Altiplano Access Controller

Simplify and automate your broadband network operations

Your access network is the future of your business. From a greenfield deployment to a brownfield enhancement, your network is constantly evolving. The Nokia Altiplano Access Controller provides the tools you need to easily deploy and manage your network today and grow into new broadband technologies and communication services.

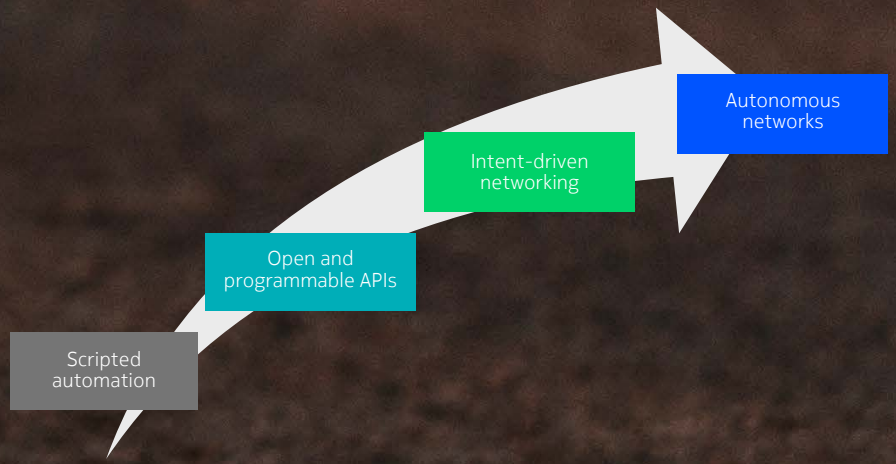
As operators start deploying SDN/NFV, there is an increasing realization that a fundamental change is needed in the network management layers. Altiplano represents this next step in the evolution of fixed access management systems. Altiplano provides an SDN platform, uniquely designed for automating operations and leveraging modern cloud technologies to simplify IT and OSS integration.

Open cloud-native approach to get to full network automation

Nokia Altiplano Access Controller is the key to the software-defined access network (SDAN). It virtualizes the intelligence of your network and centralizes it in cloud-native software applications, so that the network can be programmed and controlled through open APIs.

With an open and programmable network, you can dramatically reduce time-to-service (as well as time-to-market) and significantly streamline operating costs through automation.

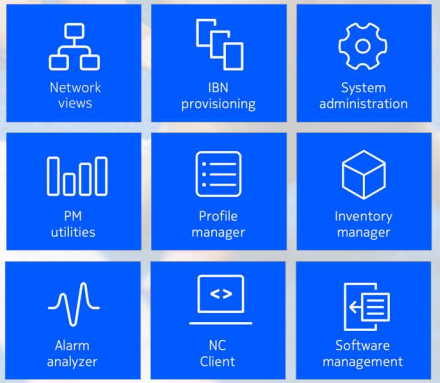
Operators can start their network automation journey with a comprehensive suite of intent-based APIs, policy, workflow, profile and software campaign management tools to enable closed loop automation and full network lifecycle management.



Welcome to the Altiplano Access Controller

The Altiplano Access Controller is a specialized domain controller providing unified management of a multi-technology, multi-cloud, multi-vendor broadband access environment. Leveraging intent-based policies and validated blueprints, Altiplano drives enhanced business outcomes with self-aware capabilities that continuously monitor and self-adjust to maintain the intended network state.

Powerful FCAPS (Fault, Configuration, Administration, Performance and Security) functions let you deploy and maintain network elements and network services smarter. It provides dashboards for network views, health, alarms, software management and network inventory, and enables easy navigation and drill down from equipment dashboards. Every GUI is 100% customizable: visualize what you use and care about. Hide what is irrelevant. Altiplano increases your operational agility, improves service fulfilment and service assurance, and significantly reduces operating costs.

