



FITI 2016 Konferencia

Jövőbiztos adatközpontok

YOUR NETWORK RUNS ON COMMScope™

**Az adatközpontok, mint az IT
világ űrtechnológiája...**

Viktor Endrész
Key Account Manager

Az adatközpontok
alapterület ára
jellemzően magasabb,
a világ ikonikus
építményeinél



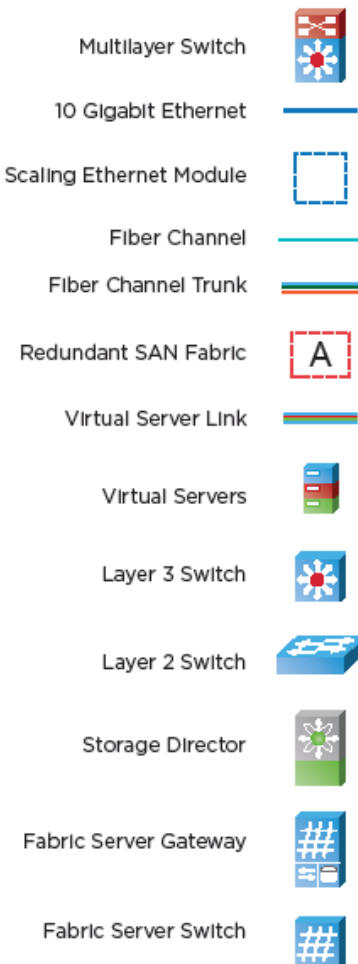
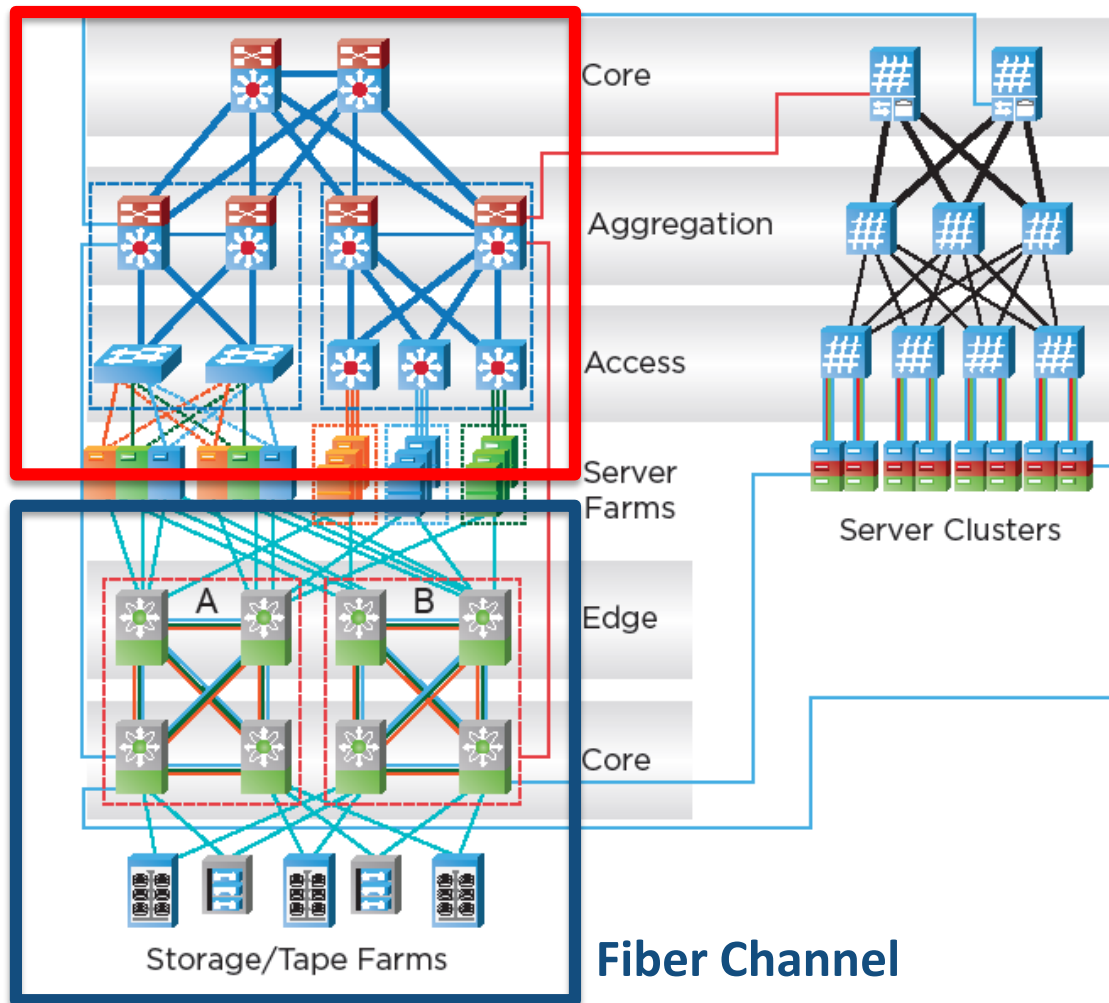
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Technológiai áttekintés

