



Campus Communications Fabric – Network Evolution



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Enterprises Are Under Increasing Pressure



Collaboration



Empowered User



SLA Metrics



Global Availability



Reg. Compliance

New Business Pressures



Operational Limitations

Power & Cooling



Asset Utilization



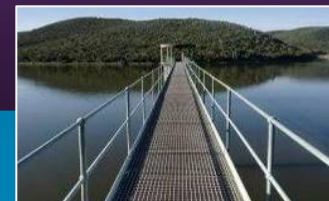
Provisioning



Security Threats



Bus. Continuance



Trends Driving New Network Challenges

Video



Video and Audio Streams



VoD



Telepresence

Voice and Data Convergence



E-mail, Chat, and IM



PC and IP Telephony



Unified Messaging

Peer to Peer



On-Line Gaming



Music Download



File Sharing

OS Applications, Devices



Mac Os X



Windows Vista



Linux

Green

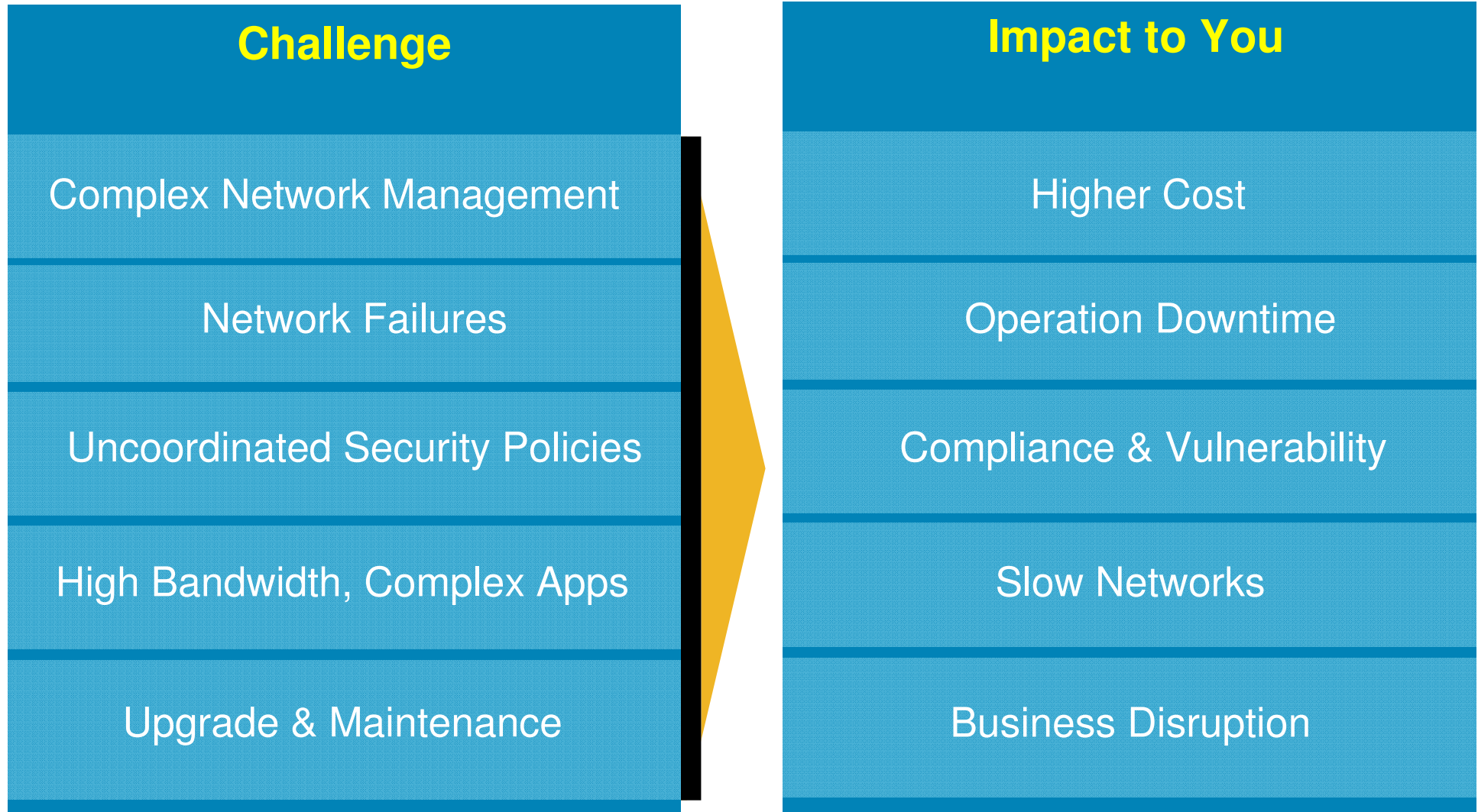


Data Center

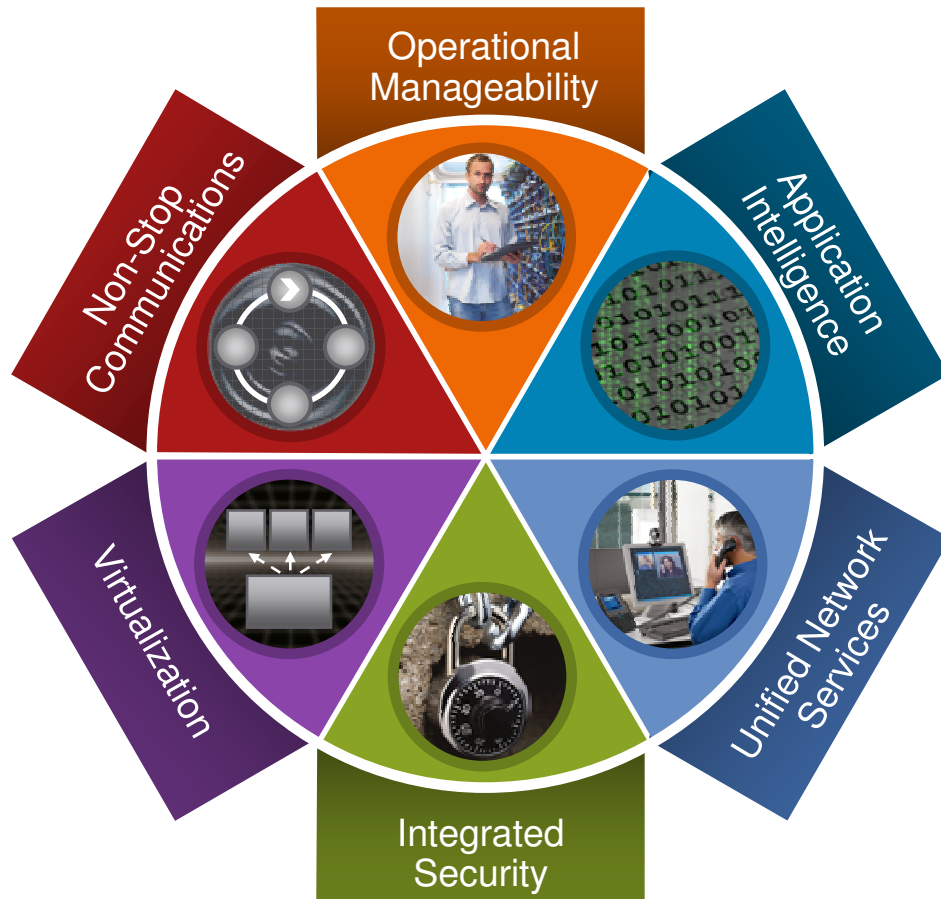


Corporate Initiatives

Today's Network Challenges



Campus Communications Fabric



Solution

Simplify Operational Management

Non-Stop Communications

Ensure security and scalability

Rich set of network services

Minimize cost and disruption

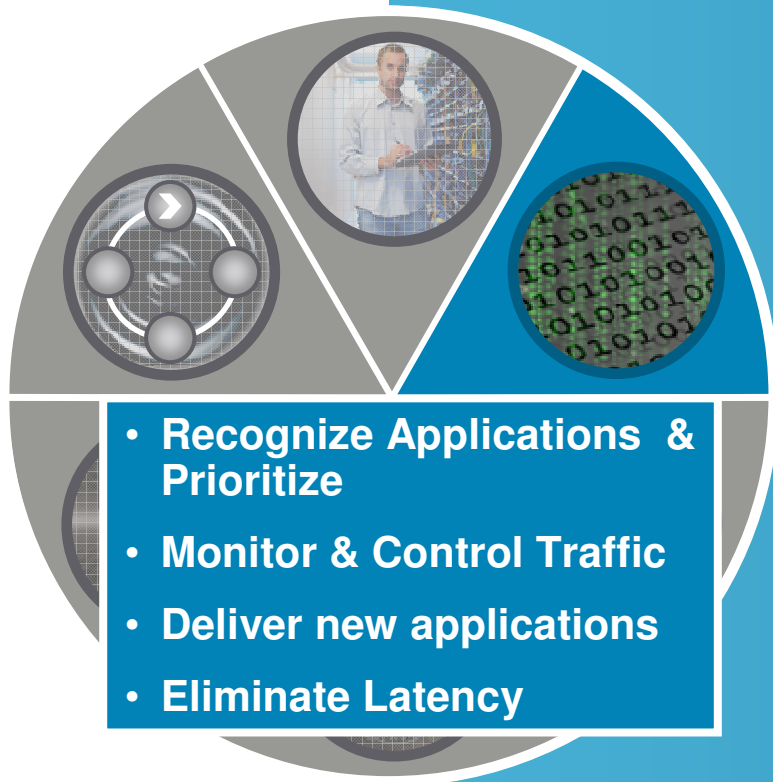


Campus Communications Fabric Framework



Application Intelligence

Maximize User Experience



Business Benefits Delivered:

- Eliminate business latency
- Improve compliance
- Delivery of new collaboration applications
- Protection of misbehaving applications

Unique Cisco Advantage:

- Highly scalable control of application flows
- Network support for TelePresence – eliminating costly travel, reduce carbon usage

Stateful Application Intelligence in Wiring Closet

Integrated into Supervisor Engine, Multi-Gigabit Scale

Link Utilization		Control
Kazaa (P2P)	25%	▪ Rate-Limit
Skype	10%	▪ Block
AOL IM	5%	▪ Prioritize
H.323 and SIP	15%	▪ Etc.
Oracle	20%	
HTTP	25%	



Catalyst 6500
Supervisor Engine 32 PISA

Capabilities

App Visibility: Identify and monitor more than 100 applications

App Control: Prioritize, limit or block apps

Up to 8 Kb deep packet inspection

Cisco QPM 4.0 provides centralized QoS management

Benefits


Control recreational applications

Meet compliance requirements

Ensure mission critical application performance

Unified Network Services

Anticipate Business Shifts

- 
- Connect to any resource/person through any device
 - Consistent services and performance
 - Wired and wireless

