OFCnet – Connection is the Catalyst

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What is OFC?

- OFC is the Optical Fiber Communication Conference and Exhibition that has been held annually since 1975.
  - Administered by Optica (formerly the Optical Society of America).
- Started out primarily as a components tradeshow.
- Has evolved significantly over time to a comprehensive conference.
  - Research and marketplace
  - Components and systems
  - Technical program and exhibition
- Typically held in March in California
  - ~ 15.5k attendees pre-COVID (2019)
  - ~11.5k attendees post-COVID (2023) and growing.

OFC 2023 Show Floor Map – San Diego Convention Center

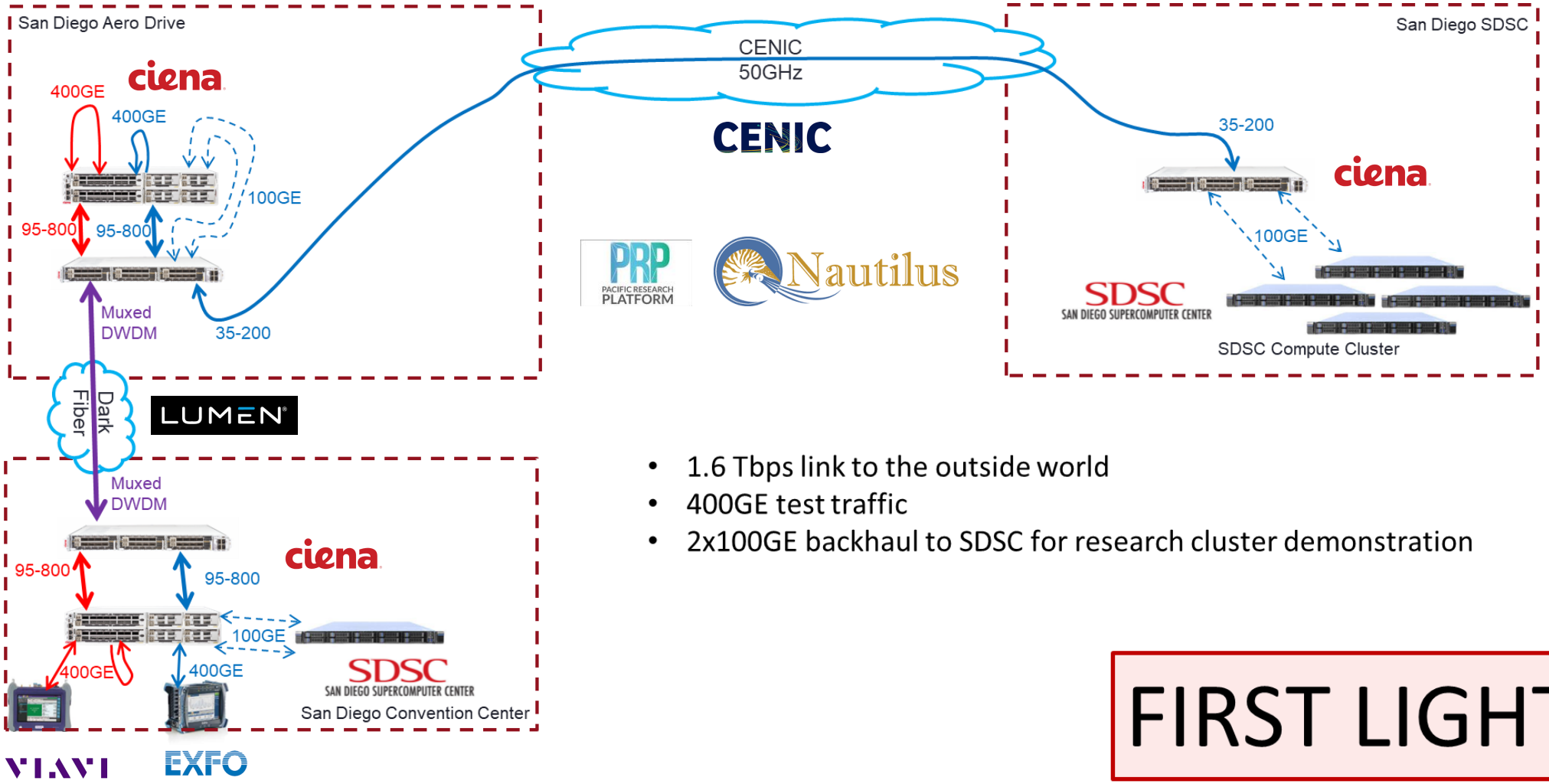
What is OFCnet?

