The bridge to possible

Smart Building Planning, Network Design and Best Practices

Jonathan Dunbar
Leviton

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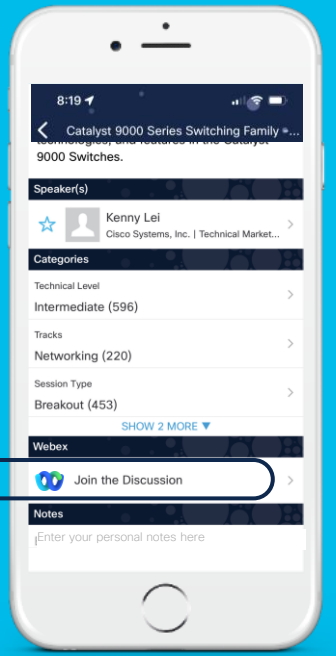

Smart Building

Planning
Network Design
and Best Practices

LEVITON

Smart Building Market Growth

$328.6 Billion
2029

22.2%
CAGR

$80.6 Billion
2022

Drivers of Smart Building Growth

Competition for Tenants

- Increased home working means fewer occupants in commercial offices

Focus on Human Centric Design and Operation

- Health, safety and wellbeing of occupants

Operational cost reduction and improved sustainability

- Reduced energy consumption and carbon footprint

Building Systems are Transforming

Traditional building systems were siloed and would not talk to each other

Each OT system often had proprietary or special purpose “networks”

Construction contracts normally solicited proposals from separate MEP, AEC, Security and IT firms

Smart buildings: require these systems to work together and share data

Where Do I Start?

How do I coordinate
so many independent systems?

How do I know which smart devices
will yield the best results?

What best practices
should I follow?

What questions should I ask
at the outset?

How do I measure ROI
for smart buildings?

Who
should I be asking?

Best Practices for Smart Building Planning

1

Establish
stakeholders

2

Define
goals and objectives

3

Benchmark
set targets

4

Identify
technologies to achieve the goals

5

Assemble
the right advisers and technology partners

Establish Stakeholders

Stakeholders can help define the goals and objectives for a smart building project

Facilities Mgmt.

- Utility management
- Building maintenance
- Health & Safety
- Building security

IT Staff

- Network operations
- Business systems support
- Network security

Tenant

- Worker productivity
- Safe, healthy environment
- Common area mgmt.
- Comfort and amenities

Building Owner

- Operational efficiency
- Risk mitigation and resilience
- Environmental sustainability
- Asset protection and enhancement

Define Goals and Objectives

What problems are we trying to solve?

What value will this deliver to our business?

- Reducing and optimizing operating costs
- Occupant satisfaction, safety, and wellbeing
- Enhancing public perception
- Achieving sustainability goals
- Optimize facility utilization
- Reducing maintenance costs
- Attracting and retaining tenants
- Efficiently managing and servicing the building
- Improved occupant productivity
- Managing risk of catastrophic events and building downtime
- Preparing buildings for addition of new technologies over time
- Reducing operational risks

How does my building compare to other buildings in my area?

But can we accomplish more?

How do I choose the most effective objectives?

How do I know if I have left anything on the table?

Benchmarking / Setting Building Targets

- There are many approaches to quantifying building performance
- Each assessment program addresses a specific area:
  Energy, Sustainability, Safety, Connectivity, Cybersecurity, Health & Wellbeing
- Improve your score and optimize outcomes

