Joint IEEE / ITU-T Workshop
Montreal, Quebec Canada
Emerging Standards in the AI/ML World

Session 3 –
"Higher Speed Solutions"

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IEEE 802 ITU

Foreword

- Per IEEE-SA Standards Board Bylaws

  “At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position of IEEE.”

Abstract

- The IEEE P802.3dj 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet project is developing 200 Gb/s electrical and optical PAM4 signaling, as well as 800 Gb/s DP-16QAM for 800 GbE coherent solutions. It is anticipated that AI Backend scale-up, scale-out, and scale-across networks will quickly leverage the technologies being developed in this standard and then begin looking for the next generation of solutions. This panel will review the current state of the IEEE P802.3dj draft standard and explore its impact on the next generation of signaling and potential network solutions.

Session Agenda

Name	Affiliation	Presentation	Time	Schedule
John D'Ambrosia Sudipta Bhaumik	Futurewei, U.S. Subsidiary of Huawei Sterlite Technologies	Introduction	10	14:00
Kent Lusted	Synopsys	Ethernet's Response to the AI Industry The IEEE 802.3 400 Gb/s/Lane Signaling Study Group	20	14:10
Marco Mascitto	Nokia	Coherent Ethernet for the AI Era	20	14:30
Qirui Fan	Huawei	ITU-T SG15/Q6 perspectives on technologies and standardization How to move from 800G to B1T?	20	14:50
Q&A			20	15:10

Moderators

John D'Ambrosia, Chair, IEEE P802.3dj Task Force and IEEE 802.3 NEA Ethernet for AI Assessment

Technical Vice President, Futurewei, U.S. Subsidiary of Huawei

John D'Ambrosia is a Technical Vice President with the Datacom Standards Research team at Futurewei Technologies, a U.S. subsidiary of Huawei. John has over 25 years of supporting standards development. John is currently the chair of the IEEE P802.3dj 200 Gb/s, 400 Gb/s , 800 Gb/s and 1.6 Tb/s Task Force. He is also leading the IEEE 802.3 NEA "Ethernet for AI" Assessment, which is exploring 400 Gb/s electrical and optical signaling, as well as 3.2 Tb/s Ethernet. Previously, John chaired the IEEE 802.3 Task Forces that developed 40 GbE and 100 GbE, 200 & 400 GbE, and 800 GbE. Additionally, he chaired other IEEE 802.3 task forces, as well as the IEEE 802.3 New Ethernet Applications Ad hoc. John is a Senior Member of IEEE. John is one of the founders of the Ethernet Alliance, served as its chairman from 2011 to 2019, and is, currently, its Chair Emeritus. John served as an advisor to the European Photonics Industry Consortium from 2019 to 2022. His previous work experience includes Dell, Force10 Networks, and Tyco Electronics.

Sudipta Bhaumik, Vice Chair ITU-T SG15 and WP2/15

Head - Applications and Standards Engineering, Optical Networking Business, Sterlite Technologies Ltd (STL)

Sudipta Bhaumik, possesses over 28 years of experience in telecom field. An architect of STL's fiber and cable manufacturing plants, his expertise spans Quality Assurance/ control, Process Engineering, Reliability Engineering, Management Systems, Business Development, Pre-sales, Applications and Standards Engineering. Sudipta serves as Vice Chair of ITU-T SG15 and WP2/15, a Liaison Officer for IEC TC86 (Fibre Optics), and project leader/ editor for nine international standards. His contributions earned him prestigious IEC 1906 Award and a Guinness World Record for the most viewers of a live-streamed telecommunications lesson. Sudipta holds an M.Tech degree from IIT-BHU, India, has published over 40 papers, holds multiple patents, and is a two-time recipient of the Urbain J.H. Malo Award for most meritorious research paper at the WAI convention in Atlanta.

Kent Lusted, Chair, IEEE 802.3 400 Gb/s/lane Signaling Study Group

Distinguished Architect, Synospys

Kent is a Distinguished Architect at Synopsys and an integral part of the company's Ethernet IP design team. He has been an active contributor and member of the IEEE 802.3 Ethernet PHY standards development leadership team for ~15 years. Prior to Synopsys, Kent worked at Intel for 30+ years, focused on designing Ethernet board products and performing Ethernet interop debug all over the world. Kent is currently the electrical track chair for the IEEE P802.3dj Task Force and Chair of the IEEE 802.3 400 Gb/s/lane signaling study group.

