CRESTRON®

DigitalMedia™ the next generation, design and implementation

Overview

- Current products
- Future products
- Considerations
- Comparisons
- Applications

CRESTRON®

Applications

- Conference rooms
- Dual projector classrooms
- Open presentation spaces
- Multipurpose rooms
- Digital signage
- Overflow

CRESTRON

DigitalMedia™ Transports

How do we effectively choose the best DM® transport and technologies?

- DM Lite™ technology
- DigitalMedia™
  - 8G+
  - 4KZ
  - H.264
- DM-NVX™ technology

DM Lite™ - Current DM Lite products
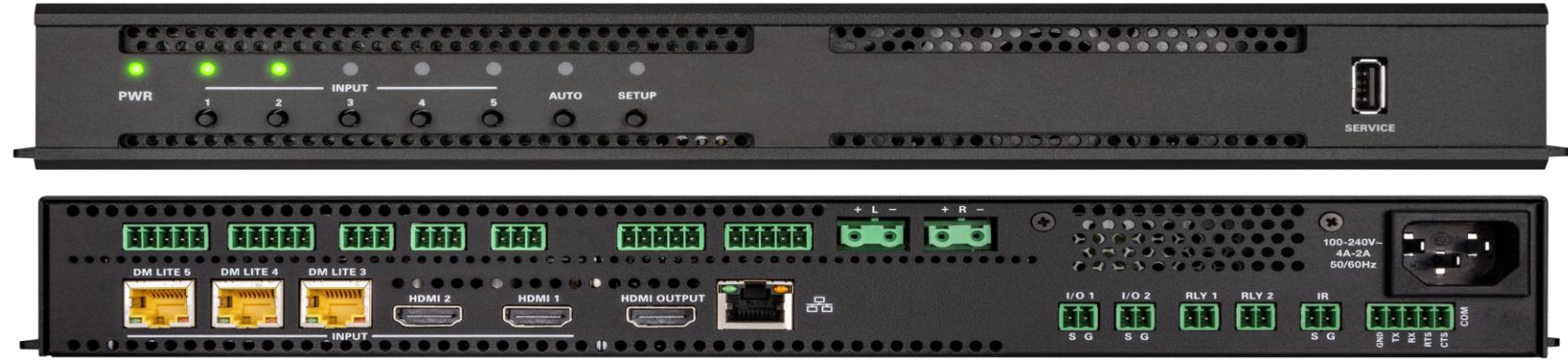
Transmitters

- HD-TX(C)-101-C-E
- HD-TX(C)-101-1G-E
- HD-TX-201-C-2G-E
- HD-TX-301-C-E

Receivers

- HD-RX-101-C-E
- HD-RX(C)-101-C-1G-E-B-T
- HD-RXC-101-C-1G-E-B-T
- HD-RX-201-C-E

CRESTRON

DMPS Lite™

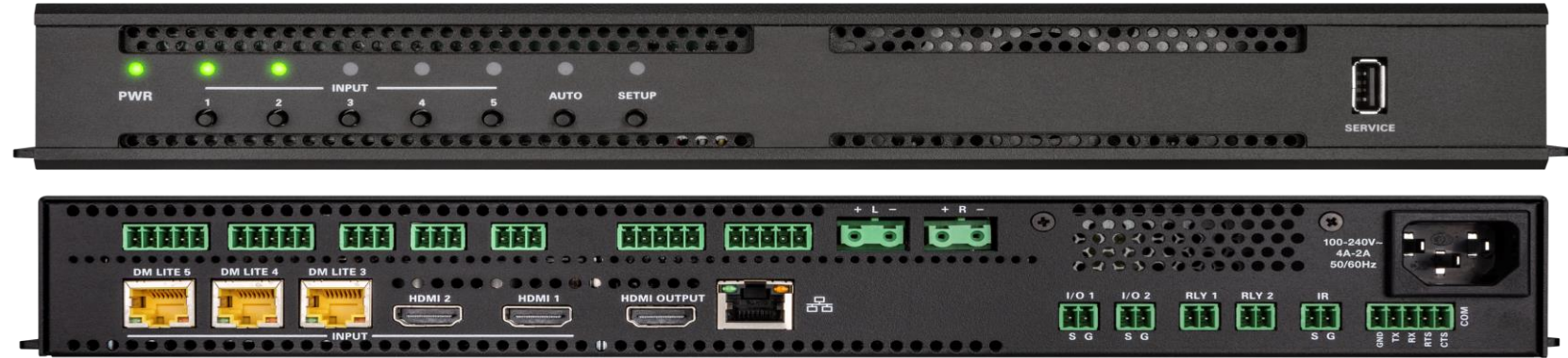**Just Launched in DM Lite**

HD-RX-4K-510-C-E

Features

- 4K/60 4:2:0 capability
- Three DM Lite™ ports for interoperability with up to three DM Lite transmitters
- Two HDMI® inputs
- One HDMI output with 4K scaler
- Gigabit Ethernet port

