



Orion: A Tipping Point for Optical Networks

5nm coherent DSP boosts performance, use cases for carriers and clouds

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Industry's 1st 800G coherent DSP for pluggable modules

- Better total cost of ownership
 - 60%-75% lower cost over embedded solutions¹
 - 30% lower cost and power per bit over existing modules²
- Extends reach of modules to 2000km
- First to enable 800 Gbps ZR/ZR+ modules
- Multiple use cases for carriers, clouds
- A packaged solution for a growing ecosystem

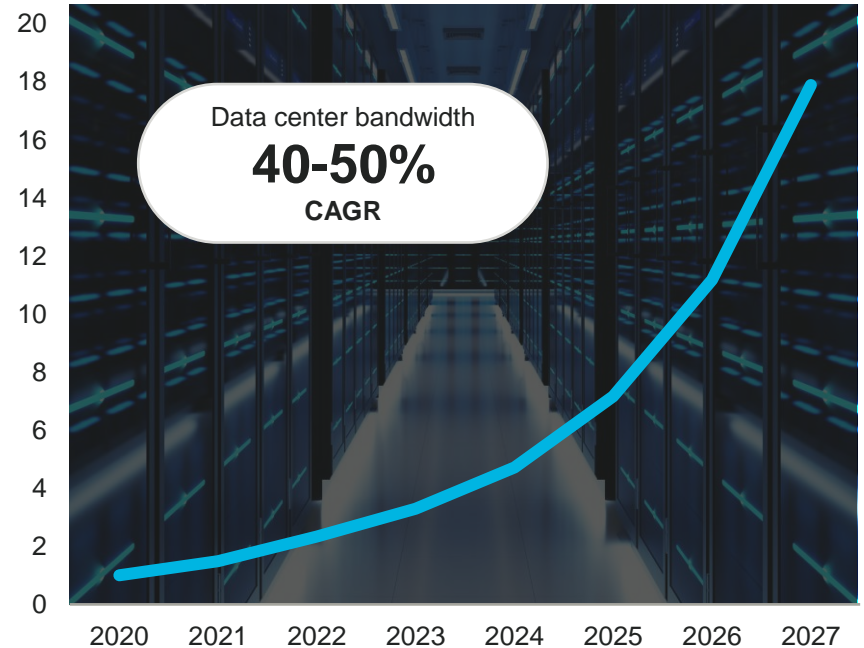
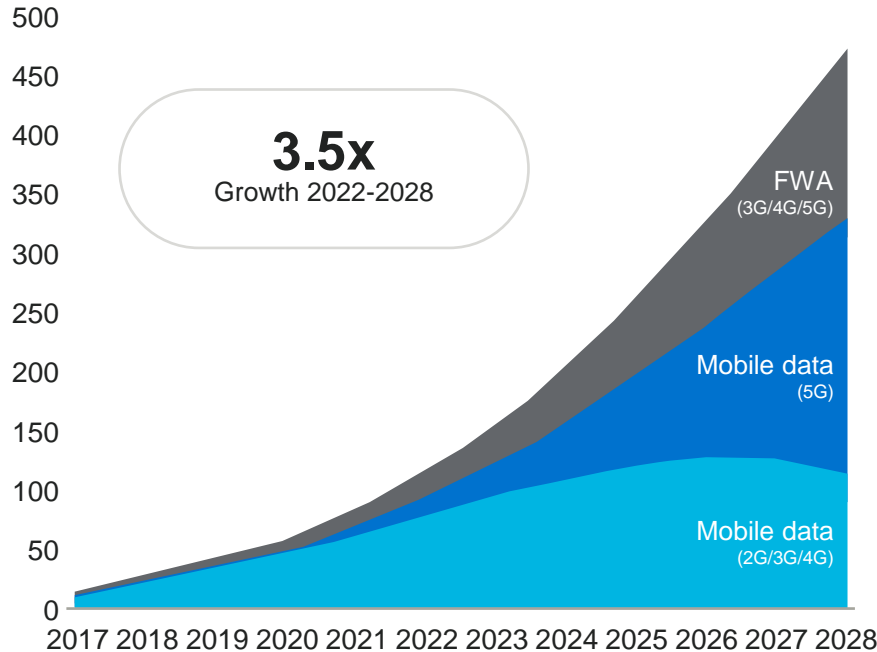


