

Is IP-over-DWDM finally ready to Cross the Chasm?



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Lead Analyst



March 7, 2023



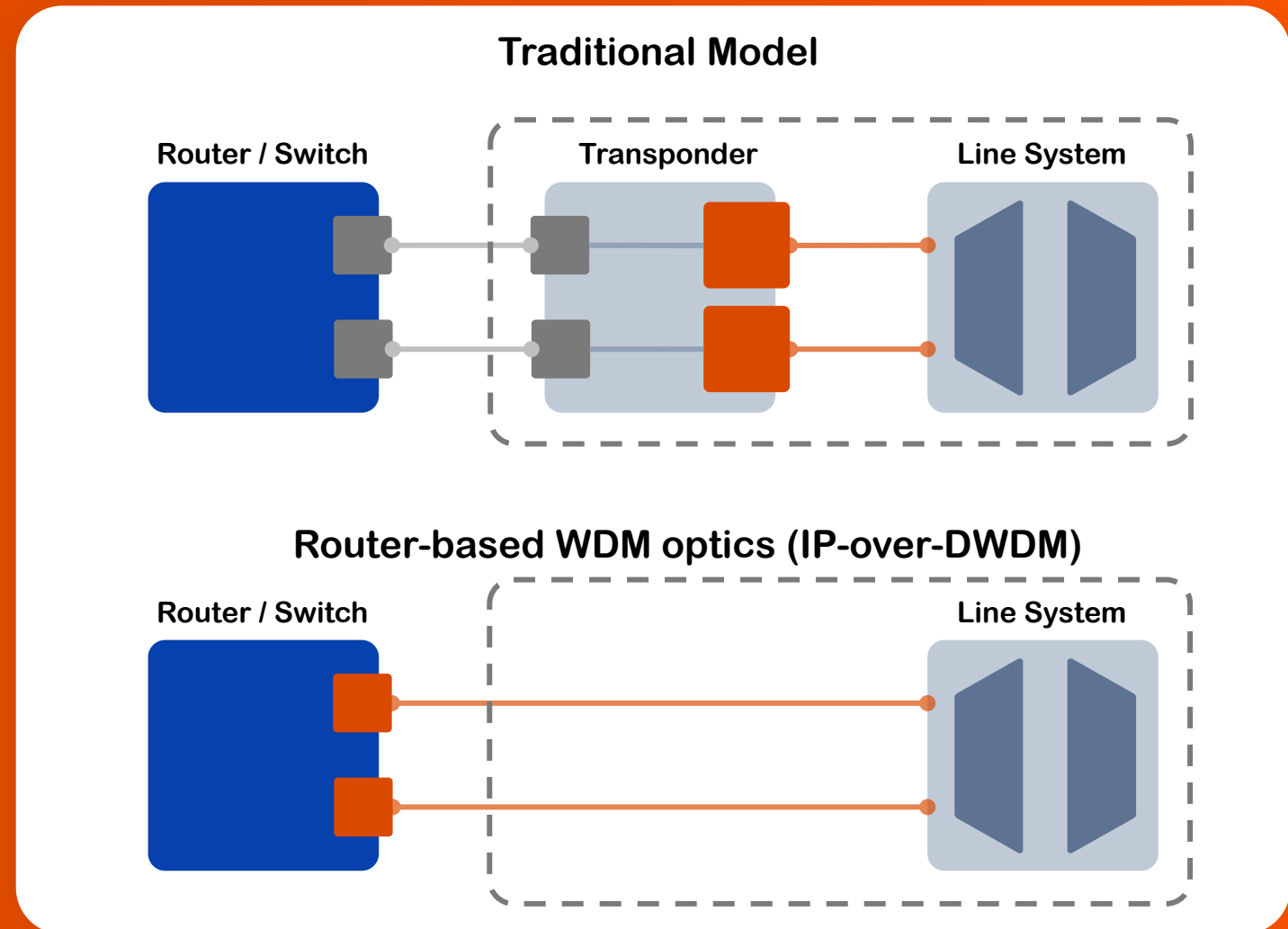
OFC '23





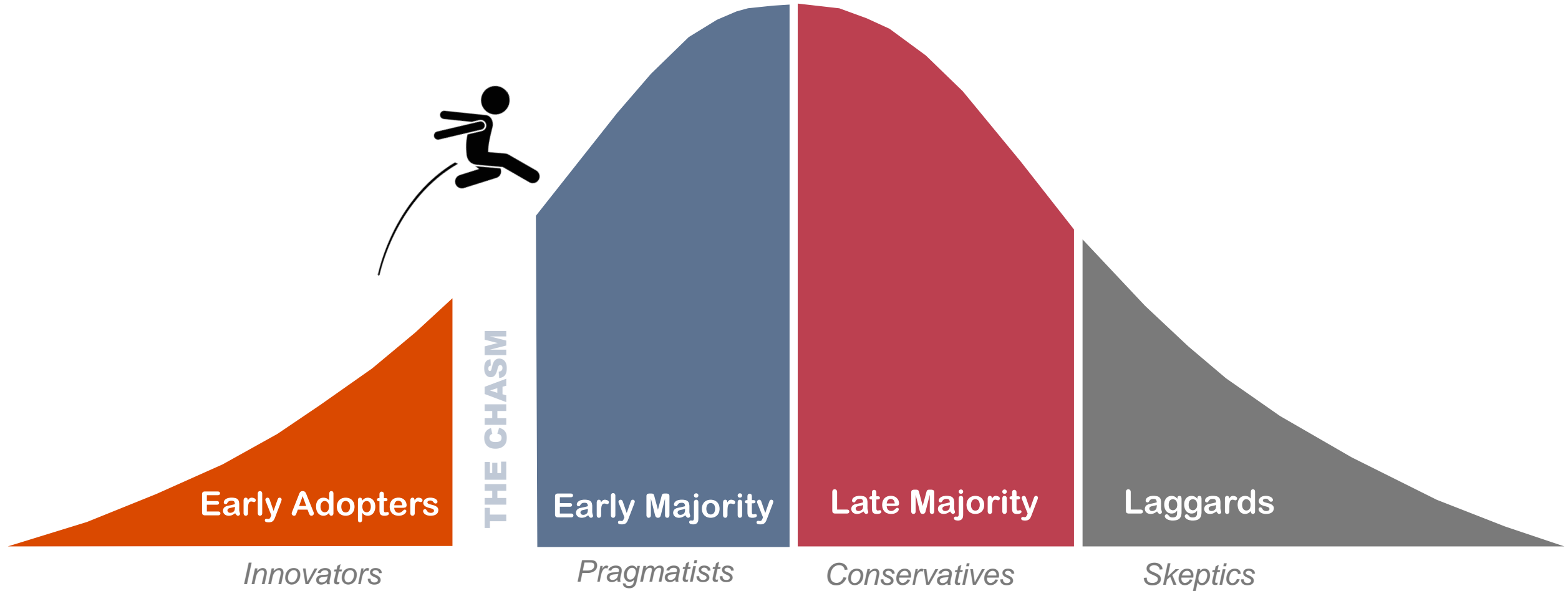
IP-over-DWDM – The Promise

- ✓ Lower cost
- ✓ Lower space
- ✓ Lower power
- ✓ Higher reliability
- ✓ Multi-layer coordination





IP-over-DWDM has failed to Cross the Chasm



Why?

How is this time different?



