The bridge to possible

Smart Building or $t#&%d Building. Is Your Building Smart Enough?

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#donthavetwitter

Before we start, this is not a “traditional” session. This session includes a VR Tour

VR Headsets are on the chairs.

Do not move the headset.

If you have zero experience with VR, let us know. VR Demo support staff is here to help.

Agenda

- Introduction
- Virtual Tour to Cisco's "Penn 1" Smart Building
- $t#&%d Buildings to Smart Buildings
- Cisco's Technologies enabling Smart Buildings
- Next Steps

About the Speakers

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Buildings are our Habitats

Born

Educated

Live

But …

3 minute read · December 7, 2022 4:11 PM CST · Last Updated 14 days ago

White House seeks to cut federal building emissions 30% by 2030

By Timothy Gardner

DECEMBER 18, 2022

EU cracks down on pollution of buildings and cars, in major win for the climate before Christmas

Home > Industry > Energy

Global emissions from buildings, construction climb to record levels

Reducing the construction sector's emissions has become vital to the larger goal of decarbonising the global economy

A review on buildings energy consumption information

Luis Pérez-Lombard [a], José Ortiz [b], Christine Pout [b]

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https://doi.org/10.1016/j.enbuild.2007.03.007 Get rights and content

$t#&%d Buildings need to become smart

Penn 1 Overview

Midtown Manhattan Location

54,000 sq. ft. Global Destination

First Talent and Collaboration Center

100% Hybrid, No Assigned Workspaces

Started w/ a Clear Data Journey

Stakeholders: HR, Workplace Resources, IT, Sales, Customer Experience

Design Strategy – Outcome Focused

LEED Alignment				✓
WELL Alignment		✓		
Consistent End User Experience			✓	
Touchless Room Control	✓	✓		
Integrated Base Building Controll	✓	✓		✓
People Count and Density Monitoring	✓	✓	✓	
People Count Data to BMS		✓		✓
Air Quality Monitoring and Display	✓	✓		
IT & FM Ops Model Reinvention	✓			
USB-C Adoptoin	✓			✓
Low Voltage Connected Desk	✓		✓	✓
Flexibility Technology Swap Out	✓			

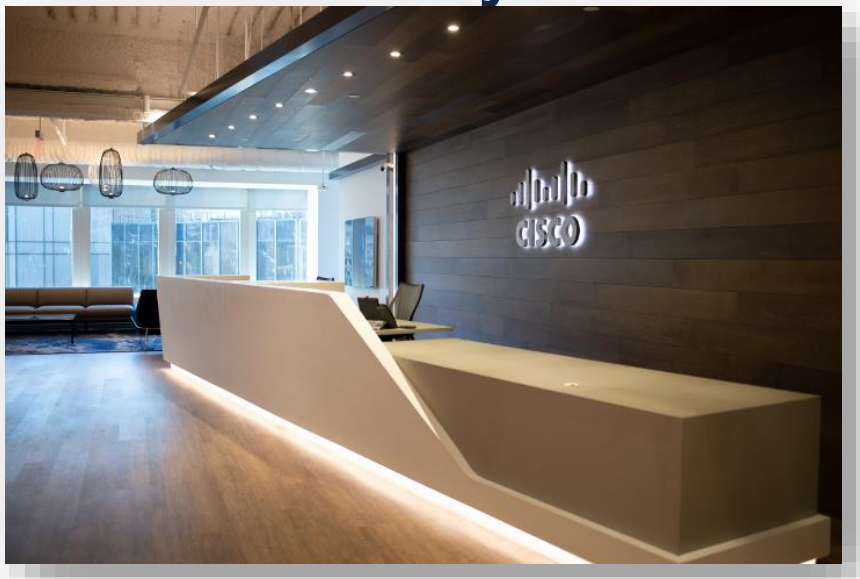
User Experience

Well Being

Net Zero

Space Behavior Data

Penn 1 Key Points



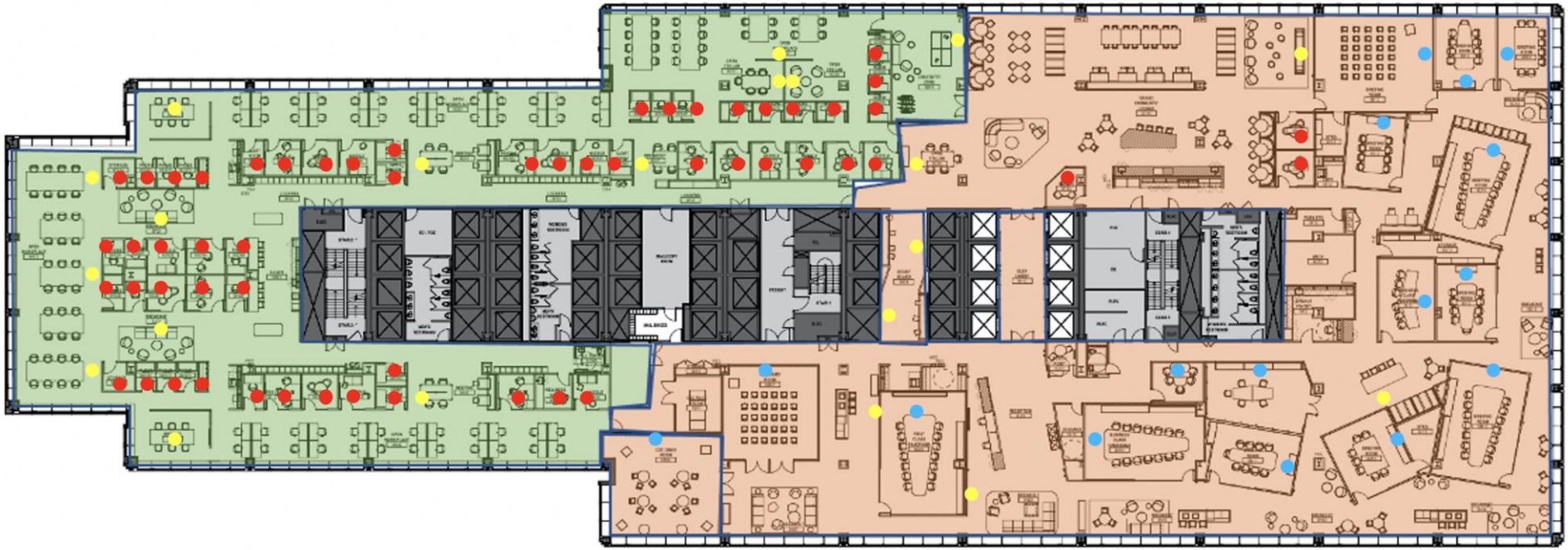
Our OT network is larger than our IT network.

