Smart Buildings and Networks:

Meshing with the IT Department

March 28, 2018

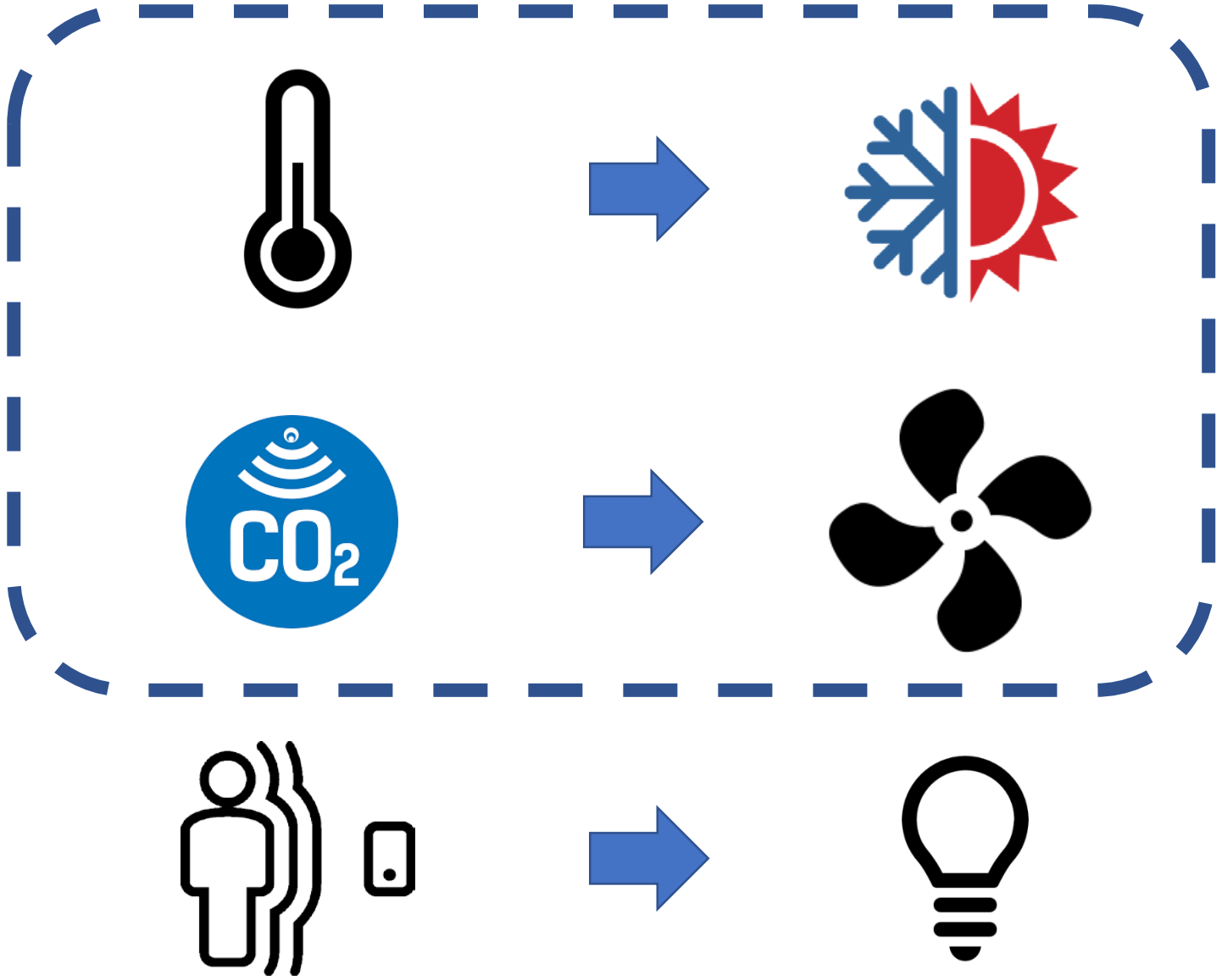