Marco Mascitto

Director, Optical Standards, Nokia.

Marco Mascitto is Director of Optical Standards at Nokia, where he drives interoperability and architecture for next generation optical networking technologies. With more than 25 years of experience in telecom and data center networking, he has led product strategy, system design, and market development across Ethernet, coherent optics, and AI infrastructure. Marco is an active contributor to the IEEE 802.3 and OIF, helping shape technologies such as coherent Ethernet and high speed interconnects for AI data centers. Before entering the data centre industry, he held the position of CTO and lead technology development for several companies that developed Carrier Ethernet solutions for the CSP market.

Qirui Fan

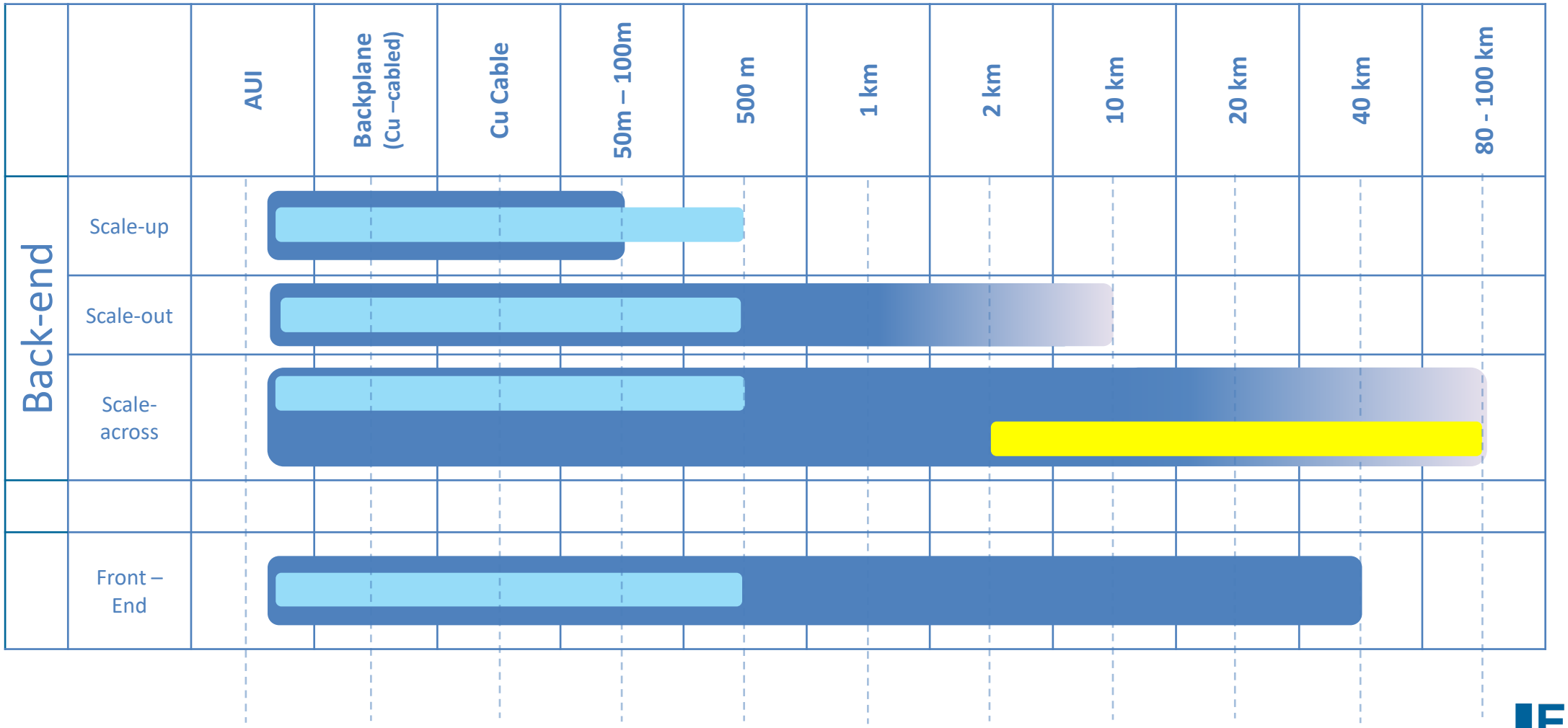
Engineer, Huawei

Qirui Fan is an engineer working on high-speed optical communications and their standardization. Since 2023 he has contributed to the transmitter quality metric work in ITU-T Q6/15, where the metric first proposed as TCC grew into ETCC, co-developed with IEEE P802.3dj, validated on OIF multi-vendor plug-fest data, and now normative in draft G.698.2. He also contributed to the statistical chromatic-dispersion model for 800G engineered links adopted into ITU-T G.652 in 2024, and participates in the work of ITU-T SG15, IEEE 802.3 and OIF. He received his PhD from The Hong Kong Polytechnic University, where his research on machine learning for optical communications was published in Nature Communications, a journal he also reviews for. He joined Huawei Hong Kong Research Center in 2022.

