 3200, CTS 3000, TX9000, TX9200	CTS 1300 and endpoint groups do not reveal the loudest participant.
Add legacy TIP endpoint	<ul style="list-style-type: none"> ■ CTS 500 ■ CTS 1000 ■ CTS 1100 ■ CTS 1300 ■ CTS 3000 ■ CTS 3010 ■ CTS 3200 ■ CTS 3210 	<p>You must add these endpoints using Add legacy TIP endpoint if they are running versions 1.6.x or 1.7.x (up to and including 1.7.3) of the CTS software.</p> <p>You may be able to add these endpoints using Add new endpoint if they are running CTS software versions 1.7.4 or higher.</p>
Conference ending notification	<ul style="list-style-type: none"> ■ CTS 500 ■ CTS 1000 ■ CTS 1100 ■ CTS 1300 ■ CTS 3000 ■ CTS 3010 ■ CTS 3200 ■ CTS 3210 ■ TX9000 ■ TX9200 	These endpoints generate their own conference ending warning when they receive notification from the TelePresence Server. They show an icon instead of an overlaid message as seen by other types of endpoints.
OneTable mode	T3	If several participants in the conference are using these endpoints, and if OneTable mode is enabled, then the TelePresence Server will use the OneTable layout mode.

Understanding clustering

A cluster is a group of blades, hosted on the same Cisco TelePresence MSE 8000 chassis, that are linked together to behave as a single unit. You can configure and manage clusters using the Cisco TelePresence Supervisor MSE 8050.

A cluster provides the combined screen count of all the blades in the cluster. This larger screen count provides you with the flexibility to set up conferences with more participants or several smaller conferences. For more information about screen licenses, see [Understanding screen licenses](#).

Overview of a Cisco TelePresence Server MSE 8710 cluster

Cisco TelePresence Server MSE 8710 blades running software version 2 or later support clustering. Currently you can cluster up to four blades, with one blade being the master and the others being slaves.

Clustering provides you with the combined video port count of the blades in the cluster. For example, on a cluster of four blades, each with 12 screen licenses, the cluster has 48 video ports. The master can allocate them as necessary, for example, all in one large conference, or distributed across several smaller conferences. See [port allocations](#) for more information.

Master blades

The screen licenses allocated to all the blades in a cluster are "inherited" by the master blade; all ports in the cluster are controlled by the master. Therefore, after you have configured a cluster, you must control functionality through the master using either its web interface or through its API. All calls to the cluster are made through the master.

Slave blades

Slave blades do not display the full blade web interface. Only certain settings are available, such as network configuration, logging and upgrading. Similarly, a slave blade will only respond to a subset of API calls. For more information, refer to the relevant API documentation.

Upgrading clustered blades

If you need to upgrade the blades in a cluster, first upload the new software images to each blade in the cluster and then restart the master. The slaves will automatically restart and the upgrade will be completed.

General points

Some points to note about clustering:

- If you want to cluster a blade, the blade must have the cluster support feature key.
- The Supervisor must be running software version 2.1 or above to configure clustering.
- You may only cluster identical blades; they must be of the same type and must be running the same version of their software.
- You can have more than one cluster in a chassis and the chassis can host different types of clusters.

- Blades that do not support clustering can be installed into an MSE 8000 chassis alongside a cluster.
- You must assign the cluster roles (master/slave) to the slots in the chassis; if a blade fails, you can replace it and the cluster configuration will persist; however, the active calls and conferences are affected as follows:
 - If you restart or remove the master, the slaves will also restart: all calls and conferences end.
 - If a slave blade fails, the clustering configuration on the Supervisor and the blade may disagree. In this case, the Supervisor pushes the clustering configuration to the blade. The clustering configuration only includes clustering information; it does not configure network settings or anything else on the blade. If the Supervisor has pushed a configuration change to a blade, the Supervisor will prompt you to restart the blade.
 - If the Supervisor restarts or is removed, the cluster continues to function, conferences continue, and the cluster does not restart when the Supervisor reappears.
- Always keep a recent backup of the Supervisor.
- You cannot upload / delete the enhanced font file on a slave blade; it is only required by the master.

