EXFO adaptive service assurance platform

Actionable insight across complex multi-generation telecom networks

The need for a new type of service assurance

5G networks demand a new way of working: it's time for an adaptive approach

Service providers face three immediate challenges with their 5G networks: they are orders of magnitude more complex than those that came before; there is a loss of visibility as they virtualize and go cloud-native; and users have increasingly higher expectations of quality of experience in a largely mature market.

Network complexity is driven by phenomena such as the separation of control and user planes (CUPS), dynamic spectrum sharing (DSS), 5G standalone's cloud-native network functions (CNFs), service-based architectures (SBA), network equipment and fiber densification, etc.

As a result, more parts of the telecom stack are generating more performance, fault and telemetry data, overwhelming existing service assurance toolsets and leaving service providers unable to respond to and resolve service degradations promptly.

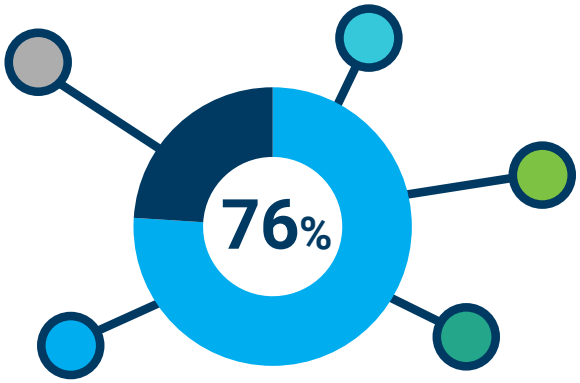
Yet, the need for timely identification and resolution of network performance impairments has never been greater.

The business cases driving 5G investment require levels of throughput, responsiveness, and availability for enterprises far above what service providers have typically committed to. However, this time they are backed by service level agreements.

Today's service assurance tools are no longer able to assure service in a way that enables service providers to deliver on their customer commitments and meet their service level agreements. They simply cannot handle handle the volumes of data being generated nor the proliferation of data sources.

Impairments cross domains, layers and services, making it difficult to achieve end-to-end visibility or correlate the lived customer experience with actual network performance.

A new approach to service assurance is needed, something that we call **adaptive service assurance**.



of MNOs say service assurance for 5G **requires real-time correlation across events, faults, telemetry and QoS/QoE analytics.**

GSMA 2021

The EXFO adaptive service assurance platform

Adapting how you capture, transport, store and analyze data

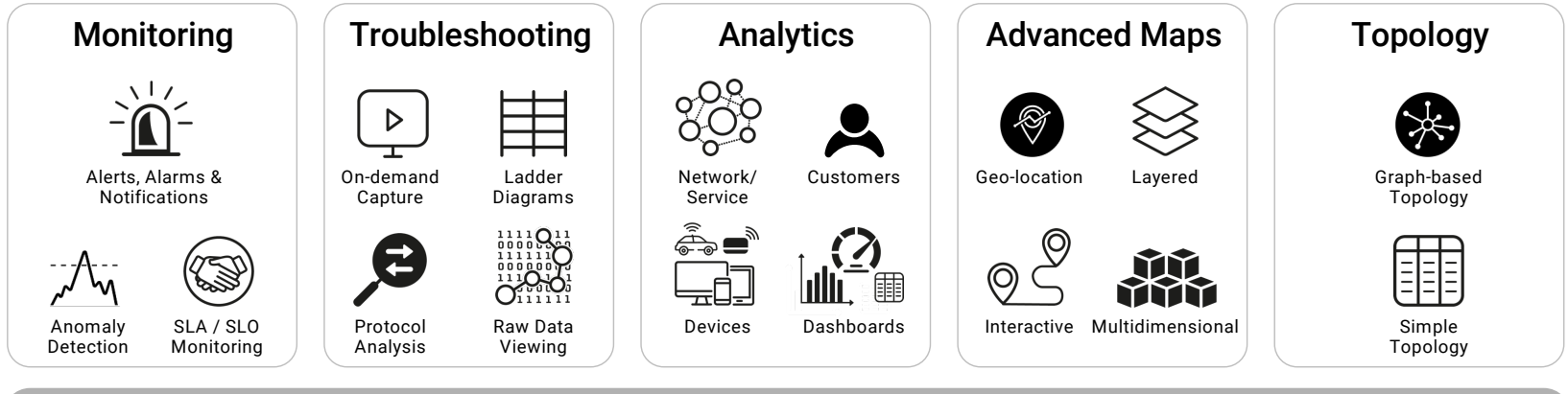
The EXFO adaptive service assurance platform provides full visibility and diagnostics into complex transport networks, extensive RAN footprints, and the services and user experiences that they support.