NABERS

CABR/M

fitwel®

SPIRE™
Smart Building Verified

INTERNATIONAL WELL™ WELL BUILDING INSTITUTE

BREEAM
CODE FOR A SUSTAINABLE BUILT ENVIRONMENT

WiredScore

BOMA 360 PERFORMANCE PROGRAM® AMBASSADOR

BCA GREEN MARK

energy ENERGY STAR

U.S. GREEN BUILDING COUNCIL LEED USGBC™

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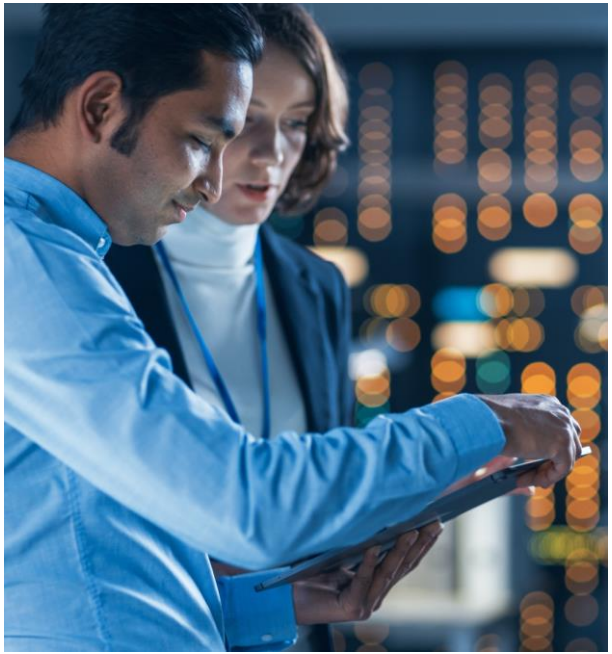
Identifying the Enabling Technologies

- **Traditional Building Automation Systems** (BAS) are just a start
- **Purpose-built software integration platforms** with AI continually improve system optimization
- **Keys to functionality:**
  Data access, cross-platform compatibility, and system integration
- **Systems are moving** from proprietary, stand-alone networks to IP-enabled platforms based on Ethernet connectivity

Assembling the right partners



Choose technology partners that have the devices and systems that support your project goals

Intelligent building expertise is important

- Smart Building Design Professional
- Control Platform Software Vendor
- Master Systems Integrator
- Building Automation Systems Providers
- Network Cabling Solution Provider

How do I configure the network to cope with this complexity?

How do I maintain network security across so many connections?

How do I bring it all together?

What best practices should I follow?

How can I enable ongoing management of this complex system?

Data Connectivity is the 4th utility

- **Essential part** of every intelligent building system and function
- **Connects all kinds of devices,** both wired and wireless
- **Often carries power** to the devices
- **Now considered as critical as** water, electricity, gas

