Overview

Overview of Cisco Spaces: IoT Service (Wireless)

Cisco Spaces: IoT Service (Wireless) is a platform service within Cisco Spaces that enables you to claim, manage, and monitor IoT devices using Cisco's wireless infrastructure. IoT Service is designed to enable management of IoT devices across vendors, form factors, and technology protocols. Bluetooth Low Energy (BLE) is the first technology available for management using IoT services.

IoT service (wireless) encompasses hardware, software, and partner components to enable the management of devices that support critical business outcomes. IoT service (wireless) uses Cisco Catalyst 9800 Series Wireless Controllers, Cisco Spaces: Connector, Cisco Wi-Fi6 access points, and Cisco Spaces. IoT service (wireless) adopts a next-generation approach to manage complexity in an enterprise environment.

Using the IoT service (wireless), you can perform the following IoT management activities:

• Deploy BLE gateways on supported APs in your network.

• Claim the BLE beacons that you acquired from Cisco Spaces: IoT Device Marketplace.

• Configure APs and manage floor beacons.

• Monitor device attributes such as location, telemetry, battery status, and movement status.

Components of Cisco Spaces: IoT Service

The section describes the various components that work to complete the Cisco Spaces: IoT Service solution.

The Cisco Catalyst 9100 Series Family of Access Points acts as a gateway of communication between Cisco Spaces and the IoT devices. Cisco Spaces: IoT Service can then use a range of common APIs to communicate with edge devices and apps. The Cisco Spaces: IoT Service collects data from devices and apps, and passes

it to Cisco-partnered websites that manage these devices far more extensively (referred to in this document as Device Manager websites). These Device Manager websites can use edge-device signals to enable outcomes specialized and targeted for each industry.

Figure 1: Components of IoT Service
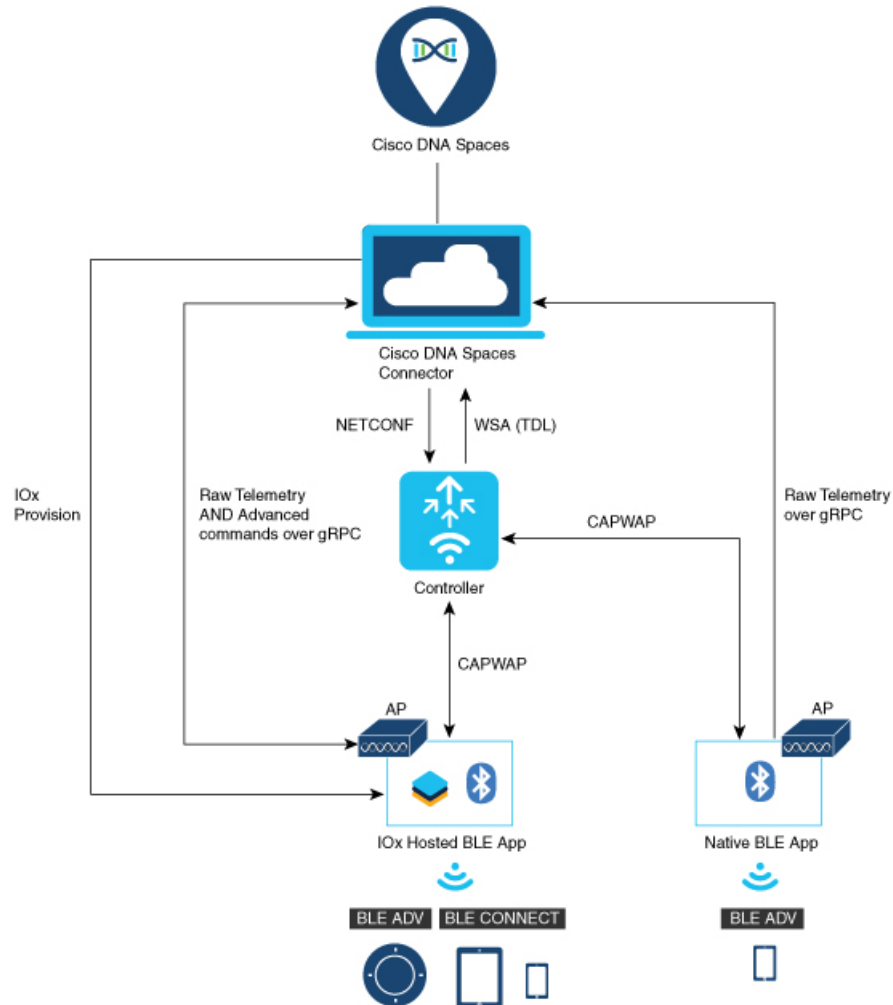
Access Points

You can configure access points as gateways in Cisco Spaces. You can find the list of supported APs in the **Compatibility Matrix** section.

