Catalyst 9000 Powered Smart Buildings
Intent-based networks for IT and OT convergence
Agenda

- Smart building drivers
- PoE and smart building
- The network as a utility
- The ecosystem
- Customer success
Smart building drivers
Drivers behind the transformation to smart buildings

Buildings Contribute
- GH Gas Emissions: 30%
- Energy Consumption: 70%
In Major Cities

Real estate is the 3rd largest corporate expense after salaries and COGS
- Unoccupied Workstations Each Day: 60%
- Employees Spend >30 min / day Finding Rooms: 40%
- Meetings are ‘No-Shows’: 25%

Connected Devices by 2025¹
- 75B Connected Devices
- 14.7B Machine-to-machine connections by 2023²

Senior leaders reported that a building management system produced an ROI

Expert interviews; Herman Miller Living Office
2018 Forbes Insights /Intel Survey

¹ Statista, “IoT connected devices installed base worldwide, 2015-2025”
Modernize IT to expedite smart buildings

97% Businesses are struggling to maintain agility with their current infrastructure

80% Employees want Digitally Enabled Company

79% CRE IoT Sensor growth


ASID

Deloitte
Smart buildings stakeholders – value stages

- Lower Capital Costs
- Sustainability
- Maintain Compliance
- Investment protection

- Differentiated innovation
- Validated designs
- Rapid prototyping
- Standardized Tech.

- Timely completion
- Compliance & Certifications
- OEM Partners

- Attract & Retain Tenants
- Adapt to changes faster
- Lower TCOs

- Health & Wellness
- Employee/Visitor experience
- Energy costs

Building/Property Owners
Architects / Engineers
General Contractors
Building/Property Management
Building Tenants

PLAN  DESIGN  EXECUTE  OPERATIONALIZE  EXPERIENCE
Intent-based networks for smart building outcomes
Enabled using cloud-based services offered by IoT ecosystem

Health and wellness
- Environmental sensing
- Intelligent disinfection (UV lighting)
- People counting & Contact tracing

Occupant experience
- Collaboration
- Productivity
- Personalized

Sustainability
- Energy Savings
- Renewability
- Lower TCO

Security
- Access control
- Surveillance
- Emergency Address
Fragmented IT and OT networks converge with Cisco intent-based networking and Catalyst 9000

Yesterday

- Managed by OT team
- HVAC

Managed by IT team
- IT Network
- Phone

Today

- Secured by ONE IT team
- Badging system
- HVAC
- IT Network
- Automated elevators
- Security cameras
- Sensors
- Fire alarm systems
- Phone
- Lightning

Intent-Based networks for smart buildings, hospitality, health care, manufacturing

Cisco DNA Center for smart buildings

- Trust-based onboarding
- Threat centric monitoring
- Automated policies
- Cloud enabled
PoE and smart building
90W PoE standardization is growing the ecosystem

IEEE standardization expands the PoE ecosystem

- IEEE 802.3bt complements Cisco UPOE® by adding 4 new classes of devices
- Safety measures ensure up to 90W of power is safely delivered
Worker mobility with 90W UPOE+ USB-C Dongle

Mobility without the need to carry custom power bricks

BEFORE

Most Name brands support USB-C and more supporting everyday

USB-C is the new standard for power and up to 5G of data
USB-C and more supporting everyday

TODAY

Flexibility of BYOD and cost savings with single cable for power and data
New PoE architectures are emerging with 90W

Catalyst 9000 802.3bt 90W switches

1. USB-C power
   (laptop charging + data)

2. UPOE Pass-through
   (for extended reach 60W)

3. Daisy-chaining
   (Cost saving with 90W)

Catalyst 9300 Series switches
1G UPOE+ 90W models (C9300-24/48H)

Catalyst 9400 Series modular switch with
1G UPOE+ 90W line card (C9400-LC-48H)
New 90W use cases revolutionizing workspaces

BEFORE

Today: Workspace powered by 90W Cisco UPOE+

PoE powered workspaces

- Automated height adjustable desk*
- PoE powered desktop switch
- All-in-one computers / Displays
- Daisy-chained PoE Lights
- IP phones
- Ethernet to USB-C for laptops/Tablets/Phones

