TE connectivity

What's the Protocol?

5 Wireless Protocols to Consider for Your Next IoT Application

Engineers and developers are keenly aware that the Internet of Things (IoT) is poised to be a game-changer, adding an unprecedented level of connectivity to every aspect of our lives. As low-powered, wireless sensors become prolific, engineers are gearing up to enable this connectivity of things and get the right infrastructure in place for IoT development success.

IOT CONNECTIVITY – THE RACE IS ON

One key area of focus: wireless protocols. Every IoT application has a distinct set of constraints in terms of its requirements for wireless range, energy consumption and security. Sorting through a seemingly endless array of connectivity options can be a daunting task. This infographic examines some of the most popular wireless technologies available for IoT applications, as well as considerations for each around cost, security and range.

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1 WIFI

Wi Fi

WiFi is the best known and most popular wireless technology. It is ideal for smart home and smart building applications, though it requires too much power for most low-power IoT applications.

› IDEAL APPLICATIONS: CONSUMER, SMART HOME, SMART BUILDING

› DATA RATE: HIGH (1 GBPS)

› SECURITY: LOW

› COST: MEDIUM

› IEEE STANDARD: 802.11

RANGE: MEDIUM (100 M)

POWER CONSUMPTION: HIGH

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2 BLUETOOTH® LOW ENERGY (BLE)

Bluetooth is a personal area network for short-range communication. Supported by most smartphone and computer makers, it is popular for a wide range of consumer and IoT applications. The latest generation Bluetooth® Low Energy (BLE) was designed for low-power devices that use less data, like control signals and sensor readings.

› IDEAL APPLICATIONS: CONSUMER, FITNESS TRACKERS, HEALTH MONITORS, SMART HOME, SMART BUILDING, SMART CITY

› DATA RATE: LOW (1 MBPS)

› SECURITY: LOW

› COST: LOW

RANGE: SHORT (50 M)

POWER CONSUMPTION: LOW

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3 ZIGBEE

zigbee

Zigbee is an open standard used to connect devices in low-power machine-to-machine (M2M) networks. Designed for building automation and control, wireless thermostats and lighting systems often use Zigbee. Zigbee can use 128-bit AES encryption, offering strong security.

› IDEAL APPLICATIONS: INDUSTRIAL, BUILDING AUTOMATION AND CONTROL, LOW-POWER HIGH SECURITY DEVICES

› DATA RATE: LOW (250 KBPS)

› SECURITY: MEDIUM

› COST: LOW

› IEEE STANDARD: 802.15.4

RANGE: SHORT (100 M)

POWER CONSUMPTION: LOW

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4 LORAWAN (LPWAN)

LoRa

One of several Low-Power Wide-Area Network (LPWAN) technologies, LoRaWAN is a media access control (MAC) layer protocol designed for large-scale public networks with a single operator. LoRaWAN is intended for battery-powered IoT devices in industrial environments. Ideal for the digital factory, it offers low-cost, long-range M2M connectivity and strong security with 128-bit AES CCM encryption.

› IDEAL APPLICATIONS: INDUSTRIAL, NOISY ENVIRONMENTS, LONG RANGE

› DATA RATE: LOW (0.3 TO 50 KBPS)

› SECURITY: MEDIUM

› COST: MEDIUM / HIGH

RANGE: LONG (15 KM)

POWER CONSUMPTION: LOW

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5 NARROWBAND IOT – NB-IOT (LPWAN)

Narrowband-IoT – or NB-IoT – is an LPWAN technology that addresses cellular M2M communications for low-power, low-data-rate devices. Popular in China, NB-IoT is commonly used in smoke detectors, door locks, alarms and agricultural and environmental sensors.

› IDEAL APPLICATIONS: AGRICULTURAL AND ENVIRONMENTAL SENSORS, BUILDING DEVICES

› DATA RATE: LOW (300 BPS TO 200 KBPS)

› SECURITY: STRONG

› COST: MEDIUM

RANGE: LONG (10 TO 15 KM)

POWER CONSUMPTION: LOW

CONCLUSION

You have numerous wireless protocol options to choose from for your IoT connectivity – and it's a crucial decision for the success of your IoT product. Each technology has its own mix of cost, performance and complexity, so it's essential that you pick the technology that best fits the unique needs of your application.

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