

**HUBER+SUHNER**



**FIA**

**FIBROPTIC INDUSTRY ASSOCIATION**

# Connector evolution

**Jonathan Lewis, FIA Standards Director**

# Communicate

Social networks

Big data

Internet of things

Industry 4.0

Smart devices

Real digital

Super-safe society

Industry 4.0

Megacities

Big data

# Feel safe

# Be mobile

Wearables

Mobile commerce

Third places

E-mobility

Autonomous driving

E-mobility

Open Innovation

Post-carbon society

Third places

Smart cities

# Act sustainably

**Communicate**

Social networks

Big data

Internet of things

Industry

Smart

**Be mobile**

Wearables

Mobile commerce

Third places

**...what is the impact of these megatrends?**

**Feel safe**

Super-safe society

Industry 4.0

Megacities

Big data

**Act sustainably**

Third places

E-mobility

Open Innovation

Post-carbon society

Smart cities

# Impact of megatrends

Internet users  
by 2023



**66 %**  
of the population  
will be using the  
internet  
*up from 51 % in  
2018*

Mobile  
devices/  
connections  
by 2023



**1.6**  
networked devices  
and connections  
per person  
*up from 1.2 in  
2018*

Total devices/  
connections  
by 2023



**3.6**  
networked devices  
and connections  
per person  
*up from 2.4 in  
2018*

Fixed speed by  
2023



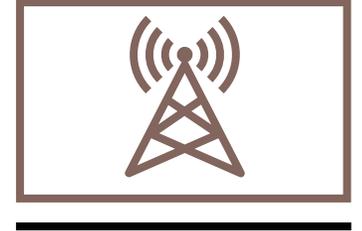
**110 Mbps**  
average broadband  
speed  
*up from 46 Mbps  
in 2018*

Wi-Fi speed by  
2023



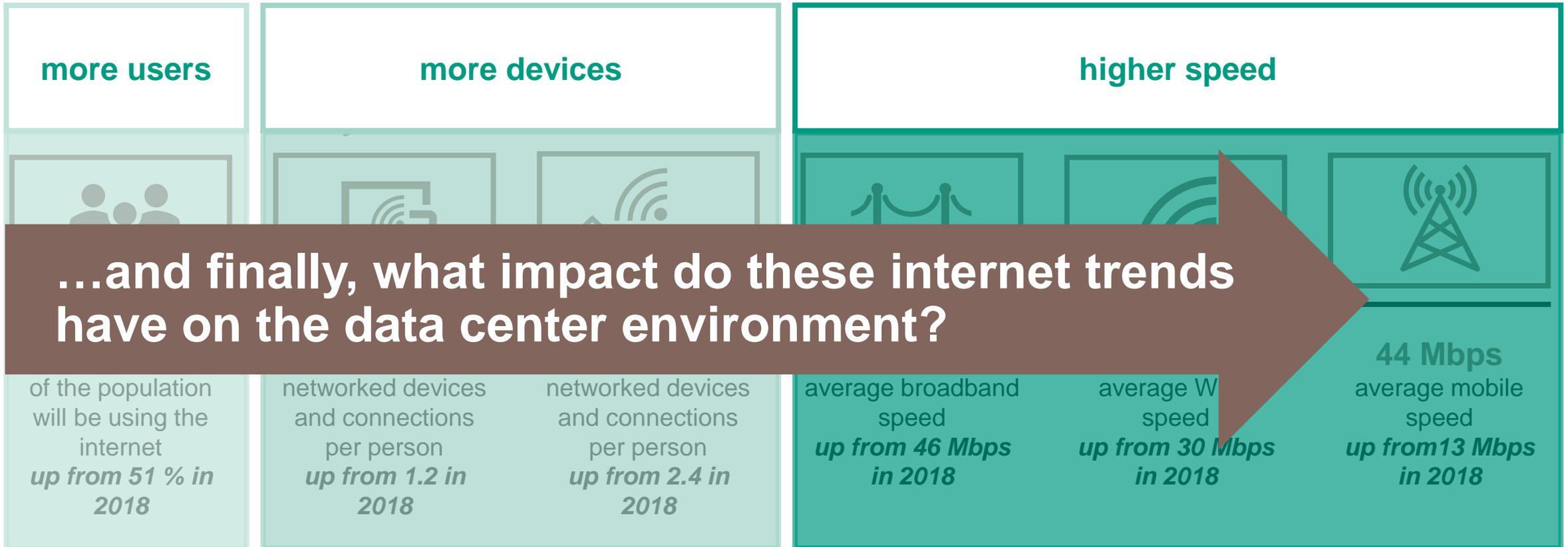
**92 Mbps**  
average Wi-Fi  
speed  
*up from 30 Mbps  
in 2018*