- Two stereo line level inputs, two mono microphone inputs, and one mono auxiliary audio input
- 6x2 audio mixing capability
- Built-in amplifier with 25 W per channel for 4- or 8-ohm stereo speakers
- Two stereo auxiliary outputs
- 1xIR, 1xRS-232, 2xRelay, and 2xI/O control ports

CRESTRON®

DMPS Lite™

Just Launched in DM Lite

HD-RX-4K-510-C-E

Features

- CEC (Consumer Electronics Control) capability

- Automatic switching of inputs

- EDID management

- HDCP management including HDCP 2.2 support

- Built-in web interface for easy configuration and monitoring

- Compatibility with Crestron® 3-Series® or later control systems

- .AV Framework™ technology support

- Crestron XiO Cloud™ service support

- Compact surface-mount design

CRESTRON

DMPS Lite™

Just Launched in DM Lite

HD-RX-4K-510-C-E-SW4

Features

As HD-RX-4K-510-C-E

Plus a 4-port Gigabit Ethernet switch with two PoE+ ports.

- Designed to provide a convenient LAN connection for local network devices.
- Ports 3 and 4 are PoE+ power sourcing equipment (PSE) ports

NOTE: The Ethernet switch functions as a simple unmanaged switch that does not support configuration and administrative settings.
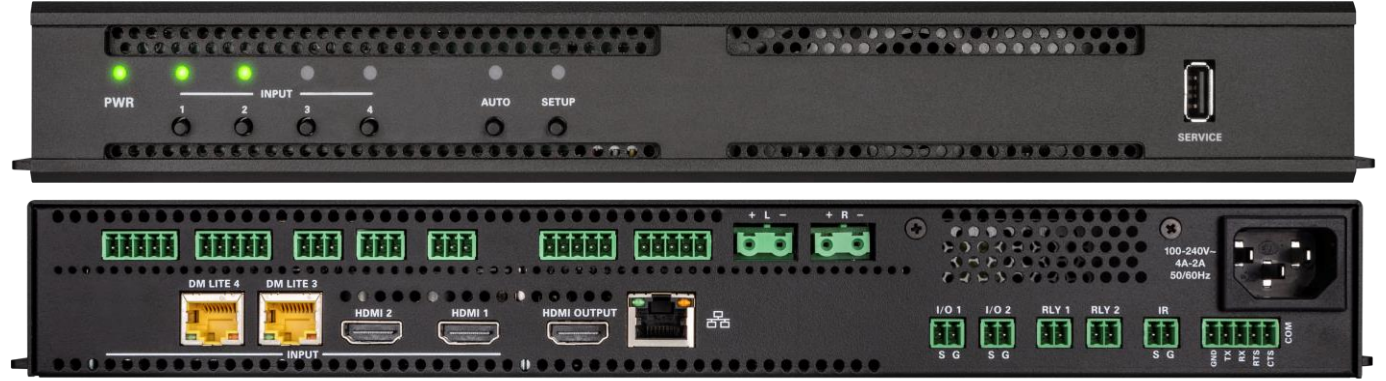
The Ethernet ports on the HD-RX-4K-510-C-E-SW4 are not recommended for streaming video content using Crestron DM NVX™ or third-party AV-over-IP products.

CRESTRON

DMPS Lite™

Just Launched in DM Lite

HD-RX-4K-410-C-E

Features

- 4K/60 4:2:0 capability
- Two DM Lite™ ports for interoperability with up to two DM Lite transmitters
- Two HDMI® inputs
- One HDMI output with 4K scaler
- Gigabit Ethernet port

- Two stereo line level inputs, two mono microphone inputs, and one mono auxiliary audio input
- 6x2 audio mixing capability
- Built-in amplifier with 25 W per channel for 4- or 8-ohm stereo speakers
- Two stereo auxiliary outputs
- 1xIR, 1xRS-232, 2xRelay, and 2xI/O control ports

