FEMTO CELL
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Technology

Most of the excitement is based around the 3G UMTS/HSPA mobile phone technology, deployed in almost every country worldwide today and which includes the ability for high speed data services. There are products available for other technologies, including 2G GSM, CDMA and more recently LTE. Small cells are fully featured, short range mobile phone base stations used to complement mobile phone service from larger microcell towers. These range from very compact residential femto cells, the size of a paperback book and connected using standard domestic internet broadband through to larger equipment used inside commercial offices or outdoor public spaces. .

They offer excellent mobile phone coverage and data speeds at home, in the office and public areas for both voice and data . Small cells have been developed for both 3G and the newer 4G/LTE radio technologies

The term femtocell was originally used to describe residential products, with picocell being used for enterprise/business premises and metrocell for public/outdoor spaces. As the underlying femtocell technology expanded to address this wider scope, the term small cell was adopted to cover all aspects.

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Standalone or integrated Femtocells

Early residential femtocell products look very much like Wi-Fi broadband modems, needing only two cables - one for power and one internet connection.

Several vendors such as Thomson, Net gear, Pirelli, Cisco and others integrated the femtocell with other features such as DSL modem, Wi-Fi and even IPTV into a single box. The vast majority of residential femtocells sold to date are standalone.

Larger enterprise and metrocells are also standalone, having sturdy casing and better protection against weather and operating in unsupervised areas.

Low power but high quality

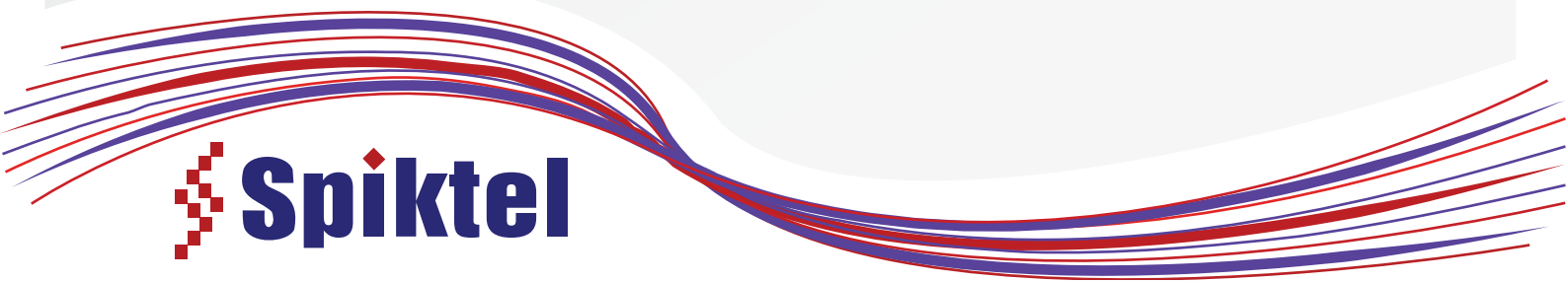
Small cells operate at very low radio power levels - less than cordless phones, Wi-Fi or some other household equipment. This substantially increases the battery life, both on standby and talk time. Since they are so much closer to the handset or mobile device, call quality is excellent and data devices can operate at full speed. The smallest femtocells can handle up to 4 simultaneous active calls from different users, with many having a standard capacity of 8.

Larger small cell designs for business (enterprise) or public area use can handle 16, 32 or more concurrent calls. These numbers are in addition to passive users not actively making or receiving voice or data calls.

Locked to a single mobile phone network

Unlike Wi-Fi, these devices use licensed radio spectrum, so must be operated and controlled by a mobile phone company. Thus it will work with only one mobile phone operator, and thus encourages all users in a household or business enterprise to switch to the same network operator

When in range of the small cell, the mobile phone will automatically detect it and use it in preference to the outdoor cellsites. Calls are made and received in exactly the same way as before, except that the signals are sent encrypted from the small cell via the public or private broadband IP network to one of the mobile operators main switching centres. Making and receiving calls uses the same procedures and telephone numbers, and all the standard features (call divert,text messaging, web browsing) are available in the same way- indeed data services should operate more quickly and efficiently due to the short range involved.



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Open or restricted access

Restrictions can be applied on who can access a small cell. Residential femtocell owners may be concerned about paying additional charges for DSL broadband supplier where a quota applies - even though this would equate to many long voice calls or heavy data service use. For this reason, many residential femtocells include a facility to restrict service to a white list of upto 30 specified telephone numbers. Enterprise use is more commonly open to all, including visitors, but may priorities phones belonging to the business itself. Metrocells are always fully open access.

Secure and self-managing

Small cells encrypt all voice and data sent and received, ensuring a high level of protection from sniffing or snooping.

In order to reduce operational and installation costs, these units are self installing and use a variety of clever tricks to sense which frequency to transmit on and power level to use.

Unlike large outdoor mobile phone base stations (masts), femtocells don't require specialist RF planning engineers to design, calibrate or configure themselves - minimizing the ongoing cost of maintaining them. They do have remote management from the network operator, who can upgrade the configuration and software as required.

Doesn't require special Phones

They are compatible with existing standard 3G mobile phones and are not restricted to any specific models. No additional software is required to enable the phone to work with a small cell.

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