

Perspective

Applying proactive intelligence to fixed broadband access networks

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Executive Summary

Fixed broadband providers are under pressure to deliver a consistently strong subscriber experience – in terms of network speed and reliability – while constraining operational costs and complexity. Traditional approaches to network management that rely on siloed, fragmented tooling and manual analysis of telemetry data have proven insufficient in allowing broadband providers to unlock the full potential of analytics and AI. Broadband providers need a unified data intelligence platform that can ingest data from heterogeneous access networks, correlate signals across domains and support proactive, AI-assisted operations.

Harmonic's cOS SensAI broadband intelligence fabric (pronounced 'sens-ay') serves as such a platform for fixed broadband access networks. Analysys Mason estimates that the total addressable market (TAM) for SensAI among Tier 2 and smaller fixed broadband providers in Harmonic's target geographies is USD2.2 billion for 2026.

This perspective is divided into two sections. The first explains why intelligence is needed for fixed broadband network operations, and how it can be applied using a unified platform/intelligence fabric. The second section discusses how Harmonic can support broadband providers in achieving these objectives.

Section 1: The Drivers and Challenges of Intelligent Network Operations

Broadband providers must maximise operational efficiency while delivering exceptional customer experience

ARPU for telecoms services has remained relatively flat for some time. In addition, with most broadband providers now offering multi-gigabit-per-second connections, high-speed connectivity is rarely sufficient to attract new customers. This means that broadband providers that want to grow their revenue need to both retain their existing customer base (that is, prevent churn) and acquire new customers from competitors. Delivering outstanding network reliability and service quality is essential to achieving both these aims. Consumers and enterprises have little tolerance for disruptions to – or degradation of – their fixed broadband connectivity. It is not enough for broadband providers to be able to resolve service outages quickly; they need to be able to detect and resolve issues proactively before the user experience is affected.

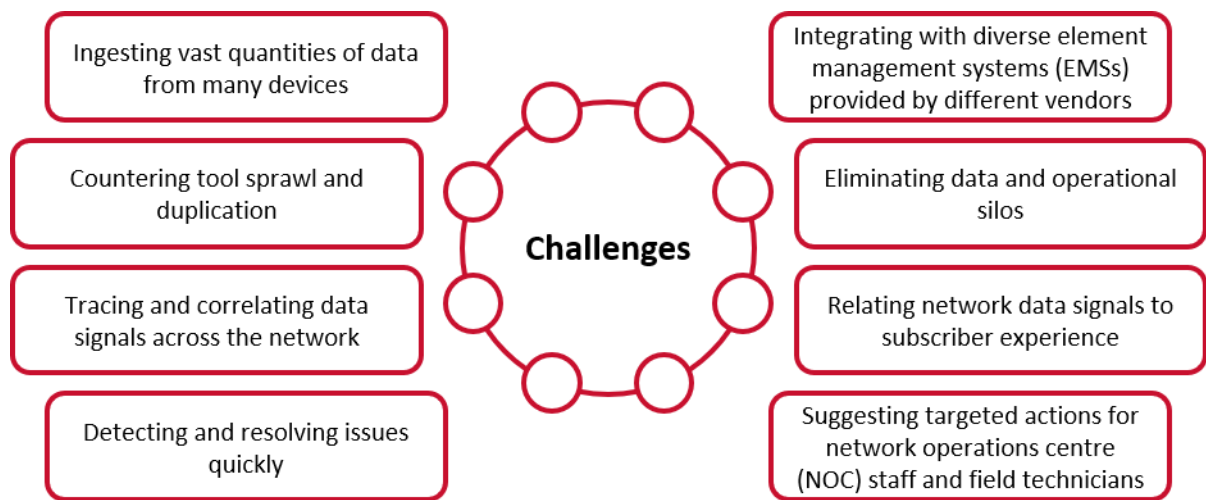
To improve profitability, broadband providers must also reduce costs. They are adopting several strategies to achieve this, including by reducing:

- the number of employees required to manage networks and the amount of training that they require
- the amount of effort, and therefore the number of employees, required to handle customer complaints
- the number of truck rolls and the time required by field technicians to resolve issues
- spending on network operations tools by consolidating tooling.