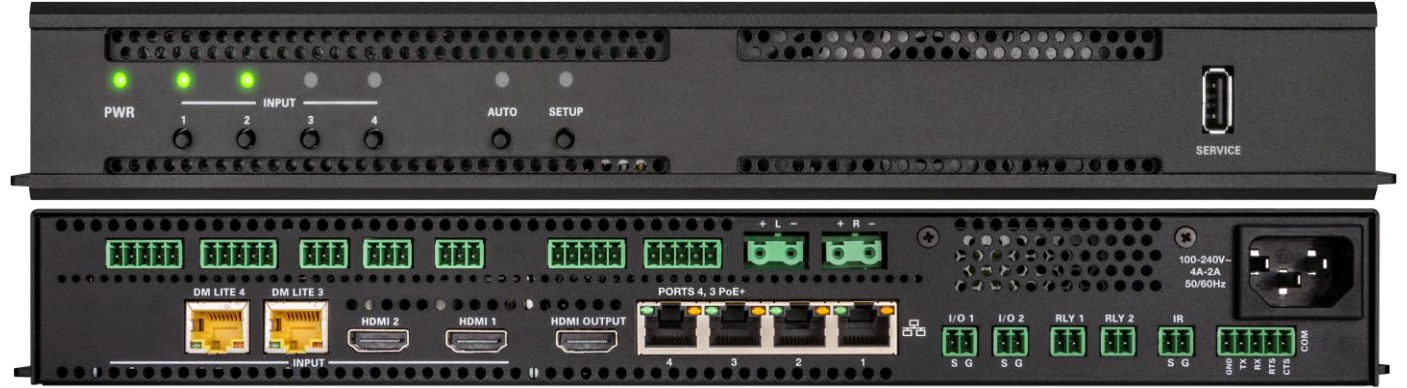CRESTRON®

DMPS Lite™

Just Launched in DM Lite

HD-RX-4K-410-C-E-SW4

Features

    As HD-RX-4K-410-C-E

Plus a 4-port Gigabit Ethernet switch with two PoE+ ports.

- Designed to provide a convenient LAN connection for local network devices.
- Ports 3 and 4 are PoE+ power sourcing equipment (PSE) ports

NOTE: The Ethernet switch functions as a simple unmanaged switch that does not support configuration and administrative settings.

The Ethernet ports on the HD-RX-4K-410-C-E-SW4 are not recommended for streaming video content using Crestron DM NVX™ or third-party AV-over-IP products.

CRESTRON

HD-RX-4K-210-C-E

4K-scaling DM Lite receiver with 4K60 4:2:0 support

- Improved network connectivity

- Crestron XiO Cloud™ support

- Full CIP integration

- Interoperable with current and future DM Lite products

1 HDMI® and 1 DM Lite Inputs

Various control ports – COM, IR, Relay, I/O

Built-in scaler with ability to bypass when necessary

DigitalMedia™

Current DM platforms

- 8G+
  - 4K60 4:2:0
- 4KZ
  - 4K60 4:4:4 & HDR
  - VESA® DSC
- H.264
  - Stream over the WAN

CRESTRON.

DigitalMedia™

Current DM 8G+® products

- DigitalMedia™ switchers
- Presentation systems
- Endpoints

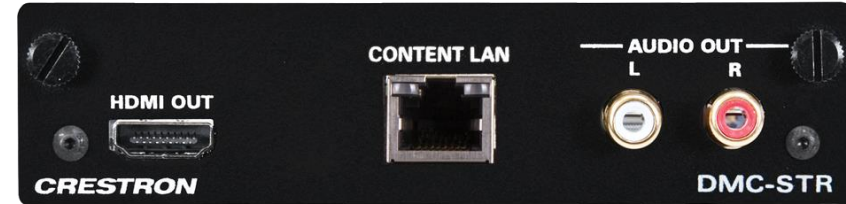# DigitalMedia™

Current 4KZ products

- Cards
- Endpoints
- HD-DAs
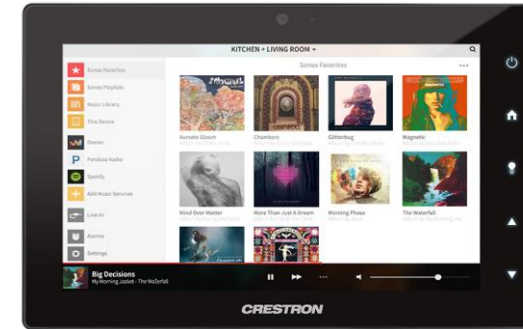
DigitalMedia™

Current H.264 products

- DMC-STR/STRO

  - Max output 1080p30

- DM-TXRX-100-STR

  - Max output 1080p60

- DM-RMC-100-STR

  - Supports HLS and MPEG-DASH

DigitalMedia™

Current H.264 products

- Digital Graphics Engines
- TSW Series
- Crestron app

DigitalMedia™

What's new to DM?

- DigitalMedia™ 4KZ Single Gang Transmitters
  - DM-TX-4KZ-100-C-1G-W-T
    - 4KZ Single-Gang Transmitter, White
  - DM-TX-4KZ-100-C-1G-B-T
    - 4KZ Single-Gang Transmitter, Black
- Features :
  - HDCP 2.2 compliance
  - Device control via CEC, IR, and RS-232
  - Powered via the DM connection or local power pack (included)
  - USA backbox
  - Decorator-style faceplate and surface-mount bracket included

CRESTRON.

