



Unified Access Switching

Driving the Next Generation Workspace

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Unified Access Agenda

- Customer Challenges
- Unified Access Portfolio Overview
- Unified Access Services that Address Customer Challenges
 - Security
 - Video
 - HA
 - PoE Leadership
- Quantifiable Savings
 - OpEx Savings
 - Planning and Deployment, Operations, and Energy Management

Cisco Borderless Networks Access Portfolio

Catalyst 4500E



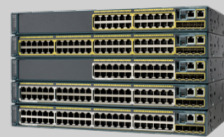
Industry-leading modular access

Catalyst 3750-X 3560-X



Industry-leading fixed switching

Catalyst 2960-S



Competitive feature set at compelling prices

Catalyst Compact Switches



Great for secure, manageable ports 'at the end of the wire'

Industrial Automation



Purpose-Built for Industrial Applications

**Innovative Services,
Lower TCO**

Next-Generation Workspace



Any Device



HD Video



VDI

Soli

Traditional Workspace



Data



Voice

**Right Sized,
No Compromise**

Outside the Wiring Closet



Oil and Gas



Retail



Manufacturing

Enterprise Class Catalyst 4500E

INNOVATION

IOS XE Open Application Platform (Wireshark)
In Service Software Upgrade
Flexible NetFlow
Universal PoE

OPERATIONAL SIMPLICITY

Extended Lifecycle of 7–10 Years
Automation
Investment Protection
Limited Lifetime Warranty



848GBPS
SYSTEM

100M+
PORTS

700K+
CHASSIS

INDUSTRY
LEADERSHIP

LOWER
TCO

Leading Modular Unified Access Platform

Catalyst 4500E Campus Portfolio

NEW

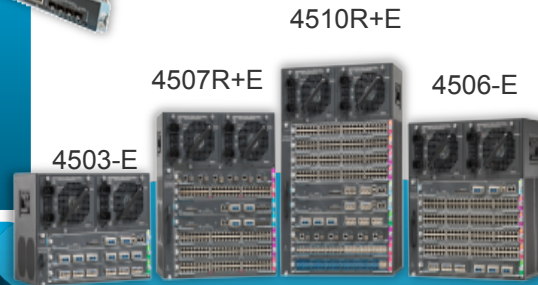
SUPERVISOR ENGINE 7-E

- Optimized for Large Campus
- 848 Gbps Switching Capacity
- 4x10G SFP+/SFP uplinks
- 250 MPPS
- Flexible Netflow



SUPERVISOR ENGINE 7L-E

- Optimized for Small/Mid Size Campus
- 520 Gbps (48G/slot)
- 2x10G (SFP/SFP+) or 4x1G SFP Uplinks
- 225 MPPS
- Flexible Netflow

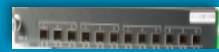


FIBER LINE CARD PORTFOLIO

High Density



WS-X4624-SFP-E



WS-X4712-SFP+E

Low Density



WS-X4612-SFP-E



WS-X4606-X2-E

1G

10G

COPPER LINE CARD PORTFOLIO

48G



WS-X4748-RJ45-E



WS-X4748-UPOE+E

24G



WS-X4648-RJ45-E



WS-X4648-RJ45V+E

Data Only

PoE+

POE POWER SUPPLIES



PWR-C45-1300ACV



PWR-C45-2800ACV



PWR-C45-4200ACV



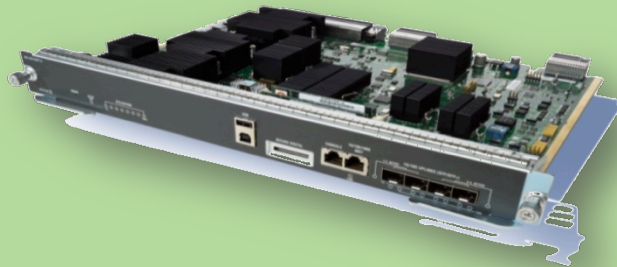
PWR-C45-6000ACV

Introducing Sup7LE on Catalyst 4500E

Best of Breed for Campus Access

Lead with The Leader

Optimized for Large Enterprise Campus Deployments



Supervisor Engine 7-E
848Gbps Switching Capacity

And more

- 4 x 10G Uplinks
- 384 10/100/1000 ports
- 3,6,7 and 10 slot chassis
- 96 SFP+ LC ports
- 256K Routes

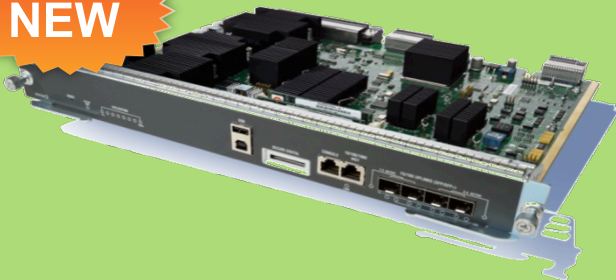
Platform Innovations

- 48G/slot
- Flexible NetFlow
- UPOE
- Hosted Applications*
- VRF-Lite, EVN*
- In Service Software Upgrade
- VSS*
- Cisco TrustSec (MACSec*)
- AutoSmart Ports

* Roadmap

Optimized for Small/Medium Sized Campus Deployments

NEW



Supervisor Engine 7L-E
520Gbps Switching Capacity

SCALABILITY

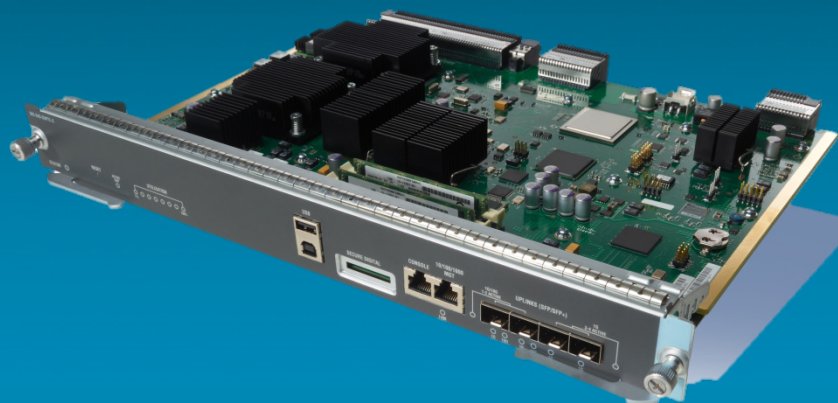
- 2 x10G or 4 x 1G Uplinks
- 240 10/100/10000 ports
- 3,6 and 7 slot chassis
- 60 10G LC Fiber ports
- 64K Routes

More Bandwidth, Scale and Features!
Priced to beat competition

Supervisor 7L-E: Third Party Certification

“Ideal platform for campus access networks.”

NEW



Supervisor Engine 7L-E

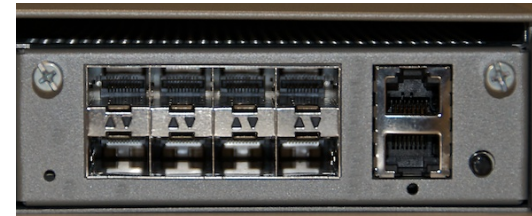
“In tests conducted of the **Cisco Catalyst 4500E Supervisor 7L-E**, Miercom was impressed with its **deterministic performance, high availability, Flexible NetFlow and Wireshark** capabilities along with **UPOE** making it an **ideal platform for campus access networks.**”

Test Report Coming Soon

Target
March 2012

Catalyst 4500X

Cisco's Response to HP 5820 & Juniper EX4500



Removable Uplink

▪ Deployment Options

- 16 Port Configuration (Q2CY12)
- 32 Port Configuration (Q1CY12)

▪ Upgradable OIR Uplink

- 8 port 10GE SFP+ (Q1CY12)
- 2 port 40G QSFP (Q4CY12)

○ Scalability

- 256K Routes, 32MB Buffer

▪ Innovations

- Flexible Netflow
- Hosted 3rd Party Applications

○ High Availability

- VSS (Q3CY12)
- N+1 Fan Redundancy
- 1+1 AC or DC* power supplies

▪ Investment Protection

- 1G/10G flexibility

Enterprise Class Catalyst 3750-X and 3560-X

INNOVATION

- StackWise Plus and StackPower
- Flexible NetFlow
- Hot-swappable power supplies & fans
- Industry's highest density PoE+
- Rolling Stack Upgrades
- MACsec

OPERATIONAL SIMPLICITY

- Automation
- Investment protection
- Enhanced Limited Lifetime Warranty



WORLD'S MOST
POPULAR
STACKABLE

¼ BILLION
PORTS

OVER 7 MILLION
UNITS

INDUSTRY
LEADERSHIP

LOWER
TCO

Leading Stackable Unified Access Platform

Catalyst 3K Campus Portfolio

Stackable Switch Portfolio



Catalyst 3750 v2

Data or PoE
StackWise
Fixed 1G Uplinks
Single PS
LLW

Fast Ethernet



Catalyst 3750-X

Data / PoE(+)
StackWise Plus
StackPower
Modular 1G/10G
Uplinks
Dual PS
E-LLW

Gigabit Ethernet



Stand-Alone Switch Portfolio



Catalyst 3560 v2

Data or PoE
Fixed 1G Uplinks
Single PS
LLW

Fast Ethernet



Catalyst 3560-X

Data / PoE(+)
Modular 1G/10G
Uplinks
Dual PS
E-LLW

Gigabit Ethernet

Network And Service Modules



C3KS-NM-1G C3KS-NM-10G



C3KS-NM-10GT



C3KS-SM-10G

Aggregation Switch



WS-C3750X-12S-S
WS-C3750X-12S-E



WS-C3750X-24S-S
WS-C3750X-24S-E

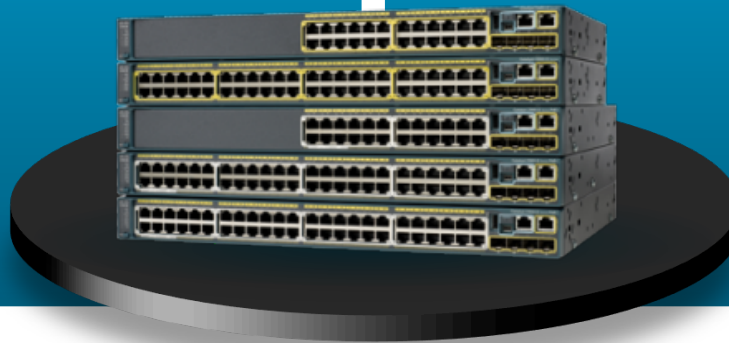
Catalyst 2960-S

KEY FEATURES

- FlexStack
- PoE on all 48 ports
- PoE+ support
- 10G uplinks available
- Low power consumption

