

February 14, 2011
Revised on March 31, 2011

Proposal of Production Equipment
Boardroom
Videoconferencing
For the Nebraska Department of Education
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Systems
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System Overview

This proposal is for updating the electronic equipment of the NDE Boardroom to meet the origination and transport of digital high definition video and audio signals for uses such as what is accustomed to like videoconferencing and one-to-many presentations, as well as adding functionality such as training, live video streaming, and archiving. While the first section deals with equipment that will be located in the Boardroom and is primarily for origination of the video and audio signals, the second part deals with the transport and encoding equipment and services required to do live video streaming over the Internet. Although videoconferencing and live video streaming require similar origination equipment, the means of encoding and transporting are quite different. This is because of the different requirements of each of the mediums. Videoconferencing being a low latency highly interactive one, while live streaming being high latency with little or no interaction. So for example, if 'return' audio is required for interaction during a live streaming feed, the conversation needs to take place outside of the delay channel. Otherwise communication is impossible.

The first section contains the lists of equipment grouped into related subsections to hopefully make it a little more understandable. There are four groups: 'Audio', 'Video', 'Control', and 'Cable and Connectors'. Following that there is an estimate for the installation, and includes the actual physical labor, and configuration and programming of the system components. The final group is the totals for the equipment with two options for the origination and transport equipment required for live video streaming.

Boardroom Equipment:

Audio Equipment Proposed:

- High Definition Audio Processor (Digital Virtual Mixer)
- Cardioid gooseneck microphones (eliminates off-axis noise).
- Phone teleconferencing interaction capabilities within the Boardroom.
- Ceiling mounted speakers for best conferencing remote / local isolation.
- Equalization and feedback elimination processing.

Board members and presenters speech is picked by super cardioid gooseneck microphones inputted into a Yamaha AD8HR head amp. From there through a virtual mixture of processing components, it is outputted to the videoconference send and the streaming video audio circuits. The primary audio processor is configurable for a wide array of audio processing requirements, virtually eliminating any external processing equipment. It is also controllable through the Crestron Pro2 control system.

Microphones:

Item	Qty	Part Number	Description	List Ea.	Budget Ea.	Total
1	14	AT857AMLX	Audio-Technica, Cardioid Condenser Gooseneck Microphone (phantom powered)	\$310.00	\$129.00	\$1,806.00
			(\$129. 'budget ea.' from Full Compass Sale Price)			
2	14	AT- (TBD)	Audio-Technica, Touch Control Base	\$65.00	\$56.55	\$791.70
			Total:			\$2,597.70

Audio Components:

Item	Qty	Part Number	Description	List Ea.	Budget Ea.	Total
1	1	DME64N	Yamaha, Digital Audio Processor	\$6,500.00	\$5,655.00	\$5,655.00
2	2	MY16-AE	Yamaha, Mini YGDAI AES Expansion Module	\$679.00	\$590.73	\$1,181.46
3	3	AD8HR	Yamaha, Remotely Controllable 8-channel 24-bit Head Amp and AD Converter	\$2,200.00	\$1,914.00	\$5,742.00
4	2	MY8-DA96	Yamaha, Mini YGDAI AES Digital Output	\$479.00	\$416.73	\$833.46
5	3	D24	Yamaha, Cable from MY16-AE to AD8HR	\$190.00	\$165.30	\$495.90
6	2	DA96	Yamaha, Break-out Cable from MY8-DA96 to XLR-M's	\$100.00	\$87.00	\$174.00
7	1	XAP400	ClearOne, Digital Telephone Hybrid	\$2,250.00	\$1,957.50	\$1,957.50
			Total:			\$16,039.32

'Microphone' Group Budget Price: \$ 2,597.70

'Audio Components' Group Budget Price: \$ 16,039.32

Audio Equipment Total Budget Price: \$ **18,637.02**

Video Equipment Proposed:

- One HD projector 3000 Lumens.
- Optionally another 2 similar projectors, or 2 LCD HD flat panels for side viewing.
- Wideband Routing Switcher for High Definition Video.
- Three Robotic HD Video Cameras.
- Optional HD Digital Video Production Switcher to enhance video streaming feed.

