Unified Switching

Driving the Next Generation Workspace

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Agenda

• New services - Unified Access Services that Address Customer Challenges
  Security
  Video
  HA
  PoE Leadership

• Products - Unified Access Portfolio Overview
  Catalyst2k
  Catalyst3k
  Catalyst4k
  Catalyst6k – NEW Sup2T
  Compact switches
  Industrial automation
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
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

DEVICE CLASSIFICATION
Profiling for both wired and wireless devices

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

The Challenge
Implement Identity-based Access Control

Typical Deployment Scenario
Deploy Access Control
Failed Access due to non 802.1X client, supplicant variation etc.
User contacts help desk for assistance
Troubleshooting problem results in loss of productivity

HELP DESK
Productivity Loss
User Downtime

802.1x
FAILURE
MAC Address
00:18:F8:46:53:D7

DENIED
Authorized Access
Zero downtime when implementing 802.1X with Monitor Mode

802.1x CONNECTED
MAC Address 00:18:F8:46:53:D7

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

The Solution
Implement in Monitor Mode

Deployment Scenario—Cisco Access Switch
802.1X is not just a check box
Cisco Simplifies 802.1X deployments

<table>
<thead>
<tr>
<th>Deployment Hurdle</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you support non 802.1X clients and Guest users/devices?</td>
<td>• Guest VLAN&lt;br&gt;• MAC Authentication Bypass, Web Authentication&lt;br&gt;• Monitor Mode</td>
</tr>
<tr>
<td>How do you handle failed access?</td>
<td>• Failed Authentication VLAN&lt;br&gt;• Monitor Mode</td>
</tr>
<tr>
<td>How do you support multiple users or devices on the same port?</td>
<td>• Multi domain Authentication&lt;br&gt;• Multi-Authentication</td>
</tr>
<tr>
<td>How do you support various kinds of devices with different authentication mechanisms?</td>
<td>• Flexible Authentication via Automated 802.1X, MAB, web Auth&lt;br&gt;• Different Supplicant types for different Client Operating Systems&lt;br&gt;• Wake On LAN&lt;br&gt;• IOS Sensor</td>
</tr>
<tr>
<td>How do you handle devices moving in your network?</td>
<td>• MAC Move/Replace</td>
</tr>
<tr>
<td>How do you handle Device proliferation?</td>
<td>• IOS Sensor&lt;br&gt;• Monitor Mode</td>
</tr>
</tbody>
</table>

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)

Cipher Data

802.1 AE Encrypted

Decrypt On Ingress Interface

Flows visible for policy enforcement

Cipher Data

802.1 AE Encrypted

Encrypt On Egress Interface

Packets in “Clear” Inside the Switch

The Solution
Data Confidentiality with Visibility

Typical Deployment Scenario
Hop by Hop L2 encryption
Visibility into the flows for Security and QoS policy enforcement

CORPORATE RESOURCES
Example of inside attacks: Operation Buckshot Yankee

Data Security at Edge

Authenticated Device

Once instantiated, malware spreads laterally.

These flows do not cross threat boundaries.

It took 14 months to find and completely eradicate the virus.

The Challenge

Protect from attacks originating from inside the network.

Attack from an authenticated device

USB Key plugged into an authenticated device.

These flows do not cross threat boundaries.

It took 14 months to find and completely eradicate the virus.

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Network Protection and Monitoring

Network Visibility with Netflow

Authenticated Device

Remote IT

The Solution

Netflow in the Wiring Closet

Data Security at Edge

Known Bandwidth distribution

Anomaly pattern of peer-to-peer flows

Drill down to the source and contain the problem

Remote IT

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

<table>
<thead>
<tr>
<th>Int./Location</th>
<th>Dest. IP</th>
<th>Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/0/10</td>
<td>10.1.1.2</td>
<td>AA23AE7B5899 Lenovo X41</td>
</tr>
<tr>
<td>Gi1/0/10</td>
<td>10.1.1.19</td>
<td>AA23AE7B5899 Lenovo X41</td>
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### Video

Your network is your business

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<th>IT Challenges</th>
<th>Unique Cisco Benefits</th>
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<tr>
<td>• Assessing network readiness</td>
<td>• Calibrate and assess the network with <strong>Built-in Traffic Simulator</strong></td>
</tr>
<tr>
<td>• Monitoring and troubleshooting</td>
<td>• Simplify hop-by-hop troubleshooting with <strong>Mediatrace</strong></td>
</tr>
<tr>
<td>• Ensuring quality of user experience</td>
<td>• Prioritize business-critical traffic with <strong>Strict Priority Queuing</strong></td>
</tr>
<tr>
<td></td>
<td>• Differentiate traffic flows with <strong>Medianet Services Proxy</strong></td>
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</table>

