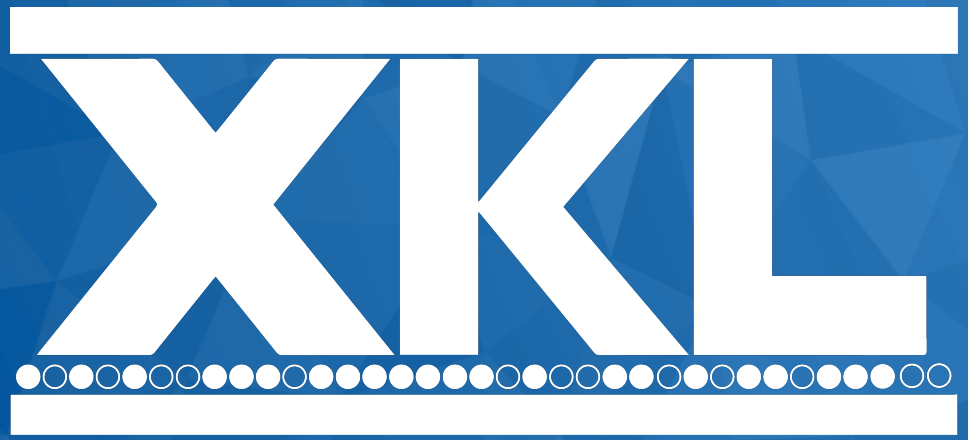


XKL Development in time of Plague

13-Feb-2023

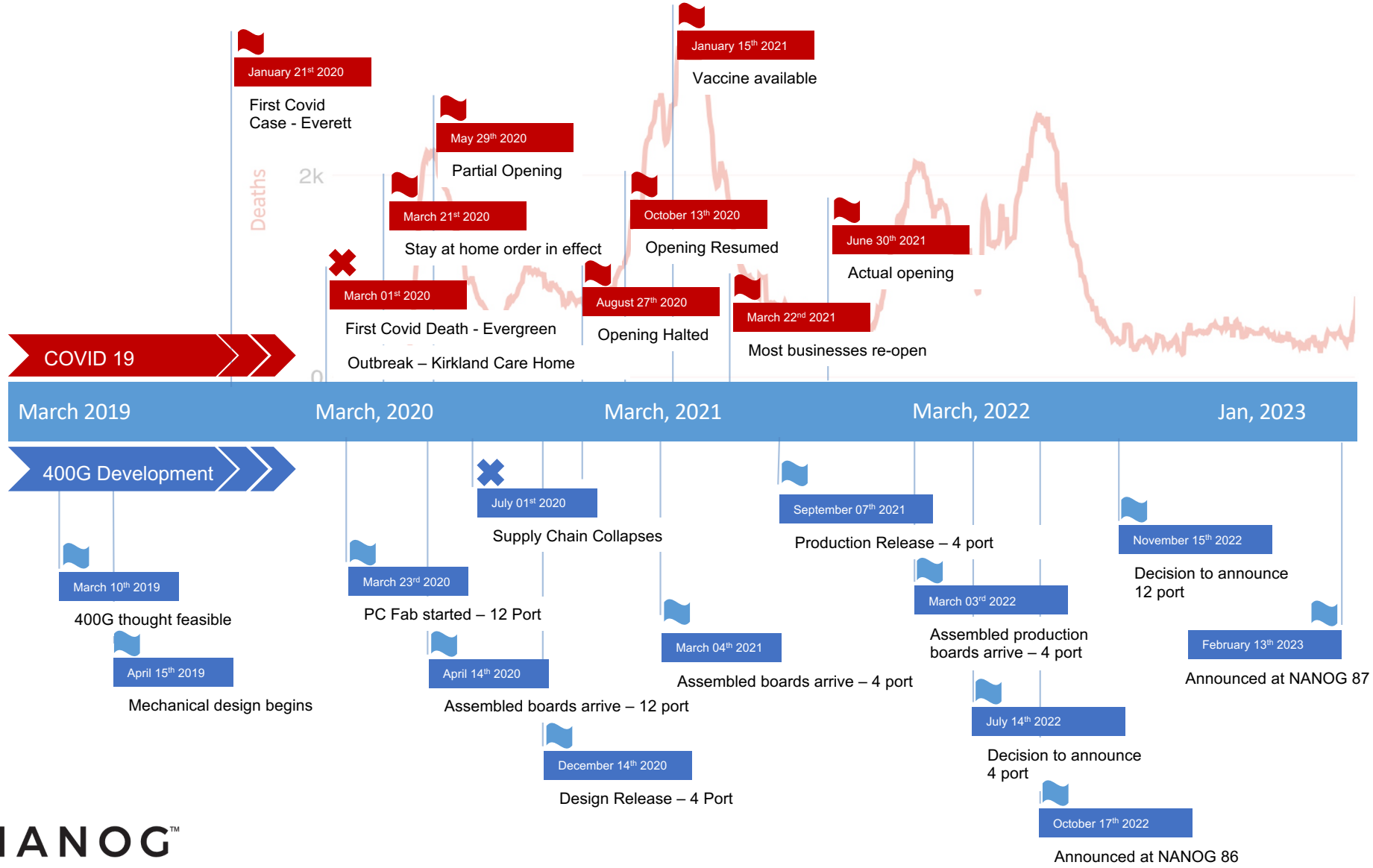
Presentation Overview

13-Feb-2023

- Timeline Overview
- 400G Early Production
- Supply Chain Challenges
- Scaling Production

Timeline Overview

US COVID Data credit: **Johns Hopkins University**
https://coronavirus.jhu.edu/region/united-states



