



Overview

- [Overview of Cisco Spaces Connect for IoT Services, on page 1](#)

Overview of Cisco Spaces Connect for IoT Services

Cisco Spaces Connect for IoT Services solution enables the delivery of advanced BLE capabilities over Cisco Catalyst Wireless infrastructure. The key component of this solution is the IoT Orchestrator, which is a Cisco IOx application that can be deployed on any existing Cisco Catalyst 9800 Wireless Controller platforms. With the Cisco Spaces Connect for IoT Services solution, you can:

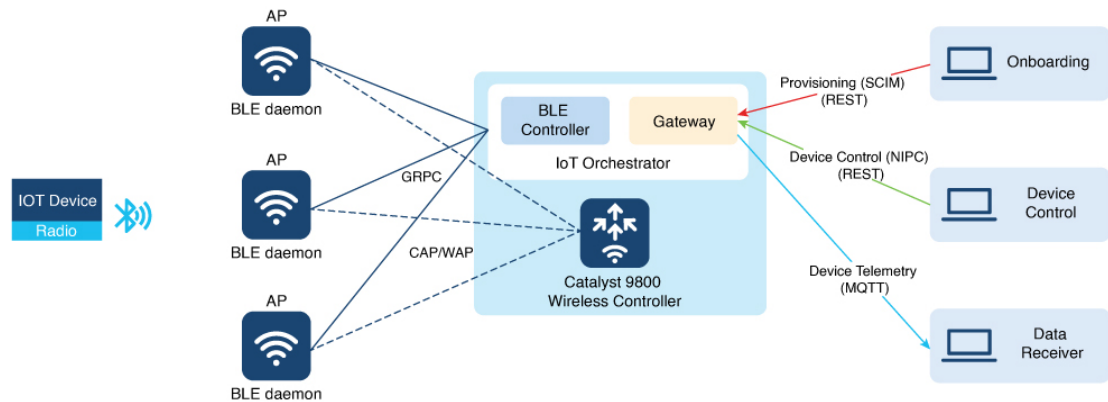
- Securely onboard and control BLE devices
- Consume data telemetry using the Message Queuing Telemetry Transport (MQTT)

Cisco's IoT Orchestrator is loaded on Cisco Catalyst 9800 Wireless Controllers and leveraged as an IoT gateway. This utilizes your existing network deployments and interfaces, reducing the need to deploy an entirely new infrastructure. Once loaded, you can use the IoT Orchestrator Manager in the Cisco Catalyst 9800 Wireless Controller to control the internal resources of the application. The IoT Orchestrator manages IoT devices to simplify the service deployment and ease of operation. The IoT Orchestrator provides a central area to control BLE devices and send BLE device data to appropriate recipients.

Cisco Spaces Connect Solution

The following diagram depicts the elements of the Cisco Spaces Connect solution.

Figure 1: Cisco Spaces Connect Solution (On-Premises Solution)



The BLE controller and gateway combined together is known as the IoT Orchestrator.

The IoT orchestrator is the new IOx application deployed on the Cisco Catalyst 9800 Wireless Controller as a Cisco IOx container that interacts with the AP using gRPC channels.

The AP uses its IoT radio to interact with the BLE device.

The IoT orchestrator provides APIs for the following:

- **Onboarding applications:** The onboarding applications leverage IETF SCIM for device models (<https://datatracker.ietf.org/doc/draft-ietf-scim-device-model/>). The SCIM allows an application to send a SCIM object to a SCIM server (gateway) to create, update, and delete devices in networks.
- **Device control applications:** The device control applications allow an application to connect to a non-IP device to exchange data with the device and register topics for streaming telemetry. The IETF draft used for this protocol is called the Non-IP Control (NIPC).
- **Data receiver applications:** The telemetry application receives the telemetry data from the IoT Orchestrator application.
- **Message Queuing Telemetry Transport (MQTT):** Message Queuing Telemetry Transport (MQTT) is a lightweight messaging protocol commonly used for communication between devices in IoT applications. Subscriptions and notifications play crucial roles in enabling devices to receive and react to messages. In MQTT, the clients subscribe to topics for receiving messages published to those topics. A topic is a string that the MQTT broker uses to filter messages for each connected client. The notification for subscribed topic happens from the IoT Orchestrator application to the data receiver application.



Note All applications must be authenticated and authorized using certificate-based mechanism or API key-based mechanism. For example, if the API key-based mechanism is used, then all applications, such as onboarding, control, and data receiver applications must be registered on the IoT Orchestrator to generate the API key. Now when these applications interact with the IoT Orchestrator Application, they must present the API key in the issued API request. If you use the certificate-based mechanism, then you will need to present the certificate when issuing API requests to the IoT Orchestrator application.