

# Catalyst Switching Innovations for Sustainability

Veera Bhaskar Mutyala Technical Marketing – Campus Connectivity BRKENS-2099



## Agenda



## Sustainability – Customer goals



- Many of our customers have net zero commitments
- Many of them will be using Doppler / S1 based platform by their committed timeline
- Cisco has set a goal to reach net-zero GHG emissions across its value chain by 2040 and has also set a goal to reduce absolute Scope 3 emissions from purchased goods and services, upstream transportation and distribution, and use of sold Cisco products by 30% by 2030\*

2030

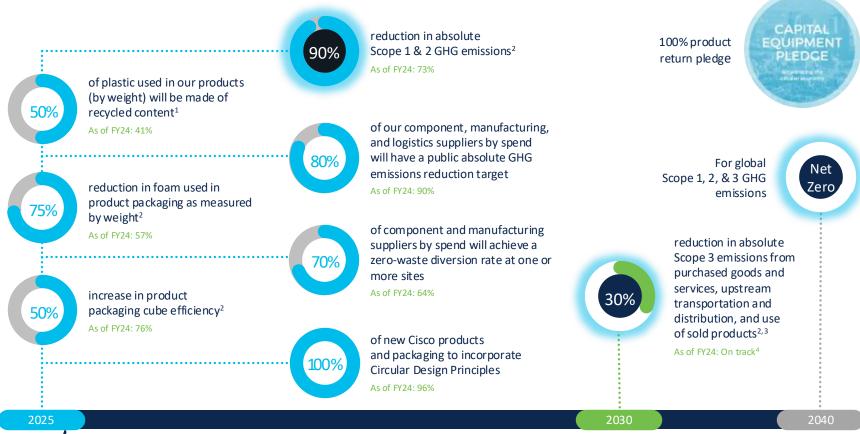
Cisco absolute scope 3 emissions reduction by 30% in categories 3.1, 3, 4 and 3.11\*

2040

illiilli cisco 2050 (Paris Agreement)

 The baseline and progress reported for our fiscal 2030 goal includes a subset of Scope 3 Category 1 (purchased goods and services from manufacturing, component, and warehouse suppliers), a subset of Scope 3 Category 4 (upstream transportation and distribution from Cisco purchased air transportation), and all of Scope 3 Category 11 (use of sold products")

## Cisco's public sustainability goals



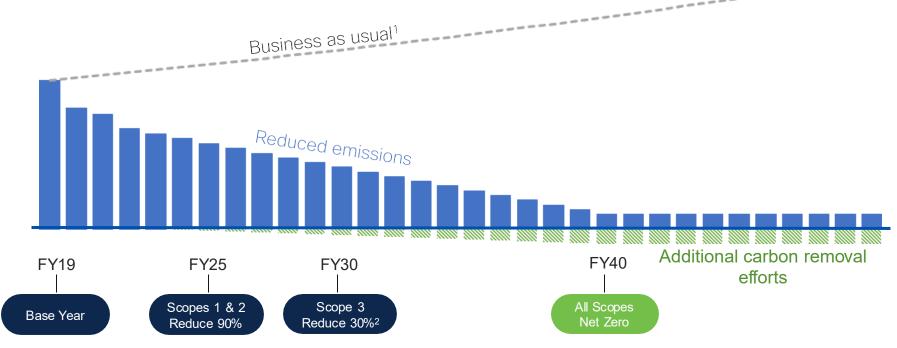
## ESG Reporting Hub & Purpose Report



Visit: cisco.com/go/esg-hub



## Net Zero Emissions Roadmap



<sup>1</sup>This chart is for illustrative purposes only. BAU assumes a 1.7% annual growth across all scopes of emissions, based on 2022 European Commission data showing the average yearly percentage growth of CO2 emissions between 1990 and 2021

<sup>2</sup> From purchased goods and services, upstream transportation and distribution, and use of sold products



Trends!



so, is sustainability really a trend?

cisco Life!

## Approaching sustainability

Responsible sourcing

Circular design

**Packaging** 

Manufacturing

regulatory compliance

**Product Use** 

**Brand Reputation** 

end of life management

Environmental, social, and governance (ESG)



## Sustainability Profiles of Catalyst 9K series

Accelerating a customer's sustainability journey through its life cycle

#### Manufacturing

#### Simplified architecture

Parts designed to serve multiple functions

#### Reduced plastic usage

Removed cosmetic plastic bezel, reducing the plastic used in the product.

#### No wet paint

Eliminated use of oil-based wet paint, reducing environmental impact of manufacturing process.

#### Transport

#### **Packaging**

Redesigned packaging to remove plastic foam and reduce overall packaging waste (C9200, C9300, C9400, C9600)

#### No paper manuals

Leverage postcard-size pointer card to connect user to digital documentation.

#### **Accessory opt-in**

Customers can opt-in to receive only the product accessories they need.

#### Jse

#### **Increased Performance per Watt**

ASIC and HW innovations enable higher bandwidth at less than proportionate increase in power

#### Platinum/Titanium rated PSUs\*

## **Energy Management and Automation**

(C9200, C9300, C9400)

Energy reporting for devices in one view reporting energy usage, mix, cost and CO2e, allowing you to make smart energy choices

## Auto-offline hardware based on usage\*

Cisco Stack Power (C9300, C9400)

#### End of Use

#### Takeback Program\*\*

Cisco picks up the product when done and reuses, remanufactures or recycles it, helping to reduce lifecycle embodied carbon.

Nearly 100% of products returned to us are reused or sent to recycling.

#### Cisco Green Pay

Customers eligible to receive up to 5% discount when participating in Green Pay.

#### Cisco Refresh

Certified Cisco remanufactured equipment, which feature lower embodied emissions at the unit levand avoidance of virgin materials, versus new product.

## Sustainability Manufacturing Innovation with **Catalyst 9000** Switches



#### **Packaging Sustainability**

Reduced foam and paper documents in Catalyst 9200/9300 packaging, plastic bags to be removed by FY25.

In FY24, Cisco reduced foam used in product packaging measured by weight by 57% against the FY19 base year.



#### No Paint Project

In 2019 Cisco removed oil-based wet paint from its Catalyst 9000 product; this resulted in eliminating approximately 40 MT per year of volatile organic compounds (VOCs) and about 1,900 MT CO2e and saving over \$5 million through the end of the company's 2023 fiscal year.

#### Tackling Embodied carbon

Product takeback program

Partner sustainability certifications

Standardize and modularize components and products

Reducing materials used in products and packaging

Increase recycled content use in products and packaging



## Cisco Product Takeback and Reuse Program

Free removal and transport of equipment at customer end-of-use

Security

Returned equipment is

stored in a secure location and

hard drives are

cleared according to the

U.S. NIST 800-88 guidelines



#### **Simplicity**

Cisco offers various tools to help you create a return request and schedule a free pickup of your used Cisco equipment











Cisco can help you reach your sustainability goals – we reuse and send to recycling of what is returned to our facilities











## Cisco programs supporting circularity

#### ...... CISCO

#### Takeback and reuse

- Cisco provides a free product takeback program upon request for Cisco and selected non-Cisco used equipment
- Helps Cisco and customers achieve their sustainability and circularity goals
- Cisco reuses or recycles nearly 100% of what is returned to us
- Increases the stock of refurbished products (Refresh)
- Mobile app available in the US, UK and all European Union countries
- Link here

#### ախախ CISCO

#### Refresh

- Certified remanufactured products
- Can help customers reduce emissions associated with the manufacture of new products
- Same warranty and support options as new products
- Often ships faster than new equipment
- Available globally in over 70 countries

BRKENS-2099

• Link here

#### CISCO

#### **Green Pay**

- Green Pay (launched April 2022) & Lifecycle Pay Programs
- Cisco Green Pay offers a 5% incentive on Cisco hardware, predictable payments and free product returns
- Financing terms from 3 to 5 years
- Cisco Takeback included in offer
- · Confirmation of entry of returned equipment into Cisco's circular economy
- Available in select countries worldwide
- Link <u>here</u>



## ESG reporting – the 3 WWWs

The European Union passed the Corporate Sustainability Reporting Directive (CSRD) to improve ESG reporting.

- Corporate Sustainability Reporting Directive (CSRD)
- Sustainable Finance Disclosure Regulation (SFDR)
- Taxonomy Regulation
- FU Green Deal
- · Circular Economy Package

POLITICS | POLICY

### Carbon-Disclosure Rules for U.S. Companies Are Coming Sooner Than Expected

California and EU set to approve regulations on emissions that cause climate change

By Paul Kiernan Follow and Christine Mai-Duc Follow
Sept. 20, 2023 9:00 am ET

**SEC Proposes New ESG Disclosure Requirements** 

California's new ESG laws are expected to affect over

**10,000** companies

doing business in the state.





## Impact of EU Regulations on Businesses

**Investor Expectations**: Investors increasingly prioritize ESG factors, and EU regulations can influence investment decisions

Climate Transition Planning: Companies need to develop strategies to reduce their carbon footprint and adapt to a low-carbon economy

**Increased Reporting Requirements**: Companies must comply with detailed reporting obligations, including climate-related disclosures

**Enhanced Due Diligence**: Businesses are expected to assess and mitigate their environmental and social impacts throughout their supply chains

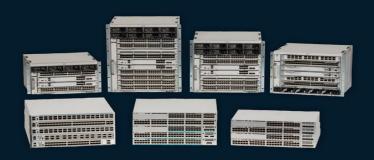
**Product Sustainability**: Products must meet specific sustainability criteria, such as energy efficiency standards and eco-design requirements

What can we do here?





