



## Agenda

- Catalyst Key Initiatives
- Catalyst 6000 Family Introduction
- Catalyst 6000 Architecture Scalability
- Catalyst 6000 System Features
  - Intelligent Wiring Closet Solutions
  - Intelligent Backbone and Web Scaling Solutions
  - High Availability/Network Resilience
  - Multicast
  - Security
- Catalyst 6000 Family Roadmap
- Catalyst Family Summary

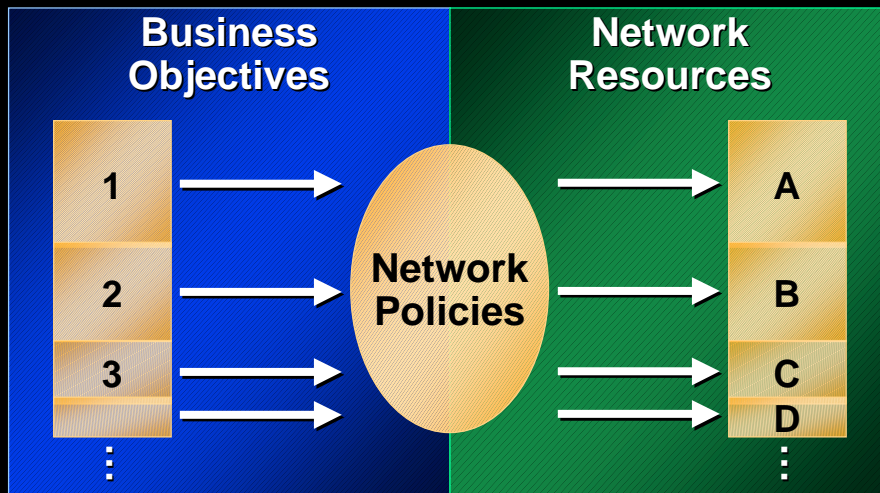
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## Catalyst Initiatives

- Intelligent switching architectures
  - Increased switch scalability
  - Enhanced QoS (traffic detection/classification, admission control, etc.)
  - Layer 4–7 switching services (application/content switching)
  - Security, multicast, management, etc.
- Convergence of data/voice/video traffic
- Multifunction device integration
  - Network appliances
  - LAN/MAN/WAN technologies
- End-to-end solutions approach

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## The Enterprise Network Challenge



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## Examples of Mission-Critical Applications

- Order entry
- Finance
- Manufacturing
- Human resources
- Supply chain management
- Sales force automation