The diverse nature of broadband providers' networks and management tooling can hinder efforts to move towards more efficient network operations

Broadband providers understand the steps required to improve network performance. They need to ingest data from networks, use analytics and AI to surface insights and then act on these insights quickly, potentially by automating remediation processes. In practice, however, this approach can be challenging for broadband providers to implement (see Figure 1).

Figure 1: Challenges faced by broadband providers in managing fixed access networks



Source: Analysys Mason

Broadband access networks consist of many devices – in terms of both the number and types of device – that serve different functions and come from a diverse range of vendors. As a result, aggregating and analysing the vast quantities of data generated by these devices within a common platform can be difficult. Complexity is further increased by the need to correlate data signals from different devices and to understand how these signals affect subscriber experience. Broadband providers commonly rely on a range of largely separate operations and management systems, linked by integrations that are often expensive to build and maintain. Key operational functions, such as assurance and fault management, performance management, capacity planning, provisioning and activation, and field service management, are commonly supported by separate tools, often sourced from different suppliers. Broadband providers often rely on multiple overlapping tools to support these functions because integrating different vendors' EMSs within a multi-vendor access network can be challenging. In addition, M&A activity among broadband providers often leads to further tooling duplication.

This tool sprawl increases broadband providers' costs and leads to 'swivel chair operations', making networks more complex to manage and increasing the training requirements for network operations centre (NOC) staff.¹ Critically, tooling silos also mean that broadband providers have no single, integrated source of data. This prevents the end-to-end correlation of data signals, which limits broadband providers' ability to gain visibility into, diagnose and remediate service-impacting issues. For truck rolls, for example, this lack of insight into issues can lead to field technicians being unable to identify the cause of a problem, or to them making changes (such as replacing hardware) that do not resolve the problem.

Fixed broadband providers that are still struggling to simply ensure that they have visibility into their networks and services are missing out on the opportunity to use automation and AI to transform

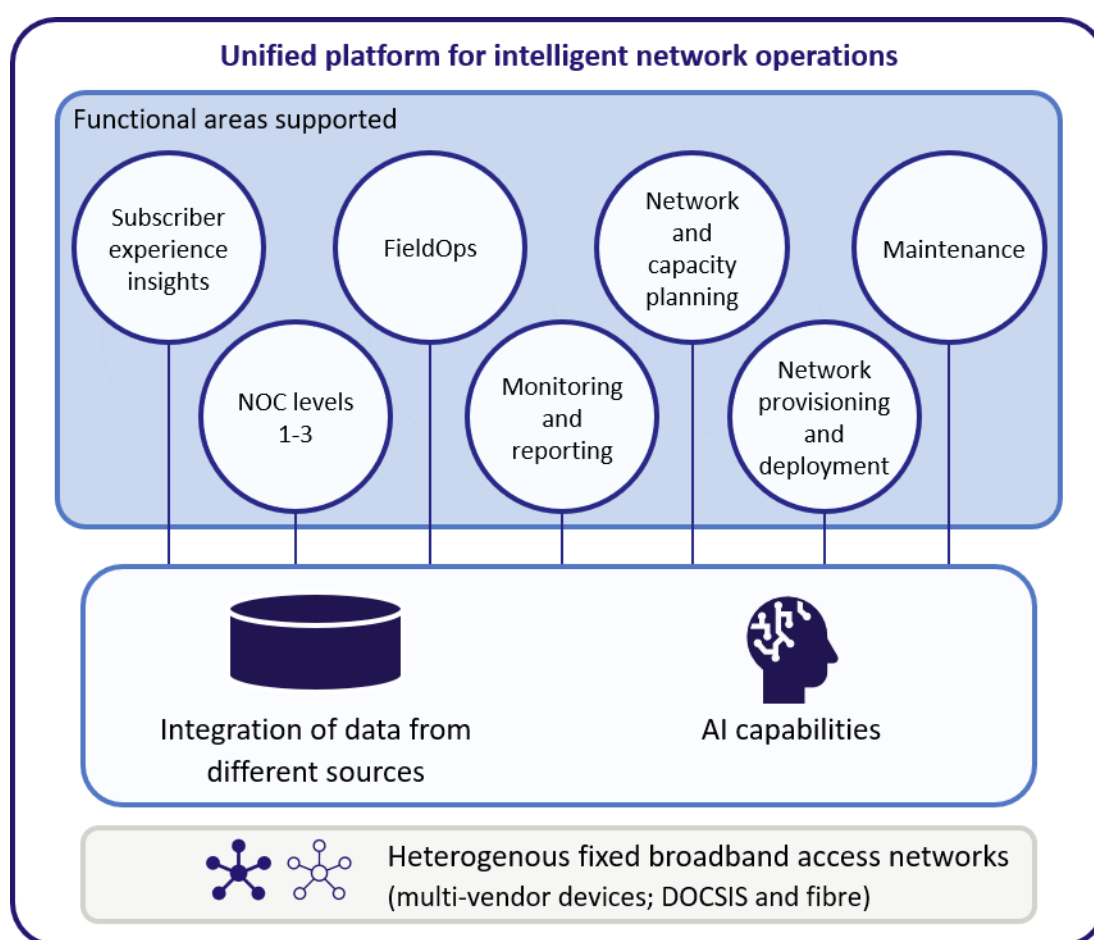
¹ The term 'swivel chair operations' refers to a situation in which employees need to rely on multiple different tools and systems that they constantly must switch between to manage networks.