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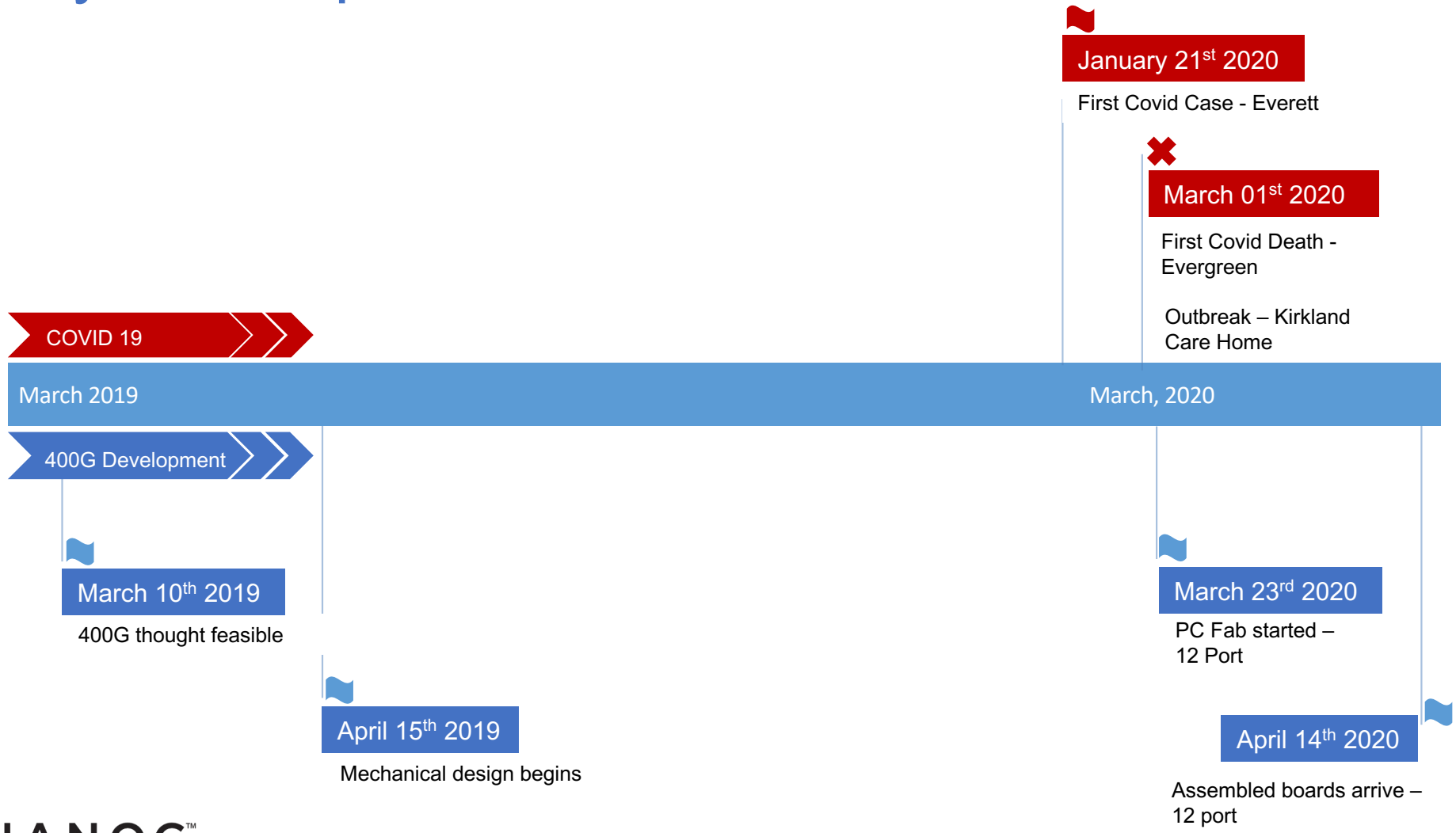
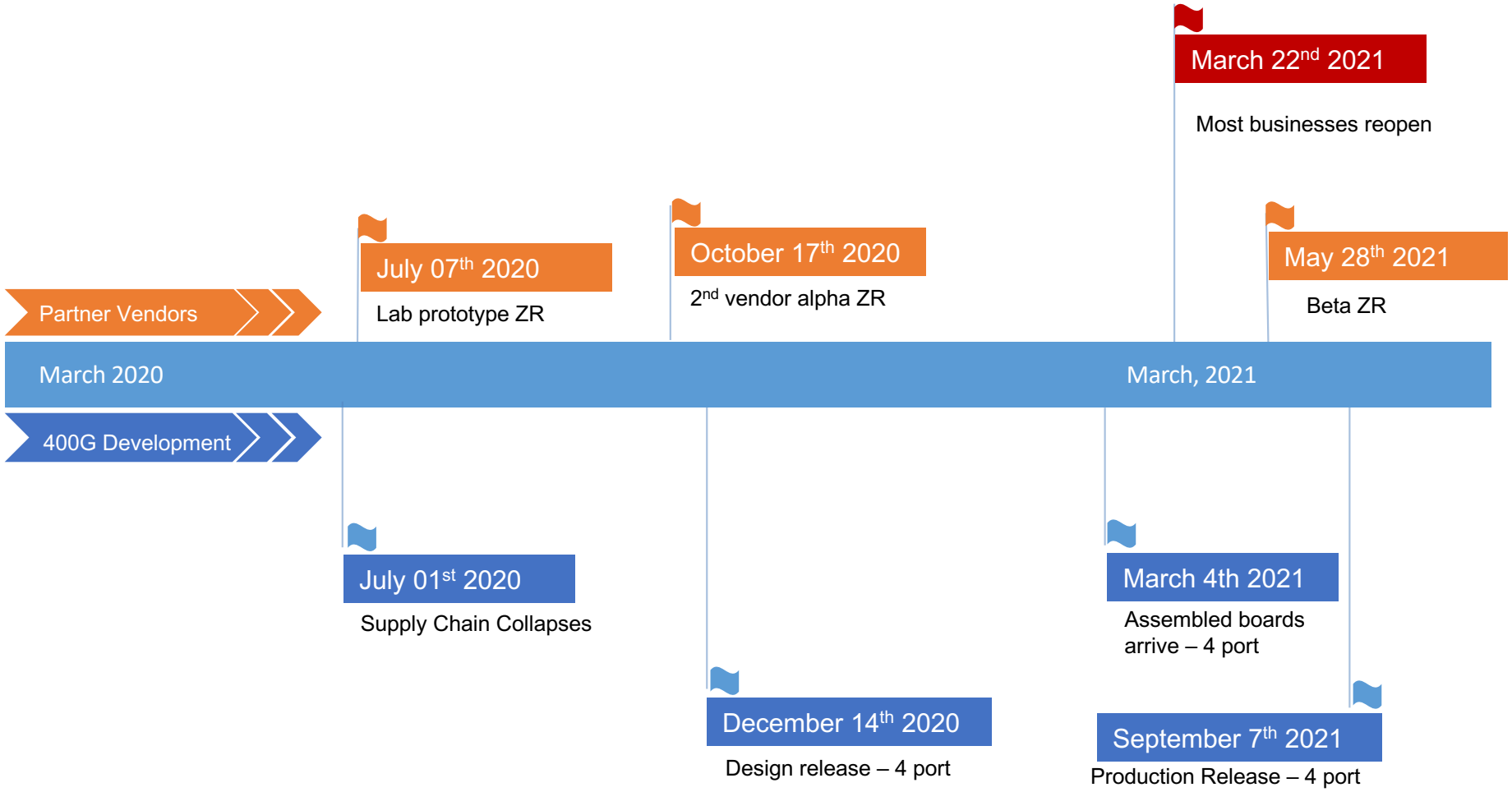
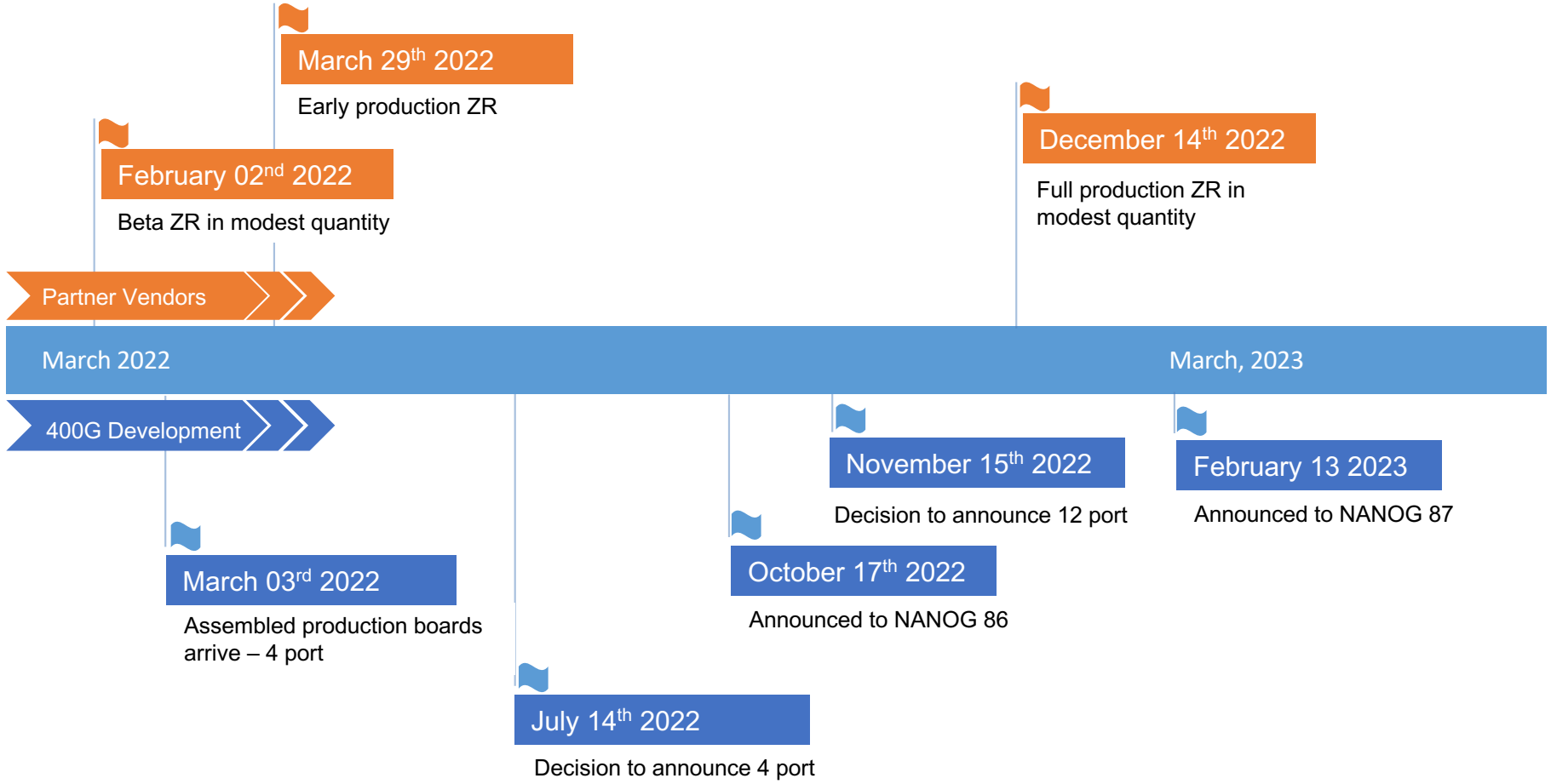
Early Development



Supply Chain Challenges



Scaling Production



400G ZR in Early 2023

What to expect of 400ZR

- Basic 400G client to client works
- Products differ at spec edges
- Performance monitoring not uniform
- Other rates have quirks
- Other modulation choices difficult
- Mixed speed 400/100 takes effort

How did this happen?

- ZR optics are complex optical and Computer systems
- Optics and supporting DSP essential
  - Computer system came later
- Never this level of computer in optics before now
- Software and firmware interact
- Much greater state to manage and report
- Actual algorithmic complexity: dispersion compensation
- User-visible effect is “hard edges”

Other Issues

- Power
  - Temperature tolerance
  - Lifetime at temperature
  - Device per-port power limits
- Slow startup
- Low output power (built-in amps coming)
- Broadband noise output
- Adverse interaction with some EDFA
- Slow recovery from bad input

Why Bother?

- 400G offers real benefits
  - Power/Gbps
  - Cost/Gbps
  - Space/Gbps
  - Ready for higher port speed

Q & A

Thank you

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13-Feb-2023

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