100% POE to help meet our LEED and Net Zero goals.

95% of meetings in the office will have 1 virtual attendee = 92 collaboration endpoints throughout the space

Gensler (world largest A&D firm) did the design. They started with technology before the architecture of the space.

Planning for Hybrid (95% of meetings will have one virtual attendee = 92 end points)



Penn 1 Achievements

100% POE
- Lighting (Molex and Igor)
- Automated Shades (Mecho SolarTrac)
- Mechanicals Controls (Delta)

Occupancy
- Meraki Surveillance + Wireless + WebEx Room Kits + WebEx Desk Hubs

Air Quality
- Molex Air Quality Sensor + WebEx Room Kit

Continuous Sustainability Data Exposed

Low Voltage Desks (Teknion and Steelcase)

ASHRAE 90.1 (Molex)

~5% CapEx Savings, $250k Cost Avoided

~39% reduction in energy utilization

Virtual Tour to Cisco's First Smart Building "Penn 1"

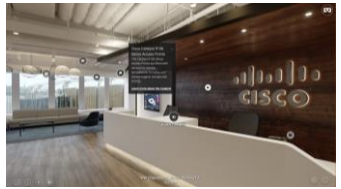
cisco Live!

It’s Time, take your headsets

Headset has Guardian System configured. Do not move outside that area

Adjust the headset tight, do not pull the headset, turn the crown or adjust the strap to fit it well

Take the control, and start navigating. Use the button on your INDEX finger to navigate.



Click on the available options using the button on your index finger

15 Mins Countdown

Importance of transforming buildings

Go Green

Remain competitive

Saves Money

HR attracts top Talent

Improve Productivity

Employees reaching their full potential

Many financial advantage of engaged employees

Challenges for organizations with $t#&%d buildings

GHG Protocol

Requires organizations to report it's direct emissions (Scope 1)

GREENHOUSE GAS PROTOCOL

Following Standards for Smart Buildings like LEED and WELL

Workplace Satisfaction

Many workplaces today, don't meet the norms for workplace satisfaction

Impact: Employee Retention, Top Talent Attraction, Disengaged Employees

Outcomes of transforming $t#&%d Buildings

Combination of

(HR) Workforce

(IT) Technology

(RE) Real Estate

Aligned to

- Reduce Costs
- Identify workforce patterns

Do not calculate space based on headcount

- Instead, Measure real Space occupancy

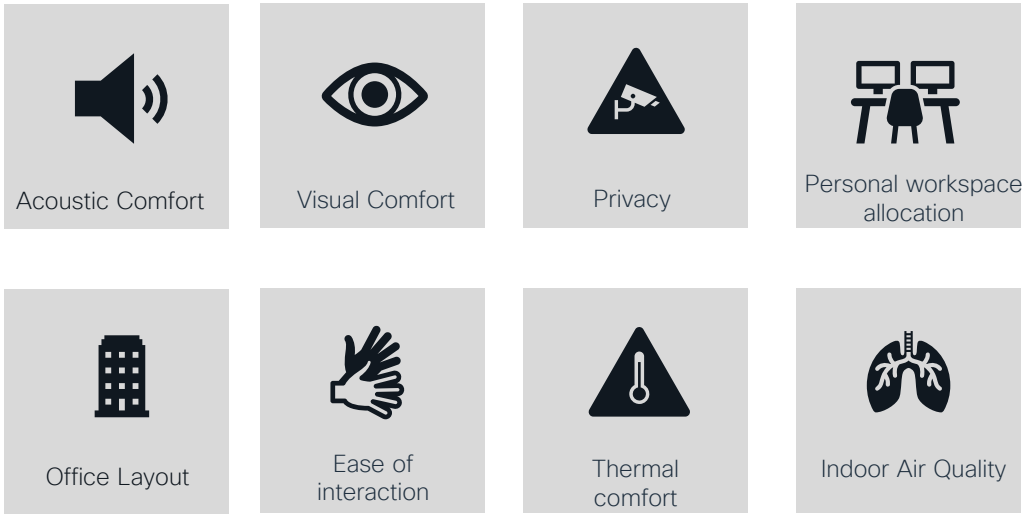
Save on Real Estate and Invest in Technology

- Invest in technologies that will help measure emissions, environmental conditions and automate operations

Review the tasks that employees do

- Provide tools to perform their work at the office (BYOD) or at home (WFH)

How to increase the IQ of a Building



Importance of Monitoring the Environment

Acoustic comfort

American Society of Heating and Air Conditioning Engineers recommends open office plans should fall between 49-58 dBA

Lulea University of Technology research indicates that performance is negatively affected when noise reaches 50dBA

Swedish Work Environment Authority Recommends a range of 35-40dBA in the workplace

Some Common Sounds

Noise Source	Decibels (dBA)
Whispering	34
Conversation	60
Vacuum cleaner	69
Heavy traffic	90
Jet aircraft (overhead)	115
Human pain threshold	120

Visual Comfort

Daylight provides comfort and reduces stress and release serotonin.

Oxford University notes that the average person needs exposure to 1,000 Lux of daylight to enjoy the maximum benefits.

Computer users should be working in rooms in which the brightness is between 200-500 lux.