It achieves this by combining source-agnostic data collection, ingestion and transformation, multi-domain, multi-layer analytics powered by telecom-specific algorithms and a common user experience across applications and reporting tools.

The EXFO platform supports a wide range of data sources such as probe data, synthetic test data, telemetry, fault data and environmental data (vehicular traffic, social media), as well as data sourced from proprietary systems and third-party solutions.

Analytics can be fed to the network orchestrator to drive the instantiation of new network resources as well as probes, enabling the EXFO platform to adapt to service assurance requirements as network conditions ebb and flow.

The EXFO adaptive service assurance platform cuts across horizontal and virtual domains to deliver full stack visibility from core to edge and up and down the compute stack. It enables service assurance for multi-domain solutions such as multi-access edge computing (MEC) assurance, fiber monitoring, private network assurance and 5G transport QoS assurance, among others.



A rich suite of service assurance capabilities

Adapting how you capture, transport and store data

To deliver on its vision of adaptive service assurance, EXFO has developed an extensive, modular platform with the following characteristics:

- **Source**support for data from network functions, infrastructure, probes, parsers, EXFO service assurance solutions, OSS and BSS systems, and third-party service assurance solutions.
- **Adaptive data collection**, with the ability to collect and store data at the network edge, streaming only data required for KPI/KQI used in dashboards, monitoring and alerting, while maintaining accessibility of the original **-agnostic data ingestion**, with data for troubleshooting drilldowns. Adaptive data collection reduces the cost of probe data capture, transport and storage by up to 90% or more.
- A **rich data processing layer** with the ability to correlate, enrich and stitch data records together to provide unique insight into actual network performance and the lived customer experience.
- A **suite of applications** that work together to provide a unified, intuitive user experience for troubleshooting and reporting across multiple service assurance use cases.
- **Platform-agnostic deployment** with support for the Big 3 hyperscaler cloud platforms and Kubernetes environments, Oracle Cloud and Red Hat OpenShift, and virtualized and bare metal scenarios.

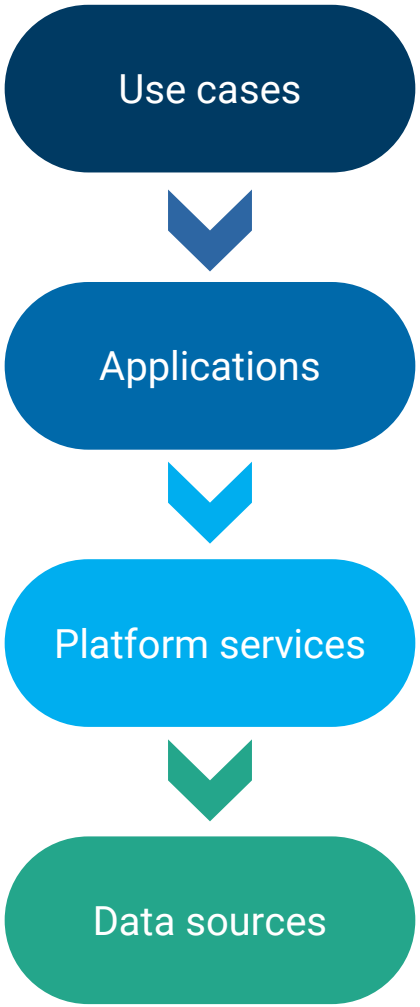
aws

Microsoft Azure

Google Cloud Platform

RED HAT OPENSHIFT

ORACLE CLOUD



Adaptive service assurance enables new use cases

By combining data from along the service path and across the compute stack, the EXFO adaptive service assurance enables several new use cases, including:

5G transport QoS assurance: An end-to-end view of transport network performance across all segments and domains, from radio to core, across dynamic xHaul, metro and long-haul transport networks. It features cloud-native, virtualized and physical active test agents that are easily deployed, scaled and orchestrated across complex multi-domain networks and cloud infrastructure.

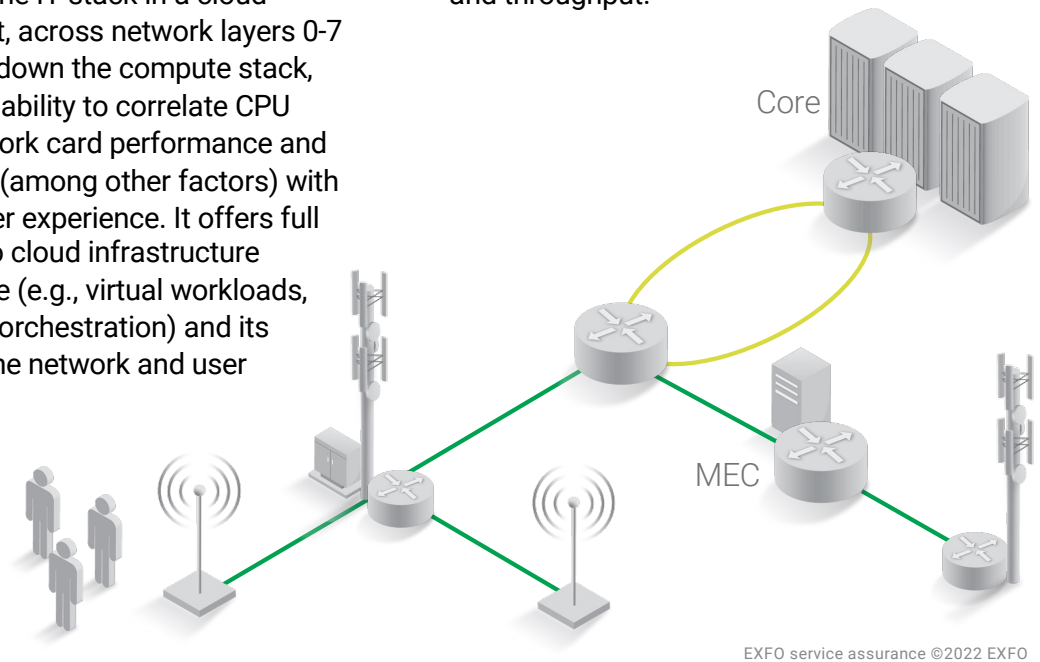
Fiber monitoring: Ongoing monitoring of FTTx, PON and fiber-based xHaul networks throughout the fiber lifecycle, from establishment of the birth certificate at turn-up to ongoing profiling of fiber performance. It supports the use of geolocation data to pinpoint a fiber break or degradation to within meters.

Multi-access edge computing (MEC) assurance: The ongoing assurance of the performance of private and public MEC instances, enabling service providers to meet commitments around latency (URLLC) and availability. The EXFO solution leverages performance monitoring, performance analytics and QoS/QoE troubleshooting.

