

SCI-Network
Távközlési és
Hálózatintegrációs
zRt.

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Nem tudtuk, hogy lehetetlen,
ezért megcsináltuk.



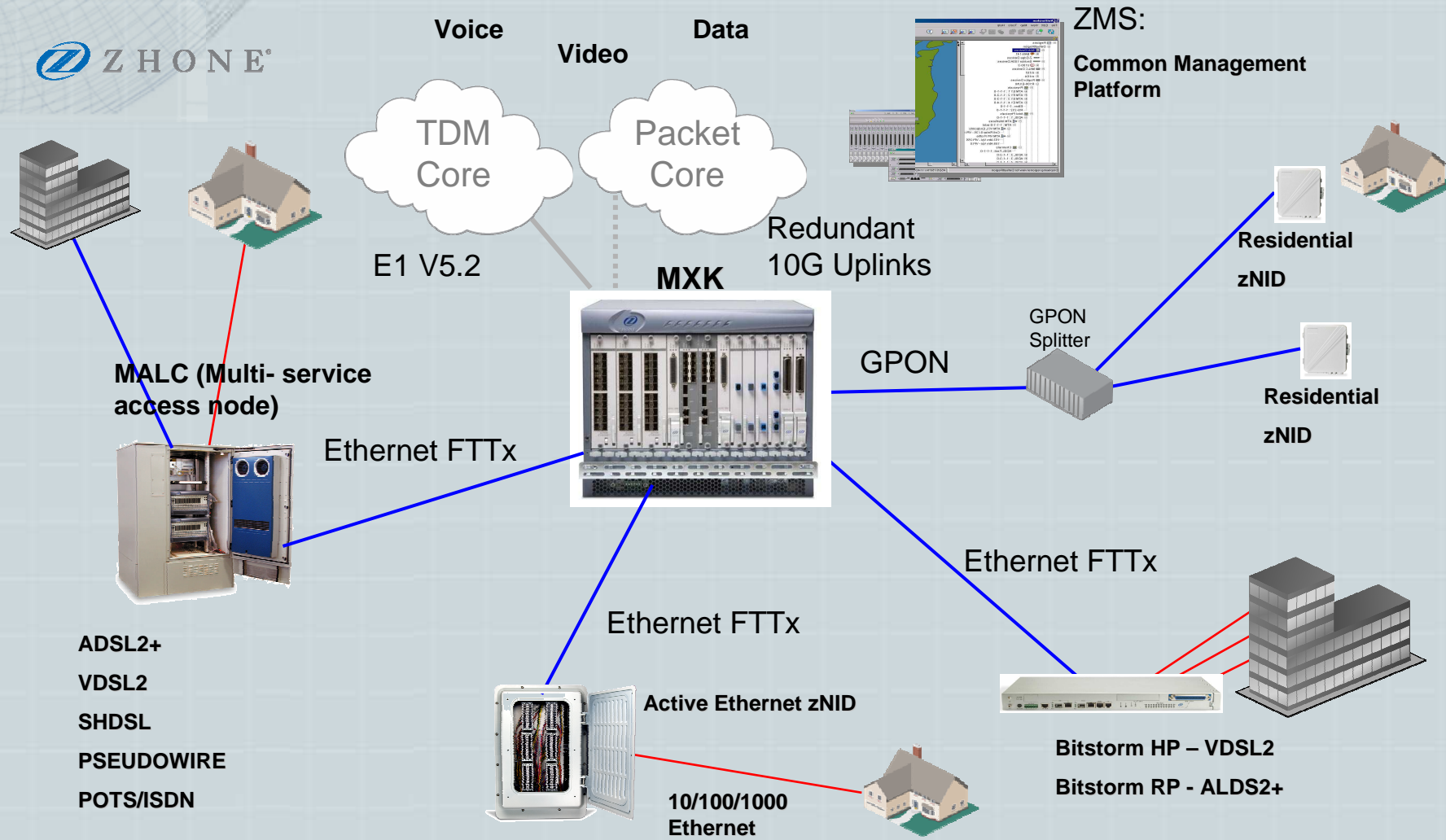
FTTx technológiai irányok és alkalmazásuk a szolgáltatók szemszögéből

Lengyel György
Projektigazgató

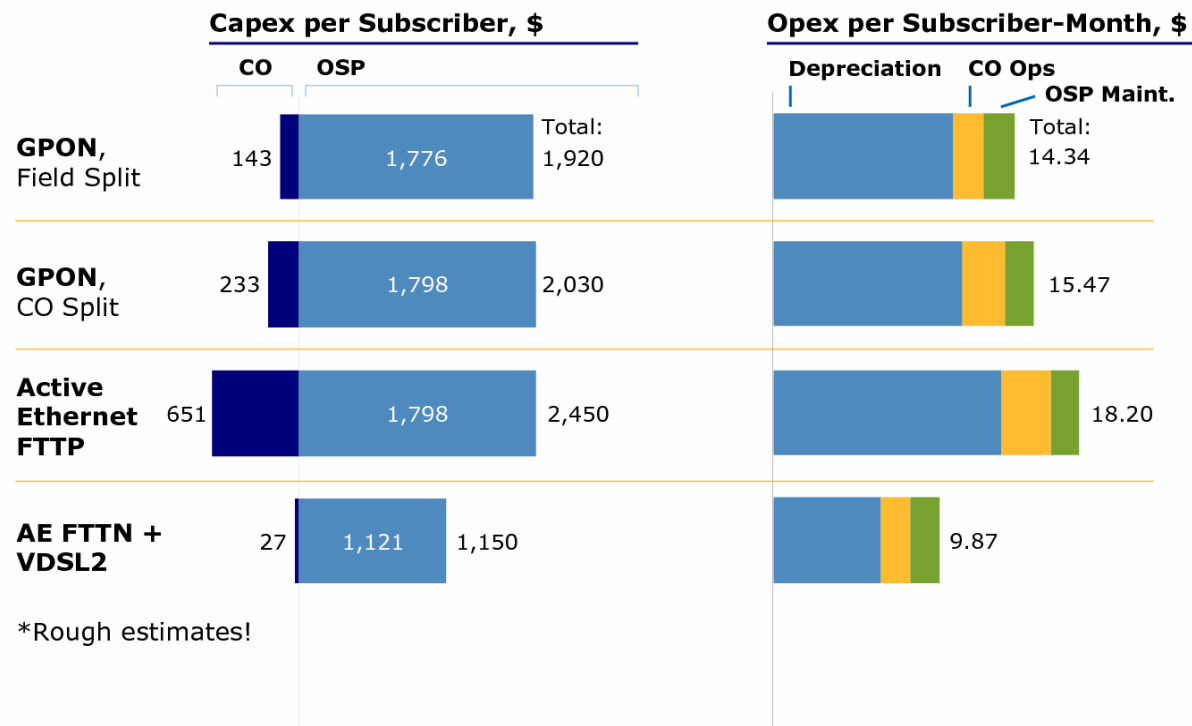
Szolgáltatói elvárások

- Rugalmasság, hogy a szolgáltatói hálózat a folyamatosan változó topológiai és felhasználói igényekhez igazodjon
- Illeszkedjen a meglévő infrastruktúrához
- Szabványosság
- Időállóság
- Átfogó eszköz és szolgáltatás management