Understanding screen licenses

Each TelePresence Server can have a maximum of 12 screen licenses, and each screen license effectively activates one video port in Full HD mode or two video ports in HD mode. For example, with 12 screen licenses you can have 24 video participants in HD mode, or 12 video participants in Full HD mode. See [port allocations](#) for more details.

If you have fewer screen licenses than the number of video ports provided, then not all of those video ports will be available for use by calls between the TelePresence Server and video conferencing endpoints. When all screen licenses are in use, the TelePresence Server will use audio-only ports for additional calls, and so those new calls will not be able to contribute or see video.

With multiple TelePresence Server devices clustered together, activated screen licenses are effectively pooled and allocated to the master blade in the cluster so that the number of available screen licenses is the sum of available screen licenses in the cluster.

You must have a screen license key, provided by your supplier, to activate screen licenses.

- For TelePresence Server 8710 blades housed in a Cisco TelePresence MSE 8000 chassis, you configure the screen license key on the Supervisor blade and then allocate licenses to the individual TelePresence Server 8710 blades.
- For TelePresence Servers that operate as standalone units, enter the screen license keys on **Configuration > Upgrade** in the same way as you add feature keys.

Getting help

If you experience any problems when configuring or using Cisco TelePresence Server, see the "Product documentation" section of these release notes. If you cannot find the answer you need in the documentation, check the web site at <http://www.cisco.com/cisco/web/support/index.html> where you will be able to:

- Make sure that you are running the most up-to-date software.
- Get help from the Cisco Technical Support team.

Make sure you have the following information ready before raising a case:

- Identifying information for your product, such as model number, firmware version, and software version (where applicable).
- Your contact email address or telephone number.
- A full description of the problem.

License information

Refer to the following sections for notices and software license information.

TANDBERG

TANDBERG is now part of Cisco. TANDBERG Products UK Limited is a wholly owned subsidiary of Cisco Systems, Inc.

The TelePresence Server firmware is Copyright © TANDBERG Products UK Ltd 2003-2012 except where specifically mentioned below. All rights reserved.

This product contains an authentication function which uses an encrypted digital signature and a public key infrastructure. It is your responsibility to ensure that any import into or export from your territory and any use of the product in your territory is in compliance with your local laws. This product may not be exported to any country embargoed by the US or any member of the European Union without the prior written consent of Cisco.

Software licenses

The TelePresence Server includes software developed by the The FreeBSD Project, software developed by Tecgraf, PUC-Rio (specifically Lua), software developed by the Free Software Foundation, Inc. and its contributors (specifically Pthreads-win32, elements of the Linux operating system, binutils and newlib), software developed by the Internet Systems Consortium, Inc (specifically DHCP), software developed by the Swedish Institute of Computer Science, software developed by Dennis Kuschel and Swen Moczarski, and software developed by Polycom, Inc. (specifically Polycom® Siren14™ audio codec).

This product can use HMAC-SHA1 to authenticate packets and AES to encrypt them.

The following copyright notices are reproduced here in order to comply with the terms of the respective licenses.

[FreeBSD](#)

[Swedish Institute of Computer Science](#)

[PicoOS](#)

[Info-ZIP](#)

[Independent JPEG Group](#)

[The OpenSSL Project](#)

[Spirit Corporation](#)

[AES](#)

[HMAC](#)

[SHA1](#)

[Lua](#)

[DHCP](#)

[Polycom Inc](#)

[Fraunhofer IIS](#)

[RSA Data Security Inc.](#)

[The Internet Society](#)

[SNMP](#)

[binutils](#)

[Newlib](#)

[ITU-T](#)

[FreeType](#)

FreeBSD

Copyright 1992-2010 The FreeBSD Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE FREEBSD PROJECT "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE FREEBSD PROJECT OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The views and conclusions contained in the software and documentation are those of the authors and should not be interpreted as representing official policies, either expressed or implied, of the FreeBSD Project.

Swedish Institute of Computer Science

Copyright (c) 2001, 2002 Swedish Institute of Computer Science. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This file is part of the lwIP TCP/IP stack.

