DATA CENTER CABLING
WHAT IS NEEDED FOR A SUCCESSFUL DATA CENTER PROJECT?

WORLDWIDE SPECIALIST
IN ELECTRICAL AND DIGITAL INFRASTRUCTURES

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Mr. Klaus Dafinger, Marketing Manager Structured Cabling, Legrand

DELIGHTED TO MEET YOU

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AGENDA

- Cabling challenges in the data center
  - Standardisation is the route to success?
  - Tackling resistance to change
  - Existing legacy infrastructure
- Technical limitations of existing cabling technology
- The right way
- The right product

DATA CENTER CABLING - CHALLENGES
FOLLOWING THE STANDARDS IS THE WAY TO SUCCESS

DEFINITION

By definition, a standard itself provides part of the answer:

- **Something that is regarded as exemplary, model-like, and by which others are guided**
- **Guideline, standard, norm**
- **In general: quality and performance level**

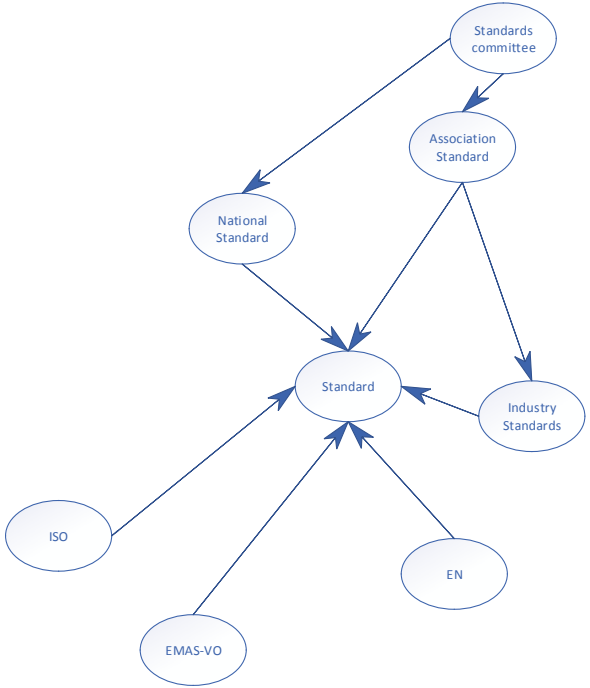
**Source: Duden (German OED)*

OBJECTIVE - STANDARDISATION

- Standardisation is a planned process, carried out jointly by the interested parties, for the purpose of standardisation of tangible and intangible objects for the benefit of the general public

- **Standard = minimum requirement**

DATA CENTER CABLING - CHALLENGES
FOLLOWING THE STANDARDS IS THE WAY TO SUCCESS



TYPE OF STANDARDS:

Following the 'right' standard could be a challenge. Types of standards:

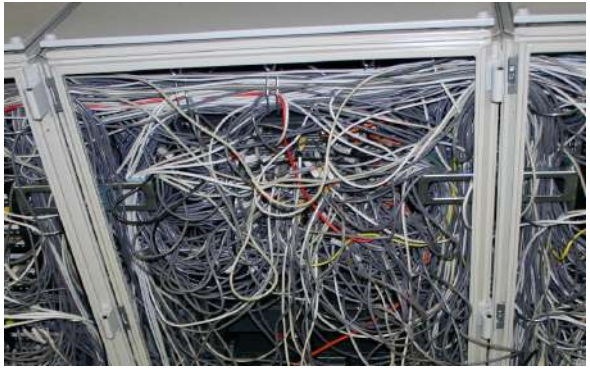
- International standards - e.g., ISO standards of the International Organization of Standardisation
- European standards - e.g., EN standards
- National standards
- Association standards

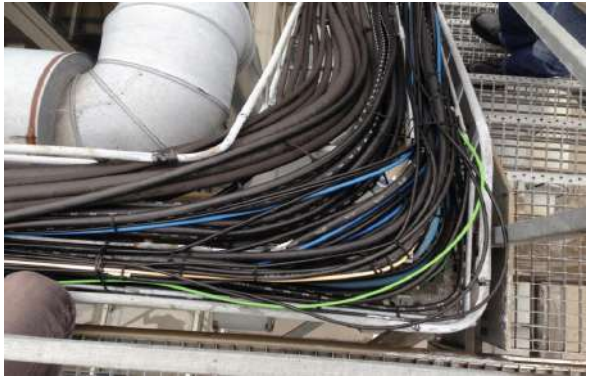
DATA CENTER CABLING - CHALLENGES
THE UNMOVEABLE OBJECT!