Business Benefits Delivered:

- Any application to any screen
- Increased productivity due to increase application access
- Quick integration of new applications and services (Telepresence)

Unique Cisco Advantage:

- Tighter integration across technology portfolios
- Integrated, advanced capabilities are inherent in Cisco's platforms

PoE Solutions

Scaling to 30W Per Port

CY 2007



CY 2008



CY 2009



IEEE 802.3af Standard
(PoE)



- Support for 400+ IP Phones
- Intelligent power monitoring
- Power supplies PoEP ready
- Chassis PoEP ready

Enhanced PoE
(EPoE)



- 20W per port
- Support EPoE devices such as:
 - Cisco 802.11n Access Point 1250
 - High power Cisco IP phone
- Supported on today's Cat6K and Cat4K modules

IEEE 802.3at Standard
(PoEP)



- 30W per port
- Supported on today's Cat4K modules
- Planned for Cat6K
- NEW Advanced features to reduce phone power consumption

Integrated Security

Ensure Protection/Privacy/Compliance



Business Benefits Delivered:

- Ensure regulatory requirements
- Safeguard client identity and application/data confidentiality
- Provide pro-active threat detection and containment

Unique Cisco Advantage:

- Embedded end-to-end security
- Less power consumption through integration vs. hundreds of appliances
- SAP relationship to deliver governance, risk and compliance (GRC) solution

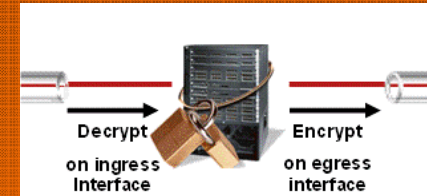
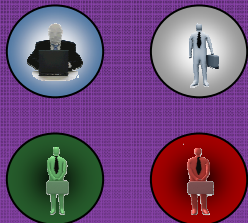
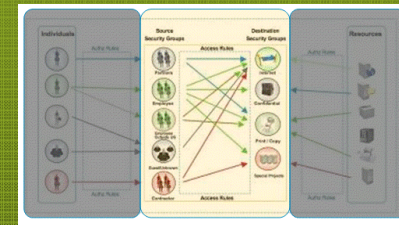
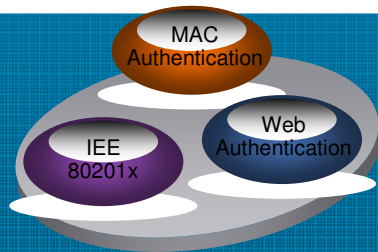
Cisco Trusted Security

Seamless Authentication for Various Access Types

Unified Identity Authentication

Converged Policy Framework

Converged Policy Definition for Different Access Types Policy Enforced Throughout the Network



Transforming From Topology-aware to Role-aware Access Control

Role Aware Network

Privacy & Confidentiality

Prevent Data Sniffing and Tampering with Line-rate Hop-by-hop Encryption

Flexible Packet Matching in Wiring Closet

Integrated into Supervisor Engine, Multi-Gigabit Scale

Catalyst 6500
Supervisor Engine 32 PISA

New

Action

- Block
- Log
- Etc.



011111010101000100001000100111110

Match Pattern

And

Or

Not

Capabilities

Flexible and granular L2-7
pattern matching

Up to 8 KB deep packet
inspection

Block or log traffic

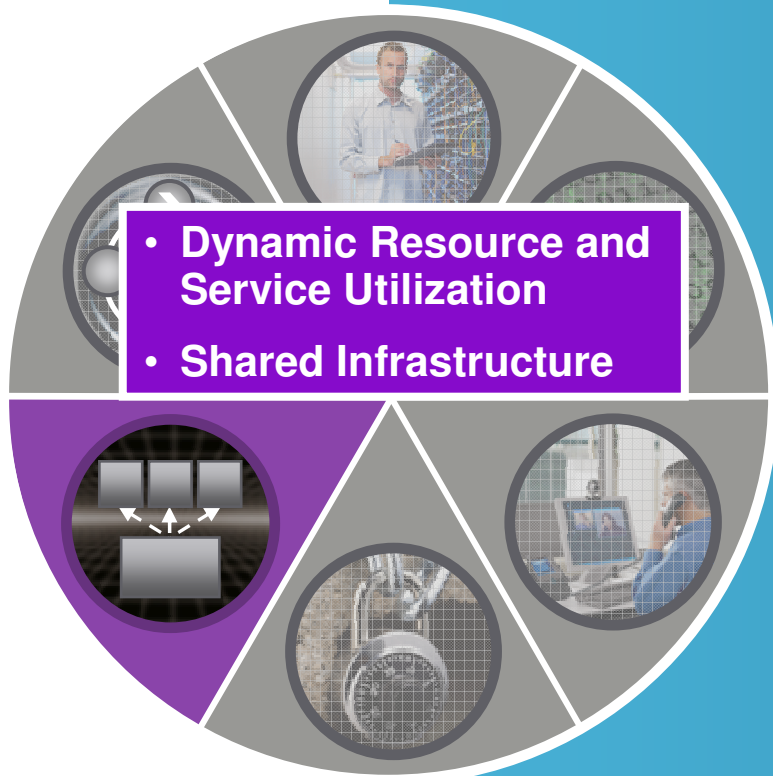
Add new FPM security
filters with Cisco Security
Manager 3.1

