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https://ciscolive.ciscoevents.com/ciscolivebot/# DEVNET-2780

Agenda

1 Introduction to Honeywell Building Technology

2 IT/OT and New offering lines incorporating Occupancy

3 Honeywell Cisco and App Hosting: Technology enabling IT/OT convergence

4 Conclusion

Honeywell facts

- HQ in Charlotte, NC
- $35bn annual revenue
- 99,000 employees
- 750 locations
- 210 manufacturing sites
- 82 countries

Source: Honeywell Annual Report (SEC 10-K filing), March 2022
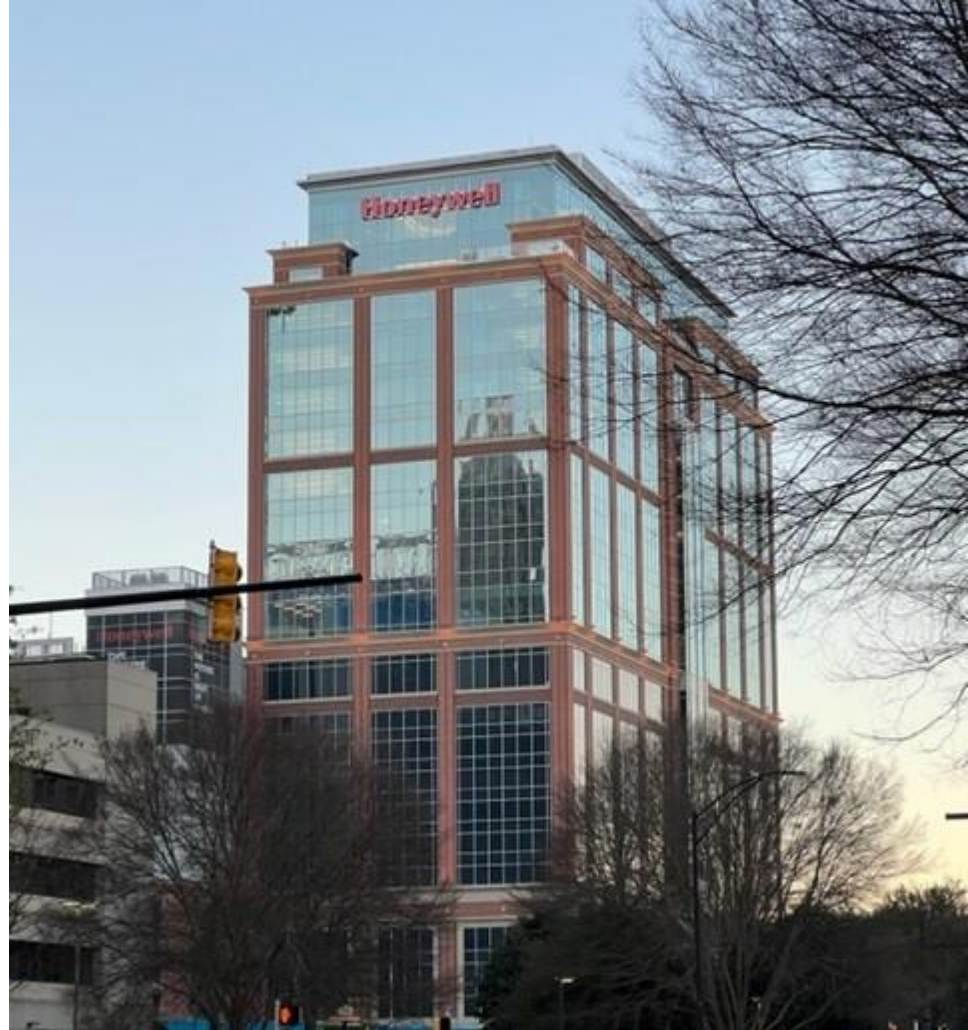
Introduction to Honeywell Building Technologies

Complex building system optimized

Intelligent lighting control solutions

Multiple locations managed centrally

Integrated building management

ALERTON

Honeywell

Ex-Or
by Honeywell

CENTRA LINE ®
by Honeywell

Phoenix Controls

FEMA
by Honeywell

TREND

sbc
SAIA BURGESS CONTROLS

Managed buildings through Honeywell Building Technologies

- Our customers' buildings typically have
  - Dozens of bits of plant with hundreds of sensors
  - Occupants and guests coming and going all the time
  - Dozens – hundreds of rooms
  - Separate lighting controls
  - Separate HVAC controls even if they are Honeywell