Mobile (cell)  
speed by 2023



**44 Mbps**  
average mobile  
speed  
*up from 13 Mbps  
in 2018*

# Impact of megatrends



# What is the impact to the data center world?



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**Higher bandwidth, lower latency, more dense**  
denser and smaller systems, new technologies (400/800 GbE), ribbon, VSFF



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**Scalable architecture, full modularization**  
modular FMS/CS system, flexible expansion, pay-/rent-as-you-grow



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**Full digitalization and AI-enablement**  
AIM, DCIM – being more intelligent, SDN-enabled, automatic monitoring



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**Closer-to-the-edge**  
edge-to-cloud-as-a-service (EtCaaS), Edge DCs, CORD DCs



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**Sustainable and green**  
reduce waste/power consumption, on-board-optics (OBO)



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**Quick deployment**  
same day/week delivery, production automatization

# What is the impact to the data center world?



**Higher bandwidth, lower latency, denser**

denser and smaller systems, new technologies (400/800 GbE), ribbon, VSFF



**..more bandwidth & higher density?**

system, flexible expansion, pay-/rent-as-you-grow

enabled, automatic monitoring

(EtCaaS), Edge DCs, CORD DCs

consumption, board-optics (OBO)

**Quick deployment**  
same day/week delivery, production automatization

# More bandwidth & higher density

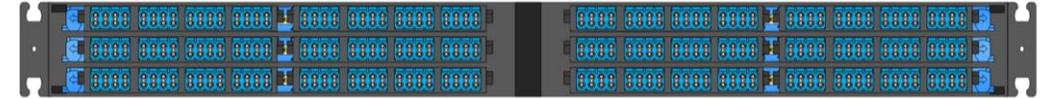
Density

more fibers in same or less space

LC connector (144f)



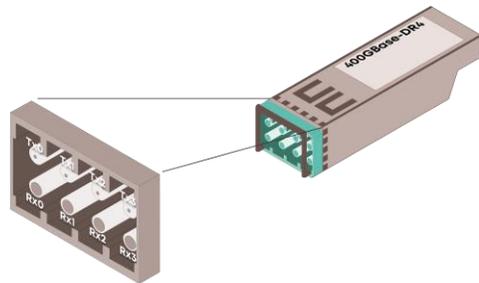
VSFF connector (384f)