Advanced Energy Conference

Dan Leonhardt – Design Engineer

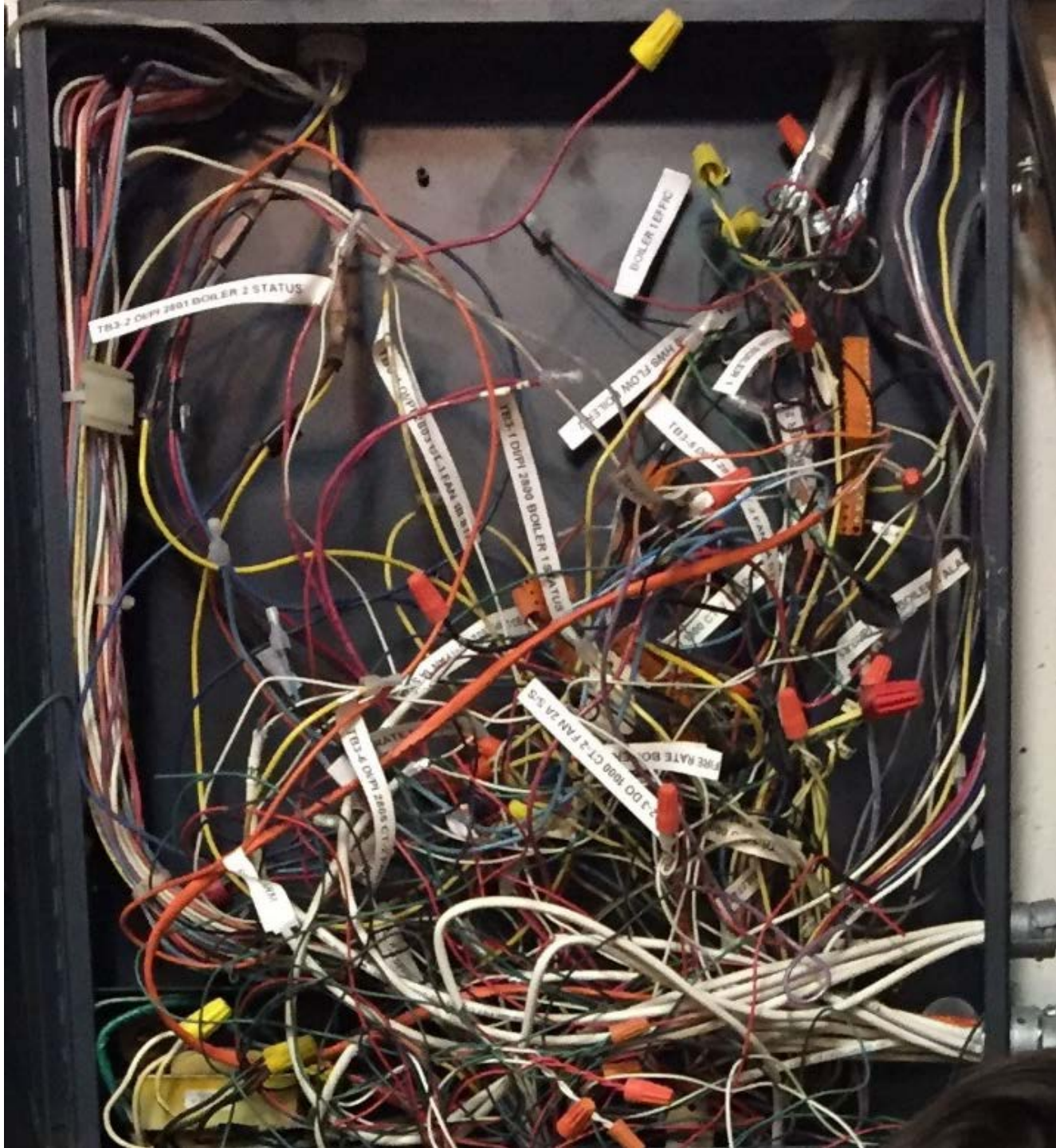
Ecosystem Energy

Historical Approach:

Separate Systems

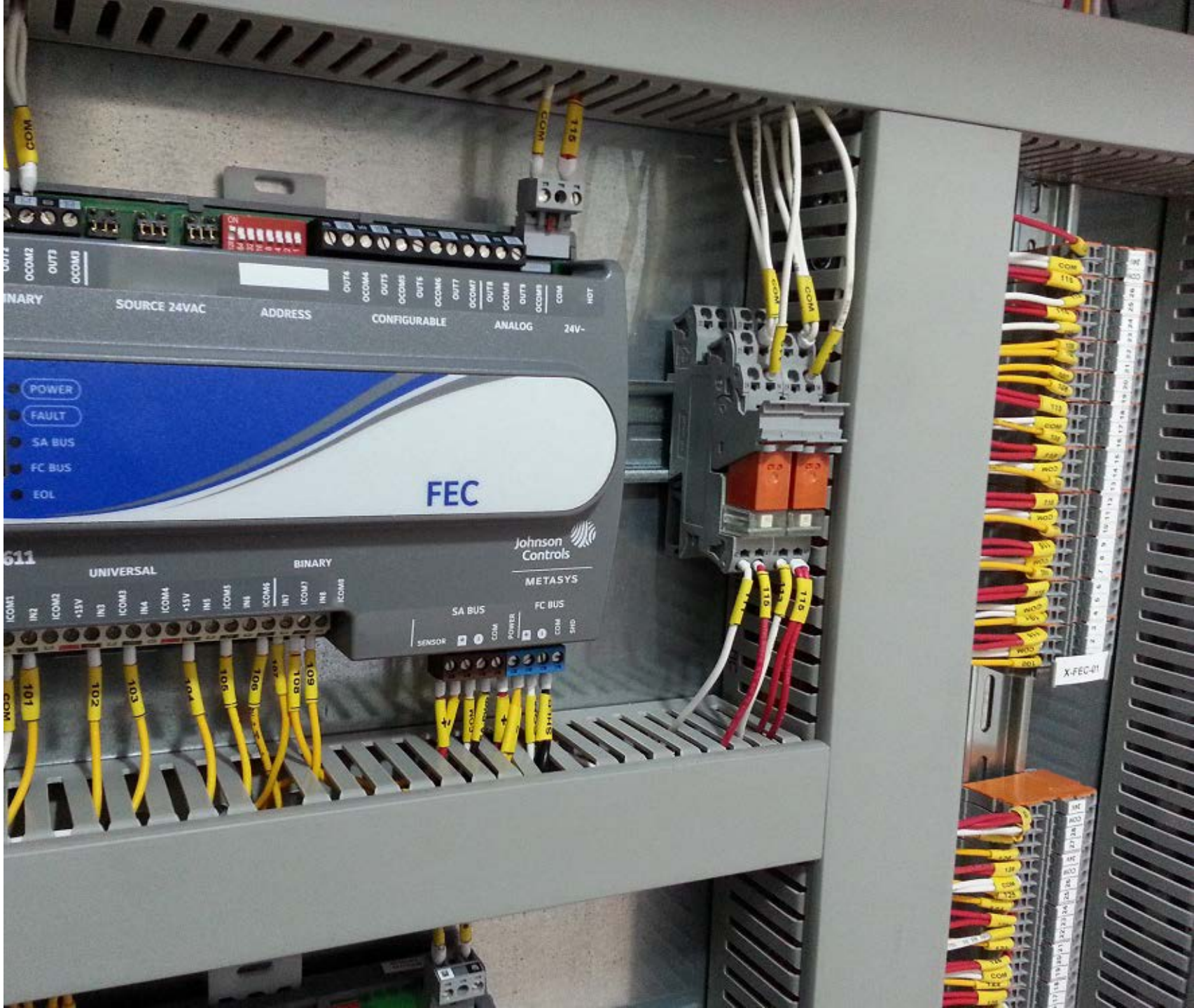


