AV in the IT Enterprise

AN INTERNET OF THINGS USE CASE

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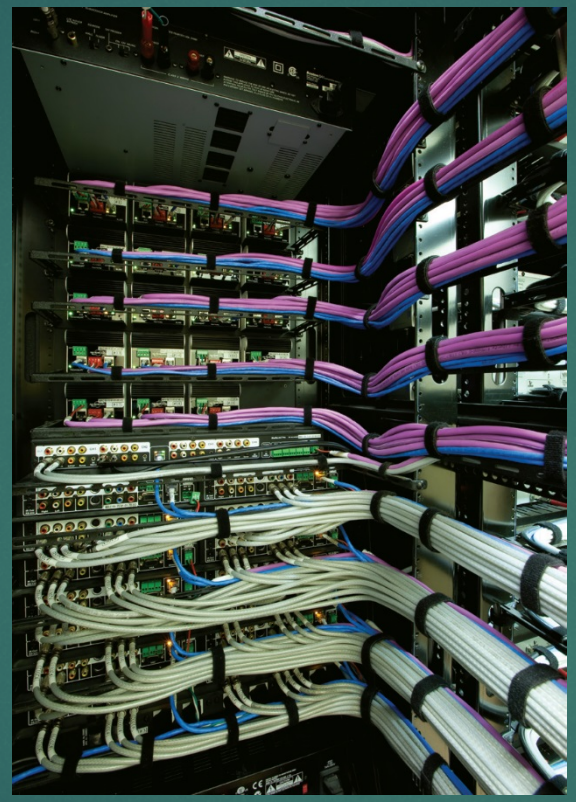
The modern AV portfolio

Kaltura
open source video

zoom

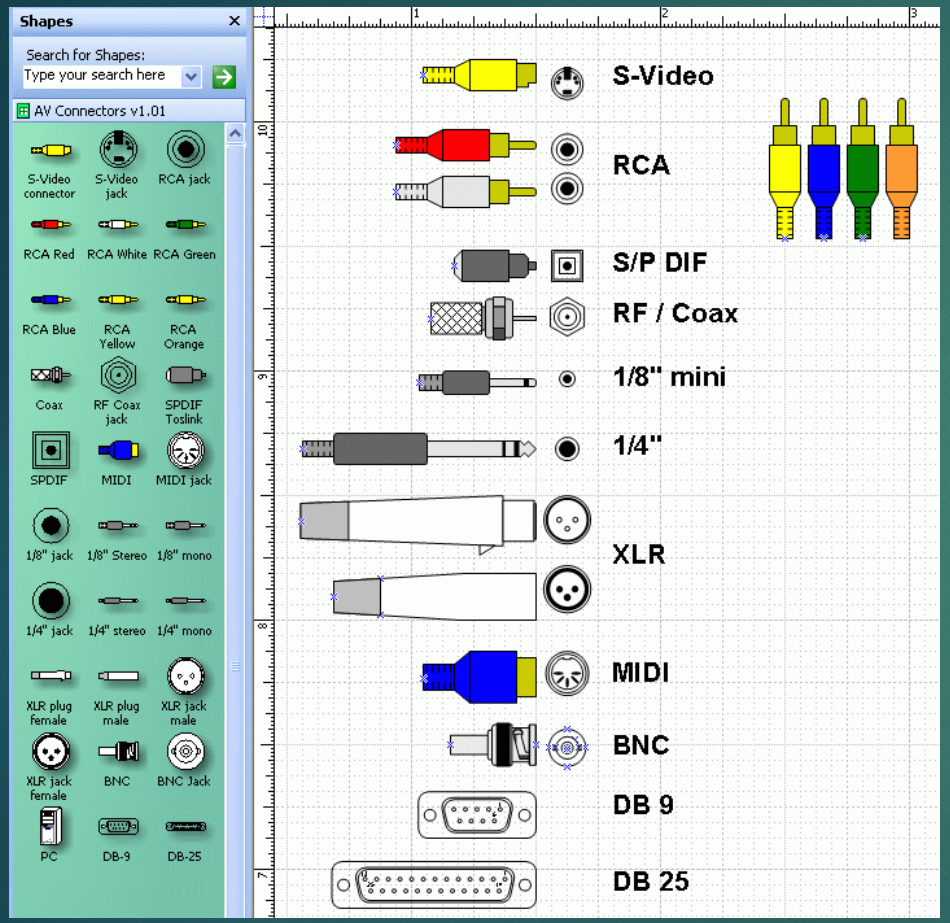
Applications



AV Infrastructure

Support

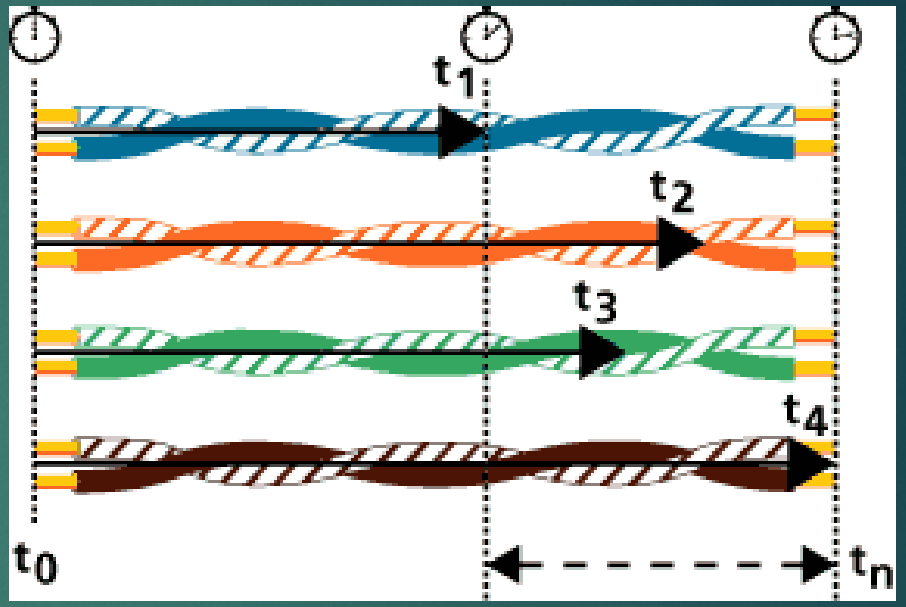
AV of the fairly recent past...



