

## Catalyst 6000 Family Voice T1 and Services Module

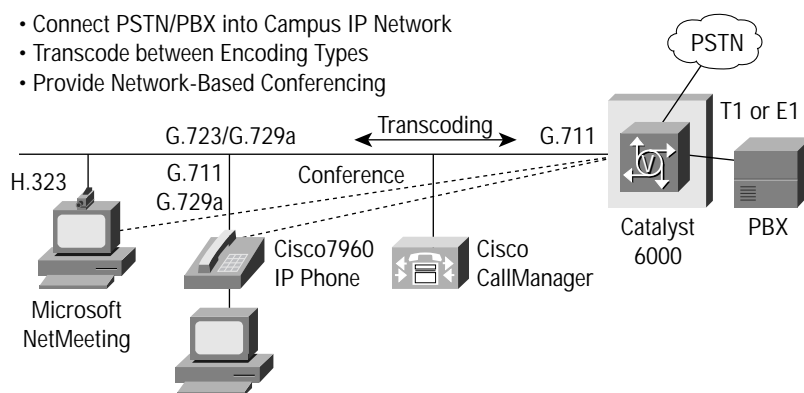
THE VOICE T1 AND SERVICES MODULE ESTABLISHES THE CISCO CATALYST® 6000 FAMILY AS THE MOST COMPLETE CAMPUS MULTISERVICE PLATFORM AVAILABLE, PROVIDING HIGH-END T1 OR E1 GATEWAYS TO THE PUBLIC SWITCHED TELEPHONE NETWORK (PSTN) OR LEGACY PRIVATE BRANCH EXCHANGES (PBXs) AND NETWORK-BASED VOICE SERVICES.

The Catalyst 6000 family brings data, voice, and video integration onto the campus for fully integrated communications on every desktop. Campus multiservice networking, or convergence, provides voice support using the IP network infrastructure rather than the traditional PBX. This drastically increases the leverage of telephony spending into overall infrastructure spending, reduces capital and operational costs, and opens the environment to innovation by supporting new applications. (See Figure 1.)

Cisco is using the Catalyst 6000 family to lead its customers to campus convergence. The Voice T1 and Services Module, also available in an E1 variant, introduces the following new features for campus multiservice networking:

- Digital T1 or E1 PSTN and PBX gateways
- Transcoding (G.711, G.729a, G.723)
- Conference bridging

Figure 1 Campus Multiservice Networking



### T1 or E1 PSTN and PBX gateway

The Voice T1 and Services Module allows larger enterprises to connect the PSTN and legacy PBXs directly into the campus multiservice network. Telephony signaling types supported include:

- Common channel signaling (CCS)—In this mode there are 23 DS0 channels for T1 and 29 for E1 for voice traffic; the 24th T1 DS0 or 16th E1 channel is for signaling. Any channel can be configured for common channel signaling.
- Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) signaling—Each interface supports 23 channels for T1 and 30 channels for E1. The default mode

is for the 24th T1 channel or 16th E1 channel to be reserved for signaling. Both network side and user side operation modes are supported.

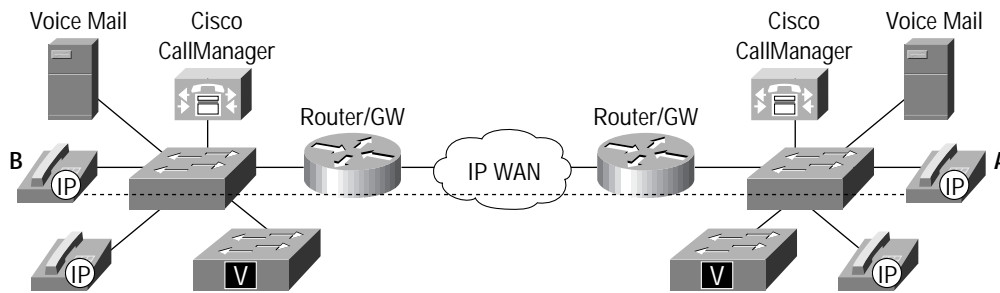
### Voice Services

The Voice T1 and Services Module provides transcoding and conferencing services for the multiservice network.