## Catalyst 9000s are now ENERGY STAR® Certified



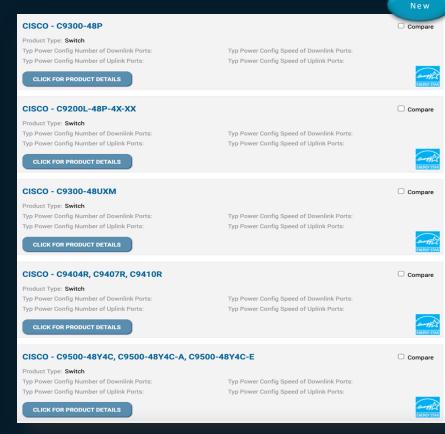
ENERGY STAR® certified large network equipment (LNE) meets energy efficiency standards set by the U.S. Environmental Protection Agency (EPA)



Large Network Equipment Requirements

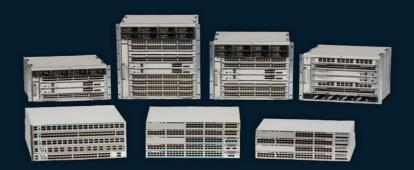


Energy Star® Certification



#### New

## Catalyst 9000s LCA reports



### Life Cycle Assessment of Catalysts

LCA reports the environmental impacts of the product throughout its entire life cycle.

All ENERGY STAR® rated PIDs have LCA reports published

### Contents

| I Goal of the Study       1         1.1 Reasons for Carrying Out the Study       1         1.2 Intended Applications       2         1.3 Target Audience       2         1.4 Critical review       2         2 Scope of the Study       3         2.1 Product and Function       3         2.2 Functional Unit       4         2.3 System Boundary       4         2.4 Temporal and Geographical Boundary       5         2.5 Cut-off Criteria and Limitations       5 |
|--|
| 1.2 Intended Applications       2         1.3 Target Audience       2         1.4 Critical review       2         2 Scope of the Study       3         2.1 Product and Function       3         2.2 Functional Unit       4         2.3 System Boundary       4         2.4 Temporal and Geographical Boundary       5         2.5 Cut-off Criteria and Limitations       5  |
| 1.3 Target Audience       2         1.4 Critical review       2         2 Scope of the Study       3         2.1 Product and Function       3         2.2 Functional Unit       4         2.3 System Boundary       4         2.4 Temporal and Geographical Boundary       5         2.5 Cut-off Criteria and Limitations       5  |
| 1.4 Critical review       2         2 Scope of the Study       3         2.1 Product and Function       3         2.2 Functional Unit       4         2.3 System Boundary       4         2.4 Temporal and Geographical Boundary       5         2.5 Cut-off Criteria and Limitations       5  |
| 2 Scope of the Study       3         2.1 Product and Function       3         2.2 Functional Unit       4         2.3 System Boundary       4         2.4 Temporal and Geographical Boundary       5         2.5 Cut-off Criteria and Limitations       5  |
| 2.1 Product and Function   |
| 2.2 Functional Unit       4         2.3 System Boundary       4         2.4 Temporal and Geographical Boundary       5         2.5 Cut-off Criteria and Limitations       5  |
| 2.3 System Boundary       4         2.4 Temporal and Geographical Boundary       5         2.5 Cut-off Criteria and Limitations       5  |
| 2.4 Temporal and Geographical Boundary       5         2.5 Cut-off Criteria and Limitations       5  |
| 2.5 Cut-off Criteria and Limitations   |
|  |
| O O Allerentee   |
| 2.6 Allocation   |
| 3 Life Cycle Inventory Analysis  |
| 3.1 C9300-48P Life Cycle Inventory   |
| 3.1.1 Component Manufacturing 6  |
| 3.1.2 Transportation of Materials and Components to Factory  |
| 3.1.3 Assembly 8   |
| 3.1.4 Testing9   |
| 3.1.5 Distribution   |
| 3.1.6 Use  |
| 3.1.7 End-Of-Life11  |
| 3.2 Limitations  |
| 3.3 Cut-Off Criteria   |
| 3.4 Allocation Procedures  |
| Life Cycle Impact Assessment   |
| 4.1 Life Cycle Impact Assessment Procedures and Calculation  |
| 4.2 Life Cycle Impact Assessment Results   |
|  |

© 2024 Cisco and/or its affiliates. All rights reserved

cisco Live!

## LCA Key measurements across ENERGY STAR® rated Catalyst 9000s

| PID                   | LCA Published | Typical power<br>In use phase | Annual energy consumption | Global Warming<br>Potential (GWP) | O Dotontial I                                |                 | Blue Water<br>Consumption<br>(BWC)* |
|-----------------------|---------------|-------------------------------|---------------------------|-----------------------------------|--|-----------------|-------------------------------------|
| Mea sure/scale        |               | watts                         | kWh                       | kg CO2e                           | kilogram [kg] a ntimony [Sb]<br>equiva le nt | megajoules [MJ] | Liters                              |
| C9200L-48P-4X         | Yes           | 63.5                          | 556                       | 1,477                             | 0.02   | 26,012          | 17,048                              |
| C9300-48P-E           | Yes           | 112                           | 981.12                    | 2,720                             | 0.05   | 45,470          | 21,002                              |
| C9407(2xsup2 + 4x48H) | Yes           | 1,679                         | 14,708                    | 36,787                            | 0.21   | 636,984         | 324,318                             |
| C9500-48Y4C           | Yes           | 230                           | 2,015                     | 5,054                             | 0.0321                                       | 85,211          | 43,589                              |

| PID                   | Global Warming Potential (GWP), by Life<br>Cycle Phase** |        |  |  |  |  |
|-----------------------|--|--------|--|--|--|--|
| Mea sure/scale        | Manufacturing  | Use    |  |  |  |  |
| C9200L-48P-4X         | 8%   | 91%    |  |  |  |  |
| C9300-48P-E           | 14%  | 85%    |  |  |  |  |
| C9407(2xsup2 + 4x48H) | 5%   | 94.47% |  |  |  |  |
| C9500-48Y4C           | 4%   | 96%    |  |  |  |  |





Sustainability data is increasingly important to a variety of stakeholders.

**BRKENS-2099** 

## Reporting & Sustainability asks

ESG reporting refers to the process of disclosing information about a company's Environmental, Social, and Governance (ESG) performance.



#### CTO / IT / Net Ops

How do I optimize energy usage in my infrastructure?



#### ESG / CSO

How do I calculate and report emissions?



#### CXO / BOD / Finance

How do we save money and drive sustainability?



#### **Procurement / Supply Chain**

How can I influence circularity and reduce upstream emissions?



## Needs starting to reflect in RFP's

| Subject: Sustainability Initiatives  |
|--|
| Hi folks,  |
| I am supporting the customer (1 of 35 WPA customers) is very much on the path to sustainability and certifications.  |
| is interested in getting ESG (WELL and LEAD Reports) for their growing Real Estate footprint. They are already leveraging UPoE, Catalyst Center Automation, but want to leverage output from these systems to assist in ESG reporting. Here are some of the areas they are looking for help with below and I'd love to connect with some folks on your team to discuss what we can/can't do. |
| There are a lot of very specific measures below and they're open to trying out other Cisco solutions and 3 <sup>rd</sup> party equipment to achieve their goals.   |
| Regards  |

What can we do?



Switching Innovations for Sustainability



## Sustainability Focus Pillars

#### Efficient Hardware

- Achieve high efficiency with PSU's, ASIC's
- Modular design for reusability and recyclability



#### Intelligent Software

- Intelligent software with inbuilt efficiency and performance minded operability
- Programmability and visibility with YANG and streaming telemetry with KPI



#### **Energy Management**

- Visualization and reporting of energy consumption
- Empower the customer to make energy / performance tradeoffs and manage consumption through centralized policies







## Hardware Innovations

#### **Power Efficiency**

- Titanium rated PSU
- hVDC PSU\*
- Energy Efficiency® Regulatory Compliance & Certifications

#### **System Efficiency**

- ASIC Efficiency
- Stack Power

#### **Design for Efficiency**

- Compact Fanless SKUs
- EEE
- App-Hosting



## Software Innovations

#### Auto-off

- Port LED
- Optics
- StackPower PSU

#### **Energy Metering Enhanced**

- System Power
- PoE Port Power

#### **Power Telemetry & API's**

- Cisco-IOS-XE-poe-oper.yang
- platform-ios-xe-oper.yang

IOS XE 17.15.1+



## **Energy Management**

## **Energy Management Dashboard with Catalyst Center**

Consumption, Cost, GHG emissions data reporting

API + Manual

**PoE Assurance with Catalyst Center** 

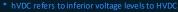
#### **Cisco Spaces**

- Energy utilization
- Environmental analytics

## Power Analytics with Open Source tools

(ex. TIG stack/Grafana)

Catalyst Center 3.1.3





## Efficiency with Power Supplies

Platinum max efficiency 92%\*

Titanium max efficiency 94%\*

- All Cat9K Core SKUs can be powered by Platinum or Titanium rated PSU's and Access SKUs can be powered by Platinum rated PSU's
- Higher-rated PSU's have higher quality components, increased efficiency & longevity
- Switch Operability with a Mix of AC/DC PSU's
- ROI with improved Efficiency











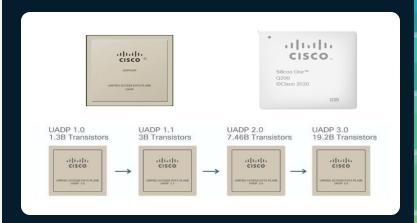




## **ASIC Efficiency**

#### **Incremental Efficiency**

- Up to 3x throughput increase with S1 ASIC's (vs UADP) for same amount of power\*
- Increased Distribution and Core scale & performance improvement over previous generations with no additional increase in power budgeting
- Operating with lesser power means lesser cooling costs
- Up to 3x reduced energy consumption in watt/gig over previous generations of Catalysts SKUs



Catalyst 9600-SUP2 provides 12.8T bandwidth while SUP1 is at 4.8T max bandwidth, bandwidth has more than doubled, yet power consumption decreased by 10%.