network operations. Enhanced EMSs are beginning to implement some AI capabilities, but these alone are insufficient to allow broadband providers to fully benefit from AI.

Broadband providers need to implement a unified network intelligence layer for the management and operations of their fixed access networks

Broadband providers need a platform that helps them to overcome the challenges outlined above and enables them to move towards proactive network management with AI-assisted operations (see Figure 2).

Figure 2: A unified network intelligence layer for fixed access networks



Source: Analysys Mason

A unified platform for intelligent network operations should include the following capabilities.

- **Data ingestion from diverse sources.** The platform should ingest data from network devices (for example, vCMTS/iCMTS, vBNG and OLT devices); customer-premises equipment (CPE), for example, Wi-Fi routers and set-top boxes; applications (for example, TV and media systems); and broadband providers' back-office systems (for example, their CRM and ticketing systems).
- **Multi-vendor and multi-technology support.** The platform should support devices from any vendor across both fibre and DOCSIS access networks. This is particularly beneficial for broadband providers that have grown through M&A.

- **Centralised data repository.** Data should be consolidated into a single repository to give providers a unified view of the network and enable correlation of data signals across domains.
- **AI-based analytics.** The platform should use AI to analyse historical and real-time data at scale, identify patterns and correlate signals from different network domains.
- **Proactive issue detection.** AI-driven insights should help identify emerging issues before they affect subscribers.
- **Simplified issue remediation.** The platform should provide insights into the resolution of network issues, potentially using large language models (LLMs) to identify root causes and present actionable explanations to network engineers. More-advanced providers may use AI to resolve some issues automatically, with or without a human in the loop.
- **Tool consolidation.** By replacing multiple standalone tools with a single platform, providers can reduce costs, simplify training and improve operational visibility. A reduction in swivel chair operations also makes life easier for network engineers.

The key insight for broadband providers is that AI initiatives are more likely to succeed when they are built around a unified strategy, platform and data repository, rather than implemented piecemeal across different functional areas using tools from multiple vendors. Broadband providers' efforts should be focused on implementing a platform that can ingest and consolidate data from across the network and other relevant sources and use AI to identify and resolve issues. If implemented effectively, such a platform can be instrumental in helping broadband providers improve network performance and reliability and streamline network operations.

Section 2: The Capabilities and Addressable Market for Harmonic's cOS SensAI Broadband Intelligence Fabric

cOS SensAI delivers a broadband intelligence fabric, enabling broadband providers to apply AI to a range of functional areas for their fixed access networks

Harmonic describes cOS SensAI as a broadband intelligence fabric that can provide actionable insights to support operational decision-making. SensAI supports multi-vendor fibre and DOCSIS access networks. It can ingest data from network devices, CPE, applications and back-office systems. SensAI ingests data directly from device endpoints, rather than needing to ingest data via a data platform.

SensAI supports multiple aspects of fixed access network operations and management, enabling it to act as a single, unified solution that replaces the diverse tools that broadband providers previously used for these functions.

