



ALE | Where  
Everything  
Connects



# Digital Age Networking for Healthcare

Brochure

Alcatel·Lucent   
Enterprise

# Digital Revolution in Healthcare

ALE Digital Age Networking helps hospitals and clinics connect patients, staff, and the healthcare ecosystem, by delivering network technologies that work across, and beyond facilities. It optimizes the patient care pathway and improves staff efficiency through innovative network services such as wayfinding and medical asset tracking, which run on top of a reliable, secure and high-performance Wi-Fi infrastructure. ALE technologies also ensure secure network setup, unified access and policy management, automated user and device onboarding, while granting optimal Quality of Service (QoS) for users and medical IoT devices.

The healthcare digital revolution differs from other industries. Healthcare providers have a variety of unique needs when it comes to the network and IT infrastructure. For this reason, it has always been difficult for hospitals, clinics, and assisted living facilities (aged care vs. healthcare), to adopt modern technology standards. In addition to privacy and patient safety requirements, access and availability of care

are also major concerns. For healthcare providers to best transition to new technology, they need assurances that the network will be specifically designed to meet industry needs. Some considerations include:

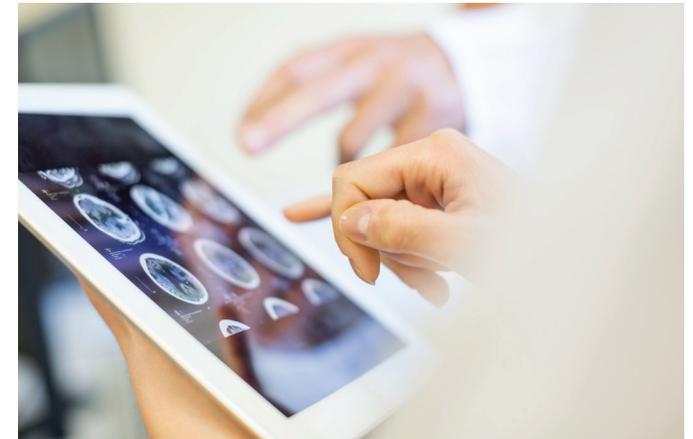
- **Connected medical devices:** A hospital network must be able to identify, securely onboard, and connect a variety of medical devices (fixed and mobile) to their respective applications.
- **Need for high resolution imaging for diagnosis:** 4k imaging and high resolution images are increasingly being used by doctors to improve diagnosis. The network must be able to transfer large image files without network delays or without affecting the performance of the network.
- **Mobile patient information:** Patient information such as EHR/EMR, imaging, and medical files, need to be accessible everywhere, anytime, on any clinician device, and on-demand, with the lowest possible latency.



Connected medical devices



Need for high resolution imaging



Access information everywhere, any time

One of the core challenges for healthcare digital transformation involves the interactions between the network's different departments. Healthcare providers generally have a variety of networks which may be completely isolated from each other. These can include medical IoT, clinical applications, patient records, administrative information, patient/visitor internet access, communication systems and more.

This multitude of requirements has led to the need for a converged network, through which multiple networks can be connected, but not consolidated. Maintaining disparate networks almost universally leads to issues with QoS and cost. The ideal solution is to tie everything into a single IT infrastructure to ease network management, monitoring and maintenance, while at the same time maintaining the security level between the networks. ALE Digital Age Networking consists of four key pillars and is an ideal network infrastructure solution for healthcare. These key pillars include:

- Connectivity
- IoT (Internet of Things)
- Augmented intelligence
- Cloud economics



