CASE STUDY

Duke Law School Modernizes Lecture Halls and Moot Courtroom with Extron AV Solutions

Extron

Room 3037 lecture hall with a projection screen, plus side flat panel display. Accommodates 89 students and four instructors.

"This is a world-class education facility. The fit and finish is traditional and sophisticated. The faculty expects that, and students feel it. It sets the mood for the learning experience. The furniture is formal. The student seating arrangements are formal. That high bar extends to the teaching technology, demanding polished AV production values for video, audio, recording, and streaming. Throughout Kontek's long association with Duke, our priority is to always exceed expectations, which is why Extron is one of our trusted suppliers."

Kim Durack
Senior Account Manager
Kontek Systems

Duke University School of Law in Durham, North Carolina, is one of the world's leading law schools. It is recognized for its outstanding faculty and scholarship, a curriculum that integrates professional skills development and a cross-disciplinary approach to learning and teaching. Students come from across the United States and from all over the world. Duke Law alumni work in top law firms, companies, and non-profit organizations. The professors are respected experts in their fields. Duke Law School fosters a collaborative environment that values not only rigorous study but also cooperation and support. Students enjoy close interactions with faculty and peers. Supporting those interactions are audiovisual learning systems in teaching spaces that span the campus. And supporting those AV systems are AV switching, distribution, and control products from Extron.

CHALLENGES

Duke Law School has long relied on audiovisual teaching systems in its teaching spaces. When the time came to refresh existing AV in three lecture halls and a moot courtroom, Duke Law's AV team upgraded the equipment with the latest Extron products, including NAV® Pro AV over IP. The upgrade resulted in an immediate boost in system reliability and also introduced user-friendly control capabilities not previously available with the older technology.

Room 3041 lecture hall with a projection screen, plus side flat panel display. Accommodates 159 students and eight instructors.

To get the upgraded AV systems up and running, Duke Law's Instructional Technologies Consulting Manager Miguel Bordo enlisted long-time Duke supplier Kontek Systems of Durham, NC for professional AV system design and integration services. Kontek recommended Extron AV products based on quality, reliability, and immediate off-the-shelf availability.

"We know that Extron has a reputation for smooth installation and reliable operation. When Kontek recommended NAV Pro AV over IP, we said yes. We are more than happy. I've been at Duke Law for 18 years, and I've worked with Kontek for that long. This was the smoothest install that I've experienced."

Miguel Bordo
Manager, Instructional Technologies Consulting
Duke University School of Law

DESIGN SOLUTION

Key design goals were implementing AV over IP signal distribution, providing the ability to route signals to multiple rooms for overflow, full streaming and production capabilities from the production control room, and the ability to tap into the control system from the AV staff office and elsewhere to perform remote maintenance and user support. Another priority was to retain the look and feel of the touchpanel user interface that people were accustomed to.

NAV Pro AV over IP Network Handles AV Switching and Distribution

A 1 Gbps NAV Pro AV over IP network distributes HDMI, USB, and audio signals between a variety of sources and destinations in lecture halls 3037, 3041, and 3043, moot courtroom 4049, a production control room, and the AV staff office.

Lecture Halls

AV Content Sources. The three lecture halls share a common AV system design. Two PTZ cameras at the front and back of

Room 3043 lecture hall with a projection screen, plus side flat panel display. Accommodates 89 students and five instructors.

the room feed HDMI signals into the AV over IP network via NAV E 101 encoders. Guest laptops connect via HDMI cables at the instructor lectern and at the front instructor table through NAV E 201 D and NAV E 101 encoders, respectively. NAV E 101 encoders also connect an Apple TV and a Blu-ray player to the AV over IP network. The Apple TV allows wireless content sharing from mobile devices. For video conferencing, a PC running soft codec UC apps communicates over the AV over IP network through HDMI and USB via a NAV E 501 encoder.

Displays. The lecture halls have a projector and a flat panel display. Both receive HDMI content and RS-232 control through the AV over IP network via NAV SD 101 scaling decoders, as do the monitors on the lectern and the instructor desk.

