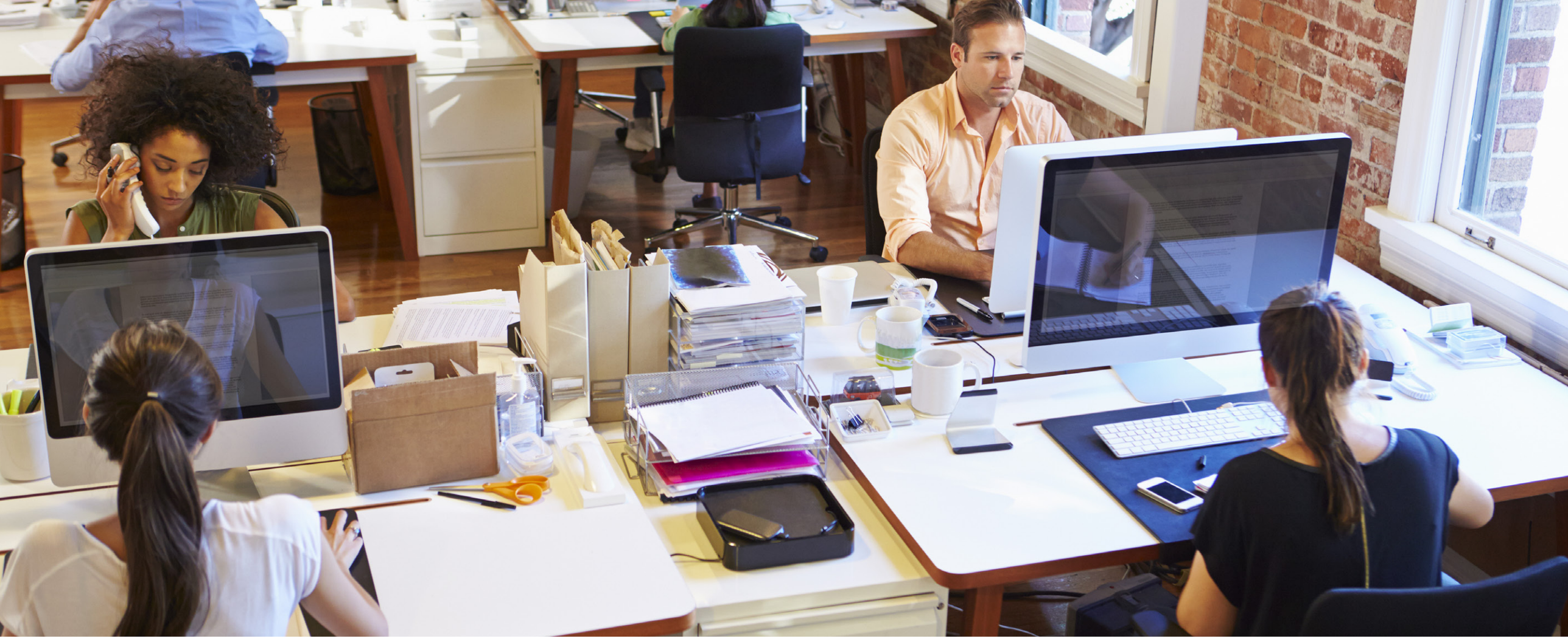

Alcatel-Lucent Enterprise: A comprehensive portfolio of Optical and Ethernet LAN solutions

Choosing the right solution for your LAN/WLAN environment.

Whitepaper
Alcatel-Lucent Enterprise A comprehensive portfolio of Optical and Ethernet LAN solutions

Alcatel·Lucent Enterprise

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Overview

Alcatel-Lucent Enterprise offers a comprehensive portfolio of Optical and Ethernet Local Area Network (LAN) solutions that deliver the network foundation for your LAN/WLAN environment.

This whitepaper provides an overview of ALE network solutions, Gigabit Passive Optical Network (GPON), and Hybrid Passive Optical LAN (HPOL) technologies. It will present the features of each of these technologies and identify where and how they can benefit your business. It’s our goal to help you choose the solution that’s right for you.

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Alcatel-Lucent Enterprise network solutions

Alcatel-Lucent Enterprise network solutions offer an extensive Ethernet portfolio including Data Centre (DC) core switches, access edge switches, and enterprise WLAN access points (APs) with PoE switch enabling IoT devices, APs, PTZ cameras and value-added applications.

