
OFC Review

Access I in Detail

Lei Shi

2011-04-26

Sessions	Industrial	Academia	Important Papers
NMD FTTX New Technologies	2	2	NMD1: Passive Optical Networks: Current and Next-Generation Technologies NMD4: New Enabling Technologies for Passive Optical Networks with Sustainable Growth
NTuD 10 Gb/s PON Technology	6	1	NTuD1: Present State of Standards for Ethernet PON Systems • 10 GB/s PON Technology NTuD5: Symmetric 10G-EPON ONU Burst-Mode Transceiver Employing Dynamic Power Save Control Circuit
OWI Energy Efficient Networks	1	4	OWI3: Energy-efficient Connection Provisioning in WDM Optical Networks OWI5: Energy Efficient Networks

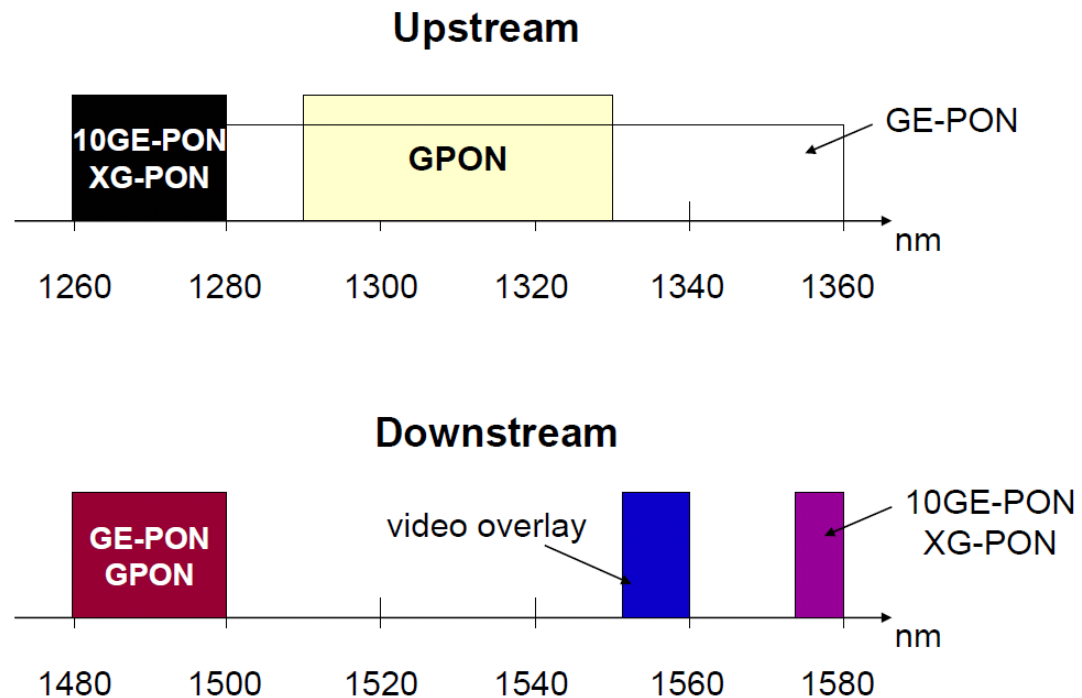
Sessions	Industrial	Academia	Important Papers
NWD Worldwide FTTx Opportunities and Challenges	4	0	
OThB Energy Efficient Optical Access	2	5	OThB1: Energy Efficient Optical Access Network Technologies OThB3: Cost-Effective and Power- Efficient Extended-Reach WDM/TDM PON Systems OThB4: An SLA-Based Energy-Efficient Scheduling Scheme for EPON with Sleep-Mode ONU
OThT High Speed PON	4	3	

NMD1

Passive Optical Networks: Current and Next-Generation Technologies

■ Evolution beyond 10G PON

- High Speed
 - WDM
 - OFDM
 - OCDM
- Long Reach
 - Optical WDM
 - Remote



NMD4:

New Enabling Technologies for Passive Optical Networks with Sustainable Growth

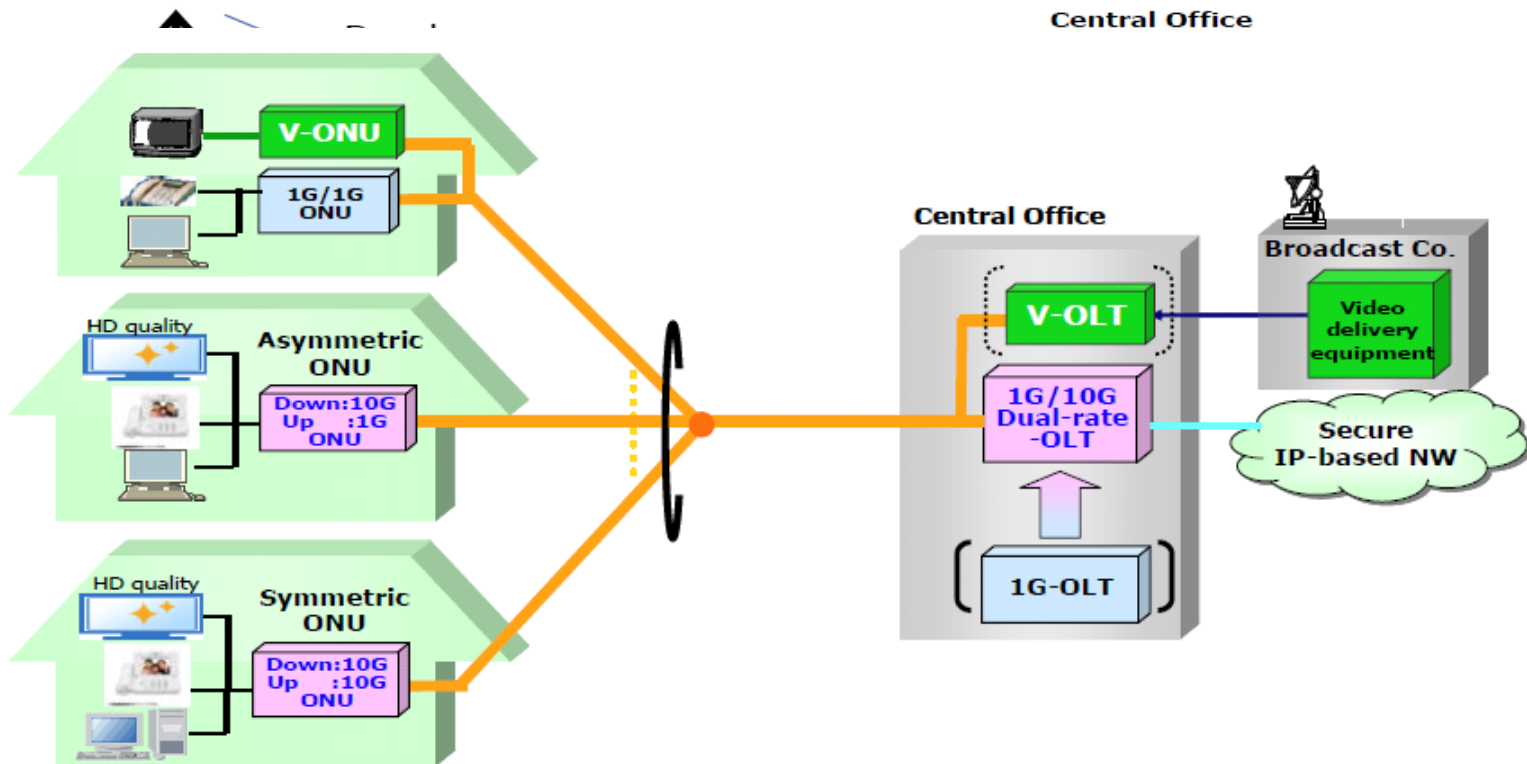


Fig.3 1G/10G co-existence PON configuration

Fig. 4 Possible directions to splitting number and reach as a result of optical budget increase

