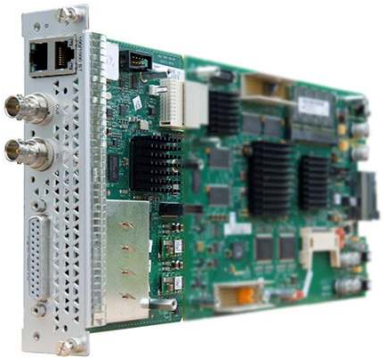
Cisco Digital Content Manager Series Audio Gateway Card

Today's contribution systems demand versatile, flexible, and compact solutions that allow content providers and service providers to support new network architectures. The Cisco® DCM Audio Gateway is a plug-in card to the Cisco Digital Content Manager (DCM) series chassis that enables transport of professional digital audio over cost-effective IP infrastructure in a highly resilient way. Common examples are live transmission of broadcast commentary, where low latency is a critical requirement, or carrying multiple audio channels to a remote mixing location. The stereo pairs may also be used to generate a Dolby surround-sound experience.

Building on Cisco's expertise in the video IP market, engineers and broadcasters alike can rest assured knowing all audio signals are not just synchronized, but also safeguarded from IP network anomalies that result in dropouts or audible artifacts. The net result is a cost-effective, uncompressed, low-latency synchronous transmission of 24-bit Audio Engineering Society (AES) audio signals from one location to another.

The Audio Gateway module (Figure 1) resembles the Asynchronous Serial Interface (ASI) and Serial Digital Interface (SDI) video gateway solutions that transport video signals over cost-effective Ethernet links, but it is engineered for audio-only applications.

Figure 1. Cisco DCM Audio Gateway Card



Features of the Cisco DCM Audio Gateway card include:

- Real-Time Transport Protocol (RTP) encapsulation according to European Broadcasting Union (EBU) Tech Spec 3326
- Transport of up to 8 AES/EBU digital audio signals - 4 transmit and 4 receive - for up to 32 stereo pairs in a 2 rack unit (2RU)
- Support for Live-Live transport through dual-path streaming and Hitless Merge at the receiver (license option)

Physical Configuration

The Cisco DCM Audio Gateway card fits into a single physical DCM slot. One card includes AES/EBU through SUB-D 25 (DB25) audio interfaces, as well as the Ethernet interfaces. The card can be colocated with any other DCM card within the same chassis. Figure 2 shows the SUB-D interface on the rear panel.

Figure 2. Cisco DCM Audio Gateway Rear Panel with the TASCAM SUB-D Interface

Workflow

To transport digital audio, position DCMs equipped with Audio Gateway cards at two locations connected by a managed IP network. At the transmitter site, the AES audio stream is sourced by connecting a standard TASCAM SUB-D 25 adapter to the back of the chassis. Once ingested into the DCM, the digital audio is encapsulated into an RTP stream and pushed back out over the Ethernet ports on the same card. RTP streams can be transmitted in a unicast point-to-point configuration, or in a multicast point-to-multipoint configuration.

At the receiver site, the second Audio Gateway card decapsulates the RTP stream back into AES audio. The AES audio stream is then resumed at the second location and made available from the chassis through the balanced AES/EBU interfaces in the SUB-D 25 port. All the streams can optionally be phase-aligned to one another by use of an externally-provided world-clock AES reference signal, if attached.

Audio Quality

There is no compression applied to the audio at any stage of the transmission. This provides audio quality at the receiving location that has the same fidelity as the source.

Redundancy and Reliability

Cisco is the market leader in the highly reliable transport of high-quality video over IP, and it is no different for audio. Failover and de-jittering are standard on every Audio Gateway, but it can also be upgraded to use DCM's Hitless Merge feature.

Each feature addresses a different issue in reliability. Failover helps to ensure, in the rare case of a port failure, that a backup stream will continue to provide critical audio. De-jittering compensates for the jittery packet inter-arrival on a single stream that could result in audible drop-outs.

Hitless Merge, on the other hand, optionally gives the added confidence that audio streams will not suffer due to unanticipated network issues. This is achieved by sending two identical audio streams out of the dual IP ports, but over different paths on the network. On the receiving DCM, when licensed and enabled, the IP Audio Gateway buffers the first incoming RTP packet it receives, and subsequently discards its duplicate from the other stream. Should there be a gap in one of the incoming streams due to a network issue, the module will maintain continuity by transparently filling in the gaps using data stored in its buffer from the alternate stream. Hitless Merge is supported with both unicast and multicast transport.

User Interface and Management

The Cisco Audio Gateway card is controlled by the DCM's intuitive drag-and-drop GUI. This HTML-based GUI can be opened by a wide range of browsers, with no additional software to download. It is accessed securely using the IP address of the box and a login profile. The interface enables stream provisioning, and provides detailed information to the user, such as network traffic and statistics on AES/EBU cyclic redundancy check (CRC) and parity errors.

For integrated video services and network monitoring and control, the DCM Series is integrated with Cisco ROSA® Network Management and Control (NMC) system. Visit http://www.cisco.com/go/rosa for more information.