\*Sup 1 775W max consumption, Sup 2 is 660W max consumption



#### auto-off Port LED

17.15.2

#### What it is

Ability to control switch downlink and uplink Port LEDs Platforms: C9300, C9200

#### What it does

Gives the ability to turn off port LEDs until an event is triggered or manually enabled by CLI or Mode button press (Turns ON for 5 minutes) for LED **Event triggers**:

- 1. Link Events \*
- 2. Mode Button press (H/W Dependent) \*\*
- 3. Console Connect Activity \*

#### hw-module switch # auto-off led

#### What it gets

Power savings at downlink and uplink LEDs, scalable impact

Switch# show hardware led

Current Mode: STATUS **LED auto-off:** Disabled

SWITCH: 1

SYSTEM: GREEN MASTER: GREEN



Energy savings with LED depowering at Scale



### auto-off Port LED

17.15.2

#### What it is

Ability to control switch downlink and uplink Port LEDs Platforms: C9300, C9200

#### What it does

Gives the ability to turn off port LEDs until an event is triggered or manually enabled by CLI or Mode button press (Turns ON for 5 minutes) for LED **Event triggers**:

- 1. Link Events \*
- 2. Mode Button press (H/W Dependent) \*\*
- 3. Console Connect Activity \*

hw-module switch # auto-off led

#### What it gets

Power savings at downlink and uplink LEDs, scalable impact

Switch# show hardware led

Current Mode: STATUS LED auto-off: Disabled

SWITCH: 1

SYSTEM: GREEN MASTER: GREEN



Energy savings with LED depowering at Scale



### auto-off Port LED

17.15.2

#### What it is

Ability to control switch downlink and uplink Port LEDs Platforms: C9300, C9200

#### What it does

Gives the ability to turn off port LEDs until an event is triggered or manually enabled by CLI or Mode button press (Turns ON for 5 minutes) for LED **Event triggers**:

- 1. Link Events \*
- 2. Mode Button press (H/W Dependent) \*\*
- 3. Console Connect Activity \*

hw-module switch # auto-off led

#### What it gets

Power savings at downlink and uplink LEDs, scalable impact

Switch# show hardware led

Current Mode: STATUS LED auto-off: Disabled

SWITCH: 1

SYSTEM: GREEN MASTER: GREEN



Energy savings with LED depowering at Scale



#### What it is

Shuts down SerDes of Fiber Ports with no SFP Inserted Platforms: C9300, C9200

#### What it does

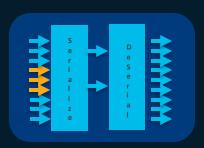
With auto-off enabled, system checks for the presence of SFPs in Fiber ports on a regular basis and turns on SerDes when SFP is detected. If no SFP is detected, system will keep SerDes off to save energy

#### hw-module switch # auto-off optics

#### What it gets

Up to 0.3 watts savings per port/SerDes lane\*









System power on a C9300-48S with SerDes **auto-off** 



System power on a C9300-48S without SerDes autooff

Metered power difference on a C9300-48S

17.15.2

## auto-off Optics

#### What it is

Shuts down SerDes of Fiber Ports with no SFP Inserted Platforms: C9300, C9200

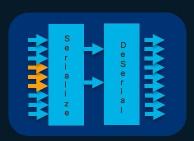
#### What it does

With auto-off enabled, system checks for the presence of SFPs in Fiber ports on a regular basis and turns on SerDes when SFP is detected. If no SFP is detected, system will keep SerDes off to save energy

#### hw-module switch # auto-off optics

#### What it gets

Up to 0.3 watts savings per port/SerDes lane\*











System power on a C9300-48S without SerDes auto-off

Metered power difference on a C9300-48S

Demo

#### auto-off StackPower PSU

17.15.2

#### What it is

Auto soft-shut power supplies on a C9300 StackPower configuration

Platform: C9300 with power stack

#### What it does

Dynamically scales active PSU's in a stack based on power allocation for peak efficiency.

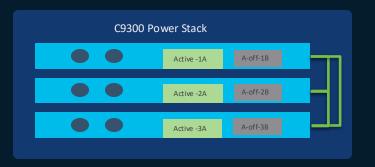
stack-power stack <stackpower-name> auto-off

#### What it gets

PSU Conversion loss elimination, up to 10-15 watts saving per offlined PSU

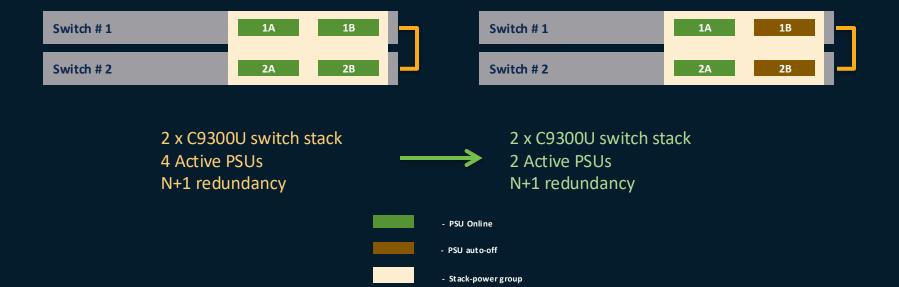
CISCO NE!

Power stack name: vstack
Stack mode: Power sharing
Stack topology: Ring
Stack total input power: 7700
Stack auto-off: Disable



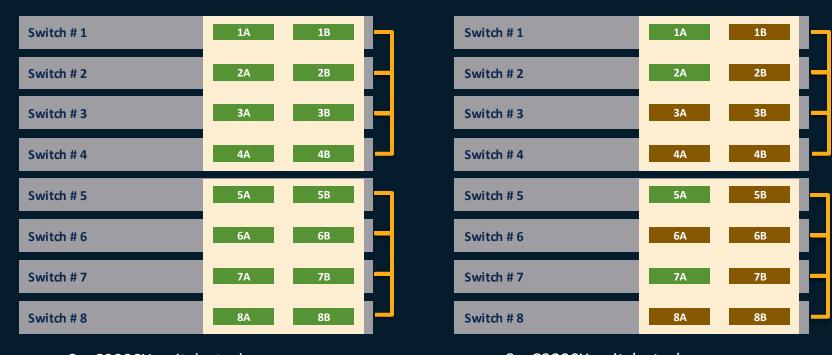
| Level | White      | Bronze               | Silver               | Gold               | Platinum               | Titanium               |
|-------|------------|----------------------|----------------------|--------------------|------------------------|------------------------|
|       | 80<br>PLUS | 80<br>PLUS<br>BRONZE | 80<br>PLUS<br>SILVER | 80<br>PLUS<br>GOLD | 80<br>PLUS<br>PLATINUM | 80<br>PLUS<br>TITANIUM |
| 10%   | X          | X                    | X                    | X                  | X                      | 90%                    |
| 20%   | 80%        | 82%                  | 85%                  | 87%                | 90%                    | 92%                    |
| 50%   | 80%        | 85%                  | 88%                  | 90%                | 92%                    | 94%                    |
| 100%  | 80%        | 82%                  | 85%                  | 87%                | 89%                    | 90%                    |

## auto-off StackPower PSU





## auto-off StackPower PSU



8 x C9300X switch stack 2 StackPower Domains 16 Active PSUs



8 x C9300X switch stack 2 StackPower Domains 4 Active PSUs

- PSU Online
- PSU auto-off
- Stack-power group

| Outlet Groups   O     |                           |                  | :                         | <b>◆</b> Outlet Groups | Outlet Group 2 - svlhw     |                | of 8         |
|-----------------------|---------------------------|------------------|---------------------------|------------------------|----------------------------|----------------|--------------|
| Outlets               |                           |                  |                           | Outlets                |                            |                |              |
| NO.                   | Outlet                    |                  | Edit Members Active Power |                        | -                          | 120000000      | Edit Membe   |
| טסי                   |                           | Status           |                           | PDU                    | Outlet                     | Status         | Active Power |
| owGrack9A (1)         | svlhw-9300x-48hx-3 8A (8) | O on             | 127 W                     | rowGrack9B (1)         | svlhw-9300x-48hx-3 8B (8)  | on on          | 116 W        |
| owGrack9A (1)         |                           | O on             | 119 W                     | rowGrack9B (1)         | svlhw-9300x-48hx-3 7B (11) | O on           | 80 W         |
|                       |                           | O on             | 124 W                     | rowGrack9B (1)         |                            | O on           | 120 W        |
|                       |                           | O on             | 114 W                     | rowGrack9B (1)         | svlhw-9300x-48hx-3 5B (18) | O on           | 79 W         |
|                       |                           | O on             | 115 W                     | rowGrack9B (1)         |                            | O on           | 119 W        |
|                       |                           | O on             | 116 W                     | rowGrack9B (1)         | svlhw-9300x-48hx-3 3B (25) | on 🥝           | 124 W        |
|                       |                           | (C) on           | 123 W                     | rowGrack9B (1)         | svlhw-9300x-48hx-3 2B (29) | <b>©</b> on    | 119 W        |
|                       |                           | O on             | 121 W                     | rowGrack9B (1)         | svlhw-9300x-48hx-3 1B (32) | O on           | 121 W        |
|                       |                           |                  |                           | 3.77                   |                            |                |              |
| ensors                |                           |                  |                           | Sensors                |                            |                |              |
|                       | Actual                    |                  | :                         |                        | Actual                     |                |              |
| Sensor▲               | Value                     |                  | State                     | ☐ Sensor ▲             | Value                      |                | State        |
|                       | 958 W                     |                  | normal                    | Active Power           | 877 W                      |                | normal       |
|                       | 13 195 999 Wh             |                  | normal                    | Active Energy          | 2 868 777 Wh               |                | normal       |
|                       | 1 107 VA                  |                  | normal                    | Apparent Power         | 1 060 VA                   |                | normal       |
| ettings               |                           |                  |                           | Settings               |                            |                |              |
|                       |                           |                  | Edit Settings             |                        |                            |                | Edit Setting |
| Name                  | svihv                     | v-9300x-3 8 of 8 | В                         | Name                   | svlt                       | w-9300x-3 8 of | 8            |
| Reset energy counter  | F                         | Reset 🖰          |                           | Reset energy counter   |                            | Reset 🐣        |              |
| Reset minimum / maxir | mum F                     | Reset            |                           | Reset minimum / ma:    | kimum                      | Reset          |              |
|                       |                           |                  |                           |                        |                            |                |              |
| Sensor History        |                           |                  | ^                         | Sensor History         |                            |                |              |
| 1 600 W               |                           |                  |                           | 900 W                  |                            |                |              |

