ABC of Fiber Method

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Agenda

1. Plug & Play Component
2. Methods
3. 40/100G upgrade path
4. MTP12 & MTP8

Plug & Play

What is it?

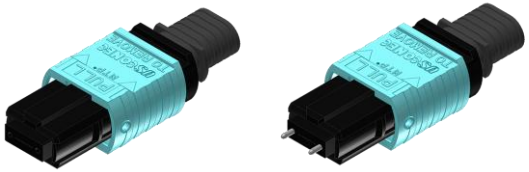
- Plug and Play is a complete fibre system composed of pre-terminated assemblies and cassettes that can be rapidly installed and activated via simple insertion of multi-fibre connectors.

- Products include: Factory-terminated, multi-fibre MTP (Mechanical Transfer Push-on) trunk cable assemblies
  MTP to duplex trunks and hydra assemblies

Plug & Play

MTP Systems

- MTP systems are mated connections male to female
- Different applications may require different ‘polarity’ options – A, B or C
- MTP connections can be converted to LC connections via the use of cassettes or hybrid cords



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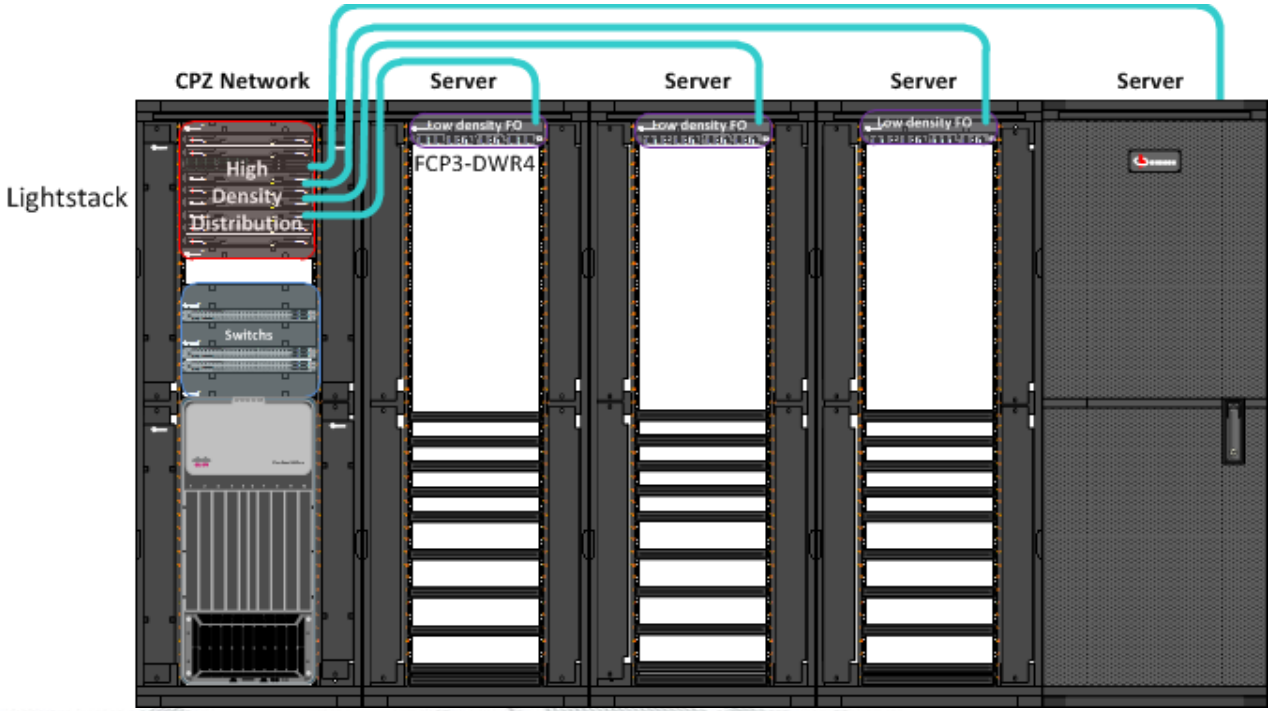
Different Designs

For Different Situations



Fiber Design

Product Level

- What are the main concerns regarding fibre designs:
  - Optical Loss (attenuation)
  - Length Limitation
  - Polarity
- Each Application will have it’s own very specific needs… Get this wrong and the system may not work!

Application Performance

This is Serious Stuff

- IEEE: 802.3 – 10BaseFL
  - Maximum Loss (OM3/OM4) 12.5dB
- IEEE: 802.3 – 10GBaseSR
  - Maximum Loss (OM3) 2.6dB
  - Maximum Loss (OM4) 2.9dB
- IEEE: 802.3 – 40GBaseSR4
  - Maximum Loss (OM3) 1.9dB
  - Maximum Loss (OM4) 1.5dB

- Designers need to know what the client is planning to run over the fibres
- From and to details
- How many hops:
  - Layout of hardware, Network Cabinets, Server Cabinets etc.
- Once we know this we can correctly select components:
  - Meeting todays needs and any trying to cater for tomorrow

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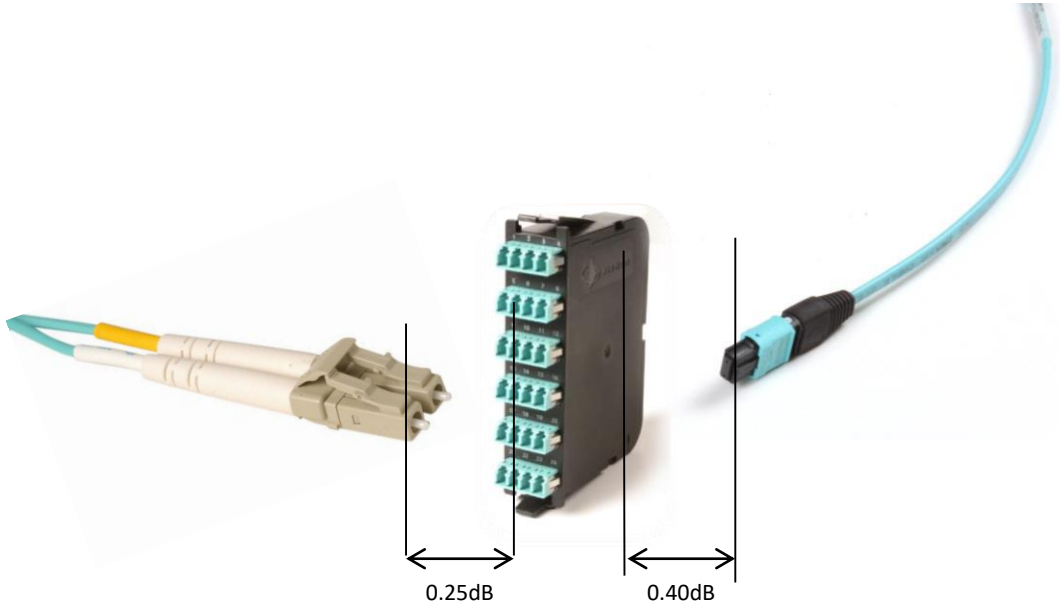
Understanding Losses