DM NVX®

Current DM NVX products

- DM-NVX-350(C)
  - Transmitter/Receiver
  - Pixel Perfect Processing
- DM-NVX-351(C)
  - DSP downmixing
  - Pixel Perfect Processing

CRESTRON®

DM NVX®

Current DM NVX products

- DM-NVX-D30(C)
  - Dedicated decoder
- DM-NVX-E30(C)
  - Dedicated encoder
- DM-NVX-352(C)
  - Dante® audio networking or AES67

CRESTRON®

New DM NVX® Firmware

AES67 Firmware

- Every DM NVX® model

- AES-67 is an interoperability standard for Audio over IP

- Provides both 2CH transmit and receive capabilities to allow for routing flexibility

- Available Summer 2020 as a free firmware update

DM NVX®

AES67

CRESTRON®

DM NVX®

DM-NVX-D80-IOAV

4K60 4:4:4

- Compatible with the Intel® Open Pluggable Specification (OPS)

- Seamless integration with OPS-supported displays.

- Supports HDR10 and HDCP 2.3

- 7.1 surround sound audio

- USB 2.0 and KVM signal extension and routing

- Device controller via RS-232, CEC, Ethernet

Ethernet USB Extenders

USB-NX2-LOCAL-1G

- Extends and routes any USB 1.1 or 2.0 device across an Ethernet network or point-to-point over one CAT5e
- Provide reliable, high-speed USB signal extension for most USB 1.1 or 2.0 devices
- Enable USB signal routing under the control of a Crestron control system or DigitalMedia™ system
- Compatible with the USB over Ethernet Extenders with Routing (USB-EXT-DM-LOCAL and USB-EXT-DM-REMOTE) and DM NVX®
- No drivers required with Windows®, macOS®, or Linux® operating systems

Ethernet USB Extenders

USB-NX2-REMOTE-1G

- Expandable using up to 4 USB hubs (not included)
- Provide 4 USB Type A ports for USB devices
- 100-240 VAC power supply (included) or Power over Ethernet (PoE)
- Expand upon the USB-HID routing capabilities of a DigitalMedia™ system without additional wiring
- Add USB host or device ports to any DM® transmitter, receiver, or switcher
- USB local (host) or remote (device) endpoint sold individually for maximum flexibility
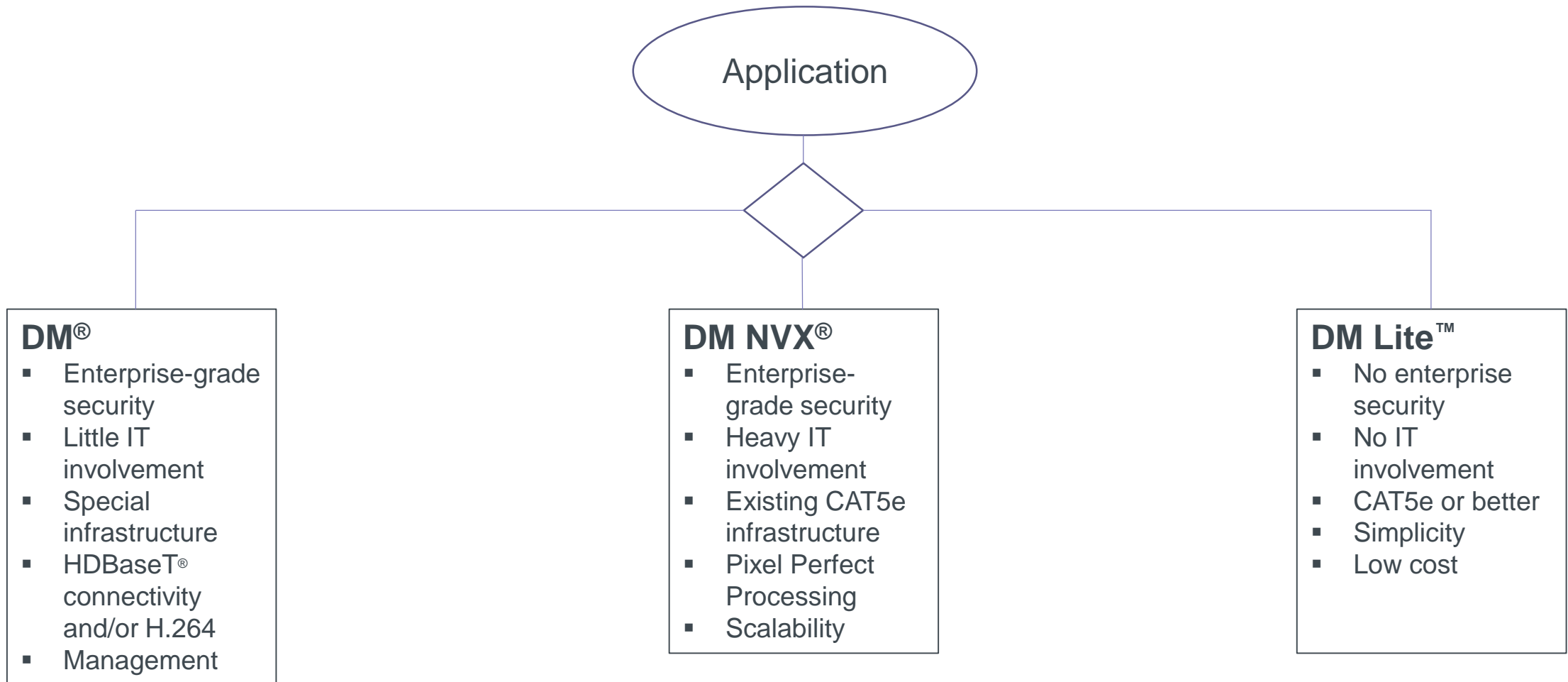
Applications

How Do We Choose The Best Transport For The Application?

