



Agenda

- **Branch Office Trends and Opportunity**
- **Multiservice Integration**
- **Multiservice Product Updates**
- **Information**

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The Evolving "Power" Branch

Small or Professional Office

Up to 20 Users
Static Environment
E-Mail, Internet Access
Price-centric



Cisco
1700,
2500,
MC3810

Traditional Branch Office

Up to 100 Users
Client/Server, Intranet Access
Low Growth or Change
Standardized on
Cisco 2500 Series
Solution Cost - centric

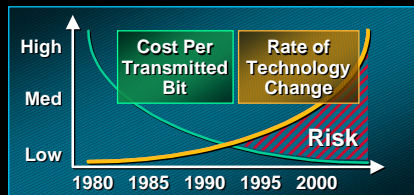
Cisco
2600,
3600

Power Branch Office

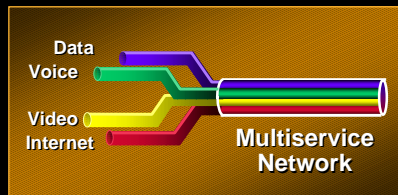
Up to 250 Users
Client/Server, Intranet, Extranet Access
High Rate of Growth or Change
Solution Life-Cycle Cost-Centric
Uses Technology for Competitive Advantage

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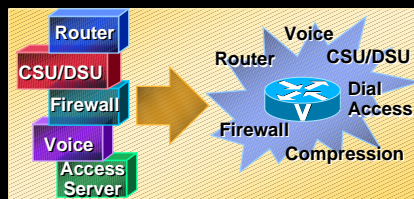
Branch Office Market Drivers



Protection from Technology Lockout



Network Infrastructure Integration



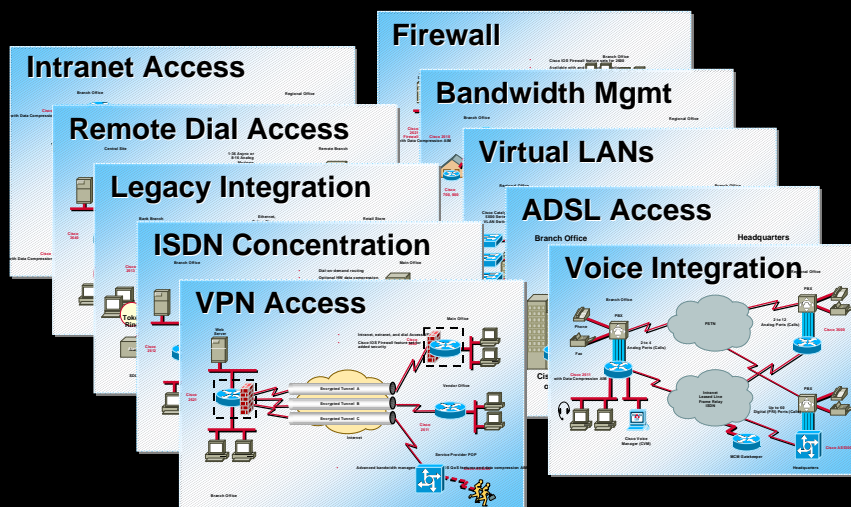
Reduced Solution Complexity



WAN Bandwidth Management

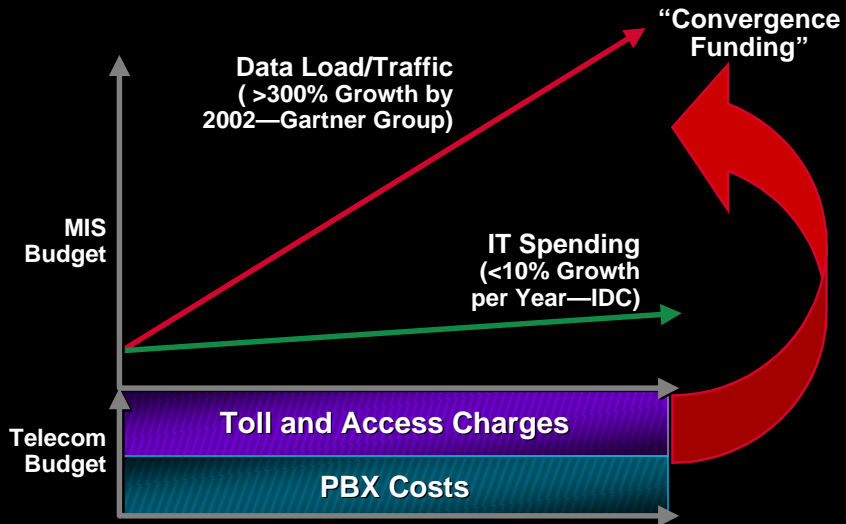
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Multiple Customer Needs in the Branch Office

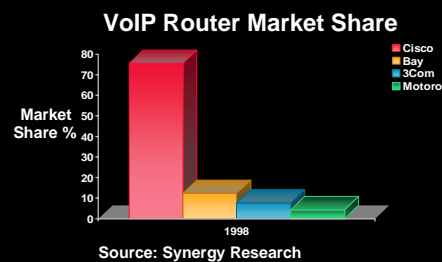
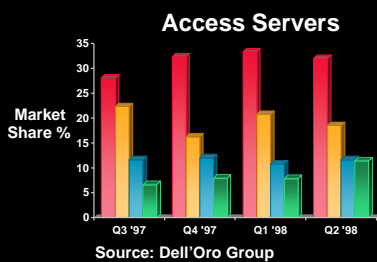
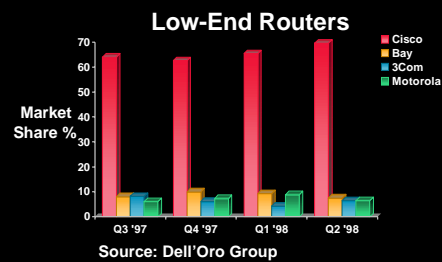
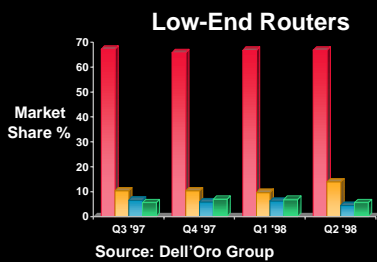


