



Digital Age Networking

for Government

Brochure

Alcatel·Lucent 
Enterprise



Government

Digital age technologies that help improve efficiency are being adopted by government agencies at an increasing rate. To stay competitive, local and central government organisations need to integrate the latest mobility, data analytics, cloud, and IoT digital innovations into their operations, processes, and computing systems. This trend, known as digital transformation, enables government organisations to evolve to an infrastructure that supports connectivity for digital applications, IoT, and user devices, while enabling workflow optimisation, more efficient processes, and differentiated products and services, resulting in improved citizen and employee satisfaction.

In the past it took days to provision a service on the network and configure it. Today it takes only seconds with error-free automation from [Alcatel-Lucent Enterprise Digital Age Networking](#). In this new paradigm, the network evolves from being a complex and costly underlying infrastructure into an enabler of new revenues with low operational costs.

Digital Age Networking is based on three pillars and enables governments and smart cities to enter the digital transformation era.

- A high-performance [Autonomous Network](#) can automatically provision network services and automate mission-critical network operations for an improved user experience. Automated provisioning of a secure network infrastructure helps public sector organisations connect citizens to services, enable smart city solutions, and improve public infrastructure operational efficiency while decreasing cost and risk.
- [IoT](#) onboarding enables governments to scale-up digitalisation 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 enterprise digital business processes. IoT onboarding simplifies government IoT network setup by easing smart devices provisioning, providing more efficient operations, and increasing security using IoT containment.

- [Business Innovation](#) helps governments accelerate their digital transformation with new automated workflows, taking the effort out of labor-intensive or repetitive tasks. Business Innovation can minimise the occurrence and risk of cyberattacks on government networks, aid in managing crisis situations by using workflow processes to prioritise critical communications and resources, and reduce down-time related to maintenance.



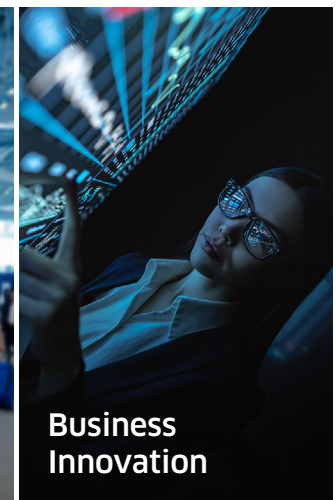
Autonomous Network

Automate mission-critical network operations and improve user experience



IoT

Scale up digitalisation with secure IoT onboarding and management



Business Innovation

Accelerate transformation with automated workflows

Autonomous Network

The citizen experience has become an important consideration for government organisations. Capabilities such as secure, responsive public services, improved emergency response systems, and wireless connectivity play a significant role in improving the experience. From air quality alerts sent to the public on mobile devices, to real-time wayfinding signage that identifies emergency evacuation routes, the public is used to being able to connect from almost anywhere, and this must extend into the government experience.

Implementing these smart city use cases requires breaking organisational silos. Information must be shared and budgets must be pooled across multiple government agencies for smart cities to be technically feasible and cost-effective. A silo architecture where each vertical use case relies on its own infrastructure, middleware, and applications increases complexity and cost.

