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Future-Proof Workplace to be Smarter & More Sustainable

A Technology Blueprint

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BRKAPP-2547

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Cisco Webex App

Questions?

Use Cisco Webex App to chat with the speaker after the session

How

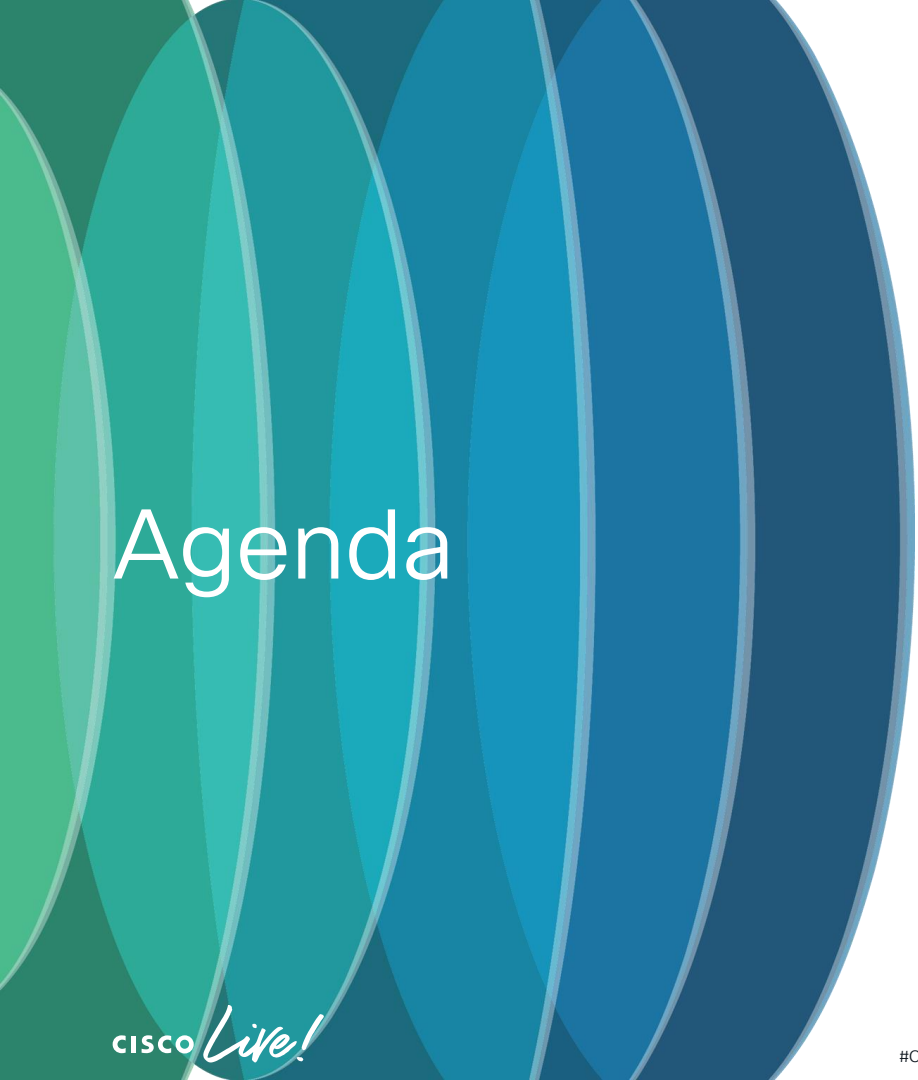
- 1 Find this session in the Cisco Live Mobile App
- 2 Click “Join the Discussion”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until November 15, 2024.



<https://ciscolive.ciscoevents.com/ciscolivebot/#BRKAPP-2547>





Agenda

- Challenges of Returning to Office
- Workplace of the Future... Today
- Technology Blueprint
- Examples around the World

Return to Office – Headlines

Australian employers want staff in the office - but for many workers home is where the heart is

Ambiguous government directive sends officials into tailspin and highlights employer-worker divide

Benefits Money

Top employee benefits in 2024

- Remote and flexible work options (25%)
- Yearly allowances to spend towards healthcare, fuel, utilities and groceries (15%)
- Discounts on everyday essentials like fuel, utilities and groceries (12%)

The real reason behind return-to-office mandates

Your boss wants you to quit.

By David Braue on Jun 17 2024 04:55 PM

— Exclusive

Workers rush back to their desks as job fears grow

Euan Black, David Marin-Guzman and Michael Read

Apr 11, 2024 - 4.33pm



Save



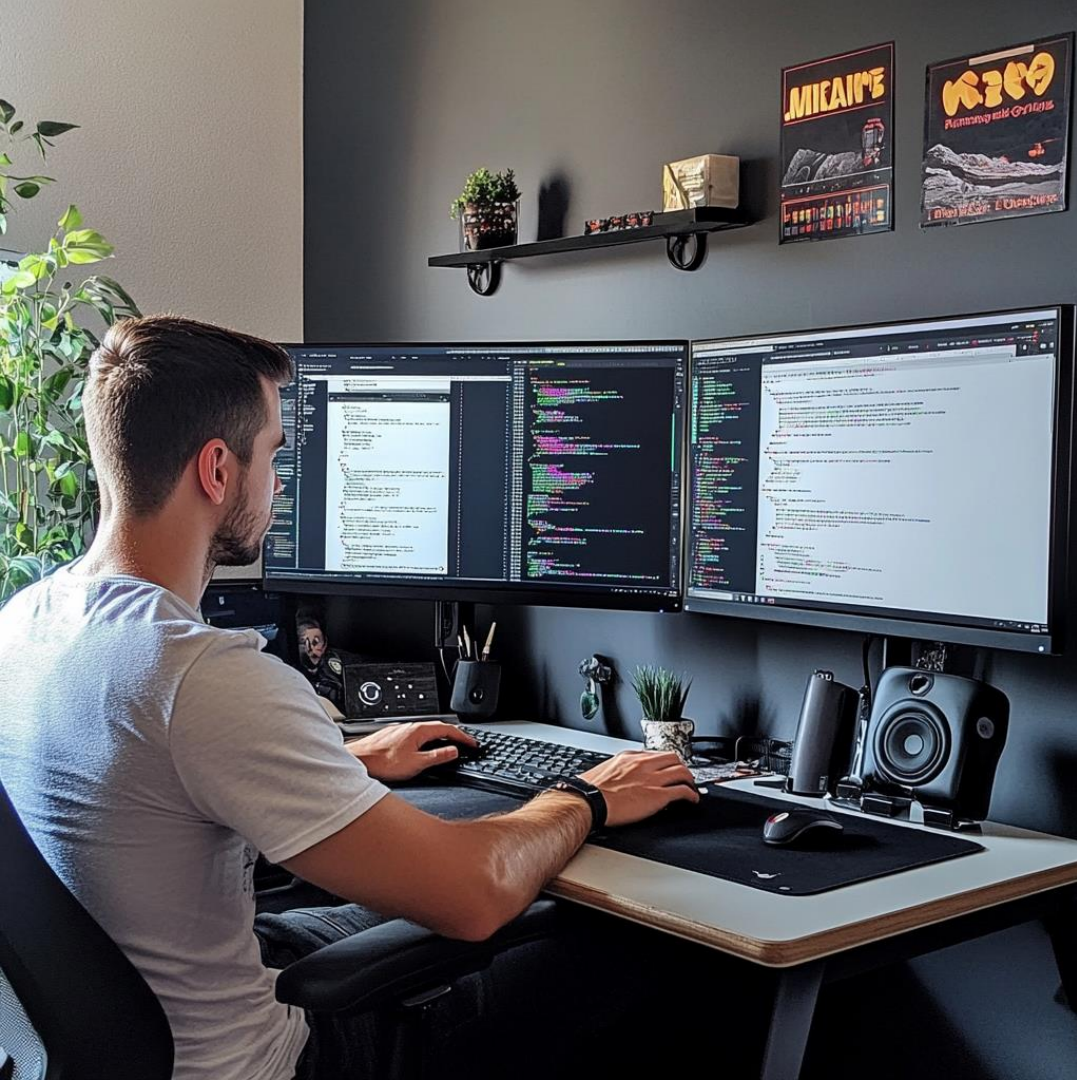
Share



Gift this article

Why we still can't agree on how to work from home

Four years on from the onset of COVID-19, companies and individuals are as far apart on a consensus on this issue as ever. But this year could bring change.



“I have better setup
at home!”



“I can hardly find
a spare meeting room
when I need it”



“People book meeting rooms and no-one shows up”



“The office is too hot / cold”



“The office seems to waste a lot of energy”



Corporate real estate:

“I don’t have insights to office occupancy and power consumption”

Workplace of the Future... Today





Workplace of the future...
Starts from the lobby

Intelligent data elevates the workplace experience

Wednesday

November 6

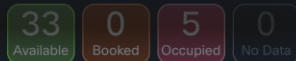
• 6:14 AM

SNG15

SNG15-25

38

Digital Twin
on this floor



Find available meeting Rooms

Room Finder

Data Source: Webex

Floor Occupancy: **Very Low**

Cisco Spaces + Cisco Wireless

Indoor Air Quality: **Good**

Temperature:

25 °C

Humidity:

63%

Data Source: Webex / Wireless + Webex

Temperature
& Air Quality

Space
Occupancy

Wayfinding

How do
this?



On This Floor

Select to find on map:

Rest Rooms

Help Desk

Stairs

Elevators

Reset Map

Powered by: **CISCO SPACES**

webex

Catalyst

Meraki

CISCO *Live!*

September 28

3:19 PM

How do I
use this?

Dolores Park

Collaboration device in this room

This meeting room is:
OccupiedScan the QR code
to navigateRoom Occupancy
1 of 8Room Air Quality: **Excellent**CO₂ Level: No Data

Room Temp.: 73°F

Room Humidity: 57%

Ambient Noise: **Quiet**

Data Source: Webex

How to use this room?

