The Evolution

Desktop → NETWORK → Data Center
The „Anywhere“ Workspace

- **Mobility**: Bring Your Own Devices
- **SaaS | DC / V**: Cloud/Virtualization
- **Network**
- **Immersive Collaboration**
- **Pervasive Video**
- **Security**
- **IT Productivity**
- **Energy Efficiency**
Unified Access Vision
Unified Network Access
One Network, One Policy, One Management

- Wired
- Wireless
- VPN
Unified Network Access
One Network, One Policy, One Management

Unified Management
Single pane of glass management for wired and wireless networks

Unified Policy
Single policy definition and deployment for all users, devices and applications

Unified Access
Common operations, multi-fold increase in wireless scale, and granular visibility/control

Cisco Prime Infrastructure (NCS+LMS)

Cisco Identity Services Engine (ISE)

Wireless Access
Remote Access
Wired Access
Network management – Place where clients meet, no matter the access method
Network Management Challenges

- Complex
- Manual
- Error Prone

Siloed non-integrated management products and processes

- In-efficient infrastructure-focused management approach
- Inadequate tools to rapidly deploy devices and services
Cisco Prime Infrastructure
Addressing Management Challenges

- Simplified
- Automated
- Integrated Best Practices

Efficient management with optimized user experience
Integrated workflows and best practices speed operations
Improved delivery and predictability of services
### Optimized Operations Experience
- Common user interface
- Intuitive user experience
- Optimized operator workflows

### Integrated Cisco Best Practices
- Guided deployment of Cisco-validated best practices
- Automated troubleshooting and diagnostics

### Complete Lifecycle Management
- End-to-end lifecycle
- ITIL-aligned operations
- Northbound integration to customer back office

### Day-One Device Support
- Support for new devices and technologies upon shipment
- Non-disruptive support upgrades

### Smart Interactions
- Context-based help tool
- Real-time access to Cisco support community
- Automated Cisco TAC case creation and management

### Physical and/or Virtual Appliance
- Two delivery options
- Both options fully self-contained
- Includes operating system, software application, database, and CLI

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Cisco Prime Infrastructure (NCS+LMS) Common Operational Attributes

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Cisco Unified Policy Management
Identity Services Engine (ISE)
Industry’s first context-based Wired+Wireless+VPN policy management

BEFORE
Separated policy management

AFTER
Context-based policy management for employees and guests across network

Unified Policy Management


Wired | VPN | Wireless

Simple | Unified | Automated

Cisco ISE = Simplified Policy Management
## Cisco's Unified Policy Management / Guest Access

### Example of BYOD / Mobility Policy Table

<table>
<thead>
<tr>
<th>User</th>
<th>Device</th>
<th>Access Method</th>
<th>Location</th>
<th>Time</th>
<th>Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guest</td>
<td>Personal Laptop</td>
<td>Wireless</td>
<td>Conference Rooms</td>
<td>M – S 8 am -6 pm</td>
<td>Captive Portal DMZ Guest Tunnel</td>
</tr>
<tr>
<td></td>
<td>Personal Device</td>
<td>Wireless</td>
<td></td>
<td></td>
<td>Guest VLAN</td>
</tr>
<tr>
<td>Contractor</td>
<td>Contractor Computer</td>
<td>Wireless</td>
<td>Anywhere</td>
<td>Anytime</td>
<td>Contractor VLAN</td>
</tr>
<tr>
<td></td>
<td>Personal Device</td>
<td>Wired</td>
<td>Anywhere</td>
<td>M – S 8 am -6 pm</td>
<td>Contractor ACL</td>
</tr>
<tr>
<td>Employee</td>
<td>VDI</td>
<td>Wired</td>
<td>Anywhere</td>
<td>Anytime</td>
<td>Employee VLAN</td>
</tr>
<tr>
<td></td>
<td>Corporate Computer</td>
<td>Wireless</td>
<td>Anywhere</td>
<td>Anytime</td>
<td>Employee ACL</td>
</tr>
<tr>
<td></td>
<td>Personal Device</td>
<td>VPN</td>
<td>Anywhere</td>
<td>Anytime</td>
<td></td>
</tr>
</tbody>
</table>

**IF $Identity AND $Device AND $Access AND $Location AND $Time THEN $Permission**
Cisco's Unified Policy Management / Guest Access
Example BYOD / Mobility Implementation