400ZRx – this time is different

✓ Form factor parity

And pluggability

✓ Timeliness

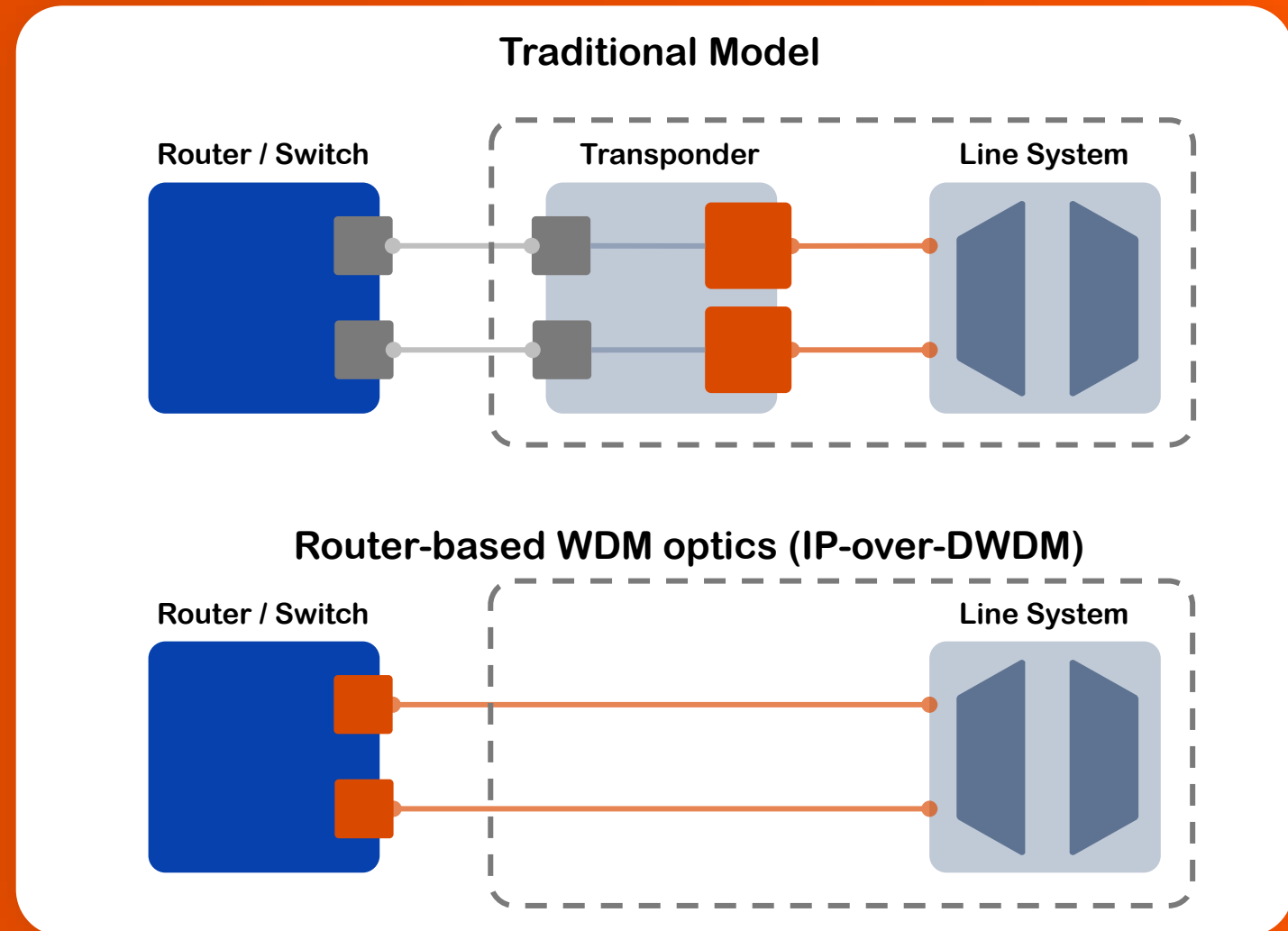
400G investment cycle