All Too Typical



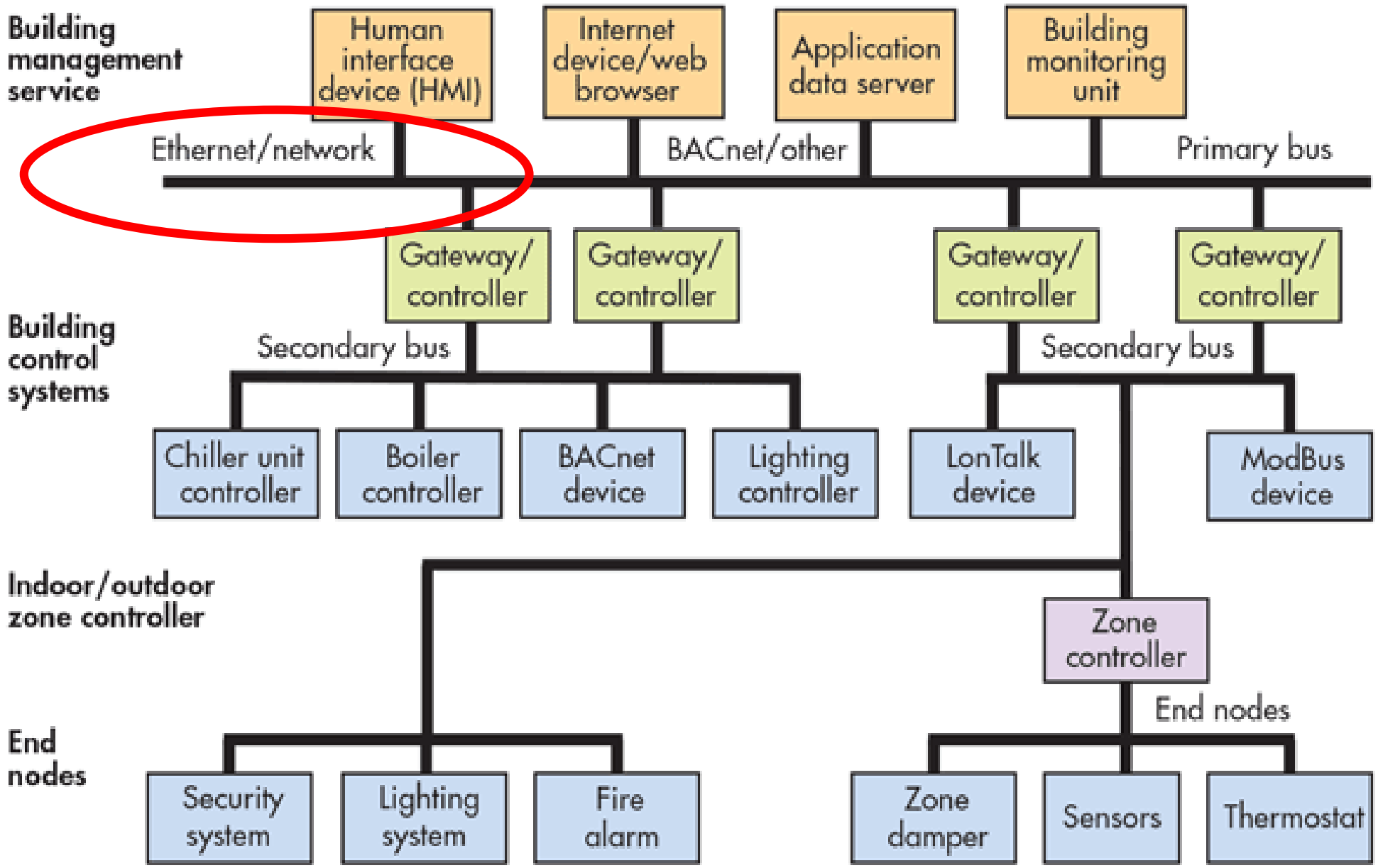
Better!