Sampling now in 5nm

Transforms carrier networks and DCI with standards-based optics

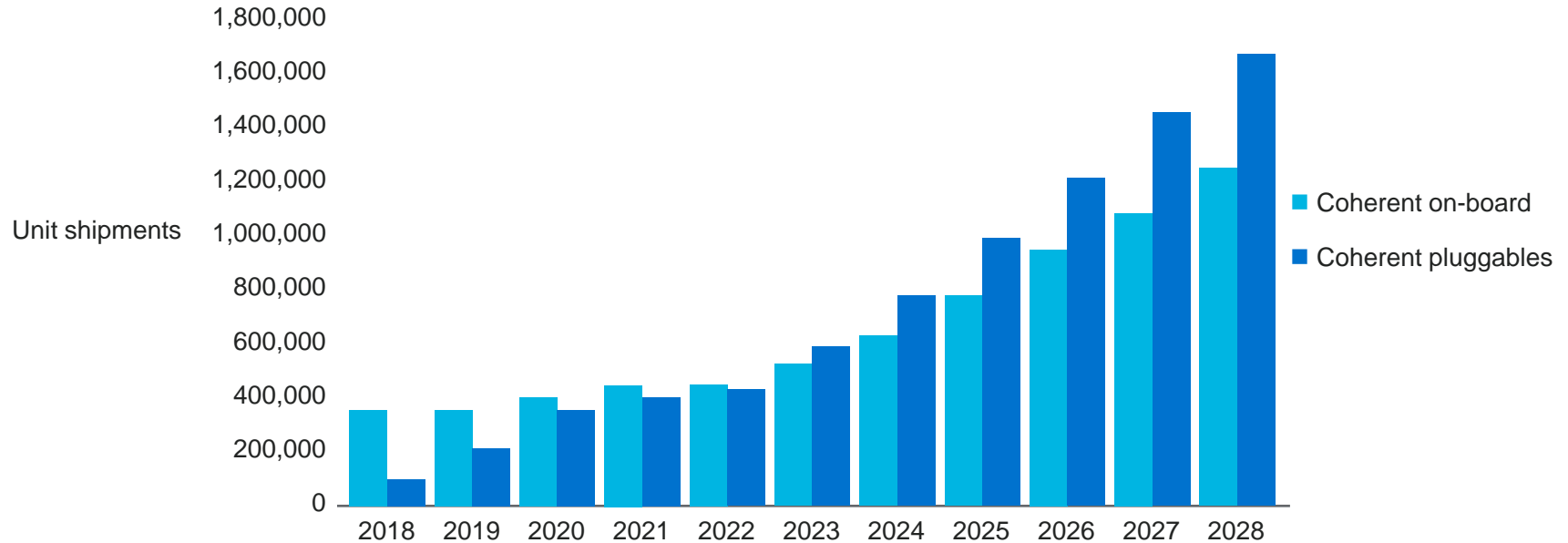
1. Marvell and Cignal AI. 2. Marvell