Standard Loss Performance



Understanding Losses

Low Loss Performance

Understanding Losses

LC Duplex Design

Application	Fibre Type	Max Length	Maximum Loss dB	2 Cassettes 50m	
				Standard Loss	Low Loss
10GBase-SX	OM3	300	2.6	1.45	0.85
	OM4	400	2.9	1.45	0.85

Understanding Losses

LC Duplex Design

Application	Fibre Type	Max Length	Maximum Loss dB	2 Cassettes 50m		4 Cassettes 50m	
				Standard Loss	Low Loss	Standard Loss	Low Loss
10GBase-SX	OM3	300	2.6	1.45	0.85	2.75	1.55
	OM4	400	2.9	1.45	0.85	2.75	1.55

Understanding Losses

Higher Data Rate Design

Application	Fibre Type	Max Length	Maximum Loss dB	2 x Adaptor Plates 50m	
				Standard Loss	Low Loss
40GBase-SR4 100GBase-SR10	OM3	100	1.8	0.9	0.5
	OM4	150	1.5	0.9	0.5
100GBase-SR4	OM3	70	1.8	0.9	0.5
	OM4	100	1.9	0.9	0.5

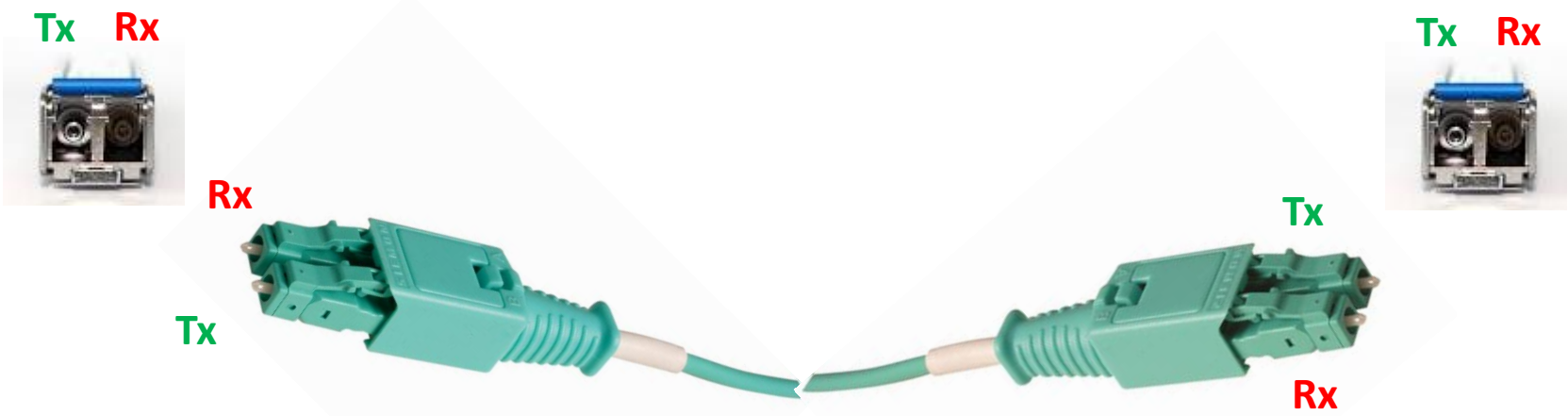
Understanding Losses

Higher Data Rate Design

Application	Fibre Type	Max Length	Maximum Loss dB	2 x Adaptor Plates 50m		4 x Adaptor Plates 50m	
				Standard Loss	Low Loss	Standard Loss	Low Loss
40GBase-SR4 100GBase-SR10	OM3	100	1.9	0.9	0.5	1.75	0.95
	OM4	150	1.5	0.9	0.5	1.75	0.95
100GBase-SR4	OM3	70	1.8	0.9	0.5	1.75	0.95
	OM4	100	1.9	0.9	0.5	1.75	0.95