Benefits

Rapid protection against worm
attacks

Virtualization

Maximize Asset Utilization



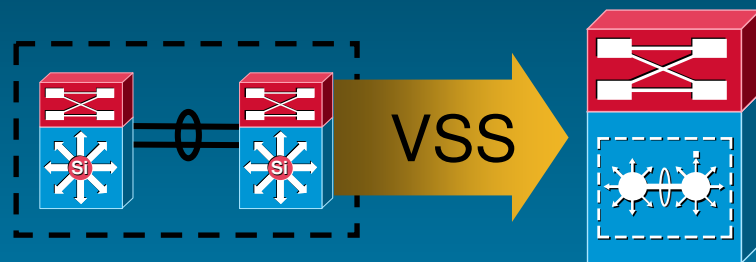
Business Benefits Delivered:

- Adopt new services on a common network (video surveillance integration)
- Secure guest or contractor access to network resources
- Department segregation for business compliance (HR vs. Finance)

Unique Cisco Advantage:

- Tested/proven architectures to ensure success
- Maximize resource use to minimize power usage

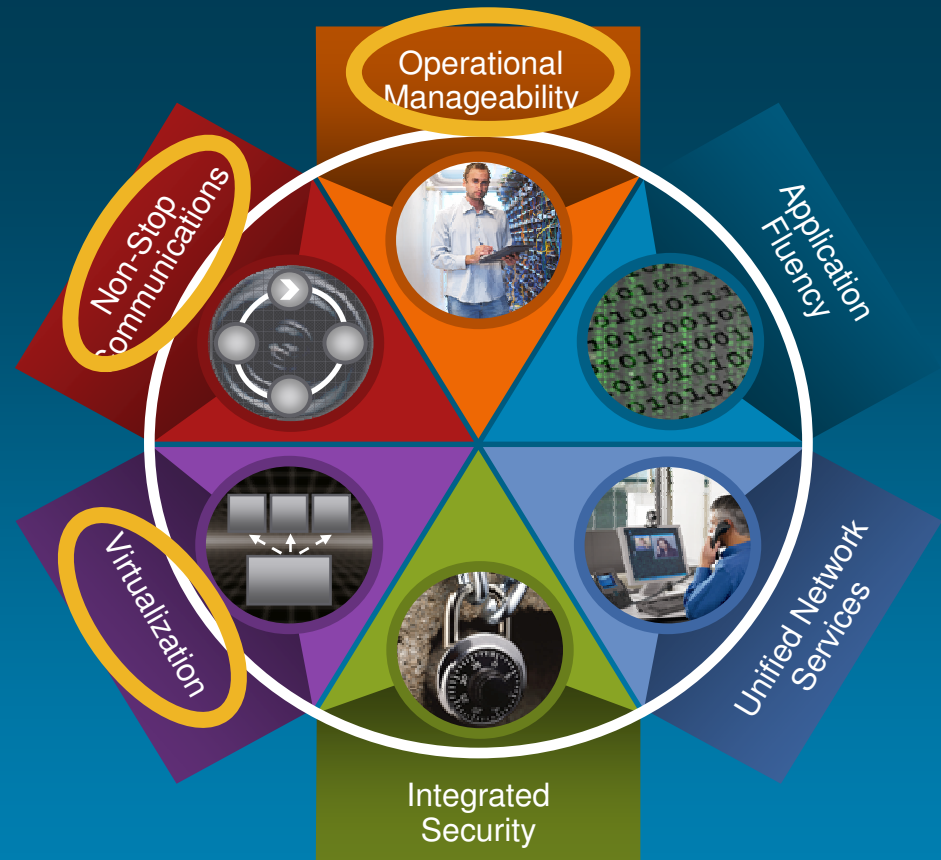
Catalyst 6500 Virtual Switching System (VSS) 1440



Multiple
Physical Cisco
Catalyst 6500s

Pooled
into One
Virtual
System

Network System
Virtualization Innovation



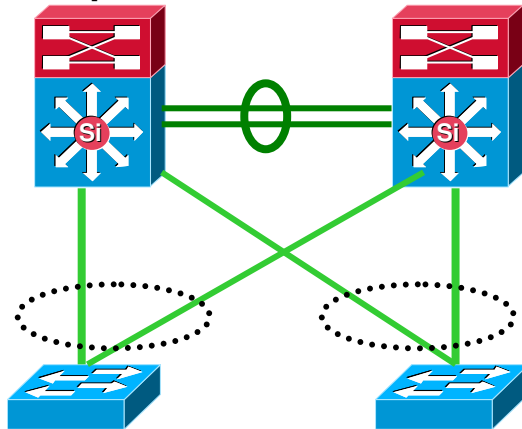
Virtual Switching System 1440

Network System Virtualization

Physical View

Active control plane
Active data plane

Hot-standby control plane
Active data plane



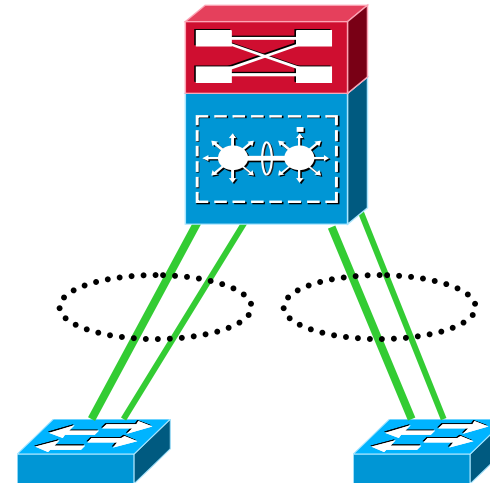
Features

Network System Virtualization

Multi-Chassis EtherChannel
(MEC)

Non-Stop Forwarding / Inter-
Chassis Stateful Switch Over
(NSF/SSO)