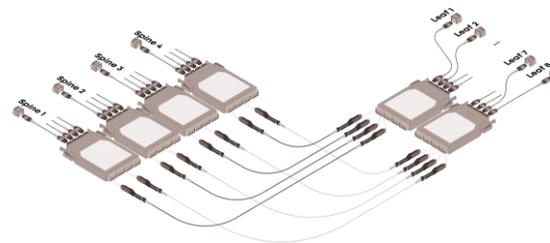
Bandwidth

new transceivers, new optical interfaces, new breakout options

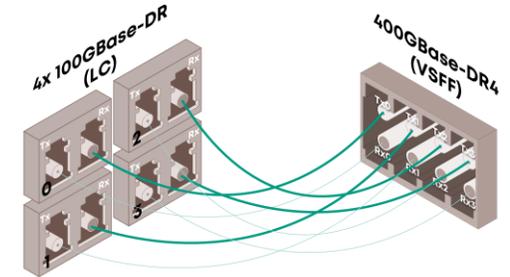
400G/800G



Spine/Leaf



Breakout



# Drivers for VSFF

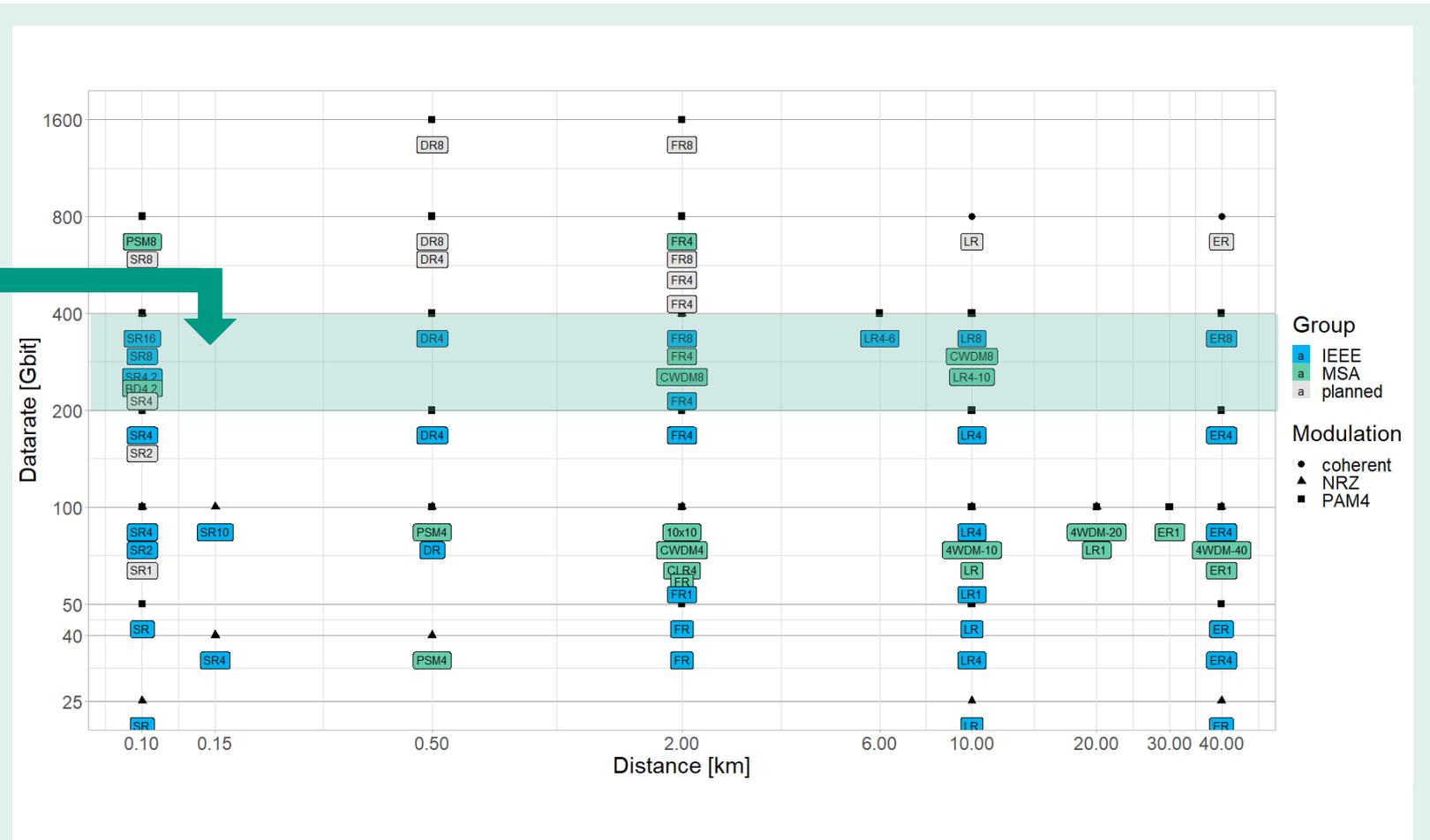
# 100G+ DC transceivers → Drivers for VSFF