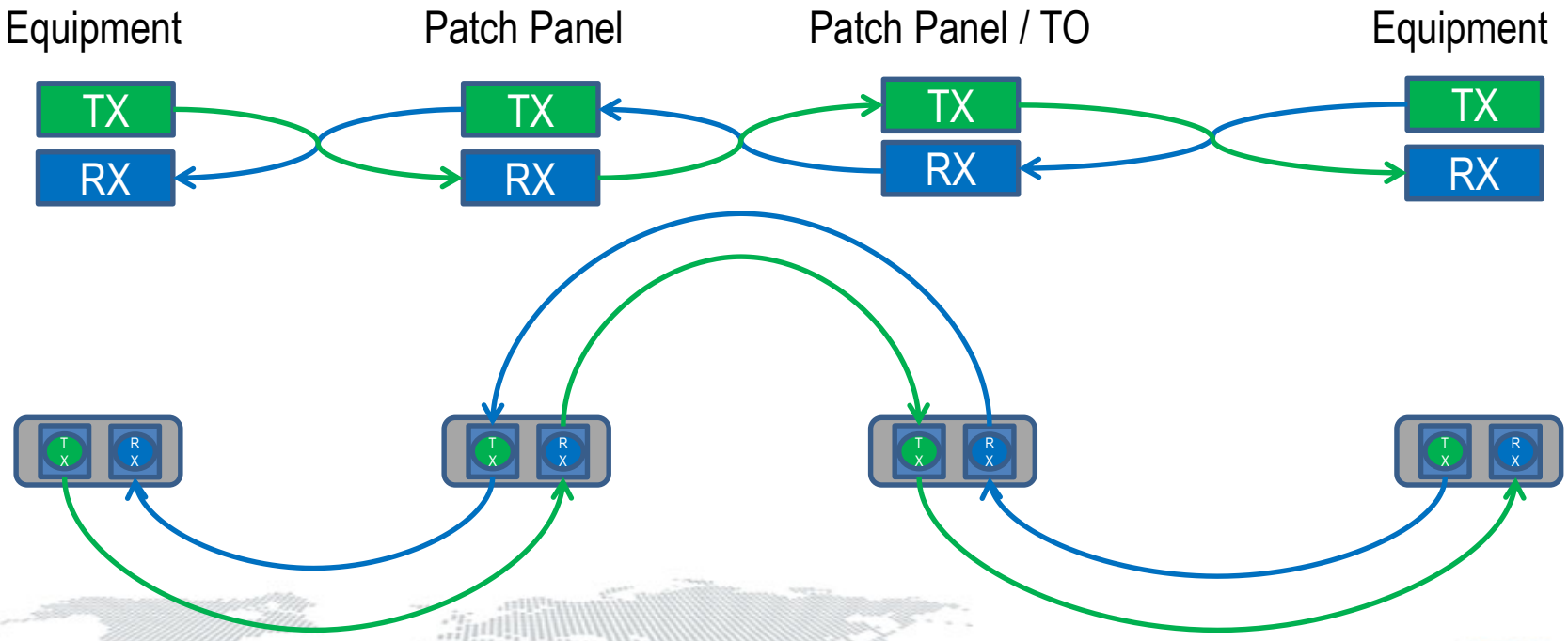
Polarity

Fibre Polarity – Rules



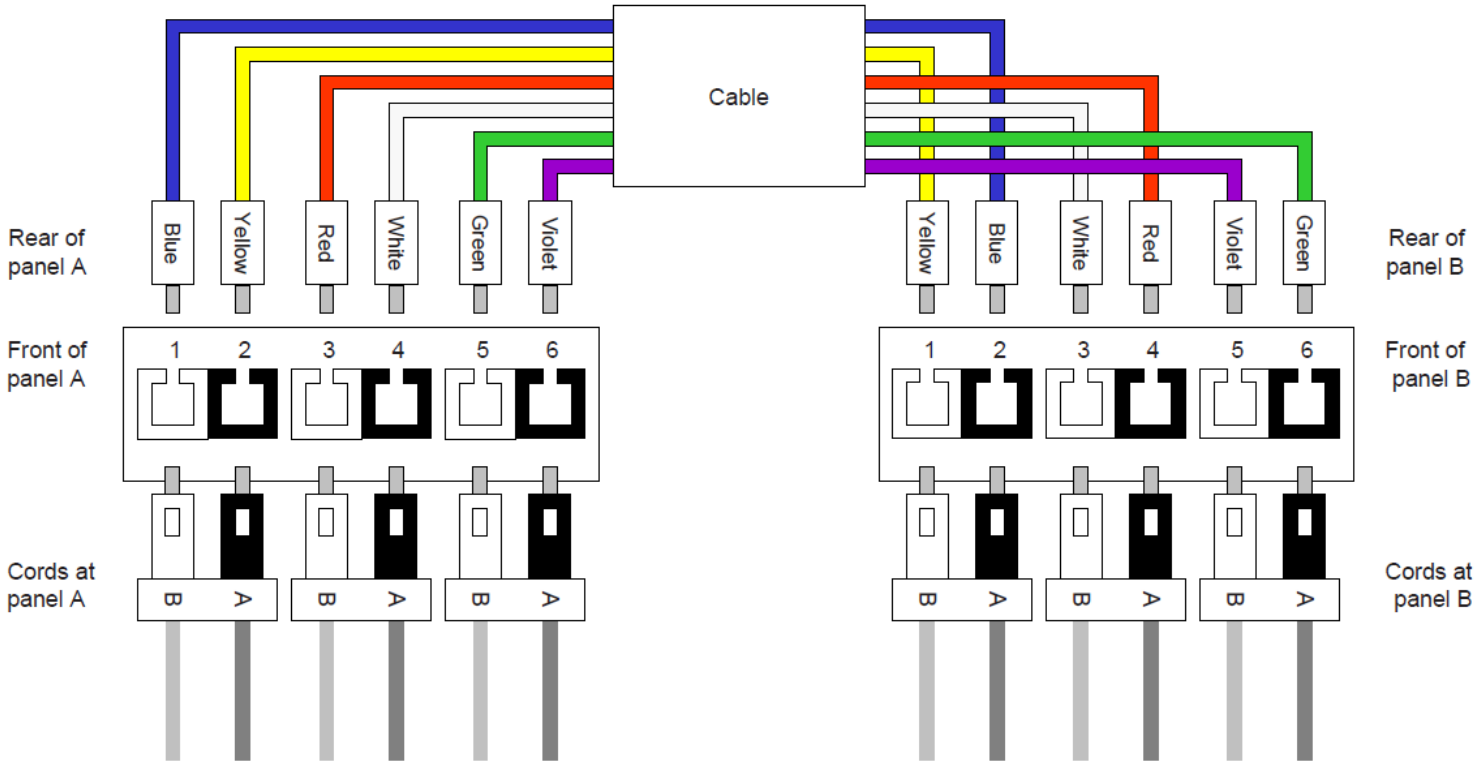
Polarity

In all fibre connectivity it is important to maintain the correct polarity so the signal goes from the optical transmitter to the optical receiver
For duplex transmissions