Lower CapEx by eliminating AC cabling to every desk. Flexibility in workspace design independent of AC outlets
Cisco Catalyst 9000 augments Cisco’s leadership in IoT

IBN expands IoT endpoints with security, visibility, scale and cloud tethering

- Extended connectivity with SD-Access Extended node solutions
- CoAP to access lights and other sensors for lighting control

Device classification and profiling with ISE
- Emerging standards support for access control (ex: Manufacturers Usage Description [MUD])

- Secure Virtual networks and segmentation of IoT from IT with SD-Access
- Scalable group-based policies

- “Thing” connectivity management with Cloud IOT services
- Container-hosted Cloud-tethered apps on open Cisco IOS XE Software

End-to-end solution managed by central IT team that lowers TCO

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Network as a utility
Smart building layers

Services Layer

Fiber or Ethernet
Switches
Camera’s
Wi-Fi Mesh
Access point
Camera’s
LoRaWAN gateway
Industrial Wi-Fi
LoRaWAN gateway
Industrial Wi-Fi
Cisco Mesh
4G / 5G Repeater
Industrial Router

Basement/Shell

Backhaul options
Fiber | MPLS | Cellular

Floors

Shared Services
PoE Lighting
Switch
Secure Server(s)
DHCP
AAA
CA
Actility
WLAN Controller and CMX/DNA spaces
Cisco DNA Center
ISE
Telepresence
Switch

Suite

Appt / Suite
IoT Sensors & Controls
POE Lighting
Switch
Router
Fiber/ Ethernet

DMZ and Internet

Apps
Internet

Cloud Vendors & External Agencies

Cisco and partner applications

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Catalyst 9000 provides high uptime for critical IoT applications

Primary power grid

Backup DC power

- N+1/N+N Redundant power supplies
- Power available from AC + DC sources
- Perpetual PoE available through upgrades
- Critical devices stay up during load shed
- Fast PoE restores power within a minute

Emergency pathway lighting

Surveillance systems

Hospital ER and OT lighting

Security control center (Reliable Data + Power)

Cisco DNA Center™

Telemetry

Network Power Assurance

Intelligent Building Management Systems

DNA Assurance

Open APIs
Catalyst 9400 90W UPOE+ line card
Highest UPOE+ scale to power latest intelligent devices

- Up to 260* x 90W concurrent power
- IEEE 802.3bt standards compliant
- PoE HA with dual supervisors
- 48 x 1G Ports per line card
- Up to 8 x 3200W AC/DC PSU

*10-slot chassis w/o power redundancy. Subject to available PoE power budget in chassis

Investment Protection with 90W UPOE+

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Cisco Catalyst 9300 Series switches
Introducing 90W UPOE+ models

24 ports 1G Copper  C9300-24H

48 ports 1G Copper  C9300-48H

- 24- and 48-port 1G Copper SKUs
- Up to 32 Ports at 90W\(^1\)
- Fast and Perpetual POE* 
- Wire-speed, non-blocking performance
- Seamlessly integrates with existing 9300 Series copper
  - Supports same optics
  - Common stacking – StackWise®-480
  - Common power stacking – StackPower
  - Common uplink modules
  - Common power supplies, fans, cables

\(^1\)Depending on the Power budget available for UPOE+ in combined mode w/ 2x 1900W PSUs

\*FCS++. FPOE/PPOE w/ Stack power on roadmap
The security challenge with an expanding IoT eco-system

Minimal IoT end-point security
Segmentation through SD-Access assures critical network is protected from security breaches

IoT device security compliance
Authentication of IoT nodes and end to end policy enforcement

Continuous malware monitoring
ETA monitors, detects, quarantines and generates incident response in real time

Built-in Catalyst 9000 security
- 802.1x authentication
- LLDP / DHCP device identification
- Radius proxy
- Manufacturer Usage Description
- MACsec AES 256-bit
- Encrypted Traffic Analytics
- SGACL scale
Smart building ecosystem
Smart building partners

**Architecture and Engineering (AE)**
- **Role:** Line-of-business facing partners, digital experience and integration services
- **Care about:** Expand consulting services for delivering end-to-end solutions