Author: Adam Dunkels adam@sics.se

PicoOS

Copyright (c) 2004-2010, Dennis Kuschel, Swen Moczarski. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Info-ZIP

Copyright © 1990-2007 Info-ZIP. All rights reserved.

For the purposes of this copyright and license, "Info-ZIP" is defined as the following set of individuals:

Mark Adler, John Bush, Karl Davis, Harald Denker, Jean-Michel Dubois, Jean-loup Gailly, Hunter Goatley, Ed Gordon, Ian Gorman, Chris Herborth, Dirk Haase, Greg Hartwig, Robert Heath, Jonathan Hudson, Paul Kienitz, David Kirschbaum, Johnny Lee, Onno van der Linden, Igor Mandrichenko, Steve P. Miller, Sergio Monesi, Keith Owens, George Petrov, Greg Roelofs, Kai Uwe Rommel, Steve Salisbury, Dave Smith, Steven M. Schweda, Christian Spieler, Cosmin Truta, Antoine Verheijen, Paul von Behren, Rich Wales, Mike White.

This software is provided "as is," without warranty of any kind, express or implied. In no event shall Info-ZIP or its contributors be held liable for any direct, indirect, incidental, special or consequential damages arising out of the use of or inability to use this software.

Permission is granted to anyone to use this software for any purpose, including commercial applications, and to alter it and redistribute it freely, subject to the above disclaimer and the following restrictions:

Redistributions of source code (in whole or in part) must retain the above copyright notice, definition, disclaimer, and this list of conditions.

Redistributions in binary form (compiled executables and libraries) must reproduce the above copyright notice, definition, disclaimer, and this list of conditions in documentation and/or other materials provided with the distribution. The sole exception to this condition is redistribution of a standard UnZipSFX binary (including SFXWiz) as part of a self-extracting archive; that is permitted without inclusion of this license, as long as the normal SFX banner has not been removed from the binary or disabled.

Altered versions--including, but not limited to, ports to new operating systems, existing ports with new graphical interfaces, versions with modified or added functionality, and dynamic, shared, or static library versions not from Info-ZIP--must be plainly marked as such and must not be misrepresented as being the original source or, if binaries, compiled from the original source. Such altered versions also must not be misrepresented as being Info-ZIP releases--including, but not limited to, labeling of the altered versions with the names "Info-ZIP" (or any variation thereof, including, but not limited to, different capitalizations), "Pocket UnZip," "WiZ" or "MacZip" without the explicit permission of Info-ZIP. Such altered versions are further prohibited from misrepresentative use of the Zip-Bugs or Info-ZIP e-mail addresses or the Info-ZIP URL(s), such as to imply Info-ZIP will provide support for the altered versions.

Info-ZIP retains the right to use the names "Info-ZIP," "Zip," "UnZip," "UnZipSFX," "WiZ," "Pocket UnZip," "Pocket Zip," and "MacZip" for its own source and binary releases.

Independent JPEG Group's JPEG software

Software is based in part on the work of the Independent JPEG Group

The authors make NO WARRANTY or representation, either express or implied, with respect to this software, its quality, accuracy, merchantability, or fitness for a particular purpose. This software is provided "AS IS", and you, its user, assume the entire risk as to its quality and accuracy.

This software is copyright © 1991-1998, Thomas G. Lane. All Rights Reserved except as specified below.

Permission is hereby granted to use, copy, modify, and distribute this software (or portions thereof) for any purpose, without fee, subject to these conditions:

If any part of the source code for this software is distributed, then this README file must be included, with this copyright and no-warranty notice unaltered; and any additions, deletions, or changes to the original files must be clearly indicated in accompanying documentation.

If only executable code is distributed, then the accompanying documentation must state that "this software is based in part on the work of the Independent JPEG Group".

Permission for use of this software is granted only if the user accepts full responsibility for any undesirable consequences; the authors accept NO LIABILITY for damages of any kind.

These conditions apply to any software derived from or based on the IJG code, not just to the unmodified library. If you use our work, you ought to acknowledge us.