Reverse Pair Polarity

The standards define how this is achieved



EN50174-2

Polarity options

The standards allow three methods to achieve this using array connectivity

- Method A
- Method B
- Method C

Other manufacturers have proprietary offerings

Method A

1 2 3 4 5 6 7 8 9 10 11 12

1 2 3 4 5 6 7 8 9 10 11 12

Method B

1 2 3 4 5 6 7 8 9 10 11 12

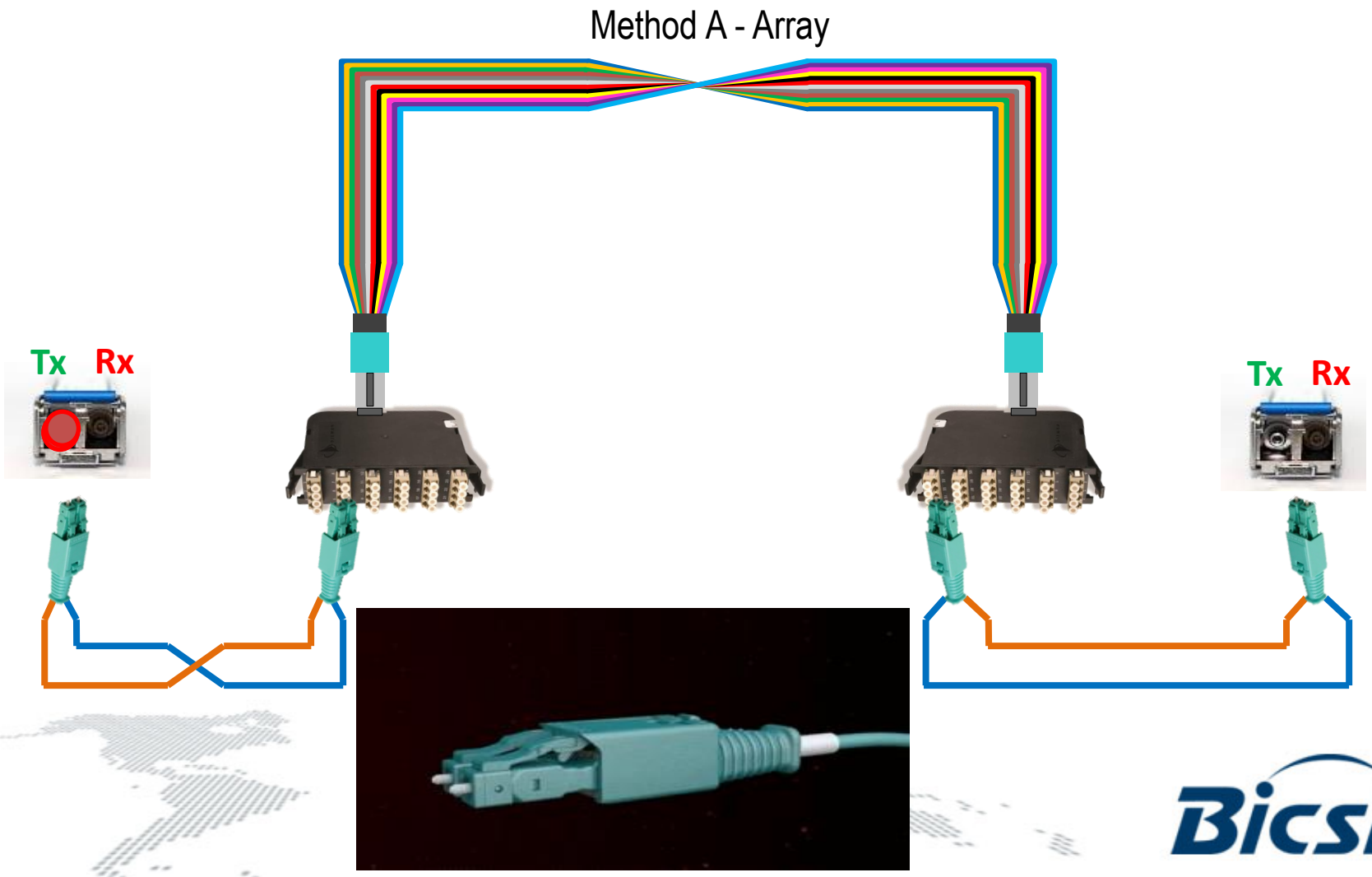
12 11 10 9 8 7 6 5 4 3 2 1

Method C

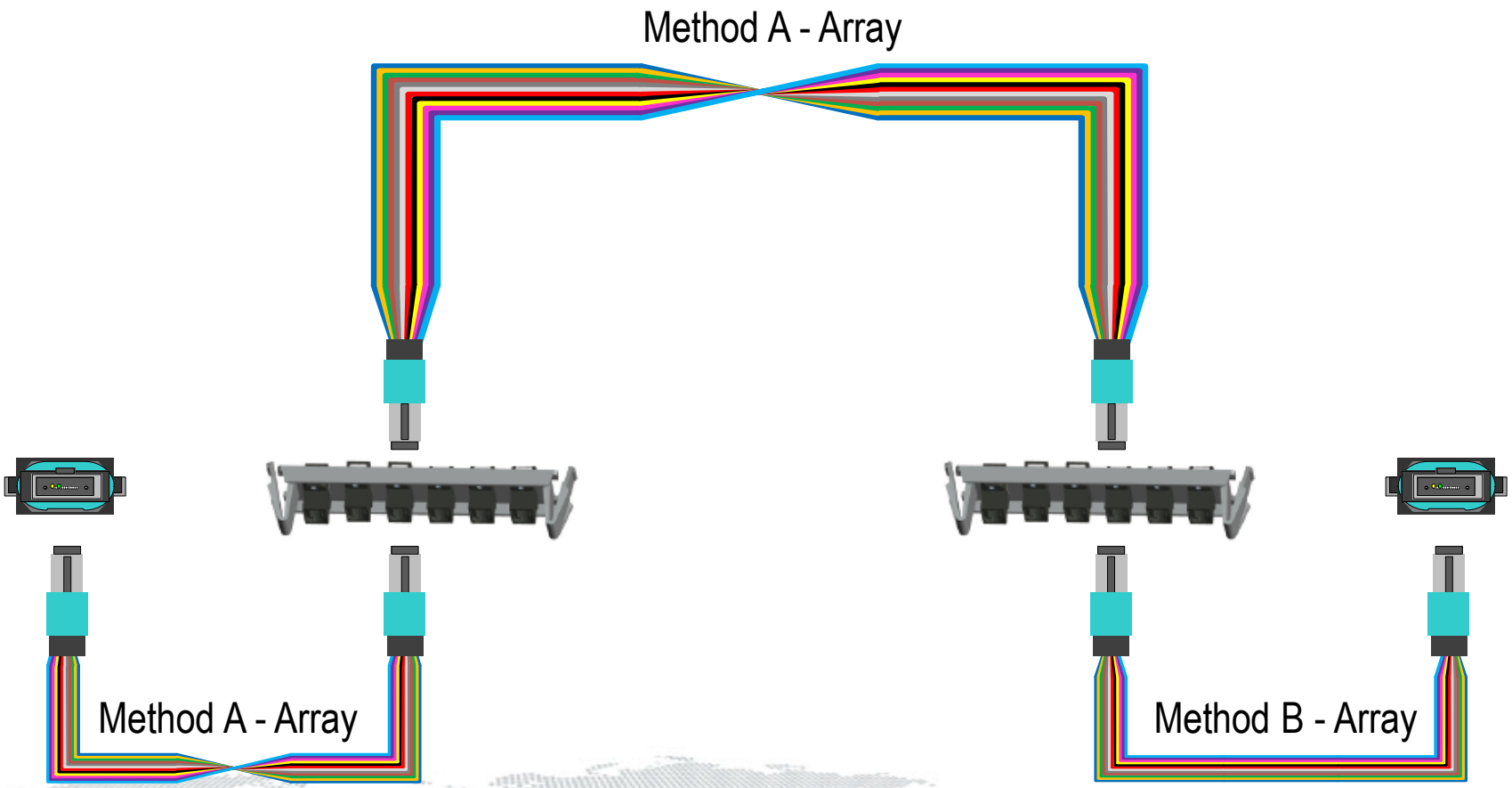
1 2 3 4 5 6 7 8 9 10 11 12

2 1 4 3 6 5 8 7 10 9 12 11

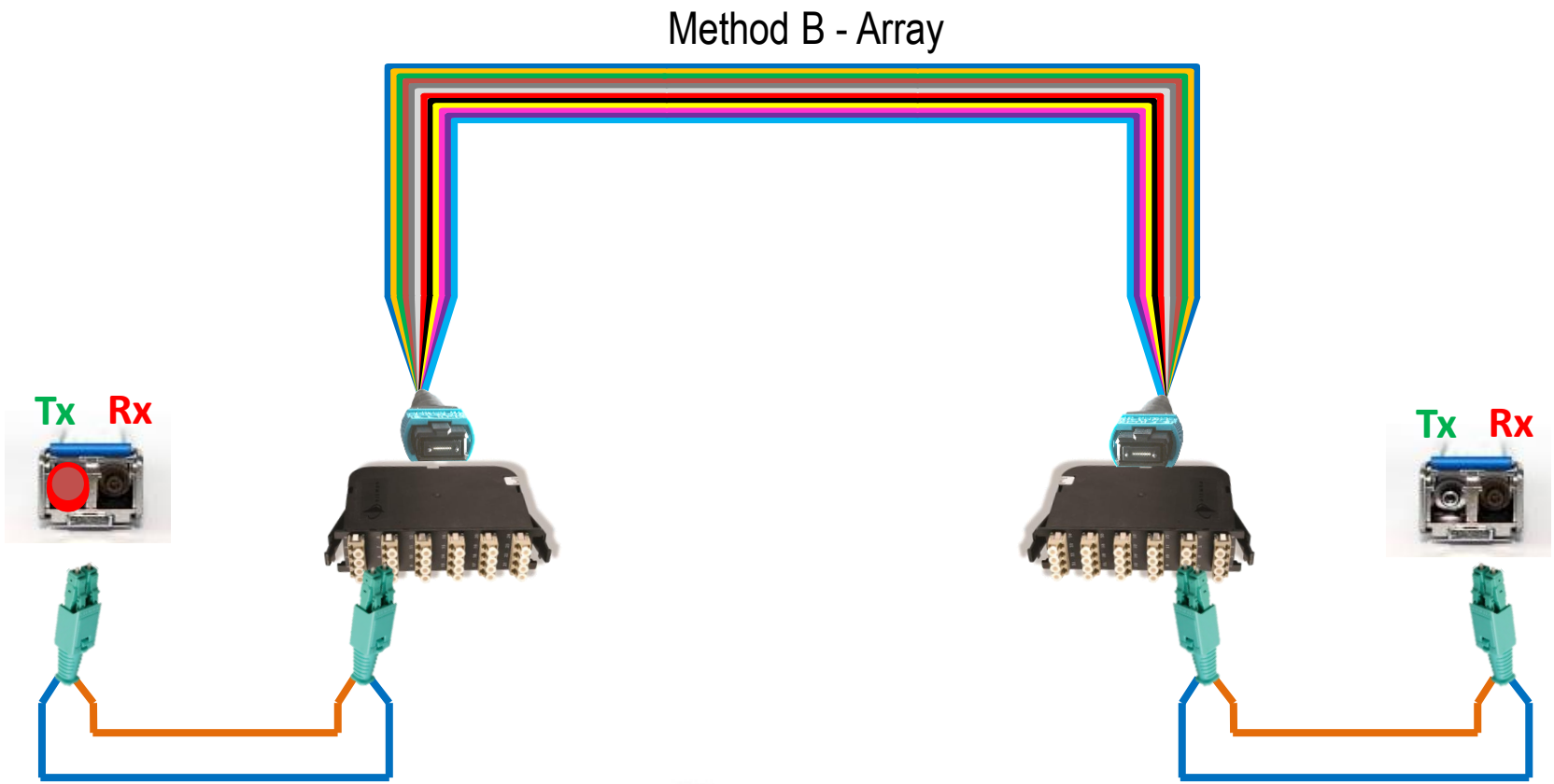
Method A – 10G



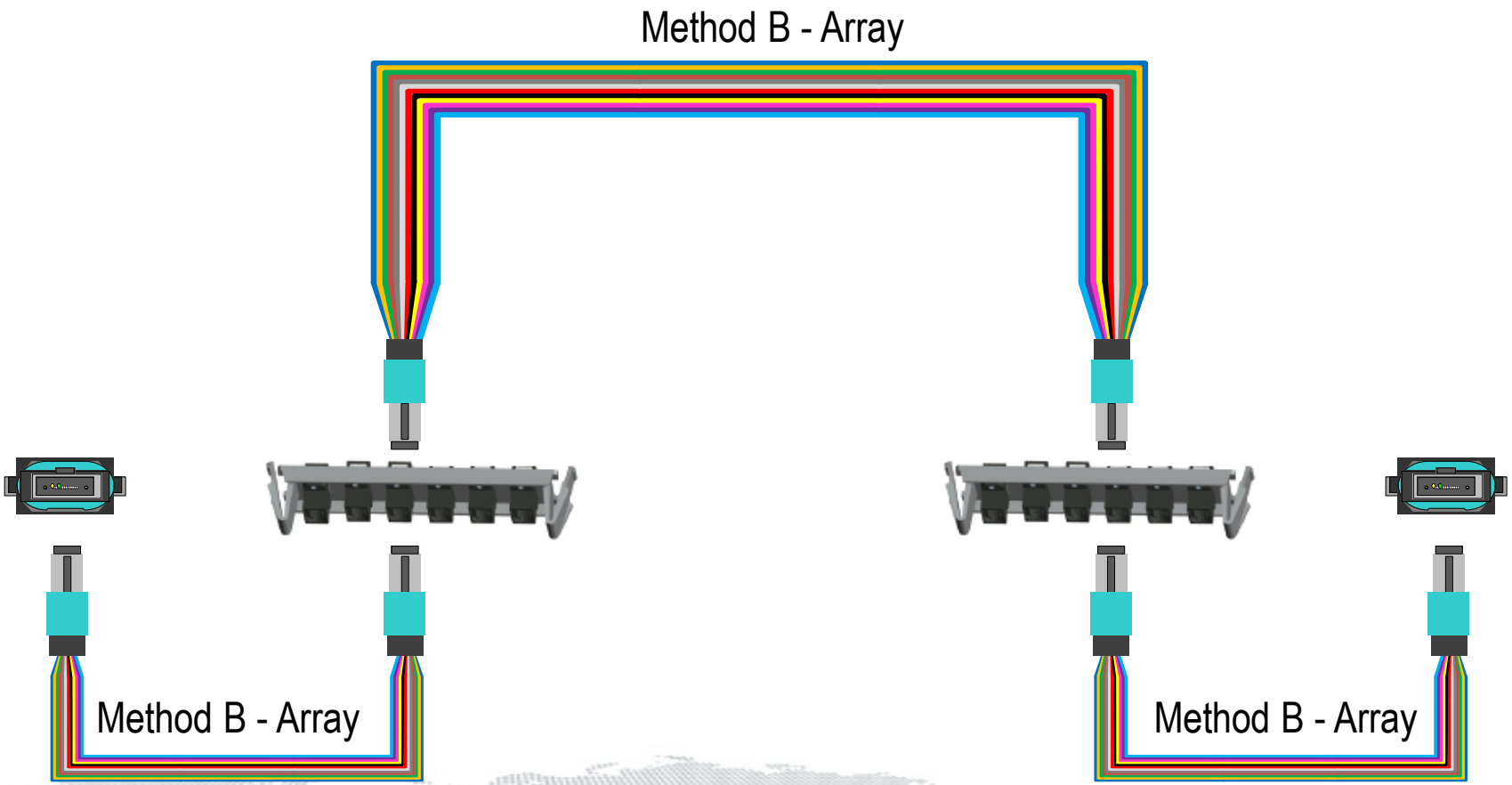
Method A – 40/100G



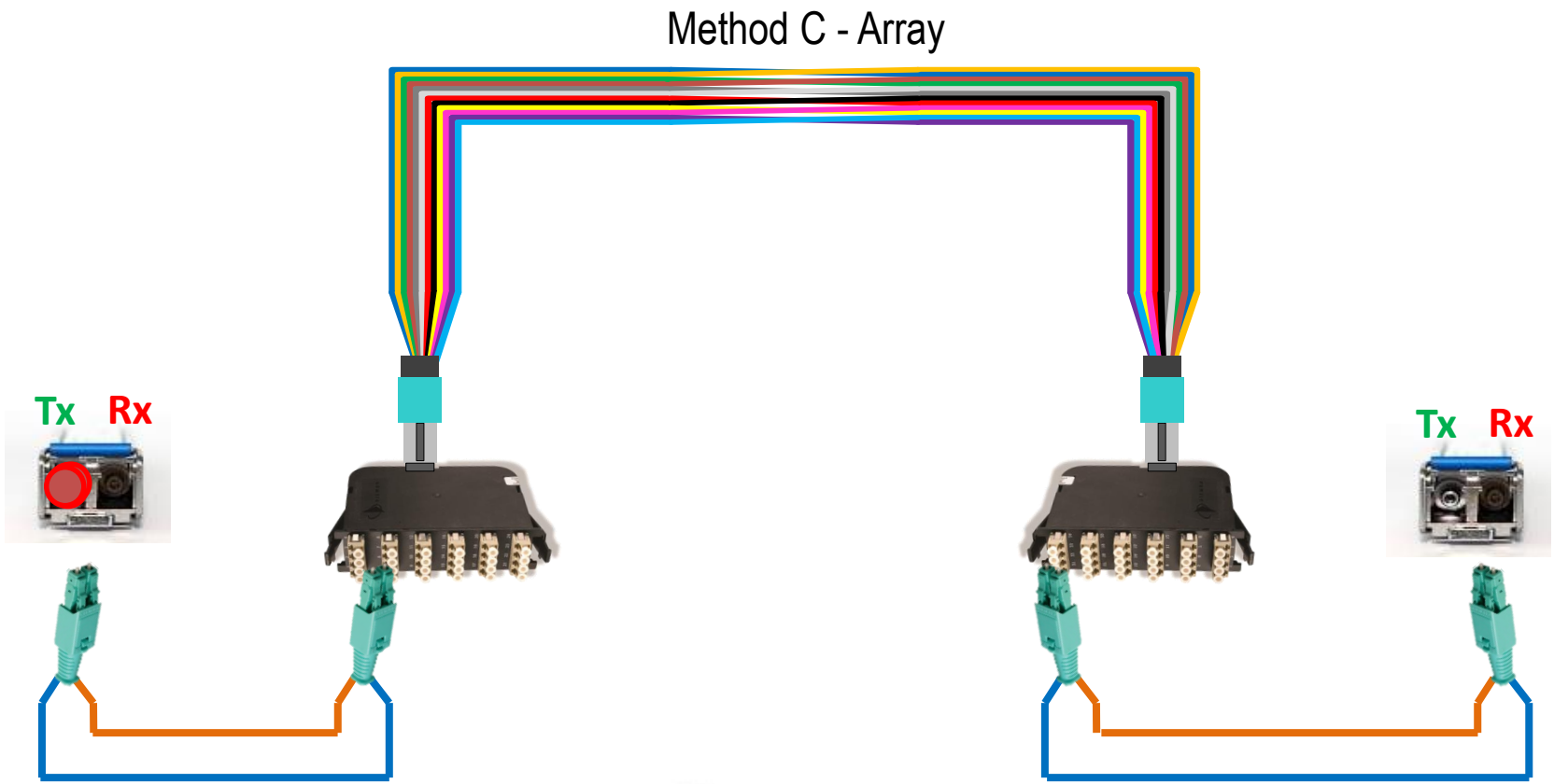
Method B – 10G