Three HD robotic cameras capture high definition video. The video can be switched into multiple sources including projectors, codec, video streaming encoders, etc. Presentation PC's can also be inputted into the video system, with the ability to present HD computer presentations into the video conference or video streaming experience. The pan, tilt, zoom, and focus controls operate remotely through the Crestron control system. There are presets for each camera to facilitate recalling the most commonly used camera shots.

Video Equipment Proposed:

Cameras and Mounts:

Item	Qty	Part Number	Description	List Ea.	Budget Ea.	Total
1	2	116637	Tandberg, PrecisionHD 1080p Camera	\$4,299.00	\$3,319.60	\$6,639.20
2	3	535-2000-217	Vaddio™, Thin Profile Wall Mount for TANDBERG PrecisionHD Cameras	\$149.00	\$129.63	\$388.89
			Total:			\$6,639.20

Video Components:

Item	Qty	Part Number	Description	List Ea.	Budget Ea.	Total
1	1	DM-MD8X8	Crestron, 8x8 DigitalMedia™ Switcher	\$4,300.00	\$3,741.00	\$3,741.00
2	6	DM-TX-201-C	Crestron, DigitalMedia 8G™ Shielded Twisted Pair Transmitter 201	\$1,300.00	\$1,131.00	\$6,786.00
3	6	DMC-C	Crestron, DigitalMedia 8G™ STP Input Card for DM™ Switchers	\$1,100.00	\$957.00	\$5,742.00
4	2	DMC-HD	Crestron, HDMI® Input Card for DigitalMedia™ Switchers	\$800.00	\$696.00	\$1,392.00
5	1	DMCO-55	Crestron, 4 DM 8G STP w/2 HDMI Output Card	\$2,600.00	\$2,262.00	\$2,262.00
6	1	DMCO-33	Crestron, 4 HDMI w/4 Stereo Analog Audio Output Card	\$1,400.00	\$1,218.00	\$1,218.00
7	4	DM-RMC-100-C	Crestron, DigitalMedia 8G™ Shielded Twisted Pair Receiver & Room Controller 100	\$900.00	\$783.00	\$3,132.00
8	1	CEN-SW-POE-5	Crestron, 5-Port PoE Switch (unmanaged)	\$400.00	\$348.00	\$348.00
9	1	915W	Epson, PowerLite 915W Multimedia Projector	\$1,299.00	\$1,130.13	\$1,130.13
10	1	TBD	Peerless, Ceiling Mount for Epson 915W Projector	\$245.00	\$213.15	\$213.15
9	2	LC-60LE810UN	Sharp, 60" LED-backlit LCD TV - 1080p (FullHD)	\$2,400.00	\$2,088.00	\$4,176.00
10	2	HRM-100	Hercules, Plasma and LCD TV Dual-Arm Wall Mount	\$290.00	\$252.30	\$504.60
			Total:			\$30,644.88

‘Cameras and Mounts’ Group Budget Price: \$ 6,639.20

‘Video Components’ Group Budget Price: \$ 30,644.88

Video Equipment Total Budget Price: \$ **37,284.08**

Control Equipment Proposed:

- IP Control Capability through VPanel interface and Internet Explorer browser.
- PTZ control of HD cameras.

The iPad and Crestron Mobile Pro G app for iPad have been included in the pricing as an alternative to using a laptop as the control screen. There is a possibility that the iPad will not work in a wireless mode within the 6th Floor of the State Office Building. Further testing will be required if the iPad is to be used as a touch panel control device. Plan on using an existing laptop for this purpose until it can be determined if the iPad can be utilized in this environment.

Remote Control Components:

Item	Qty	Part Number	Description	List Ea.	Budget Ea.	Total
1	1	PRO2	Crestron, Pro2 Control System	3,600.00	\$3,132.00	\$3,132.00
2	1	C2ENET-2	Crestron, Dual Ethernet Port Module for PRO2	1,300.00	\$1,131.00	\$1,131.00
3	1	iPad	Apple, iPad for Touch Panel Interface (via App)	600.00	\$522.00	\$522.00
4	1	CresApp	Crestron, Mobile Pro G	300.00	\$261.00	\$261.00
			Total:			\$5,046.00

Control System Equipment Total Budget Price: \$ 5,046.00

Video Conferencing Capability

- HD 1920x1080p maximum resolution.
- PTZ HD Camera included.

