

# Why 1 is sometimes more than 4

## The merit of 100G LR1 vs LR4

Thomas King, CTO, DE-CIX

# Warning!

**This content is not DE-CIX specific, it is generally applicable**

# Topics

1. What do 100G LR4 and LR1 actually stand for?
2. Why is now the right moment to introduce 100G LR1?
3. Introducing 100G LR1

# What do 4 and 1 actually stand for?

## Transceiver naming convention (simplified)

100G LR 4

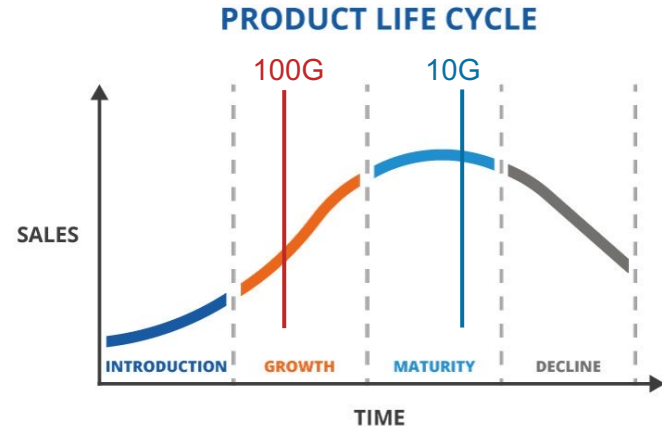
*L* - Long ~1300 nm wavelength  
*S* - Short 850 nm wavelength  
*E* - Extra long ~1300 nm wavelength  
*R* - large block code 64b/66b.

indicates the number of lanes used per link  
  
4 lanes -> 4 optical components  
1 lane -> 1 optical component

# Why is now the right moment to introduce 100G LR1?

100G is the new 10G

- 100G grows much faster than 10G (tier 1 markets)
- Driven primarily by new 100G customers



## Customer Statement

“100G is the de facto standard interconnect method for us going forward for the foreseeable future....”

# Is it just us? No! The industry is switching to 100G LR1

## 10G/100G

- 10G on peering will be off less interest going forward and will not be offered anymore other than on an exception-basis. In our 400G edge-platform a 10G port means sacrificing 390G to 360G of potential capacity on the port (40G Breakout-optics on 400G). We must leave 10G land
- 100G continues to be the de-facto standard interconnect-method for us going forward for the foreseeable future. Happy to hear and take note if anyone would be interested in **100G-LR1** instead of **100G-LR4** to optimize for cost and simplification in 400G native networks.

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**Sebastian Neuner** @neunerseb · Jun 30

The first few links with **100G-LR** (instead of LR4) are running in the new @belwue DC :)



1



19



837

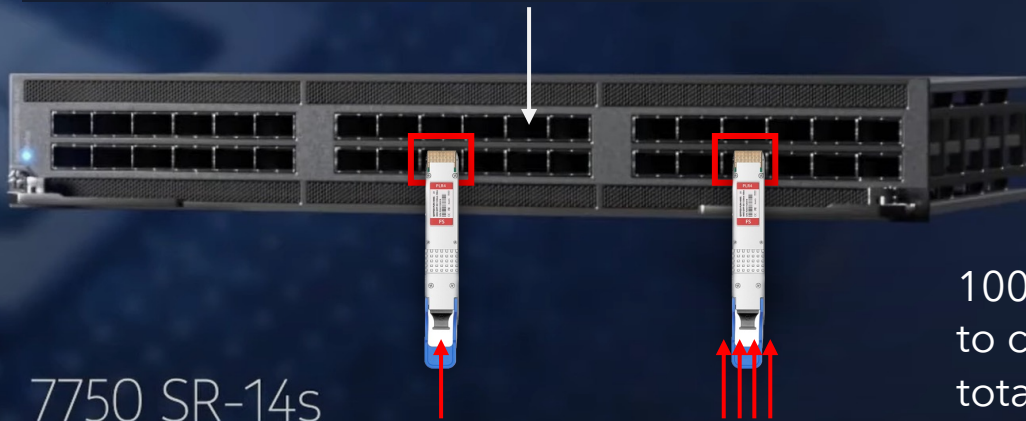




High-capacity, high-density, power-, and cost-efficiency are critical for the data center infrastructure of peers, carriers, transit providers, and IXPs.