Logical View



Benefits of VSS

Simplifies Operational
Manageability

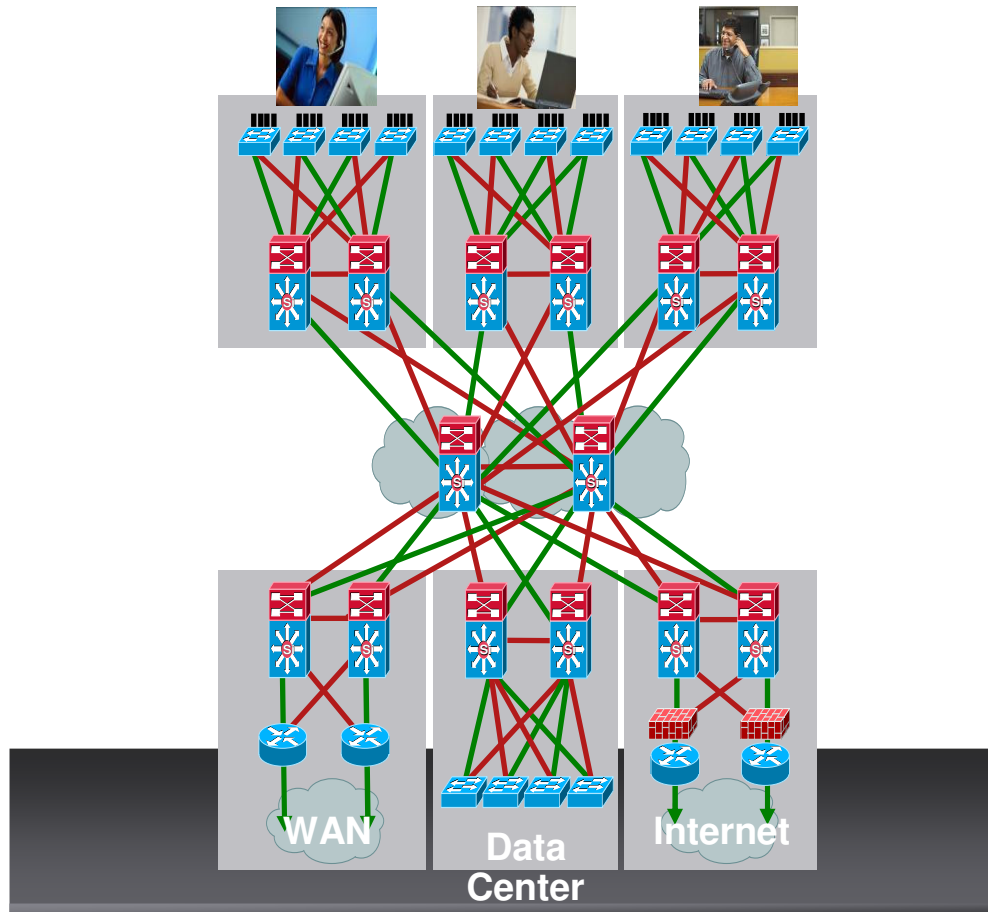
Scale the System Bandwidth
Capacity to 1.4 Tbps

Boost Non-stop Communication

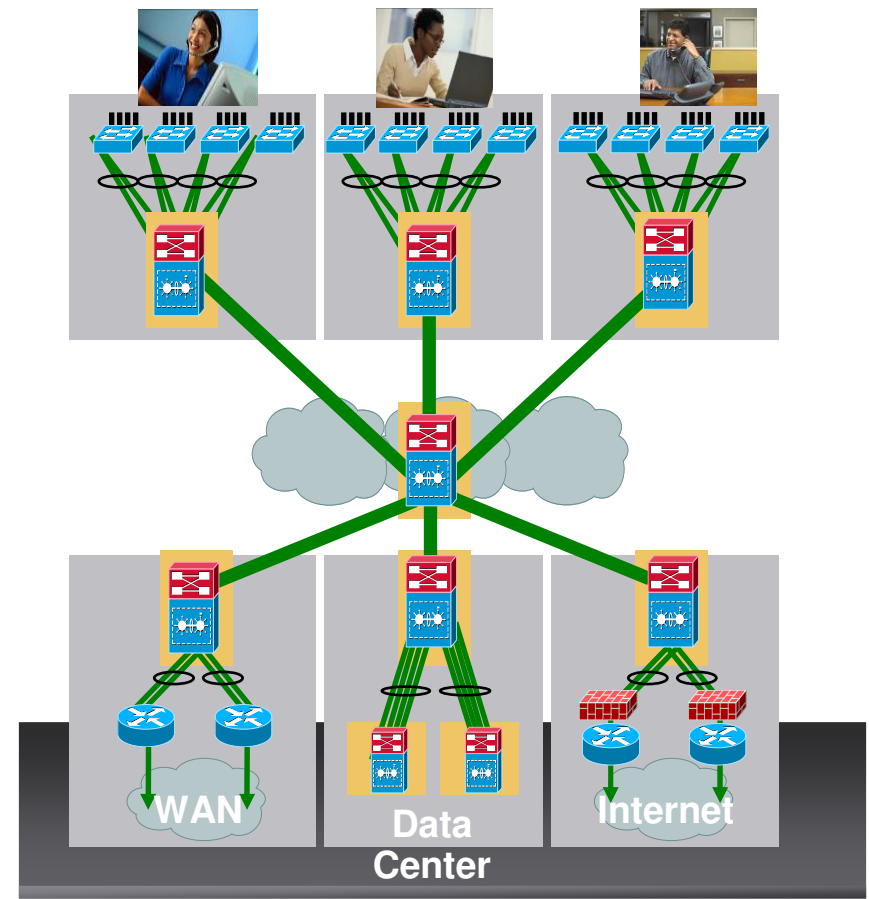
Cisco Catalyst 6500 VSS 1440

Network System Virtualization Innovation

Before



After



Non-Stop Communications

Ensure Business Continuity



Business Benefits Delivered:

- Reduction of downtime whether planned or unplanned
- Increased productivity and customer/employee satisfaction due to highly available network
- Reduce costly network outages that result in lost business, bad reputation or potential law-suits

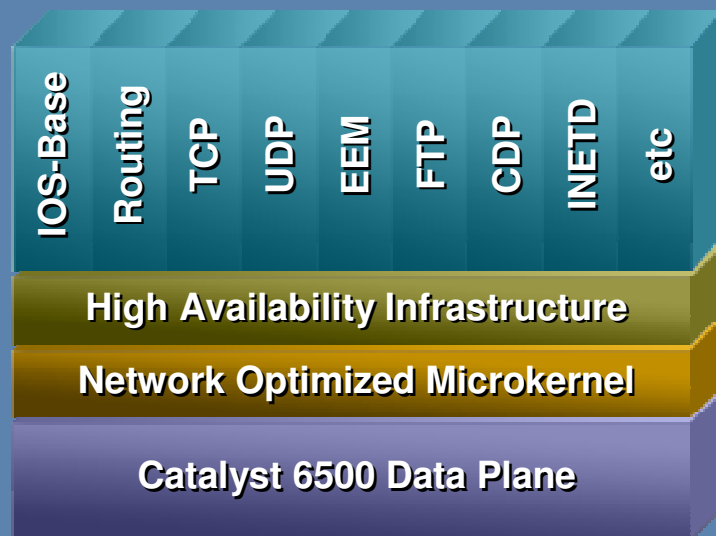
Unique Cisco Advantage:

- Tested/proven designs to ensure architectures support network, service and application continuity
- Device, System and Architecture level resiliency

Catalyst 6500 with Cisco IOS Software Modularity

INNOVATION

Cisco IOS Software Modularity



- Memory protection
- Fault containment
- Stateful process restarts
- Subsystem ISSU

BENEFITS

Catalyst 6500 Series with Cisco IOS Software Modularity



Minimize Unplanned Downtime

Simplify Software Changes

Automated Policy Control

Full Image In Service Software Upgrade (ISSU)