Video Conferencing Components:

Item	Qty	Part Number	Description	List Ea.	Budget Ea.	Total
1	1	1198252	TANDBERG, Integrator Package C40 4x - includes Codec C40, PrecisionHD 1080p 4x camera, 2 HDMI cables and 1 table microphone. Natural Presenter Package (NPP) is included.	\$7,167.40	\$7,167.40	\$7,167.40
2	1	1198252V27	TANDBERGIntegrator Package C40 4x 1 Year Constant Care Core Advanced Service YEAR 1	712.00	\$712.00	\$712.00
			Total:			\$7,879.40

HD Video Conferencing System Total Budget Price: \$ 7,879.40

Cables, Connectors, and Miscellaneous

Cables, Connectors and Miscellaneous:

Item	Qty	Part Number	Description	List Ea.	Budget Ea.	Total
1	1	DM-CBL-8G-P-SP500	Crestron, DigitalMedia 8G™ Cable, plenum, 500 ft spool	\$600.00	\$522.00	\$522.00
2	1	DM-8G-CONN-100	Crestron, DigitalMedia 8G™ Cable Connector, 100-Pack	\$500.00	\$435.00	\$435.00
3	1	DM-8G-CRIMP	Crestron, Crimping Tool for DM-8G-CONN	\$800.00	\$696.00	\$696.00
4	250	Clark – RS422	Clark, Cable for Camera VISCA Remote Control (plenum rated)	\$0.80	\$0.70	\$174.00
			Total:			\$1,827.00

Cables, Connectors, and Miscellaneous Total Budget Price: \$ 1,827.00

NDE Boardroom System Installation:

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Item	Qty	Part Number	Description	List Ea.	Budget Ea.	Total
1	1	NET-INSTALL	NET, Installation of NDE Boardroom System	\$5,000.00	\$5,000.00	\$5,000.00
			(Complete system installation)			
			Total:			\$5,000.00

NET Installation of NDE System Total Budget Price: \$ 5,000.00

Combined Total Costs with One HD Projector and Two 60-Inch LCD Flatpanels:

			NDE Boardroom Equipment Total (before Live Web Video Streaming):			\$75,673.50
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Total Budget Price of Live Streaming Option:

NDE Live Video Internet Steaming and Archive Cost Estimate

NET Internet Video Streaming Service:

Item	Qty	Part Number	Description	List Ea.	Budget Ea.	Total
1	1	NET-VSTREAM	NET, Live Web Video Streaming Service – per month (Live Broadcast – ex. 8 three hour sessions)	.30 per G	10.00 per mo.	\$10.00
2	1	NET-VARCHIVE	NET, Web Archive Service – per month (Stored as web object for web site linking).	1.20 per G	40.00 per mo.	\$40.00
			Total Estimated Video Streaming and Archive Costs per Month:			\$50.00

			Total NDE Live Web Switched Video Streaming:			\$ 50.00 per month*
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Final cost will be determined by OCIO and NET and will be available after July 1, 2011. The Live Video Streaming as well as the recording of video conferencing infrastructure is currently in place. But the archive repository and asset management portion will be forthcoming around the July 1, 2011 or later time frame.

Additional Considerations:

There are a few items regarding the installation that must be completed by the state building division for the State Office Building. An AC receptacle must be installed at each location of where a camera will be located (if one does not exist). The same for where each of the projectors or LCD flat panels will be located. Each location needs to have an AC outlet installed if one is not currently available.

Usually the cable within state buildings must be installed (pulled in) by the OCIO cable department (Matthew Easton – OCIO, 402-471-2761). We can work with them to make the few cable runs that will be required.

Equipment Informational Links:

Crestron 8G DigitalMedia 8x8 Router Link:

http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?cat=1047&subcat=1362&id=1722