

Schaalbaarheid bekabeling/connectivity



Frank van Kessel
Sales Manager Benelux & Germany

Over Molex

- Sinds 1940 Wichita, Kansas USA
- 120.000 werknemers in 59 landen
- Omzet ca. \$120 Miljard dollar (*Forbes.com*)
- 2nd largest private US company (*Forbes.com*)



- Bestaan sinds 1938
- Fabrikant elektronische oplossingen t.b.v. smartphones, connected vehicles, hyperscale data centers, connected buildings, medical etc.
- 45 productie locaties in 17 landen en wereldwijd 45.000 medewerkers
- Omzet ca. 5 Miljard Dollar

- Divisie Molex Connected Enterprise Solutions
- Fabrikant koper- en glasvezel bekabelingsoplossingen en Global Turn-key System Integrator.

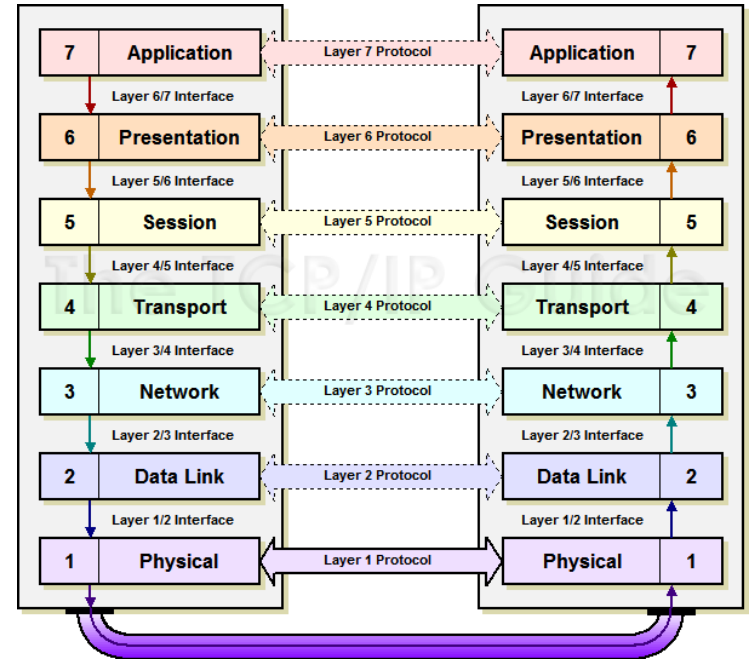


Bekabeling: Fysieke laag van het netwerk; fundament; laag 1

Bicsi: “The physical layer represents all the physical components of a network including cables, computers, switches, servers, patch panels, peripherals, access control devices, Internet protocol (IP) phones, and so forth, some of which remain solid for at least ten to fifteen years. **In other words, the network physical layer is the foundation of enterprise connectivity.**”

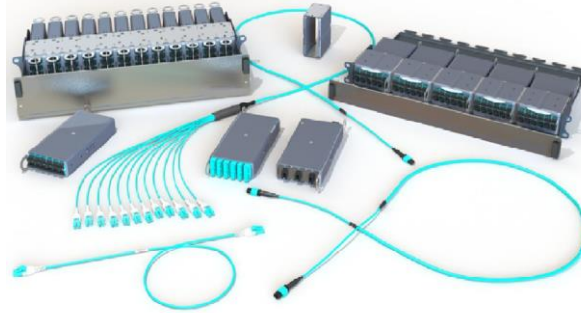
Wikipedia: “The physical layer or layer 1 is the first and lowest layer in the seven-layer OSI model of computer networking”

PC Magazine: “The services in the OSI protocol stack (layer 1) that provide the transmission of bits over the network medium.”



Hoe wordt bekabeling gezien?

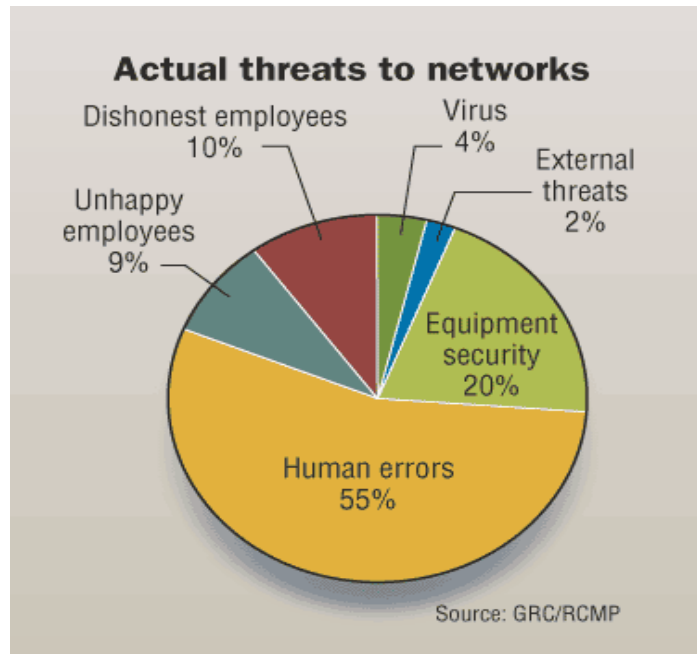
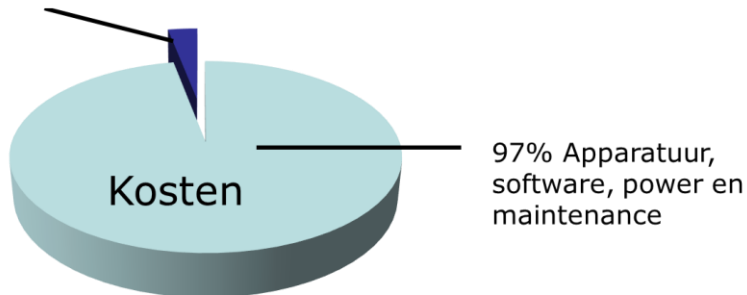
- Een sluitpost
- Saai
- Uit het zicht
- Ondergewaardeerd
- Goedkoop
- Niet high-tech