Hold for 3min, while you make
a reservation. **Hold Room**

Reset Map

Indoor Air Quality:

Excellent

Temperature:

°F

Humidity:

56%

Data Source: Meraki / Webex

Cisco Spaces - Meraki Wireless

Low

webex

Cisco Catalyst

Meraki

Hot Desking

NEW



Desk
Booking
Status

Room Finder

Data Source: Webex

106 Desks on this floor

78 Available	22 Occupied	2 No Data
--------------	-------------	-----------

See Available Desks

Data Source: Webex + Spaces

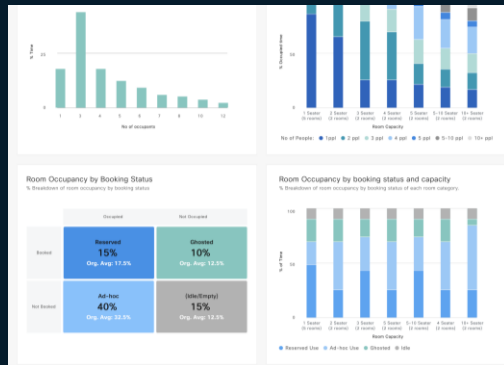
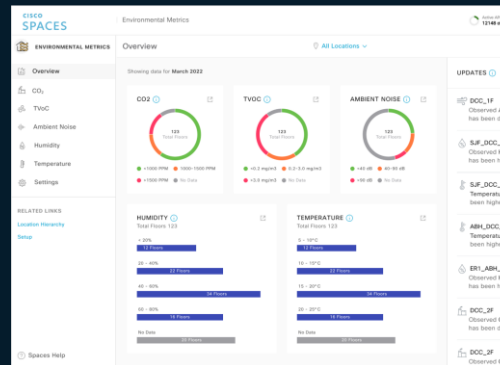
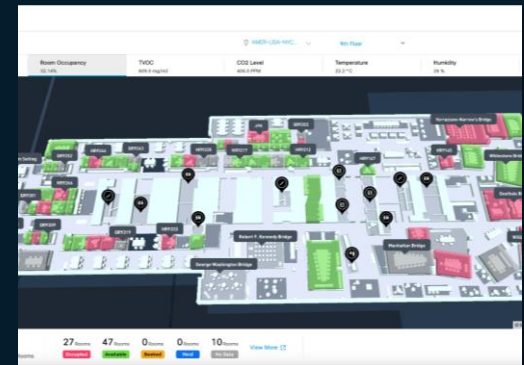
Environmental metrics



cisco Live!

Analytics from Future-Proofed Workplace

For Corporate Real Estate, Property Strategy & Facility Manager



- Space Utilisation
- See how your real estate portfolio is being utilised from a building to floor to workspace and desks. Leverage occupancy & people count data from Cisco devices.
- Environmental Telemetry
- View and analyse detailed environmental trends at your workplace – air quality, temperature, humidity, CO2, ambient noise, etc. Tap into environmental data from Cisco devices & Meraki MT Sensors.
- Real-time Occupancy
- See where people are located and how they use your workspaces, on a 3D map of your floor. Leverage occupancy & environmental data from Cisco devices and Meraki MT environmental sensors.



Space Utilization

← **Building 05** ▾

January 2023 ✓

All Days ▾

Glossary

Location: All Locations > Asia > India > Bengaluru > BGL Campus > Building 05

Total Area: 30,000sqft

Floors: 7/10 ⚠️

Meeting Rooms: 500 

PEAK UTILIZATION

63%

Out of 1,000 seats

PEOPLE COUNT

693

Avg. per day

832

Peak on Jan 5

TIME SPENT

5.5 hr

Avg. per day

ROOM UTILIZATION

40% of times

Rooms are unoccupied

LOW OCCUPANCY

8 of 31

Days

 Overview Building 05

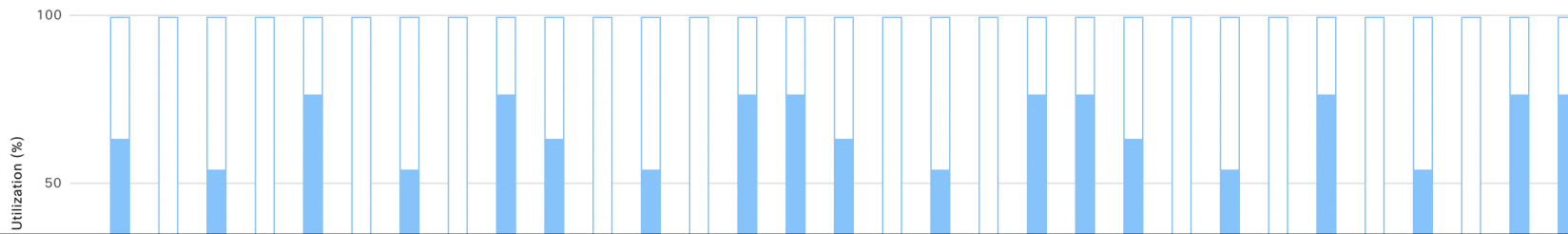
 Floors in Building-05 (7 floors)

Building Occupancy [Learn more](#)

Aggregating data from all floors in the building | Data source: Cisco wireless



Peak occupancy of campus as a % of capacity



Removing inefficient AC to DC power conversions

Utilising Category Ethernet Cabling to Deliver DC Power to Devices

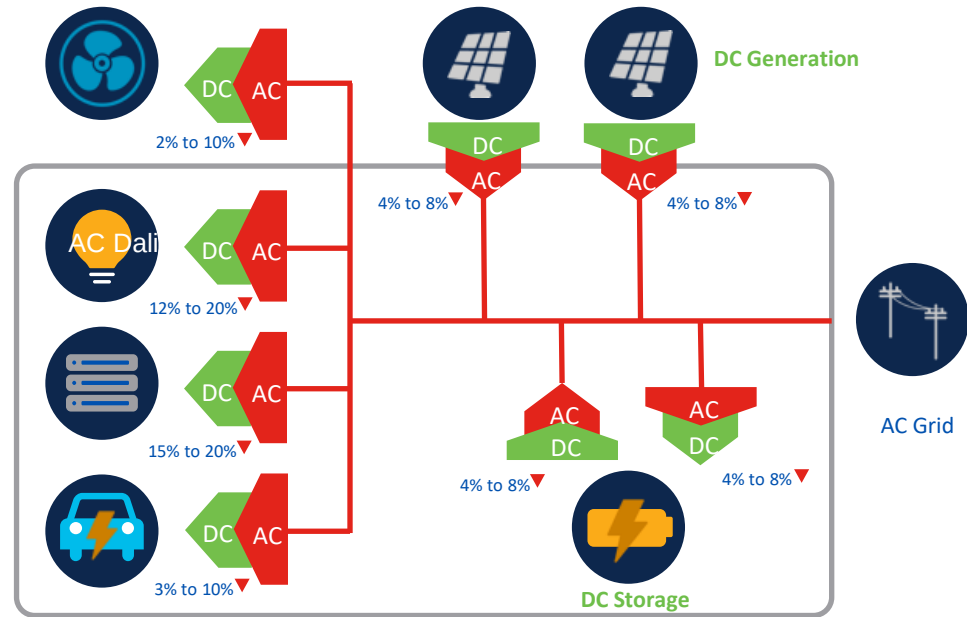
Many modern devices such as laptops, smart phones, monitor, LED lighting are all DC-powered

Power over Ethernet cables and fixtures are easier to install

Up to 10% CAPEX savings in Lighting Systems considering labor and hardware vs. Mains (AC)

More Efficient 80Plus Platinum PS

Centrally converting AC to DC at wiring closet to deliver up to 10% more power saving



Rich Set of Energy Efficient PoE Devices

Reuse Category Cabling, More Sustainable, Lower Opex, Increased Flexibility

Lighting



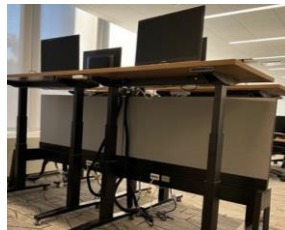
Monitor



Desk Lamp



Motorised Desk



Docking



Shading



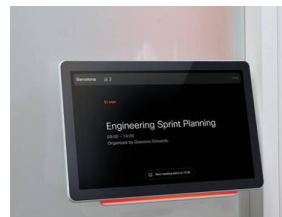
VAV Controller



WiFi



Cisco Devices



Mini PC



Accelerate Net Zero – BMS Integration

- Integration into your Building Management System (BMS)
- HVAC and lighting combined typically consume up to 64% of electricity* in office building (DCCEEW)
- Optimisation leads to significant sustainability improvement
- Automation based on real time occupancy changes and environmental threshold triggers



*<https://www.environment.gov.au/system/files/energy/files/hvac-factsheet-energy-breakdown.pdf>

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People count



Lighting levels



Room acoustics



Humidity



Ambient noise



Overall noise



Temperature



Air quality

A man with dark hair, wearing a black jacket with white stripes on the collar and cuffs, is seen from the side, interacting with a large digital display. The display has a dark blue background with two overlapping circles. The top circle is outlined in green and contains the text 'Step into a'. The bottom circle is outlined in blue and contains the text 'Cisco Smart Room'. The man's hand is near the bottom of the blue circle. To the right of the man is a wall made of grey rectangular blocks, and a white chair is partially visible in the bottom right corner.