Introduction – IEEE 802.3

- IEEE P802.3dj (200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet) completion anticipated Q4/26
- IEEE 802.3 400 Gb/s Per Lane Study Group
  - 400 Gb/s per lane signaling for electrical interconnects as well as single-mode fiber optical interconnects with reaches up to 500 meters
  - Approved @ IEEE 802 March 2026 Plenary
  - Anticipated approval of IEEE P802.3dv Task Force, Q3/26
- 1.6 TbE forecasted to dwarf shipments of 400 GbE and 800 GbE
  - https://www.ieee802.org/3/ad_hoc/E4AI/public/26_0611/dambrosia_e4ai_01a_260611.pdf#page=14

“AI Networks” Industry Need versus Efforts



Radix
“break-out”
“Fat-Pipe”
Point-to-point

Industry Need
IEEE 802.3 400GPL SG
LR / ZR Optics – May be used as part of DWDM system

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Looking at Potential IEEE 802.3 Efforts Going Forward

Ethernet Rate	AUI	Backplane	Cu Cable	MMF	SMF 500m	SMF 2km	SMF 10km	SMF 20km	SMF 40km
200 Gb/s	200GAUI-1 C2C C2M	200GBASE-KR1	200GBASE-CR1	1. 200GBASE-SR1-30 2. 200GBASE-SR1-50 3. 200GBASE-MR1	200GBASE-DR1	200GBASE-DR1-2			
400 Gb/s	400GAUI-2 C2C C2M	400GBASE-KR2	400GBASE-CR2	1. 400GBASE-SR2-30 2. 400GBASE-SR2-50 3. 400GBASE-MR2	400GBASE-DR2	400GBASE-DR2-2			
800 Gb/s	800GAUI-4 C2C C2M	800GBASE-KR4	800GBASE-CR4	1. 800GBASE-SR4-30 2. 800GBASE-SR4-50 3. 800GBASE-MR4	1. 800GBASE-DR4 2. 800GBASE-FR4-500	1. 800GBASE-DR4-2 2. 800GBASE-FR4	1. 800GBASE-LR1 2. 800GBASE-LR4	800GBASE-ER1-20	800GBASE-ER1
1.6 Tb/s	1.6TAUI-8 C2C C2M	1.6TBASE-KR8	1.6TBASE-CR8	1. 1.6TBASE-SR8-30 2. 1.6TBASE-SR8-50 3. 1.6TBASE-MR8	1.6TBASE-DR8 FR Optics	1.6TBASE-DR8-2	Coherent Optics		
3.2 Tb/s	3.2TAUI-8 C2C C2M	3.2TBASE-KR8	3.2TBASE-CR8		3.2TBASE-DR8	3.2TBASE-DR8-2			

