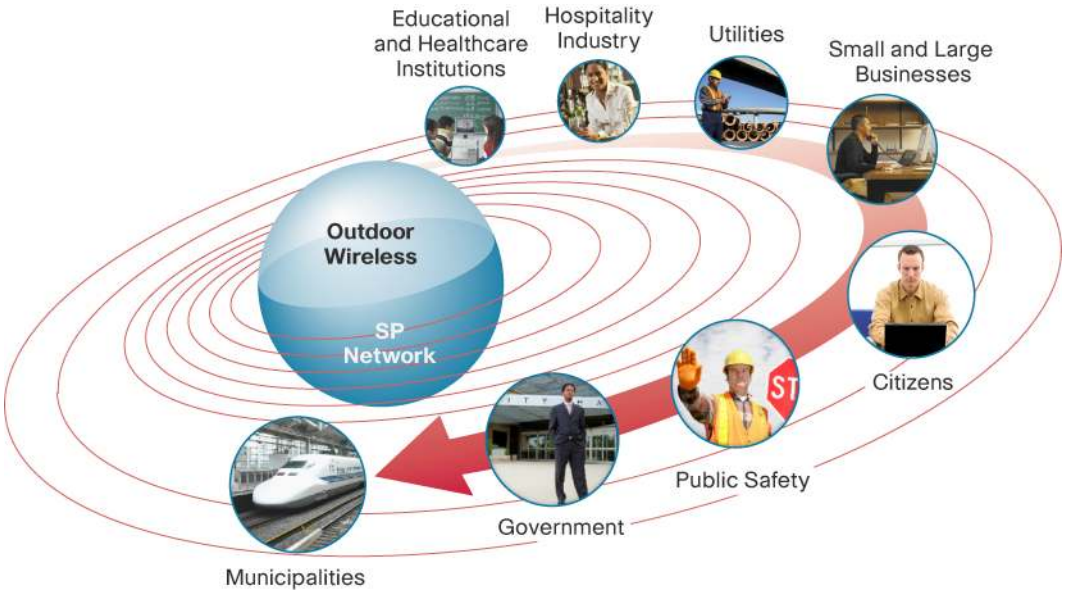
Cisco ServiceMesh—Secure New Business with Broadband Mobility for Government

Cisco® helps service providers create new revenue opportunities through the deployment of an outdoor wireless mesh solution that leverages their existing Carrier Ethernet infrastructure to cost-effectively expand their market reach with new wireless service offerings.

In recent years, service providers have driven the broadband market with triple-play offerings: TV, Internet, and telephone services. In order to remain competitive, carriers are adding mobility to their offering suite, allowing them to maintain their customer base and extend their reach into new markets.

Service providers are finding that outdoor wireless mesh networks offer a cost-effective foundation layer for next-generation wireless mobility. Providers have a Carrier Ethernet infrastructure that can be used as the basis for building an efficient and effective outdoor wireless network. As Figure 1 shows, operators can use Wi-Fi to expand their market by offering new services to cities, universities, convention centers, hotels, and other businesses that have mobile employees or outside operations (for example, ports, harbors, and distribution centers).

Figure 1. Market Expansion Opportunities with Mixed-Use Outdoor Wireless Network



The Municipal Wireless Mesh Trend

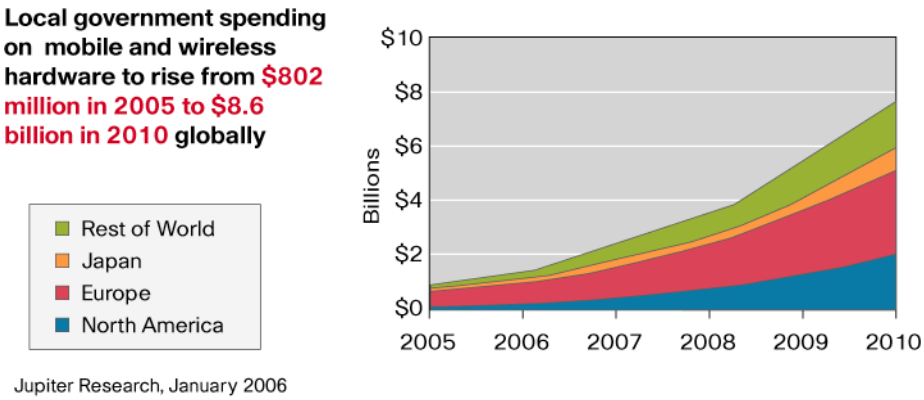
Local governments and public service agencies worldwide are seeking ways to foster economic development, improve department collaboration and productivity, and enhance public safety. Service providers can address this opportunity by helping municipalities deploy wireless broadband networks based on wireless mesh technology. The Cisco ServiceMesh solution addresses the needs of both the city and the provider.