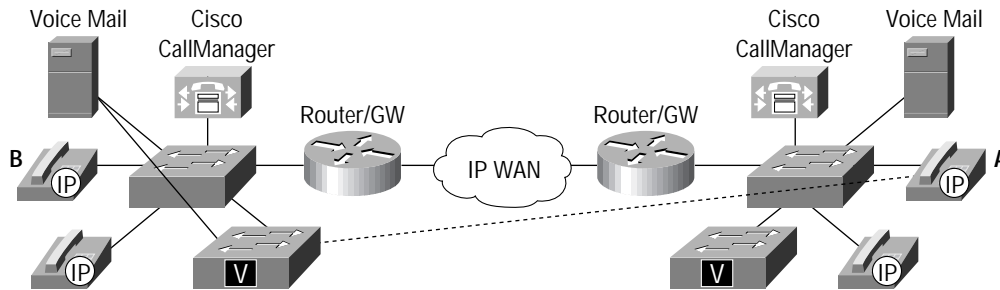
Transcoding enables a full voice-compression solution by offering transcoding services to endpoints not capable of supporting compressed voice or a different encoding type to the remote end. Figure 2 shows an example of transcoding.

Figure 2 Example of Transcoding

#### Party 'A' Calls 'B' and 'B' Diverts to Voice Mail



Initial Call Is Reserved and Compressed by End Stations



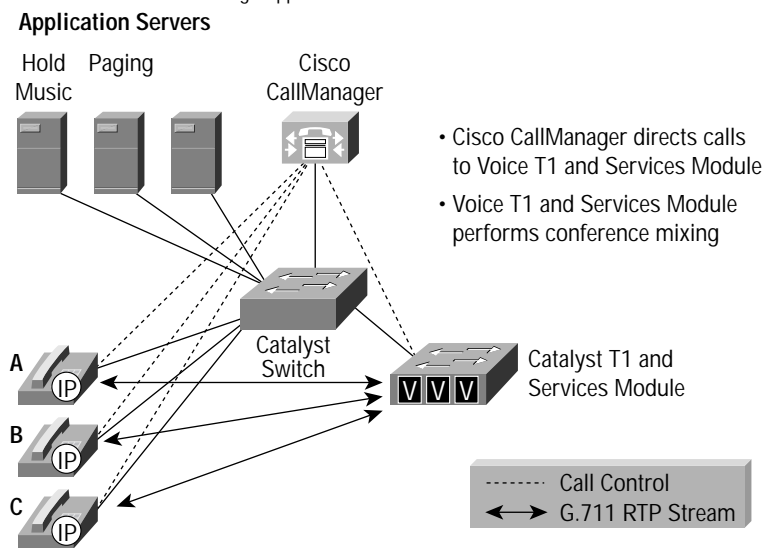
On diversion to voice mail, DSP resources help decompress the call-compressed WAN call leg, and reservation is safely "moved" to DSP farm; reservation is held intact

In the top part of Figure 2, a call is completed between two endpoints capable of supporting compressed voice. The bottom of Figure 2 shows what happens when the call is transferred to an endpoint, such as voice mail, that does not support compressed voice.

Figure 3 shows an example of the Voice T1 and Services Module in a conference bridge application. In Figure 3, IP Phone B conferences IP Phones A and C. The Cisco CallManager directs the media stream to the Voice T1 and Services Module, which bridges the media streams together.

Combining the features of conferencing and transcoding allows endpoints supporting differing codecs to participate in the same conference session.

Figure 3 Voice T1 and Services Module Used in Conference Bridge Application



## Features

The Cisco Catalyst Voice T1 and Services Module features:

- T1 CCS signaling
- T1 binary 8-zero substitution/alternate mark inversion (B8ZS/AMI) line coding, u-law or a-law coding
- E1 CCS signaling
- E1 HDB3 line coding
- ISDN PRI, network and user side operation modes
- Echo cancellation
- Silence suppression, Voice Activity Detection (VAD)
- Comfort noise generation
- G.711 to G.723 and G.729a transcoding (max. 8 x 32 channels of transcoding)
- Conference bridging, meet-me and ad-hoc conference modes (max. 8 x 16 channels of conferencing)
- Fax pass-through
- Network management support
- Simple Network Management Protocol (SNMP) compliant
- CiscoWorks interface for configuration
- Cisco Voice Manager (CVM)
- Cisco CallManager
- Switched Port Analyzer (SPAN) or port mirroring support

## Specifications

### Digital T1/E1 Interfaces

Interface type: RJ-48 connector

Line bit rate: T1—1.544 Mbps, E1—2.048 Mbps

Line code: T1—AMI, B8ZS; E1—HDB3

Framing format: D4 Super Frame (SF) and Extended Superframe (ESF)

Input level: +1 dBo to -24 dBmo

Output level: 0, -7.5, or -15 dB

Diagnostic loopback support

### Physical Specifications

Occupies one slot in the Catalyst 6000 family platform

Dimensions (H x W x D): 1.2 x 14.4 x 16 in.