"We have been doing it exactly like this for years and it always worked"

- Every now and then, one of the biggest challenges is to convince skeptics in your own ranks to go new ways
- The rapid development of IT, the sharp increase in bandwidth requirements in all areas are not making this any easier

DATA CENTER CABLING - CHALLENGES
HISTORICALLY GROWN





“WE HAVE HISTORICALLY GROWN STRUCTURES”

Derived from this, there are several scenarios that recur:

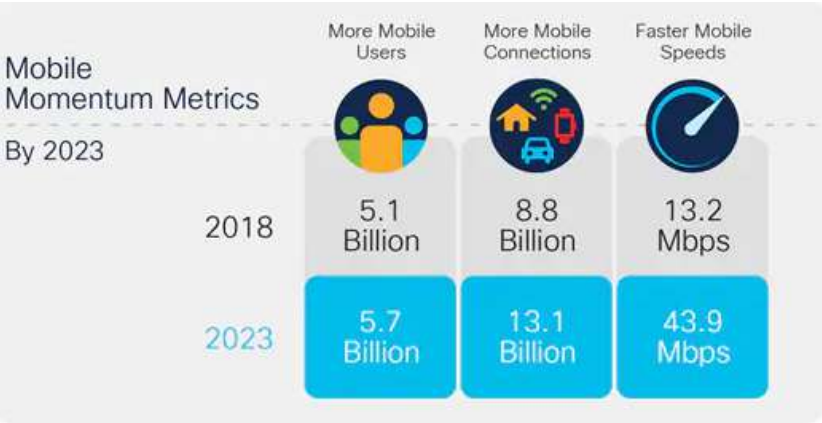
- No overview of the existing structures, resources and quality
- No or only superficial technical and qualitative requirements for products
- Hiding behind certain standards (e.g. EN50173) without comparison with actual needs
- Not widely accepted in the company, explicitly in IT - a necessary evil
- Cost-driven and not solution-driven

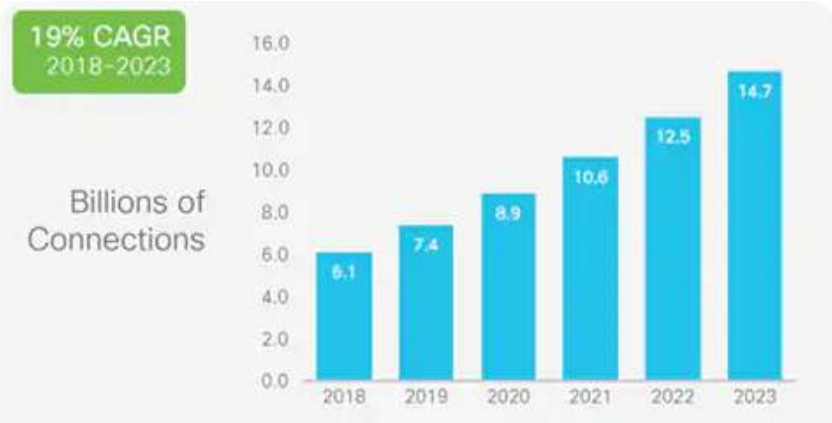
DATA CENTER CABLING - CHALLENGES
TECHNICAL LIMITATIONS OF TODAY'S CABLING TECHNOLOGIES

TODAY'S CABLING TECHNOLOGIES ARE SUBJECT TO LIMITATIONS

Traffic growth is placing pressure on data centers

- Users expect high-performance connectivity anywhere, anytime, on any device. Additionally, wireless IoT devices are becoming more ubiquitous in many business sectors (manufacturing, healthcare, logistics, etc.). This wave of IoT applications dramatically changes networking requirements in terms of scale, traffic patterns and volumes.





Source: Cisco Annual Internet Report

DATA CENTER CABLING - CHALLENGES
TECHNICAL LIMITATIONS OF TODAY'S CABLING TECHNOLOGIES

TWO LANES AREN'T ENOUGH

- The higher the bandwidth, the more optical fiber is required. The amount of data increases enormously with parallel optical applications.

The loss budget, however, does not!

- Bidirectional transmission are needed in addition for "normal" applications, also sometimes the increment of bandwidth is done by multiplexing in 2-fibre-systems.

DATA CENTER CABLING - CHALLENGES
TECHNICAL LIMITATIONS OF TODAY'S CABLING TECHNOLOGIES

COMPLICATED INSTEAD OF COMPLEX

Today's cabling technologies for high bandwidths cannot handle every application and are also far too complicated in practice.

