Solution Sheet

IPSTAR Backhaul for Femtocells

Low cost mobile service with nationwide coverage

Femtocell Evolution

Femtocell is a small cellular base station designed to be used in residential or small business environments where the mobile network's coverage is weak or non-existent. It gets connection to the mobile network using broadband ADSL, and typically supports 4 or 8 concurrent subscriber voice calls. Femtocells from different telecom vendors are currently available for 2G, CDMA and 3G technologies—service providers can easily integrate them into their existing networks. Although originally intended for indoor use with a small coverage of less than 100 meters, femtocells are increasingly being adapted for outdoor use for an extended range of up to 2 kilometers.

Femtocells are plug-and-play devices with Ethernet interfaces and work immediately after connecting to a broadband Internet connection, without the need for any configuration. Being a small device about the size of an average Wi-Fi Access Point, it consumes little space. This enables rapid installation and deployment by operators. When coupled with satellite backhaul services like IPSTAR, a femtocell based mobile BTS can provide instant coverage in any remote location.

IPSTAR Backhaul

IPSTAR is an excellent solution for overcoming geographical distance and barriers to provide mobile phone service in rural areas. IPSTAR can be used to backhaul the network traffic from the remote Femtocell Base Transceiver Station (BTS) to the Base Station Transceiver (BSC) or RAN Gateway of the service provider. The direct point-to-point or point-to-multipoint capability of IPSTAR eliminates the need to deploy costly fiber network infrastructure or maintain extensive microwave links to the targeted areas. IPSTAR has the capability to provide nationwide coverage, giving service providers unlimited capability to expand their networks.

Benefits

Cost-effective
- Lower bandwidth and equipment costs in providing femtocell cellular service for geographically dispersed areas.

New Markets
- Capability to target new markets in an age when ARPUs are reducing.

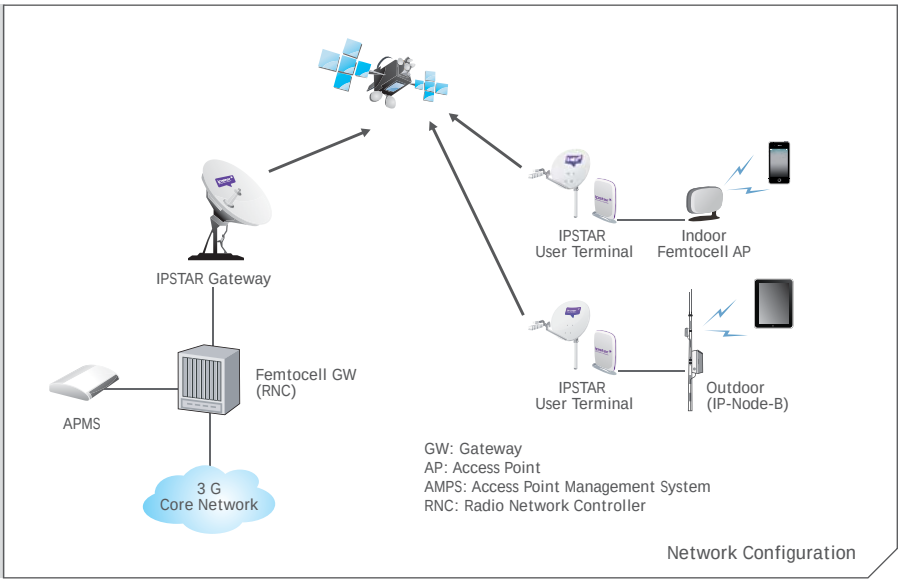
Easy Integration
- Both IPSTAR and femtocells are IP-based systems

Complementary
- Femtocell fills in mobile coverage blind spots, and IPSTAR fills in terrestrial backhaul blind spots.

Fast Time-To-Market
- Quickly deploy in new areas, acquire new subscribers and earn immediate revenue

IPSTAR Femtocell Backhaul can:

- Extend network coverage in rural and remote areas.
- Connect isolated locations into a regional network when terrestrial backhaul is too expensive or not available.
- Quickly expand coverage for special events or provide communication backup in the wake of a disaster, without the need of building permanent cellular network infrastructure.
- Provide special or ad-hoc services for disaster management, mobile vehicles and other related applications.



Network Configuration

Femtocell Service with IPSTAR

Combining femtocell cellular service with IPSTAR backhaul makes perfect sense as femtocell can fill mobile coverage blind spots and IPSTAR can fill terrestrial backhaul blind spots. Both are essentially IP-based systems and their integration is seamless. As femtocells are smaller and more cost-effective than traditional MicroBTS and PicoBTS, network operaters can now target highly remote areas with very thin population density. In an age when the Average Revenue Per User (ARPU) are reducing due to tough competition, the combination of femtocell service with IPSTAR backhaul opens up new market opportunities where service providers can go in with very low CAPEX and OPEX investments and generate immediate revenues. At the same time the people that have so far been denied mobile coverage can now avail to the latest mobile voice and data services.

Femtocell Remote Site

The remote BTS site using femtocells can be setup rapidly using a standard electric pole due to the small form factor of femtocells. The femtocell AP, a signal booster, and the IPSTAR User Terminal can be installed in a small weatherproof box. The IPSTAR antenna is placed outside on ground and the omni-directional femtocell antenna is placed on top of the pole, providing circular coverage of up to 1 or 2 kilometers. Due to the low power requirements of femtocells, these remote sites can be powered using solar panels and other alternative energy sources, where grid electricity is not available.

Bandwidth on Demand

IPSTAR helps service providers connect new subscribers to the mobile network by way of femtocell technology in a cost-effective manner, while maintaining high quality voice and data traffic. IPSTAR can also be used in a shared access environment, as part of the services provided by a network operator. IPSTAR dynamically allocates satellite resources only when they are needed, multiplexing bandwidth to reduce the resources required by network signaling. In addition, IPSTAR optimizes traffic, such as idle frame suppression and discarding silent frames, thus reducing the amount of traffic transmitted on the satellite network.

IP-Node-B over IPSTAR Satellite Link, JAPAN

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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