A SCI-Network megoldása

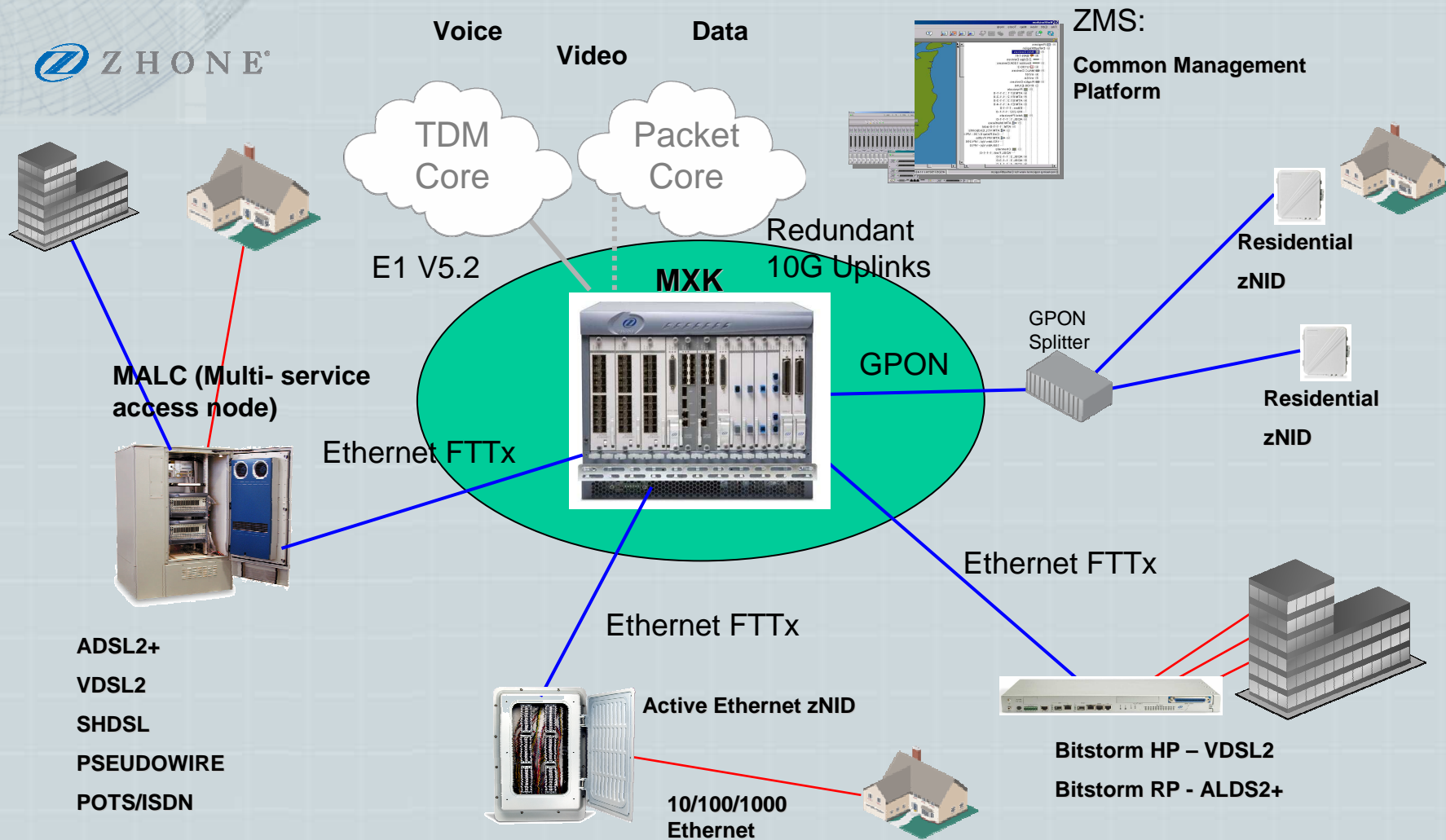


FTTx Cost Comparison



Sources: various industry/customer benchmarks; Zhone analysis.

A SCI-Network megoldása



Intelligent Terabit Access Concentrator

- ◆ Non-blocking 200 Gbps
- ◆ Scalable
- ◆ Optimized for High Bandwidth Applications
- ◆ 10GE Redundant Uplink
- ◆ GPON, Active Ethernet
- ◆ E1 PWE



MxK System Overview

Bezel with Fan Assembly & Status LED

Active-Ethernet Line Card

Fiber Tray & Management



Redundant Controllers + Uplinks

Eight 1G Ports (SFP)

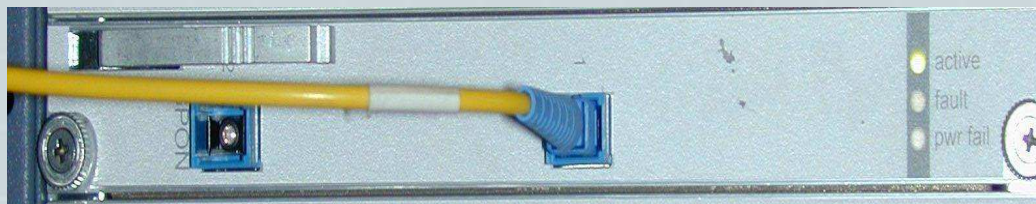
Dual 10G Ports

GPON Line Card

Power & Alarms Cable Entry

MxK GPON OLT Line Card

- GPON OLT Line Card
 - ◆ Standards based GPON
 - ◆ 64 Subscriber / OLT
 - ◆ 2, 4 v. 8 OLT / Line Card
 - ◆ 14 OLT Line Card / Chassis