POLARITY A

Near / Far End	Fiber Sequence (viewing the end face of the connector with key up)											
Near	1	2	3	4	5	6	7	8	9	10	11	12
Far	1	2	3	4	5	6	7	8	9	10	11	12

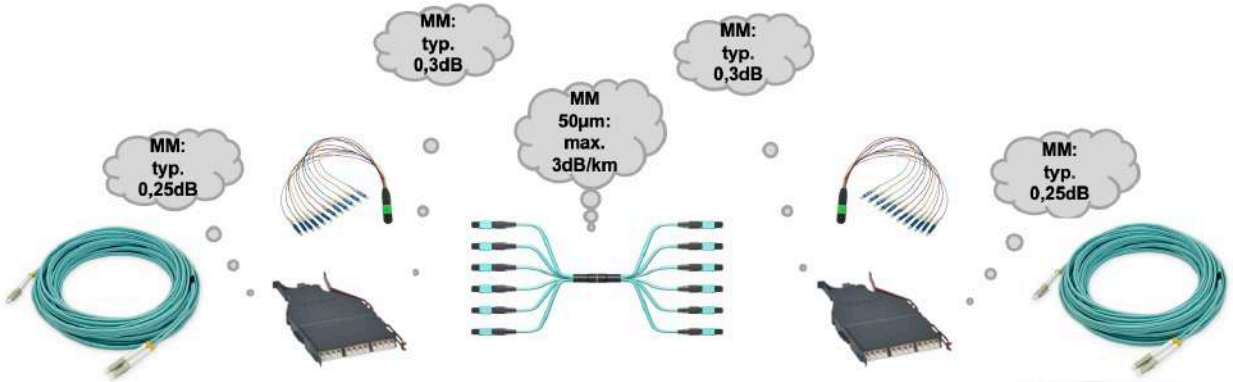
POLARITY B

POLARITY C

Near / Far End	Fiber Sequence (viewing the end face of the connector with key up)											
Near	1	2	3	4	5	6	7	8	9	10	11	12
Far	2	1	4	3	6	5	8	7	10	9	12	11

DATA CENTER CABLING - CHALLENGES
TECHNICAL LIMITATIONS OF TODAY'S CABLING TECHNOLOGIES

QUALIFIED LIMITATION



Coupling A: typ. 0,25dB	Coupling B: typ. 0,3dB	Fibre: 150m*0,003= 0,45dB	Coupling C: typ. 0,3dB	Coupling D: typ. 0,25dB	Total attenuation: 1,55dB

IEEE-Norm	Max. dB attenuation	Max. length
802.3: 40GBase-SR4	OM3: 1,9 dB / OM4 1,5 dB	OM3 100m / OM4 150m
802.3: 100GBase-SR10	OM3: 1,9 dB / OM4 1,5 dB	OM3 100m / OM4 150m

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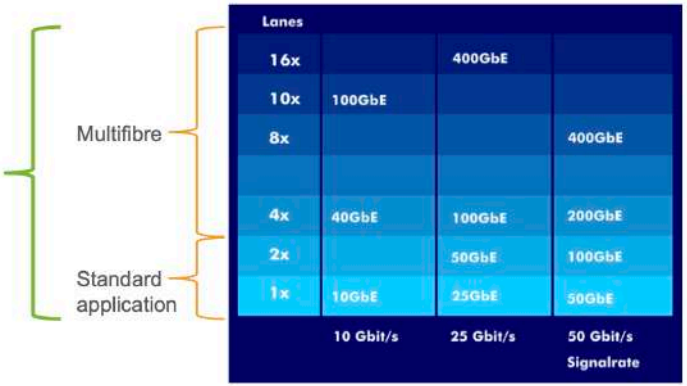
DATA CENTER CABLING
THE RIGHT WAY

NEVER WALK ALONE

One of the biggest challenges is to find the way to a successful data cabling project

DATA CENTER CABLING
THE RIGHT PRODUCT

Future cabling technologies, for all applications and qualitative reserves for everything to come



WHY IS A NEW SOLUTION NEEDED?