Key Features and Benefits

System:

- Transport of up to 8 AES/EBU digital audio signals - 4 transmit and 4 receive - for up to 32 stereo pairs in a 2RU.
- RTP encapsulation according to EBU Tech Spec 3326.
- Support for Live-Live transport through dual-path streaming and Hitless Merge at the receiver (option).

Flexible modular design:

- Cisco DCM Audio Gateway is both hardware and software modular.
- The Cisco DCM Audio Gateway card fits into any application slot of the Cisco DCM Series 1RU and 2RU chassis.
- Combined with the existing I/O (ASI, GbE, Satellite and Terrestrial) and application (Scrambling) cards, the Cisco DCM Series allows you to build truly converged applications.
- Functionality is software-enabled by an electronic "pay-as-you-grow" licensing scheme.

High availability:

- The Cisco DCM Series can be configured in a hot 1:1 configuration to support maximum uptime with minimum switchover interruption.
- To maximize service availability, the Cisco DCM Series offers port redundancy as well as stream redundancy by the Hitless Merge feature.

Fast, easy setup and configuration:

- The Cisco DCM Audio Gateway card is fully integrated in an easy-to-use HTML-only web user interface. Services can be easily configured with the user interface in a drag-and-drop style.

Product Specifications

Table 1 provides detailed specifications for the Cisco DCM Audio Gateway card.

Table 1. Product Specifications

Specification Category	Specification
Inputs	
Audio stream	Up to four AES/EBU 24-bit, 48kHz Reference input: AES signal (DARS) PCM

Specification Category	Specification
	Compressed streams, Dolby E and AC-3, are passed; AES receivers vary in support
Input frequency tolerance	±10 ppm for free-running audio sources and ±50 ppm for genlocked sources
Outputs	
Audio stream	Up to four AES/EBU 24-bit, 48kHz Monitor stream (mirror of any other output or input)
RTP stream	Approximately 2.4 Mbps audio stream TOS, TTL VLAN ID and priority Jitter tolerance range: 10 to 200 ms, user adjustable Hitless Merge range (option): 1 to 250 packets (up to 1 second)
Physical and Power	
Physical specifications	Audio Gateway card that occupies 1 slot in the DCM 1RU or MKI 2RU chassis or the DCM MKII 2RU chassis: • Height: 1.6 in (39.5 mm) • Width: 5.7 in (145 mm) • Depth: 14.4 in (365 mm) • Weight: 2.5 lbs (1120 g)
Physical connectors	SUB-D 25 (DB25), 110 ohm, balanced AES3id BNC output: monitoring signal, 75 ohm AES3id BNC input: AES clock reference signal, 75 ohm Two 10/100/1000 Base-T ports
Power consumption	26W
Environmental Specifications	
Operating temperature	32 to 122º F (0 to 50º C)
Storage temperature	-40 to 158º F (-40 to 70º C)
Relative operating humidity	5 to 90% noncondensing
Relative storage humidity	5 to 95% Note: Not to exceed 0.024 kg water or dry air
Operating altitude	-61 to 3048m (up to 2000m conforms to IEC/EN/UL/CSA 60950 requirements)
Compliance	
ETSI standards	• EN300 386: Telecommunications Network Equipment (EMC)
EMC standards	• FCC 47 CFR Part 15 Class A • ICES- 003 Class A • AS/NZS 3548 Class A • CISPR 22/EN55022 Class A • CISPR 24/EN55024 • VCCI Class A • KN 22 • IEC/EN 61000-3-2: Power Line Harmonics • Tested for worldwide regulatory compliance
Immunity	• IEC/EN-61000-4-2: Electrostatic Discharge Immunity • IEC/EN-61000-4-3: Radiated Immunity • IEC/EN-61000-4-4: Electrical Fast Transient Immunity • IEC/EN-61000-4-5: Surge • IEC/EN-61000-4-11: Voltage DIPS, Short Interruptions, and Voltage Variations
Safety	• UL/CSA/IEC/EN 60950-1 2nd edition • ACA TS001 • AS/NZS 60950

Ordering Information

Table 2 provides ordering information for the Cisco DCM Audio Gateway card. Note that a Cisco DCM D9901 or D9902 chassis is required to house this module. For more information, visit http://www.cisco.com/en/US/products/ps9230/index.html.

Table 2. Ordering Information

Features	Part Number
Card	
DCM Audio Gateway card	DCM-GWY-AUD-4
DCM Audio Gateway card, spare	DCM- GWY-AUD-4=
Optional Licenses	
DCM Audio Gateway Hitless Merge	DCM-GWY-PROT-AUD

Service and Support

Using the Cisco Lifecycle Services approach, Cisco and its partners provide a broad portfolio of end-to-end services and support that can help increase your network's business value and return on investment. This approach defines the minimum set of activities needed by technology and by network complexity to help you successfully deploy and operate Cisco technologies and optimize their performance throughout the lifecycle of your network.

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For More Information

To learn more about this product, contact your local account representative or visit http://www.cisco.com/go/dcmg.

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