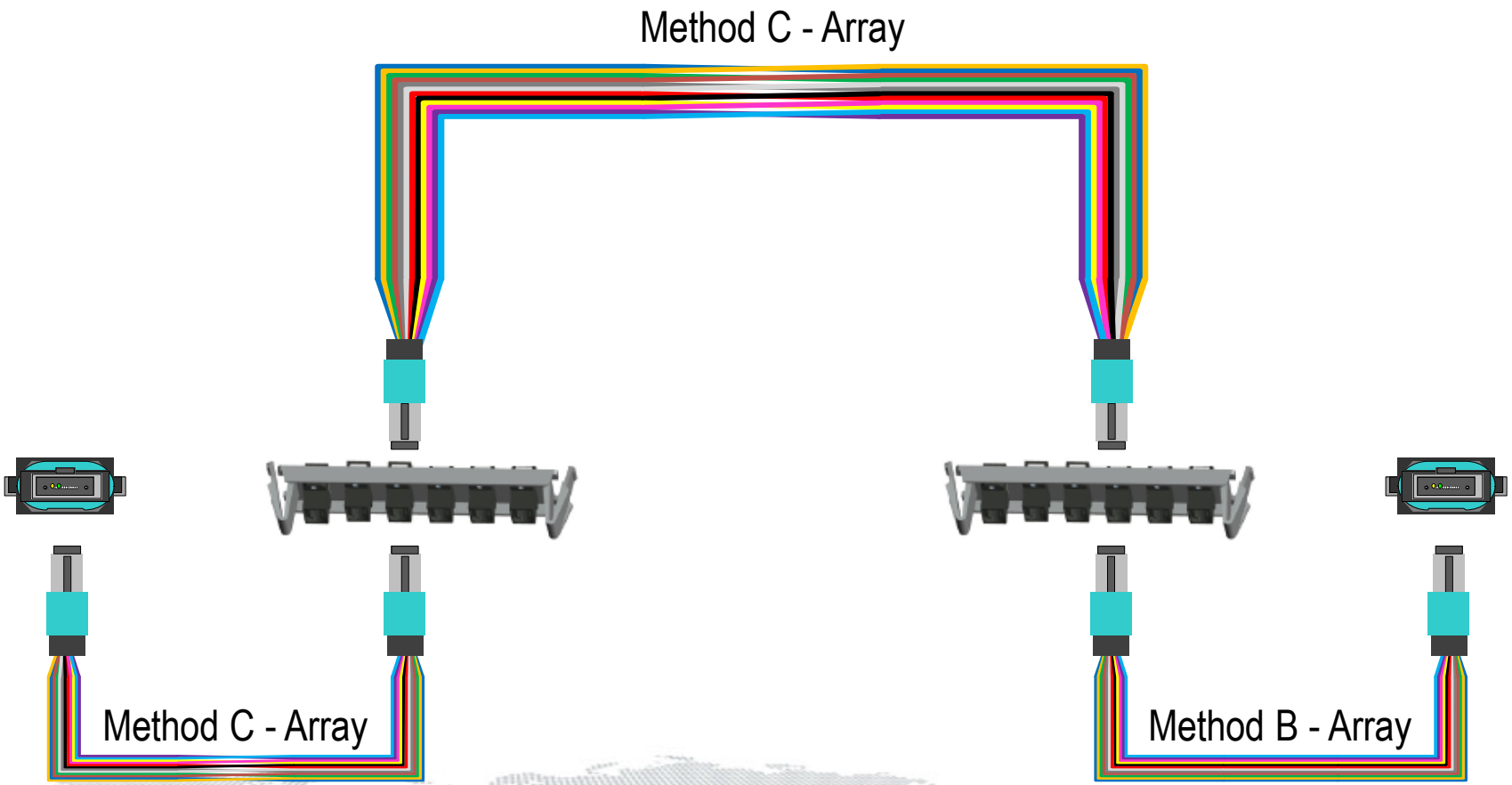
Method B – 40/100G



Method C – 10G



Method C – 40/100G



Polarity

The Standard offer 3 type of polarity A, B and C on MTP assemblies. Be carefull with non standard polarity

Who should think about polarity and gender in a Channel?

- End users **Be aware**
- Installers **Install correctly**
