

Nova Context

Dynamic topology –
customer, services and network





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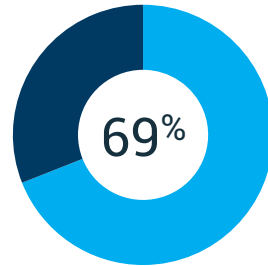
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Growing complexity demands change

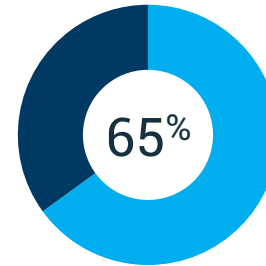


Operations have to be one step ahead of customers, identify possible problems that affect services before customers realize them.

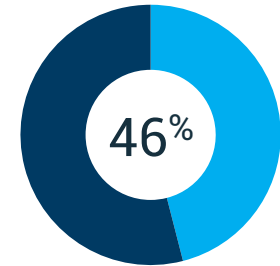
Ahmet Fethi Ayhan
Director Network
Operations, Turk Telecom



of networks are now virtualized, orchestrated



of faults originate from virtualized domains and functions

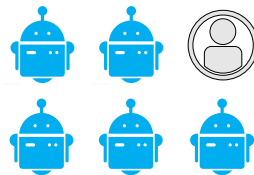


more outages in the past 3 years

IT and network systems were originally built for physical networks; they're simply not up to the task of managing virtual and hybrid networks. Unchecked, more virtual networks means more outages, in part because it's hard to identify where issues originate from. The number of outages reported bears this out.^{2,3}

Automation is essential to support real-time operations. Topology and the dependencies it reveals are critical to effectively managing and troubleshooting virtualized networks and services.

Caught between shrinking OPEX budgets and increasing pressure to deliver more reliable services, operations teams must rethink their approach.



5x

more machines than humans by 2025



53% CAGR

Mobile data growth accelerates

1. Heavy Reading 2019 global CSP survey

2. 2019 GSMA Mobility Report

3. 2019 Analysys Mason, European Telecoms Summit

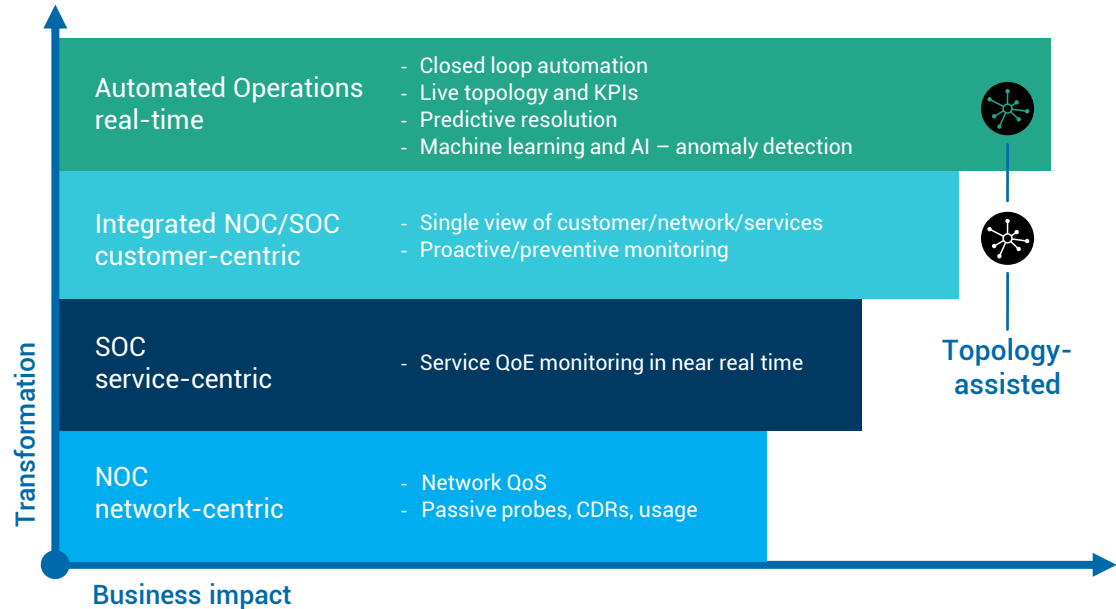
Intelligent automated operations

Operations teams are feeling the squeeze. Budgets are flat. Network complexity is growing. The expectation to 'do more with less' is prevalent.