OPERATIONAL SIMPLICITY

- Enhanced Limited Lifetime Warranty
- Auto Smart Ports



EASE-OF-USE

20M
PORTS

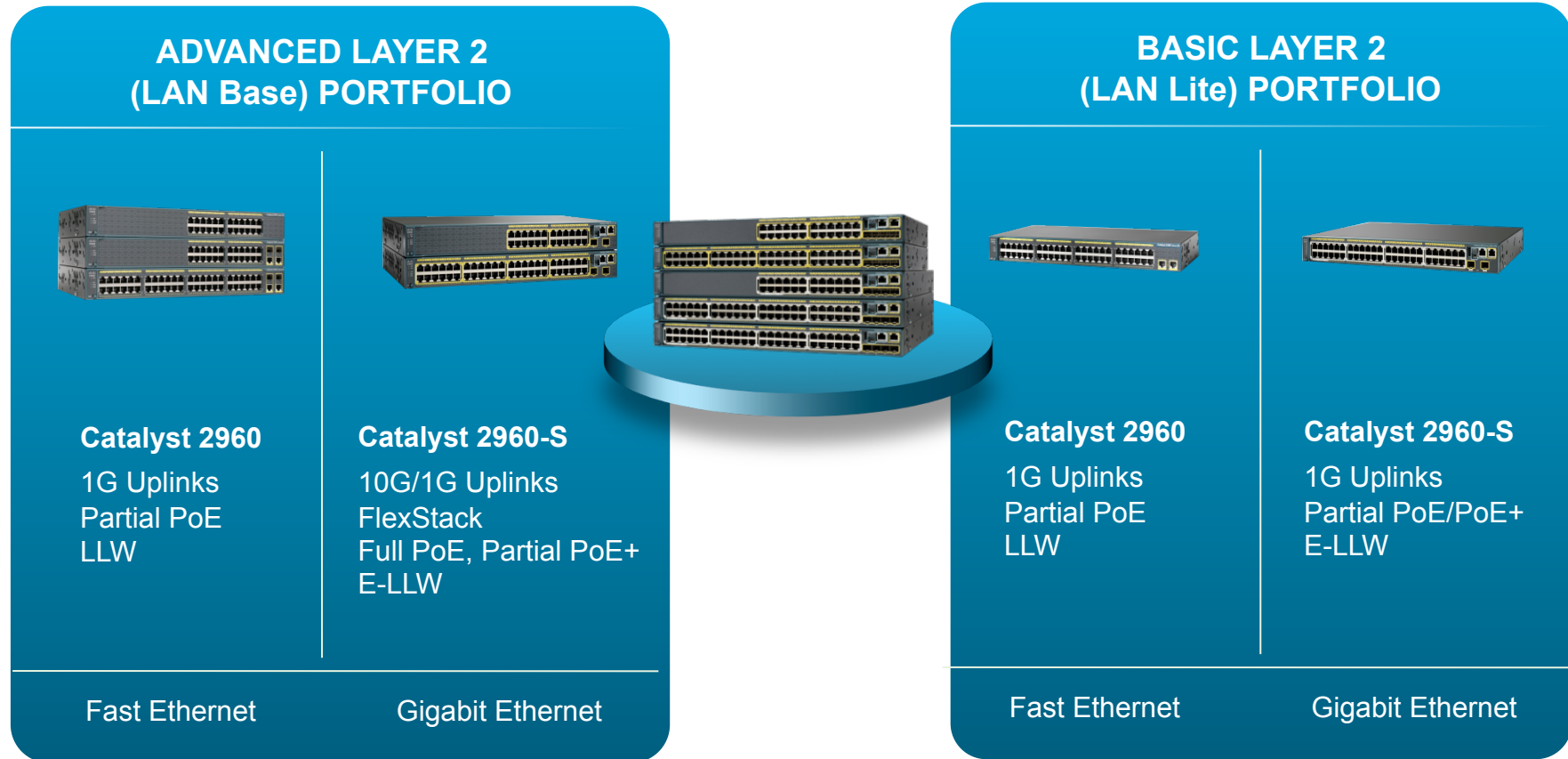
500K+
UNITS

ENERGY
EFFICIENCY

LOWER
TCO

Cisco Quality at Competitive Price

Catalyst 2K Campus Portfolio



FLEXSTACK MODULE



C2960S-STACK

Catalyst Compact Switches

KEY FEATURES

Can be powered via PoE(+) or UPoE
Pass through PoE for end devices
Uplink & Downlink Data Encryption
12 models to choose from

OPERATIONAL SIMPLICITY

Zero-touch deployment
Auto Smart Ports
Enhanced Limited Lifetime Warranty



8 & 12 PORT
MODELS

QUIET
(FANLESS)

EXTEND THE
CISCO
NETWORK

FULL-SIZE
CAPABILITIES

LOWER
TCO

Ideal for Retail Check Stands, Classrooms,
Conference Rooms, Hotel Suites, and More

Catalyst Compact Switch Portfolio

3560-C IP BASE PORTFOLIO

ADVANCED LAYER 2 (LAN Base) PORTFOLIO



3560-C Portfolio

IP Base
8 and 12 port FE
Data or PoE+
2 x 1G Uplinks
E- LLW

IP Base
8 port GE
Data or PoE+
2 x 1G Uplinks
E- LLW

Fast Ethernet

Gigabit Ethernet

2960-C Portfolio

LAN Base
8 and 12 port FE
Data or PoE
2 x 1G Uplinks
E- LLW

LAN Base
8 port GE
Data Only
2 x 1G Uplinks
E- LLW

Fast Ethernet

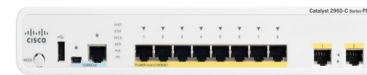
Gigabit Ethernet



PoE Pass Through Switch



WS-C3560CPD-8PT-S



WS-C2906CPD-8PT-L

Unified Access Agenda

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 - PoE Leadership
- Quantifiable Savings
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Security



Security

Deliver End-to-End Iron-Clad Security

IT Challenges

- Authorized Access
- Regulatory Compliance
- Network Protection and Monitoring

Unique Cisco Benefits

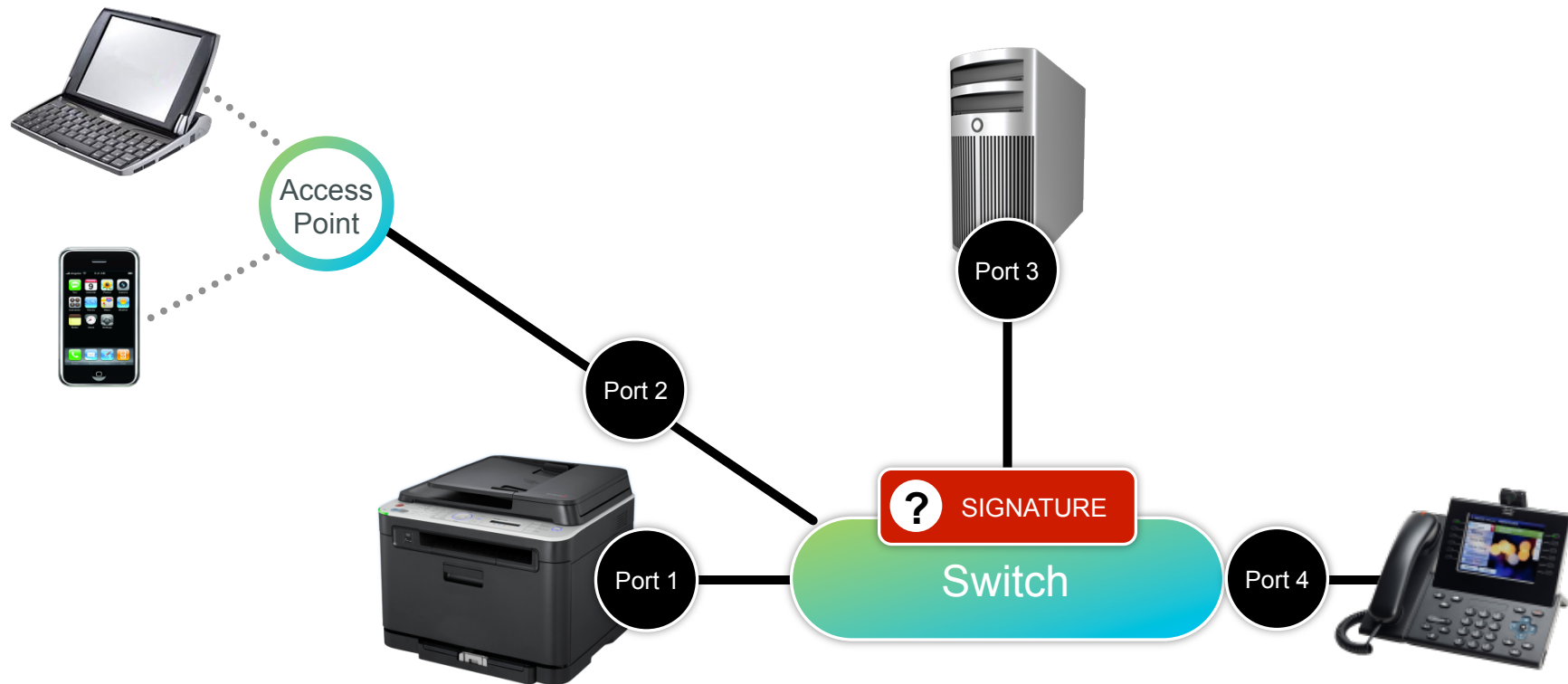
- Discover and profile end devices with **IOS Sensor**
- Identity-based access control with no impact using **Monitor Mode**
- Link layer encryption with policy enforcement via **MACsec**
- Network visibility to security vulnerabilities with **Flexible NetFlow**
- Attack forensics with **Smart Logging and Telemetry**



Unified Management and Policy with
Identity Services Engine (ISE)

Authorized Access

Manual Device Classification and Policy Enforcement



The Challenge

Device proliferation and identification for policy enforcement

Typical Deployment Scenario

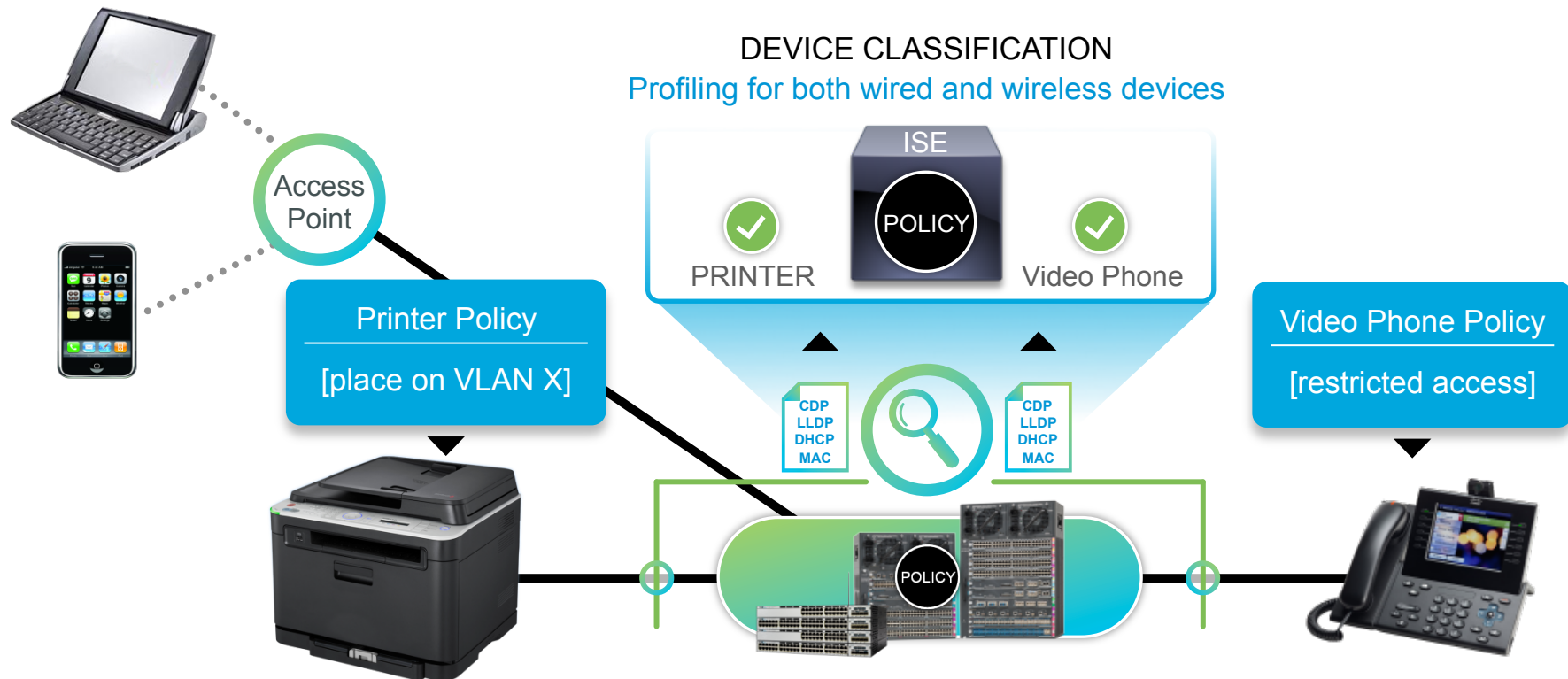
Multitude of devices on the network, wired and wireless

