



CHAPTER 12

Voice-Related Modules

This chapter describes the Voice-Related Modules and contains the following sections:

- [Communications Media Module \(WS-SVC-CMM\)](#), page 12-1
- [8-Port T1/E1 PSTN Interface Module \(WS-X6608-T1/E1\)](#), page 12-4
- [24-Port FXS Analog Interface Module \(WS-X6624-FXS\)](#), page 12-6



Note

Specific combinations of supervisor engines and modules may not be supported in your chassis. Refer to the release notes of the software version running on your system for specific information on modules and supervisor engine combinations that are not supported.

Communications Media Module (WS-SVC-CMM)

The Cisco 7600 series routers Communications Media Module can support single or multiple Cisco CallManagers in a voice-over-IP network. (See [Figure 12-1](#).) The Communications Media Module, which acts as the media gateway, uses the Media Gateway Control Protocol (MGCP) to communicate with Cisco CallManager, which acts as the media gateway controller (Call Agent).

You can install up to three interface modules into the base module of the Communications Media Module. The Communications Media Module accepts either a 6-port T1 interface module or a 6-port E1 interface module. You must use the same types of interface modules (either all T1 modules or all E1 modules) in the Communications Media Module; you cannot mix the interface module types.

The 6-port T1/E1 interface modules have onboard digital signal processor (DSP) resources that allow you to connect the interfaces to the public switched telephone network (PSTN) or private branch exchanges (PBXs) through T1 Channel Associated Signaling (CAS) or T1/E1 ISDN Primary Rate Interface (PRI). The DSP resources on the interface modules provide echo cancellation, transcoding, fax relay, tone detection and generation, and jitter buffers.

The Communications Media Module provides Layer 2 forwarding only. If a packet needs to be Layer 3 routed, it is forwarded to the default gateway.

The Communications Media Module has a Gigabit Ethernet backplane interface that can have one IP address and one MAC address.



Note

The Communications Media Module requires a static IP address. Obtaining an IP address through a DHCP server is not supported. You assign an IP address to the Communications Media Module Gigabit Ethernet backplane interface through the CLI using the **interface GigabitEthernet1/0** command.

**Note**

For an overview of a VoIP network using the Catalyst 6500 series switches, refer to the “Configuring a VoIP Network” section of the *Catalyst 6500 Series Switch Software Configuration Guide* at this URL:

http://www.cisco.com/univercd/cc/td/doc/product/lan/cat6000/sw_7_4/config_gd/voicecfg.htm

Figure 12-1 Communications Media Module (WS-SVC-CMM)

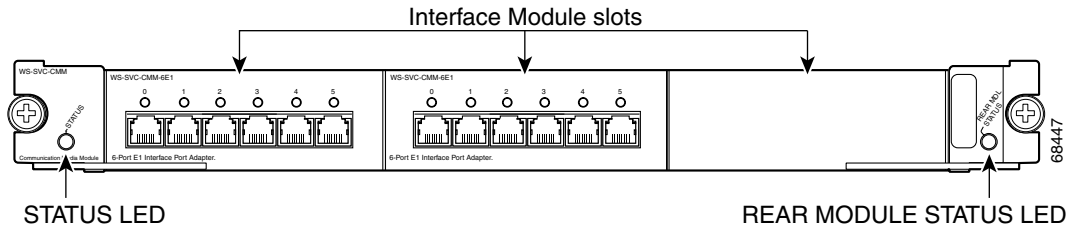


Table 12-1 lists the supported features for the Communications Media Module interface modules.

Table 12-1 CMM Interface Module Supported Features

WS-SVC-CMM-6T1 Module	WS-SVC-CMM-6E1 Module
Line code—B8ZS ¹ , AMI ²	Line code—HDB3 ³ , AMI
Frame format—SF ⁴ , ESF ⁵ with CRC ⁶ /no CRC	Frame format—with CRC4/no CRC4
MGCP:	MGCP:
T1-PRI	E1-PRI
T1-CAS E&M ⁷ Wink Start	Fax Pass-through
T1-CAS E&M Delay Dial	Cisco Fax Relay
Fax Pass-through	DTMF Relay
Cisco Fax Relay	Modem Pass-through
Modem Pass-through	Music on Hold
Music on Hold	G711 codec (sampling size: 10, 20, and 30 ms)
DTMF ^{8, 9} Relay	G729 codec (sampling size: 10, 20, 30, 40, 50, and 60 ms)
G711 codec (sampling size: 10, 20, and 30 ms)	
G729 codec (sampling size: 10, 20, 30, 40, 50, and 60 ms)	

1. B8ZS = binary 8-zero substitution
2. AMI = alternate mark inversion
3. HDB3 = high-density bipolar with three zeros
4. SF = super framing
5. ESF = extended super framing
6. CRC = cyclic redundancy check
7. E&M = ear and mouth
8. DTMF = Dual Tone Multi-Frequency
9. DTMF is supported; DTMF/MF is not supported

For additional information, refer to the *Catalyst 6500 Series and Cisco 7600 Series Communication Media Module Installation and Verification Note*.

