

What is IoT device management?

IoT device management refers to processes managing the entire lifecycle of Internet of Things (IoT) devices and sensors, from planning and onboarding, to monitoring and maintenance, through to retirement.

IoT device management encompasses all of the tools, capabilities, and processes necessary to support IoT solutions effectively at scale. It gives you the ability to connect and configure any number of IoT devices with ease, control devices and their data, monitor device status, maintain security, and keep your IoT solutions aligned with your IoT strategy.

Why use IoT device management?

You may be familiar with the oft-quoted statement that “Amateurs talk about tactics, but professionals study logistics.” In many ways, IoT device management is the logistics of your IoT strategy. It encompasses a variety of processes and functions to deploy, connect, maintain and retire physical devices at scale, effectively providing the logistics to bridge the physical and digital worlds.

Although IoT device management is a foundational capability for building solutions based on connected devices, it is one of the most complex aspects from a technology perspective. Effective IoT device management means the ability to manage and monitor devices—securely, at scale, efficiently—across a heterogeneous environment. Master the logistics of IoT device management and you unlock the potential to launch new services, create new sources of recurring revenue, and minimize the cost of solution support.

What is an IoT device management platform?

An [IoT device management platform](#) is an integrated application that simplifies IoT device management by allowing you to manage and monitor the entire lifecycle of devices and sensors in one place—from planning and onboarding, to monitoring and maintenance, through to retirement.

In general, the capabilities of an IoT device management platform include the ability to onboard and register your IoT devices, monitor your device’s information (such as status and location), perform software and firmware updates, manage devices at scale, troubleshoot problems,

remotely configure devices, maintain security, and integrate data with other enterprise applications.



How does IoT device management work?

IoT device management facilitates control over the full lifecycle of IoT devices, from the initial provisioning to retirement, and everything in between.

Device onboarding

The initial step in IoT device management involves provisioning. Provisioning entails the initial device configuration to modify the device from its original, off-the-shelf settings to those required for the device to be integrated into your network.

Following provisioning, you need to authenticate the device by confirming its identity as it is added into the IoT system, and authenticating users at login. This step ensures that only authorized devices are enrolled, to prevent intrusions and keep proprietary information secure.

IoT device management platforms that support bulk device registration simplify and accelerate the onboarding of your IoT devices by offering the ability to onboard hundreds and thousands of devices at once.

Device viewing

Gain full visibility over all your IoT devices in one place. A device list allows you to sort devices by searching and filtering devices, so you can find exactly what you need when you need it.

Device configuration

Devices and networks are not static objects. Instead, they are always evolving. IoT device management enables configuration beyond the initial provisioning phase. Configuration can include factors including updates to firmware, networking, access permissions, or other properties.

Device grouping

Efficient IoT device management relies on scaling from a handful of devices to thousands or more—and then keeping every device current with firmware and other configuration updates. Organize your devices by grouping them according to their function, location, or other characteristics into top-level groups, subgroups, or dynamically constructed smart groups. Grouped devices allow for easier management of devices and bulk operations.

Diagnostics

Perform diagnostics on your IoT devices, from an individual unit to the entire device network. Troubleshoot and remediate issues quickly and efficiently to prevent system downtime.

Status monitoring

Gain insights into the performance of individual devices or a group of your definition. Gain insights on user-defined data points, such as temperature or vibration. Establish user-defined notifications to trigger decisions, such as events that are associated with a need for preventive maintenance to prolong machine life. Detect and address issues that can lead to security breaches, such as attempted device configuration changes. View device alarms to maintain in-spec operations.

Device security

IoT security is an absolute essential to doing business in today's connected world. IoT device management enables firmware updates to ensure devices are running on the latest secure software. The IoT device management platform's architecture should be designed to protect physical, network, application and access control.

Device updates

At some point—or many points—you will need to update your devices' firmware, software, configurations, credentials, profiles and trusted certificates. Bulk configuration is the key to efficient IoT device management, and that is especially true with IoT device updates. The ability to configure groups of devices with one click improves consistency and efficiency.

Data integration

The value of your IoT devices is the data they provide to users across the organization: operators, product designers, business decision-makers and more. Data integration capabilities enable your IoT device management platform to communicate with third-party applications. This enables functions such as pushing updates and code out to your entire installation of deployed devices, and routing data from devices to the appropriate users and dashboards.

Device retirement

Replace or decommission devices after a device fails, you enter an upgrade cycle, or at the end of the service lifetime. Choose whether to retain device information if the physical device is being replaced, or archive the data if it will be permanently retired.

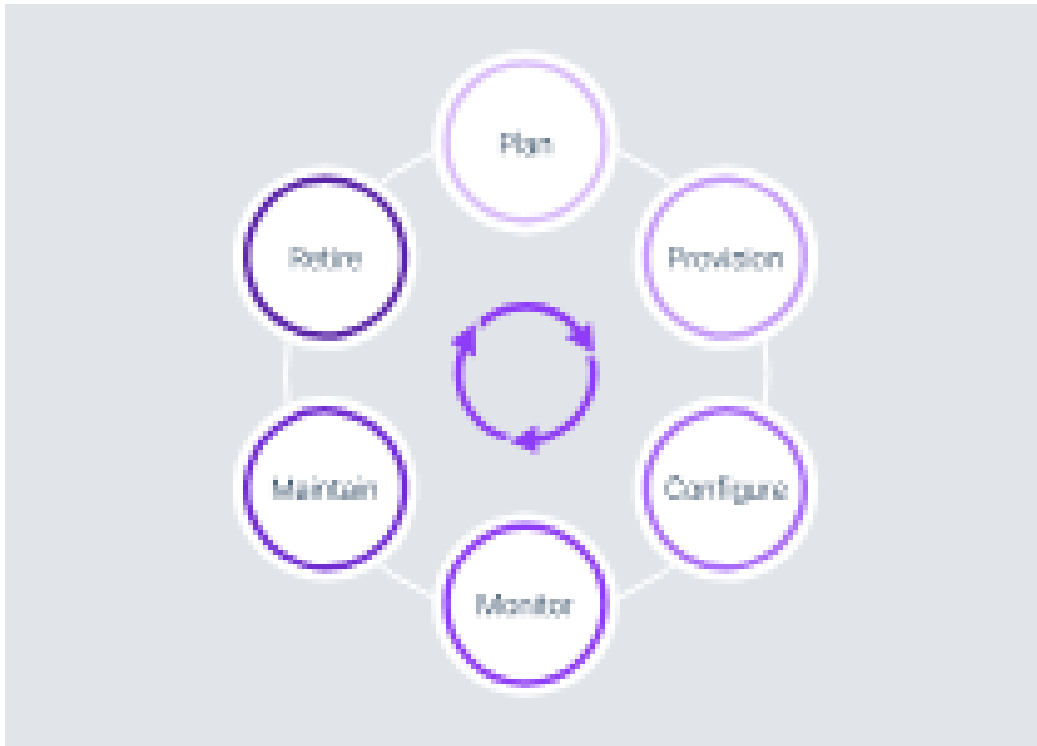


Figure 2: IoT device management covers the full lifecycle of IoT devices