Mobile

WEB Browser

Kiosk Dashboard

Firewall

niagara⁴

Ethernet / LAN

http, BACnet IP, oBIX, KNX, SNMP, XML, FoxS

IP Field Controllers with the multi-system integration power and speed of a Master Controller and providing more data throughput

WEB-8000

3rd Party Drivers

Spyder VAV

Spyde

Stryker

Stryker VAV

BACnet

Modbus

LONMARK

T7350

Lighting Control

CIPer Model 30

CIPer Model 30

CIPer Model 30

CIPer Model 30

CIPer Model 30

CIPer Model 30

CIPer Model 30

CIPer Model 30

CIPer Model 30

IP Camera

Plant Control

Lighting

Security Elevator Control

Small Unitary IP Field Controllers with more power and speed than traditional wired Field Controllers

CIPer Model 10

Motion/Glass Breakage Detection

Data scale

Thousands of sensors per building

Hundreds of buildings per customer

Tens of thousands of telemetry data points each sending data every 30 seconds

- Everything is useful so capture everything
  - Everything might be useful so make sure we can access it where and when needed
- Some data is only useful locally, has high reliability and low latency requirement
- Forge is Honeywell's IoT solution for getting our customers' data accessible for cloud processing.

IT world Provides

Who is in the building with mobile phones and laptops

Where are they in the building

- OT Building Management systems needs:

- Where do we need to provide healthy conditioned air
  - Which rooms and areas require attention?