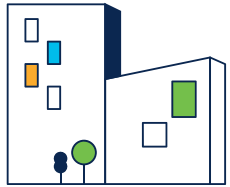
In Spaces where there are no other sources of light, lightning of around 300lux is appropriate

Illuminance (lux)	Example
120,000	Brightest sunlight
110,000	Bright sunlight
20,000	Shade illuminated by entire clear blue sky, midday
1,000 – 2,000	Typical overcast day, midday
<200	Extreme of darkest storm clouds, midday
400	Sunrise or sunset on a clear day (ambient illumination).
40	Fully overcast, sunset/sunrise
<1 lux	Extreme of darkest storm clouds, sunset/rise

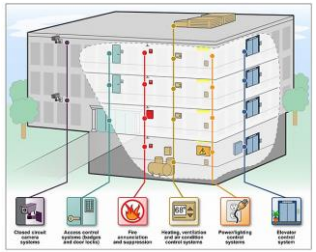
Importance of Monitoring the Environment

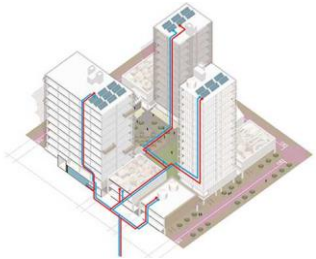
	Thermal comfort	Suggested temperatures that contribute to efficient building operations: Summer occupied 22° C at 60% humidity Winter occupied 21° C Summer unoccupied 27° C Winter unoccupied 15° C
	Indoor Air Quality	Recommended Co2 Levels: Outdoor 400ppm Indoor maximum of 1,000ppm

Starting with Smart buildings



Discovery of Building Infra





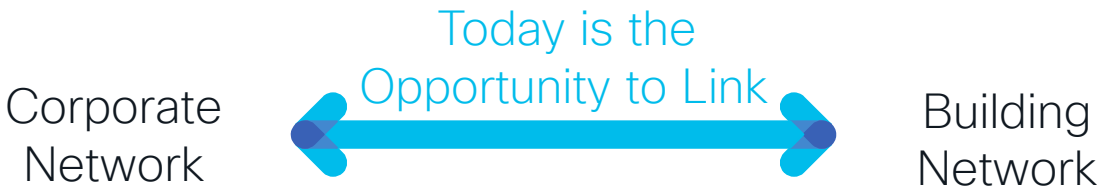
- Understand the needs/status of existing systems
- Have a clear view on human component (skills)

- Goal
- Overarching goal of a Smart Building is to CAPTURE DATA

However,

- Data only has value IF can be used to those OPERATING the building

The Role of IT in Smart Buildings



Questions to start with a Smart Building Strategy:

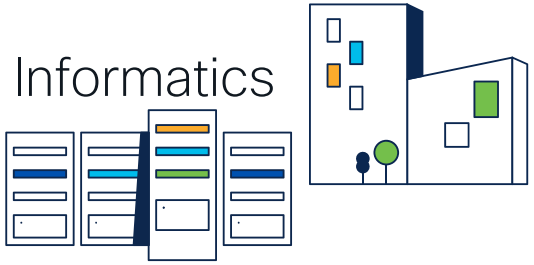
- What kind of data will the system(s) generate?
- Who will control the data and manage the integration of that data across systems?
- Who will have access to the data?
- Who can benefit from access to the data? How can this benefit be shared across business units and/or departments?
- What standards will be supported for data and network integration?
- Who will have long-term responsibility for IoT within the enterprise, including the infrastructure, network security, and standards, while ensuring maximum business value?
- What will be the system of record – an enterprise resource planning (ERP) system or a building management system (BMS)?
- What KPIs will be tracked?

New Developments in Operations and Maintenance

- Digital Twin

- Digital Twin in the context of the built environment refers to a digital replica of physical assets (physical twin), places, processes, systems, and devices.

- Facilities Informatics



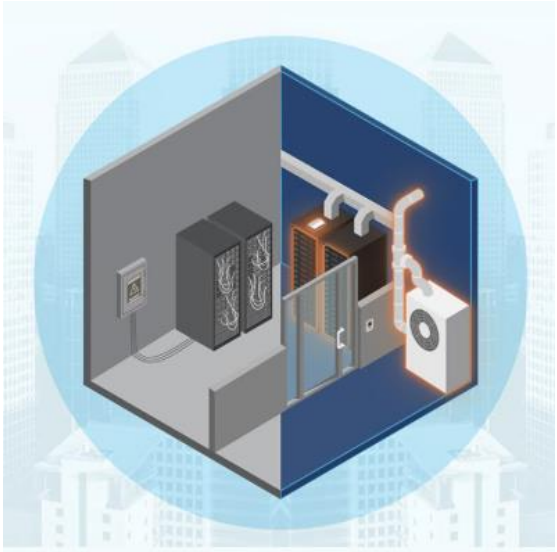
- Facilities informatics (FI) is the intersection of facilities, IM/IT, and management practices to improve operations, based on facilities-related data, information, and knowledge

Difference Between BAS and Smart Building Operations

BAS

(Building automation Systems)

Help facility owners conserve energy and optimize performance with controls that allow for example scheduling, occupancy and maintaining set-points



Smart building Operations

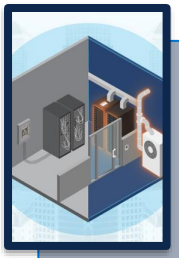
Smart building operations are just a step away from BAS, and simply represent a facility's ability to gather this data and change operational outcomes accordingly.

The key is data acquisition, analytics, and diagnostics.