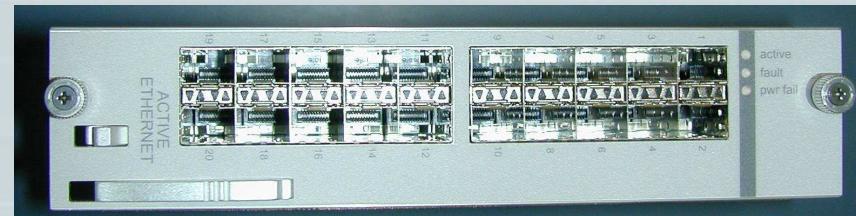
MxK Active Ethernet Line Card

■ Zhone Technologies – MxK Active Ethernet

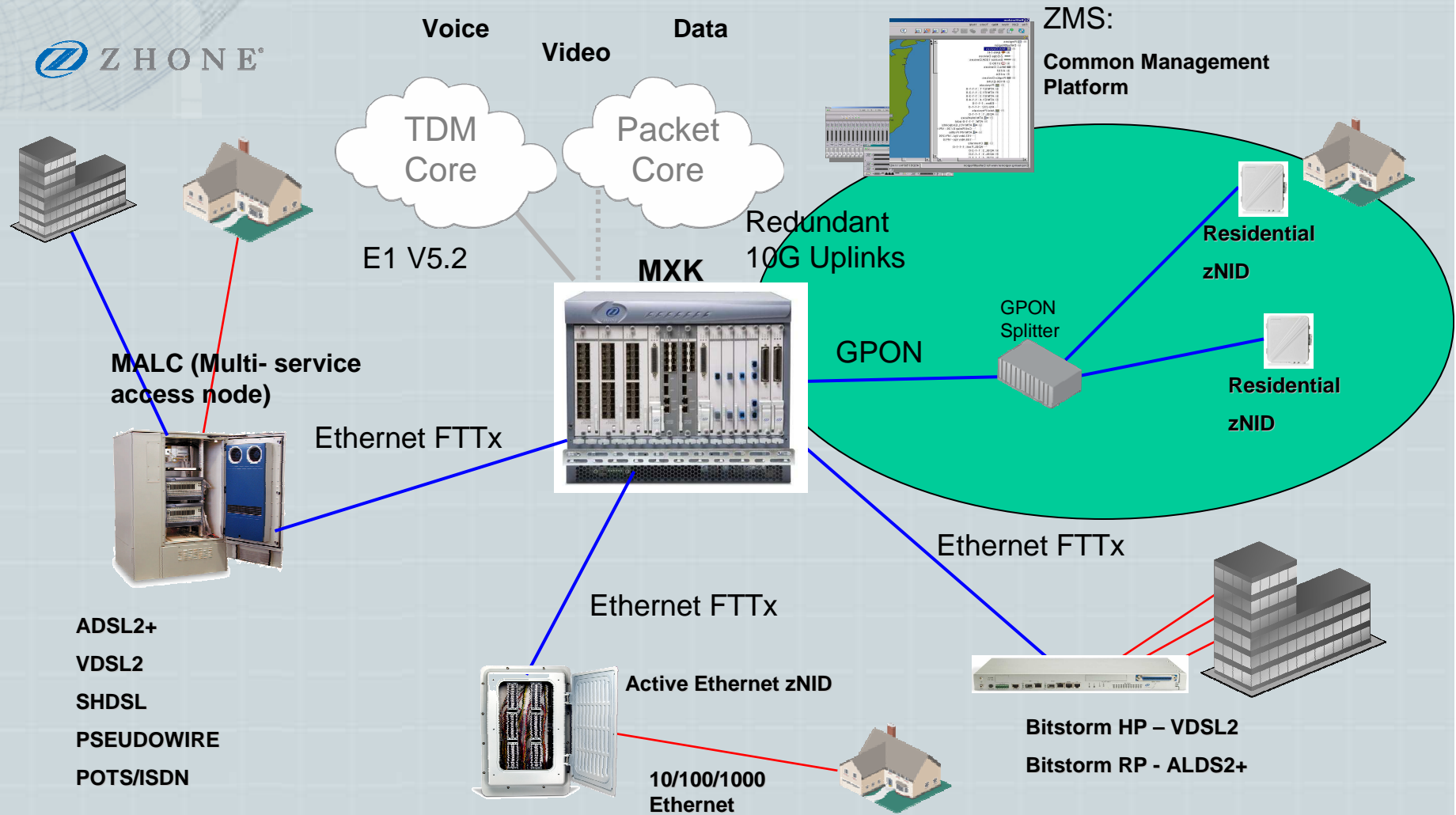
- ◆ 20 subscribers per blade
- ◆ SFP Based
- ◆ Single and Dual Fiber
- ◆ Mix & Match copper and fiber services on the same card
- ◆ Maximum 140 ports / Chassis

■ Indoor/Outdoor Residential Gateway

- ◆ 3 Ethernet Ports
- ◆ 2 FXS Ports (VoIP)



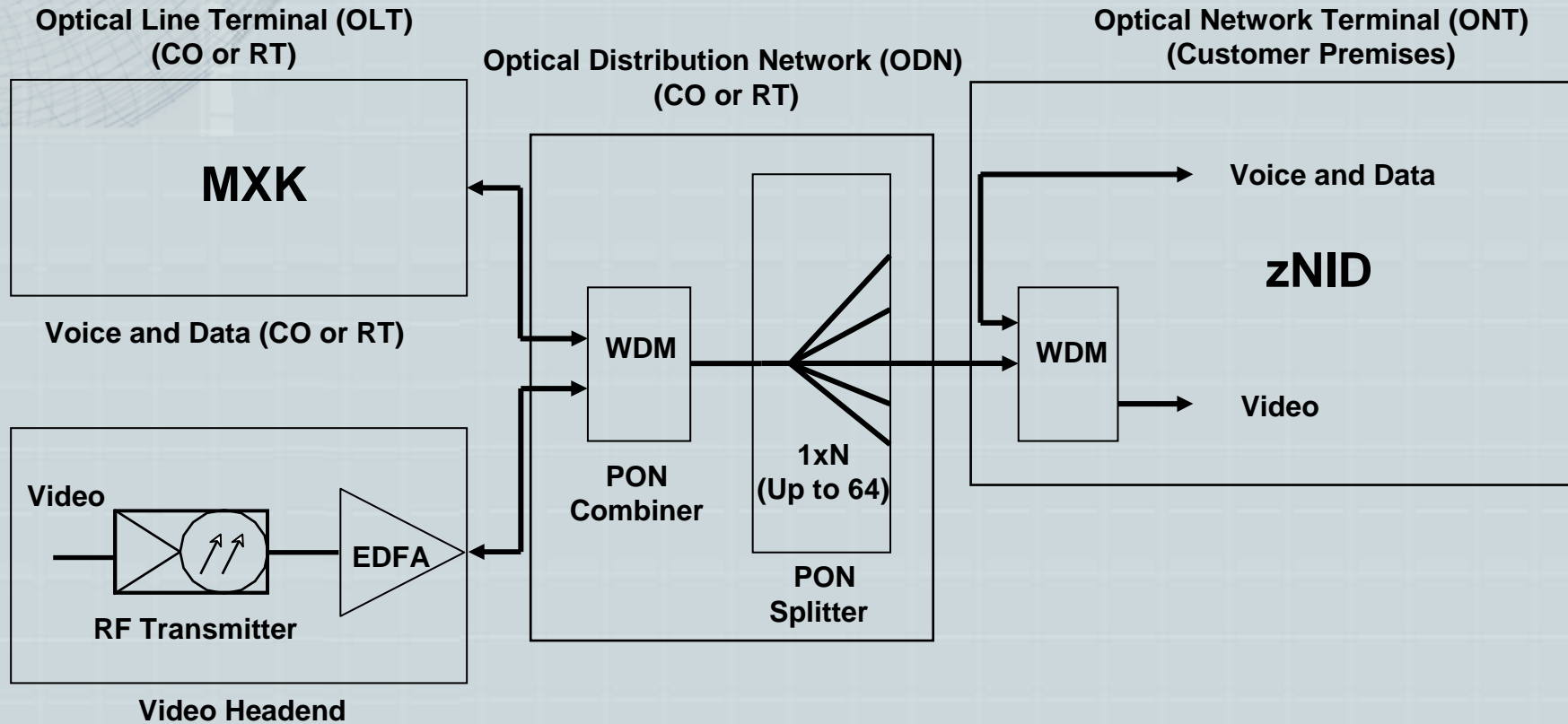
A SCI-Network megoldása



MxK GPON lehetőségei

	GPON
PON Standard	ITU-T G.984
Packet Size	Generic Frame Configurable from 53 up to 1,518 bytes
Bandwidth	Downstream up to 2.5 Gbps Upstream up to 1.25 Gbps
Downstream Wavelength	1490 nm (1480 nm to 1500 nm)
Upstream Wavelength	1310 nm (1260 nm to 1360 nm)
Traffic Modules	ATM, Ethernet, TDM (GEM ports)
Voice	VoIP or Native TDM
Video	RF 1550nm overlay or Video over IP
ODN Classes	A, B, and C
Max PON Splits	32/64/128 (max. 64 currently)