ALE network solutions support unpredictable requested bandwidth such as traffic bursts or extended wire-rate bandwidth. They also support advanced security features such as deny peer-to-peer (port mapping), Snooping Security (DHCP/IP/VLAN source filtering), Access Control Lists (ACLs), and Learned Port Security (LPS). The Alcatel-Lucent OmniVista® Network Management System (NMS) provides a single pane of glass for all management and connectivity including network elements, BYOD, APs and guest access.

Where to use

Ideal deployments include new, renovated, or existing facilities that have a traditional Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF) infrastructure with up-to-date fibre/Cat5 copper infrastructure and where redundancy and quarantine management are required, as well as advanced Quality of Service (QoS) requirements such as auto phone VLAN/prioritisation, policy lists and conditions, traffic policing, and shaping.

Gigabit Passive Optical Network (GPON)

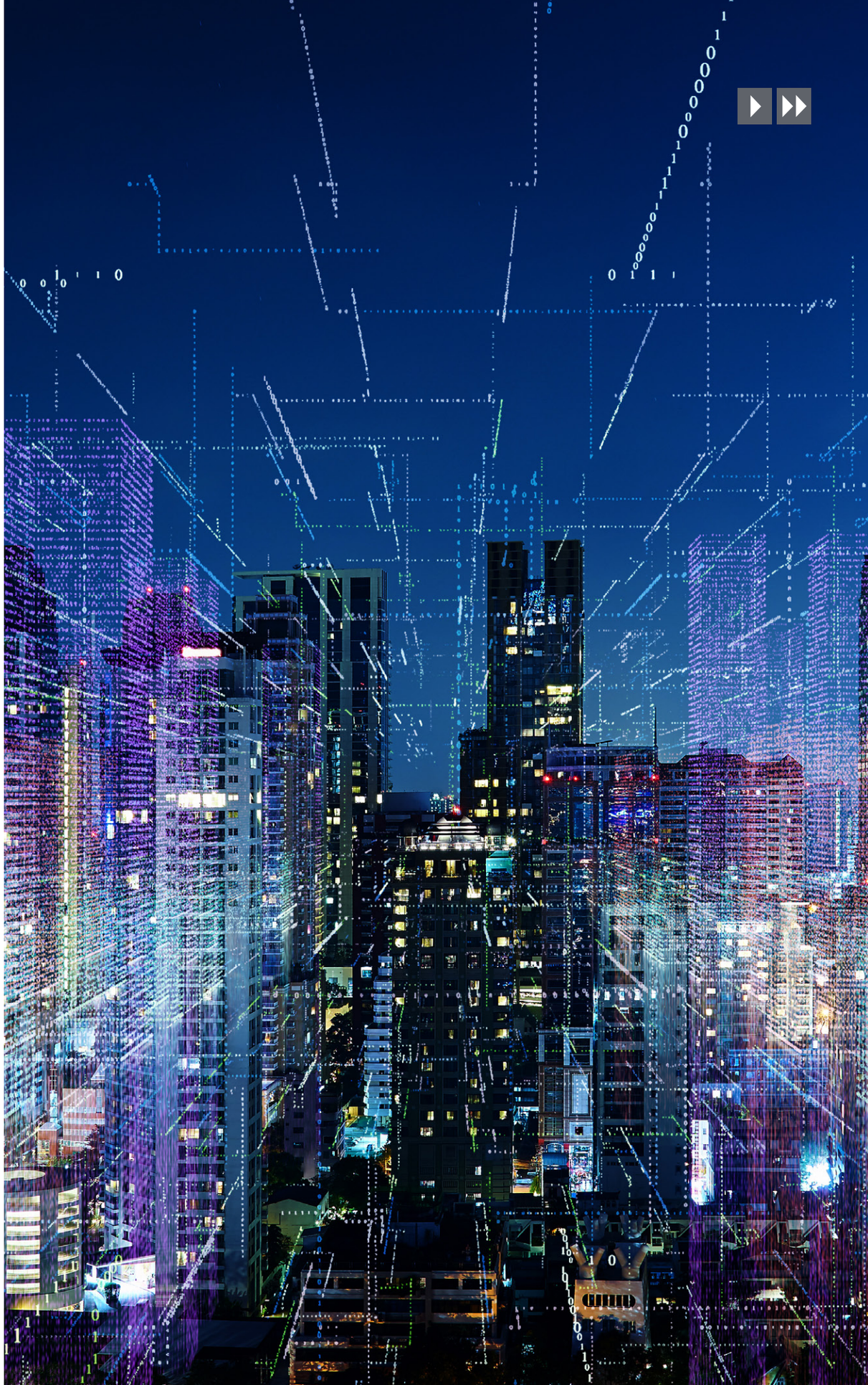
Gigabit Passive Optical Network (GPON) technology provides asymmetrical 2.4Gbps downstream and 1.2Gbps upstream capacity. It is used in LANs in buildings and across campuses. GPON is deployed across a wide variety of environments including governments, enterprises, hospitality, education, retail, public venues, and healthcare networks.