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The IT Budget Dilemma



Cisco's Provides the Solutions for Multiservice Networking

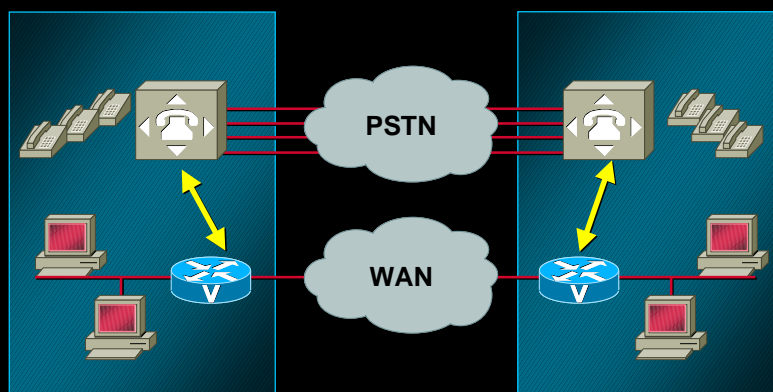


Agenda

- Branch Office Trends and Opportunity
- **Multiservice Integration**
 - What is it?
 - Business Drivers
 - VoX Technology
- Multiservice Product Updates
- Information

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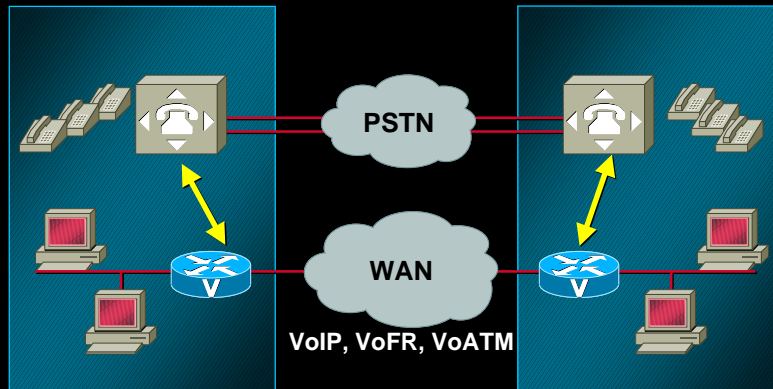
What Is Multiservice Networking



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What Is Multiservice Networking

Branch Office Voice and Data Integration

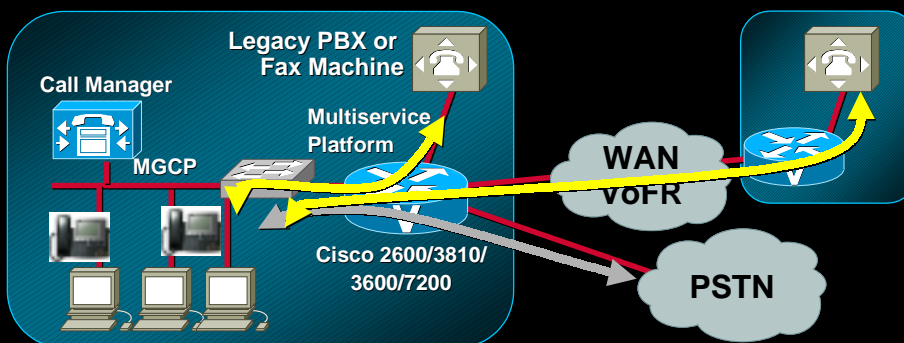


- Decreases number of local loops
- Reduces expenses by eliminating costly toll charges

www.cisco.com

What Is Multiservice Networking

Provides the infrastructure for IP Telephony!



- Provides flexible/scalable gateways to meet customer requirements (DID is coming)
- Can interwork with customers preference of VoXX WAN technology

www.cisco.com

Why Packet Voice/Video?

- **Allows network convergence**

Lower network capital and transport costs

Packet infrastructure cost efficiencies

Compression economies, non-consequential busy hours, single network (data and voice) volume economies

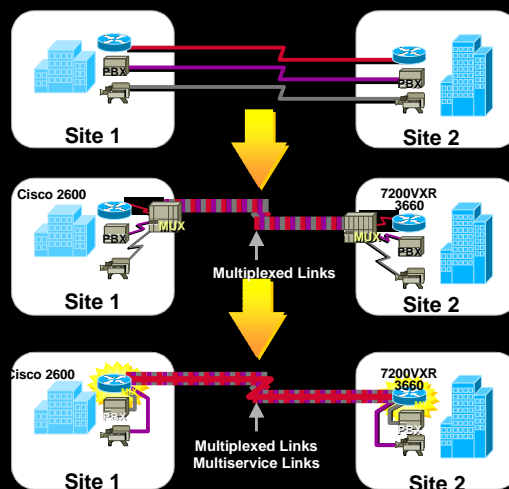
- **Enable new services**

Interactive call centers, enhanced fax services, video calls, expand into new markets, voice messaging

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Migrating to a Multiservice Network