Microsoft

ORACLE

SAP

Sum  
microsystems

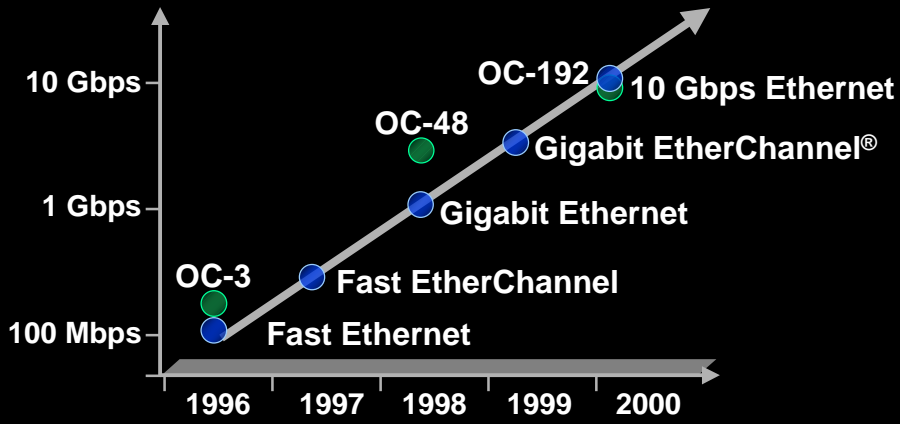
IBM

PEOPLE  
Soft

Baan

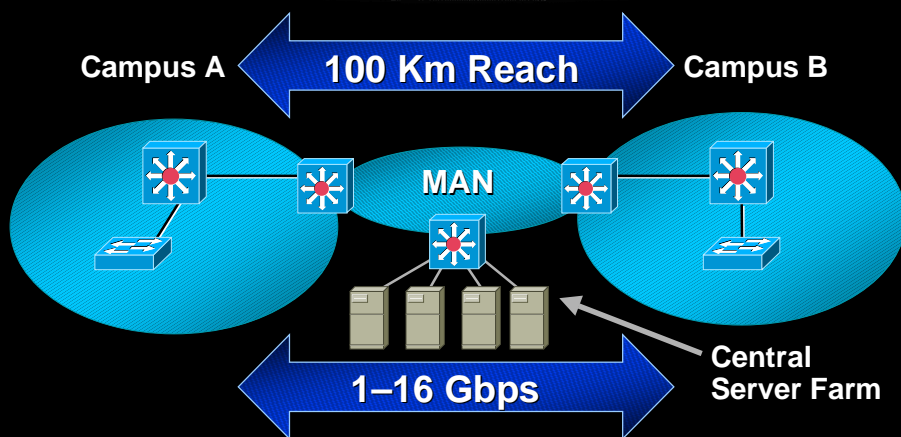
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## Next-Generation Performance and Scalability



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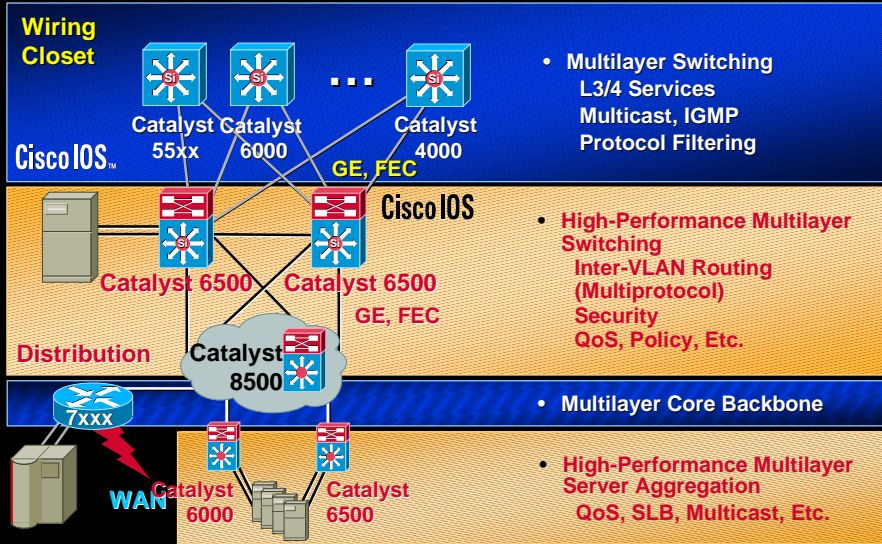
## Long-Reach Gigabit Ethernet



- Cost-effective bandwidth for the MAN
- 1000BaseZX GBIC support on all Catalyst switches

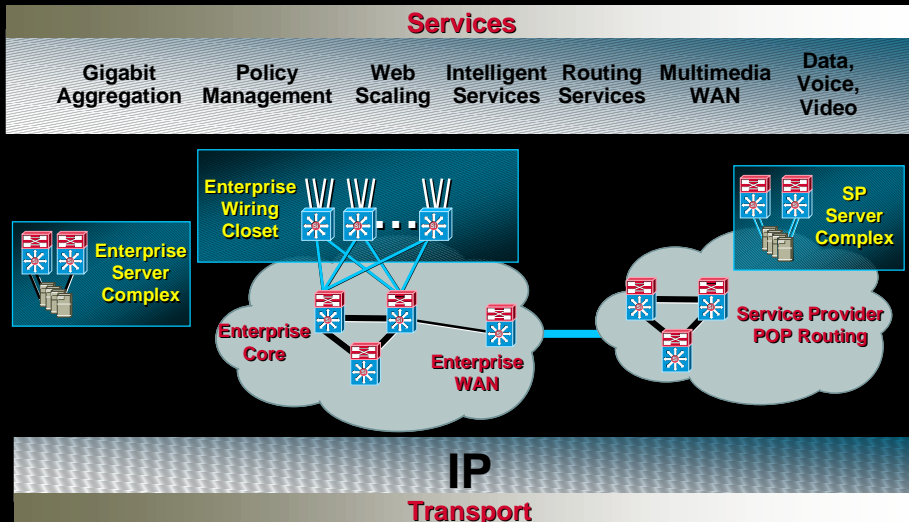
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# Catalyst Evolution—'99+



