Fraser Public Schools wanted a robust network to support their 1:1 initiative, Delta provided a first class solution

Fraser Public Schools, located in Fraser Michigan, understood that students learn differently than when we went to school. "It was time to re-design the learning environment to better prepare students for their future so they have the skills needed to compete in a global world" said Kris Young, Director of Educational Technology and Information Systems. The district didn't have much in the way of wireless (Wi-Fi) network connectivity, limited

to only a few mobile carts that were moved around the buildings where needed and a couple hot spots. The district realized several key points: Students learn **Differently,** Remote access was **Demanded,** Students want to use their own **Devices,** Learning environments are **Changing**, Budgets and support staff are **Decreasing**, Technology integration needs are **Increasing**. **F**raser has 9 school buildings on campus, a football

stadium, administration building plus a couple service buildings. The existing wired network was limited to 10/100Mbps and didn't provide Power-over-Ethernet (PoE) to support planned devices such as wireless access points, security cameras and Voice over IP phones. The district required a system that could be centrally managed, allowed for multiple security and authentication methods and could easily be expanded.

The district's plan was to deploy wall to wall wireless coverage so students, as well as staff members and guests, had anytime anywhere connectivity to all resources on campus with the eventual goal of launching a 1:1 initiative where every student is assigned a wireless learning device.

The district also wanted to embrace students bringing their own computers and devices, know as BYOT, or Bring Your Own Technology. However, since these devices aren't owned or controlled by the district, they needed a way to safely and securely allow them access to the network. The new WLAN had to provide an easy but secure way for student and guest users, with a wide variety of devices, a simple way to access the network. Kris

REQUIREMENTS

- Support for current 802.11n wireless standards with backward compatibility and expandability
- 100% Wi-Fi compliant
- Support for all devices Tablets, Phones, Mac, Linux, Windows (Win7, IOS, Android, etc.)
- Secure environment
- No mass management of encryption keys on individual workstations
- Allow known, trusted users and guest access
- Seamless roaming between APs
- Centralized management of WLAN
- Ability to deny given protocols (ie. ICMP, NetBIOS, etc.)
- Min 65dbi wall to wall AP coverage
- Power over Ethernet
- Support high density user environment

Young went on to state, "We wanted to ensure our network was easy to access for staff, students and the community when they are in the buildings to visit. And, with limited support staff resources, the system had to be easy to maintain."

The district's technology bond consultant, Convergent Technology Partners, assisted in the selection of a company that could provide the network infrastructure that would support their vision of the "21st Century Learning Community". After evaluating several other vendor's solutions, Fraser

awarded the contract to Delta Network Services, an Auburn Hills Michigan based firm. The solution is comprised of Extreme Networks Ethernet switches for the wired backbone and a WLAN system from Aruba Networks. Kris Young said, "Both the Extreme and Aruba systems had all the features we were looking for and was below our project budget." "Delta Network Services completed the installation and integration of the systems ahead of schedule, even installing our wireless network before school started when it was initially slated to finish in December. They were a pleasure to work with and I feel their knowledge of the products was key to our successful installation." The Ethernet switches from Extreme Networks, all from their Summit family of products,

provide a wired network consisting of 10GB connections between all buildings and all closets within the buildings. They provide the district with 10/100/1000MB connectivity at the edge with PoE+ to support the wireless access points, as well as, planned addition of IP security cameras and Voice over IP (VoIP) phones. Fast connections are provided by wire-speed routing within the Extreme Summit X650 at the core. Ridgeline, Extreme Networks management platform, provides and easy and intuitive single point of management for the districts entire wired network. "Our previous network did not have this type of visibility and toolset. This allows us to look into the overall health and state of the network quickly and easily" said Kelly McCarty, Network Administrator at Fraser.

The Aruba system provides high availability, maximum up time, and redundancy. The solution consists of (1) Aruba 6000 chassis with (2) M3 controllers each capable of terminating up to 512 campus AP's. The dual M3 controllers are configured for redundancy so if the primary controller should fail, all AP's remain operational via the secondary M3 controller. This level of redundancy is provided via standards based Virtual Router Redundancy Protocol (VRRP), further demonstrating Aruba's support of standards based protocols.

To ensure accessibility to the wireless network, Fraser has deployed 287 Aruba model AP-105 dual radio 802.11a/b/g/n access points in classrooms and hallways throughout the district. 19 model AP-135 dual radio 802.11a/b/g/n access points were deployed in high density areas such as the cafeteria and auditorium where 500 or more users are expected to connect simultaneously.