Step into a

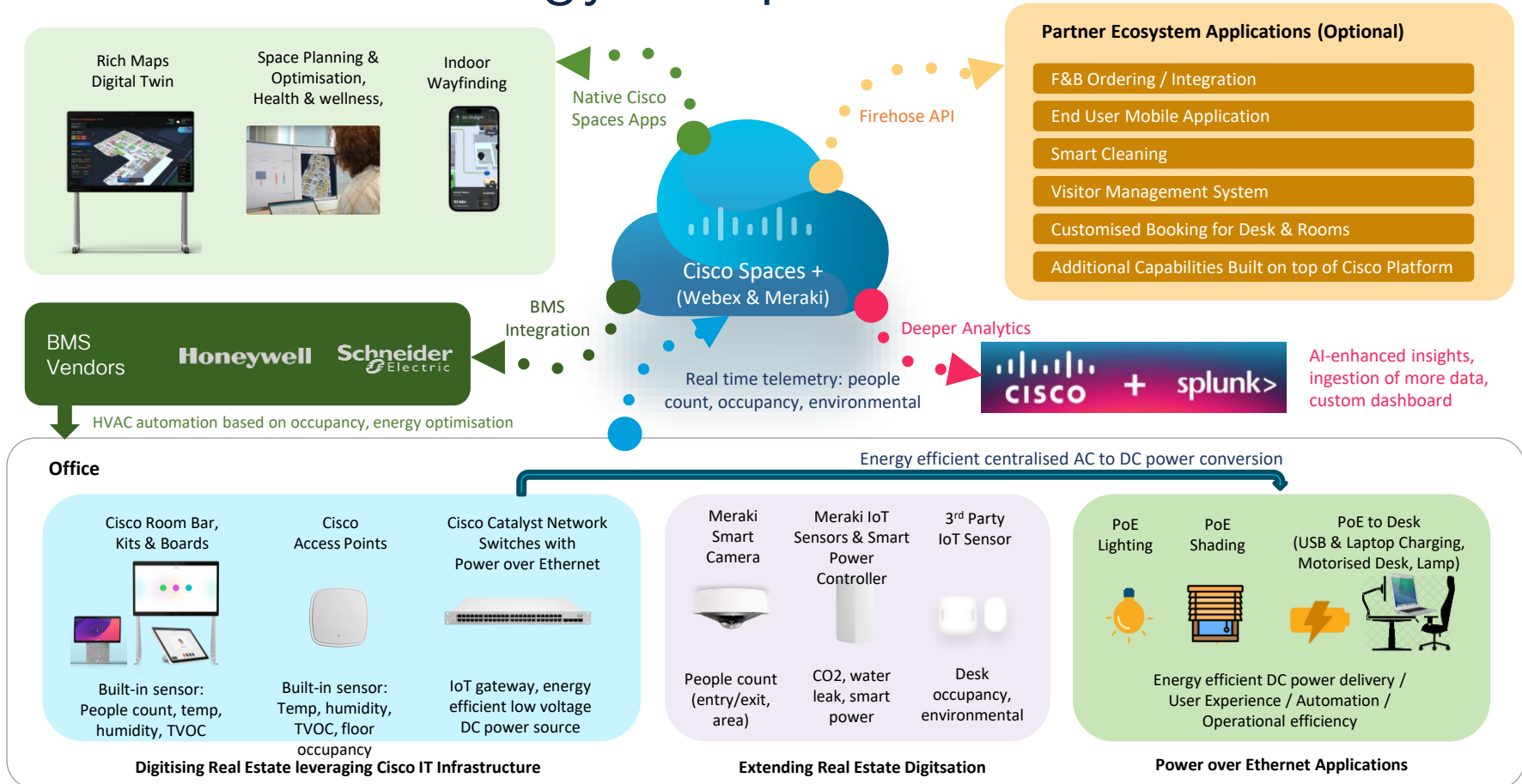
Cisco
Smart Room

Technology Blueprint

Key Design Steps

1. Technology components
2. Data acquisition
3. Rich Map creation
4. PoE applications
5. BMS integration
6. Data export

Overall Technology Blueprint



Network as the Sensor and Energy Networking

Office

Energy efficient centralised AC to DC power conversion

Cisco Room Bar,
Kits & Boards



Built-in sensor:
People count, temp,
humidity, TVOC

Cisco
Access Points



Built-in sensor:
Temp, humidity,
TVOC, floor
occupancy

Cisco Catalyst Network
Switches with
Power over Ethernet



IoT gateway, energy
efficient low voltage
DC power source

Digitising Real Estate leveraging Cisco IT Infrastructure

Meraki
Smart
Camera



People count
(entry/exit,
area)

Meraki IoT
Sensors & Smart
Power
Controller



CO2, water
leak, smart
power

3rd Party
IoT Sensor



Desk
occupancy,
environmental

Extending Real Estate Digitisation

PoE
Lighting



PoE
Shading



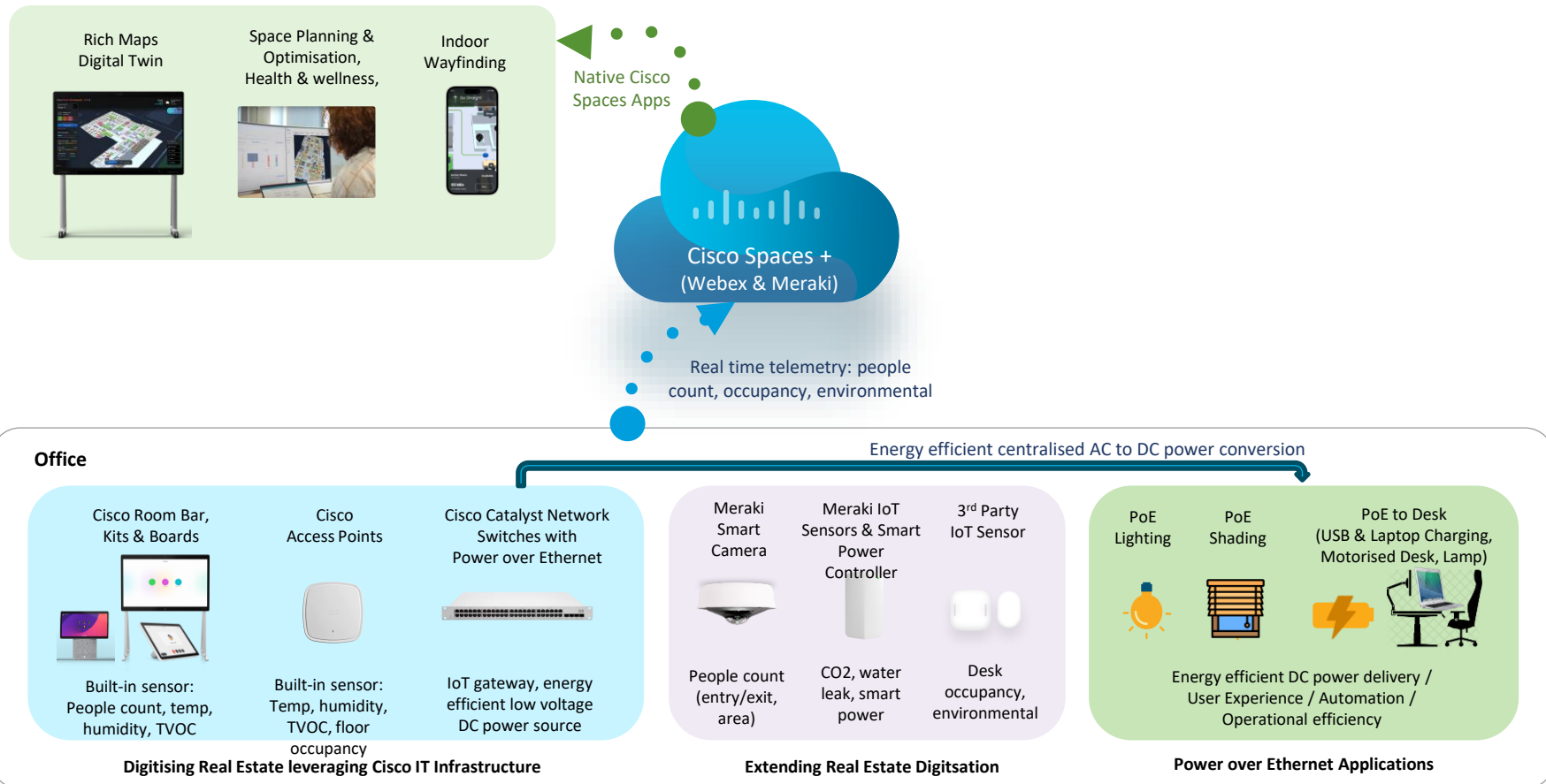
PoE to Desk
(USB & Laptop Charging,
Motorised Desk, Lamp)



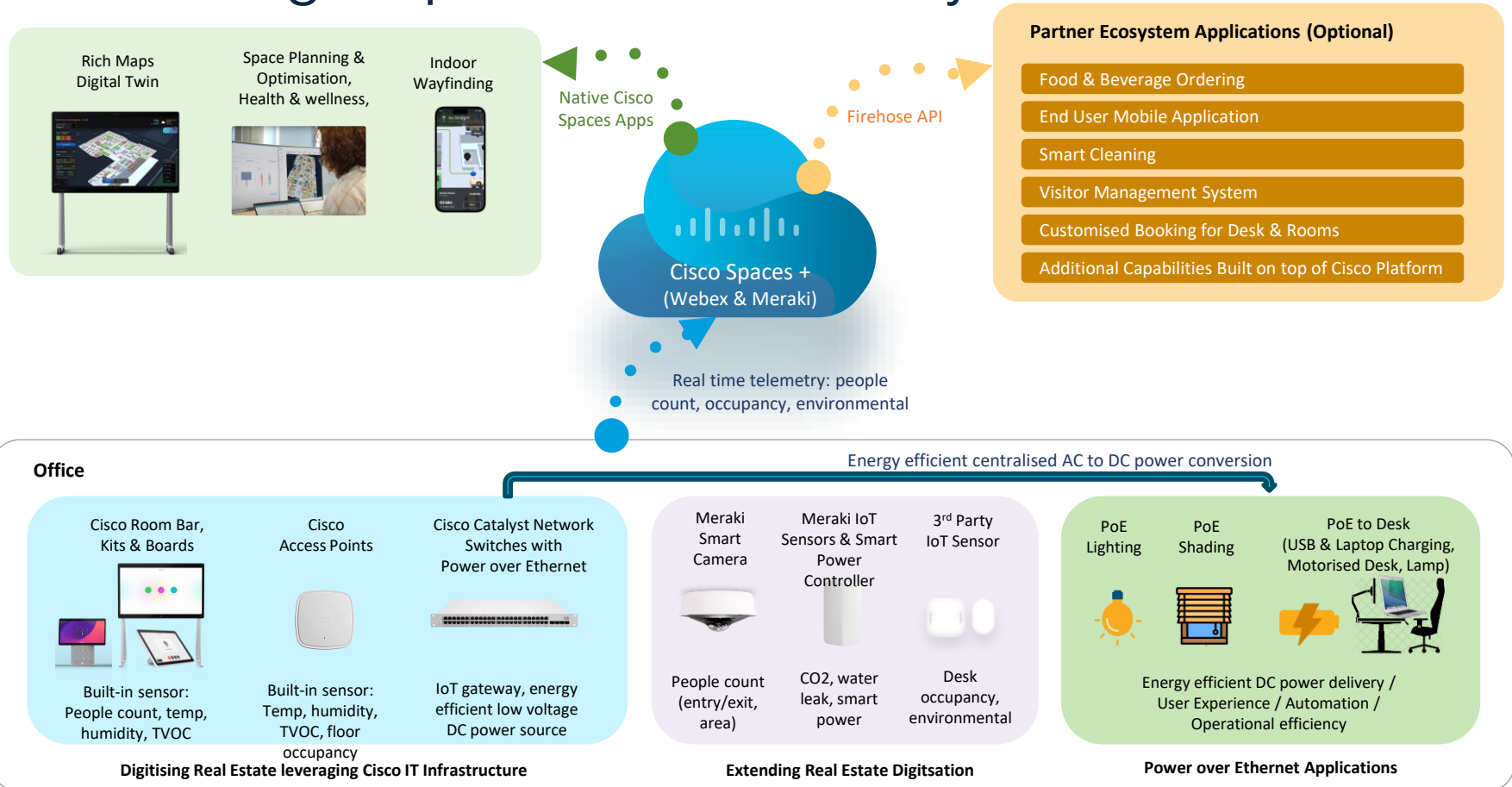
Energy efficient DC power delivery /
User Experience / Automation /
Operational efficiency

