

# uLAN<sup>™</sup>

Network Architecture for  
Smart and Healthy Buildings







# smart building technology

## Smart building technology is evolving quickly.

With booming urban growth, intelligent devices and sensors have become critical for improving efficiency and sustainability in dense cities and large buildings. Facility managers are adopting Building Automation Systems, while healthy building initiatives like air quality sensors and occupancy tracking have surged as a response to the global pandemic. Yet as more smart devices join the network, traditional infrastructure designs cannot always handle the resulting bandwidth demand and added complexity.

Leviton cabling systems are designed to support intelligent devices requiring both bandwidth and power. And our infrastructure experts understand your unique network requirements, with extensive experience in all types of enterprise environments, including businesses, hospitals, schools, factories, and government facilities.




In this brochure, we will recommend a new type of network architecture specifically for smart buildings, along with cabling system recommendations for specific smart technologies.

# Foundation of a Smart Building

In a traditional enterprise facility, each building system is an island. Ethernet is the common language within the core local area network (LAN) — for devices such as workstations, WAPs, and VoIP phones — but historically all other systems speak their own language, with separate controls, support functions, and different managers responsible for them.

This traditional model is quickly changing. With smart building initiatives, more building systems such as HVAC, lighting, security systems, and energy management systems are being incorporated into the LAN. Organizations are seeing the efficiency and cost-savings benefits of converging once-disparate building systems onto their IP networks. We have organized these building systems into six categories.



## CORE LAN APPLICATIONS



WIRELESS    ADVANCED DESKTOP    ADVANCED VOIP

The traditional LAN supports important enterprise applications such as office workstation computers, wireless access points (WAPs), and VoIP phones. These applications increasingly require higher bandwidth, and PoE delivery to WAPs.

## HEALTH & WELLNESS




THERMAL IMAGING    AIR QUALITY




PEOPLE COUNTING    UV DISINFECTION

Healthy building applications have become an integral part of today's smart building. These low-data and low-power devices include air quality sensors, temperature controls, occupancy management and touchless control systems to protect and enhance the health and safety of building occupants.

## BUILDING AUTOMATION

SMART LIGHTING    HVAC    WINDOW SHADES

ELEVATORS    ENERGY MANAGEMENT    OCCUPANCY SENSORS

Many smart devices supporting building automation have low data and power requirements, such as thermostats. Smart lighting does not typically require high bandwidth but does often require higher power, and Leviton PoE-optimized systems are designed and tested to support these high PoE requirements.

## COMMUNICATIONS




A/V    IN-BUILDING WIRELESS









SOUND MASKING    PAGING SYSTEM    NURSE CALL

Traditional communication applications are increasingly joining the IP network, such as paging systems, intercoms, nurse call systems in hospitals, and audiovisual installations for classrooms and conference rooms. High-end videoconferencing solutions will typically require higher bandwidth and power.

## SAFETY & SECURITY




SECURITY CAMERAS    PARKING GATES

ACCESS CONTROL    SHOOTER DETECTION    BADGE READERS

Integrating your physical security infrastructure with your IP network results in reduced installation and materials costs, simplifies future moves, adds and changes. Leviton systems ensure always-on security performance for applications like access controls and security cameras.