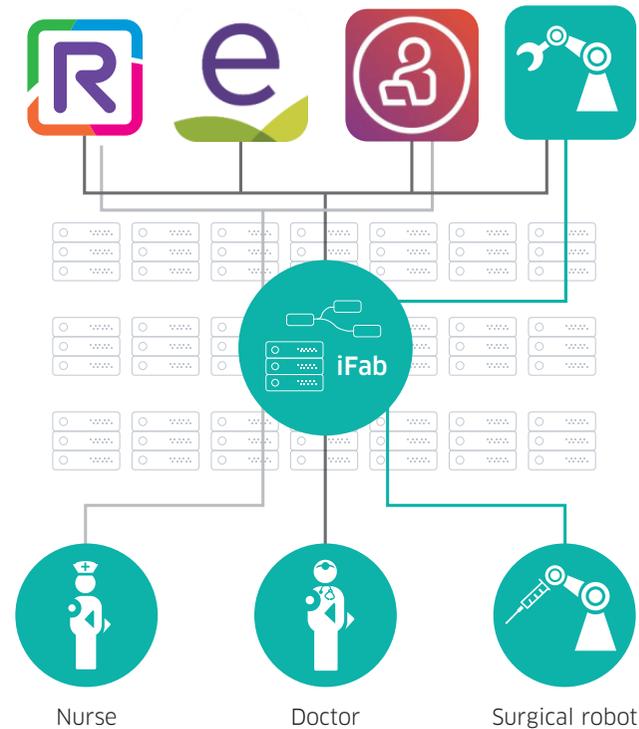
<p><b>Connectivity</b></p>  <p><b>Service defined network</b></p> <p>To easily and securely connect clinicians, patients and staff to devices and applications</p>	<p><b>IoT</b></p>  <p><b>IoT digital business</b></p> <p>To improve health outcomes and patient wellness by enabling millions of IoT</p>	<p><b>Augmented intelligence</b></p>  <p><b>Proactive analytics</b></p> <p>Using data analytics and AI to optimize patient care workflows and streamline operations</p>	<p><b>Cloud economics</b></p>  <p><b>IT as a business engine</b></p> <p>Leverage IT to increase patient-clinician time and reduce equipment costs with LBS and asset tracking</p>
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Digital Age Networking is the enterprise networking solution that enables businesses and organizations to enter the digital age and achieve unprecedented levels of success. The primary mission is to help businesses generate new outcomes, based on technological evolutions.

A high performance, ALE Service Defined Network technology provides the foundation for Digital Age Networking. The ALE technology for network connectivity, easily, automatically and securely delivers network services by interconnecting users and devices with authorized processes and applications. Digital Age Networking can integrate, onboard and connect, the massive number of Internet-of-Things (IoT) devices that need to be connected to their applications. The goal is to optimize the quality of experience for all users. Digital Age Networking also provides cloud advantages, coupled with advances in network technology, to enhance productivity and create additional potential revenue sources while reducing operating costs.

# Connectivity

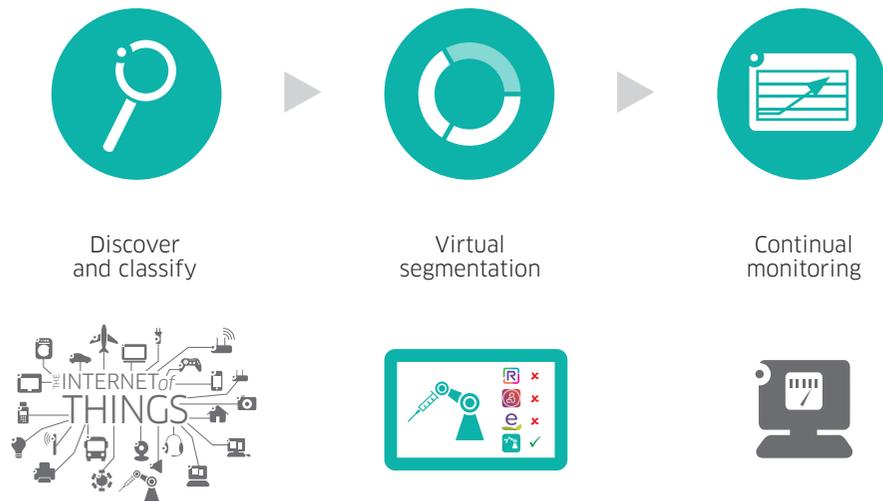
Digital Age Networking provides a high availability end-to-end network solution, from the datacenter to the access layer, connecting LAN and wireless LAN devices, Internet of Medical Things (IoMT), and users need to be connected, seamlessly and securely. The Service Defined Network provides a secure connection from a user or object, to an authorized application, and leverages a combination of ALE technologies, including **Intelligent Fabric (iFab)**, **Unified Access (UA)** and **Shortest Path Bridging (SPB)**. iFab technology automates the deployment of the network and makes moves, adds, and changes simple, reducing the time and effort it takes to maintain and operate a network. iFab works in conjunction with SPB, an industry standard bridging technology that enables a network to leverage all network links and ensures an efficient and resilient network architecture. UA technology implements universal network profiles to ensure the right policies (departmental and application access, security, performance and QoS parameters) are established for clinicians, administrative staff, security personnel, patients, visitors and others, while the unique policies are enforced across the individual wired and wireless LAN users and devices. UA ensures that Digital Age Networking for healthcare simplifies and secures how staff, patients, visitors, devices and objects, connect to a hospital, clinic, or assisted living facility network, while delivering a performance level that is appropriate for individuals, groups, or assets.