Permission is NOT granted for the use of any IJG author's name or company name in advertising or publicity relating to this software or products derived from it. This software may be referred to only as "the Independent JPEG Group's software".

We specifically permit and encourage the use of this software as the basis of commercial products, provided that all warranty or liability claims are assumed by the product vendor.

The OpenSSL Project

Copyright (c) 1998-2007 The OpenSSL Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

All advertising materials mentioning features or use of this software must display the following acknowledgment: This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<http://www.openssl.org/>)"

The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.

Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.

Redistributions of any form whatsoever must retain the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

Original SSLeay License

Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com) All rights reserved.

This package is an SSL implementation written by Eric Young (eay@cryptsoft.com). The implementation was written so as to conform with Netscape's SSL.

This library is free for commercial and non-commercial use as long as the following conditions are adhered to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).

Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.

Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

All advertising materials mentioning features or use of this software must display the following acknowledgement: "This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)" The word 'cryptographic' can be left out if the routines from the library being used are not cryptographic related :-).

If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement: "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The licence and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution licence [including the GNU Public Licence.]

Spirit Corporation

Copyright © 1995-2003, SPIRIT

The TelePresence Server includes a G.728 audio codec used under license from Spirit Corporation.

AES License

Copyright (c) 2001, Dr Brian Gladman, Worcester, UK.

All rights reserved.

LICENSE TERMS

The free distribution and use of this software in both source and binary form is allowed (with or without changes) provided that:

distributions of this source code include the above copyright notice, this list of conditions and the following disclaimer;

distributions in binary form include the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other associated materials;

the copyright holder's name is not used to endorse products built using this software without specific written permission.

DISCLAIMER

This software is provided 'as is' with no explicit or implied warranties in respect of its properties, including, but not limited to, correctness and fitness for purpose.

Issue Date: 29/07/2002

HMAC License

Copyright (c) 2002, Dr Brian Gladman, Worcester, UK. All rights reserved.

LICENSE TERMS

The free distribution and use of this software in both source and binary form is allowed (with or without changes) provided that:

distributions of this source code include the above copyright notice, this list of conditions and the following disclaimer;

distributions in binary form include the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other associated materials;

the copyright holder's name is not used to endorse products built using this software without specific written permission.

ALTERNATIVELY, provided that this notice is retained in full, this product may be distributed under the terms of the GNU General Public License (GPL), in which case the provisions of the GPL apply INSTEAD OF those given above.

DISCLAIMER

This software is provided 'as is' with no explicit or implied warranties in respect of its properties, including, but not limited to, correctness and/or fitness for purpose.

Issue Date: 26/08/2003

SHA1 License

Copyright (c) 2002, Dr Brian Gladman, Worcester, UK. All rights reserved.

LICENSE TERMS

The free distribution and use of this software in both source and binary form is allowed (with or without changes) provided that:

1. distributions of this source code include the above copyright notice, this list of conditions and the following disclaimer;
2. distributions in binary form include the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other associated materials;
3. the copyright holder's name is not used to endorse products built using this software without specific written permission.

ALTERNATIVELY, provided that this notice is retained in full, this product may be distributed under the terms of the GNU General Public License (GPL), in which case the provisions of the GPL apply INSTEAD OF those given above.

DISCLAIMER

This software is provided 'as is' with no explicit or implied warranties in respect of its properties, including, but not limited to, correctness and/or fitness for purpose.

Issue Date: 01/08/2005

Lua

Lua 5.0 license

Copyright © 2003-2004 Tecgraf, PUC-Rio.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

DHCP

Internet Systems Consortium DHCP Client 4.1.1-P1

Copyright © 2004-2010 Internet Systems Consortium, Inc. ("ISC").

Copyright © 1995-2003 Internet Software Consortium.

All rights reserved.

Permission to use, copy, modify, and/or distribute this software for any purpose with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear in all copies.

THE SOFTWARE IS PROVIDED "AS IS" AND ISC DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL ISC BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF

USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Polycom, Inc.

The Polycom® Siren14™ audio coding technology, including patents relating to that technology, is licensed from Polycom, Inc.