Need to have policy control for each device type

Need assurance that a device conforms with signature

Authorized Access

Device Profiling Automated with IOS Sensor



The Solution

Device Profiling
+ IOS Sensor

Deployment Scenario with Cisco IOS Sensor

Collection—Switch collects device related data and sends report to ISE

Classification—ISE classifies device, collects flow information and provides device usage report

Authorization—ISE executes policy based on user and device

Authorized Access

Deployment Hurdles with 802.1X

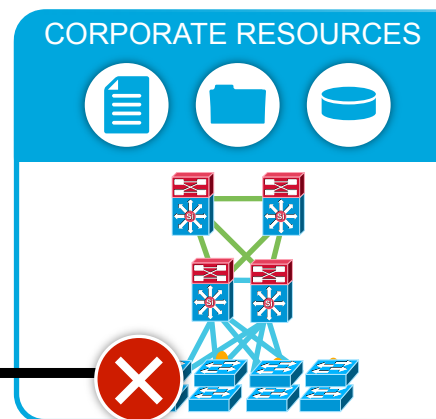


Productivity Loss
User Downtime



802.1x
FAILURE

MAC Address
00:18:F8:46:53:D7



DENIED



The Challenge

Implement
Identity-Based
Access Control

Typical Deployment Scenario

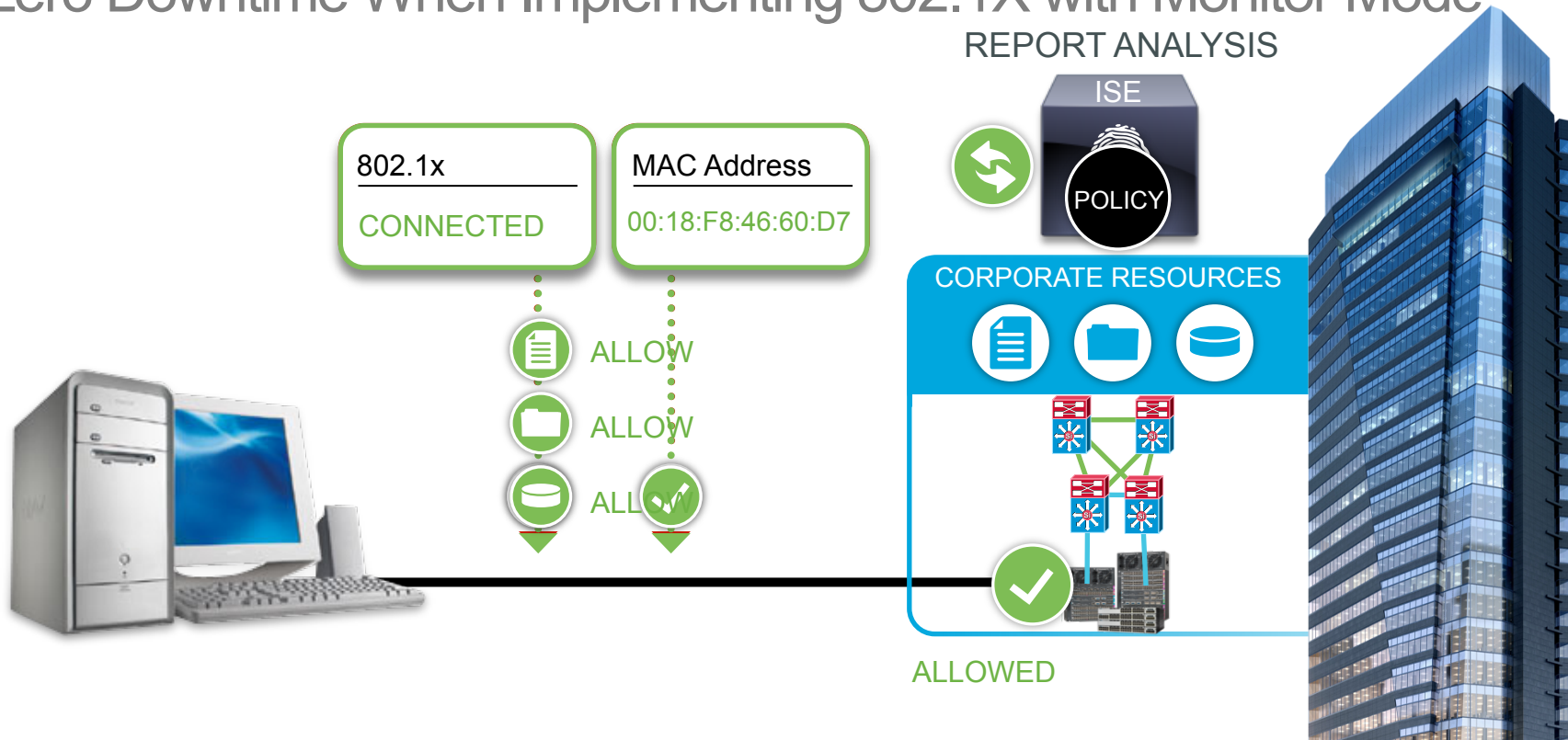
Deploy Access
Control

Failed Access due to non User contacts help
802.1X client, supplicant desk for assistance
variation etc.

Troubleshooting
problem results in
loss of productivity

Authorized Access

Zero Downtime When Implementing 802.1X with Monitor Mode



The Solution

Implement in
Monitor Mode

Deployment Scenario—Cisco Access Switch

Deploy
Access
Control

Discovery—Allows
connection regardless
of device types

Correct —View failed
reports on ACS or ISE;
troubleshoot and resolve
issues; ensure future
authorization

Add Authorization—
Block unauthorized
access; add policy for
restricted resources

802.1X Is Not Just a Check Box

Cisco Simplifies 802.1X Deployments

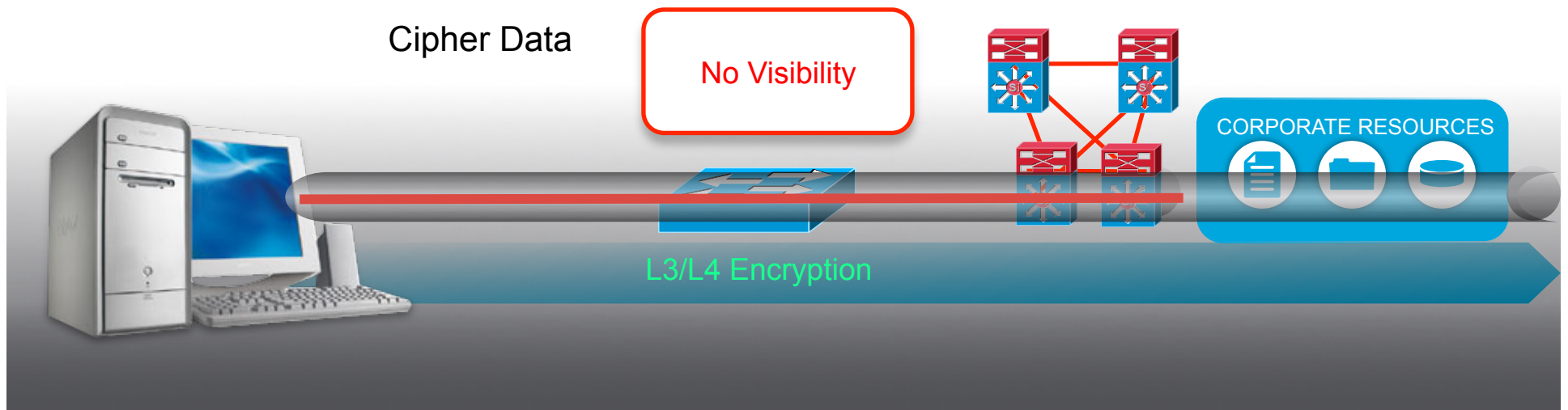
Deployment Hurdle	Feature
How do you support non 802.1X clients and Guest users/devices?	<ul style="list-style-type: none">• Guest VLAN• MAC Authentication Bypass, Web Authentication• Monitor Mode
How do you handle failed access?	<ul style="list-style-type: none">• Failed Authentication VLAN• Monitor Mode
How do you support multiple users or devices on the same port?	<ul style="list-style-type: none">• Multi domain Authentication• Multi-Authentication
How do you support various kinds of devices with different authentication mechanisms?	<ul style="list-style-type: none">• Flexible Authentication via Automated 802.1X, MAB, web Auth• Different Supplicant types for different Client Operating Systems• Wake On LAN• PXE boot• IOS Sensor
How do you handle devices moving in your network?	<ul style="list-style-type: none">• MAC Move/Replace
How do you handle Device proliferation?	<ul style="list-style-type: none">• IOS Sensor• Monitor Mode



Cisco Has Many Features to Enhance 802.1x and Make Identity Networking **Truly** Deployable, Not Just a Check-Box

Regulatory Compliance

Data Protection with L3/L4 Encryption



The Challenge

Encryption disables visibility for policy enforcement

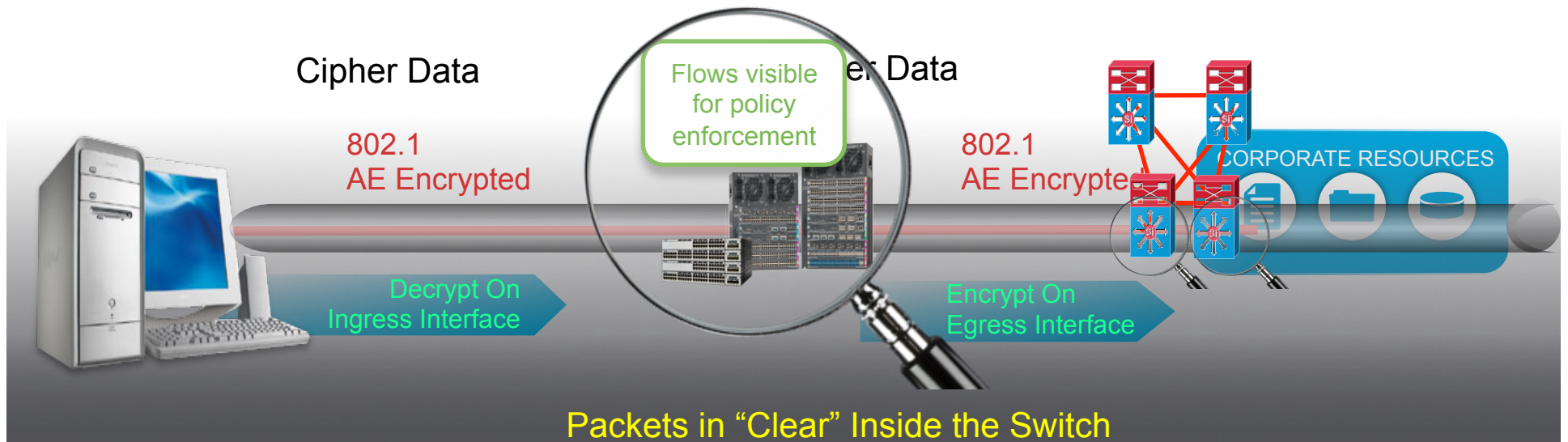
Typical Deployment Scenario

Encryption at IP or application layers

No visibility into the flows for Security and QoS policy enforcement

Regulatory Compliance

Data Protection with L2 Encryption (MACSec)



