



Catalyst 9000 Powered Smart Buildings

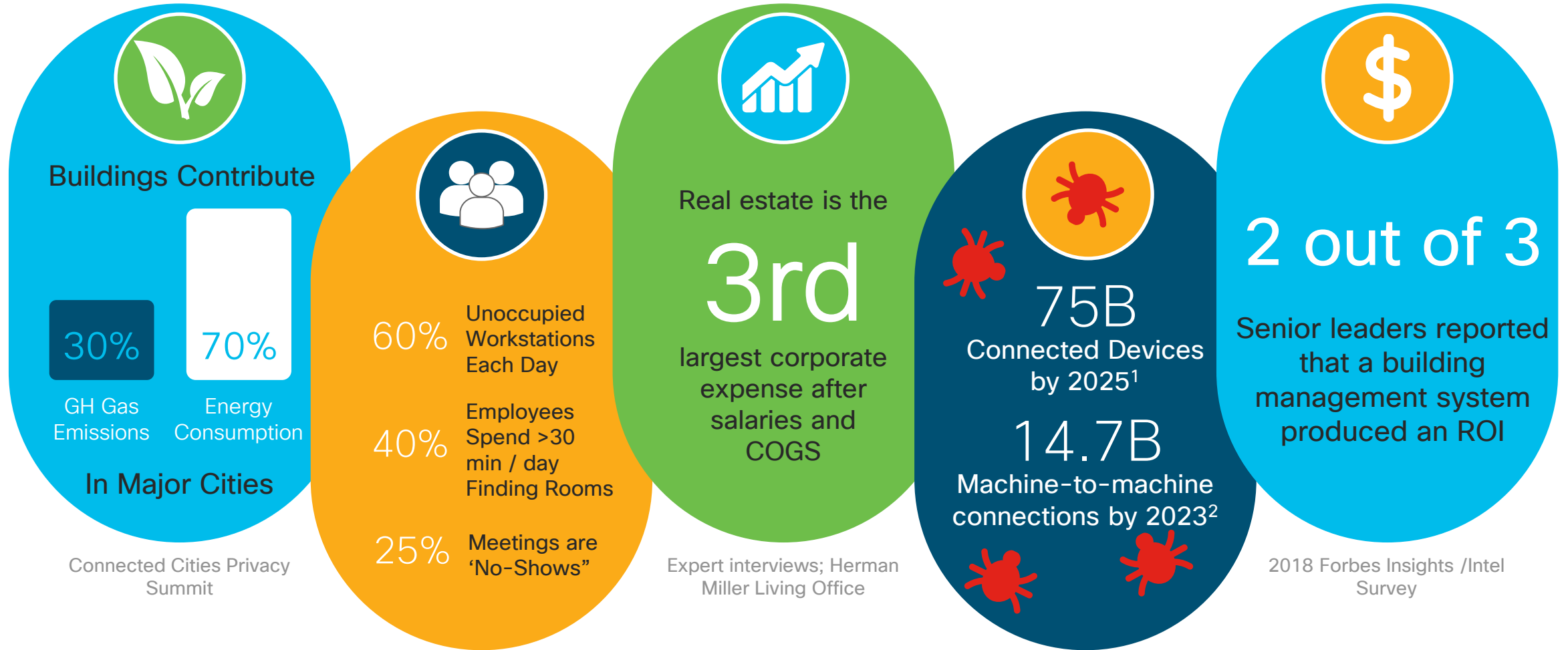
Intent-based networks for IT and OT convergence

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



Connected Cities Privacy Summit

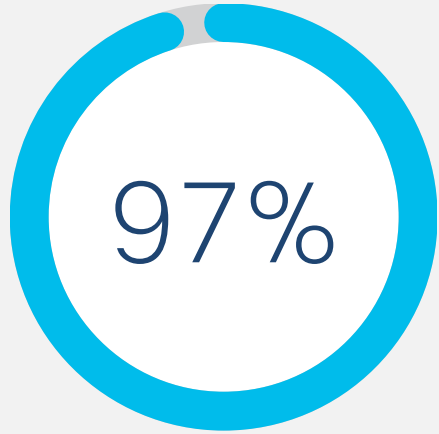
Expert interviews; Herman Miller Living Office

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1 Statista, "IoT connected devices installed base worldwide, 2015-2025"
2 Cisco Annual Internet Report, 2020, "Machine-to-Machine connections worldwide" 2018-2023