Analog AV and control connectors

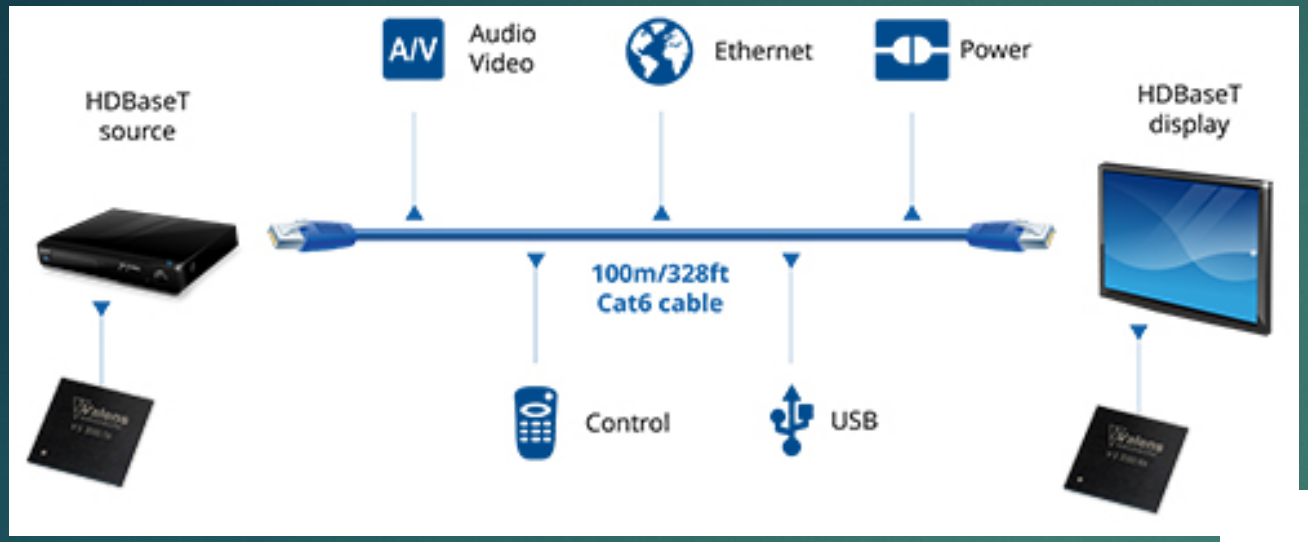
Changes in AV distribution – Moving to IP

“5 Pack” of coaxial cable with BNC terminations
Signals carried: red, green, blue, horizontal sync, and vertical sync (RGBHV)



Skew free UTP carries analog video over category cable

Changes in AV distribution – Moving to IP



HDBaseT digital video, auidio, control, but is not IP…yet.

Video over IP

Changes in AV Control – Moving to IP

RS-232 9 pin serial

Contact closure, IR, and RS232

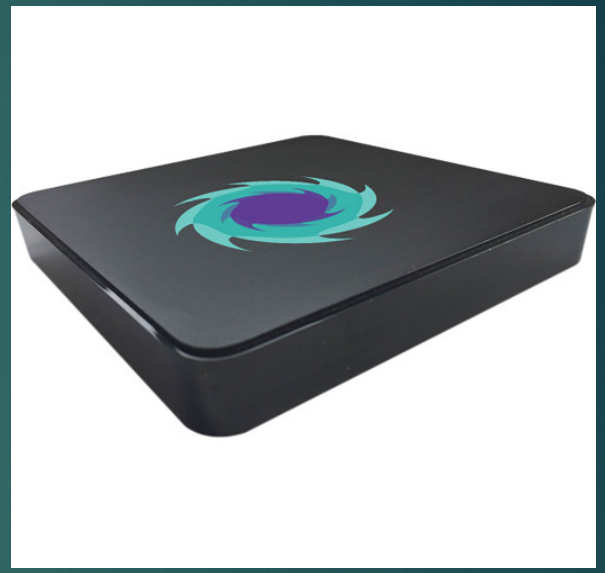
Infrared bud and extender

IP-based control on a modern digital audio signal processor (DSP)