## CONSUMER APPLICATIONS



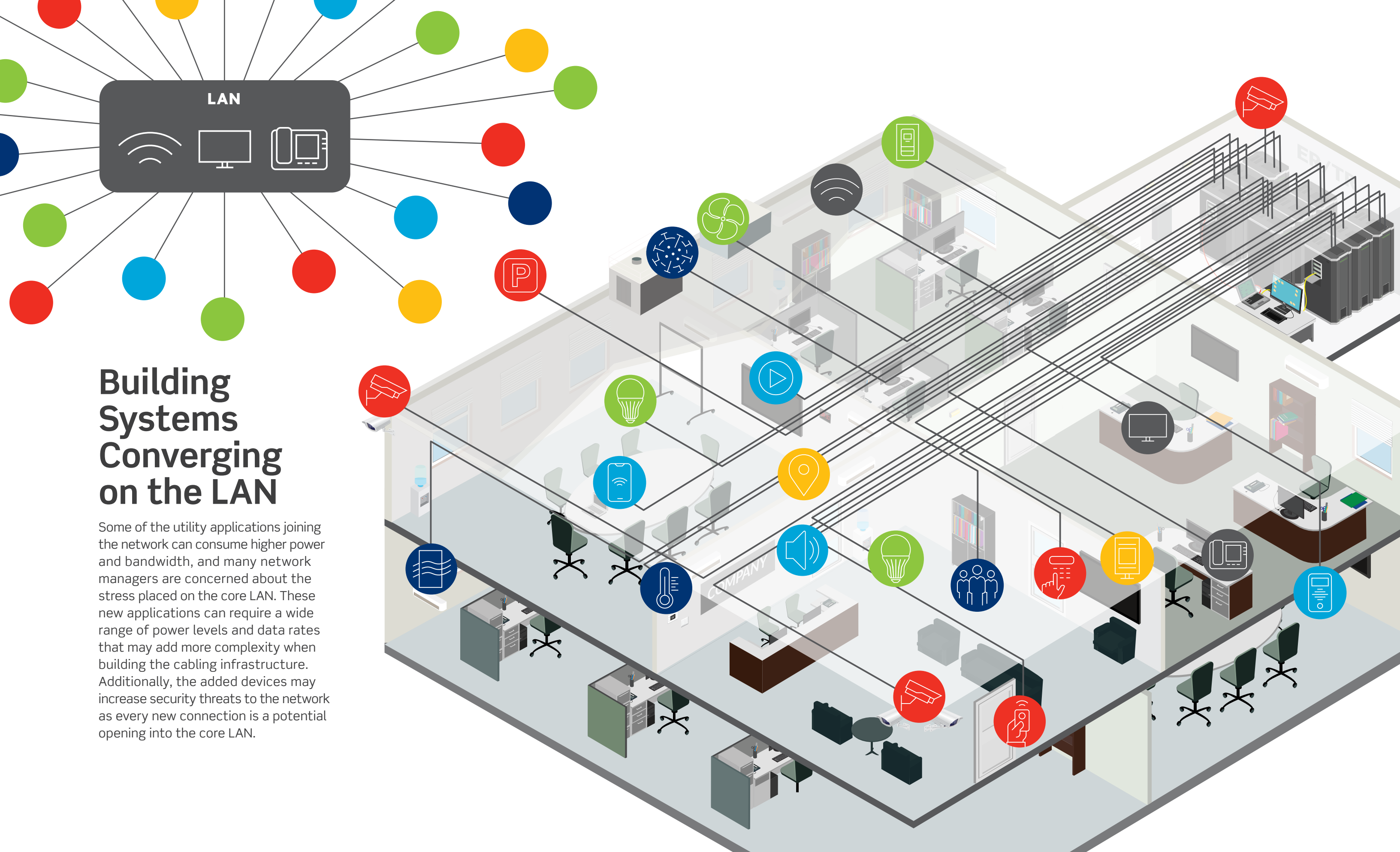

POINT OF SALE    CUSTOMER KIOSK




LOCATION SERVICES    DIGITAL SIGNAGE

When part of the IP network, remote customer service kiosks, digital signage, and point of sale terminals can be managed and controlled from a centralized location for greater efficiency. These devices can have varying requirements for data and power.





# Building Systems Converging on the LAN

Some of the utility applications joining the network can consume higher power and bandwidth, and many network managers are concerned about the stress placed on the core LAN. These new applications can require a wide range of power levels and data rates that may add more complexity when building the cabling infrastructure. Additionally, the added devices may increase security threats to the network as every new connection is a potential opening into the core LAN.