Feiten

- Fouten kosten:
 - Geld
 - Reputatie
 - Vertrouwen
 - Omzet
- Vervanging slechts 25% elke 4-5 jaar; gemiddeld elke 10-15 jaar
- Verorzaker 70% incidenten

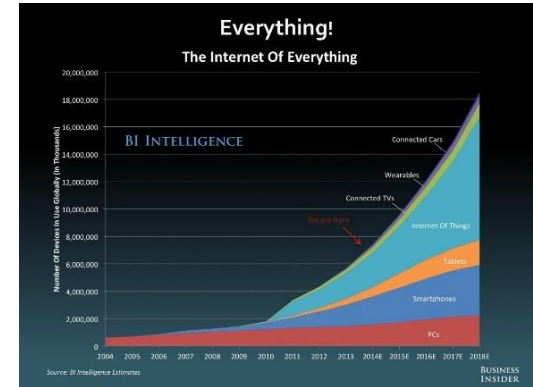
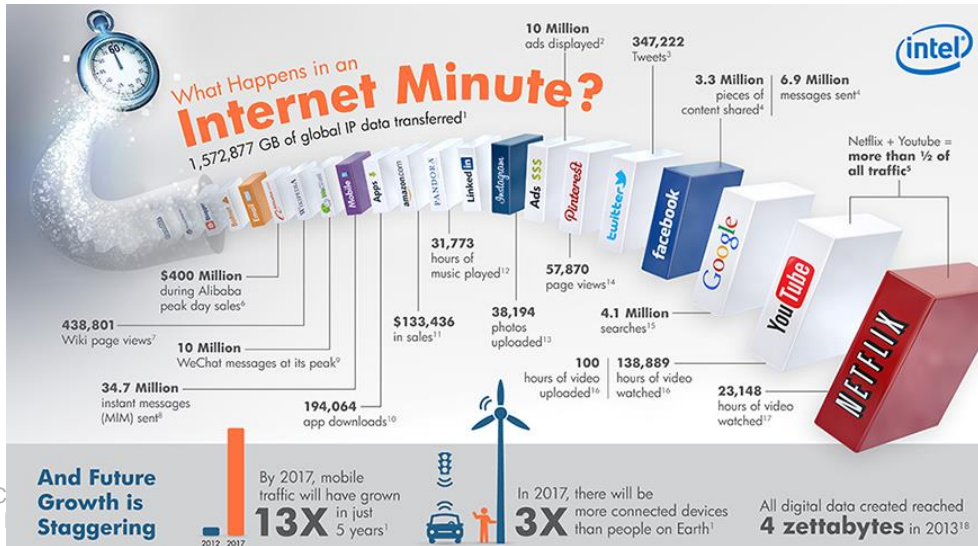
3% bekabeling



Trends



- Elke dag: Meer gebruikers, die sneller toegang willen tot internet, op meer manieren met meer devices, die meer content gebruiken welke meer snelheid en bandbreedte vraagt
- The Internet of Things
- MvO: ISO 14001
- Veiligheid



More: Mobile
Video
Data
Applications

Trends

- Internet of Things (IoT)

“20.8 billion connected devices by the year 2020 where the value of associated goods/services is \$3 trillion.”

Gartner, November 2015

- Connected LED Lighting

“1 billion connected lights installed in the year 2020”

US DOE, 2016

- Office Densification

“In 2006 the average office worker had 250 sq ft of space (including common areas) - current metric is 150 sq ft projected to drop to 75 sq ft / employee.”

Gartner, March 2016, “The Rebirth of the Office Space”