- Separate parallel networks don't make sense
- Multiplexing reduces cost
- Cisco "Mix" TDM voice technology eliminates external multiplexing
- Migrate to multiservice one DS0 at a time or all at once



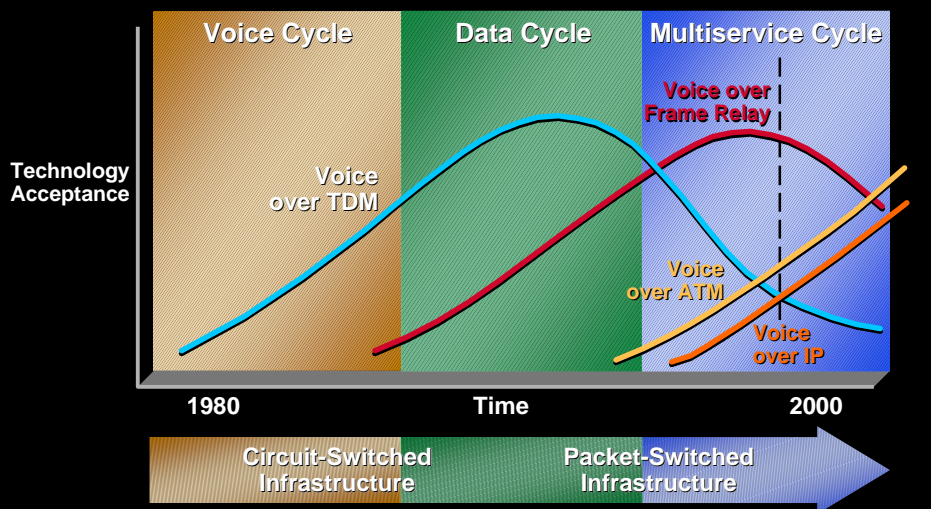
www.cisco.com

MultiService Challenges and Solutions

Challenge	Solution
Prioritization	QoS, IP Precedence
Echo	Standards-Based Echo Cancellation G.165
Packet Loss	Autofill in Algorithm
Delay	Use of Real-Time Protocol, Queuing Algorithms, Prioritization's, DSPs
Jitter	Dynamic Buffer Allocation
Bandwidth Utilization	Use of Standards-Based Voice Compression, Fragmentation, and QoS

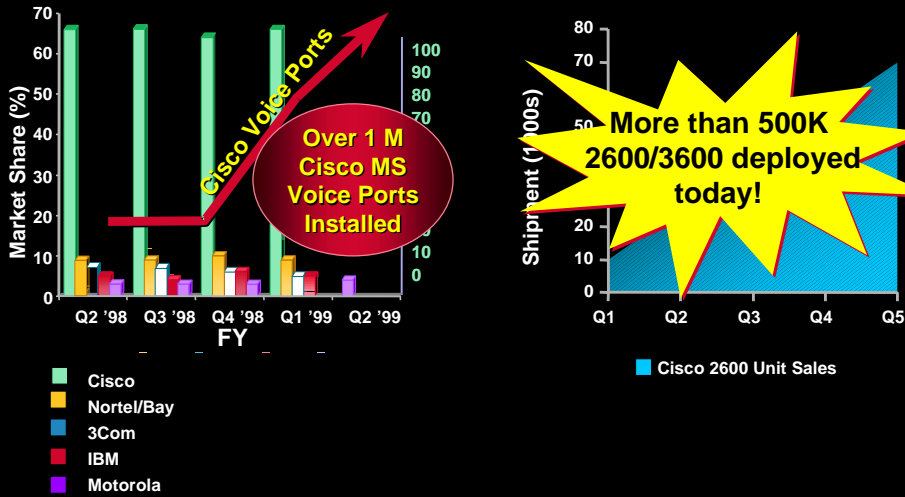
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Packet Voice Technology Acceptance Cycle



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Migration to Cisco Multiservice and Modular Platforms Is Well Under Way!



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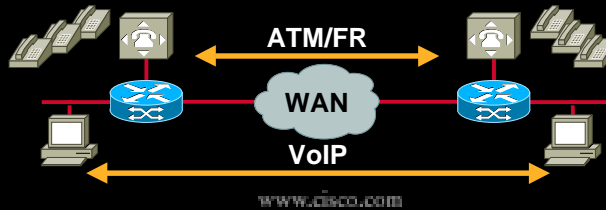
VoIP/VoFR/VoATM

Voice	Over ATM	Over IP	Over Frame
Governing Body	ATM Forum	IMTC/IETF	Frame Relay Forum
Standard	AAL1/CES AAL2 AAL5	H.323 RTP xGCP SIP	FRF.11 FRF.12 VoFR

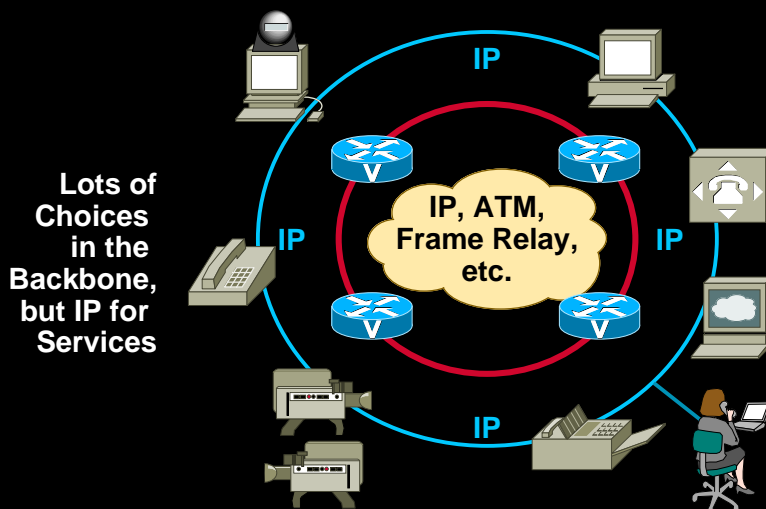
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Packet Types