Enabled via Cisco Prime with workflows to deploy, monitor, and troubleshoot video
Video Deployments with Medianet
Built-in Traffic Simulator to Automate Network Readiness

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

(Traffic Simulator based on IPSLA)
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
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 any 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
PoE Leadership
Lower operational expense for end points

IT Challenges
• Support and quickly rollout new devices such as Virtual Desktop Infrastructure (VDI), personal Tele-presence, in-suite services, video kiosks and more
• Reduce high installation costs and deployment time for new power outlets

Unique Cisco Features & 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
VIRTUAL DESKTOP

TRADING FLOOR
TRADING FLOOR

PERSONAL TELEPRESENCE
PERSONAL TELEPRESENCE

CONNECTED REAL ESTATE
CONNECTED REAL ESTATE

HOSPITALITY/RETAIL
HOSPITALITY/RETAIL

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Agenda

• Unified Access Services that Address Customer Challenges
  Security
  Video
  HA
  PoE Leadership

• Unified Access Portfolio Overview
Cisco Borderless Networks Access Portfolio

- **Catalyst 4500E**
  - Industry-leading modular access

- **Catalyst 3750-3560-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

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**Full Borderless Network Services for Enabling New Applications & Delivering Lower TCO**

- **Next-Generation Workspace**
  - Any Device
  - HD Video
  - VDI

- **Traditional Workspace**
  - Data
  - Voice

- **Outside the Wiring Closet**
  - Oil & Gas
  - Retail
  - Manufacturing

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**Purpose-Built for Industrial Applications**

- **Low Port Density**
  - Ruggedized for industrial applications

- **Industrial Automation**
  - 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

SUPERVISOR ENGINE 7-E
- Optimized for Large Campus
- 848Gbps Switching Capacity
- 4x10G SFP+/SFP uplinks
- 250MPPS
- Flexible Netflow

FIBER LINE CARD PORTFOLIO
<table>
<thead>
<tr>
<th>High Density</th>
<th>Low Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS-X4624-SFP-E</td>
<td>WS-X4612-SFP-E</td>
</tr>
<tr>
<td>WS-X4712-SFP+E</td>
<td>WS-X4606-X2-E</td>
</tr>
</tbody>
</table>

1G 10G

SUPERVISOR ENGINE 7L-E
- Optimized for Small/Mid Size Campus
- 520Gbps (48G/slot)
- 2x10G (SFP/SFP+) or 4x1G SFP Uplinks
- 225MPPS
- Flexible Netflow

COPPER LINE CARD PORTFOLIO
<table>
<thead>
<tr>
<th>48G</th>
<th>24G</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS-X4748-RJ45-E</td>
<td>WS-X4648-RJ45-E</td>
</tr>
<tr>
<td>WS-X4748-UPOE+E</td>
<td>WS-X4648-RJ45V+E</td>
</tr>
</tbody>
</table>

Data Only PoE+

POE POWER SUPPLIES
- PWR-C45-1300ACV
- PWR-C45-2800ACV
- PWR-C45-4200ACV
- PWR-C45-6000ACV
Enterprise Class Catalyst 3750-X and 3560-X

INNOVATION
StackWise Plus & 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

STAND-ALONE SWITCH PORTFOLIO

Catalyst 3560 v2
- Data or PoE
- Fixed 1G Uplinks
- Single PS
- LLW

Catalyst 3560-X
- Data / PoE(+)
- Modular 1G/10G Uplinks
- Dual PS
- E-LLW

Fast Ethernet
Gigabit Ethernet

NETWORK & SERVICE MODULES

C3KS-NM-1G
C3KS-NM-10G
C3KS-NM-10GT
C3KS-SM-10G

STACKABLE SWITCH PORTFOLIO

Catalyst 3750 v2
- Data or PoE
- StackWise
- Fixed 1G Uplinks
- Single PS
- LLW

Catalyst 3750-X
- Data / PoE(+)
- StackWise Plus
- Modular 1G/10G Uplinks
- Dual PS
- E-LLW

Fast Ethernet
Gigabit Ethernet

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

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EASE-OF-USE

- 20M PORTS

500K+ UNITS

ENERGY EFFICIENCY

LOWER TCO

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Cisco Quality at Competitive Price
Catalyst 2K Campus Portfolio

**BASIC LAYER 2 (LAN Lite) PORTFOLIO**
- Catalyst 2960
  - 1G Uplinks
  - Partial PoE
  - LLW
  - Fast Ethernet
- Catalyst 2960-S
  - 1G Uplinks
  - E-LLW
  - Gigabit Ethernet

**ADVANCED LAYER 2 (LAN Base) PORTFOLIO**
- Catalyst 2960
  - 1G Uplinks
  - Partial PoE
  - LLW
  - Fast Ethernet
- Catalyst 2960-S
  - 10G/1G Uplinks
  - FlexStack
  - Full PoE, Partial PoE+
  - E-LLW
  - Gigabit Ethernet