Power over Ethernet Applications

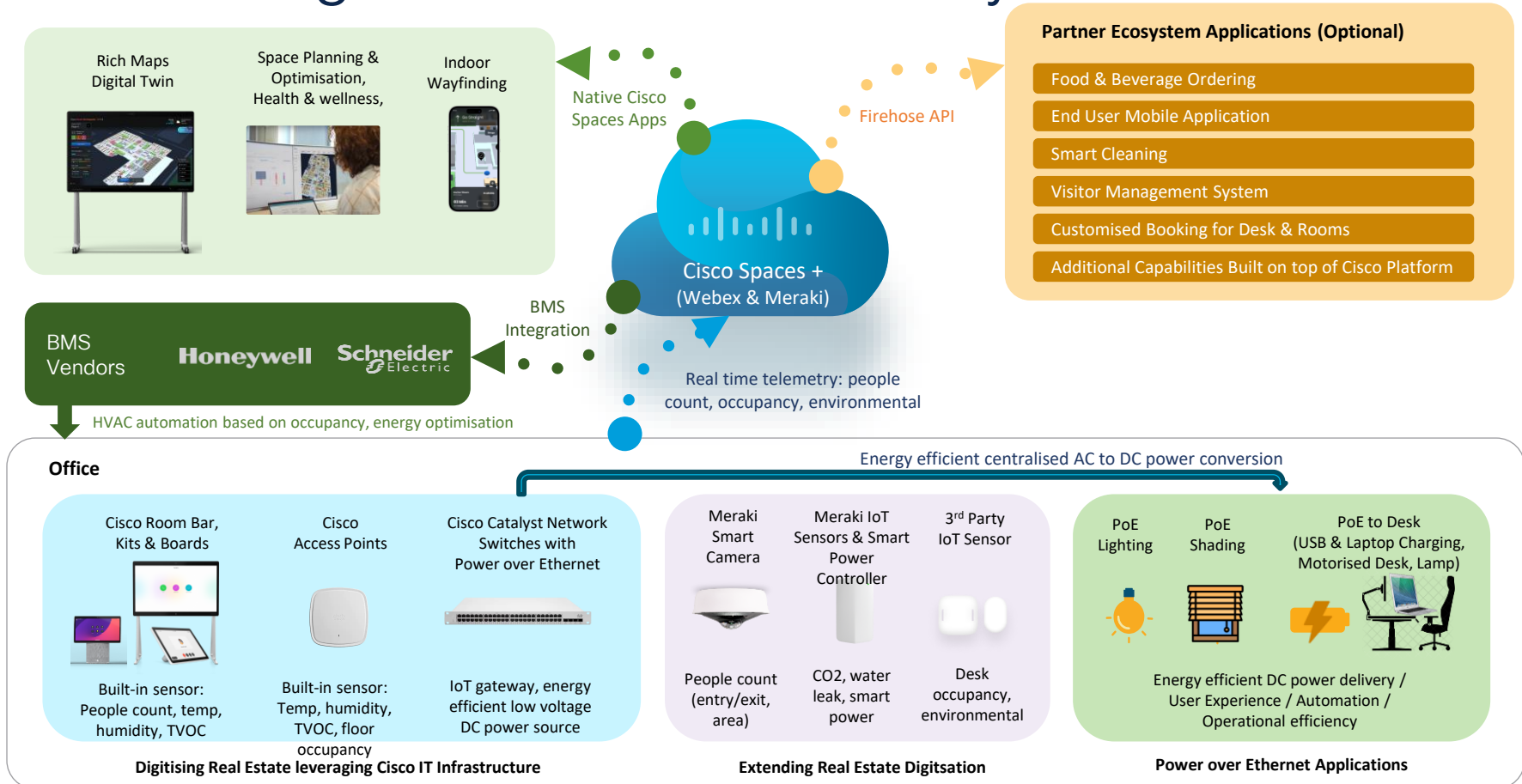
Aggregating Data and Deliver Native Experience



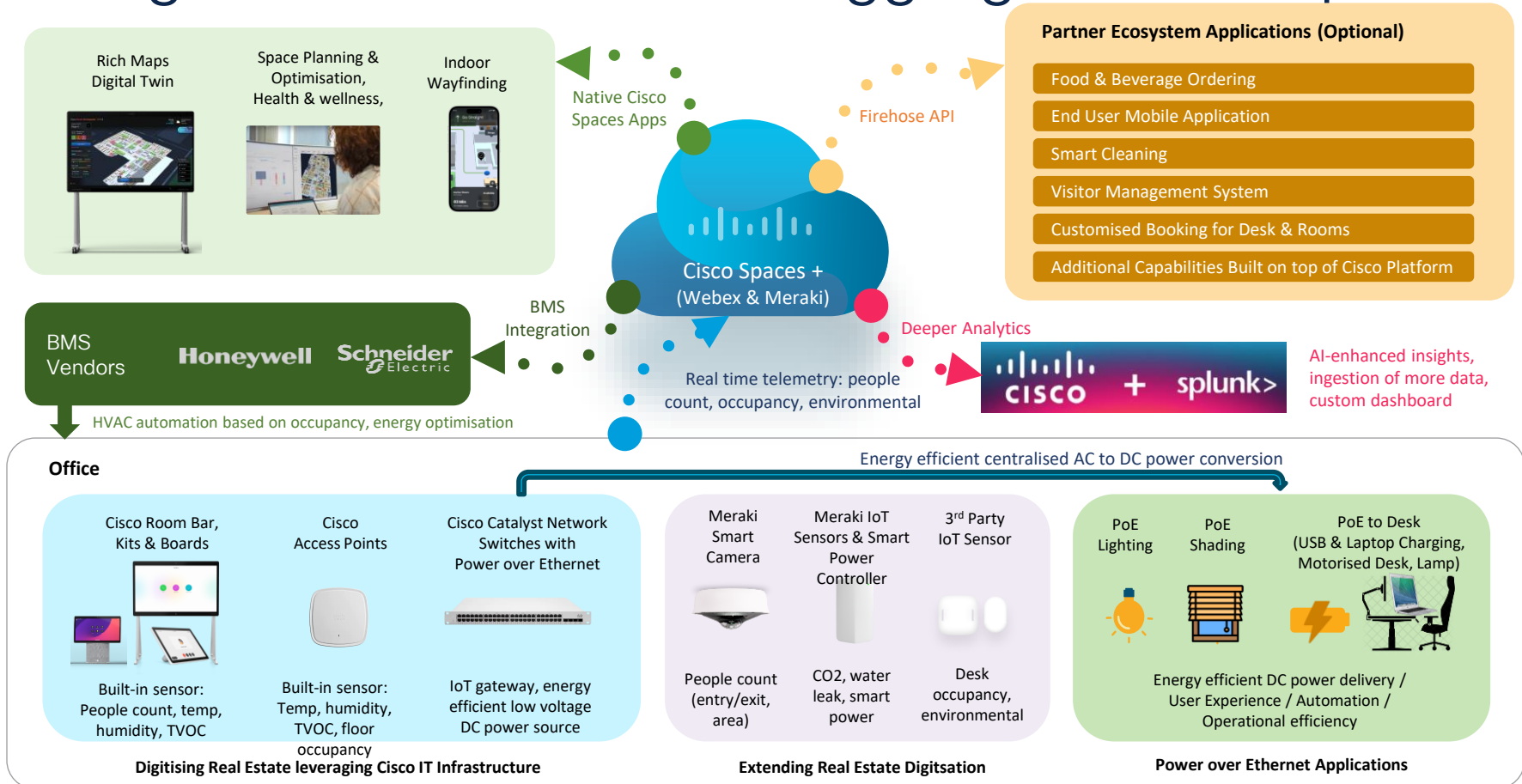
Extending Capabilities via Ecosystem Partners



BMS Integration for Sustainability



Insights and Further Data Aggregation via Splunk

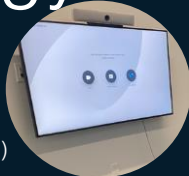


Step 1: Technology Components



Cisco Catalyst Access Points

- Wi-Fi as a sensor for occupancy
- Air quality, temp, humidity (9136)
- Multi-Vendor IoT Gateway (Wi-Fi 6 APs)



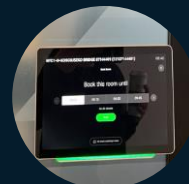
Cisco Devices (Room Bar, Board)

- People Count
- Ambient Noise



Catalyst Switches

- Multi-Vendor IoT Gateway
- Occupancy & Energy analytics
- 90W UPoE+ applications



Cisco Navigator

- Temperature, Humidity, Indoor Air Quality



Meraki Access Points

- Wi-Fi as a sensor for occupancy
- Meraki Things gateway



Cisco Desk Pro

- People Count, Ambient Noise, Temperature, Humidity, Indoor Air Quality



Meraki MT Sensors

- Temperature, CO2, Humidity, TVOCs, Indoor Air Quality, Ambient Noise, PM2.5



Wired & Wireless Third Party Sensors

- Wired & wireless sensors for occupancy, environmental metrics, etc.

Aggregating occupancy & environmental telemetry into Cisco Spaces



Cisco Spaces: Cisco Sensor Support Matrix

Last Updated: April '24	Room & Board Series	Navigator	Desk Series (Mini, Desk, & Pro)	Desk Phone 8800 & 9800	Catalyst & Meraki Wireless	Meraki Things (MT10/14/15)	Meraki Video (MV63/93)
Telemetry							
Temperature		B, F, MR	B, F, MR		B, F cw9166^	B, F, MR (MT10/14/15)	
Humidity		B, F, MR	B, F, MR		B, F cw9166^	B, F, MR (MT10/14/15)	
Air Quality (TVOC)		B, F, MR	B, F, MR (Desk Pro only)		B, F cw9136/66^	B, F, MR (MT14/15)	
CO ₂						B, F, MR (MT15)	
Ambient Noise	MR		MR			MR (MT14/15)	
Presence	MR		MR W*	MR*, W*			
Occupancy / People Count	MR		MR W*		B, F		B*, F*

B =
Building

F =
Floor

MR =
Meeting Room

W =
Workstation

* = Roadmap

^ Meraki
persona not
supported on
9136/9166

Cisco Spaces: IDM (Partner IoT) Support Matrix

Occupancy Sensors			
Portal Beam via Plug-In Framework	Presence, People Count	MR (EFT)	MR*, W*
Hella camera (Wired)	Tripwire		B*
senSource (Wired)	Tripwire		B*
Thingsee Presence (BLE)	Presence	MR (EFT)	MR*, W*
EnOcean (EMDCB- CS) (BLE)	Presence		MR*
Moko PIR PRESENCE (BLE)	Presence	MR (EFT)	MR*
Molex CoreSync Advanced Lighting Sensor (Wired)	Presence	MR (EFT)	MR*
MHTi-OC-100 (Wired)	Presence	MR (EFT)	MR*