Fraunhofer IIS

MPEG-4 AAC audio coding technology licensed by Fraunhofer IIS

<http://www.iis.fraunhofer.de/amm/>

RSA Data Security Inc.

Copyright © 1991-2, RSA Data Security, Inc. Created 1991. All rights reserved.

License to copy and use this software is granted provided that it is identified as the "RSA Data Security, Inc. MD5 Message-Digest Algorithm" in all material mentioning or referencing this software or this function.

License is also granted to make and use derivative works provided that such works are identified as "derived from the RSA Data Security, Inc. MD5 Message-Digest Algorithm" in all material mentioning or referencing the derived work.

RSA Data Security, Inc. makes no representations concerning either the merchantability of this software or the suitability of this software for any particular purpose. It is provided "as is" without express or implied warranty of any kind.

These notices must be retained in any copies of any part of this documentation and/or software.

The Internet Society

Copyright © The Internet Society (1999). All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the Internet Society or other Internet organizations, except as needed for the purpose of developing Internet standards in which case the procedures for copyrights defined in the Internet Standards process must be followed, or as required to translate it into languages other than English.

binutils

binutils, version 2.14, Copyright (C) 1998, 2000, 2001, 2002, 2003 Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA

binutils comes with ABSOLUTELY NO WARRANTY. This is free software, and you are welcome to redistribute it under the General Public License v.2 (<http://www.gnu.org/licenses/gpl-2.0.html>) See User Manual ("Licensing") for details.

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc.,
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies
of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software—to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Lesser General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the

source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

GNU GENERAL PUBLIC LICENSE

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in

the term "modification".) Each licensee is addressed as "you".

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.

c) If the modified program normally reads commands interactively

when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by

all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to

address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING

OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

Copyright (C)

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc.,

51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA.

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

```
Gnomovision version 69, Copyright (C) year name of author
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type 'show w'.
This is free software, and you are welcome to redistribute it
under certain conditions; type 'show c' for details.
```

The hypothetical commands 'show w' and 'show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than 'show w' and 'show c'; they could even be mouse-clicks or menu items--whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

```
Yoyodyne, Inc., hereby disclaims all copyright interest in the program
'Gnomovision' (which makes passes at compilers) written by James Hacker.
```

, 1 April 1989

Ty Coon, President of Vice

This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Lesser General Public License instead of this License.

Newlib

Newlib, version 1.17.0 Copyright (C) Copyright holders, as detailed in copyright notices that follow.

This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.

You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

The newlib subdirectory is a collection of software from several sources. Each file may have its own copyright/license that is embedded in the source file. Unless otherwise noted in the body of the source file(s), the following copyright notices will apply to the contents of the newlib subdirectory:

(1) Red Hat Incorporated

Copyright (c) 1994-2007 Red Hat, Inc. All rights reserved.

This copyrighted material is made available to anyone wishing to use, modify, copy, or redistribute it subject to the terms and conditions of the BSD License. This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY expressed or implied, including the implied warranties of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. A copy of this license is available at <http://www.opensource.org/licenses>. Any Red Hat trademarks that are incorporated in the source code or documentation are not subject to the BSD License and may only be used or replicated with the express permission of Red Hat, Inc.

(2) University of California, Berkeley

Copyright (c) 1981-2000 The Regents of the University of California.

All rights reserved.

Redistribution and use in source and binary forms, with or without modification,

are permitted provided that the following conditions are met:

* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

* Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.

IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT,

INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT

NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR

PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY,

WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)

ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY

OF SUCH DAMAGE.

(3) David M. Gay (AT&T 1991, Lucent 1998)

The author of this software is David M. Gay.

Copyright (c) 1991 by AT&T.

Permission to use, copy, modify, and distribute this software for any purpose without fee is hereby granted, provided that this entire notice is included in all copies of any software which is or includes a copy or modification of this software and in all copies of the supporting documentation for such software.

THIS SOFTWARE IS BEING PROVIDED "AS IS", WITHOUT ANY EXPRESS OR IMPLIED WARRANTY. IN PARTICULAR, NEITHER THE AUTHOR NOR AT&T MAKES ANY

REPRESENTATION OR WARRANTY OF ANY KIND CONCERNING THE MERCHANTABILITY OF THIS SOFTWARE OR ITS FITNESS FOR ANY PARTICULAR PURPOSE.