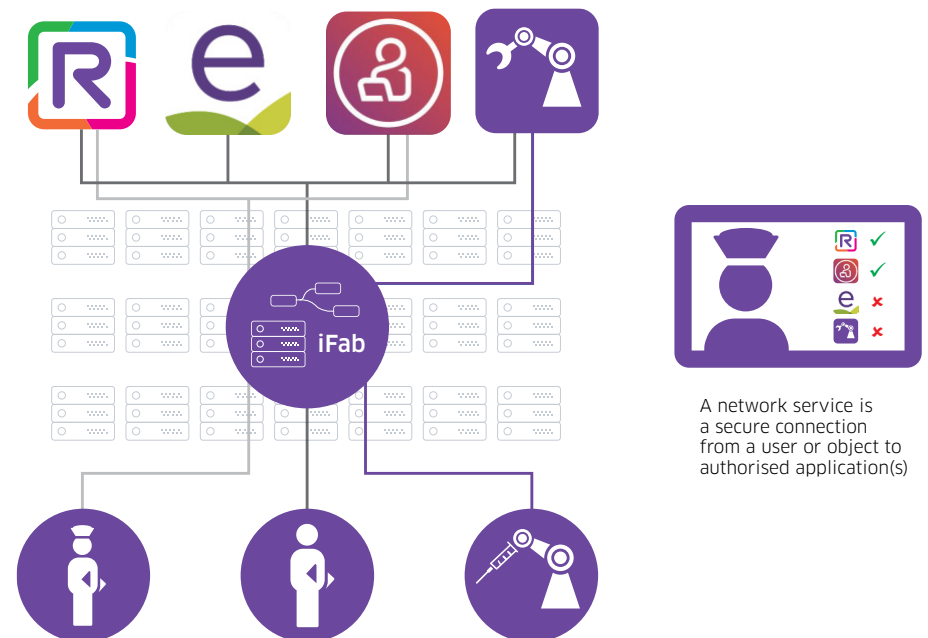
The ALE reference architecture for smart cities uses Digital Age Networking, a horizontal architecture that provides a common infrastructure and services layers for use cases and applications.

IT infrastructure has evolved over the last 20 years to where it is now fully automated. Networks unfortunately have not kept up. 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. This is now changing. IT leaders are shifting their focus to business transactions rather than building and running the infrastructure as was previously required.

The ALE Autonomous Network is configured and provisioned automatically. It ensures mission-critical, secure network operations, while optimising the user experience. In the future it will adapt automatically to changing business conditions and provide a secure connection automatically from a user, or object, to an authorised application. As part of the Autonomous Network architecture, [Intelligent Fabric](#) (iFab) technology automates the deployment of the network and simplifies moves, adds, and changes while reducing the time and effort it takes to maintain and operate a network.

The ALE Autonomous Network provides a resilient and seamless connected experience with the [Alcatel-Lucent OmniSwitch®](#) (LAN) and [Alcatel-Lucent OmniAccess® Stellar](#) (WLAN) with ultra-fast convergence time, secure network access control, and assured Quality of Service (QoS). New generation enterprise Wi-Fi with embedded WLAN control in access points remove the need for physical centralised controllers. This distributed architecture delivers the best performance and scalability and ensures high availability, with operational simplicity and low total cost of ownership (TCO). The WLAN solution is coupled with a comprehensive wired LAN that supports deployment requirements ranging from access, to core, and data centre. All of this is supported in even the most extreme and harsh environments.

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



Internet of Things (IoT)

The Internet of Things (IoT) has the potential to transform the public sector by profoundly altering how government entities gather data and information and by bringing together major technical and business trends including mobility, automation, and data analytics. IoT refers to the networking of physical objects, using embedded sensors, actuators, and other devices that collect and transmit information about real-time activity within the network.

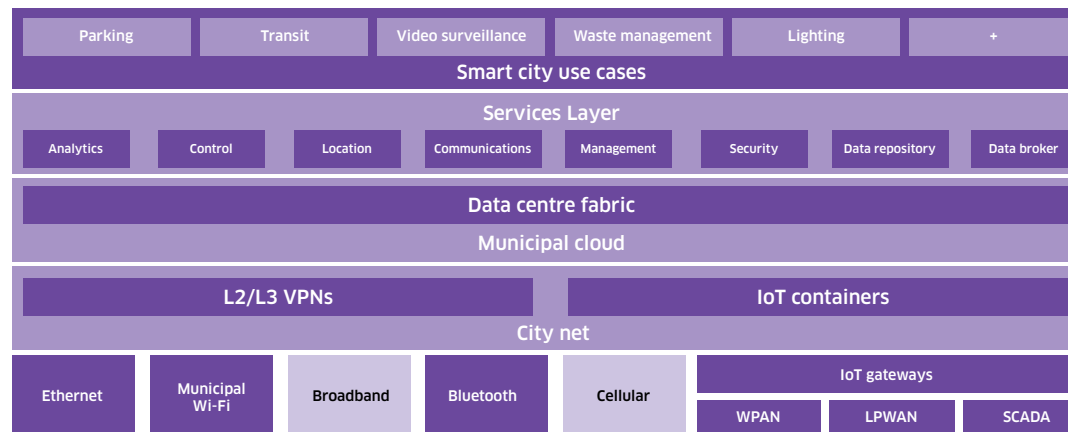
A typical smart city network consists of users, employee devices (IoT), and the network infrastructure that interconnects users to the multiple applications within the data centre. Next is installation of the associated IoT devices such as sensors, cameras, and telemetry devices that support each of the different groups within a smart city deployment including utilities, healthcare, education, and security, among others.