Outcomes
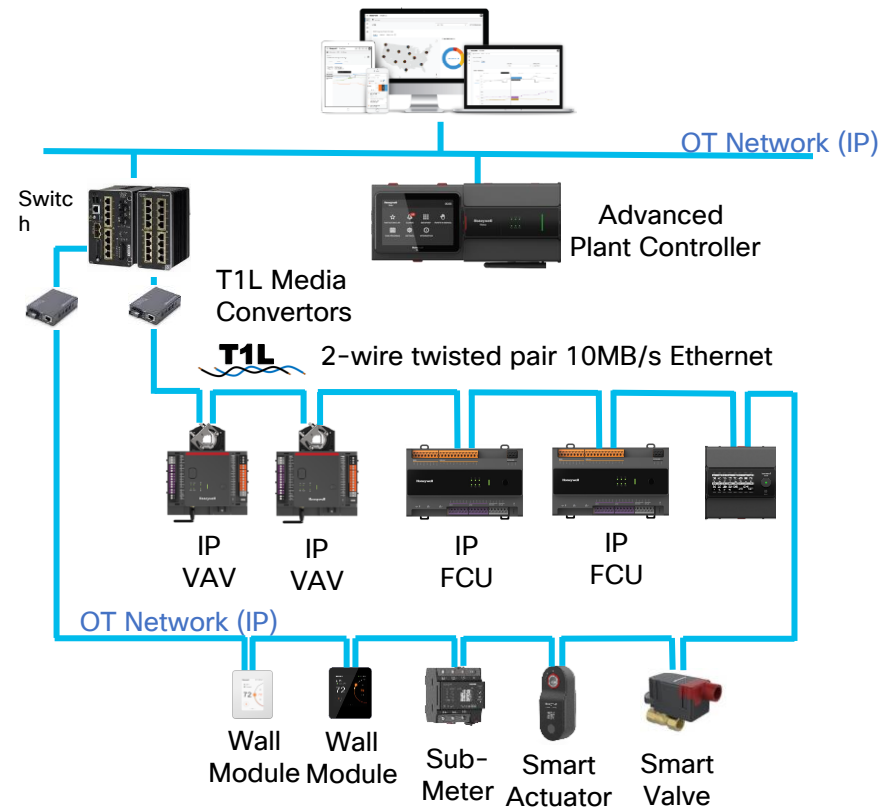
- Better air-quality

- Targeting energy management – reducing carbon footprint

- Knowing where your people are which rooms are under/over utilized

A traditional solution

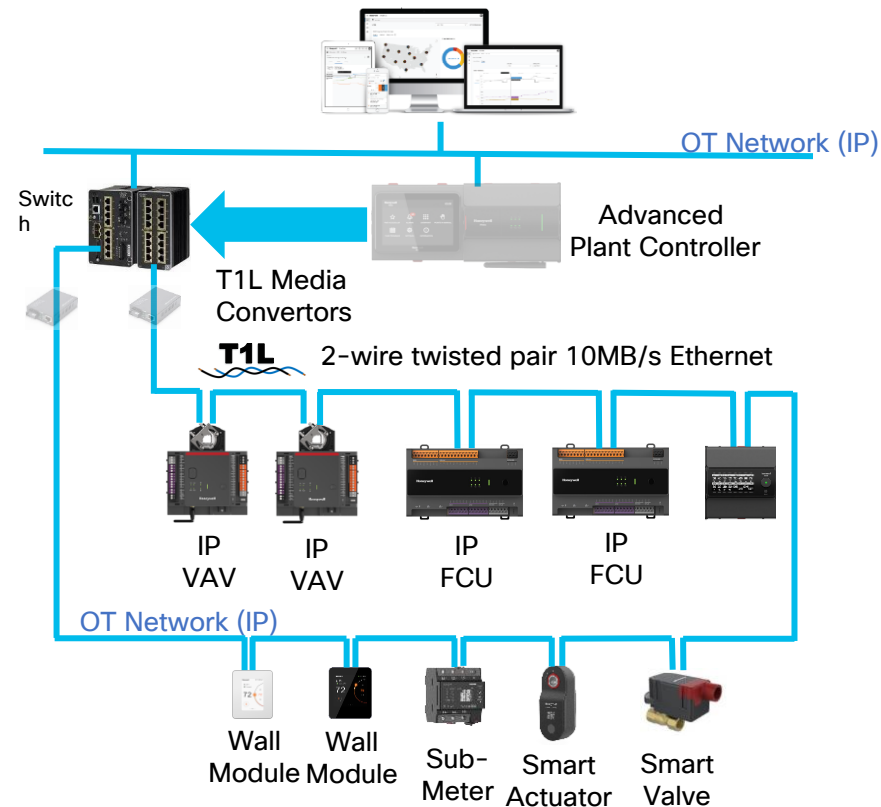## COMPLEX – MULTIPLE PHYSICAL NETWORKS

OT Network (IP)

Plant Controller

Plant Controller

