Corning Powers Next-Generation Mobile Workplace Collaboration

Millions of square feet of labs with hundreds of device types now enjoy secure, faster, mobile access

Mobilizing a creative culture

One of the world's top innovators in materials science, Corning has a 167-year track record of life-changing inventions. The firm applies unparalleled expertise in glass science, ceramics science, and optical physics, together with deep manufacturing and engineering capabilities to transform industries and enhance people's lives.

At Corning, technology innovation is woven deeply into the fabric of its organization. Its leadership pictures a world that not only provides people with massive amounts of fiber bandwidth, but also freedom and mobility.

"David Morse, Corning's chief technology officer, recognizes the importance of future-ready connectivity, and we envision that the vast majority of end-user connectivity will be wireless," says Glenn Bleiler, Information technology director, Science and Technology and Manufacturing Technology at Corning. "We partnered with Cisco to support this mission by building an innovative foundation."

Corning took a major step forward in bringing its vision to life when it upgraded its main RD&E campus in Sullivan Park, New York. When its existing network infrastructure needed a refresh, the company considered the project an opportunity to improve collaboration, spark new ideas and innovation, and improve its business agility.

"We had a legacy cable environment that needed an upgrade, and the natural choice for our offices was wireless." Says Bleiler. "We also have a couple million square feet of labs, with everything from glass furnaces to electron microscopes. Most of those devices won't go wireless right away, so the solution needed to be flexible."

Corning was seeking a versatile solution that could provide voice, video, and desktop connectivity for thousands of office users, as well as office devices like printers and visitor information kiosks. The solution would have to deliver performance and security, as well as high-bandwidth connectivity to most of its wired lab systems. Corning was also seeking to transform its fundamental network architecture to use its facilities and office space more efficiently, help people work more productively, and save employee time.

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Summary

Corning is bringing the vision of a 100-percent wireless office to life, with a Cisco wireless solution that lets employees communicate and work together via voice, video, or data across its facility.

Solution

Wireless
- Cisco Aironet 2700 Series Access Points
- Cisco Aironet 2600 Series Access Points
- Cisco Aironet 1140 Series Access Points

Switching and Routing
- Cisco Industrial Ethernet 4000 Series Switches
- Cisco Catalyst 2960-X Series Switches

Security and Management
- Cisco Identity Services Engine (ISE)
- Cisco Prime Infrastructure

Unified Communications
- Cisco IP Phones 8861

Collaboration
- Cisco Webex

Infrastructure
- Corning ONE Fiber-Deep Structured Cabling Solutions

Cellular
- Corning ONE Cellular Solutions
- Corning ONE DAS Solutions
- Corning ONE SpiderCloud Small Cell Solutions

Corning Incorporated

Industry:

Manufacturing

Location:

Corning, NY

Employees:

40,700

Providing wireless connectivity without compromises

To deliver the connectivity needed to support an open wireless office space, Corning and Cisco came together as partners to develop a comprehensive solution. At the network edge, Corning installed Cisco Aironet® 2600 and 2700 Series Access Points for completely wireless connectivity to all its office employees, as well as guests.

Cisco® Aironet 2600 Series Access Points are packed with advanced features, and cost-effectively deliver a combination of performance, functionality, and reliability. The 802.11n device includes 3x4 Multiple In, Multiple Out (MIMO) technology, enabling Corning to utilize multiple radio antennas for better range and reliability, resulting in less interference with other equipment in its offices and adjacent labs.

For more crowded parts of the office that require a dense array of connections, Cisco Aironet 2702 Access Points offer 802.11ac Wave 1 connectivity at triple the rates offered by earlier 802.11n devices. Cisco High Density Experience (HDX) technology automatically manages the airwaves and improves Wi-Fi performance to help minimize network strain when multiple clients are connecting. “Cisco’s wireless access points deliver the performance and security we need to power a 100-percent wireless office environment,” says Bleiler.

Pervasive wireless makes it easy for Corning employees to work together and share information anywhere in the facility, without being tied to a particular workstation or office. “A scientist might bring a tablet or laptop device into the lab, conduct experiments, take photos, and collect all the data they need,” says Bleiler. “Then they could pick up the device, go back to their desktop, and all their work is right there with them.”