B =
Building

F =
Floor

MR =
Meeting Room

W =
Workstation

* = Roadmap

EFT =
Early Field Trial

Cisco Spaces: IDM (Partner IoT) Support Matrix

Environmental Sensors			
Portal Beam via IoT Services	Temperature, Humidity, TVOC	B, F, MR (EFT)	B*, F*, MR*
Molex CoreSync Advanced Environmental Sensor (Wired)	Temperature, Humidity, TVOC, CO2	B, F, MR	
HibouAir Quality CO2 (BLE)	Temperature, Humidity, TVOC, CO2	B, F, MR	
HibouAir Quality PM (BLE)	Temperature, Humidity, TVOC, PM1, PM2.5, PM10		B*, F*, MR*
Thingsee AIR (BLE)	Temperature, Humidity, TVOC, CO2		B*, F*, MR*
Moko Smart H4 (BLE)	Temperature, Humidity		B*, F*, MR*
Minew S1 (BLE)	Temperature, Humidity		B*, F*, MR*
EnOcean (EMSIB-CS) (BLE)	Temperature, Humidity		B*, F*, MR*
acnAMBIENT (BLE)	TBA		B*, F*, MR*
acnAMBIENT Office Edition (BLE)	TBA		B*, F*, MR*
acnSENSA (BLE)	Temperature, Humidity		B*, F*, MR*

B =
Building

F =
Floor

MR =
Meeting Room

W =
Workstation

* = Roadmap

EFT =
Early Field Trial

Data Ingestion from Meraki

- Ingest Meraki WiFi location, environmental telemetry sensor data, and camera MQTT events
- Setup Guide: <https://spaces.cisco.com/setupguide/meraki-integration/>

Most preferred and recommended

Meraki Integration

Seamlessly connects your Meraki Organization to the Cisco Spaces Cloud in just a few clicks



Meraki API Key

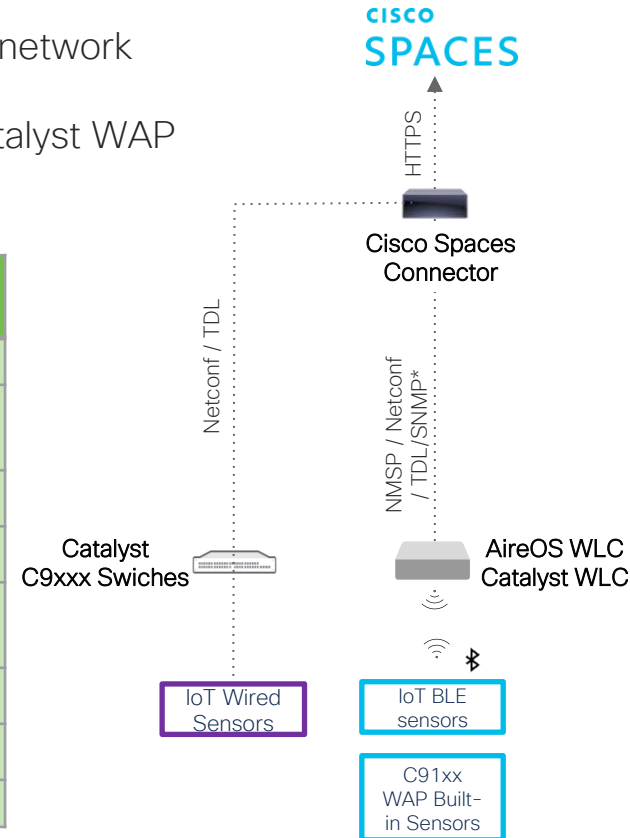
Connect your Meraki account by entering Meraki API Key into Cisco Spaces



Data Ingestion from Catalyst Infrastructure

- Ingest IoT sensor data from wired (Catalyst switches) or wireless network (Catalyst WLC)
- Location information (X/Y compute) and occupancy data from Catalyst WAP
- Spaces Connector 3.0 VM in OVA form factor

Feature	Spaces Connector 3.0
X/Y compute	Yes
Cisco Spaces Apps and Rule Engines (Right Now, Captive Portals, Engagement etc.)	Yes
Mobility Express and EWC Support	Yes
Partner Apps integration / Partner App Center	Yes
Detailed visibility into incoming data stream and anomalies	Yes
IOT Services (Wireless / Wired)	Yes
Hyperlocation	Yes
Open Roaming	Yes



Spaces Connector Sizing Guide

- 3 sizes: Standard, Advanced 1 and Advanced 2
- Recommend starting with the Standard Connector which can handle up to 10,500 (Network Mobility Services Protocol) NMSP messages/second with 12,500 APs for RSSI (Received Signal Strength Indicator) based messages.
- Recommended to put 16 WLCs (1 HA pair is 1 WLC) on a Spaces Connector
- When running IoT services, always use Advanced 2
- Configuration Guide:
https://www.cisco.com/c/en/us/td/docs/wireless/spaces/connector/config/b_connector_30/m_overview_30.html

Standard OVA 'Recommended' limits	#
AP Count (For RSSI only)	12,500
Device Count	350,000
NMSP Messages/Sec	10,500

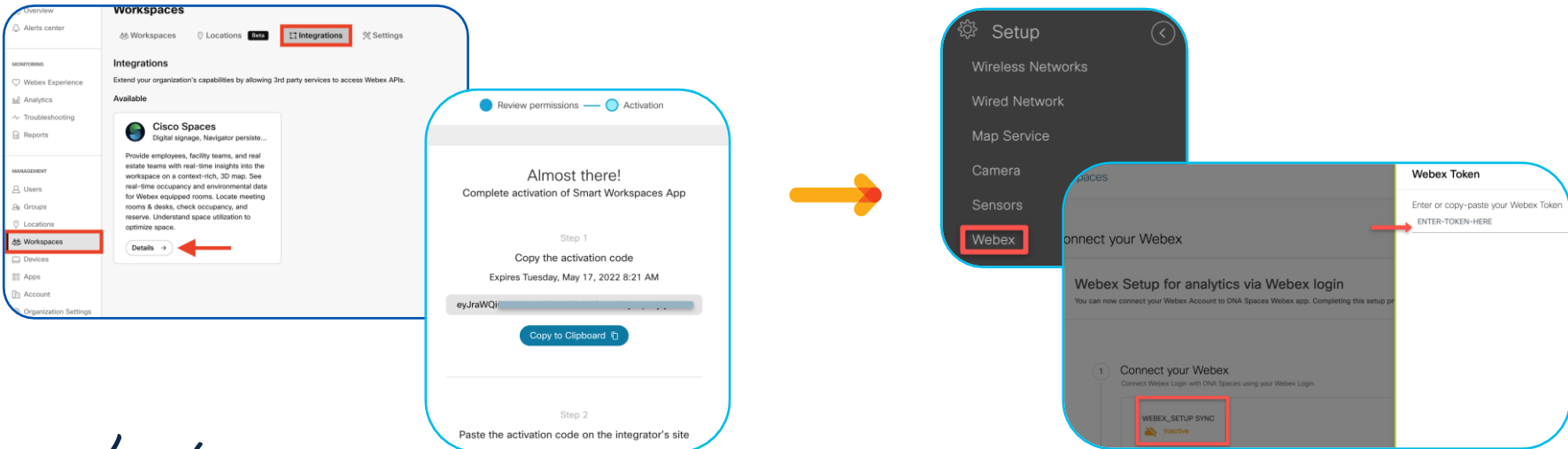
OVA Type	vCPU	RAM	Storage
Standard (Recommended)	2	4 GB	120 GB
Advanced 1	4	8 GB	120 GB
Advanced 2 (running IoT)	8	16 GB	120 GB

Data Ingestion from Cisco Webex

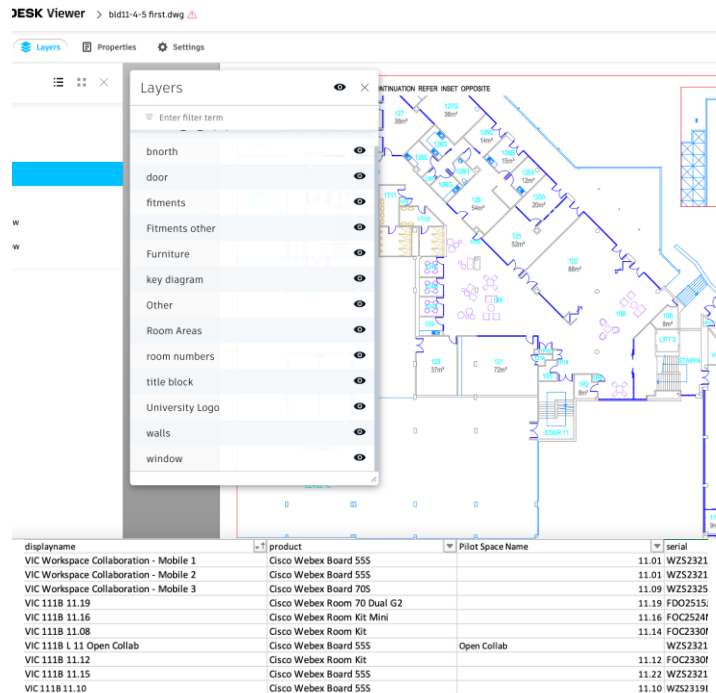
Activate Webex Control Hub to Cisco Spaces Integration

This integration allows telemetry from selected workspaces to be sent directly from Webex Control Hub to your Cisco Spaces account. This enables room occupancy, booking status, and in-room environmental telemetry (temperature, humidity, TVOC, ambient noise, etc)

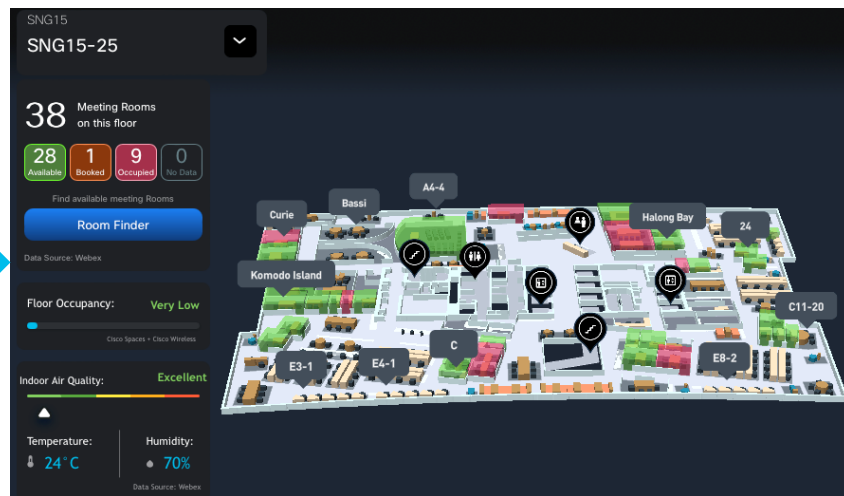
Configuration guide: <https://www.cisco.com/c/en/us/td/docs/wireless/spaces/configuration-guide/ciscospaces-configuration-guide/m-cisco-webex.html>



