

# Ruckus IoT Generic Beacon Connector Programming Guide

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## Document Conventions

The following table lists the text conventions that are used throughout this guide.

**TABLE 1** Text Conventions

Convention	Description	Example
monospace	Identifies command syntax examples	<code>device(config)# interface ethernet 1/1/6</code>
<b>bold</b>	User interface (UI) components such as screen or page names, keyboard keys, software buttons, and field names	On the <b>Start</b> menu, click <b>All Programs</b> .
<i>italics</i>	Publication titles	Refer to the <i>Ruckus Small Cell Release Notes</i> for more information.

## Notes, Cautions, and Warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

### NOTE

A NOTE provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

### ATTENTION

An ATTENTION statement indicates some information that you must read before continuing with the current action or task.



### CAUTION

A CAUTION statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.



### DANGER

A DANGER statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

# Command Syntax Conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
<b>bold text</b>	Identifies command names, keywords, and command options.
<i>italic text</i>	Identifies a variable.
[ ]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ <b>x</b>   <b>y</b>   <b>z</b> }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
<b>x</b>   <b>y</b>	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, <i>member[member...]</i> .
\	Indicates a “soft” line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

## Document Feedback

Ruckus is interested in improving its documentation and welcomes your comments and suggestions.

You can email your comments to Ruckus at [ruckus-docs@arris.com](mailto:ruckus-docs@arris.com).

When contacting us, include the following information:

- Document title and release number
- Document part number (on the cover page)
- Page number (if appropriate)

For example:

- Ruckus SmartZone Upgrade Guide, Release 5.0
- Part number: 800-71850-001 Rev A
- Page 7

## Ruckus Product Documentation Resources

Visit the Ruckus website to locate related documentation for your product and additional Ruckus resources.

Release Notes and other user documentation are available at <https://support.ruckuswireless.com/documents>. You can locate the documentation by product or perform a text search. Access to Release Notes requires an active support contract and a Ruckus Support Portal user account. Other technical documentation content is available without logging in to the Ruckus Support Portal.

White papers, data sheets, and other product documentation are available at <https://www.ruckuswireless.com>.

## Online Training Resources

To access a variety of online Ruckus training modules, including free introductory courses to wireless networking essentials, site surveys, and Ruckus products, visit the Ruckus Training Portal at <https://training.ruckuswireless.com>.

## Contacting Ruckus Customer Services and Support

The Customer Services and Support (CSS) organization is available to provide assistance to customers with active warranties on their Ruckus products, and customers and partners with active support contracts.

For product support information and details on contacting the Support Team, go directly to the Ruckus Support Portal using <https://support.ruckuswireless.com>, or go to <https://www.ruckuswireless.com> and select **Support**.

### What Support Do I Need?

Technical issues are usually described in terms of priority (or severity). To determine if you need to call and open a case or access the self-service resources, use the following criteria:

- Priority 1 (P1)—Critical. Network or service is down and business is impacted. No known workaround. Go to the **Open a Case** section.
- Priority 2 (P2)—High. Network or service is impacted, but not down. Business impact may be high. Workaround may be available. Go to the **Open a Case** section.
- Priority 3 (P3)—Medium. Network or service is moderately impacted, but most business remains functional. Go to the **Self-Service Resources** section.
- Priority 4 (P4)—Low. Requests for information, product documentation, or product enhancements. Go to the **Self-Service Resources** section.

### Open a Case

When your entire network is down (P1), or severely impacted (P2), call the appropriate telephone number listed below to get help:

- Continental United States: 1-855-782-5871
- Canada: 1-855-782-5871
- Europe, Middle East, Africa, Central and South America, and Asia Pacific, toll-free numbers are available at <https://support.ruckuswireless.com/contact-us> and Live Chat is also available.
- Worldwide toll number for our support organization. Phone charges will apply: +1-650-265-0903

We suggest that you keep a physical note of the appropriate support number in case you have an entire network outage.