Cisco ServiceMesh is an easy to deploy, high-speed wireless broadband network solution, delivering a scalable and secure end-to-end design that allows service providers to layer new applications and classes of service in order to cost-effectively deliver secure government services from a single outdoor wireless network. The solution allows service providers to move quickly from proposal to profitability while working closely with municipalities and partners.

Given the aggressive growth rates shown in Figure 2, it is clear that the municipal wireless mesh trend is real—projected to grow to US$8.6 billion by 2010. In recent months, interest in these municipal applications has actually increased, in spite of a rash of press articles highlighting cities withdrawing from free public access projects. Studies conducted by Muniwireless.com[1] and validated in a 2007 Crimson Consulting study[2] commissioned by Cisco confirm that the interest from these cities in municipal wireless networks is centered around government efficiencies, in particular public safety, code enforcement, and public works.

[1] Muniwireless “State of the Market Report: 2006”
[2] Conducted April 2007 by Cisco; interviewed 80 US municipalities on applicability of Wi-Fi mobility and Unified Communications within local governments

Figure 2. State of the Municipal Wireless Market



Many municipalities and regional governments are discovering that collaboration with a service provider for mesh network deployment and operation is the right way to spend public funds. Expenses are shifted away from capital outlay and staff, network transport costs are reduced by using the service provider network, and city services can be rapidly deployed on a reliable network.

The economics of the outsourced model are very favorable for service providers, who can extend their geographical reach beyond their current physical plant and earn new revenue by offering value-added services based on the municipal Wi-Fi network.

The key to successful outdoor wireless networks implementation lies in the discovering the value that the right applications can bring to the regional government. This value can be derived from four areas: increased productivity, cost avoidance, revenue generation, and improved quality of life. Wherever municipal workers can gain efficiencies in their jobs, it pays off for the city and its residents. Cities can provide reliable city services within budget, and not have to raise taxes to hire more workers, keeping residents happy, too.

Figure 3 shows a small sampling of some of the applications in use today. It is recommended that service providers partner with cities to discover the right mix of municipal applications for the first phase of the network, and then expand into some of the other areas listed, including small business and hospitality.

Figure 3. Applications Available with Cisco ServiceMesh

Municipal Applications

Let's take a look at some of the municipal applications that are already starting to add value to cities.

Public Safety

Mobile wireless applications for police and firefighters are the top "must-have" applications. Before wireless mesh, real-time data was not available to police officers working from their vehicles, nor could they quickly access high-bandwidth data like video and photographs. With broadband wireless, a police car equipped with a mobile router and 4.9-GHz and cellular antennas becomes a mobile command center from which wireless devices, such as laptops, printers, cameras, and handhelds, can be operated. With instant access to criminal databases, police can get mug shots, crime bulletins, and even building floor plans to crime scenes on command.

Not only are police much better equipped to identify and apprehend criminals, but access to municipal resources in the field increases police coverage for the city. It is estimated that access to online reporting and database applications can help regain at least an hour of field time per patrol officer per shift.

Video Surveillance

Another crime-deterring technology is wireless video surveillance. Remote, pole-mounted digital surveillance cameras can stream real-time video from higher-crime areas, providing a cost-effective and visible crime deterrent. The wireless cameras scan outdoor areas for potential criminal activity, such as theft and vandalism. The cameras can stream video back to the police dispatch station or to the police force in squad cars.

With video surveillance evidence, criminals are more easily prosecuted, thus lowering court costs. Once cities get their wireless infrastructures in place, they are eager to add on video surveillance applications in order to help police and fire departments work more efficiently.

