

Impact of mobile WiFi technology on multimedia applications

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Abstract

Wireless transmission mechanisms of the IEEE 802.11 family are widespread due to the mobility in indoor and outdoor environment as well. At hot-spot deployment an essential question is that 802.11b or 802.11g and/or 802.11a system will be installed. For this decision an efficiency analysis is needed beyond the economic and rational considerations.

As we know WiFi system is based on the ISM frequency bands that allow to the providers to deploy hot-spots independently in the same physical environment. In practice the providers use radio channels in outdoor environment without or with rare conciliations with each other. As ETSI standards applied for emitted microwave energy, the densely installed APs may cause interference with each other.

In corporate and university environments multimedia services of wireless mobile devices (notebooks, palmtops, and intelligent mobile phones) conceive of an increasing user demand. As IP phone system is increasingly available in university environment, the analysis of practicability of WiFi phones during movement appears as an obvious object in indoor and outdoor environment as well. In the 2.4GHz ISM range the voice transmission properties of the WiFi IP phone mainly depend on the used voice compression algorithm. The channel encoding mechanism of the 5 GHz WiFi transmission is more effective than the 802.11g, whereas its transmission rate is quite sensitive to the distance from the AP. During motion the transmission standard that has a higher compression ratio is more sensitive to the cell switching than the lower compression algorithm. We know from previous analyses that the quality of multimedia services on mobile stations is hardly influenced by the physical velocity of the device under the roaming event.

In our presentation we will focus on the analysis of the properties of multimedia applications (video, streaming, IP phone) operated over IEEE 802.11b/g/a WiFi systems. We give also an overview of the practical experiences of a recently deployed WiFi system with 20 indoor APs at the University of Debrecen.