LIGHTWAVE

Simplify, Save, and Scale:
Modernize your broadband access

Presenters:
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Ricky Martinez, General Manager and CEO, Taylor Telecom
Robin Olds, Sr. Business Development Manager, Cisco Systems

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KEY TAKEAWAYS

- Cisco Agile Services Networking solves crucial industry challenges.
- Routed PON leverages technology advancement to deliver on performance.
- Routed PON unlocks four significant business benefits.
- Cisco addresses network resiliency both reactively and proactively.

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OVERVIEW

In today's hyper-connected world, service providers face unprecedented pressure from bandwidth-intensive applications, such as AI workloads, 4K and 8K video, and virtual reality. Traditional networks are struggling to keep pace, as these applications demand networks that are not only faster, but also smarter, more efficient, and sustainable. As bandwidth and performance demands continue to grow, service providers must evolve their network strategies to reduce complexity and cost.

Cisco Routed PON allows FTTx integration directly into routing architecture. This represents a fundamental shift in access network design—from layered, hardware-heavy, and vendor-locked systems to a software-driven, IP-routed, and highly converged architecture. By aligning access networks with the principles that already govern modern IP cores, Cisco enables service providers to meet exploding bandwidth demands, deliver low-latency AI-ready services, improve resiliency and security, and do so with significantly lower cost and complexity over the long term.

CONTEXT

The presenters discussed the benefits of Cisco's Routed PON solutions over traditional network architecture.

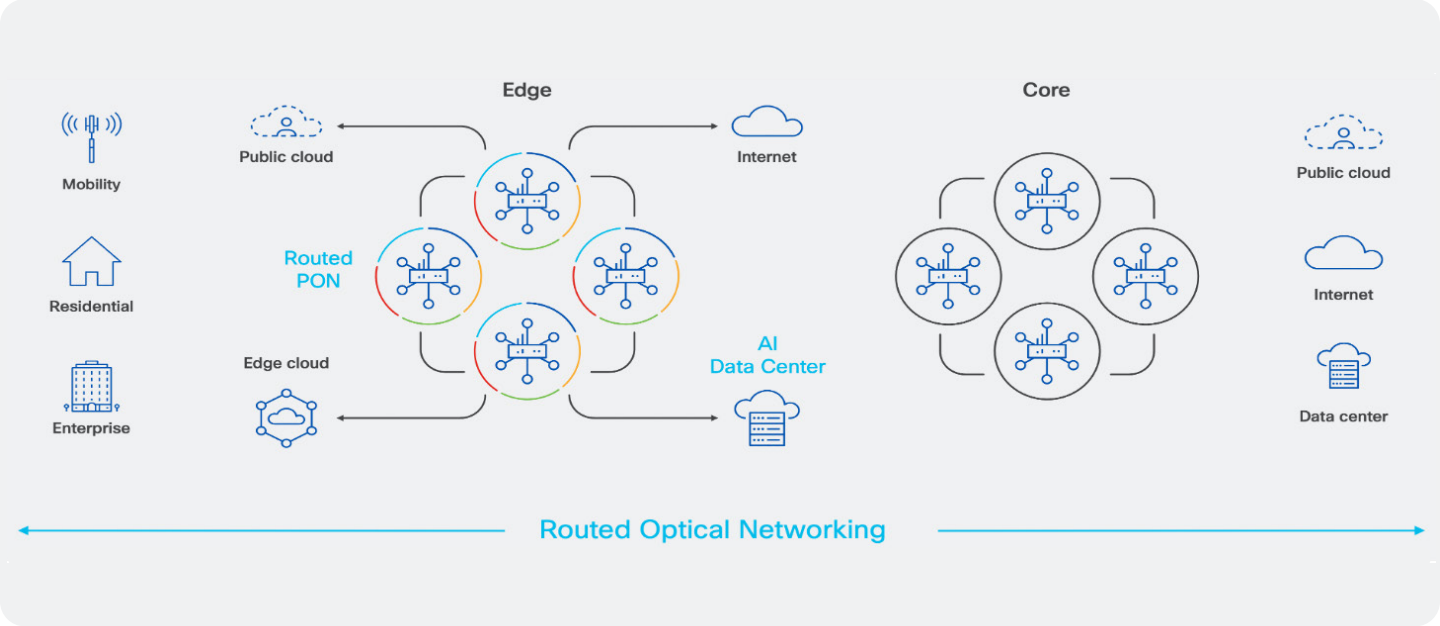
KEY TAKEAWAYS

Cisco Agile Services Networking solves crucial industry challenges.