| PSU#                    | Switch # | Active Power reading |          | PSU<br>Efficiency | Average<br>Efficiency | c             |   | PSU#                    | Switch# | Active Power reading |          | PSU<br>Efficiency | Average<br>Efficiency | 0              |
|-------------------------|----------|----------------------|----------|-------------------|-----------------------|---------------|---|-------------------------|---------|----------------------|----------|-------------------|-----------------------|----------------|
|                         | ▼        |                      |          | 70.1100007        |                       | L             |   |                         |         |                      |          |                   |                       | ▼              |
| PS1 POWin               |          | 122875               | mW       | 73.4486267        |                       |               |   | PS1 POWin               | 1       |                      | mW       |                   |                       |                |
| PS1 POWout<br>PS2 POWin |          | 90250<br>125375      | mW       | 00 0010045        |                       |               |   | PS1 POWout<br>PS2 POWin | 1       |                      | mW<br>mW |                   |                       |                |
| PS2 POWin               |          | 87000                | mW<br>mW | 69.3918245        |                       |               |   | PS2 POWIN               |         |                      | mW       |                   |                       |                |
| PS1 POWin               |          | 123375               | mW       | 73.1509625        |                       |               |   | PS1 POWin               | 2       |                      | mW       |                   |                       |                |
| PS1 POWout              |          | 90250                | mW       | 73.1309023        |                       |               |   | PS1 POWout              |         |                      | mW       |                   |                       |                |
| PS2 POWin               |          | 122250               | mW       | 70.9611452        |                       |               |   | PS2 POWin               | 2       |                      | mW       |                   |                       |                |
| PS2 POWout              |          | 86750                | mW       | , 0.0011.02       | 70.88251742           |               |   | PS2 POWout              |         |                      | mW       |                   |                       |                |
| PS1 POWin               |          | 122125               | mW       | 68.986694         |                       |               |   | PS1 POWin               | 3       |                      |          | 91.81360202       |                       |                |
| PS1 POWout              |          | 84250                | mW       |                   |                       |               |   | PS1 POWout              |         |                      |          |                   |                       |                |
| PS2 POWin               | 3        | 129750               | mW       | 72.2543353        |                       |               |   | PS2 POWin               | 3       | 0                    | mW       |                   | 92.02868466           |                |
| PS2 POWout              | 3        | 93750                | mW       |                   |                       |               |   | PS2 POWout              | 3       | 0                    | mW       |                   |                       |                |
| PS1 POWin               | 4        | 115625               | mW       | 73.5135135        |                       |               |   | PS1 POWin               | 4       | 361000               | mW       | 92.24376731       |                       |                |
| PS1 POWout              | 4        | 85000                | mW       |                   |                       |               |   | PS1 POWout              | 4       | 333000               | mW       |                   |                       |                |
| PS2 POWin               | 4        | 76125                | mW       | 65.3530378        |                       |               |   | PS2 POWin               | 4       | 0                    | mW       |                   |                       |                |
| PS2 POWout              | 4        | 49750                | mW       |                   |                       | 16 Active PSU | S | PS2 POWout              | 4       | 0                    | mW       |                   |                       | 4 Active PSUs  |
| PS1 POWin               | 5        | 112625               | mW       | 74.8057714        |                       | 71% Efficienc | y | PS1 POWin               | 5       | 358000               | mW       | 91.89944134       |                       | 92% Efficiency |
| PS1 POWout              | 5        | 84250                | mW       |                   |                       |               |   | PS1 POWout              | 5       | 329000               | mW       |                   |                       |                |
| PS2 POWin               | 5        | 122250               | mW       | 70.9611452        |                       | N+1 Redundanc | у | PS2 POWin               | 5       | 0                    | mW       |                   |                       | N+1 Redundancy |
| PS2 POWout              | 5        | 86750                | mW       |                   |                       |               |   | PS2 POWout              | 5       | -                    | mW       |                   |                       |                |
| PS1 POWin               |          | 122375               | mW       | 75.9959142        |                       |               |   | PS1 POWin               | 6       |                      | mW       |                   |                       |                |
| PS1 POWout              |          | 93000                | mW       |                   |                       |               |   | PS1 POWout              |         |                      | mW       |                   |                       |                |
| PS2 POWin               | 6        | 119375               | mW       | 74.7643979        |                       |               |   | PS2 POWin               | 6       | 0                    | mW       |                   |                       |                |
| PS2 POWout              |          | 89250                | mW       |                   | 72.53688882           |               |   | PS2 POWout              |         |                      | mW       |                   | 91.73135839           |                |
| PS1 POWin               |          | 127125               | mW       | 71.7797443        |                       |               |   | PS1 POWin               | 7       |                      |          | 91.56327543       |                       |                |
| PS1 POWout              |          | 91250                | mW       |                   |                       |               |   | PS1 POWout              |         |                      |          |                   |                       |                |
| PS2 POWin               |          | 79375                | mW       | 64.8818898        |                       |               |   | PS2 POWin               | 7       |                      | mW       |                   |                       |                |
| PS2 POWout              |          | 51500                | mW       |                   |                       |               |   | PS2 POWout              |         |                      | mW       |                   |                       |                |
| PS1 POWin               |          | 127625               | mW       | 75.4162586        |                       |               |   | PS1 POWin               | 8       |                      | mW       |                   |                       |                |
| PS1 POWout<br>PS2 POWin |          | 96250                | mW       | 74 0000000        |                       |               |   | PS1 POWout              |         |                      | mW       |                   |                       |                |
| PS2 POWin<br>PS2 POWout |          | 116125<br>83250      | mW<br>mW | 71.6899892        |                       |               |   | PS2 POWin               | 8       |                      | mW<br>mW |                   |                       |                |
|                         |          |                      | mvv      |                   |                       |               |   | PS2 POWout              | _       | -                    | mvV      |                   |                       |                |
| Total AC Power output   |          | 1864.375             |          |                   |                       |               |   |                         |         | 1519                 |          |                   |                       |                |
| Total DC Power output   |          | 1342.5               |          |                   |                       |               |   |                         |         | 1395.5               |          |                   |                       |                |

## StackPower Efficiency with auto-off

| 73.5% | 71%   | 73.1% | 70.9% | 69.1% | 72.6% | 71.9% | 63.6% |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 76%   | 73.4% | 76.2% | 74.4% | 70.5% | 64.7% | 76.7% | 71.5% |
| 0%    | 0%    | 0%    | 0%    | 91.2% | 0%    | 92.3% | 0%    |
| 91.5% | 0%    | 0%    | 0%    | 91.6% | 0%    | 0%    | 0%    |

### StackPower Power draw with auto-off

| Stack Power Supplies Output Power      | 88.8 | 90.3 | 86.8 | 85.3 | 94.8 | 83.3 | 48 |
|--|------|------|------|------|------|------|----|
| 86.8                                   | 89.5 | 93   | 89.3 | 90.3 | 51.5 | 98   | 84 |
|  |      |      |      |      |      |      |    |
| Stack Power Supplies Input vs Output F | O    | 0    | 0    | 362  | 0    | 331  | 0  |

### **Enhanced Energy Metering**

#### What it is

Enables energy meter for Switch System Power and PoE switchport power consumption

Platforms: C9200, C9300, C9400

#### What it does

System energy is energy consumed by the system for a specific duration, measured in unit of Watt-Seconds. macro metered window size of 3-hours with 15 minutes x 12 buckets

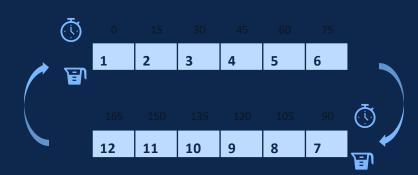
Gives the visibility within the windows of consumption that can be further analyzed and considered for carbon intensity reporting, density-based usage analysis and so on.

#### What it gets

Ledger on Energy consumption for System Power and PoE Port with a bucketized data of 15 minutes each.