FCU Controller

VAV Controller

Wall Module

Sub Nets

Valve

Sub-Meter

Actuator

BACnet IP, FOX, MQTT
BACnet MS/TP, LON, Modbus, C-Bus, KNX, Other
Propriety Bus, BACnet MS/TP, KNX, Other Propriety Bus, Analog
Panel Bus, BACnet MS/TP, LON, Modbus, C-Bus, KNX, Other
BACnet MS/TP, Modbus, M-Bus
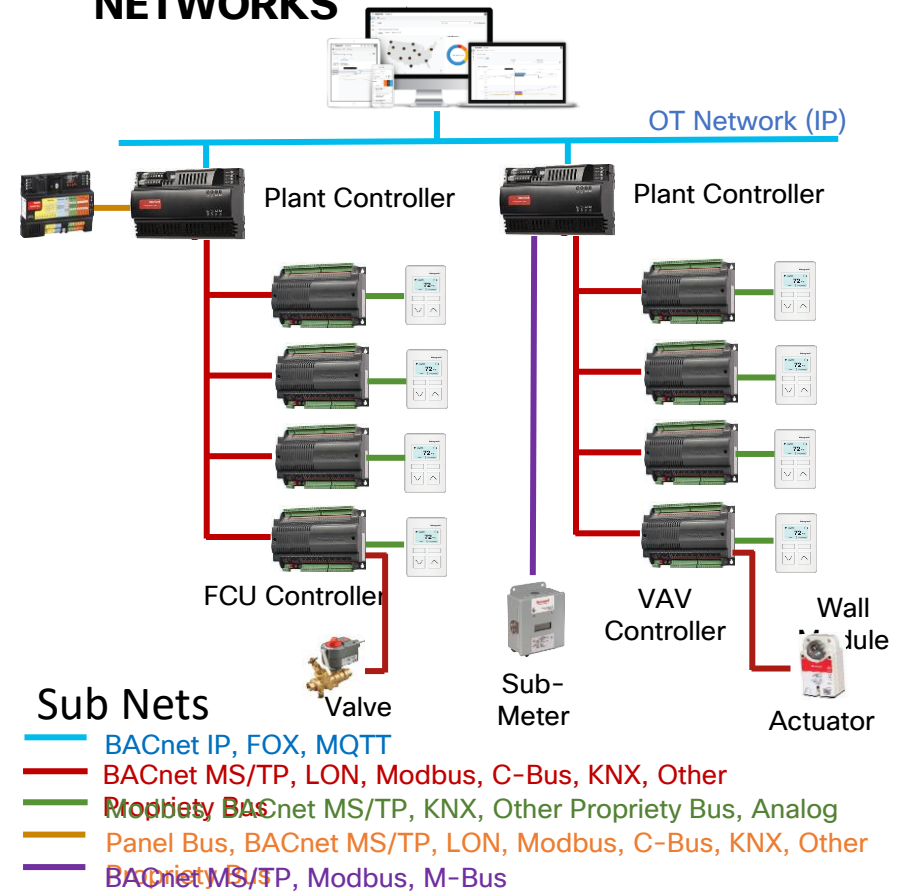
Today's approach – IP to the edge