■ Capabilities

Allows full IOS image upgrade without taking switch out of service

Supports deployment of new features, hardware, services and maintenance fixes

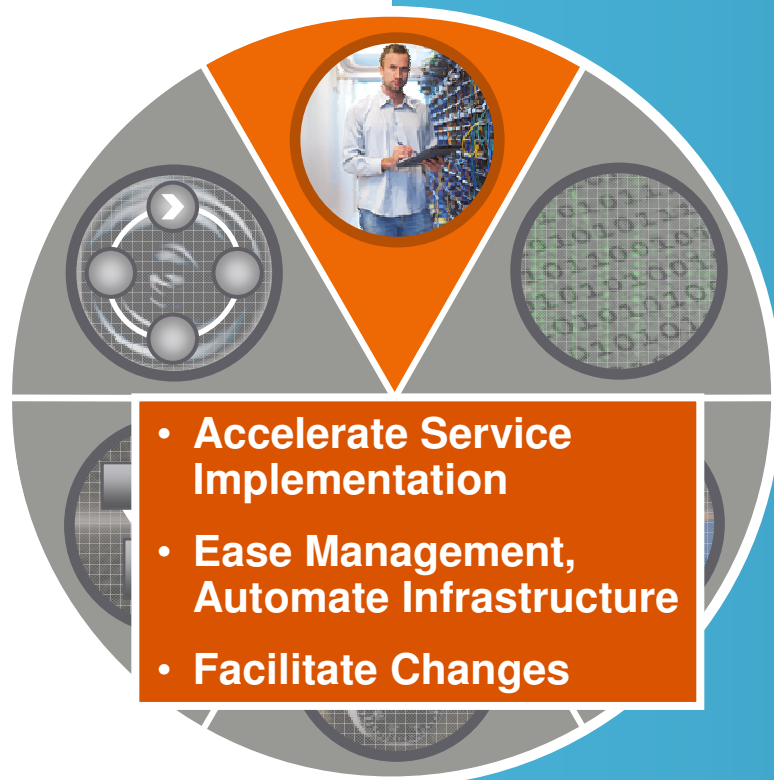
■ Benefits

Eliminate network disruption for software upgrade

Upgrades can be scheduled at anytime

Operational Manageability

Faster Service, Lower OpEx



Business Benefits Delivered:

- Rapidly accommodate business change and growth
- Minimize user impact of network maintenance/operations
- Manage and track network assets (software, hardware)

Unique Cisco Advantage:

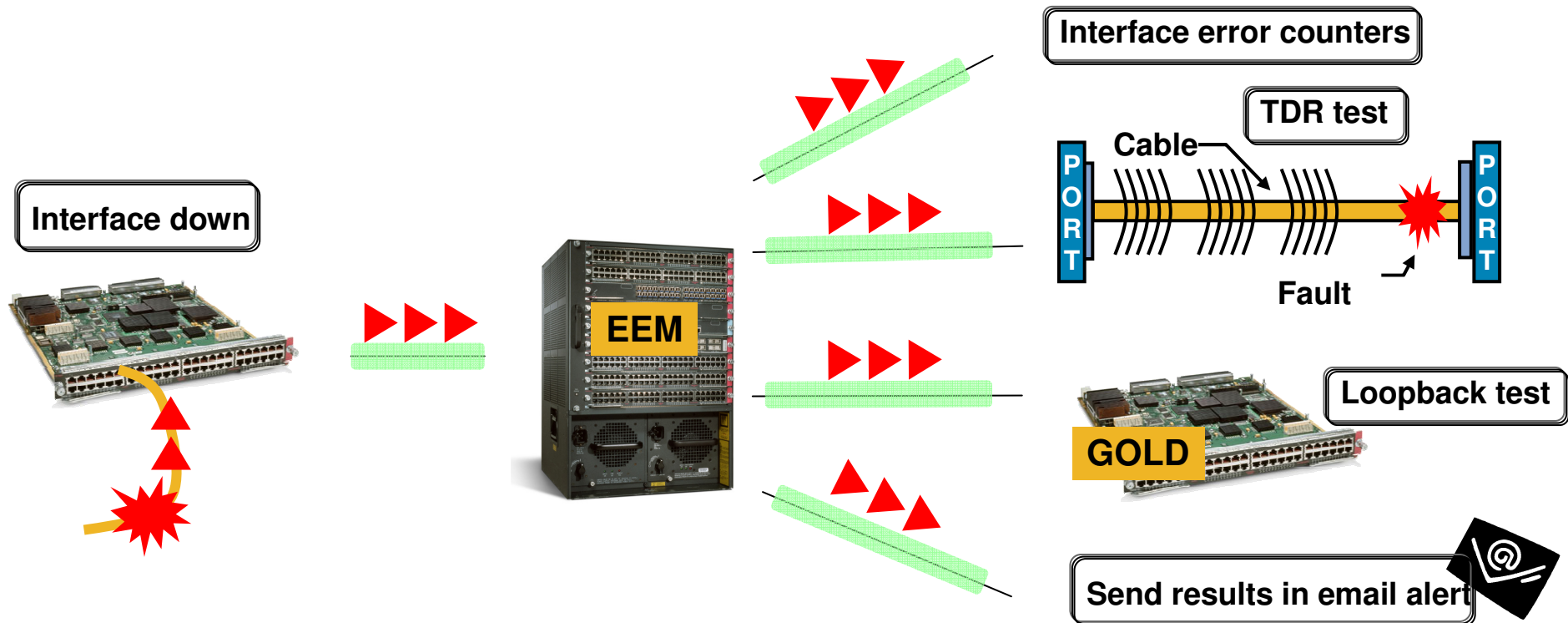
- Deep visibility into communications flows for planning and diagnosis
- Automate problem resolution through event management

Embedded Event Manager

Application Example

Upon matching the provided SYSLOG message 'LINK-3-UPDOWN', the switch performs the following actions:

- Display counter error statistics for the link that has gone down
- Start a Time Domain Reflectometry (TDR) test
- Start a GOLD Loopback test
- Send the results using a provided template to a user-configurable address



Minimum Functionality

	Functionality	Benefits Delivered
Quality of Service	Gigabit uplinks Priority Queues	Ensure Voice and Video Quality
Non-Stop Communications	Redundant paths Scalable protocols	Reduce Planned Downtime Maintain Calls during Failures
Integrated Security	Anti-Virus, Firewall Intrusion Prevention	Mitigate Conventional Attacks
Unified Network Services	PoE Ports Wireless LAN Controller	Power Endpoint Devices Support Wireless Devices
Operational Management	Smart Ports Online Diagnostics	Automatically Detect UC Devices Proactive Issue Resolution
Virtualization	Virtual LANs	Segment Users and Resources

Best Practice

	Functionality	Benefits Delivered
Quality of Service	Application Intelligence	Dynamically Manage Traffic
Non-Stop Communications	In-Service Updates Nonstop Forwarding Redundant Components	Automated Recovery
Integrated Security	Interception Prevention Flexible Packet Matching 802.1X support	Mitigate Denial of Service Attacks Mitigate Adaptive Threats Identity-based Services
Unified Network Services	Intelligent Power Mgmt ePoE support	Efficient use of Power Support High-speed Wireless Access Points
Operational Management	Automated Device Configuration (EEM) Smart Call Home	Faster, More Cost-Efficient Deployments Avoid Onsite Visits
Virtualization	Virtual Switching	Shared Capacity and Control Minimal Downtime



Campus Communications Fabric 3 – Video Ready Campus



Video Transformation

Top Business Benefits Today*

Cost Savings



Travel
Meetings

Collaboration



Ecosystem
Processes

Strategic
Differentiation

Customer
Satisfaction



Training
Global
Interactions

Culture and
Branding



Pervasive
Real-Time
"Green"

*Video in the Enterprise: A Snapshot of Current and Planned Adoption, IDC, January 2008.