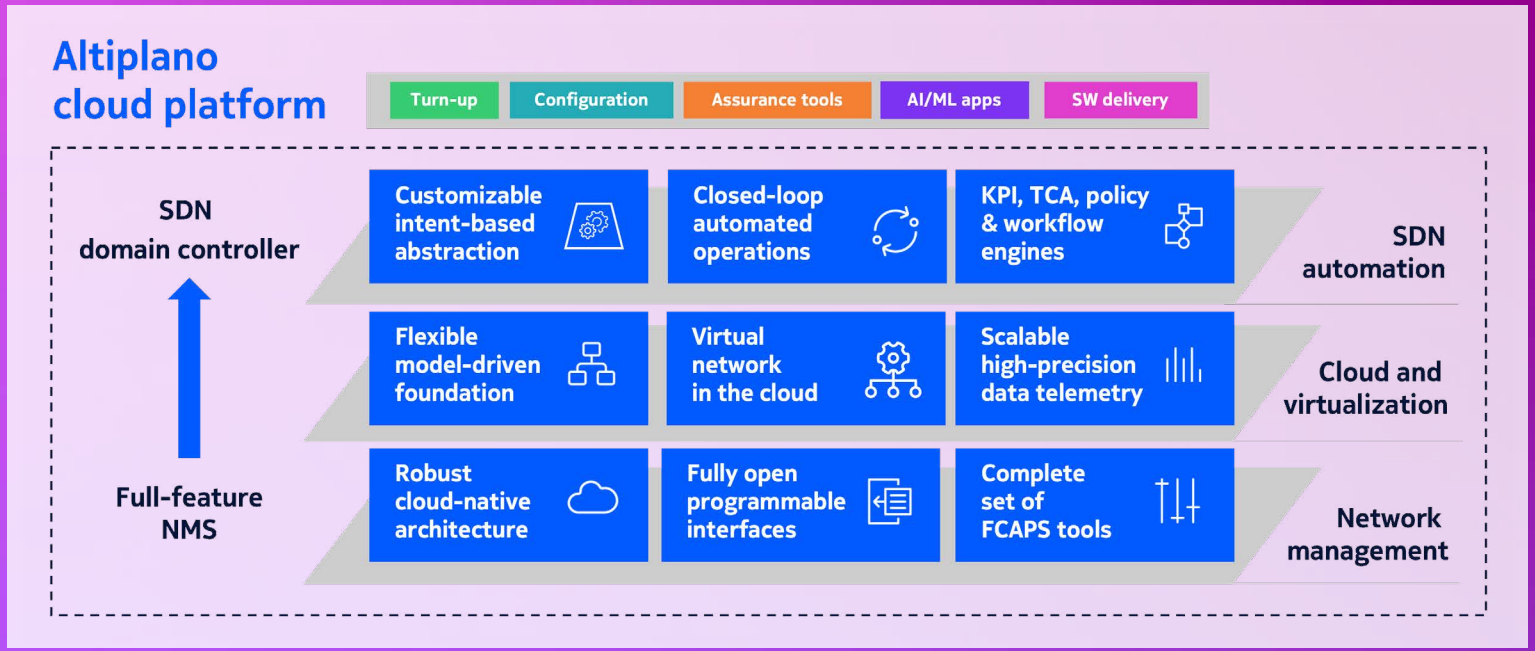


Network automation in a cloud-native world

Nokia Altiplano Access Controller is the only cloud-native management and SDN control solution that can support you throughout the entire life cycle of your access network, including pre-provisioning the always-on network, automation and abstraction, understanding service health, applying complex intents, network policies, process workflows, troubleshooting and handling network upgrades.

Altiplano's cloud-native modular architecture grows with your business in a traditional, SDN or hybrid environment. It allows you to transition to SDN whenever you are ready, with agile and flexible deployment options. Altiplano operates in an open and disaggregated way since it is made up of microservices, running inside containers and it is deployable in any cloud environment.

Altiplano provides a digital representation of the physical network, in software, to simplify device and service operations in your network and offer new virtualized functions such as persistency agents, network slicing at scale, health views, always-on data telemetry, faster diagnostics, and continuous versioning for easy back-ups.



Always-on, zero-touch provisioning

An always-on network extends the concept of high availability and ensures that network operations are always available. Altiplano provides logic and primitives that let you control and monitor hundreds of thousands of nodes. It presents a logical and abstract interface to the OSS so that it no longer needs direct access to the devices. By removing the need to manually coordinate provisioning and installation activities, a zero-touch environment is created. For example, network nodes can be fully provisioned, and configuration verified, before installation. This makes installation a simple plug and play operation: after the node is powered up, it communicates with the cloud, loads the right software and is automatically configured. This drastically reduces the time required to install equipment and bring it into service. With an always-on network, you simplify the field operations, reduce integration time and reduce time-to-market.