Depending on the type of Cisco APs, you can configure an AP as one of the following types of BLE gateways:

- **Base BLE Gateway**: This is a type of AP that you can configure in either the **Transmit** mode or the **Scan** mode.

  In the **Transmit** mode, the AP can broadcast iBeacon, Eddystone URL, and Eddystone UID profiles.

In the **Scan** mode, the AP can scan the vicinity for other BLE devices. Using gRPC, an AP sends the scanned data to Cisco Spaces: Connector. The AP can also receive telemetry data from floor beacons. The Cisco Spaces: Connector dashboard decodes and displays this information.

- **Advanced BLE Gateway:** This gateway is an AP that is installed with the Cisco IOx App. Using the installed Cisco IOx App, you can configure floor beacons on the Cisco Spaces dashboard. You can also upgrade the floor beacon firmware from the Cisco Spaces dashboard.

You can configure this AP in the **Scan** mode and the **Transmit** mode.

In the **Transmit** mode, the AP can broadcast iBeacon, Eddystone URL, and Eddystone UID profiles.

In the **Scan** mode, the AP can scan the vicinity for other BLE devices. Using gRPC, an AP sends the scanned data to Cisco Spaces: Connector. The AP can also receive telemetry data from floor beacons. The Cisco Spaces: Connector dashboard decodes and displays this information.

Cisco Catalyst 9800 Series Wireless Controllers

The Cisco Catalyst 9800 Series Wireless Controller (Catalyst 9800 controller) combines RF excellence with Cisco IOS-XE benefits, and comes in physical or virtual form factor. This wireless controller is reliable and highly secure. You can manage this Catalyst 9800 controller using CLI, GUI, NETCONF, Yang, or the Catalyst Center.

The Catalyst 9800 controller is the single point for configuring and managing a wireless network and access points. The Catalyst 9800 controller configures and manages APs using the CAPWAP protocol.

The Catalyst 9800 controller receives BLE configuration from Cisco Spaces over NETCONF and passes the configuration to AP over CAPWAP. The feedback path from the AP to the wireless controller is through CAPWAP, and from the Catalyst 9800 controller to Cisco Spaces through Telemetry data logger (TDL) telemetry streaming. The gRPC configuration from Cisco Spaces also goes through the Catalyst 9800 controller, and from there to the corresponding AP. The configuration sets up the gRPC channel between the AP and Cisco Spaces. The AP sends the gRPC channel statistics to the Catalyst 9800 controller, and you can view these statistics on the Catalyst 9800 controller.

Note
- You can have only one gRPC session between an AP and connector.

- Cisco Catalyst 9800 Series Wireless Controller running Cisco IOS XE Amsterdam 17.3.x supports only one of the following:
  - IoT service (wireless) with Cisco Spaces.
  - Network Assurance solution on Catalyst Center using Intelligent Capture (iCAP)

IoT service (wireless) and Intelligent Capture (iCAP) can co-exist from Cisco IOS XE Cupertino 17.7.x or higher.

Cisco Spaces: IoT Device Marketplace

Cisco Spaces: IoT Device Marketplace is a platform where you can discover, research, and purchase IoT devices. IoT Device Marketplace is a part of the Cisco Spaces full-stack partner ecosystem. Each device is preconfigured to give the customer an out-of-the-box experience with sensors, tags, wearables, and more. All the devices are compatible with the applications in the App Center. Current devices in the IoT Device

Marketplace leverage BLE to transmit telemetry, with plans to add other technology in the future, such as Ultra Wide Band (UWB) and Zigbee.

Cisco Spaces: Connector

Cisco Spaces: Connector allows Cisco Spaces to communicate with more than one Cisco AireOS Wireless Controller.

APs connect to connector using the gRPC framework.

The APs establish a connection to connector using the gRPC protocol. The gRPC protocol configures floor beacons and receives telemetry data from the floor beacons. gRPC is a bidirectional streaming service, and requires a certificate to validate the host connection and a token for authentication. Each AP creates a gRPC connection. Connector can thus support many simultaneous connections.