

System Configuration

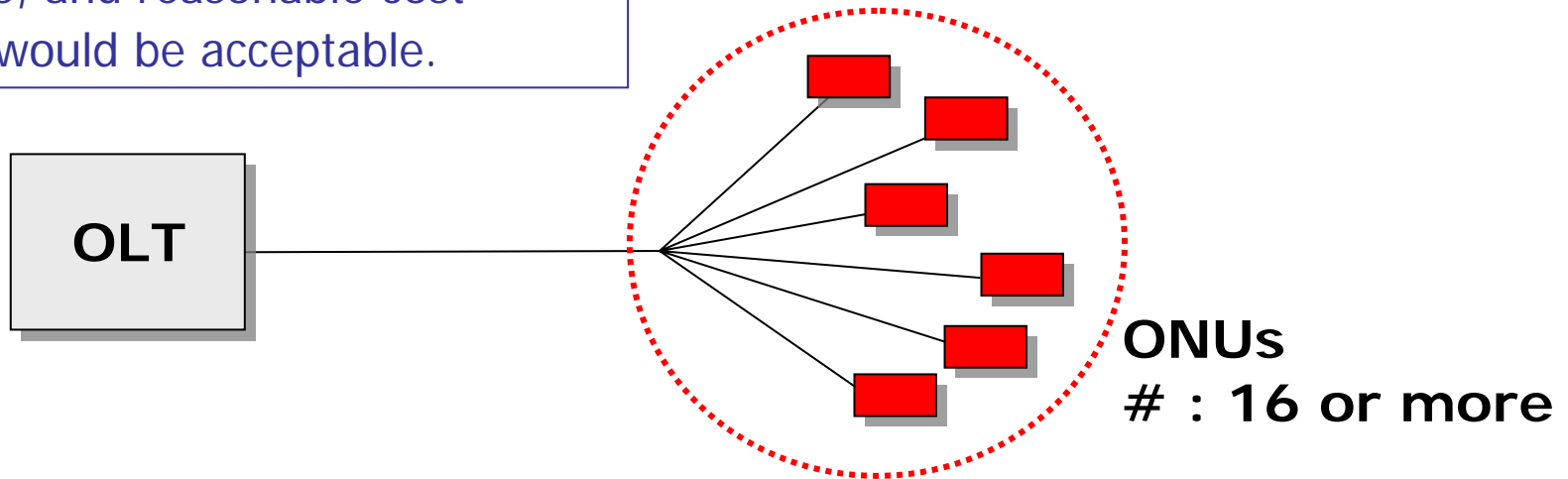
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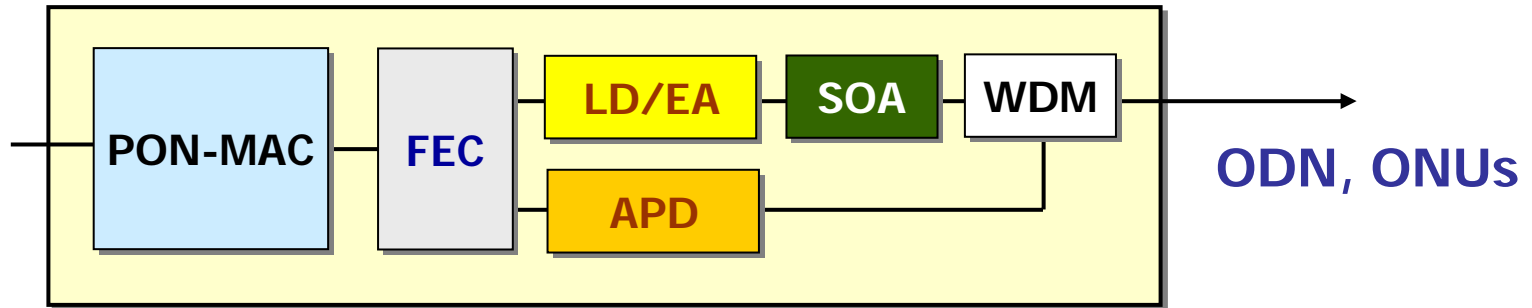
The performance and cost should be considered in the "overall" system which consists of one OLT and > 16 ONUs.

Sophisticated technologies can be applicable, and reasonable cost increase would be acceptable.



Low-cost technologies should be adopted.

