

Mobilize Network Big Data to Drive Service Agility and Quality

Global demand for data services is exploding. The investment in network capacity and infrastructure required to keep pace is massive. The introduction of new technologies — Network Functions Virtualization (NFV), Software-Defined Networking (SDN), 4G and 5G, Carrier Ethernet, IP VPNs, Cloud-based services — are part of the solution. However, increased network complexity results in increased operational complexity: inventory inaccuracy, inability to resolve faults quickly, lengthy circuit turn-up time, and unreliable performance for high value applications such as video and VoLTE. CENX's Exanova Service Intelligence provides the central intelligence based on sophisticated real-time and historical analytics that eliminates this complexity and ushers in next-generation network operations.

Actionable Intelligence for Rapid Service Assurance

CENX's Exanova Service Intelligence software solution powers end-to-end Lifecycle Service Orchestration (LSO) in mobile, wireline, and cloud data center service provider networks, bridging operations across traditional physical and next-generation virtualized NFV/SDN network infrastructure. Exanova enables service providers to drive service agility, assure service quality, and reduce operational costs — while keeping pace with market demand, rapidly integrating new technologies, and making the most of existing infrastructure investment.

Why Choose Exanova Service Intelligence?

- ▶ **Develop a trusted model of the network.** Exanova improves data integrity by continuously ingesting, auditing, and reconciling data from existing OSS and other tools to build a single, accurate, and comprehensive view of service topology and underlying physical and virtual network infrastructure — the unified Service Information Model.
- ▶ **Turn uncorrelated data into actionable intelligence.** Exanova harnesses the power of big data with Dynamic Network Analytics (DNA). DNA's big data engine reconciles, aggregates, and correlates data across disparate systems in real-time to make it actionable, delivering sophisticated, predictive real-time and historical analytics at web-scale performance.
- ▶ **Navigate the network at lightning speed.** Exanova provides advanced visualization to manage layer 1/2/3 data connectivity services. Exanova's real-time, contextual search and intuitive and detailed macro-geographic and detailed path views enable operations personnel to map data services and then drill down to individual circuit path segments with rapid precision.
- ▶ **Drive the transformation to SDN and NFV.** Exanova integrates new and emerging network technologies including SDN, NFV infrastructure, small cell, wavelength services, video (VDSL), Carrier Ethernet services such as Virtual Private LANs. Exanova's open architecture and proven interoperability ensure that service providers will be able to adopt the latest technologies while future-proofing their operations.
- ▶ **Manage more easily, resolve more rapidly, and improve service quality.** Exanova assures end-to-end performance efficiently with Exanova's real-time troubleshooting, and SLA management and Just-In-Time capacity management capabilities. Sectionalize faults rapidly to reduce MTTR. Leverage extensive performance and utilization analytics and reporting for accurate SLA and capacity management.
- ▶ **Plan smarter, automate orchestration, and drive service agility.** Exanova is built on an open, vendor-agnostic, and network agnostic architecture, leveraging a wide range of existing OSS and IT data sources. Exanova's power-assisted workflow orchestration and policy-driven capacity planning capabilities accelerate service delivery and time to revenue. Reduce opex, deliver new services, and gain increased benefit from existing infrastructure investment.

CENX Exanova Service Intelligence: A Flexible, Modular, and Comprehensive Solution

Exanova’s modularized software and services provide a comprehensive, flexible solution that meets the needs of service providers as their needs evolve beyond inventory integrity assurance to service management and assurance, and from physical network and service orchestration to NFV, SDN, and end-to-end LSO.

Built on next-generation technologies that deliver extreme performance, massive horizontal and vertical scalability, and elasticity, Exanova accelerates Lifecycle Service Orchestration for networks of all sizes.

exanova

Service Intelligence

Service Visualization

Provides real-time contextual search and unique geographic topology visualization of aggregation and cell sites, DWDM, Ethernet LANs, MPLS, IP-VPNs, complex circuit path topologies for on-net and off-net circuits and multipoint networks within a common inventory and monitoring dashboard.