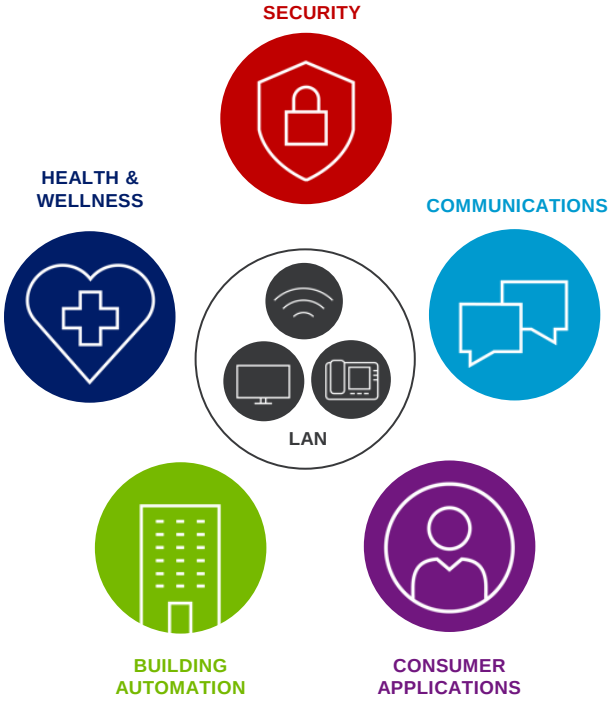
WATER

ELECTRICITY

GAS

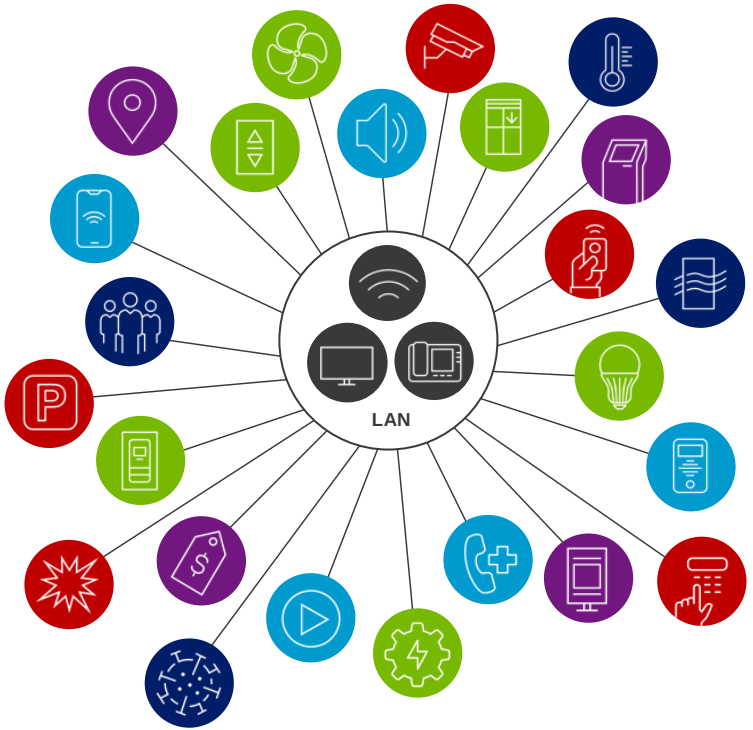
DATA CONNECTIVITY

Before buildings were smart



Each building system is installed, controlled and managed separately.

IP Convergence: *"Start of Smart"*



Ethernet enabled, converged systems add complexity, open security risks, and can disrupt core LAN performance.

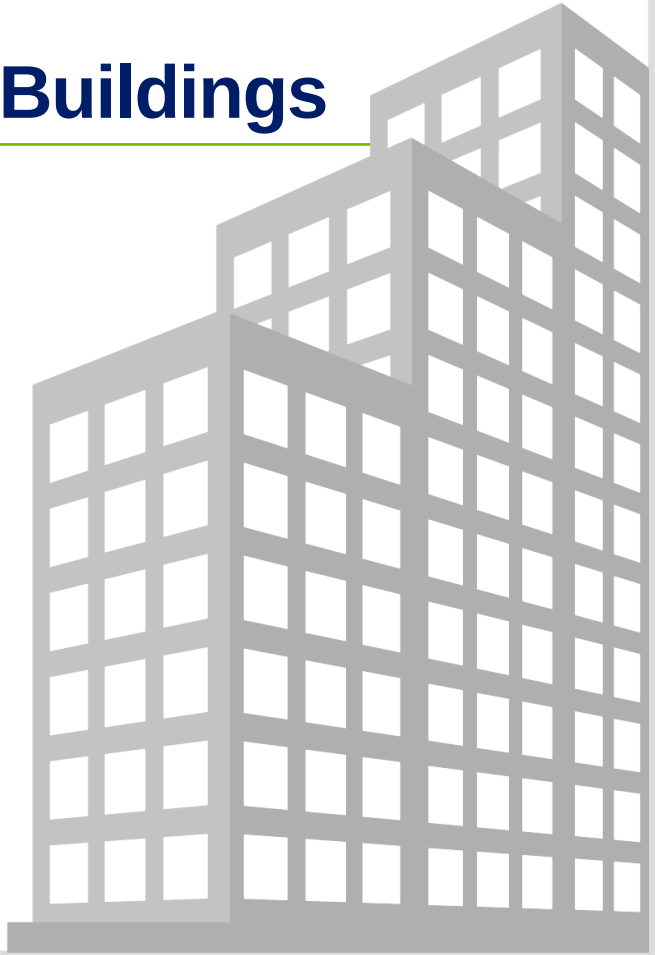
Cabling Standards for Intelligent Buildings