Explosive growth in immersive experiences, AI workloads, cloud gaming, and streaming have driven demand for greater bandwidth, low latency, and consistent performance. Along with the continued growth of these applications, Cisco predicts that by 2028, 68% of customer service and support interactions with technology vendors will be handled by agentic AI, adding further strain to access networks.

At the same time, industry research reveals that most telecom executives lack confidence that their current architecture can support future increases in bandwidth demand.

Figure 1: Cisco Agile Services Networking enables monetizing delivery of assured services and networking



Surveys have found that 81% of telecom operators are unprepared for AI- and streaming-driven growth in bandwidth demand, while 84% report that customer expectations already exceed network capabilities. Changes to network architecture at the edge are necessary to reduce backhaul traffic and ensure positive subscriber experience.

Cisco Agile Services Networking with Routed PON (Passive Optical Networking) addresses traditional network challenges by transforming how access networks are built and operated.

Instead of maintaining the traditional rigid separations between IP routing, optical transport, and access layers, Cisco's new network architecture focuses on the convergence of IP routing and optical technology—especially at the middle and last mile, where AI connectivity and low latency are crucial.

Routed PON leverages technology advancement to deliver on performance.

Cisco's Routed PON offers a valuable solution to bandwidth and performance challenges, leveraging advancements in PON technology—from 1 Gbps to 10 Gbps today, with development already planned toward 25 Gbps, 50 Gbps, and beyond.

Routed PON operates PON as a Layer 3 service with resiliency. Cisco replaces traditional PON architecture—which uses Layer 2 protection such as G.8032 rings—with routing. Routed PON extends Layer 3 routing to the network edge, resulting in faster convergence, better bandwidth utilization, and quicker failure recovery for improved subscriber experience.

For access networks, Cisco Routed PON enables optical transceivers to connect directly into the router, transforming traditional Layer 2 solutions into fast, intelligent Layer 3 routing and enabling service providers to deliver residential, business, and wireless services over a single, unified infrastructure. In addition, networks built with Cisco technologies can be optimized in real time using AI-powered automation to ensure efficiency—even under heavy demand.

> "Routed PON does not require a large footprint for deployment, and addresses the demand for high-speed, high-quality broadband connectivity in a cost-effective and scalable manner, allowing providers to better serve customers at the edge of their network."
>
> – *Robin Olds, Cisco Systems*

Redefining the last mile

Several key features make the Cisco Routed PON an ideal launching point for redefining the last mile:

- **PON OLT pluggable.** The enabling element of the Routed PON is the PON OLT pluggable, an SFP+ pluggable that supports XGS-PON and integrates directly into existing Cisco access routers. This eliminates the need for a traditional chassis-based OLT and line card solution, increasing operational efficiency and allowing service providers to grow in increments alongside subscriber demand (pay-as-you-grow), rather than committing to a large upfront investment and stranding capacity.
- **Third-party ONT support.** Incumbent PON vendors typically provide a closed ecosystem, requiring the purchase of vendor-specific ONTs. In addition to its own ONT portfolio of flexible solutions, Cisco also provides third-party ONT interoperability (for ONTs supporting OMCI protocols) with the Cisco PON OLT.
- **Robust protection.** Traditional Ethernet protection schemes have inherent scalability, flexibility, and efficiency limitations. Cisco extends Layer 3 segment routing to TI-LFA—a protection mechanism that allows for sub-50-microsecond restoration while maintaining full bandwidth utilization.
- **Consolidation.** Cisco further simplifies the network by integrating coherent DWDM optics (DCOs) into the same router platform. These optics offer the same performance and reach capabilities of traditional optical line systems and transponders.
- **Expanded revenue opportunities.** A traditional PON focuses primarily on residential services, with limited support for businesses. Cisco's multi-use router not only supports XGS-PON but also Active Ethernet and cell site backhaul to enable multiple revenue streams on a single router. Cisco also offers PON integrations with its Meraki and Catalyst platforms to generate additional revenue streams on the network.
- **Future-proof.** Cisco SFP+ cages support simple plug-and-play for increased PON speeds as the technology evolves to 25 Gbps, 50 Gbps, and beyond.