Enterprise Video

Key Technology Trends and Implications



**Migration to
HD Video**



**New Content
Creators /
Consumers**



**Unified
Communications**



**Universal
Access**

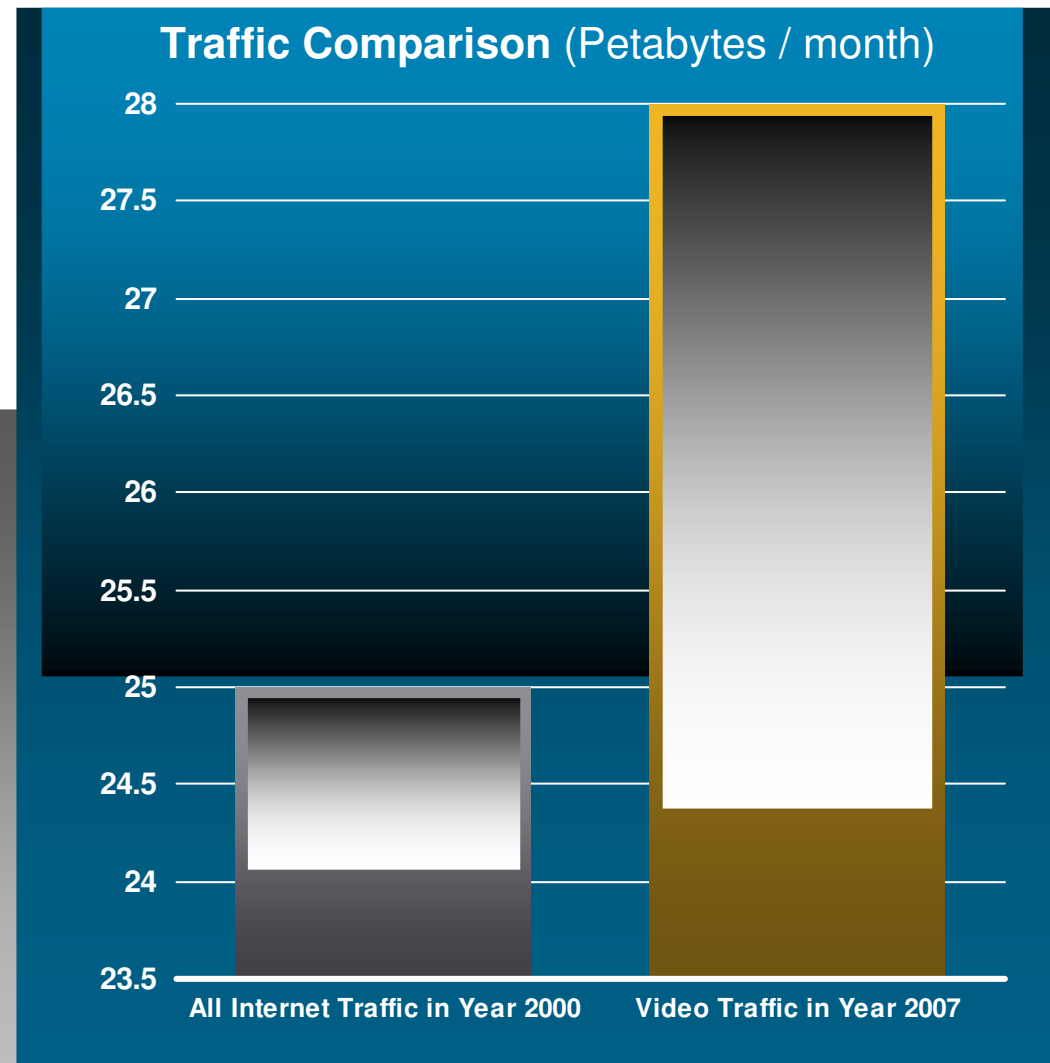
Enterprise Video

Video on the Network

Unprecedented Growth

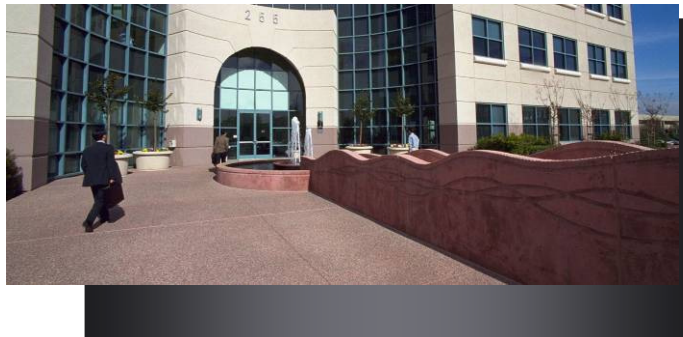
- Video traffic in 2007 exceeded **all** Internet traffic in 2000
- Video is 40% of Cisco WAN bandwidth
- Video traffic in enterprises expected to more than double in next two years*

*Video in the Enterprise: A Snapshot of Current and Planned Adoption, IDC, January 2008.