Content over IP
Wireless presentation gateways

Apple's Apple TV

Mersive's Solstice Pod



Crestron's AirMedia

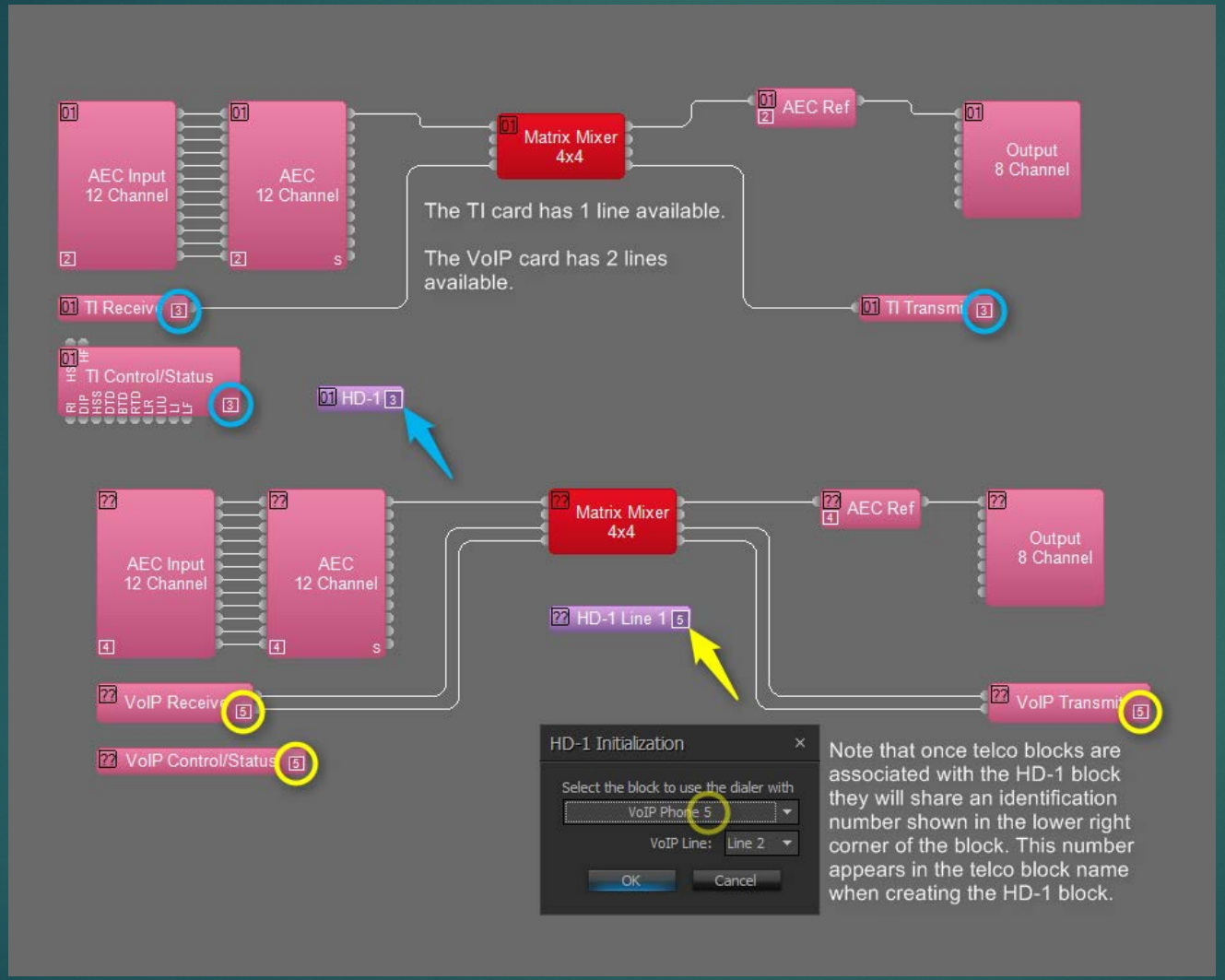
Content over IP Videoconferencing

Cisco's SX-80 Flagship "big iron" video codec

Cisco's SX-20 All-in-one

Vaddio's AV Bridge for USB-based Zoom / Skype Integration

Content over IP - SIP VoIP Integration



Audio digital signal processor flow with SIP VoIP soft client

Changes in AV Technology

Changes

- AV signal distribution – moving to category cable and eventually IP
- Control – moving to IP
- Content – increasingly delivered over the network

Challenges

- Vendors building their own one-off solutions with no or limited remote access,
- Lot’s of little “Best Buy” unmanaged switches and a general ad hoc approach.

- Switch activations, infrastructure, general flow of the work
- Device registration
- Device configuration
- Firewall rules
- Password management

A standardized approach

- Service request process for bringing new rooms builds on the network
- Provides standardized network infrastructure
- Addresses back-end configuration, monitoring, and notifications
- Addresses information security

- Flexible Standards
  - Functional room types defined (What activities a room supports)
  - Basis of design defined (What we install)
  - Design and construction standards (How we install)

Request Share

Managed AV

Use this form to request Managed AV supports for new and, in some cases, existing room technologies.

Request for: Andrew Page change customer

Email: andrew.page@cornell.edu Edit
Phone: 607/254-5247

Request Details

What type of request would you like to make?

