

## WFI Takes Building Surveillance to the Next Level

**Westfield UTC, an outdoor mall east of La Jolla Village, San Diego, has 155 shops and 25 eateries, plus an ice-skating rink.**

**In 2005, Westfield commissioned Wireless Facilities, Inc. (WFI) to design an ambitious, state-of-the-art expansion of the mall's information infrastructure to include Wi-Fi hotspot services available to its retail tenants, fast and reliable capacity for mission-critical sales-transaction traffic, as well as high-resolution security video surveillance covering the entire mall.**

### **Wireless Facilities, Inc. (WFI)**

Headquartered in San Diego, CA, WFI (NASDAQ: WFII) is an independent provider of systems engineering, network services and technical outsourcing for the largest wireless carriers, enterprise customers and government agencies.

The company has nearly 2,700 employees and numerous office locations throughout the United States and abroad.

WFI often designs, deploys and manages property management and building security solutions for large and multi-site properties, based on wireless infrastructure. In large deployments, these solutions require next-generation converged network infrastructures to handle the integration of data and telecommunication services for tenants and property management: Wi-Fi hotspots, point-of-sale transaction processing, converged VoIP, advanced in-building automation, and security systems supporting many high-resolution surveillance video streams simultaneously.

### **The Westfield UTC Mall Project**

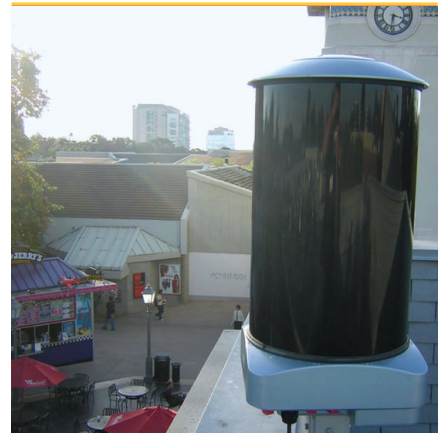
Westfield UTC's management came to WFI with a significant challenge. It wanted to offer to its retail store owners next-generation point-of-sale (PoS) transaction traffic capacity plus a mall-wide Wi-Fi "hot zone" capability – both integrated with the mall's IT network infrastructure. Additionally, WFI's solution would need to accommodate, in a second phase of deployment, high-capacity video streams from more than 70 surveillance cameras mall-wide.

In order to cover the entire mall, the solution needed to tie all of the mall's buildings into a converged network with a common IT NOC, data center, and security surveillance center in the main administration office.

### **Managed Property Security**

A key component of property management and security applications is the aggregation of high-resolution video surveillance traffic for central presentation, monitoring and storage. In multi-property projects like Westfield UTC, the continuous video streams of 70 high-resolution surveillance camera signals would require substantial capacity in the aggregation network.

A single surveillance camera signal using the MPEG4 compression algorithm, at 4CIF resolution of VGA quality at 640 x 480 pixels and transmitting at 30 frames per second



*Westfield is the highest-branded shopping center chain in the United States. Since aesthetics are very important to them, overhead cables couldn't be run to connect remote kiosks/PoS terminals, Wi-Fi and video traffic to the network infrastructure.*



*ClearMesh 300s are rooftop mounted and connected to up to 3 different buildings within the mall campus to create a highly resilient mesh network.*



requires between 3 and 4 Mbps of IP service capacity. Multiply that by 70, and you sense the scale of the challenge. Exotic signal-encoding algorithms can reduce the bandwidth requirement somewhat, but only by sacrificing frame rate and resolution – which WFI wanted to avoid.

In order to provide sufficient video aggregation capacity for Westfield's requirements, WFI considered extending fiber-optic cable laterally to each of the buildings in the mall. Construction or leasing costs for laying fiber, however, would have broken the project's budget.

In addition to video traffic, the aggregation network at Westfield UTC needed to be able to aggregate the mall-wide Wi-Fi traffic with point-of-sale (PoS) transaction traffic coming from the retail stores in the mall. This required not only a high-capacity solution, but a fully converged aggregation network, managing competing application priorities and protecting the mission-critical PoS traffic from bursty Internet traffic.