Now what? Let's help those $t#&%d Buildings

Smart Buildings will lead to a more efficient and sustainable use of resources

The overarching goal of Smart Building transformation is to CAPTURE DATA



We have the opportunity Today to link the Corporate Network and the Building Network

Cisco's Technologies enabling Smart Buildings

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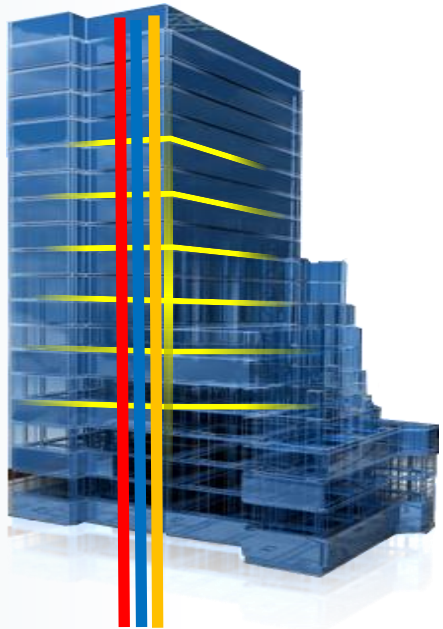
Anatomy of a Smart Building

Digital Twin

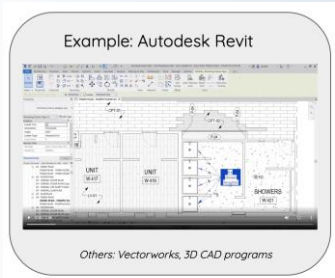