CRESTRON

Considerations

Application

DM®
- Enterprise-grade security
- Little IT involvement
- Special infrastructure
- HDBaseT® connectivity and/or H.264
- Management

DM NVX®
- Enterprise-grade security
- Heavy IT involvement
- Existing CAT5e infrastructure
- Pixel Perfect Processing
- Scalability

DM Lite™
- No enterprise security
- No IT involvement
- CAT5e or better
- Simplicity
- Low cost

CRESTRON

Comparisons

Theoretical bandwidth

Theoretical Bandwidth Required by Video Format Type

Video format name	horizontal	vertical	bpp	hz	Overhead factor	Gbps
720p	1280	720	24	60	1.50	1.99
1080p	1920	1080	24	60	1.50	4.48
4K30	3840	2160	24	30	1.50	8.96
HDMI 2.0 (4K60 - 4:2:0)	3840	2160	12	60	1.50	8.96
HDBaseT limit						9.00
2160p (4K60 – 4:4:4)	3840	2160	24	60	1.50	17.92
HDMI 2.1 (8K60 - 4:2:0)	7680	4320	12	60	1.50	35.83

Source: Understanding & Evaluating AV-over-IP Whitepaper

CRESTRON

Comparisons

Network bandwidth compatibility

Network Bandwidth Compatibility by Video Format based on CODEC Compression Ratios

Video format name	Data Rate	2 to 1	5 to 1	20 to 1	20 to 1
	Gbps	DSC compression	JPEG-XS compression	JPEG2000 compression	Pixel Perfect Processing compression
1080p	4.48	2.24	0.90	0.22	0.22
4K30	8.96	4.48	1.79	0.45	0.45
HDMI 2.0 (4K60 - 4:2:0)	8.96	4.48	1.79	0.45	0.45
2160p (4K60 – 4:4:4)	17.92	8.96	3.58	0.90	0.90
HDMI 2.1 (8K60 - 4:2:0)	35.83	17.92	7.17	N/A	1.79

Minimum Required Network Type and Corresponding Cabling
- ■ 40Gb (Fiber)
- ■ 10Gb (Cat6a)
- ■ 5Gb (Cat6)
- ■ 2.5Gb (Cat5e)
- ■ 1Gb (Cat5e)

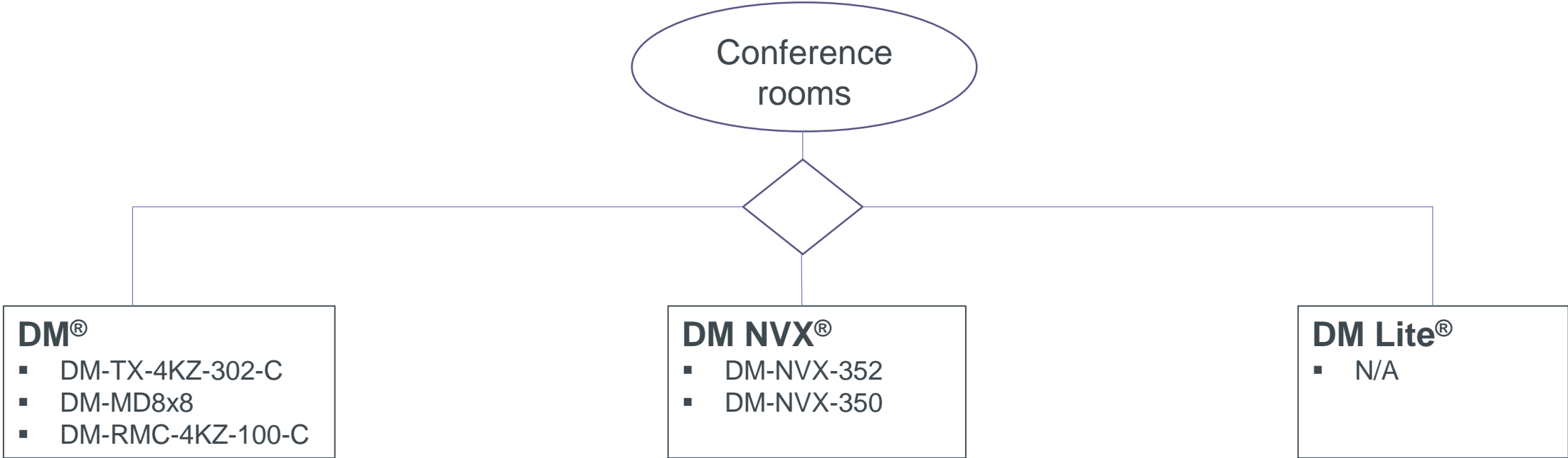Source: Understanding & Evaluating AV-over-IP Whitepaper