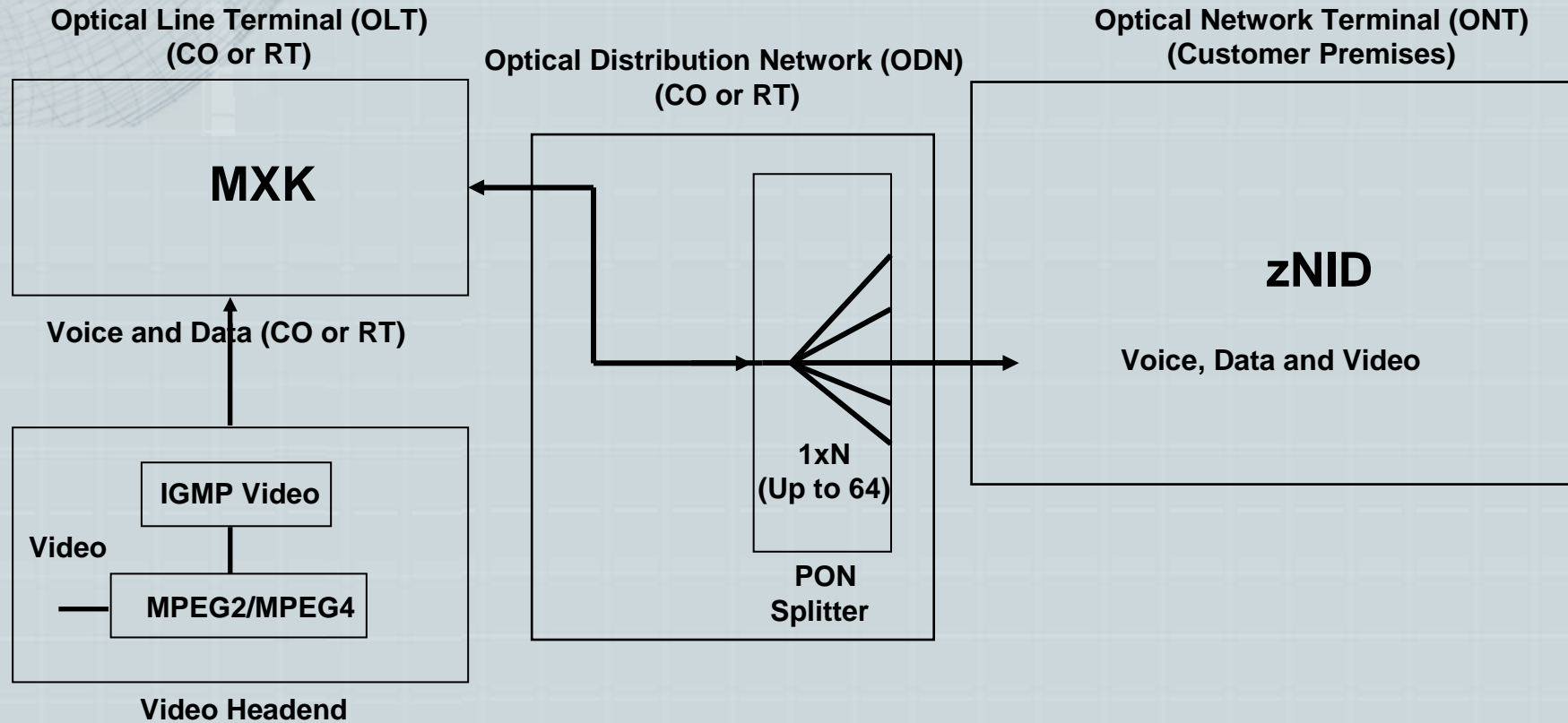
GPON RF Overlay



Voice and Data packets transmitted/received @ 1490nm/1310nm wavelengths

Analog/Digital Video transmitted/received @ 1550nm wavelength

GPON Video over IP (IPTV)

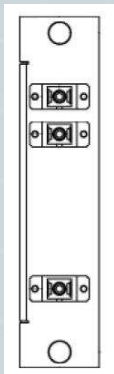


Voice and Data packets transmitted/received @ 1490nm/1310nm wavelengths

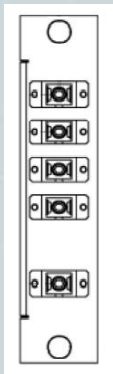
IGMP Video transmitted/received also @ 1490/1310nm with appropriate QoS over data and voice

zPON Splitter Modulok

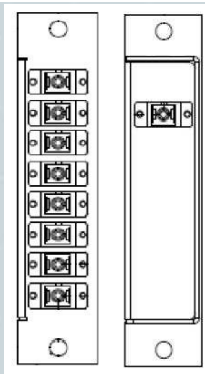
- ◆ PON SPLITTERS 1x2 SC/APC CONNECTORS LGX SINGLE WIDTH
- ◆ PON SPLITTERS 1x4 SC/APC CONNECTORS LGX SINGLE WIDTH
- ◆ PON SPLITTERS 1x8 SC/APC CONNECTORS LGX SINGLE WIDTH
- ◆ PON SPLITTERS 1x16 SC/APC CONNECTORS LGX DOUBLE WIDTH



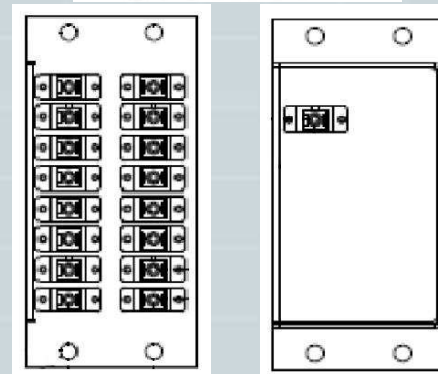
**1x2 Splitter
(Front View)**



**1x4 Splitter
(Front View)**



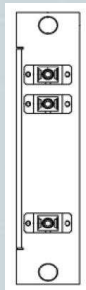
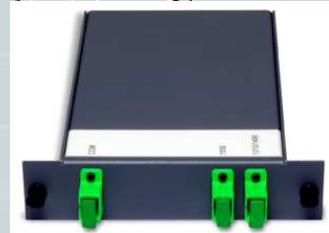
**1x8 Splitter
(Front & Rear View)**



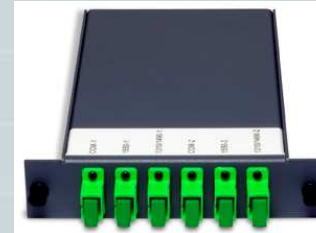
**1x16 Splitter
(Front & Rear View)**

zPON WDM Combiner Modulok

- ◆ SINGLE COMBINER 1310/1490/1550 SC/APC CONNECTORS LGX SINGLE WIDTH CARD
- ◆ DOUBLE COMBINER 1310/1490/1550 SC/APC CONNECTORS LGX SINGLE WIDTH CARD



