

Singapore National Day Parade

Popular Singapore Event Proves Wireless Mesh Reliability



ORGANIZATION

Singapore National Day Parade

LOCATION

National Stadium, Singapore

INDUSTRY

Events, Public Safety, Government

PURPOSE

Provide an easy-to-install network for security, voice and multimedia at a national event for 65,000 spectators

SOLUTION

Firetide Wireless Mesh Network, AscenLink Load Balancers, IP Cameras

MORE INFORMATION

- National Day Parade, Singapore
www.ndp.org.sg/
- iCell Network
(Internet Service Provider)
www.icellnetwork.com
- D-Synergy (Firetide distributor)
www.d-synergy.com

The National Day Parade or NDP in Singapore is an annual extravaganza with 5,000 participants and 65,000 spectators. Each year, residents of the island nation celebrate Singapore's birthday in an event that lasts four hours but requires six months to prepare. During the event, spectators thrill at the sounds and colors of marching soldiers, dancers, acrobats and patriotic displays. The event culminates in bright fireworks bursting in the night sky. Since 1966, when the nation celebrated its first parade, the demands of creating such a big show have grown tremendously — especially with current world events and threats of terrorism. This year, the organizing NDP EXCO group implemented a fresh solution to increase security without over investing in a system for an aging stadium that is slated for demolition and replacement.

New Approach for an Old Stadium

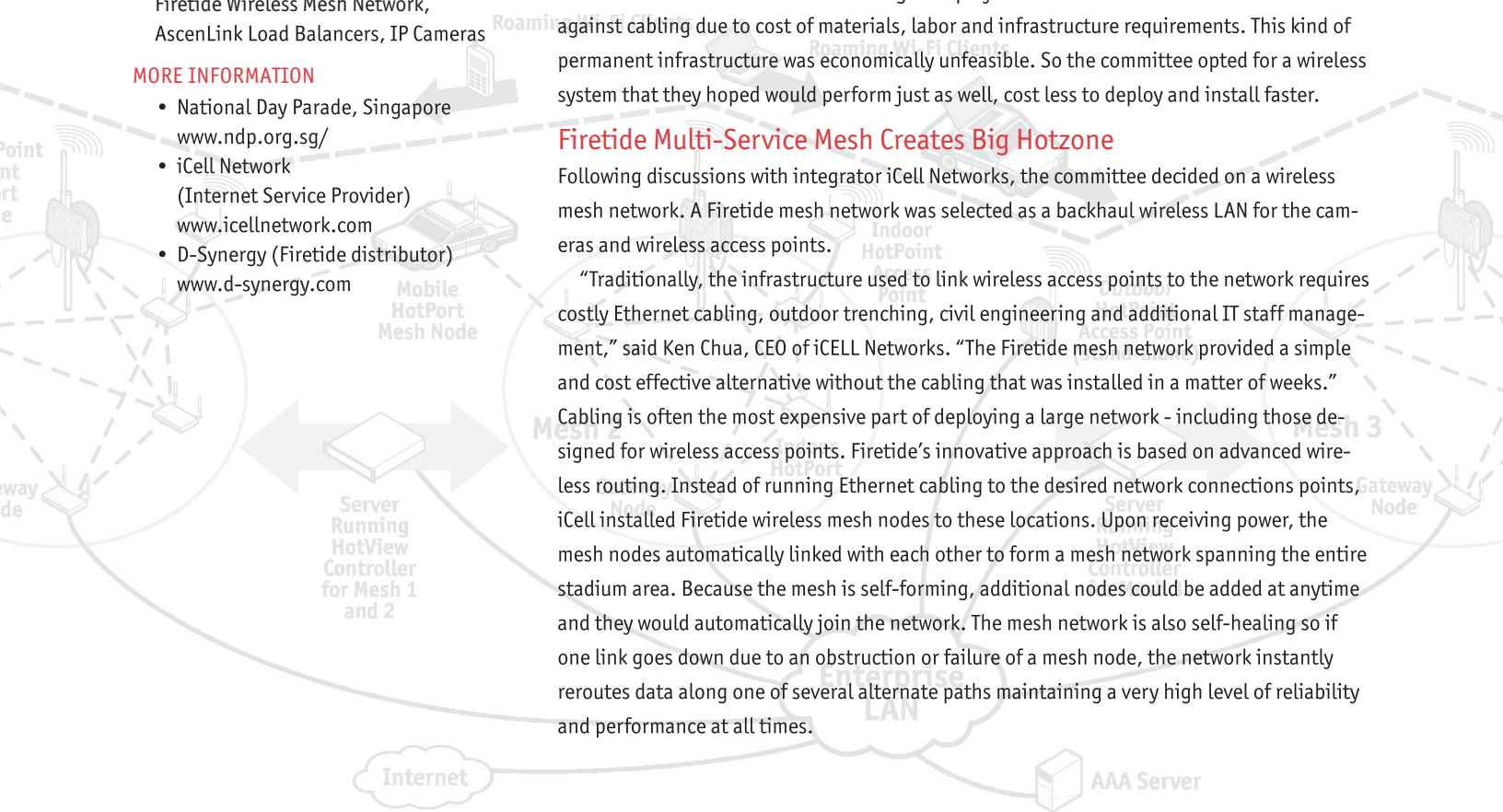
Built 30 years ago, the National Stadium has served Singaporeans well but the facility no longer caters to the needs of modern audiences. But the plan for a future facility didn't help the planners of the 2006 National Day Parade because their event was coming up fast, much sooner than the new stadium.