OT Network (IP)

Switch

Advanced Plant Controller

T1L Media Convertors

T1L 2-wire twisted pair 10MB/s Ethernet

IP VAV   IP VAV   IP FCU   IP FCU

OT Network (IP)

Wall Module   Wall Module   Sub-Meter   Smart Actuator   Smart Valve

- Ethernet with resilience to the Edge
- 10MB/s over twisted pair
- Removes complexity
- Only IP knowledge needed

But what if………

OT Network (IP)

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T1L Media
Convertors

T1L 2-wire twisted pair 10MB/s Ethernet

IP VAV   IP VAV   IP FCU   IP FCU

Advanced Plant Controller

OT Network (IP)

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Unitary Building Automation Controller

- ARM Cortex-M7

- FreeRTOS
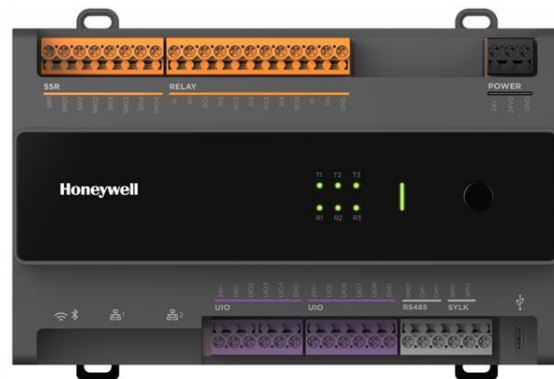
Advanced Building Automation Controller

- Quad-core ARM Cortex-A53

- Linux

Cisco IE3400 Switch

- Quad-core ARM Cortex-A53
- IOx App Hosting enables whatever you want to run in Docker

Resource	IE3400 & IE3300 10G HW Spec	Available for IOx
CPU	ARM Cortex-A53, 64bit, 4cores @ 1.2GHz	2cores @ 1.2GHz
Memory	4GB DRAM	2GB DRAM
On-board Flash	1.5GB	–
SD-Card	3.8GB	3.8GB