2018 Forbes Insights /Intel Survey

Modernize IT to expedite smart buildings



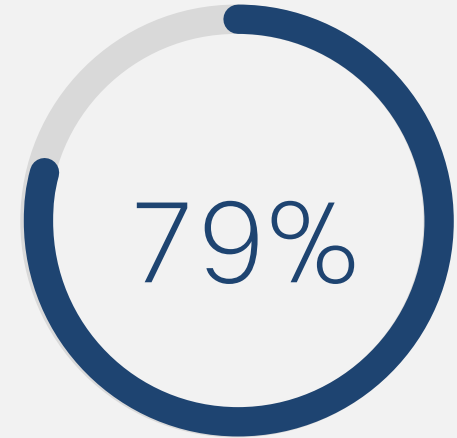
Businesses are struggling to maintain agility with their current infrastructure

Digital Journal: Aging infrastructure still impeding digital transformation (2017)



Employees want Digitally Enabled Company

ASID



CRE IoT Sensor growth

Deloitte

Smart buildings stakeholders – value stages

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



Building/Property Owners

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



Architects / Engineers

- Timely completion
- Compliance & Certifications
- OEM Partners



General Contractors

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



Building/Property Management

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



Building Tenants

PLAN

DESIGN

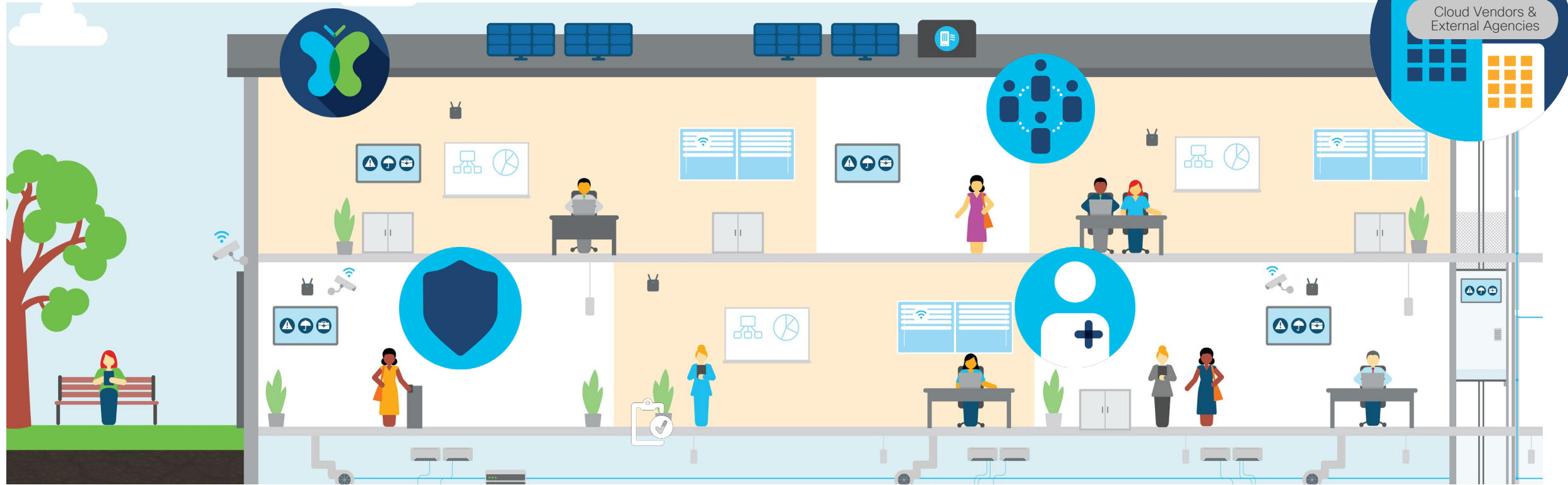
EXECUTE

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

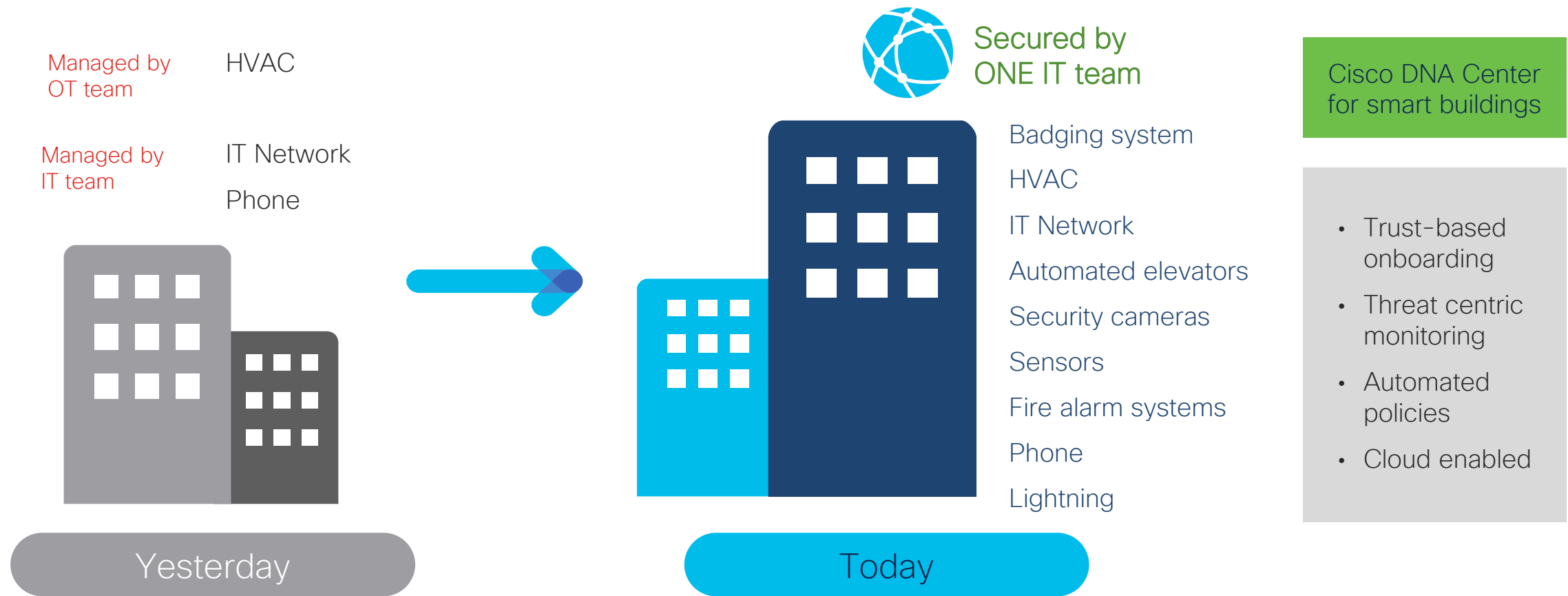
- Energy Savings
- Renewability
- Lower TCO



Security

- Access control
- Surveillance
- Emergency Address

Fragmented IT and OT networks converge with Cisco intent-based networking and Catalyst 9000

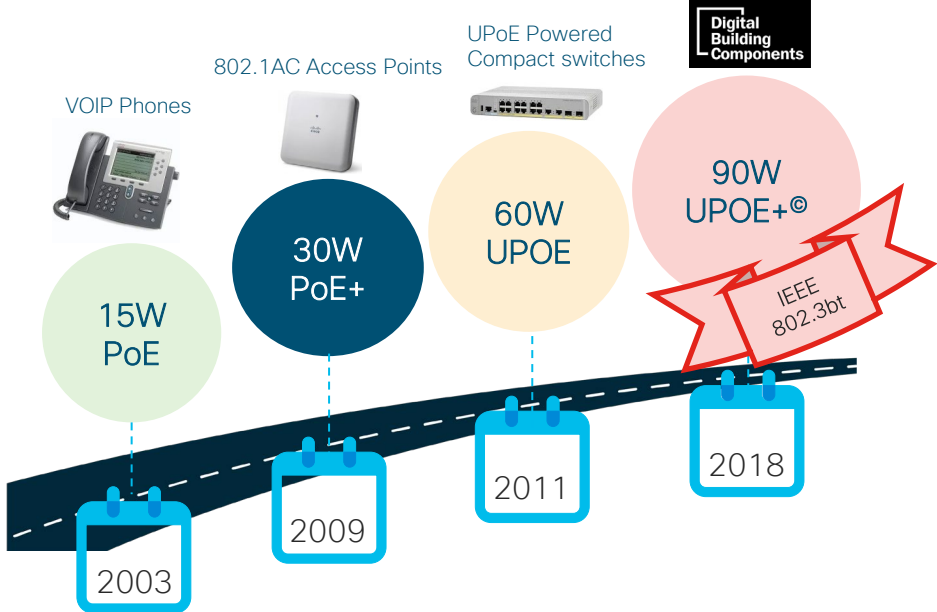


Intent-Based networks for smart buildings, hospitality, health care, manufacturing