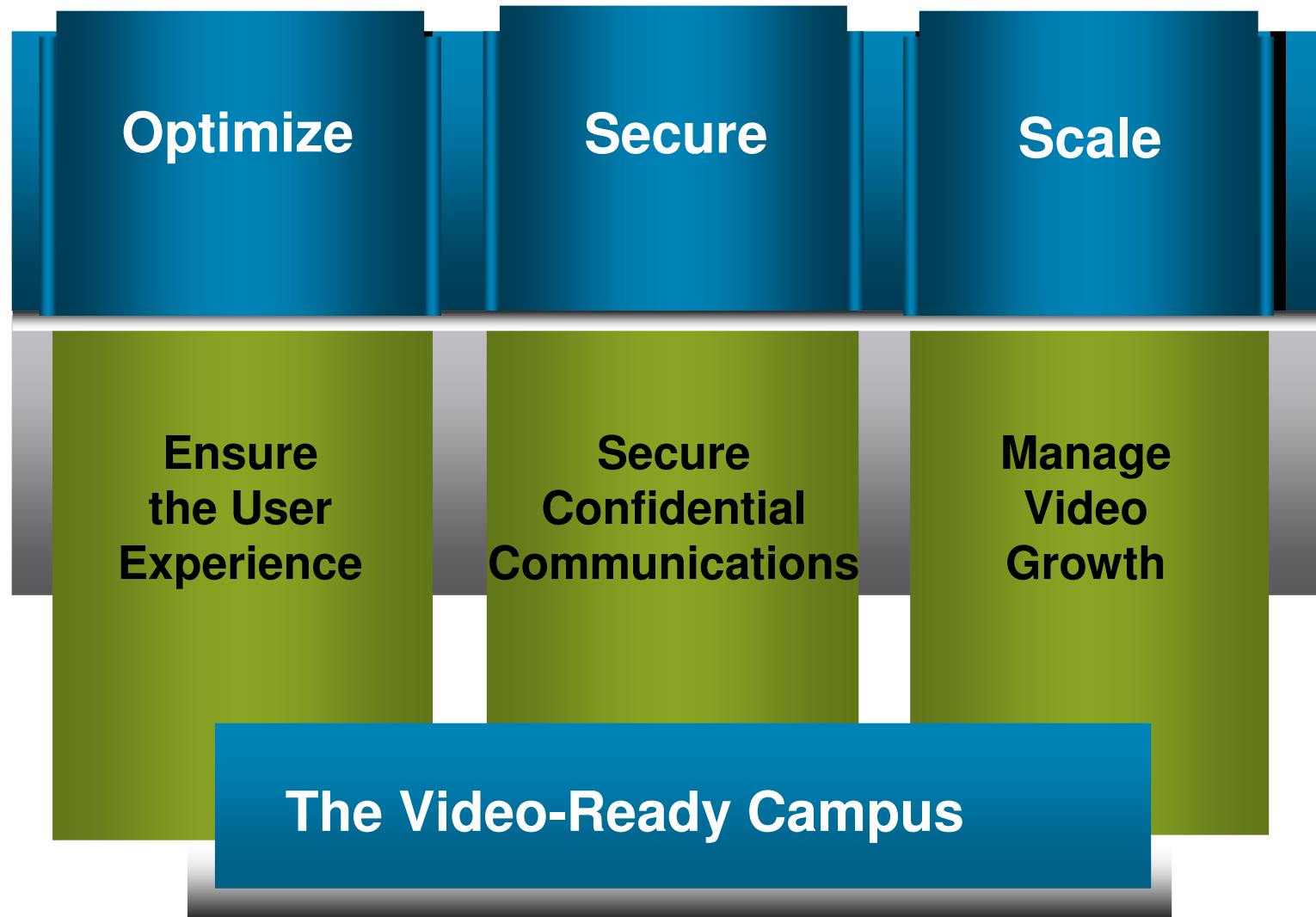
Business Use of Video

Delivering an Intelligent, Converged Environment for Video



Enterprise Video

Network Requirements



Video Optimization

How Do You Ensure the Video Experience

- **Delivery Optimization**

 - Traffic Control

 - Bandwidth Utilization

- **Non-Stop Communications**

 - Business-Critical Video

- **Monitoring & Management**

 - Operational Expense

 - Video Asset Management



Video Optimization

How Do You Ensure the Video Experience



Video Security

How Do You Ensure Confidential Communications

- **Users and Endpoints**

Access Control

- **Network Virtualization**

Logical Partitions

- **Infrastructure Security**

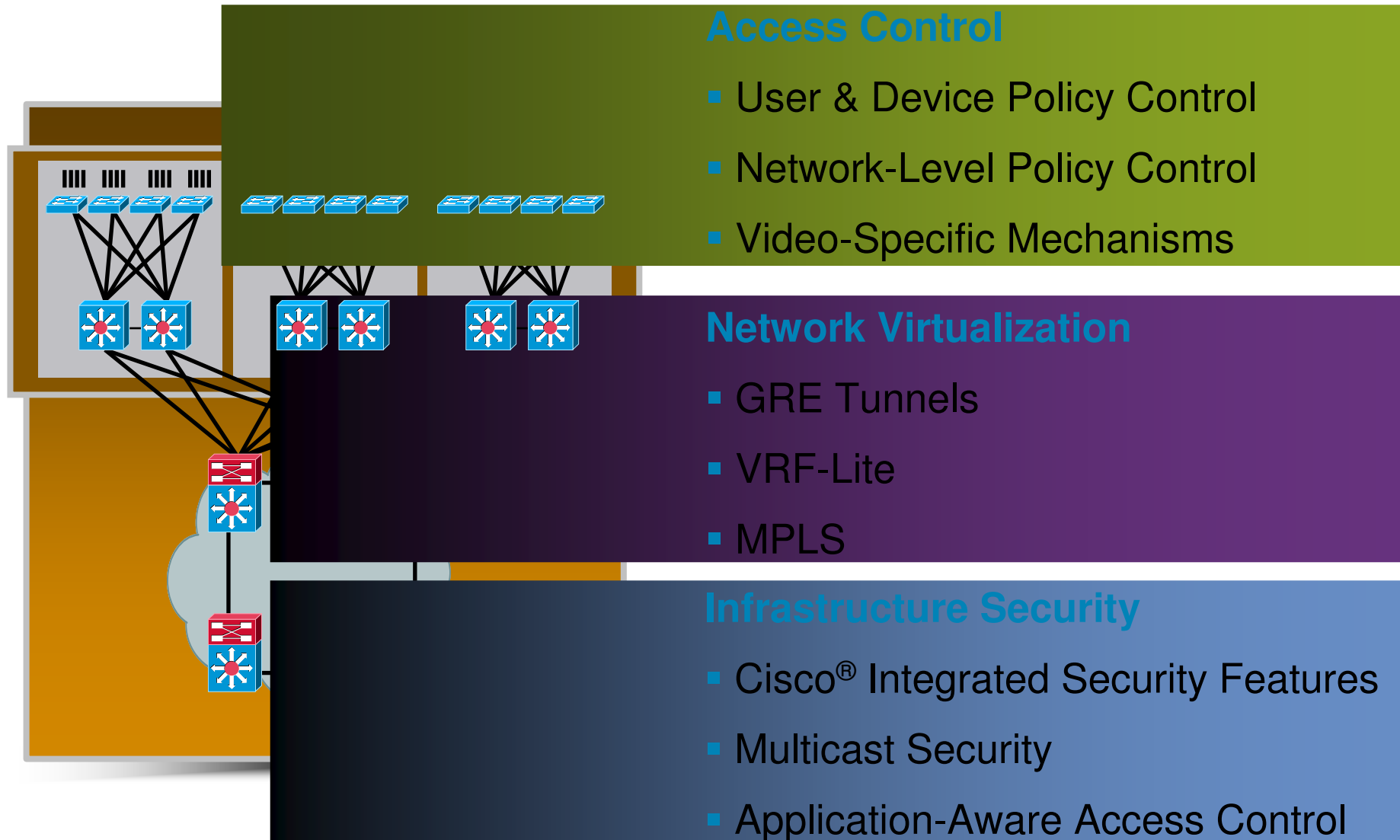
Video-Specific Attacks

Network Integrity



Video Security

How Do You Ensure Confidential Communications



Access Control

- User & Device Policy Control
- Network-Level Policy Control
- Video-Specific Mechanisms

Network Virtualization

- GRE Tunnels
- VRF-Lite
- MPLS

Infrastructure Security

- Cisco® Integrated Security Features
- Multicast Security
- Application-Aware Access Control

Video Scaling

How Will You Replicate Your Successes

- **Increased Bandwidth**

HD Video

- **Hardware Compatibility**

Modularity

StackWise® Plus

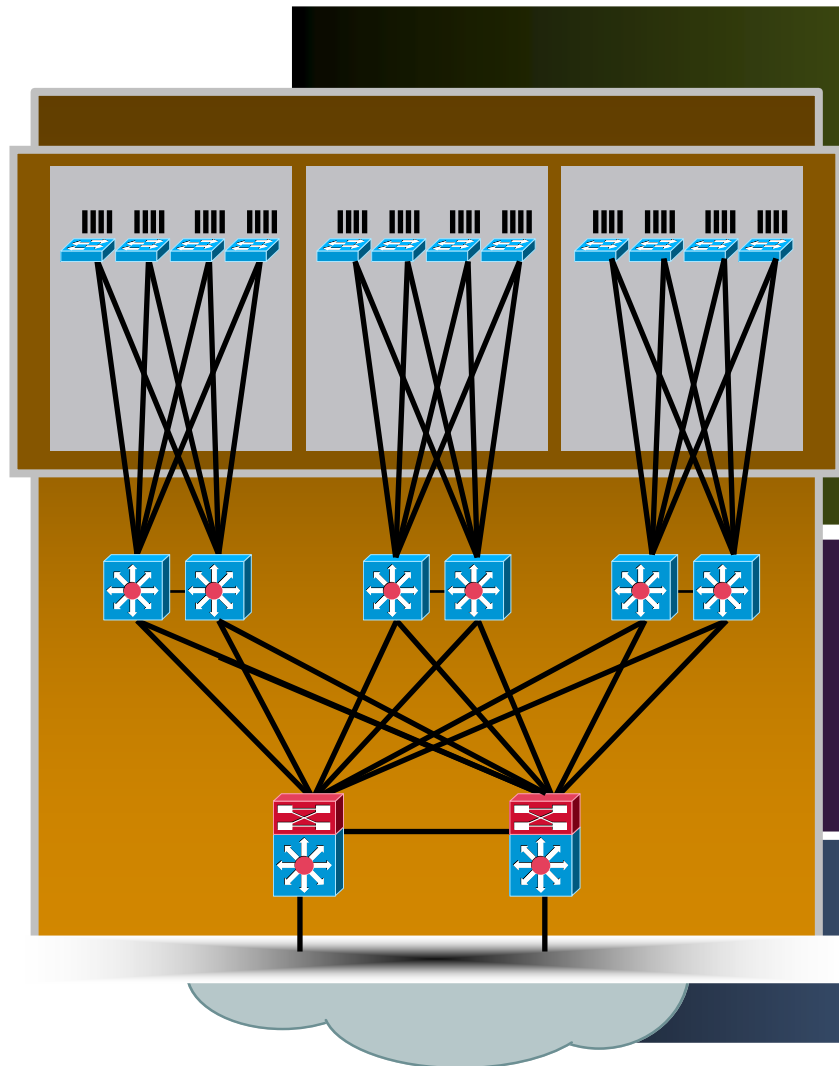
- **Mobility**

Wireless Integration



Constructing the 10 Gigabit Campus

Design Options for 10 Gigabit Video Deployment



Access Layer

- Catalyst® 6500
- Catalyst 4500 E-Series
- Catalyst 3750-E
- Catalyst 3560-E

Distribution Layer

- Catalyst 6500
- Catalyst 4500

Core Layer

- Catalyst 6500

Video-Ready Campus Architecture

Enabling Wireless Integration

▪ Enhanced Power over Ethernet

Available across Catalyst Switching portfolio

Standard 802.3af Power over Ethernet

Enhanced Power over Ethernet provides up to 30w per port for Cisco 802.11n AP support