- Cassette complexity (performance, polarity, delivery, cost, etc.)
- Speed and bandwidth increasing – Optical budget compressing
- Industry reducing reliance on MTP/MPO connector

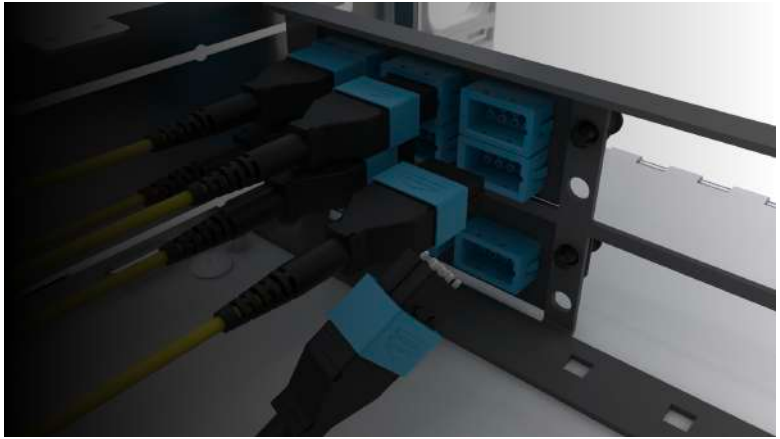
DATA CENTER CABLING
FIBER CABLING SYSTEM OF THE FUTURE

INFINIUM acclAIM™

Less complex, infinite scalability, faster installation

- Components
- Opportunities and possibilities

DATA CENTER CABLING
FIBER CABLING SYSTEM OF THE FUTURE



The **Infinium acclAIM** solution, featuring the AIM fiber interconnect system, is designed to mate a trunk cable with acclAIM connectors directly to an array of twin-fiber patch cord connectors by means of a “conversion adapter.”

LESS IS MORE

Unlock a more effective network using significantly less resources with Infinium acclAIM

- **Less** Money
- **Less** Complexity
- **Less** Time
- **Less** Optical Loss

- **More** Density
- **More** Migration Capability
- **More** Sustainable
- **More** acclAIM

DATA CENTER CABLING
COMPONENTS

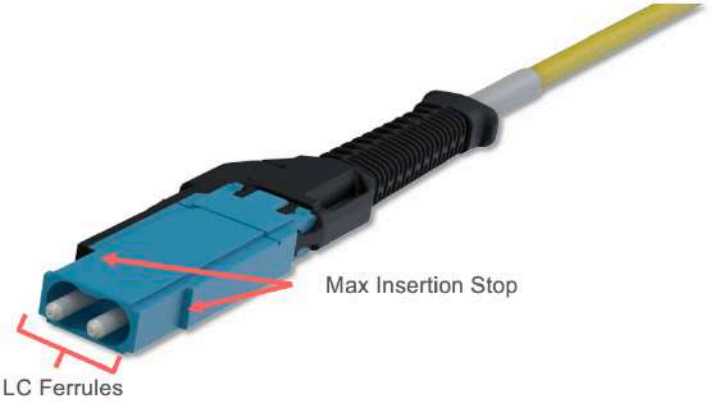
COMPLEX INSTEAD OF COMPLICATED!