NTuD1:

Present State of Standards for Ethernet PON Systems

- 10 GB/s PON Technology

- 1G/10G
- EPON
- DPoE
- IEEE 802.3av (10G-EPON)
 - "S
 - Ne



PON
:ical

Figure 1: Many external specifications supply requirements relevant to SIEPON.

NTuD5:

Symmetric 10G-EPON

Table 1 Power consumption of three power save modes

Doze mode	Dynamic power save mode
0.7W	1.3W

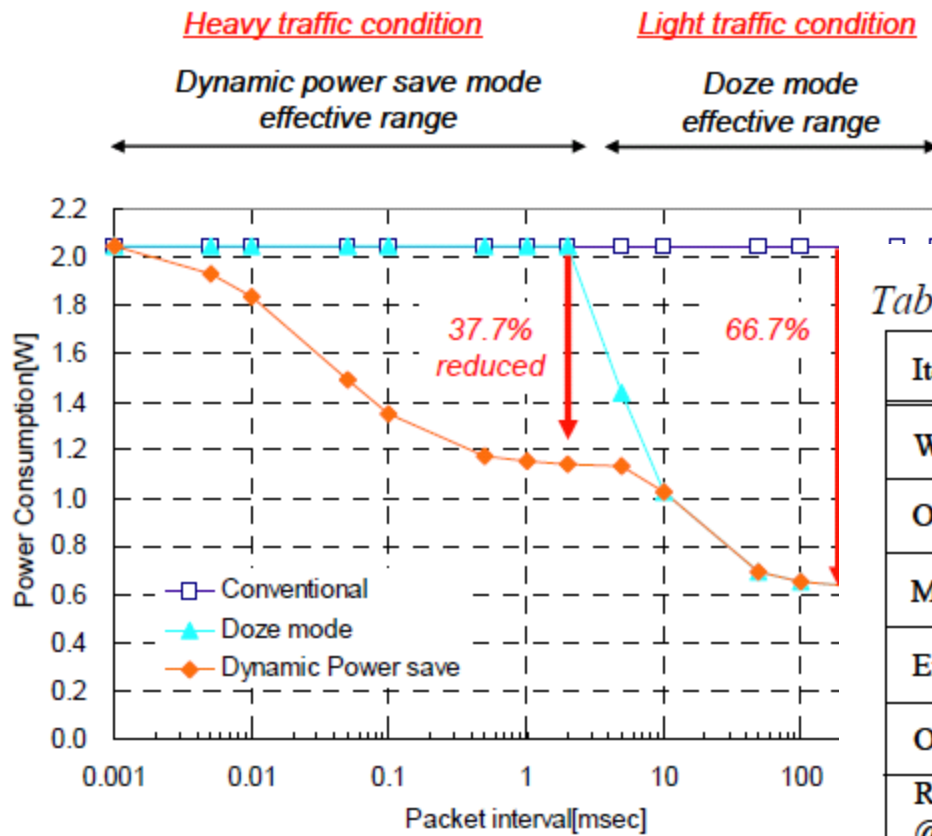


Table 2 Performance summary ($T_c=0 - +75^\circ C$)