The relentless growth of traffic and bandwidth



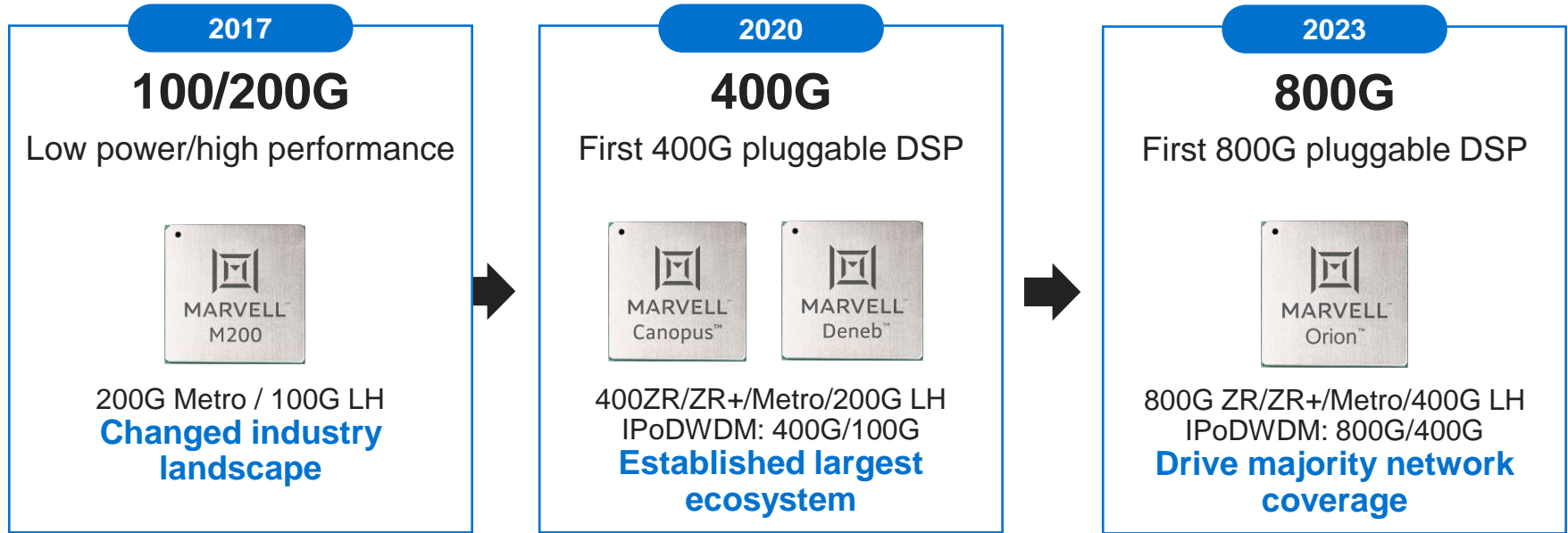
Sources: Ericsson Mobility Report, 2023 and Marvell estimates based on Industry Analyst forecasts

