
Power saving ad-hoc Report

Sep. 2008
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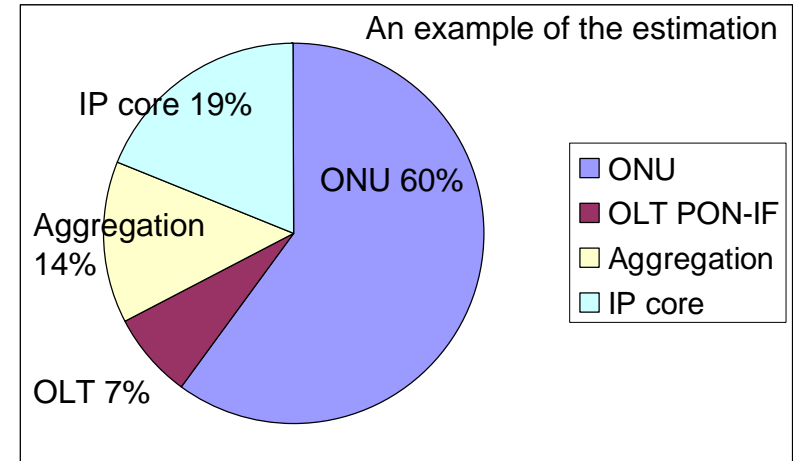
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Background

- In the rough estimation, 60-80% power is consumed in the access in the current FTTH.

For additional information, see page 7.



- On the other hand, the access line utilization is quite low.

Japanese environment (2007)

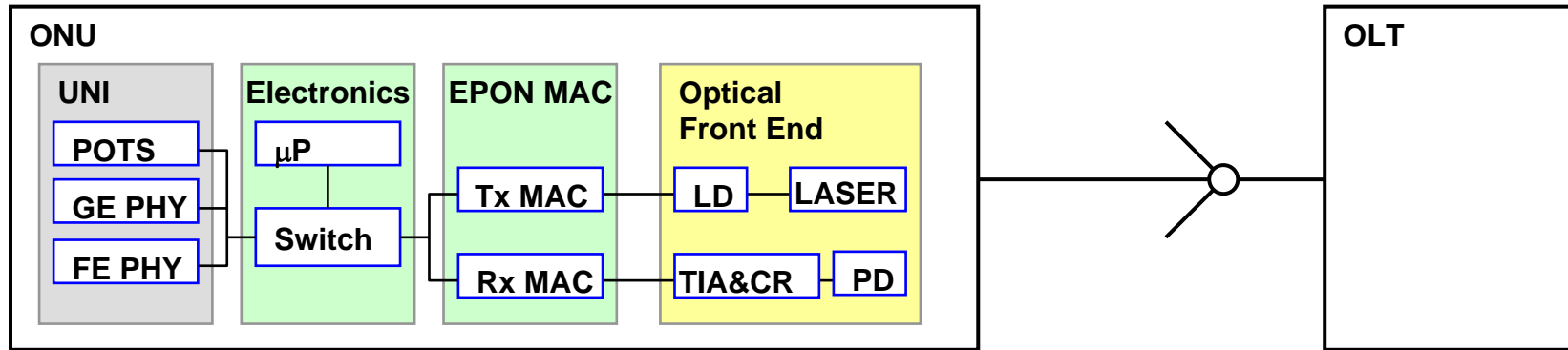
Total traffic (download) = 721 Gb/s (24-hours average)
Broadband lines = 15 million (FTTH 10.5 M, ADSL 5 M)

Average utilization = **48 kb/s/line**

- The majority of spent power can be therefore saved!

Power estimation of 10G-EPON

Model



Power consumption estimation

		UNI (W)		Electronics (W)			Optical front end (W)	PSU efficiency	total (W)
		Ether (GE)	POTS	MAC (W)	uP & switch (W)				
1	ONU	2.0	-	?	?	4.0	7.0		13.0
2		2.0	-	?	?	3.0	4.0		9.0
3		1.11	0.2	?	?	3.0	2.78	90%	7.84
4		1.0	-	0.54	0.66	1.20	2.50	81%	5.80
5	OLT								

- Power saving for Ethernet UNI is discussed in 802.3az (EEE).
- The part except UNI spends more power of 3.7 - 11 W compared with the UNI. (These data seem to have inaccuracy.)