There is a growing need to streamline processes, automate wherever possible, and be proactive and accountable for service quality. With 5G we are

Customer-impacting issues must be detected and resolved faster. Multiple siloed systems, limited visibility and data quality issues make this difficult.

Managing, monitoring, reporting and assuring real-time business-critical mobile services will be a key requirement to monetize 5G and ultra-reliable low-latency (URLLC) services.



You can't automate with aggregate visibility. 5G devices and users have diverse performance requirements that can only be met with customer-centric, insight-driven automation.

Peter Jarrich
Head of GSMA Intelligence

Simplify to automate

IT siloes. Multiple network domains and layers. High data volumes.



Overcoming operational complexity

Service providers suffer from an overload of disjointed IT and network management systems and lack good quality data. Only 15%¹ have an accurate view of network and services inventory.

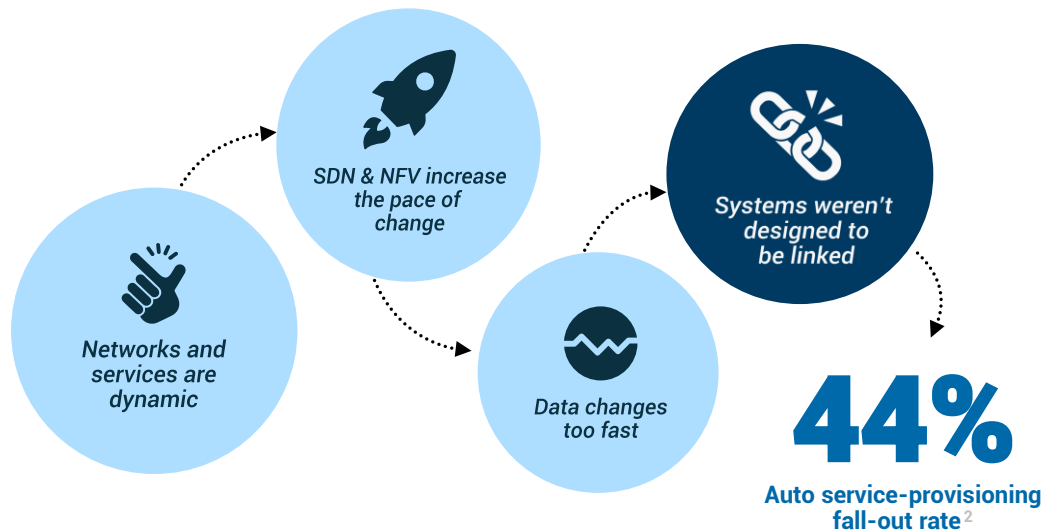
To speed up transformation, service providers are optimizing and simplifying processes to be agile and digital end-to-end and then looking at automation. The key is not to automate poor processes.

Impacts of poor data quality

- Teams are less likely to believe in the power of automation if the **data integral to processes** is questionable, also automation might just fail.
- **Accurate data provides business context.** A current view of customers, services and network topology **puts operations in control and improves critical decision-making.**
- In dynamic service environments, **provisioning services 'right first time'** and resolving service issues depend on accurate real-time data.

Dynamic real-time services

An **accurate, current and unified view** of networks, services and customers is **hard to get**.



Telco networks weren't designed to match evolving customer expectations... we need to make it simple for end users.

Art Nichols
Director Operations, Windstream

In dynamic network as a service (NaaS) applications, enterprise customers want to define, manage and prioritize connectivity and applications based on their needs, and they want it done fast.

For this to work, service providers need an accurate **live network and service topology model** to automate 'right first time' provisioning for network-as-a-service and dynamic service design models that rely on transient resources.

Once services are activated and tested, performance KPIs should then stream directly to end customers via APIs and self-serve portals. This live reporting is necessary to effectively manage and guarantee business-critical services.