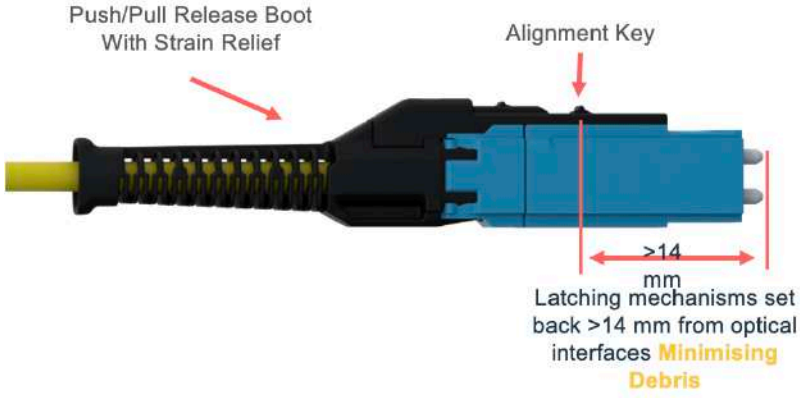
acclAIM Conversion Adapter

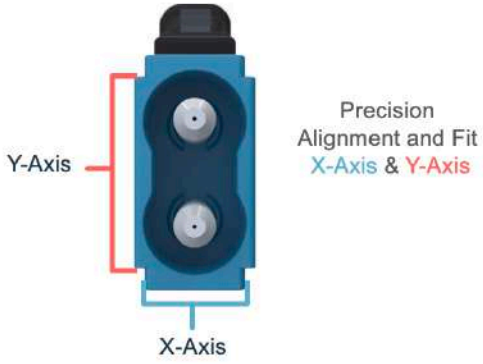
MDC Connector

acclAIM Connector

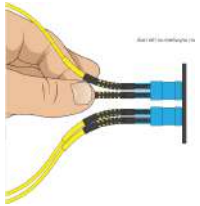
DATA CENTER CABLING
MDC CONNECTOR BY USCONEC

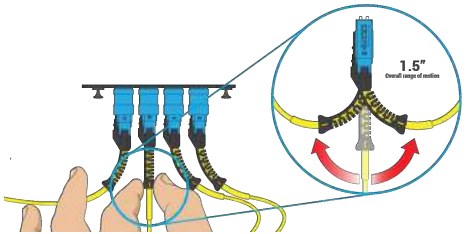






DATA CENTER CABLING
MDC CONNECTOR BY USCONEC



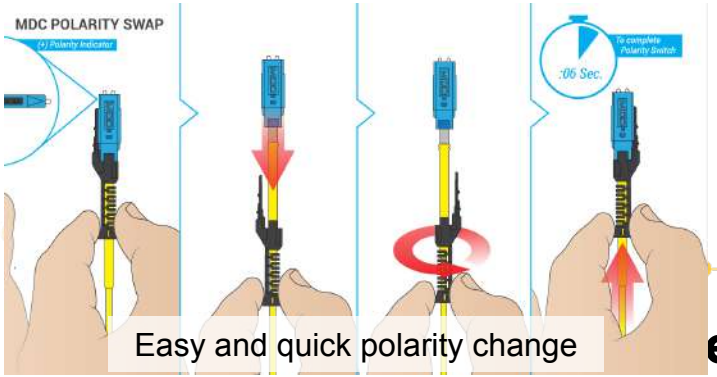


Faster Patch Cable Install

Faster Patch Cable Removal

Advantages

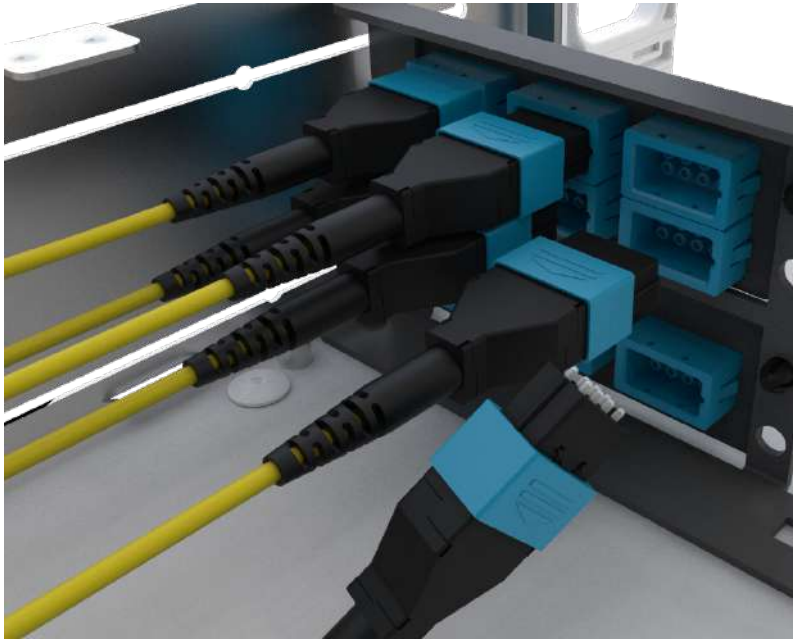
- No cassette to inspect before mating
- No front / rear connector trouble shooting – one connection point
- Fewer components = less packaging
- Adapters do not become obsolete if new grades of fiber are developed, can be reused indefinitely, and do not require delicate handling