Currently not in development

Currently not in development, but could leverage IEEE P802.3dv solutions

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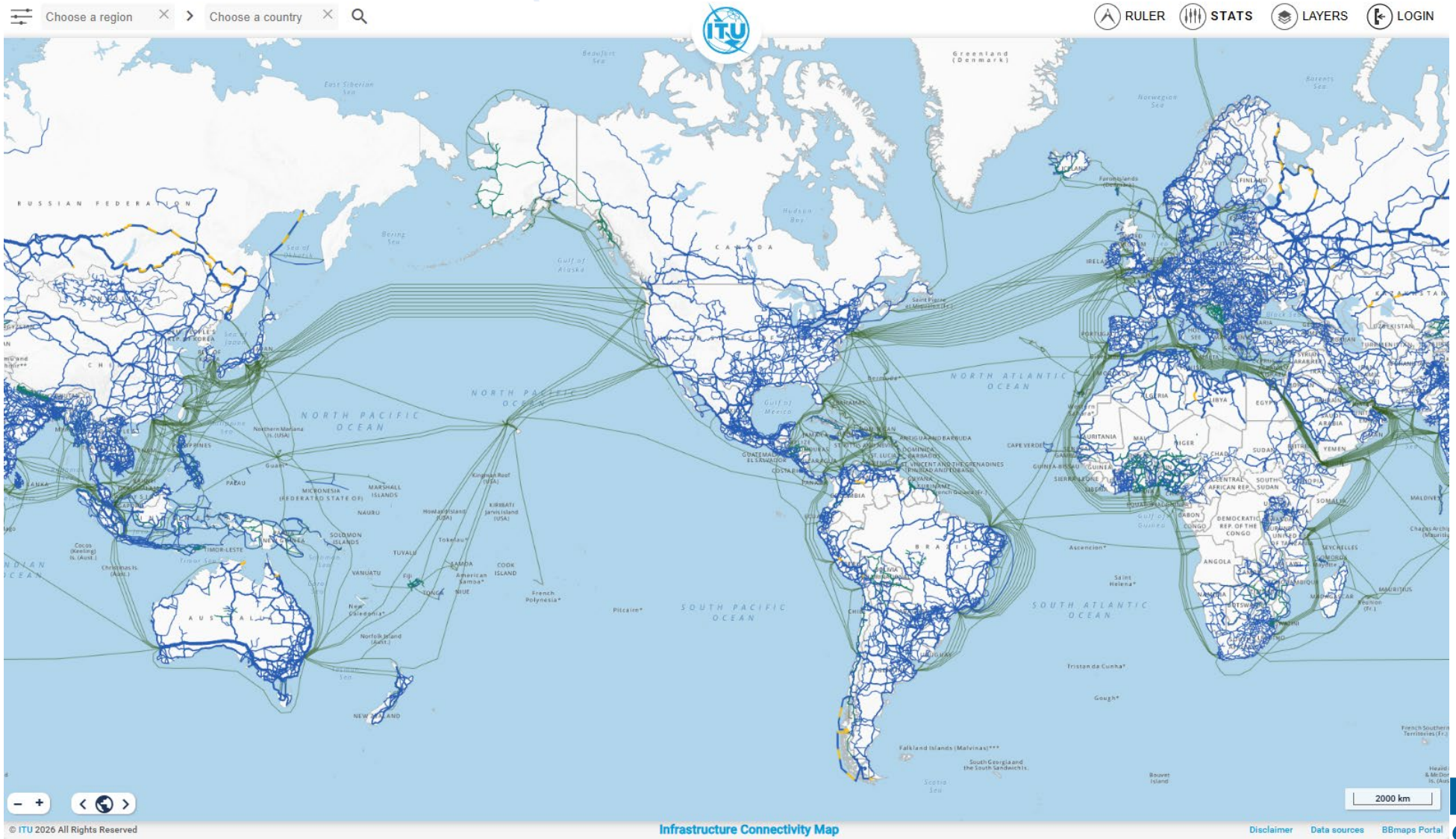
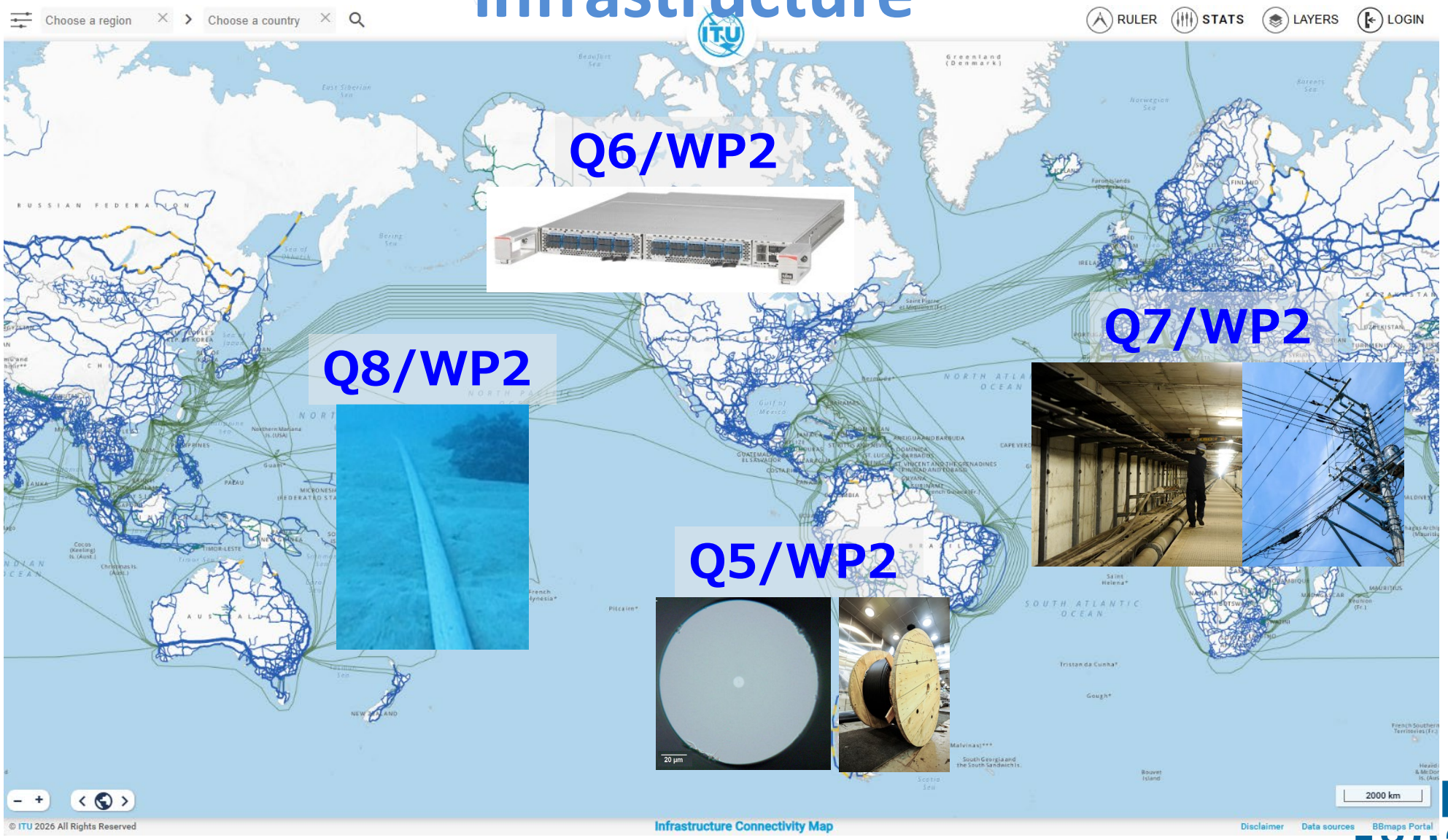
ITU-T WP2/SG15- Optical Technology and Physical infrastructure