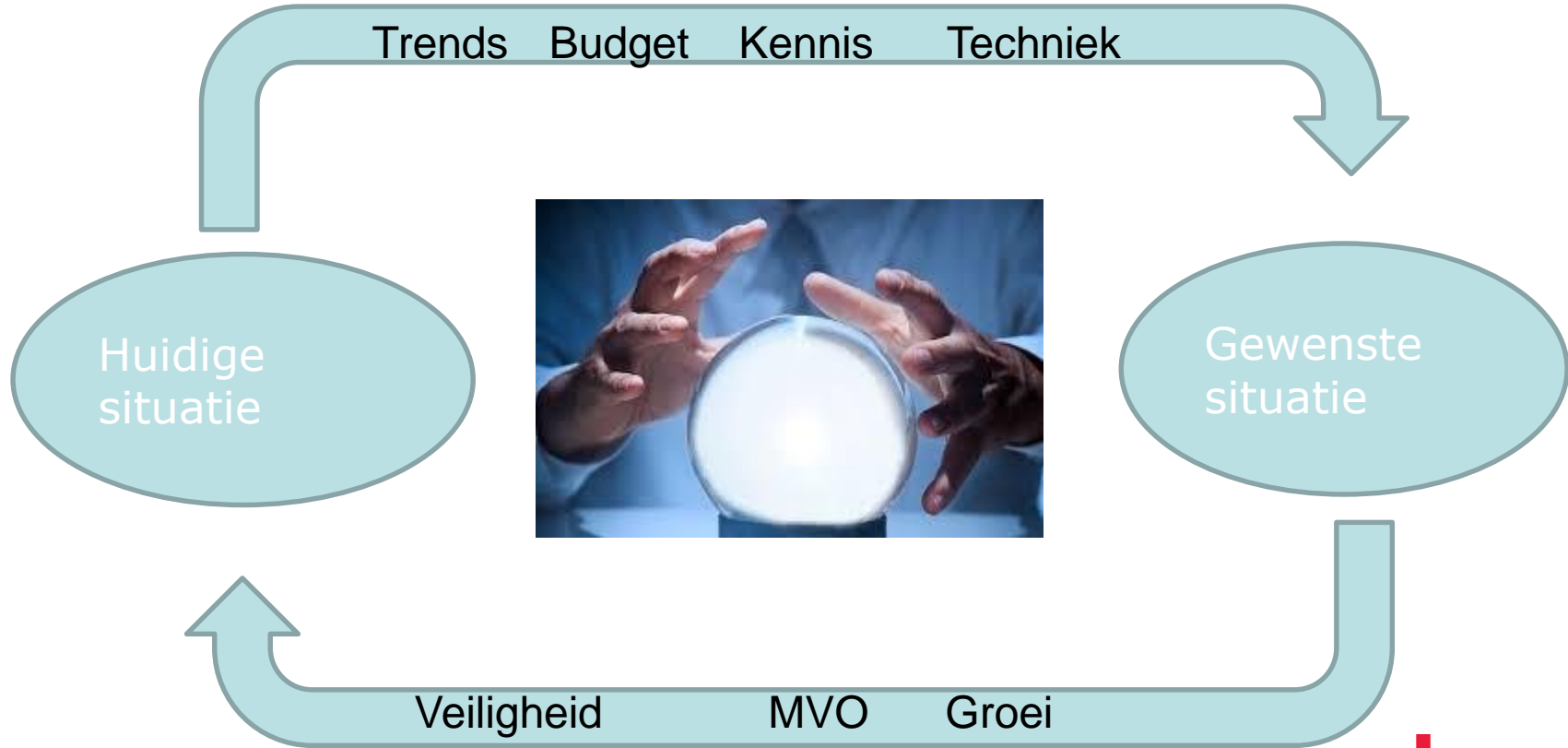


Impact IoT op bekabeling

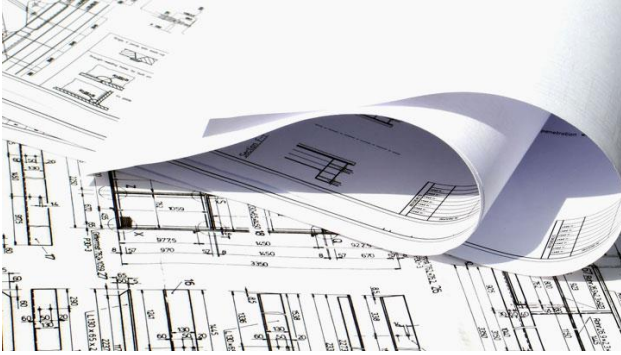
- Meer aansluitingen nodig ondanks minder vaste werkplekken
- Betere bandbreedtes/snelheden gevraagd
- Meer gebruik van Power over Ethernet (PoE)
- Hogere densiteit in datacenters om kosten in balans te houden
- Hoge kwaliteit connecties nodig



Is uw netwerk klaar voor de trends?



Welke keuzes te maken?



**Trusted
Advisor**



WiFi?

LAN, PON LAN,
Fiber to the desk

Standards
CAT6,6A,7,8?

Number of outlets?

IP applications?

Management?

PoE?

Keuzes netwerk

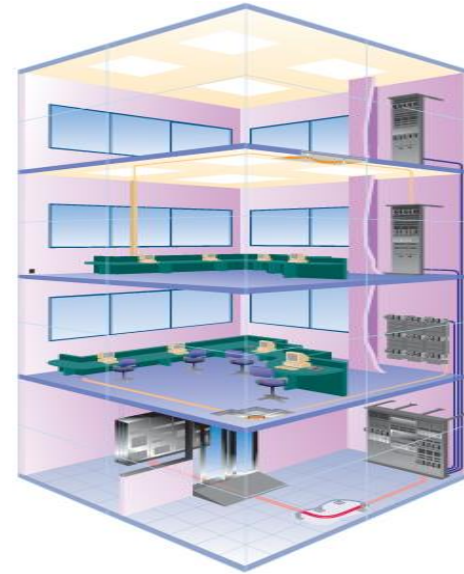
Overweging:

- LAN ster-topology koper
- LAN ster topology Fiber to the Desk
- Fiber to the Office
- PON LAN



Koper LAN ster-topology

- Meest voorkomend
- Universeel platform voor alle (toekomstige) applicaties
- Modulair en flexibel
- PoE opties / veiligheid (brand)
- Manageable