Viktor Endrész
Key Account Manager

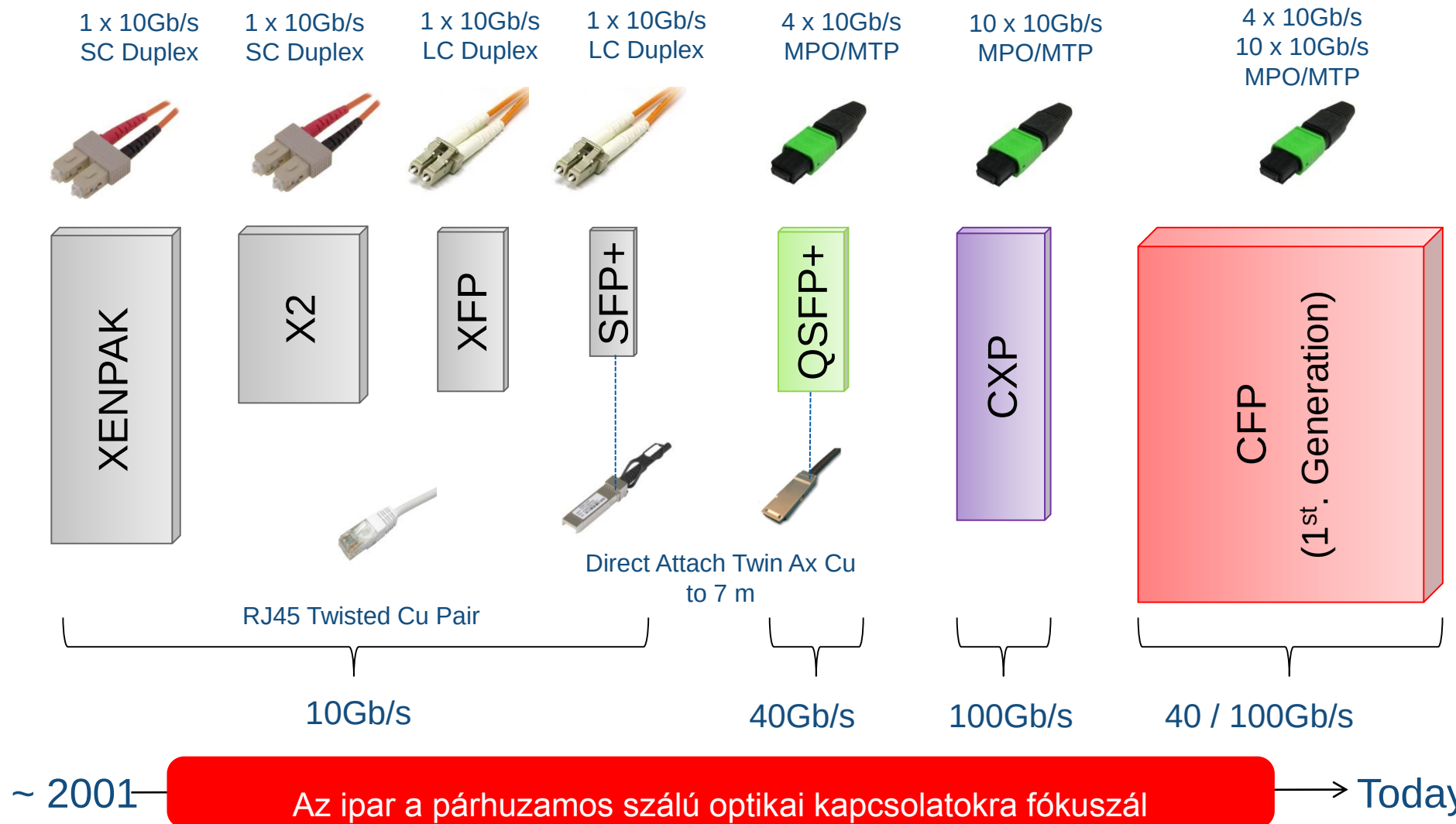
Ethernet

Layers



Source: Cisco

Csatlakozó felületek Ethernet SR DC alkalmazásokhoz



Cisco 40GBASE-SR4 QSFP Module



Cisco CFP-100G-SR10 Module



IEEE 802.3 Ethernet Channel Layout

MMF only

Data Rate	10Gb/s	40Gb/s	100Gb/s
Laser Type	VCSEL	VCSEL Array	VCSEL Array
Fiber Type	OM3	OM3/OM4	OM3/OM4
Connector	LC x 2	12-fiber MPO	2x12f MPO or 1x24f MPO
# of Fibers	2	12	24
Schematic			

• Approved in June 2010



40GBASE-SR4



Single Port (recommended)

100GBASE-SR10



or

Side-by-Side Ports (alternative)



