Massachusetts Institute of Technology's CSAIL

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Jack Costanza, Assistant Director, Massachusetts Institute of Technology's CSAIL

Challenge

Poor reliability of client connections

Rapid growth of wireless devices

Physical challenges in building's architecture

Sophisticated existing network policies

Results

Reduced wireless support tickets

High throughput with a growing user base

Elimination of dead spots and flaky coverage

Consistent policies across wireless and wired networks

Imagine a house that Dr. Seuss would build—a fantastic, whimsical creation that is playful and unexpected. Add tilting towers, spiraling atriums, and dramatic curves of brick, metal, and glass. Finally, fill it with hundreds of the world's top computer scientists, and deliver the bandwidth they need – wirelessly.

This was the challenge faced by Jack Costanza, the Assistant Director of Infrastructure at the Massachusetts Institute of Technology (MIT) Computer Science and Artificial Intelligence Laboratory (CSAIL) in Cambridge, MA. Costanza needed to replace a legacy wireless system in one of the most challenging RF environments ever built. "You sort of have to see the Stata Center for yourself to really understand what we're dealing with," said Costanza. "It's a very unique animal."

Designed by architect Frank Gehry, the 8-story, 720,000 sq. ft. Stata Center houses the largest lab at MIT, with over 800 faculty, staff and students. As complaints about the reliability and performance of the legacy wireless system increased, the CSAIL IT team sought a replacement, with five goals in mind:

1. Improve the reliability of the client connections
2. Have enough capacity to sustain the rapid growth of wireless
3. Overcome the physical challenges of the building's architecture
4. Support sophisticated existing network policies
5. Reduce network management overhead

As Costanza and his team evaluated possible solutions, they found that most vendors could achieve 2-3 goals, but not all 5. The greatest challenge for vendors was demonstrating an improved wireless experience while integrating into the building's existing IT infrastructure. The Stata Center has a sophisticated design by which wireless devices are provisioned with different policies, though they associate with the same wireless network. When a device connects, the wireless network uses the device's credentials (MAC address, username/password, etc.) to dynamically assign it to a specific VLAN, which in turn has an appropriate access control level. Firewall rules, bandwidth limits, and splash page settings may also be assigned on a per-client basis. All of these policies are invisible to the end user.

Rather than integrating products from multiple vendors to achieve these five goals, Costanza was able to satisfy all of them with Meraki's integrated solution. Costanza deployed 80 Meraki MR14 dual-radio 802.11n access points that employ technologies such as Multi-Ratio Combining (MRC) and Multiple In, Multiple Out Spatial Streams (MIMO) to improve signal coverage, reliability, and performance. "We were seeing strong signal in nooks and crevices that we had previously written off as impenetrable deadspots," said Costanza. Client reliability improved significantly as well, with a measured decrease in submitted help desk tickets. And when client configuration and related tickets did come in, Meraki's event logging and "remote hands" troubleshooting tools enabled Costanza's team to diagnose them easily. Finally, Costanza used Meraki's Identity Policy Manager (IPM) to provide the required fine-grained policy enforcement.

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