

Allied Telesis řešení pro EPON

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Základní pojmy a zkratky

PON Passive Optical Network

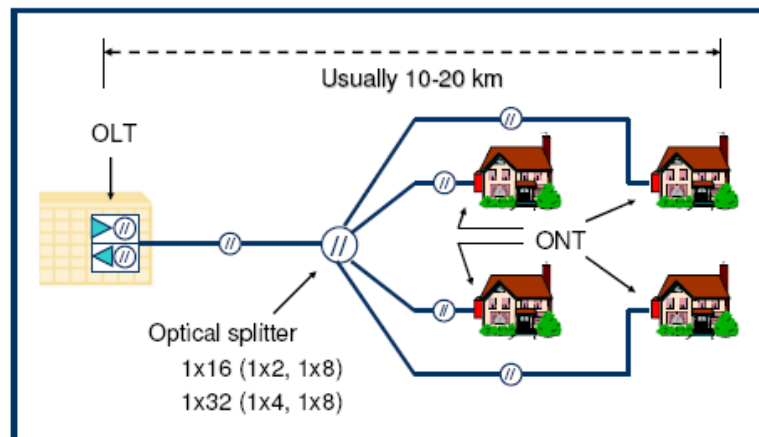
EPON Ethernet verze PON (1Gb/s), v materiálech ATI obvykle GEPON (Gigabit Ethernet PON)

OLT Optical Line Terminator, umístěn v „Central Office“

CO Central Office – místo u poskytovatele (distribuční místo)

ONT Optical Network Terminal – zakončení vlákna, obvykle u uživatele (totéž jako ONU = Optical network unit).