OLT



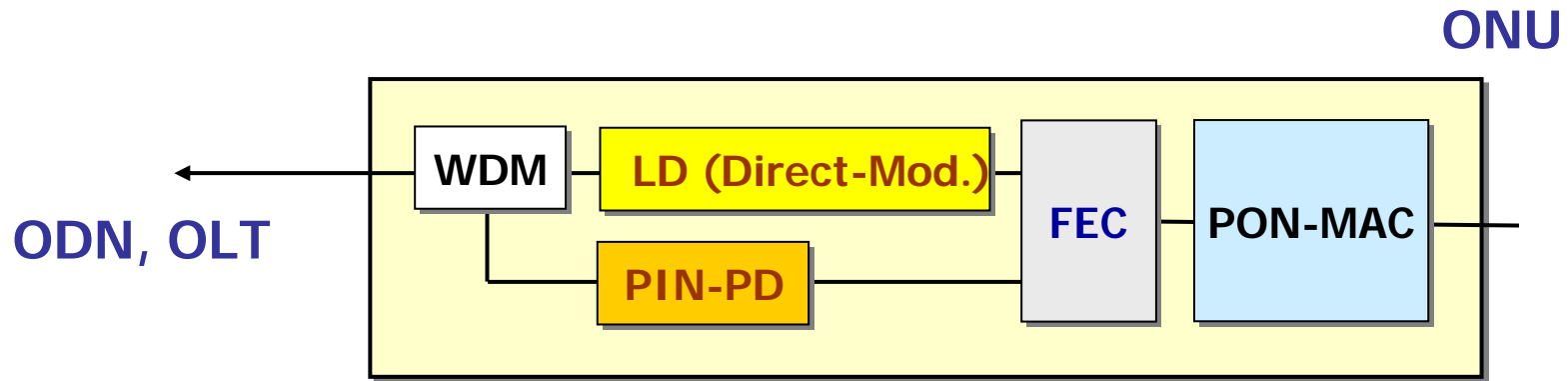
Key technologies and components

➤ Downstream direction

- (1) **Optical amplifier** to enhance the loss budget
- (2) **DFB-LD/External modulator** not to induce the dispersion penalty regardless of the wavelength assignment

➤ Upstream direction

- (1) **APD**
- (2) **Sophisticated FEC decoding**



Key technologies and components

➤ Downstream direction

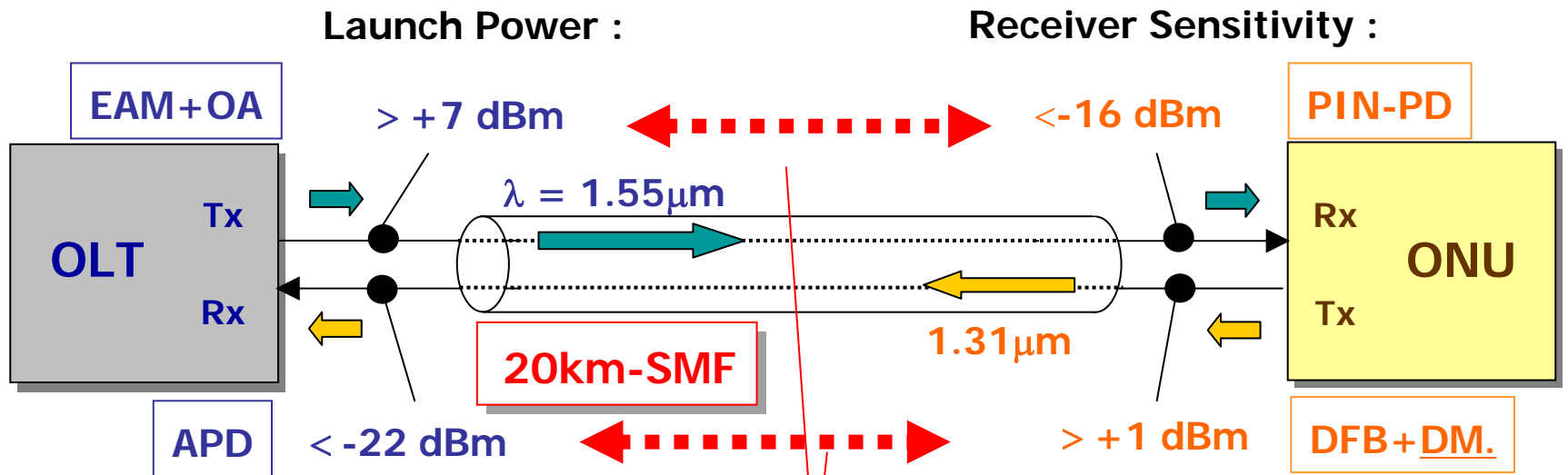
- (1) **Hard-decision FEC decoding**
- (2) **PIN-PD** or ADP depending on the loss budget requirement

