



Case Study

IPSTAR Cellular Backhaul

Mobile BTS, Japan, March 2011

IPSTAR Helps Restore Cellular Networks in Tsunami Hit Japan

Telecommunication facilities have become an essential part of our everyday lives and the need for communications becomes especially crucial during disaster situations. However, communication infrastructure can easily become damaged as a result of disasters such as earthquakes, tsunamis, floods, landslides and typhoons. Ground-based telecom infrastructures such as fixed line and mobile networks get easily damaged no matter how well designed or sophisticated they are.

A rapid re-establishment of telecom facilities becomes essential not only for the victims to communicate with the outside world, but also for the first responders and disaster recovery personnel for proper coordination of their activities. Telecom companies need to re-establish their service coverage as early as possible, and may not be able to rely on traditional terrestrial backhaul methods at least in the primary stages of their recovery effort.

Communications based on advanced broadband satellite platforms are well suited for immediate deployment in emergency situations as they are immune to disaster events. The IPSTAR product and solution portfolio is designed to meet the precise needs of putting communication networks back on line in the event of any natural or man-made disasters.

Challenge

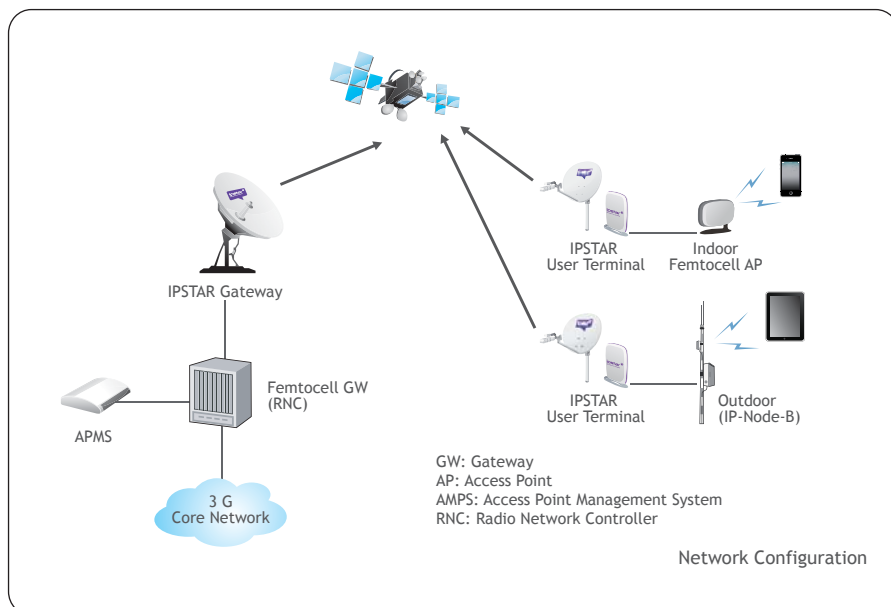
- Provide mobile service coverage in disaster hit areas where network infrastructures have become inoperable.
- Provide backhaul to base stations - PicoBTS, NanoBTS, and MacroBTS, where terrestrial links have been destroyed.
- Provide indoor mobile coverage and Internet access in emergency shelters and schools when all other communication infrastructure is destroyed.

Solution

- Use of portable and auto pointing antennas to rapidly connect base stations to core network
- Use Femtocells coupled with IPSTAR backhaul to provide indoor service in designated areas.

Benefits

- **Rapid Deployment**
Quick setup of communication networks for rapid recovery of mobile networks
- **IP Compatible**
Capable of interfacing with a wide range of IP based base stations
- **Flexibility**
Due to dynamic bandwidth usage capabilities, IPSTAR can support base stations of various sizes from Femtocells to MacroBTS
- **Nationwide Coverage and QoS**
IPSTAR provides nationwide coverage and consistent QoS regardless of which disaster hit area is to be serviced



The Situation

A magnitude 9.0 earthquake struck Japan with epicenter approximately 70 kilometers east of the Oshika Peninsula of Tōhoku on 11 March, 2011. It was the most powerful known earthquake ever to hit Japan and also triggered massively destructive tsunami waves of more than 30 meters that struck the Japanese coast, in some cases travelling up to 10 Km inland. The unfortunate victims include more than 15,000 dead, around 5,000 injured and more than 8,000 designated missing. With 18 prefectures affected, over 125,000 buildings destroyed or damaged, the overall cost of the disaster could exceed \$300 billion, making it the most expensive natural disaster ever experienced by human kind.

The earthquake and resulting tsunami caused extensive and crippling structural damages. Besides heavy destruction of housing and transportation infrastructure, destruction of a nuclear power plant, collapse of a dam, as well as fires in many areas, the disaster caused massive disruption of cellular phone services. All the 4 major service providers of Japan had their infrastructure destroyed—with NTT Docomo, KDDI, Softbank Mobile (SBM), and Emobile losing 6720, 3680, 3800, and 878 base stations respectively over 11 prefectures.

The Solution

The service providers selected IPSTAR for its instant backhaul capability to bring back their service into operation. Base stations of various capabilities such Pico BTS, Micro BTS, and even full capacity Macro BTS made use of IPSTAR backhaul to connect to their core network. This backhaul over IPSTAR will continue until the service providers recover their capability to reconnect their lost terrestrial networks. Up to 500 base stations have been reconnected via IPSTAR, with most of the deployments in the hardest hit Iwate and Miyagi prefectures.

In the immediate aftermath of the disaster, the service providers also used instant IPSTAR backhaul to provide mobile phone and internet services in emergency shelters, schools and community centers. Mobile operators SBM and KDDI used Femtocells to provide indoor mobile coverage in designated locations. Coupled with IPSTAR User Terminals (UT), Femtocells become the ideal platform to provide instantaneous cellular service in disaster and emergency situations.

Proof-of-Concept

IPSTAR has proved time and again that it is the ideal satellite platform for deployment during the loss of terrestrial networks in unexpected disaster situations. Due to its rapid deployment capability and end-to-end IP architecture, the IPSTAR platform is well suited to connect with any kind of IP-based base stations. The IPSTAR UT is a low power satellite modem and can be deployed using solar power or electrical generators even when the electricity grid is down. Coupled with portable or auto-pointing antennas, or with Mobile VSAT Vehicles (MVV), IPSTAR becomes a highly mobile and instantaneous telecommunication solution for penetrating disaster hit areas.

With its dynamic bandwidth usage capabilities, IPSTAR is perfect for the backhaul need of cellular service providers to get diverse base stations—from small Femtocells to Macro BTS's—on line. IPSTAR helps service providers to recover network coverage quickly and maintain continued trust of their subscribers.

About IPSTAR

THAICOM-4 (IPSTAR) is the world's largest and most advanced commercial satellite serving up to 10 million users in Asia-Pacific. The breadth of the satellite's geographical reach in the region – covering an area inhabited by 4 billion people or roughly 60 percent of the world's population – positions IPSTAR as the preferred gateway in 14 countries across Asia-Pacific. IPSTAR has achieved a critical milestone in its pursuit to bridge the digital divide in the region. With a combined 120,000 subscribers in Australia and New Zealand alone and still growing, IPSTAR has become the single largest VSAT network operator in both countries. Across the region, IPSTAR has sold nearly a quarter of a million user terminals.

For more information, visit www.ipstar.com.

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