1. GSMA Intelligence, 2020

2. As reported at CenturyLink before Nova Context was deployed

Know the current state of your network

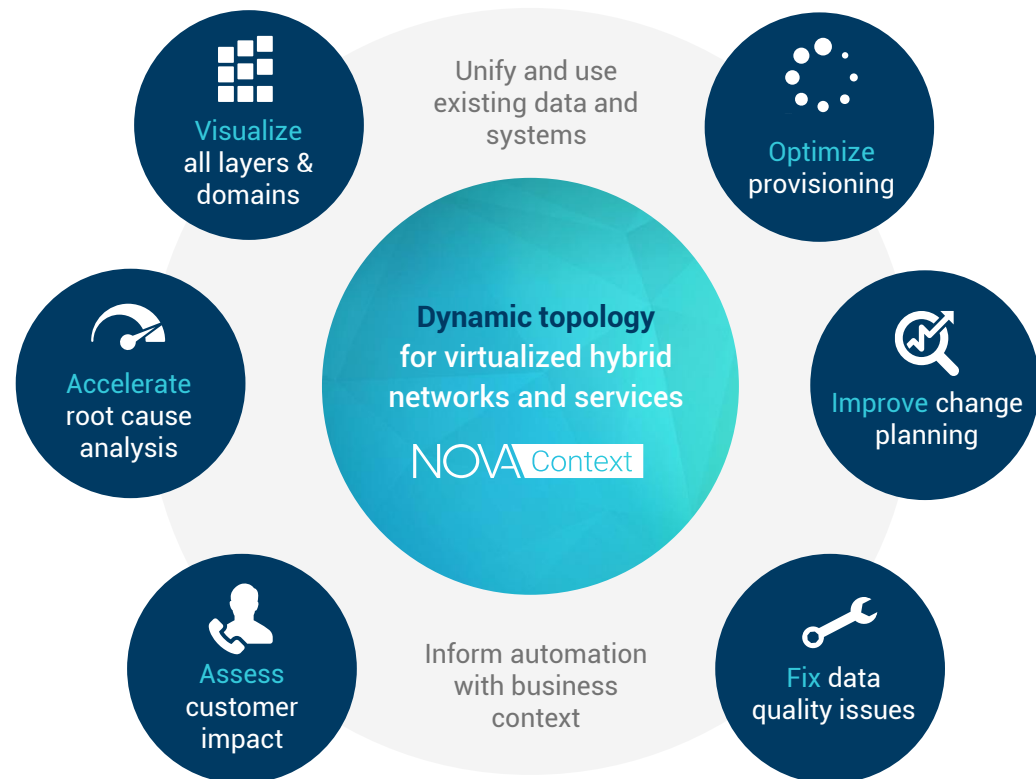
Visualize all layers and domains with dynamic topology

An accurate, solid view of network and services topology (routers, functions, paths, dependencies) is the foundation for **efficient network operations, trusted automation, real-time service delivery and customer quality of experience (QoE)**.

Dynamic topology means seeing which services rely on which routes and equipment. This creates 'a single source of truth' that can be easily adapted to support a range of use cases.

Virtualized, cloud-native networks require operators to have 'dynamic topology' capabilities. Otherwise, it's impossible to take informed actions to:

- provision services over optimal network paths
- assess how performance issues impact customers
- troubleshoot and correlate issues to identify root cause and service impact