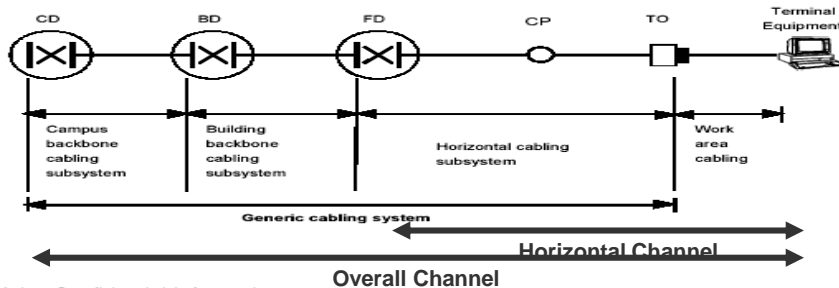


LAN koper

CAT6A U/FTP biedt:

- Schaalbaarheid – voldoende snelheid/bandbreedte (10Gb)
- Goede absorptie warmteontwikkeling in combinatie met PoE+ or PoE++
- Flexibele, dunne kabel
- Eenvoudige installatie (onveranderd)

Gebruik van consolidatie
punten t.b.v. fysieke
schaalbaarheid



Invloed PoE

Temperatuur stijging bundels

Temperature raise PoE+

| Kabeltype | Draad | Temp. stijging C |
|-----------|--------|------------------|
| CAT5E UTP | AWG 24 | 10 |
| CAT5E STP | AWG 24 | 8 |
| CAT6 UTP | AWG 24 | 8 |
| CAT6A UTP | AWG 23 | 6 |
| CAT6A STP | AWG 23 | 5 |
| CAT7 | AWG 22 | 4 |

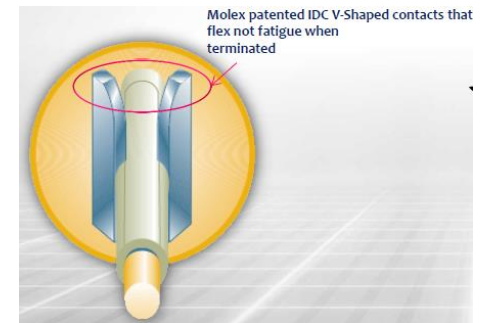
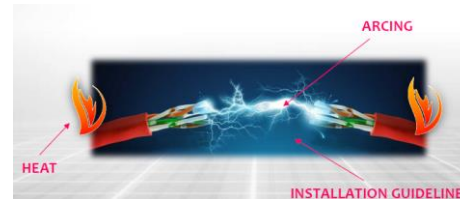
UP TO 15.4 WATTS IEEE 802.3af – at/Type 1
2-Pair PoE / 2003
Thin Client, 802.11n Wireless, Biometric Access

UP TO 30 WATTS IEEE 802.3at – Type 2
2-Pair PoE+ / 2009
RFID Readers, VoIP Phones, Alarm Systems, PTZ IP Cameras

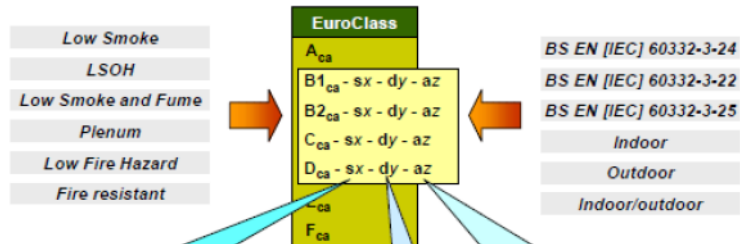
UP TO 60 WATTS IEEE 802.3bt – Type 3
4-Pair PoE / 2016-2017
802.11ac Wireless, Nurse Call, Info Kiosks, PTZ IP Cameras, PoS Readers, Access Control, Laptop Computers

UP TO 100 WATTS Proprietary CISCO
Lighting
4-Pair UPoE / 2011

UP TO 100 WATTS Power over HD Base-T - 2011
IEEE 802.3bt – Type 4 – “PoE++”
4-Pair PoE / 2016-2017
High Power Wireless, Video Conferencing, TVs, Desktop Computers



Nieuwe EU regels Kabel per 1-7-2017



s1 is the most demanding classification

s1a is more demanding than s1b

s3: Products for which no performance is declared or which do not comply with the s1 and s2 criteria.

a1 is the most demanding classification

a3: Products for which no performance is declared, or if the product does not comply with the a1 and a2 classification criteria in EN 50267-2-3*

d0 is the most demanding classification

d2: products for which no performance is declared or which do not comply with the d0 and d1 criteria.