OM3 / OM4

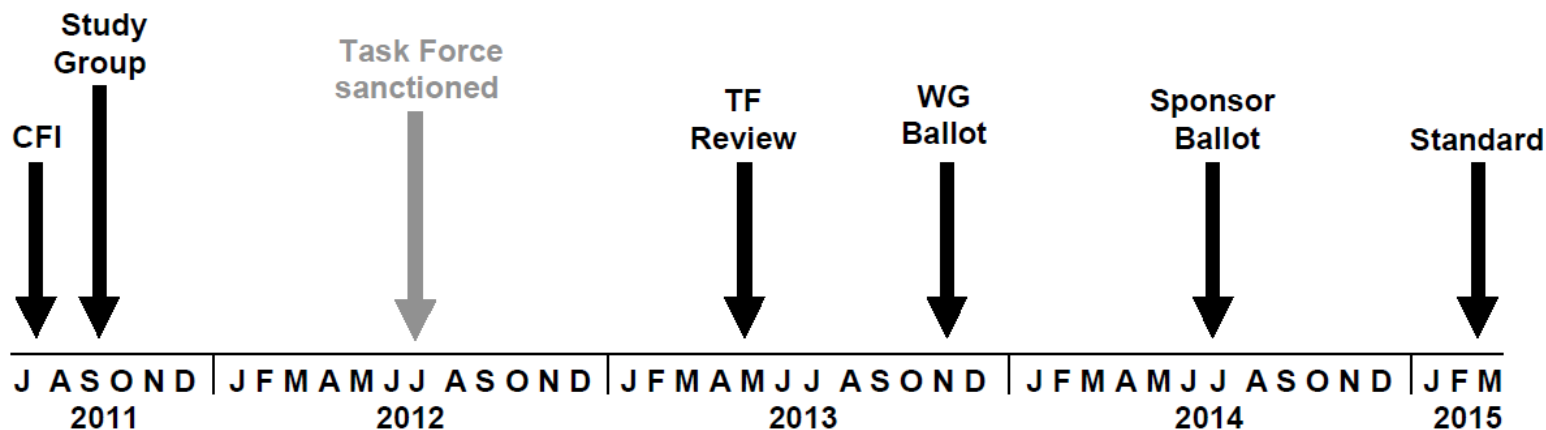
Max. channel IL of **1.9 dB** / **1.5 dB**

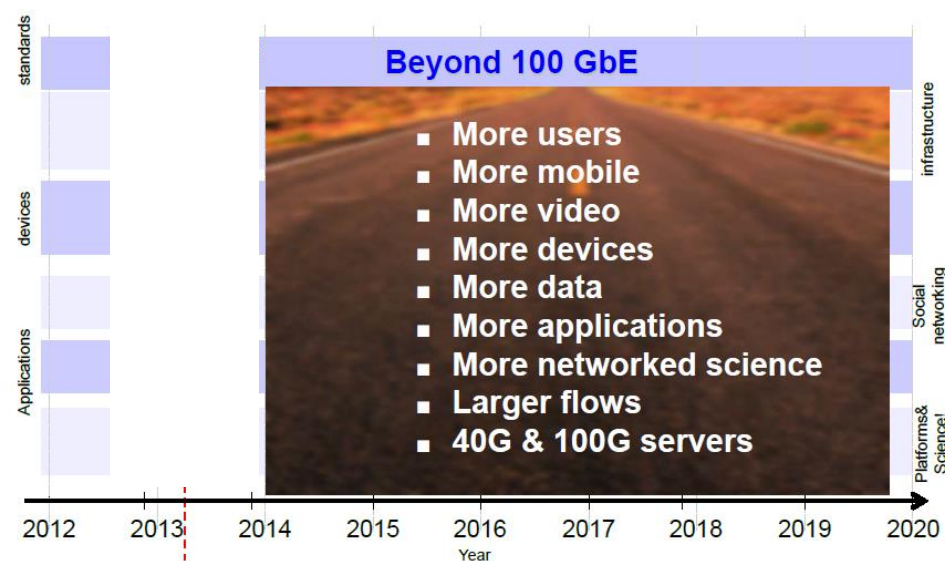
Connector and splice loss

allocation of **1.5 dB** / **1.0 dB**

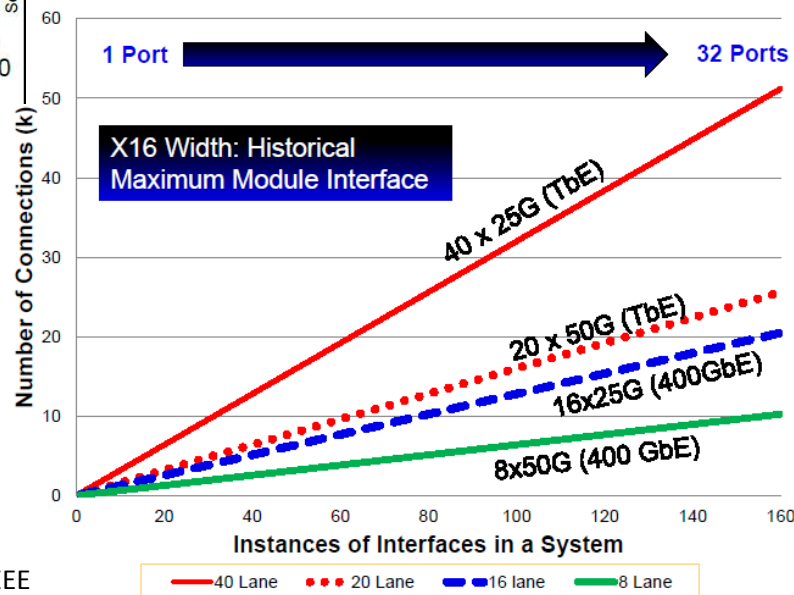
	Channel length 40GBASE-SR4	Channel length 100GBASE-SR10	Channel length 40GBASE-LR4	Channel length 100GBASE-LR4	Channel length 100GBASE-ER4
OM3, 50/125 μm	100 m	100 m	N/A	N/A	N/A
OM4, 50/125 μm	150 m*	150 m*	N/A	N/A	N/A
OS1/OS2 9/12 μm	N/A	N/A	10 km	10 km	40 km

