



AT&T's View on ION 2030

AI-Enabled Access Networks and Standardization

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AI Activities in ITU Q2-SG15 Q2

- ITU-T SG15 Q2-Q3 has initiated a new supplement G.suppl.ION-aiBB focused on AI-enhanced broadband optical networks (ION-2030 vision)
- Q2 is defining use cases, requirements, and architectural direction for integrating AI into access networks and home environments
- Broad set of AI-enabled network operations, optimization, and services across access and home environments
- Keys Areas Identified in AIBB Supplement

Category	Key Areas	AI Impact
AI for Broadband Network	Energy efficiency, bandwidth prediction & DBA, ops automation, event detection, signal processing, optics prediction	Power saving, traffic forecasting, automated fault detection, improved signal quality, proactive optics maintenance
Broadband Network for AI	Elastic networks, computing bus, distributed storage	Scalable infrastructure to support AI workloads across edge–cloud
AI & Broadband Network	2D→3D video, AppFlow services, service type identification	AI-driven applications, app-aware QoS, intelligent service classification
AI-Enhanced Network Mechanisms	Optical network enhancements, AI process flows	

Why AI Matters to Service Providers



Unlock new revenue-generating services beyond traditional residential broadband, helping justify investment in HSP and VHSP networks.



Enhance customer experience through predictive assurance, bandwidth-on-demand, low-latency services, and improved service reliability.



Improve operational efficiency through automation, predictive maintenance, and faster root-cause analysis across network layers.



Optimize network resources and energy consumption, reducing operational costs while improving network utilization.



Enable differentiated premium services with assured performance, reliability, and application-aware experiences.



Transform broadband networks into intelligent service platforms, creating flexibility for operators to rapidly introduce new AI-enabled capabilities and business models.

AT&T View : Priority AI applications and expected benefits

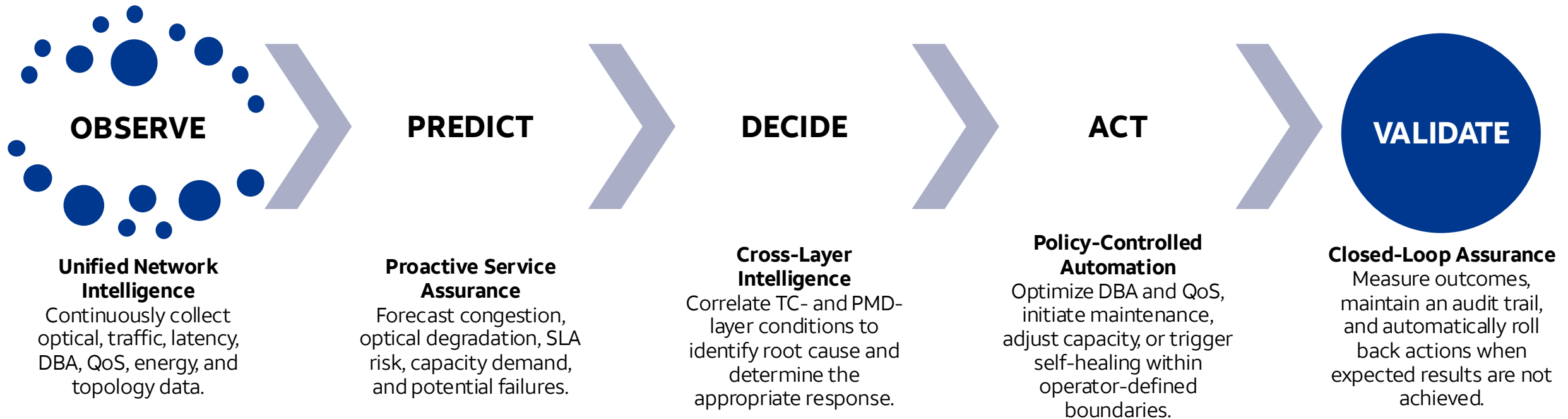
Use case	Example	Service-provider benefit
Automated telemetry	Monitor PHY, DBA, and QoS metrics per ONU	Detect degradation earlier and reduce troubleshooting time
Predictive assurance	Predict congestion, optical-power drift, or SLA risk	Prevent customer impact and improve reliability
Topology and digital twins	Simulate a higher split ratio before deployment	Reduce deployment risk and improve planning
Differentiated services	Dynamically adjust DBA for an enterprise SLA	Introduce premium low-latency and assured-throughput services
Cross-layer correlation	Compare traffic demand with optical margin	Accelerate root-cause analysis
Safe automation	Apply a bounded QoS change and validate the result	Reduce manual effort while controlling operational risk

End-to-end example

AI predicts evening congestion for an enterprise service, evaluates a DBA adjustment using a digital twin, applies the authorized change, validates SLA performance, and rolls back the change if the expected results are not achieved.

How AI Enables an Autonomous PON

AI transforms TC- and PMD-layer telemetry into predictive, policy-controlled actions that improve reliability, efficiency, and customer experience.



Operator Outcomes

Higher Reliability • Enhanced Customer Experience • New Revenue Opportunities • Lower OPEX

Facts and AI Evolution Considerations

AI models, algorithms, training methods, and implementations will continue to evolve rapidly and should remain vendor and operator implementation choice.

Compute placement should be driven by business value. Any increase in OLT/ONT cost, power, or complexity must be offset through improved operational efficiency, enhanced customer experience, or new revenue-generating services.

Operators require AI decisions based on consistent, trustworthy, and correlated network data across TC and PMD layers.

Interoperability is critical because operators deploy multi-vendor networks and AI ecosystems.

For deployed PON technologies, enhancements should focus on introducing AI-enabling capabilities within existing TC and PMD frameworks while preserving interoperability and protecting deployed investments.

As next-generation systems such VHSP are developed, AI readiness should be designed into the TC and PMD layers.

Future TC and PMD specifications should incorporate native support for enhanced telemetry, observability, security, and AI-assisted network optimization.

A phased approach enables operators to realize near-term AI benefits on existing networks while establishing a foundation for fully AI-enabled next-generation access systems.

Standardize the data, interfaces, and trust framework. AI deployment models, including where compute resides, should remain implementation choices driven by operator economics and vendors business objectives. Q2, FSAN and BBF Collaboration is needed .