**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 Checkstands, Classrooms, Conference Rooms, Hotel Suites, and more…
Catalyst Compact Switch Portfolio

3560-C Portfolio
- IP Base
  - 8 and 12 port FE
  - Data or PoE+
  - 2 x 1G Uplinks
  - E- LLW
- Fast Ethernet
- Gigabit Ethernet

2960-C Portfolio
- LAN Base
  - 8 and 12 port GE
  - Data or PoE
  - 2 x 1G Uplinks
  - E- LLW
- Fast Ethernet
- Gigabit Ethernet

PoE Pass Through Switch

WS-C3560CPD-8PT-S
WS-C2906CPD-8PT-L
Agenda

• Unified Access Services that Address Customer Challenges
  Security
  Video
  HA
  PoE Leadership

• Unified Access Portfolio Overview

• Cat6k – Sup2T is here..
Switch-On "2T": Introducing the New Supervisor 2T

Supported with LMS 4.1

The Most Scalable Catalyst 6500 Ever

- 3X System Performance
- 4X Data Plane Scalability
- 4T Virtual Switching System
- 40 Gigabit Ethernet Ready
- Up to 13M NetFlow Entries/system
- 1 million routes and 256K multicast groups
- Large Packet Buffers

Unparalleled BN/DC Feature Set

End to End Network Virtualization—MPLS, EoMPLS, L2VPN/VPLS, VRF-Lite, Easy Virtual Networks (E VN)

Security with TrustSec, MACsec, Atomic ACL’s and ASA-SM

Application Visibility with NAM-3 and Flexible NetFlow

Unified Mobility with WiSM2

Comprehensive IPv6 Ready for Transition

Future Proof: 40G Ready, OTV Ready, TRILL Ready, LiSP Ready
New 69xx Series and 68xx Series Ethernet Modules

**69xx SERIES w/ DFC4**
- 8p 10G
- **NEW**
- Non-Blocking 80G/slot Performance
- Wire Rate MacSec
- Virtual Switching Link (VSL)
- Large packet buffers (256MB/port)
- X2 Transceiver or SFP+ w/ adapter
- Available in Standard and XL Sizes
- LISP and OTV Ready

**4P 40G* (6904-40G)**

Doubled System Performance

**68XX SERIES W/ DFC4**
- 24p 1GbE
- **NEW**
- 48p 10/100/1000
- **NEW**
- 16p 10GbE
- **NEW**
- 6p 10GBASE-T
- **NEW**

- 40G/slot Linecards w/ Integrated DFC4
- 24 and 48 ports 1GbE Fiber Linecards
- 48 ports 10/100/1000
- 16 ports 10GbE Fiber and 10GBASE-T
- Available in Standard and XL Sizes

Distributed Forwarding Performance at Central Forwarding Price

*Roadmap
New High Performance Catalyst 6500 L4-7 Service Modules

Integrate Wire/Wireless Management

Next Generation WiSM Blade—WiSM-2

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>10 Gbps</td>
</tr>
<tr>
<td>Access Points</td>
<td>500 - 1000</td>
</tr>
<tr>
<td>Clients</td>
<td>10,000</td>
</tr>
<tr>
<td>Concurrent AP Upgrade/Joins</td>
<td>Up to 500</td>
</tr>
<tr>
<td>Mobility, Domain Size</td>
<td>Up to 18,000 APs</td>
</tr>
</tbody>
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Enhance Visibility, Accelerate Troubleshooting

Next Generation NAM Blade—NAM-3

<table>
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<tbody>
<tr>
<td>Monitoring Performance</td>
<td>Up to 15 Gbps</td>
</tr>
<tr>
<td>Capture to External Disk</td>
<td>Up to 5 Gbps</td>
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<tr>
<td>Performance Analytics</td>
<td>1588 Timestamps</td>
</tr>
<tr>
<td>HW Filters/ Packet Captures</td>
<td>Rapid Troubleshooting</td>
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Accelerate & Balance Application Performance

Next Generation Load Balancer—ACE-30

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<td>Performance</td>
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<td>Compression</td>
<td>Up to 6 Gbps</td>
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<tr>
<td>Transactions per Second</td>
<td>30,000</td>
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<tr>
<td>Virtual Context</td>
<td>250</td>
</tr>
<tr>
<td>VLANs</td>
<td>4000</td>
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Deliver Robust, Integrated, Streamlined Security

Next Generation Firewall Blade—ASA-SM

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<tr>
<td>System Performance</td>
<td>64 Gbps</td>
</tr>
<tr>
<td>Performance / Service Mod.</td>
<td>16 Gbps</td>
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<td>Concurrent Sessions</td>
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Integrate Wire/Wireless Management

Next Generation WiSM Blade—WiSM-2

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Enhance Visibility, Accelerate Troubleshooting

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