#### **System Meter**

#### **PoE Port Meter**



### **Enhanced Energy Metering**

```
C9300X-Edge-POD16#sho power detail
                                                   Sys Pwr PoE Pwr Watts
   PID
                       Serial#
                                   Status
   PWR-C1-1100WAC
                       LIT21463TAG OK
  Not Present
PS Configuration Mode : SP-PS
PS Operating state
                     : Stndaln
Power supplies currently active : 1
Power supplies currently available : 1
Automatic Module Shutdown : Enabled
Power Budget Mode = SP-PS
                          shutdown Power
Mod Model No
                                             Budget Instantaneous Peak Reset Reset
    C9300X-48TX
                                    accepted 510
Total 510
Power Summary
                     Maximum
                     Available
 (in Watts)
System Power 510
OE Power
Total
```



|              | ID                     | 9                      | Serial#                  | Status    |             | Sys Pwr     | PoE Pwr      | Watt            | S           |  |
|--------------|------------------------|------------------------|--------------------------|-----------|-------------|-------------|--------------|-----------------|-------------|--|
|              |                        | QCS23253JD5<br>Jnknown | OK<br>No Inp             | out Power | Good<br>Bad | Good<br>Bad | 1100<br>Unkn |                 |             |  |
|              | nfigurati<br>erating s |                        | StackPower<br>StackPower |           |             |             |              |                 |             |  |
|              |                        | currently<br>currently | active :<br>available :  | 1 2       |             |             |              |                 |             |  |
| lutom        | atic Modu              | le Shutdowr            | : Enabled                |           |             |             |              |                 |             |  |
| Mod Model No |                        | shutdown<br>Priority   |                          | Budge     | t Instan    | taneous     | Peak         | Out of<br>Reset | In<br>Reset |  |
| <br>1        |                        | 4                      | accept                   | ed 240    | 74          |             | 74           | 240             | 50          |  |
| <br>Fotal    |                        |                        |                          |           | 240         | 74          |              |                 |             |  |
| Power        | Summary                |                        |                          | Maximu    | ım          |             |              |                 |             |  |
| (in          | Watts)                 | Allocated              | Consumed                 | Availa    | ble         |             |              |                 |             |  |
| Syste        | m Power                | 240                    | 74                       | 240       |             |             |              |                 |             |  |
| POE P        | ower                   | 120                    | 7                        | 860       |             |             |              |                 |             |  |
|              |                        | 360                    | 81                       | 1100      |             |             |              |                 |             |  |

| Module    | Available<br>(Watts) | Used<br>(Watts) | Remaini<br>(Watts |                      |   |
|-----------|----------------------|-----------------|-------------------|----------------------|---|
| 1         | 860.0                | 120.0           | 740.              |                      |   |
| Interface |                      | ate             |                   | Hourly Metered       | Metered Energy in MilliWattSec (15min Bucke |
|           | Time                 |                 |                   | /alue (MilliWattSec) |   |
| Gi1/0/1   | 2024-10-22           | 11:21:09        | PST               |                      | 0-0-0-0-0-0-0-0-0                           |
| Gi1/0/2   | 2024-10-22           | 2 11:21:09      | PST               | 10507380             | 1465368-3553224-3558320-1930468-0-0-0-0-0-0 |
| Gi1/0/3   | 2024-10-22           | 2 11:21:09      | PST               | 0                    | 0-0-0-0-0-0-0-0-0-0-0                       |
| Gi1/0/4   | 2024-10-22           | 2 11:21:09      | PST               | 0                    | 0-0-0-0-0-0-0-0-0-0                         |
| Gi1/0/5   | 2024-10-22           | 2 11:21:09      | PST               | 0                    | 0-0-0-0-0-0-0-0-0-0                         |
| Gi1/0/6   | 2024-10-22           | 2 11:21:09      | PST               | 0                    | 0-0-0-0-0-0-0-0-0-0-0                       |

SB-Salonel-C9324H uptime is 45 minutes SB-Salonel-C9324H uptime is 45 minutes BRKENS-2099 Uptime for this control processor is 46 minutes

### Enhanced Energy Metering - Model Driven

Data models updated for Telemetry

### **Energy Metering - System Power**

Energy Metering – PoE Port Power

Name cname Nodetype leaf

Datatype string

 Description
 References component name

 Module
 Cisco-IOS-XE-platform-oper

**Revision** 2023-03-01

Xpath /components/component/cname

Prefix platform-ios-xe-oper

Namespace http://cisco.com/ns/yang/Cisco-IOS-XE-platform-oper

Schema Node Id /components/component/cname

Key true

Access read-only
Operations • "get"

Name power-consumption

Nodetype leaf

Datatype decimal64

**Description** Actual Power consumed by power device

Module Cisco-IOS-XE-poe-oper

**Revision** 2024-03-01

**Xpath** /poe-oper-data/poe-port-detail/power-consumption

Prefix poe-ios-xe-oper

Namespace http://cisco.com/ns/yang/Cisco-IOS-XE-poe-oper
Schema Node Id /poe-oper-data/poe-port-detail/power-consumption

**Units** Watts

 Min
 -92233720368547758.08

 Max
 92233720368547758.07

Fraction Digits

Access read-only
Operations • "get"



Hour#0

Hour#1

Hour-2

Table Record Index  $5 = {$ [0] name = energy-bucket0 [1] value.property value = PROPERTY STRING [2] value.string = 138409365 [3] value.boolean = null [4] value.intsixfour = null [5] value.uintsixfour = null [6] value.decimal = null [7] configurable = false [8] parent platform component cname key = Table Record Index 6 = { [0] name = energy-bucket1 [1] value.property value = PROPERTY STRING [2] value.string = 158805315[3] value.boolean = null [4] value.intsixfour = null [5] value.uintsixfour = null [6] value.decimal = null [7] configurable = false [8] parent\_platform\_component\_cname\_key = Table Record Index 7 = { [0] name = energy-bucket2 [1] value.property\_value = PROPERTY\_STRING [2] value.string = 158761950 [3] value.boolean = null [4] value.intsixfour = null [5] value.uintsixfour = null [6] value.decimal = null [7] configurable = false [8] parent platform component cname key = Table Record Index 8 = { [0] name = energy-bucket3 [1] value.property value = PROPERTY STRING [2] value.string = 158608535[3] value.boolean = null [4] value.intsixfour = null [5] value.uintsixfour = null [6] value.decimal = null [7] configurable = false [8] parent platform component cname key =

```
Table Record Index 9 = {
[0] name = energy-bucket4
[1] value.property value = PROPERTY STRING
[2] value.string = 158465730
[3] value.boolean = null
[4] value.intsixfour = null
[5] value.uintsixfour = null
[6] value.decimal = null
[7] configurable = false
[8] parent platform component chame key =
Table Record Index 10 = {
[0] name = energy-bucket5
[1] value.property value = PROPERTY STRING
[2] value.string = 158564015
[3] value.boolean = null
[4] value.intsixfour = null
[5] value.uintsixfour = null
[6] value.decimal = null
[7] configurable = false
[8] parent_platform_component_cname_key =
Table Record Index 11 = {
[0] name = energy-bucket6
[1] value.property_value = PROPERTY_STRING
[2] value.string = 158501365
[3] value.boolean = null
[4] value.intsixfour = null
[5] value.uintsixfour = null
[6] value.decimal = null
[7] configurable = false
[8] parent platform component cname key =
Table Record Index 12 = {
[0] name = energy-bucket7
[1] value.property value = PROPERTY STRING
[2] value.string = 158563800
[3] value.boolean = null
[4] value.intsixfour = null
[5] value.uintsixfour = null
[6] value.decimal = null
[7] configurable = false
[8] parent platform component cname key =
```

```
Table Record Index 13 = {
[0] name = energy-bucket8
[1] value.property value = PROPERTY STRING
[2] value.string = 158361130
[3] value.boolean = null
[4] value.intsixfour = null
[5] value.uintsixfour = null
[6] value.decimal = null
[7] configurable = false
[8] parent platform component cname key =
Table Record Index 14 = {
[0] name = energy-bucket9
[1] value.property value = PROPERTY STRING
[2] value.string = 159022120
[3] value.boolean = null
[4] value.intsixfour = null
[5] value.uintsixfour = null
[6] value.decimal = null
[7] configurable = false
[8] parent_platform_component_cname key =
Table Record Index 15 = {
[0] name = energy-bucket10
[1] value.property_value = PROPERTY_STRING
[2] value.string = 158760350
[3] value.boolean = null
[4] value.intsixfour = null
[5] value.uintsixfour = null
[6] value.decimal = null
[7] configurable = false
[8] parent platform component cname key =
Table Record Index 16 = {
[0] name = energy-bucket11
[1] value.property value = PROPERTY STRING
[2] value.string = 158681055
[3] value.boolean = null
[4] value.intsixfour = null
[5] value.uintsixfour = null
[6] value.decimal = null
[7] configurable = false
[8] parent platform component cname key =
```