- (•) New
- ( ) Change
- ( ) Ask a Question/Report an Issue

Billing Account Number for One-Time Charge(s): *

Use the same account number for monthly recurring charge(s)? *

- ( ) Yes
- ( ) No

PROJECT INFORMATION

Project Title: *

Project Description: *

Request for Service Form

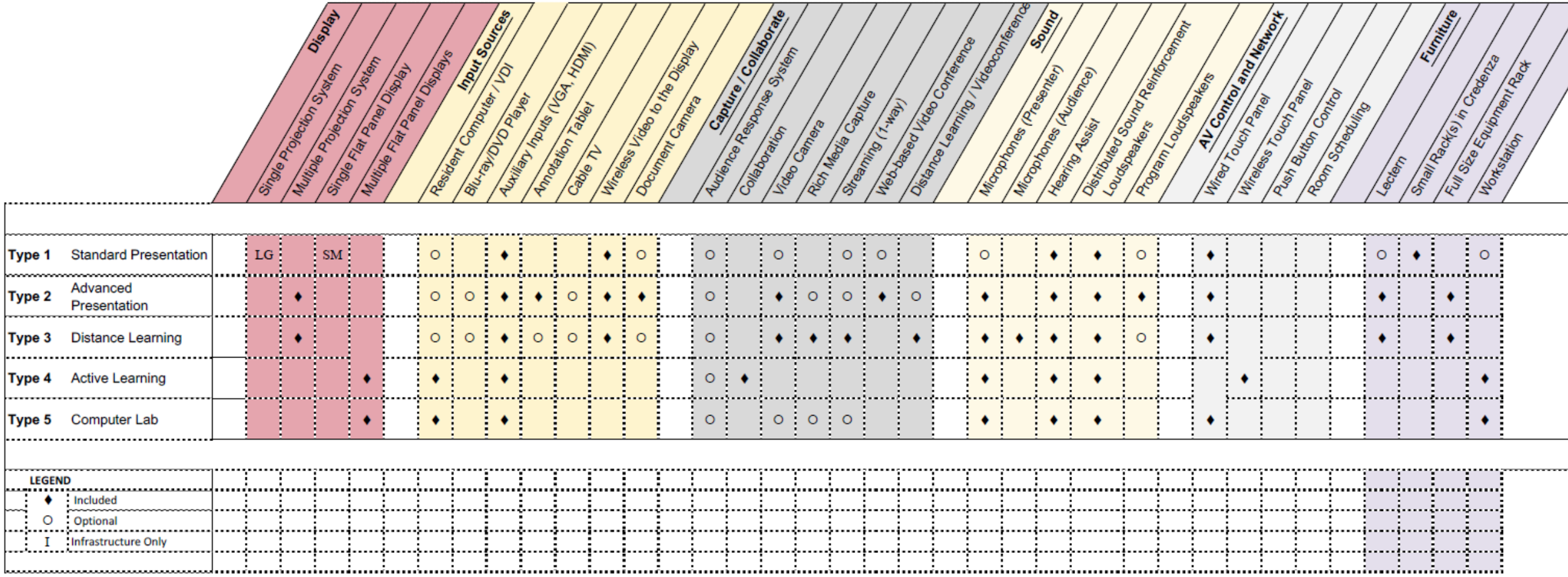
Grouping	Task Name	Task Description
Infrastructure Engineering	1. Estimate Worksheet (only for 8 port and 23 port, or no existing infrastructure).	• Infrastructure Assessment • Create EWOR if needed
Service Analyst	2. Send Customer Estimate	• Using estimate template, draft estimate • Finalize estimate and email customer
Service Analyst	3. Infrastructure & Managed AV WO	• WO for Infrastructure, referencing EWOR • WO for Managed AV (includes Managed AV network switch)
Service Analyst	4. Customer and Vendor Communications	• Send out Vendor IP Table to AV Integrator. Request contact for lead tech • Send Link to Website with documentation / FAQ to Cornell Customers
Service Analyst	5. Provision Soft Number (if SIP VoIP Option is selected)	• Provision Soft Number in Pinnacle • Add soft number to work info note for voice engineering to reference
IAVE	6. Integration Phase	• Add DNSDB Registrations • Managed Firewall exceptions • Send Port Assignments, IP Table and, SIP info to Vendor • Send Port Assignments to CIT Field Technicians • . Escrow and dropbox codec password • Configure codec in TMS • Assign SIP URI • Provision wireless presentation • Provision room schedulers
Voice Engineering	7. SIP VoIP (if SIP VoIP Option is selected)	• Configure DSP with Gateway, Configure PBX
IAVE	8. Commissioning Phase	• Add Room to FusionRV • Set password on codec • Confirm IP's • Confirm Codec in TMS, set Address Books • Configure Mediasite • Load X-Panels • Escrow Source Code
Service Analyst	9. Close Out Task	• Customer Close Out Communications • Billing

