

## **AP** as a Beacon

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## **AP** as a Beacon

You can configure your access point (AP) to act as a beacon (AP beacons) by enabling BLE on it.

IoT Service categorizes APs according to their configurations as the following:

- Disabled: APs with BLE disabled. These APs are not scanning or transmitting.
- Scan Mode: AP beacons that are only scanning.
- **Transmit Mode:** AP beacons configured in one of the beacon transmit profiles. You can configure up to five iBeacons in this mode.
  - The MAC address advertised in the iBeacon payload is derived from the radio MAC address of the AP. (iBeacon MAC address).
  - The MAC address advertised in the Eddystone payload is the default MAC address of the AP's BLE chip, which is preset by the chip vendor.
- **Dual Mode:** AP beacons that are transmitting and scanning. You can configure only one iBeacon in this mode.
  - The MAC address advertised in this mode is the default MAC address of the AP's BLE chip, which is preset by the chip vendor (For both Eddystone and iBeacon single advertisement profiles)
- Needs Config Change: AP's that have an error in configuration. You can configure these APs in Scan Mode, Dual Mode, or the Transmit Mode.

You can configure an AP Beacon in one of the following transmit modes.

- iBeacon
- Eddystone UID

• Eddystone URL

You can also see all the APs irrespective of their configurations under All Profiles.

Figure 1: Various Profiles of AP Beacons

	≡	🗄 Spaces												
	🏮 Dash	iboard v	Но	me Devices	Groups Poli	cles	Settings							
	값 Home ⑦ Local ④ Integ	a Ion Hierarchy rations	All Cal All Pro 3	files	Sensor AP Sensors 2	18	Transmit leacon		Transmit Eddystone UID O		Transmit Eddystone URL O	Scan Scan Mode 3	Dual Mode O	Pual 9
	Admi	tor n Management ervices	Needs 0	Config Change	Disabled 3									
	💮 Setup	2	List Vier	Map View	$\nabla$ Filters Actions $\sim$	Bulk Re	quest History						As of: Feb 1, 5	2024 8:59 PM
				Mac Address	AP Name •	Label	BLE	AP Model	Profile Type	Label	Location		BLE Firmware Version	AP Beacon
loT Services	Abou	t IoT Services		68:7d:b4:5f:66:e0 Out of Sync	AP687D.845C.1E00	-	✓ Enabled	C9136I-B	Scan	-	DNA Spaces loT Dev Test-	Building 19->Main Floor	3.2.4	Feb 1st, 20: 7 minutes ag
tật ocup	loT G	ateways ion		1c;d1:e0;65;c3;40	AP84F1.47B2.8868	-	✓ Enabled	C9115AX0-E	Scan	-	DNA Spaces loT Dev Test-:	Building 19->Main Floor	2.7.21	<b>?</b>
	Device Manitoring		0	1cid1:e0:79:8e:a0	AP84F1.47B3.31D4	-	✓ Enabled	C9115AX0-E	Scan	-	DNA Spaces IoT Dev Test-	Building 19->Main Floor	2.7.21	COVID-19 App

You can also enable telemetry on the AP beacon and collect sensor information.

### iBeacon Transmit Mode

A single AP can support up to five iBeacons in the transmit mode. Each iBeacon has a unique address derived from the base radio MAC address of the AP.

Use Cisco Spaces to configure an iBeacon's payload.

Following are some terms related to iBeacons:

- **Transmit mode**: Mode that allows nearby devices to pick up an iBeacon's broadcasting (or 'advertising') signals.
- Advertisement payload: Data broadcast by an iBeacon. The advertisement payload contains information relevant to the iBeacon's purpose, such as the iBeacon's location. Use Cisco Spaces to configure this payload.
- **iBeacon MAC address**: Unique identifier of an iBeacon on the network that helps other devices recognize and differentiate one iBeacon from another. This address is part of the iBeacons' advertisement payload. The AP uses the AP's own base radio MAC address to derive this unique address. The address is derived by adding a predefined address block value to the last byte of the base radio MAC address and decrementing this value by the beacon ID.

## Configure AP as a Beacon in Scan Mode

You can configure an AP as a beacon in the scan mode.