PoE and smart building

90W PoE standardization is growing the ecosystem

UPOE+(90W) Standardization



Growing 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

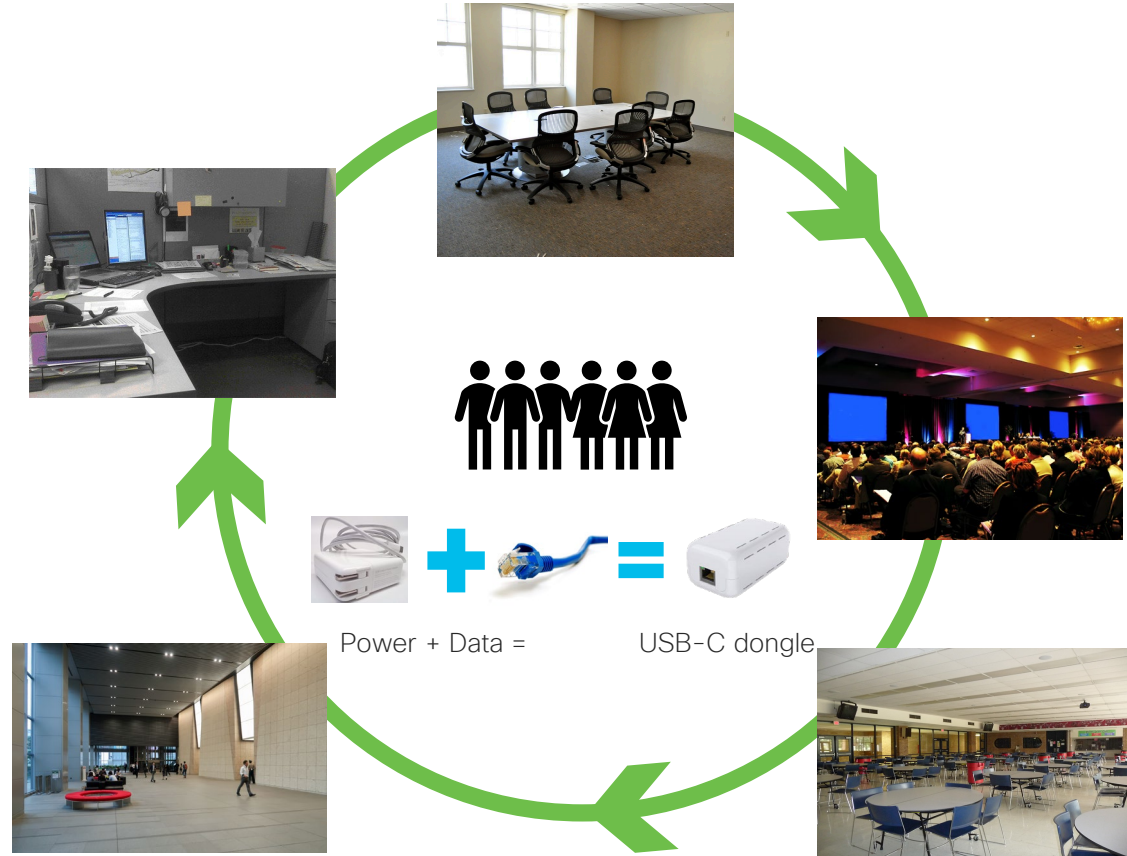
BEFORE



TODAY



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



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

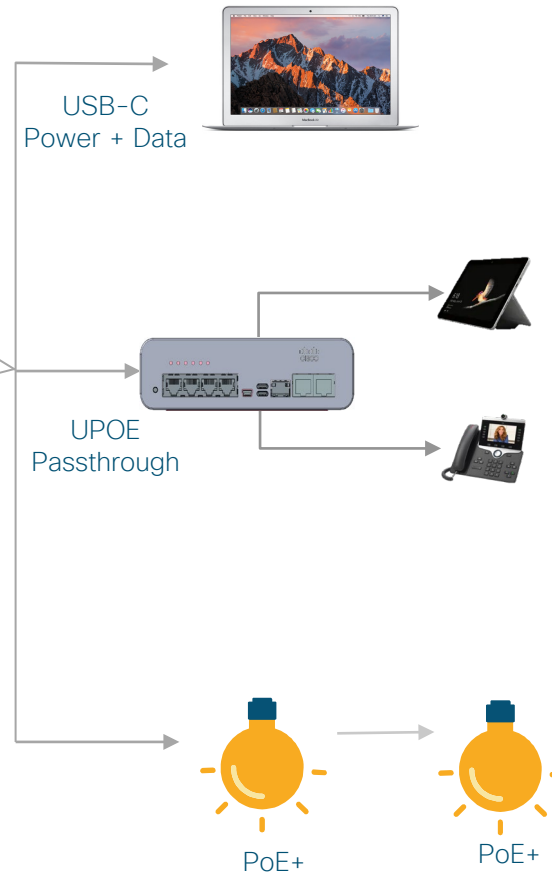


Catalyst 9300 Series switches
1G UPOE+ 90W models (C9300-24/48H)