> "This router is basically a Swiss army knife that allows you to do multiple levels of revenue streams, as well as have scalable support for XGS and 25 Gbps in the future."
>
> – *Mike Kim, Cisco Systems*

Routed PON unlocks four significant business benefits.

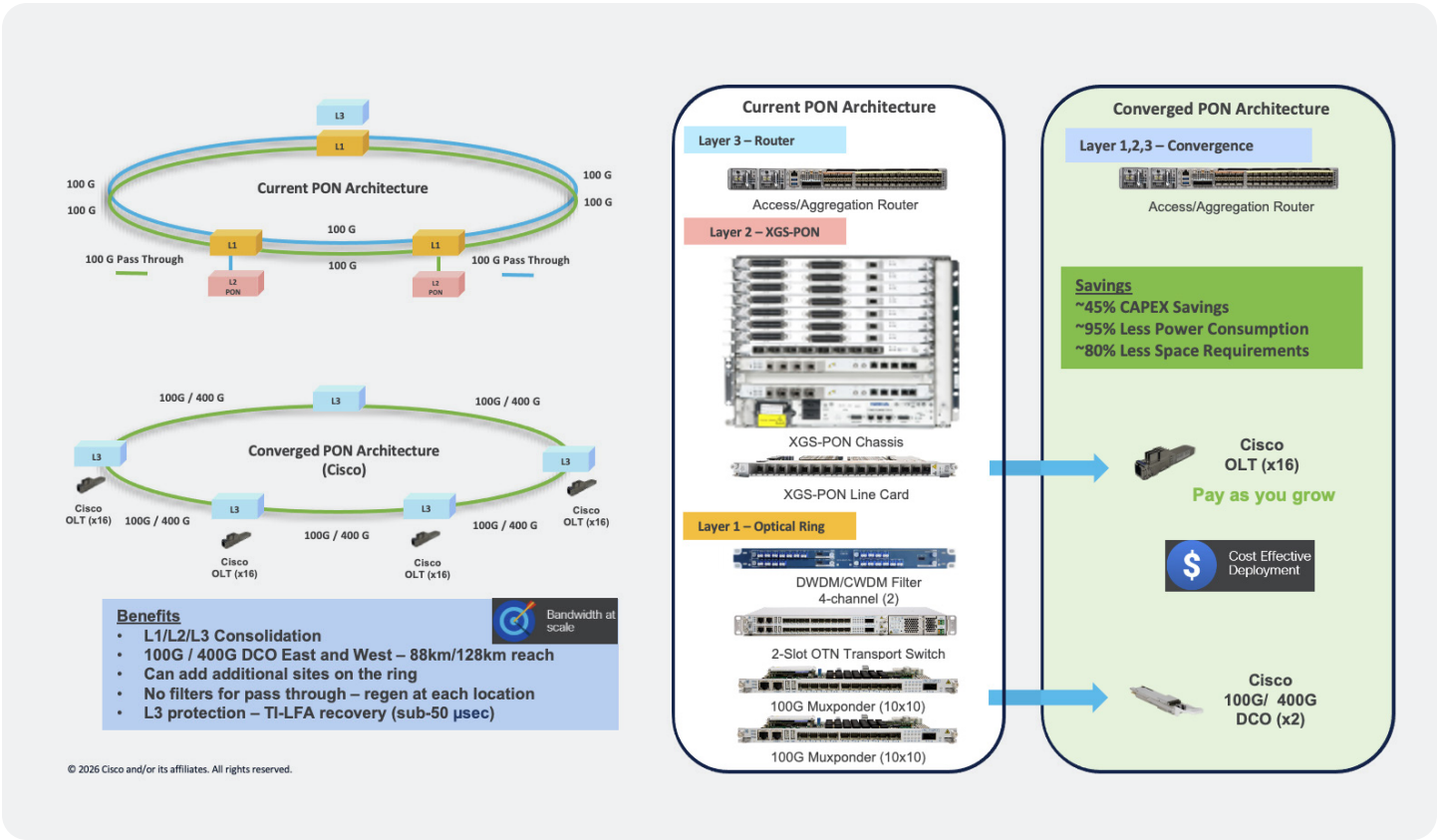
Cisco's Routed PON solution was developed around four core pillars: bandwidth-at-scale, cost-effective deployment, network resiliency, and security.

