



Empowering Students and Teachers with Streamlined Access and Opportunity



“Our goal was to choose a new system that would get information to student and faculty users faster and easier, with access virtually everywhere on and off campus.”

- Stephen Choi, Director of Technology, San Marino Unified School District

Situation: Quest for Higher Performance

Located in central Los Angeles County just south of Pasadena, the City of San Marino lies nestled in a valley below the foothills of the San Gabriel Mountains. In addition to its picturesque surroundings and gracious lifestyle, San Marino Unified School District has the distinction of being the top-ranked K-12 unified school district in terms of the academic performance index (API) for the past five years. San Marino High School is also a Gold Medal Winner in *U.S. News and World Report's* 2008 listing of top-performing U.S. high schools.

“We face two major challenges,” says Stephen Choi, director of technology, San Marino Unified School District. “The first is the rapid growth of Internet-based educational resources such as streaming multimedia content. The second is a huge increase in the number of students with Internet-enabled wireless laptop computers, phones and other devices.”

The district quickly recognized that to accomplish their goals, its communications technology needed to be faster, more powerful and more mobile. The technology upgrade project was planned in stages, beginning with the multi-building high school campus. The objectives were clear. The high school needed high-speed Wireless Local Area Network (WLAN) connectivity, campus-wide mobility, multi-user streaming multimedia capabilities and the need for a forward-looking network in terms of standards and performance. The search began for a high-performing network solution that would meet all these requirements now and into the future.

Solution: High-Speed Wireless Network

The district decided to partner with Moonblink Communications, a highly experienced wireless solutions distributor headquartered in Sunnyvale, California. “We did quite a bit of research looking at what technology is available on the market,” notes Choi. Together, the team selected a Motorola 802.11n WLAN. “San Marino had a very good idea of what they wanted,” says Moonblink’s CEO, Darrell Alfaro. “At the core of their vision was the ability to have multiple users, including both students and faculty, using streaming

CUSTOMER PROFILE

San Marino Unified School District:

- K-12
- Schools: two elementary, one middle, one high school
- 3,200 students
- 300 staff members

Solution:

- Motorola 802.11n WLAN
- AP-7131 Access Points
- AP-5181 Access Points for outdoor coverage
- Mesh football stadium coverage

Results:

- High-speed campus-wide coverage
- Savings of \$100 per Ethernet drop
- Streaming video of football games



"In a nutshell, the district's current LAN environment just did not have enough throughput for what they wanted to do."

- Darrell Alfaro, CEO, Moonblink Communications

multimedia from the Internet at the same time. We believed that the high-bandwidth Motorola 802.11n WLAN, with throughputs of 150 Mbps, would be the ideal network for the district."

Results: High-Speed Campus Wide Coverage

Benefits have been instantly apparent and response has been gratifying. "Users have been very positive about how easy the network is to use," notes Choi. "Many are surprised at the capacity. We have one classroom with about 30 laptops, and even in that difficult environment, users have been able to enjoy good performance." In addition, complaints of interrupted service that used to be common have become virtually non-existent.

Wireless vs. Wired

The district explored a number of wired and wireless technology options. With the help of Moonblink, they eventually chose to go with a wireless broadband network for two crucial reasons: performance and cost.

In terms of performance, a wireless broadband network would optimize mobility and throughput. High bandwidth services would be available virtually everywhere on or off the high school campus, indoors or out.

There were two aspects to cost; the first involved two types of recurring costs. With its legacy wired system, the district was continually faced with re-configuring classroom access. "Whenever a teacher

wanted to change the configuration of a classroom, it would cost us at least \$100 per Ethernet drop," says Randy Teets, network analyst, San Marino Unified School District. "With wireless, classroom configurations are no longer a problem. Computers get high-speed access from anywhere in the room. The service is better and the cost savings are significant." In addition, with a wireless solution, the considerable recurring monthly expenses for phone lines would be virtually eliminated.

The second aspect of cost had to do with the realities of finances. "Wireless networking gave us a valuable solution for bridging the gap between increasing student and teacher computer usage and a decreasing amount of funds available for technology initiatives," says Choi.