Step 3: Smart Workspaces Rich Maps Creation



Transform
your floorplan
CAD file into
3D Rich Maps

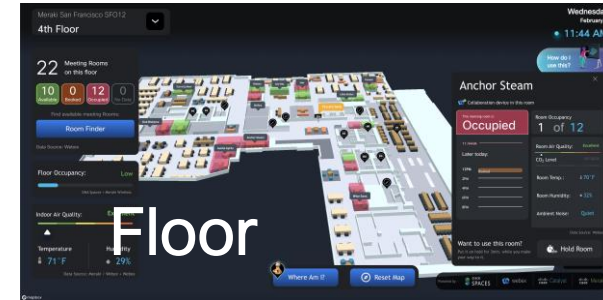


CAD File Best Practices for Smart Workspaces

- 3 main elements for a good CAD file (.dwg)
 1. **Architecture layers** (e.g. walls, doors, stairs, windows, etc)
 2. **Furniture layer**
 3. **Space names / IDs / labels**
- **Room** and **Desk** and **spaces (Space Types)** clearly marked and **name** provided, e.g. a space with a Cisco Collaboration Device will need a room or desk to assign it to
 - **Melbourne Collins St Board Room 101** vs **Board Room**
 - **Sydney George St Zone N Desk 25** vs **Desk Area N**
- Partition **Desks** within a larger table in the CAD file
- Provide clear **layer names** in CAD, e.g. “A-Furn” (Furniture), “Doors”, etc
- **Cross Reference (XREF)** will not be processed. Bind them into a **single .dwg**

Smart Workspaces Rich Map Creation

- Upload floorplan CAD file(s) to Cisco Spaces team for review
- Self-serve CAD to Rich Map conversion dashboard under Setup > Locations & Maps > Digital Maps
- Self-serve Space Manager app for matching Webex Workspaces from Webex Control Hub to CAD file room names
- Self-serve Space Experience app to deploy Signage to Webex Board and/or other digital signage displays with options



Step 4: Deploying PoE Devices

Dive Deeper into Power over Ethernet Lighting

Lighting



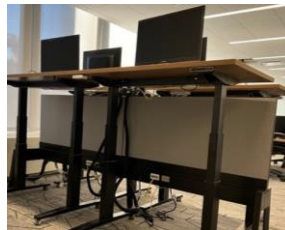
Monitor



Desk Lamp



Motorised Desk



Laptop Dock



Shading



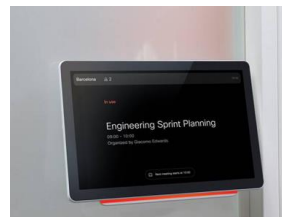
VAV Controller



WiFi



Cisco Devices

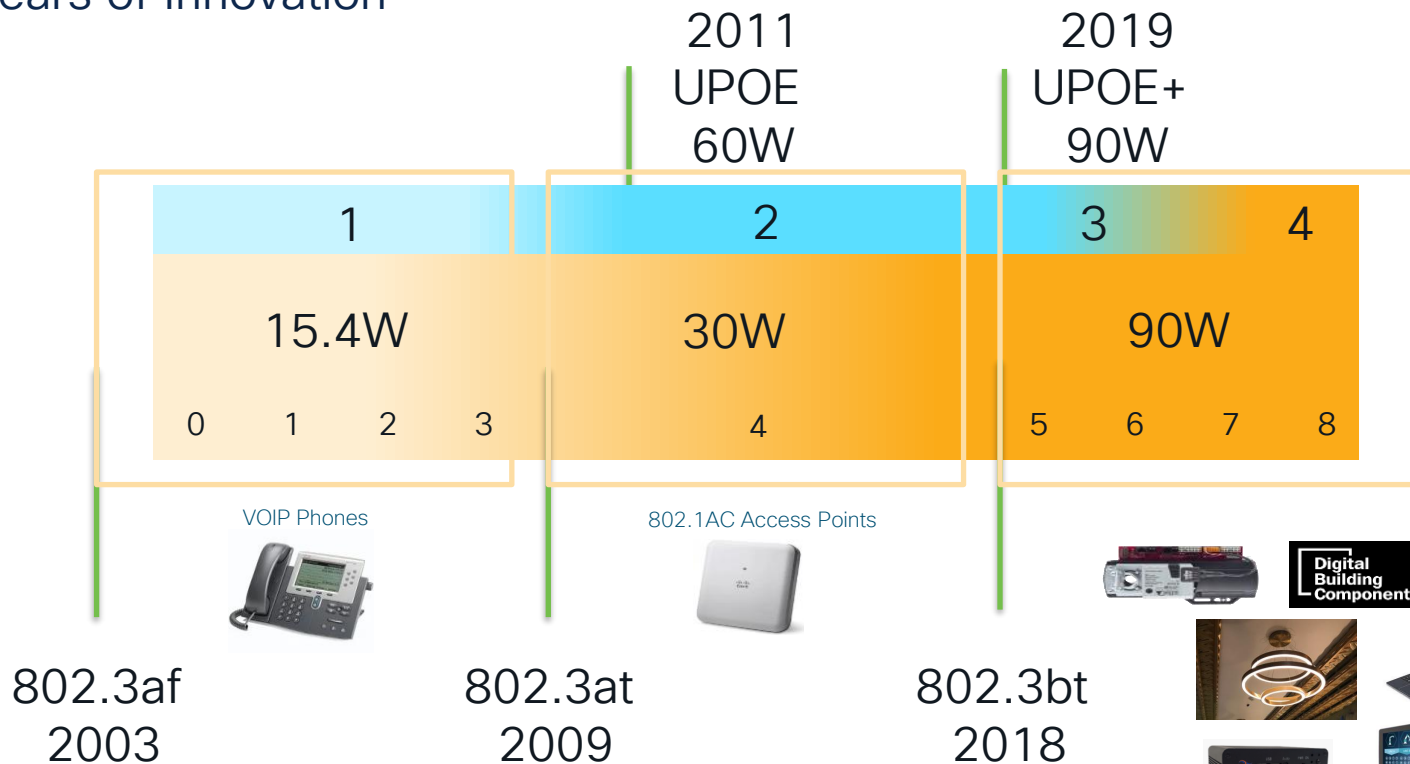


Mini PC



Enabling Technology: Power over Ethernet (PoE)

20+ Years of Innovation



Benefits of Category Data Cable for Power

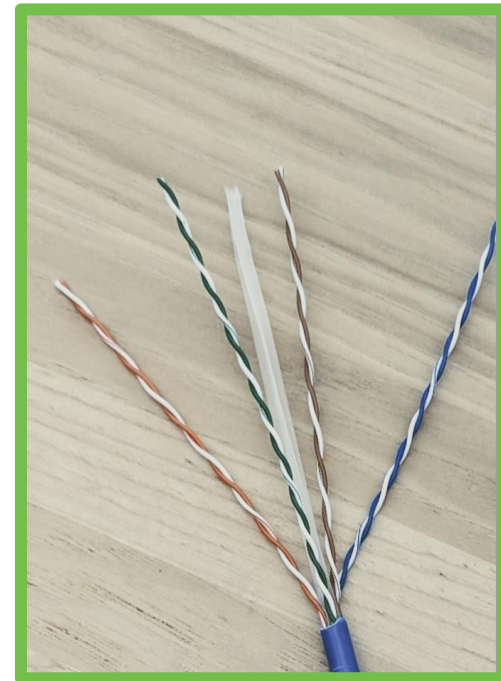
Mains AC Cable

- Heavy materials
- No fault management
- Risk of accidents
- No data path, multiple cables



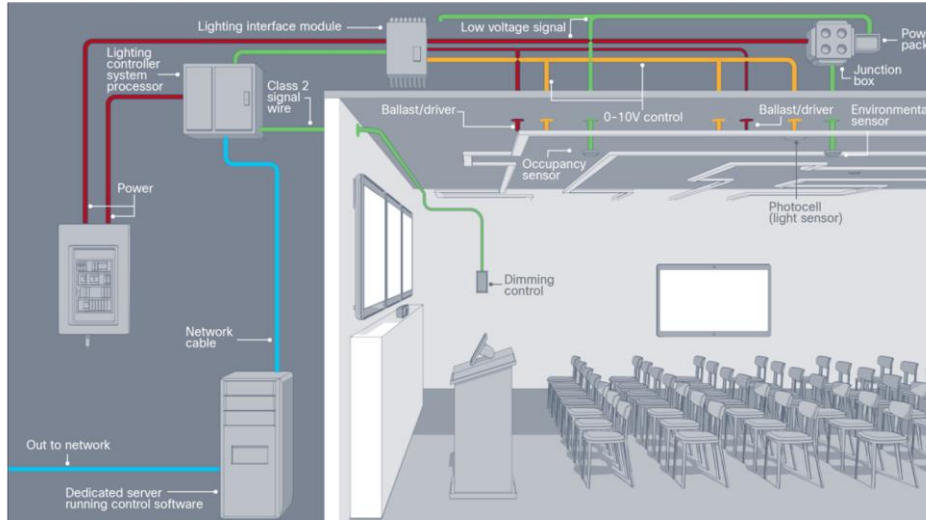
- Less copper, no conduits
- Standards based intelligent data
- Low voltage with inherent safety

Category Data Cable



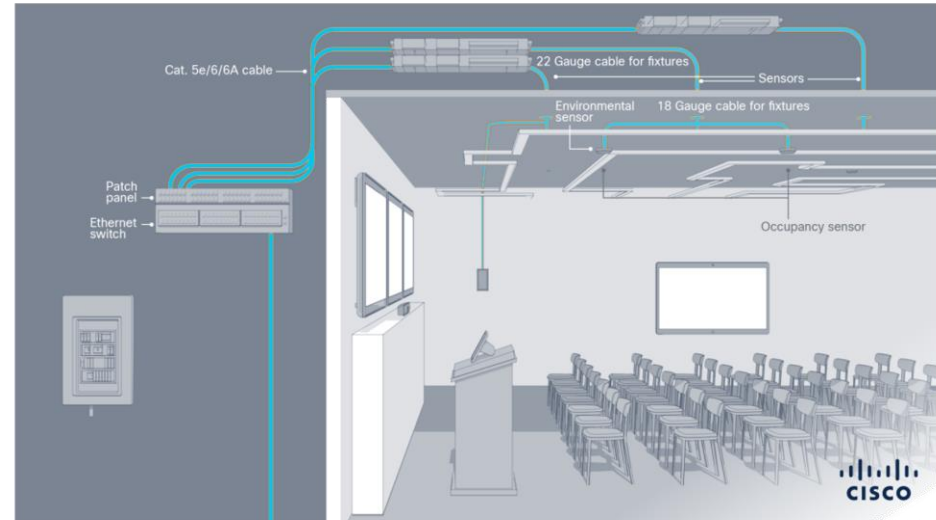
Traditional Lighting vs PoE Lighting Cabling