Collapsing multiple network layers into fewer, intelligent ones simplifies networking, improves efficiency and performance, and increases resilience. Routed PON significantly flattens network architecture, enabling consolidation into a 1U chassis, reducing space, power consumption, and cooling requirements.

By eliminating OLTs, Routed PON lowers total cost of ownership over traditional PON. Cisco calculates that consolidation achieves 45% CapEx savings, 95% less power consumption, and 80% less space.

> "We're seeing tremendous competition increases within markets. The time-to-market aspect is extremely important. Because [Cisco Routed PON] flattens the network at Layer 2 and Layer 3, that makes it very easy and cost-effective for an operator to deploy."
>
> – *Jeff Heynen, Dell'Oro Group*

Figure 2: Cisco consolidates current PON architecture for bandwidth-at-scale and cost-effectiveness

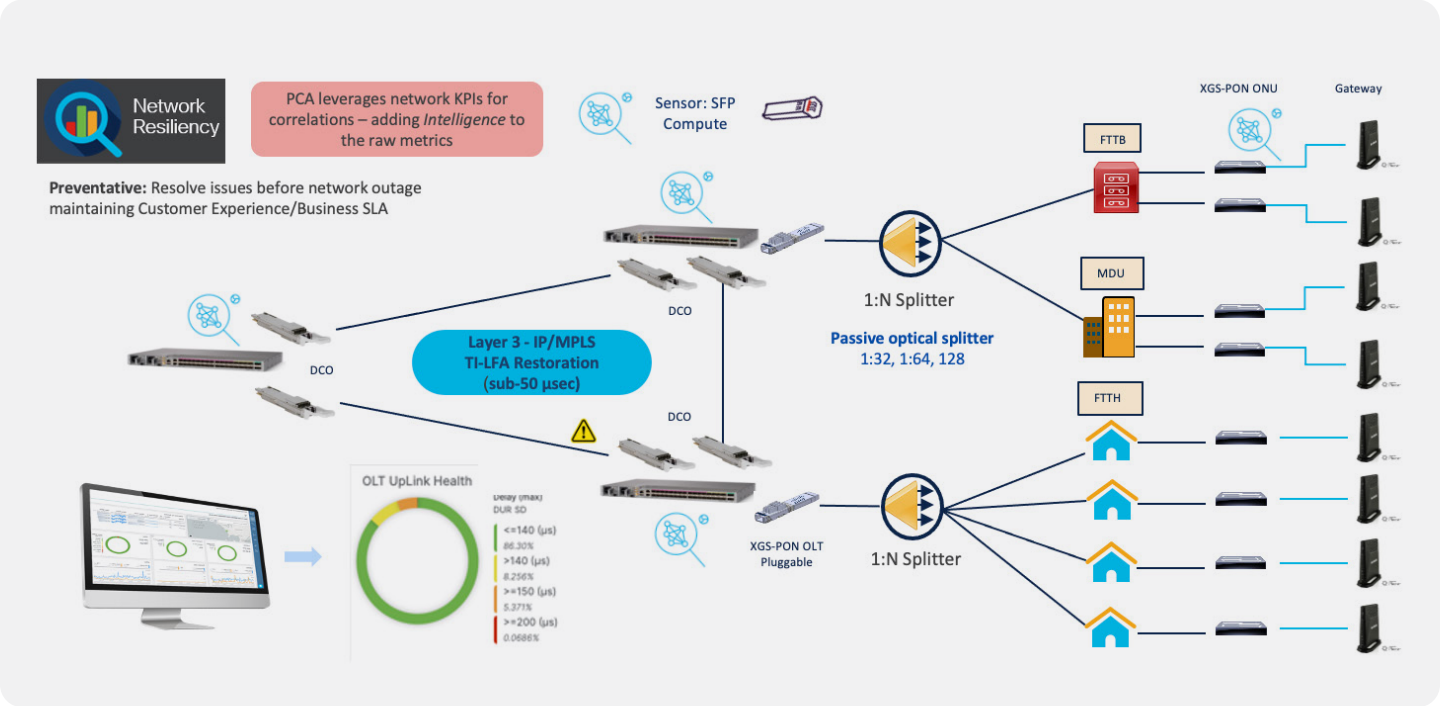


Cisco addresses network resiliency both reactively and proactively.