- **Subscriber experience insights.** SensAI provides a comprehensive view of the quality of service that subscribers are currently experiencing and/or have experienced in the past.
- **NOC levels 1–3.** SensAI supports the tasks that NOC engineers perform, including root-cause analysis, deep investigation of issues and escalation of incidents to vendors.
- **FieldOps.** SensAI can create tickets that pinpoint the problem that technicians must solve and will provide recommendations to technicians about how to solve the problem.
- **Monitoring and reporting.** SensAI provides insights into network health and proactively flags issues that may affect network performance in the future.
- **Network and capacity planning.** SensAI supports network planning teams in deciding where to allocate additional capacity in their networks.
- **Network provisioning and deployment.** SensAI supports the provisioning of new network devices, including the benchmarking of these devices to create 'birth certificates'.
- **Maintenance.** SensAI helps to mitigate the effect of planned network maintenance on subscribers.

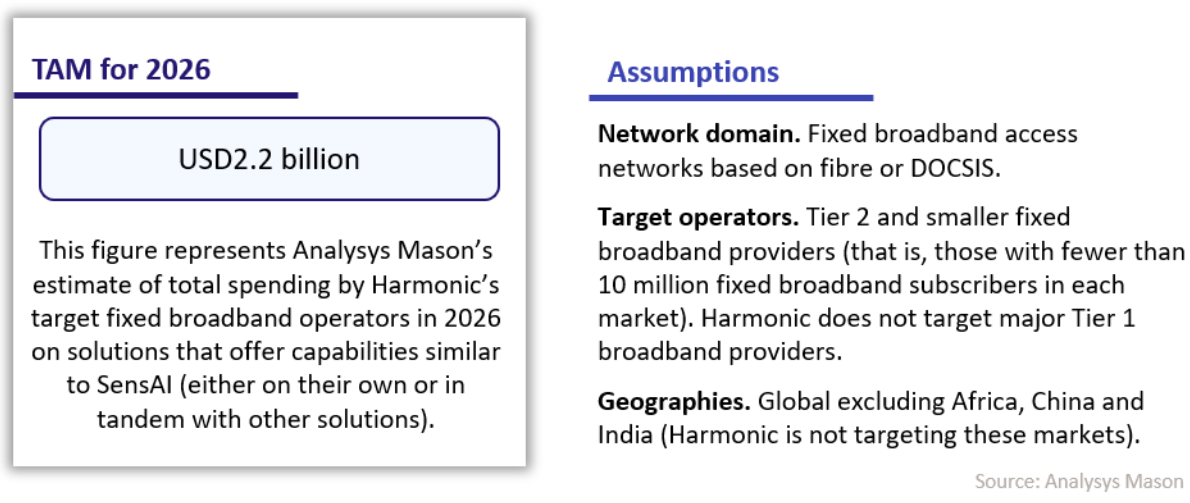
Ambitious broadband providers can also use SensAI to implement closed-loop automation, whereby SensAI detects and resolves issues automatically. Harmonic also works with customers to implement use cases in which providers entrust AI-based systems with making changes to live networks with minimal or no human supervision.

Broadband providers that adopt SensAI can improve network performance and reliability, increase operational efficiency, simplify network operations and reduce costs. Cost savings can be achieved from helping network engineers work more efficiently, but also from reducing the number of subscriber calls about network issues, avoiding unnecessary field technician dispatches and giving technicians the insights that they need to resolve issues quickly and with a greater success rate. SensAI can also reduce the level of expertise needed to manage networks effectively.

cOS SensAI enables Harmonic to target an addressable market of around USD2.2 billion in 2026

Analysys Mason has modelled the size of the TAM for Harmonic's cOS SensAI intelligence fabric. We have constrained our model to calculate the opportunity only for the market segments – that is, fixed broadband access networks for Tier 2 and smaller providers – and the geographies in which Harmonic is looking to sell.² This market represents a USD2.2 billion opportunity in 2026, which will grow at a CAGR of 2% to USD2.4 billion by 2030. If Tier 1 providers were included, the TAM for 2026 would be USD3.4 billion. A summary of this modelling exercise is shown in Figure 3.

Figure 3: TAM for Harmonic cOS SensAI



This TAM model is based on Analysys Mason's OSS market forecasts, which draw on 25 years of analysis of the OSS market. We take a 'bottom-up' approach to forecasting the size of that OSS market, which begins with us collecting or estimating revenue for different OSS components for over 70 players in this market. For this report's TAM model, we considered how SensAI's functionality overlaps with the different aspects of the OSS market that we forecast to understand how SensAI's TAM compares to the total size of the OSS market, scaled according to the assumptions in Figure 3.³ We also include a share of the customer experience management market, which is captured in our BSS forecasts.