DECLARATION OF PERFORMANCE
No. 12345 To be given by the manufacturer To be given by the manufacturer

- Unique identification code of the product To be given by the manufacturer
- Type, batch or serial number or any other identifier allowing identification of the construction product in, inquired under Article 112; To be given by the manufacturer
- Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification as referred to in Article 112; Supply of electricity in buildings and other civil engineering works with the objective of harmonized generation and storage of heat energy
- Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 112;

MOLEX NV
1000 Brussels
R 1050 Brussels, Belgium
Tel: +32(0)27022000
Fax: +32(0)27022000
Email: sales@molex.com
- Where applicable, name and contact address of the authorized representative whose mandate covers the tasks specified in Article 112(2);

Alpexx Ltd
Alpexx Co. 29
2900 Mechelen
2900 Mechelen, Belgium
Tel: +32(0)37242000
Fax: +32(0)37242000
E-mail: sales@alpexx.com
- System or systems of assessment and verification of consistency of performance of the construction product as set out in Article 112(3); System No. 1
- In case of the declaration of performance concerning a construction product covered by a harmonized standard, Member State manufacturer being the manufacturer of the construction product, the manufacturer of the construction product and/or the manufacturer of the construction product shall be responsible for the assessment and verification of the product and for the awarding of copies, either before placing the product on the market and/or the certificate of declaration of performance.
- Declared performance

| Essential characteristics | Performance | Harmonized technical specification |
|---------------------------|-------------|------------------------------------|
| Reaction to fire | EN 13501-1 | EN 50575:2014 |
| Flammability | | |
| Drop test | | |
| Progressive substances | | |
- The performance of the product specified in points 1 and 2 is in conformity with the declared performance in point 1. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Digitally signed on behalf of the manufacturer by: _____
Name and Surname: _____
Given name and Surname: _____ (Signature)

Not necessarily a "paper" document
Electronic options may exist

Legally required to be produced in the specified language(s) of the country(s) into which the product is "placed on the market"

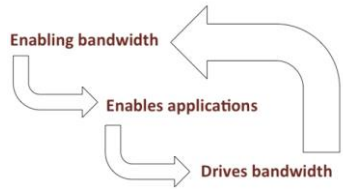
Declaration of Performance

CPR: Construction Product Regulations. EU Regulation EU 305/2011.

- Identifies a number of "basic requirements" that shall be met by *products used in construction works*. It lays down harmonised conditions for the marketing of construction products.

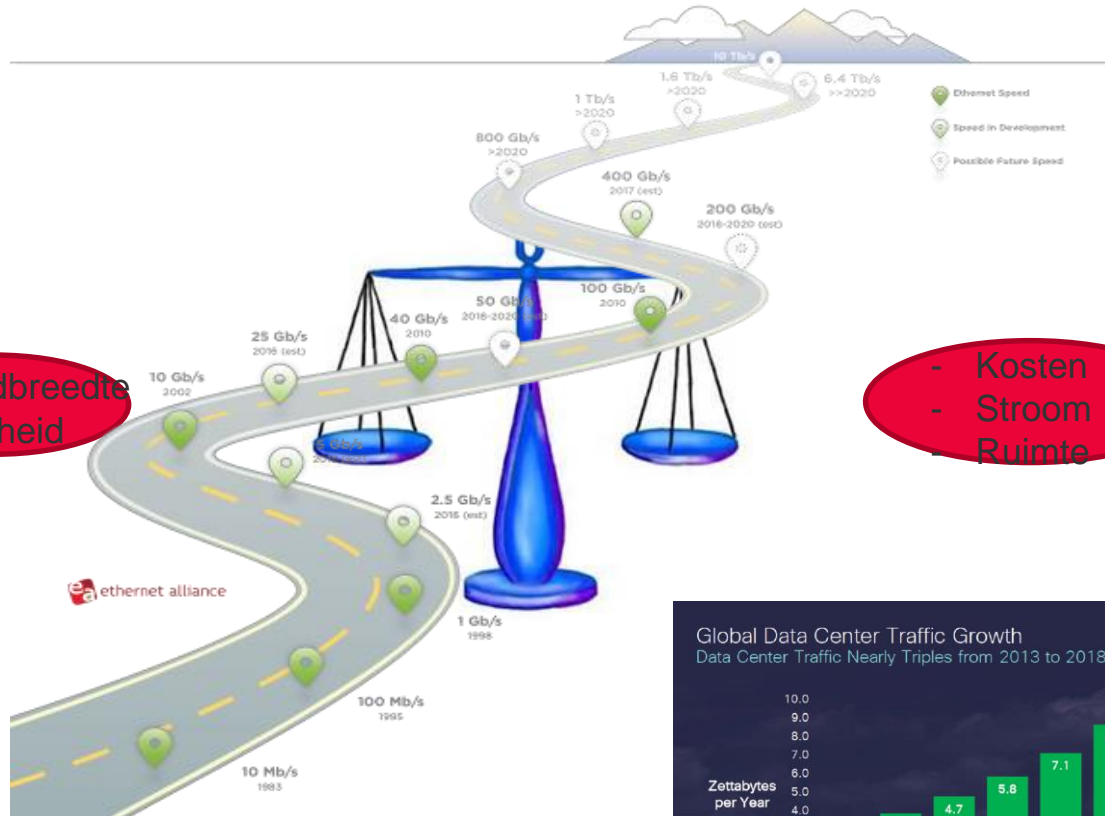
EN 50575:2014 -The reference standard for power, control and communications cables. Cables for general applications in construction works subject to reaction to fire requirements.