**Global Industry Partner (GIP)**
- **Role:** OEM, Embed or Embrace Cisco technology as key component to their offering, Industry thought Leader
- **Care about:** Grow vertical solutions, drive consistent roadmap for customers

**Independent Software Vendors (ISV)**
- **Role:** Deliver analytics, IoT platform and LoB applications validated on Cisco network
- **Care about:** Access to Cisco partner/sellers and sell more SW licenses

**Independent Hardware Vendors (IHV)**
- **Role:** Embed sensors, devices, SW into solution
- **Care about:** Sell their products/services in our reference architecture

**Systems Integrator (SI)**
- **Role:** Deliver large-scale strategy and business transformation services
- **Care about:** Consulting services engagement retail and IoT use cases

**IT Resellers**
- **Role:** Sell Cisco infrastructure and professional services aligned to Retail
- **Care about:** Develop long term client relationship expanding product and services revenue.
Customer success
90W expands existing OT landscape across verticals

**Hospitality**
- Lights
- Access points
- IP phones
- Smart mirrors
- Motorized Blinds
- HVACs
- Minibars
- Emergency Alert systems
- PoE TVs
- Emergency Alert systems

**Healthcare**
- Emergency signs
- Paging systems
- Bio medical devices
- Patient room control
- Patient vitals display
- Daisy-chained lights
- Patient smart card readers
- BLE Access points

**Retail**
- Surveillance cameras
- Price tag readers
- Checkout registers
- Emergency alert systems
- BLE Access points
- UHD 4K product displays
- People counting sensors

- Up to 50%* cost savings
- 1.5X power + reliability
- 20%* increase in sales

*Independent research on businesses using digitization through IoT
Financial services case study

“90W enables... the office of the future by letting me daisy-chain... light fixtures from each port... flexibility for our office while saving money ... We’ve seen a 60% cost savings ...”
- Eric Madeson, SVP Head of Infrastructure

Challenge

- NYC is setting the standard for greener, more energy conscious buildings across the U.S. with a city-wide goal of 80% carbon emission reduction by 2050.
- Flexibility needed as office space expands
- Cut construction cost
- Reduce power usage
- No room for security breaches

Solution

- Cisco Catalyst 9400 Series with 90W Cisco UPOE+

Business outcomes

- Cutting power costs by 2/3rd's
- Reduced construction cost by half
- Able to take advantage of local electric rebates from Com Ed
- Able to daisy-chain lighting giving 3x light fixtures per port
- Combined IT and OT systems into one platform
- Strong security posture on all the elements of the network
Manufacturing case study

“90W offers flexibility for our office and manufacturing space without having to rely on electricians every time ... I can power my lights, put in new digital displays...anything needed.”

-Ron Grohman, Sr. Network Engineer

Challenge

- Flexibility in placement both in office and manufacturing floor
- Needed to reduce complexity
- Cut construction cost
- Reduce power usage
- No downtime

Solution

- Cisco Catalyst 9400 Series with 90W Cisco UPOE+

Business outcomes

- Able to quickly build out their new space, without the cost electrician or a permit to install or change
- Reduced office construction cost by more half
- Able to daisy-chain lighting giving 3x light fixtures per port reducing complexity
- Combined IT and OT systems into one platform
- Able to deploy larger POE monitors
- PoE power LED lighting alone will more than pay for the upgrade
Hospitality case study

"Once we had everything on a single network then we can do wonders with it. We are making the system intuitive and smart... the sky is the limit to where you can take this infrastructure... Network infrastructure should be taken seriously... as the fourth utility"

– Farukh Aslam, President, Sinclair Holdings, LLC

Challenge

• Historic building retrofit
• Create best experience for clients
• Cut construction cost
• Reduce energy usage
• Take advantage of new PoE based
• Must be plug and play

Solution

• Cisco Catalyst 9400 Series with 90W Cisco UPOE+

Result

• UPOE+ allowed combined management of IT and OT from energy monitoring, to room automation to building management.
• Created an enhanced user experience with an intuitive, user friendly room controls
• Cutting power costs by more than 50%
• Reduced retrofit construction cost by more than half with daisy-chain lighting, screens, shades and environmental controls
• Able to take advantage of local Texas PACE incentive program