ISO/IEC 11801-6
Information Technology –
Generic Cabling Systems –
Part 6: Distributed Building Services

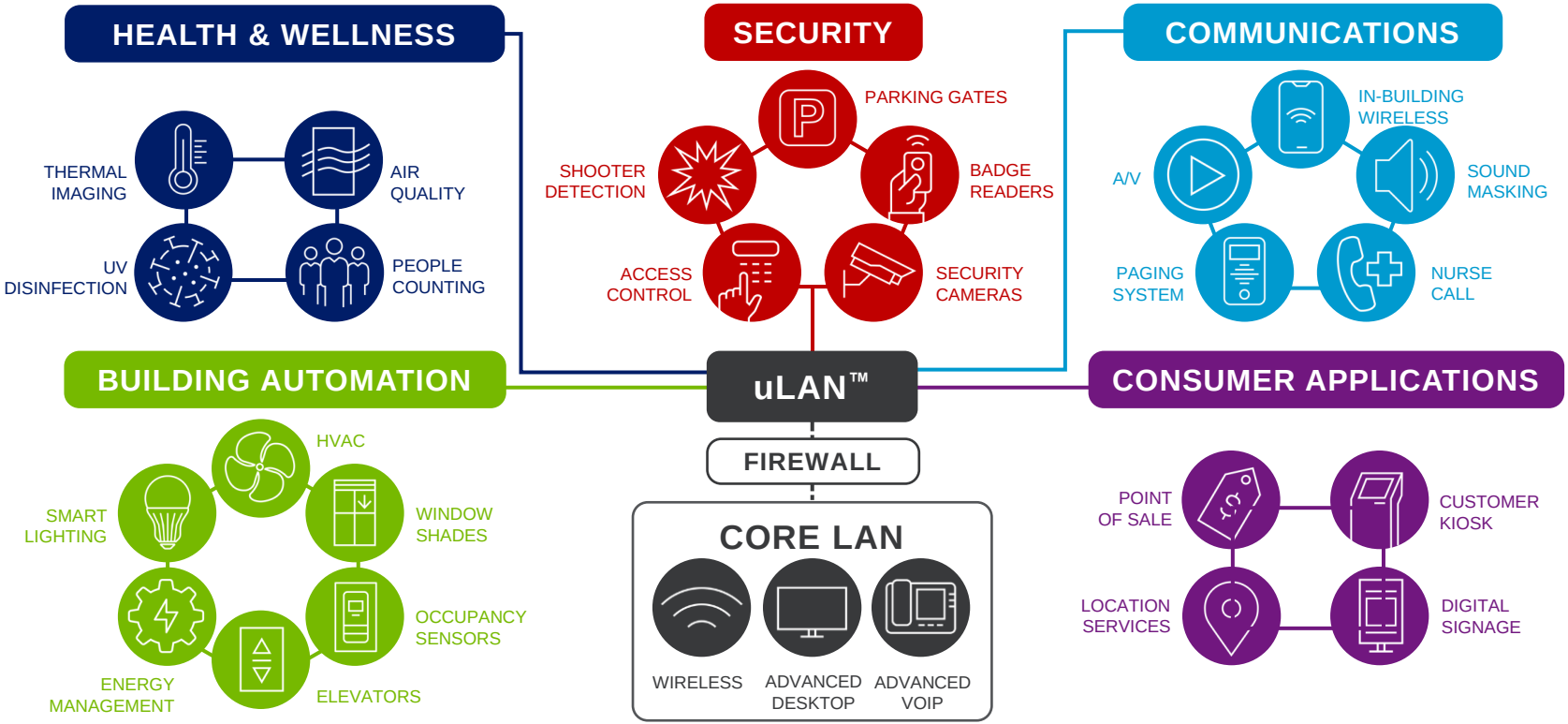
ANSI/TIA-862-B
Standard for Structured
Cabling Infrastructure for
Intelligent Building Systems