SOLUTION

- Extreme Networks wired switches providing 10/100/1000MB PoE connectivity and 10GB backbone links

- Extreme Ridgeline to centrally manage the wired network infrastructure

- Aruba 6000 with redundant wireless controllers for maximum uptime

- Aruba AP-105 access points for wall to wall coverage

- Aruba AP-135 access points in key high density areas

BENEFITS

- Plenty of bandwidth to support 7,000—10,000 wireless devices

- Campus wide Wi-Fi system

- Centralized RF management

- Thin AP model providing security as well as lower cost of ownership

- Wi-Fi "Overlay" simplifying deployment.

- Lifetime warranty on key components

"We wanted to ensure our network was easy to access for staff, students and the community when they are in the buildings to visit. And, with limited support staff resources, the system had to be easy to maintain." *said Kris Young, Director of Educational Technology and Information Systems..*

A big benefit of deploying the centrally managed Aruba system for the Fraser support staff will be when it comes time to roll out a new software version on the access points to support a new feature or function. "You simply upgrade the software on the centrally located Aruba Controllers and the updates automatically get pushed out to every AP in the network. This will save a lot of time.", said Kelly McCarty.

To ensure the network is easy to access and secure on the client side, several authentication methods are utilized. 802.1X is used for staff and student device connectivity and the Aruba Captive Portal is used for guest users. Guests associate to the wireless network, open their web browser and are quickly redirected to a Captive Portal which forces the user to review the AUP (Acceptable Use Policy) prior to gaining network access. Staff and Student devices authenticate using their activity directory domain login credentials which uses 802.1X as the authentication method that ties into a backend RADIUS server to validate the user name and password. Once these users are successfully authenticated, a unique AES encryption key is automatically assigned to that client's machine providing secure encryption. No shared keys are required further simplifying on-going support.

The Aruba system software, AOS, allows the support staff to dynamically create security rules based upon individual users or groups of users - granting them permission to systems, protocols or destinations appropriate for their given role in the wireless domain. The entire wireless system is managed from a single point in the network and includes advanced features such as Automatic Radio Management (ARM) calibration (including channel assignment and AP power level adjustments) and user mobility tracking. This feature is especially important for any organization moving towards Wireless VoIP phones where E911 locator service is critical.

"Delta Network Services ensured our project success by pre-staging our Extreme and Aruba equipment in their lab to ensure everything would operate as designed before it actually arrived on-site. This methodology ensured not only a successful project, " said Kris Young. "Delta was very instrumental in making sure all of our goals and major deadlines were exceeded."

"The Fraser network/wireless project was very exciting for us at Delta and we are happy to have been a part of the process. The staff at Fraser are visionaries that have an excellent plan to create a 21st Century Learning Community." said John Zawacki— Project Manager at Delta Network Services. "Customer satisfaction is what Delta Network Services is all about. As a company, we differentiate ourselves from the competition by providing an unmatched level of personalized service to our customers."
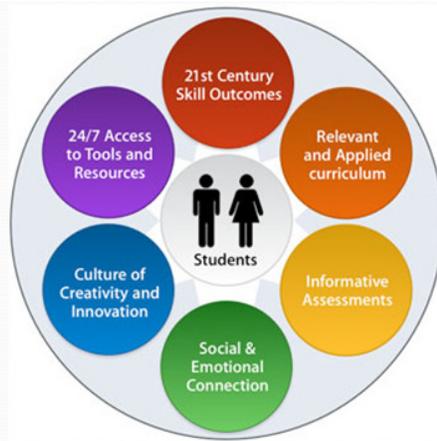
DELTA NETWORK SERVICES

Delta was formed as a partnership in 2001 and is privately held. Our three founders continue to be fully engaged in the day to day operation of the Company. We are a premier provider of converged IP network solutions. We specialize in the design, installation and maintenance of converged IP networks supporting data switching and routing, voice over IP (VoIP) and IP-based video distribution over secure wired and WLAN infrastructures.

Based in Auburn Hills, we provide all of our services in Michigan and areas of the Midwest, with product sales, design and consulting services available nationwide.

Our people are truly what separates us from our competition. It is our collective mission on every project to leave our customers delighted with the results and happy to become our latest reference account. We invite you to experience the Delta difference.

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