NETWORKING



Meta 102.4T Ethernet Switch

Rongchun Zhou *Network Hardware Engineer, Meta*
Reza Niazmand *Network Technical Program Manager, Meta*



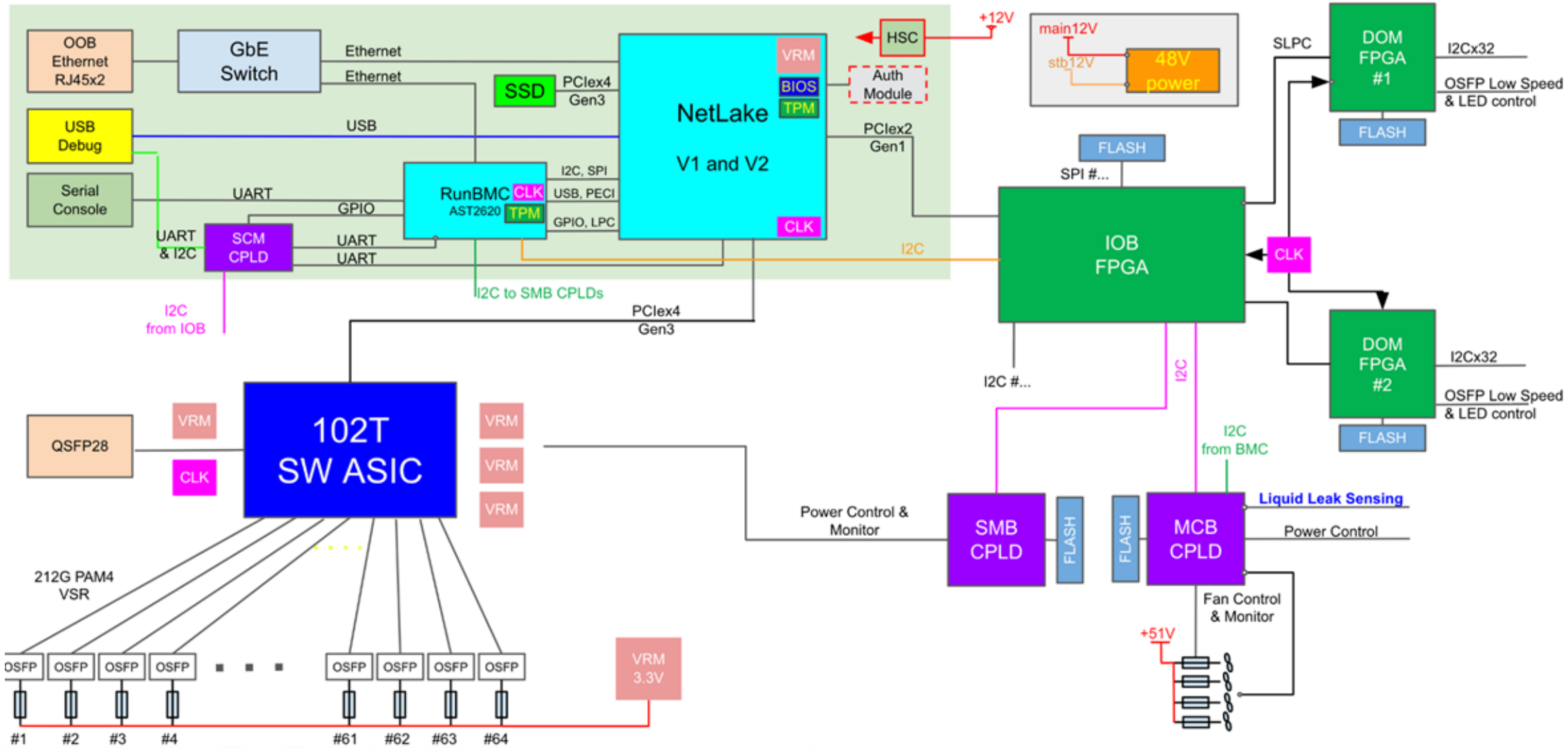
IceCube System Overview

- Meta’s first-generation Icepack switch family
- 2OU, Hybrid liquid/air cooled
- PHY-less design with flyover cables
- Deployed in ORv3-HPRv1 racks
- Based on Broadcom Tomahawk6C ASIC
- Features 64x OSFP ports, 128x 800GE/512x 200GE non-blocking switch capacity
- Intel Icelake-D CPU or other CPU for network platform micro server
- Equipped with Meta 2x800G-DR4/-FR4 OSFP modules
- Partnered with Celestica.



