

# Sleep Mode on Delay Sensitive Traffic on Optical Network Unit

Nurazmina Lingas\*, M. Rakib Uddin\*\*

*Electrical and Electronic Engineering Programme Area, Faculty of Engineering  
University Teknologi Brunei (UTB), Brunei Darussalam  
nurazmina.lingas@utb.edu.bn, Rakib.uddin@utb.edu.bn*

**Abstract**— The search for energy efficient solution in communication networks has been a priority both in academia and in industrial research, especially in Access Networks. It is known that PONs contribute a significant amount of percentage (about 70 percent) of the fixed communication network energy consumption in fibre to the home system especially at ONU which consume about 60 percent of the power usage which originates from the user's site. In this paper, the simulation of fast sleep mode technique is conducted to test both the power and latency performance of the ONU for delay sensitive traffic in Time Division Multiplexing (TDM) PON.

**Keyword**— Optical fiber, Optical network unit (ONU), Passive Optical Network (PON), Power consumption, Sleep mode



**Nurazmina Lingas** received her BEng in Electrical and Electronic Engineering from the University of Glasgow, Scotland in 1995 and MSc in networked communication from Loughborough University in 2011. She also received Master of Teaching from Universiti Brunei Darussalam in 2013. Immediately after graduate in 1995, she worked at the telecommunication industry before joining Universiti Teknologi Brunei in 2008 as a lecturer. She is currently pursuing her part time PhD Degree in the area of communication engineering. Her research interests include broadband access networks, photonics, telecommunication networks and computer networking.



**Dr. M. Rakib Uddin** was born in Bangladesh in February 18, 1978. He received his PhD degree in the area of communication engineering from KAIST, Daejeon, Korea in 2010. He received his MSc in Electrical and Electronic Engineering from Bangladesh University of Engineering and Technology, Dhaka, Bangladesh in 2005 and BSc in Electrical and Electronic Engineering from Chittagong University of Engineering and Technology, Chittagong, Bangladesh in 2002.

He is working as ASSOCIATE PROFESSOR with Electrical and Electronic Engineering Programme Area, University Teknologi Brunei (UTB), Bandar Seri Begawan, Brunei Darussalam since December 2014. He worked for Samsung Electronics/Samsung Advanced Institute of Technology, Hwaseong/Geheung, Korea as research staff Member/Senior Engineer from 2011 to 2014. He worked as Post-doctoral fellowship with KAIST from 2010 to 2011. He has more than 60 articles in international journals and conference proceedings along with seven international patents.

Dr Rakib Uddin is a Senior member of IEEE, USA and Member of IET, UK. He got Korean government IITA full scholarship for his PhD programme from 2006 to 2010 at KAIST. He also got Korean Government Brain Korea 21 (BK21) fellowship for his post-doctoral research with KAIST, Korea. Dr Rakib Uddin received University Teaching as well as Research Excellence Awards in 2017 and 2019 at UTB, Brunei Darussalam.