The limited processing power of connected objects prevents devices from having embedded, sophisticated security capabilities. This creates two major problems; devices are hard to configure, and they are easy to hack. The highest security risk is not the objects themselves, but rather the doors they open to other network segments. Once the object is compromised and hacked the whole enterprise network becomes vulnerable to attack vectors such as a Trojan horse or other virus. When you consider the fact that smart cities connect thousands, if not millions of these objects, the challenge becomes clear; configuration and management of individual devices is totally unrealistic and the security risks are enormous.

Alcatel-Lucent Enterprise's [IoT containment](#) solution is designed to provide an automated solution to efficiently and securely onboard IoT devices while protecting the government network.

Three major steps to connect, manage, and properly control any IoT device must be followed:

- **Discover and classify:** Each object connected to the network must be discovered and classified. Digital Age Networking provides the ability to access a very large (29+ million) device database to immediately identify the object connected to the network and automatically provision a configuration associated with a specific device.
- **Virtual segmentation:** It is critical to segment a single physical network infrastructure into separate virtual networks, or containers, to ensure that each service, or application has its own dedicated segment, ensuring proper function and secure operations.
- **Continuous monitoring:** The network monitors behavior to ensure that the IoT devices and applications are functioning as desired. Each authorised object is stored in an inventory. This enables IT to know exactly and instantly how many devices are connected on the network. It is important to continuously monitor a connected object on the network to take immediate action if there is a deviation from usual behavior. In the event of unusual activity the network can take actions such as, disconnecting the faulty device, sending a notification to the network administrator, or changing the destination of the dedicated IoT container for further verification.





Business Innovation

New processes are optimised when they leverage user, app and IoT metrics in real-time. Digital Age Networking can help governments optimise processes and services. This is key to business innovation, improved productivity, workflow optimisation, and an enhanced user experience.

Technology innovations including IoT, location services, and collaboration platforms are at the forefront of process and services automation. Alcatel-Lucent Enterprise is leading the way by integrating these components to help governments reap the benefits of their technology investments.

[Alcatel-Lucent OmniAccess Stellar Location Services](#), which include asset tracking and contact tracing, can help increase safety and reduce both operational and asset-related costs.

[Alcatel-Lucent OmniAccess Stellar Asset Tracking](#) provides real-time and historical location of users or objects in government facilities using Wi-Fi and Bluetooth technologies. This information allows governments to better understand workflows, increase utilisation of equipment, significantly reduce the time it takes to find someone or something, avoid lost or stolen assets, and increase productivity,

while enhancing user experiences. From an operations perspective, misplaced or lost equipment incurs heavy costs to governments every year. Knowing where assets are in real-time, or where they are stored, can help facilities keep equipment costs under control. Other key OmniAccess Stellar Asset Tracking features include real-time occupancy management and historical contact tracing which can help identify areas where crowd restrictions are being exceeded, or allow follow-up notifications to individuals in case of an incident such as exposure to harmful chemicals, or infectious diseases.

Occupancy management is simplified with the ability to quickly check people density in predefined areas. Limits can be set and automatic alerts can be sent when occupancy limits are exceeded.