Meanwhile, security was one of the most talked about subjects during the planning stage. The issue was how much time and money should be invested in a stadium that is outdated and on its way out. For sure, an improved security network system had to be set up, but how? The organizing committee mulled over ways to build a network to improve surveillance, provide Internet access and offer voice capabilities. It did have a few options: Install a conventional network with Ethernet cabling or deploy a wireless network. The committee decided against cabling due to cost of materials, labor and infrastructure requirements. This kind of permanent infrastructure was economically unfeasible. So the committee opted for a wireless system that they hoped would perform just as well, cost less to deploy and install faster.

Firetide Multi-Service Mesh Creates Big Hotzone

Following discussions with integrator iCell Networks, the committee decided on a wireless mesh network. A Firetide mesh network was selected as a backhaul wireless LAN for the cameras and wireless access points.

"Traditionally, the infrastructure used to link wireless access points to the network requires costly Ethernet cabling, outdoor trenching, civil engineering and additional IT staff management," said Ken Chua, CEO of iCELL Networks. "The Firetide mesh network provided a simple and cost effective alternative without the cabling that was installed in a matter of weeks." Cabling is often the most expensive part of deploying a large network - including those designed for wireless access points. Firetide's innovative approach is based on advanced wireless routing. Instead of running Ethernet cabling to the desired network connections points, iCell installed Firetide wireless mesh nodes to these locations. Upon receiving power, the mesh nodes automatically linked with each other to form a mesh network spanning the entire stadium area. Because the mesh is self-forming, additional nodes could be added at anytime and they would automatically join the network. The mesh network is also self-healing so if one link goes down due to an obstruction or failure of a mesh node, the network instantly reroutes data along one of several alternate paths maintaining a very high level of reliability and performance at all times.



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Using the Mesh Network's Full Capabilities

The NDP network offered greater capacity over distant locations along with redundancy to ensure a successful event. This is how the installation guaranteed success with each described issue, followed by iCELL's solution:

ENSURING CAPACITY

Issue

The network included 40 cameras, 200 nomadic Wi-Fi surfers, and assorted Wi-Fi voice over IP phones. All were connected to the Internet with a transmission speed of 40 Mbps using a mesh network with a node-to-node capacity of 22 Mbps maximum.

Solution

From the core switch, iCELL installed five Firetide mesh nodes as Network Gateway Interfaces (NGI) and one mesh node as a gateway server. No clients were more than three mesh hops to a wired gateway and even when all surfers congregated around just a few access points on one side of the stadium, traffic load was well balanced over multiple paths.

DISTANT LOCATION

Issue

To avoid taking valuable visitor space, many of the command vehicles, storage sites and participant-assembly areas were kept well away from the main stadium. However they all still required connectivity and running separate Internet cables to these areas was not feasible.

Solution

From a wired NGI, the mesh packets could hop across the stadium to nodes in sight of the car park and make a second hop to the ground level. By adding a second similar link and building a fresh mesh at the end of these two long hops provided the connectivity to the remote areas.

REDUNDANCY

Issue

The National Day Parade network simply could not fail. Full failover and a comfortable level of redundancy were vital and had to be ensured.

Solution

iCELL technicians acquired two 20 Mbps DSL lines from different ISPs and joined these with two AscenLink load balancers to a single gateway. The Firetide mesh network provided its own self-healing level of redundancy, thus ensuring that even with some mesh nodes down, connectivity remained intact. Also part of the solution were two Hotport 3100 nodes, one as a fail over backup for the other, to manage the mesh as gateway servers. Everything went well during the event, and the redundant half of the network was never needed.

The Bigger the Network, the More It Offers

The larger the wireless mesh network, the more capability it offers. Proof came in the outcome of the National Day Parade 2006 in Singapore.

"NDP gave us the opportunity to show that large wireless networks are a reliable and affordable alternative to cabling," Chua said. "Singapore is in the forefront of applying hi-tech at a practical level."

Chua added that in the months to come, iCELL will roll out more mesh and load balancing equipment to expand the island nation's pervasive Wi-Fi network. iCELL is Singapore's only dedicated ISP servicing about 300 public hotspots and operating wireless networks in some 60 local schools.

Time to Celebrate

Fifty years ago, Singapore faced high unemployment and a shortage of housing. Although the small island has few natural resources, the nation has made tremendous economic progress by exporting electronics and manufactured products. Today, Singapore has a population of 4.3 million on 270 square miles and offers the best quality of life in Southeast Asia.

Singapore's 41st birthday was a success and the organizing committee will soon be tasked with developing plans for National Day Parade 2007. A great deal of knowledge and practical information was accumulated about wireless mesh this year. And it's likely the valuable data will be used to make next year's event even better.

Happy birthday, Singapore!



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