Service Request Fulfillment Task List

Cornell University

Learning Technology Room Types

Audiovisual Technology Matrix
February 22, 2016



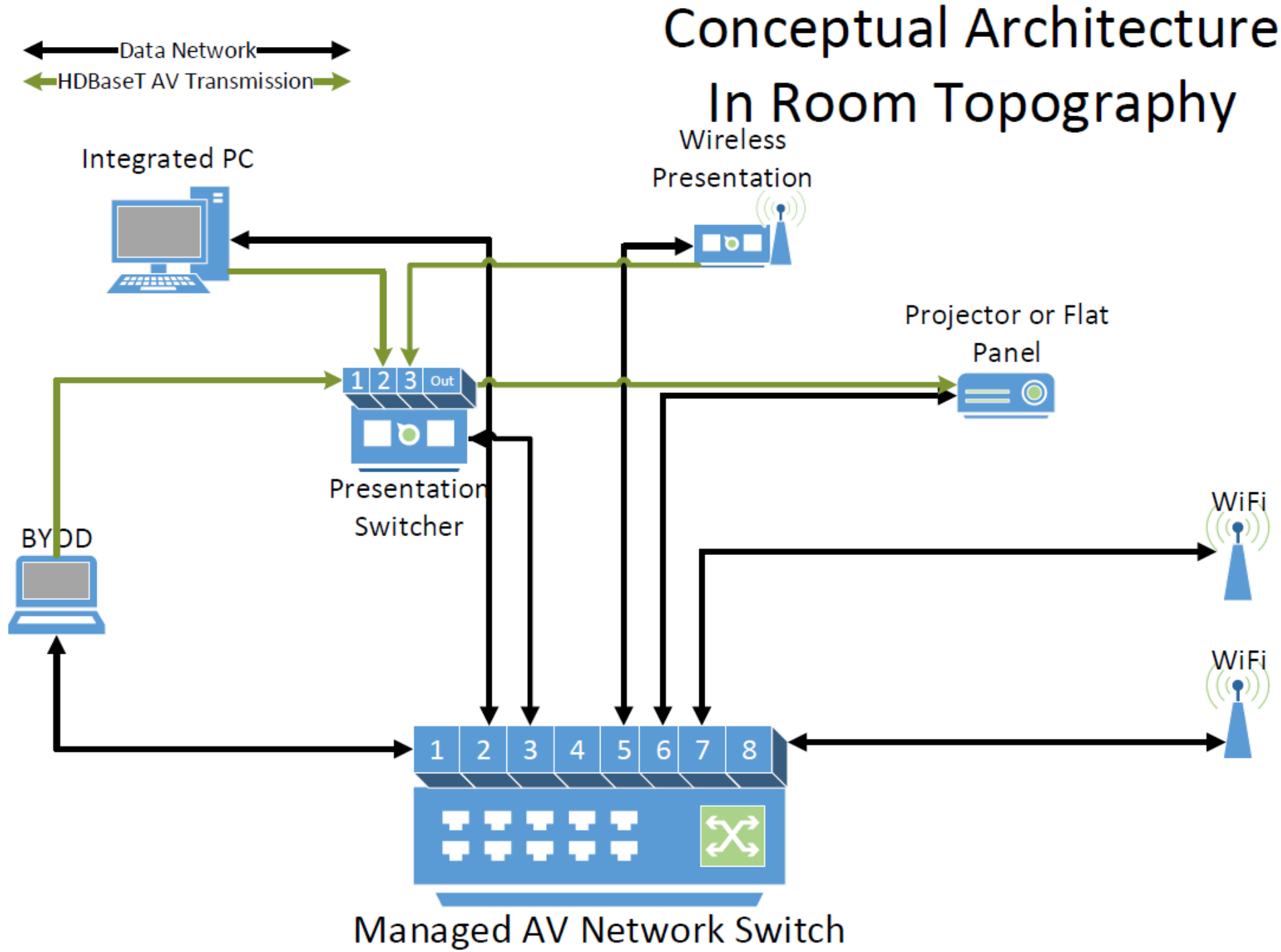
		Display				Input Sources							Capture / Collaborate								Sound						AV Control and Network					Furniture			
		Single Projection System	Multiple Projection System	Single Flat Panel Display	Multiple Flat Panel Displays	Resident Computer / VDI	Blu-ray/DVD Player	Auxiliary Inputs (VGA, HDMI)	Annotation Tablet	Cable TV	Wireless Video to the Display	Document Camera	Audience Response System	Collaboration	Video Camera	Rich Media Capture	Streaming (1-way)	Web-based Video Conference	Distance Learning / Videoconference	Microphones (Presenter)	Microphones (Audience)	Hearing Assist	Distributed Sound Reinforcement	Loudspeakers	Program Loudspeakers	Wired Touch Panel	Wireless Touch Panel	Push Button Control	Room Scheduling	Lectern	Small Rack(s) in Credenza	Full Size Equipment Rack	Workstation
Type 1	Standard Presentation	LG		SM		○		♦			♦	○		○		○		○	○		○		♦	♦	○		♦					○	♦		○
Type 2	Advanced Presentation		♦			○	○	♦	♦	○	♦	♦		○		♦	○	○	♦	○		♦		♦	♦	♦		♦					♦		♦	
Type 3	Distance Learning		♦			○	○	♦	○	○	♦	○		○		♦	♦	♦		♦		♦	♦	♦	♦	○		♦					♦		♦	
Type 4	Active Learning				♦	♦		♦						○	♦					♦		♦	♦						♦						♦
Type 5	Computer Lab				♦	♦		♦						○		○	○	○		♦		♦	♦			♦									♦

LEGEND

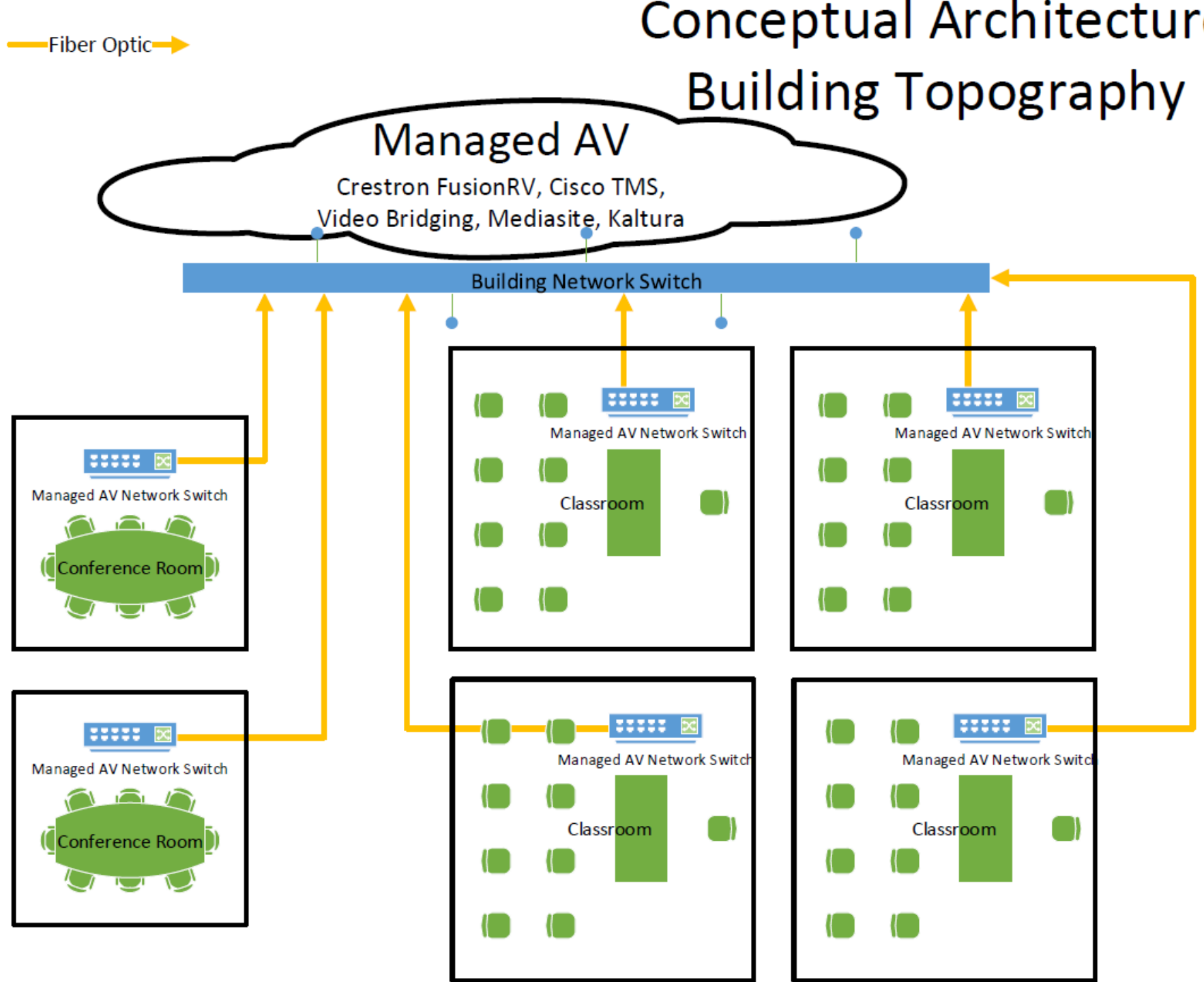
♦	Included
○	Optional
I	Infrastructure Only