Data



Power
Enterprise IT
OT Systems & IOT

Data

Integrated Workplace Management System



BIM
Building Information Model

Data Journey

Users & Facilities

Visualize

Acquire

Consolidate

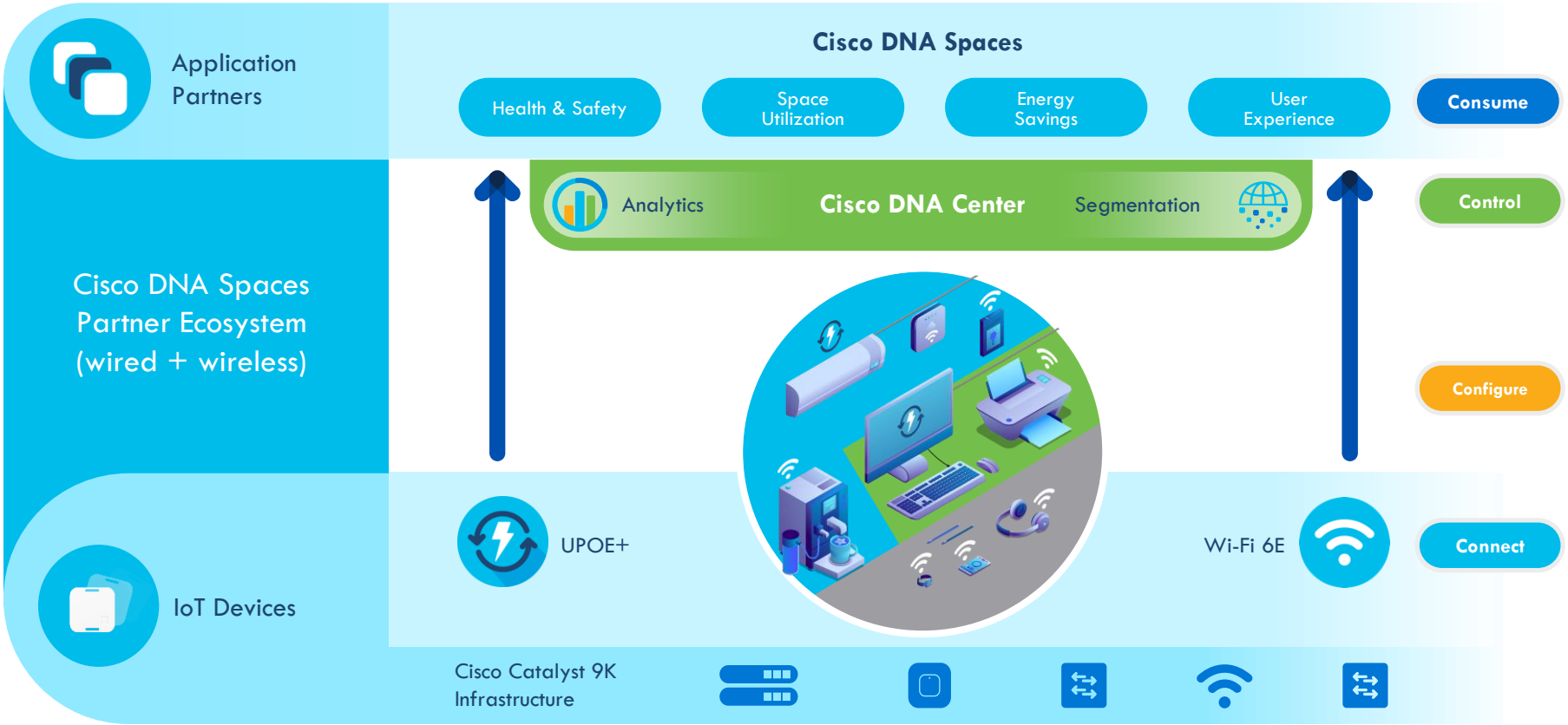
Normalize

Collect the data
From the endpoints

Structure the data
To make meaningful

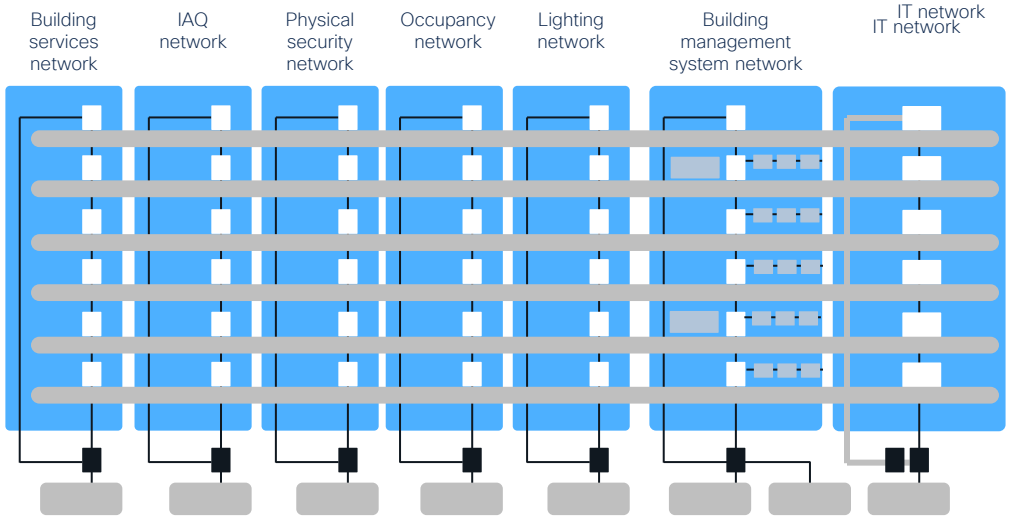
Export the data
so it can be used

Smart Building Framework



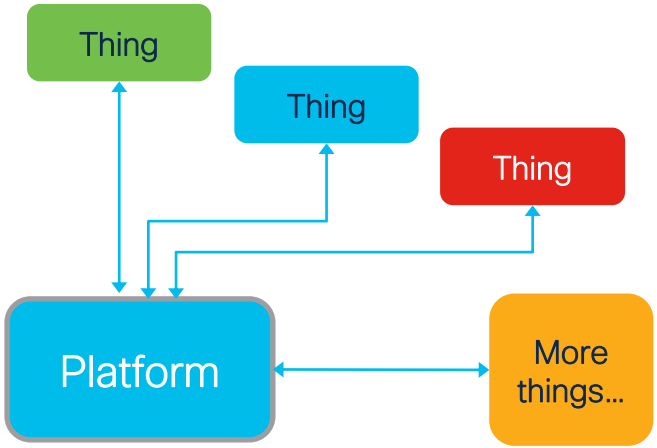