### Procedure

**Step 1** In the Cisco Spaces dashboard left-navigation pane, click **IoT Service > Device Management > Devices**, and then click **AP Beacons**.

#### Figure 2: List of AP Beacons

	≡	tiste Spaces												
	\$	Dashboard v	Home De	evices	Groups Polic	cies	Settings							
	ଘ ତ ଡ	Home Location Hierarchy Integrations	All Campuses All Profiles 3		Sensor AP Sensors 2	18	Transmit Beacon		Transmit Eddystone UID 0		Transmit Eddystone URL O	Scan Scan Mode 3	Dual Mode 0	al
	2 0 0	Monitor Admin Management IoT Services	Needs Config Cha O	ange	Disabled 3									
	\$	Setup	List View Map V	ňew	√ Filters Actions → AP Name ▲	Bulk Re	quest History	AP Model	Profile Type	Label	Location		As of: Feb 1, 20 BLE Firmware Version	124 8:59 PM
loT Services		About IoT Services	68:7db4:1	5f:66:e0	AP587D.845C.1E00	-	✓ Enabled	C9136I-B	Scan	-	DNA Spaces IoT Dev Test-	Building 19->Main Floor	3.2.4	Feb 1st, 202 7 minutes ago
ξ <mark>Ο</mark> ያ Setup		IoT Gateways inv	1c:d1:e0.t	65:c3:40	AP84F1.47B2.8868		✓ Enabled	C9115AX	8 Scan		DNA Spaces IoT Dev Test-	Building 19->Main Floor	2.7.21	0.
		Device Monitoring	10:d1:e0:3	79:8e:a0	AP84F1.47B3.31D4		✓ Enabled	C9115A00-	8 Scan		DNA Spaces loT Dev Test-	Building 19->Main Floor	2.7.21	COVID-19 Apps

**Step 2** Click the **Disabled** tab, if the count is greater than zero. Click the MAC address of one of the listed APs to open a detailed view.



Figure 3: Select an AP to Configure

**Step 3** In the **Settings** area, click **BLE**.

Figure 4: Enable BLE

					)   Ç
Home Devi	ices Groups	Policies Settings		AP Beacon - 00:df:1d:87:6e:00 Out of Sync BLE	×
All Campuses	×			Heard 2 minutes ago Heard 6 minutes ago	
All Profiles 4 Needs Config Chi 0	Sensor AP Sensors 2 Disabled 2	Transmit IBeacon O	Ed O	IOx App - Zigbee Capable Ves Channel Last Heard IOx Capable Ver USB Capable Ver USB Capable Ver BLE	
List View Map View	W Filters Action	ns ∨ Bulk Request Histo	ry	Enabled	
Mac Address	AP Name 🔺	AP Model	La	> Request History	
Out of Sync	AP00DF.1D86.26	5A8 C9105AXW-B	-		
C 78:72:5d:ee: Out of Sync	2b:80 Development_AF	P_3 AIR-AP4800-B-K9	-	•	0.

**Step 4** In the **BLE mode** area for the **Scan** option, click **Enable**.

#### Figure 5: Enable Scan Mode

AP Beacon - e4:38:7e:42:ad:e0	nc Sensor BLE	×
Sensor		
BLE		
Before enabling BLE, you need to select BL properly.	E mode for the beacon to function	
BLE mode		Enable Scan
S Scan Scans for nearby bluetooth devices	Enable	
Transmit Only does beacon transmitting	Enable	
Dual Does both Scan & Transmit	Enable	
> Sensor Information	(	<b>?</b>

AP is enabled as a beacon in Scan mode. You can observe the AP under the Scan tab.

**Step 5** From the **Request History** area, observe the status of the configuration change you requested. On the **AP Beacons** page, notice that the AP now has an **Out of Sync** message beside it. This message disappears once the configuration requested is complete.