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

UPOE+



1

USB-C power
(laptop charging + data)

2

UPOE Pass-through
(for extended reach 60W)

3

Daisy-chaining
(Cost saving with 90W)

New 90W use cases revolutionizing workspaces

BEFORE



Today : Workspace powered by 90W Cisco UPOE+



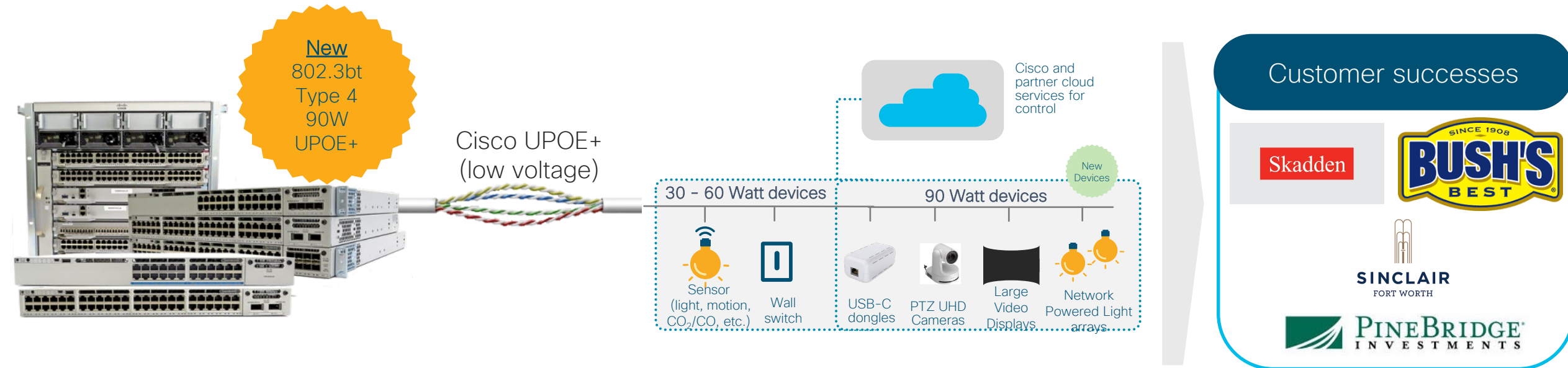
PoE powered workspaces

- 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



Connect



Classify



Policy



Integrate

- 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

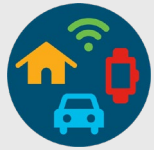
- “Thing” connectivity management with **Cloud IOT services**
- Container-hosted **Cloud-tethered apps** on open Cisco IOS XE Software

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

Network as a utility

Smart building layers

Services Layer



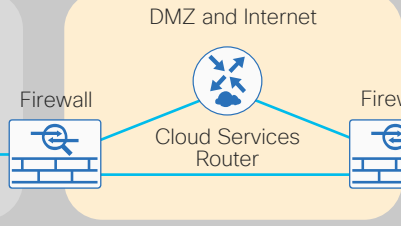
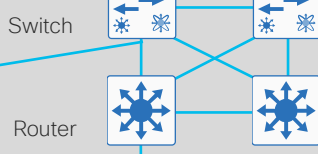
Cisco and partner applications



Suite



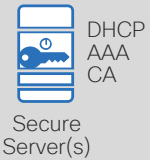
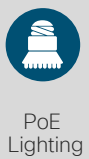
Appt / Suite