Provision and assure on-demand network services

Dynamic topology provides visibility, accuracy and context

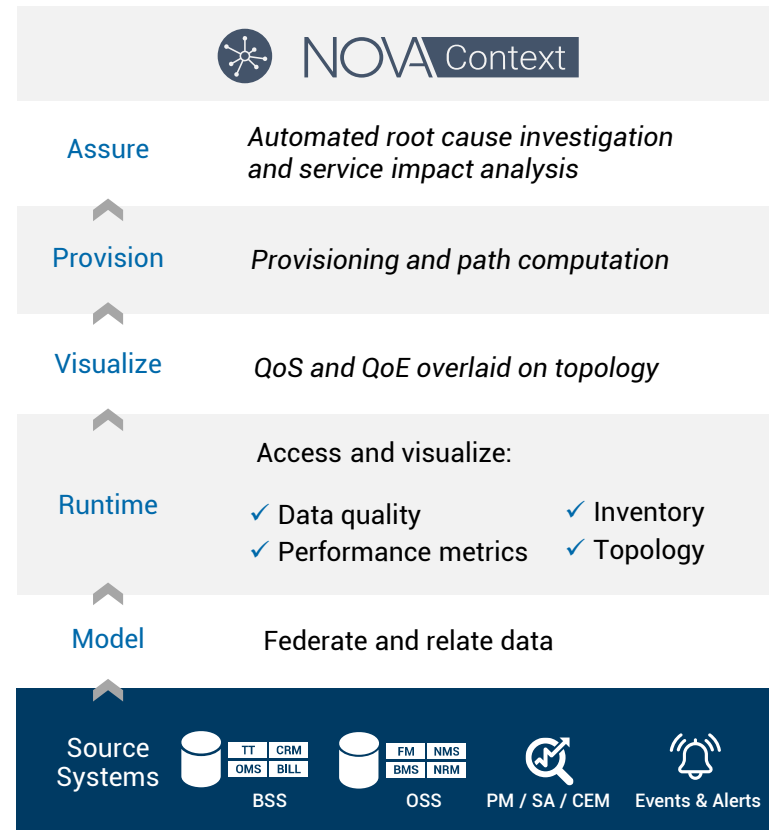
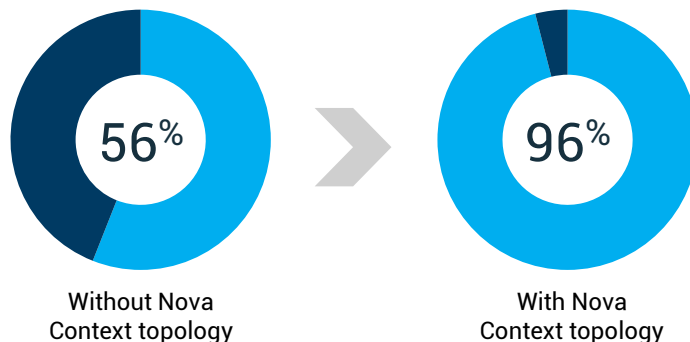
Operations teams are challenged by the **massive amount of data generated by dozens of systems**. 5G virtualized networks and edge functions exacerbates this problem.

Service providers must **bring new services to market faster**, and be able to **activate, test, assure and monitor those services on-demand in real time**.

Nova Context dynamic topology can be integrated into existing systems to:

- **Model and visualize accurate and dynamic topology** from diverse multi-vendor element and network management systems (EMS/NMS).
- Quickly **determine optimal routes** across multiple network domains.

