

Summary

Executive summary

Femtocells are small cellular base stations intended to extend service coverage and offload the mobile macro network in home and small office environments. Femtocells are self-installing, plug-and-play devices deployed by users similar to Wi-Fi access points and use IP broadband connections for backhaul. The femtocell concept can be applied to any cellular technology, but the industry is currently focusing on 3G UMTS and CDMA devices.

Fixed-mobile convergence solutions such as femtocells and Unlicensed Mobile Access (UMA) leverage the fact that many locations, including homes, offices and public areas have access networks in the form of Wi-Fi, DSL and cable. UMA provides complementary access to existing GSM/GPRS/EDGE services over Wi-Fi. The UMA technology allows users to roam and handover between cellular networks and Wi-Fi networks using dual-mode GSM/Wi-Fi handsets with an UMA client. However, in contrast to UMA services, which require compatible dual-mode handsets, femtocells can be used with any device that supports the femtocell's air interface.

A number of different architectural approaches have been proposed for integration of femtocells into macro networks with the main ones being – lub-over-IP, lu-over-IP, IMS and UMA/GAN based architectures. The 3GPP has chosen the lu-over-IP approach, defined as luh, which is part of the 3G femtocell standardisation in its release 8. The approach builds upon utilizing existing UMTS network infrastructure that simplifies integration. However, in a long-term perspective, introduction of an IMS based architecture that completely offloads the macro network will be better suited to provide additional capacity as well as function as a platform for delivery of advanced services.

The femtocell concept is still at an early stage with few commercial deployments. It will take several years before shipments of femtocells become substantial. To begin with, the industry needs to prove that femtocells can be deployed without causing adverse interference.

Femtocells also need to become sufficiently standardised to ensure efficient integration and low cost per unit. Moreover, operators need to find and adjust business models that make femtocells attractive for their customers, who will ultimately buy or receive femtocells for placement at their premises.

Berg Insight forecasts femtocell shipments to reach 12 million units worldwide in 2014, up from 0.2 million in 2009. The European, North American and advanced markets in Asia Pacific will account for the vast majority of femtocell shipments in the foreseeable future. In many other countries worldwide, the penetration of fixed broadband connections is much lower and 3G services less developed. By 2014, there will be almost six femtocells per macro base station and the number of femtocell users is estimated to surpass 70 million.