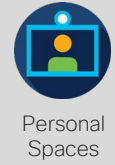
Internet

Floors

Shared Services



SD-Access Transit

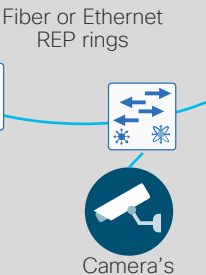


Basement/Shell

Backhaul options



Fiber | MPLS | Cellular



Kinetic



Catalyst 9000 provides high uptime for critical IoT applications

Network Power Assurance

Intelligent Building Management Systems



Open APIs



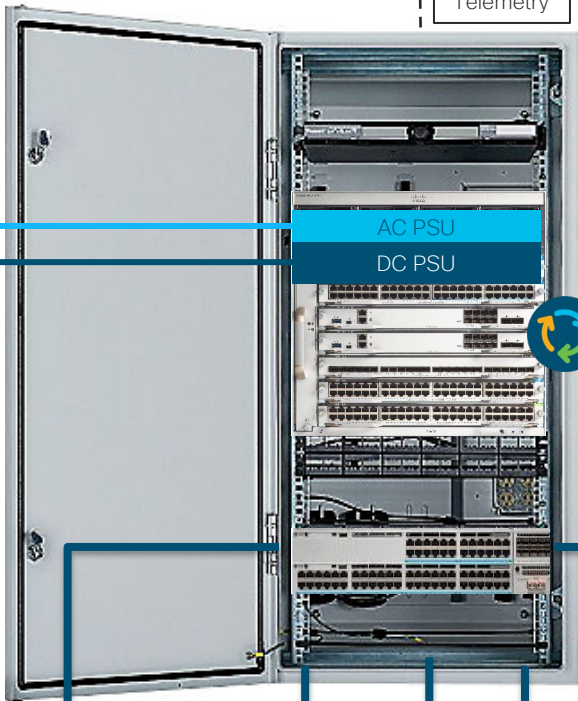
Telemetry



Primary power grid



Backup DC power



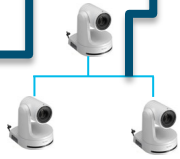
- ▶ N+1/N+N Redundant power supplies
- ▶ Power available from AC + DC sources
- ▶ Perpetual PoE available through upgrades
- ▶ Critical devices stay up during load shed
- ▶ Fast PoE restores power within a minute



Warning and status signs



Emergency pathway lighting



Surveillance systems



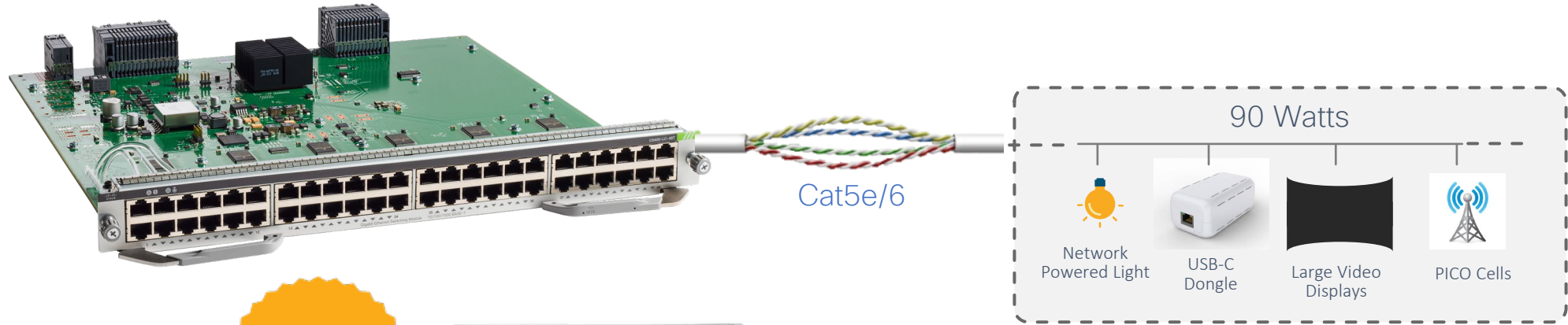
Hospital ER and OT lighting



Security control center (Reliable Data + Power)

Catalyst 9400 90W UPOE+ line card

Highest UPOE+ scale to power latest intelligent devices



Industry's
highest PoE
scale



Catalyst 9400

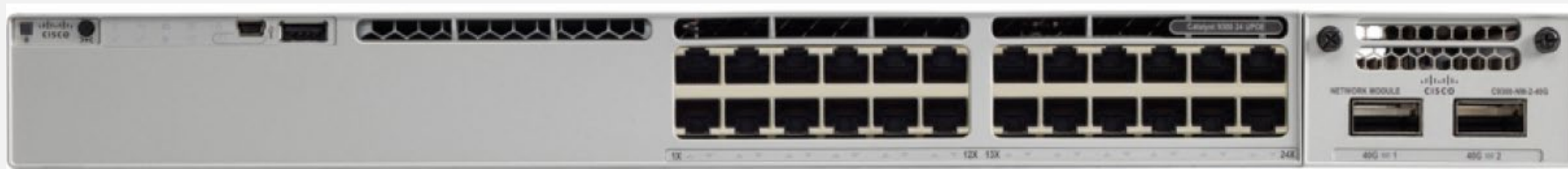
- Up to 260* x 90W concurrent power
 - PoE HA with dual supervisors
 - IEEE 802.3bt standards compliant
 - 48 x 1G Ports per line card
 - Up to 8 x 3200W AC/DC PSU
- Investment Protection with 90W UPOE+