- After the 2019 conference, Optica was challenged by the OFC long-range planning committee to make the conference more relevant to networking.
  - One of the outcomes of this challenge was the idea of OFCnet.
- Primary goals of OFCnet:
  - Highlight the networking aspect of OFC.
  - Increase the Exhibits value proposition.
    - Allow current exhibitors to have live demonstrations possibly extending outside the CC.
    - Increase inter-booth collaboration
    - Reduce the barriers of live demonstrations
  - Draw new attendees and exhibitors.
    - Networking science
    - High Performance Networking applications
    - Emerging technologies
  - Bridge the technical and exhibits programs.
    - Demonstration of technical papers.
    - Activities that lead to new publications and awards.

Turbulent Beginnings

- Initial schedule was to have the first instantiation of OFCnet in 2020.
  - Delays getting fiber built into the convention center.
  - COVID-19!!!
- OFCnet activity was cancelled for 2020.
- OFC 2021 conference was virtual only.
- OFCnet activity was reset for the 2022 conference.
  - Still many unknowns/challenges due to COVID.
  - Modest goals to provide “First Light”
    - Proof of concept to show that external fiber could be brought into the show floor and a live demonstration run on the show floor.
    - Collaboration between Optica, Lumen, CENIC, Ciena and Smart City to get fiber into the SDCC from the Aero Drive POP in San Diego and 2x 100GE backhaul to UCSD campus.
    - Worked with local researchers at SDSC to define a demo.
    - Test equipment provided by EXFO and Viavi.

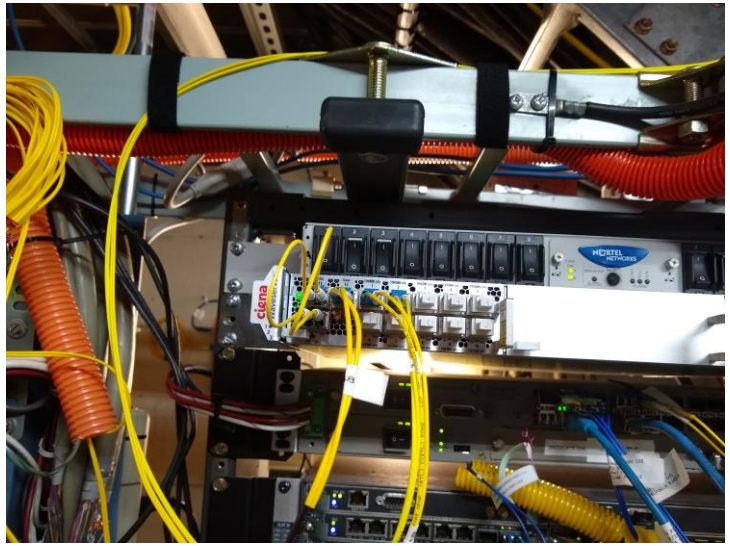
OFCnet 2022 Architecture Diagram



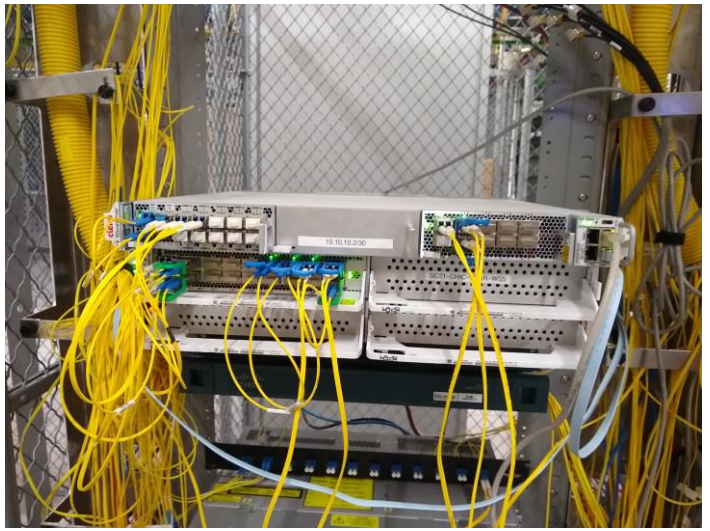
- 1.6 Tbps link to the outside world
- 400GE test traffic
- 2x100GE backhaul to SDSC for research cluster demonstration