Optical Splitter Pasívní dělič

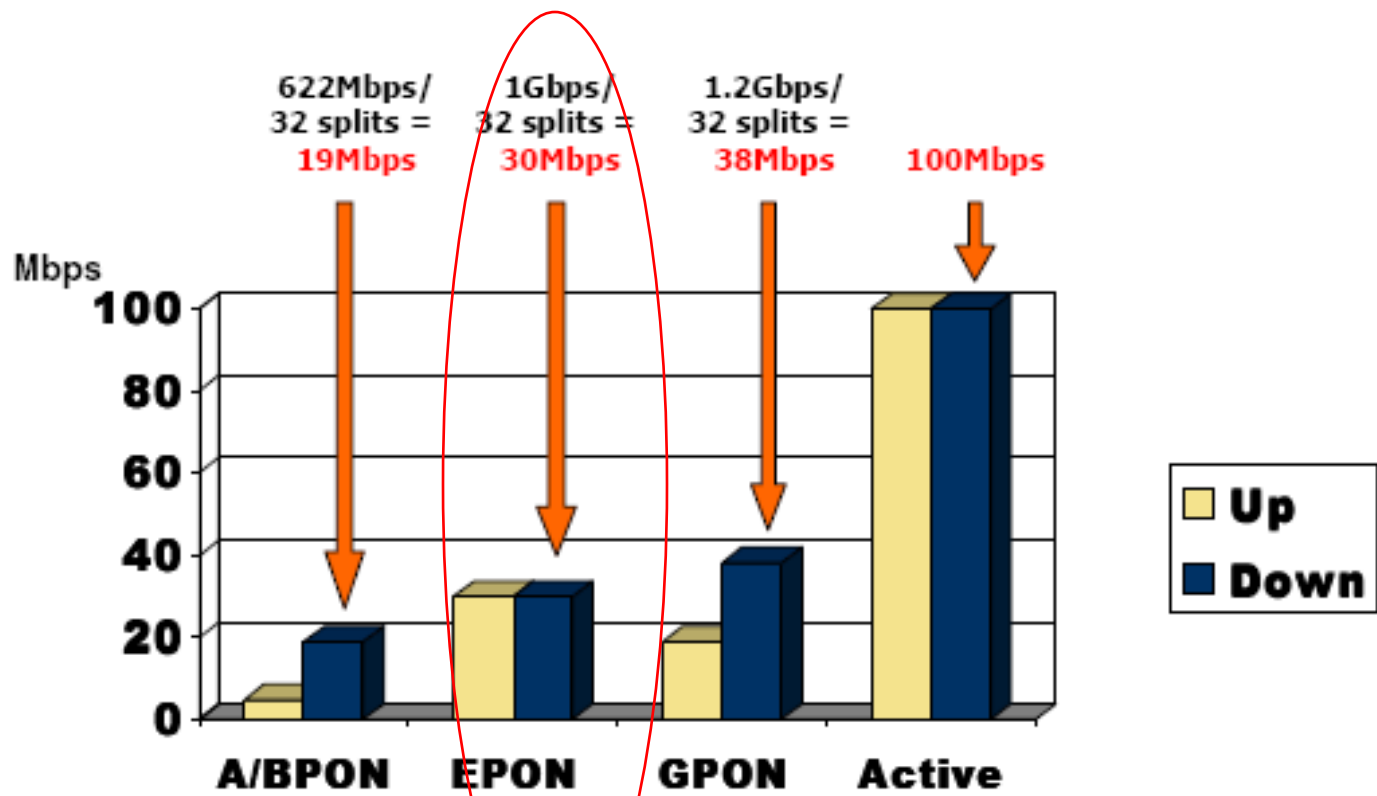




„PON“ aktuální stav na trhu

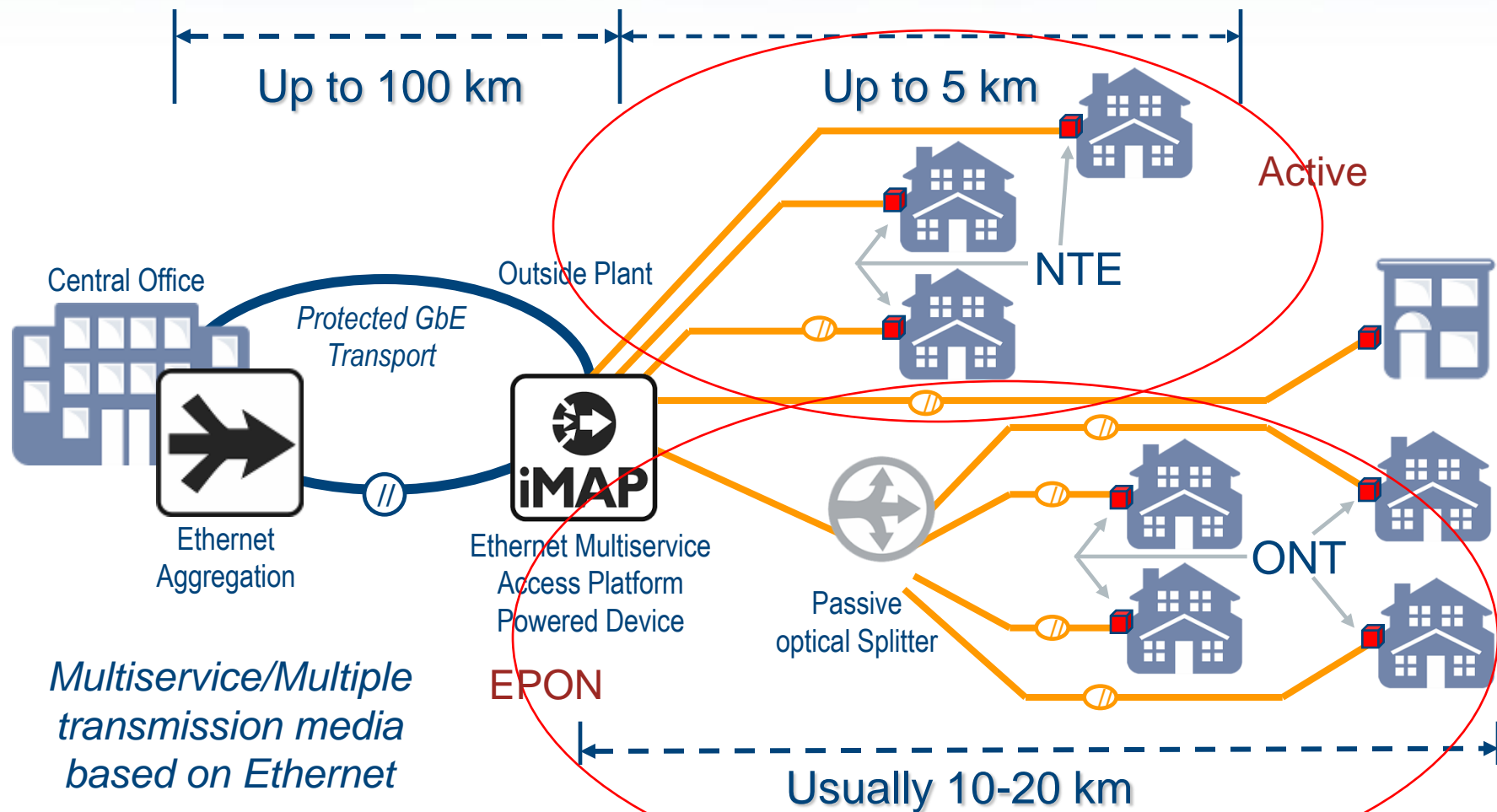
- Historically, deployments were BPON in US and EPON in Asia
- Of these three ‚PONs‘ EPON has the largest market share today
 - » Infonetics research indicates that GPON will not exceed EPON deployment until 2009 at the earliest
- BPON deployments moving to slowly (very slowly) to GPON due to ease of migration and backwards compatibility
- Tier 1 European Service Providers like GPON due to i) ATM and ii) TDM legacy support
- Many of the non-Tier1 Service Providers are deploying Active Ethernet Networks (AEN)

Dosahovaná přenosová kapacita pro jednoho uživatele při poměru 1:32 u různých technologií PON a porovnání s aktivním Ethernetem