✓ Multi-vendor ecosystem

Price pressure and interop

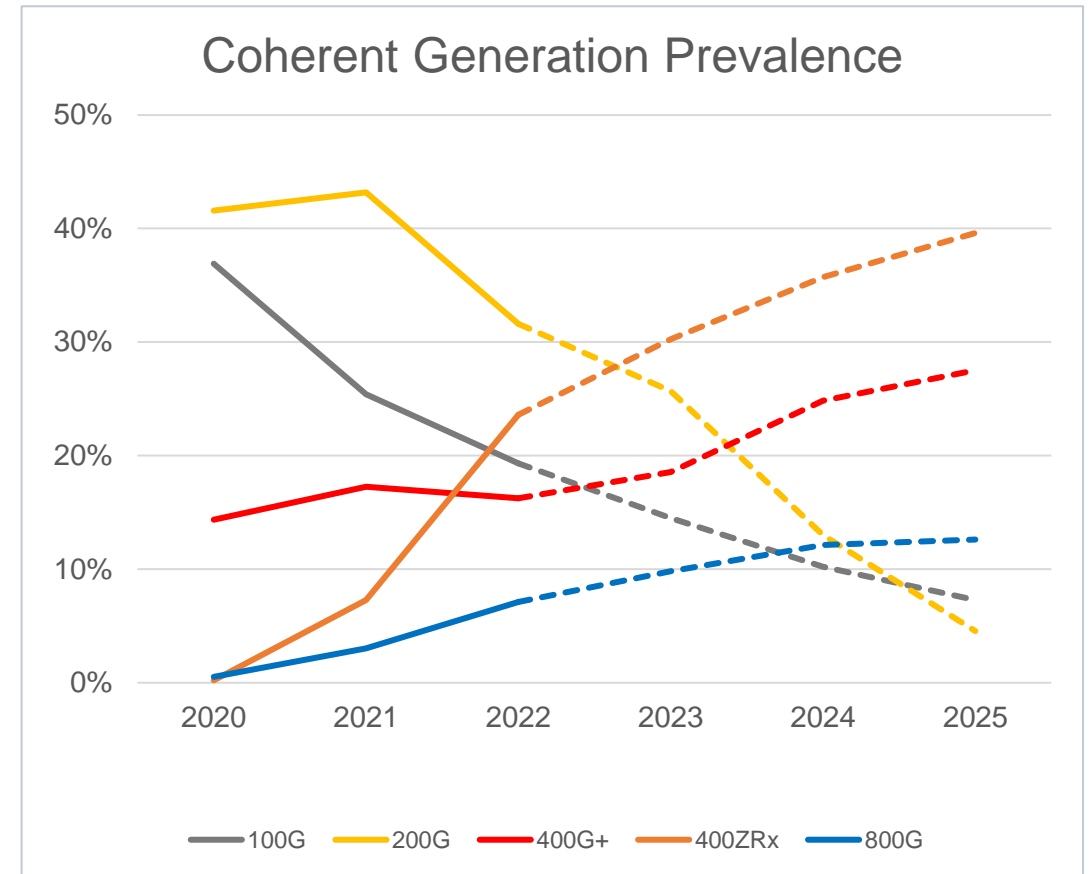
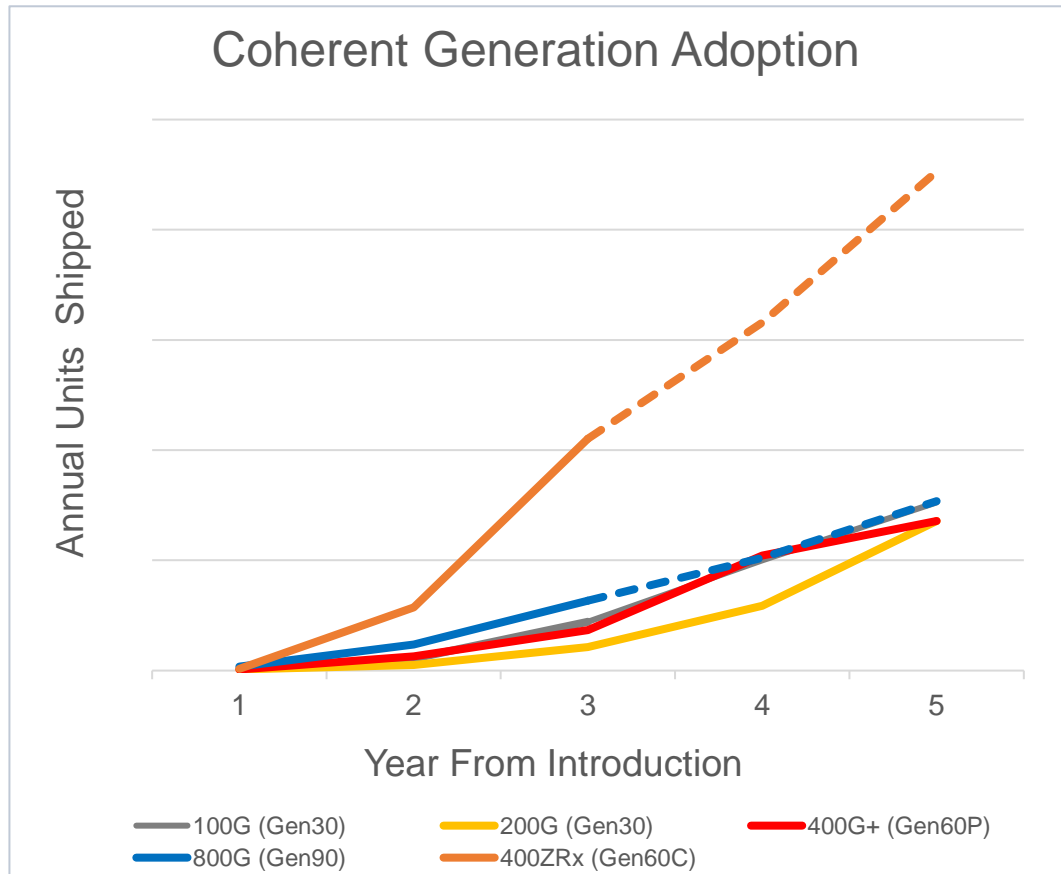
✓ It works