Corporate Issued Device
1. User Authentication and Authentication
2. Profiling to identify device
3. Policy decision
4. Policy enforce to “VLAN 10” on same SSID
5. Full access granted
6. Full device visibility

PERSONAL Device
1. 802.1x EAP User Authentication
2. Profiling to identify device
3. Policy decision
4. Policy enforce to “VLAN 10 or 20” on same SSID
5. Full or Restricted access granted
6. Full device visibility
Secure And Reliable Wired Access
Catalyst 3K-X, 4K are Best Suited to Support Next Generation Workspace

Traditional Workspace
- Data
- Voice

Next Generation Workspace
- Any Device
- HD Video
- VDI

Catalyst 3K-X
- Security
- Video
- PoE Leadership
- HA

Catalyst 4K
- Security
- Video
- PoE Leadership
- HA

Catalyst 2960-S
- Competitive feature set at compelling prices
- Reduced TCO with Smart Operations

Benefits

ENABLING THE BORDERLESS EXPERIENCE
Key Technologies That Address Your Business Challenges

<table>
<thead>
<tr>
<th>Collaboration</th>
<th>Operations</th>
<th>Evolve with Changing Business Needs</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Challenges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology Enablers</td>
<td></td>
<td>Video</td>
<td></td>
</tr>
<tr>
<td>High Availability</td>
<td></td>
<td>Security</td>
<td></td>
</tr>
<tr>
<td>PoE Leadership</td>
<td></td>
<td>Simplification</td>
<td>Catalyst 3K-X and 4K</td>
</tr>
<tr>
<td>Simplification</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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## Customer Challenges

<table>
<thead>
<tr>
<th>Scalable 802.1X Identity solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing users the right level of access</td>
</tr>
<tr>
<td>Meeting compliance requirement (PCI, SoX, HIPPA etc.)</td>
</tr>
</tbody>
</table>

## Catalyst 3K-X and 4K

### Simplify 802.1x Identity Deployments
- Integrated switch sensor & ISE
- Monitor Mode
- Flexible Authentication methods

### Protect Against Malicious Behavior
- Control Plane Policing (4K)
- Flexible NetFlow

### Prevent Eavesdropping
- MACsec for line-rate HW encryption

## Benefits

- **Eliminate Data Snooping, Tampering and Attacks**
- **Comply With Security Regulations**
- **Effortless Security Roll-outs**
# 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</td>
</tr>
<tr>
<td></td>
<td>• MAC Authentication Bypass, Web Authentication</td>
</tr>
<tr>
<td></td>
<td>• Monitor Mode</td>
</tr>
<tr>
<td>How do you handle failed access?</td>
<td>• Failed Authentication VLAN</td>
</tr>
<tr>
<td></td>
<td>• Monitor Mode</td>
</tr>
<tr>
<td>How do you support multiple users or devices on the same port?</td>
<td>• Multi domain Authentication</td>
</tr>
<tr>
<td></td>
<td>• Multi-Authentication</td>
</tr>
<tr>
<td>How do you support various kinds of devices with different authentication</td>
<td>• Flexible Authentication via Automated 802.1X, MAB, web Auth</td>
</tr>
<tr>
<td>mechanisms?</td>
<td>• Different Supplicant types for different Client Operating Systems</td>
</tr>
<tr>
<td></td>
<td>• Wake On LAN</td>
</tr>
<tr>
<td></td>
<td>• 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</td>
</tr>
<tr>
<td></td>
<td>• 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.
# Video with Medianet

## Deploy Video with Confidence

### Customer Challenges

- Keeping up with explosive video growth: network provisioning & readiness assessment
- Delivering high quality video experience
- Troubleshooting video experience issues

### Catalyst 3K-X and 4K

#### Ensure Network Readiness
- Traffic Simulator and Mediatrace

#### Simplify Deployments
- Auto-configuration
- Automate content stream with Location Aware Content

#### Provide Optimal Experience
- Traffic identification and differentiated QoS
- Strict Priority Queuing

#### Monitor and Troubleshoot
- Mediatrace for hop-by-hop analysis; Traffic Simulator

### Benefits

- Simplified/Rapid Deployments
- Scalable/High Quality Video
- Easily Integrate New Video Applications

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# High Availability

## Best in Class Resiliency Capabilities

### Customer Challenges

- Ensuring business continuity
  - No dropped voice or video conferences
  - Non-stop access to critical resources