The Solution

Data Confidentiality
with Visibility

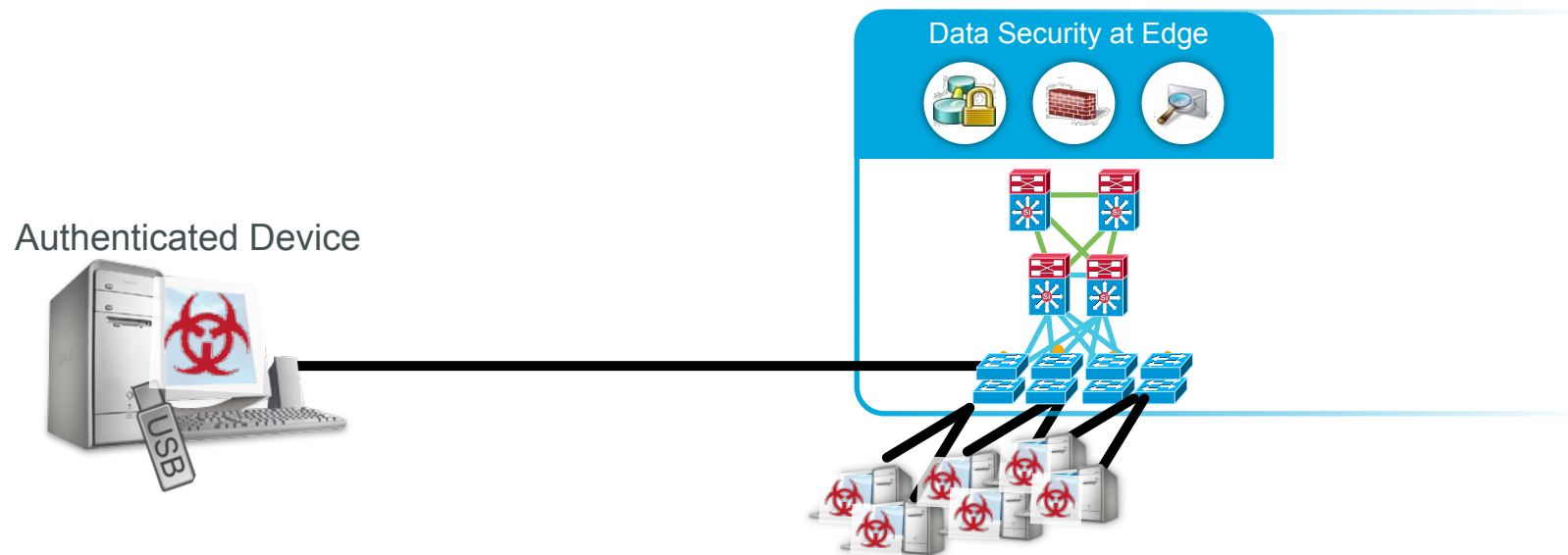
Typical Deployment Scenario

Hop by Hop L2
encryption

Visibility into the flows for Security
and QoS policy enforcement

Network Protection and Monitoring

Example of Inside Attacks: Operation Buckshot Yankee



The Challenge

Protect from attacks originating from inside the network

Attack from an Authenticated Device

USB Key plugged into an authenticated device

Once instantiated, malware spreads laterally

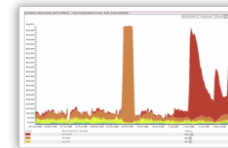
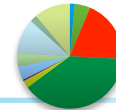
These flows do not cross threat boundaries

It took six months to find and completely eradicate the virus

Network Protection and Monitoring

Network Visibility with Netflow

Int./ Location	Dest. IP	Client
Gi1/0/10 B-3/2	10.1.1.2	AA23AE7B5 899Lenovo X41
Gi1/0/10 B-3/2	10.1.1.19	AA23AE7B5 899Lenovo X41



Data Security at Edge

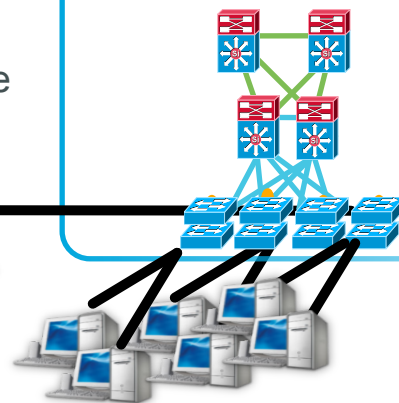


Known bandwidth distribution

Anomaly pattern of peer-to-peer flows

Drill down to the source and contain the problem

Authenticated Device



Remote IT

The Solution

Netflow in the Wiring Closet

Network Visibility

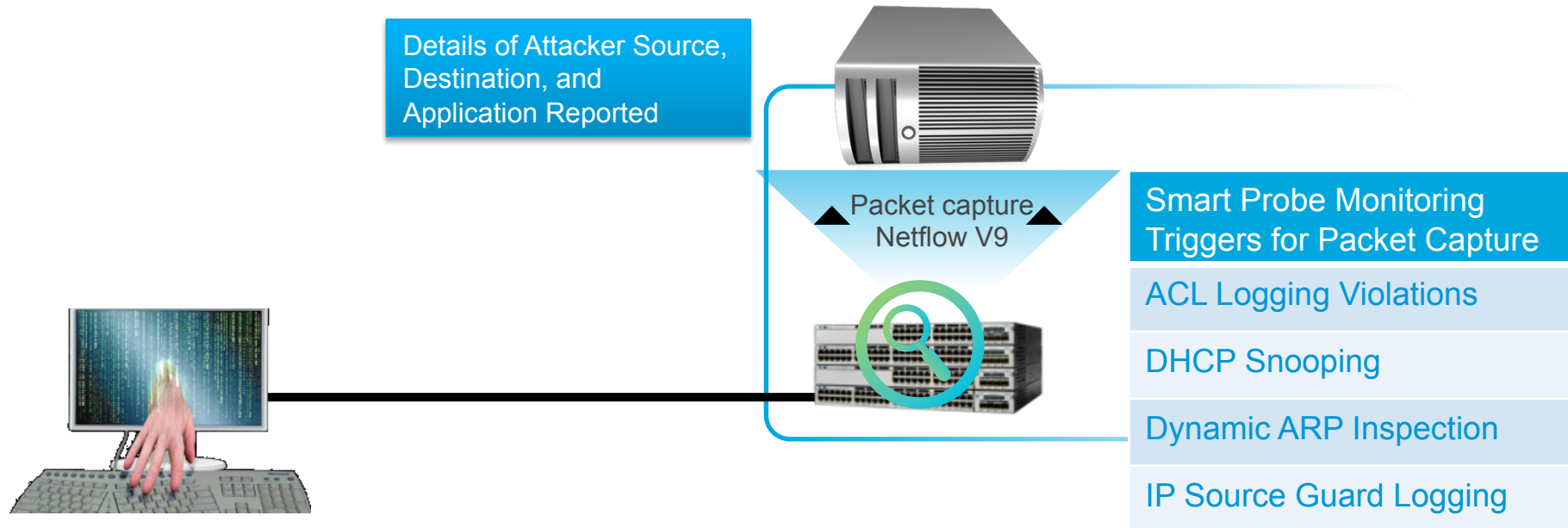
Know what applications are running in your network

During attack unusual traffic patterns are created

Knowing the source of the attack down to mac-address and port number enables quick action

Network Protection and Monitoring

Attacker Visibility with Smart Logging and Telemetry



The Solution

Smart Logging and Telemetry

Attacker Visibility

Attacker launches an attack

Smart Probe Monitoring triggers packet capture

Netflow v9 is used to send the packets to the collector that provide details on the attack

Video



Video

Your Network Is Your Business

IT Challenges

- Assessing network readiness
- Monitoring and troubleshooting
- Ensuring quality of user experience

Unique Cisco Benefits

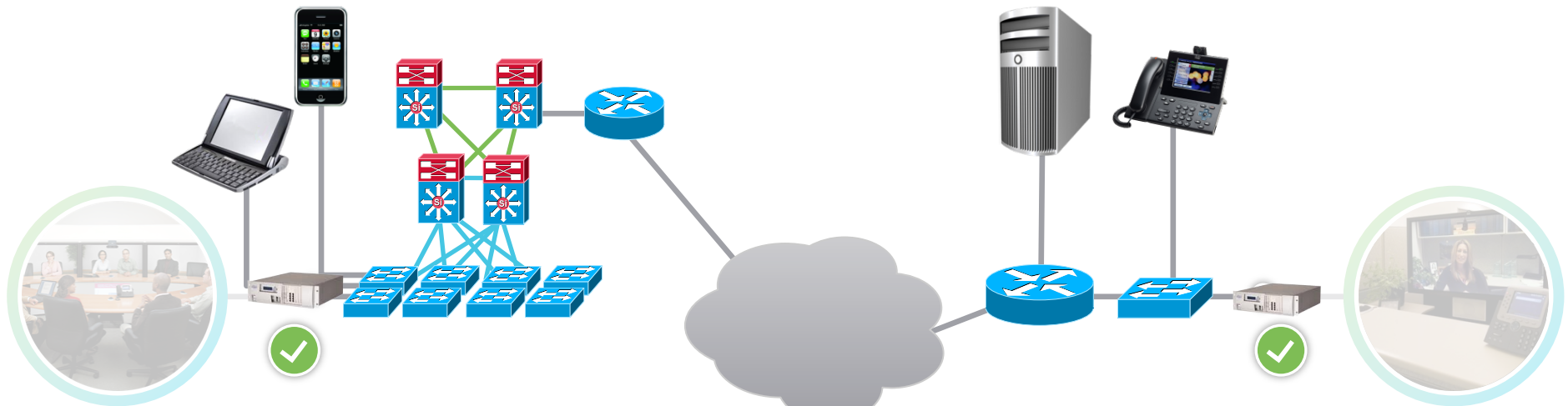
- Calibrate and assess the network with **Built-In Traffic Simulator**
- Simplify hop-by-hop troubleshooting with **Mediatrace**
- Improve network visibility with **Flexible Netflow**
- Differentiate traffic flows with **Medianet Services Proxy**



Enabled via Cisco Prime with Workflows to Deploy, Monitor, and Troubleshoot Video