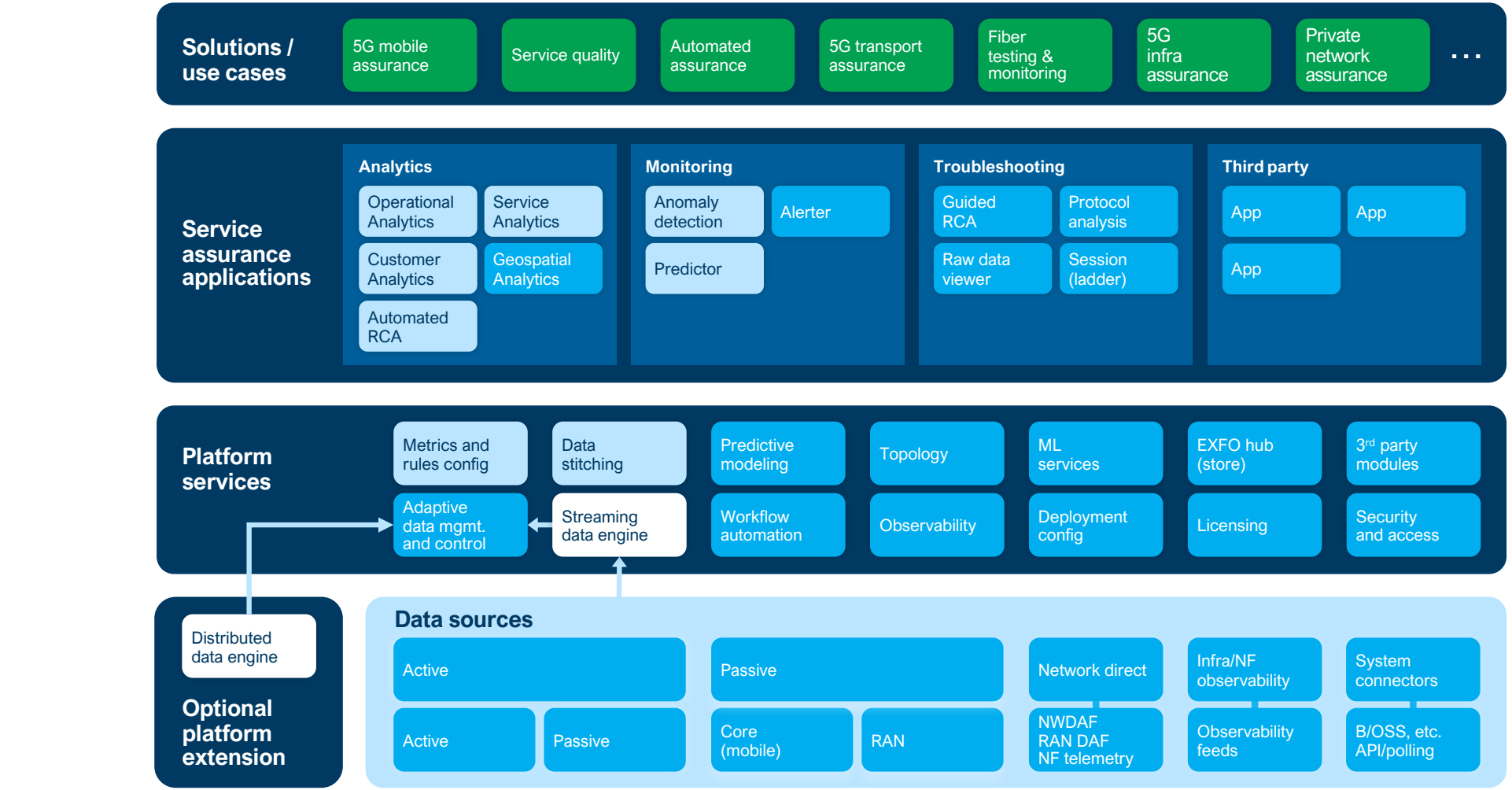
5G infrastructure assurance: Full visibility of the IT stack in a cloud environment, across network layers 0-7 and up and down the compute stack, offering the ability to correlate CPU usage, network card performance and RAM usage (among other factors) with the customer experience. It offers full visibility into cloud infrastructure performance (e.g., virtual workloads, Kubernetes orchestration) and its impact on the network and user experience.