Convergence & Simplicity

Current state



Multiple physically separate networks

Future state



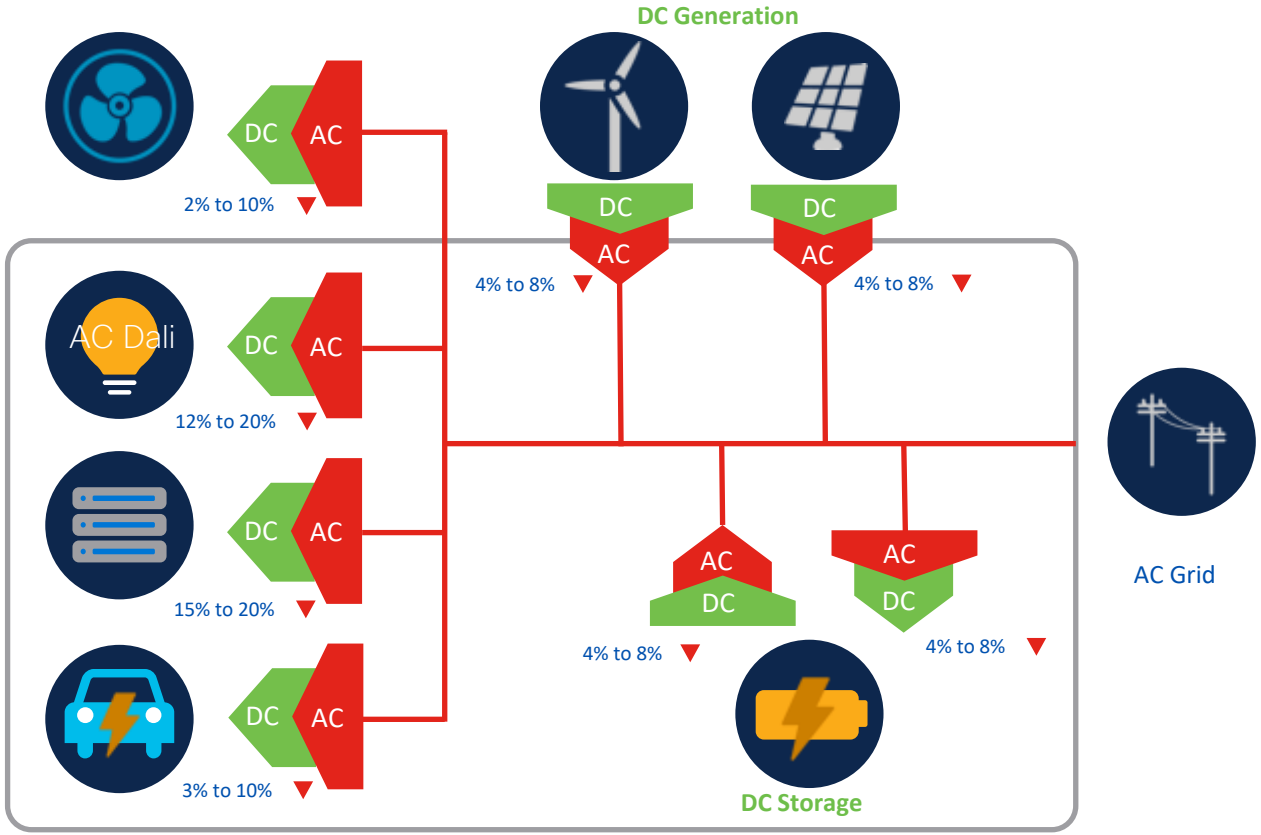
Software-defined, AI converged network

The traditional approach to power is wasteful

Up to

20%

of power wasted in conversion loss

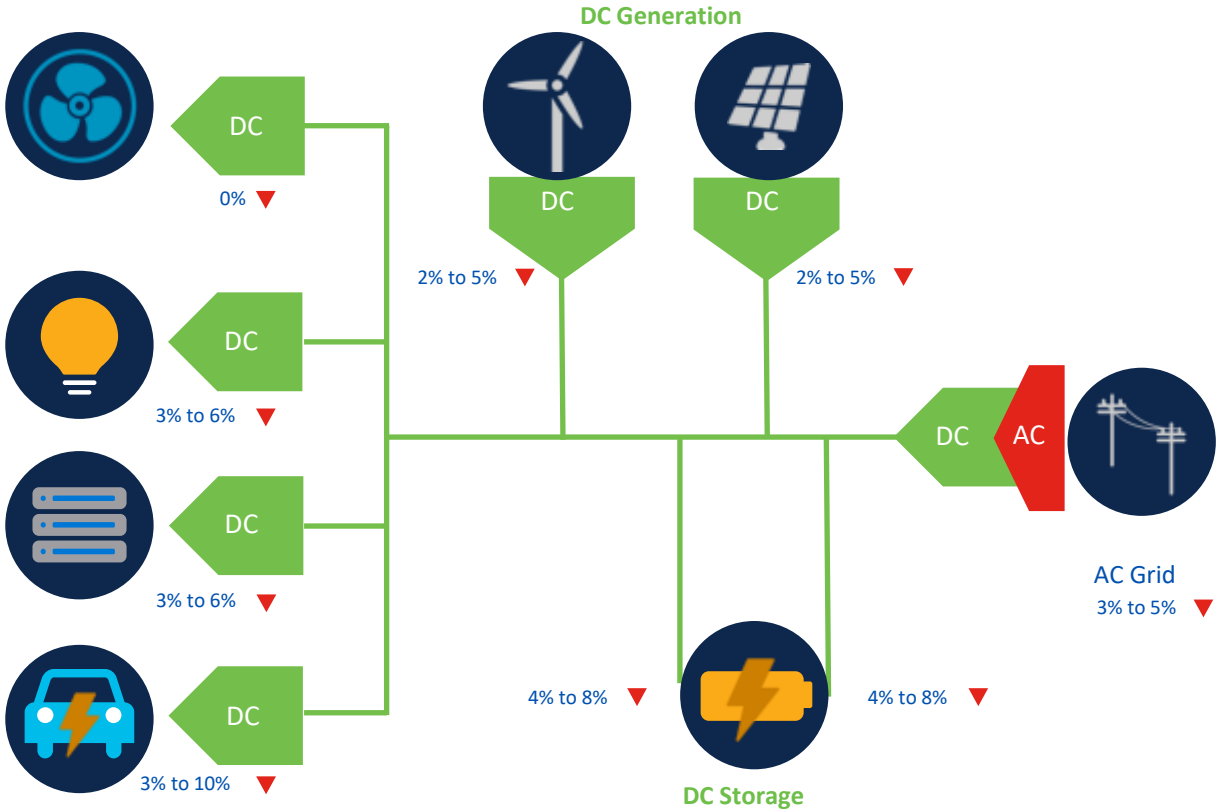


Smart buildings save energy, cost less to operate

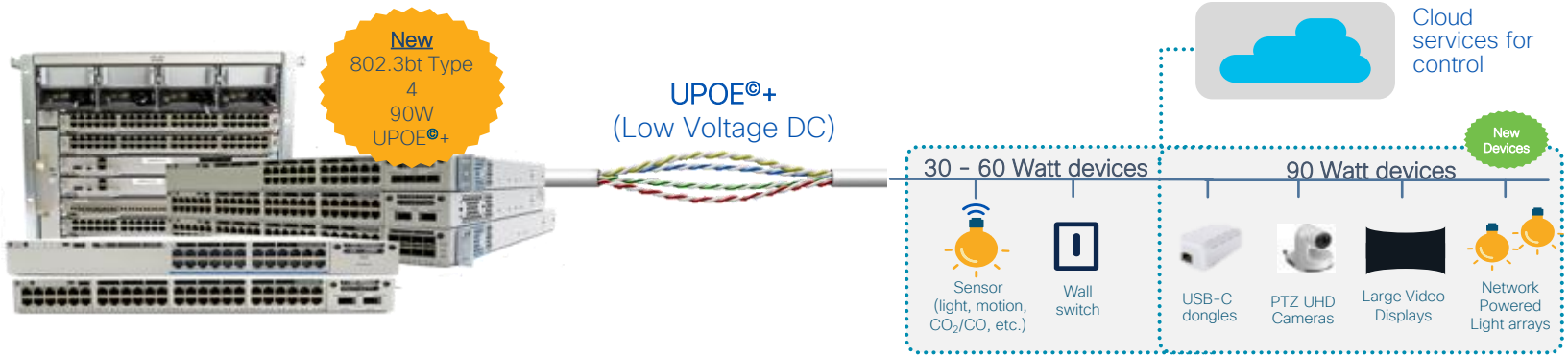
45%+

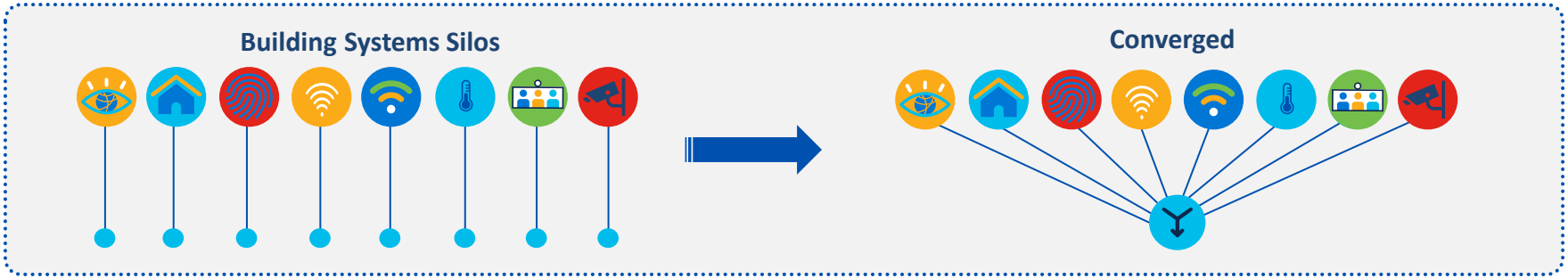
Reduction in energy waste by using DC power