Video Deployments Today

Manual Network Readiness Assessment



Onsite IT

The Challenge

Network
Readiness

Typical Deployment Scenario—Traditional Switch

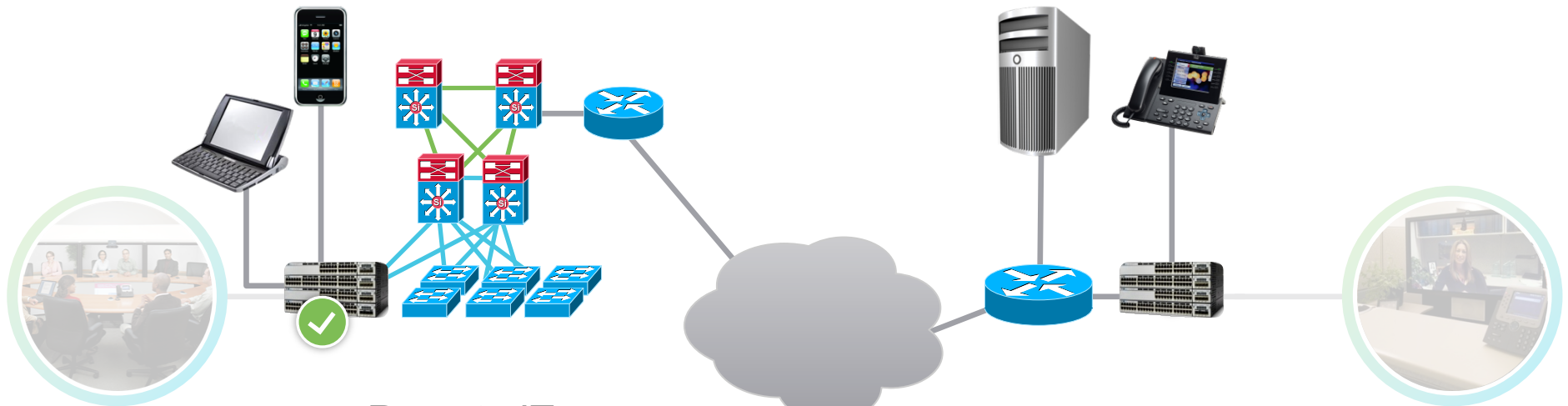
Need to purchase
extra traffic generation
appliances

IT employee must
travel to set up
appliances

Time consuming
to implement and
control

Video Deployments with Medianet

Built-in Traffic Simulator to Automate Network Readiness



Prime



Remote IT



Scheduler

(Traffic Simulator based on IPSLA)

The Solution

Automate Network Readiness

Deployment Scenario—Cisco Catalyst 3K/4K Series Switch

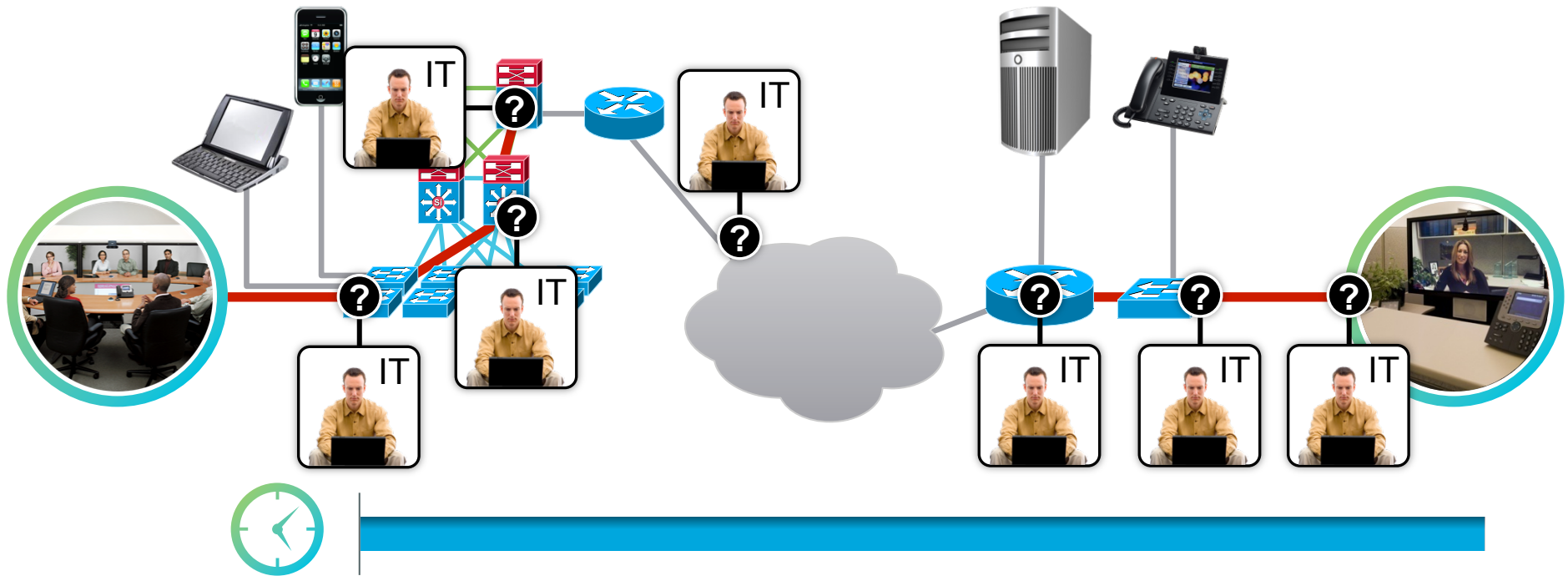
Traffic simulator built into switch; no extra appliance needed

IT can monitor and test remotely

Includes a scheduler to run periodic test over extended durations

Monitoring and Troubleshooting Today

Manual, Time Consuming, Expensive and Business Critical



The Challenge

Monitoring and
Troubleshooting

Typical Deployment Scenario

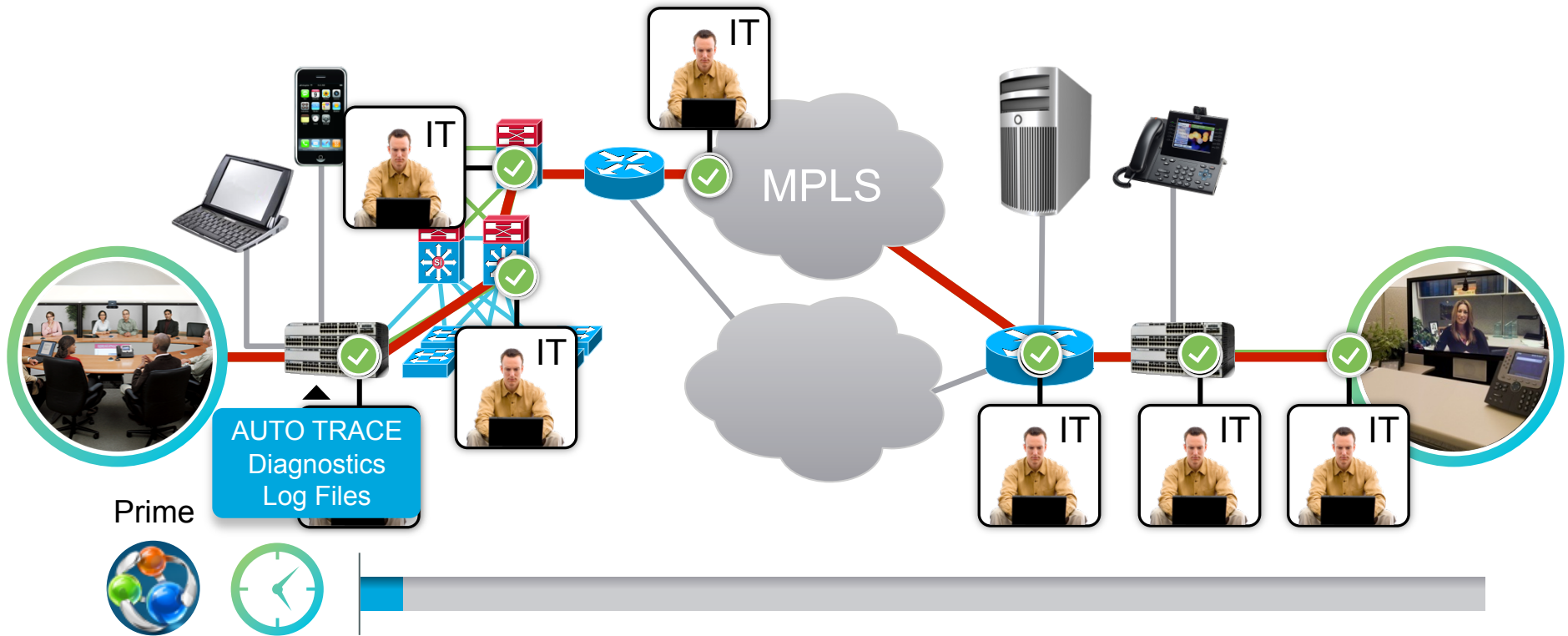
Manual troubleshooting
at location and device;
and manual simulation

Hop by hop logging
into each network
node is needed

Huge time consumption
to troubleshoot and
simulate problems

Monitoring and Troubleshooting with Medianet

Automation Results in Time and Resource Savings



The Solution

Automate
Monitoring and
Troubleshooting

Deployment Scenario—Cisco Catalyst 3K/4K Series Switch

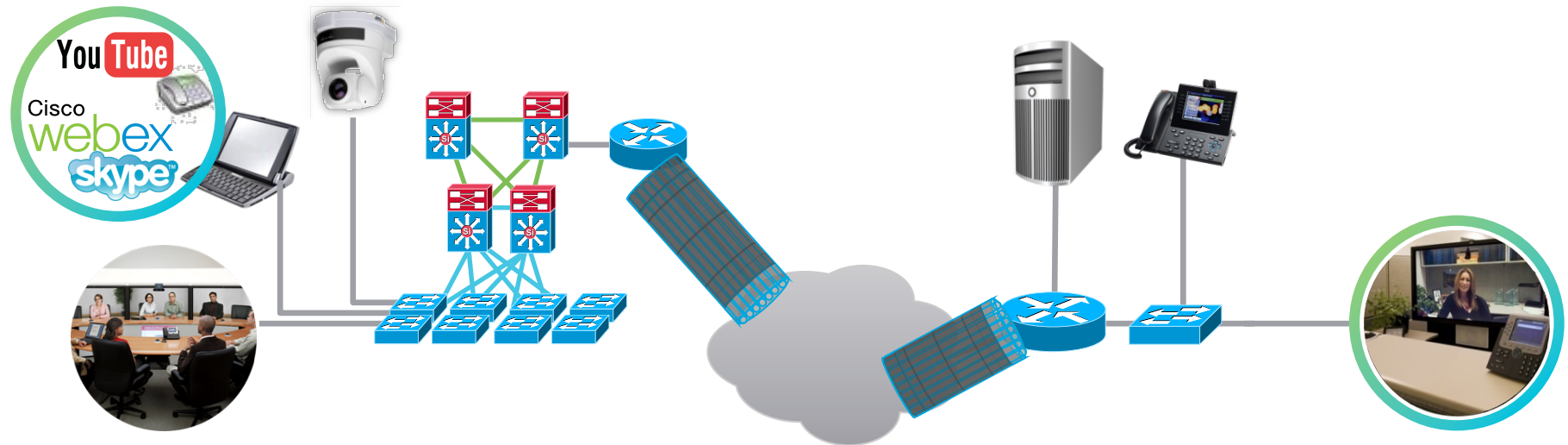
Mediatrace
automatically
traces the
mediapath

Hop by hop statistics
collected to find the
problem node; enabled
remotely

Allows easy recreation of
problems with built-in traffic
simulator, yielding time and
resource savings