#### Figure 6: Configuration Status

	Ves	Connection	Mode Connector	
Settings		Obse	erve the status	of
Sensor Informati	on			-
Request History				
				🖞 Export
Operation	Status	Initiated At 👻	Last Updated At	Status Message
Operation DISABLE BLE	Status • SUCCESS	Initiated At  Jan 31st, 2024 11:36:14 AM 16 minutes ago	Last Updated At Jan 31st, 2024 11:36:16 AM 16 minutes ago	Status Message Successfully ackr
Operation DISABLE BLE TRANSMIT MODE	Status • SUCCESS • SUCCESS	Initiated At  Jan 31st, 2024 11:36:14 AM 16 minutes ago Jan 31st, 2024 11:34:05 AM 18 minutes ago	Last Updated At Jan 31st, 2024 11:36:16 AM 16 minutes ago Jan 31st, 2024 11:34:09 AM 18 minutes ago	Status Message Successfully ackr
Operation DISABLE BLE TRANSMIT MODE IBEACON CONFIG	Status  Success Success Success	Initiated At ~           Jan 3114, 2024 11:36:14 AM 16 minutes ago           Jan 3154, 2024 11:34:05 AM 18 minutes ago           Jan 3154, 2024 11:34:05 AM 18 minutes ago	Lest Updated At Jan 31st, 2024 11:36:16 AM 16 minutes ago Jan 31st, 2024 11:34:09 AM 18 minutes ago Jan 31st, 2024 11:34:10 AM 18 minutes ago	Status Message Successfully ack Successfully ack Successfully ack

# **Configure AP as a Beacon in Transmit Mode**

You can configure an AP as a beacon in transmit mode.

### Procedure

Step 1In the Cisco Spaces dashboard left-navigation pane, click IoT Service > Device Management > Devices, and then click<br/>AP Beacons.

Figure 7: List of AP Beacons

			their Spaces												
		\$	Dashboard v	Hom	e Devices	Groups Poli-	cies	Settings							
		ଘ ତ ⊕	Home Location Hierarchy Integrations	All Cam All Profi	les	Sensor AP Sensors 2	"	Transmit Beacon D		Transmit Eddystone UID O		Transmit Eddystone URL O	Scan Scan Mode 3	Dual Mode 0	al
	2 2 9	Monitor Admin Management	Needs C 0	onfig Change	Disabled 3										
		¢	Setup	List View	Map View	√ Filters Actions  √ AP Name	Bulk Re	quest History	AP Model	Profile Type	Labal	Institut		As of: Feb 1, 20	124 8:59 PM
() Iot	Services		About IoT Services	0	68:7d:b4:51:66:e0	AP6870.845C.1E00	-	✓ Enabled	C9136I-B	Scan	-	DNA Spaces IoT Dev Test-	>Building 19->Main Floor	3.2.4	Feb 1st, 202 7 minutes age
1Åt ser	up		IoT Gateways		1c:d1:e0:65:c3:40	AP84F1.4782.8868		✔ Enabled	C9115AX0-8	B Scan	-	DNA Spaces IoT Dev Test-	>Building 19->Main Floor	2.7.21	9.
			Device Monitoring		1c:d1:e0:79:8e:a0	AP84F1.47B3.31D4	-	✓ Enabled	C9115AX0-6	B Soan	-	DNA Spaces IoT Dev Test-	>Building 19->Main Floor	2.7.21	COVID-19 App:

Step 2Click the AP Beacons tab. Click the MAC address of one of the listed APs to open a detailed view.Figure 8: Select an AP to Configure

s	Dashboard	÷	Home D	evices Groups	Policies Se	ttings			IoT Servin
ଜ ତ	Home Location Hierarchy		Floor Beacon	AP Beacons	Wired Sensors	0 Cameras O	Smart PDUs 0		
\$	Integrations		All Profiles	Sensor AP Sensors	Transmit	Transmit Eddystone UI	Transmit D Eddystone URL	Scan Scan Mode	Dual Mode
~	Monitor		4	2	0	0	0	4	0
8	Admin Management								
3	IoT Services		Needs Config Ch	Disabled					
@	Setup		0	2	Click to co	nfigure an AP t	beacon		
			List View Map	View <b>View</b> Ac	P ox Reque	st History		As of: Jan 31, 2024 8:40	M 📿 Refresh
			Mac Address		Label	BLE AP Model	Profile Type Label	Location	
			C 04.08.74	42:ad:e0 AP6649.927	5.0800 -	Enabled CW91667-8	Scan -	DNA Spaces IoT Dev Test-	Building 19->Main Floo

Step 3In the BLE mode area for the Transmit option, click Enable.Figure 9: Enable BLE

