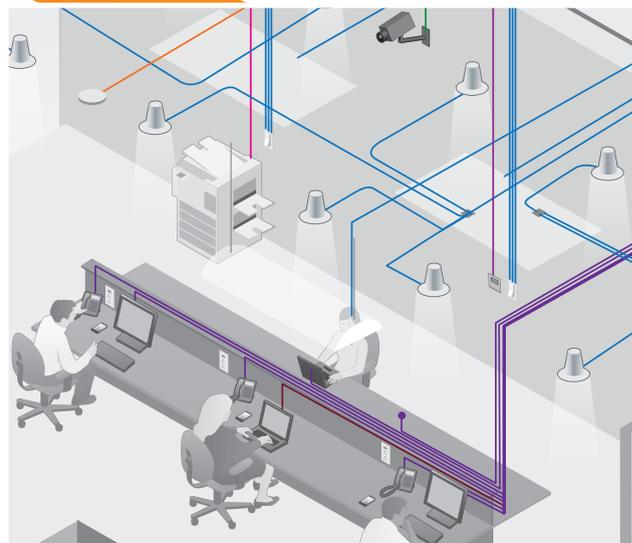# Intelligent building applications and infrastructure

The connected and efficient building is built to support dynamic work environments and unlock the potential of the Internet of Things (IoT)

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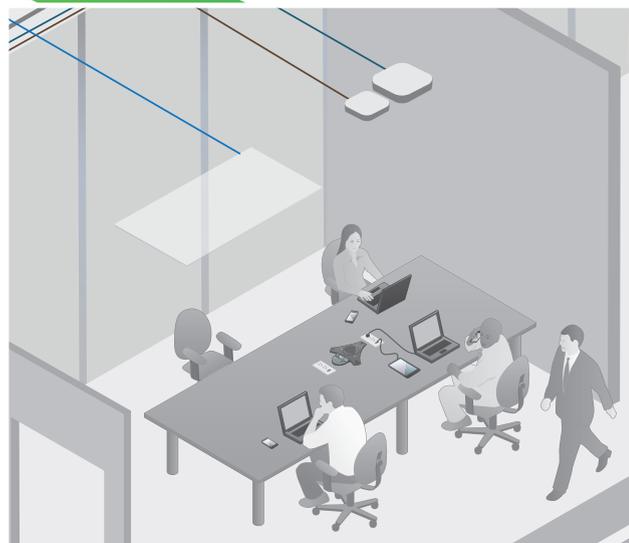| Wired LAN	Wi-Fi and in-building wireless	Intelligent lighting and sensors	Audiovisual services	Building automation systems and access control

Problem: Provide the optimal infrastructure to support wired devices at the work area, including PCs, printers and VoIP terminals. Deliver high-speed communication and remote power to a growing range of work area devices.

Solution: Category 6A cabling for the wired LAN offers optimal support for gigabit Ethernet today and up to 10 gigabits in the future. Category 6A uses the ubiquitous RJ45 connector, simplifying connectivity and backwards compatibility. Compared to the lower categories, Category 6A offers lower dc resistance and improved heat dissipation for remote powering. This makes it the ideal solution for combining Ethernet performance and PoE support.

Typical wired LAN deployments include between two and four Category 6A work area outlets to support a PC/laptop (or a PoE-powered display), a VoIP phone, a network printer, and a spare.
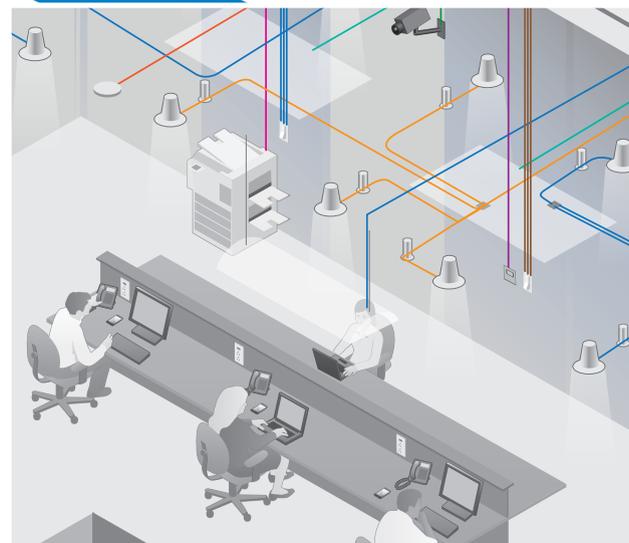
Problem: Provide the optimal infrastructure to support the wide range of BYOD mobile devices that rely on a high-speed Wi-Fi infrastructure, plus a cellular in-building wireless network for high-quality connections.

