DATACRAFT **SUCCESS STORY**

Mitsubishi Heavy Industries (builder of the Singapore Flyer)

Datacraft

The Singapore Flyer Scales New Height with Onboard Entertainment with Datacraft's Wireless LAN Network Solution

Landmark Project First-of-its-kind Deployment on High-rise, Continuously Moving, Massive Structure

Industry
Manufacturing

Country
Japan

Challenge
To install a system on the Singapore Flyer, a giant observation wheel with 28 fixed passenger capsules, for continuous on-board audio and video entertainment during the 30-minute ride.

Solution
Datacraft's designed WLAN network solution

Primer and Consulting Services

Results

- Landmark project was delivered within the agreed timeframe and on budget.
- A flexible and dynamic communications medium on board the Singapore Flyer
- Advanced communication tools such as digital signage that can be used for various interactive services in the future

Executive Summary

Standing at a commanding height of 165 metres, the Singapore Flyer – a giant observation wheel with 28 fixed, fully air-conditioned passenger capsules – looks set to becoming one of Asia's biggest tourist attractions. Accompanying the passengers during the leisure 30-minute ride is the in-capsule, state-of-the-art audio and video entertainment system that is linked to an advanced wireless local area network (WLAN) infrastructure designed by Datacraft.

This project marks the first time any vendor has implemented a wireless solution for a high-rise, massive, spinning and continuously moving structure. Based on Datacraft's Primer consulting methodology, the team was successful in the technical design and deployment of the requisite WLAN network; the system was on schedule and went 'live' in March 2008.

Client Overview

Standing at a height of 165 metres, or the equivalent of a 42-storey building, the Singapore Flyer is arguably the world's largest giant observation wheel and looks set to being one of Asia's biggest tourist attractions.

The towering beauty – with a 150-metre diameter wheel – features 28 fixed passenger capsules, each about the size of a bus. Each sealed, air-conditioned capsule has about a 28-person capacity and the spectacular monument is able to hold up to 784 passengers in total.

Inspired by famous landmarks such as the Eiffel Tower in France and the London Eye, the Singapore Flyer was the creation of Dr. Kisho Kurokawa of Japan and DP Architects, industry leaders well-known for their unique architectural designs.

Business Challenge

During the leisurely 30-minute ride, passengers on the Singapore Flyer get treated to a panoramic view of the city centre and the breathtaking sights of the neighbouring Indonesian islands of Batam and Bintan, as well as Malaysian's southern state of Johor.

In addition to the impressive hardware and the stunning view, passengers on board the Singapore Flyer stand to enjoy state-of-the-art audio and video (AV) entertainment that is played continuously during the ride.

Mitsubishi Heavy Industries

To ensure a smooth connection between the flyer's operation room to the IP phones and monitoring web cameras in each of the individual capsules, especially in the event of emergencies, Mitsubishi Heavy Industries (MHI) – the builder of the giant structure – turns to Datacraft to design, develop and install an innovative wireless local area network (WLAN) solution for the Singapore Flyer.

WLANs are popular with businesses and enterprises as a convenient and cost-effective way to integrate with other network or network components. Its "no wires" nature allows users to access network resources from nearly any location. Wireless networks can also quickly scale up to meet a sudden increase in the number of users within the existing equipment. In a wired LAN infrastructure, additional users will require additional wiring.

The initial set up of the WLAN infrastructure is relatively straight-forward, compared to a wired network. It requires the installation of a WLAN bridge that connects the wired and wireless networks together, to transmit data and voice between the operation room and the individual capsules of the Singapore Flyer.

The challenge? This WLAN deployment project on the Singapore Flyer marks the first time that any vendor has implemented a wireless solution for such a high-rise, massive, spinning and continuously moving structure. It also meant that there is no prior project that Datacraft can refer to, and the team had to start from scratch in designing, developing and deploying the unique WLAN solution.

Some problems that the Datacraft team had to overcome include the inherent limitations of WLAN technology. For instance, the effective range of a typical WLAN network is maximum 100m, which is insufficient to cover the entire giant observation wheel. To obtain additional range, more access points had to be installed. In order to maintain the stability and reliability of the connection, Datacraft provided the wired access point at the spindle (or the hub) of Singapore Flyer, which made all connections to each capsules from the same distance.

