

Public-Private Wireless Partnership Mobilizes City Workers

Oregon Town and Local ISP Team Up to Extend Services to City Workers and Offer Free Wi-Fi with Cisco Wireless Mesh Network

Business Challenge

The city of Lebanon is located in Northwestern Oregon, near the capitol of Salem, in the beautiful Willamette Valley. The growing community offers its 13,000 citizens a small-town, neighborly atmosphere, a variety of cultural and sports activities, and most recently a growing reputation for technology leadership.

Thanks to a unique partnership with local Internet provider Peak Systems, Lebanon has begun to differentiate itself from other larger, better-known communities by building the state's first free citywide wireless mesh network.

EXECUTIVE SUMMARY
<p>CITY OF LEBANON</p> <ul style="list-style-type: none"> • Municipal government • Northwestern Oregon • 13,000 residents, 200 city and fire district employees <p>BUSINESS CHALLENGE</p> <ul style="list-style-type: none"> • Extend productivity applications and network access to public safety and other city employees in the field • Promote economic development by attracting visitors, residents, and businesses • Offer wireless services with minimum capital outlay and maintenance costs <p>NETWORK SOLUTION</p> <ul style="list-style-type: none"> • Cisco Wireless Mesh Networking Solution supports citywide Wi-Fi services • Cisco Unified Wireless Network <p>BUSINESS RESULTS</p> <ul style="list-style-type: none"> • Cost-effectively provides city employees with innovative tools to do their jobs • Promotes a business-friendly, technology-savvy public image • Expands wireless services with low capital outlay and maintenance costs

According to Lebanon city manager John Hitt, municipal leaders wanted to significantly improve public safety and public works responsiveness, safety, and efficiency in the field with a cost-effective, user-friendly communications solution. They also wanted to encourage economic development by attracting more residents, visitors, and businesses to the former lumber-mill town.

IT manager Tom Oliver saw a community-wide wireless network as a relatively inexpensive way to accomplish both aims. But although the town could build the network, it lacked the funds to provide ongoing support.

PEAK Internet, a local ISP with wireless expertise, was looking to expand into municipal services but was stymied by costly right-of-way fees incurred during network infrastructure build-outs. One day over coffee at a local café, Oliver and PEAK's Dustin Denver conceived a plan to pool resources. The City of Lebanon agreed to supply the poles, power, and

permits, while PEAK Internet agreed to supply the support and technical expertise, handling wireless network deployment, maintenance, and expansion.

Network Solution

The next step was finding a vendor who could offer a cost-effective, reliable, high-performance wireless network solution that public safety and public works employees would find easy to use and beneficial.

Denver and Oliver decided to try out Cisco's new Outdoor Wireless Mesh Networking Solution. Outdoor wireless mesh is a relatively new technology that is attractive to municipalities because of its lower cost, ease of expandability, and management and mobile application support. Denver, a longtime Cisco Systems® customer, says Cisco worked hard to make sure that the product met their requirements.

The City of Lebanon's wireless mesh network consists of 71 sturdy, compact Cisco Aironet 1500 Series lightweight access points that easily mount to streetlights and are specifically designed to withstand harsh weather conditions and to self-heal in response to interference or outages. With potentially life-saving information traversing the network, the highly resilient mesh network and rugged access point design were key selling points. The network's self-healing capabilities also significantly reduce field maintenance costs.

The access points deliver reliable, high-capacity bandwidth to support video and graphics applications for public safety and public works employees in the field. Municipal traffic is securely separated from public traffic and flows from PEAK's facilities over a private link to Lebanon's city hall offices.

The city of Lebanon owns the wireless mesh network infrastructure and, through PEAK, offers 10 hours per month free wireless Web access to anyone with Wi-Fi capability within the city limits. The ISP pays the town a franchise fee for the right to sell higher bandwidth and support wireless service packages to residential and business customers, so over time Lebanon will recoup a sizable percentage of its upfront equipment investment and be able to fund expansion plans.

Freed from telephone company dependency, PEAK has complete control over its infrastructure and the services that it provides. "We can truly differentiate ourselves as a locally owned and operated service provider," says Denver. Cisco's intuitive, easy-to-use centralized graphical management interface controls security and wireless radio frequency coverage for the entire network, which helps keep PEAK's technical support costs competitive. PEAK sees this first wireless mesh installation with Lebanon as an opportunity to refine their solution and quickly expand their wireless mesh services throughout the state.

"Working with a private sector service provider and Cisco, we can provide wireless services to visitors, residents, and city workers for far less than if we had undertaken it on our own."