FIRST LIGHT

OFCnet 2022 Photos



WSAi in SDCC MDF



WSAi and WS5 in Aero Drive POP

WS5 and SDSC server on the show floor

2023 – OFCnet Pilot

- 2023 was the official pilot year for OFCnet
  - Attempt to realize some of the goals of the original 3-year vision for OFCnet in a significantly increased scale from the 2022 activity.
  - Many more volunteers needed to plan and build the network.
  - Increased participation from equipment vendors.
  - Much larger number of demonstrations.
- OFCnet provided the following for the OFC 2023 conference:
  - Space and power for demonstrators that did not otherwise have booth space to host their demos.
  - Fiber connectivity to the outside world.
    - One pair for high bandwidth connectivity to research networks.
    - Two pairs for optical research demonstrations.
  - Dark fiber connectivity within the convention center.
  - Limited commodity internet access specific to OFCnet demonstrations only.

OFCnet Volunteers

- OFCnet planned, built and maintained by 24 volunteers from the following organizations:

OFCnet Equipment and Network Vendors

- OFCnet infrastructure equipment and networking services loaned by the following organizations:

ADVA Optical Networking

ciena

CISCO

CENIC

CORNING

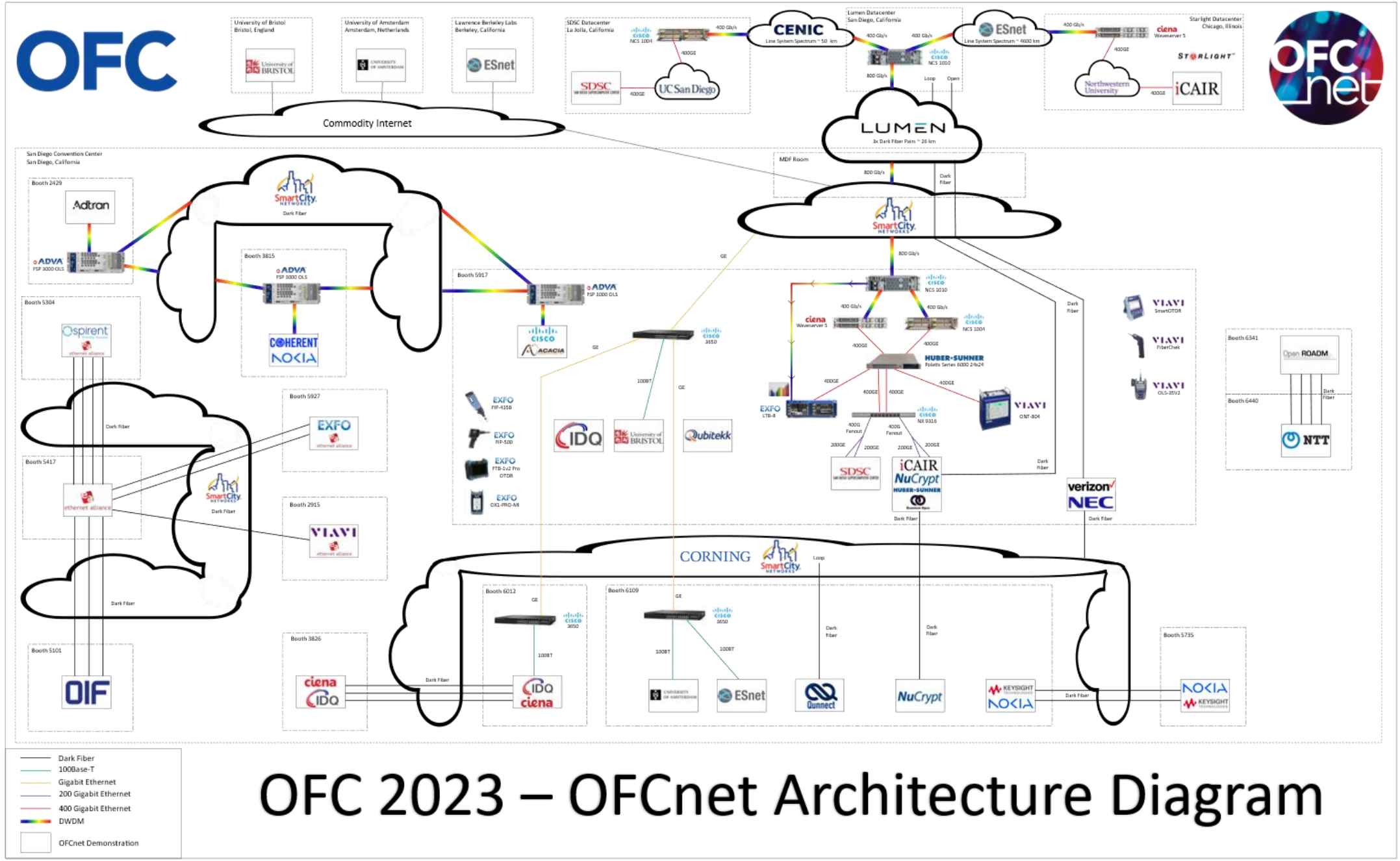
ESnet ENERGY SCIENCES NETWORK

EXFO

HUBER+SUHNER

LUMEN

VIAVI



OFC 2023 – OFCnet Architecture Diagram

OFCnet 2023 Demonstrations

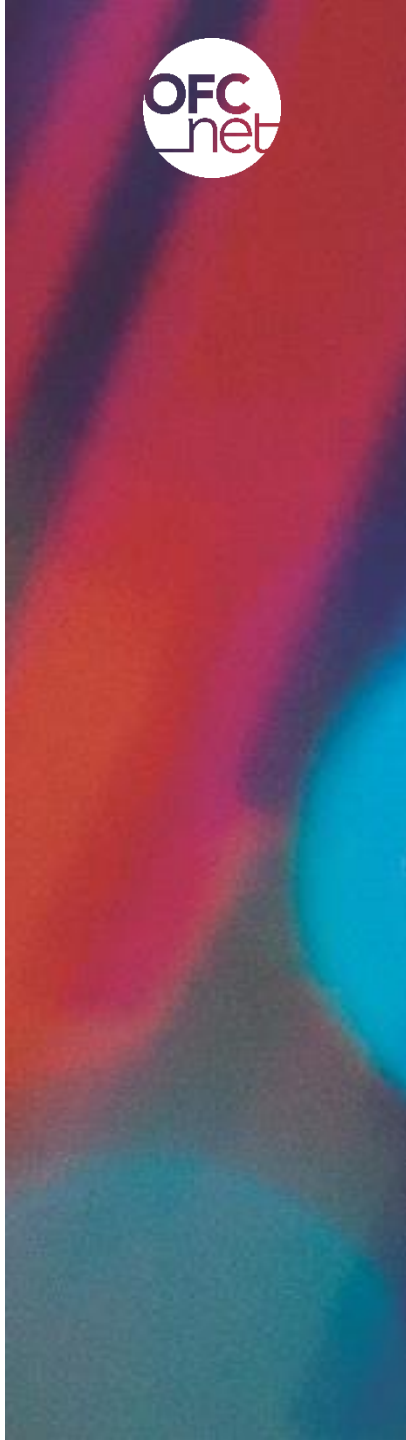
https://www.ofcconference.org/en-us/home/exhibition-and-show-floor-programs/ofcnet/ofcnet-demonstrations/

- OFCnet supported 19 different demonstrations on the show floor.
  - Most demonstrations hosted in two large OFCnet booths, others scattered across the show floor.
  - Combination of classical and quantum demonstrations with the following involved organizations:

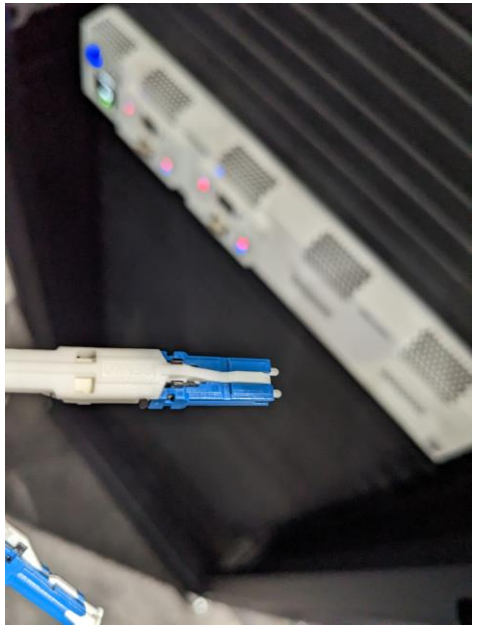
iCAIR, HUBER+SUHNER, NuCrypt, Quantum Opus, SDSC San Diego Supercomputer Center, ESnet, Adtran, COHERENT, Cisco, Acacia Communications, Inc., Nokia, Keysight Technologies, VIAVI, ethernet alliance, EXFO, Spirent Promise. Assured., OIF, University of Bristol, Open ROADM, NTT, ciena, IDQ, Qubitekk, University of Amsterdam, verizon, NEC, Qunnect