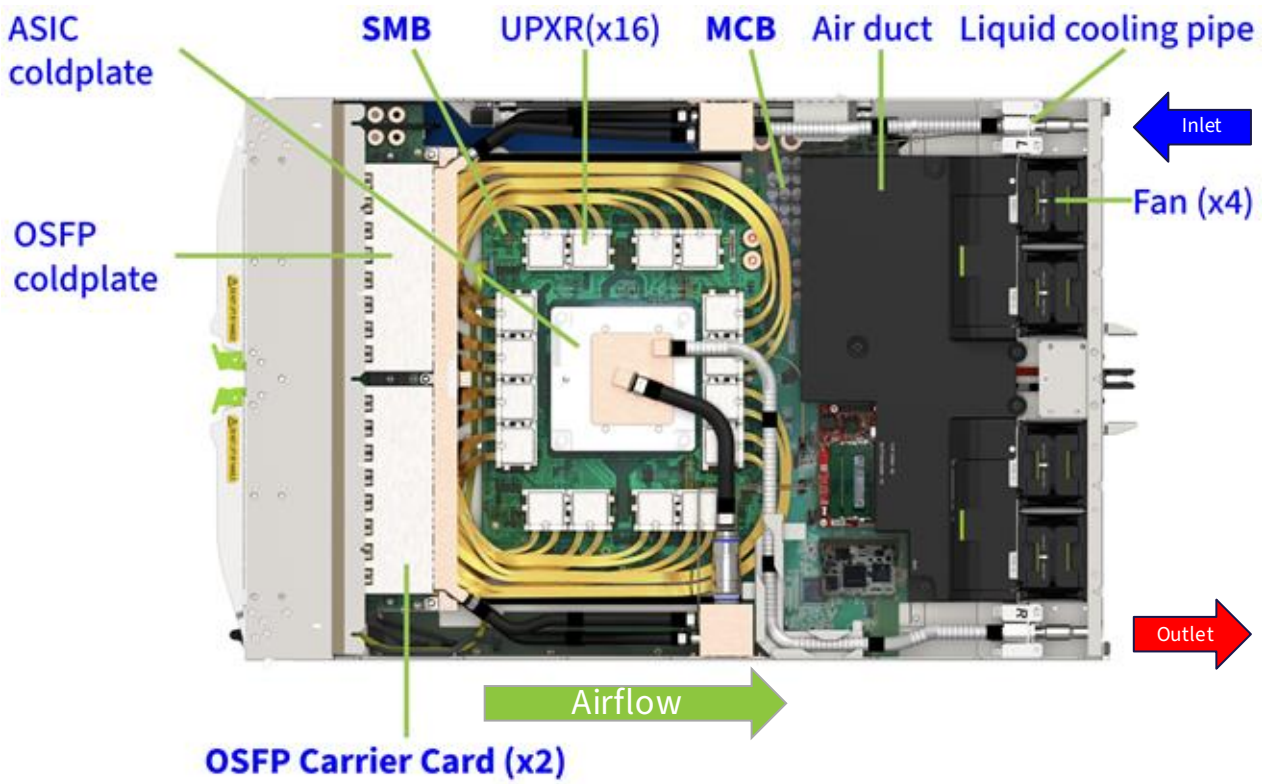
Celestica

IceCube System Architecture

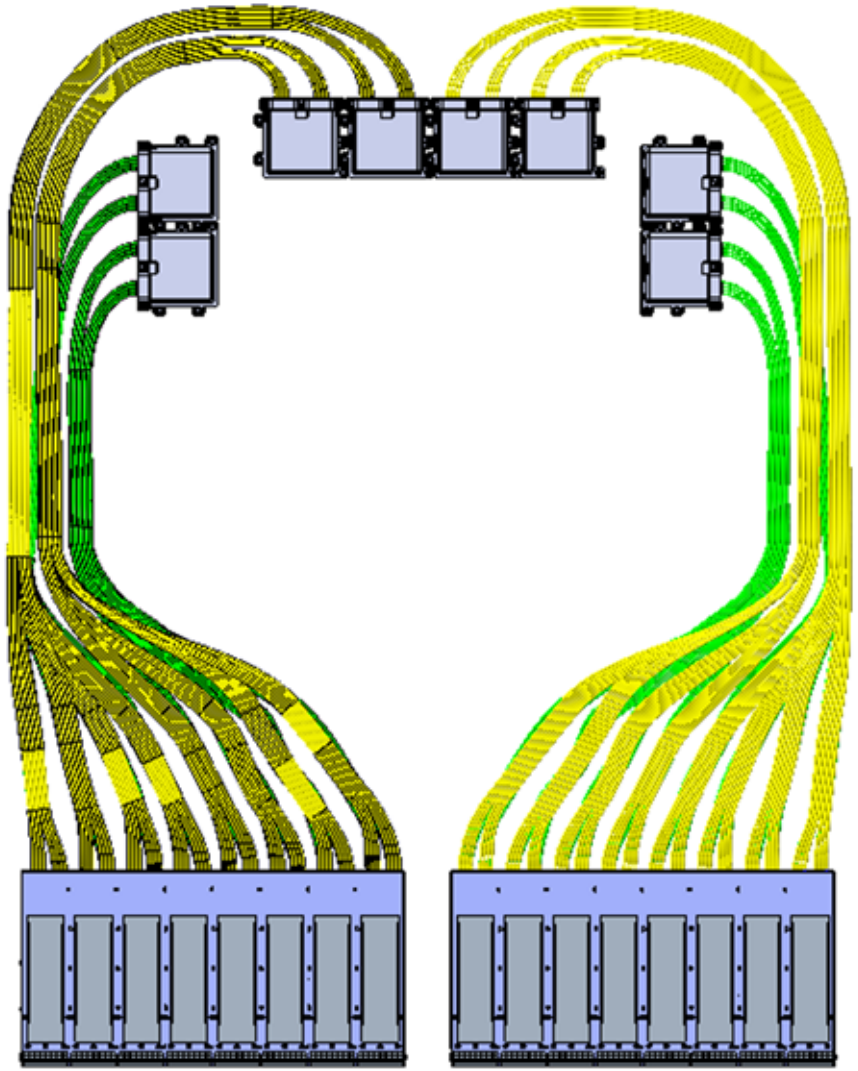


IceCube Top View

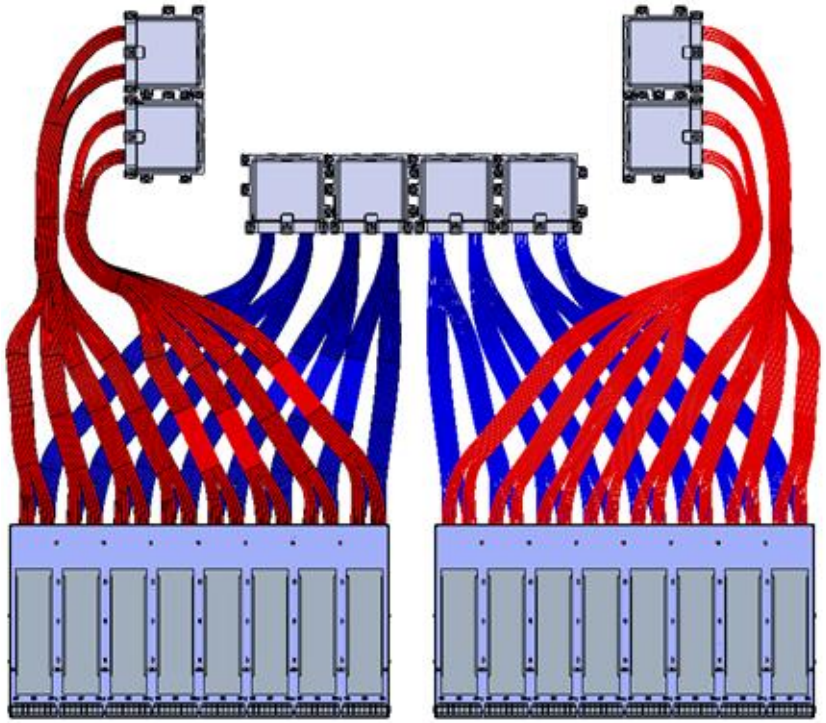
- Common SMB PCB for multiple Meta platforms
- UPXR-OSFP flyover cables
- Hybrid cooling
  - ASIC and OSFP liquid cooled, ~85%
    - OCP BMQC for blade coolant delivery
    - Parallel flow network for optics cooling
    - Multiple leak detection zones
  - userver, power stages, BMC air cooled ~15%