CRESTRON

Applications

- Conference rooms

- Dual projector classrooms

- Open presentation spaces

- Multipurpose rooms

- Digital signage

- Overflow

CRESTRON

Scenarios

Conference rooms

- Four laptop inputs

- One room PC

- Two displays

- Enterprise-grade security
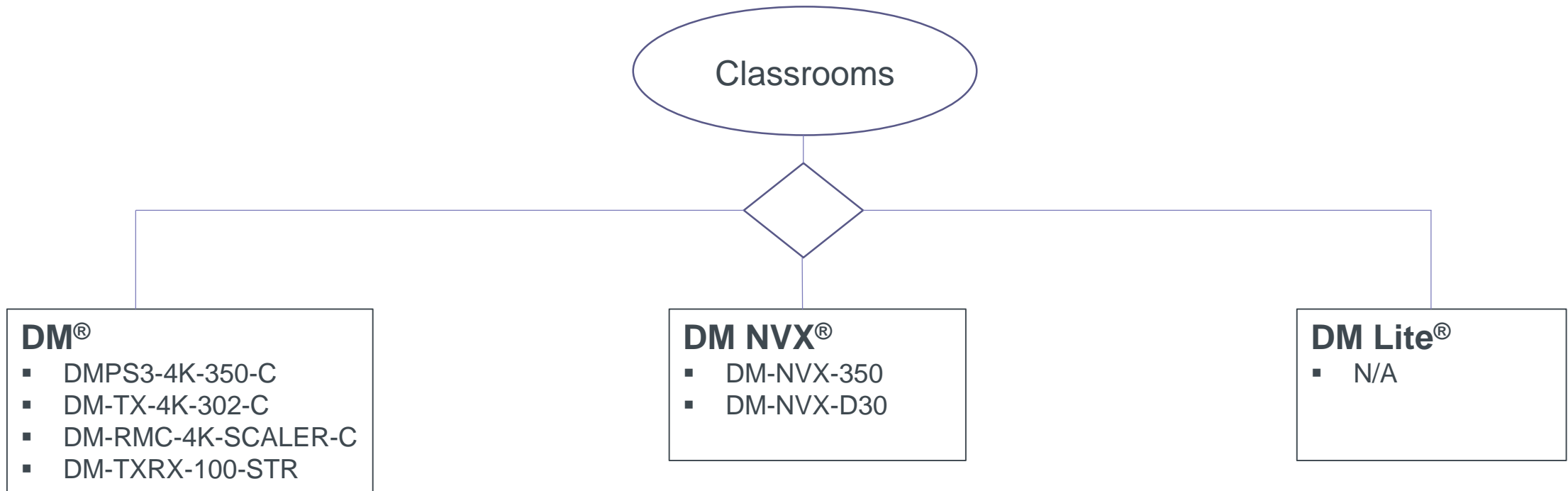
- Infrastructure open

- IT involvement

CRESTRON.

Scenarios

Conference rooms

DM®
- DM-TX-4KZ-302-C
- DM-MD8x8
- DM-RMC-4KZ-100-C

DM NVX®
- DM-NVX-352
- DM-NVX-350

DM Lite®
- N/A

Scenarios

Classrooms

- Four laptop inputs
- One room PC
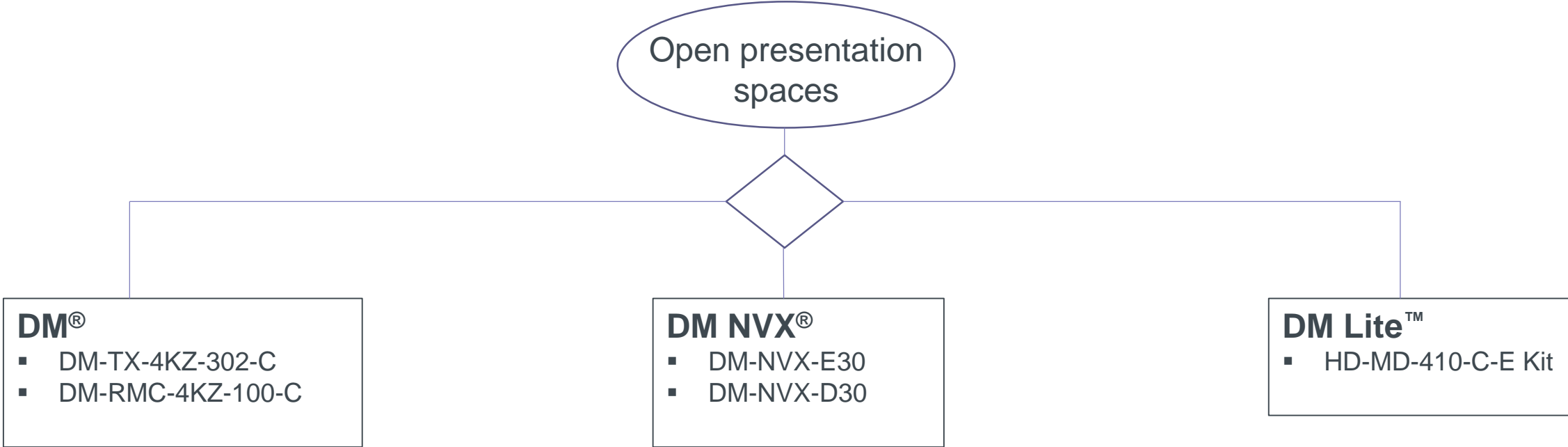- 4 displays
- Infrastructure open
- IT involvement