Net-Zero



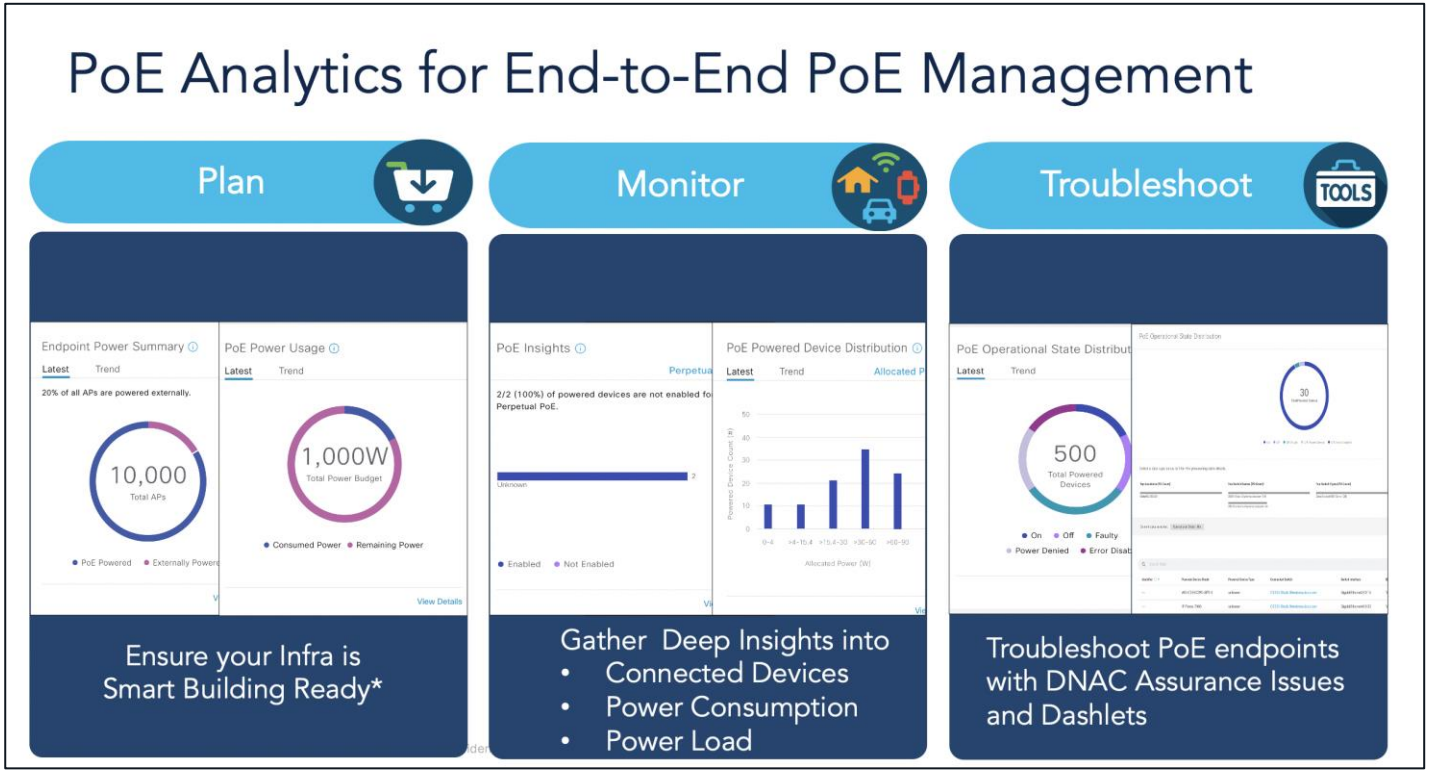
90W PoE (Power over Ethernet) enables greater ROI for IT & Building Systems convergence





End-to-end solution managed by central IT provides lowered costs, intelligent control, new experiences

Cisco Enterprise Networking



Catalyst 9136I – Wifi6 and has three built-in environmental sensors with full Cisco DNA Spaces integration in Release 17.8.1

Air quality

The built-in Gas Sensor Module will enable the reading of Total Volatile Organic Compound (TVOC) concentration and Indoor Air Quality (IAQ) rating.

Humidity

The built-in module is a fully calibrated sensor with the ability to measure the relative humidity in the air.

Temperature

The built-in module can also capture the temperature to provide a reading of the environment remotely.

Note: The temperature generated by the AP will be considered during temperature and IAQ readings.

Cisco Enterprise Networking

Application Hosting in Catalyst 9K Platforms

Setting all required parameters via Netconf

App parameters/resources /config

Name	app-hosting-cfg-data
Nodetype	container
Description	app-hosting configuration data
Module	Cisco-IOS-XE-app-hosting-cfg
Revision	2020-03-01
Xpath	/app-hosting-cfg-data
Prefix	app-hosting-ios-xe-cfg
Namespace	http://cisco.com/ns/yang/Cisco-IOS-XE-app-hosting-cfg
Access	read-write
Operations	• "edit-config" • "get-config" • "get"
Schema Node Id	/app-hosting-cfg-data

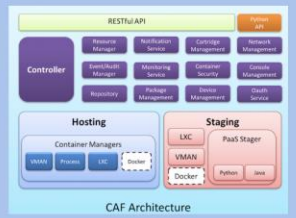
ERSPAN related Config

Name	session
Nodetype	list
Description	Configure a SPAN session
Module	Cisco-IOS-XE-native
Revision	2020-07-01
Xpath	/native/monitor/session
Prefix	ios
Namespace	http://cisco.com/ns/yang/Cisco-IOS-XE-native
Keys	• "id"
Access	read-write
Operations	• "edit-config" • "get-config" • "get"
Schema Node Id	/native/monitor/session