WFI looked for an alternative wireless solution – more cost-effective than fiber, but with fiber-like capacity and robustness to handle the multiple applications. After successful trials, WFI selected a high-capacity wireless optical mesh solution engineered by ClearMesh Networks.

As Desmond Wheatley, President, WFI Enterprise Services Division, points out, "The ClearMesh solution is the only wireless solution that combines fiber-grade service quality and capacity with integrated mesh switching capability. It is able to provide the capacity required for large surveillance projects, and it supports mission-critical and real-time Internet applications concurrently."

#### **The ClearMesh Wireless Optical Mesh Solution**

WFI decided to trial the wireless optical mesh solution from ClearMesh because it is scalable enough to aggregate the large amount of video traffic while maintaining business-grade LAN communication services for mission-critical transaction applications.

The ClearMesh Networks solution shares the advantages of wireless mesh networking – economy, flexibility, and resilience. But by operating in the license- and interference-free infrared spectrum, it can be deployed in very high density without the interference that plagues wireless RF solutions dependent on license-free RF spectrum bands.

Without the significant up-front capital expense (CAPEX) and permit-pulling delays involved in extending fiber, the ClearMesh solution enables fast deployment and provides for a very fast payback cycle. For growing property-development projects like shopping malls, the ClearMesh solution offers a "pay-as-you-grow" investment model and a flexible infrastructure capable of supporting tomorrow's bandwidth-intensive applications.

The ClearMesh wireless optical mesh was a natural fit for the Westfield UTC project, and WFI confidently specified it for deployment across the entire mall.

#### **Managed Services Solutions**

Since WFI offers its customers not only project design and deployment services, but also continuing post-installation network management, ease of operation was also critical in its decision to choose ClearMesh. The wireless optical mesh from ClearMesh Networks keeps recurring operational expenses (OPEX) very low, since it behaves simply as if it were a standard switched Ethernet network, requiring minimal specialized operator training.

All installation- and operations-related tasks are handled by the centralized ClearMesh Management System (CMS). The CMS provides carrier-class element and mesh management functions from a single or redundant CMS in WFI's remote NOC. All operations can then be carried out centrally or at the customer site, using an authenticated operator-access GUI based on standard Java technology.

With the LAN capacity and business-grade service capabilities of the ClearMesh solution, WFI will be able to centrally manage the various traffic overlays resulting from the mall-wide Wi-Fi, point-of-sale (PoS) and surveillance video applications at Westfield UTC. The CMS allows central provisioning of end-to-end mesh service overlays and all related networking capabilities across the entire ClearMesh solution.

Eventually, WFI will be able to manage numerous customer projects – not just the Westfield UTC mall – each with several ClearMesh deployments, from a single CMS in its NOC.

#### **Converged Multi-Property Mesh Network Solutions**

Beyond meeting the basic requirements of centralized, remote building management, a fully converged wireless mesh infrastructure across multiple properties allows property owners to offer their tenants a variety of value-added services.

High-capacity, Ethernet-based wireless meshes allow infrastructure investments to become the foundation for additional services, resulting in incremental revenue opportunities and even more rapid return on investment (ROI) while increasing tenant loyalty and reducing vacancies.

In the case of Westfield UTC, integrated sales-transaction traffic aggregation and video surveillance services together justified management's investment in the project. The deployment allowed an ROI on up-front CAPEX and recurrent OPEX of less than one year.

But since the same ClearMesh solution also provides service aggregation for the Wi-Fi hot zone, mall-wide hotspot availability will attract loyal customers, generating business for the store owners and incremental subscription revenue for the mall's operators. The Wi-Fi capability even enables extending PoS support wirelessly to kiosks and other temporary retail locations.

In the future, WFI will be able to roll out additional services such as VoIP-based Internet telephony or video streaming to plasma monitors throughout the mall – all based on the existing LAN service capacity of the ClearMesh solution.