QoE-optimized 5G transport: Providing network-wide insight on to the customer experience, along the service path from the radios to the network core, across all xhaul instances.

Private network assurance: Assurance of network slices as well as discrete private networks running on private or shared spectrum to ensure compliance with SLAs regarding latency, availability and throughput.



The EXFO adaptive service assurance platform



A modular approach to delivering best-of-breed QoE

EXFO's adaptive service assurance platform enables service providers to achieve—and act upon—end-to-end visibility across multi-generation, multi-vendor technology stacks. It supports physical, virtualized and cloud-native network functions with a range of deployment and automation scenarios.

The EXFO service assurance platform features adaptive data sampling to cut through the noise, drastically reducing the volume of data that needs to be captured, transmitted and stored for analysis. It measures only what's needed, where it's needed, when it's needed, delivering **the small data that enables actionable insight**.

In addition, the EXFO platform correlates events across domains to identify fault origination and speed resolution, making relevant data available at the click of a mouse. It provides deep context for decision-making, tying network performance to QoE and other KQIs.

Key features

- End-to-end visibility from core to RAN to subscriber, services and applications. 100% visibility into all network domains, network elements and user equipment (UE).
- Support for multiple network generations and vendors, including 5G standalone (2G/3G/4G/5G NSA/5G SA).
- Adaptive data capture with on-demand tracing and adaptive outputs (xDRs and traces).
- Ability to ingest multi-vendor network function events across CP and UP, EXFO and 3rd party probe data, RAN traces and active test data.
- Feedback for closed loop automation, enabling QoE-based network orchestration.