Voice Packets	Type	Header Sizes	Packet Efficiency	QoS	Routes
ATM	Connection Oriented, Layer 2	Small Headers	56%	Can Be Hard (CBR)	Fixed/ Known
Frame Relay	Connection Oriented, Layer 2	Small Headers	62.5% (FRF.11) 79% (Cisco VoFR)	Deterministic	Fixed/ Known
IP	Connection-less Layer 3	Larger Headers	33% 83% (With CRTP)	Better than Best	Flexible



Cisco Multiservice Routers Enable Network Convergence



Cisco Provides the Solutions for Multiservice Networking

Standards

G.711
G.729
G.113
G.165
H.323
FRF.11

Cisco IOS™

High Reliability Hardware
99.999%

Quality of Service

Fragmentation and Interleaving
FRF.12
IP Precedence
WFQ/WRED
RSVP, RTP/CRTP

Management

Call Quality Monitoring
Call Detail Reporting



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Agenda

- Branch Office Trends and Opportunity
- Multiservice Integration
- **Multiservice Access Products**
 - **Portfolio Overview**
 - **New Features and Applications**
- Information

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Cisco's Multiservice Access Lineup

- Cisco 3600 Series, 2600 Series, MC3810 and 1750
- Data, Voice, Video, and VPN services
- Ethernet, Fast Ethernet, and Token Ring solutions
- Maximum investment protection

Cisco 3600 Series



Cisco 2600 Series



Cisco MC3810

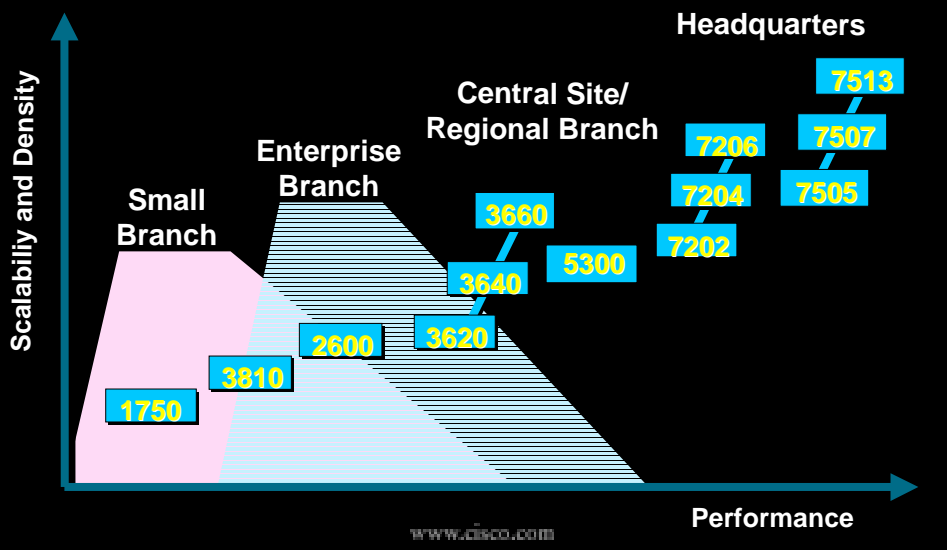


Cisco 1750



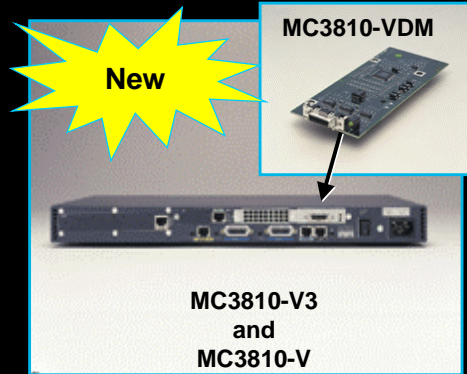
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Cisco Multiservice Platform Portfolio



MC3810-V3 and Video Dialing Module (VDM)

- MC3810V/MC 3810V3 Video Dialing Module RS-366 interface
- Video codec connects via V.35 universal serial ports for ATM SVC video
- Six Analog Voice Ports or T1/E1
- Support for VoFR, VoATM (AAL2), and VoIP



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Cisco 2600 Series Modular Access Routers

- Data, voice, dial and VPN access applications
- One network module slot, two WAN Interface Card (WIC) slots, one AIM slot
- Ethernet, Token Ring, mixed LAN, and 10/100 Fast Ethernet models
- ISL and 802.1Q VLAN on FE models
- 12-15 Kpps on Cisco 261x
- 23-25 Kpps on Cisco 262x
- From \$1995 list



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Cisco 3600 Family Platforms

- 50-70 kpps fast switching
- 3-4 kpps process switching
- Four network module slots

↑
Versatility
↓
Integration
Performance

- 20-40 kpps fast switching
- 1.5-2 kpps process switching
- Two network module slots



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Introducing the Cisco 3660

New

- **Higher performance**
100-120 Kpps
(Cisco 3640: 50 to 70 kpps)
- **Higher density: six slots**
- **Higher level of integration**
One or two Fast Ethernet ports
Two Advanced Integration Module (AIM) slots
Console port, aux port, dual PCMCIA card slots, dry contact closure
- **Higher availability**
Dual power (dual AC, dual DC, or AC and DC)
Hot-swap network modules
Hot-swap power supplies