## The good old days – 10Gbps:

- 3 reach standards (SR, LR, ER)
- 1 package (SFP+)
- 1 connector type → LC

## Zoo of variants, e.g., 400 Gbps:

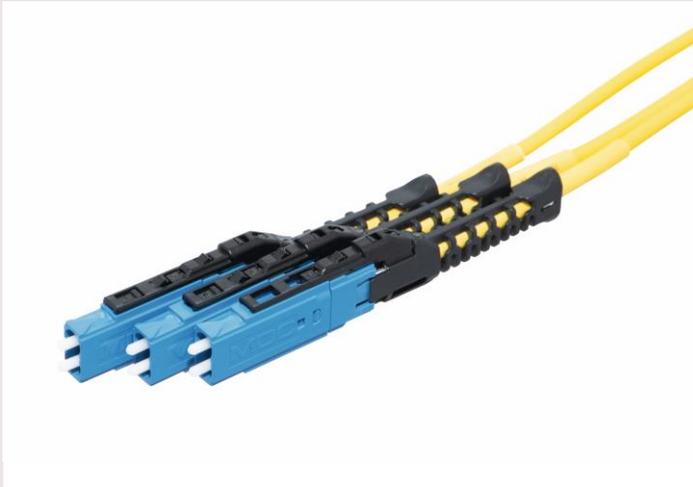
- 6 reach standards (SR, DR, FR, LR, LR+, ER)
- Each reach stands with up to 4 different modulation formats (→ amount of fibers!)
- 4 packages (OSFP, QSFP-DD, CFP-8, OSFP-XD)
- 7 connector types (LC, Mini-LC, VSFF, MCX, MPO)