FP5 SR-s line card

Capacity of up to 36 x 400Gb



7750 SR-14s

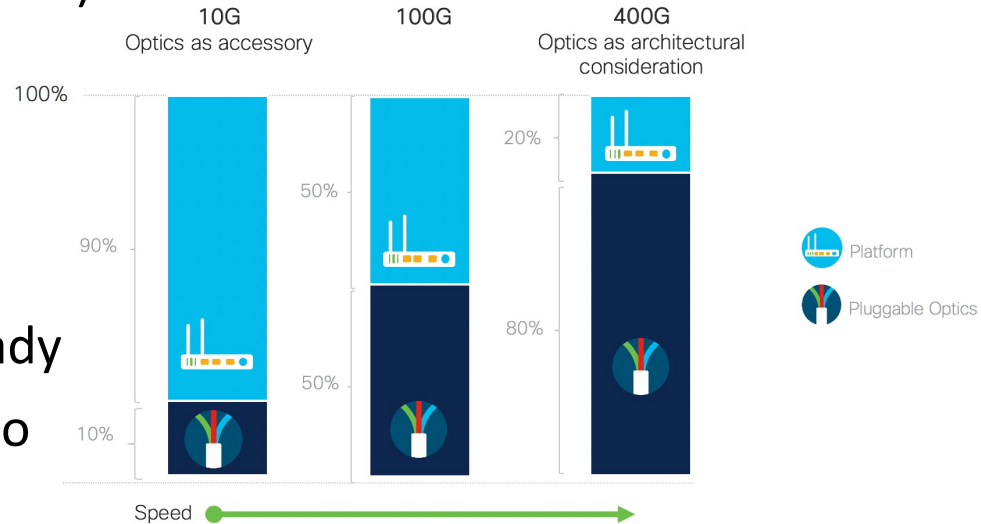
**1 x 100G LR4 or  
2 x 100G LR4**

**4 x 100G LR1**

100G LR1 allows to consume the total capacity of modern routers.

# 100G LR1: Lower initial investment and TCO

- Reduce (optical) complexity (1 instead of 4 optical components)
- Lower MTBF & MTBR
- Backwards compatible and interoperable (switch/router, cabling, etc.)
- LR1 is about 20% cheaper, already
- High production volumes lead to further price erosion





# Introducing 100G LR1

## Customer communication is the key to success

- Customer survey: How ready are customers?
  - ✓ 91% of customers are ready to use 100G LR1
  - ✓ 82% of customers would consider switching existing interconnections links from 100G LR4 to LR1
- Various marketing campaigns to reach our customer base to introduce 100G LR1

## Joined IXP Initiative

Press Release together with AMS-IX, BCIX, and LINX to promote the adoption of 100G LR1

- BCIX, Netnod and other IXPs already offer 100G LR1 today



AMS-IX @AMS\_IX · Jun 20

#Proudmoment! @DECIX, @LINX\_Network, #AMSIX & @bcix will be introducing a new generation of optical transceivers, the **100G LR-1** to their platforms, starting in #Frankfurt, #London, #Amsterdam, and #Berlin [ams-ix.net/ams/news/next-...](https://ams-ix.net/ams/news/next-...)



**Next-Generation IX:  
The world's leading  
Internet Exchange  
operators to  
introduce new  
cutting-edge 100G  
LR-1 technology**



3



13



1,689



the same benefits to our peers is just the next logical step," says Anore Gruneberg, CEO at BCIX.

# Roll-out of 100G LR1 at DE-CIX

## 100G LR1 as a product

- Dual operation 100G LR4 & LR1 (existing contracts)
- Single product option: 100G LR1 (new contracts)

## Roll-out location by locations

Start in Frankfurt, followed shortly by other markets

- Available in all 37 DE-CIX-enabled data centers
- Launch in September 2023

Other locations (e.g., New York, Madrid, Dallas, ...) will follow shortly after!



Plan



Implement



Achieve

QnA