An inflection point for the market



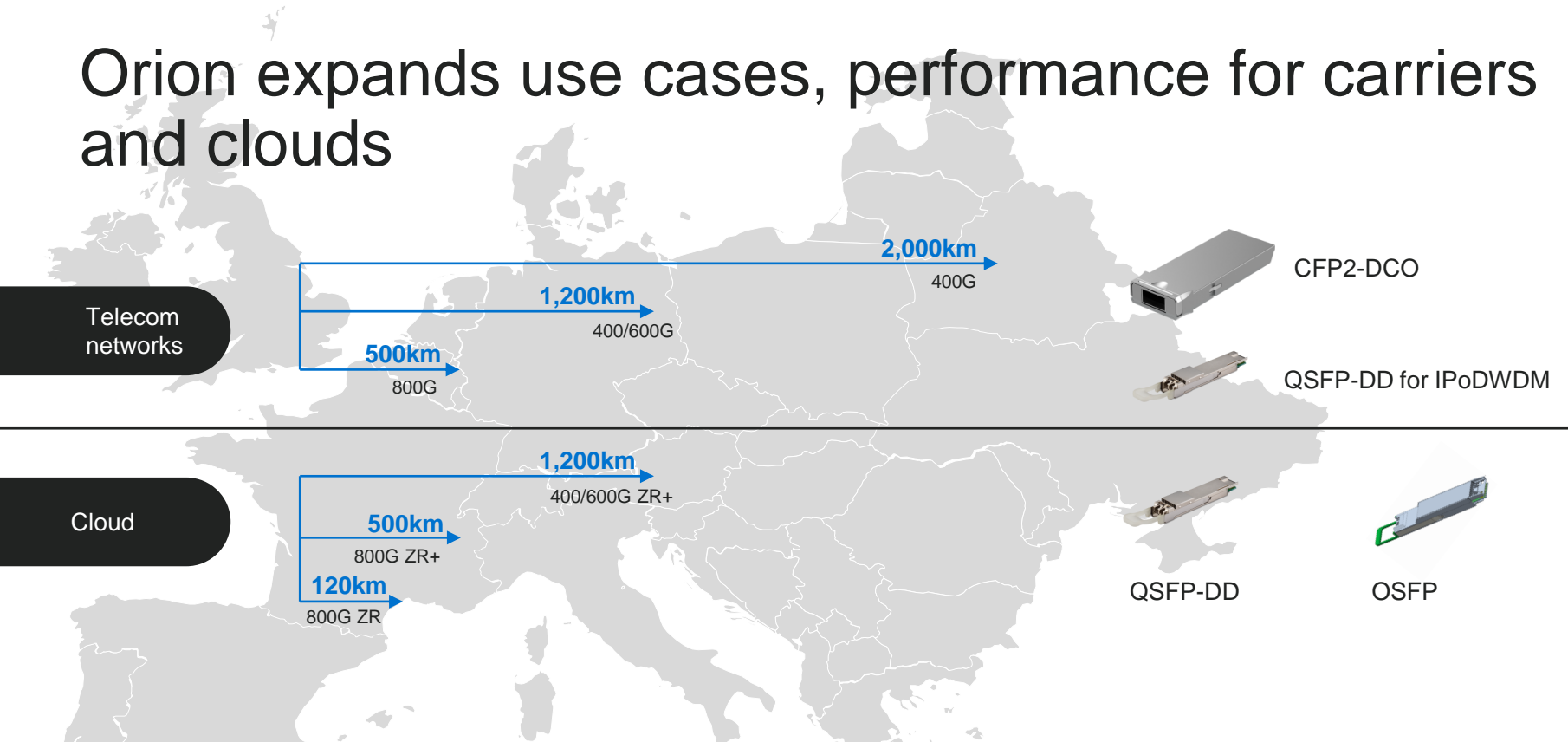
Source: LightCounting

Marvell accelerates the pluggable ecosystem








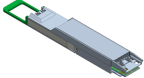
30% lower cost and power per bit per generation

Orion expands use cases, performance for carriers and clouds



Pluggable use cases expand from 50-55% to 80%+ for carriers

Cheat sheet: Orion use cases

Markets	Use cases	Bandwidth	Distances	Form factors
 <p>Telco networks</p>	<p>Long-haul</p> <p>Regional</p> <p>Metro</p>	<p>200G → 400G</p> <p>400G → 600G</p> <p>400G → 800G</p>	<p>2,000 km</p> <p>1,200 km</p> <p>500 km</p>	 <p>CFP2</p>  <p>QSFP-DD for IP over DWDM</p>
 <p>Data center</p>	<p>DCI</p>	<p>400G → 800G</p>	<p>120 km and 500km</p>	 <p>QSFP-DD</p>  <p>OSFP</p>

A massive reduction in capex with IPoDWDM



Synchronized with infrastructure upgrades

Carriers:

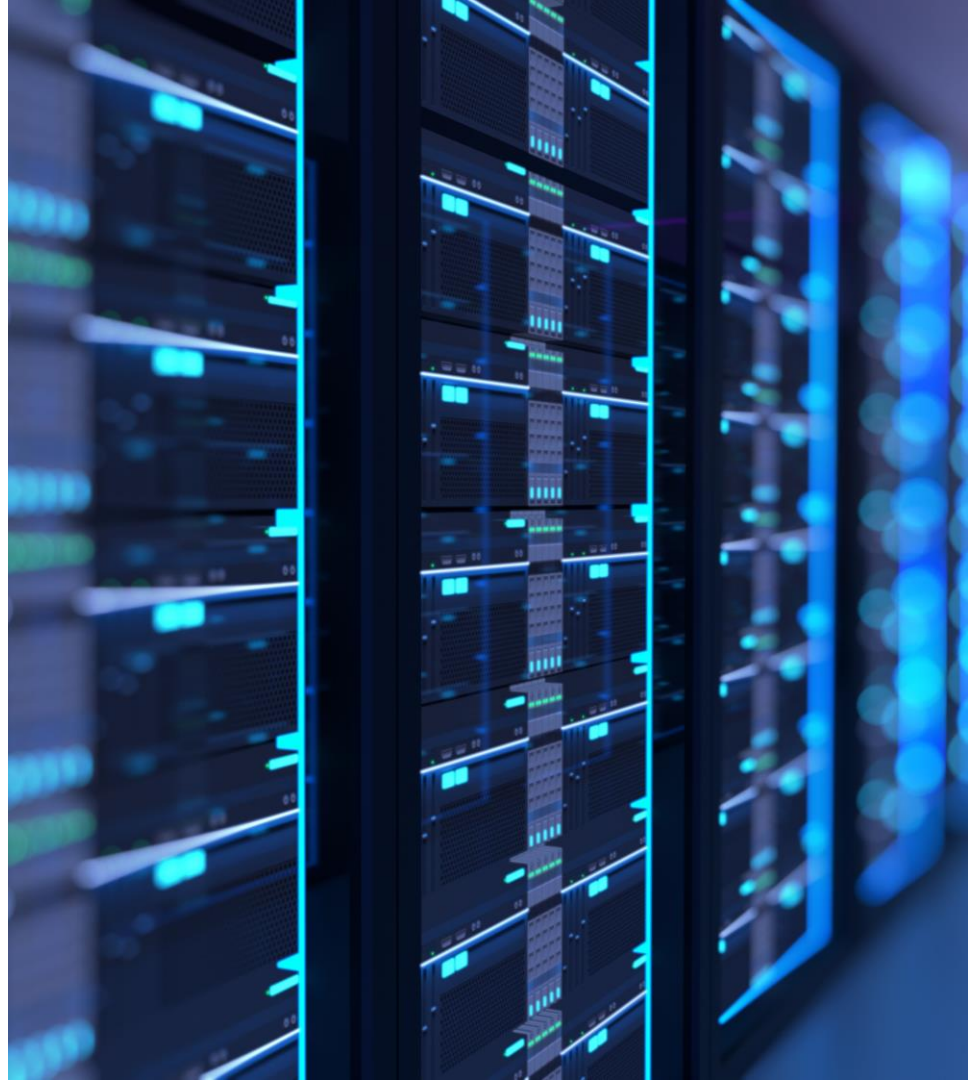
100G to 400G routers

- A once in a decade shift
- China, North America, EMEA starting upgrade in 2023.

Clouds:

12.8T to 51.2T switching

- 51.2T: 1/3 the power, 1/5 the cost
- New switches to be coupled with 800 Gbps ZR/ZR+ modules and 1.6T PAM-4 modules.



A broad spectrum of technologies

Standard

OIF

OpenZR+
MULTI-SOURCE AGREEMENT

Open ROADM



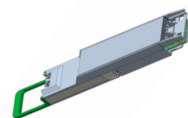
Form Factor



CFP 2

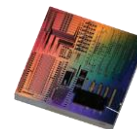


QSFP-DD

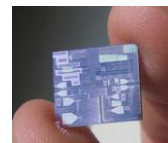


OSFP

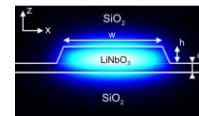
Optics Technology



Indium phosphide



Silicon photonics



Thin-film lithium niobate

An expanding ecosystem

“Our collaboration creates cutting-edge IP-over-DWDM pluggable solutions that enable the continued scaling of data center interconnect and metro network capacity.”

**Marc Stiller, VP, Product Line Management,
Coherent Modules**



“Orion is a milestone in infrastructure because it expands the applications for pluggable technology. Long-haul is now a use case suitable for coherent modules. The collaboration between InnoLight and Marvell will fuel this transition for carriers and cloud providers.”

Osa Mok, CMO



“Marvell’s cutting-edge technology enables pluggable solutions for advancing carrier networks, DCI, and other emerging AI applications. We are thrilled to integrate the Orion DSP into our coherent transceivers that will meet market demands for scalability and reduced power consumption.”

Yukiharu Fuse, Executive Director



Key takeaways

1

Orion allows carriers and clouds to scale rapidly and economically

2

Orion expands pluggable use cases: more bandwidth, greater distances

3

Orion is supported by a growing, diverse ecosystem of module makers



Thank You



Essential technology, done right™