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

# IoT

Digital Age Networking supports IoT (or IoMT) by providing device fingerprinting and secure onboarding so that only known and authorized devices have access to a healthcare network. Market analysts<sup>1</sup> predict that 20-30 billion IoMT devices will be connected to healthcare networks by 2020. The question is, how is this done in a secure manner using a single network infrastructure? The network can be secured via **IoT enablement and containment**, using segmentation techniques (such as VLANs or Virtual Private Networks leveraging SPB), and unified policies based on departmental requirements, or workflow functions. For example, EHR systems, imaging systems (such as MRI, ultrasound, and X-ray), administrative ERP systems, patient and guest Wi-Fi, security systems (including video cameras and access control), and facilities systems (such as HVAC, laundry and lawn sprinklers). This enables a healthcare provider to operate a converged network, virtually separated, enhancing security for all users, devices and functions. It also empowers clinicians and caregivers with the tools they need to deliver an enhanced patient experience.



1 - Frost & Sullivan 2019

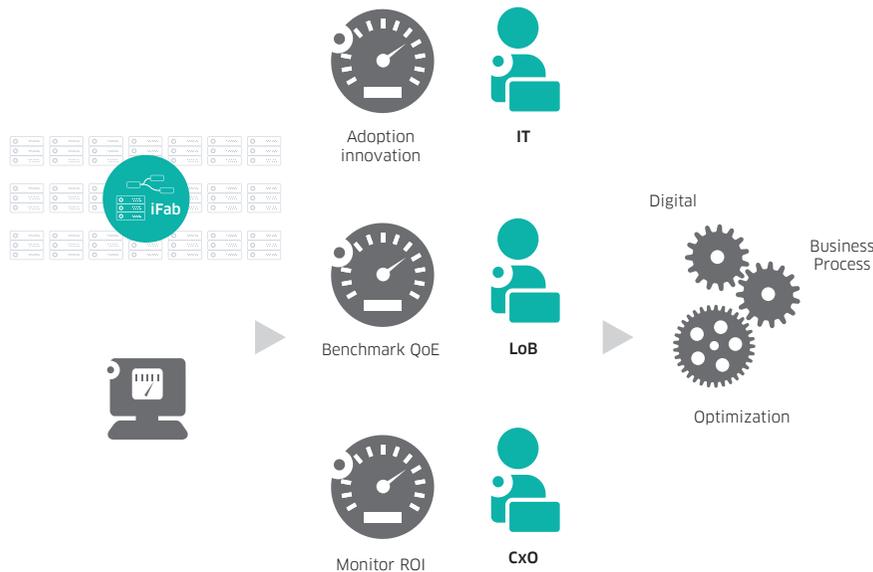


# Augmented Intelligence

Augmented Intelligence, in Digital Age Networking for healthcare, provides proactive analytics about people, assets, and the network. With one network management system for LAN and WLAN, on-premises (Alcatel-Lucent [OmniVista® 2500 Network Management System](#)), or in the cloud ([Alcatel-Lucent OmniVista Cirrus](#)), healthcare providers can set up user and device policies, consistent security, and can inventory of all IoMT devices and network elements connected to the network. IT managers benefit from one place to view and manage all IoT containers, one interface for all analytics and network services, and a workflow wizard to simplify analysis.

Healthcare providers have the ability to fine tune the performance of the network based on the statistics and application analytics available to them. Users, devices, and applications can get the expected performance, reliability, and security, while IT can best optimize the use, operation, configuration, and evolution of the network.