Perfectly for Metro DCI





400ZRx – Unprecedented rate of adoption



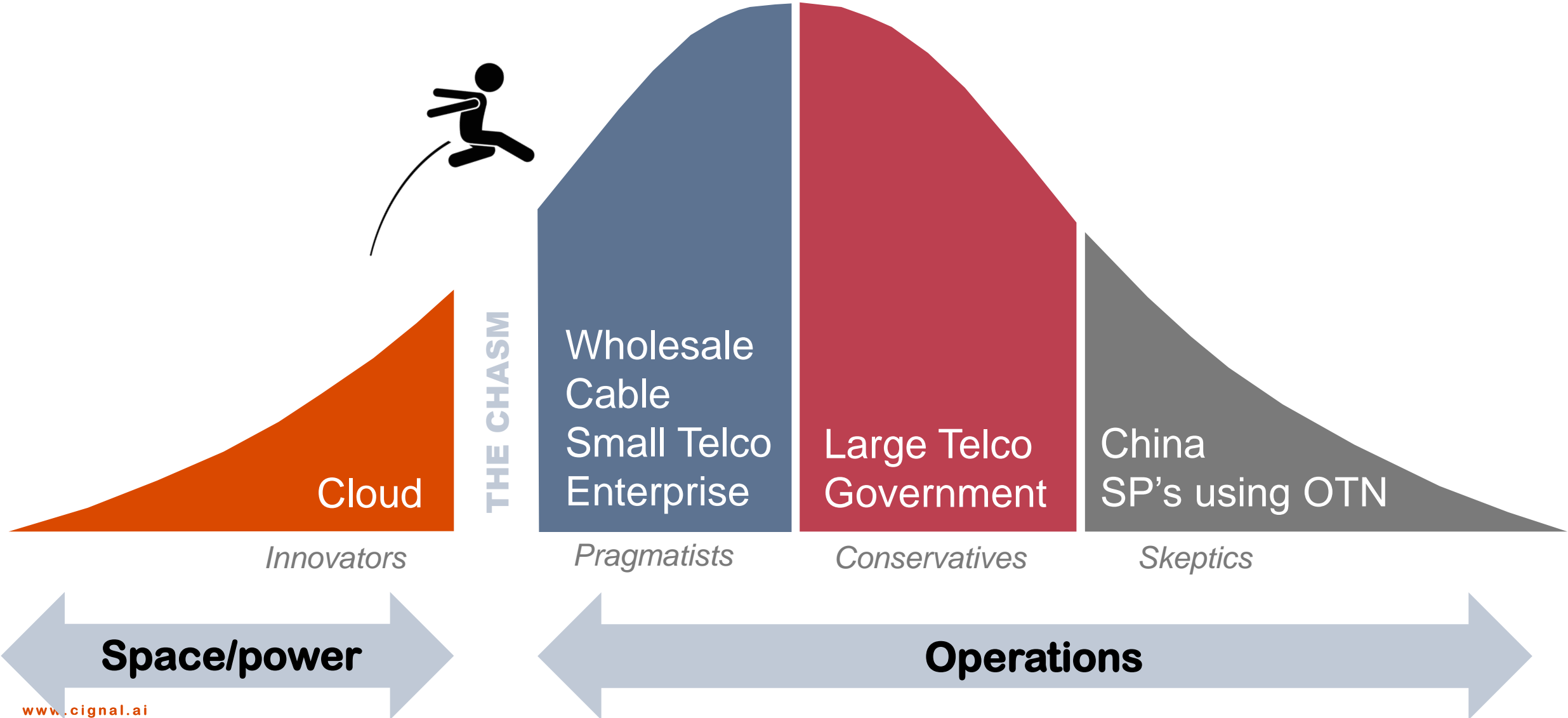


Has IP-over-DWDM already crossed the chasm?



Not so fast. The chasm is large.

But so is the market on the other side



Is IP-over-DWDM going to make it this time?



Innovators

THE CHASM

Pragmatists

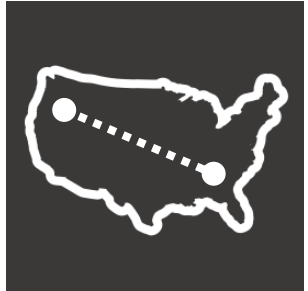
Conservatives

Skeptics

Crossing the Chasm



**ROADM
Compatibility**



**Long Haul
Capability**



Pragmatists

Conservatives

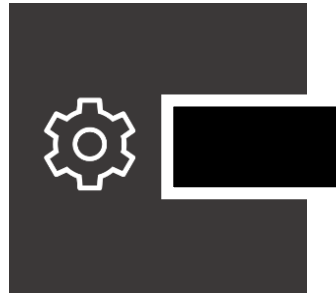
Skeptics



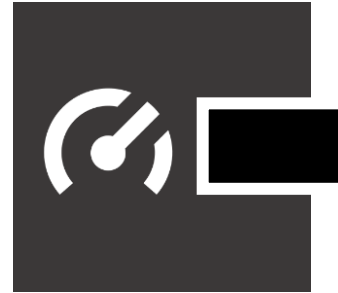
Innovators

THE CHASM

Crossing the Chasm



Host
interop



Management
& Control

Innovators

THE CHASM

Pragmatists

Conservatives

Skeptics

Crossing the Chasm



Cost
Reduction



Public
Success

Innovators

THE CHASM

Pragmatists

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Skeptics



How about a bridge?