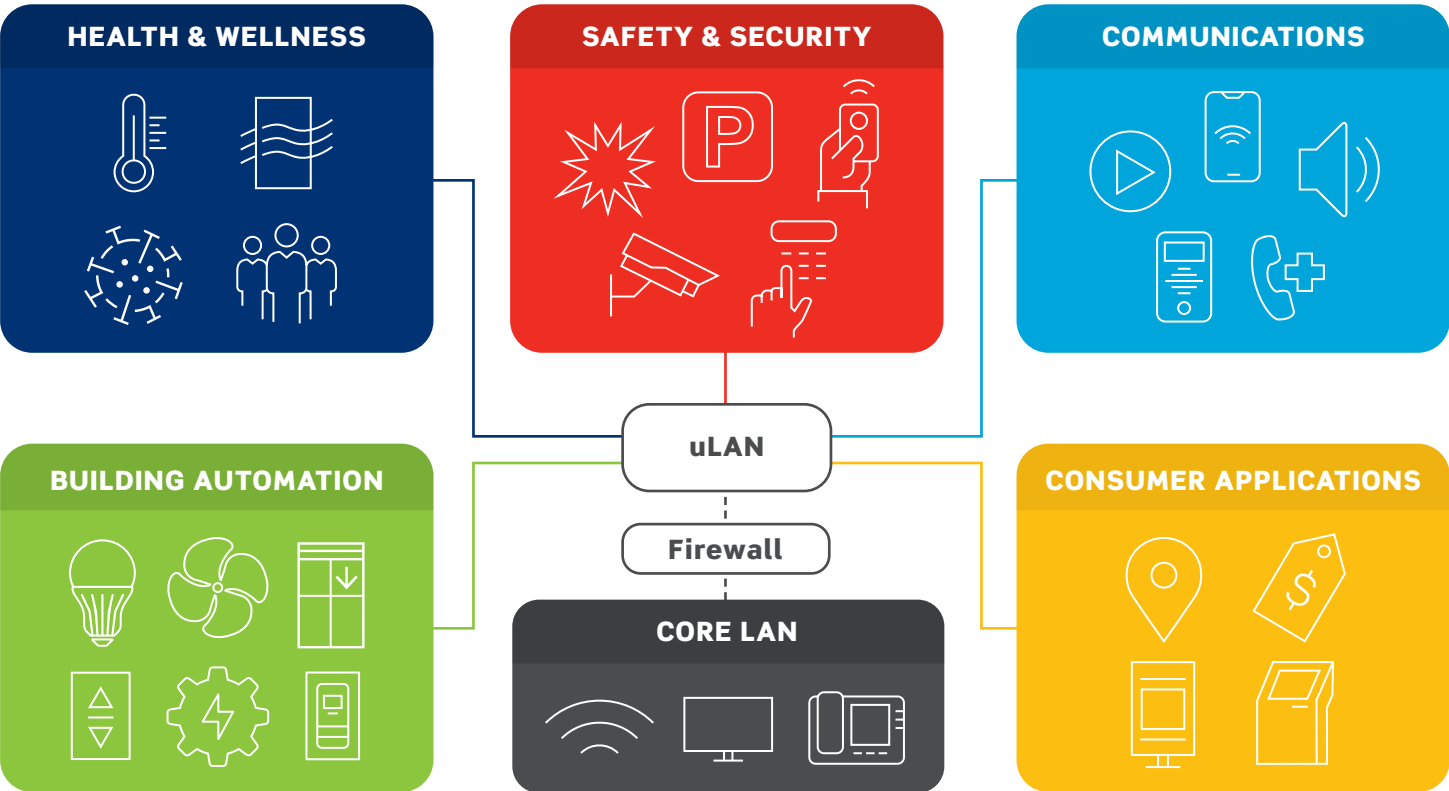


# The Benefits of a uLAN

To simplify management, improve security, and alleviate network stress in smart buildings, Leviton recommends that the network infrastructure connecting core LAN applications and utility applications become physically separated. This creates a utility LAN or “uLAN” in telecommunications rooms or closets as illustrated below.