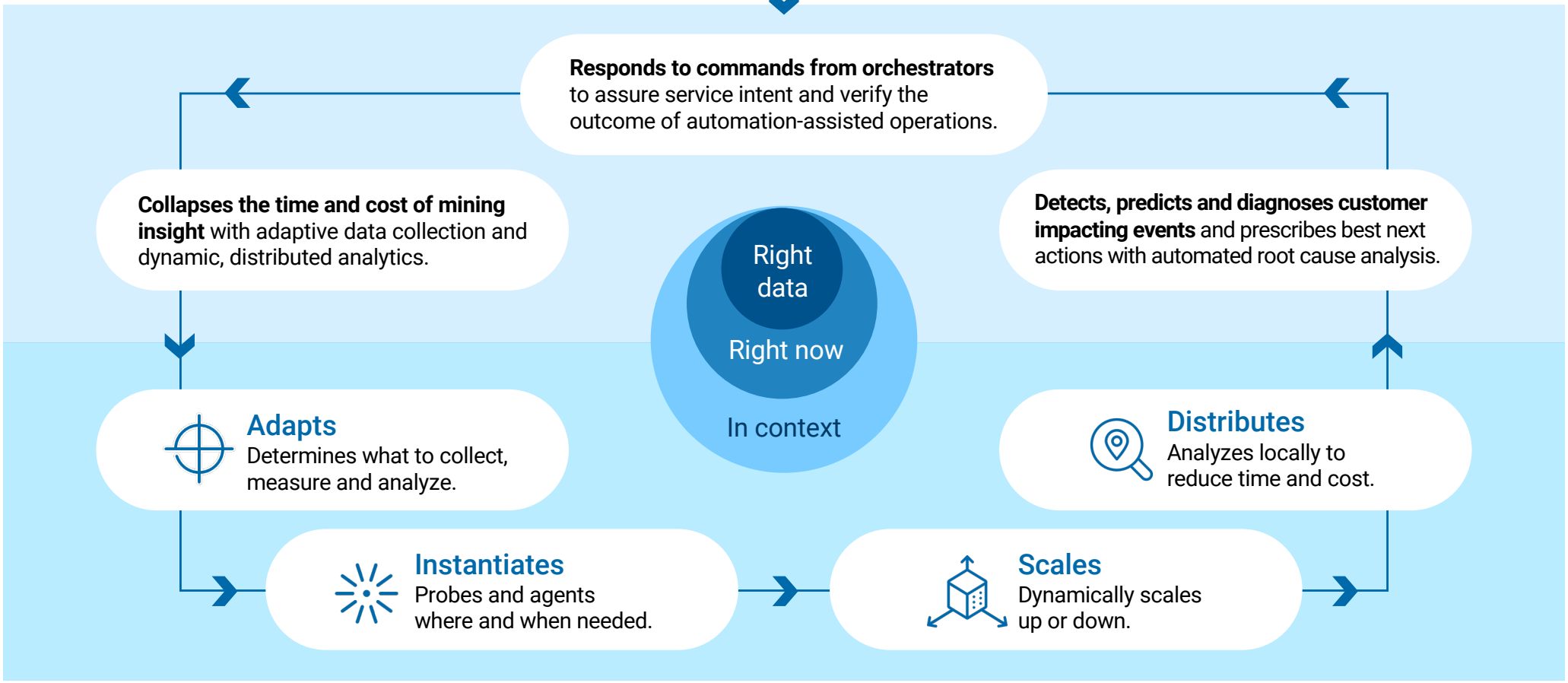
Key benefits

- Faster 5G migration with integrated 4G-5G monitoring.
- Automatic detection, prediction, prioritization and diagnosis of customer-impacting events.
- Expedited troubleshooting—powered by AI, ML and telecom-specific algorithms— with faster mean-time-to-resolve (MTTR) and root cause analysis (RCA).
- Enhanced subscriber experience, leveraging per-subscriber drill downs to correlate call traces with network events and UP KQIs.
- Ability to correlate events across control and user plane separation.

Adaptive service assurance

for orchestrated, automated networks

EXFO's adaptive service assurance platform uses AI-driven automation and analytics to shatter big-data overhead and **reveal the small data that matters in the moment** to enable real-time operations and network automation.