Network sharing and slicing

Altiplano has a powerful slicing engine enabling you to partition your physical network as many times as possible. Each slice can have different characteristics to cater for different services or types of traffic e.g for Industry 4.0, smart cities or cloud gaming. A partition can also be used to deliver wholesale open access and enable sharing of network resources among virtual network operators (VNOs). The sharing includes passive cabling, equipment, and ports, with strong operational isolation and process automation, while increasing flexibility and maintaining network visibility and control for the VNOs. It offers a configurable level of control allowing VNOs to set their own service levels and provide VNO differentiation. The solution is easily scalable and lets you manage large numbers of partitions and parameters without slowing down nodes.

Open and standardized

Nokia strongly commits to collaborating with open industry initiatives and standard bodies to increase solution interoperability. Openness at all layers speeds up the pace of innovation and avoids lengthy integration cycles. Open source has also become an integral part of Nokia's R&D process. Best-in-class IT and open-source tools were heavily used in building our solution.

Altiplano adheres to the Broadband Forum's Cloud CO architecture and can easily manage 3rd party equipment in a multivendor set-up. Altiplano supports a vendor agnostic device management for any type of equipment, whether it's traditional or SDN. This is all thanks to the flexible device modeling and powerful software plugins that allow to easily extend the platform capabilities.

Flexible cloud deployment models

Kubernetes is now mainstream in companies for automating deployment, scaling, and management of containerized applications. Cloud-native applications have less operational barriers or cloud dependencies and are flexible and scalable to match your own cloud strategy.

Operators can deploy the Altiplano Access Controller on a stand-alone server, in private or public cloud or in Software-as-a-Service (SaaS). There is also an Altiplano Appliance option for smaller sized networks. The fully containerized microservices design allows smooth migrations between different cloud deployment models. Nokia SaaS offers the same experience as an on-premises installation with no compromise between flexibility and functionality.

High availability and geographical redundancy

The cloud-native Altiplano software supports high availability (HA) by making use of the Kubernetes platforms scaling horizontally as well as providing recovery from node failure in runtime.

Altiplano can also be deployed in geographical redundancy (GR) mode whether in a CSP hosted model or in the SaaS model. A disaster recovery module keeps the data across the two sites in sync (near real time) such that the GR site can take control of the entire network within no time, minimizing your operations risk and making your network tolerant to a complete site of the Altiplano going down due to any unforeseen circumstances.

Open ecosystem and app framework

Nokia's application framework opens up the Altiplano platform for developers, partners and operators to create and combine applications for it through a digital marketplace.

There are ready-made apps in our catalogue for:

- Network Automation to optimize network, service and subscriber operations.
- Network Insights to improve quality, design and planning of networks.
- Network Support for pro-active monitoring, analysis and incident management.

You can also create new or additional value: our platform is open and easy-to-adapt, allowing you to customize and extend the software beyond its core functionality through the use of the Altiplano SDK for 3rd party developers. Nokia also provides a virtual lab environment for testing and integrating Altiplano in a contained ecosystem.

Deliver operational excellence with Altiplano App Marketplace

Network automation

ONT Easy Start

Automate the ONT activation process to enable first-time-right and user self-install

Bandwidth Sharing Optimizer

Dynamic PON bandwidth management for fair peak rate availability

Wholesale Network Portal

Wholesale API and WebUI for service fulfillment and service assurance of Altiplano Open Access solution

Secure Network Activation

Automate the onboarding process of access nodes in a zero-trust network environment

Network insights

Network Trend Analyzer

Anomaly prediction framework using time series analysis to predict network behavior

Network Capacity Manager

Monitor capacity, utilization and future bandwidth bottlenecks on the PON, OLT and uplinks

PON Capacity Planner

Run what-if scenario analysis to accurately predict congestion risks and set optimal subscriber peak rates

Optical Link Certifier

Automatically validate the end-to-end optical path in the PON before connecting subscribers