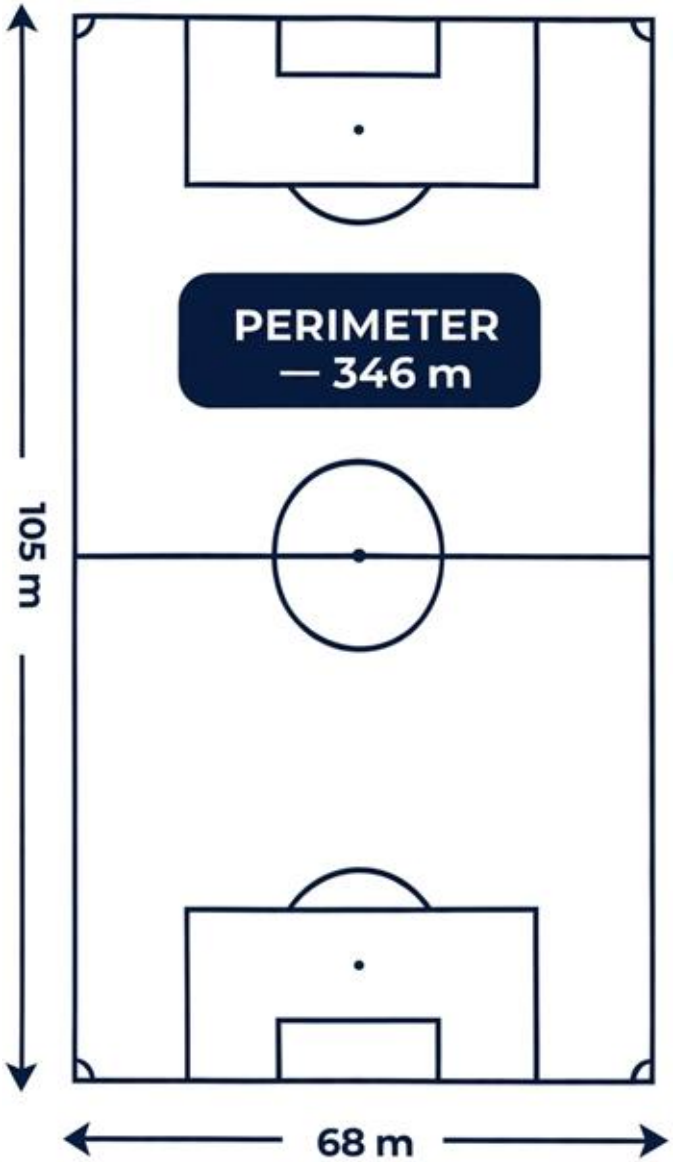


212GPAM4 copper cables



Total DP length = 340m

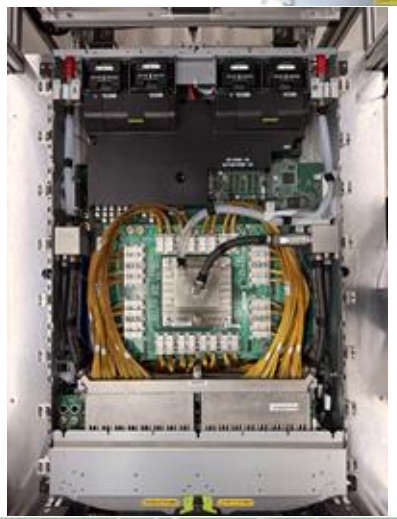




212GPAM4 copper cables