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 90W¹
- 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

Modular fans

Modular uplinks

Higher-efficiency AC and DC power supplies

Platinum rated



8x 10G



2x 40G



4x Multigigabit



4x 1G



2x 25G



315W AC



715W AC/DC



1100W AC



1900W AC*

PoE/PoE+/UPOE/UPOE+ capable

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



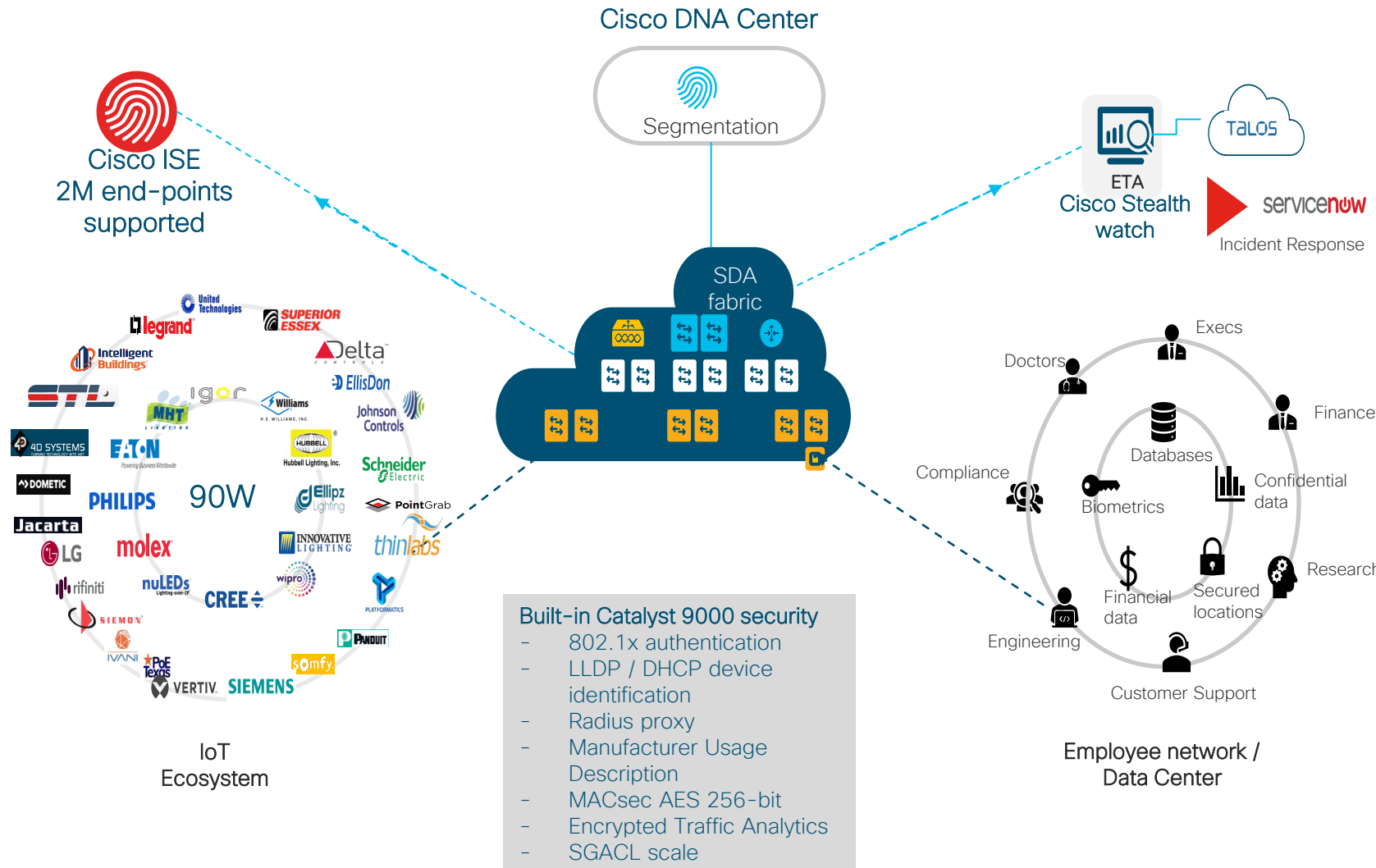
IoT device security compliance

Authentication of IoT nodes and end to end policy enforcement



Continuous malware monitoring

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



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



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



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 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.