Datacenters



- Bandbreedte
- Snelheid

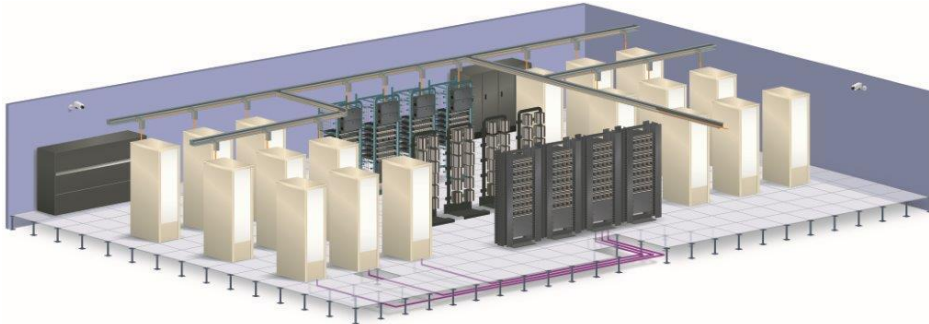
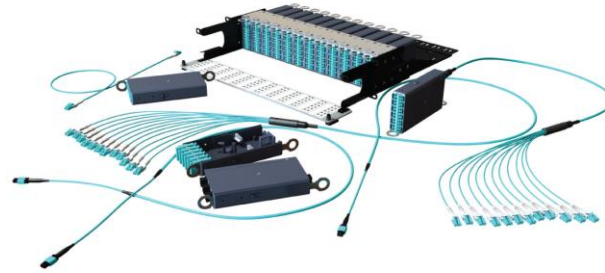
- Kosten
- Stroom
- Ruimte



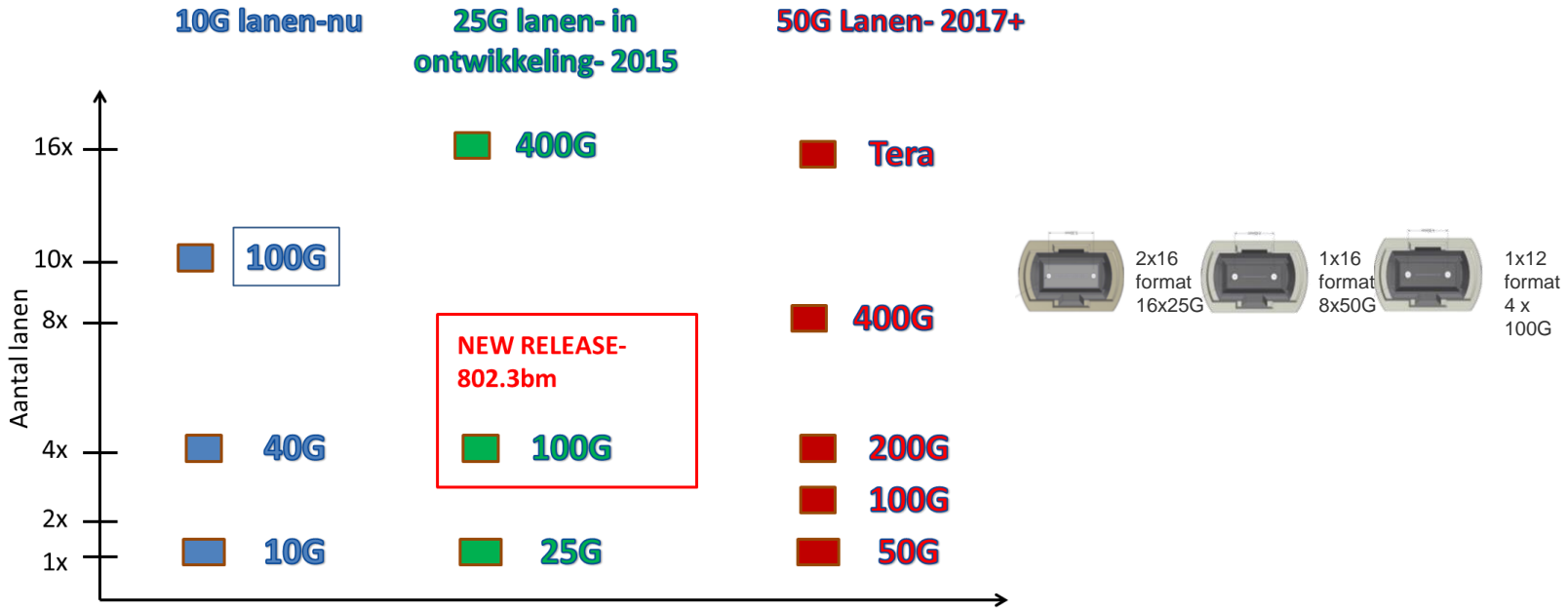
Gebruik Parallel Optics

Overweging Parallel Optics

- Fysiek schaalbaar
- Bandbreedte schaalbaar
- High density
- Modulair
- Gebruikersvriendelijk (Plug&Play)



Ontwikkeling parallel Optics



Migratiepad naar 100Gb+

Overweging toekomstvast concept

- “Low Loss” , high performance MTP® producten
- MTP cassettes vervangen door MTP adapters