- 100G 4 szálpáron @ 25G mindkét móduson MMF & SMF
- 8 x MMF (mint a 40 Gbit/s)
- 4x25G előnye a nagy sűrűség, alacsonyabb ár & teljesítmény
- 100m via MMF





2016 Január: Draft 1.1



Power → Lower
Cost → Lower
Complexity → Lower

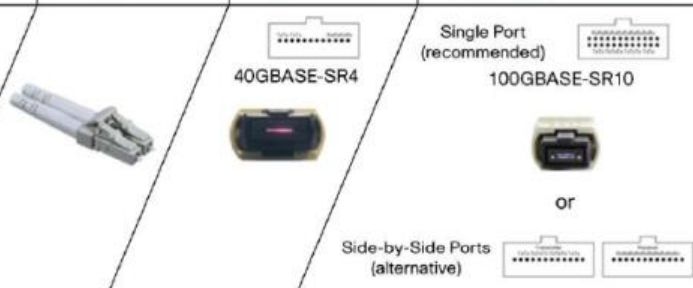
Source: IEEE

• Provide physical layer specifications which support link distances of:

- at least 100 m over MMF
- at least 500 m over SMF
- at least 2 km over SMF
- at least 10km over SMF

IEEE 802.3 Ethernet Channel Layout

Data Rate	10Gb/s	40Gb/s	100Gb/s
Laser Type	VCSEL	VCSEL Array	VCSEL Array
Fiber Type	OM3	OM3/OM4	OM3/OM4
Connector	LC x 2	12-fiber MPO	2x12f MPO or 1x24f MPO
# of Fibers	2	12	24
Schematic			



	Fibers	Length OM3	Length OM4
10G	2	300	400
40G IEEE 802.3ba	8	100	150
40G Cisco BiDi	2	100	125
25G	2	70	100
100G IEEE 802.3ba	20	100	150
100G IEEE 802.3bm	8	70	100
400G IEEE 802.3bs	32	70	100

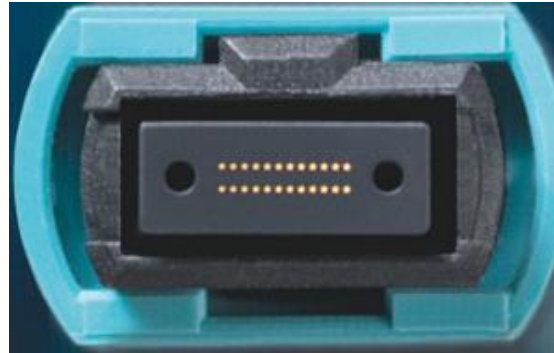
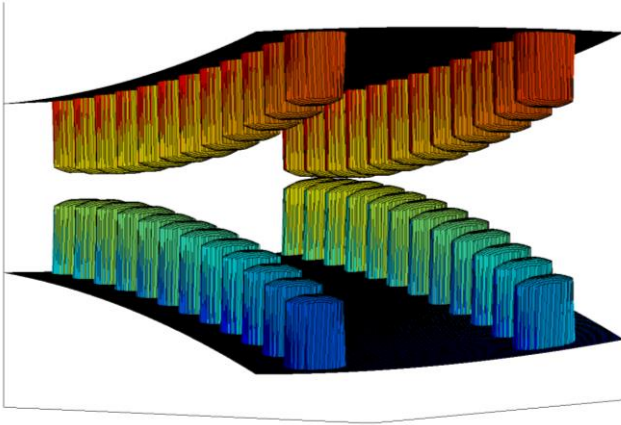
MPO kazetta lehetőség: 4 x 24f MPO és 3 x 400G portos kazetta

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**24 szálás MPOptimate
megoldások**

Viktor Endrész
Key Account Manager

The Next Generation Low Loss MPO



Infrastructure
for the Next 3
Generations



24 Fiber MPOptimate Trunks

Attenuation:
typical 0.18 dB,
max. 0.25 dB
Return loss:
28 dB min.



10 Gb/s Cassettes

Attenuation:
typical 0.25 dB,
max. 0.35 dB
Cassette RL:
27 dB min.