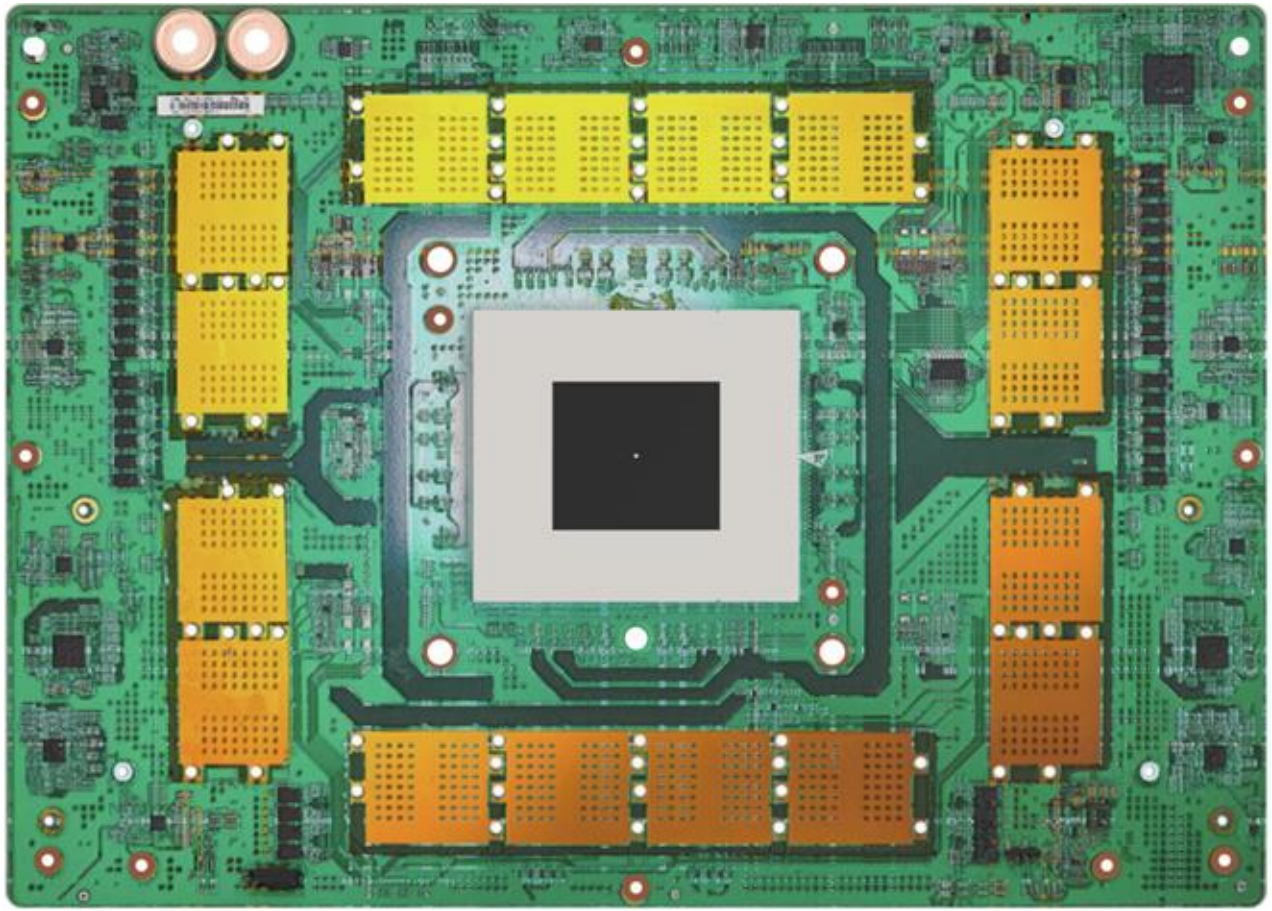




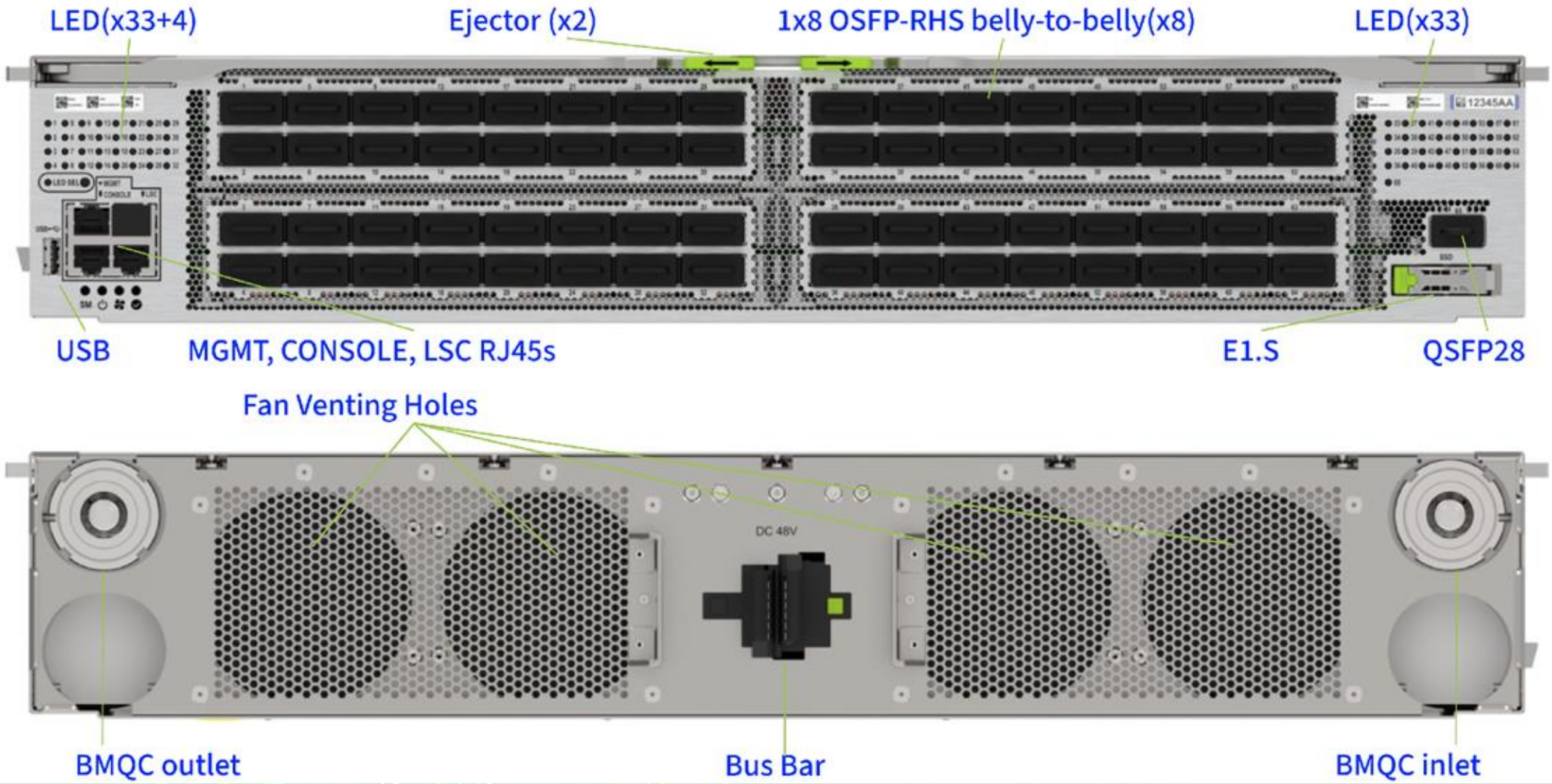




Switch Main Board

- EM892K2+MC24PV+EM370Z+MC24P
- 370mmx265mm,
- Thickness 5.62mm+/-7%
- 26+18 =44 layer N+M
- Surface finish: ENEPIG
- Shared design with other Meta platforms for better NPI efficiency