GPON connects computers, phones, servers, Wi-Fi, and enables building automation, monitoring, intelligence, security surveillance, enterprise video and all IP/Ethernet devices within the digital ceiling, as well as Internet of Things (IoT) devices.

Where to use

GPON is ideal for new or renovated facilities where fibre to each location is easy to install, and copper infrastructure is outdated (for example data, phone, coax). It is also ideal where there is limited availability of IDF closets aggregation, and Optical Network Terminal (ONT)/splitter installations in the ceilings.

GPON is preferred where there are no ONT redundancy requirements, as well as simple Quality of Service (QoS) classification (Virtual LAN/Class of Service (COS) only). It is used in networks where there are predictable GPON uplink line rate bandwidth requests and where secure denial of peer-to-peer communications is desired. GPON provides a POL Command Center (PCC) management solution for configuration, monitoring, and management.



HPOL in the real world

For hospitality customers with large hotels and resorts an optical network can provide real benefits.

For a large integrated casino and resort in Southeast Asia the challenge was to respond to extremely demanding scalability, reliability and security requirements while providing high-level network capabilities and functionality.

Due to the long distances within the resort, a fibre infrastructure based on a passive optical network (PON) was chosen, which meant optimisation of the wiring costs and distribution switching. However, to provide connectivity to the high volume of servers and wired devices, and satisfy the advanced network functionality, as well as the level of reliability required, ALE deployed a Hybrid Passive Optical LAN (HPOL) network with a campus core consisting of the Alcatel-Lucent OmniSwitch 6900 (OS6900) and an access layer made up of the Alcatel-Lucent OmniSwitch 6560 (OS6560), connected to the edge of the passive optical LAN (POL).

The IP connectivity to all the wired devices in the casino (gaming tables, slot machines, and workstations), in the retail areas, and in the hotel rooms (IPTVs, WLAN APs, and IP phones) was provided by the OS6560 switches, each one connected to the optical network through two SPF ONTs and redundant uplinks. To ensure complete redundancy of the network, the OLTs, the core OS6900 switches, and the links between them were duplicated as well.

The ALE HPOL network solution provides redundancy, security, and scalability, ensuring critical network connectivity and quality of service in the gaming area, hotel, and retail spaces.

Hybrid Passive Optical LAN (HPOL)

Hybrid Passive Optical LAN (HPOL) is an Alcatel-Lucent Enterprise strategy that combines Nokia GPON and ALE Ethernet solutions to adress customer needs. By leveraging the advantages of GPON's optical fibre optimisation for shared traffic, and Ethernet's ease–of-use and maintenance capabilities, ALE HPOL brings a new set of benefits for large resorts, campuses, and equivalent deployments including:

Easy network management: Centralised management for both POL and Ethernet LAN with Nokia and Alcatel-Lucent Enterprise powerful and user-friendly management systems. Provides highly-scalable network evolution capabilities.

Cabling reduction: The use of Optical NetworkTerminals (ONTs) and small-factor access switches at the POL edge, which can be installed closer to the endpoints, reduces the copper cabling horizontal runs and eliminates the need for dedicated telecom closets and cooling systems.

Latest Wi-Fi: Alcatel-Lucent OmniAccess® Stellar WLAN Access Points provide enterprise-grade Wi-Fi with the latest Wi-Fi standards supported on top of the POL.

Infrastructure cost savings: The point-to-multipoint optical infrastructure removes the distribution switching layer in dense installations, which results in reduce switching infrastructure costs.

Where to use

Companies that span several buildings and long distances can benefit from a combined Passive Optical LAN and Ethernet LAN solution. ALE HPOL offers cost savings and better network performance, with advanced networking and Wi-Fi. This solution is a good fit for medium- to high-user density networks in large premises.