Quality of Experience Issues Today

Increase Bandwidth to Ensure Quality



The Challenge

Quality of experience

Typical Deployment Scenario—Traditional Switch

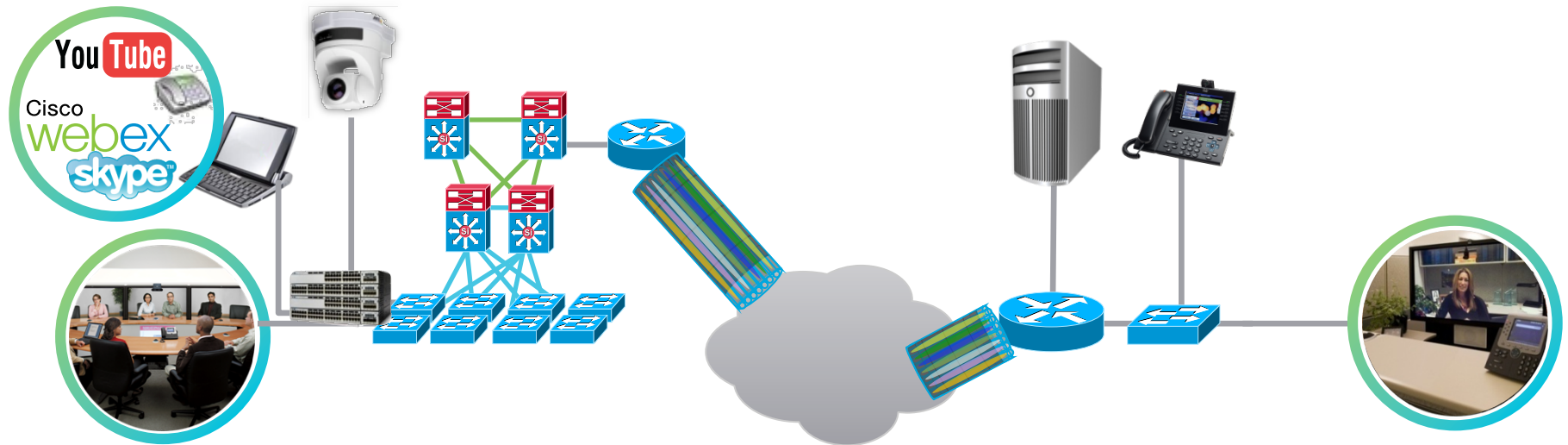
Multiple kinds of Video and Non-Video Applications using the same protocol wrapper

IT employee must increase bandwidth to avoid congestion

Time consuming and does not guarantee differential treatment

Deterministic Quality of Experience with Medianet

Differential Traffic Treatment Ensures Quality of Experience While Optimizing Bandwidth



The Solution

Optimize quality of experience

Deployment Scenario—Cisco Catalyst 4K Series Switch

Various Detection techniques in the switch to identify devices and applications

Switch passes device/application info and requests services from the network

Differential treatment guaranteed throughout the network Optimized bandwidth requirements

High Availability



High Availability

Because the Business Depends on It

IT Challenges

- Ensure non-stop communications and access to network resources
- Minimize planned and unplanned downtime

Unique Cisco Benefits

Catalyst 4K

- Upgrade software without disruption with **In Service Software Upgrades**
- Support chassis-level stateful failover with **VSS**—(Q3 CY2012)

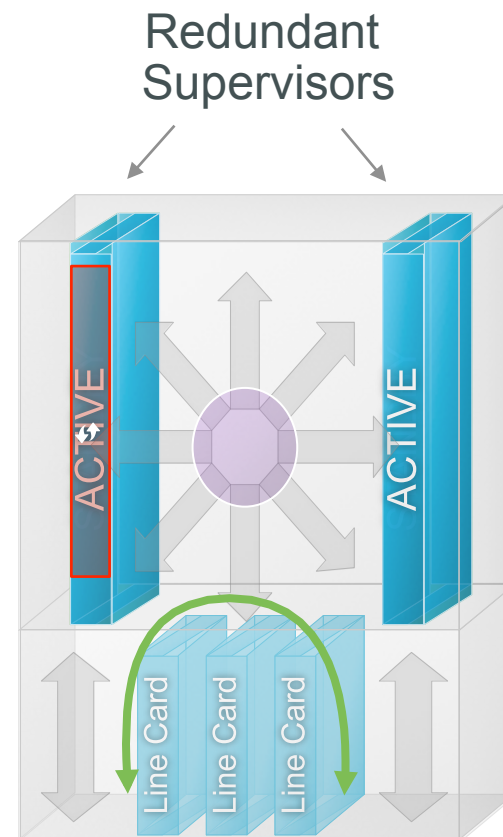
Catalyst 3K-X

- Upgrade software with minimal disruption with **Rolling Stack Upgrades**
- Maximize power availability and flexibility with **StackPower**

In-Service Software Upgrade (ISSU)

Software Upgrades—Without Service Interruption

- Comprehensive, non-intrusive software upgrade solution
- Transparent to end users—no loss of user sessions
- Upgrades can be scheduled at anytime—even during business hours



Virtual Switching System (VSS)

Achieving Highest Levels of Network Availability

Coming
Q3
CY2012

Pools Two Catalyst 4500 Series Switches into One Virtual Switch

Increases Operational Efficiency

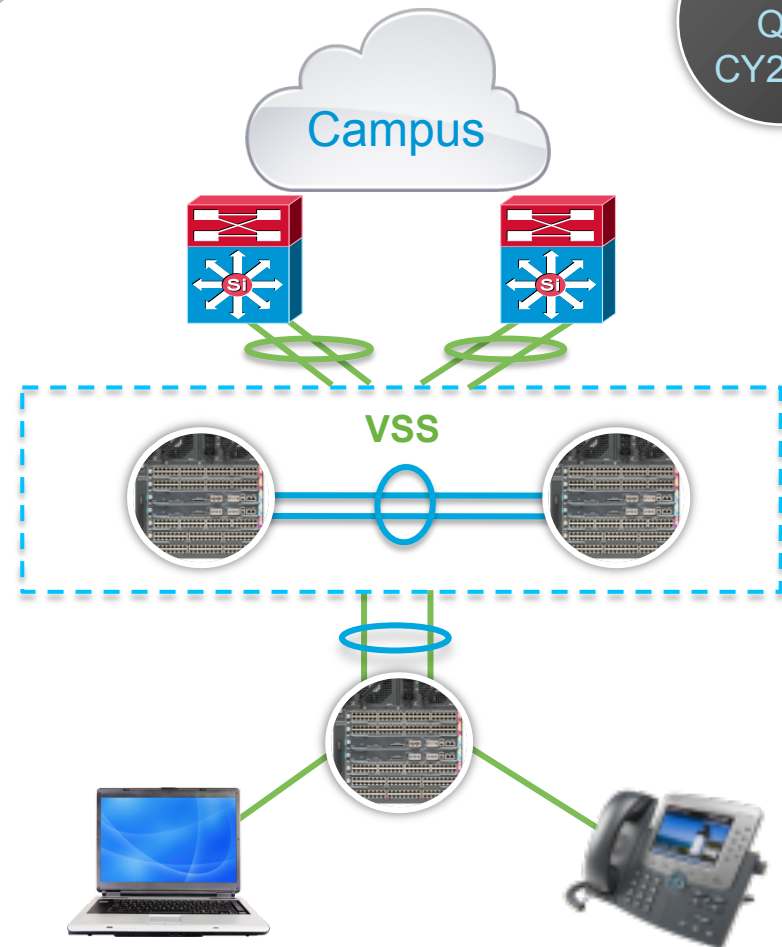
- Single point of management
- Eliminates dependency on Spanning Tree Protocol with Multichassis EtherChannel (MEC)

Increases Network Availability

- Inter-chassis stateful failover—utilizes NSF with SSO w/ virtual active & “hot” standby switches
- Sub-second virtual switch / uplink recovery

Improved Performance

- Twice system bandwidth—1696 Gbps



StackPower on the Catalyst 3750-X Series

Delivering Unprecedented Power Availability and Flexibility

StackPower

- Adaptable “pool of power” available to all stack members
- Provides “Zero-footprint” RPS i.e. power supply redundancy without an RPS
- Intelligent power shedding—turn off low priority PoE end devices in the event of a power supply failure



Rolling Stack Upgrade on 3750-X

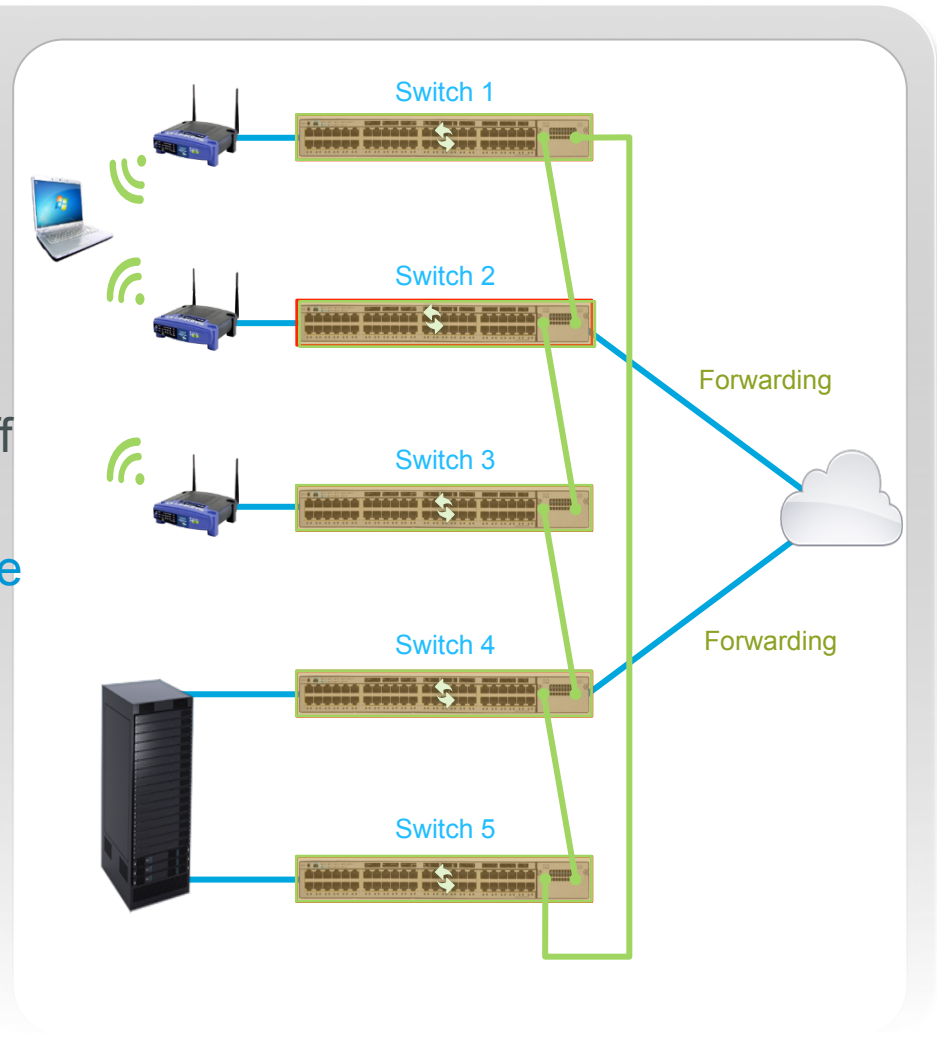
Non-Disruptive Software Upgrades

Rolling Stack Upgrade (RSU) Intelligent s/w Upgrade Mechanism

- Ensures minimal service disruption during an upgrade
- The entire stack will not be taken off line

Stack members taken off-line one at a time

- Redundant uplink always remains active to maintain connectivity
- Connectivity to critical dual-homed servers and wireless clients can be maintained



Cisco Catalyst 4500E and 3K-X Series

Trusted Solutions for Business-Critical Applications

“Instead of having to prepare for two weeks for a planned outage, software upgrades with Cisco 4500 **ISSU** features in the new emergency department are absolutely transparent. We no longer have any downtime at all.”