ROADM
Compatibility



Long Haul
Capability



Host
interop



Management
& Control



Cost
Reduction



Public
Success

Innovators

THE CHASM

Pragmatists

Conservatives

Skeptics



**Thank
You**



800ZR and 800LR Market



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Lead Analyst



March 8, 2023

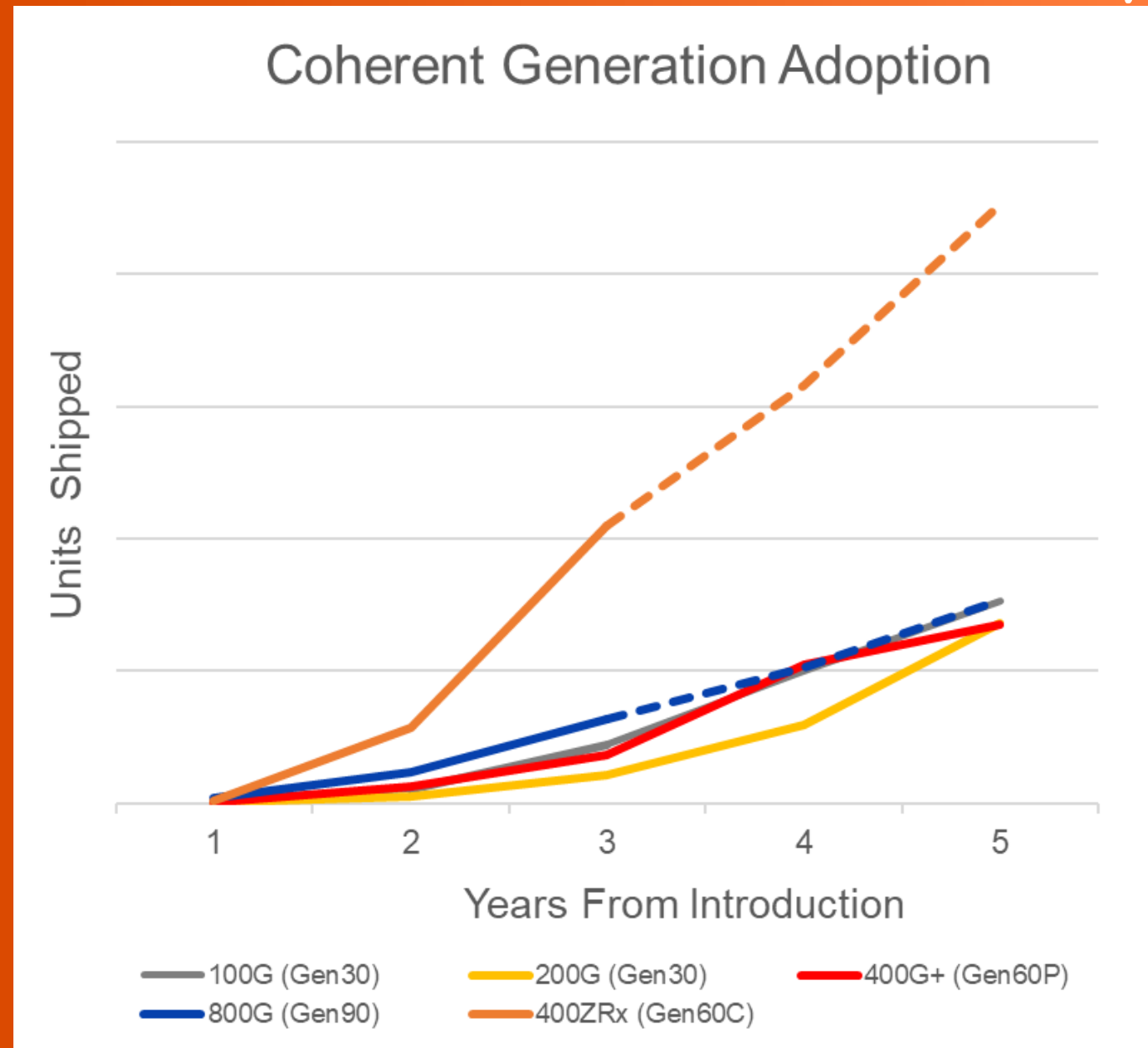


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400ZR Ignited a Revolution

- The fastest-growing new optical technology of all time
- Multiple varieties built on top of the original specification, expanding the market
- Networks can be built now that could not be built before
- There would be no 800ZR or 100ZR without the success of 400ZR