### Catalyst 3K-X and 4K

#### Support Non-Stop Communications

- Non-stop forwarding (NSF)/ Stateful switch over (SSO)
- StackWise Plus
- StackPower
- Full HW redundancy

#### Minimize Planned Downtime

- Hot Swap components
- In Service Software Upgrade and Rolling Stack Upgrade

### Benefits

- Uphold SLA’s
- Reduce OpEx
- Better Network Stability
PoE Leadership
Most Efficient and Comprehensive PoE support in the Industry

Customer Challenges
Support and quickly rollout new PoE devices for new services
  • VDI
  • Next gen video surveillance
  • Multiple radio wireless APs
  • Video phones

Catalyst 3K-X and 4K
Harness Industry-Standard PoE+
  • Highest density PoE+
  • 30W on every port

Maximize Power Flexibility and Availability
  • StackPower
  • Hot-swappable
  • Intelligent Power Management
  • PoE passthrough

Support Next Gen Devices (VDI, IP Turret, Compact Switch)
  • uPoE (60W)

Benefits
PoE with no Restrictions
Save Cost
Support Widest Array of Devices
## Energy Management with EnergyWise
### Enterprise-Wide Energy Management Solution

### Customer Challenges
- Reduce Costs
  - Reduce Total Cost of Ownership
- Track IT assets
- Comply with regulations

### Catalyst 3K-X and 4K

#### Measure Power of Various Devices
- PoE powered devices
- IP Phones, APs, PCs, printers
- Manage non-IT devices via EW partnerships e.g. PDU’s, meters

#### Easy Deployment and Management
- Built into IOS
- Easily managed with LMS, Orchestrator or other partner app

#### Investing in Technology’s Future
- Over 80 partners in EW CDN
- Driving industry-wide standardization through IETF

### Benefits
- Comprehensive Visibility
- Lower’s Opex
- Driving standardization

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Smart Operations=Cost Savings

SECURE AND SCALABLE

New switch is connected
Software image is downloaded
Configuration automatically applied

New device attached to switch:
Port Configuration—Applied
QoS—Enforced
Security—Enforced

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

Smart Install
Zero Touch Deployments and Maintenance
Auto Smart Ports
Plug and Play for End Devices
Smart Call Home
Quickly Identify and Resolve Network Issues

Cost Savings
Significant savings for large/remote networks: $15,000 (or 230 hours) / 100 switches*

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Quantifiable Savings

**EnergyWise**
- Reduce power utilization on all IT devices connected to the network
- Range is based on the customer deployment scenario (greater desktop usage generally lead to higher savings) and the customer’s discount rate applicable to the cash flows

**Platform Longevity Savings**
- Extend refresh cycle from 3 to 5 years
- Driven by 3K / 4K capabilities in security, video, HA, and PoE leadership, and competitive advantages in IPv6 and QoS
- Range is based on 3K-X SKU used and customer’s discount rate

**Additional operational savings**
- Smart Operations: Smart Install and Auto Smart Ports
- Ease of deployment for video and security
- Advanced troubleshooting capabilities
- Advanced network and policy management: LMS, ISE, Medianet.

*Note: Platform longevity savings are based on 3K-X platform; EnergyWise savings assume full PoE and mix of deployment scenario’s. Details in notes.*
Secure And Reliable Wireless Access
Enterprise Wireless Evolution
From best-effort to mission-critical – delivering a wired experience over wireless
Cisco CleanAir Technology
Industry’s first chip level proactive and automatic interference protection

BEFORE
Wireless interference decreases reliability and performance

AFTER
CleanAir mitigates RF interference improving reliability and performance

Cisco CleanAir – Improves Reliability and Performance
**Cisco ClientLink Technology**

Advanced beam forming technology improves wireless client performance

BEFORE

Beam not directed towards legacy A/G client resulting in lower performance

AFTER

Beam directed towards client resulting in better performance

Cisco ClientLink - Improves Reliability and Performance
Why Is Cisco’s ClientLink so Unique?
Reduces coverage holes and improves client performance

BEFORE
Client-link disabled

AFTER
Client-link enabled

Lower Data Rates

Higher Data Rates

Cisco ClientLink = Up to 65% Improved Throughput
Cisco VideoStream Technology
Wired-like video delivery over wireless

BEFORE
No resource reservation, degraded voice and video, cannot deliver multicast

AFTER
Stream prioritization, resource reservation, reliable multicast over wireless