Overview of discussion on power saving

1) **Power estimation for 10G-EPON ONU.**

- We have three contributions.
- Data seems to have inaccuracy.
- So we do not know the potential of power savings for ONU.

2) **Power estimation for 10G-EPON OLT.**

- We have no data, (but we think that OLT may have typically 2 - 3 times larger than single ONU power consumption.)
- So we do not know the potential of power savings for OLT.

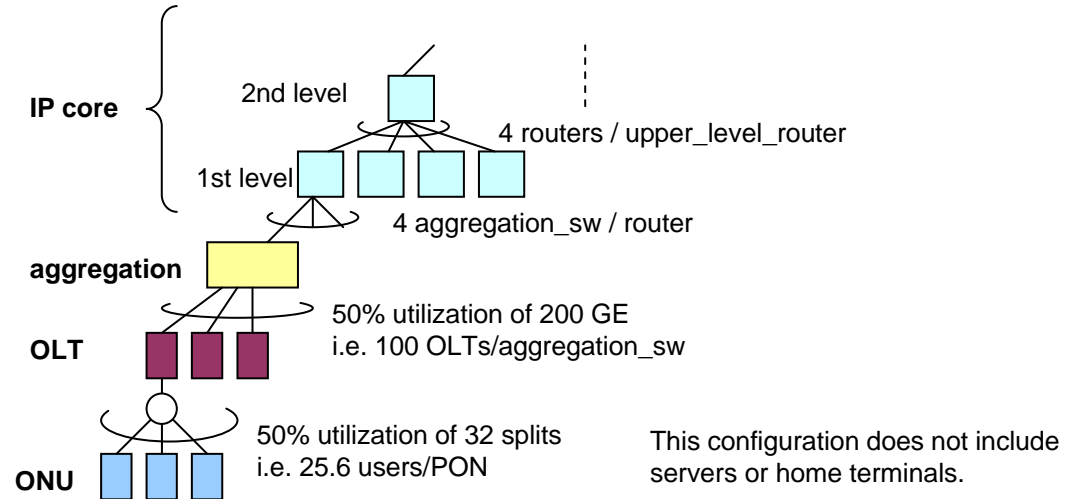
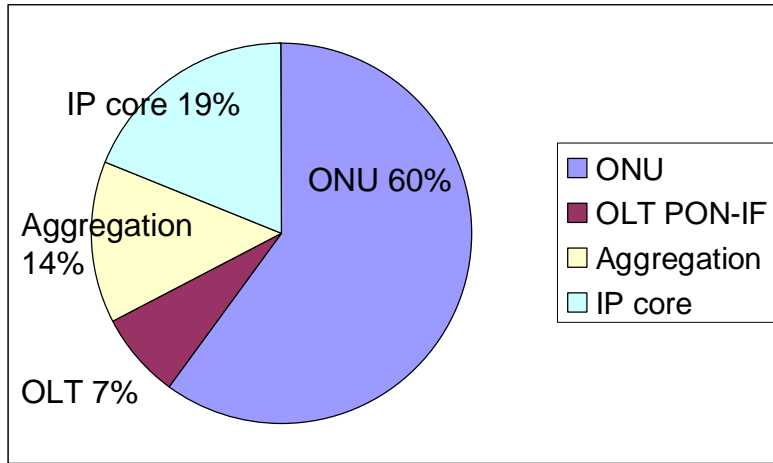
3) **Potential of power saving and mechanism.**

- We have one proposal that shows the “Sleep mode” enables a steep drop off in ONU power consumption (maybe in the ideal case).
- And we have one proposal which realize longer silence-status of ONU.
- We have just started to discuss on these.

We will have further discussion.

Thank you

Backup: An example of the estimation of power consumption



	watts	users	power/user	
ONU	5 W	1	5 W	
OLT (PON-IF)	15 W	32*80%	0.59 W = 15W/25.6	
Aggregation	3 kW x1	200*50%*user_per_PON	1.17 W = 3 kW/2560	200 Gb/s class switch
IP core	3 kW xn	$n^{\text{st}} \text{Level_user} = 4 * (n-1)^{\text{st}} \text{Level_user}$	1.56 W = 3kW/2560+3kW/4/2560 +3kW/16/2560+3kW/64/2560....	200 Gb/s class router