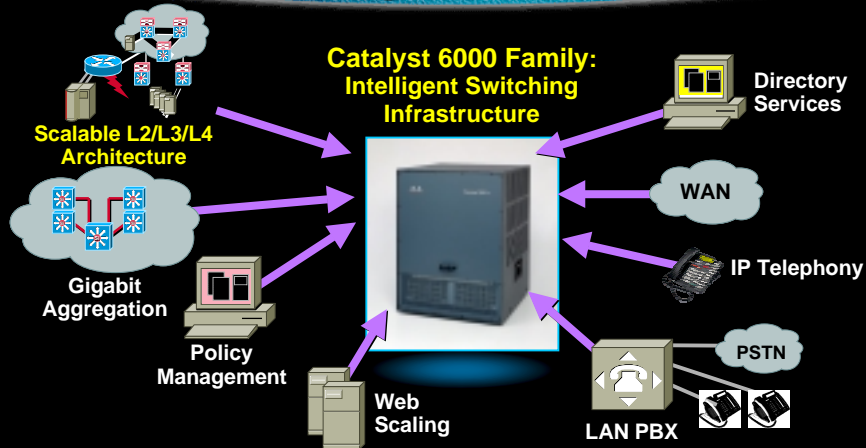
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# Catalyst 6000 Family One Platform, Multiple Deployment Options



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## Catalyst 6000 Family: Intelligent Switching Infrastructure



**New-World Networks Demand that Switching Infrastructure Scales to Support Scalable, Intelligent Services, and Multiple Device Functionality**

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## Catalyst 6000 Family

- **Key features include:**

Wire-speed, multilayer switching scalable to 256 Gbps

Scalable IP, IPX, IPmc routing performance to 150 Mpps

Multiprotocol routing support for AppleTalk, DECnet, VINES

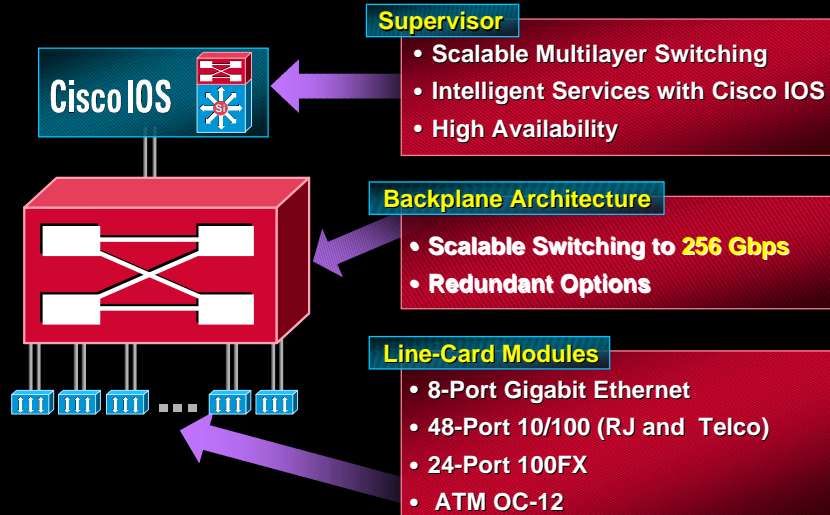
Support for CiscoAssure, all key network services like QoS, security, multicast and management