Some Demonstration Highlights

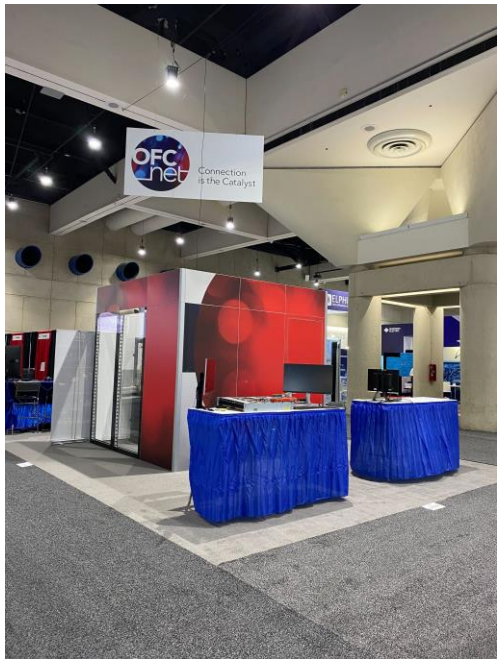
- Many Quantum demonstrations including QKD encryption at 800 Gb/s linerate, quantum entanglement over > 50 km of external fiber, co-propagation of quantum and classical signals.
- High Performance 400GE flows over a 9300 km WAN.
- Distributed High Performance Compute clusters
- 800GE optics
- 400ZR/ZR+ coherent pluggable optic interop
- Open ROADM and Open transponder platforms
- High Touch line rate packet telemetry
- Photonic Remote sensing




Quantum Opus
ELPHIC




OFC net
Connection is the Catalyst
ELPHIC
LOBBY • RESTROOMS
B1
KEYSIGHT
Joint demos with industry innovators to showcase comprehensive solutions
Our partners at OFC 2023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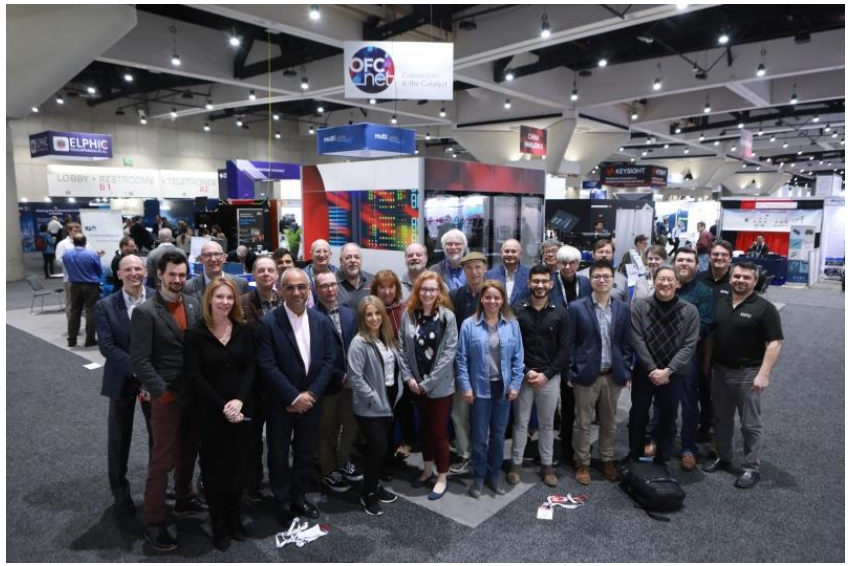

OFC net
ELPHIC
KEYSIGHT

Other OFCnet Activities in 2023

- Beyond the demonstrations on the show floor, OFCnet also hosted 7 different panel discussions.
  - Introduction to OFCnet
  - Optical Engineering and Maintenance
  - Quantum Key Distribution
  - Quantum Networking – Coexistence and Entanglement Transportation
  - High Performance Networking
  - Backstage Pass – Providing Optical Connectivity to the SDCC
  - Emerging Technologies
- A “Birds of a Feather” workshop was also held to discuss the future of OFCnet and how to better integrate with the existing technical program.
  - Combination of industry and academia participation.
  - Many ideas discussed, needs further evaluation to understand feasibility.