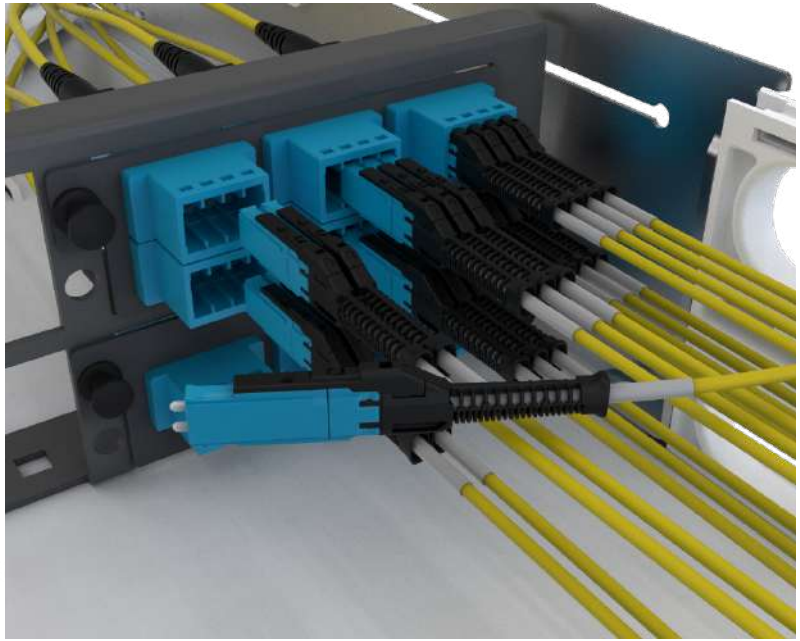
Easy and quick polarity change

DATA CENTER CABLING

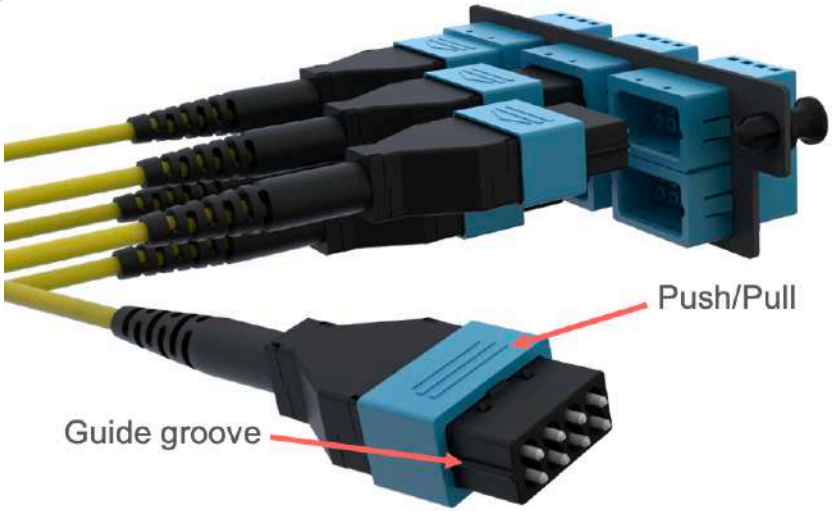
MDC SIDE (REAR ENCLOSURE)

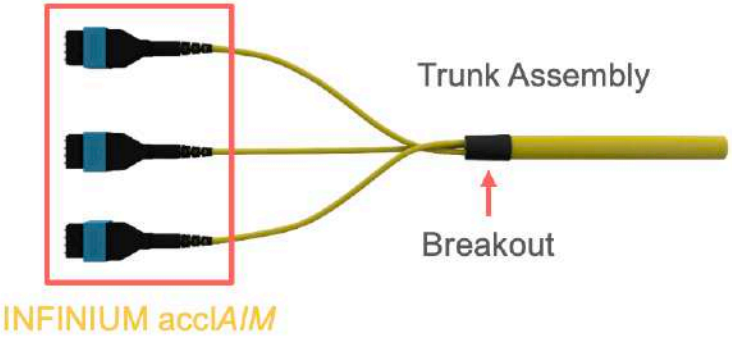


MDC SIDE (FRONT ENCLOSURE)



DATA CENTER CABLING

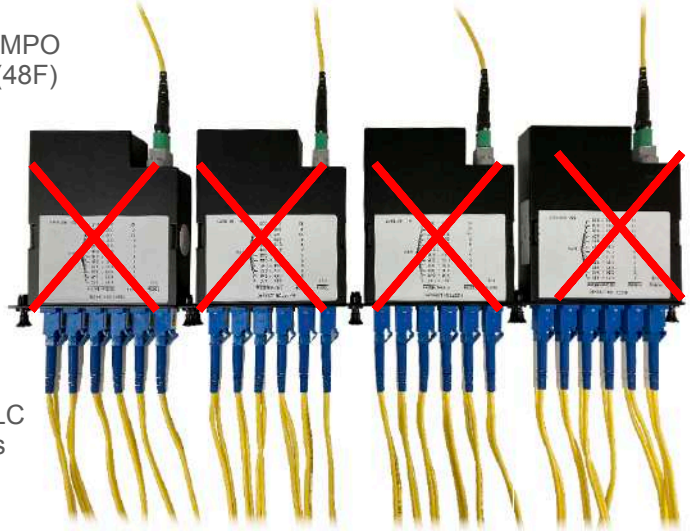




DATA CENTER CABLING
COMPARISON

CURRENT CASSETTE BASED ARCHITECTURE

4x 12F MTP/MPO Connectors (48F)