Traditional Lighting



Different cabling for sensor, data, power, control

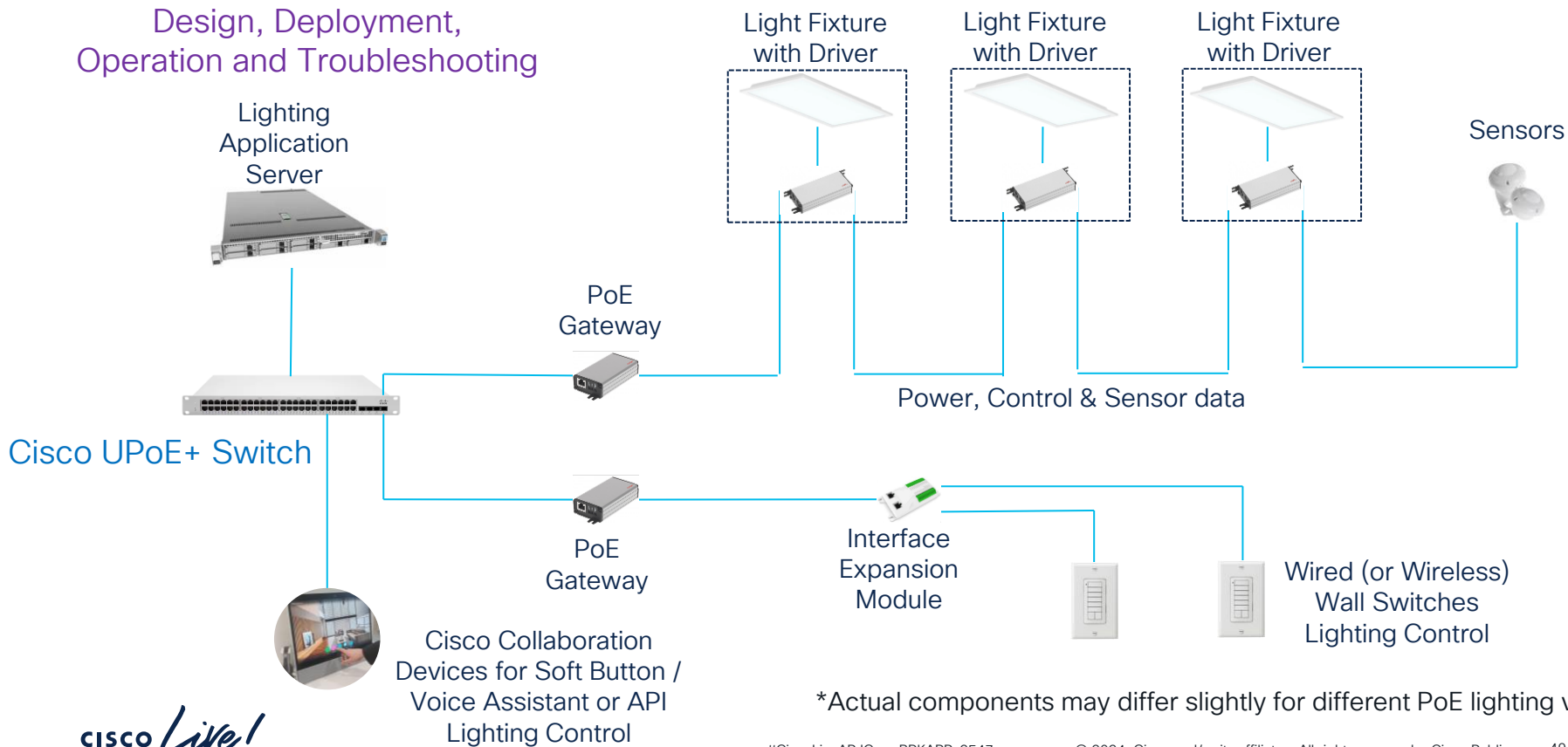
PoE Lighting



Simplified & standardised cabling for lower capex

PoE Lighting High Level Block Diagram*

Design, Deployment,
Operation and Troubleshooting



*Actual components may differ slightly for different PoE lighting vendor

PoE Lighting Design Considerations (90W)

Cooling



- Add total wattage of PoE devices
- Add power consumed by switches
- Determine conversion loss in PS (Calculate Wattage wasted as heat)
- Resulting Wattage is the heat load
- E.g. 2kW AC can cool 10x24 port 90W switch stack fully populated
- Low-voltage PoE lighting design:
<https://www.cisco.com/c/en/us/solutions/enterprise-networks/low-voltage-poe-lighting-dg.html>

Cabling



- Minimum of Category 5E required per IEEE 802.3bt
- Recommend Category 6A for better thermal and power efficiency
- Different cable bundle sizes can be designed for, depending on ambient temperature and conductor sizes
- PoE IT/OT convergence whitepaper:
<https://www.cisco.com/c/en/us/solution/collateral/enterprise-networks/nb-06-upoe-plus-it-ot-wp-cte-en.html>

PoE Switch Selection with PoE Resiliency Features

90W
UPOE+

IEEE 802.3bt
Type 1-4

P/PoE with
Stack power

288
concurrent
90W ports
in a stack



C9300-24/48H, 24/48HX



1900W AC PSU



C9300X-48HX

36 90W
ports per
switch

48/24p x mGig (5G/10G) & UPOE+ ports



DC Power Supply options for
C9200, C9300, C9400 Switches

260
concurrent
90W ports



4-Slot



7-Slot



10-Slot



C9400-LC-48H



C9400-LC-48HN



SUP2/XL Perpetual POE Capable



C9400-LC-48HX

48 x (10G + UPOE+) ports



Cisco StackPower



Perpetual PoE



Fast PoE

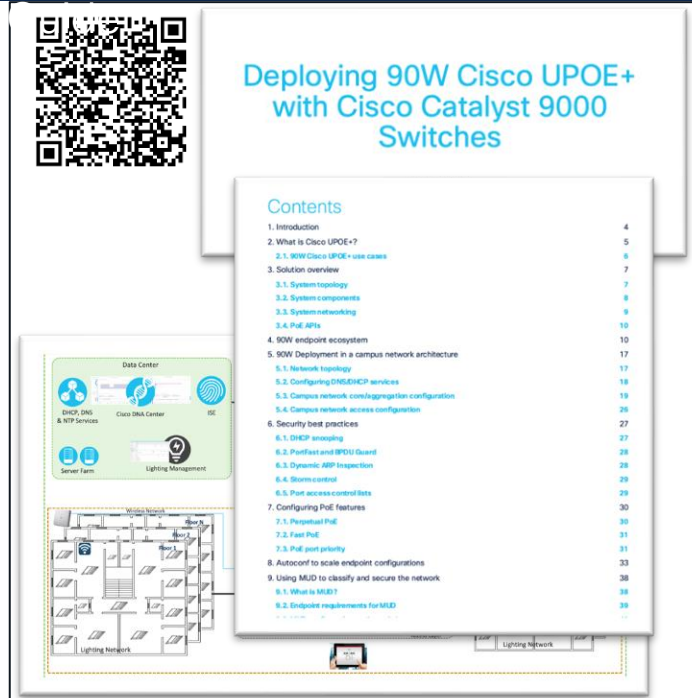


PoE Port Priority

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Additional Cisco UPOE+ Resource

Catalyst 9K 90W Deployment



PoE Configuration Guide

Security Best Practices

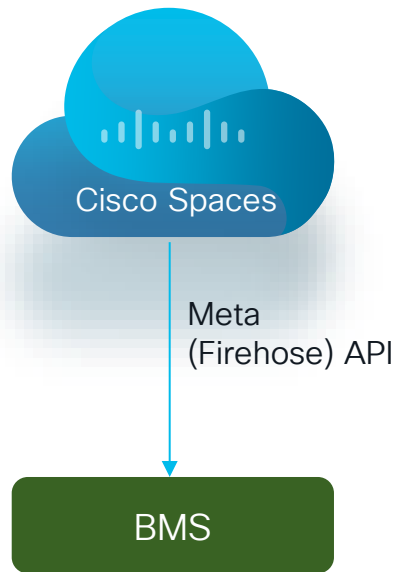
Troubleshooting PoE

<https://www.cisco.com/c/en/us/products/colateral/switches/catalyst-9300-series-switches/guide-c07-744813.html#2WhatIsCiscoUPOE>

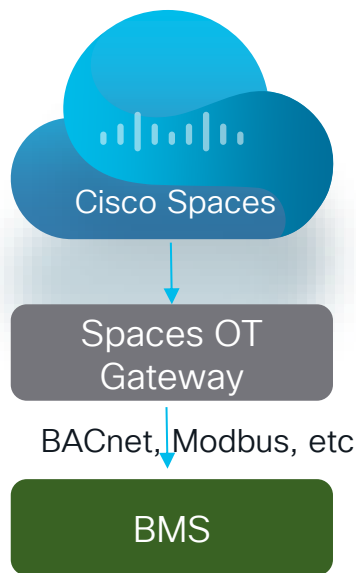
Step 5: Building Management System BMS

Automation for HVAC, Lighting, etc based on Occupancy / Environmental

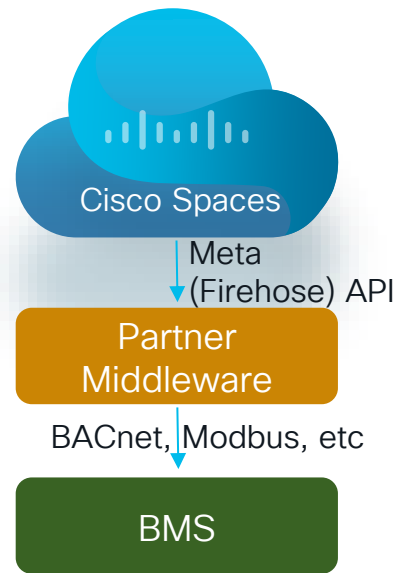
Option 1:
Native BMS to Spaces



Option 2:
Spaces Smart Room*



Option 3:
Partner Integration



BMS Integration Considerations

- Regardless of integration option, aim is to send more data points to BMS so it can make better decisions around HVAC, lighting, shading operations etc. Cisco Spaces does not need to “control” the BMS
- Optimal scenario for BMS integration
 - Current floor spaces have little to no occupancy sensor
 - Floor space has zoned HVAC that is BMS-controlled
 - Building owner / facility management open to collaborate
- Most integration work is involved around mapping the Spaces occupancy and sensor telemetry to the right zone / location within BMS



Step 6: Data Export Methods

Cisco Spaces Meta (Firehose) API

Extend and built on top of native Cisco Spaces reports, used specifically for partners and customers to integrate their business applications with Cisco Spaces

Spaces Meta API characteristics:

- Secure and high-volume streaming API
- Carries multiple technology data
- Contains machine learning algorithms



Spaces Meta API



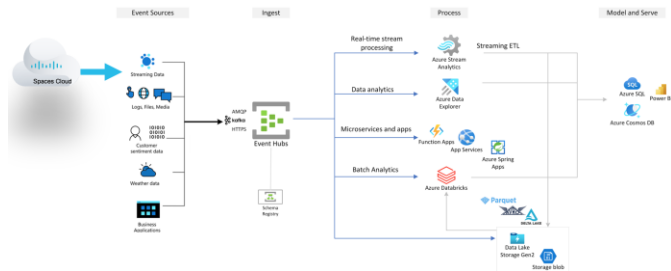
Wi-Fi data
BLE data
Sensors data
Video
Staff presence
Guest location
Customer visits
Map changes
and more!