› Current 1-10 Gig Plug N Play



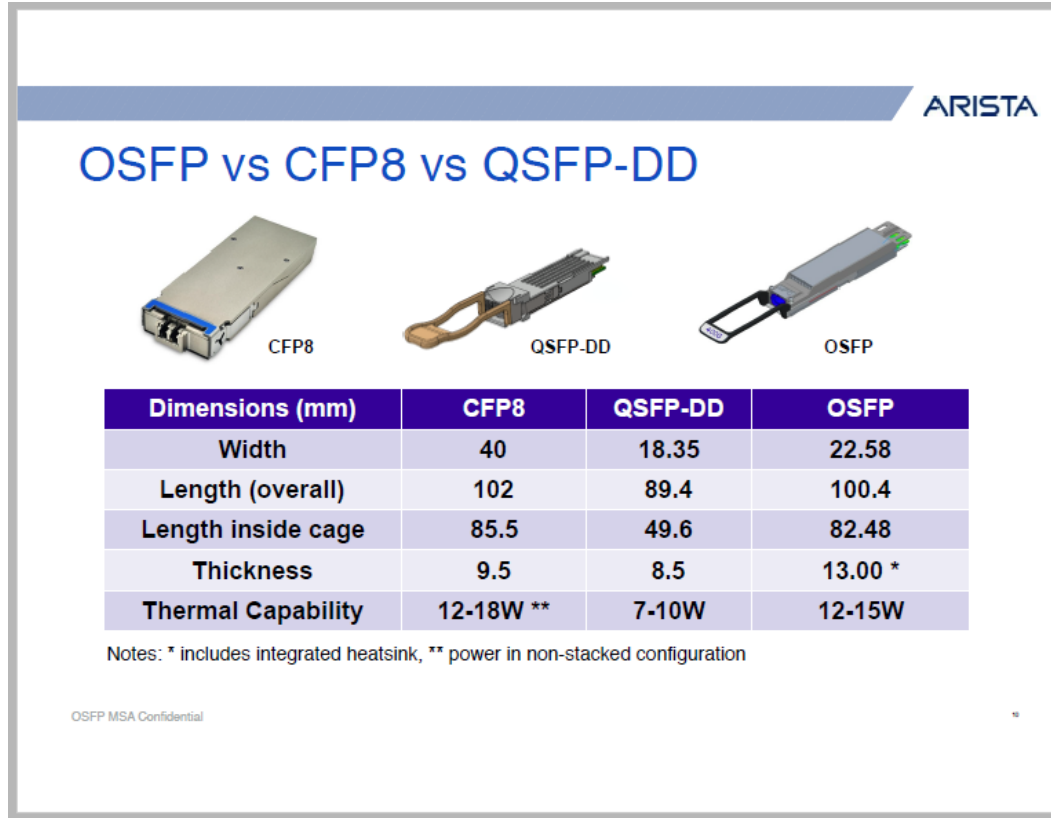
› Proposed 1-10 Gig Plug N Play



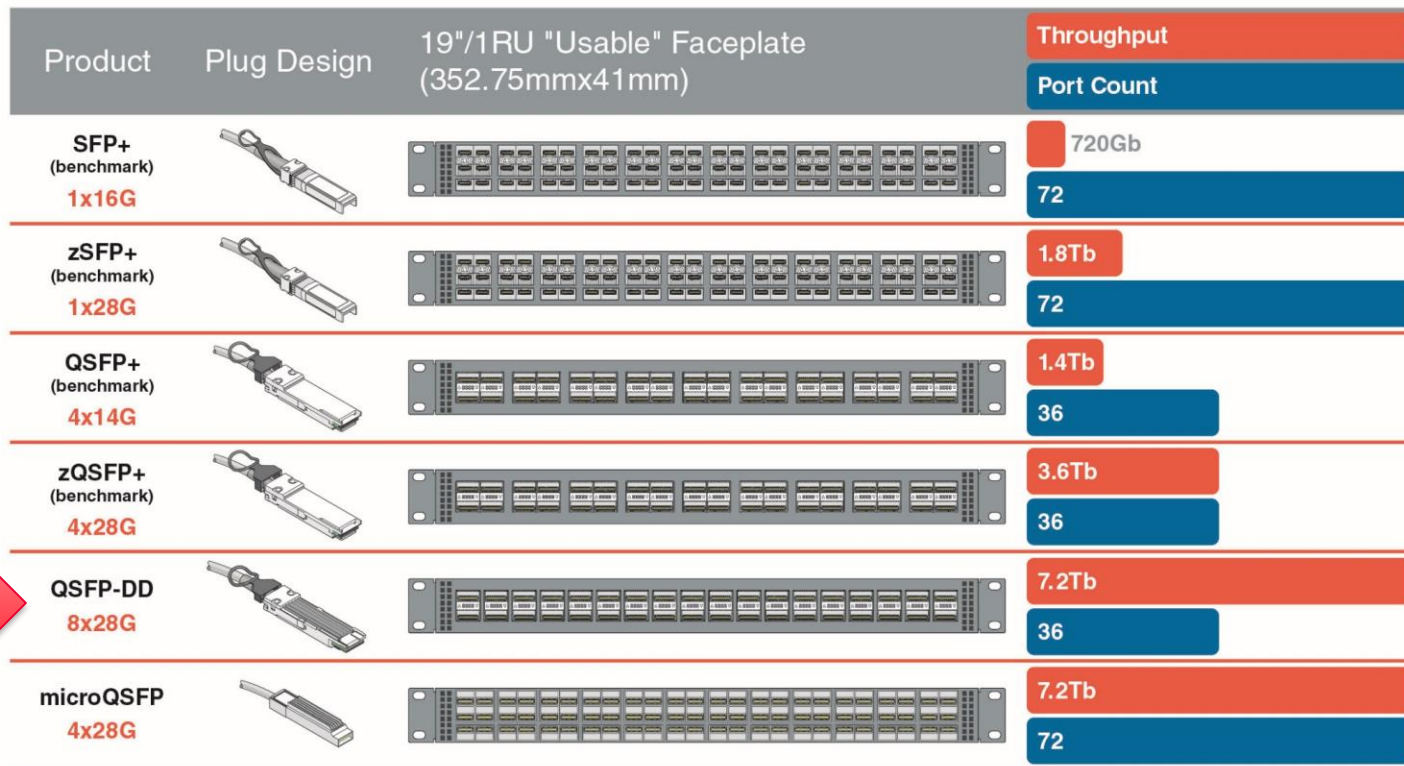
› Migration from 1-10 Gig to 40+ Gig



Trends..... Bandwidth vs Thermal

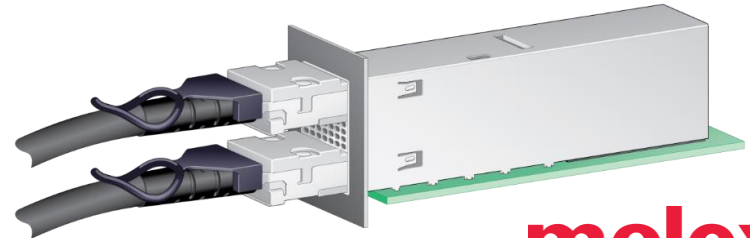
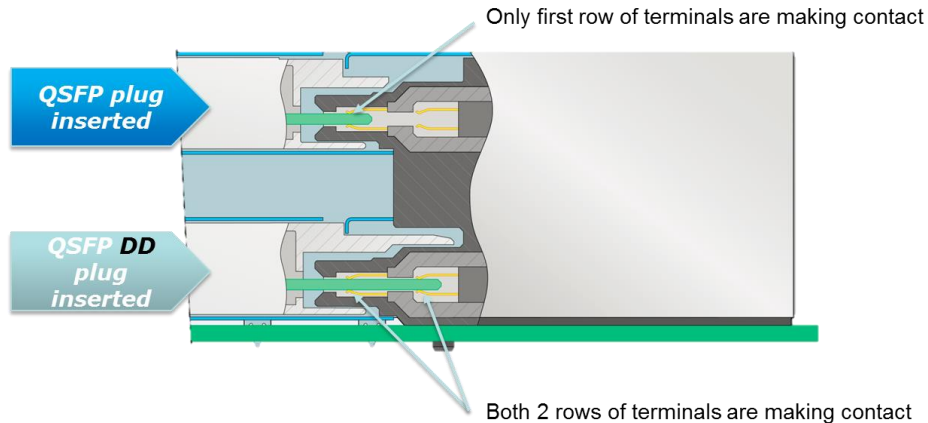
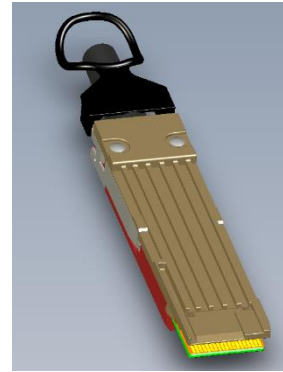
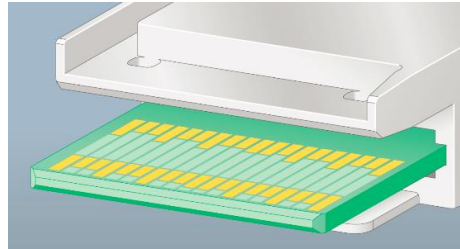


Bandwidth versus Switch port density