The author of this software is David M. Gay.

Copyright (C) 1998-2001 by Lucent Technologies

All Rights Reserved

Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that the copyright notice and this permission notice and warranty disclaimer appear in supporting documentation, and that the name of Lucent or any of its entities not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission.

LUCENT DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL LUCENT OR ANY OF ITS ENTITIES BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

(4) Advanced Micro Devices

Copyright 1989, 1990 Advanced Micro Devices, Inc.

This software is the property of Advanced Micro Devices, Inc (AMD) which specifically grants the user the right to modify, use and distribute this software provided this notice is not removed or altered. All other rights are reserved by AMD.

AMD MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS SOFTWARE. IN NO EVENT SHALL AMD BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING FROM THE FURNISHING, PERFORMANCE, OR USE OF THIS SOFTWARE.

So that all may benefit from your experience, please report any problems

or suggestions about this software to the 29K Technical Support Center at 800-29-29-AMD (800-292-9263) in the USA, or 0800-89-1131 in the UK, or 0031-11-1129 in Japan, toll free. The direct dial number is 512-462-4118.

Advanced Micro Devices, Inc.

29K Support Products

Mail Stop 573

5900 E. Ben White Blvd.

Austin, TX 78741

800-292-9263

(5) C.W. Sandmann

Copyright (C) 1993 C.W. Sandmann

This file may be freely distributed as long as the author's name remains.

(6) Eric Backus

(C) Copyright 1992 Eric Backus

This software may be used freely so long as this copyright notice is left intact. There is no warrantee on this software.

(7) Sun Microsystems

Copyright (C) 1993 by Sun Microsystems, Inc. All rights reserved.

Developed at SunPro, a Sun Microsystems, Inc. business.

Permission to use, copy, modify, and distribute this software is freely granted, provided that this notice is preserved.

(8) Hewlett Packard

(c) Copyright 1986 HEWLETT-PACKARD COMPANY

To anyone who acknowledges that this file is provided "AS IS" without any express or implied warranty:

permission to use, copy, modify, and distribute this file for any purpose is hereby granted without fee, provided that the above copyright notice and this notice appears in all copies, and that the name of Hewlett-Packard Company not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission.

Hewlett-Packard Company makes no representations about the suitability of this software for any purpose.

(9) Hans-Peter Nilsson

Copyright (C) 2001 Hans-Peter Nilsson

Permission to use, copy, modify, and distribute this software is freely granted, provided that the above copyright notice, this notice and the following disclaimer are preserved with no changes.

THIS SOFTWARE IS PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

(10) Stephane Carrez (m68hc11-elf/m68hc12-elf targets only)

Copyright (C) 1999, 2000, 2001, 2002 Stephane Carrez (stcarrez@nerim.fr)

The authors hereby grant permission to use, copy, modify, distribute, and license this software and its documentation for any purpose, provided that existing copyright notices are retained in all copies and that this notice is included verbatim in any distributions. No written agreement, license, or royalty fee is required for any of the authorized uses.

Modifications to this software may be copyrighted by their authors and need not follow the licensing terms described here, provided that the new terms are clearly indicated on the first page of each file where they apply.

(11) Christopher G. Demetriou

Copyright (c) 2001 Christopher G. Demetriou

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES

OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(12) SuperH, Inc.

Copyright 2002 SuperH, Inc. All rights reserved

This software is the property of SuperH, Inc (SuperH) which specifically grants the user the right to modify, use and distribute this software provided this notice is not removed or altered. All other rights are reserved by SuperH.

SUPERH MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS SOFTWARE. IN NO EVENT SHALL SUPERH BE LIABLE FOR INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING FROM THE FURNISHING, PERFORMANCE, OR USE OF THIS SOFTWARE.

So that all may benefit from your experience, please report any problems or suggestions about this software to the SuperH Support Center via e-mail at softwaresupport@superh.com .