40 Gb/s Cassettes

Attenuation:
typical 0.36 dB,
max. 0.5 dB
Cassette RL:
27 dB min



100 Gb/s Cassettes

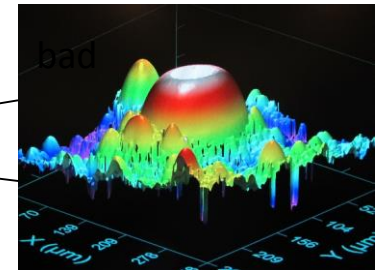
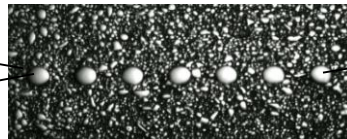
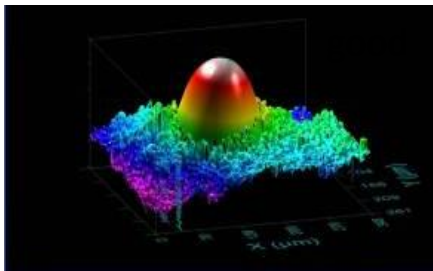
Attenuation:
typical 0.36 dB,
max. 0.5 dB
Cassette RL:
27 dB min



MPOptimate Patch Cords

Attenuation:
typical 0.1 dB,
max. 0.15 dB
Return Loss:
35 dB min

MPO	MPOptimate
Standard Attenuation, cassette loss 0.75dB	Low loss Attenuation, cassette loss 0.35dB
Standard Return Loss MPO connector 20dB and cassette 17dB	Improved Return Loss MPO connector 28db and cassette 27dB
MPO end face meet IEC requirements	End face meet or exceed IEC requirements
Does meet and support IEEE and FC standards	Does meet and exceeds IEEE and FC standards



• 40/100 Gb/s Ethernet channel budget

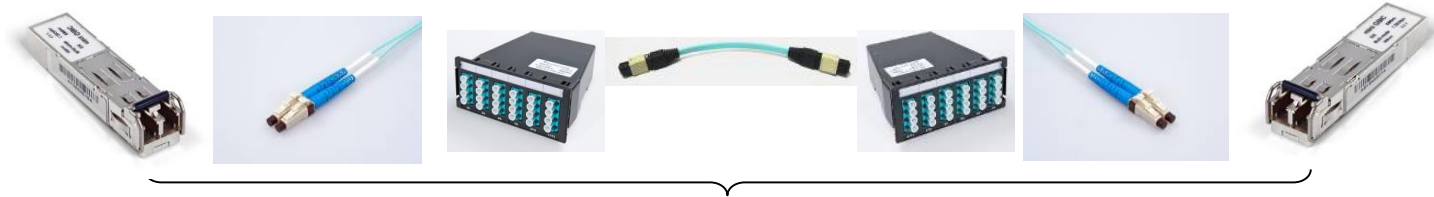
IEEE 802.3: 40GBASE-SR4	1.9 (100m OM3) 1.5 (150m OM4)*	←
IEEE 802.3: 100GBASE-SR10	1.9 (100m OM3) 1.5 (150m OM4)*	←

• „Fibre Channel“ channel budget

Channel Budget / dB					
Fiber type	1 Gbps FC	2 Gbps FC	4 Gbps FC	8 Gbps FC	16 Gbps FC
OM1, 62.5/125 µm	3	2.1	1.78	1.58	-
OM2, 50/125 µm	3.85	2.62	2.06	1.68	1.63
OM3, 50/125 µm	4.62	3.31	2.88	2.04	1.86
OM4, 50/125 µm	4.62	3.31	→	2.19	← 1.95
OS1/OS2, 9/125µm	7.8	7.8	7.8	6.4	6.4

Table 9: Channel budget for Fibre Channel over fiber depending on application and fiber type

MPO versus MPOptimate: channel return loss



The IEEE and Fiber Channel standard do provide :

1. Limits for channel attenuation and limits for transceiver return loss (12dB)
- MPOptimate products do have extended return loss values (27dB per cassette)