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Introducing the Cisco 1750

Extension of Cisco 1600, Enables Multiservice and VPN Access



- Desktop form factor for more modest needs
- Modular product with one VIC slot, two VIC/WIC slots, one internal slot for future hardware encryption
- One 10/100 Ethernet, one Console and one AUX port
- Shares WICs with Cisco 1600, 2600 and 3600 series
- Supports up to 4 Analog voice ports using 2600/3600 VICs
- Integrated voice/data-router with optional firewall-encryption-VPN-DSU/CSU-NT1

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Product Line Overview— LAN-to-LAN Routing

	Cisco 4500/4700	Cisco 3640	Cisco 3620	Cisco 2600	Cisco 2500
Fast Switched Performance (Kpps)	45-60	50-70	30-40	12-25	3-5
Process Switched Performance (Kpps)	5-7	3-4	1.5-2	1-1.5	.5-1
LAN Density	2-12	1-16	1-8	1-6	1-2
Serial Density	T1/E1: 2-12 A/S: 16-32	T1/E1: 1-8 A/S: 4-24	T1/E1: 1-6 A/S: 4-8	T1/E1: 1-4 A/S: 2-12	T1/E1: 2 A/S: 2-8
ISDN BRI Density	4-16	1-24	1-10	1-10	1
CT1/CE1 ISDN PRI Density	1-2	1-6	1-2	1-2	0
LAN Media	E, TR, FE FDDI, ATM	E, TR, FE	E, TR, FE	E, TR, FE	E, TR
WAN Media	PRI, MBRI, Serial, ATM, HSSI	PRI, MBRI, Serial, ATM	PRI, MBRI, Serial, ATM	PRI, MBRI, Serial, ATM	Serial, BRI

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Product Line Overview— Data/Voice Integration

	Cisco 1750	Cisco MC3810	Cisco 3600	Cisco 2600
Cisco IOS LAN-to-LAN Routing	Yes	Yes	Yes	Yes
Voice Over IP	Yes	Yes	Yes	Yes
Voice Over Frame Relay	No	Yes	Yes	Yes
Voice Over ATM	No	Yes	Yes	(Q2 '00)
ATM WAN Access	No	Yes	Yes	Yes
Integrated Dial	No	No	Yes	Yes
LAN Media	FE	E	E, TR, FE	E, TR, FE
Wan Media	PRI, MBRI, Serial	Serial, BRI, ATM	PRI, MBRI, Serial, ATM	PRI, MBRI, Serial, ATM
Maximum Analog/Digital Voice Over	4 - 6/0	6/24	24/288	4/60

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Product Line Overview— Remote Dial Access

	Cisco AS5300	Cisco 3640	Cisco 3620	Cisco 2600	Cisco 2500
Hybrid Access	Yes	Yes	Yes	No	No
LAN Density	1	1-16	1-8	1-6	1
LAN Media	E, FE	E, TR, FE	E, TR, FE	E, TR, FE	E, TR
ISDN BRI with NT1	No	26	10	10	No
ISDN PRI with CSU	4	6	2	2	No
Analog Modems	No	Yes	Yes	Yes	No
Digital Modems	Yes	Yes	Yes	No	No
Async Density	No	8-96	8-34	2-36	8-16

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Cisco MC3810—What's New?

- **New features and interfaces**

MC3810-V3—Enhanced CPU (80MHz)

H.323v2 VoIP support

HCM2/6—Higher performance DSP
Modules—2 to 4 times (24 channels of
any CODEC)

G.726, G.728, G.723.1 (5.3 and 6.3 Kbps)

RS-366 Signaling Interface for Video

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Cisco MC3810 High Compression Voice Modules

- **Key features**

Double the density

Supports 24 channels of fax
relay, G.729a, G.726 and
G.711



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Cisco 2600 Models with 10/100 Fast Ethernet

- Cisco 2620 and 2621
- Modular access routers with single or dual autosensing 10/100 Fast Ethernet ports
- Up to 25-kpps fast switching performance
- ISL and 802.1Q for VLAN support
- From \$2295 list



Cisco 2620 and 2621



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FE Combo Network Modules

- Four new network modules enabling new configurations, increased port density, and performance options

0 LAN 2 WIC slots (supported on 2600 and 36xx)

1FE/2W, 2FE/2W, 1FE/1R/2W
(supported on 3620 and 3640 only)

All WICs supported on 3620/40 including:

2 x WIC-2T, 2 x WIC-2AS, 2 x 2 port Multiflex VWIC

Able to sustain 2Mbps on each port or 8 Mbps on 1 port

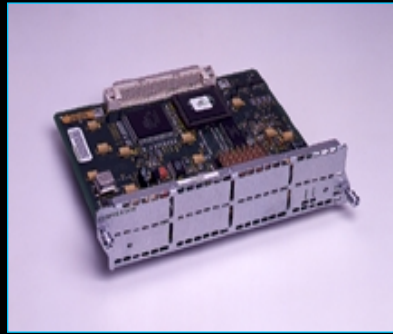


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Data Compression Network Module for the Cisco 3600 Series

- Compresses up to 8 Mbps total
- PPP and STAC compression protocols
- Supports a variety of WAN interfaces

Channelized T1/E1 (ISDN PRI)
ISDN BRI
Serial
CSU/DSU



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High Density Voice/Fax Module

Flexible Voice Interfaces (VICs)

- T1 and E1
- Up to 48/60 (T1/E1) Compressed Voice Channels

Diverse Signaling

- Delay, immediate and wink start
- CAS, QSIG w/PRI (PRI,R2 in Q2)



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DSP Architecture—TI549

- G.729, G.728, G.726, G.723.1, G.729a, G.711 PCM
- Group III Fax Relay

Protocol Support

- VoIP, VoFR
- VoATM with 3640/60 (2600 future)
- H.323 vers. 2
- Support for:SGCP, MGCP in future