—John Hitt, Lebanon City Manager

Business Results

Thanks to a visionary town council, resourceful IT manager, and creative local service provider, Lebanon has a reliable, citywide wireless network for minimal cost outlay. "We are a small community without a lot of financial resources," Hitt says. "Working with a private sector service provider and Cisco, we can provide wireless services to visitors, residents, and city workers for far less than if we had undertaken it on our own."

Lebanon mayor Ken Toombs says that the citywide Wi-Fi service has been very well received: restaurants in town report that visitors are quite impressed with the free, easy-to-use Internet access, and residents who would otherwise not be able to afford the access fees are very appreciative of the 10 free hours per month of network access.

PRODUCT LIST
<p>Wireless</p> <ul style="list-style-type: none"> • Cisco Aironet 1500 Series lightweight outdoor mesh access points (Dual-mode 1510 model) • Cisco 4400 Series Wireless LAN Controller • Cisco Wireless Control System (WCS)

Meanwhile, Oliver is busy implementing new bandwidth-intensive productivity applications for city workers. “Our goal with the citywide Wi-Fi network is to extend automated processes to all employees, whether they work behind a desk, in a patrol car, or on a maintenance crew,” he says.

Soon public safety officers and public works employees will be able to submit reports, respond to and generate service orders, and access e mail from terminals in their cars, using the same applications they work with at the office, freeing them to spend more time in the field. Oliver says that his police chief expects the online reporting and database applications will help him regain at least an hour of field time per patrol officer per shift.

Immediate wireless access to city, state, and federal databases will deliver everything from police photographs to warrants, crime bulletins, and building floor plans to crime scene command and emergency response crews. Remote, pole-mounted digital surveillance cameras will stream real-time video from higher-crime areas, providing a cost-effective and visible crime deterrent.

Public works engineers and road crews will have real-time access to the department’s geographical information system, a database of digital maps illustrating water lines, roads, and other spatial features that can be updated in the field.

Building officials who spend hours performing inspections will have real-time access to the town’s electronic permit management system to access and update permits and other records, enhancing efficiency and providing better service to residents and businesses.

And those are just the short-term plans. As Oliver says, “It is hard to predict how the system will affect our operations. The enhancements are far-reaching and continually evolving.”

Technical Implementation

The City of Lebanon’s Cisco outdoor wireless mesh network will eventually cover ten square miles. Cisco Aironet 1510 lightweight outdoor mesh access points scattered over the geographic area communicate continuously with one another, transmitting data back to a central LAN controller (hub) then to a wired Internet connection. The 802.11 dual band (2.4 GHz and 5 GHz) Cisco Aironet 1510 access points can be installed anywhere power is available, without the need for a network connection.

The overlapping mesh network infrastructure is self-healing. If one or more access point nodes stop working, neighboring access points will detect the lapse and pick up the transmission workload with no disruption.

Mesh wireless networks can cover greater distances than bridged wireless networks because the meshed nodes act as repeaters, passing radio signals along until the wired Internet connection is found. Expanding the network just requires more access points; no new bridges or hubs are needed.

The Cisco Wireless Mesh Networking Solution is composed of products from the Cisco Unified Wireless Network architecture. It includes Cisco Aironet lightweight outdoor mesh access points connected to a Cisco 4400 Series Wireless LAN Controller that is managed by the Cisco Wireless Control System (WCS). The wireless LAN controller is responsible for system wide wireless LAN functions such as security policies, intrusion prevention, RF management, quality of service (QoS), and mobility. Intelligent wireless routing based on Cisco's patent-pending Adaptive Wireless Path Protocol (AWPP) dynamically optimizes the route through the connected mesh network to deliver reliable, high-capacity bandwidth. Cisco WCS centralizes wireless LAN systems management of RF prediction, policy provisioning, network optimization, troubleshooting, user tracking, and security monitoring.

Denver uses the solution's advanced wireless mesh security capabilities, such as broadcast service set identifiers to create multiple virtual wireless LANs to separate and secure sensitive municipal communications. Standards-based encryption and class-of-service tools separate, secure, and automatically prioritize public safety and public works traffic from commercial traffic at each access point in compliance with state and federal mandates. Municipal traffic automatically flows from PEAK's facilities over a secure fiber link to Lebanon's central office LAN.

For More Information

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To find out more about the Cisco Unified Wireless Network, visit:
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To find out more about Cisco Wireless Mesh Networking Solutions, visit:
<http://www.cisco.com/go/wirelessmesh>

This customer story is based on information provided by the City of Lebanon and describes how the town benefits from the deployment of Cisco products. Many factors may have contributed to the results and benefits described. Cisco does not guarantee comparable results elsewhere.

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Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Europe Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: +31 0 800 020 0791
Fax: +31 0 20 357 1100

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