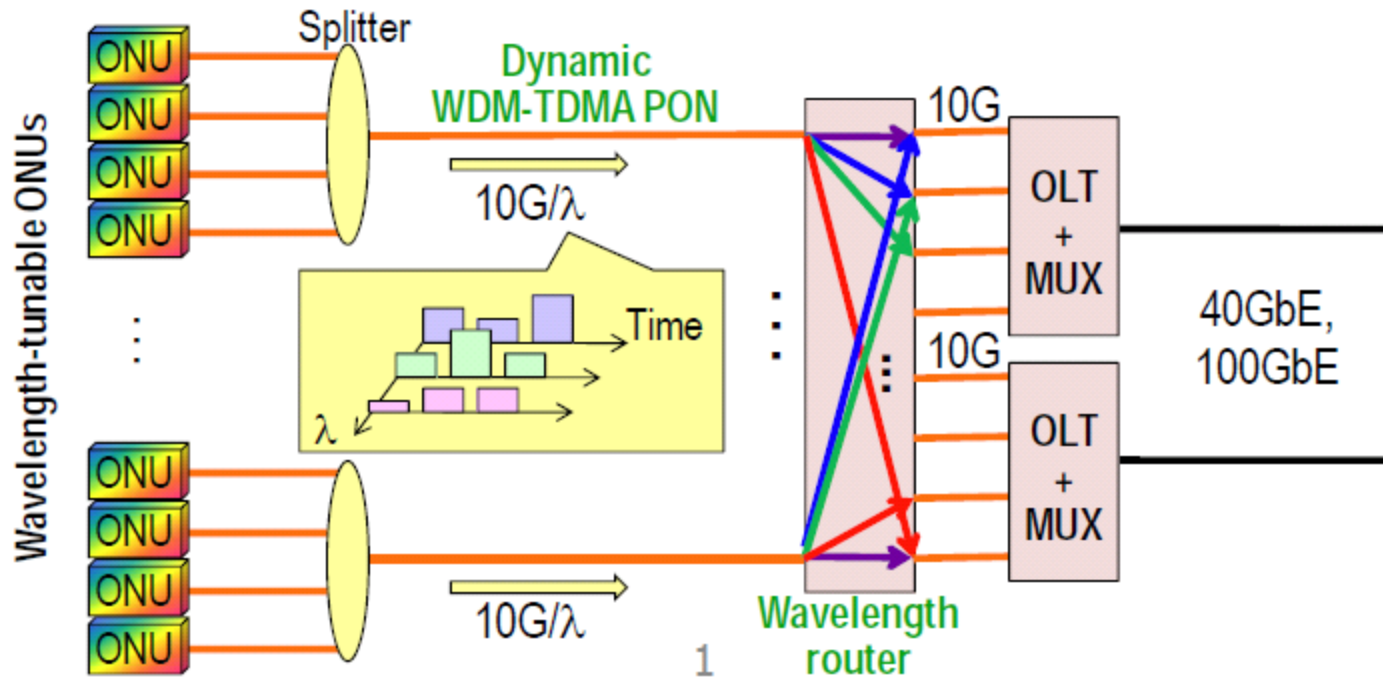
Item	IEE802.3av	Results
Wavelength	1260-1280nm	1265-1273nm
Output power	4-9dBm	>+7dBm
Mask margin	—————	>26%
Extinction ratio	>6dB	>7dB
Overload	>-10dBm	>-4dBm
Receiver sensitivity @BER=1E-3	<-28.5dBm	<-32.4dBm

(d) Measured and calculated power consumption

OThB1:

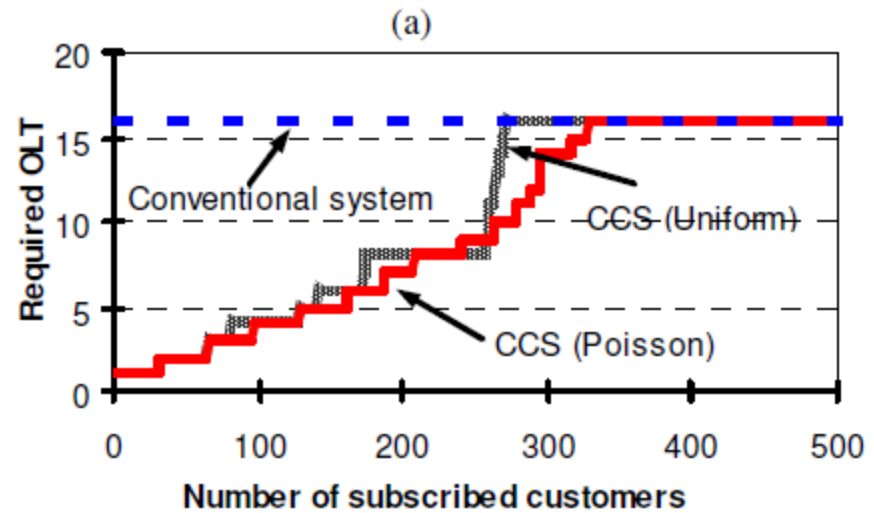
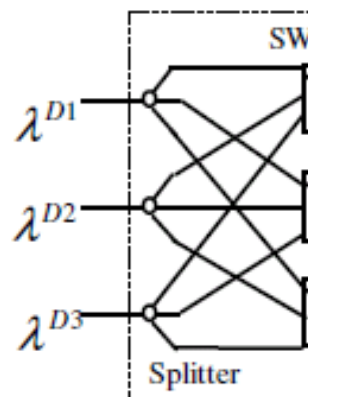
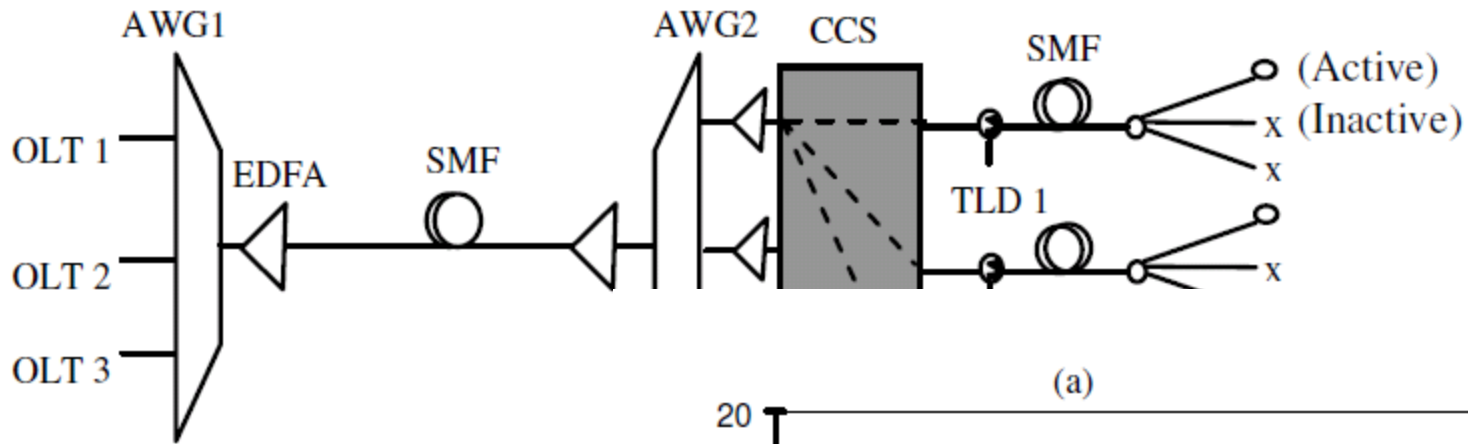
Energy Efficient Optical Access Network Technologies

- Mid-term upgrade of current networks
 - Cyclic sleep for ONU



OThB3:

Cost-Effective and Power-Efficient Extended-Reach WDM/TDM PON Systems



Industry Perspective

How to use today's network? – Migration, Adaptation, SIEPON

How to make 10G possible? – Burst Transmitter/Receiver

How to save cost? – Energy Efficiency, Long Reach

Academic Perspective

How to make network energy efficient?

How to extend reach?

How to WDM...