(3.0 x 35.6 x 40.6 cm)

## Environmental Conditions

- Operating temperature: 32 to 104 F (0 to 40 C)
- Storage temperature: -40 to 167 F (-40 to 75 C)
- Relative humidity: 10 to 90 percent, noncondensing
- Operating altitude: -60 to 4000m
- Mean Time Between Failure (MTBF): seven years for system configuration

## Telecom

T1—FCC Part 68 (CFR47), CS03, JATE Green Book

E1—CTR13, TS016

## Safety

UL1950, CSA C22.2 No. 950, EN60950, IEC950, AS/NZS3260, TS001

## EMC

CE marking

FCC Part 15 (CFR47) Class A with UTP

EN55022 Class A with unshielded twisted-pair (UTP),

EN55022 Class B with FTP

CISPR22 Class A with UTP, CISPR22 Class B with File Transfer Protocol (FTP)

VCCI Class A with UTP, VCCI Class B with FTP

AS/NZS 3548 Class A with UTP, AZ/NZS 3548 Class B with FTP

## Network Management

- Dial control Management Information Base (MIB) (RFC 2128) and CISCO dial control MIB ext. to RFC 2128
- CISCO-VOICE-DIAL-CONTROL-MIB Voice Dial Control MIB
- CISCO-VOICE\_IF\_MIB Voice Interface MIB
- CISCO-VOICE-ANALOG-IF\_MIB Voice Analog Interface MIB
- CISCO-DSP-MGMT-MIB Digital Signal Processing Management MIB
- RFC 1157 SNMP
- RFC 1643 Ethernet MIB
- RFC 1493 Bridge MIB
- RFC 1213 MIB II
- RFC 1573 MIB II Interface Extensions
- RFC 1757 Ethernet RMON

## Service and Support

Cisco AVVID (Architecture for Voice, Video and Integrated Data) support solutions are designed for one purpose—to ensure customer success by delivering a suite of proactive services. The award-winning Cisco internetworking service and support offerings provide presales network audit planning, design consulting, network implementation, operational support, and network optimization. Cisco interactive knowledge-transfer solutions enhance customer success by leveraging Cisco expertise and experience. By including service and support when purchasing Cisco AVVID products, customers can confidently deploy AVVID networks utilizing Cisco expertise, experience, and resources.



Corporate Headquarters  
Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
<http://www.cisco.com>  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 526-4100

European Headquarters  
Cisco Systems Europe  
11, Rue Camille Desmoulins  
92782 Issy Les Moulineaux  
Cedex 9  
France  
<http://www-europe.cisco.com>  
Tel: 33 1 58 04 60 00  
Fax: 33 1 58 04 61 00

Americas  
Headquarters  
Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
<http://www.cisco.com>  
Tel: 408 526-7660  
Fax: 408 527-0883

Asia Headquarters  
Nihon Cisco Systems K.K.  
Fuji Building, 9th Floor  
3-2-3 Marunouchi  
Chiyoda-ku, Tokyo 100  
Japan  
<http://www.cisco.com>  
Tel: 81 3 5219 6250  
Fax: 81 3 5219 6001

Cisco Systems has more than 200 offices in the following countries. Addresses, phone numbers, and fax numbers are listed on the

**Cisco Connection Online Web site at <http://www.cisco.com/go/offices>.**

Argentina • Australia • Austria • Belgium • Brazil • Canada • Chile • China • Colombia • Costa Rica • Croatia • Czech Republic • Denmark • Dubai, UAE  
Finland • France • Germany • Greece • Hong Kong • Hungary • India • Indonesia • Ireland • Israel • Italy • Japan • Korea • Luxembourg • Malaysia  
Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Singapore  
Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela

Copyright © 2000, Cisco Systems, Inc. All rights reserved. Printed in the USA. Catalyst, Cisco, Cisco IOS, Cisco Systems, and the Cisco Systems logo are registered trademarks of Cisco Systems, Inc. or its affiliates in the U.S. and certain other countries. All other trademarks mentioned in this document are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any of its resellers. (9912R)