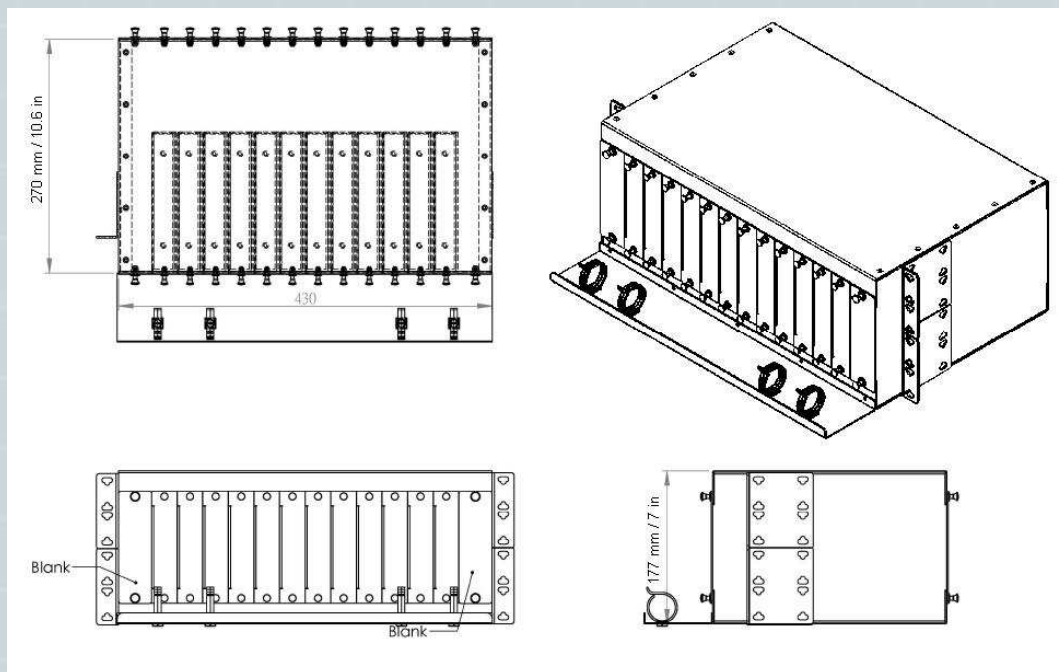
**Single WDM Combiner
(Front View)**



**Double WDM Combiner
(Front View)**

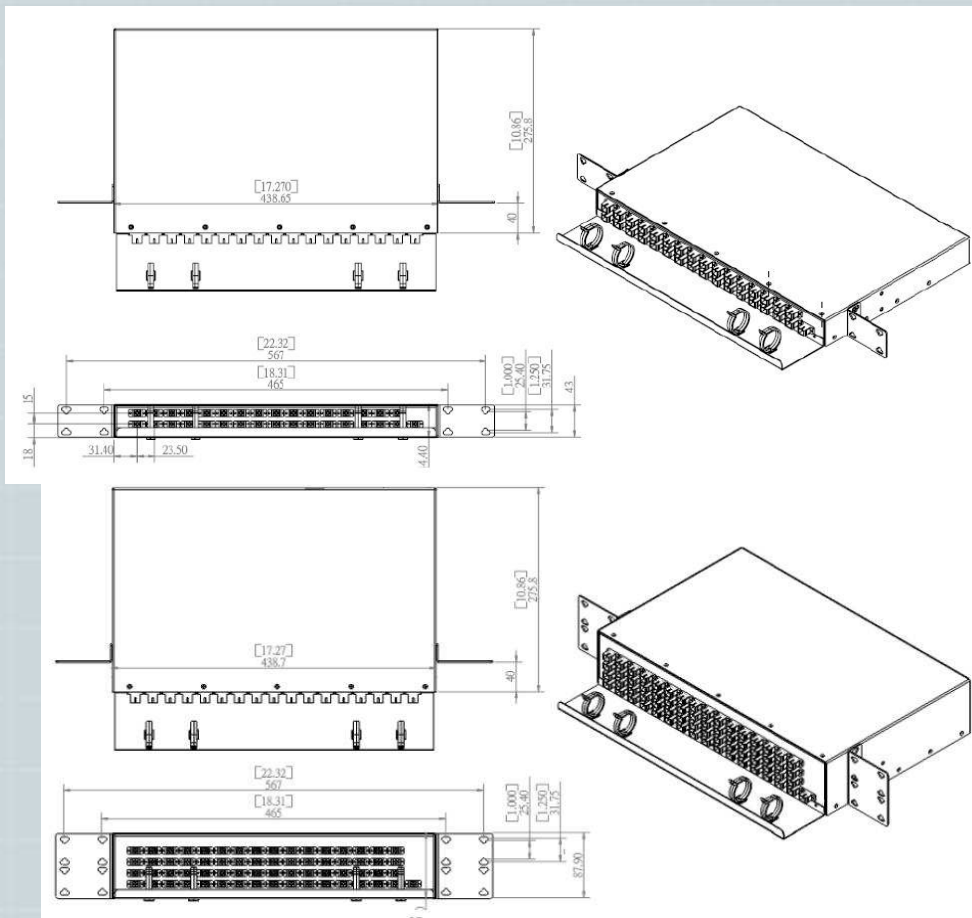
zPON 4RU PON Splitter & WDM Combiner chassis

- **4RU chassis for Splitters and Combiner cards**
 - ◆ 19"/23" mounting options
 - ◆ 12 LGX slots
 - ◆ Supports single or double width LGX cards
 - ◆ Modules can be installed in the front or in the rear part



zPON Splitters - 1RU and 2RU chassis

- ◆ PON SPLITTERS 1x32 SC/APC CONNECTOR 1RU RACK MOUNT
- ◆ PON SPLITTERS 1x64 SC/APC CONNECTOR 2RU RACK MOUNT



Single Family Unit ONTs

	ZNID-GPON-2110	ZNID-GPON-2210	ZNID-GPON-2211	ZNID-GPON-2610	ZNID-GPON-2710	ZNID-GPON-4110	ZNID-GPON-4111	ZNID-GPON-4114	ZNID-GPON-4210	ZNID-GPON-4211	ZNID-GPON-4213
Indoor/Outdoor	Indoor	Indoor	Indoor	Indoor	Indoor	Outdoor	Outdoor	Outdoor	Outdoor	Outdoor	Outdoor
POTS		2	2		2	4	2	4	2	2	2
10/100/1000 Ethernet	1			1	4	2	1	2			
10/100 Ethernet		4	4					3	3	3	
RF Video			1				1	1		1	1
RF Return							X	X			
HPNA											X
Res. Gateway								X	X	X	
POE				X	X						

■ GPON ONT (zNID) Features Overview

- ◆ Bridging/Switching/Routing
 - DHCP, NAT/NAPT, DDNS, PPP, IP Multicast
- ◆ QoS
 - 802.1p and DSCP marking and queuing
 - Traffic shaping on both downstream and upstream traffic;
 - Detailed priority rules
- ◆ VoIP
 - SIP and SIP-PLAR, VoIP Test
- ◆ Firewall
 - Stateful packet inspection, comprehensive logging, intrusion detection, port forwarding,
- ◆ VPN
 - Termination and Pass-through
- ◆ Logging
 - VoIP, IGMP, System, Firewall, QoS



A Zhone GPON ONT-t üzleti előfizetők bekapcsolására tervezték, ami az Ethernet interfészen kívül támogatja az E1 áramkör emulációt is

Outdoor SBU ONT

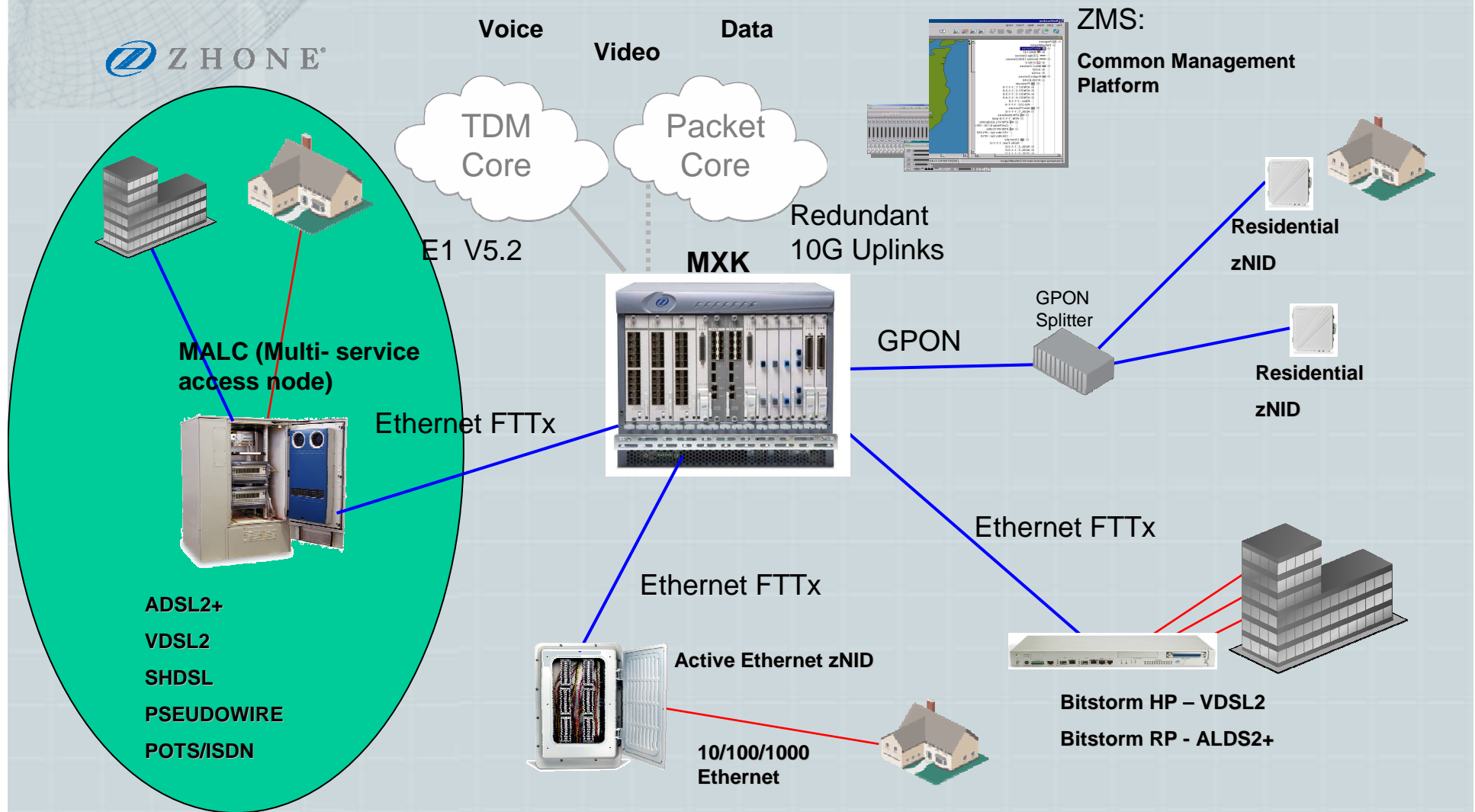
Voice :	8x VoIP lines
Ethernet :	1x 10/100/1000 Base-T Ethernet interfaces
T1/E1 :	2x T1/E1 PWE3
Enclosure :	Rugged outdoor enclosure
Management :	OMCI
Power :	Standard 7-pin battery backup interface