Reactive protection is provided through fast reroute mechanisms such as TI-LFA. Proactive protection is achieved through Cisco's Provider Connectivity Assurance platform, which uses sensors and telemetry throughout the network to monitor performance against provider-defined KPIs.

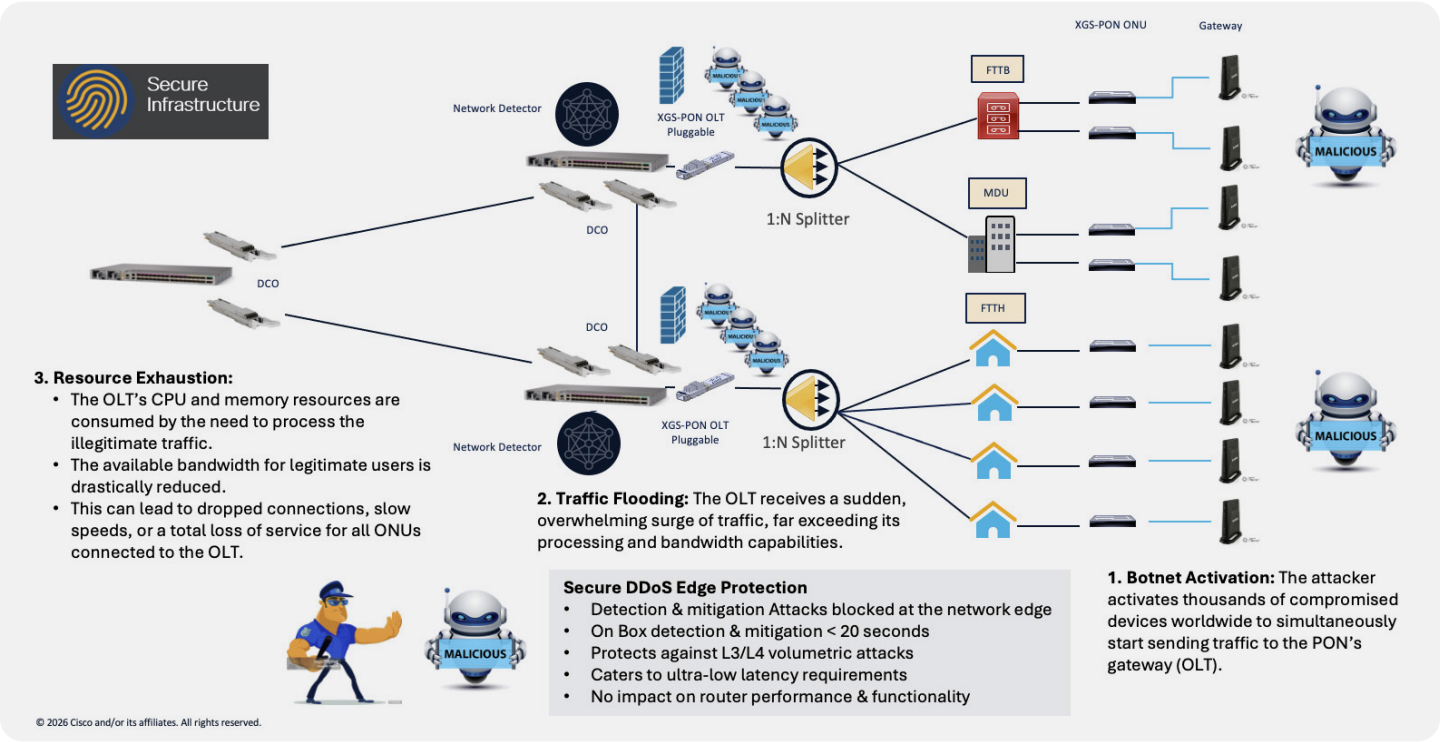
Constant monitoring enables detection and escalation of potential issues before customers experience an outage, enabling preventative maintenance and unlocking additional strict-SLA revenue streams.