CRESTRON®

Scenarios

Classrooms

DM®
- DMPS3-4K-350-C
- DM-TX-4K-302-C
- DM-RMC-4K-SCALER-C
- DM-TXRX-100-STR

DM NVX®
- DM-NVX-350
- DM-NVX-D30

DM Lite®
- N/A

Scenarios

Open presentation spaces (20)

- One laptop input

- One display

- Infrastructure open

- IT involvement

Scenarios

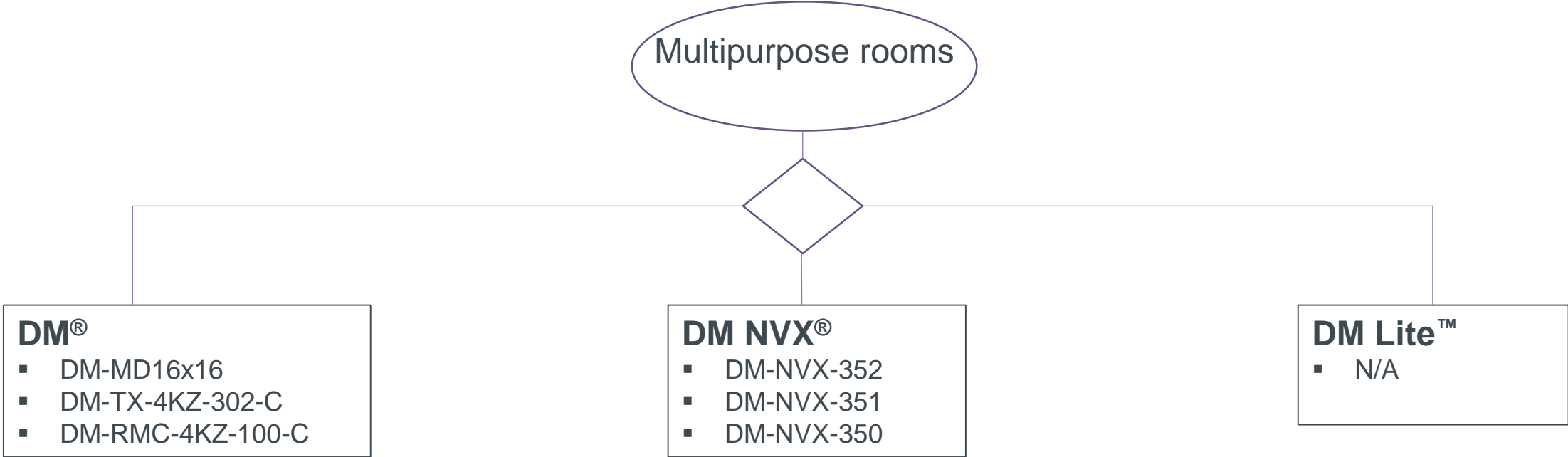**Open presentation spaces**

DM®
- DM-TX-4KZ-302-C
- DM-RMC-4KZ-100-C

DM NVX®
- DM-NVX-E30
- DM-NVX-D30

DM Lite™
- HD-MD-410-C-E Kit

Scenarios

Multipurpose room

- Six laptop inputs

- Three displays

- Enterprise-grade security

- Infrastructure open

- IT involvement

CRESTRON