- Designers **Take care**

Application	Polarity Type	Installer	End User
Duplex Application (LC based)	A	Medium	Hard
	B	Medium	Easy
	C	Easy	Easy
Parallel Optics (MTP Based)	A	Medium	Hard
	B	Easy	Easy
	C	Hard	Hard

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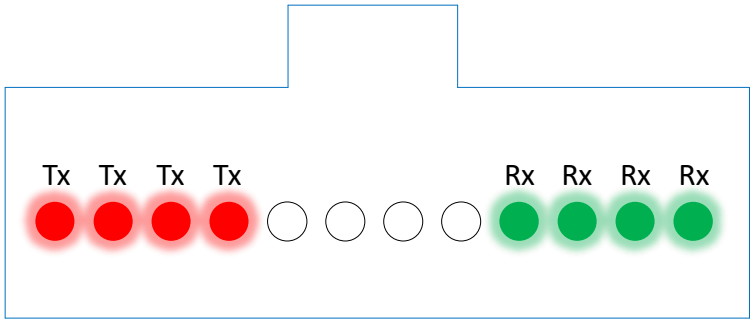
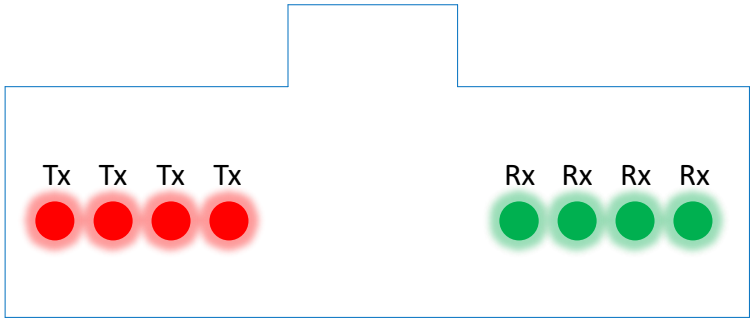
Array Application