➤ Upstream direction

- (1) **DFD-LD / Direct modulation**

Experimental Results

Bit rate : 10.3125Gbps

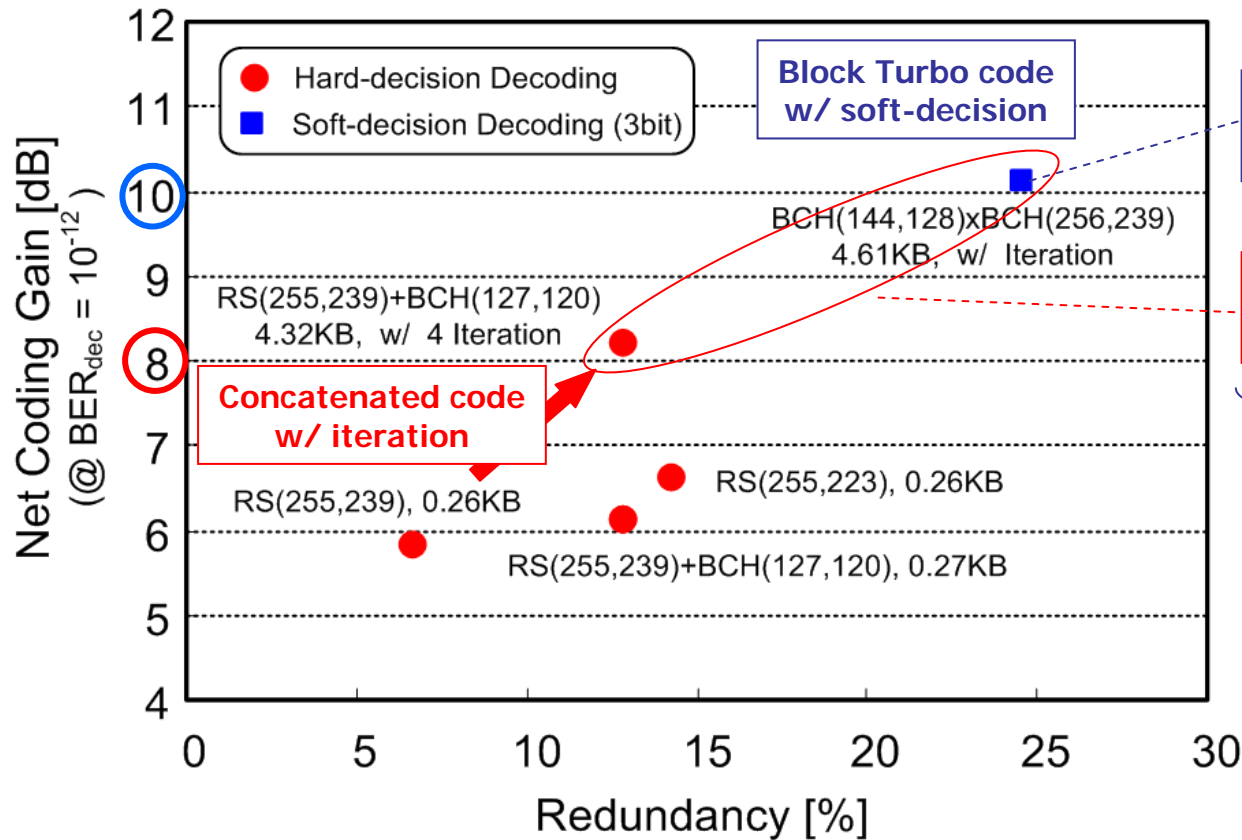


Loss budget: > 23 dB w/o FEC (BER $< 10^{-12}$)

w/ FEC

> 26 dB loss budget can be expected

FEC method



Soft-decision decoding: needs a large-scale circuit

Iteration: increases the latency



Drawbacks

Net coding gain, processor ability/cost, latency and optical transceiver performance should be considered totally.

System configuration

The following technologies should be adopted;

- Direct modulation at ONUs
- Suitable FEC coding/decoding to enhance the loss budget

Wavelength plan

- Downstream: 1.55 μ m or longer
- Upstream : 1.31 μ m

Backward compatibility

- Downstream: WDM-overlay
- Upstream : TDM-overlay

(The OLT is operated at 1G if the system contains 1G-ONUs.)