FTTH technology in the aftermath of Sandy

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FTTH - PON: a robust wireline access solution

- Fully passive distribution network over long distances
- No active equipment in field => improved reliability
- Future safe
- Power efficient
- Best choice when replacing damaged copper infrastructure or investing in civil works for underground utilities

OLT

ONU

1:32 (⇒64)
<10 – 20 km

GPON:
2.5 / 1.25 G

XG-PON1:
10 / 2.5 G
Resilience options (X)G-PON

1. Feeder redundancy
2. + Dual homing
Resilience options (X)G-PON

1. Feeder redundancy
2. Dual homing
3. Full redundancy
4. + ONU redundancy
Wireline access power efficiency

- **ADSL**: 1.2 W/port
- **Optical feeder**: 0.2 W/user
- **GPON OLT**: 0.35 W/user (1:32 split)
- **GPON ONU**: 13 W/ONU (GPON + Gateway)
- **VDSL**: 1.8 W/port
- **Remote**: 9.1 W/CPE (ADSL2 + Gateway)
- **Remote**: 10.3 W/CPE (VDSL2 + Gateway)

(Upper bound values from EU CoC – CPE includes 4xFE, WiFi, and voice)
Sleep Mode in Standard (X)G-PON

- Sleep state
- ONU Power time: ~10 ms
- Awake state
Standard (X)G-PON

2.5 - 10 Gb/s
~10 Mb/s
(~100 kb/s for voice)
Bit-Interleaving PON

2.5 - 10 Gb/s

~10 Mb/s
(~100 kb/s for voice)

Note: Long term research concept
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>10x better efficiency of MAC electronics for Bi-PON than XG-PON in cyclic sleep mode!
Combination of improvement to enable new power back-up approaches

10 W
~8 h on lead-acid battery

Standby 0.1 W - Active voice: 1 W
~8 h active on 4 rechargeable AA cells
~3 d standby on 4 rechargeable AA cells

Power shedding
Cyclic sleep mode
Bi-PON (long term)
Moore’s law

Ref: forums.verizon.com
Ref: wikipedia.org

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