Service Visualization

Capacity Planning

Provides correlated utilization and performance data and forecasts utilization and performance over time, enabling a Just-in-Time approach to capacity upgrades that reduces capex and opex while ensuring quality customer experiences.



Capacity Planning

Workflow Orchestration

Automates workflows using a fully customizable workflow engine and unifies traditionally disparate systems within a service provider’s network infrastructure, automates manual processes that are prone to human error, and reduces the time to deliver new services and capabilities.



Workflow Orchestration

Network Analytics

Enables management and planning, orchestration and assurance with comprehensive utilization and sophisticated analytics, dashboards and report, for ports, circuit utilization, and performance KPIs.



Network Analytics

Real-time Troubleshooting

Displays near real-time state and monitoring data and leverages extensive analytics to isolate faults to root-cause domains and objects. Reduce truck rolls and MTTR, and determine fault dependencies between access providers.



Real-time Troubleshooting

Service Level Assurance (SLA) Management

Enables service providers to manage SLA performance for access vendor partners, and for key customers such as access vendors, and enterprises with visualization of near real-time performance metrics, and reporting.



SLA Management

Automated Reconciliation

Re-populates inventory systems with clean data, ensuring network-wide trusted data, reducing the cost associated with error-prone manual processes.



Automated Reconciliation

Continuous Data Audit

Ensures continuous data integrity by leveraging data from multiple sources, including OSS and tools, to enable a single visualized and trusted source of network data.



Continuous Data Audit

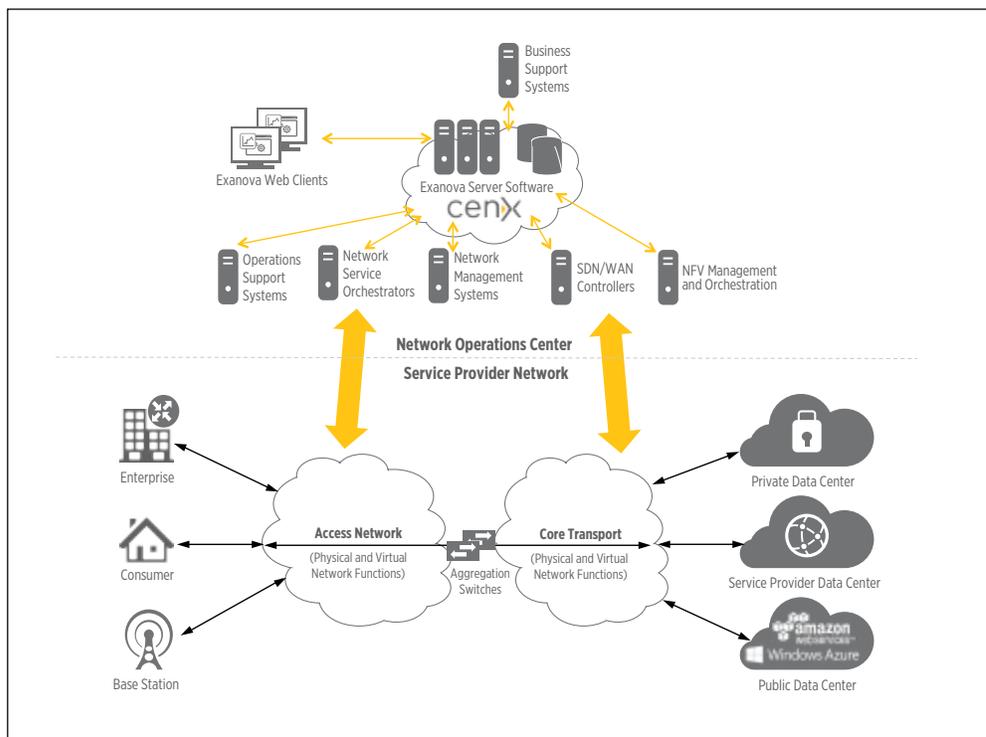
Exanova Service Intelligence Solutions

Exanova provides real-world solutions to real-world challenges (even when they're virtual).