Storage, Streaming, Conferencing. NAV decoders feed AV content to Duke's Panopto enterprise platform for recording and sharing lecture video. A MediaPort® 200 scaling bridge connects to the AV over IP network via HDMI and USB through a NAV SD 501 scaling decoder.

The USB connectivity enables the MediaPort 200 to provide AV program content to the conferencing PC. The MediaPort 200 also receives voice audio from the room's microphones via the room's audio system so that far-end teleconference participants can hear the voices of presenters and the audience in the lecture hall.

Moot Courtroom 4049 has two ceiling-mounted flat panel displays and a mobile flat panel display. The room seats 56 spectators.

Touchpanels in all rooms feature intuitive buttons for setting all AV system functions and room lighting. (WL=Wireless, CR=Control Room).

Sound. A Dante/AES67 network distributes and processes audio delivered from the NAV AV over IP network via a NAV SD 101. Voices are captured by ceiling array mics, lectern and instructor table mics, and wireless handheld and bodypack mics. Volume/mute for each audio source is individually adjustable from touchpanel sliders and buttons. Ceiling speakers and front column array speakers driven by a 200 watt XPA amplifier deliver sound to the lecture halls. Assisted listening is available via RF receivers and Wi-Fi over smartphones.

AV System and Room Control. Each lecture hall is equipped with a 12" tabletop TouchLink® Pro touchpanel and a quad core IPCP Pro xi control processor. The touchpanels have buttons and sliders for AV system on/off, video and audio routing, sound volume/mute, projection screen raise/lower, room lighting on/off/dim and window shade raise/lower. A NAVigator system manager configures and manages the NAV AV over IP network, not only during initial network setup, but also for day-to-day AV system maintenance.

Moot Courtroom

Moot courts simulate real-life court proceedings. Students stand before professors and peers to test classroom knowledge and oral skills.

The Moot Courtroom shares the same NAV AV over IP design as the lecture halls. A 12" tabletop TouchLink Pro touchpanel allows users to control the AV system and room lighting. The AV sources are two PTZ cameras, an AV-equipped lectern, guest laptops on the judge's bench, the plaintiff table, and the defense table, an Apple TV unit for wireless sharing from mobile devices, and a Blu-ray player. Video is viewed on ceiling-mounted flat

In the control room, a Tricaster control panel and TLP Pro touchpanel put creative options at the fingertips of event producers.

"We encourage members of our design and installation teams to sign-up for Extron training courses and to earn Extron certifications. Extron courses are always thorough and can be demanding. Our pool of Extron-trained designers and technicians are in the field every day solving complex AV challenges. Extron training enables our team!"

Kim Durack
Senior Account Manager
Kontek Systems

panel displays on either side of the room, plus a mobile flat panel display. Voices are picked-up by a ceiling mic, mics at the witness stand, the counsel table, the jury box, the judge's bench, and at the lectern. Two wireless mics are also available. Volume/mute for each audio source is individually adjustable at a touchpanel. Overhead speakers deliver sound to the room.

Control Room

The control room is a live production studio for symposia, speaker series, and similar high-profile events that demand polished media presentation. It's also an AV media distribution hub that allows content from any of the four rooms to be fed to the other rooms for overflow audiences, as well as streaming to the internet for remote audiences. The AV staff can assist instructors and presenters from the control room by remotely monitoring and controlling AV functions in the rooms.

A Tricaster® switches, streams, and records AV content from any of the rooms, and provides transition effects, virtual set backgrounds, and other production enhancement features. It receives video and audio content from the AV over IP network and the Dante/AES67 network. It outputs the live-switched content to a NAV E 101 encoder, which connects program content back to the AV over IP network for distribution to displays in any of the rooms. The Tricaster can stream content directly to the Internet for live or on-demand viewing on YouTube and similar platforms.

Production personnel monitor program content and view the Tricaster workspace GUIs at two desktop monitors and a 42" wall mounted monitor. The three monitors connect to the AV over IP network through NAV SD 101 scaling decoders.

