Uptake of Convergence

IoT in Commercial Buildings

BRACKNELL, BERKSHIRE, U.K.—While there is a great deal of interest in convergence and in the potential for IoT in commercial buildings, there is still limited understanding of just how many devices are being connected, and many published numbers include consumer devices, residential products, utility metering, asset tracking in the supply chain and industrial product.

BSRIA thinks there is a need for reliable numbers for connected devices in commercial buildings as the majority of connected devices today are audio streaming, data transfer (such as fitness trackers and keyboards), home security and automation and utility metering.

BSRIA has been tracking convergence in commercial buildings over the last 15 years and the uptake has been slow, but we expect to see an increase in the number of connected devices over the next five to 10 years due to the latest developments in both wired and wireless technologies. One example is the Wi-Fi access points (Wi-Fi 6, 802.11ax) that can handle multiple devices using several protocols such as Bluetooth and Zigbee.

BSRIA's latest study uses the IT/Ethernet network as the basis for estimating the number of connected devices in commercial buildings. Connected devices use an average of 40 to 50 m (131 to 164 ft) of structured cable per device, except for some products that use one connection point for several devices. Daisy chaining—where multiple devices are wired together in sequence or in a ring—is mainly used for access control products such as lock actuators, readers and keypads and thermostats, sensors and power over Ethernet (PoE) lights.

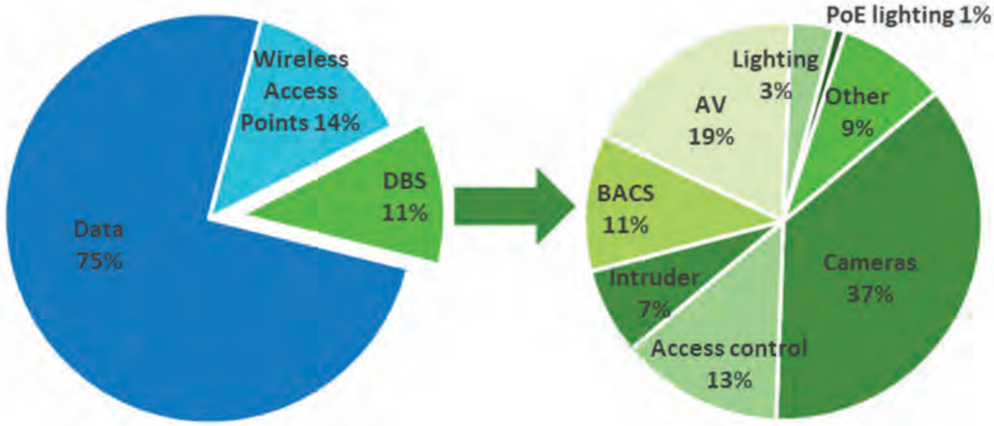
There were an estimated 154 million Ethernet connections/ports worldwide in 2019. The majority of these are supporting data (and voice), but a significant number are connected to wireless access points (WAPs) and distributed building services (DBS). The key products included under DBS are surveillance cameras, audio/video, access controls and building automation controllers.

An average of 3.6 devices are connected to each of the 17 million Ethernet port for DBS, equivalent to more than 60 million connected (cabled) devices.

The use of wireless technologies in commercial buildings is increasing. The most prominent short-range, low-power technologies in commercial buildings are Bluetooth and Zigbee followed by EnOcean. The typical applications for short range low power technologies are sensors and lighting. BSRIA estimated the number of connected (wireless) devices in commercial buildings worldwide in 2019 to be 150 to 200 million.

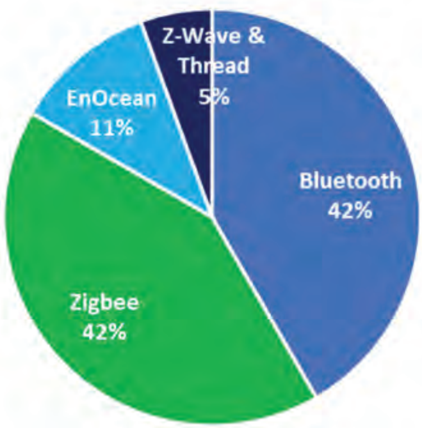
The uptake of low-power wide-area (LPWAN) technologies such as Lorawan, Sigfox and NB-IoT is still

WIRED ETHERNET CONNECTION/NODES FOR DATA, WIRELESS ACCESS POINTS AND DBS, WORLDWIDE 2019



Other includes: blinds, fire detection and notification, point of sales, distributed antenna systems (DAS), asset & personal tracking, smart parking, etc.

SOURCE: CONVERGENCE - IOT IN COMMERCIAL BUILDINGS, NO. 61564



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very limited in commercial buildings. They are used mainly for smart metering, tracking the supply chain, monitoring of soil and livestock, smart parking, etc.

Connectivity is about connecting devices, collecting data and undertaking analytics and diagnostics that will enable end-users and building operators to manage and operate their buildings efficiently. The COVID-19 pandemic has increased the focus on safety and trust, which potentially includes monitoring of use and social distancing, access to buildings and increasing use of remote monitoring.

BSRIA expects that the COVID-19 pandemic will negatively impact 2020 sales network infrastructure (structured cabling) and connectable devices due to shut-downs, supply chain interruptions and a reduction in new construction, but in the medium term, the penetration of connected devices could be boosted due to the need for remote monitoring and safety issues.

Industry Roundup

Artificial Intelligence Tool Helps Identify Energy-Wasting Buildings

PITTSBURGH, PA.–A multi-institution team of researchers have developed a system that uses artificial intelligence to pinpoint which buildings in a city or region are the least energy-efficient. The new system, called WattScale, provides a more accurate snapshot of which buildings waste the most energy and predicts possible causes, such as poor construction. Researchers applied WattScale to energy data from Austin, Texas; Boulder, Colorado; and a small city in New England to analyze inefficiencies in the regions' buildings. *Source: Venture Beat*

Tool Could Help Reduce Exposure To Virus-Carrying Aerosols

GAITHERSBURG, M.D.–NIST researchers have created an online simulation tool that could help reduce the number of aerosols containing the SARS-CoV-2 virus in indoor spaces such as hospital rooms, retail stores and offices. The user enters details about the room's geometry, rate of ventilation, air filter efficiencies and presence of air cleaners. The tool then estimates the concentration of aerosols in the room, helping building managers explore options for minimizing occupant exposure. *Source: National Institute of Standards and Technology*

Small Devices Could Turn Waste Heat Into Clean Energy Source

UNIVERSITY PARK, PA.–New matchbook-sized devices could convert wasted heat in buildings into electricity, according to a team of scientists at Pennsylvania State University. Thermoelectric devices reliably convert heat into electricity, but the technology has been inefficient in real-world conditions. The new modules achieved high efficiencies previously obtained only in laboratory settings. The technology could also offer an alternative to air-conditioning units containing hydrofluorocarbons. *Source: Pennsylvania State University*

Study: Water-Filled Glass Windows Could Save Energy

LOUGHBOROUGH, U.K..–A researcher from the U.K.'s Loughborough University has created "water-filled glass" (WFG) systems that use water to heat and cool structures without an additional energy supply. Tests of two prototype "water houses" show that buildings using a window system made of WFG can save energy in different climates. During warm temperatures, the water absorbs heat from the inside and outside of the building. A system with a pump then circulates the warm water to a storage tank to keep the building cool. *Source: Loughborough University* ■