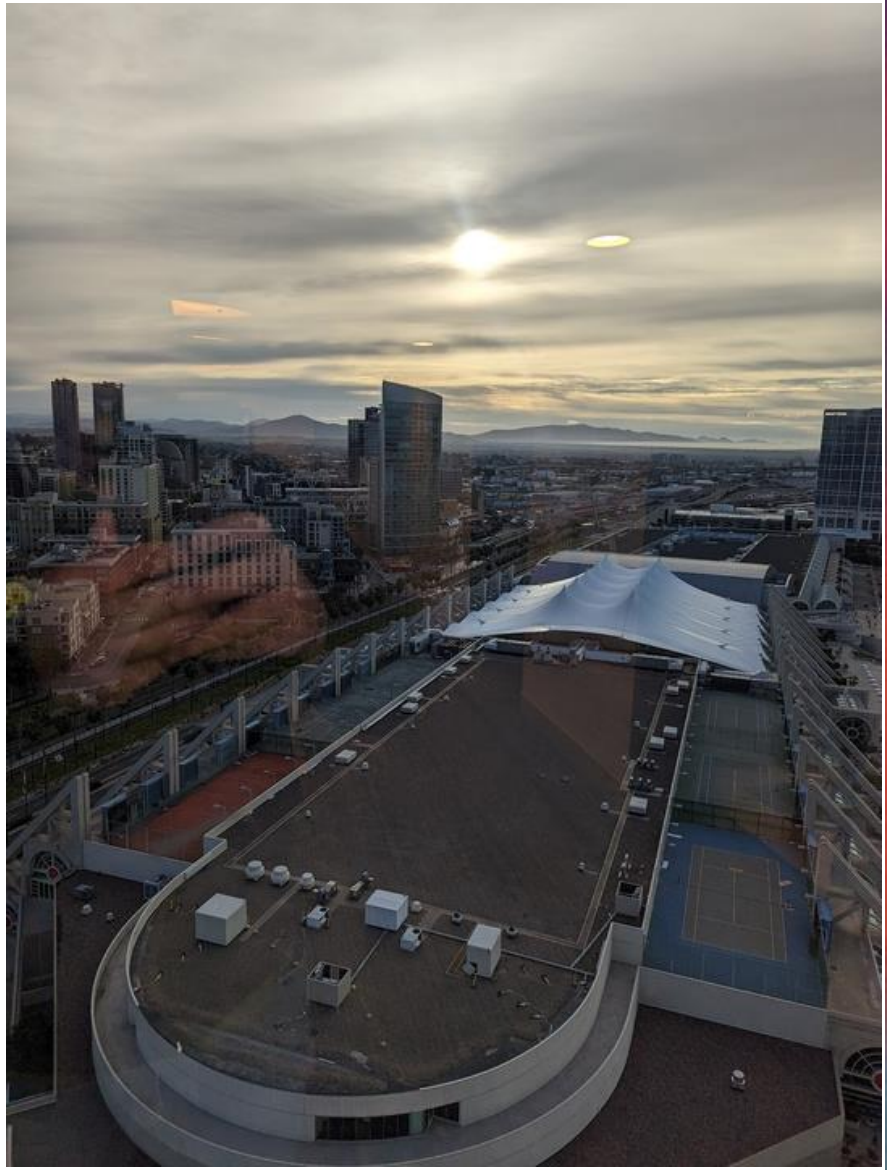
What's Next for OFCnet

- Optica was very pleased with the interest that OFCnet generated for the 2023 OFC conference.
  - Initial target of ~ 10 demonstrations was nearly doubled.
  - 100% of those involved with OFCnet for 2023 (including volunteers, demonstrators, contributors) were interested in being involved for 2024.
  - Many learnings from the pilot experience, but overall deemed a large success.
- Proposed additions for 2024
  - Larger team of volunteers required.
  - Formal call for demonstrations.
  - Addition of a "breakable" network to demonstrate troubleshooting and diagnosis technologies.
  - Closer ties to the tech program
    - Potential live demonstrations of tech paper concepts
    - Network challenges, workshops and short courses.

2024 OFC Conference Details

- 2024 OFC Conference
  - San Diego, California
  - Technical Conference: March 24-28, 2024
  - Exhibition: March 26-28, 2024

- OFCnet planning for 2024 is starting now.
  - Those interested in being part of OFCnet for 2024 in any capacity can contact the OFCnet chair: Marc Lyonnais



Q&A

Questions??

Thank You

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