The front panel LEDs are described in Table 12-2.

Table 12-2 CMM STATUS LED

Color/State	Description
Off	<ul style="list-style-type: none"> • The module is waiting for the supervisor engine to turn on power. • The module is not online. • The module is not receiving power, which could be caused by the following: <ul style="list-style-type: none"> – Power is not available to the module. – Module temperature is over the limit¹.
Red	<ul style="list-style-type: none"> • The module is released from reset by the supervisor engine and is booting. • If the boot code fails to execute, the LED stays red after power up.
Orange	<ul style="list-style-type: none"> • The module is initializing hardware or communicating with the supervisor engine. • A fault occurred during the initialization sequence. • If the module fails to download its Field Programmable Gate Arrays (FPGAs) on power up, it continues initializing and is granted module online status from the supervisor engine, but the LED stays orange. • If the module is not granted module online status from the supervisor engine, the LED stays orange. This problem could be caused by the supervisor engine detecting a failure in an external loopback test that it issued to the module.
Green	<ul style="list-style-type: none"> • The module is operational; the supervisor engine has granted module online status.

1. Enter the **show environment temperature mod** command to display the temperature of each of four sensors on the module.

Figure 12-2 and Figure 12-3 show the front panels of the 6-port T1 and E1 interface modules.

Figure 12-2 6-Port T1 Interface Module

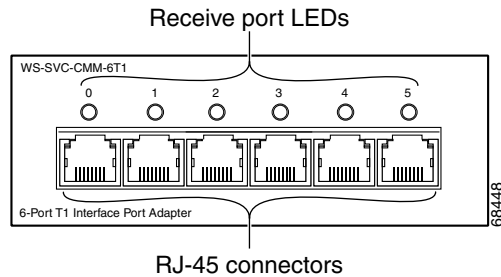
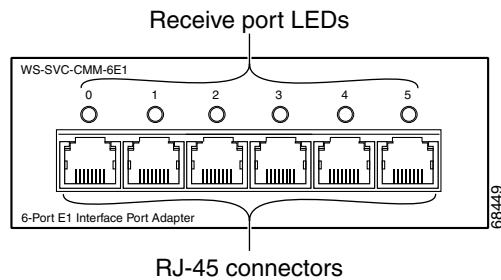


Figure 12-3 6-Port E1 Interface Module



The front panel LEDs are described in Table 12-3.

Table 12-3 6-Port T1 and E1 Interface Modules Receive Port LEDs

Color/State	Description
Green	T1/E1 interface is operational.
Red	T1/E1 receive alarm.
Yellow	T1/E1 remote alarm.
Off	The administrative port shut down or there is no power.

8-Port T1/E1 PSTN Interface Module (WS-X6608-T1/E1)

The 8-port T1/E1 PSTN interface module (WS-X6608-T1/E1) is a high-density, 8-port T1/E1 voice-over-IP (VoIP) module that can support digital T1/E1 connectivity to the Public Switched Telephone Network (PSTN) or transcoding and conferencing. (See Figure 12-4.) The module requires an IP address, is registered with Cisco CallManager in its domain, and is managed by Cisco CallManager.

The module software is downloaded from a TFTP server. Depending upon which software you download, the ports can serve as T1/E1 interfaces or support transcoding and conferencing as follows:

- Transcoding for IP-to-IP connections support the following:
 - 128 channels of full-duplex transcoding per module, 16 channels per port, if transcoding is between G.711 and a low bit-rate codec (such as the G.723.1).

- 64 channels of full-duplex transcoding per module, 8 channels per port, if transcoding is from a low bit-rate codec to a low bit-rate codec (such as from G723.1 to G.729).
- G.711, G.723.1, and the G.729A codecs in any combination.
- Conferencing supports the following:
 - Meet-Me and ad-hoc conferencing.
 - 32 channels of conferencing ports, 4 conferencings per port. The maximum conference size on a single port is 16 parties; 6 parties at a time can be active (talking) while the rest are idle (listening).
 - Transcoding and conferencing functions; for every transcoding port in use, one less conferencing port is available and vice versa.