The ever-watchful eye of the video camera has other uses as well. Cities can use video surveillance to improve traffic management and transportation infrastructure. Additional applications include video conferencing between city staff and groups in other locations to facilitate trainings and council meetings.

Building Inspection

With an outdoor wireless network, building inspectors can use portable, wireless devices to complete data entry of inspection results on site, reducing the time it takes to get inspection data to construction workers and other land management officials. Electronically scheduled inspections can be accessed in the field, and real-time inspection data can be accessed from work sites and offices. Reduced inspection turnaround time can, in turn, reduce building permit process time, construction time, and travel time and expenses.

Building code enforcement officers also perform an important function for the land and building management of a city. Code enforcement officers are able to connect to city data sources from a wireless laptop in the field or from a vehicle. With such data as plat maps, zoning information, property owner information, and property addresses at their fingertips, code enforcement officers are more efficient and can send reports and update cases from their laptops in the field.

Automated Meter Reading

When city and utility personnel have to physically read parking, water, and electric meters, the potential for error is high. The use of automated meter reading (AMR) increases meter reading accuracy and thus billing. AMR “drive-by” solutions are performed from a computer-equipped truck that reads meters with a short-range wireless connection as the truck drives down the street. Meters must be retrofitted or replaced with electronic registers and RF transmitters. However, with Wi-Fi-enabled AMR, the truck and the truck driver are no longer needed. Smart meters can transmit meter data through the wireless connection to a data collector unit (DCU) on the network that receives the meter data and routes it to the utility’s data center, where it is processed. A single DCU can serve a cluster of neighborhood meters.

Cities are finding that the use of AMR improves not only meter reading accuracy, but also customer service operations. For example, with AMR applications, meter data is available to customer service representatives (CSR) within 12 hours of a reading, with a minimum of two reads per day per meter. Billing errors and questions are greatly reduced. Meter data is also available to customers via the city’s Web portal. Data analysis software is used to help with leak detection and system management. AMR is now being used successfully by many cities across the United States and the world.

Asset Management with Location Tracking

Cities can use radio frequency identification (RFID) to track assets, such as a truck fleet. A location-tracking system accounts for assets and helps prevent lost or stolen assets, and it can also be used to track maintenance activities. RFID tracking technology has been in use for years, but this market has changed since Wi-Fi technology has been introduced. Because Wi-Fi can use existing wireless infrastructure the total cost of ownership of a location-tracking system can be significantly lowered.

Asset tracking and asset management helps cities to lower operating costs. Because asset management systems keep inventory records up to date, they are also used for Sarbanes Oxley

compliance. The Sarbanes Oxley Act became federal law in 2002, requiring companies to keep accurate records of their assets.

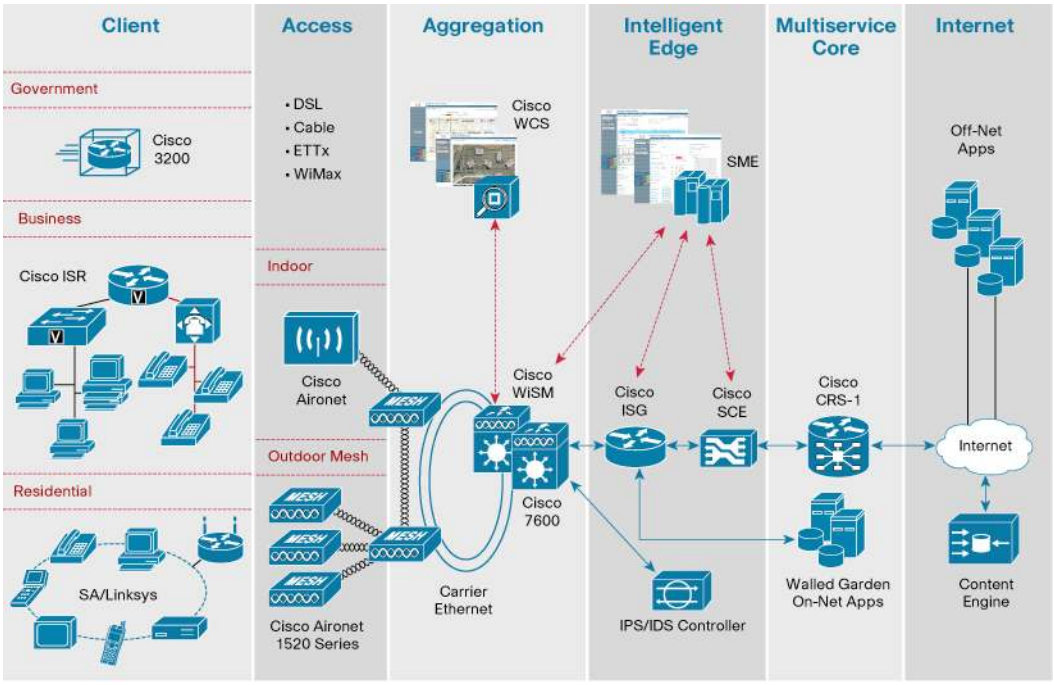
Healthcare facilities and hospitals are a large potential market for asset tracking, including tracking of personnel and patients. IT assets in server rooms can be monitored remotely, thus protecting not only expensive equipment but sensitive information. As cities take full advantage of this capability in their wireless networks, more remote sensing applications will be implemented.

