



## Unwiring the Venetian Resort Hotel Casino

### CASE STUDY

#### CHALLENGE

When it opened in May 1999, the Venetian Resort Hotel Casino was the world's largest hotel, casino, and convention complex, and the property has since remained a premiere destination for travelers to Las Vegas. With more than 4000 guest suites, a 650,000 square-foot conference center, the 2 million square-foot Sands Expo Center, corporate offices, and a 160,000 square foot casino, the Venetian complex hosts thousands of guests each year. Rather than resting on their laurels, the Venetian's owners are now expanding the property with a new tower that will accommodate 3,000 more guest suites as well as three floors of new meeting rooms.

Running a successful hotel resort like the Venetian depends not only on the property's architectural beauty, but on outstanding customer service. Clients should be made to feel that their every need is being satisfied, and that means that the property's employees, or team members, must have fast and reliable communications in order to coordinate services. Within two years of opening, however, the Venetian's management recognized one key need that was not being met: reliable wireless communications. Hotel guests and workers have come to expect that their cellular phones or portable data terminals will work wherever they are, but that wasn't the case inside the Venetian.



## BIG BUILDINGS BLOCK SIGNALS

This problem is not a new one to cellular carriers or their customers. Any large building presents indoor cellular coverage challenges, because the steel, concrete, stone, and other materials used in buildings or furnishings tend to block or attenuate cellular signals. Cell phones may work fine next to exterior windows, but have problems getting calls farther inside the building. And even if the cellular phone can still transmit from inside a building, it must boost its transmission signal to do so, which reduces its battery life.

The solution is an in-building wireless system that delivers a strong cellular signal to every interior area via on-site cellular carrier base stations and remote antennas. In some cases, the facility itself pays for the deployment of the in-building system, but often, carriers are the ones who bear the cost. This was the case with the Venetian.

In 2001, four major cellular carriers (Verizon, Nextel, Sprint, and AT&T Wireless) approached the Venetian about installing the first in-building wireless system in Las Vegas, and the hotel's chief technical officer, Steve Vollmer, quickly agreed.

"We knew there were some major dead spots inside the hotel where coverage was either weak or non-existent because we had had complaints from guests and our own team members," said Vollmer. "When the carriers offered to install a system to eliminate them, we were all for it."

## SELECTING THE RIGHT SYSTEM

A typical in-building wireless system incorporates an on-site carrier base station plus a hub, distribution cabling, and remote antennas that supply distributed coverage. There are several choices in in-building wireless systems, but the Venetian's cellular providers had some very specific technical requirements:

- The system had to accommodate any carrier, so it had to support iDEN, GSM, CDMA, and TDMA protocols at both 800 and 1900 MHz frequencies.
- The system had to allow each carrier to separately manage its infrastructure.
- The system had to accommodate future enhancements such as high-speed data.

- The system had to offer the highest possible performance to minimize battery drain for handheld phone users.
- The system had to have end-to-end alarming so that problems such as malfunctioning antennas could immediately be spotted and fixed.
- The system had to preserve the hotel's aesthetics.
- The system had to be cost-effective to install, with minimal disruption to guests.

Based on these criteria, the carriers chose the MetroReach and LGCell systems. The systems active architecture easily supports any number of carriers with high performance, independent management, and low installation costs. While other systems required rigid coaxial cabling over which wireless signals degraded with distance, for example, the LGCell system delivered exactly the same level of performance at all remote antennas, no matter how far they are from their expansion hub. In addition, systems based on coax cabling do not offer end-to-end management. Finally, the deployment costs were far lower with LGCell because it could use standard fiber and Ethernet cabling (including some existing cabling), and required no special training or equipment to install.

## DEPLOYMENT AND MAINTENANCE

Over a period of about two months, the carriers installed individual base stations in the Venetian's Campanile Tower (where they also provide outdoor coverage on the Las Vegas Strip in front of the hotel) as well as one (for AT&T Wireless) in its IT data center. A separate MetroReach system and LGCell Main Hubs (located in the hotel's IT data center) deliver signals from each carrier's base stations. From each Main Hub, carrier technicians ran fiber optic cabling up building risers to connect with distributed Expansion Hubs on each floor. From each expansion hub, standard CAT-5 Ethernet cabling was run to each remote, ceiling-mounted antenna.

In all, the system includes more than 80 hubs and more than 200 antennas to provide coverage in all hotel rooms, restaurants, gaming areas, theaters, Grand Canal shops, and other facilities.

The flush-mount antennas in the ceiling have been painted to blend in seamlessly with the frescoes that are part of the hotel's décor.

Since each carrier's system has its own base station, hubs, and antennas, each carrier can remotely monitor and manage its system. When there's a problem, the carrier sends out a service technician to fix it. Due to recent mergers and acquisitions, the carriers managing equipment at the Venetian today include Sprint/Nextel, Verizon, Cingular, and T-Mobile. In addition, the system has been expanded and ADC's InterReach Unison® has been deployed in some areas of the resort.

Since its installation, the system has quietly provided full coverage and outstanding performance. "We don't realize how well this works until an antenna goes down or there's a problem with an expansion hub," says Vollmer. "Then we get complaints. As far as I'm concerned, in-building wireless is no longer a nice-to-have feature; it's a must-have feature. There used to be a rumor that the hotels would never allow cell phones in casinos, but now people can't live without their Black Berry® devices and cell phones, no matter where they are."

## FLEXIBILITY AND PERFORMANCE

Over time, the flexibility and performance offered by MetroReach and LGCell have allowed for fast and trouble-free upgrades. For example, when Sprint and Verizon upgraded their base stations to deliver higher-speed EV-DO data services and Cingular upgraded to support UMTS services in Las Vegas, they all did so without having to upgrade any of the LGCell hubs or antennas. It will be just as easy to upgrade to HSDPA services when Cingular rolls out this service in Las Vegas.

Comprehensive, reliable cellular coverage is a given at major resorts like the Venetian Resort Hotel Casino, and now guests and hotel team members get such coverage.



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