New

T1/E1 Multiflex VWICs for Cisco 2600 and 3600 Series

- **Maximum investment protection supporting:**

- WAN connections as a WIC
- Drop and Insert for voice and data as an add/drop multiplexer
- Packet voice as a VIC w/ the high density packet voice NM for PBX or PSTN connections
- Future NM support planned

NEW



Use as Standalone as WIC or D&I Multiplexer

- **Integration to simplify network management**

- T1CSU/DSU or E1 DSU
- E1 balanced and unbalanced
- Add/Drop Mux. (2 port D&I version only)

- **Full set of management and diagnostic features (BERT functionality in future)**

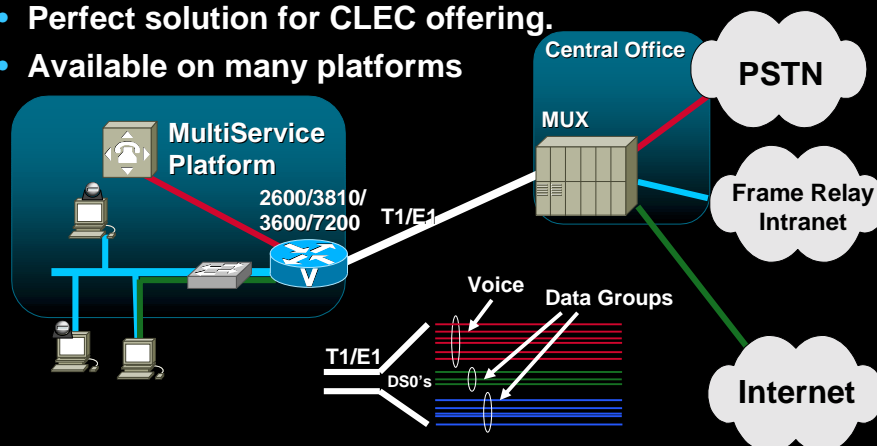


Required for T1/E1 Packet Voice as PBX/PSTN connection

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Drop and Insert (MIX) Integration

- Provides ideal step for customers not quite ready for packet voice.
- Perfect solution for CLEC offering.
- Available on many platforms





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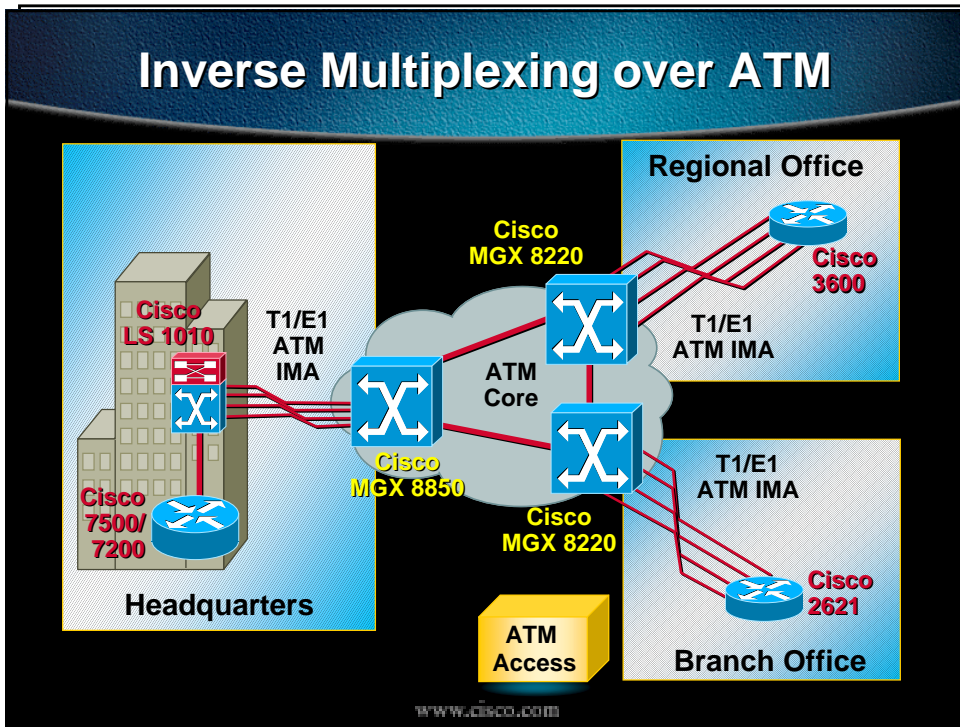
New! Multiport ATM Network Module

Supports Inverse Multiplexing over ATM (IMA)—provides cost effective way to increase bandwidth without the high cost of a T3/E3 connection

- 4/8-port T1/E1 versions
- ATM Forum IMA Version 1.0 Compliant
- Integrated CSU/DSU on T1 versions
- ATM Adaptation Layer 5 (AAL5)
- 256 VC's per interface
- 4 IMA bundles per module
- UBR, VBR-rt, VBR-nrt, and ABR support
- Supported in Cisco IOS release 12.0(5)T or later

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ATM-25 Network Module

New
Feature!