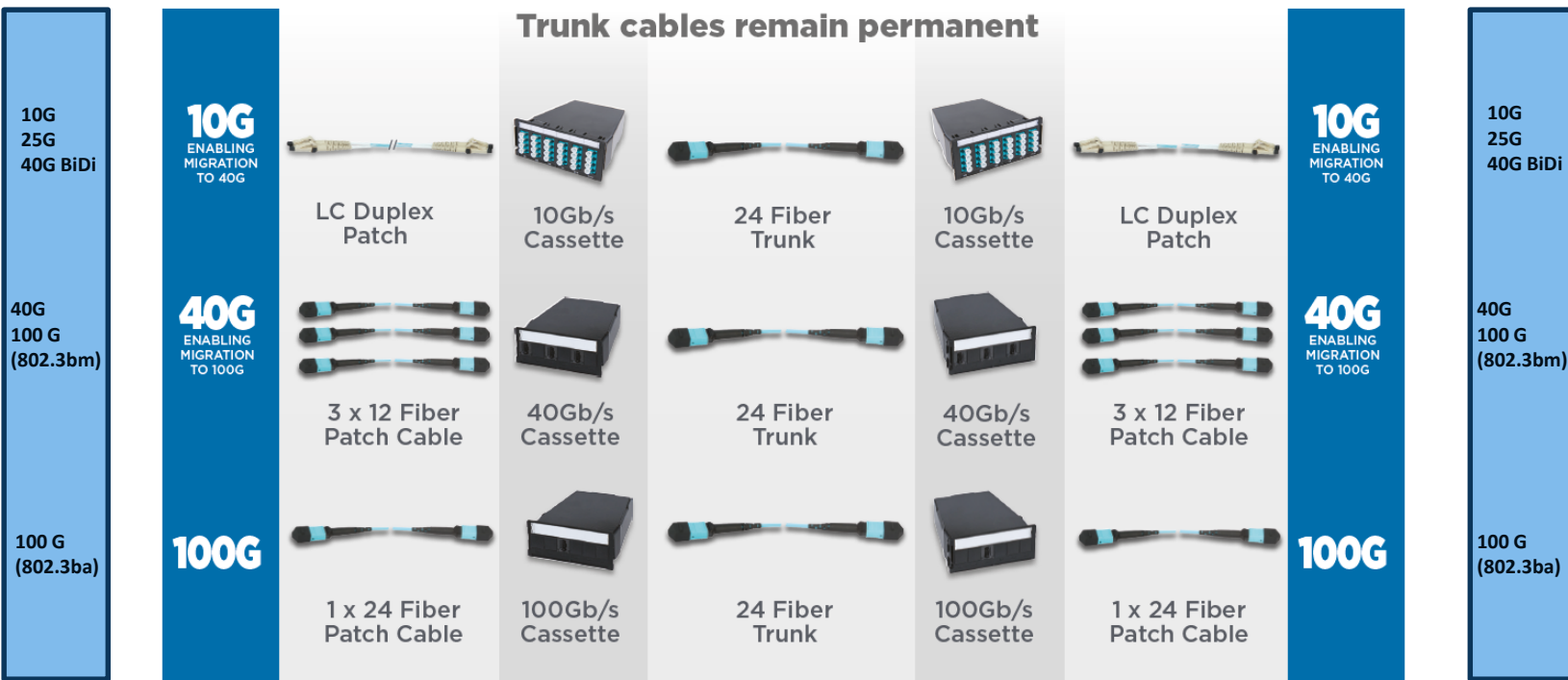
Return Loss calculation(dB)		
Number of cassettes	MPO system	MPOptimate system
1	17	27
2	14	24
3	12	22
4	11	21
5	10	20
6	9,2	19

2. And do provide limits for the signal quality, the eye pattern

Jelenleg

Jelenleg

Trunk cables remain permanent



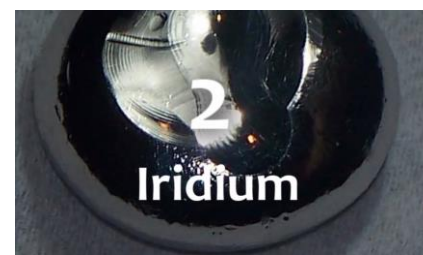
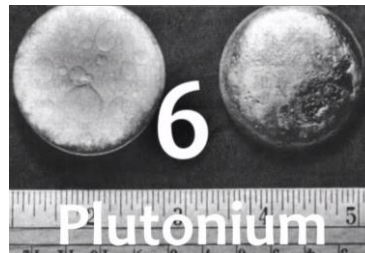
COMMScope®