BICSI 007
ICT Design and Implementation Practices
for Intelligent Buildings and Premises

EN 50173-6
Information Technology –
Generic Cabling Systems –
Part 6: Distributed Building Services

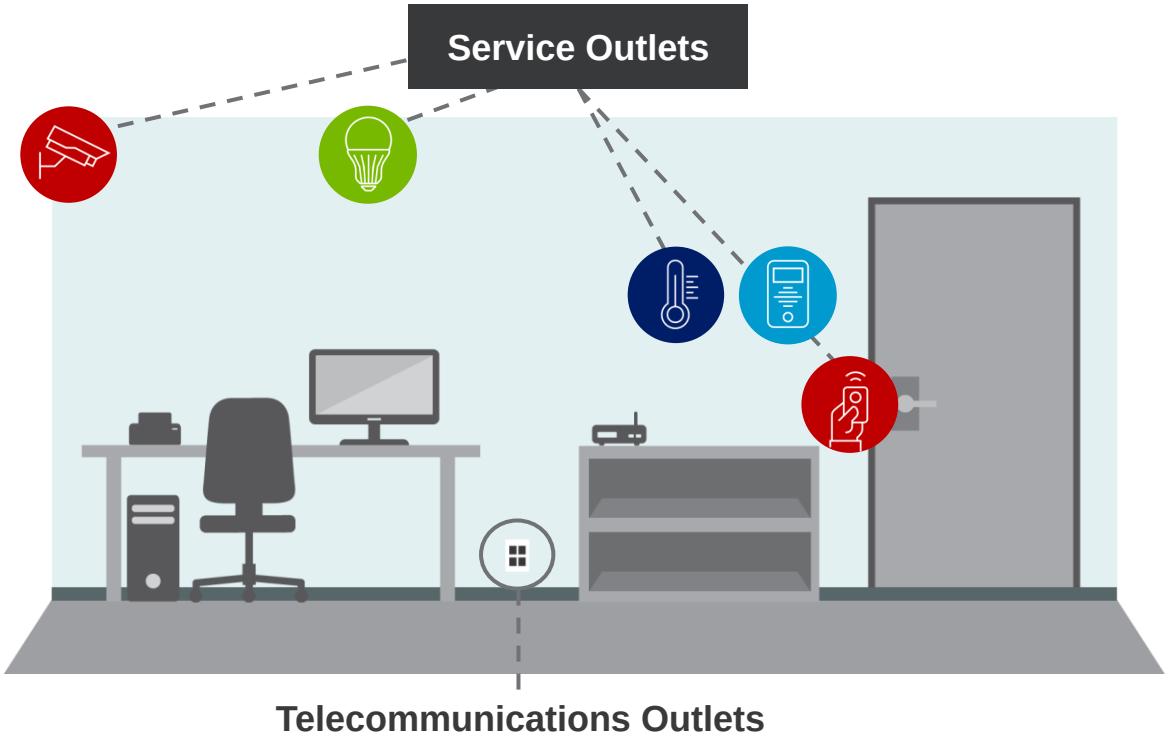


The Utility LAN Architecture - uLAN™



Cabling Design for the uLAN™

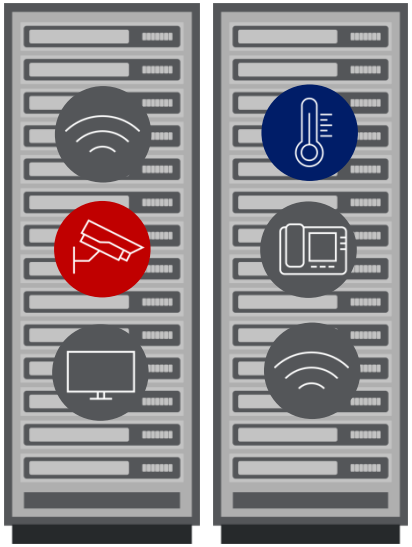
- New **Building Internet of Things (BIoT)** devices
- Smart building connections are often **located in walls or ceiling**
- Referred to as **Service Outlets**
- **Higher density** that traditional LAN