Functional Room Types – Feature Matrix

Conceptual Architecture In Room Topography



Conceptual Architecture
Building Topography



Cornell Basis of Design AV Equipment
rev. 2/17/17

Product Type	Sub Type	Manufacturer	Notes
Control/Processing	Control	Crestron	
Control/Processing	Switching	Crestron	
			Tesira Forte (or other) * See AVB
Control/Processing	DSP	Biamp	Switch
Control/Processing	DSP (alt)	ClearOne	Converge
Displays	Data Video Projector	Epson	Typically G series
Displays	Flat Panel Monitors	Samsung	
Displays	Flat Panel Monitors (alt)	Panasonic	
Displays	Flat Panel Monitors (alt)	Sharp	
Displays	Wireless Presentation	Mersive	Solstice Pod
Displays	Wireless Presentation (alt)	Crestron	Airmedia
Conferencing	Standards Videoconferencing	Cisco	SX Series
Conferencing	Camera	Panasonic	HE Series
Conferencing	USB Interface	Vaddio	
Conferencing	USB Microphone	ClearOne	Chat series
Conferencing	USB Webcam	Logitech	BCC 950
Audio	ALS	Listen	IR
Audio	ALS (alt)	Sennheiser	IR
Audio	Microphones	Shure	Various wired and wireless
Audio	Microphones (alt)	Audio Technica	899CT4 for lapel use
Audio	Speakers	Tannoy	
Audio	Speakers (alt)	JBL	
Screens/Mounts/Racks	Mounts	Chief	projector & flat panel
Screens/Mounts/Racks	Screens	Da-Lite	16:10 aspect, matt white
Screens/Mounts/Racks	Screens (alt)	Draper	
Screens/Mounts/Racks	Racks	Middle Atlantic	

