

BI 04 Investigation of femtocell and development possibilities in Sri Lanka

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Cellular networks consist of a dedicated terrestrial backbone while WLANs usually connect directly to IP networks. In cellular systems, one of the major issues is relatively weak or degraded network signal levels usually available for indoor users in apartments or buildings. To address this issue, cells that are smaller in size than Macrocell – namely Micro and Picocells – were introduced. Since the introduced technologies are purely cellular and cater primarily for voice services with mobility, these could only increase the network coverage. What is more, these also require much resource for deployment. A possible solution is Femtocells which in fact are cellular network access points that can connect standard mobile devices to a mobile operator's network, using an existing residential broadband connection such as DSL or cable connections. Femtocells can easily integrate with 2G, 3G and upcoming 4G networks, meaning that GSM, UMTS, Mobile Wi-MAX, CDMA, EVDO and other current and future protocols, standardized by 3GPP, 3GPP2 and Wi-MAX Forum and other wireless broadband users will be able to take full advantage of the services in areas where coverage would otherwise be spotty. Being direct successors of cellular technology, Femtocells operate in licensed spectrum and within parameters set by the licensed operators. When operating in licensed spectrum, operators are able to provide certain assured quality of service (QoS) to customers over the air, free from interference but making efficient use of their spectrum. Femtocell is the air access technology that promises to cope with such issues and it is also regarded as a solution that helps to reduce the capital and operational expenses of a mobile network while enhancing system coverage and capacity. This research work covers an overview of Femtocells, the benefits and challenges related to joint deployment of Femtocells and Macrocells. In addition to that this research work investigates the Femtocells deployment possibilities in Sri Lanka context.

Keywords: Femtocell, Macrocell, UMTS, Wi-Fi, QoS.