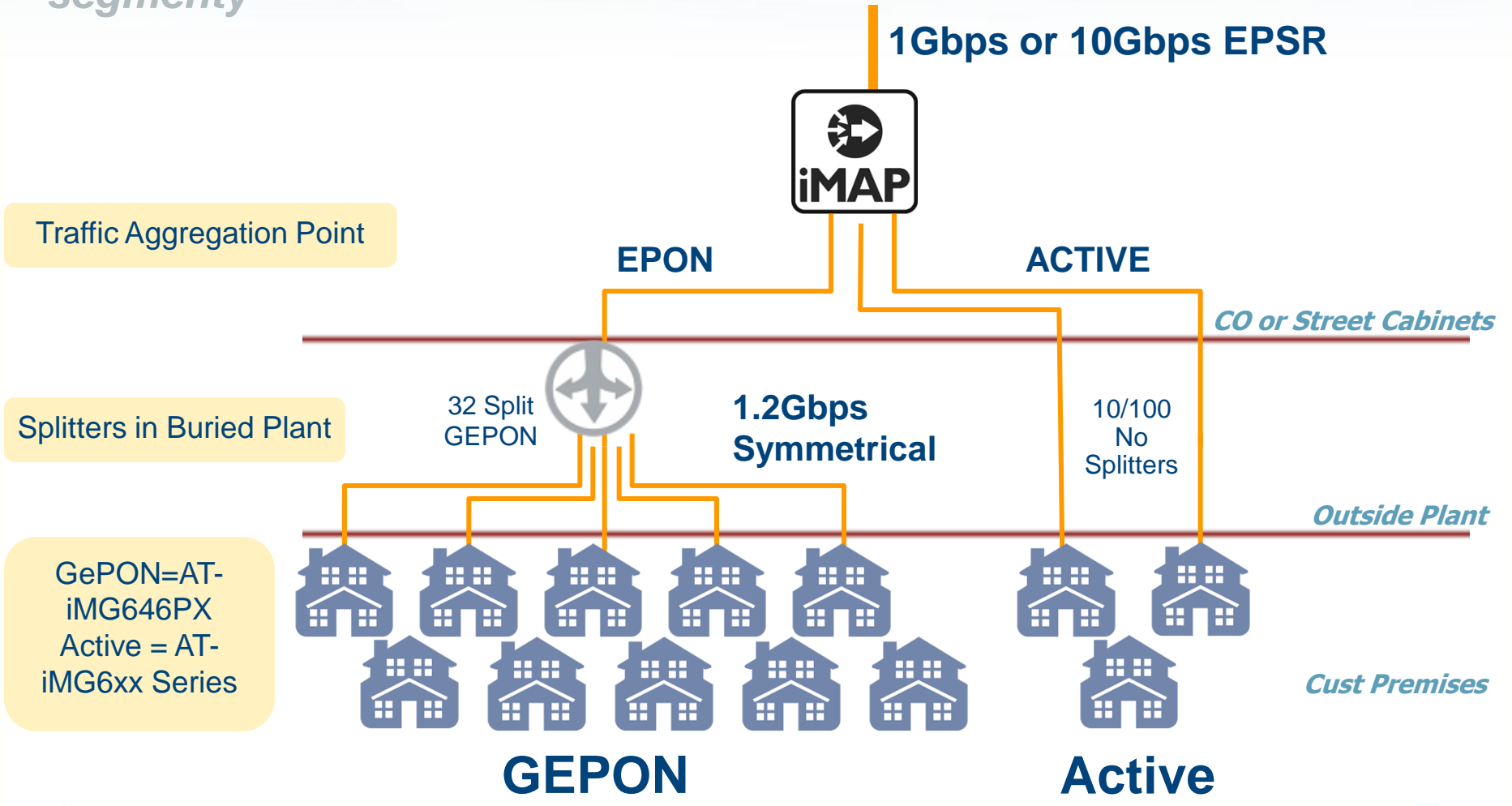
Evoluce: od xDSL k FTTH: aktivní nebo pasivní Ethernet. Od Allied Telesis v jednom zařizení