24x Duplex LC Connectors (48F)

1 Rack Unit

ACCLAIM BASED ARCHITECTURE

6x Infinium accl*AIM* Octal Ferrule Connectors (48F)

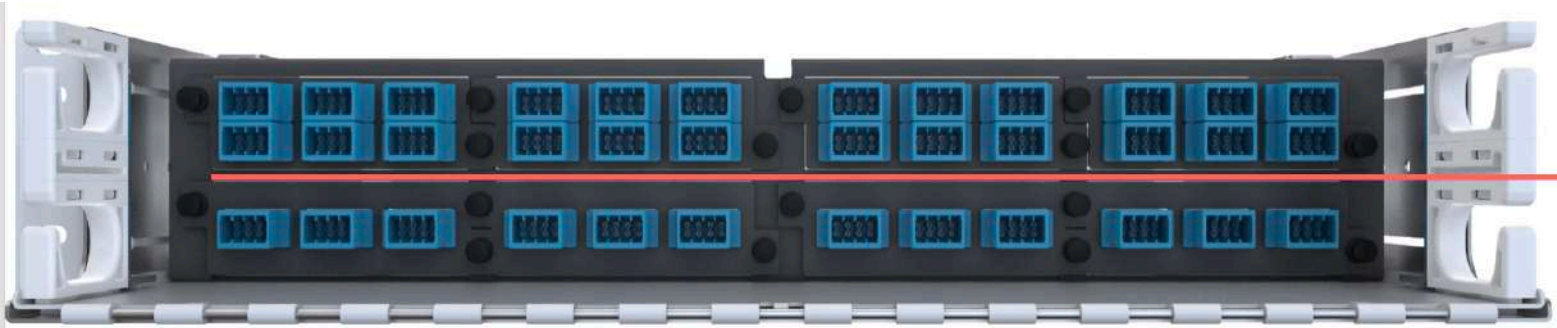
24x Duplex LC Connectors (48F)

1/4 Rack Unit

DATA CENTER CABLING
PACKING DENSITY

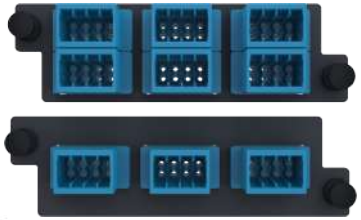
UHD+

Ultra-High Density +



High Density
192 Fibers/RU

High Density
96 Fibers/RU



HD

High Density

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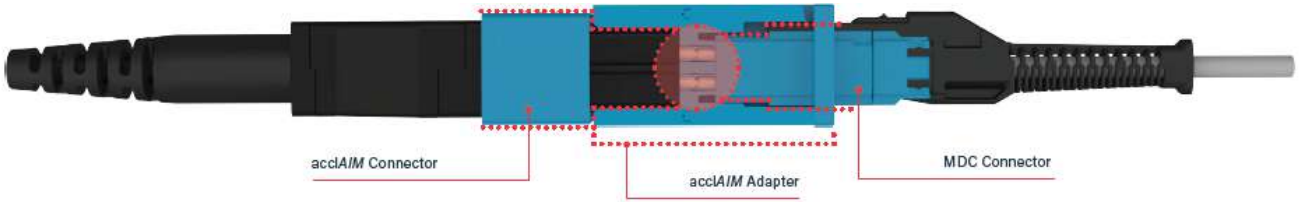
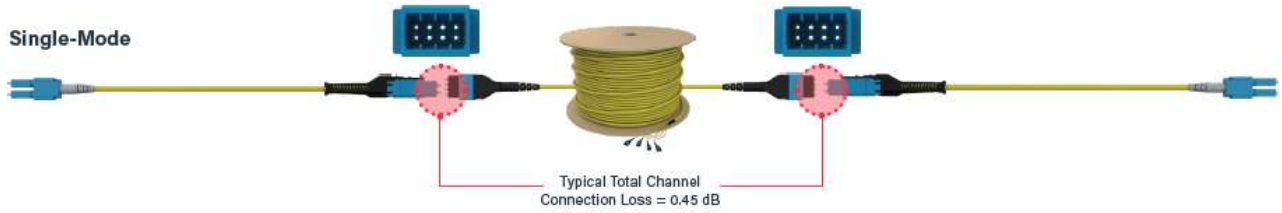
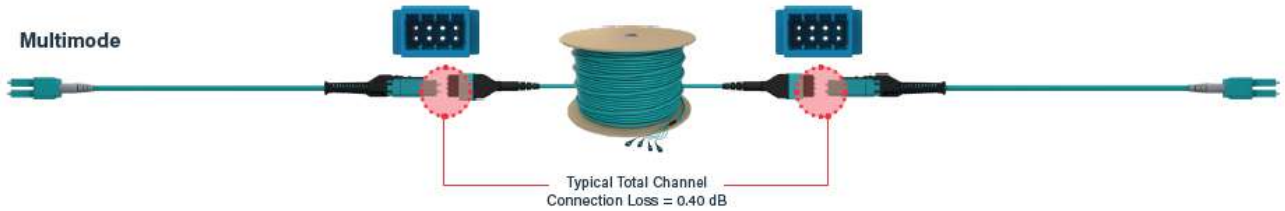
DATA CENTER CABLING
PERFORMANCE

