

## Triple-play to the last mile over free space optics

### ABSTRACT

This paper demonstrates the implementation of variable weight optical code division multiple access system in free space optics in order to support services with different quality of service requirement to the end users. This is achieved by varying the code weight of a particular user to provide signals with different quality level. Three users of different weights were transmitted at 622Mbps per channel rate over a free space optical channel. The received signals of different bit error rate of in several orders of magnitude such as  $10^{-3}$ ,  $10^{-9}$  and  $10^{-12}$  are presented, to support the triple-play services, which are voice, data and video, respectively. The proposed system was simulated in different weather conditions with regard to Malaysia environment, whereby rain attenuations of 10 dB/km and 0.5 dB/km were used for heavy rain and clear weather, respectively.

**Keyword:** Free space optics; Optical code division multiple access; Triple-play; Variable code weight; Weather condition