- Adopted Catalyst 3K Series for access – for **High Availability**, PoE/PoE+ scalability and Security
- **StackPower** was a huge differentiator – sealed the deal at 60% premium to HP



“Cisco’s new Catalyst 4500E with Sup7-E delivers on our need for maximum uptime for IP telephony infrastructure with unmatched **In-Service Software Upgrade** capabilities....”



24-hour service availability - a high priority
“We have developer groups in China, India and the UK.... so if access goes down, our core development work comes to a standstill. Our comprehensive Cisco environment (Cat 3K-X) helps drive our success by keeping our teams collaborating w/o interruption”



PoE Leadership



PoE Leadership

Lower Operational Expense for End Points

IT Challenges

- Quickly rollout new devices
- Reduce high installation costs and deployment time

Unique Cisco Benefits

Catalyst 4K

- Support next generation PoE devices at 60W per port using **Universal PoE**

Catalyst 3K-X

- The highest PoE and PoE+ density solutions in the industry—**Full PoE and PoE+**

Industry Leading Partnerships

Transforming Enterprise Networks



Virtual
Desktop



Trading
Floor



Personal
Telepresence



Building
Management



Hospitality/
Retail



Cisco Universal Power over Ethernet

World's Only Global Standard for Network Power—Extended

Universal

- Covers unprecedented range of devices with up to 60W of power
- Uses standard RJ45 connectors and Category 5e or higher cabling



Catalyst 4500E
Industry's
Leading Modular
Access Switch

Resilient

- Intelligent power redundancy and prioritization extended to devices
- Consolidate UPS infrastructure and eliminate battery backup



Catalyst 4500E
UPOE Line
Card

Efficient

- Up to \$128/port estimated savings over five years* with Cisco EnergyWise
 - Lowers CapEx and OpEx
- UPS consolidation,
eliminate 110/220V circuits
- Eliminate battery
replacement cycles



Cisco UPOE
Splitter
(Shipping
January 2012)

*Based on a mix of VDI Terminals, compact switches, IP Turrets, and Personal TelePresence Systems managed by EnergyWise. Turn devices off for 12 hours per day, power cost 10 cents per kWh

Next Generation Access Linecard WS-X4748-UPOE+E

Now
Shipping



CISCO UNIVERSAL POE (UPOE)

- 60W PoE with maximum line card budget of 1500W
- Estimate cable loss with intelligent diagnostics
- LLDP enhancement to negotiate beyond 30W
- Power X-Generation applications
 - IP Turrets in financial trading floors
 - Integrated Virtual Desktop Clients

ENERGY EFFICIENT ETHERNET

- Compliant with IEEE 802.3az for:
 - 100/1000 Base-T
- Power consumption is based on link utilization
- Green: Save up to 190W per chassis
- Mandatory for Energy Star Compliance*

* Energy Star Requirements for Enterprise Switches Expected to Be Published Mid-2011

Cisco Catalyst 4500E and 3K-X Series

Enabling Next Generation PoE Applications

“Cisco and British Telecom are partnering with our customers to deliver the next generation trading floor architecture with leading security, availability, and manageability. Cisco UPOE is foundational to this architecture to provide resiliency to the trader desk.”



“The main reason we bought Cisco over HP is because Cisco can do PoE on every port, and HP cannot without extra power.”



“As one of China’s leading Internet gaming developers, the workspace environment of Perfect World is experiencing tremendous growth in the number of PoE devices. The new Cisco UPOE technology will greatly simplify our virtual desktop and personal video conferencing deployments.”



Nagra - OpenTV is realizing further benefits from the Catalyst 3K-XSeries switches with Power over Ethernet Plus (PoE+).

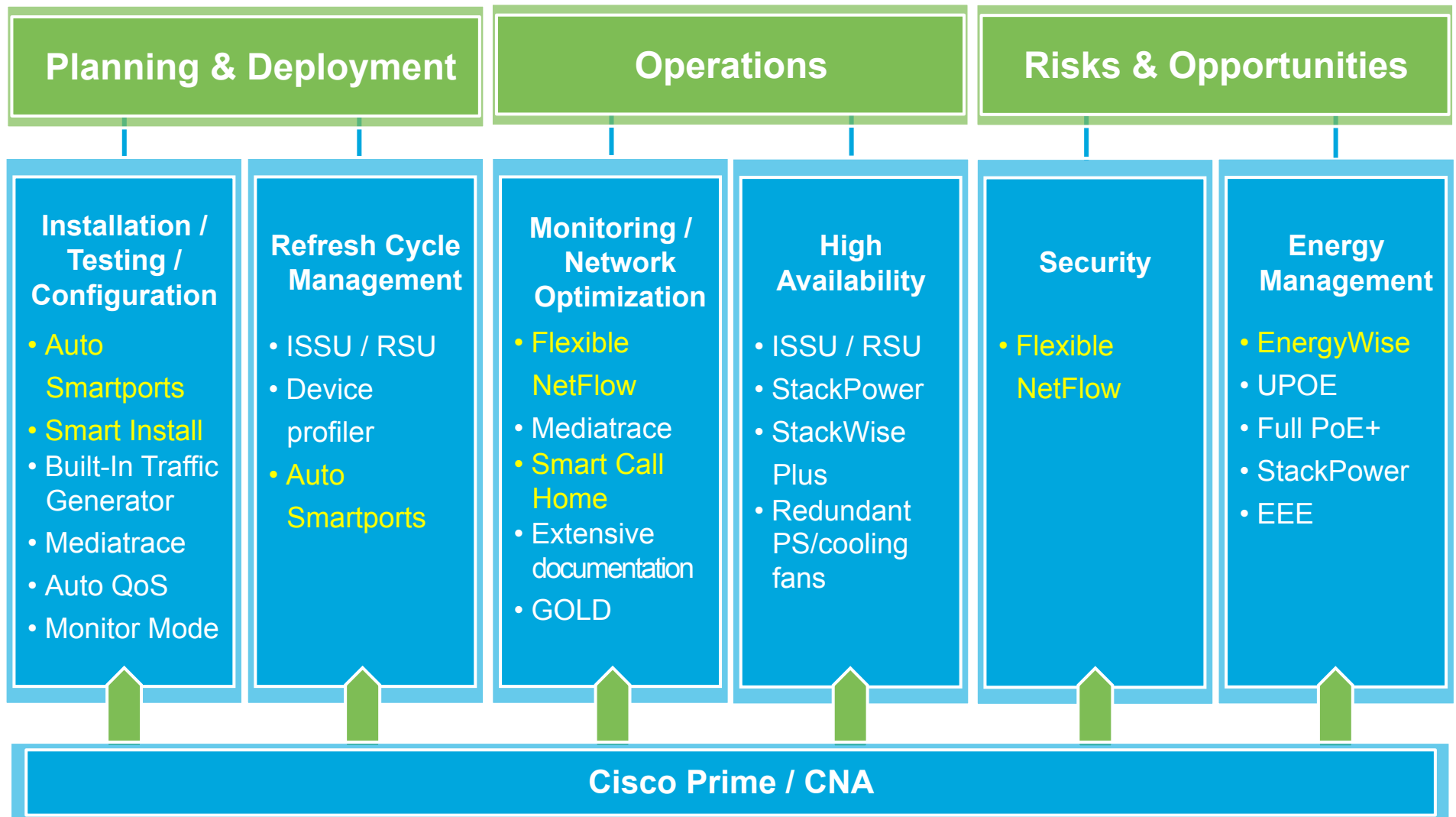
“We can deliver more reliable power to our systems, while simplifying management. Given the scope of our operations, this is critical.”



Unified Access Agenda

- Customer Challenges
- Unified Access Portfolio Overview
- Unified Access Services that Address Customer Challenges
 - Security
 - Video
 - HA
 - PoE Leadership
- Quantifiable Savings
 - OpEx Savings
 - Planning and Deployment, Operations, and Energy Management

Operational Efficiency with Cisco Catalyst Switches

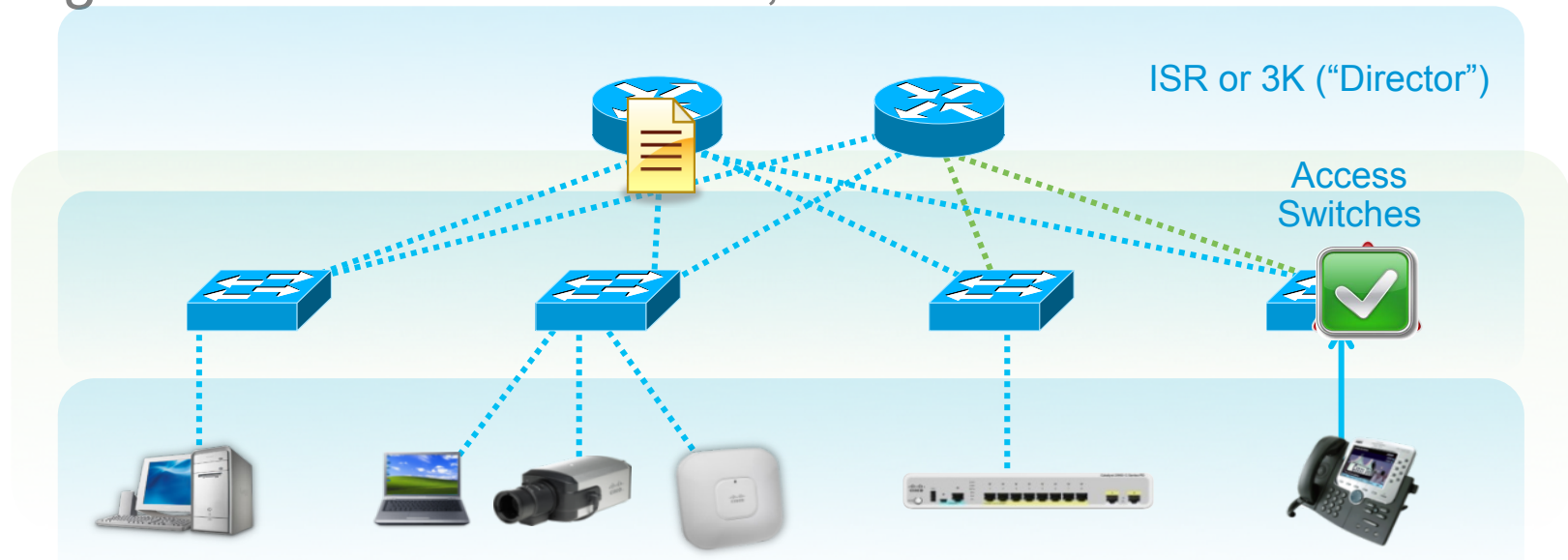


Savings from Smart Operations



Cisco Catalyst Smart Operations

Intelligence—Health Assessment, Best Practice



Smart Install

Zero Touch Deployments
and Maintenance

New Switch is Connected

Software image downloaded;
Configuration automatically
applied

Auto Smart Ports

Plug and Play for End Devices

New Device Attached

Port Configuration: **Applied**
QoS Policy: **Enforced**
Security Policy: **Enforced**

Smart Call Home

Quickly Identify and
Resolve Network Issues

Anomaly Detected

Proactive diagnostics
Alert created in real-time
Web-based reports
Routed to correct TAC team
Remediation initiated

Cost Savings: \$15,000 (or 230 Hours) per 100 Switches*

Reducing TCO—Smart Operations

WILLIAMS-SONOMA

- 600 Stores Nationwide
- Using ISR 2811 as the Director
- Store access switches include 2960 and 2960-C
- Ship directly to Store
- Using Smart Install for zero touch installation
- Simplify switch replacement process
- Simplify code upgrades

“Before we used a 3rd party vendor to stage switches for implementation.
Today using Smart Install we are able to eliminate the middleman.”