To enable policy-based security and guest access, Corning employs the Cisco Identity Services Engine (ISE). Cisco ISE transforms the network from a transmitter of data into a security enforcer that grants access based on who, what, when, and where connections are happening—while providing a consistent user experience. The organization can also tailor access for specific devices. While leading in manufacturing, Corning is a constant think-tank, striving to push the limit of technology. “Making sure only the right people have the right access from any location for workforce agility is a key priority for Corning’s IT”, says Bleiler. Corning continues working with Cisco to enable Internet-of-Things (IoT) device authentication using Public Key Infrastructure (PKI).

Voice connectivity is an essential part of every office environment, and Corning deployed the Cisco IP Phone 8861 for secure, wireless, comprehensive VoIP communications across the office. Cisco support engineers worked closely with Corning to optimize the solution to provide the dependable communication the company required through the completely wireless network.

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“Our Corning ONE and Cisco solution has saved us a tremendous amount of time and money, and about 16,000 square feet of closet space.”

Glenn Bleiler
Information Technology Director, Science and Technology and Manufacturing Technology, Corning Incorporated

A network that automatically adapts

To connect its rich wireless infrastructure back to the wired network, Corning uses Cisco Industrial Ethernet (IE) 4000 Series Switches. Built for extreme environments, they include support for industrial protocols. They also offer superior bandwidth and capacity—40 Gbps of non-blocking switching capacity, with up to 20 Gigabit Ethernet ports per switch. The switches’ Application Visibility and Control (AVC) feature lets Corning prioritize bandwidth and performance to optimize voice, video, and collaboration tools for users on the move. This high level of switching performance plays a critical part in Corning’s innovative network architecture.

Of course, connecting all of these Wi-Fi access points from across a large facility back to the centralized switches was a non-trivial task. “When we started planning the project, we were following the conventional network topology of fiber from the MDF out to 54 IDF closets with switches, and then long cable runs out to each of the access points. But then Corning ONE provided a better solution,” says Bleiler.

Corning ONE™ is a visionary fiber-based network topology that enables future-ready connectivity over a single, simplified infrastructure. Corning ONE extends fiber from the MDF, bypassing unneeded IT closets into the horizontal space, all the way to the access point or any other endpoint, enabling all IT applications for the facility. The composite fiber plus copper cables can deliver virtually unlimited bandwidth and hundreds of watts of power to the edge of the network, powering and connecting Wi-Fi access points, DAS remote antenna units, and other devices.

“By changing the way we designed our network to the Corning ONE approach, we dramatically simplified our network,” says Bleiler. “We only used six MDFs where we injected power into our composite cables. And each access point had its own fiber path all the way back to the central switch. You can’t have a more future-ready network than that.”

To administer this dynamic, secure wired and wireless network, Corning uses Cisco Prime® Infrastructure Management, which delivers a single point of control spanning the entire infrastructure. Cisco Prime features that Corning leverages include WAP and switch health monitoring and utilization, firmware and configuration updates, RF environment management, device location for troubleshooting and maintenance, and numerous other features.

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Real savings and improved agility

The close partnership between Corning and Cisco has delivered measurable savings and benefits, starting with the innovative architecture itself.

“Our Corning ONE and Cisco solution has saved us a tremendous amount of time and money, and about 16,000 square feet of closet space,” says Bleiler. “We were able to cut installation time, from years under a traditional copper cabling environment with 54 closets, down to months. And we saved about 60 to 70 percent on network installation.”

Corning experienced not just cost and time savings, but improved performance across its RD&E campus. “We’re seeing much better performance, because now we can bring fiber as far out to the edge as possible,” says Bleiler.

Like every organization, Corning’s business is constantly changing and evolving. By deploying a combined wireless and fiber network infrastructure, the company can easily scale performance, and rapidly add new devices or processes when conditions change.

“We’ve laid the groundwork for our wireless and wired IoT reference architecture,” says Bleiler.

With its flexible solution in place, Corning has established a foundation with massive potential for future applications. Corning is now exploring the Cisco wireless solution for continued network performance optimization, location-based services, IoT authentication and connectivity, and various analytics applications. These services are currently provided through Cisco Mobile Experience (CMX) while initiating a migration to Cisco’s Digital Network Architecture (Cisco DNA). The foundations are installed to further drive business and workforce productivity improvements by taking advantage of analytics and assurance.

Together, Corning and Cisco are making new strides in bringing the possibilities of the empowered edge and IoT to life.

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