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OSMIUM Hi-D megoldások

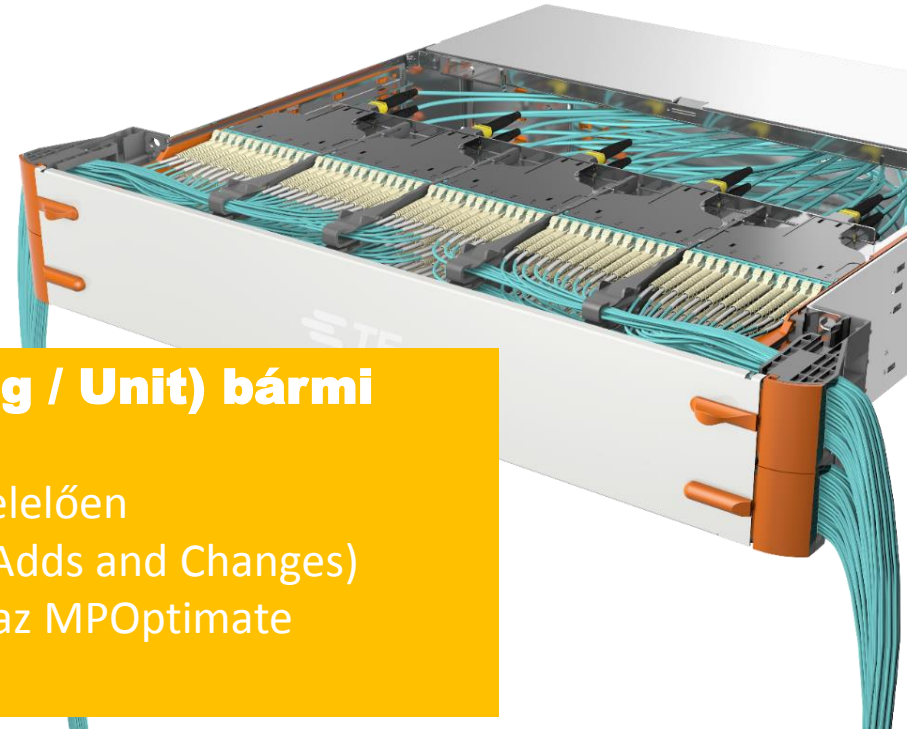
Viktor Endrész
Key Account Manager

Miért “Osmium” ?



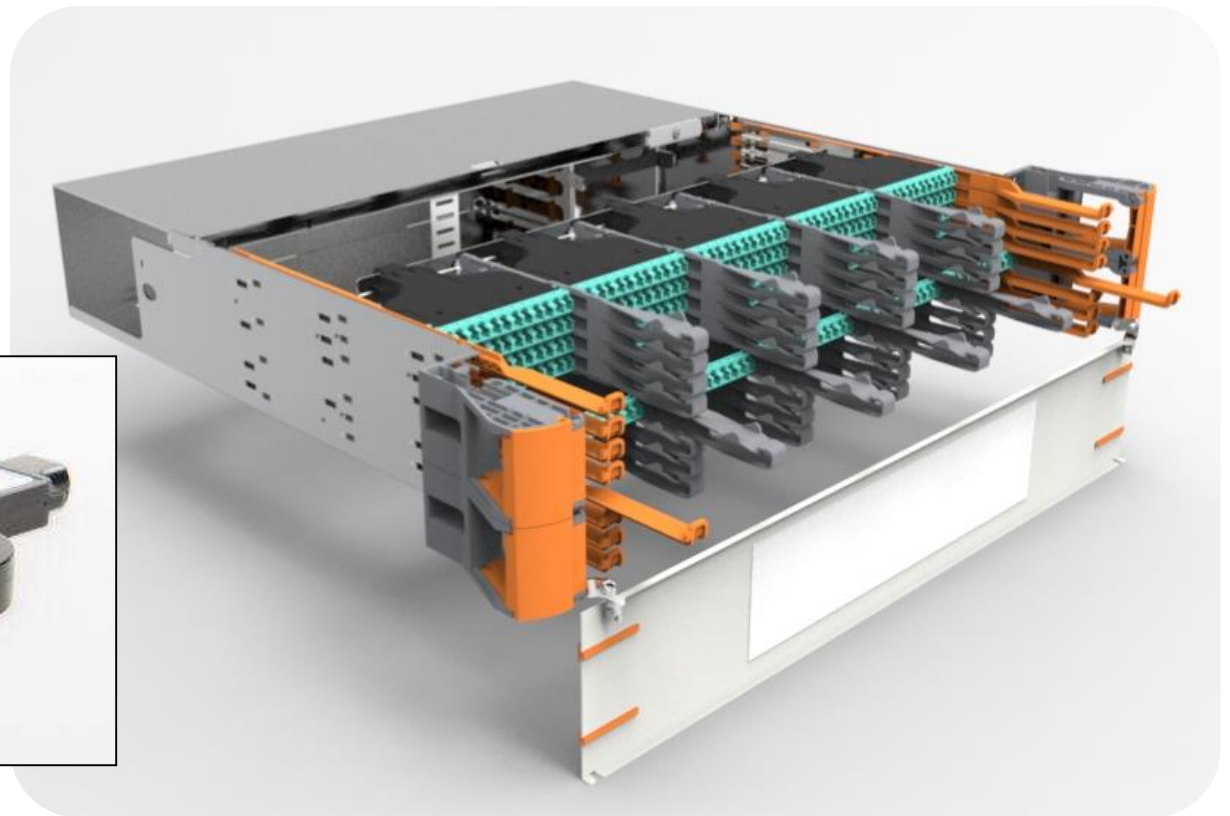
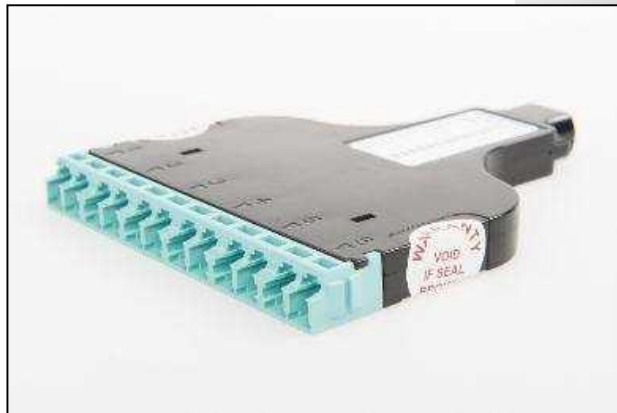
OSMIUM

