



Case Study

IPSTAR Cellular Backhaul

China Telecom and IPSTAR Join Forces to Extend Mobile Phone Service in Remote Areas

China is a global economic giant with one of the highest rates of industrialization and urbanization in the world. China has made great inroads in the development of its infrastructure, transportation and telecommunication facilities. China is also the world's fastest growing mobile phone market. The total number of mobile phone subscribers in China has reached more than 830 million by September 2010.

However large parts of the country's population still reside in rural areas.

Even among different rural areas the distribution of telecommunication infrastructure is not equal - with areas in southern and coastal China faring better compared to those in western and north-western regions. Several parts of China have mountain ranges and large deserts, inhabited with sparse and isolated human population. Although wireless technology and mobile phones have become the most prevalent mode of communication to penetrate underserved markets such as these, network operators are hindered by deployment costs.

It requires huge capital expenditure for laying out fibers or extending and maintaining microwave links to these outlying areas.

IPSTAR is an excellent solution for overcoming geographical distance and barriers to provide mobile phone service in rural areas such as these. The broadband satellite capacity of IPSTAR can be used to provide backhaul from the BTS (Base Transceiver Station) at remote sites to the Base Station Controller (BSC) of cellular service.

Challenge

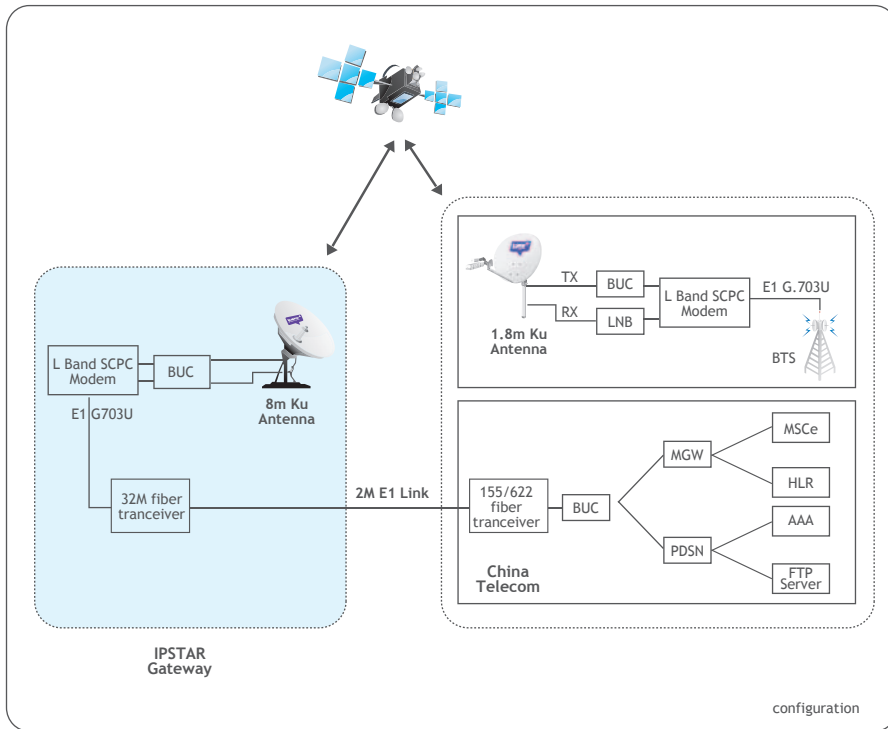
- Provide mobile phone network coverage in remote areas of China
- Backhaul using fiber or microwave links become too costly
- Installation is challenging due to difficulty in transportation and lack of power supply

Solution

- Use IPSTAR platform for backhaul link from remote site to BSC (Base Station Controller) of mobile service provider.
- The intermediate connection to BSC from IPSTAR Gateway is achieved through a fixed leased line of the service provider.
- Complete IPSTAR satellite coverage over China allows installation in any remote site.

Benefits

- **Nationwide**
Wide coverage and quick deployment nationwide
- **Cost-effective**
Lower bandwidth and equipment costs in providing cellular backhaul for geographically dispersed subscribers
- **Easy Integration**
Interoperable with most equipment
- **Scalable**
Allows seamless increase of users on a single platform
- **Fast Time-To-Market**
Quickly acquire new service subscribers and earn immediate revenue



The Situation

China Telecom wanted to extend their GSM and CDMA mobile phone service in remote areas of Qinghai, Xinjiang and Hainan provinces. The proposed BTS sites in these provinces were in mountainous areas, with elevation of sites particularly in Qinghai and Xinjiang ranging from 2500 to 4000 meters above sea level.

The purpose for most of the sites was to serve the local residents living in those areas, where as for Hainan the service was targeted at small businesses, with one particular site in Jianfenglin serving the construction of a hydropower project. Some of the areas had prior CDMA WLL (Wireless Local Loop) fixed phone service, but no mobile phone coverage. The proposed sites had no electricity available.

The Solution

China Telecom partnered with IPSTAR to deploy satellite cellular backhaul at seven sites in three provinces utilizing IPSTAR Gateways in both Shanghai and Guangzhou. The remote site deployment was done fully using solar photovoltaic

cells and battery backup due to unavailability of electricity. IPSTAR satellite platform provides reliable backhaul from the remote BTS sites to BSC as there is less chance of network failure.

Proof-of-Concept

China Telecom's successful deployment of IPSTAR for mobile backhaul in remote areas is a perfect example of its effectiveness in delivering bandwidth-efficient and scalable service. It has been demonstrated that IPSTAR backhaul systems can work with alternative energy sources such as solar energy. China Telecom says the partnership with IPSTAR has helped them to extend their mobile service and achieve cost effective backhaul to remote sites in the country.

IPSTAR enables the elimination of setting up and maintaining microwave links and repeaters, increases reliability and reduces CAPEX and OPEX expenditures by up to 30 percent. The IPSTAR platform has been tested successfully to provide backhaul solutions for 2G, CDMA and 3G



mobile technologies. The robust IPSTAR backhaul solution can be deployed in areas with low population density on a point-to point, multipoint or mesh network configuration. IPSTAR also enables network operators to quickly and seamlessly expand cellular service in the remote area. Extending service to accommodate higher traffic loads or to cover more geographical areas can be done economically via the satellite, since IPSTAR-enabled cell sites only require minimal additional infrastructure.

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 100,000 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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