SuperH, Inc.

405 River Oaks Parkway

San Jose

CA 95134

USA

(13) Royal Institute of Technology

Copyright (c) 1999 Kungliga Tekniska Högskolan

(Royal Institute of Technology, Stockholm, Sweden).

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright

notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

3. Neither the name of KTH nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY KTH AND ITS CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL KTH OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(14) Alexey Zelkin

Copyright (c) 2000, 2001 Alexey Zelkin

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL

DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(15) Andrey A. Chernov

Copyright (C) 1997 by Andrey A. Chernov, Moscow, Russia.

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(16) FreeBSD

Copyright (c) 1997-2002 FreeBSD Project.

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(17) S. L. Moshier

Author: S. L. Moshier.

Copyright (c) 1984,2000 S.L. Moshier

Permission to use, copy, modify, and distribute this software for any purpose without fee is hereby granted, provided that this entire notice is included in all copies of any software which is or includes a copy or modification of this software and in all copies of the supporting documentation for such software.

THIS SOFTWARE IS BEING PROVIDED "AS IS", WITHOUT ANY EXPRESS OR IMPLIED WARRANTY. IN PARTICULAR, THE AUTHOR MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND CONCERNING THE MERCHANTABILITY OF THIS SOFTWARE OR ITS FITNESS FOR ANY PARTICULAR PURPOSE.

(18) Citrus Project

Copyright (c)1999 Citrus Project,

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(19) Todd C. Miller

Copyright (c) 1998 Todd C. Miller

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO,

PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(20) DJ Delorie (i386)

Copyright (C) 1991 DJ Delorie

All rights reserved.

Redistribution and use in source and binary forms is permitted provided that the above copyright notice and following paragraph are duplicated in all such forms.

This file is distributed WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

(21) Free Software Foundation LGPL License (*-linux* targets only)

Copyright (C) 1990-1999, 2000, 2001 Free Software Foundation, Inc.

This file is part of the GNU C Library.

Contributed by Mark Kettenis , 1997.

The GNU C Library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

The GNU C Library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.

You should have received a copy of the GNU Lesser General Public License along with the GNU C Library; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA.

(22) Xavier Leroy LGPL License (i[3456]86-*-linux* targets only)

Copyright (C) 1996 Xavier Leroy (Xavier.Leroy@inria.fr)

This program is free software; you can redistribute it and/or modify it under the terms of the GNU Library General Public License as published by the Free Software Foundation; either version 2

of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Library General Public License for more details.

(23) Intel (i960)

Copyright (c) 1993 Intel Corporation

Intel hereby grants you permission to copy, modify, and distribute this software and its documentation. Intel grants this permission provided that the above copyright notice appears in all copies and that both the copyright notice and this permission notice appear in supporting documentation. In addition, Intel grants this permission provided that you prominently mark as "not part of the original" any modifications made to this software or documentation, and that the name of Intel Corporation not be used in advertising or publicity pertaining to distribution of the software or the documentation without specific, written prior permission.

Intel Corporation provides this AS IS, WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Intel makes no guarantee or representations regarding the use of, or the results of the use of, the software and documentation in terms of correctness, accuracy, reliability, currentness, or otherwise; and you rely on the software, documentation and results solely at your own risk.

IN NO EVENT SHALL INTEL BE LIABLE FOR ANY LOSS OF USE, LOSS OF BUSINESS, LOSS OF PROFITS, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND. IN NO EVENT SHALL INTEL'S TOTAL LIABILITY EXCEED THE SUM PAID TO INTEL FOR THE PRODUCT LICENSED HEREUNDER.

(24) Hewlett-Packard (hppa targets only)

(c) Copyright 1986 HEWLETT-PACKARD COMPANY

To anyone who acknowledges that this file is provided "AS IS" without any express or implied warranty:
permission to use, copy, modify, and distribute this file
for any purpose is hereby granted without fee, provided that

the above copyright notice and this notice appears in all copies, and that the name of Hewlett-Packard Company not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission.

Hewlett-Packard Company makes no representations about the suitability of this software for any purpose.