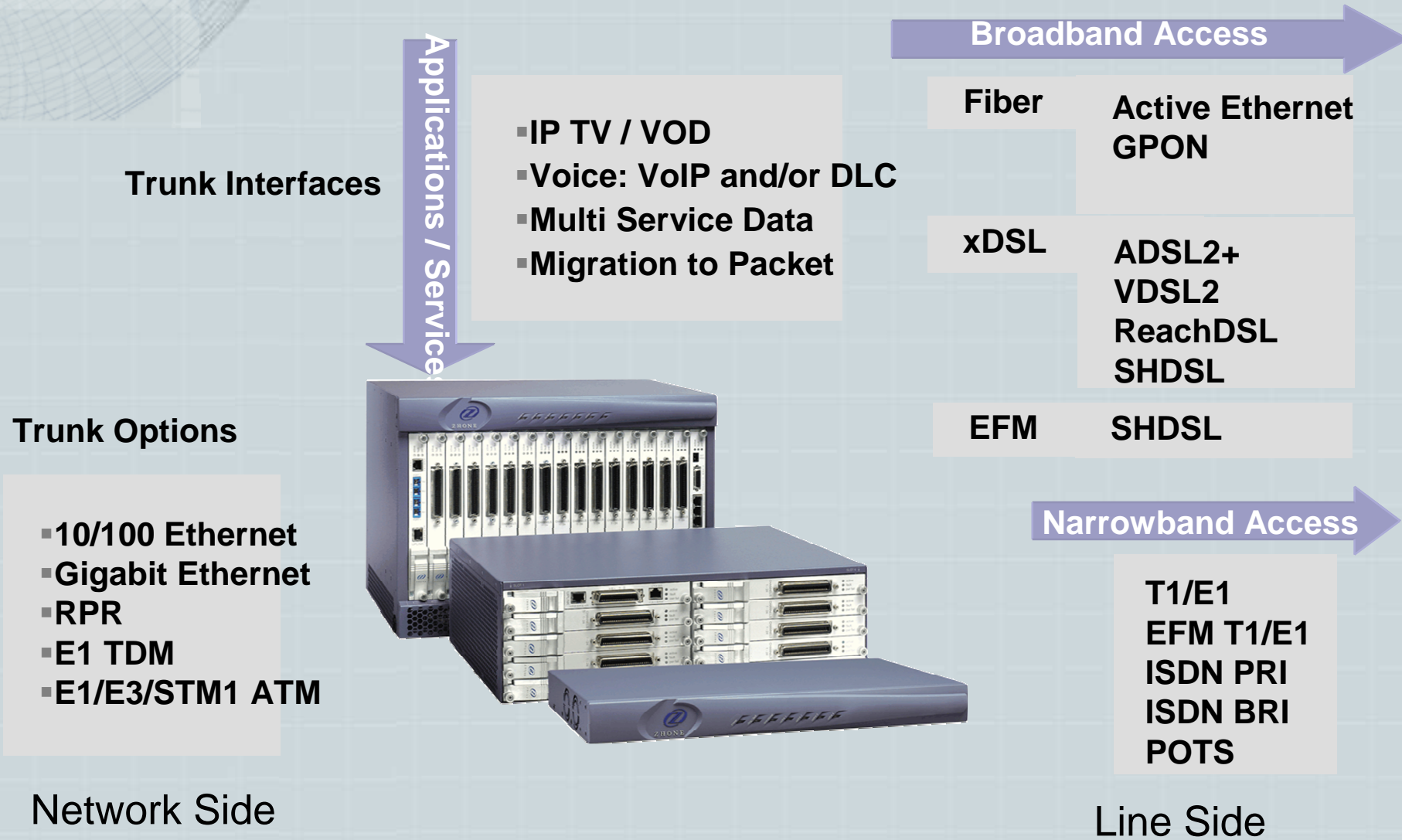
Indoor SBU ONT

Ethernet :	1x 10/100/1000 Base-T Ethernet interfaces
T1/E1 :	4x T1/E1 PWE3
Management :	OMCI
Power :	Standard 7-pin battery backup interface