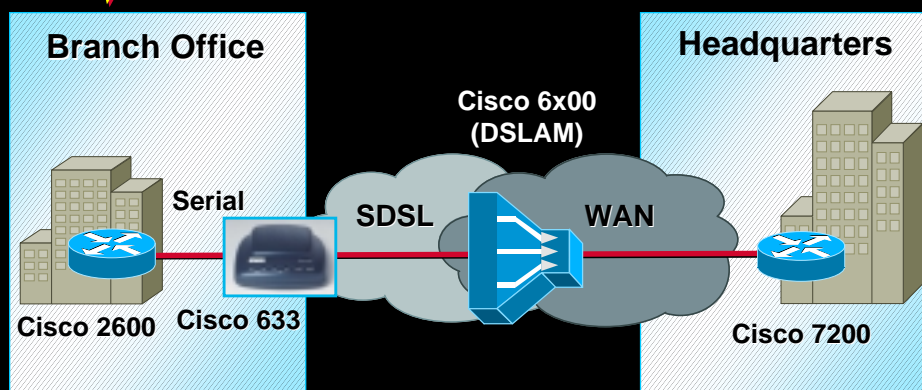
- Designed for connection to external ATM-enabled ADSL modems (Cisco 626, Westell, and Alcatel)
- Supports full ATM traffic shaping (AAL5)
- Requires Cisco IOS "Plus" image
- \$2,200 list price



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NEW

SDSL Access

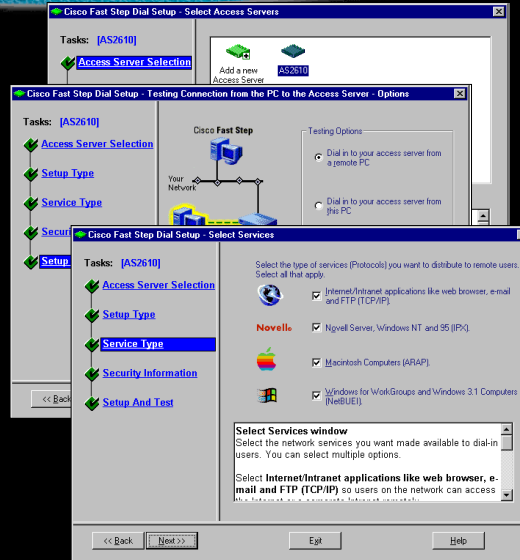


- Use serial interface connected to Cisco SDSL CSU/DSU
- Symmetric data rates up to 1168 kbps

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Cisco Fast Step for 2610

- Simplifies the process of providing dial access services
- Provides user-friendly interface for configuration of dial-up protocols and security services
- Included at no extra cost with analog modem network modules



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Enhanced Dial Features

Works on 2600 and 3600

- V.90 modem support
- PRI and BRI in the same chassis—11.3(3)T
- Dial-out, fax-out, channelized T1 for digital-11.3(4)T
- VPN support
- R2 support 12.0(1)T
- Digital modems over BRI—12.0(2)T



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Cisco IOS Firewall and Encryption Feature Sets

- Integrated firewall and IPSec encryption: 56 bit and 168 bit (3DES) VPN access solutions for Cisco 2600 and 3600 series
- Context-based access control
- Java blocking
- Logging and real-time alerts
- Intrusion Detection in 12.05T and later



Cisco 2600 Series



Cisco 3600 Series

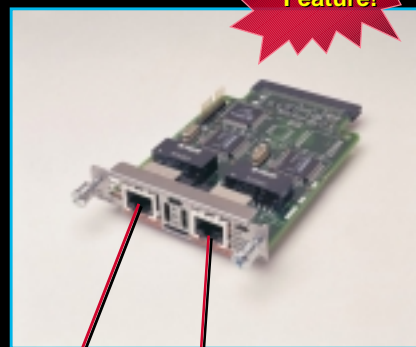


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BRI Voice Interface for C2600/C3600

• Key features

- 2 BRI interfaces per VIC
- Up to 4 voice channels
- Q.931 user side support
- Connects to PBX or off net
- Supports DID and caller ID



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Cisco H.323 Gatekeeper (Voice and Video)

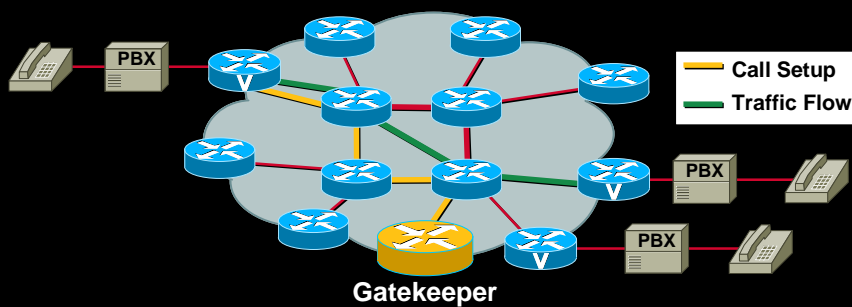
- VoIP Scalable address resolution
- Bandwidth management
- H.323 traffic segregation
- Proxy for secure access to enterprises
- Provides QoS for intra-zone calls
- CDR generation
- H.323 V2 features
- Fault-tolerant network capability (HSRP)
- Available on Cisco 3640 NEBS compliant router platforms

New Capability
Expanded to
MultiService
Routers!