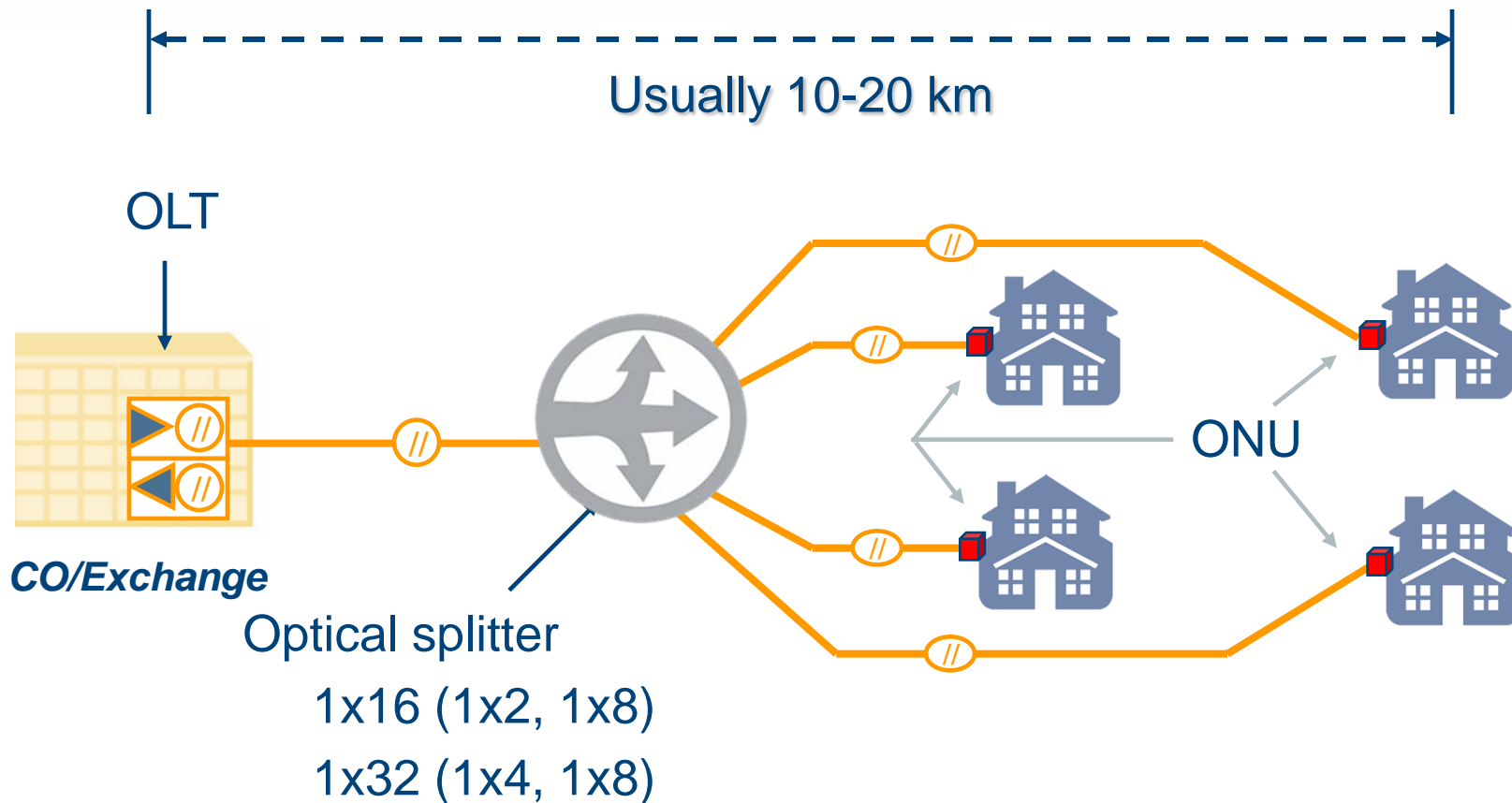
Allied Telesis EPON nebo Active Ethernet

Obojí lze řešit v rámci jedné platformy – iMAP, pohled na síťové segmenty



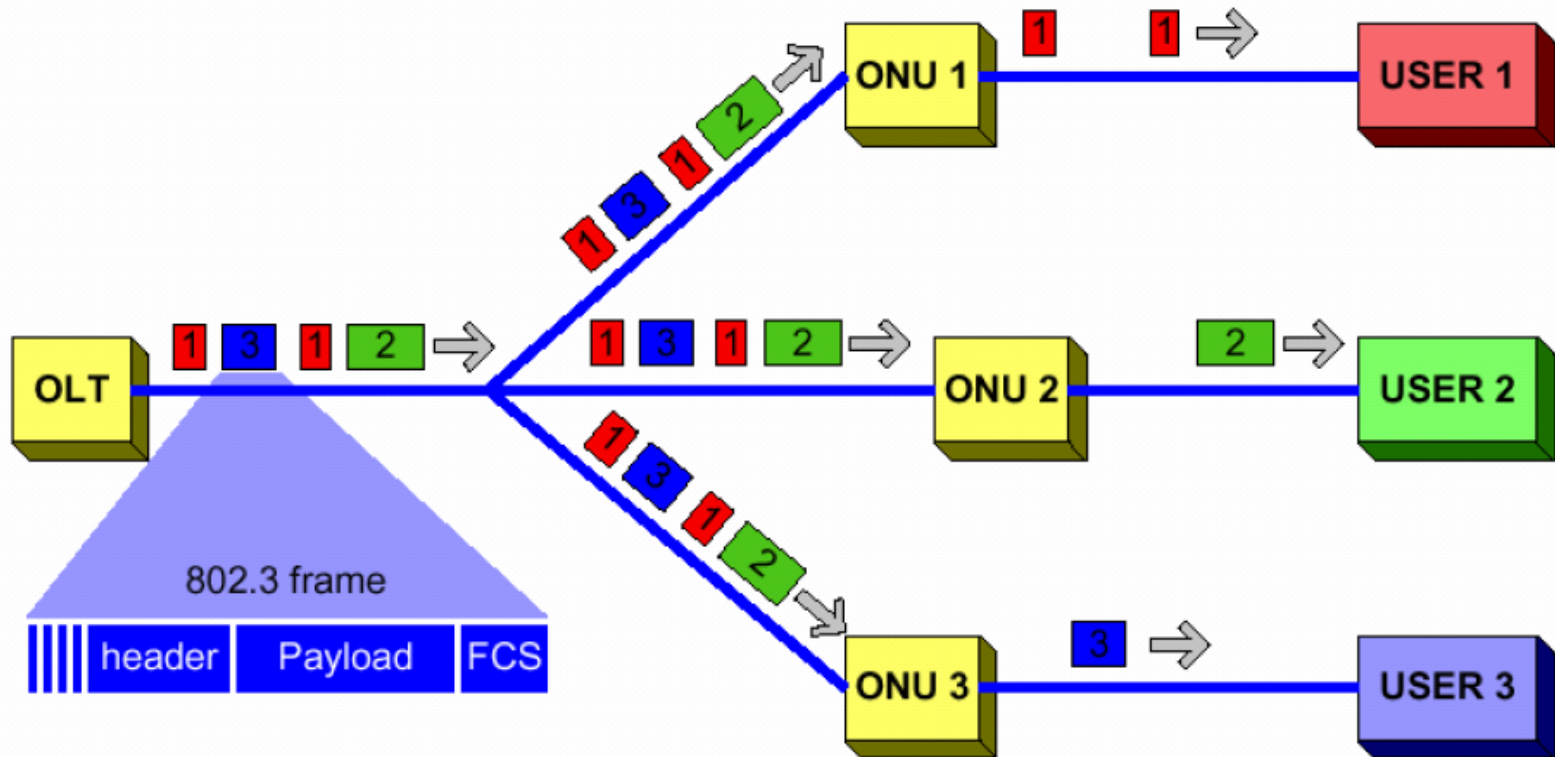
Passive Optical Networks (PONs)