### Energy Metering @PoE Ports

```
Table Record Index 0 = {
[0] intf name = GigabitEthernet2/0/1
[1] power used = 25.96
[2] pd class = POE PD CLASS IEEE4
[3] device detected = true
[4] device name = leee PD
[5] police = false
[6] power admin max = 60
[7] power from pse = 25.96
[8] power to pd = 25.96
[9] power_consumption = 9.7
[10] max_power_drawn = 10.92
[11] oper state = POWER STATE ON
[12] admin state = ILPOWER ADMIN STATE AUTO
[13] oper power = 9.7
[14] admin police = POLICE ACTION NONE
[15] oper police = OPER POLICE NONE
[16] cutoff power police = 25.96
[17] power negotiation used = POWER NEG IEEE 802 3 AT LLDP
[18] four pair poe supported = true
[19] four pair poe enabled = false
[20] four pair pd arch = PD ARCHITECTURE SHAREDX
```

```
[21] over current counter = 0
[22] short current counter = 0
[23] power denied counter = 0
[24] conn type = CONN CHK SP
[25] signal pair data.pd class = POE PD CLASS IEEE4
[26] signal pair data.assigned pd class = POE PD CLASS UNKNOWN
[27] signal pair data.oper power = 9.7
[28] signal pair data.power from pse = 0
[29] signal_pair data.power to pd = 0
[30] signal pair data.oper state = POWER STATE ON
[31] spare pair data.pd class = POE PD CLASS NULL
[32] spare pair data.assigned pd class = POE PD CLASS NULL
[33] spare pair data.oper power = 0
[34] spare pair data.power from pse = 0
[35] spare pair data.power to pd = 0
[36] spare pair data.oper state = POWER STATE OFF
[37] discovery = ILPOWER PD DISCOVERY CISCO AND IEEE
[38] Ildp mdi rx.power type = LLDP POWER TYPE 2 PD
```

```
[41] Ildp mdi rx.power requested = 22
[42] Ildp_mdi_rx.power_allocated = 22
[43] IIdp mdi rx.pd 4pid = 0
[44] IIdp mdi rx.length = 0
[45] Ildp mdi rx.pd req pwr mode a = 0
[46] IIdp mdi x.pd req pwr mode b = 0
[47] IIdp mdi rx.pse alloc pwr mode a = 0
[48] Ildp mdi rx.pse alloc pwr mode b = 0
[49] IIdp mdi rx.pse pwring status = PSE PWR STATUS IGNORE
[50] Ildp mdi rx.pd pwred status = PD PWR STATUS IGNORE
[51] IIdp mdi rx.pse pwr pair ext = LLDP PWR PAIR TYPE IGNORE
[52] Ildp mdi rx.dual sig pwr class mode a = DS PWR CLASS IGNORE
[53] Ildp mdi rx.dual sig pwr class mode b = DS PWR CLASS IGNORE
[54] Ildp mdi rx.pwr ss class ext = SS PWR CLASS IGNORE
[55] Ildp mdi rx.pwr type ext = POWER EXT TYPE 3 PSE
[56] Ildp mdi rx.pse max available_power = 0
[57] IIdp mdi rx.pse auto class support = false
[58] Ildp mdi rx.auto class comp = false
[59] Ildp mdi rx.auto class reg = false
[60] Ildp mdi rx.pwr down reg = false
```

```
[61] Ildp mdi rx.power down time = 0
[62] Ildp mdi tx.power type = LLDP POWER TYPE 2 PSE
[63] IIdp mdi tx.power source = POWER SOURCE PRIMARY
[64] Ildp mdi tx.power priority = LLDP POWER PRIORITY LOW
[65] Ildp mdi tx.power requested = 22
[66] Ildp mdi tx.power allocated = 22
[67] ||dp mdi tx.pd 4pid = 0
[68] [Idp mdi tx.lenath = 0
[69] Ildp mdi tx.pd req pwr mode a = 0
[70] [Idp mdi tx.pd reg pwr mode b = 0
[71] Ildp mdi tx.pse alloc pwr mode a = 0
[72] Ildp mdi tx.pse alloc pwr mode b = 0
[73] IIdp mdi tx.pse pwring status = PSE PWR STATUS IGNORE
[74] IIdp mdi tx.pd pwred status = PD PWR STATUS IGNORE
```

```
[75] Ildp mdi tx.pse pwr pair ext = LLDP PWR PAIR TYPE IGNORE
[76] Ildp mdi tx.dual sig pwr class mode a = DS PWR CLASS IGNORE
[77] Ildp mdi tx.dual sig pwr class mode b = DS PWR CLASS IGNORE
[78] Ildp mdi tx.pwr ss class ext = SS PWR CLASS IGNORE
[79] Ildp mdi tx.pwr type ext = POWER EXT TYPE 3 PSE
```

```
[80] IIdp mdi tx.pse max available power = 0
```

```
[81] IIdp mdi tx.pse auto class support = false
[82] Ildp mdi tx.auto class comp = false
[83] Ildp mdi tx.auto class req = false
[84] Ildp mdi tx.pwr down reg = false
[85] Ildp mdi tx.power down time = 0
[86] Ildp med mdi rx.power type = LLDP MED POWER TYPE PSE
[87] Ildp med mdi rx.power source = LLDP MED POWER SRC UNKNOWN
[88] Ildp med mdi rx.power priority = LLDP MED POWER PRIORITY UNKNOWN
[89] Ildp med mdi tx.power type = LLDP MED POWER TYPE PSE
[90] Ildp med mdi tx.power source = LLDP MED POWER SRC UNKNOWN
[91] IIdp med mdi tx.power priority = LLDP MED POWER PRIORITY UNKNOWN
[92] fast poe enabled = false
[93] perpetual poe enabled = false
[94] oper priority = PORT OPER PRIORITY LOW
[95] post done = false
[96] upoe plus enabled = false
[97] poe intf enabled = true
[98] module id = 2
[99] chassis num = 1
[100] prot pd highest reg pwr = 25.96
[101] prot_req_state = ILPOWER PROT REQ_GRANTED
[102] pwr_state = ILPOWER_PD_PWR_FULL
[103] meter start time = Sun. 09 Feb 2025 12:39:31 +0000
[104] metered energy value = 5.766e+08
[105] device tag =
[106] last update time = Mon. 10 Feb 2025 05:09:32 +0000
[107] bucket width = 900
11081 number of buckets = 12
[109] poe bucket = [
   5584842
    8775982
   8774618
    8794728
    8772724
   8778436
    8767694
    8774648
    8765118
    8769720
    8766007
    8765613
```

[39] Ildp mdi rx.power source = POWER SOURCE PSE

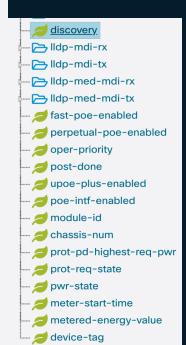
[40] Ildp mdi rx.power priority = LLDP POWER PRIORITY HIGH

42

**BRKENS-2099** 

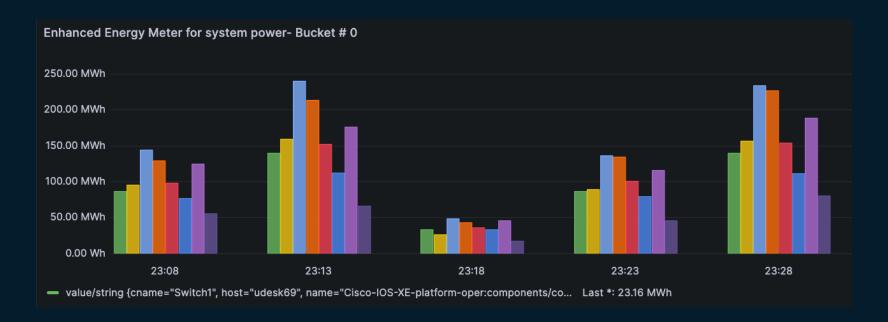
#### poe-port-detail intf-name power-used pd-class device-detected device-name police power-admin-max power-from-pse power-to-pd power-consumption max-power-drawn oper-state admin-state oper-power admin-police oper-police cutoff-power-police power-negotiation-used four-pair-poe-supported four-pair-poe-enabled four-pair-pd-arch over-current-counter short-current-counter power-denied-counter conn-type signal-pair-data spare-pair-data

### Before

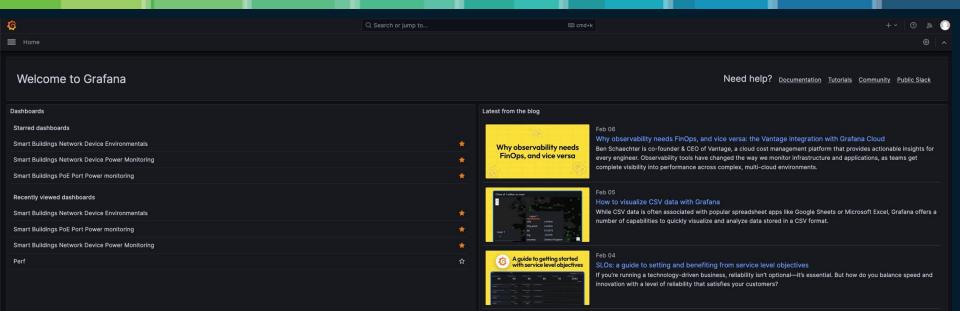




### **Energy Metering on Grafana**











GrafanaCON 2025: Register today for our biggest community event of the year!

#### Power Measurement is the Key



### Energy Management

consistent measurement • monitoringoptimizing energy use

saves costs • reduces greenhouse gas emissions • increases energy resilience



Power is the Foundation



### **Energy Management - Starts with Telemetry**

Powered by Cisco's Energy Management Capability

#### **Standardized Energy Metrics**



#### **IT Sustainability Outcomes**

See power telemetry and consistent GHG metrics across global on-premises, cloud, and edge environments

**Control** consumption and emissions with software optimizations and innovations

Report GHG emissions and track against environmental goals

Automate workflows with AI based recommendations and virtual assistant to achieve sustainability goals \*

\*Future



### **Energy Management KPIs and Personas**

Metrics

**Use Cases** 

Persona



### **Energy** Consumption

Energy consumed in kilowatt hours (kWh)

- Monitor energy consumption for specific devices and locations
- Compare and Identify areas of improvement
- Optimize usage based on recommendations\*
- · Prioritize tech refresh based on top impacting devices or locations
- Leverage stimulus funds for refresh
- Calculate and report Scope 2 emissions from energy usage

Network Admin/ CSO CTO/ IT Director CFO

cso



#### GHG Emissions

Total metric tonnes of CO2e

- Assess the total carbon footprint and impact of operations with view of top impacting devices and locations
- Set Absolute targets aiming to reduce GHG emissions by a set amount.
- Monitor progress and enable reporting on net zero goal per regulatory/ compliance/ local needs.