CEO Meeting  |  M&A Negotiation  |  Sports Event

CEO Meeting  |  M&A Negotiation  |  Sports Event

Global Enterprise

Cisco VideoStream – Improves Reliability and Performance
Why Is Cisco’s VideoStream so Unique?
We optimize end-to-end starting at the Access Point

Multicast to Unicast Conversion at the AP

Selectable Stream Prioritization

Resource Reservation Prevents Oversubscription

Multicast Stream

UNICAST STREAMS

HIGH PRIORITY EVENT
CLASSROOM PROGRAM
LIVE SPORTING EVENT

resource reservation prevents oversubscription

Tested for 30X Less Bandwidth Consumed and Double the Performance of Competitors
Cisco AnyConnect Technology
Industry’s first context-based and persistent VPN Connectivity

BEFORE
Unmanaged devices
— risk of data loss and lack of access

AFTER
Always-on VPN connectivity

Acceptable Use
Access Control
Data Loss Prevention

Mobile Worker

Cisco AnyConnect = Persistent VPN Connectivity
Cisco’s Mobility Solutions – Be Connected!
Gartner MQ Leader where it counts for Mobility - LAN, WLAN, & VPN

Best-of-Breed and Best-in-Class Mobility Technology

CleanAir
- Improved Reliability
  Proactive and automatic interference mitigation

ClientLink
- Improved Performance
  Better coverage for an improved user experience

VideoStream
- Superior Video Quality
  Reliable multicast, stream prioritization, resource reservation

AnyConnect
- Persistent VPN Connectivity
  Broad OS support, context-aware VPN connectivity

Common Policy and Network Management

ISE

NCS

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Cisco Wireless Controllers

- **Cisco 2500**
  - Desktop Appliance
  - 50 Access Points

- **Wireless Controller On ISR SRE**
  - Software on ISR module
  - 50 Access Points

- **Cisco 5500**
  - I RU Appliance
  - 500 Access Points
  - 8 GB Mbps
  - 8 GE ports

- **Wireless Services Module on Catalyst 6500**
  - Blade for Catalyst chassis
  - 500 Access Points
  - 10 GB Mbps

- **Cisco Flex 7500 Cloud Controller**
  - I RU appliance
  - 2000 Access Points
  - 500 remote locations

**Functionality**
- **Small Enterprise and Full Service Branch**
- **Small Enterprise and Full Service Branch**
- **Mid-Large Enterprise**
- **Mid-Large Enterprise**
- **Multiple Lean Branch Deployments**

**Scale and Performance**
Cisco 802.11n Access Points

**Aironet 1040**
- Small Enterprise
- ClientLink 1.0
- up to 300 Mbps

**Aironet 1140, Aironet 1260**
- High performance for indoor and indoor ruggedized spaces
- All Enterprise
- ClientLink 1.0
- VideoStream
- up to 300 Mbps

**Aironet 1550**
- High performance for indoor and indoor ruggedized spaces
- All Enterprise
- Mesh
- CleanAir
- ClientLink 1.0
- VideoStream
- up to 300 Mbps

**Aironet 3500, Aironet 3500p**
- High performance with spectrum intelligence
- All Enterprise
- CleanAir
- ClientLink 1.0
- VideoStream
- up to 300 Mbps

**Aironet 3600**
- Top performance with client acceleration and spectrum intelligence
- Education, Healthcare
- CleanAir
- ClientLink 2.0
- VideoStream
- 3 spatial streams
- up to 450 Mbps

**Aironet 1040**
- Small Enterprise
- ClientLink 1.0
- up to 300 Mbps

**Aironet 1140, Aironet 1260**
- All Enterprise
- High performance for indoor and indoor ruggedized spaces
- ClientLink 1.0
- VideoStream
- up to 300 Mbps

**Aironet 1550**
- All Enterprise
- High performance for indoor and indoor ruggedized spaces
- Mesh
- CleanAir
- ClientLink 1.0
- VideoStream
- up to 300 Mbps

**Aironet 3500, Aironet 3500p**
- All Enterprise
- High performance with spectrum intelligence
- CleanAir
- ClientLink 1.0
- VideoStream
- up to 300 Mbps

**Aironet 3600**
- Education, Healthcare
- Top performance with client acceleration and spectrum intelligence
- CleanAir
- ClientLink 2.0
- VideoStream
- 3 spatial streams
- up to 450 Mbps
Thank you.