Home De	vices Groups	Policies	Settings	AP Beacon - Out of Sync Sensor BLE e4:38:7e:42:ad:e0 Scan Transmit Dual
+	2	0	0	As of: Jan 31st, 2024 08:44:29 AM 🔀 Refresh Sync
Needs Config Chi	Disabled			> AP Information
0	2			~ Settings
				Sensor
List View Map V	iew V Filters Act	ions 🗸 Bulk Re Label	equest History BLE	Sensor
Jet View Map V Mac Address	ew Fitters Act AP Name * 2:ad:e0 AP6849.9275	ions v Bulk Rr Label	equest History BLE ✓ Enabled	Sensor
Liet View Map V Mac Address e4:38:7ex ozci 5y 68:7d:54:3	Fitters         Act           AP Name ^         2:adia0           AP6849.9275         AP6870.8435	ions - Bulk Rr Label .0800 -	equest History BLE	Sensor BLE BLE BLE mode Scars for rearby bluetson't divinces
List View Map V Mac Address 0x0155 000155 000155 1c01:e04	Image: Name         Titlers         Act           2:adia0         AP6845.9275         AP6845.9275           AP6845.9275         AP6845.9275         AP6845.9275           A55340         AP6845.14782         AP6845.14782	ions ∨ Bulk Ri Label .08C0 - 2.1000 - .8068 -	equest History BLE ✓ Enabled ✓ Enabled ✓ Enabled	Sensor BLE BLE BLE Conservation BLE Conservation BLE Conservation

- **Step 4** In the **Enable Transmit Profile** area, you can configure this beacon in two modes. Do one of the following:
  - Check the first checkbox to enable iBeacon. From the **Profile Type** drop-down, choose one of the beacons. Configure the remaining values for the iBeacon's payload.

Figure 10: Configuring an AP as an iBeacon



#### Note

APs can support up to five iBeacons in the **Transmit** mode. For more information, see iBeacon Transmit Mode, on page 2

• Select the second checkbox to enable Eddystone. Configure the values for the Eddystone payload.

Figure 11: Configure an AP Beacon as an Eddystone

Before enabling BLE, you nee	d to select BLE mode for the b	peacon to function pr	roperly.	
BLE mode			Click t	o enable
S Scans for nearby blue	tooth devices	Enable		
			Edd	ystone
Transmit		Enable		
Unly does beacon tran	ismitting			
i Enable Transmit Profile				
i Enable Transmit Profile			Cancel X	Save √
() Enable Transmit Profile	/		Cancel X	Save 🗸
i Enable Transmit Profile	0		Cancel X	Save 🗸
(i) Enable Transmit Profile Profile Profile Type*		IID	Cancel X	Save 🗸
Fnable Transmit Profile  Profile Profile Type*		IID	Cancel X	Save 🗸
Enable Transmit Profile  Profile  Profile Type*  Eddystone Namespace ••	C C C C C C C C C C C C C C C C C C C	ID	Cancel X	Save 🗸
Enable Transmit Protile  Profile  Profile  Eddystone Namespace	C C EDDYSTONE U C C C C C C C C C C C C C C C C C C	ID 000000000	Cancel X	Save 🗸

AP is enabled as a beacon in Transmit mode. You can observe the AP under the Transmit tab.

**Step 5** From the **Request History** area, observe the status of the configuration change you requested. On the **AP Beacons** page, notice that the AP now has an **Out of Sync** message beside it. This message disappears once the configuration requested is complete.

Figure 12: Configuration Status

	USB Capable	✓ Yes	Connectio	n Mode Connector	
> \$	Settings		Obse	erve the status	of
> :	Sensor Informati	on			
~ 1	Request History				
					🖞 Export
	Operation	Status	Initiated At 🔻	Last Updated At	Status Message
	DISABLE BLE	SUCCESS	Jan 31st, 2024 11:36:14 AM 16 minutes ago	Jan 31st, 2024 11:36:16 AM 16 minutes ago	Successfully ack
	TRANSMIT MODE	SUCCESS	Jan 31st, 2024 11:34:05 AM 18 minutes ago	Jan 31st, 2024 11:34:09 AM 18 minutes ago	Successfully ack
		SUCCESS	Jan 31st, 2024 11:34:05 AM 18 minutes ago	Jan 31st, 2024 11:34:10 AM 18 minutes ago	Successfully ack
	IBEACON CONFIG				

# **Configure AP as a Beacon in Dual Mode**

You can configure an AP as a beacon in dual mode.

