



Alcatel-Lucent Enterprise

Autonomous Networks

Overview

The need for, and adoption of, new technology for enterprises to remain operational and competitive has become more apparent than ever, primarily due to the pandemic. The global health crisis highlighted the lack of preparation many organizations experienced in implementing secure solutions, expanding their network capabilities, or implementing remote access, such as in telehealth, virtual learning, and work from home programs. Digital transformation requires an automated, intent-based network that enables organizations to quickly adopt the latest technologies, while maintaining a secure infrastructure for all users whether they are on-premises or remote.

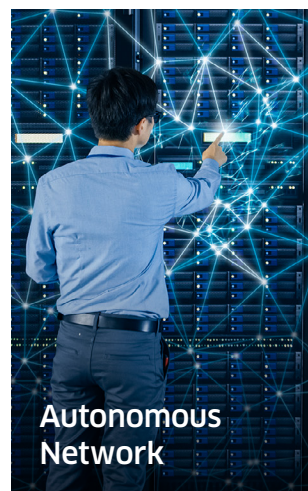
An automated, or [Autonomous Network](#), can accelerate the enforcement of network policies across an organization's devices, and it can self-monitor and continuously optimize itself to meet user demands.

"The Autonomous Networks' objective is to provide a wide variety of autonomous "Network/ICT" services, infrastructure and capabilities with "Zero-X" (zero wait, zero touch, zero trouble) experience based on fully automated lifecycle operations of "Self-X" (self-serving, self-fulfilling, self-assuring) to dynamically accommodate and adapt to customer needs and available resources. These services range from more efficient versions of current services, to mission-critical services, to new disruptive services for support of new business models and innovative user experiences; Autonomous Networks also feature self-evolving telecom network infrastructures."¹

The Alcatel-Lucent Enterprise Autonomous Network is one of the three key pillars of the [ALE Digital Age Networking](#) (Autonomous Network, IoT, and Business Innovation) blueprint that enables enterprises to enter the digital transformation era.

The ALE high-performance **Autonomous Network** can automatically provision network services and automate mission-critical network operations while

improving the user experience. **IoT** onboarding enables enterprises to scale-up digitalization through secure IoT provisioning and management. It can integrate, onboard, and connect a massive number of IoT devices that are at the foundation of new digital business processes. **Business Innovation** enables enterprises to leverage technology to accelerate their digital transformation with new automated workflows, taking the effort out of labor-intensive or repetitive tasks.



Autonomous Network

Automate mission-critical network operations and improve user experience



IoT

Scale up digitalization with secure IoT onboarding and management



Business Innovation

Accelerate transformation with automated workflows

¹<https://www.etsi.org/images/files/ETSIWhitePapers/etsi-wp-40-Autonomous-networks.pdf>



Autonomous Networks

An evolving infrastructure

IT infrastructure has evolved over the last 20 years, from data center-centric, to distributed architectures. While it takes minutes to deploy a new application, it can take days or even weeks to manually configure the enterprise network, element-by-element.