(APON, BPON, EPON, or GPON) – základní schéma





EPON Downstream Traffic



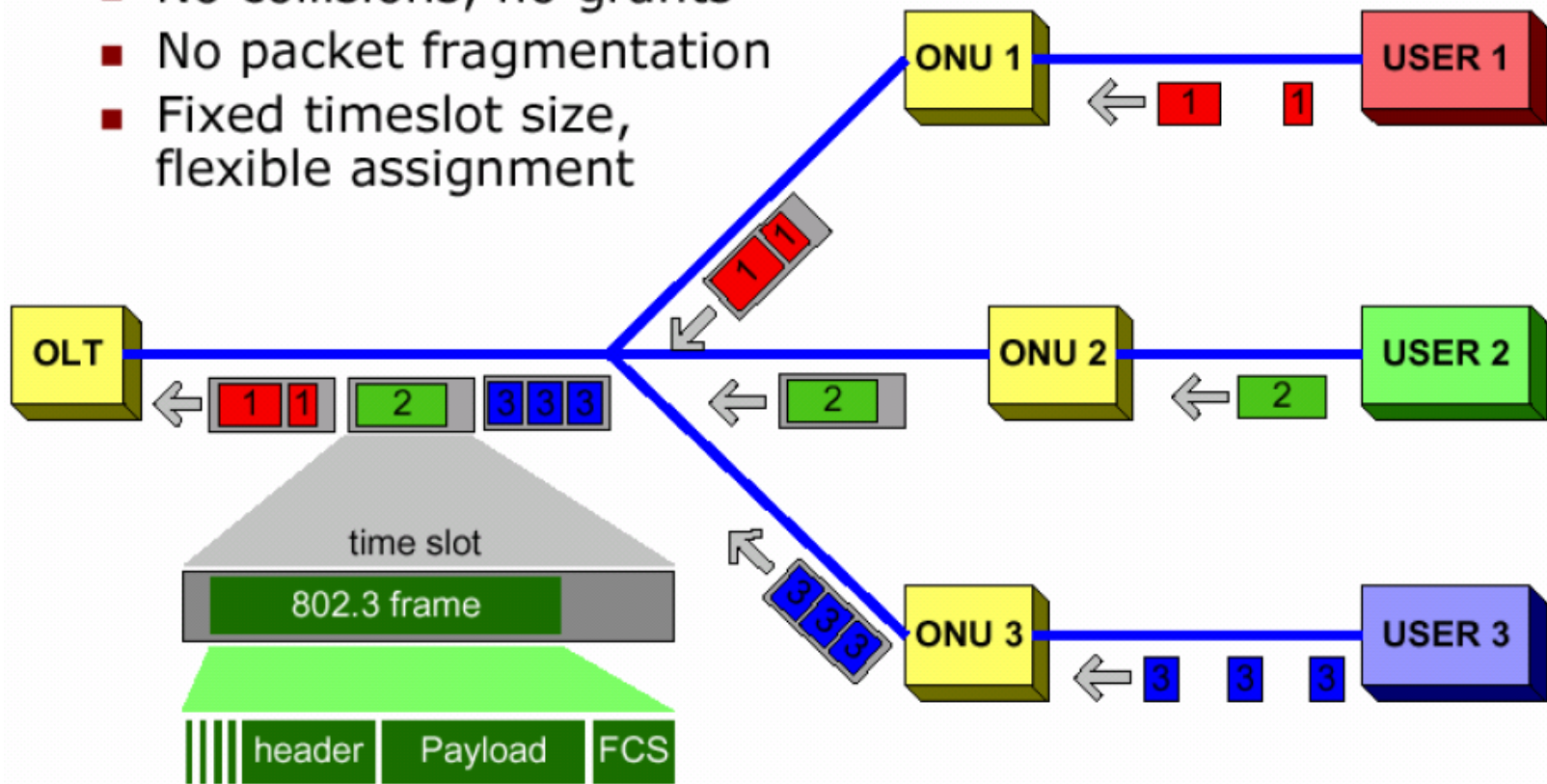
- Downstream channel uses true broadcast.
- Packets extracted by the MAC addresses.
- Not different from any shared-medium Ethernet LAN.