▪ Wireless Services Module

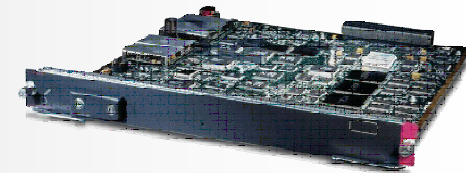
Security, Mobility, Redundancy

Centralized Security Policies

Wireless Intrusion Prevention

Quality of Service

Layer 3 fast roaming

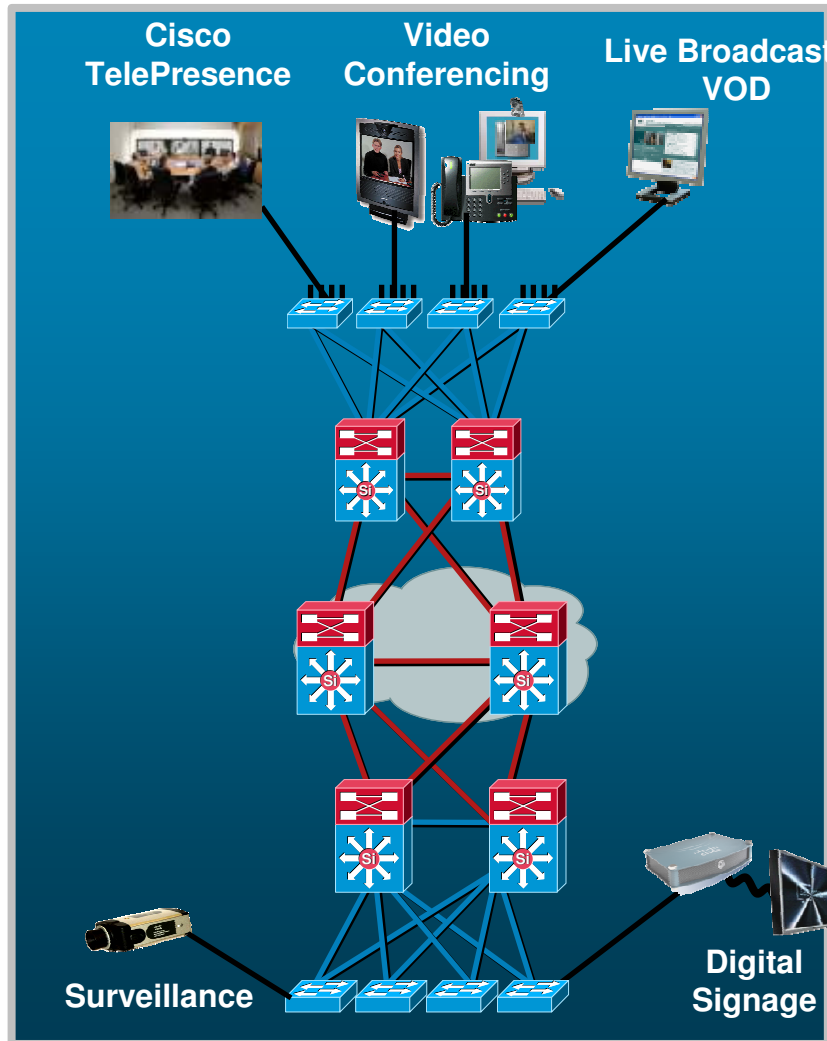


▪ Integrated Wired and Wireless Voice and Video



Video-Ready Campus Architecture

Best Practices



Latency & Bandwidth

GE access, **10 GE** distribution/core
IP multicast and/or stream splitting services

Real-time Application Delivery

Robust **QoS** service policies to manage application service levels

High Availability

Strategy for sub-second failover
HA architecture with **NSF/SSO**, **VSS**, etc

Network Virtualization

VRF-Lite (or other) Path Isolation for sensitive video application segregation

Confidentiality

Authentication of endpoints and users
Data protection strategies

Learn More:

www.cisco.com/go/ccf

Video-Ready Campus

Your Roadmap

Deployment

5 Deploy Integrated Video Solutions

4 Implement and Build a Video-Ready Network

Planning

3 Assess Network Architecture

2 Define Video Strategy Including Integration

1 Identify Video Solutions for Your Business

Summary: CIO Priorities Addressed



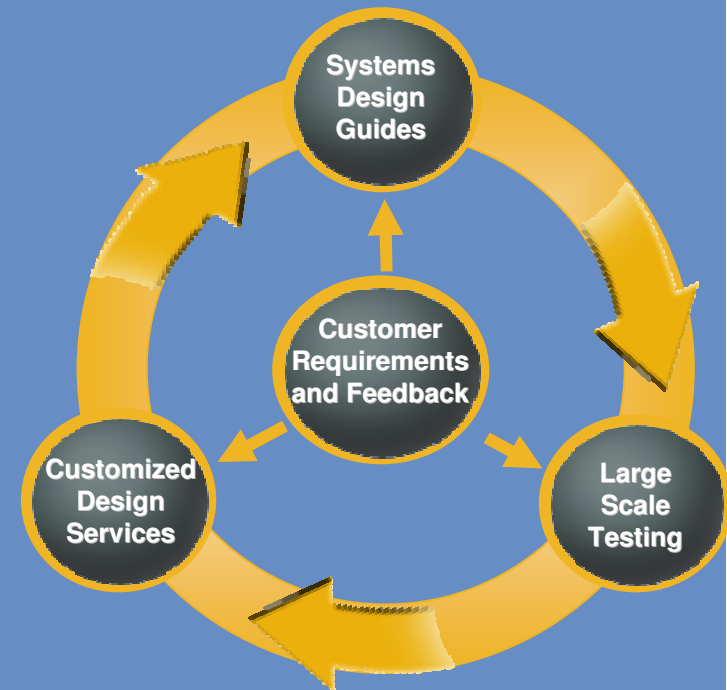
Resources

Cisco Validated Designs

Benefit

Reduce the risk and cost associated with technology change

- Documented and Tested End-to-End systems designs
- Design and implementation guides
- Production scale validation testing
- Cisco Advanced Services system testing customized to meet specific customer requirements



Resources

Campus Switching Portfolio

Distribution / Core



Catalyst 4500
and 4500-E



Catalyst 6500
and 6500-E



Catalyst 6500 Virtual
Switching System 1440

Wiring Closet



Catalyst 2960



Catalyst 3560
and 3560-E



Catalyst 3750
and 3750-E



Catalyst 4500
and 4500-E



Catalyst 6500
and 6500-E

Small

Medium

Large

Scale

Resources

Where You Can Learn More

Enterprise Campus

http://www.cisco.com/en/US/netsol/ns340/ns394/ns431/networking_solutions_packages_list.html

Cisco Validated Design Program

http://www.cisco.com/en/US/netsol/ns741/networking_solutions_program_home.html

Campus Communications Fabric

http://www.cisco.com/en/US/netsol/ns725/networking_solutions_package.html

Cisco Switching Portfolio

<http://www.cisco.com/en/US/products/hw/switches/index.html>