Cisco ServiceMesh

Cisco offers a single solution to make all of this possible: Cisco ServiceMesh. Cisco ServiceMesh enables carriers to extend their services to offer ultra-fast Internet broadband connections to outdoor areas. The seamless handoff of broadband services from their Carrier Ethernet infrastructure to an outdoor wireless network allows providers to cost-effectively deliver a vast array of new applications. Cisco ServiceMesh provides a robust network that can support all of these applications and discreetly manage customer groups, offering quality of experience to each.

Built on the Cisco IP Next-Generation Network (NGN) architecture, Cisco ServiceMesh combines a superior access network with a fully integrated and intelligent back-end network, as illustrated in Figure 4. Cisco ServiceMesh is an award-winning solution built on a manageable and flexible architecture that securely and dynamically controls subscriber access and applications across wireless mesh networks. The carrier-grade architecture consists of an easy-to-deploy, high-speed, multipurpose, and secure outdoor Wi-Fi mesh network infrastructure that seamlessly integrates with existing Carrier Ethernet networks. Cisco ServiceMesh incorporates all the primary network elements for successful service implementation—from customer devices through the intelligent network edge to the multiservice core.

Figure 4. Cisco ServiceMesh—Award Winning Broadband Wireless Solution



The Cisco ServiceMesh solution is ideal for any environment in which laying new fiber or copper might be a challenge. In a wireless mesh network, the network dynamically routes packets from

node to node (or access point to access point). A few nodes have to be connected directly to the Carrier Ethernet network, but the rest share a connection with one another over the air. The fact that wiring issues can be mitigated makes such a network ideal for outdoor deployments.

The benefits of the Cisco ServiceMesh solution are:

- **Engaging new markets:** Offers outdoor broadband service to new municipal and business customers, allowing carriers to capture new markets.
- **Increasing revenue:** Maximizes revenue opportunity and lowers customer turnover by offering mobility extensions to existing service offerings.
- **Lowering deployment cost:** Provides new broadband services without the high costs and delays associated with infrastructure construction projects.
- **Faster return on investment:** Quickly enables outdoor wireless services with a self-configuring, flexible, pre-integrated, fully tested solution.
- **Lowering operating cost:** Efficiently manages the new services with an integrated end-to-end architecture that includes management for all application, services, devices, and users.
- **Future growth:** Positions the company for future rollout of next-generation, broadband mobility services.

Conclusion

Service providers can take the first step toward broadband mobility with proven technology that's available today. Cisco ServiceMesh offers operators a cost-effective, secure system for deployment of outdoor Wi-Fi networks, combining a superior access network with a fully integrated back-end network. Simple to deploy and operate, Cisco ServiceMesh is based on intelligent wireless routing technology and a powerful, self-organizing, self-healing, and self-configuring end-to-end architecture.

With Cisco ServiceMesh, providers can now offer outdoor broadband services to current and new customers, all while making use of their existing Carrier Ethernet investment. This translates into reduced operating expenses, improved communication and efficiency for businesses, and better service and safety for communities.

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