Gen120C: Pluggable 800Gbps

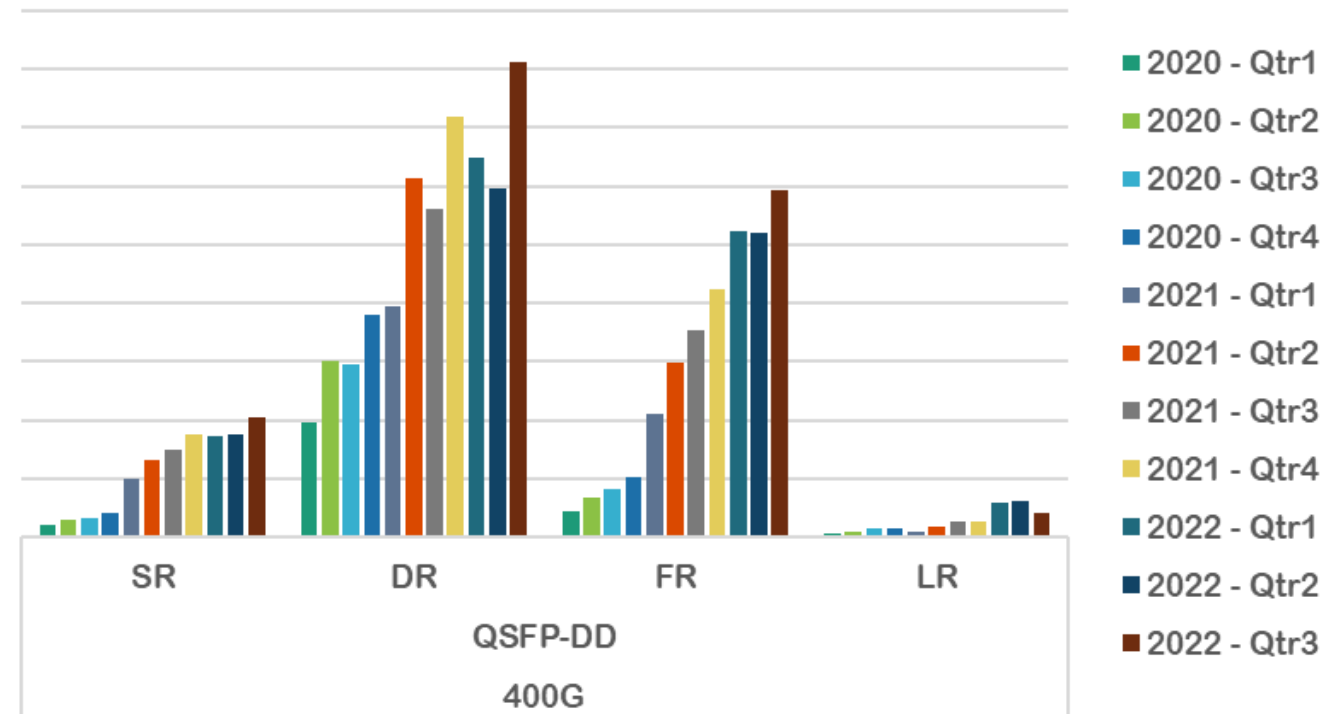
- Arriving concurrent with Gen120P
 - The development cycle has collapsed
- 800ZR: The successor to 400ZR
 - Lines up with the transition to 800GbE
 - Will operate as a long-distance 400Gbps pluggable – the killer app
 - Can also operate as 800G DCI, but 800GbE will not be as popular as 400GbE for DCI
- 800LR: Short distance (~10km) competitor to direct detect
 - Predicated on IMDD performance not being enough at 200GBaud
 - Not clear there is a market as a standalone product, especially if IMDD reaches 8-10km
 - Could be very interesting as part of a 1.6TbE solution