Trends Parallel Optics

- Q-SFP DD



MSA Promotors

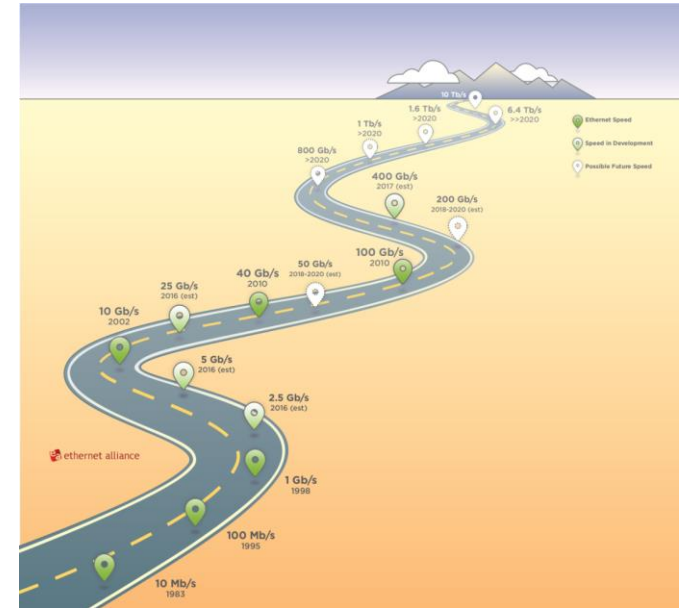
QSFP-DD 



Schaalbaarheid bekabeling/connectivity in Dataruimtes

Schaalbaarheid: “Flexibiliteit van een systeem; klaar voor gebruik met (verwachte) groei van devices, snelheid, bandbreedte”

- Anticiperen op toekomstige ontwikkelingen
- Fysieke schaalbaarheid
- Bandbreedte/snelheid schaalbaarheid
- Terugkerende kosten laag houden



molex[®]