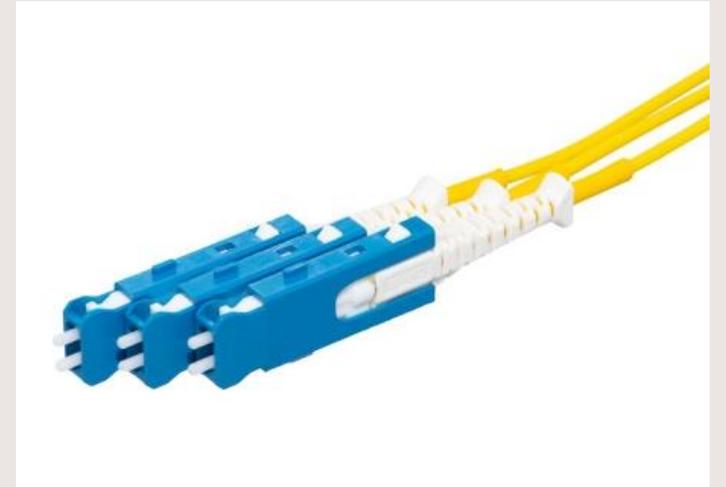
# Introducing VSFF

# New VSFF connectors

## MDC USCONEC



## SN SENKO



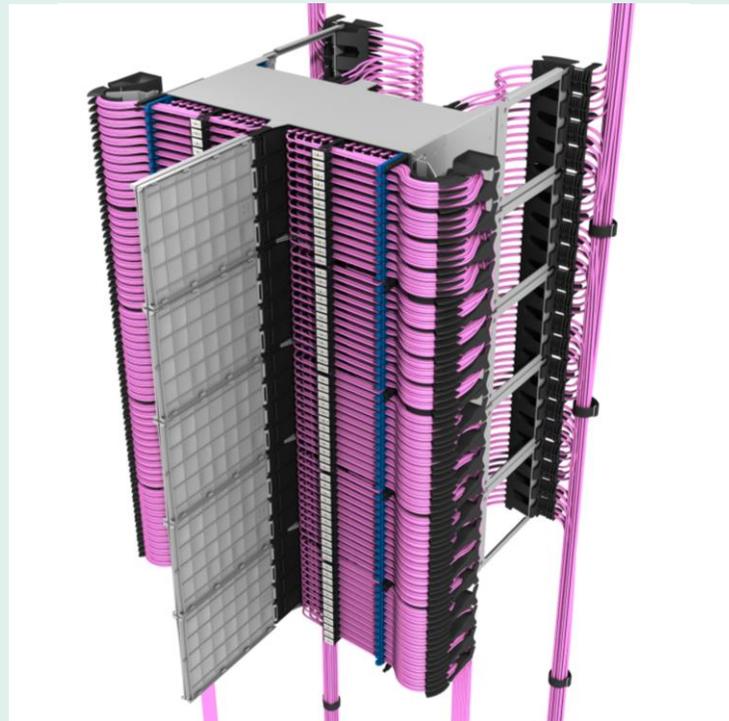
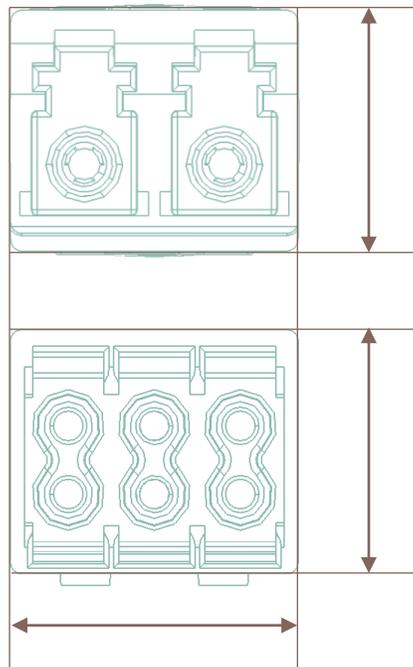
**Rosenberger**      COMMSCOPE®      **tde**®  
      **HUBER+SUHNER**      CORNING

COMMSCOPE®      **tde**®  
 CORNING      **AFL**  
**HUBER+SUHNER**

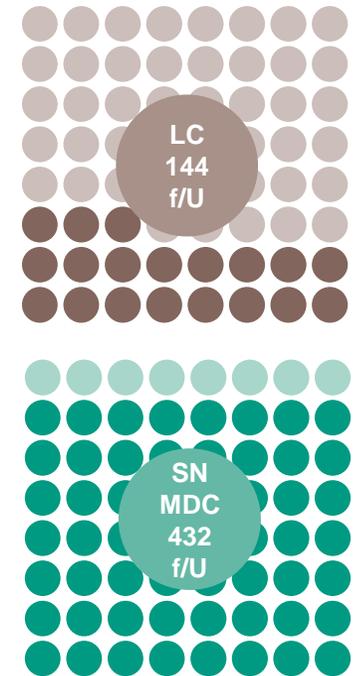
# MDC and SN, next level density

## IANOS

Market leading product with LC connectivity



## Density comparison



# Main benefits of MDC and SN



## Maximise space

Up to **3 times** higher packing density can be achieved increasing the number of connection possibilities while enabling **easy patch cord over length** organisation. The high-density design **offers maximum scalability** to fulfil new requirements on demand.



## High performance

The **safe and easy-to-clean ferrule technology** provides **smaller loss** of attenuation per connection **and better return loss** compared to MTP/MPO.



## Save time

The efficient and effective handling provides **fast polarity changes** and **eliminates repeated cleaning** using plug-and-play pre-terminated connectivity functionality.



## Easy to clean

The IL has a high resistance to dirt, is **easily cleaned** with **existing equipment** and does not require special training.



## Save cost

**3 times** more links possible in the same area which offer the customer saving space and saving costs → **increase port per space.**

The background of the image is a dark blue gradient. It features a complex network of glowing blue nodes, each represented by a small, bright, circular light. These nodes are interconnected by a dense web of thin, light blue lines that crisscross the entire frame, creating a sense of connectivity and data flow. The overall aesthetic is futuristic and technological.

**Connecting – today and beyond**