**Establishing a separate uLAN network creates numerous benefits:**

- It allows for system convergence while alleviating strain on the core LAN
- Functional managers can maintain control of their own systems (security, HVAC, lighting, etc), while continuing to leverage the benefits of IP convergence
- It allows for cost-effective IT equipment and infrastructure designed specifically for utility devices that can vary widely in their PoE and bandwidth consumption, while reserving tier one switching for the core LAN
- Separation allows for a firewall to be placed between the core LAN and uLAN, providing additional security and protection measures for the core LAN



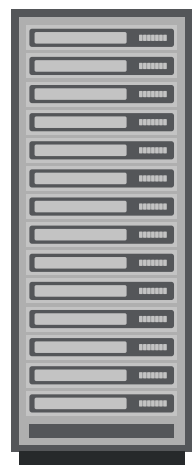


# uLAN and the Telecom Room

Traditionally, a standard Telecom Room will support all the IP connections needed for a building floor. Usually, 80-90% of those connections are to traditional LAN devices like computer docking stations, VoIP, and WAPs. The other 10-20% of connections are for uLAN applications like IP cameras, intercom systems, or access control systems. With the expansion of IoT and non-traditional IP enabled utility devices, that ratio will start to flip. Considering the numbers of lights, sensors, and other utility devices joining the network, equipment rooms will likely need more space.



Move uLAN applications to dedicated rack(s)



Traditional TR or IDF Racks



Dedicated uLAN Racks



Core LAN Rack

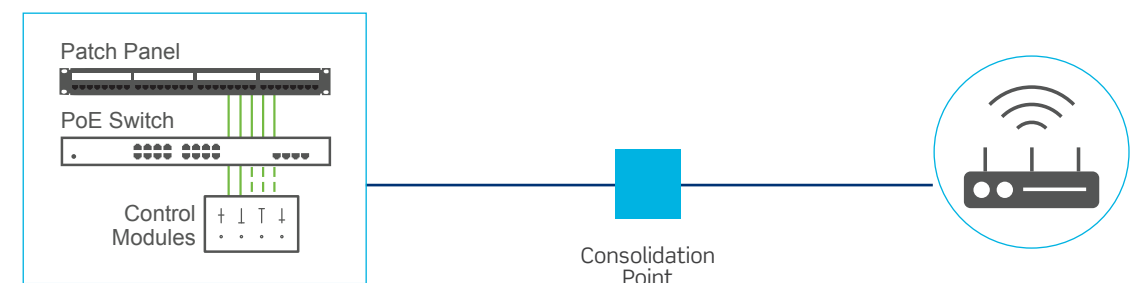
# Architecture Beyond the Telecom Room

Once cabling leaves the telecom room, there are two general designs for networking end devices: home run and zone cabling.

Traditional **home run cabling** directly links devices to the telecommunications room. This design is more common for remote devices such as security cameras or devices with fixed locations. It centralizes all the active equipment in the TR, which can simplify installation and make it easier to supply back-up power to critical systems.



A **zone cabling** architecture offers numerous advantages in a smart building. Zone cabling provides a horizontal cable run from the telecommunications room to a consolidation point enclosure, then to the device outlet. This creates a highly flexible infrastructure that offers simple maintenance. If devices need to be moved in a room, the only change happens to the connecting patch cord, while the consolidation point and permanent link stay in place.



For information on Leviton products and systems to support uLAN architecture, visit [Leviton.com/uLAN](http://Leviton.com/uLAN).



Today's networks must be fast and reliable, with the flexibility to handle ever-increasing data demands. Leviton can help expand your network possibilities and prepare you for the future. Our end-to-end cabling systems feature robust construction that reduces downtime, and performance that exceeds standards. We offer quick-ship make-to-order solutions from our US and UK factories. We even invent new products for customers when the product they need is not available. All of this adds up to the **highest return on infrastructure investment.**

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