(25) Henry Spencer (only *-linux targets)

Copyright 1992, 1993, 1994 Henry Spencer. All rights reserved.

This software is not subject to any license of the American Telephone and Telegraph Company or of the Regents of the University of California.

Permission is granted to anyone to use this software for any purpose on any computer system, and to alter it and redistribute it, subject to the following restrictions:

1. The author is not responsible for the consequences of use of this software, no matter how awful, even if they arise from flaws in it.
2. The origin of this software must not be misrepresented, either by explicit claim or by omission. Since few users ever read sources, credits must appear in the documentation.
3. Altered versions must be plainly marked as such, and must not be misrepresented as being the original software. Since few users ever read sources, credits must appear in the documentation.
4. This notice may not be removed or altered.

(26) Mike Barcroft

Copyright (c) 2001 Mike Barcroft

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS "AS IS" AND

ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(27) Konstantin Chuguev (--enable-newlib-iconv)

Copyright (c) 1999, 2000

Konstantin Chuguev. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

iconv (Charset Conversion Library) v2.0

(28) Artem Bityuckiy (--enable-newlib-iconv)

Copyright (c) 2003, Artem B. Bityuckiy, SoftMine Corporation.

Rights transferred to Franklin Electronic Publishers.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(29) IBM, Sony, Toshiba (only spu-* targets)

(C) Copyright 2001,2006,

International Business Machines Corporation,

Sony Computer Entertainment, Incorporated,

Toshiba Corporation,

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

* Neither the names of the copyright holders nor the names of their contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(30) - Alex Tatmanjants (targets using libc/posix)

Copyright (c) 1995 Alex Tatmanjants

at Electronni Visti IA, Kiev, Ukraine.

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS

OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(31) - M. Warner Losh (targets using libc/posix)

Copyright (c) 1998, M. Warner Losh

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(32) - Andrey A. Chernov (targets using libc/posix)

Copyright (C) 1996 by Andrey A. Chernov, Moscow, Russia.

All rights reserved.

Redistribution and use in source and binary forms, with or without

modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(33) - Daniel Eischen (targets using libc/posix)

Copyright (c) 2001 Daniel Eischen .

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE

IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

(34) - Jon Beniston (only Im32-* targets)

Contributed by Jon Beniston

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

ITU-T

The G.722 Codec is licensed under the ITU-T General Public License.

You can redistribute and/or modify such ITU-T GPL code under the terms of ITU-T GPL (<http://www.itu.int/rec/T-REC-G.191>).

The ITU-T GPL code is free software that comes with ABSOLUTELY NO WARRANTY.

The following copyrights apply:

====g722.rme - G.722 module read-me file=====

(31.Jan.2000, updated 06.Aug.2009)

=====

COPYRIGHT NOTE: This software module was developed by CNET

France Telecom, who holds the copyrights of the implementation

and its *use* was granted as per the Terms in ITU-T Rec.G.191.

This module, and all of its derivations, is subject to the

"ITU-T General Public License". Please have it read in the

distribution disk, or in the ITU-T Recommendation G.191 on

"SOFTWARE TOOLS FOR SPEECH AND AUDIO CODING STANDARDS".

=====

/******

/* FRANCE TELECOM/CNET ITU-T ANSI C G.722 module to be included in */

/* ITU-T UGST software package Tool */

/******

/* Copyright CNET Lannion A TSS/CMC J-P PETIT Tel 33 2 96 05 39 41 */

/* Fax 33 2 96 05 13 16 */

/* Email petitjp@lannion.cnet.fr */

/******

/* Revision during ITU-T 2005-2008 Study period performed by: */

/* - L.M. Ericsson: Nicklas Sandgren, Jonas Svedberg */

/* - France Telecom: Balazs Kovesi, Stephane Ragot */

/******

FreeType

Portions of this software are copyright © 2012 The FreeType

Project (www.freetype.org). All rights reserved.

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Cisco and the Cisco Logo are trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and other countries. A listing of Cisco's trademarks can be found at www.cisco.com/go/trademarks. Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1005R)

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

© 2012 Cisco Systems, Inc. All rights reserved.