Network support

Automated Trouble-shooting Assistant

Create alarm rules and execute corrective actions for resolving network problems

SFP Health Monitor

Proactively detect SFP issues, degradation and outliners in optical performance

ONT Health Monitor

ONT proactive monitoring automatic analysis of key performance indicators

Network Perfor-mance Monitor

Monitor network nodes and management system health status

Making network operation faster, simpler, cheaper

With the Altiplano Access Controller you can automate network operations, reduce time-consuming manual interventions, and break down complex network configurations into discrete tasks. Altiplano Access Controller simplifies network complexity for the human operator, meaning that service reliability increases as your network evolves in a predictable and consistent manner. Every task is accelerated, with a significant reduction in time, effort and errors. Take advantage of new device capabilities more quickly using streamlined modular software upgrades. The network becomes easy to scale and manage: Altiplano provides a unique entry point to aggregate, persist and manage configuration, performance and fault databases for the entire network. Availability is maximized. Every connection is protected: TLS, certificates and HTTPS provide utmost security along with an additional central identity management role-based authorization.

Reducing operations effort

Provision nodes faster with zero-touch operations **50%**

Continuous versioning replaces backup-and-restore procedures **95++%**

Better assurance efficiency with always-on unified data access **43%**

Faster diagnostics and remediation with high-precision telemetry **29%**

Reduction in processing errors that will require repeat work. **85%**

Speeding up innovation

Faster integration with common controller and automated testing **71%**

Faster feature delivery with DevOps modular software roll-out **4x**

Short integration cycles for 3rd party access nodes **<2 weeks**

Reduced OSS integration complexity with IBN-based APIs **90%**

Faster time to revenue (TTR) through automated service provisioning **88%**

Powered by software-defined networking

Automation and abstraction

- Simplifies network management through intent-based abstractions for optimized automation of tasks such as device deployment and subscriber fulfillment.
- Provides monitoring insights of the configurations via abstract rollup of various KPIs into health indicators.
- Automatically optimizes the network via policies, such as correcting configuration misalignments.
- Guaranteed ACID (Atomicity-Consistency-Isolation-Durability) properties for transactions.

Unified management

- Serves as a single management interface for your OSS/BSS.
- Provides workflows and tools to visualize, automate and optimize the network.
- OSS can perform operations that seamlessly span several network elements.
- Functions across different operational deployment models and device implementations.
- Enforce business rules independently from the underlying implementations.
- Bridge traditional and software-defined networks (PNFs and VNFs).