EPON Upstream Traffic

■ Main concepts

- TDM-like upstream time slicing
- No collisions, no grants
- No packet fragmentation
- Fixed timeslot size, flexible assignment





EPON Services

- All services converted to **Ethernet**
- Services types classified at end points
 - » 802.1p priority bits
 - » 802.1q VLAN tag
- Upstream DBA service priority
 - » ONT reports to OLT service buffer status and OLT grants bandwidth accordingly
 - » Per ONT (single LLID per ONT)
 - All ONT services are burst in same timeslot
 - » Per service type (multiple LLID per ONT)
 - Individual ONT services are burst in individual timeslots



Allied Telesis řešení pro EPON - produkty

- Central Office – univerzální přístupový koncentrátor iMAP
 - » 1 PON port = max. 32 splits per port – may reach 20km
 - » CPE – 2 varianty řešení:
 - outdoor iMG (není vhodná pro ČR)
 - converter ON1000 - cenově dostupné řešení





Allied Telesis řešení pro EPON – produkty iMAP – central office

Chassis:	9700, 9400, 9100
Controller card:	12Gbps pro 9100 chassis 24Gbps nebo 56Gbps (for 10GB uplink)
Uplink:	1 až 3x Gigabit Ethernet nebo 1x10GE

- Configuration:
 - » Up to 17x Dual port Service Module (OLT) + special SFP module

Řešení pro max. 192 EPON uživatelů iMAP9100

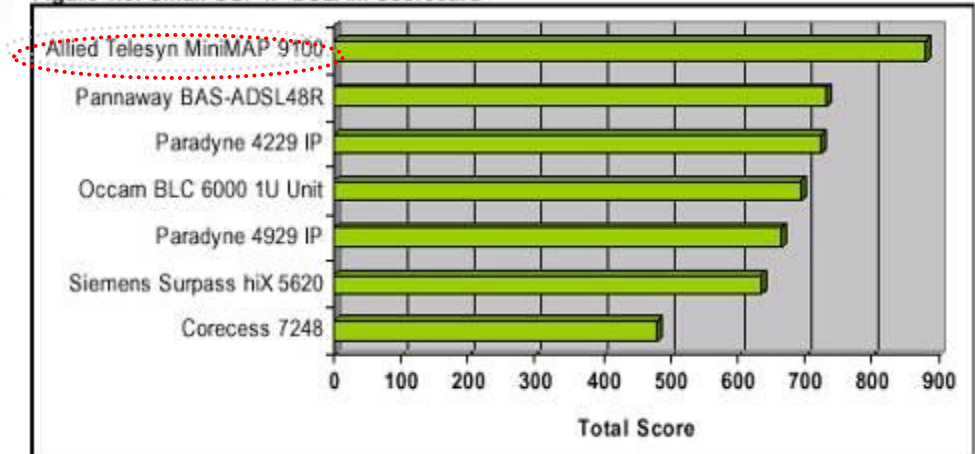


MiniMAP 9100 – best in class

Heavy Reading 2006 tests - “Among small OSP products, Allied Telesis MiniMAP 9100 earned top scores..... this was an excellent all around performance.”

Beating, Alcatel, Siemens, Paradyne..etc

Figure 1.8: Small OSP IP DSLAM Scorecard



- Výška 1U
- Max. 3 x GEPON karta TN118
- Napájení AC nebo DC



MiniMAP 9100 Capacity at Wirespeed Performance

Service	ADSL / ADSL2+ / VDSL2	POTS	T1 / EI	GbE	FTTx / CTTx	G.SHDSL	POTS / ADSL2+ Combo	GEPON
No. of Subscribers	72	72	24	24	60 / 30	72	24	192



Řešení pro max. 448 EPON uživatelů iMAP 9400 – výborný poměr cena/hustota portů

- Výška 3U
- Max. 7 x GEPON karta TN118
- Napájení pouze DC (nebo externí převodník)



iMAP 9400 Capacity at Wirespeed Performance

Service	ADSL / ADSL2+ / VDSL2	POTS	TI / EI	GbE	FTTx / CTTx	G.SHDSL	POTS / ADSL2+ Combo	GEPON
No. of Subscribers	168	168	56	56	140 / 70	168	72	448