Smart Building Infrastructure

LAN 80% / uLAN™ 20%

Traditional TR serving **101-200** equipment outlets



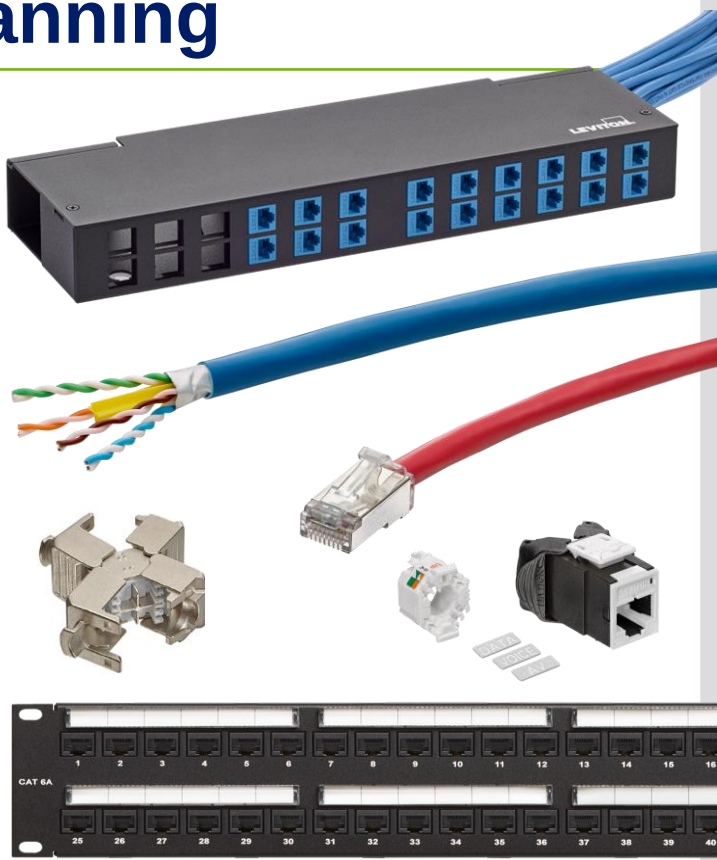
LAN 20% / uLAN 80%

TR with uLAN serving **201-800** equipment outlets

Connectivity needs Careful Planning

Physical infrastructure should

- Consider communication and power
- Support all current and future devices
- Be capable of adapting to new technologies
- Be designed for long term reliability, ensure building resiliency and reducing risk
- Support all critical modes of communication and data transfer, wireless and wired



Choosing the Right Cabling System

CENELEC EN 50173-6 Standard for Generic cabling systems - Distributed building, specifies Class EA (Cat 6A) as the minimum cabling category for distributed building services

Beyond Bandwidth also consider and plan for:

- Contribution to **sustainability** goals
- **Coverage** - location of device connections
- **Power needs** - especially higher PoE levels
- **Expansion capability** - now or later
- **Support** for new technologies