Enable IOX & App Installation using CAF framework

App Installation using CAF framework

Rest API calls to the CAF framework



CAF Architecture

Netconf to activate & Start the App

Netconf to activate and Start the App

Name	app-hosting-cfg-data
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Operations	• "edit-config" • "get-config" • "get"
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Cisco Spaces

Occupancy Insights

Asset Management

Environmental Monitoring

Efficient Energy Management – Optimize HVAC, lighting and other resources, reduce wasted space

Optimal Resource management – Reduce overprovisioning, unused or lost equipment

Temperature, Humidity and Air Quality Monitoring – for Employee well being and Energy Management

Industry leading devices for any workspace

For any worker, any workstyle, anywhere

Wireless & DECT Phones

Desk Cameras & Headsets

Desk Phones

Desk Hub

Desk Mini

Desk & Desk Pro

Room Bar & Room Kits

Board Pro

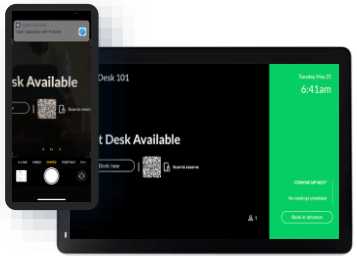
Room Panorama

Frontline

Knowledge workers

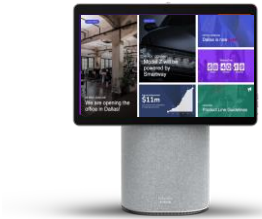
Room & Executive

Providing a seamless, engaging in-office journey



Reserve a desk or a room

Enable a smooth check-in for employees and visitors

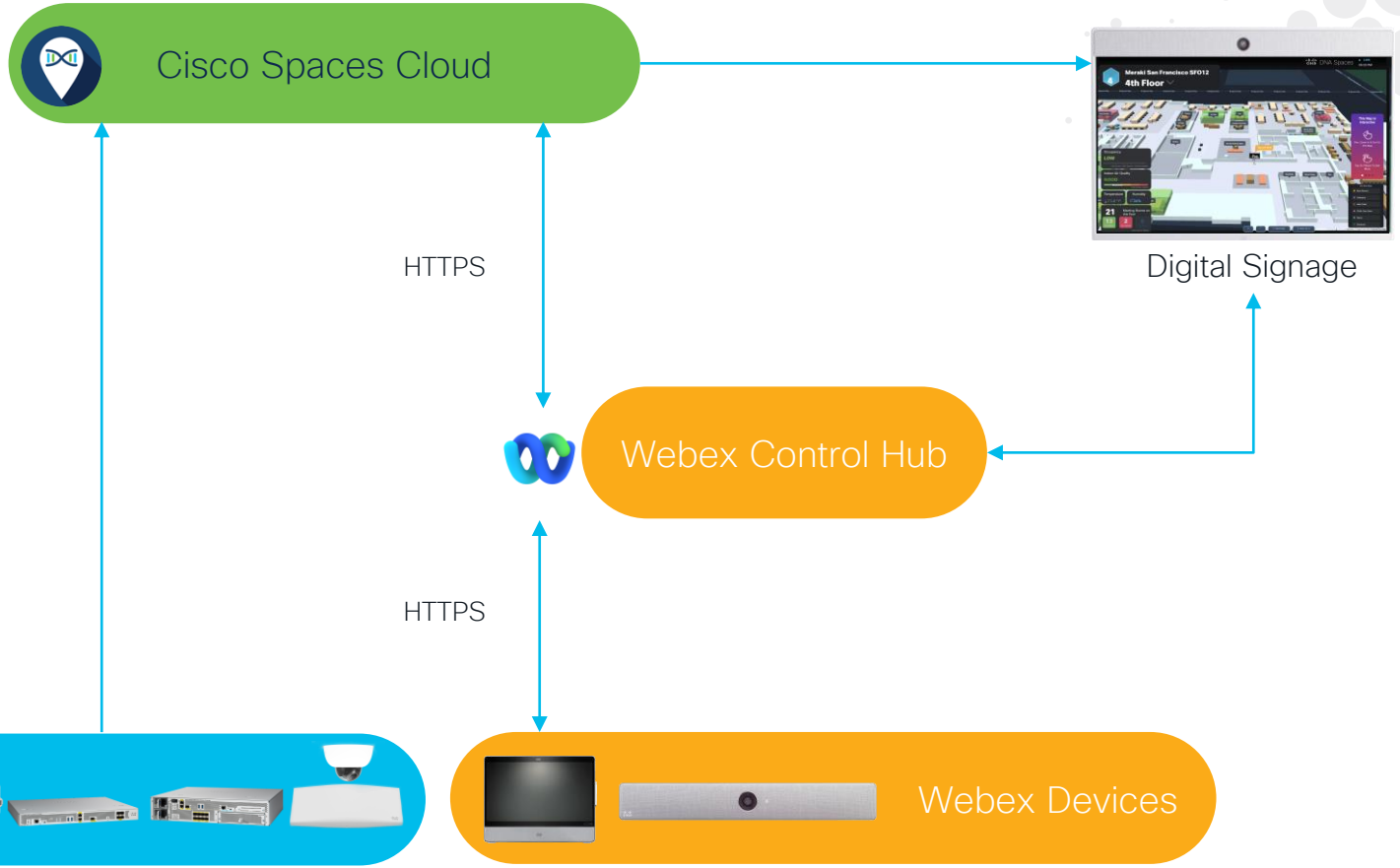


Keep everyone informed via digital signage

Navigate to a workspace or find out if a room is occupied

Cisco Smart Workspaces

How does it all come together?



Summary

- “Penn 1” is an example that a S#%&/d building can become smart.
- S#%&/d buildings don´t capture any data, Smart Buildings do.
- Acquire data is the first and most important stage of the data journey.
- Cisco’s Technologies and partners help you to enable Smart Buildings outcomes.

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- Complete a minimum of 4 session surveys and the Overall Conference survey (open from Thursday) to receive your Cisco Live t-shirt.

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ALL IN