² In this report, Tier 1 broadband providers are those with 10 million or more broadband subscribers in a given country. Harmonic is not looking to target broadband providers in Africa, China or India.

³ The overlap between SensAI and the functional breakouts we specify in our market forecasts is illustrated in Figure 4.

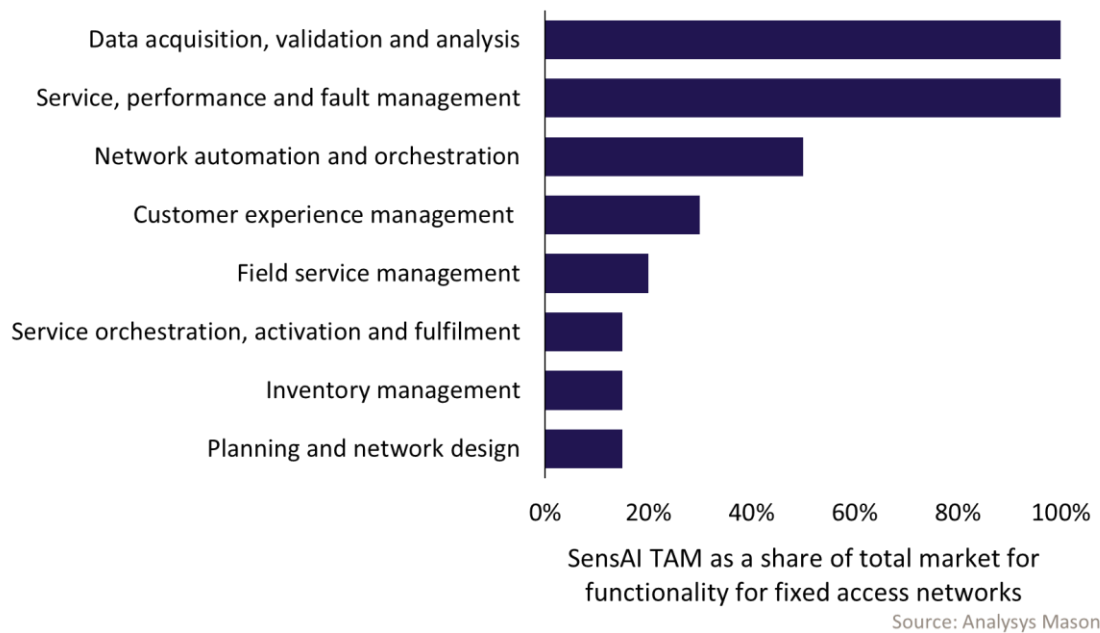
Conclusion

cOS SensAI expands Harmonic's fixed broadband access portfolio with an AI-driven broadband intelligence fabric that helps fixed broadband providers ensure the health of their networks and optimise network performance. It reduces broadband providers' reliance on multiple disparate management tools by consolidating key capabilities within a single platform that can ingest and analyse data from any network device or application, including in multi-vendor environments. This enables broadband providers to apply AI for network operations more effectively and to better realise the benefits of AI.

Appendix

TAM for Harmonic cOS SensAI compared to the total OSS market

Figure 4: Assumed share of the total OSS market for fixed broadband access networks that is relevant to cOS SensAI, by functional area used in Analysys Mason's forecasts⁴



TAM for Harmonic cOS SensAI by region

Figure 5: TAM for Harmonic cOS SensAI by region, 2026

Region	2026 TAM (USD million) ⁵
All Harmonic target markets	2230
North America	690
Latin America	170
Western Europe	610
Central and Eastern Europe	190
Middle East	160
Developed Asia-Pacific	330
Emerging Asia-Pacific, excluding China and India	80

Source: Analysys Mason

⁴ Customer experience management is captured in our BSS, rather than our OSS, market forecasts.

⁵ Numbers are rounded to the nearest USD10 million.

About the authors



Justin van der Lande (Research Director) leads the Operational Applications practice. He specialises in business intelligence and analytics tools, which are used in all telecoms business processes and systems. In addition, Justin provides technical expertise for Analysys Mason in consultancy and bespoke large-scale custom research projects. He has more than 20 years' experience in the communications industry in software development, marketing and research. He has held senior positions at NCR/AT&T, Micromuse (IBM), Granite Systems (Telcordia) and at the TM Forum. Justin holds a BSc in Management Science and Computer Studies from the University of Wales.



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