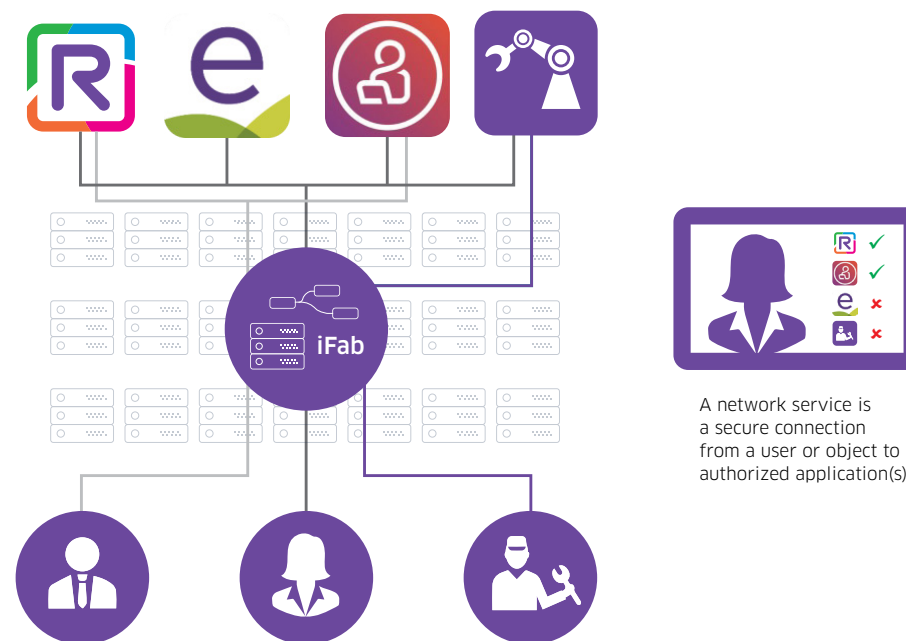
Some of today's networks' digital transformation challenges include: complexity of operation, lack of agility, susceptibility to human error, and the inability to support business innovation. Organizations often lack the foundational network infrastructure required for their enterprises' digital transformation, whatever business it may be.

This is now changing. IT leaders can now shift their focus to business transformation rather than just building and running the infrastructure.

The ALE Autonomous Network

The Alcatel-Lucent Enterprise Autonomous Network is configured and provisioned automatically to run with minimal-to-no human intervention. It ensures that new technologies are operational and scalable for distributed workforces and provides mission-critical, secure network operations, while optimizing the user experience. The ALE Autonomous Network architecture provides automated service provisioning between users, devices, and applications and ensures a robust network infrastructure by automating moves, adds, and changes, reducing the time and effort it takes to maintain and operate a network.

Example of automated user/device connectivity to authorized applications:



A network service is a secure connection from a user or object to authorized application(s)

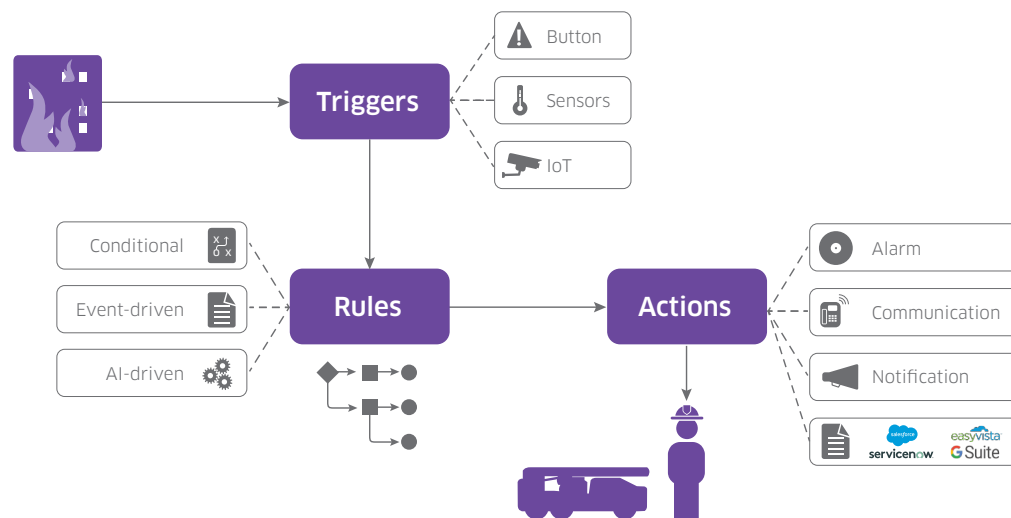
Automation from the edge to the core

The Alcatel-Lucent Enterprise Autonomous Network architecture operates from the network edge to the core:

- **Unified edge:** Users, devices, and IoT can connect to the Local Area Network (LAN) and/or Wireless Local Area Network (WLAN) with a consistent connection experience and performance capabilities. Switching from fixed LAN to wireless LAN with the same device is simple and secure.
- **Unified fabric:** LAN, WLAN, core/data center, and soon, a branch portfolio with cloud management and embedded security
- **Network services automation:** This is the key layer in the autonomous network that enables network automation through programmability, provisioning, analytics, the Rainbow™ by Alcatel-Lucent Enterprise workflow engine, as well as third-party integration. Well defined telemetry (syslog) and APIs enable a variety of automation capabilities, including:
 - Situational awareness: The network senses moves, adds or changes and adjusts network parameters automatically
 - Network analytics: Enables automated network services responses to specific pre-defined network performance or connectivity criteria
 - Policy management: Unified Policy Authentication Manager (UPAM) provides network, device and user configuration. It manages roles, network, and application access policies.
 - Proactive Lifecycle Management (PaLM): Provides inventory management and ensures that software and networking equipment maintenance are up-to-date
 - Zero trust orchestration and management platform: Delivered using secure IoT onboarding and monitoring
 - Orchestration and management: Using a single management platform either on-premises or in the cloud
 - Third-party integration: ALE APIs enable customized services and/or reports, based on specific business needs
 - Workflow automation: When integrated with Rainbow as a workflow engine, the network can act upon API or IoT inputs, apply them based on preset rules and triggers, which automatically execute a pre-defined set of actions

All of which is designed to deliver business outcomes that match customers' business objectives.

Workflow automation:



For other non-ALE networks and domains, the Autonomous Network supports branch infrastructure automation, which includes:

- Zero-touch branch setup
- Maximum security (hardened switch OS supplemented with secure diversified code, independent validation and verification of the Alcatel-Lucent OmniSwitch® operating system software, and application analytics and policy enforcement at the edge of the network)
- Central management (on-premises or cloud)
- Centralized access policies
- Automatic VPN setup
- Device finger-printing. Alcatel-Lucent OmniVista® 2500 Network Management System database supplemented by cloud device database to fingerprint and ID millions of devices and equipment and enable automatic and secure onboarding; devices not identified are temporarily quarantined until further action is taken.



Resilient and seamless connectivity

The Autonomous Network provides a resilient and seamless connected experience with the LAN and WLAN combined with ultrafast convergence, secure network access control, and hardened switch OS supplemented with secure diversified code. The latest generation enterprise Wi-Fi with embedded WLAN control in access points removes the need for physical centralized controllers. This distributed intelligence architecture delivers the best performance and scalability, and ensures high availability, operational simplicity, and low total cost of ownership (TCO). The WLAN solution is coupled with a comprehensive high performance, ultra-scalable multigigabit Ethernet LAN portfolio that supports deployment requirements ranging from access, to core, and data center. All of this is supported in even the most extreme and harshest environments.

A single Network Management System (NMS) provides an additional level of integration between wired and wireless networks. This reduces the IT managers' workload as they no longer have to handle two management systems with two sets of policies and configuration rules (one for the LAN, and another for the WLAN). The NMS provides unified service management and network-wide visibility, which can improve IT efficiency and business agility.

Individually, these technology elements can stand on their own to improve deployment, monitoring, policy enforcement, and performance of any network. However, combined they deliver a network that is easily expandable, supports both local and remote/distributed users, and is capable of self-healing and optimization.



Summary

The Alcatel-Lucent Enterprise high-performance [Autonomous Network](#) automatically provisions network services and automates mission-critical network operations while improving the user experience. As a key pillar of the [Alcatel-Lucent Enterprise Digital Age Networking](#) blueprint, the Autonomous Network enables enterprises to enter the digital transformation era.

The ultimate goal of the Autonomous Network is to improve the Quality of Experience (QoE) for all users (IT, business management, and customers).

For additional information or to speak to an expert, please feel free to [contact us](#).