Support for Cisco IOS® software



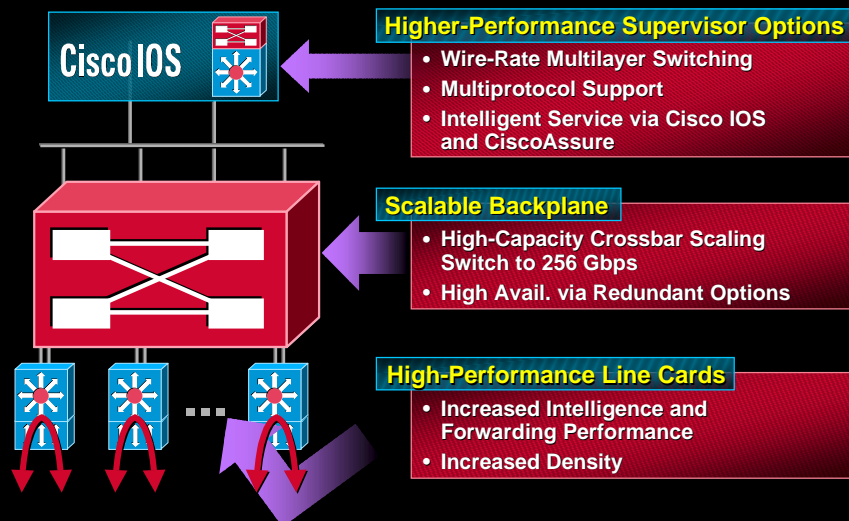
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## Catalyst 6000 Family Architecture



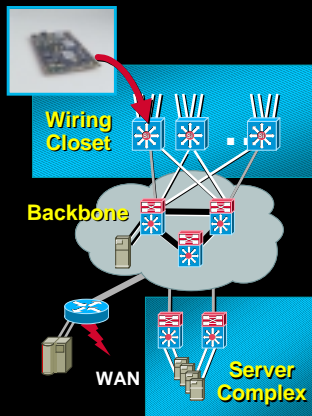
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## Catalyst 6000 Scalable Architecture



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## Delivering Intelligent Services to Wiring Closets



- 15 Mpps Multilayer Switching (Layer-2/3/4 Services)
- Enhanced QoS Supports Converged V/V/D Networks (e.g., IP Telephony, NetMeeting, VoD, Etc.)
  - Admission Control
  - Traffic Detection
  - Traffic Classification
- Network Security via VLAN ACLs
- Multicast, IGMP, Protocol Filtering

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## Delivering CiscoAssure in the Wiring Closet

- Traffic detection

Ability to identify applications  
e.g., SAP vs. DOOM

- Traffic classification

Can classify based upon:

IP SA/DA (with mask), Ingress Port, Source/Destination L4 Port (with mask)

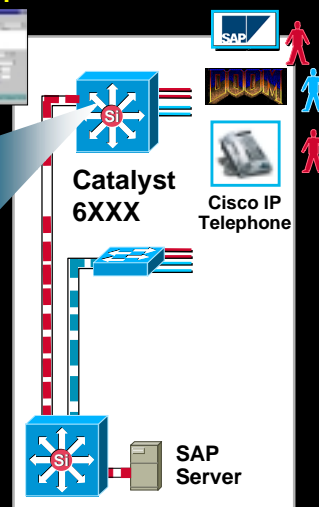
- Admission control

Ability to restrict applications

Wire-speed access control lists

### QPM 1.1

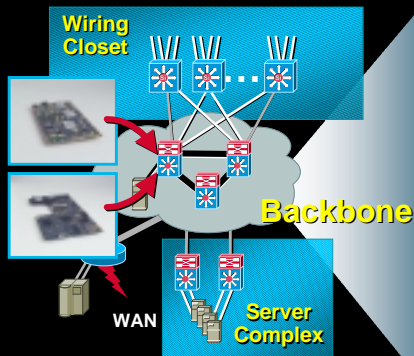
Set SAP = High  
Set Voice = High  
Set DOOM = Low



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## Delivering Backbone and Server Farm Intelligence



- Wire-speed IP, IPX and IP Multicast at 15 Mpps
- Multiprotocol Support for AppleTalk, DECnet and VINES
- Large Network Support via IS-IS and BGP4 for Scalable Internal or Interdomain Routing
- High-Availability (Layer-1/2/3)
- Web Caching Technologies to Conserve WAN Bandwidth and Increase Response Time
- Accelerated Server Load Bal.