Solution: As Wi-Fi backhaul speeds are poised to exceed one gigabit with the latest generation of 802.11ac access points, Category 6A is becoming widely recognized as the optimal media for the wireless infrastructure. Modern DAS and small cell solutions can share Category 6A infrastructure without an overlaid physical network. These in-building wireless solutions deliver multiband, multi-operator, multitechnology capabilities through ceiling-mounted universal access points.

A Category 6A ceiling grid is recommended to support the wireless infrastructure with four or more outlets per cell to support Wi-Fi and DAS/small cell networks.
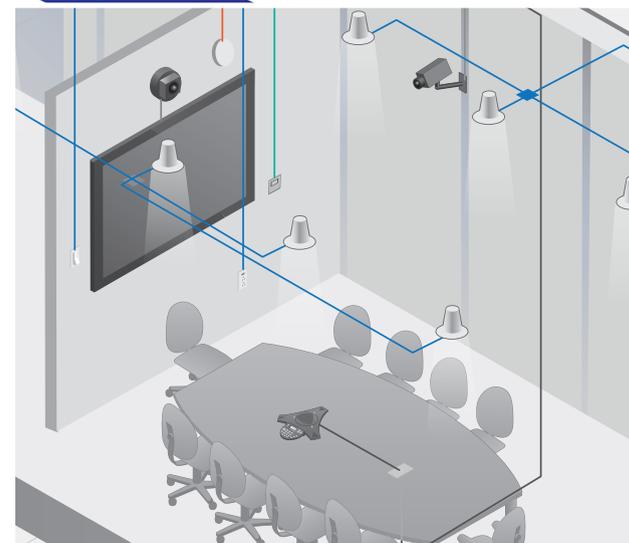
Problem: Provide the optimal infrastructure to support a highly efficient lighting platform with integrated sensing and controls.

Solution: Newer lighting systems with highly efficient LED lights and integrated sensing and control capabilities rely on twisted-pair cabling to deliver a high-performance building intelligence platform. This platform enables sophisticated analytics to optimize occupancy and energy efficiency.

Occupancy sensors allow for real-time and historic data on room usage and occupancy rates in order to make informed decisions about room configuration and sizing.

Category 5e cabling can be used to support the newer LED lighting systems, and Category 6 or better cabling offers improved efficiency for power delivery. Typical deployments provide ceiling connectivity to fixtures, downlights and sensors.

Problem: Provide the optimal infrastructure to support evolving audiovisual requirements in collaborative areas and conference rooms.

Solution: As highly-visible examples of the fast-growing Internet of Things (IoT), state-of-the-art audiovisual services increasingly rely on twisted-pair cabling and PoE to support a range of devices, including projectors, touch screens, digital displays, electronic white boards and other high-definition video and audio devices.

Category 6A cabling provides optimal performance in support of the growing bandwidth demands for high-definition video and audio and to support the power and data requirements of the newer audiovisual systems based on the **HDBaseT Alliance.**

Problem: Provide a reliable infrastructure to support building automation and access control systems with a wide range of controllers, sensors, and devices that rely on legacy protocols as well as IP communication.

Solution: A common twisted-pair media is increasingly being deployed to support building automation and access control systems, among other IoT devices. Category 5e or better cabling can often be deployed to support many devices that rely on legacy protocols and with newer devices that rely on IP communication. Additionally, a growing number of building automation and access control devices are becoming PoE enabled.

Typical deployments utilize Category 5e or Category 6 cabling to provide connectivity to controllers, sensors, VAVs, card readers, and other building automation and access control equipment.

The Universal Connectivity Grid

Universal Connectivity Grid

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Problem: Provide the optimal infrastructure to support and manage various disparate communications infrastructures in the building. This includes Wired LAN, wireless technologies, occupancy sensors, intelligent lighting, audiovisual services, building automation and access control to enable the Internet of Things (IoT) to create a truly connected and efficient building.

Solution: A common connectivity platform provides infrastructure efficiencies from the design phase to the operations phase of an intelligent building. Product cost and installation efficiencies can be identified at the design phase and realized at the installation phase by addressing common media and pathway requirements. Maximum operational efficiency can be realized by deploying a grid-based layout with distribution boxes to improve administration and minimize the cost and disruption when providing additional services or space reconfigurations.

Category 6A cabling provides high bandwidth and remote power to support legacy and emerging intelligent building applications—making it the foundation for the universal connectivity grid, a vital of a connected and efficient building.

1. Ceiling distribution box
2. Category 6A cable bundle
3. Individual cable
4. Workstation
5. VoIP phone
6. Printer/copier
7. IP camera
8. Wi-Fi access point
9. IBW access point
10. Video teleconferencing
11. Light/temperature control
12. Occupancy/daylight sensor
13. Light fixture with sensor
14. Access control
15. Fire detection and evacuation*
16. Floor distribution box
17. Multimode and singlemode backbone cabling
   *consult local codes

Open Office

Collaborative Work Space

Focus Work Space

Telecom Room

Equipment and Telecom Room