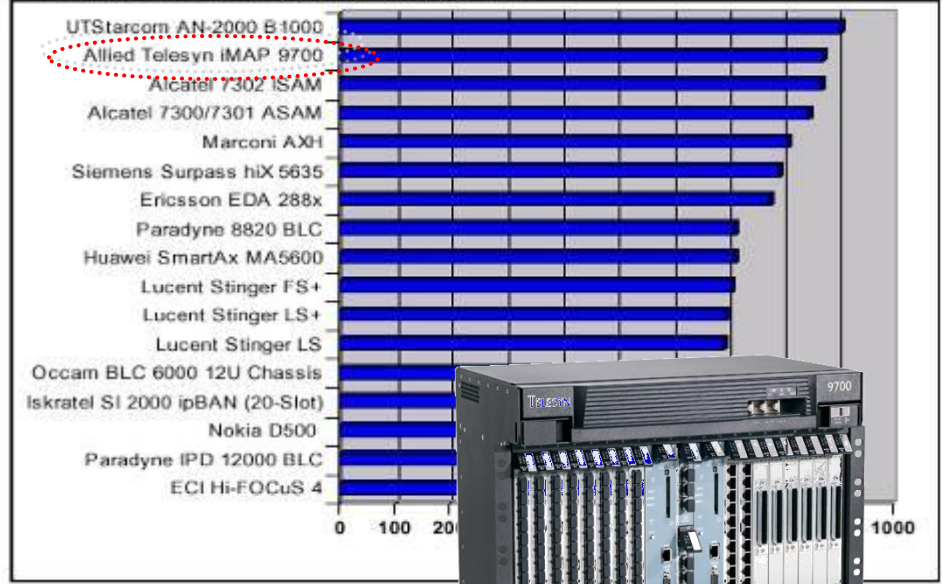
Řešení pro max. 1088 EPON uživatelů iMAP 9700

Key Findings – IP DSLAM Product Evaluations.

“Allied Telesyn’s iMAP 9700 graded out second-best in these categories*..”

Beating, Alcatel, Siemens, Ericsson, Lucent, Huawei, Iskratel...etc

Figure 1.1: Central Office (CO) IP DSLAM Scorecard



- Výška 9U
- Max. 17 x GEPON karta TN118
- Napájení pouze DC (nebo externí převodník)

iMAP 9700 Capacity at Wirespeed Performance								
Service	ADSL / ADSL2+ / VDSL2	POTS	TI / EI	GbE	FTTx / CTTx	G.SHDSL	POTS / ADSL2+ Combo	GEPON
No. of Subscribers	408 (432*)	408	136	136	340 / 170	408	192	1088



Vlastnosti Allied Telesis EPON řešení

Layer 1

- » 2 OLT ports; 32 ONUs per OLT port
- » 1G backplane
- » SFP optics allow for 20km

Layer 2+

- » 4094 VLANs with 6 per ONU
- » 4K MACs per OLT
- » Layer 2 forwarding
- » IP Multicasting: with small limitations
 - IGMP Snooping - Fast Leave
 - IGMP Aggregation
 - 512 Multicast Groups (80 per ONU)

QoS

Downstream

ONU to iMG: 8 CoS Strict Priority

Upstream

ONU to OLT: 1 CoS per VLAN

EPON Card Combinations:

- » 9100 – CFC12
- » 9700/9400 with CFC24 or CFC56

Network Configurations

- » 8 node rings
- » root + 3 nodes Daisy-Chained



EPON Feature Set

Protection

- » xSTP not supported on PON

Service Security

- » Upstream Forwarding Only per VLAN; UCP
- » DHCP Option 82 Relay or Snooping per VLAN w. Auto-IP filtering

OAM&P

- » ONU Management
 - iMAP manages ONU half of ONU/NID (incl firmware upgrade)
 - NMS/ZTC manages RG half
- » SNMP V1, V2c GET Limited SET; CLI; Front-panel & In-band
- » Front Panel 10/100; Out-of-Band
- » RADIUS authentication of craft
- » Statistics
 - PM and Histories - yes
- » LOGs, Telnet, Logs, Text Config, Cmd Alias, Profiles
- » Software upgrades, ZModem, FTP, Compact Flash

Miscellaneous

- » Hardened for Outside Plant; NEBs; UL



GEPON karta TN118 pro iMAP

2 Port GEPON (802.3ah) OLT w. SFP

Vlastnosti:

- » 32 ONUs per port
- » 5 Q-VLANs per ONU (Triple-play)
- » Min/Max BW QoS per ONU per VLAN
 - Shaped Downstream
 - DBA controlled Upstream
- » 1G Backplane

Podporovaná CPE:

- » iMG-NID - ONU plus intelligent Media gateway (iMG)
- » ON-1000 - ONU Media Converter