Network Admin/ CSO CTO/ IT Director



#### carbon Intensity

Total grams of CO2e to produce a kWh of electricity

- Intensity targets allow customers to set emissions reduction targets while accounting for economic growth.
- Monitor progress and enable reporting on net zero goal per regulatory/compliance/local needs.

Network Admin/ CSO CTO/ IT Director



#### Energy Mix

The mix of renewable vs non-renewable sources of energy

- Assess energy mix vs net zero goals and allow for purchase renewable credits for dean energy
- Tap into renewable forms of energy where available for optimization

Network Admin/ CSO CTO/ IT Director



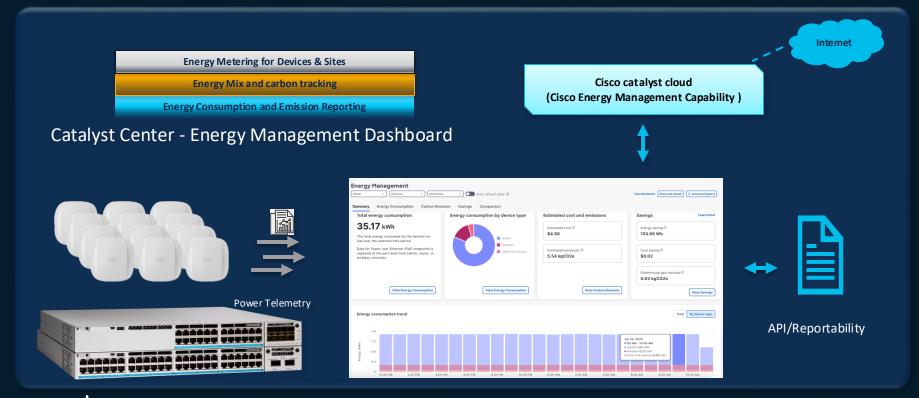
#### Energy

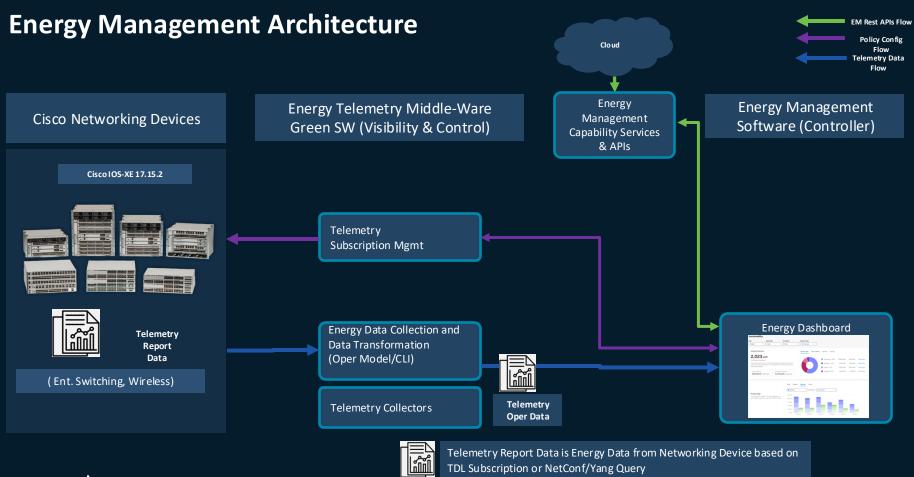
Cost of energy consumption In US or local currency\*

- Assess potential economic impact of current devices and specific locations
- Optimize workspace utilization based on trends .
- Optimize device usage based on trends and software recommendations  $^{st}$
- Prioritize tech refresh based on top impacting devices or locations

CTO/ IT Director CFO

# Catalyst Energy Management – Phase 1 Overview





**BRKENS-2099** 

### Catalyst Center Energy Management

### Reportability

emission reports

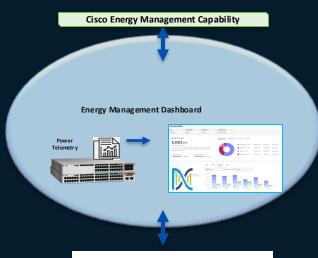
#### 9 x APIs

/data/api/v2/siteEnergySummaries /data/api/v1/siteEnergySummaries/count /data/api/v1/siteEnergySummaries/{id} /data/api/v1/siteEnergySummaries/query

/data/api/v1/deviceEnergySummaries/query /data/api/v1/deviceEnergySummaries/summaryAnalytics /data/api/v1/deviceEnergySummaries /data/api/v1/deviceEnergySummaries/{id} /data/api/v1/deviceEnergySummaries/count /data/api/v1/deviceEnergySummaries/trendAnalytics

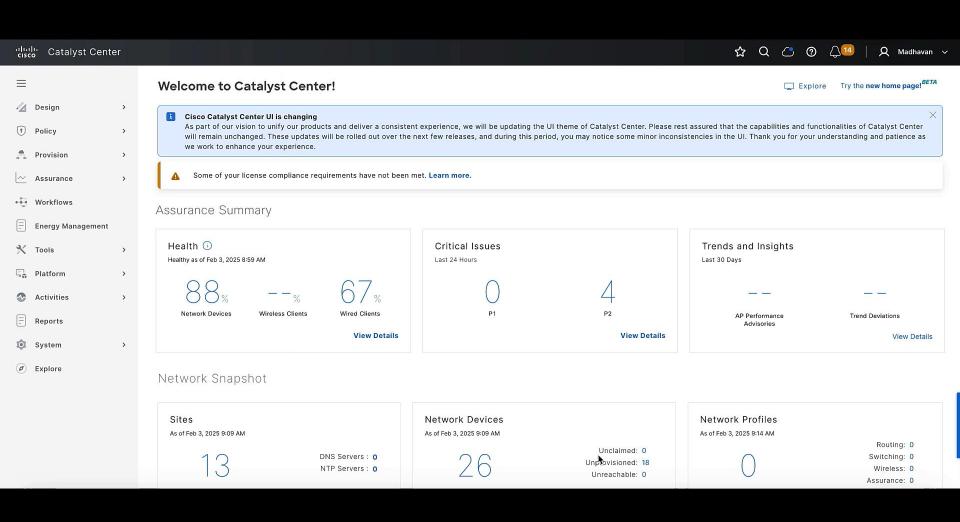
#### **Manual Reporting**

- CSV
- PDF
- JSON
- TDE

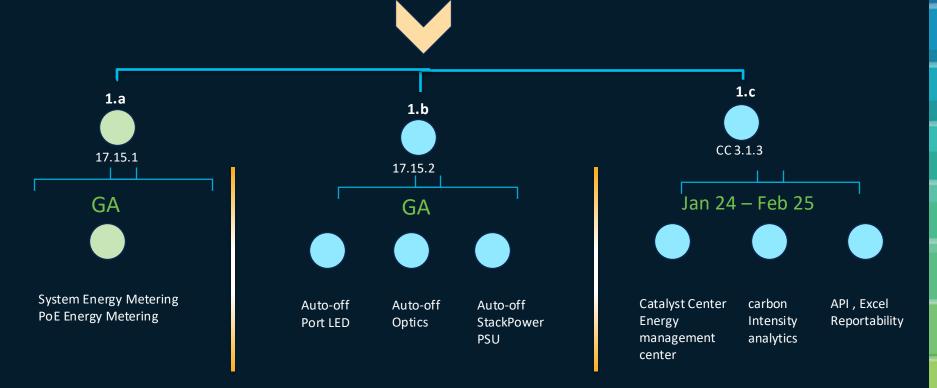








### Catalyst Sustainability – Ongoing EFTs

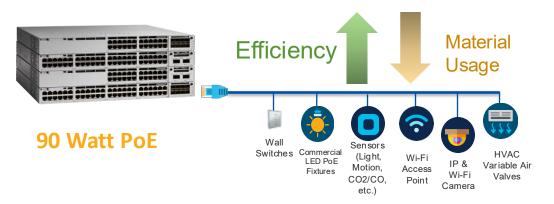


## Powering Smart Buildings



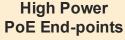
Future Proofed Spaces

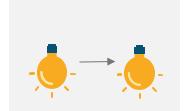












**Daisy-chaining** (Cost saving with 90W)



UPOE Passthrough (for extended reach 60W)

USB-C Power + Data

USB-C power (laptop charging + data)

Cabling and material reduction in "home run" wiring with a >10:1 daisy chain ratio compared to line voltage

