Title: Radio on Fiber & Free Space Optics Systems for Broadband Wireless Access

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Abstract

In order to realize the ubiquitous networks, a combination of IP network and broadband heterogeneous wireless access services will play an important role. Users' demands for various types multimedia services will be increasing more and more; therefore full wireless IP connectivity will be required to accommodate variety of contents. Moreover, such diversification appears also in air interfaces of wireless access. A suitable wireless service should be provided according to users' different demands for applications, quality, latency, and moreover users' situations such as indoor, outdoor, and fast/slow mobility. Therefore, a universal platform for heterogeneous wireless services will become a key issue to realize ubiquitous networks.

In current wireless networks, however, various operators independently overlaid their own radio base stations and network. This leads redundant equipments and investments on infrastructures, and prevents the quick start of a new wireless service and employing microcellular architecture. These problems are revealed especially in in-building, underground at urban areas, and rural areas where broadband fiber-infrastructures have not yet been constructed due to their high cost and a low population.

Radio on Fiber (RoF) technologies can realize a cost effective universal platform for future ubiquitous wireless services. RoF can be extended into RoFSO (Radio on Free Space Optics) or RoR (Radio on Radio) networks, which provide a free space for heterogeneous wireless services in Free Space Optics or millimeter wave radio. We have started developing a new advanced RoFSO system. This presentation describes its concept, features, and current technologies, and furthermore, discusses Radio on Fiber & Free Space Optics networks from a viewpoint of its role in future ubiquitous broadband wireless access.