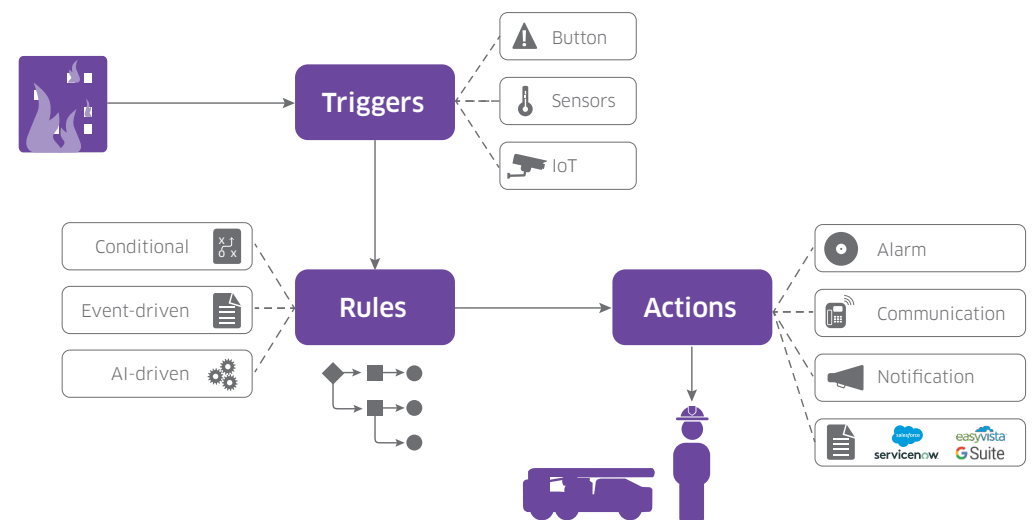


Real-time and historical data with a geolocation context enable the development of new innovative digital processes and services. Integrating data from the OmniAccess Stellar Location Services with a business collaboration tool like [Rainbow™ by Alcatel-Lucent Enterprise](#) enables automation of simple or repetitive tasks. It also enables the development of workflows that can be automated using **triggers, rules, and actions**, as shown in the following graphic.

Minimising the chances of cyberattacks is always a high priority. Machine Learning (ML) can study the normal behaviors of IoT devices, traffic patterns of users, and access rights. When anomalies are identified, Rainbow workflows can help detect and take immediate remediation action to minimise, or stop the effects of a malicious attack. Rainbow workflows can also minimise or eliminate down-time related to maintenance through proactive analytics. It can alert IT operators about predictive bottlenecks, recommend upgrades based on best practices, and identify potential network problems.

Rainbow workflows can also help in managing crises such as weather, natural disasters, or man-made. In these situations, network infrastructures can easily become overwhelmed when many people are trying to communicate at the same time. ALE has the capabilities to ensure key individuals, such as first responders, have their communication requirements prioritised as well as any special resources such as a live feed from a specific surveillance camera.

The possibilities with Rainbow workflow are numerous and can take interactions between “things” and “humans” to the next level for both citizens and government employees.





Summary

Digital Age Networking is the ALE blueprint that helps governments and smart cities enter the digital era and enable their digital transformation.

The ALE digital transformation blueprint is based on three pillars:

- **An Autonomous Network that easily, automatically, and securely connects citizens, government employees, processes, applications, and objects:** The Alcatel-Lucent Enterprise Autonomous Network also is based on a streamlined portfolio complete with a true unified management platform delivering common security policies across the LAN and WLAN. The Autonomous Network also provides deployment flexibility indoors, outdoors, and in industrial environments. Network management can be delivered on-premises, in the cloud, or in a hybrid deployment depending on customer preference.

- **Secure and efficient onboarding of IoT devices:** Digital Age Networking enhances security and can automatically onboard IoT devices. Segmentation keeps devices in their dedicated containers and minimises the risk of having the device and network compromised. IoT containment can help businesses easily and automatically understand if the device is behaving properly, or not, and help to keep the network safe.
- **Business innovation through workflow automation:** Integrates users, applications, and IoT metrics in real-time using geolocation data. Rainbow workflow capabilities, simplifies the creation and roll-out of new digital business processes. This is the key to business innovation, enhanced productivity and automated digital processes and services.

Alcatel-Lucent Enterprise is committed to developing networking technology and solutions that help public sector agencies realise their potential through digital transformation.