### Procedure

Step 1In the Cisco Spaces dashboard left-navigation pane, click IoT Service > Device Management > Devices, and then click<br/>AP Beacons.

Figure 13: List of AP Beacons

	_	ali di se											
	=	"cisco" Spaces											
	s	Dashboard ~	Home Devices	Groups Poli	cies	Settings							
	ଘ ତ ଡ	Home Location Hierarchy Integrations	All Campuses All Profiles 3	Sensor AP Sensors 2	IE C	Transmit leacon		Transmit Eddystone UID O		Trassmit Eddystone URL O	Scan Scan Mode 3	Dual Mode 0	al
	ا~ ھ	Monitor Admin Management	Needs Config Change O	Disabled 3									
	0	IoT Services			_								
	¢	Setup	List View Map View	V Filters Actions ~	Bulk Ret	quest History	AB Model	Bueldo Turon	Label	Langting		As of: Feb 1, 20	24 8:59 PM
<ul> <li>IoT Services</li> <li>Setup</li> </ul>	3	About IoT Services	68:7dtb4:5f:56:e0	AP687D.845C.1E00	-	✓ Enabled	C9136I-B	Scan	-	DNA Spaces IoT Dev Test->1	Juilding 19->Main Floor	3.2.4	Feb 1st, 202 7 minutes apr
604P		IoT Gateways	1c:d1:e0:65:c3:40	AP84F1.47B2.B868	-	✓ Enabled	C9115AXI-I	B Scan		DNA Spaces IoT Dev Test->8	Building 19->Main Floor	2.7.21	9.
		Device Monitoring	1c:d1:e0:79:8e:e0	AP84F1.47B3.31D4		✓ Enabled	C9115AXI-I	B Scan		DNA Spaces IoT Dev Test->8	Building 19->Main Floor	2.7.21	COVID-19 Apps

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Step 2Click the AP Beacons tab. Click the MAC address of one of the listed APs to open a detailed view.Figure 14: Select an AP to Configure

🗧 Dashboard 🗸 🗸							loT Servi
	Home Devices	Groups Poli	cies Settings				
G Home	Floor Beacons	AP Beacons Wir	ed Sensors 0 C	ameras 🛛 S	imart PDUs 0		
Location Hierarchy	All Campuses	<u> </u>					
Integrations	All Profiles	Sensor II	Transmit Beacon	Trassmit Eddystone LIID	Traterrit Eddystone LIRI	Scan Scan Mode	Dual Dual Mode
- Monitor	4 2	(	) (	0	0	4	0
Admin Management							
loT Services	Needs Config Chi Di	sabled					
Setup	0 2						
		Cli	ck to configure	e an AP bead	con		
	List Wew Map View	V Fitors Act	Request History			As of: Jan 31, 2024 8:40 A	M 📿 Refresh
	Mac Address	1	Label BLE	AP Model	Profile Type Label	Location	
	04:38:7e:42:adte0	AP6849.9275.08C0	- 🖌 Erabled	CW9166I-8	Scan -	DNA Spaces loT Dev Test->1	Juliding 19->Main Floo

- **Step 3** In the **BLE mode** area for the **Dual** option, click **Enable**.
- **Step 4** In the **Enable Transmit Profile** area, you can configure this beacon in two modes. Do one of the following:
  - Check the first checkbox to enable iBeacon. Configure the remaining values for the iBeacon's payload.

Figure 15: Configuring an AP as an iBeacon



#### Note

APs can support only one iBeacon in the **Dual** mode. For more information, see iBeacon Transmit Mode, on page 2

• Select the second checkbox to enable Eddystone. Configure the values for the Eddystone payload.

Figure 16: Configure an AP Beacon as an Eddystone



AP is enabled as a beacon in **Dual** mode. You can observe the AP under the **Dual** tab.

**Step 5** From the **Request History** area, observe the status of the configuration change you requested. On the **AP Beacons** page, notice that the AP now has an **Out of Sync** message beside it. This message disappears once the configuration requested is complete.