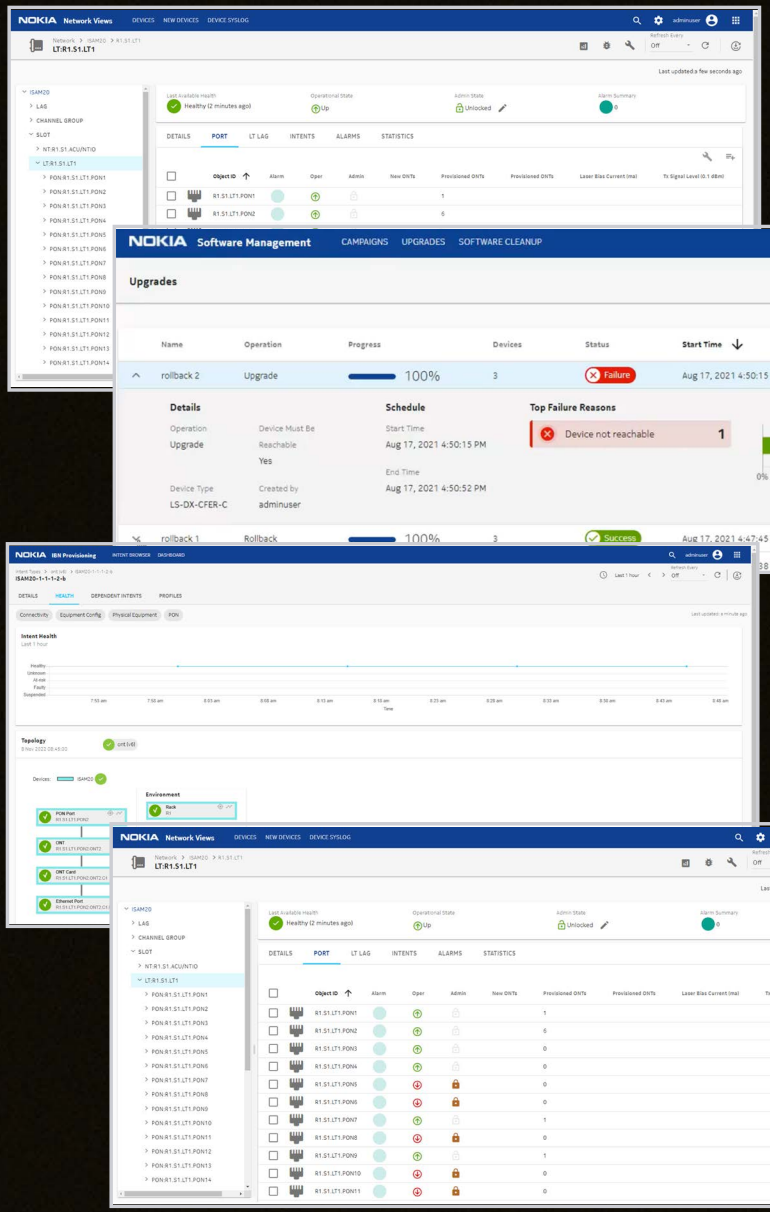
Programmable, modular design

- Open modular framework of scalable and reusable components.
- Full programmability of devices and capabilities through a set of open and standard interfaces.
- Fully multi-vendor capable and YANG model driven.
- Rich choice of NBI protocols: Netconf, Restconf, Kafka, REST, WebUI.
- Decouples devices and service layers, which inherently reduces the risk of introducing new technologies, allowing incremental investment in new systems and services.

Ready for the cloud era

- Cloud-native microservices solution, pre-integrated with common tool chains and IT platforms.
- Catering to all cloud deployment models and easy to migrate
- Persistent network representation in the cloud, always in sync with connected network elements.
- Scalable data telemetry framework for network assurance processes
- Centralized data store for easy access and back-up and restore.
- Application marketplace & SDK to meet unique business needs

Advanced network management, simplified



Network views

Configuration, status, health, alarm summary and equipment details.

Software management

Orchestrate equipment upgrade activities and view reports to track progress.

Intent-based networking

Fulfilment and assurance logic with live and historical service health view and topology

Alarm analyzer

Present live and historical alarm data and retrieve alarms from data lake.

Nokia, your partner for next generation fixed access networks

Nokia is the world leader in fixed access technologies. We have 30+ years of broadband experience and our equipment powers and manages some of the most advanced fixed networks in the world.

No matter where you are with your access network — from a greenfield development to a brownfield enhancement — the Nokia Altiplano Access Controller can help you to deploy and maintain your network faster and smarter.

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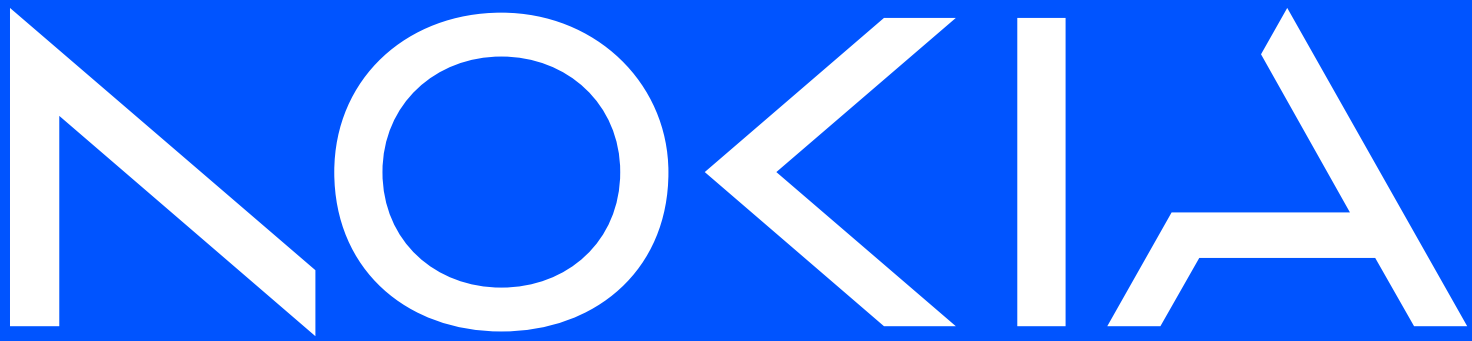

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering the future where networks meet cloud to realize the full potential of digital in every industry.

Through networks that sense, think and act, we work with our customers and partners to create the digital services and applications of the future.