Figure 3: Routed PON offers reactive and proactive network resilience



Cisco embeds DDoS edge protection directly into the router operating system, allowing volumetric attacks to be detected and mitigated at the network edge within 20 seconds—before they consume bandwidth or CPU resources deeper in the network, and with no impact on router performance.

Figure 4: Cisco Routed PON mitigates attacks at the edge (access point network)



Case Study: Taylor Telecom

Taylor Telecom is a telecom provider serving primarily rural communities across 2,000 square miles surrounding Abilene, Texas.

Two years ago, Taylor identified the need for a cost-effective solution that would meet its immediate needs and support future multi-gig offerings. The Taylor team sought a fluid solution to minimize the opportunity for failure and provide redundancy and resiliency.

Cisco Routed PON checked all the boxes.

Working closely with Cisco, Taylor became the first adopter of Cisco Routed PON, conducting successful replacement of DZS ONTs within their existing enclosures—each customer install took less than five minutes.

Since deployment, Cisco Routed PON's smart routing has delivered high reliability with minimal issues, generating strong operational confidence in the platform. Having a dependable, scalable solution in place empowers Taylor to optimize long-term investment and drive better outcomes.

> "Everything's smart routed—we've never had an issue with our PON . . . and it allowed us to address some other issues that were important to us."
>
> – *Ricky Martinez, Taylor Telecom*

ADDITIONAL INFORMATION

To learn more, visit **Cisco Routed PON**

BIOGRAPHIES

Jeff Heynen

Vice President of Broadband Access and Home Networking Market Research
Dell'Oro Group

Jeff Heynen joined Dell'Oro Group in 2018 and is responsible for the Broadband Access and Home Networking market, Fixed Wireless Access Infrastructure & CPE, Cable Outside Plant, and vBNG market research programs. Mr. Heynen has expanded the scope of the Broadband Access and Home Networking areas to encompass fixed wireless CPE, virtual CCAP, Remote PHY, remote MACPHY, and DOCSIS 4.0 infrastructure. He has also authored numerous articles and white papers, and his research and analysis have garnered widespread citations in leading trade and business publications. Furthermore, Mr. Heynen is a frequent expert judge and invited speaker at industry conferences and events.

Mike Kim

Account Executive, Architecture
Cisco Systems

Mike Kim is a Product Sales Consultant at Cisco with over 30 years of experience in networking, engineering, and product sales. Known for his ability to align technical solutions with customer needs, he has helped shape product strategy and drive engagement across diverse infrastructure environments. He is especially passionate about Cisco's Routed PON solution, which is redefining broadband access for enterprises and service providers. Mike brings deep industry insight and a practical approach to every conversation.

Ricky Martinez

General Manager and CEO
Taylor Telecom

Ricky Martinez brings over 33 years of experience in broadband, education, and public affairs, dedicated to strengthening communities and fostering meaningful connections. As the General Manager & CEO of Taylor Telecom, he leads a committed team in expanding broadband access across 2,000 square miles and nine counties in rural Texas. His expertise in telecommunications, regulatory and legislative affairs, and technology integration has been instrumental in driving growth and innovation in the region. Throughout his career, Ricky has held key roles in education, public relations, and broadband operations, working closely with schools, local leaders, and policymakers to bridge the digital divide. Under his leadership, Taylor Telecom remains focused on delivering reliable service to those who need it most. A firm believer in lifelong learning, Ricky is committed to finding solutions that empower rural communities. He values teamwork, service, and the opportunity to make a lasting impact.

Robin Olds

Sr. Business Development Manager
Cisco Systems

Robin Olds is a Senior Sales Business Development Manager for Broadband Program Office in Americas Service Provider at Cisco Systems. He has been in the network industry for over 25+ years and has worked within banking, healthcare, manufacturing, public sector, and service provider verticals. At Cisco, Robin is recognized as the thought leader for Cisco's broadband solutions and US government broadband funding that help bridge the digital divide to provide an inclusive future for all. Robin joined Cisco in 2013 as a Select Account Manager in US Commercial and transitioned in 2016 to Americas Service Provider as a Territory Account Manager. In 2019, Robin was promoted to Senior Sales Business Development Manager for sales strategy covering the US Mid-Market space for Americas Service Provider and in 2021 transitioned to sales strategy and innovation in Headquarters at Americas Service Provider, until 2023 where he now co-leads the team for the Broadband Program Office.