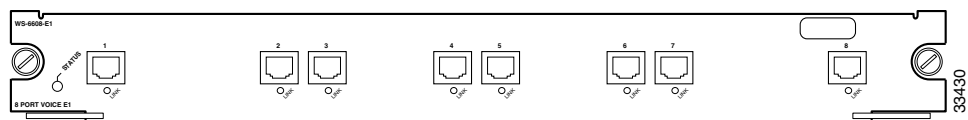
**Note**

To configure the module interfaces, refer to the “Configuring a VoIP Network” chapter of the *Catalyst 6500 Series Switch Software Configuration Guide*. To configure the interfaces to work with Cisco CallManager, refer to the *Cisco CallManager Administration Guide*.

When the 8-port T1/E1 PSTN interface module powers up, it initializes various hardware components and communicates with the supervisor engine.

The front panel LEDs are shown in [Figure 12-4](#).

Figure 12-4 8-Port T1/E1 PSTN Interface Module (WS-X6608-T1/E1)



The front panel LED operation is described in [Table 12-4](#).

Table 12-4 8-Port PSTN Interface Module LEDs

LED	Color/State	Description
STATUS	Green	The module is operational. The supervisor engine has granted the module online status.
	Orange	The module is booting or running diagnostics.
		The supervisor engine has disabled the module.
	Red	An overtemperature condition has occurred. (A minor temperature threshold has been exceeded during environmental monitoring.)
The module is resetting. (The switch has just been powered on or the module has been hot inserted.)		
The module processor detected a fatal error during its diagnostics.		
Off	An overtemperature condition has occurred. (A major temperature threshold has been exceeded during environmental monitoring.)	
	The module is not receiving power. The module was powered down due to lack of power. (The module is listed as <i>power-deny</i> in the show module status field.)	

Table 12-4 8-Port PSTN Interface Module LEDs (continued)

LED	Color/State	Description
LINK	Green	The link is up.
	Yellow	Frame synchronization has been lost or an RAI signal has been received.
	Flashing Yellow	The SPAN is in loopback.
	Red	No carrier is detected or an AIS signal has been received.
	Off	The registration with Cisco CallManager is lost.

24-Port FXS Analog Interface Module (WS-X6624-FXS)

The 24-port FXS analog interface module (WS-X6624-FXS) interfaces connect directly to standard analog telephones or fax machines. The module interfaces supply ring voltage and dial tone. The module emulates the central office (CO) or private branch exchange (PBX), providing a service to an analog telephone or fax machine. The telephone or fax machine connected through the FXS module operates as if it were connected to a normal CO or PBX line.

The front panel LEDs are shown in [Figure 12-5](#).



Warning



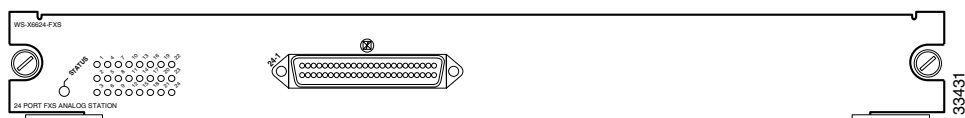
If the symbol of suitability with an overlaid cross appears above a port, you must not connect the port to a public network that follows the European Union standards. Connecting the port to this type of public network can cause severe personal injury or can damage the unit. Statement 1031



Note

When installing the WS-X6624-FXS analog interface module in a chassis, you must have a system ground cable attached to the chassis. Refer to the *Catalyst 6000 Series Switch Installation Guide* or the *Catalyst 6500 Series Switch Installation Guide* for the system grounding cable installation procedure.

Figure 12-5 24-Port FXS Analog Interface Module (WS-X6624-FXS)



When the 24-port FXS analog interface module is powered up, it initializes various hardware components and communicates with the supervisor engine.

The front panel LEDs are described in [Table 12-5](#).

Table 12-5 24-Port FXS Analog Interface Module LEDs

LED	Color/State	Description
STATUS	Green	The module is online and operational.
	Orange	The module is booting or running diagnostics. The supervisor engine has disabled the module. The supervisor engine has sent an “SCP_SET_DIAG_FEATURES” message indicating that the diagnostics have failed. An overtemperature condition has occurred. (A minor temperature threshold has been exceeded during environmental monitoring.)
	Red	The module processor powered up but is not running. The module processor detected a fatal error during its diagnostics. An overtemperature condition has occurred. (A major temperature threshold has been exceeded during environmental monitoring.)
	Off	The module is not receiving power. The module was powered down due to insufficient power. (The module is listed as <i>power-deny</i> in the show module status field.)
Port number	Green	The telephone or fax machine is off-hook.
	Yellow	The module or port is disabled through the CLI ¹ .
	Off	The port is not active (connected device is on-hook) or the link is not connected.

1. CLI = command-line interface