But still…

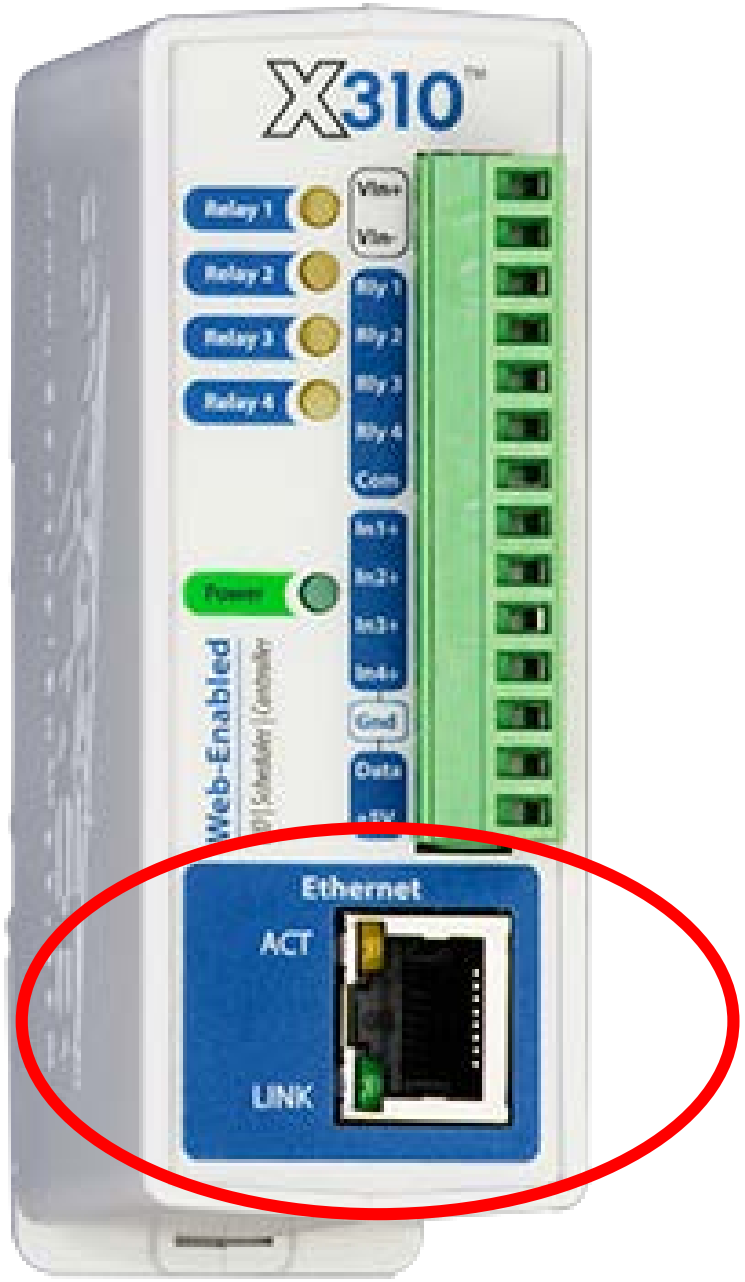



FLUKE
.004
300 mV
Ø=C
ADD=4

Sample Systems Architecture



Technology is Migrating Towards Ethernet



Source: BC Hydro, IEA Task 23 and others

Design Best Practice

- Building Maintenance Staff
- Commissioning Agent

Both should be intimately involved in the design process, and throughout the project.

(among others of course)

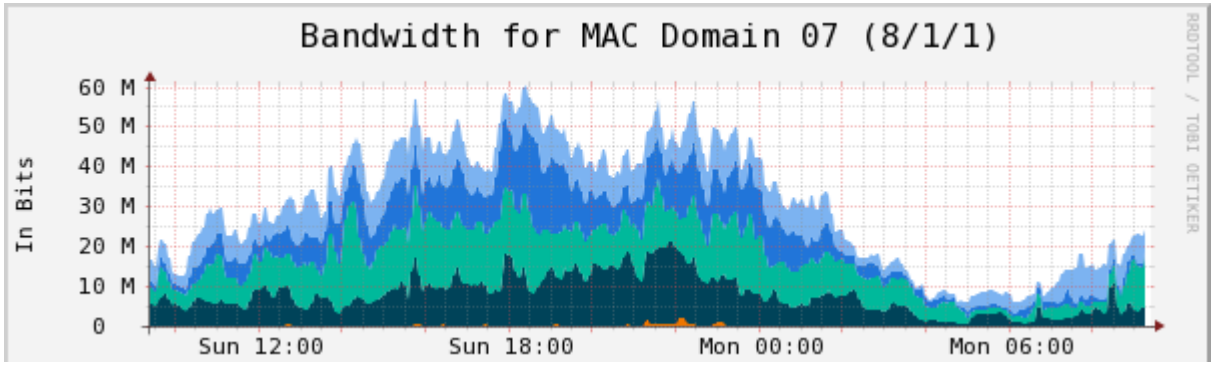
Corollary & Key Takeaway

Corporate IT should be involved early on, and throughout!

Design Discussion:

Capacity

- Physical ports
- Wireless signal coverage
- Bandwidth requirements



Design Discussion:

Capacity *(cont.)*

- Gather bandwidth requirements for devices
  - These are usually quite minimal
  - Quantify them to alleviate concerns
- Switch ports & wireless access points (WAP)
  - How many “plugs?”
  - More areas (mechanical spaces) in the building(s) may need wireless coverage

Design Discussion:

Soft Skills

- In-house IT *might* need additional outside help, e.g., network architect
  - How is this evaluated?
- Who pays?
- Pitch this as an opportunity for housekeeping and optimization

Design Discussion:

Security

- Virtual local area network (VLAN) → completely separate security space
- SAS 70 Audit Issue?
- With isolated HVAC network, do vulnerabilities remain?
  - Life safety and key settings are and will likely remain hard-wired

Additional Design Parameters

- Distance Limitations
  - 100Mbps ~ 100 meters with copper wire
    (typically 4 twisted pairs)
- Power Over Ethernet (PoE)
  - Need compatible network hardware
- Quality of Service (QoS)

Additional Design Parameters *(cont.)*

- Some components can be battery powered
  - Think about battery life and replacement process
- Maintenance Windows
  - Operations are intertwined
  - Building offline during network maintenance

Define Roles & Resp.

- Discuss and document who is responsible for each portion of the system and process

- Frame out use cases
  - Alert types
  - Issue routing
  - Device failures
  - Battery changes
  - Network maintenance

Summary:

Involve IT Early and Often

- Budgets
  - Hardware
  - Ongoing Maintenance (staff)
- Security concerns are valid but can be managed
- (Carefully) See if IT will need outside help
- Clearly define roles and responsibilities

Thank you

ecosystem

Dan Leonhardt
dleonhardt@ecosystem-energy.com