PLANT CONTROLLER

Communications between controller & I/O

Distance – Distributed I/O modules 300m between devices

Performance – Sub 20mS round trip performance

Secure – Encrypted communication to I/O using standard IT solutions
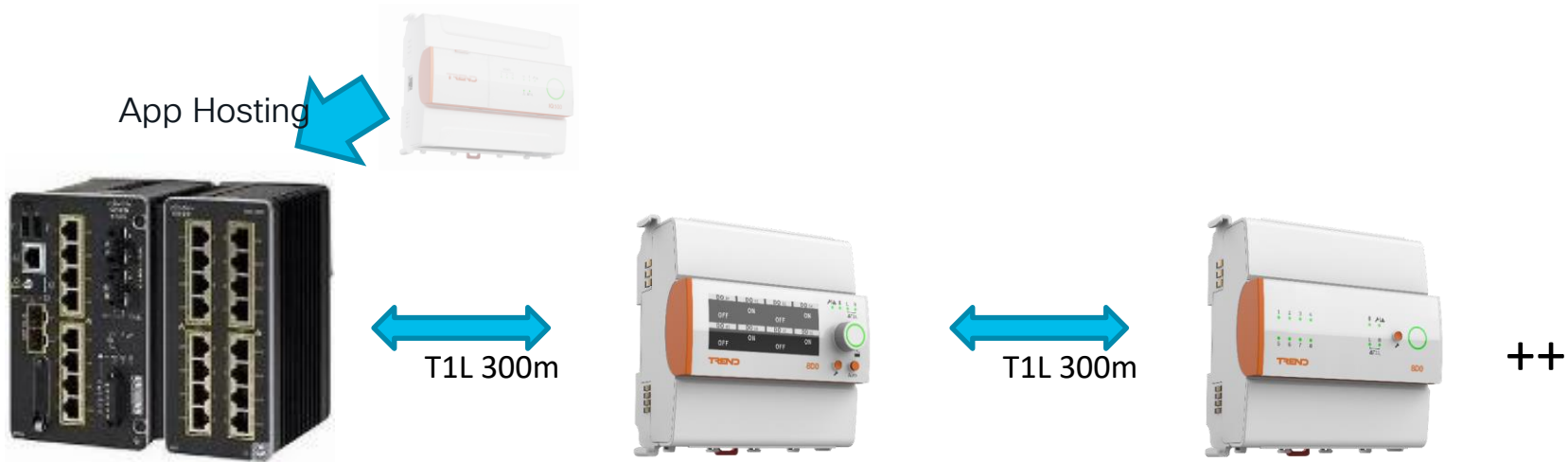
T1L 300m

T1L 300m

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PLANT CONTROLLER

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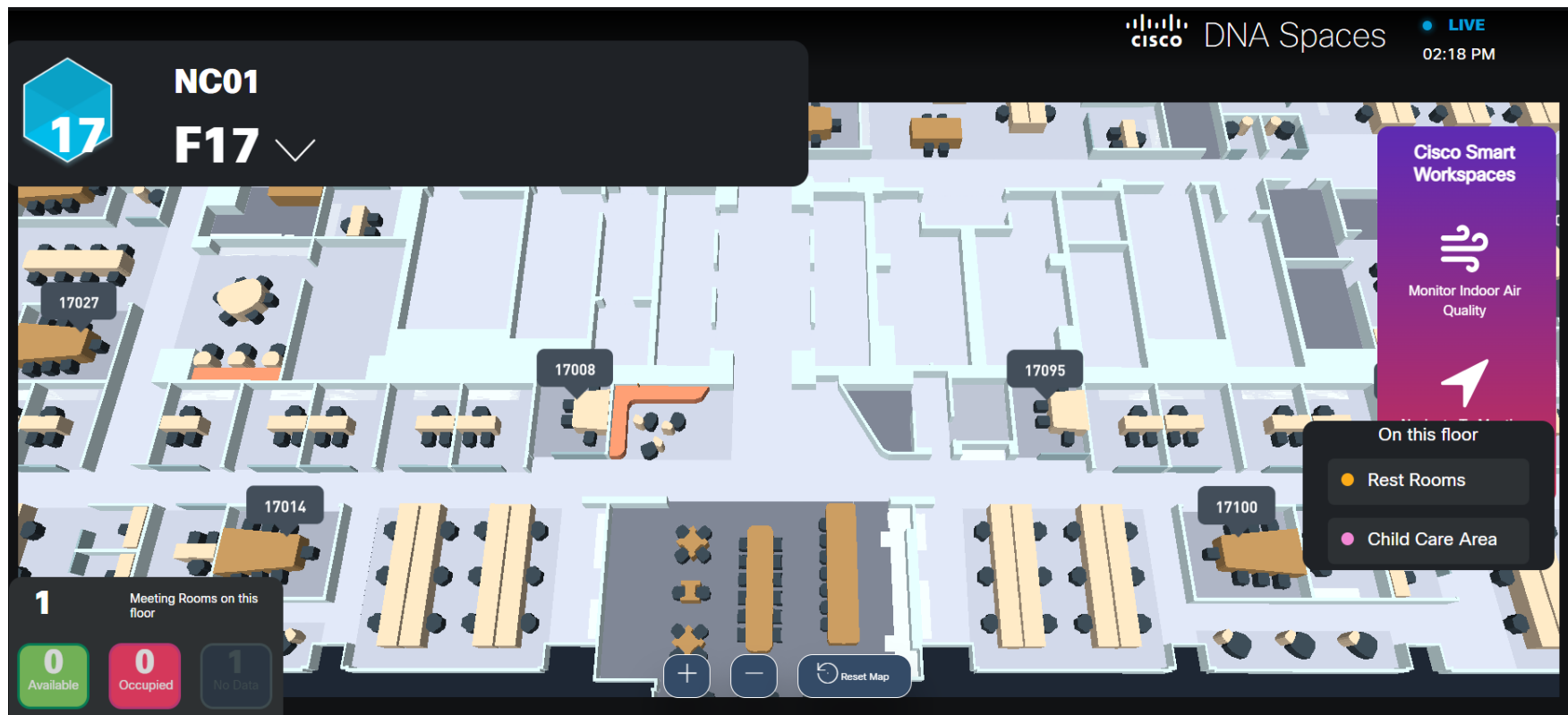
App Hosting