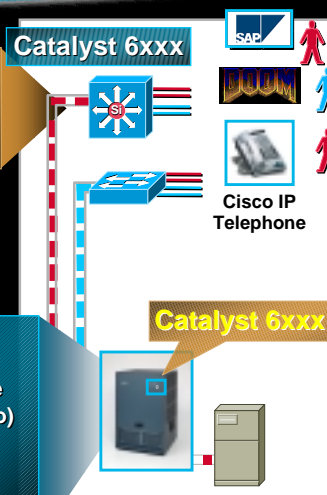
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## Delivering End-to-End QoS in the Backbone

- Congestion avoidance  
WRED, multiple queue thresholds
- Scheduling  
IP precedence, 802.1p and ISL priority  
Dual transmit queues on a per port basis, WRR  
TOS<->COS mapping

Set SAP & Voice = High  
TOS = 7  
Set DOOM = Low  
TOS = 2

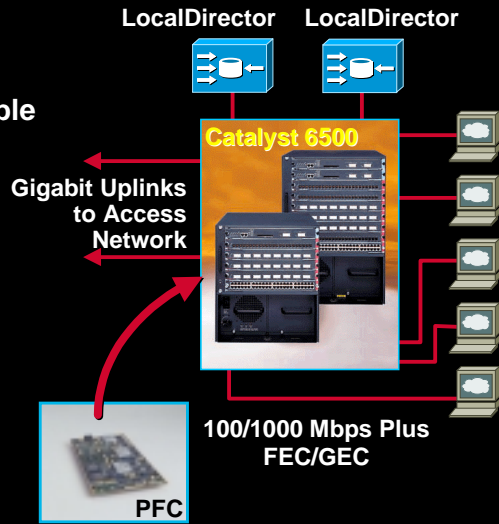
For TOS = 7  
Threshold = 4  
High-Priority Queue  
(70% Transmit Ratio)  
For TOS=2  
Threshold=1  
Low-Priority Queue  
(30% Transmit Ratio)



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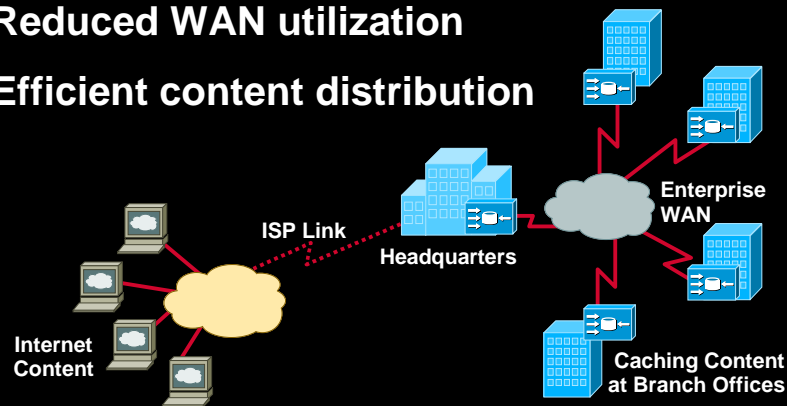
## Delivering Accelerated-SLB to the Server Complex

- Wire-speed server load balancing
- Multiple LDs provide scalable content redirection and high-availability
- Wire-speed security, IP switching
- Different customer service types with policing
- Scalable to thousands of connections
- High density 100/1000



## Efficiency Through Content Caching

- Improved response time
- Reduced WAN utilization
- Efficient content distribution



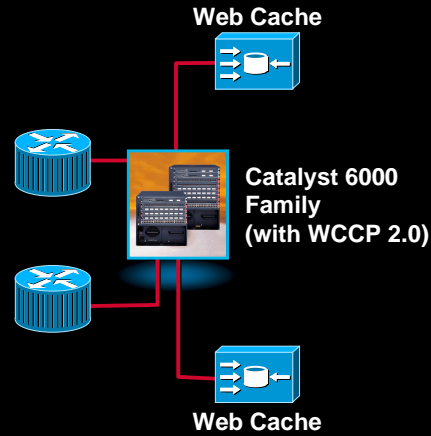
## Cache Engine and the Catalyst 6000 Family