800LR: Limited demand

- The demand for LR optics – in general – is much smaller than for other reaches
- 800GbE demand will be smaller than 400GbE, except in AI/ML applications
 - Those are short-reach applications
- IMDD 800GbE solutions will be based on 100Gbps and 200Gbps PAM4
 - 100Gbps = more expensive (8 lanes) and complicated, but can easily reach 10km
 - 200Gbps = better (4-lane) solution, may stretch to 8km
- Things get interesting at 1.6TbE
 - Requires 200Gbps PAM4 optics (limited reach)
 - Could be well served with a 2x800LR solution

Datacom 400GbE Modules by Quarter

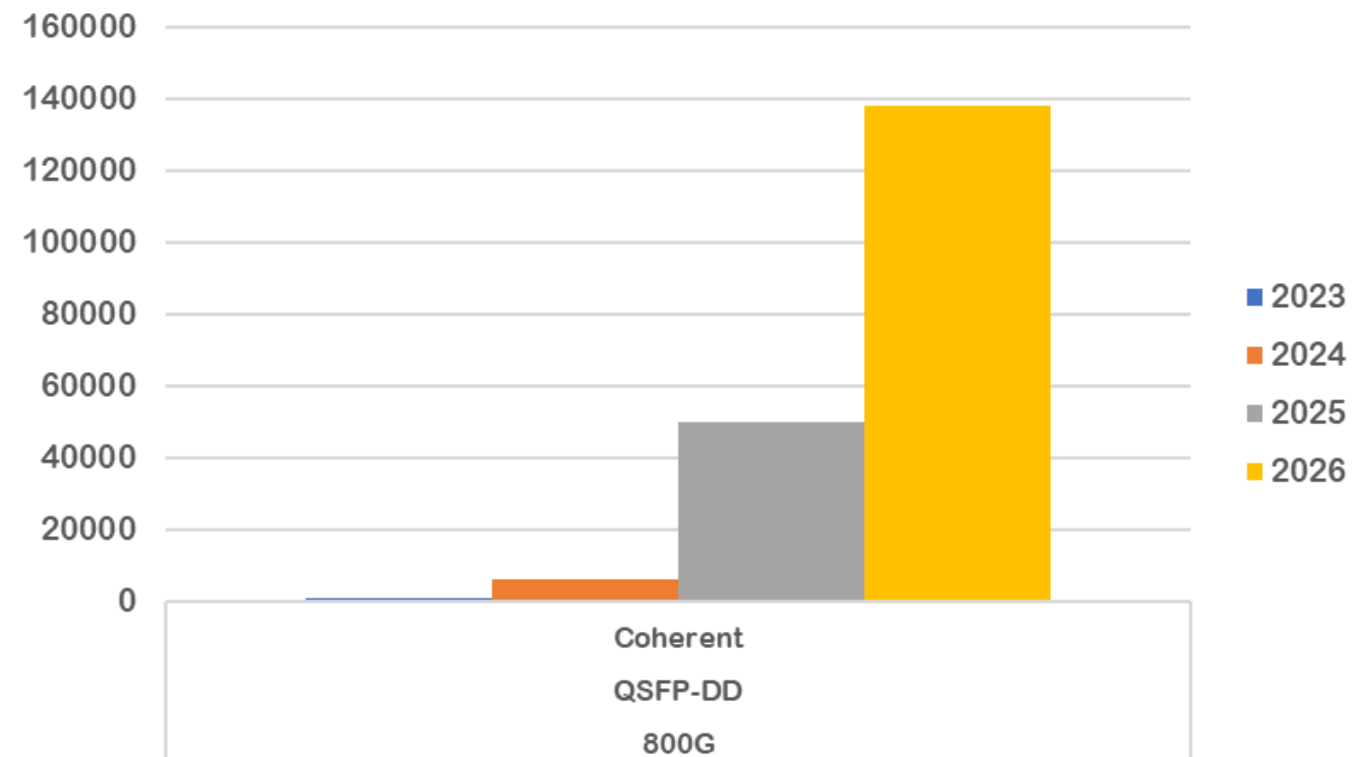




800ZR: 400ZR+++++

- Telcos are excited about a pluggable 400Gbps QSFP-DD solution that can cover 1000s of km and/or dozens of ROADMs
- 400Gbps coherent lines up with the need to 400GbE on the client side
- 800GbE is less popular, especially in networks that traditionally have a lot of DCI
 - Webscales on the 100G/400G upgrade path will wait for 1.6G solutions
 - BUT if 1.6G is delayed, then all bets are off
- Same DSP could be repurposed as an 800LR
 - Less sophisticated front end
 - No additional DSP development

Gen120C (Pluggable 800G) - Forecast





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Active Insight

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