T1L 300m

T1L 300m

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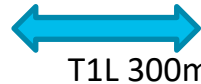
Acquisition Dataflow

- Globally relevant data published to cloud using eBLE and DNA spaces

- Locally relevant data collected by gateway App hosted on AP – may be locally aggregated and published to Forge
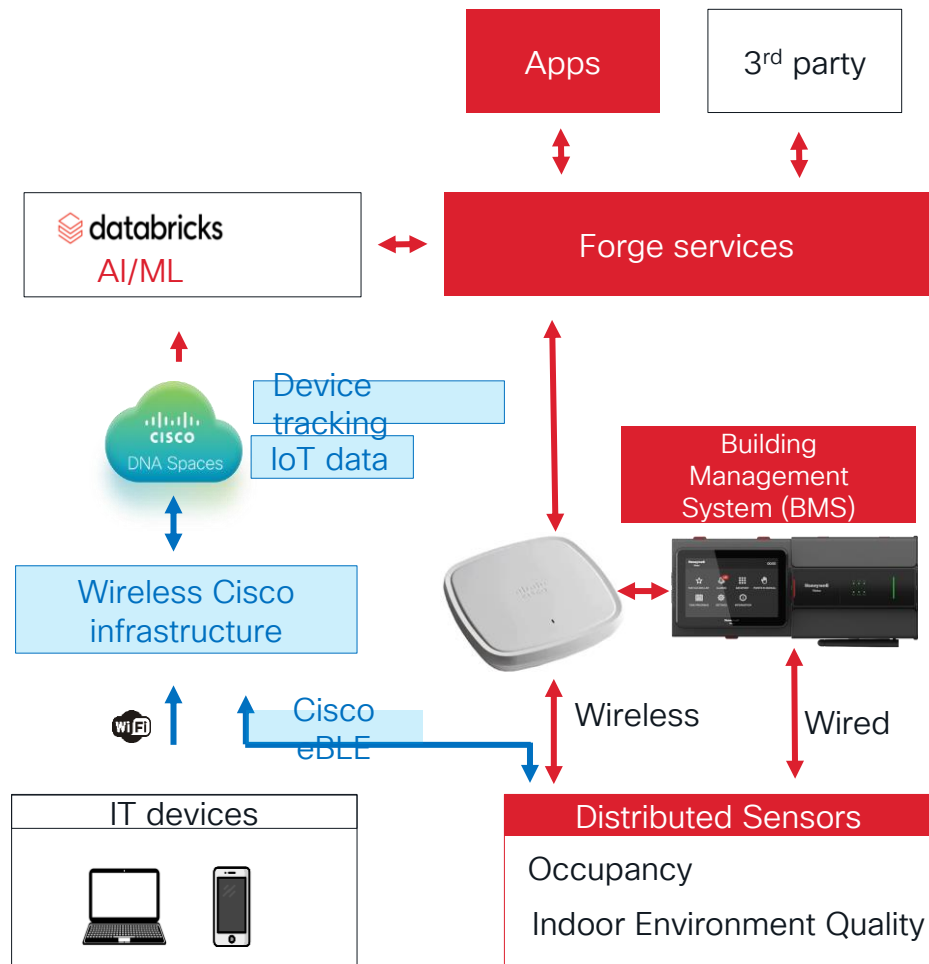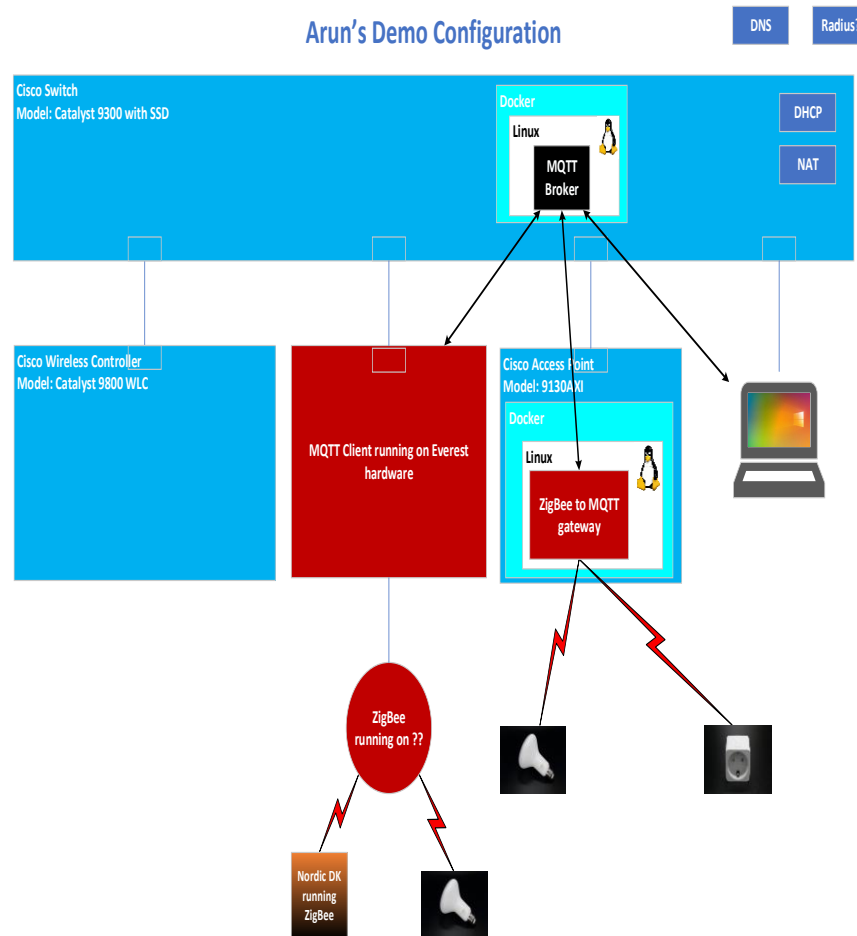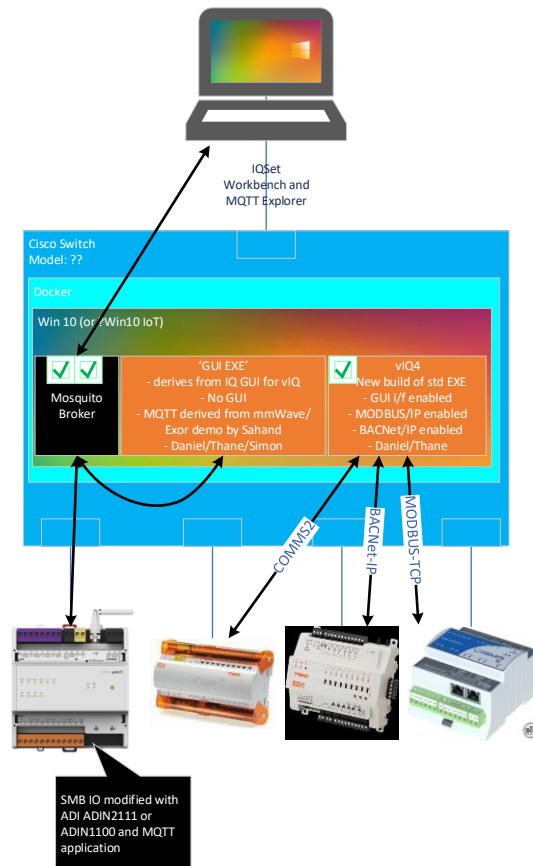
Building Dashboard Example