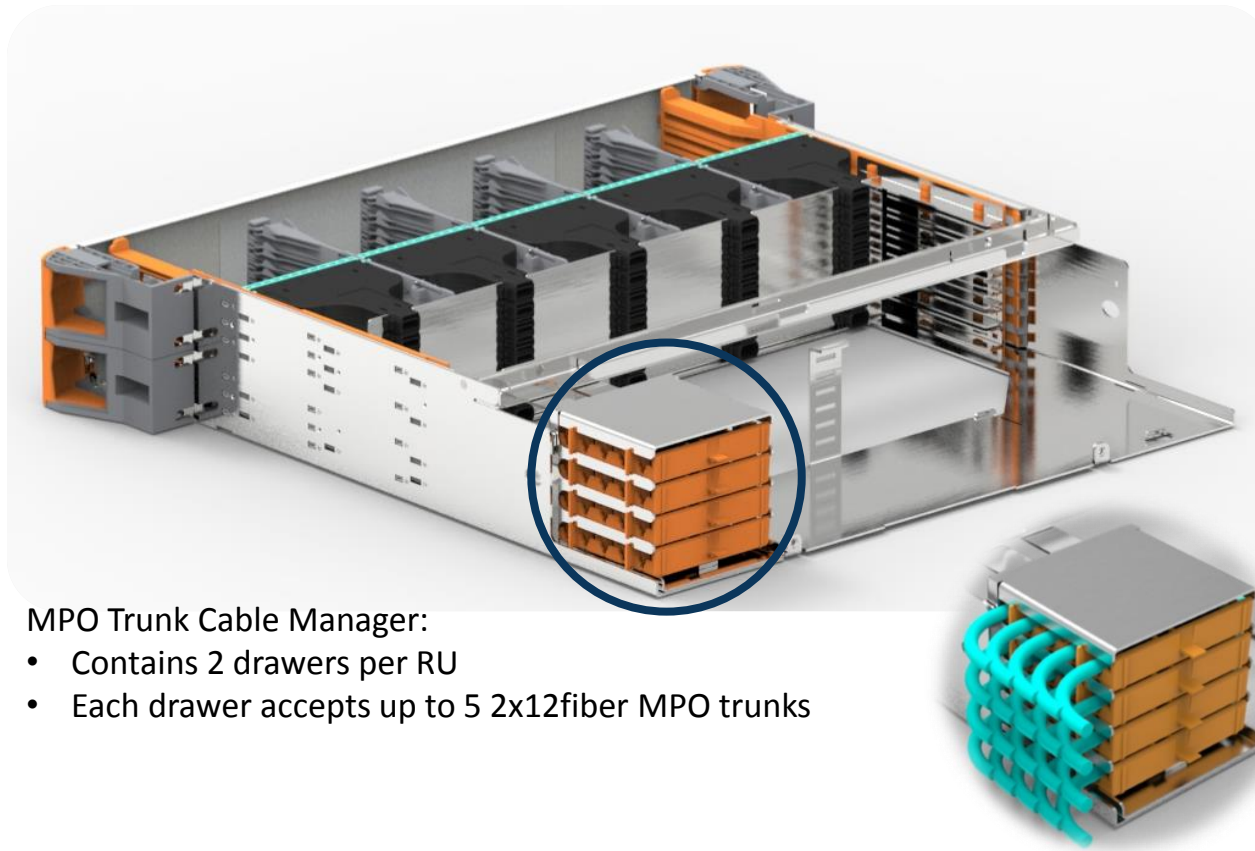
Nagysűrűségű optikai megoldás



- **Akár 45%-al több LC port (sűrűség / Unit) bármi másnál**
- Skálázható, konfigurálható igényeknek megfelelően
- Könnyű változtatási lehetőség (easy Moves, Adds and Changes)
- Egyedülállóan kiváló jel átviteli teljesítmény az MPOptimate technológiának köszönhetően

- ❑ Nagy sűrűségű optikai rendszer
- ❑ MPOptimate mikrokazetta támogatással





MPO Trunk Cable Manager:

- Contains 2 drawers per RU
- Each drawer accepts up to 5 2x12fiber MPO trunks

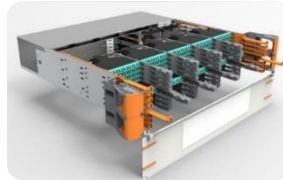


1RU



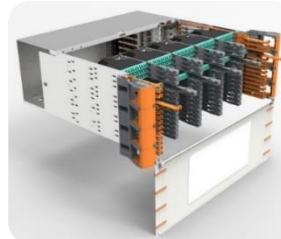
90 Duplex ports
180 Fibers

2RU



210 Duplex ports
420 Fibers

4RU



420 Duplex ports
840 Fibers



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**IT infrastruktúra
menedzsment**

Viktor Endrész
Key Account Manager

AMPTRAC™

❑ 9th Wire Technology

❑ CPID
Connection Point ID



Quareo™



ICM
Software



ICM Mobile
for the iPhone



Köszönöm a figyelmet!