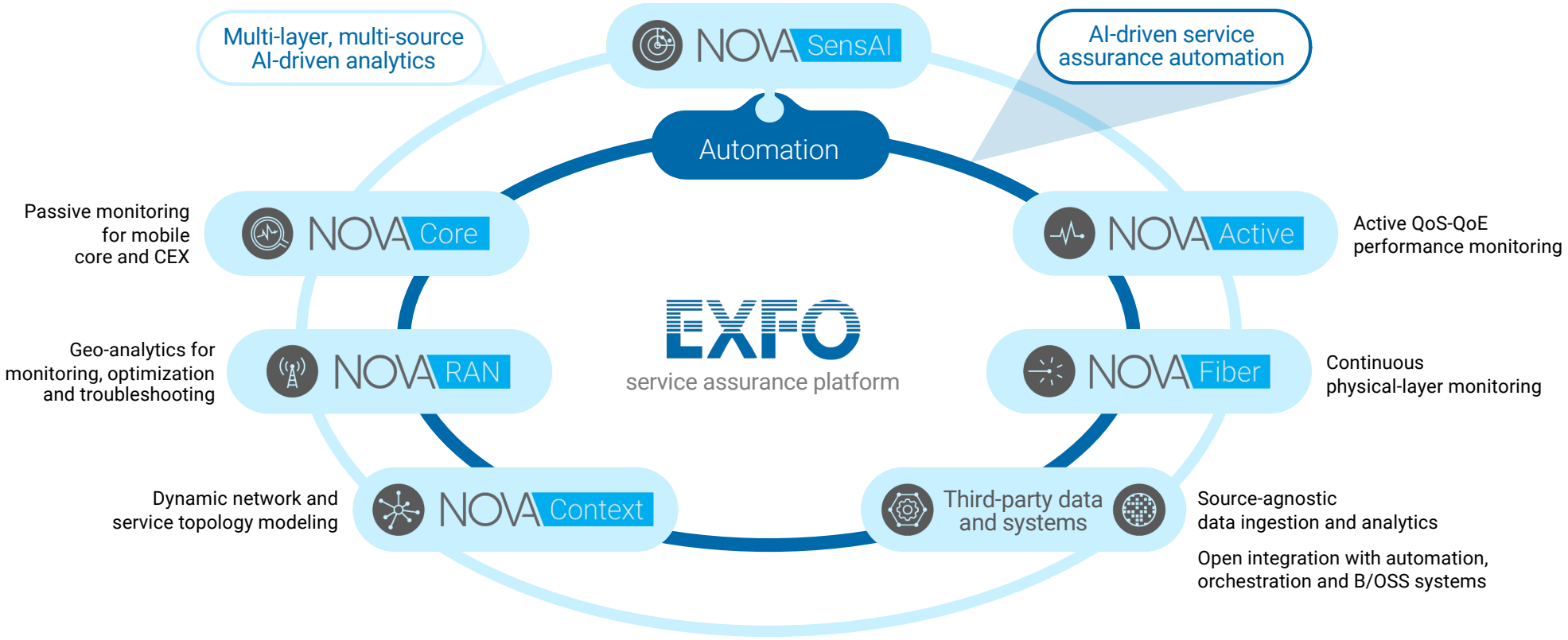


Extracts context, insight and value from existing systems by openly ingesting data from service assurance, B/OSS, network functions and more.

Platform components

The EXFO service assurance platform delivers contextual insights that relate service quality and customer experience to infrastructure performance across all layers and domains—fiber, core, cloud, RAN and transport networks.

EXFO platform components and third-party systems integrate to assure multi-vendor networks, services, applications and infrastructure.



Platform coverage

Cloud-native 5G passive monitoring and troubleshooting from core-to-RAN

Wireless
RAN and core

5G SA, MEC and enterprise SLAs

Wireline
transport and services

NOVA Core — In-depth visibility into network, services and subscribers across multi-vendor networks.

NOVA RAN — RF, device and network geo-analytics across multi-vendor networks, vRAN and ORAN.

Full stack assurance from core to cloud, edge to customer

NOVA Active — Integrated QoS and QoE visibility to assure network, voice, video, and application performance.

NOVA Fiber — Remote, proactive physical layer testing, monitoring and analytics for transport and access fiber networks.

NOVA SensAI — Automated detection, diagnosis and predictive analytics for customer-impacting events.

Adaptive data collection from existing third-party systems.

NOVA Context — Dynamic topology maps relationships between infrastructure, services and customers for accurate fault isolation and root cause analysis.

xHaul, slices, MEC ● Business services ● DCI/Cloud ● FTTx/Triple-play ● IP transport

Solution coverage

Service providers use the EXFO platform to overcome operational challenges, advance automated cloud-native networks, accelerate new revenue and deliver a differentiated customer experience.

Modular EXFO solution components integrate with existing systems, including third-party ones, to provide real-time, predictive insight that breaks down silos to get things done.

EXFO platform	Solutions and components*	SensAI	Core	RAN	Active	Fiber	Context
Network performance	Assure and optimize networks to enhance customer experience with an integrated view of network and service performance.	●			●	●	●
Service quality	Ensure every user and device gets the experience they need with an integrated view of application, network and infrastructure performance.	●	●	●	●		●
5G and mobile	Accelerate the deployment of 5G. Monitor and optimize 3G/4G/5G networks and services from core to RAN to customer.	●	●	●			
Automated assurance	Adaptive, automated insight for orchestrated networks with fast AI-driven problem detection and diagnostics for closed-loop control.	●	●	●	●	●	●
Fiber monitoring	Deploy, optimize, maintain fiber networks for 5G, enterprise and residential services with continuous physical layer monitoring and analytics.	●				●	
OTT QoE	Deliver exceptional quality of experience to differentiate and drive loyalty with network-aware OTT video and application monitoring.	●	●		●		

* The EXFO service assurance platform also assures the adoption of MEC, network slices, private networks, and O-RAN.

Glossary

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