Relationship History

This is MHI first collaboration with Datacraft. This appointment is an affirmation of Datacraft's strong consulting and technical capabilities.

Solution Provided

Working closely with Cisco Japan, the Datacraft team deployed a suite of sophisticated routers and WLAN Bridge on the Singapore Flyer. In total, 1 router, 6 root bridges, and 28 work group bridges were used to deliver the WLAN solution.

In creating a memorable on-flight experience for all passengers, MHI outfitted each of the 28 passenger capsules with a web camera, IP phone, workstation for AV entertainment system and capsule facility sensor.

How We Delivered

"Implementing a wireless LAN for the Singapore Flyer presented significant technical challenges. We are particularly appreciative of Datacraft's project management expertise and its teamwork internally and with Cisco Systems."

Ryo Miyoshi, Project Leader for Mitsubishi Heavy Industries

Datacraft stands by the principle that the key to designing the best solution for a client starts with a deep and thorough understanding of the unique environment in which the company operates, and the challenges it entails. Always pragmatic and client-centric, Datacraft consultants and services team worked closely with MHI's team to design the IT networking architecture for the flyer.

The WLAN solution developed for the Singapore Flyer is standards-based, and designed with flexibility and scalability in mind.

Typical WLAN deployments and signal strength propagation are horizontal in nature. Due to the structure of the Singapore Flyer, normal methods to survey and implement the Wireless LAN could not be used. As a result, onsite evaluations had to be conducted daily through the Cisco WLAN Bridge and command line interface. Even though collecting and consolidating the data tedious and time consuming, this process was necessary to ensure a proper WLAN deployment and coverage for the Singapore Flyer.

Datacraft implemented the project based on the Primer delivery methodology. Primer is a turnkey project management and solutions delivery framework based on proven project management and consulting

disciplines. A detailed operational plan was also drawn up to optimise deployment and minimise risk.

The Primer methodology ensures that the client's business challenges are addressed and the solutions are implemented meticulously and according to the agreed blueprint, timeline and budget. This entails consultation with the client to fully understand MHI's needs, design and site preparation, staging and piloting, as well as logistics and installation.

Value Derived

Datacraft's ability to conceptualise a new technological idea and translate it into a reality, as well as its project management expertise were critical to the successful implementation of the Singapore flyer project. As a result of the success, MHI is able to gain competitive advantage as the first manufacturer to build a fully functional landmark moving object. In addition, the implementation was executed within the agreed timeframe and on budget. Proven methodologies and best practices were applied to ensure seamless implementation.

The Cisco modular wireless access points provide reliable and predictable WLAN coverage for both the existing 802.11a/b/g standards and the newer 802.11n standard. Cisco switches offer high availability and uninterrupted access to information across the company, and are able to support bandwidth-hungry applications. With the wireless technology deployed at the Singapore Flyer, MHI is able to:

- Augment throughput for high-bandwidth wireless applications
- Increase network reliability for mission-critical applications

With the completion of the WLAN project in March 2008, passengers on board the Singapore Flyer can now view and listen to information and entertainment broadcasts, while the wheel is in motion.

Datacraft's WLAN solution offers several benefits to the operating company of the Singapore Flyer as well. Besides protecting its investment in wireless networking technology, the company is empowered to offer innovative services for its passengers by:

- Providing a flexible and dynamic communications platform for entertainment, information and emergency broadcasts
- Offering advanced communication tools such as digital signage that can be used for various interactive services in the future.

Solution at a glance

- Cisco WLAN Bridge (Cisco Aeronet 1310 outdoor wireless bridge): Enables secure wireless connection with high speed.
- Cisco 2821 ISR Router: Provides high performance voice and data traffic transportation.
- Primer: A turnkey methodology, consulting and implementation service that helps organisation plan and design their IT strategy for optimal network performance and greater efficiencies.
- Consulting: An IT and business consulting service that helps organisations plan and design their IT strategy for optimal network performance and greater efficiencies.