Technology Choices

The choice of the 802.11n standard was in keeping with the district's student-centric philosophy. As Randy Teets notes: "We think of students as customers on our network, and we work to serve their specific needs. One thing we know about students in our district is that about 95% of their laptops are Macintoshes, and since Macs are 802.11n-compliant, we believed we should be too."

The choice of Motorola as the wireless technology supplier was easy as well. "We knew that Motorola had an excellent reputation as both a leader in wireless technology and as an innovative company. We felt we could have a long term relationship with them," says Choi.

"We knew that the 802.11n standard is already included in a growing number of devices and we wanted to be forward looking."

- Randy Teets, Network Analyst, San Marino Unified School District

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Between-Sessions Installation

One other major benefit of a Motorola wireless broadband network was speed of installation. When students and staff returned for the new school year, the network was already up and running.

“We are very familiar with Motorola products, so by examining the construction materials used in the school buildings we were able to determine the number of Access Point (APs) needed based on potential signal loss,” says Alfaro. “We were also able to plan the AP locations and pre-configure all the APs before beginning installation. That allowed us to install the network in just four days.” Moonblink and its affiliates did all the physical installation, and provided training as well. “The district only had to do a little system configuration,” says Teets.

Network Components

The network consists of Motorola AP-7131 Access Points, providing coverage to 95 percent of the multi-building high school campus. “In classrooms, the APs were able to be located above ceiling tiles to attract as little attention as possible,” says Alfaro. “A light that can be seen through the tiles tells that the devices are working.” Motorola AP-5181 units were used to provide outdoor coverage in common areas like the Quad.

Security Considerations

“Security is a serious concern for us, as in all schools,” says Teets. “But at the same time, our teachers are not techies. We want the network to be as easy to use as possible.” In addition to existing security applications, the district is working with Motorola and Moonblink to provide students and teachers with a secure VLAN with simplified password protection.

Network Usage

Network users are taking advantage of the network in a myriad of ways. Teachers and students both have simple access to the district’s own Student Information System called PowerSchool, which stores and provides student data, grades, assignments, test scores and more. Because the district didn’t want students to have access to restricted faculty information, Virtual LANs (VLANs) are used to separate students and teachers. Teachers and students alike can also access the Internet in the classroom and elsewhere, utilizing a wide variety of educational sites and resources including streaming video and multimedia content. Some teachers and students also use an online course management system called Moodle, which allows teachers to post assignments and tests, and students to log on to take tests, submit assignments and more.



“We noticed significant improvements in coverage immediately. Right after installation we were able to walk around campus with our laptops and get excellent coverage at very fast speeds.”

- Stephen Choi, Director of Technology, San Marino Unified School District



“Our new high-speed wireless network helps us achieve our goal of providing a true partnership experience with students, parents and the community.”

- Stephen Choi, Director of Technology, San Marino Unified School District

Streaming Football

The new wireless network is also facilitating streaming video of the San Marino Titans football games. “In our area, quite a number of parents travel extensively both nationally and internationally,” says Choi. “Many have expressed a desire to see the games online in real time wherever they happen to be. Our new high-throughput Motorola 802.11n network is now making this possible.”

Explains Alfaro: “The Motorola AP-7131 has mesh networking capabilities, so we are running a point-to-point hop to the press box allowing the school to provide streaming video of football games. To get around signal problems associated with the steel construction of the stadium, we placed antennas outside the pressbox, which then deliver the signal inside. The system also provides WiFi access to the crowd in the stadium. This is probably the most unique thing we’re doing for them.”

Moving Forward

Now that the high school network is proving so successful, the San Marino Unified School District is planning to work with Motorola and Moonblink to install networks in the middle and elementary schools in 2009. In addition, the district is exploring the option of replacing the expensive fiber network that links all the schools and district offices with a high-speed wireless network.

Says Moonblink’s Alfaro, “We have a very high opinion of Motorola’s support. They are an integral part of our team, their equipment meets its specifications and their response is always timely.” Summing up the project so far for the district, Stephen Choi concludes, “We have a vision for success, and we feel that by partnering with Motorola we are able to achieve that vision, giving us the ability to provide more resources and utilize the best technology that’s available.”



MOTOROLA

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