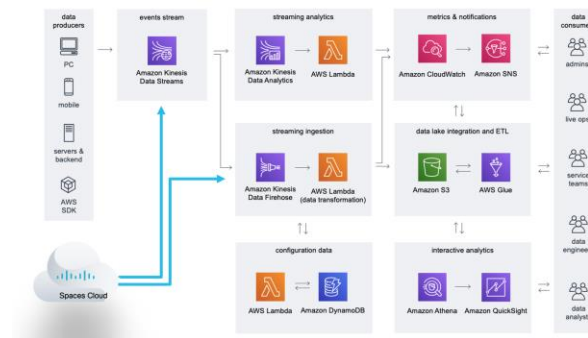
Partners or
Customers

Meta API Streaming Data for Further Analysis

Meta API to Power BI using Azure Event Hub



Meta API to AWS Ecosystem



Meta API to Splunk



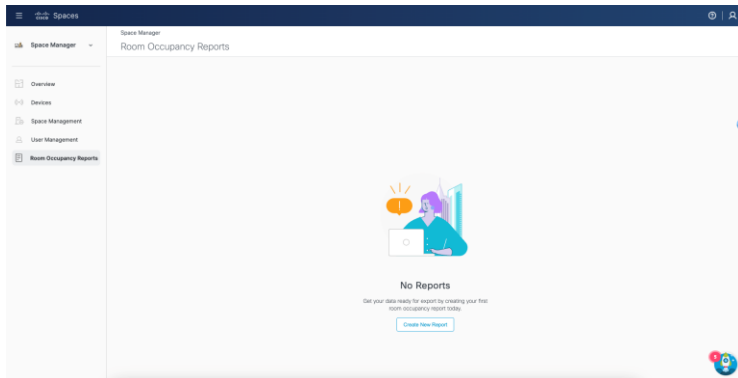
Cisco Spaces API Guide:

https://www.cisco.com/c/dam/en/us/td/docs/wireless/cisco-dna-spaces/partner-app/partner-firehose-api/Cisco_Spaces_API_Guide.pdf

Additional Data Exports

Room Occupancy Report

- For Webex & non-Webex Rooms
- Buildings, Floor & Room level
- One off or recurring (weekly, bi-weekly, monthly)
- Reporting intervals of 15, 30, 60 min
- Dashboard only download

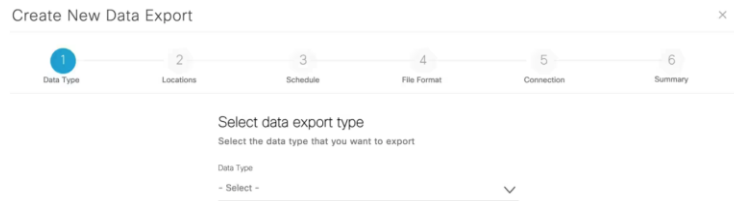


<https://www.cisco.com/c/en/us/td/docs/wireless/spaces/config-guide/ciscospaces-configuration-guide/m-data-export.html>

CISCO Live!

Wireless Data Export

- Retail user acquisition, user visit, proximity rule match data
- Auto export of raw level Wireless Data as csv
- Raw csv uploaded directly or to a cloud SFTP, or cloud providers
 - Amazon AWS S3
 - Microsoft Azure Blob
 - Google Cloud Storage
 - Box



Step 7: Other Considerations

- Environmental sensor density & placement
- Levels of occupancy detection (cost vs granularity)
- Desk booking vs desk occupancy (warm vs hot data)



Examples around the World

Cisco and Customer Smart Buildings

Cisco Office | Singapore



Retrofit Existing Space

- Leverage existing ports and Wi-Fi
- Upgrade to PoE switching infrastructure
- Add Endpoints: Cisco + Partners
- Maximum real estate utilisation

Penn1 | New York

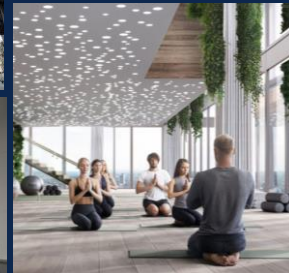


Penn 1
VR Experience

Tenant Build-Out

- Converge building OT environment
- Reduced power consumption and costs
- Improved user experience
- Data and insights

22 BishopsGate | London

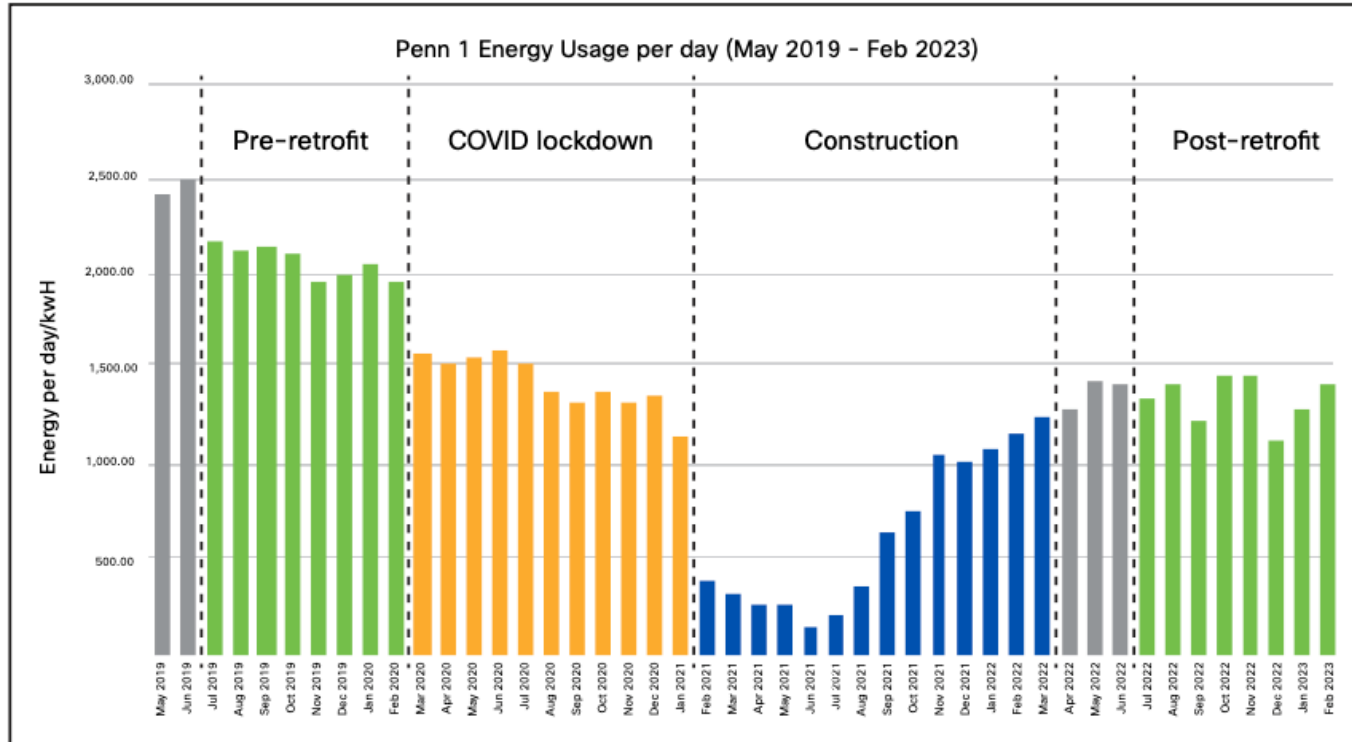


New Build

- Smart BMS, HVAC, CCTV
- Converged IT, OT and energy management
- Visibility and automation drives power efficiency
- Reduce CapEx and OpEx

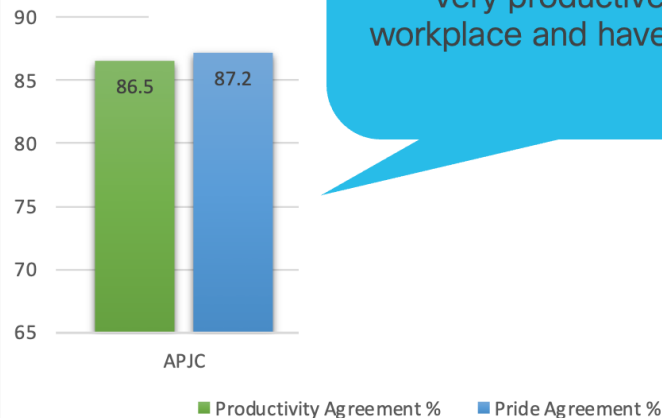
Cisco NYC Penn1 Energy Savings

37% avg power saving from automation, conversion to DC, PoE applications, etc



Workplace Experience Survey – APJC

Cisco APJC outperformed industry benchmarks by 15-30%



As a hybrid organization in APJC, our employees told us they are very productive in their workplace and have great pride

Ability to personalize my workstation – 44.6%

“Office as a magnet, not a mandate.”

Chuck Robbins, CEO
Cisco

Keynote Deep Dives

Wednesday
10:30am – 11:30am



Experiences Amplified:
How AI Can Fuel
Better Employee
and Customer
Experiences

Level 1
Room 106



Smart, Secure,
Seamless:
Transforming
Experiences with
Next-Generation
Networking

Level 2
Room 204



Harness a Bold
New Era:
Transform Data
Centre and
Service Provider
Connectivity

Level 2
Room 203



Securing User to
Application and
Everything in
Between

Level 2
Melbourne Room 2



Unlocking
Digital Resilience
through Unified
Observability

The HUB
Centre Stage

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Thank you

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