Auto-provisioning success rate



1. As reported by CenturyLink before and after Nova Context was deployed

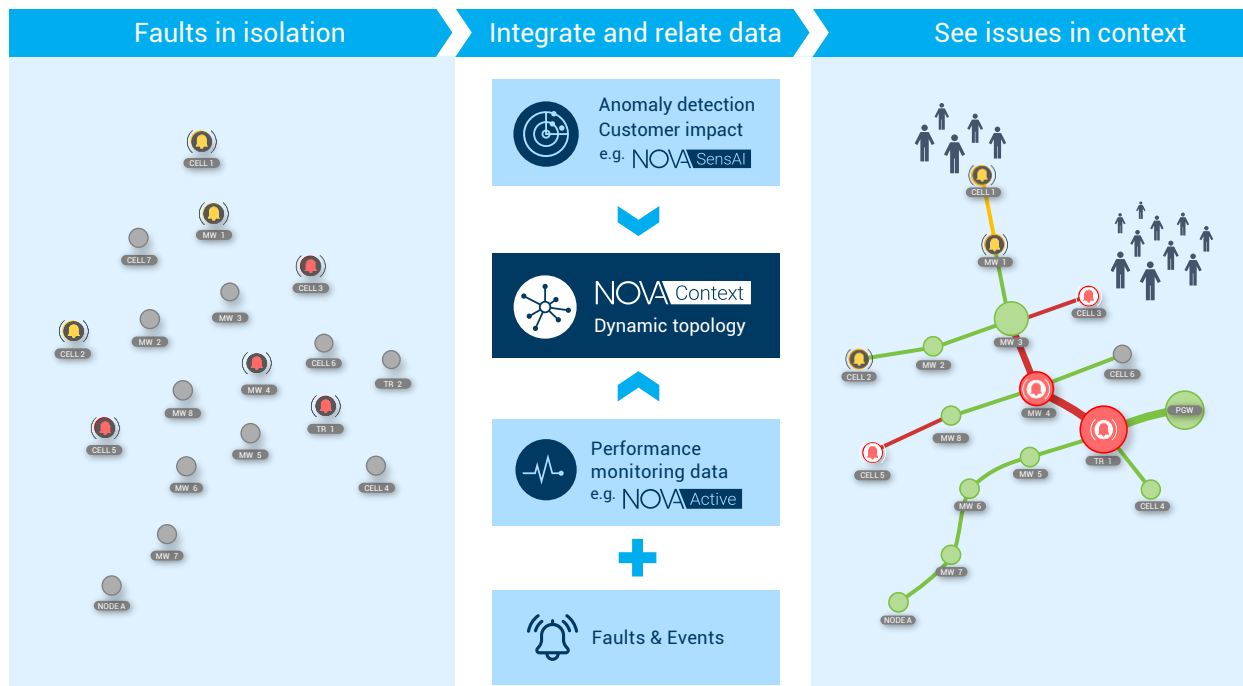
Performance troubleshooting

Dynamic topology accelerates root cause analysis and time to resolve

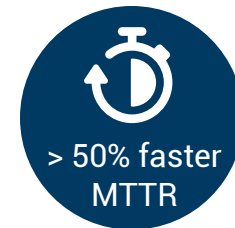
Troubleshooting is difficult without seeing the customer, network and services in context. **Topology reveals the relationships and dependencies between them.**

EXFO's Nova Context visualizes and analyzes performance data, customer impact, network configuration and alarms using topology to provide insight.

Events with a common root cause are automatically grouped and diagnosed together, revealing dependencies between seemingly unrelated issues.



Dynamic topology allows impairments to be quickly correlated and isolated.



NOVA SensAI

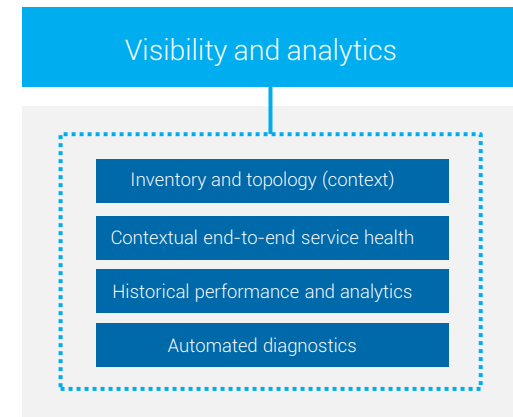
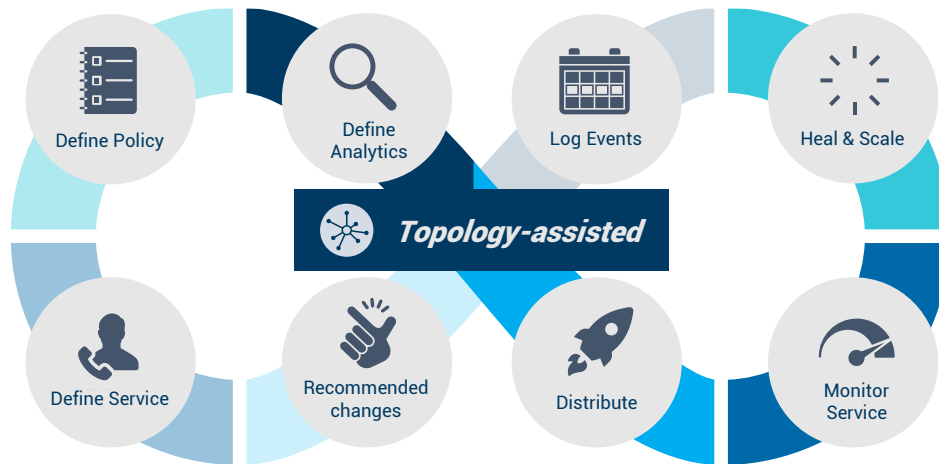
Automate further

Nova SensAI can automatically initiate root cause analysis in Nova Context when customer impacting events are detected.