Healthcare providers are better able to understand their business and can use the data to optimize departmental workflows or processes to deliver the best possible patient experience.

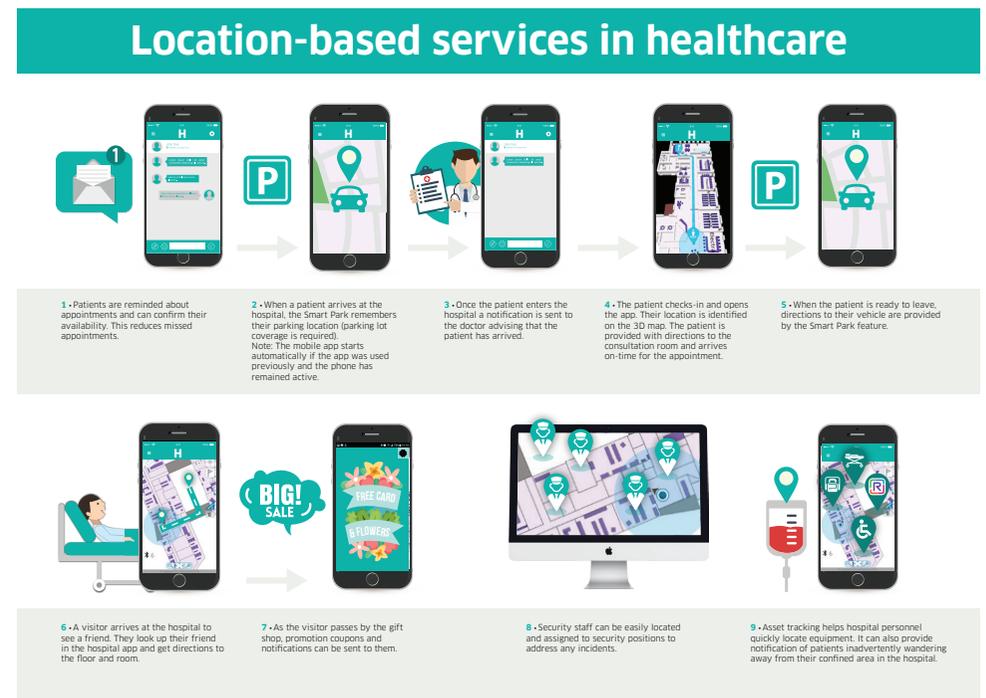


# Cloud economics

The challenge for healthcare providers, whether private or socialized healthcare, is trying to figure out how to secure and enable connectivity for users, devices and IoT in their facilities, while keeping costs down. Moving to the cloud is one way to save money. Digital Age Networking for healthcare provides options for on-premises or cloud-based network management and application analytics (Smart Analytics), as well as financial models to suit CAPEX (pay up front), OPEX (pay per use), or hybrid (combination of CAPEX and OPEX) financing offers.

Digital Age Networking for healthcare can also help providers reduce costs, both operational and asset related, using **location-based services (LBS)**. LBS includes wayfinding (self-navigation indoors), geonotifications (push messages) and asset tracking (people, devices, and IoT), all managed from a cloud application. More than one hour per day of a nurse's time is consumed looking for someone, or something. Asset tracking can identify, in real-time, the location of users, devices, and assets. It can also recognize whether devices are available (active) or not (non-active, or in maintenance), and it can locate clinicians, high risk patients (wandering elderly and new-born children), and security personnel. Wayfinding can direct nurses to find the people or assets they are looking for on a floor plan map of the facility, and a patient's room can easily be found by family and friends with turn-by-turn directions. Medical equipment, such as infusion pumps and bio monitors, need to be cleaned and serviced on a regular basis or they cannot be used and new equipment must be purchased. Asset tracking can ensure that this equipment is located, inventoried, and properly maintained. Geonotifications are messages that can be sent to the mobile devices of nursing staff, doctors and visitors, for example, to remind them to sanitize their hands before entering and leaving a certain area or patient room helping to reduce the spread of infections.

Tracking people (hospital staff and patients, as well as, anonymous visitor location) and assets in real-time generates a lot of data. The LBS cloud application captures the data and provides analytics dashboards that can be used to optimize people, assets, and operational workflows. This information can help healthcare providers and facilities run more efficiently, which saves money and enables better patient care services. Following are a few examples of the cloud at work in a healthcare environment.