DIRECT MATING BREAKOUT

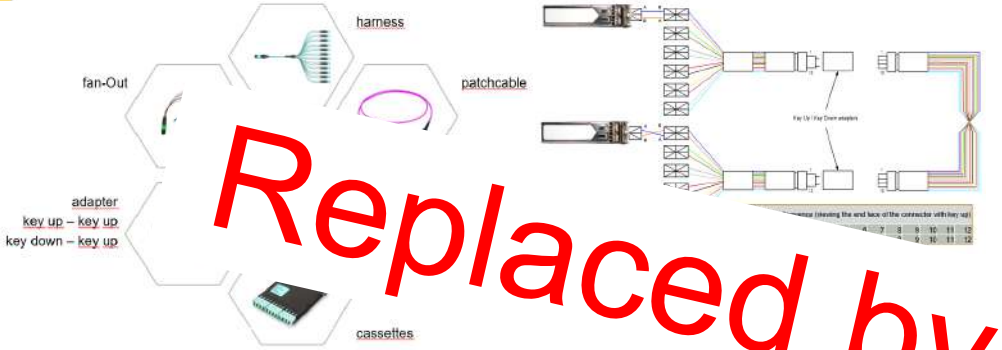






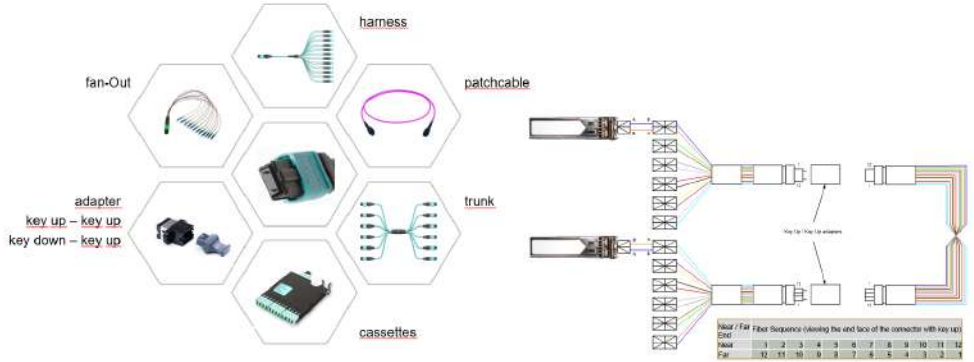
DATA CENTER CABLING
FIBER CABLING SYSTEM OF THE FUTURE

Polarity A

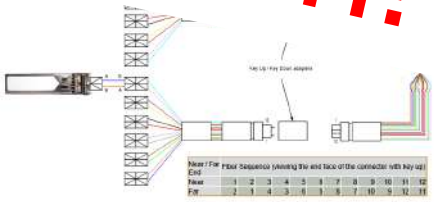


Polarity C

Polarity B



Replaced by evolution!



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DATA CENTER CABLING
FIBER CABLING SYSTEM OF THE FUTURE

INFINIUM acclAIM™ ADVANTAGE

Less complex, infinite scalability, faster installation

- No cassette
- Better performance
- Higher patch field density
- Simpler polarity
- Higher density
- No trunk furcation/stagger
- Simplified cable management
- Less bulk
- No cassette housing

REPLACES

- MPO cassettes and pre-terminated MPO trunks
- Pre-terminated LC-LC trunks and LC adapter panels

DATA CENTER CABLING

IS THERE A STANDARD?

Since we no longer need the MPO/MTP cassettes: **Blend them!**

Not the best for the environment, but extremely satisfying for everybody who experienced challenges with the cassettes in terms of polarity or cleaning the fibre etc.

QUESTIONS?


Thank you!