Why HPOL might be the right choice for you

HPOL uses ONTs in a small form-factor pluggable (SFP) with the Alcatel-Lucent OmniSwitch® portfolio. This enables use of an underlying Transport Layer composed of the optical line terminals (OLTs), optical fibre, optical splitters, and ONTs. Customer services (such as IPTV, Internet access, mobile-to-screen, business services, and IP Telephony) occur in the upper Service Layer. This Service Layer is pure Ethernet, with the associated benefits including:

- **Ubiquitous knowledge with Ethernet/IP bionomy**: It is guaranteed to find a partner with enough ability to set up, maintain, and troubleshoot an Ethernet network
- **OmniSwitch rich feature set**: The Service gateway becomes an OmniSwitch, providing extensive security features and micro-segmentation techniques, reduced operational costs due to MTBFs of years, and simplified switch replacement
- **Multicast under control**: With Alcatel-Lucent Enterprise Operating System (AOS), advanced Multicast support, the use of IPTV, business services, or Multicast-enabled solutions (such as Apple Bonjour, DLNA, and UPnP), are extremely easy to deploy
- **Centralised Management for the Service Layer**: In HPOL, the Transport Layer is set up, just once, at the beginning of the deployment. Then, everything related to daily operations is performed at the Service Layer. The OmniVista 2500 NMS is available for customers wanting a management system on premises. Alcatel-Lucent OmniVista® Cirrus Network Management as a Service is available for customers who prefer management in the cloud. With OmniVista Cirrus, a single tenant (for example a hotel chain) will manage each premises (a hotel) separately, providing different administrators to different networks.
- **Reduced consumption**: Today most end devices are powered by PoE (such as lights, APs, IP Phones, and CCTV). Using a centralised powering device is more efficient than spreading out the powering units. With 24 or 48 ports PoE density, the OmniSwitch provides a more efficient solution.
- **Facility management**: All facility management systems are evolving to Ethernet/IP, so the design must accommodate 'users' or 'services'. It will become more and more common to connect the facility management devices to the network. In this space, some critical points arise: Security in terms of micro-segmentation, AOS, and User Network Profile (UNP), can deliver role-based access as part of a zero trust security policy. OmniSwitches offer unbeatable port density with 24/48 ports and the ability to build a virtual chassis of up to eight members.
- **High-PoE and Perpetual PoE**: More and more devices are PoE powered, this means that a switch reboot may interfere with the operations. OmniSwitches supports up to 100W PoE and Perpetual PoE, so even when the switch is rebooting, the PoE is still provisioned in the port, and the powered device remains active. Perpetual PoE is critical for new LED lights PoE powered from switches, CCTV cameras (able to quickly store the seconds when the Ethernet connection is lost, and will still record), and emergency phones, among others.
- **High-end Wireless LAN**: With Alcatel-Lucent OmniAccess Stellar WLAN, managed from the OmniVista NMS on premises or in the cloud, the WLAN infrastructure can be controlled. The Stellar WLAN solution provides:
  - ¬ Radio Dynamic Adjustment (RDA)
  - ¬ Role-based access control
  - ¬ Support port for Apple Bonjour/DLNA/UPnP
  - ¬ Quality of Experience (QoE)
  - ¬ WLAN Real-time Location Tracking (WLAN RTLT)
- **Service gateway placement**: The OmniSwitch ruggedized switches provide solutions for commercial, extreme temperature, and industrial environments. Finding a place for the product is always be possible. For instance, a small OmniSwitch can be deployed in-room (similar any other ONT), alternative deployments include aisle deployments in a raised-floor, where a 24-port switch may serve several rooms, simplifying Operations and Maintenance, and, in the hospitality industry where the goal is to not disturb the guests. With the extreme temperature models, in most cases air conditioning will not be required, and some ALE PoE switches are fanless, eliminating noise.

Summary

Alcatel-Lucent Enterprise offers a comprehensive portfolio of networking solutions that span commercial, industrialised, and ruggedised environments across industries.

GPON offers solutions for new or renovated facilities where fibre is easy to install, and copper infrastructure is outdated.

ALE HPOL takes advantage of both worlds. It provides increased security and intelligence, using the advanced Ethernet LAN and WLAN features and services implemented in the Alcatel-Lucent OmniSwitch product family and the Alcatel-Lucent OmniAccess Stellar Access Points, as well as the redundancy options at all levels of the network. It delivers the combined benefits of POL and Ethernet LAN/WLAN in terms of cost savings and performance for customers where an optical network infrastructure makes sense.

Understanding what technology to use based on requirements and the targeted deployment environment can help ease the decision-making process. Learn more about ALE networking and HPOL solutions.