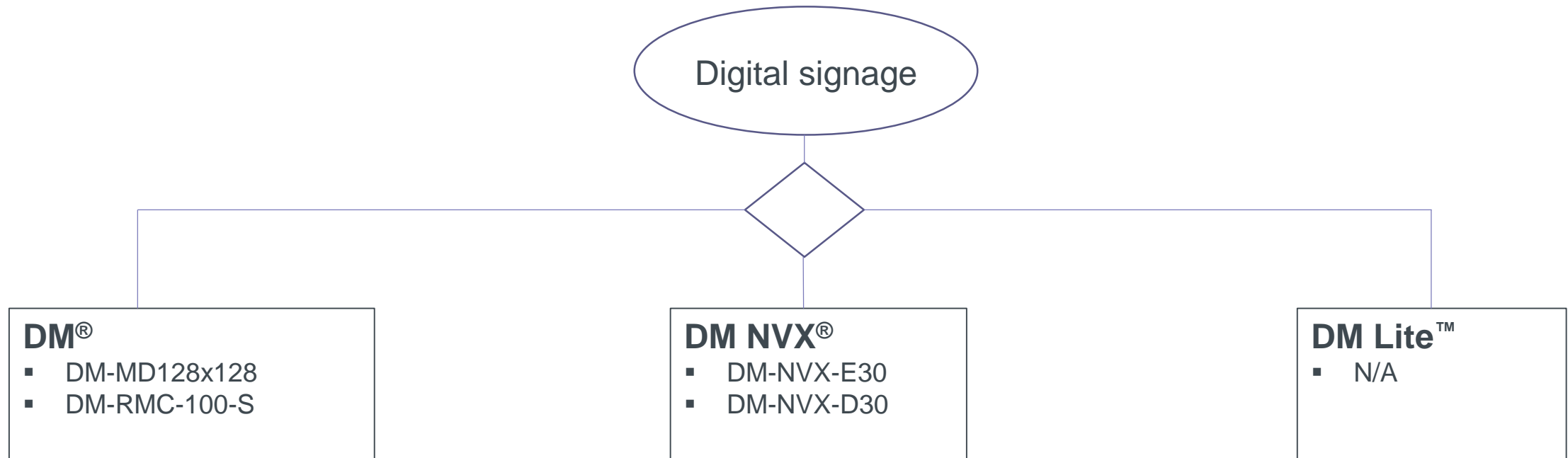# Scenarios

Multipurpose rooms

DM®
- DM-MD16x16
- DM-TX-4KZ-302-C
- DM-RMC-4KZ-100-C

DM NVX®
- DM-NVX-352
- DM-NVX-351
- DM-NVX-350

DM Lite™
- N/A

CRESTRON®

Scenarios

Digital signage

- Eight signage players
- 64 displays (potential for more)
- Enterprise-grade security
- Infrastructure open
- IT involvement

CRESTRON®
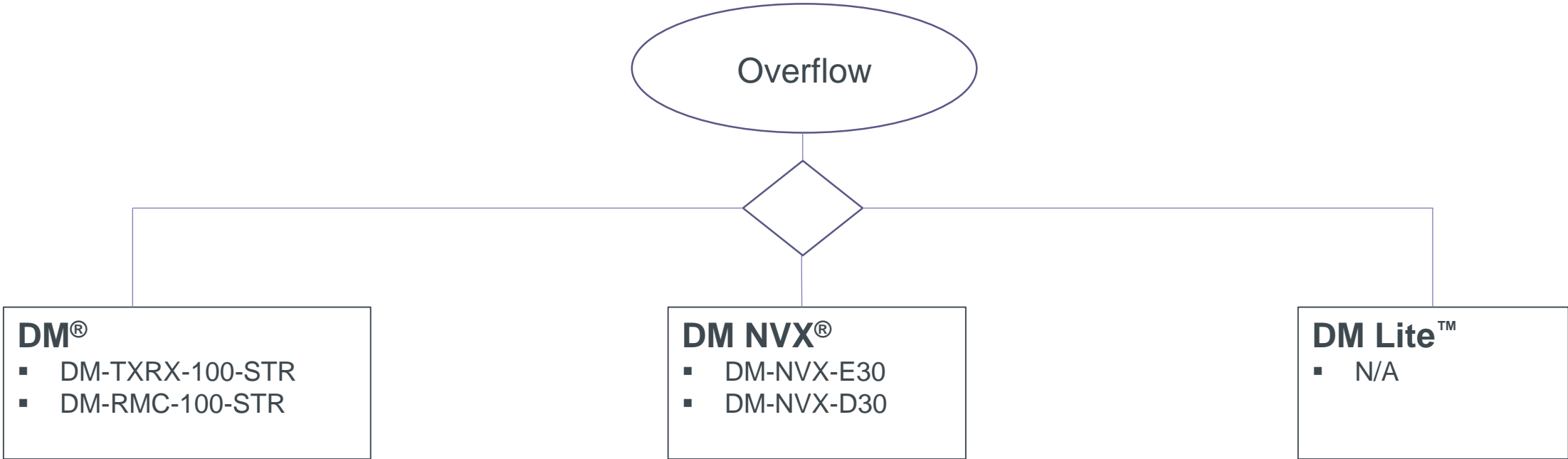
Scenarios

Scenarios

Overflow

- One source feed

- Five overflow rooms with displays

- Infrastructure open

- IT involvement

CRESTRON.

Scenarios

Overflow

DM®
- DM-TXRX-100-STR
- DM-RMC-100-STR

DM NVX®
- DM-NVX-E30
- DM-NVX-D30

DM Lite™
- N/A

Thank You!