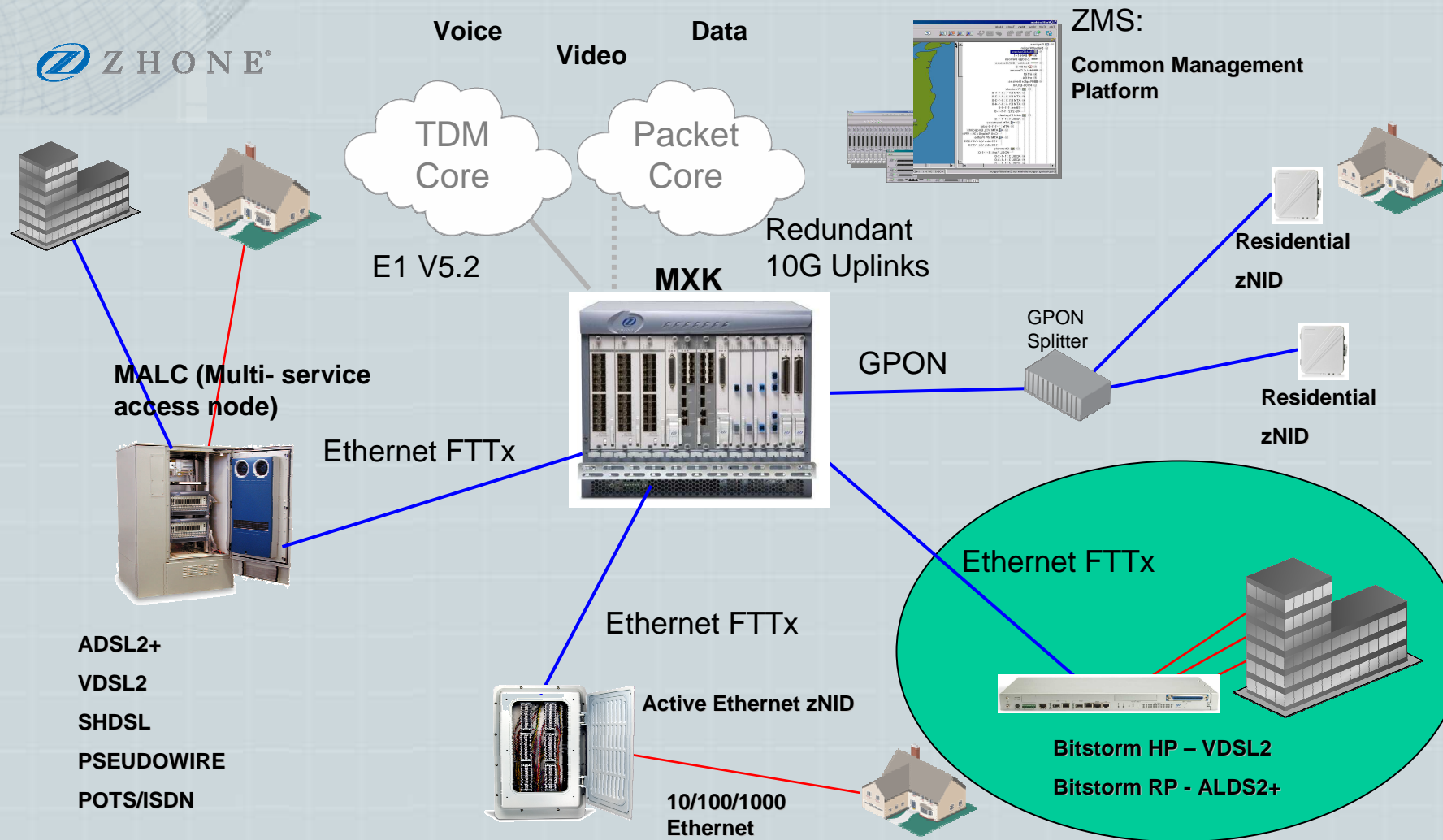
A SCI-Network megoldása



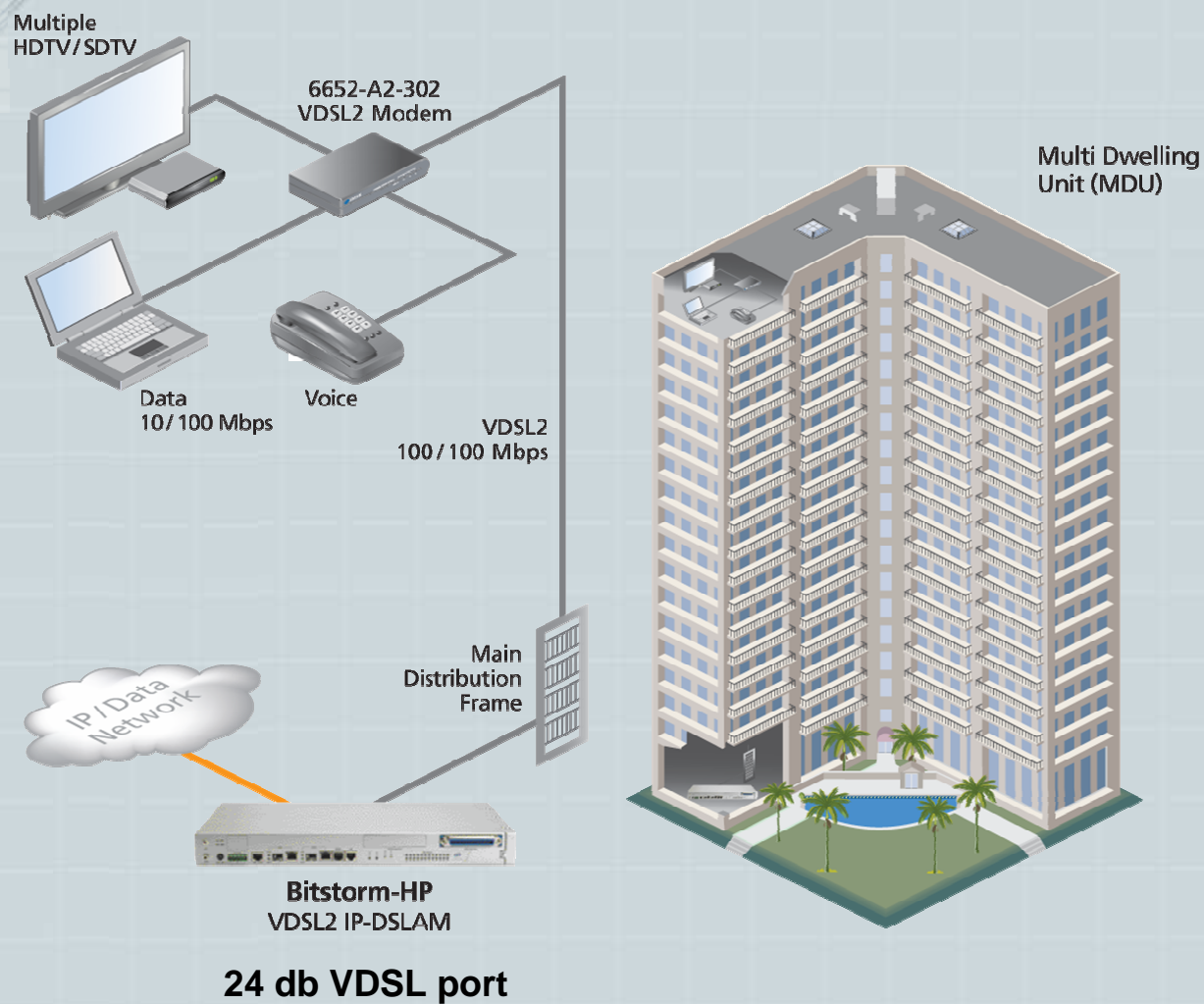
Multiservice Access Line Concentrator



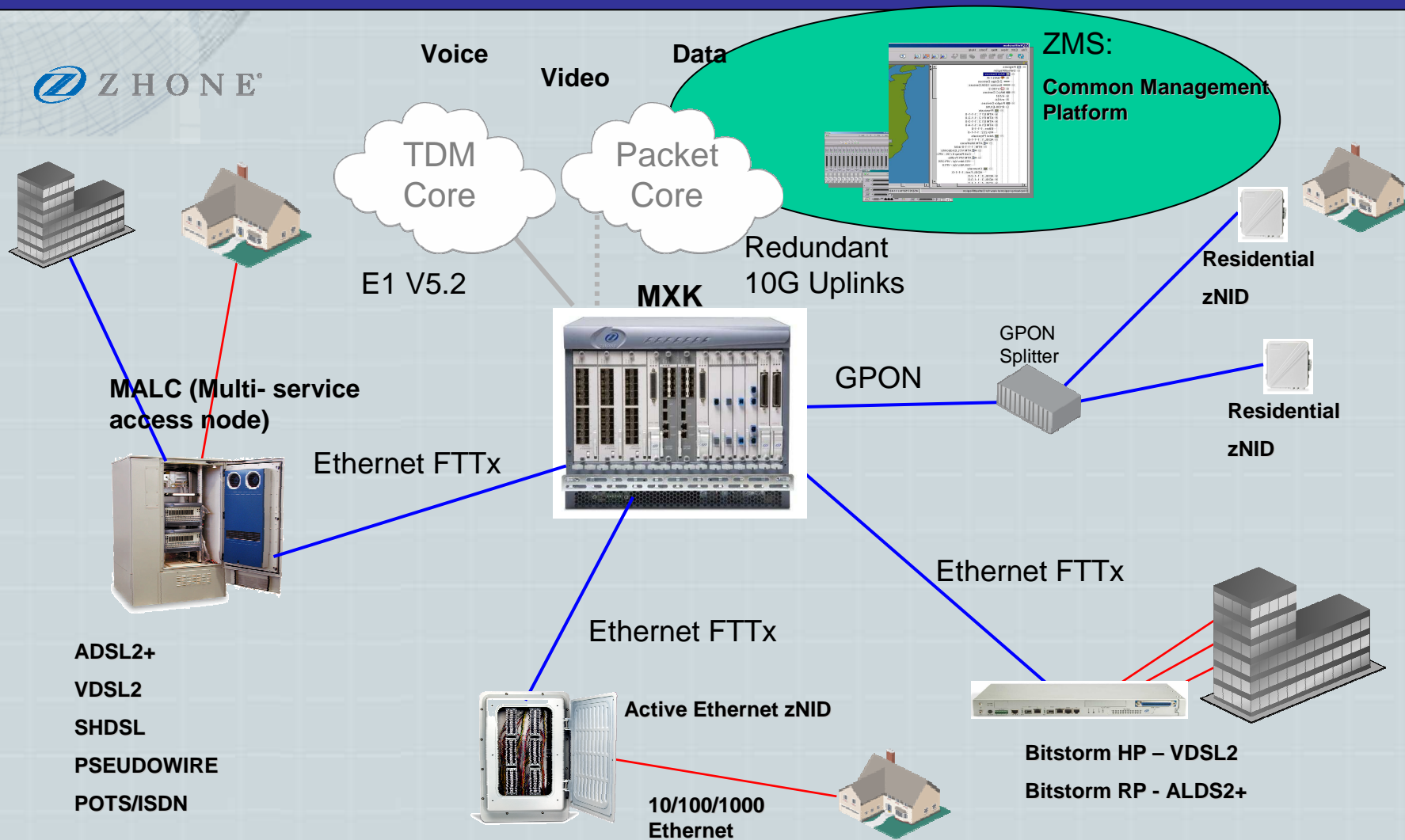
A SCI-Network megoldása



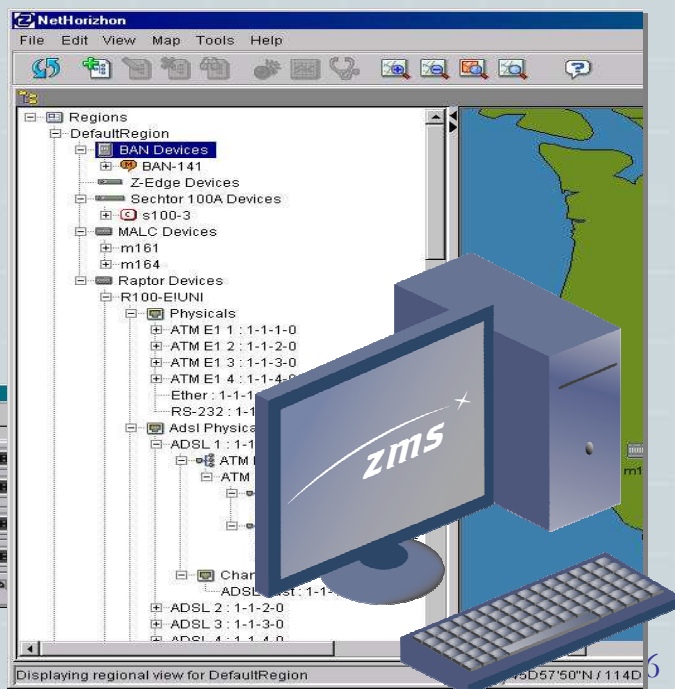
Bitstorm VDSL2



A SCI-Network megoldása

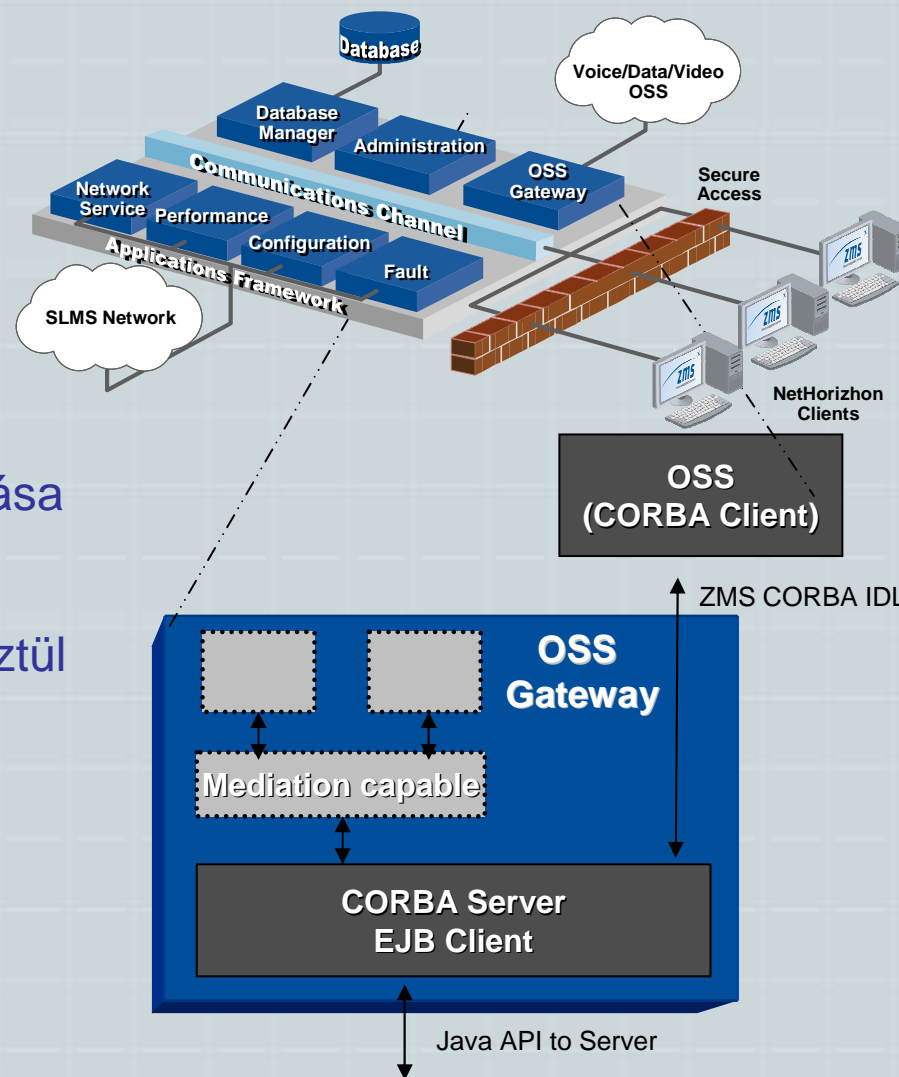


- Teljeskörű menedzsment képességek
 - ◆ Hiba, Konfiguráció, Nyilvántartás, Teljesítmény, Biztonság, Szolgáltatás Menedzsment
 - ◆ Nagy hálózatokra tervezett
 - ◆ Solaris operációs rendszer
 - ◆ OSS Gateway interfész külső számlázási rendszerekhez



ZMS OSS Gateway

- Konfiguráció és Provisioning
 - ◆ Northbound CORBA IDL
- Nyilvántartási és Státusz információk
- Real-time üzenetek
- Szinkron és aszinkron kérések támogatása
- Skálázható
- Részletes hibajelentések
- Hiba menedzsment / Trap-ek továbbítása / hibák lekérdezése
- Gyűjtött, eltárolt statisztikák
- Valós idejű statisztikák SNMP-n keresztül



Köszönöm a figyelmüket!



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