[ITU - Infrastructure Connectivity Map]

ITU-T WP2/SG15- Optical Technology and Physical infrastructure



[ITU - Infrastructure Connectivity Map]

High-Speed Optical Transport for AI/ML

01. The AI/ML Catalyst

The Bottleneck

Training foundation models requires moving petabytes of data with sub-microsecond latency. AI clusters are entirely constrained by "East-West" network throughput.

The SG15 Mandate

AI is no longer just a compute problem; it is a transport and optical networking problem. The goal is to provide deterministic, ultra-high-bandwidth pipes for distributed AI.

02. High-Speed AI Transport Blueprint

Scaling Beyond 800G

Standardizing 800G metro DWDM (Q6) and accelerating industry consensus toward 1.6T optical systems and Beyond 1 Terabit (B1T) OTN (Q11).

Next-Generation Media (Q5 & Q6)

Pushing optical physics with G.654.E, Space-Division Multiplexing (SDM), and Hollow-Core fibers for near-speed-of-light, ultra-low latency AI DCI.

Energy-Efficient Optics

Addressing massive power draw by exploring transport support for low-power interfaces (CPO, LPO) and AI-native optical infrastructure.

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The Strategic Horizon and Session Objectives

03. The Strategic Horizon

The ION-2030 Framework

To sustain the global AI rollout, next-gen networks must support critical physical standards:

- **Sub-millisecond** latency
- **Multi-terabit** line capacities
- **Pico-Joule/bit** energy efficiency

04. Session Objectives

Bridge the Gap

Harmonize SG15's optical transport and physical layer innovations with IEEE 802's high-speed Ethernet (802.3dj).

Drive Interoperability

Ensure multi-vendor compatibility across massive scale-out AI computing fabrics.

"We cannot scale AI without scaling the optical foundation. Today's session explores how we build the physical layer of the AI revolution."