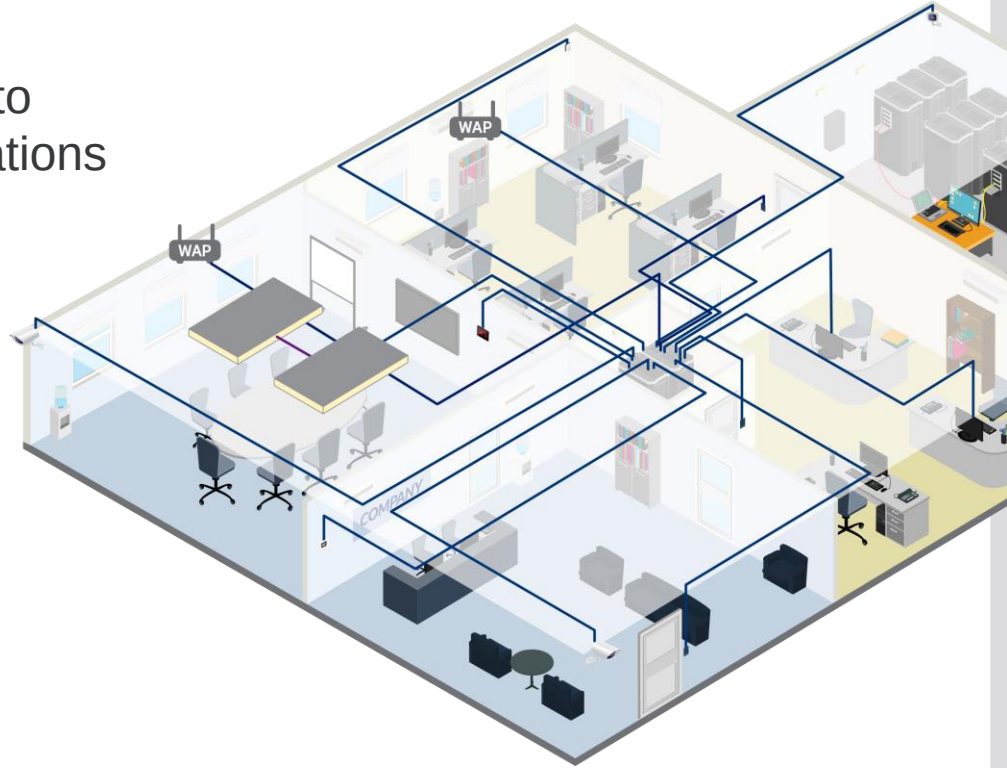
Key Elements of uLAN™ Copper Applications

End to end copper channels
with bandwidth and power capability to support a very broad range of applications

Field-terminated options simplify cable routing and organization while supporting fast installation

Specialized products specifically engineered for uLAN applications:

- Zone enclosures
- In-ceiling termination solutions
- Couplers and coupler assemblies

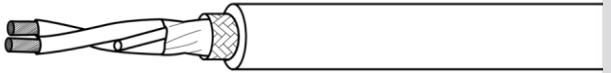


The Future of Smart Building Cabling

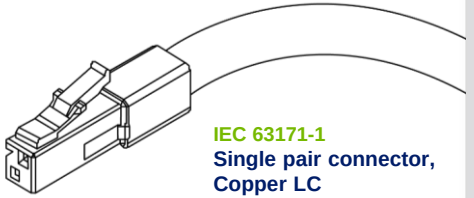
Single-Pair Ethernet (SPE) will be part of the answer

New SPE standards

- **IEEE 802.3cg**
  10Mb/s over single pair cable – 10BASE-T1S, 10BASE-T1L
- **IEEE 802.3bu**
  Power over Data Lines (PoDL) for SPE PoE
- **TIA 568.5**
  Single Balanced Twisted-Pair Telecommunications cabling and Components Standard
- **SP1-400** (400m) and **SP1-1000** (1000m)
  cable and channel specifications supporting 10BASE-T1L
- **Copper LC**
  new Connector type



IEC 61156-13
Single pair horizontal cable, 20 MHz
Shielded and unshielded cable
Conductor sizes from 18 to 26 AWG



IEC 63171-1
Single pair connector, Copper LC

Smart Building Recommendations

- **Invest in upfront planning**

1. **Establish** stakeholders
2. **Define** goals and objectives
3. **Benchmark** set targets
4. **Identify** technologies to achieve the goals
5. **Assemble** the right technology partners

- **Utilize a uLAN architecture**
  to optimize your smart utilities and protect your core LAN
- **Select a high-quality structured cabling system**
  to future proof and assure critical building system functions
- **For more information visit LEVITON**
  @ World of Solutions Booth B08

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