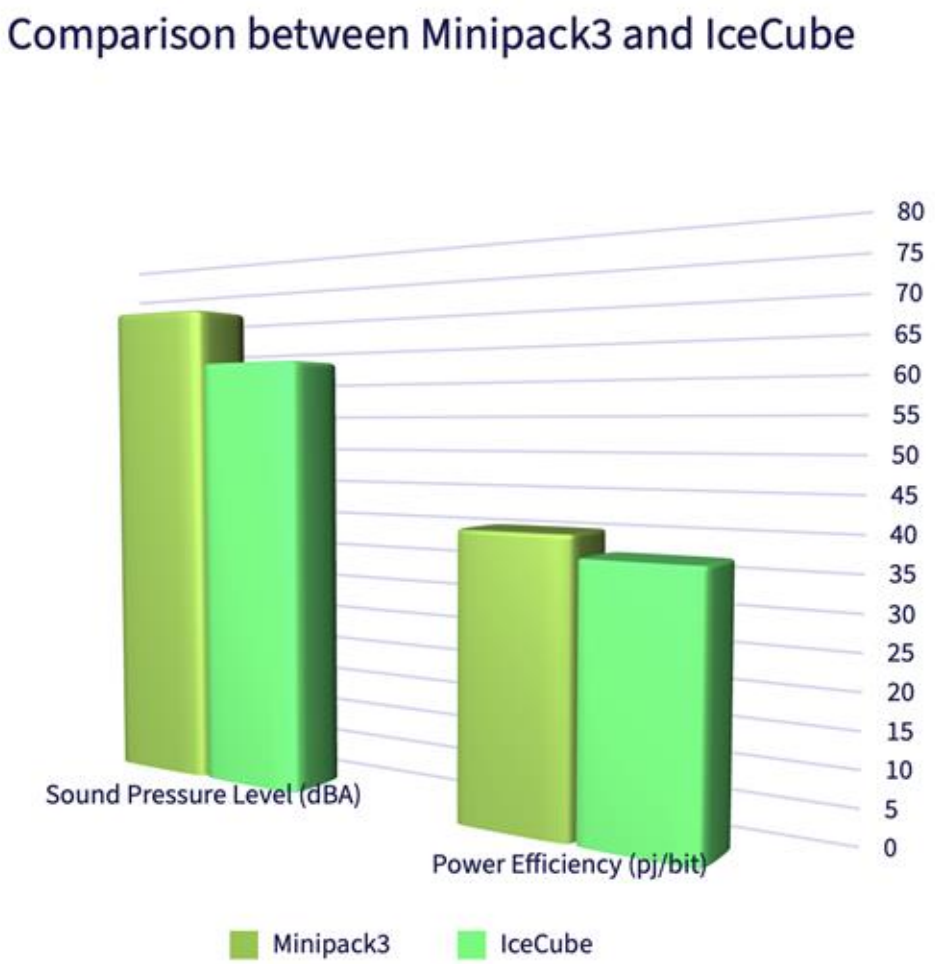


IceCube Front and Rear Views



Blade Thermal, Power and Acoustics

- Support 30C/40C coolant inlet for AALC or FLC deployment @ ~6 LPM/blade
- Blade max typical power: 3,820W (fully retimed 5nm DSP DR4 modules)
- Sound Pressure Level: 63.3 dBA at 30°C/6000ft

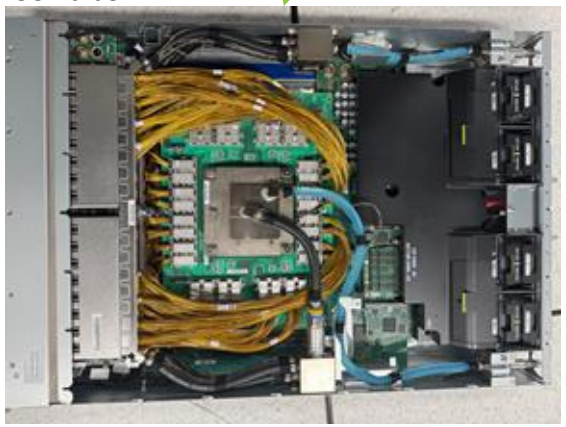


Design Reuse and Optionality

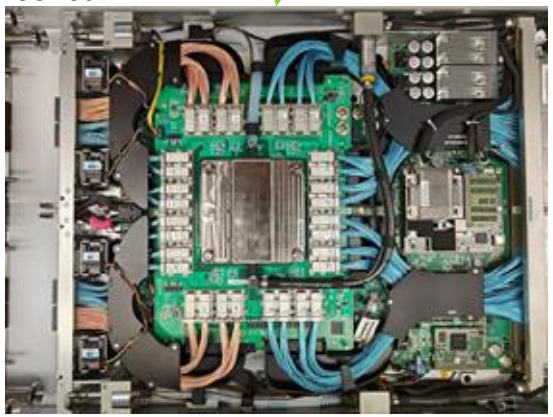
- **IceTea — Hack**
  - Leverages IceCube's flyover cable design
  - half the ports to the rear
  - Cable backplane eliminates fiber and optics
  - A single design serving multiple applications