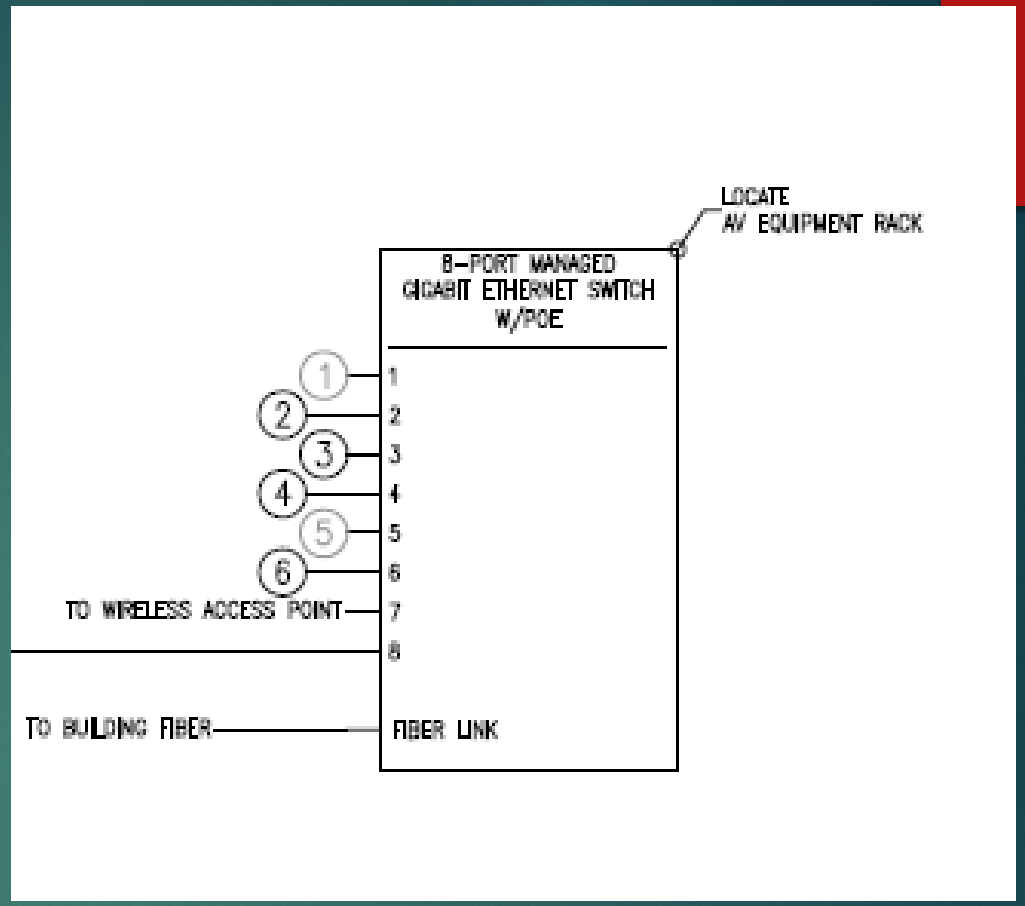
Basic Presentation

Type 1

- 8 port managed switch
- Generally single mode fiber (might be copper)

Example:

- Integrated PC
- BYOD connection
- Wireless presentation gateway
- Video switcher & control
- Projector
- Touchpanel
- Wifi AP



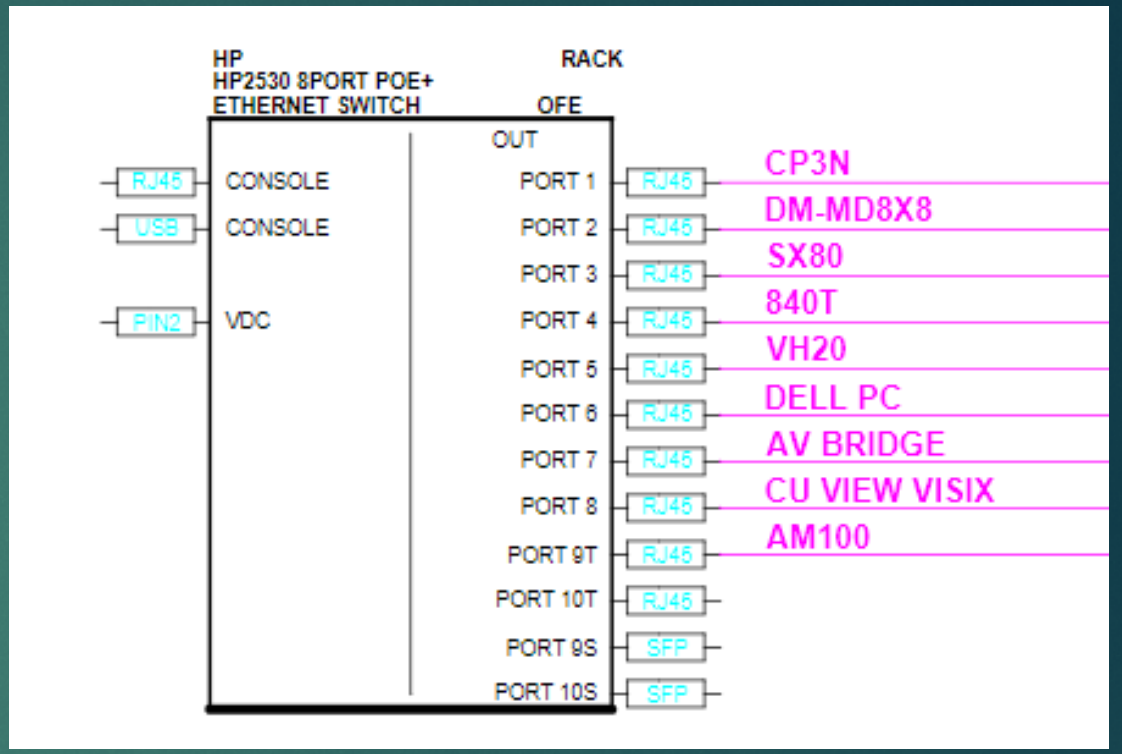
Advanced Presentation

Type 2

- 8 or 24 port managed switch
- Single mode fiber

Example:

- Control Processor
- Video matrix
- Video Codec
- Audio Digital Signal Processor (DSP)
- Sip VoIP
- Integrated PC
- Video Bridge for Zoom / Skype Integration
- Digital Signage
- Wireless Presentation Gateway