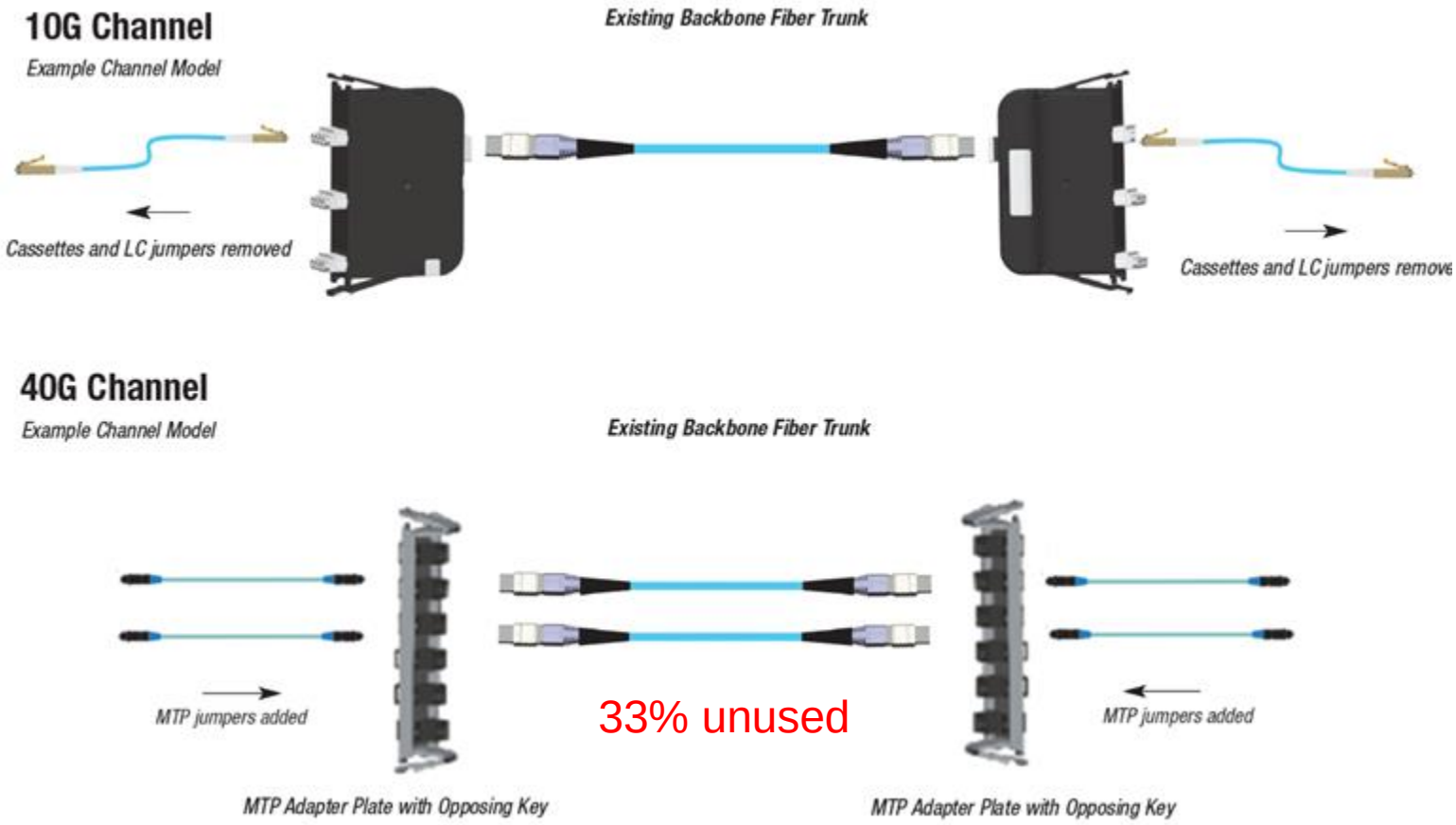


MTP 12

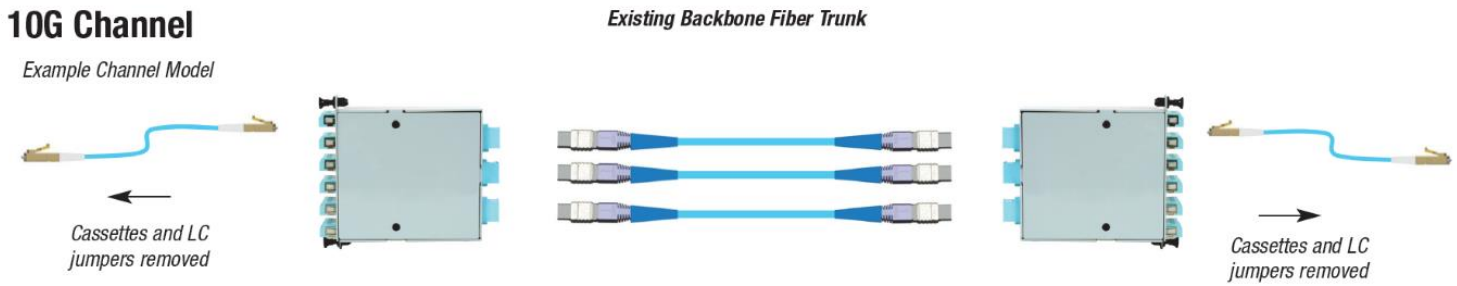


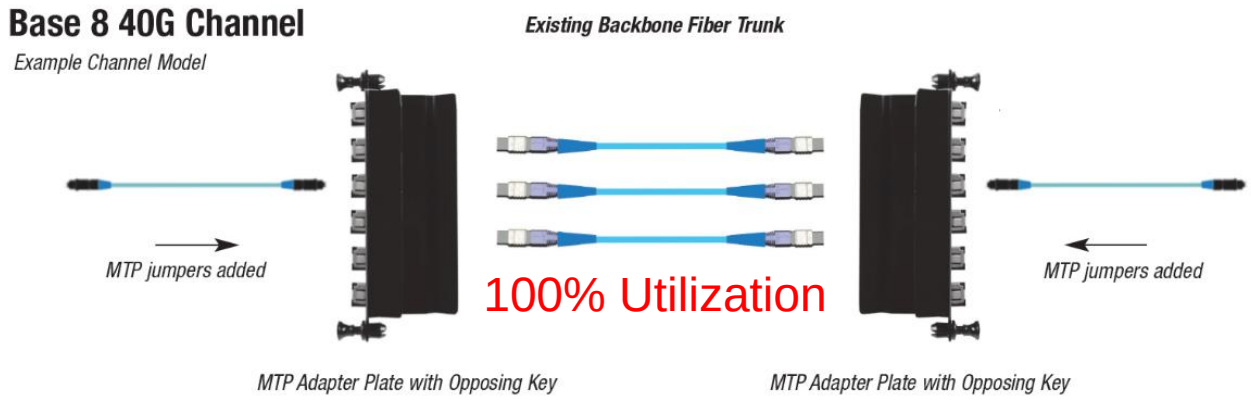
MTP 8

Migration Path : 12Core Array



Migration Path : 8Core Array





Thank You

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