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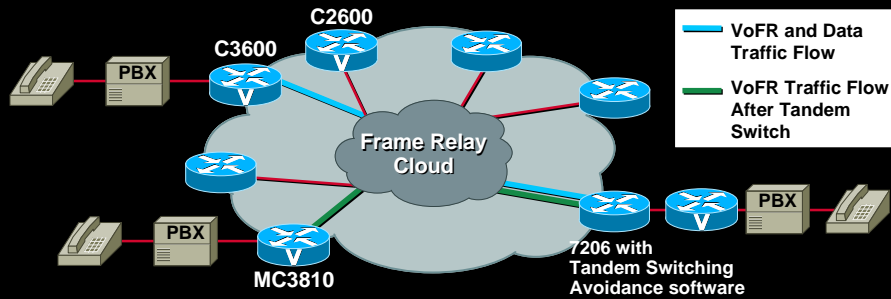
Gateway Initiated VoIP Calls— H.323 Gatekeeper



- Defined by H.323 (used in VoIP products like 2600/3600)
- Gateways auto register with gatekeeper
- Gateways initiate calls but do not know about other gateways
- Telephony E.164-style addresses mapped to IP addresses by gatekeeper
- H.323 gatekeepers allow scaling

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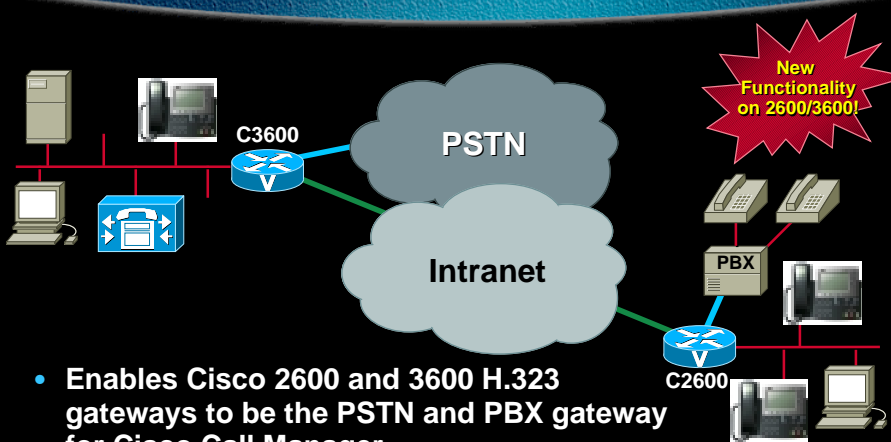
Voice over Frame Relay and Tandem Switching Avoidance for VoFR



- FRF.11 and FRF.12 on 26xx,36xx and 3810
- Allows large scale VoFR networks
- Voice switching without de-compression/re-compression
- 7200 manages large numbers of PVC's
- Data can share same PVC

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Interworking with AVVID

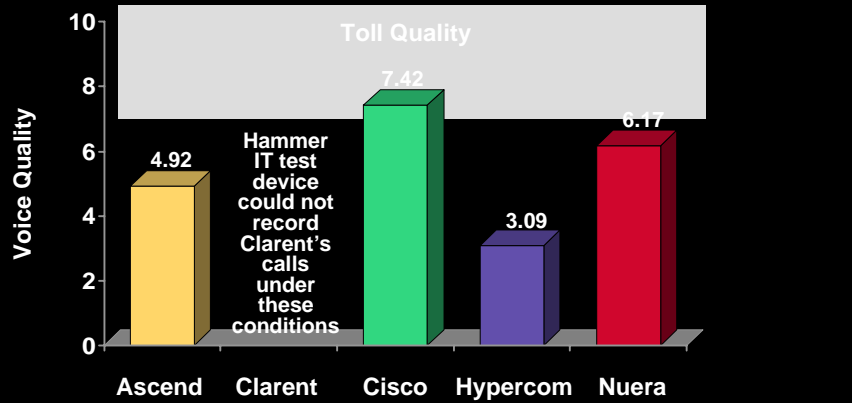


- Enables Cisco 2600 and 3600 H.323 gateways to be the PSTN and PBX gateway for Cisco Call Manager
- Enables supplementary services through Cisco H.323 gateways with H.323 Open Close Logical Channels

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Voice Quality Under **Poor** Network Conditions

*With Burst Errors Applied to our Backbone T1 Router Link to Introduce Errors in Approximately 10% of IP Data Packets



Cisco Provides the Solutions for MultiService Networking

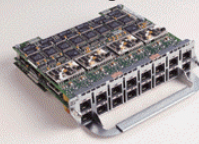
New Compression AIM



New ATM Modules



New Analog Modems



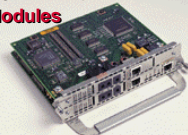
New FE 2600 Platforms



New BRI Voice Interface



New FE with PRI Modules



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Voice Roadmap for the Multiservice Branch Office



12.0(6)X	12.1(1)X	12.1(2)X	12.1(3)X
VoIP on 3810 VoATM on 3600 Enhanced Voice features VoFR on Digital module QSIG support PRI/BRI AAL1 on OC3 CVM V2	Hoot and Holler Voice Trunk Conditioning	MGCP support Full Call Manager support AAL1 on IMA Enhanced Signaling-PRI,FGD, T-CCS	VoATM - AAL2 Caller ID DID Network Side PRI

Dates and features subject to change

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Agenda

- Branch Office Trends and Opportunity
- Voice/Data Integration
- MSABU Product Updates
- Roadmaps
- **Information**

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Cisco MultiService Access Web Sites

Web Sites for Branch Office Multiservice Access

- Cisco 26xx
<http://www.cisco.com/warp/public/728/2600/>
- Cisco 36xx
<http://www.cisco.com/warp/public/728/3600/>
- MC3810
<http://www.cisco.com/warp/public/728/3800/>

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Solution Finder for Modular Routers

- An on-line dynamic “catalog” of available modules
- Accessible from the Modularity Café
- Presents basic marketing information with a link to each module’s datasheet
- Partner:
www.cisco.com/go/modulefinder
- Customer:
www.cisco.com/go/modulecafe



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Cisco Provides the Solutions for MultiService Networking

Cisco 3600 Series



Voice Services



Data Services



VPN Services



Cisco 2600 Series



Dial Services



Cisco MC3810



Video Services



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Please Complete Your Evaluation Form

Session 1208

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CISCO SYSTEMS



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INTERNET GENERATIONSM

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