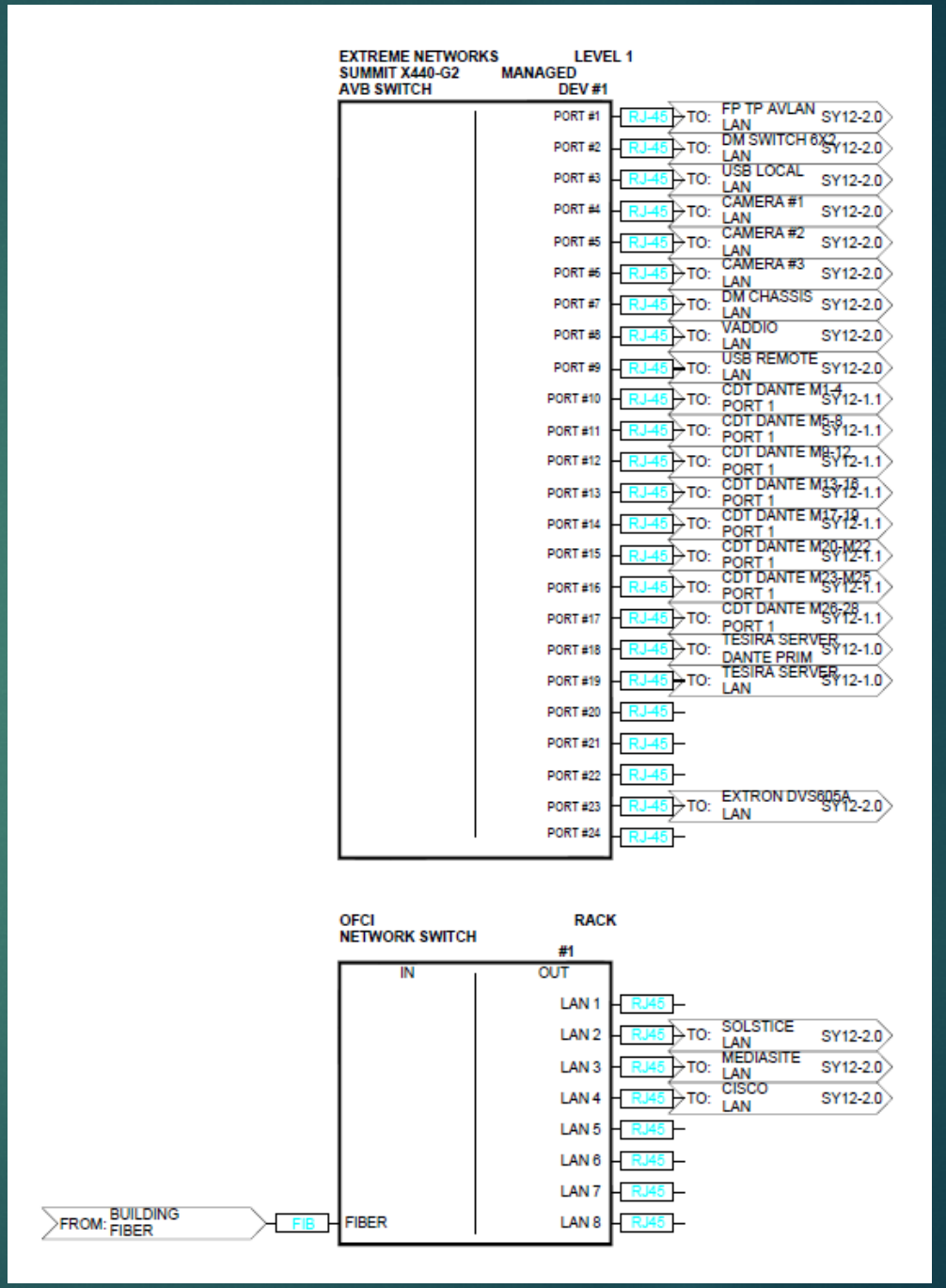
Distance Learning

Type 3

- 24 port or larger managed switch
- Single mode fiber

Example:

- Microphones X4 Control
- Microphones X4 Audio over IP (Dante)
- Audio Digital Signal Processor (DSP)
- SIP VoIP
- Video Matrix Switch
- Touchpanel
- USB/HDMI extenders
- Controllable pan, tilt, zoom, cameras X2
- Video Bridge for Zoom / Skype Integration
- Wireless Presentation gateway
- Webcasting appliance
- Hardware Videoconferncing codec



IoT Approach to AV Advantages

- Project deliverables can be productized
- Request for service work flow
- Enterprise monitoring and notifications
- Remote support capabilities
- Remote configuration and diagnostics
- Scalable and repeatable (~85 deployments in 2 years)
- Securable

What's Next? – More Security

Vulnerability scanning

AAA Control

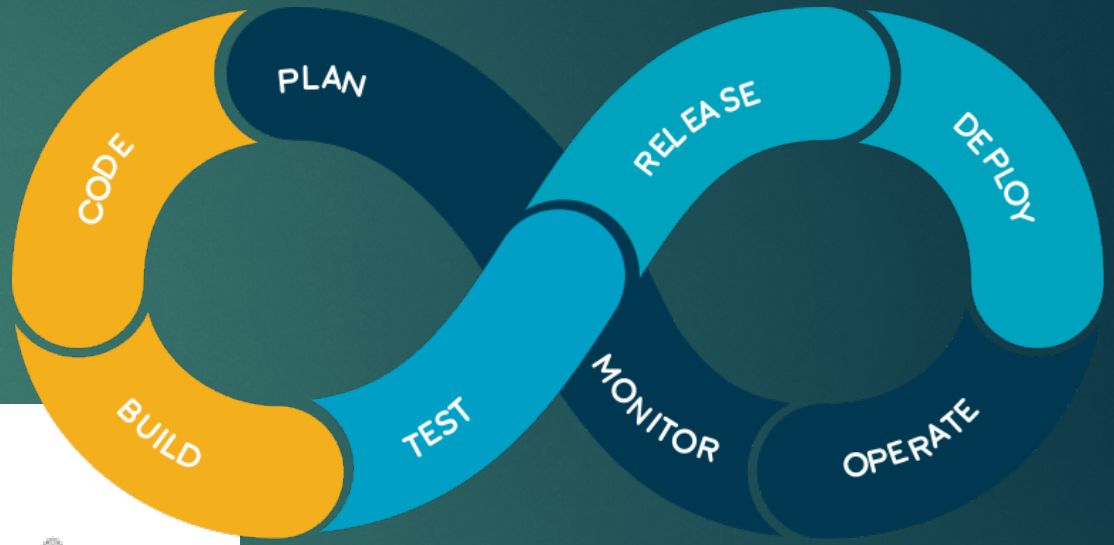
Encrypt all IP traffic

What's Next? – Operational Maturity

Enterprise Monitoring & Notifications

Systems Intelligence

splunk>



Devops for AV

Proprietary stacks replaced with Standardized IT technology

- What's next?:
  - Digital Signage
  - Control
  - Signal distribution (audio over IP, video over IP)
  - Will still need the transducers (cameras, mics, displays, speakers)

Thank you!

Questions?

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