Looking Towards the 6G Future: Highlights from MOPA's September 2025 Webinar

Industry leaders discuss why optical standardization is critical for 6G networks

The mobile industry stands at a critical inflection point. With 5G subscriptions surpassing 2.9 billion globally and data traffic growing 20% year-over-year, the infrastructure demands are unprecedented. In our recent webinar, "Racing to 6G: Why Optical Standardization Matters Now," MOPA brought together experts from Ericsson, Nokia, and Semtech to address why standardization is urgent.

The Challenge: Mobile Networks as Critical Infrastructure

Mobile networks now serve far more than smartphone users—they support enterprise applications, satellite communications, mission-critical services, and increasingly, AI traffic. Monthly global mobile network data traffic has reached 180 exabytes, projected to grow to 482 exabytes by 2031. By decade's end, 5G networks will handle 83% of all mobile data traffic.

The Hidden Bottleneck: Optical Transport

While spectrum and radio technology capture attention, optical connections linking antenna sites to the network core represent a critical bottleneck. Every cell site requires fiber connections using optical pluggables—and in dense urban areas, sites can be deployed every 50 meters.

Mobile networks face unique requirements:

- Extreme temperature ranges (-40°C to +85°C)
- Remote, hard-to-access locations
- Small form factors with 20+ year lifespans
- Sub-microsecond timing synchronization accuracy

Without standardization, the industry risks fragmentation and deployment complexity.

MOPA's Role: Unifying the Industry

MOPA brings together RAN vendors (Ericsson, Nokia), IC suppliers (Semtech, MACOM), and pluggable manufacturers (Coherent, Lumentum, Sumitomo Electric, NEC, Point 2 Technologies, Bifrost, APAC Opto) to publish technical "blueprints" for mobile optical transport.

Our current technical paper (version 3.2) covers 19 blueprints with 23 data rate variants. Working with an Operator Advisory Board including Orange, Verizon, NTT, Telia, Telefonica, T-Mobile, BT, and SK Telecom, we ensure real-world needs drive standardization.

Key achievements include:

- Frameworks for tight timing synchronization with IEEE
- Increased awareness of mobile-specific requirements
- Active liaison with ITU, OIF, IETF, and other standards bodies

The Roadmap: 25G to 100G and Beyond

Andrew Bender (Nokia) outlined the evolution: today's 25G connections transition to 50G in 2026, then 100G in 2028 as new spectrum triggers site upgrades and initial 6G deployments. Looking ahead, fronthaul may require 100 Gbps with sub-200 microsecond latencies.

Stefan Dahlfort (MOPA President, Ericsson) emphasized that 6G isn't a 2030 problem—it's a 2025 challenge. Analysis shows existing spectrum portfolios reach capacity by 2029-2030, making today's standardization work critical.

Why It Matters: The Supply Chain Perspective

Raza Khan (MOPA CMO, Semtech) highlighted that semiconductor companies plan chip development three years ahead with millions in R&D investment. "Without standardization telling us the right requirements at the right time, we risk missing critical deployment windows," Khan explained.

This makes MOPA essential not just for interoperability, but for enabling the entire supply chain to move forward confidently.

Operator Priorities

Webinar participants identified critical requirements:

- Auto-negotiation to simplify deployment across thousands of sites
- Tight synchronization for advanced network slicing
- Cost-effective 100G solutions with clear ROI
- Long lifespan and wide temperature range support

As one operator noted: "These requirements aren't theoretical. Any deployment friction multiplies exponentially."

Looking Ahead

The webinar confirmed that optical standardization is foundational to 6G success. With first commercial 6G deployments expected in 2030-2031, the standards work must happen now. MOPA's role in unifying operators, equipment vendors, and component suppliers ensures the industry moves forward

together.

Join the Conversation

MOPA's technical papers are publicly available at **mopa-alliance.org**. We welcome operators, equipment vendors, and component suppliers interested in shaping mobile optical transport's future.

The next MOPA technical paper release is scheduled for **OFC 2026**.

About MOPA: The Mobile Optical Pluggable Alliance publishes technical papers describing requirements and optical solutions for mobile transport in 5G and emerging 6G networks. For more information, visit mopa-alliance.org