	<p>NFV Service Assurance</p> <ul style="list-style-type: none"> • Build out NFV infrastructure while assuring the high Quality of Experience end users expect • Simplify service assurance with a common approach to physical and virtual infrastructure • Visualize physical and virtual network function infrastructure in a single pane of glass • Rapidly isolate performance issues and faults across physical and virtual network functions
	<p>Just-In-Time Capacity Management</p> <ul style="list-style-type: none"> • Eliminate the costly, long-horizon Just-in-Case approach to managing network capacity • Measure actual utilization based on network statistics and service OAM • Enable policy-driven, automated changes to physical and virtual capacity • Reduce costs by eliminating network over-engineering
	<p>Mobile Backhaul Lifecycle Service Orchestration</p> <ul style="list-style-type: none"> • Smooth the transition from TDM- to packet-based services in the mobile backhaul network • Improve inventory integrity with continuous audit and repopulation • Maximize network uptime with rapid fault isolation • Orchestrate inter-carrier services with on-net and off-net circuit visualization
	<p>Internet of Things Lifecycle Service Orchestration</p> <ul style="list-style-type: none"> • Plan, orchestrate, and assure IoT service connectivity in service provider networks • Streamline network operations and reduce operating costs • Ensure data integrity between disparate systems • Eliminate time-consuming manual processes associated with data correlation
	<p>Enterprise Connectivity Lifecycle Service Orchestration</p> <ul style="list-style-type: none"> • Provide a superior approach to traditional fiber cross-connect and IP peering architectures, with differentiated connectivity options including variable Quality of Service (QoS) • Streamline connectivity services over L2 Ethernet or L3 IP VPNs • Accelerate order to revenue time with automated, power-assisted workflow orchestration of data services and circuits and improved inventory integrity
	<p>Services Workflow Orchestration</p> <ul style="list-style-type: none"> • Blend automated and manual actions to accelerate new services and inventory audit functions • Lower opex through increased operational efficiency, streamlined workflow, and easy integration with existing systems • Accelerate revenues through simplified service activation • Increase customer satisfaction with reduced risks of manual errors and service fallout
	<p>Cloud Exchange Lifecycle Service Orchestration</p> <ul style="list-style-type: none"> • Facilitate exchange partnerships with self-service and policy-driven workflow orchestration • Guarantee end-to-end Ethernet connectivity with variable QoS options • Manage performance for SLA assurance and customer satisfaction • Monetize value added services by providing differentiated customer portal for self-service and SLA performance transparency

Exanova Service Intelligence Architecture

CENX is committed to open standards and architectures, and to interoperability in multi-vendor environments. Exanova’s architecture provides rapid integration to NFV components, SDN Controllers and existing OSS, NMS, EMS, and test and measurement tools. CENX is leading LSO standards within MEF, European Telecommunications Standards Institute (ETSI), the Open Networking Foundation (ONF), and TM Forum.



Technical specifications - Version 6.1

- Operating system — Red Hat Enterprise Linux 6.6
- Physical hardware — COTS hardware (virtualized environment) such as Intel-based CPU architectures, AMD; server with minimum 8 cores (not virtualized)
- Virtual machine environment — VMware ESXi V6.5+
- Supported clients — Google Chrome
- Supported APIs — REST, Corba, SNMP, SOAP/XML, and TLI

About CENX

CENX transforms network big data into real-time actionable intelligence. We accelerate end-to-end operations by harnessing dynamic analytics and web-scale computing to visualize, manage and assure data services across multi-vendor, SDN and NFV networks. Our software solutions are deployed by the largest, most innovative service providers worldwide.

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