Roland Law – Manager, Network Engineering Williams Sonoma

Fresno Unified School District

- Replaces HP infrastructure with that of Cisco within the next year
- 1400 Switches with 500+ switches within over 6–9 months
- 3K director at each school site with 12 to 20 client switches (2K and 3K) per school site
- Smart Install—deployment time will be cut in half. Reduction in repetitive steps
- 2960/S, 3560v2, 3750G Switches



**Fourth Largest School District in California
100+ School Sites**

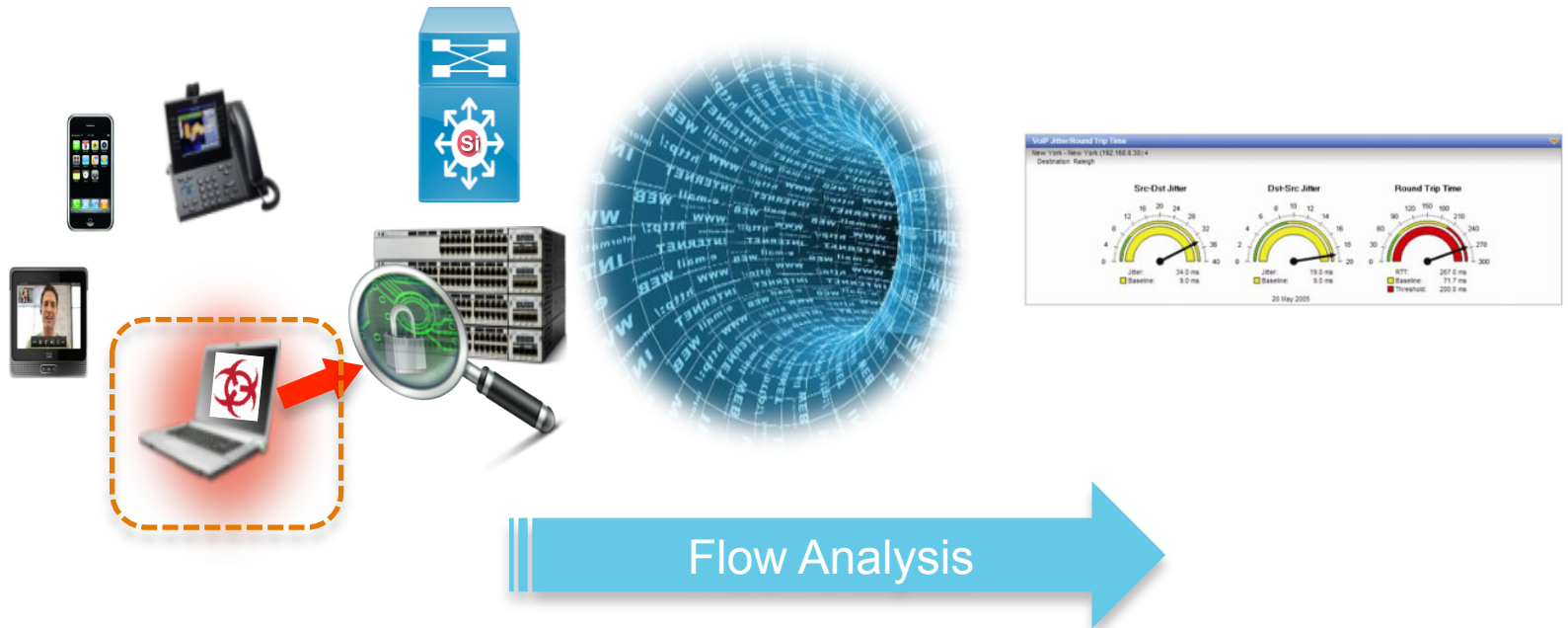
“Smart Operations was a key feature in helping Fresno Unified School District realize the value in Cisco. CAPEX is only 20% of your network costs while 80% is OPEX. Smart Operations highlights the added value that only Cisco delivers, demonstrating how we are continuing to innovate in networking to deliver bottom line value and savings.”

- Phi Yim – Account SE

Savings from Network Visibility



Greater Network Visibility with Flexible NetFlow at the Access



Know Your Network

Identify Applications Running over the Network, Top Talkers, Changes in Network Performance Throughout the Day—All the Way Down to the Interface

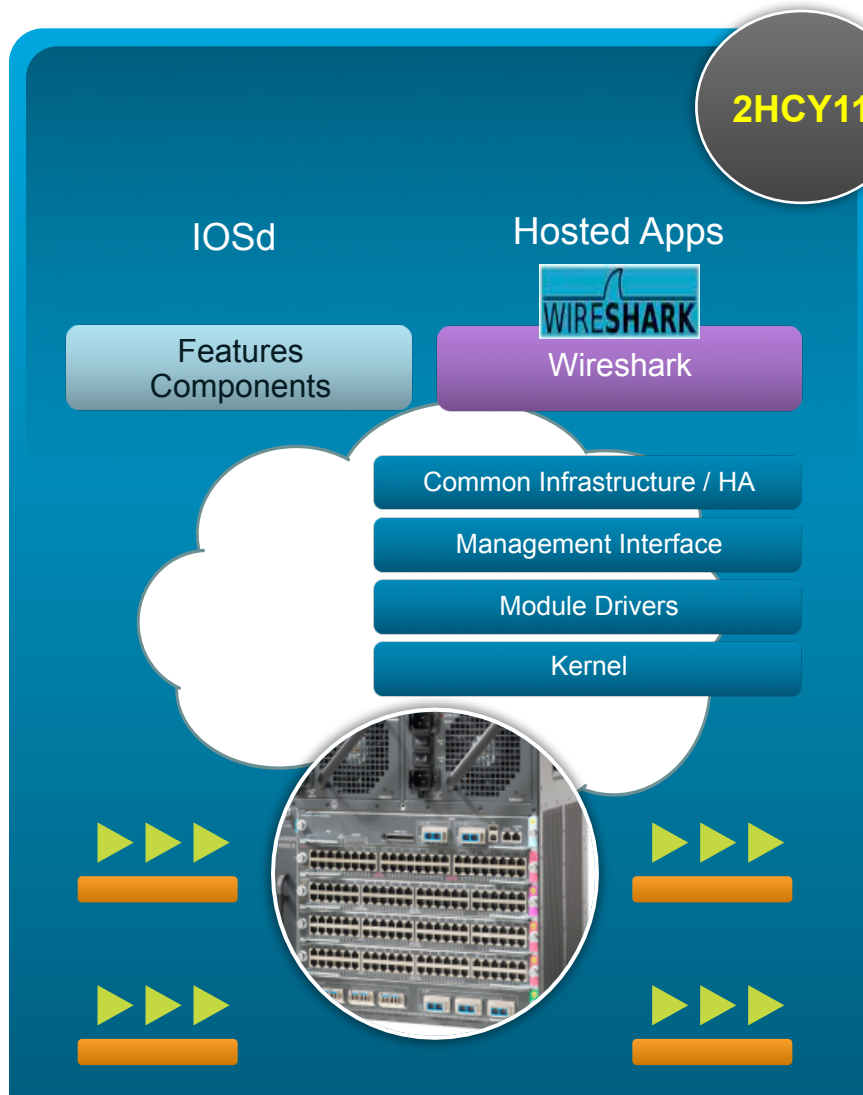
Perform Capacity Planning

Catalyst 3K-X Full Line Rate NetFlow vs. sFlow

Features	3K-X NetFlow	sFlow on other vendors
Dedicated Hardware & no impact to packet forwarding performance	✓	✗
Tracks all Flows	✓	✗
Security Anomaly Detection	✓	✗
Top Talkers	✓	✓*
User defined flows	✓	✗
Multiple Collectors	✓	✗
Export Bandwidth consumption	Small: Proportional to # of flows	Large: Proportional to # of packets

* sFlow employs "packet-sampling" techniques and statistical analysis to provide network flow-statistics. Sampling rates are dependent on the CPU performance.

IOS XE Application “Wireshark” Running on SUP7-E



Simplified Troubleshooting






- Wireshark provides a built-in packet sniffer and decoder to enable remote troubleshooting
- Wireshark removes the need to travel onsite for packet captures and also need for external equipment to be connected on the path
- Wireshark: Real-time capture and decode on Sup7E (Lightweight Text version “T-Shark”)
- Capture and Display Filters to capture packets and/or decode and display packets
- Captured packets can be stored on SD card or USB
- Ability to display packets in brief, detailed or hexadecimal dump mode

Savings from EnergyWise



EnergyWise Lowers IT Operational Costs

Across 5,000 Employees Working 9 Hours a Day, 5 Days a Week...

	Annual Energy Cost by Device	EW Annual Savings	EW Annual Savings
 PCs: Desktop	\$95	10–35%	\$50,000 – 175,000
 Laptop	\$35	10–15%	\$20,000 – 30,000
 PC Monitors	\$30	10–15%	\$15,000 – 25,000
 APs using POE	\$10	40–65%	\$20,000 – 35,000
 IP Phones	\$5	30–50%	\$10,000 – 15,000

Saves up to \$65 per Switch Port**

**Up to 30%
Savings
in IT!**

*Estimates 65% desktops, 35% laptops, 1 AP for every 20 employees, everyone has an IP Phone
Results vary based on what, if any, energy management solution is previously in place; Assumes \$0.12 per kWh (kilowatt-hour).

** Assumes ROI across 5 years; modeled on a 250 employee campus

Brunel University

4000 IT Man-Hour Savings/Year with a Borderless Network Architecture

Background

- 3500 staff; 14,500 students
- World class university in West London

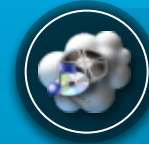
Key Challenges

- Manage influx of student devices. Simplify device registration, maintain identity, eliminate rogue devices
- Green initiatives

Why Cisco

Standardize on a single architecture to meet all their wired, wireless and security needs while simplifying deployment of solutions and supporting initiatives such as Green and Mobility

Cisco Borderless Network Services Deployed



Voice/Video

Medianet to support Video on campus



Green

EnergyWise for lowering energy consumption



Security

Cisco ACS for consistent identity management



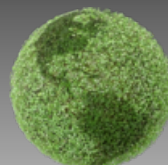
Mobility

CleanAir pilot for RF interference mitigation



OpEx Savings

Reduction in IT man hours by ~4000/year



Green

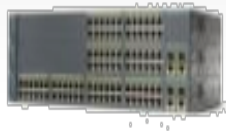
Pilot program yielding £20-30,000 annual energy savings



Rapid ROI

Payback (EnergyWise) on investment in less than 12 months

Cisco EnergyWise Product Portfolio



Catalyst 2960-S



Catalyst 2960



Catalyst 4500 & 4900



Catalyst 6500



Catalyst 3750 and 3560-G/E/V2 Series



Catalyst 3750-X and 3560-X



Catalyst 2960-C and 3560-C Compact



Cisco Prime LMS



Cisco IP Phones



VDI Phone Backpack and Tower



Integrated Services Routers (ISR i.e. 1900/2900/3900) G2

Partner Program for Devices and Applications Is Growing Rapidly

- Over 70 partners onboard to date
- Schneider BMS solution (FCS June)
- JCI Building gateway (integration in progress)
- FieldServer (FCS February)
- Lenovo PC client (FCS May)
- Joulex energy application (now)
- IBM Tivoli application (integration in progress)
- CA ecoMeter data center application (now)



Thank you.