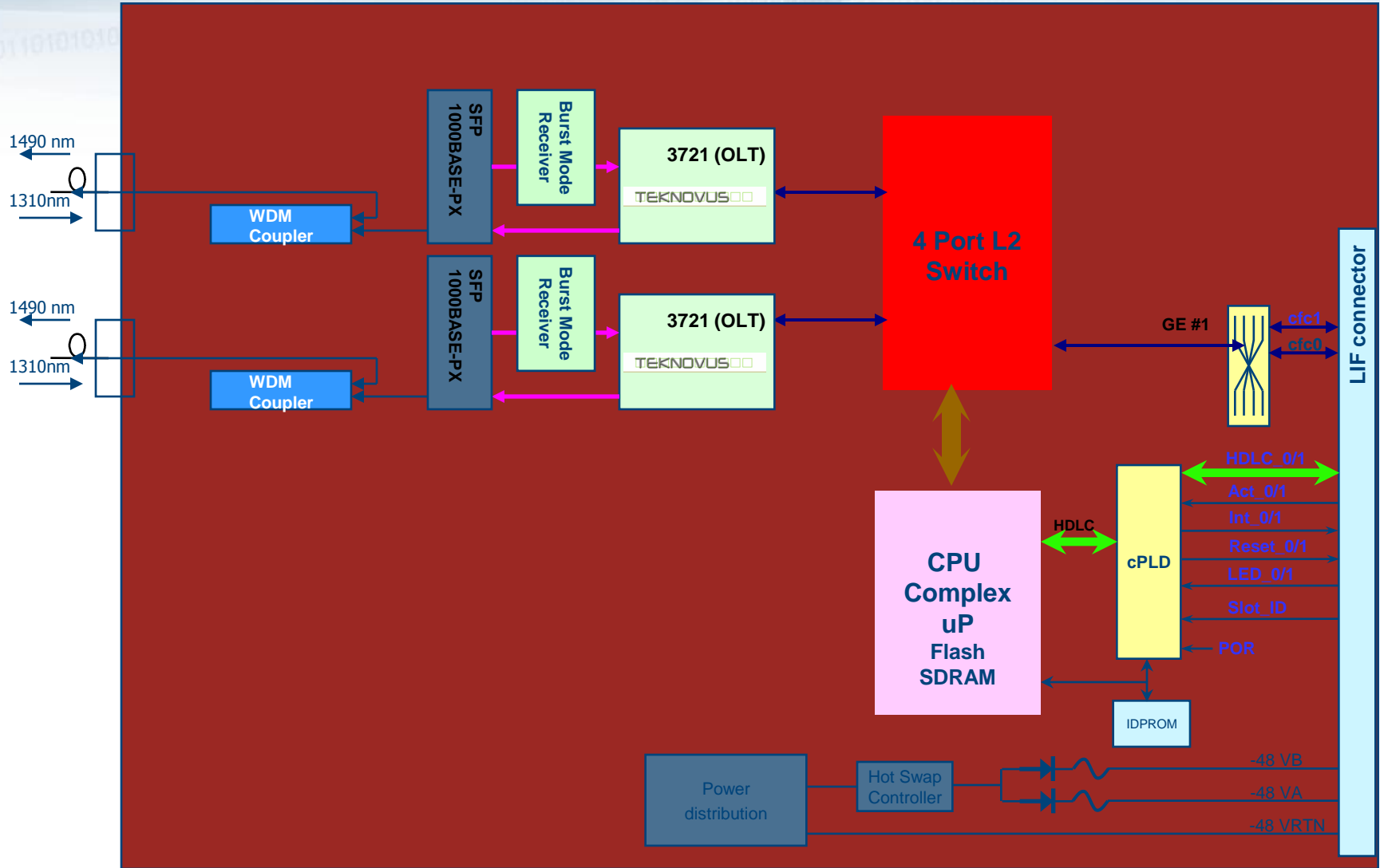




OLT optická specifikace – SFP modul pro TN118

- Fiberxon SFP FTM-9712S-SL20
- Compliant with IEEE 802.3ahTM-2004 1000Base-PX20-D SC Receptacle
- Operation 0 to +70C
- OLT Transmit Power
 - » 1480-1500nm OLT min TX power = +2dBm (end of Life)
 - » max TX power = +7dBm
- OLT Receive Sensitivity
 - » 1310nm OLT max RX sensitivity = -30dBm
 - » min RX saturation = -10dBm
 - » min RX damage = 0dBm

EPON (2 port OLT karta – TN118) - schéma





iMG646PX – EPON gateway pro venkovní aplikace



Corning
NID

6 Ports of
10/100



1000BASE-PX20 Optics
(100BASE-BX available
100)

AT-ON1000 - GEPON Optical Networking Unit

Превodník EPON - Gigabit Ethernet (10/100/1000Base-T)



Key Features:

- IEEE 803.2ah PX20 Compliant ONU
- 1Gbps Data Delivery
- Small Form Factor
- Flexible Mounting Options: Wall, Desk, or Rack Mount
- External AC Adapter
- Securely Managed and Configured via AlliedView NMS





Děkuji Vám za pozornost

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