

## **FAQ: 3GPP HNB (Femtocell) Standards Announcement**

### **What is an HNB?**

In 3GPP, a femtocell is referred to as a “Home NodeB”, or HNB. Within the macro 3G radio access network (RAN), base stations in the field are known as NodeBs. These NodeBs connect to Radio Network Controllers, or RNCs. A NodeB in the home is therefore called a Home NodeB, or HNB.

### **What exactly was agreed at the May 2008 3GPP RAN plenary meeting?**

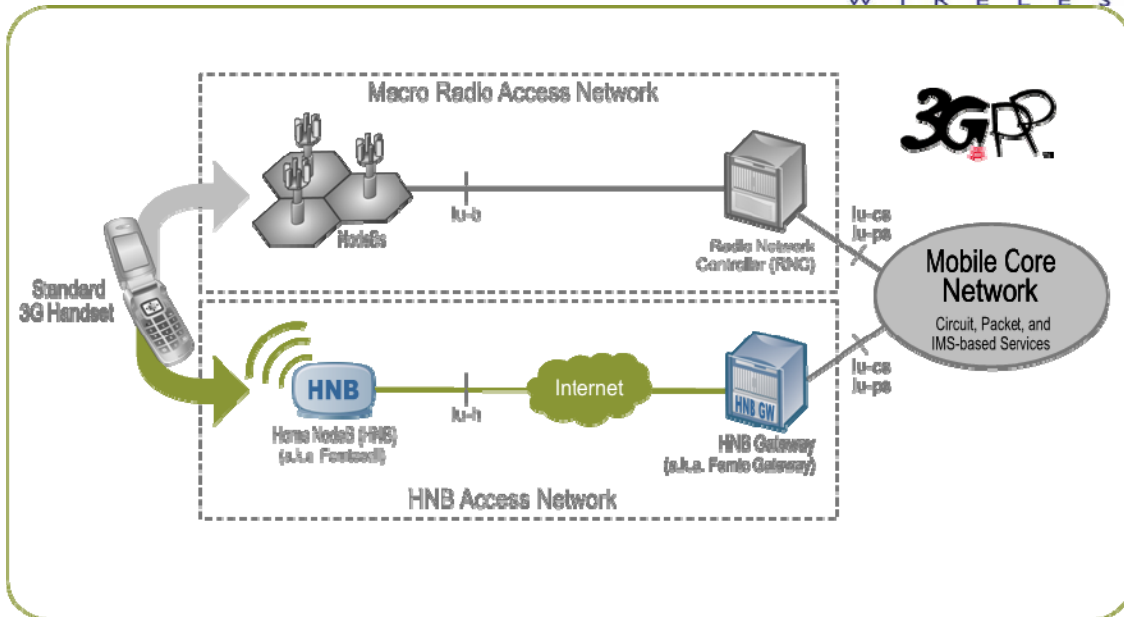
On May 30<sup>th</sup> at the 3GPP RAN plenary meeting, an HNB (femtocell) feasibility study was completed and work items were approved to develop the detailed HNB (femtocell) specifications.

One key area investigated as part of feasibility study was architectures for femtocell-to-core network connectivity. After significant debate, the participating companies reached a consensus and agreed an HNB reference architecture. The work items to develop the detailed Stage 2 (architecture) and Stage 3 (protocols) specifications based on the agreed reference architecture were also approved at the meeting, with completion targeted by the RAN plenary meeting in December 2008.

### **What are the highlights of the agreed HNB architecture?**

The agreed 3GPP HNB architecture follows an access network-based approach, leveraging the existing lu-cs and lu-ps interfaces into the core service network. The architecture defines two new network elements, the HNB (a.k.a. Femtocell) and the HNB Gateway (a.k.a. Femto Gateway). Between these elements is the new lu-h interface.

- Home NodeB (HNB) – Connected to an existing residential broadband service, an HNB provides radio coverage for standard 3G handsets within a home. HNBs incorporate the capabilities of a standard NodeB as well as the radio resource management functions of a standard Radio Network Controller (RNC).
- HNB Gateway (HNB-GW): Installed within an operator’s network, the HNB Gateway aggregates traffic from a large number of HNBs back into an existing core service network through the standard lu-cs and lu-ps interfaces.
- lu-h Interface: Residing between an HNB and HNB-GW, the lu-h interface includes a new HNB application protocol (HNBAP) for enabling highly-scalable, ad-hoc HNB deployment. The interface also introduces an efficient, scalable method for transporting lu control signaling over the Internet.



### How was a consensus reached on the architecture?

The feasibility study, which was initiated in March 2007, evaluated a number of architectural proposals for femtocell-to-core network connectivity.

In February 2008, a consensus was reached on an access network-based approach that leveraged the existing Iu-cs and Iu-ps interfaces into the core service network, and extended Iu signaling and bearer traffic over the Internet to a HNB. This approach required the definition of a new interface between the HNB and HNB-GW, which was commonly referred to as the “Iu-over-IP” interface.

A number of companies made proposals to define the Iu-over-IP interface. For example, Kineto, NEC, and Motorola made detailed joint submissions showing how the existing 3GPP UMA/GAN specification could be leveraged to meet the requirements of the Iu-over-IP interface. Submissions from Alcatel-Lucent, Nokia Siemens Networks (NSN), Huawei and others were also considered.

In order to facilitate a consensus, Kineto approached Alcatel-Lucent to collaborate on a joint submission, as the Alcatel-Lucent and Kineto/GAN proposals had a number of similarities. Subsequently, Kineto and Alcatel-Lucent developed a joint submission blending attributes of the two approaches. The joint proposal, which introduced the Iu-h interface, was presented at the RAN3 working group meeting in early May. By the end of the meeting, Ericsson, Nokia-Siemens Networks, Nokia, Huawei, Vodafone, Samsung and ip.access added their names to the proposal, with the goal of receiving approval at the RAN plenary meeting on May 30th.

It's this proposal which was approved last week.