Arsenal Moves from Aging System to New Age of Network-Based Technology with Quantum

ARSENAL TECHNICAL HIGH SCHOOL
Indianapolis, IN

The Challenge

- Design a system supporting inter- and intra-building communications between 15 buildings on 76 acres
- Leverage a campus-wide network supporting more than 700 stations
- Underground copper cables require repair or replacement

The Solution

Part of the Indianapolis Public School system since 1912, Arsenal Technical High School is set within a beautifully wooded campus near the heart of downtown Indianapolis, Indiana. The oldest buildings on campus date to the 1860s, when they served as an arsenal for the Union Army during the Civil War. For many years, Arsenal Technical was one of the largest high schools in the nation.

The school had used a Bogen Multicom-2000® Administrative Communications System since the late 1990s, consisting of six different Multicom systems. This system relied on copper cables that were beginning to fail; wiring that ran through a web of damp tunnels was especially troublesome. Arsenal Technical turned to Fairchild Communications to develop a long-term solution that would fit their communications and budgetary needs.

Owner and engineer Charles Fairchild was aware of the current installation and the service problems that Arsenal Technical was experiencing. He was also one of the first contractors in the country certified on Bogen Communications' new Quantum Multicom IP communications system. Fairchild suggested that Arsenal Technical upgrade to a Quantum solution. "Arsenal Technical was pro-Quantum from the beginning," said Fairchild. "They already had a positive experience with Bogen and its products and saw Quantum as the answer to their problems." Upgrading to Quantum would alleviate the need for wires in tunnels, leverage existing network infrastructure and seamlessly tie together the separate Multicom-2000 systems, and allow for possible future connection to other schools within the district – all without requiring extensive equipment purchases.

System Components

Bogen national training manager Scott Hepler worked with Fairchild's director of engineering Mike Cast and lead technician Eric Scott to install six Quantum processor cards into the high school's existing Multicom equipment racks. As an existing Multicom customer, the high school was able to upgrade to a Quantum system easily by replacing the processor cards in their existing hardware with the new Quantum processor card (QSPC1). These cards would now represent interconnected network nodes in the facility's IT infrastructure. Backwards compatible with all Multicom-2000 systems, the Quantum processor card quickly installs into existing racks and wall-mount systems to provide users with new and enhanced operating features. The high school currently uses wall and rack mount units, but is looking to the new Quantum Compact Rack (QCR48) unit for future expansions.

"After surveying the site and downloading the current station and schedule programming, we disconnected the existing analog copper network," Fairchild explained. "We replaced the processor cards and upgraded the firmware to the wall display." The installation also included upgrading existing administrative telephones and performing a full-system test. Station programming was re-entered exactly as it existed on the old network, resulting in an effortless upgrade.

The Result

Installation, programming and testing took only three days during the summer, giving the school a reliable, comprehensive communications network in time for the 2007-08 school year. The expandable, six-node system includes over 700 call switch and speaker stations, and allows Arsenal Technical to abandon the dedicated copper wiring in favor of seamless integration of all the previously separate systems using the campus network.

School administrators are excited about having network access to operational features, the excellent sound quality, and campus-wide all-call capabilities. With Quantum, school administrators control bell schedules, announcements, and alarm tones for two separate schools on the campus from an easy-to-use browser-based interface;

BOGEN®

The Result (cont'd)

can interconnect and communicate between multiple Quantum nodes distributed throughout their campus; and record system announcements and save them using the Quantum Commander from any authorized computer. Facilities and operations representatives rave about the network access. "The ease of programming is very beneficial," says Sylvia DeWitt, Assistant Campus Administrator in charge of buildings and grounds. "Our utilities staff has typically handled changes, but with Quantum, when I need to I can go in and make the changes that I need to without difficulty."

Arsenal Technical makes good use of Quantum's extensive bell system, assigning different sounds for different commands, including normal daily activities and emergency procedures. The staff has been trained on the various tones and schedules and when a response is necessary can now act in real time. "Quantum enables me to communicate with all 16 buildings at once, using bell tones or announcements," adds Bogard. "The staff and the students have responded very positively to the new system."

System Highlights

Bogen's Quantum Multicom IP is a comprehensive communications network that connects administrative areas and staff locations in a single building, multiple building sites throughout a campus, or an entire school district. Quantum enables facility- or district-wide mass notification, paging to zones or select point-to-point communications. Emergency notification, direct-dial 911, emergency alarm tones, pre-recorded messages and network time synchronization are possible, and Quantum also supports media control of VCRs and DVDs. The system nodes are interconnected using existing network infrastructure. In many installations this greatly reduces the need for long home-run wiring, conduit, trenching, surge protectors, and associated installation costs.

Quantum is highly scalable, with as many as 64 processor nodes combining to serve up to 16,000 stations per facility, and up to 99 facilities possible in a Quantum district. A full 64-node system handles up to 960 central office telephone lines, and up to 512 non-blocking calls and pages. Distributed facility architecture allows for convenient deployment of hardware throughout a facility, and easily accommodates future expansion.

Each Quantum system includes a built-in master clock with 32 schedules, including calendar-based holiday schedules, and up to 1,024 programmable events per facility. Each unit offers up to 64 multipurpose time/paging/security zones.

The Quantum Commander is Quantum's comprehensive, browser-based control suite, enabling administrators to control facility bell schedules, announcements, alarm tones, and many other features from the easy-to-use interface; and interconnect and communicate between multiple Quantum systems within a building, campus or district.

Quantum Commander allows access from any computer and eliminates the need for special PC software. Authorized personnel easily access functions related to the manual setup of tones, pre-recorded messages, external equipment operation and schedule selection through the intuitive user interface. Quantum also enables equipment maintenance personnel to access, configure, and update system software remotely, reducing the need and cost of site visits.

Product Highlights

Processor Cards

The Quantum Model QSPC1 Processor Card is required to operate the Quantum Multicom IP system. Containing a PowerPC CPU, 12 channels of DSP, non-volatile flash memory, and two Ethernet Local Area Network (LAN) interfaces, the card handles all system operational functions. The card also contains a crystal-controlled real-time clock (with battery backup), relay driver circuits, external function inputs, audio tone synthesizer, and voltage supervision circuits.

Administrative Display Telephones

The Bogen MCDS4 is a 12-push-button DTMF-dialing telephone, designed as an administrative station in Bogen Multicom-2000® and Quantum Multicom IP Systems. The MCDS4 incorporates a high-contrast supertwist LCD-type display panel, and a unique, easy-to-read menu-driven display system to provide rapid, efficient, and reliable control over the system's paging, intercom, or signal distribution features.

Rack-Mount Systems

The Quantum rack-mount system supports up to 250 stations. Any rack system can function independently or as a node in a larger, distributed system of up to 64 nodes supporting as many as 16,000 stations. Quantum is built into a standard 19-inch rack and may be from 44 to 77 inches high, depending on customer requirements. Each rack houses one QSPC1 processor card.

Wall-Mount Systems

The space-saving wall-mount unit supports up to 130 stations in a 24 x 32 x 10-inch cabinet. The wall-mount system may function independently, or as a node in a larger, distributed system serving up to 16,000 stations. The compact size of the unit allows for more flexible placement within any facility. The wall-mount unit is home to one QSPC1 processor card, and supports all the functionality of the larger, standing rack unit.

System Equipment

QSR-Series
Quantum Rack System

QSW-Series
Quantum Wall System

QUANTUM COMMANDER
Browser-based Control Suite

MCDS4
Administrative Display Phone

QSPC1
Quantum Processor Card

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