Automated operations

Dynamic topology for managing services in cloud-native networks



For virtualized cloud networks and 5G, OSS must transform into agile software components. On-demand service activation and provisioning, service monitoring assurance and fault management become critical parts of service lifecycle management.

This is driven by the move to virtualized networks, micro services and cloud network architectures, 5G network slicing, agile service design and service chaining.

Nova Context dynamic topology plays a key role in the complete service lifecycle management from design and provisioning through to assurance, monitoring and fault management.

Nova Context provides the critical multi-layer network path and service topology in real time which the orchestrator and analytics functions need to make reliable and fast decisions across the service lifecycle.

Accelerate transformation

Nova Context addresses the challenges of virtualized and dynamic 5G networks

Dynamic topology Increase visibility

- **Leverage existing data sources** to deliver an accurate model of network and service topology.
- **Improve data quality, bridge siloes and visualize** inventory and multi-vendor network management systems.
- Leverage **automated provisioning of hybrid physical and virtual networks.**
- **Cut troubleshooting time** by finding common root causes of customer-impacting issues.

Dynamic services Automate processes

- Dynamic topology and visualization shows the current network and service state, making **closed loop automation** possible.
- Automate provisioning of on-demand network-as-a-service **with full control of all network layers and service paths.**
- **Increase efficiency of managing hybrid networks** using physical and virtual network topology.
- **Reduce customer-impact of change planning** with dynamic view of dependencies before maintenance begins.

Assured benefits Grow top and bottom line

- **Accelerate revenue with accurate fast provisioning** and inline path computation in seconds, and eliminate errors.
- **Prioritize faults based on business impact** and customer importance. **Reduce churn and increase loyalty.**
- Assure performance of business-critical services with real-time data and automated assurance to **guarantee SLAs.**
- **Manage services in hybrid networks and domains** with integrated visualization of topology and 'current state' of network and service views.



Summary

Operations teams find themselves squeezed between budget pressures while being tasked to deliver a better customer experience, improved service quality and faster troubleshooting.

Improving and automating processes, as well as speeding up operations in general, requires more dynamic real-time operations tools. Fundamental to everything is having an accurate topology on the network and services for decision-making as well as the ability to prioritize issues that are impacting customers.

There's no need to 'rip-and-replace' any of your existing analytics, assurance or inventory solutions.

Nova Context is an open platform that ingests data from multiple sources and integrates via APIs with other systems, which protects existing investments.



NOVA Context



Dynamic topology model that delivers insight and data quality by integrating and correlating multiple existing network, service and customer data sources



Manage complex networks: cross-domain, multi-vendor, multi-layer and hybrid



Enable service lifecycle automation by rapidly aligning topology data for provisioning, monitoring, and troubleshooting.



Optimize network-as-a-service provisioning with accurate path identification based on customer criteria



Troubleshoot customer-impacting events faster with accurate insight on the customer's network and service topology elements

Glossary

AI	artificial intelligence
AMPU	average margin per user
API	application programming interface
CNF	containerized network function
CSP	communications service providers
eMBB	enhanced mobile broadband communications
IoT	Internet of Things
LLC	low latency communications
LTE	long term evolution (4G)
M2M	machine to machine
MEC	mobile edge compute
ML	machine learning
mMTC	massive machine type communications

NFV	network function virtualization
NFVI	network function virtualization infrastructure
NPS	net promoter score
OTT	over the top
PNF	physical network function
QoE	quality of experience
QoS	quality of service
SLA	service level agreement
SP	service provider
UR	ultra reliable
VNF	virtualized network function
VoIP	Voice over IP
VoLTE	Voice or LTE



EXFO corporate headquarters

400 Godin Avenue, Quebec City (Quebec) G1M 2K2 CANADA
T +1 418 683-0211

Toll-free (USA and Canada)

1 800 663-3936

info@EXFO.com

EXFO.com



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