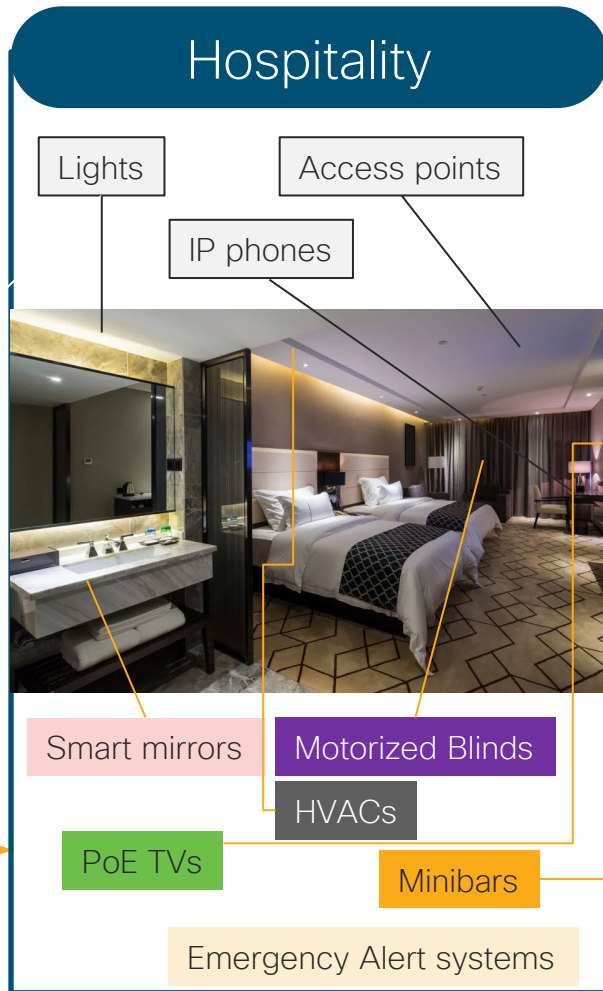


Customer success

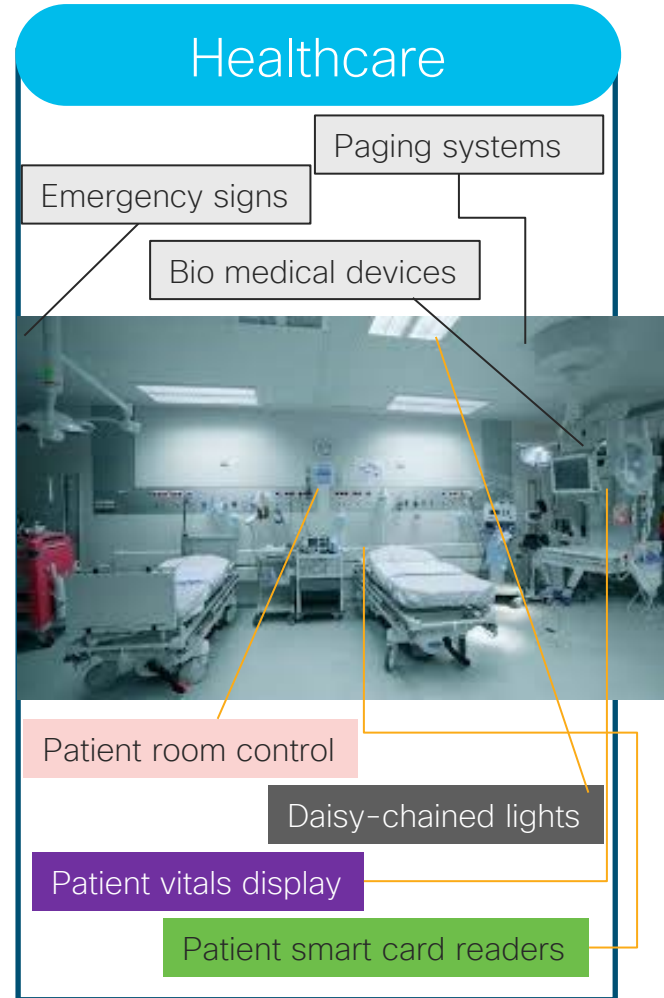
90W expands existing OT landscape across verticals

Existing POE devices

90W enabled devices



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 2/3rds
- 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



SINCLAIR
FORT WORTH

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