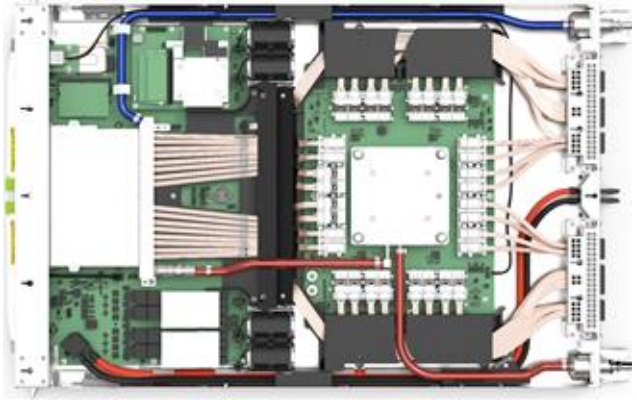
IceCube



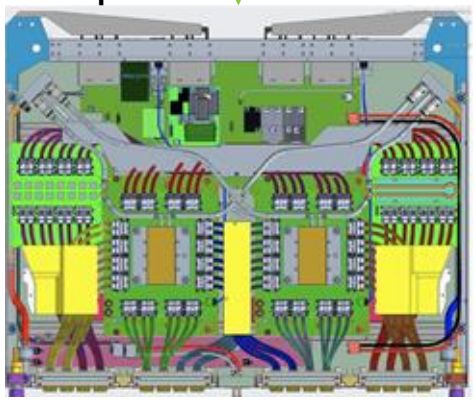
IceTea



Santa Barbara

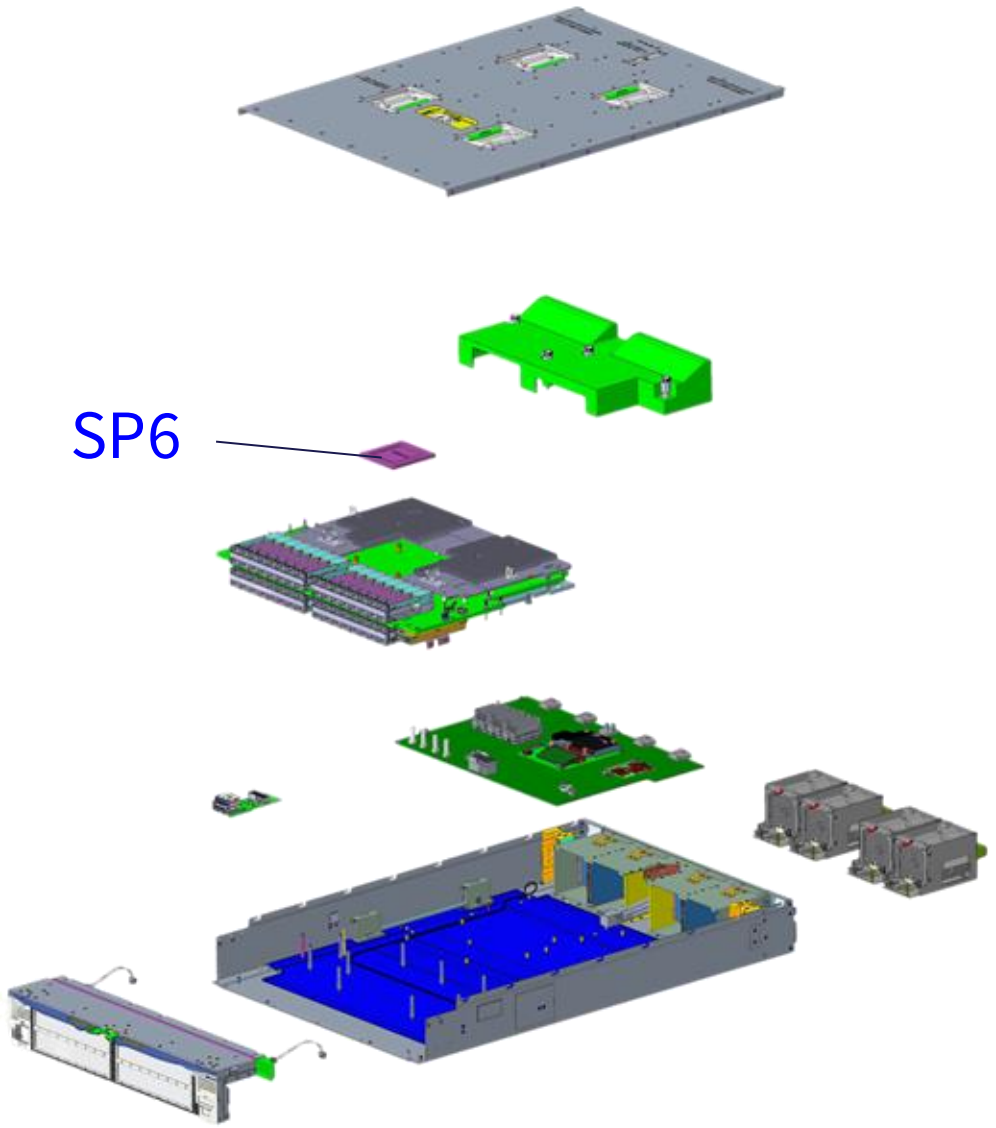


Anacapa



IceCube-N preview

- Leverage the IceCube OCP design.
- Nvidia Spectrum6 102T switch ASIC
- 100% PCB routing for 212GPAM4 signals
- 2x8 stacked OSFPs cage and cold plate in belly-to-belly layout
- Partnered with Accton



Accton

IcePack Racks

- Rack types based on ORv3-HPRv1:
  - GTSW rack,
  - STSW rack and
  - ETSW rack
- Same rack elevation, different optic module/fiber configurations
- GTSW rack has 8,192 in-rack fibers
- Intricate fiber-shuffle design
- Pre-cabled at integrator





Call to Action

- Specs and design package submission Sept 2026
- Where to find additional information: IceCube and IcePack – www.celestica.com

1. The industry should advance the copper cable technology for future generation high speed interconnect designs.

1. Rack level interconnect technology at its limits on current 100T platforms, enabling dense next gen network will require innovation in L11 fiber management, cable backplanes, optical backplanes.

Thank You!

