

CASE STUDY



THE WI-FI PERFORMANCE COMPANY

California State University

Improves Wi-Fi performance 11X with Wi-Fi Optimization Platform



This California State university is set in an urban area, with a 300 acre campus and over 100 buildings. Its student population approaches 30,000 and has a choice of 150 undergraduate degree and 60 masters programs.



Situation

To cover such a vast area, this campus network comprised thousands of access points and associated infrastructure. And like many other university campus networks it faced unique scalability challenges due to the high number of devices and the use of bandwidth intensive applications including video and gaming. Students carry 2 to 4 devices, sometimes all connecting to the wireless LAN simultaneously.

Challenge

The Wi-Fi at this California State university was below par and everyone knew it. Administrators feared this put the student experience and reputation of the university at risk. But one of the challenges facing this university was its sheer physical size. This meant users needed to roam a lot. Because students are constantly “on-the-go” moving across campus and between buildings, they are more likely to experience coverage issues and a poor experience.

The overworked network team was in a tough spot. Their existing wireless network tools could only identify failure or poor performance at the network element level, like a failing access point or lack of resources in a switch. This was helpful in identifying many equipment failure issues, but did not provide visibility of impact to end users.

They simply didn't have the tools to measure, identify and address Wi-Fi performance issues proactively. For example, “we discovered there was poor wireless coverage in residence halls which had gone unreported for three weeks.” recounts the WLAN Lead Engineer for the university. “The NMS did not show anything out of the ordinary. It was only when we noticed a slew of complaints on social media that we sent someone out for a closer look with a spectrum analyzer. Unfortunately when there's an intermittent problem, we are often the last to find out!”

The California State University

Location: 300 Acre urban campus in California, USA

Students: ~30,000

Benefits Realized from the Sapphire Wi-Fi Performance Management System

- Lowest average performance was raised 1100%
- Jitter was reduced 90%, dramatically improving voice quality
- Unnecessary AP upgrades were avoided, and budget was conserved for expansion
- Network team now able to respond proactively to Wi-Fi issues

Solution

7SIGNAL was brought in to measure, analyze and optimize the Wi-Fi network using Sapphire Eye sensors. Sapphire Eye sensors were deployed in strategic locations in student halls and other high density areas known to have the most acute problems. Ruggedized Sapphire Eye sensors were also deployed outdoors between major clusters of buildings, where the network team expected that users should be able to roam seamlessly between buildings without getting disconnected – though this was far from normal experience at the time.

After the initial deployment and collection of baseline data, 7SIGNAL helped the university network team identify the key areas of their network performance that impacted negatively on end users. While the university's WLAN network had been implemented following best practices, there was clearly room for improvement. The data showed that end users consistently had difficulties in connecting reliably to the network. During day time hours, compared to almost idle night time conditions, end user throughput dropped between 70 and 90% and network latency increased between 1,000 and 2,000%. This level of performance was insufficient to satisfy the connectivity needs of students and faculty.

After analyzing the sensor data, the network team embarked on a sequence of WLAN configuration changes. After each batch of changes, they benchmarked performance for a few days, to verify the changes were making things better, not worse. On completion of the optimization project, the 7SIGNAL platform was left in place to provide ongoing visibility of end-user performance. The team was well aware that optimization is not a set it and forget it exercise. They knew usage patterns and demand would continue to change, and they wanted to have their finger on the pulse going forward.

Results

As a result of implementing an optimization program, student productivity and the Wi-Fi experience were significantly enhanced. Daily throughput values increased between 65% and 250% depending on the area. Jitter, which is the primary cause of poor voice quality when using Skype or other VoIP communications systems, decreased by a staggering 90%. And the worst daily observed hourly throughput values improved a whopping 1100%.

In addition, by optimizing what they had, instead of upgrading the WLAN with next generation access points, they conserved their limited funds for network expansion, and avoided the upheaval of unnecessary AP swap outs. "The magnitude of these performance improvements is staggering. They completely eclipse what we might have gained by upgrading access points to 802.11ac. We have plenty of money left over to expand our coverage. And best of all, every new AP we deploy, will benefit from the continuous performance assessment we get from 7SIGNAL," notes the University's CIO.

Since the 7SIGNAL deployment, the network team has reported they no longer need to guess as to how their network is performing. They can see it first hand on the Sapphire dashboard. By proactively managing performance from the end-user perspective, they are able to better serve their students and staff with less effort and less cost. They have stopped trying to solve the user experience issues the old way - by throwing in bandwidth in the form of AP upgrades, now that they can see it is usually not the root cause of poor performance.

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Lead WLAN Engineer

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Director,
Campus Infrastructure