Some Proof of Concept

- ZigBee Co-Ordinator running on AP delivering data to BACnet

Arun's Demo Configuration

Some Proof of Concept

- Full Building Automation Controller running in Docker on IE3400

Advanced Virtualised IQ

Issues and Opportunities

- Fully configured building automation controller devices and associated application deployed through Network Automation Tools

- Alternative security model required for virtual platform

- Licensing of 3rd party Intellectual Property running in IOx

Conclusion

- Cisco provides both infrastructure and pertinent data for Building Management systems

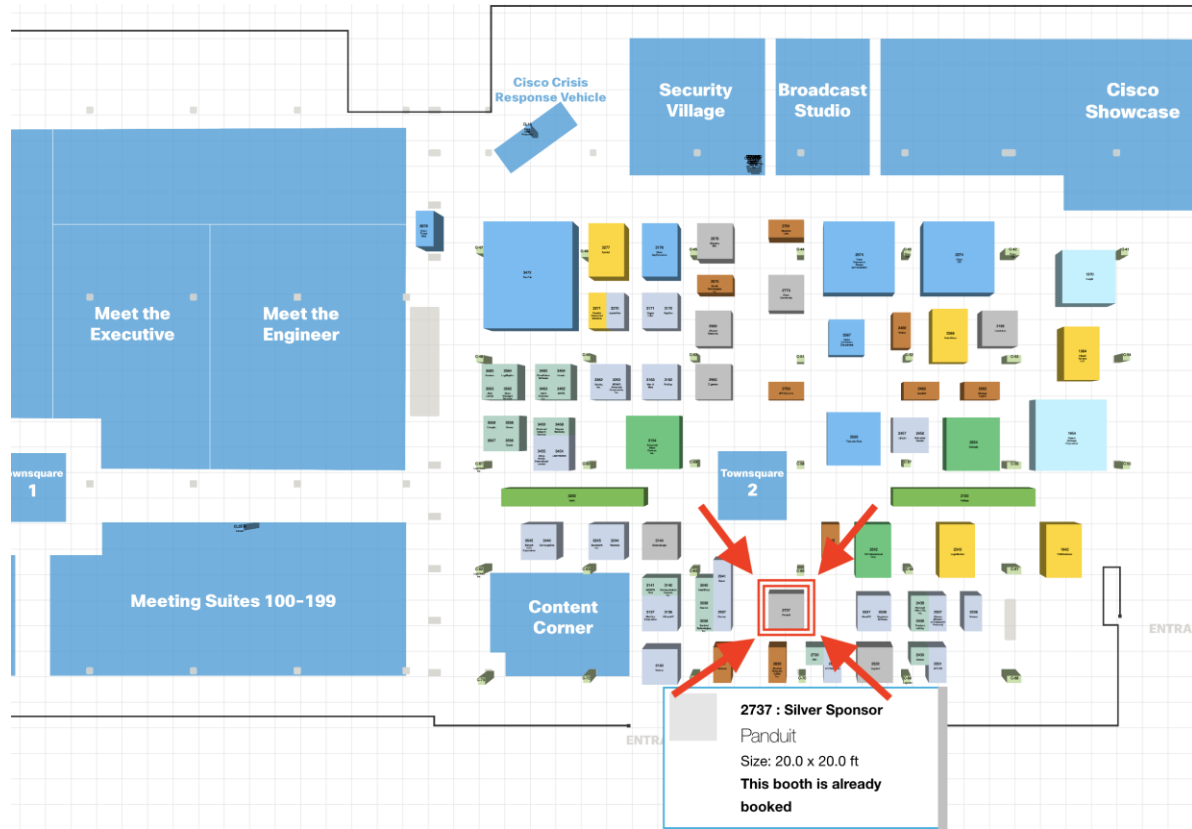- Together: Honeywell and Cisco help facilitate the IT/OT sustainability

Come and see us on the Panduit Stand

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Size: 20.0 x 20.0 ft
This booth is already booked

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Thank you

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For Your Reference

- BACnet – A networking standard defined by American Society of Heating Refrigeration and Air-conditioning Engineers (ASHRAE). Includes various transports
  - -MS/TP – a token passing technology with RS485 electrical layer
  - -IP – v4/UDP and now v6
  - -SC – TLS secured alternative to –IP using hub and spoke architecture
- BMS – Building Management System