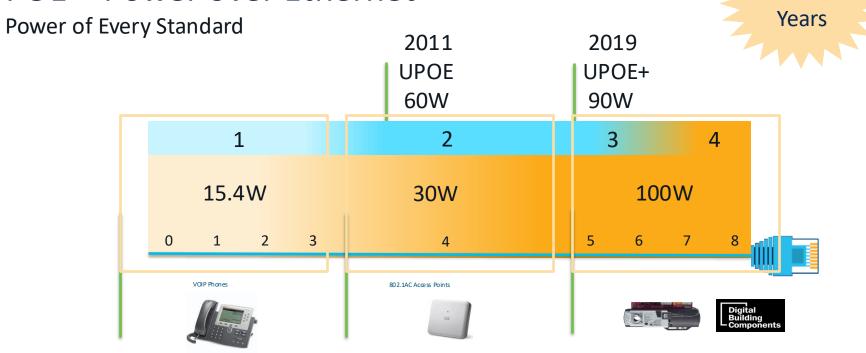
### Sustainability with Materials







### POE – Power over Ethernet



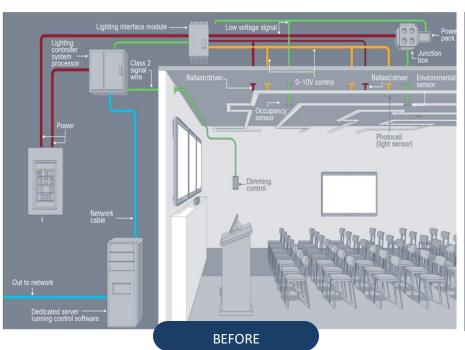
802.3af 2003 802.3at 2009

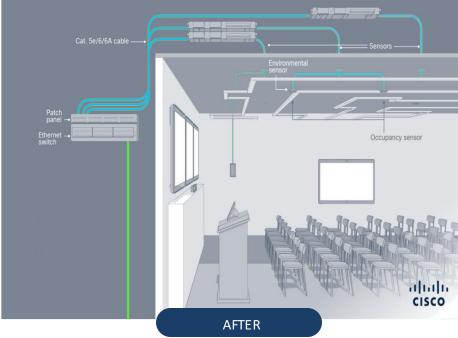
802.3bt 2018

cisco live!

### Line Voltage Cabling vs

### The Simplicity of PoE







### Workspace Powered by 90W Cisco UPOE+

#### Before



### **Today & Future**



- One Ethernet cable to support 90W PoE
- Automated height adjustable desk
- Embedded Sensors: Occupancy, Temperature, Humidity
- 2 USB-C, 1USB-A port for charging
- Track usage and predictive maintenance based on usage/Error Code

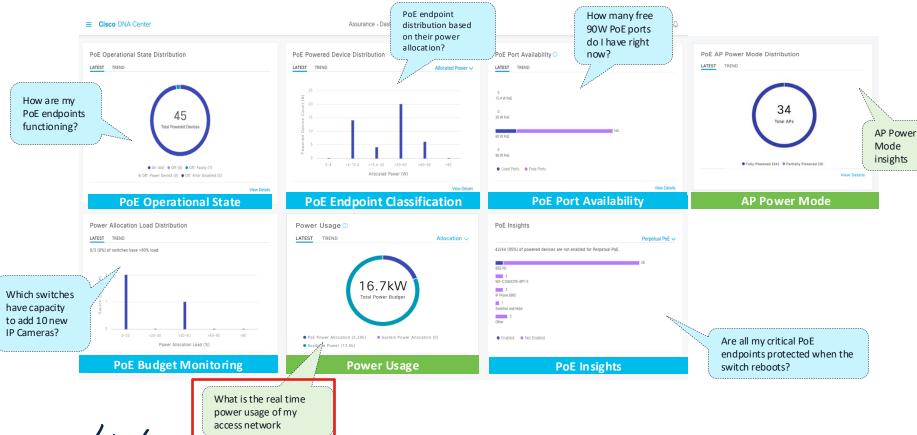




Lower CAPEX by eliminating AC cabling to every desk. Flexibility in workspace design independent of AC outlets



### Cisco DNA Center PoE Analytics



BRKENS-2099

allalla CISCO.

**GROSS FT<sup>2</sup> USABLE FT2** 

REDUCED FT<sup>2</sup>

**KEY DATES** 

OCCUPANCY

CONSTRUCTIO

**COMPLETION &** 

OCCUPANCY

N START

J.T. Magen & Company Inc.

Gensler

VORNADO

**((())** JLL

TH DBS

I ANDI ORD **GENERAL** CONTRACTOR

**KEY PARTNERS** 

ARCHITECT

PROJECT

MANAGER

SMART BUILDING DESIGN & INSTALL COLLABORATION **DESIGN &** 

**EMPLOYEE** 

**DEMOGRAPHICS** 

**EST. DAILY** OCCUPANCY

**EST. UNIQUE** 

VISTS / QTR

TOTAL

(CT, NY, NJ)

#### SUPPORT HYBRID WORK

**BEFORE AFTER** INDIVIDUAL SPACES

**COLLABORATIO** SPACES

# INDIVIDUAL WORKSTATION # PERSONAL **OFFICES** 

# INDIVIDUAL FLEX SPACE 16 # BOOKABLE

VIDEO SPACES # NON-BOOKABLE VIDEO SPACES

COLLAB SPACES VIDEO ENABLED CISCO

#### **CORPORATE SUSTAINABILITY**

CISCO NET ZERO GOAL BY YEAR

MARCH

BASE ARCHITECTURE (lighting, shading, thermostats. IoT sensors)

DRIVE CONSTRUCTION SUSTAINABILITY

Reduce embodied carbon Use recycled materials Eliminate waste





### **EMPLOYEE HEALTH & WELLNESS**



MAXIMIZE

NATURAL DAYLIGHT



**PROVIDE HEALTHY SNACKS** 



**PROVIDE** THERMAL COMFORT



SIT / STAND DESKS

> DIGITAL SIGNAGE

**MEASURE &** 

DISPLAY

AIR QUALITY

SOCIAL

DISTANCING

**ALERTS** 

**NOTIFICATIONS** 

(APPSPACE)

### **DIGITIZE CISCO REAL ESTATE**

**DATA POINTS** BEING **HARVESTED** 



#### allada Meraki CISCO

Floor occupancy (macro floor plate loading)



Lux level to maximize daylight & manage visual & thermal comfort



Occupancy (employee



People count, Ambient noise, Temp, Humidity, VOC



Smart Buildings cloud platform to ingest the "data exhaust"



zone), True air quality / CO2. Temp. Humidity. its affiliates . A/IQ Onts reserved . Cisco Public

#### What did we Achieve?



LEED Silver for Sustainability



100% smart building Power-over-Ethernet



Real-time Air Quality



Real-time Space utilization



Well health Safety Rating



Real-time 5000 data points/sec



92 Mixed type Collaboration Areas



Low-voltage Teknion Desks





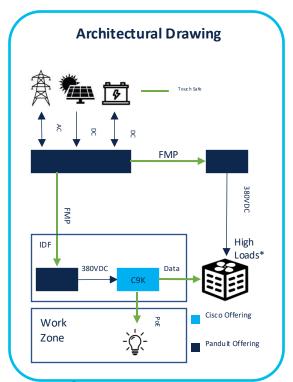


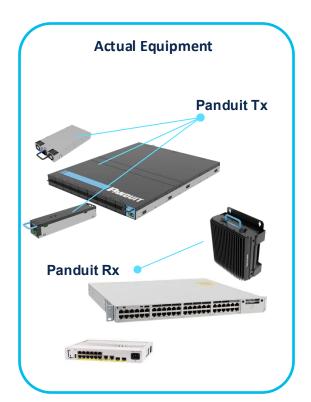
5% Capex Savings

\$250K Cost Avoided – Reduced labor, reduced cabling



### Watt are we seeing here









### Cisco Smart Buildings Useful Resources





Cisco Smart Buildings Landing Page



Smart Buildings Technologies Guide



Cisco Smart Buildings Implementation Guide



Cisco Catalyst 9000 Switches eBook (rev.3)



Cisco Catalyst 9300 Series Data Sheet



Cisco Smart Buildings Tech Field Day Session



Cisco Catalyst 9400 Series Datasheet

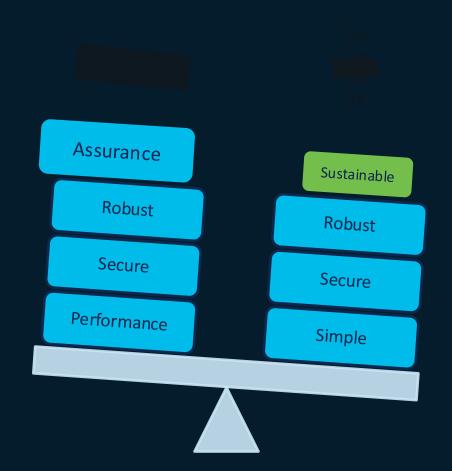


Cisco UPOE+ IOT Whitepaper



Cisco Smart Buildings Portfolio Explorer







### Webex App

#### Questions?

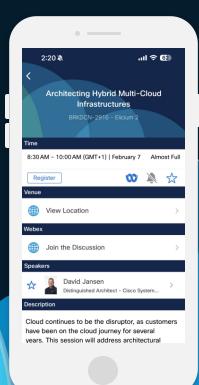
Use the Webex app to chat with the speaker after the session

#### How

- 1 Find this session in the Cisco Events 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 February 28, 2025.





### Fill Out Your Session Surveys



Participants who fill out a minimum of 4 session surveys and the overall event survey will get a unique Cisco Live t-shirt.

(from 11:30 on Thursday, while supplies last)



All surveys can be taken in the Cisco Events mobile app or by logging into the Session Catalog and clicking the 'Participant Dashboard' link at

https://www.ciscolive.com/emea/learn/session-catalog.html.



# Continue your education

- Visit the Cisco Showcase for related demos
- Book your one-on-one
   Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at <u>ciscolive.com/on-demand</u>. Sessions from this event will be available from March 3.

Contact me at: vemutyal@cisco.com

ılıılı cısco

# Thank you



cisco Live!

GO BEYOND

cisco Life!