

INDOOR GSM WITH FEMTOCELL TECHNOLOGY

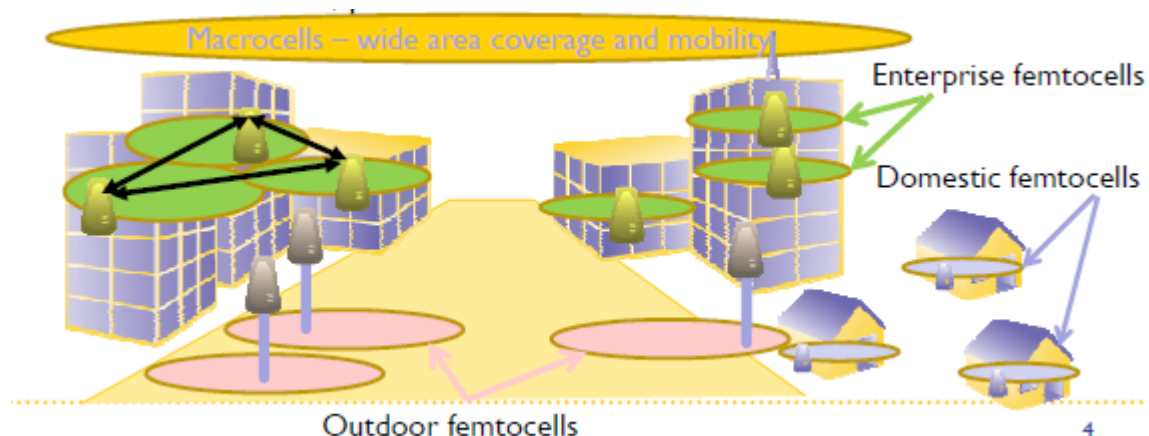
We start to have a new buzz word in the telecom industry – femtocell. I will try to shed some light on the subject.

“Femto” comes from the same prefix as micro (10^{-6}) and nano (10^{-9}) and means 10^{-15} but in this context should be interpreted as “very small”. Although the concept of femtocell can be applied to many different technologies, today it’s focused on 3G systems. Very small cells are in this context similar to the cell sizes that we see in DECT.

There are several drivers for femtocell development, one of them is saturation of the existing 3G frequency spectrum and by using very small cells, the available spectrum can be reused (this is by the way how DECT and WiFi works)

Another driver is that the operators are trying to secure revenues from domestic users that move from fixed line to mobile subscriptions.

This concept is not new and the cellular networks are designed for hierarchical cell structures from the beginning. The new twist that the femtocell suppliers are offering is a cheaper base station architecture where most of the network intelligence is left in the core network and the femto base stations are simpler and cheaper “radio heads”. Another difference is that the femtocell base station requires internet access where the data and speech is transported into the operator’s core network by means of a local router.



This router also allows data traffic to be directly filtered out and transported over internet and not loading the operator network.

The first wave of femtocell products that are targeted at domestic users has been recently introduced on the market. The volumes are far much lower than anticipated. There is already development ongoing for enterprise networks where additional requirements of “femto to femto” handover and enhanced macro cell interference avoidance must be solved.

From a user point of view the femtocell solution will be transparent and only enhance coverage and throughput in areas with bad coverage.

Also for enterprise solutions the service will be similar to today’s operator supplied mobile extension, but with enhanced coverage in some areas.

There are still some practical issues that need to be addressed, these femtocell bases will be rather easy to move and since they operate in a licensed band a number of security measures need to be in place to prevent unauthorized moving and dynamic functions for interference avoidance with the macro cell network.