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| **Abstract:** |  |
| In this paper, 4-QAM architecture was developed where Optical-OFDM (O-OFDM) technique was used along with the incorporation of WDM, through which up to 40 channels were multiplexed each with 55 Gbps data speed. This paper investigates the system by evaluating the effect on OSNR, Error vector magnitude (EVM) and Power Loss in the network. It has been found from this architecture that sufficient power is received at the receiver side maintaining a low Bit error rate (BER), less than 10 −3 according to IEEE standard. Through this endeavor, a PON with unprecedented capacity of 2.2 Tbps was created with a maximum transmission distance of 120km which is a very exceptional and noteworthy result for O-OFDM WDM PON, regarding both capacity and transmission distance | |