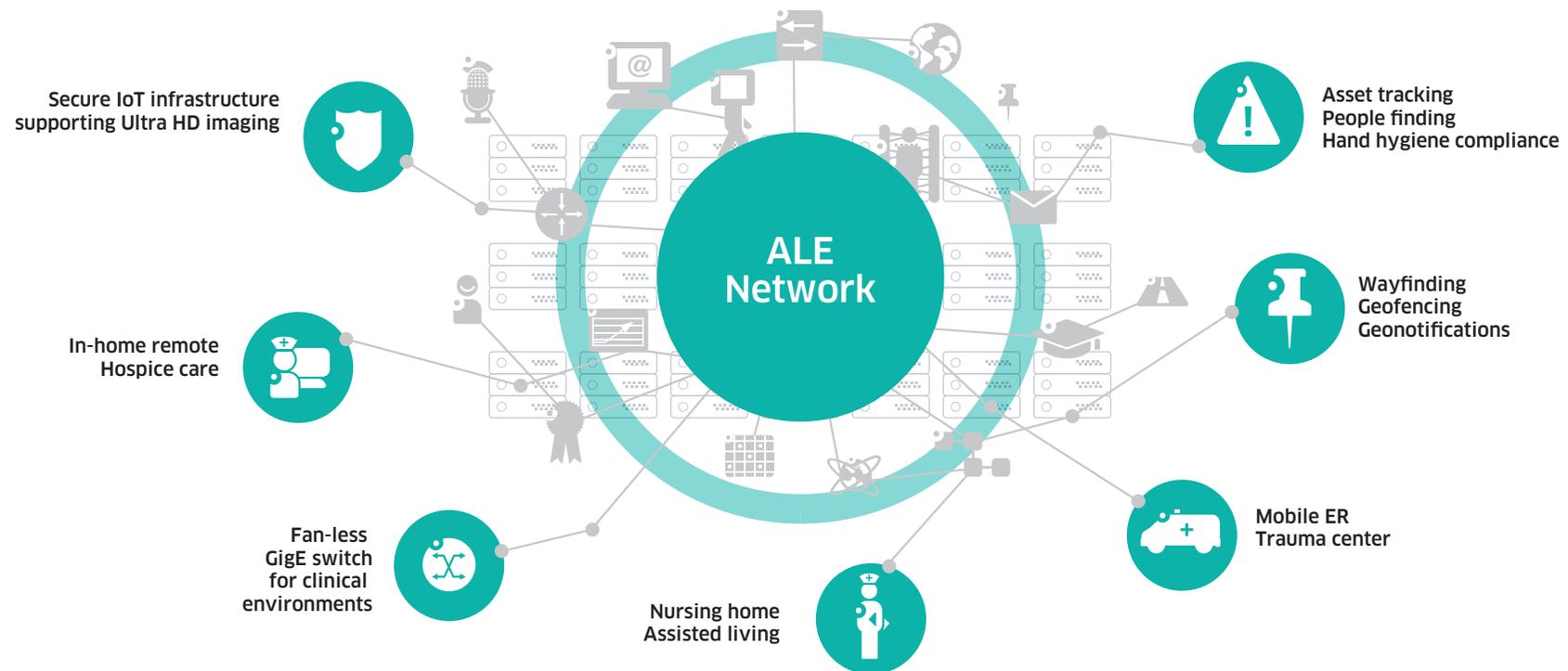


Location-based services examples in Healthcare.

# Healthcare use cases

ALE Digital Age Networking for healthcare supports multiple care areas. They include:

- Network infrastructure performance improvements for LAN and wireless LAN equipment to support EHR systems and 4K imaging
- The introduction of in-home remote/hospice care solutions, nursing home/assisted living solutions for small to large networks
- Location-based services (LBS) providing indoor navigation, geolocation and geonotifications
- Asset tracking to locate people and assets
- A mobile trauma center in an ambulance
- The ability to quickly set up a trauma center/triage area with full high-performance network capabilities





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We help you Connect your patients,  
staff and healthcare ecosystem.  
Delivering technology that works  
across and beyond your facilities.

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