- **Web Cache Control Protocol**

Provides “network intelligent” load distribution across multiple network caches

Maximizes download performance and content availability

Licensed by all major cache vendors



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## Catalyst 6000 Multicast

- **Wire-rate multicast forwarding**

- **IGMP snooping**

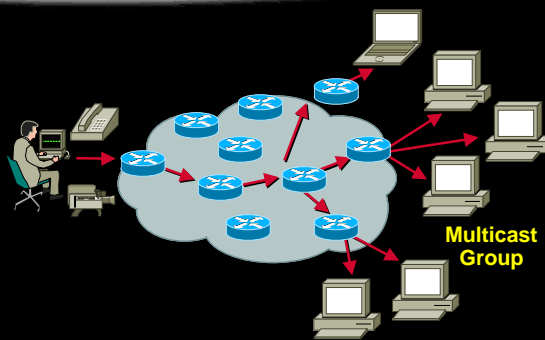
Learns about various multicast routers and multicast sources

- **Scalable multicast protocols**

PIM (sparse and dense modes)

IGMP, CGMP

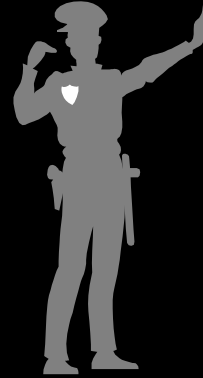
GMRP (multicast registration protocol)



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## Catalyst 6000 Network Security Services

- **Customer drivers:**
  - Secure networks and networked applications
  - Comprehensive and uniform end-to-end security policies
- **Cisco solution**
  - Port security
  - User registration
  - Dynamic VLAN membership
  - TACACS+
  - IP permit lists
  - MD5 route authentication
- **Wire-speed Access Control Lists**



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## Catalyst 6000 Family Network Resilience—Platform Level



### Supervisor

- Redundant Supervisors
- Redundant GE Uplinks
- Redundant Switch Fabrics
- Fast Switchover without Loss of Connectivity

### Line Card Modules

- FEC and GEC
- Hot-Swap Line Card

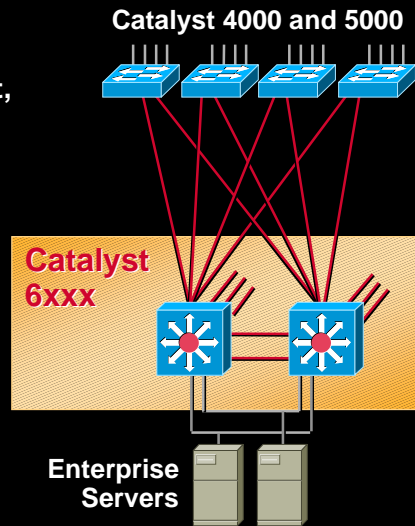
### Common Equipment

- Redundant Power Supplies
- Redundant Load-Sharing Fans

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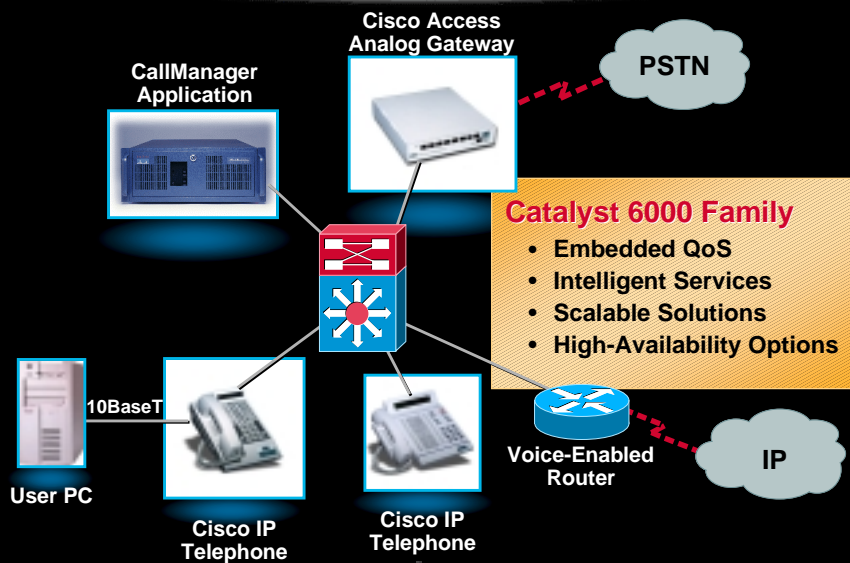
## Catalyst 6000 Family Network Resilience—Network Level