An IPCP Pro xi control processor and a 15" tabletop TouchLink Pro touchpanel provide the control interface. The production crew can select any of the four rooms by tapping a button on their touchpanel. From there, they have the same control over the room as the in-room touchpanel. A monitoring function lets the crew view any of the rooms from the rear PTZ camera, hear the audio from the selected room, and monitor the program content from the various sources in the room.

Remote Maintenance and User Support From The AV Staff Office

The AV staff office is tied into the same enterprise LAN and AV networks as the lecture halls and courtroom. The AV

Some of the AV system racks that service lecture halls 3037, 3041, and 3043.

maintenance staff can monitor and control the AV systems in any of the rooms remotely from their office for system maintenance, management, and user assistance.

The AV staff office connects to the AV over IP network via a NAV SD 101 scaling decoder, which feeds HDMI to an SMP 111 streaming media processor. The office has its own network switch, which connects to network switches in the other rooms via 10 Gbps fiber optic Ethernet links.

The SMP 111 HDMI output feeds a monitor in the AV staff office, allowing staff to view content coming from the AV over IP network. The SMP 111 also streams the AV content to Duke's LAN, allowing viewing on any streaming-capable device connected to the LAN.

A PC in the staff office mirrors the touchpanels in the lecture halls and courtroom. From this PC's display, AV staff monitors the touchpanels in the rooms and can control the AV systems in the rooms by mouse-clicking on the mirrored touchpanel GUIs. AV staff can monitor and control from anywhere via remote login to the office PC.

RESULTS

Duke Law School has been creating in-house AV media since the 1990s and has a sophisticated infrastructure for producing, disseminating, and archiving this media. This infrastructure is continually updated to take advantage of technological advances and to refresh hardware and software that is nearing end of useful life. The update of rooms 3037, 3043, 3041, and 4049 decommissioned older and sometimes failing equipment and took advantage of the latest AV over IP technology to

"Compared to the legacy AV systems, the AV over IP topology requires fewer components, yet delivers more capability and easier scalability. We can take content from one classroom and feed it into another for overflow audiences. It's a capability we've always had and was a must-have requirement for the retrofit. It's working great through the AV over IP network."

Miguel Bordo
Manager, Instructional Technologies Consulting
Duke University School of Law

improve flexibility and usability of these learning spaces. The look and feel of the user interfaces were preserved as part of the changeover from old to new.

Users are satisfied with the AV tools in the updated rooms. They are comfortable with the AV systems, since the user interface is familiar. The controls are user friendly and there is not much of a learning curve. Duke Law AV staff is particularly satisfied with the results. They like the snappiness of the touch panels compared to the ones that were replaced, and they are impressed with the reliability and flexibility of the NAV Pro AV over IP network now being used to switch and distribute AV content between rooms and to the school's various online video sharing platforms for students and the general public.

FEATURED EXTRON PRODUCTS

Model	Description
NAV E 101	1G Pro AV over IP Encoder - HDMI
NAV E 201 D	1G Pro AV over IP Encoder - HDMI – Decorator-Style Wallplate
NAV E 501	1G Pro AV over IP Encoder - HDMI, Ethernet, and USB
NAV SD 101	1G Pro AV over IP Scaling Decoder - HDMI
NAV SD 501	1G Pro AV over IP Scaling Decoder - HDMI, Ethernet, and USB
NAVigator	Pro AV over IP System Manager
MediaPort 200	HDMI and Audio to USB Scaling Bridge
SMP 111	Single Channel H.264 Streaming Media Processor
XPA U 2002 SB	Two Channel Bridgeable Output Amplifier 200/400 Watts Per Channel
TLP Pro 1225TG	12" Tabletop TouchLink Pro Touchpanel
TLP Pro 1525TG	15" Tabletop TouchLink Pro Touchpanel
IPCP Pro 255Q xi	IPCP Pro xi Quad Core Control Processor
IPCP Pro 555Q xi	IPCP Pro xi Quad Core Control Processor
IPL EXP RIO8	Control System I/O Expansion Interface
Cable Cubby 1402	Cable Access Enclosure for AV Connectivity, Remote Control, and Power

DUKE LAW VIDEO LINKS

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