- **Physical layer**
  - EtherChannel (Fast Ethernet, Gigabit Ethernet)
  - Port/uplink/backbone fast
  - Multimodule channeling
- **Link layer**
  - ISL, 802.1Q
  - Spanning tree per VLAN
- **Network layer**
  - HSRP
  - L3 load balancing



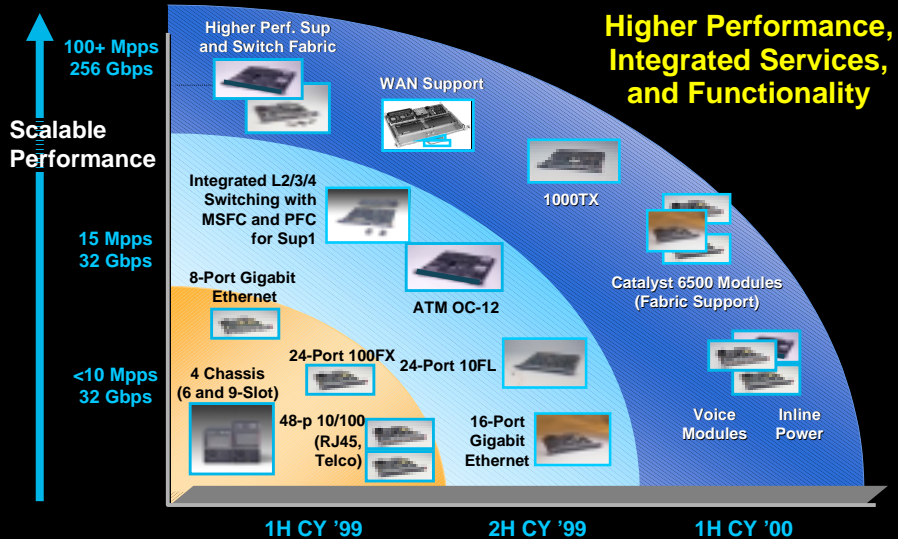
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## Catalyst 6000 Voice Directions

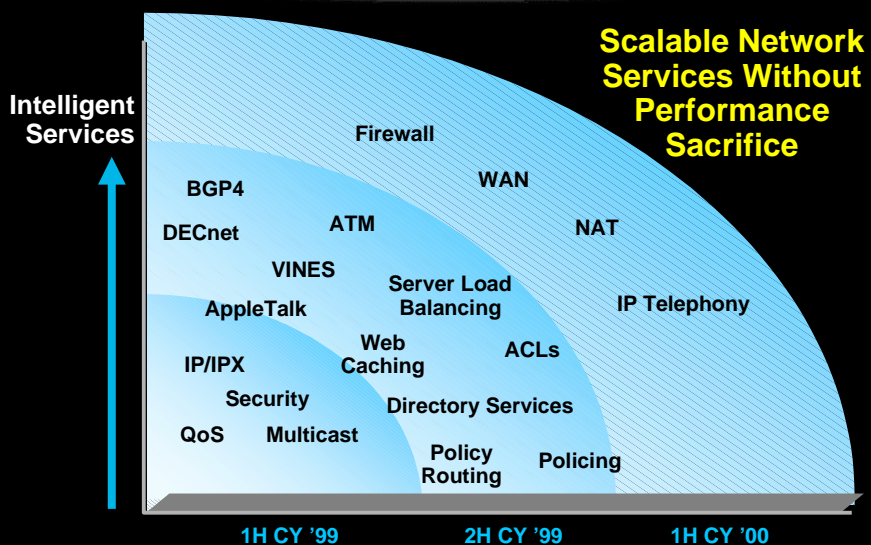


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# Catalyst 6000 Hardware Roadmap



# Catalyst 6000 Family Multilayer Services Roadmap





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