### Self-Service Resources

The Ruckus Support Portal at <https://support.ruckuswireless.com> offers a number of tools to help you to research and resolve problems with your Ruckus products, including:

- Technical Documentation—<https://support.ruckuswireless.com/documents>

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### Contacting Ruckus Customer Services and Support

- Community Forums—<https://forums.ruckuswireless.com/ruckuswireless/categories>
- Knowledge Base Articles—<https://support.ruckuswireless.com/answers>
- Software Downloads and Release Notes—[https://support.ruckuswireless.com/#products\\_grid](https://support.ruckuswireless.com/#products_grid)
- Security Bulletins—<https://support.ruckuswireless.com/security>

Using these resources will help you to resolve some issues, and will provide TAC with additional data from your troubleshooting analysis if you still require assistance through a support case or RMA. If you still require help, open and manage your case at [https://support.ruckuswireless.com/case\\_management](https://support.ruckuswireless.com/case_management).



# Introduction

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The Ruckus IoT Suite seamlessly integrates with a Bluetooth Low Energy (BLE) beacon vendor's cloud service.

The Ruckus IoT Controller release 1.1 and later supports the generic iBeacon and Eddystone plugins. This document describes the payload data structure, API request and response information, input parameterization, and other information needed to enable a BLE beacon vendor to integrate with the Ruckus IoT Suite.



# Implementation Overview

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An IoT access point (AP) is capable of detecting iBeacon and Eddystone BLE packets and sending them to the Ruckus IoT Controller. The Ruckus IoT Controller reads these BLE packets and reformats them into an API call. The IoT Controller then packages these packets and sends them out to the BLE beacon vendor's cloud service.

## Standard Packet Support

The Ruckus IoT Suite supports standard-length iBeacon and Eddystone packets. If the BLE beacon payload is greater than the standard payload, there is no guarantee that the Ruckus IoT Suite can receive and relay the complete or partial packets.

## Aggregation, Compression, and Filter Support

The Ruckus IoT Suite aggregates all packets received for an interval of one second before sending them out. The receiving beacon vendor's cloud service should be able to handle the aggregated packets. The format of the packet is provided in [Beacon Payload Format](#) on page 13. Additionally, the filtering option is enabled so that the duplicate beacon messages (per device) are removed.

## Customization Support

The Ruckus IoT Suite does *not* support any customization or payload parser functionalities, but provides as-is passthrough of beacon data to the vendor plugin side.

## Latency and Reordered Packets

When the Ruckus IoT Controller posts the beacon payload to the BLE beacon vendor's cloud service endpoint (which may be collocated or a cloud operating system), there is no guarantee of latency, jitter, or ordered packet delivery. The BLE vendor's cloud service is required to take into consideration any latency, drops, and reorder issues.



# Beacon Payload Format

The beacon payload format uses JSON JavaScript Object Notation (JSON) and is aggregated per second (the default aggregation value). The following example shows an aggregated beacon payload.

```
{
  "gateway_euid": "EC:8C:A2:33:B6:30",
  "longitude": "-122.036346",
  "latitude": "37.36883",
  "altitude": "Floor 1",
  "timestamp": 1518421586,
  "meta_data":
  {
    "provider": "ruckus",
    "version": 1
  },
  "events": [
    {
      "rssi": "-51",
      "data": "010B20D304567AEFC3",
      "srData": "F01020304567AEBC3",
      "timestamp": 1518421585,
      "device_euid": "00:00:F9:10:E1:40:D4:F1"
    },
    {
      "rssi": "-55",
      "data": "01020304567AEFBC3",
      "timestamp": 1518421584,
      "device_euid": "00:00:F9:10:E1:40:D4:F1"
    }
  ]
}
```

**TABLE 2 Beacon Payload Parameter Descriptions**

Parameter	Type	Description	Optional
gateway_euid	String	Gateway MAC address which received the beacon packet	No
longitude <sup>1</sup>	String	Gateway Location Longitude	Yes
latitude <sup>1</sup>	String	Gateway Location Latitude	Yes
altitude <sup>1</sup>	String	Gateway Location Altitude	Yes
timestamp	Integer	Epoch timestamp, when the packet is sent to the vendor or connector	No
meta_data	Dictionary	Ruckus-related metadata	No
meta_data/provider	String	Provider name (Ruckus)	No
meta_data/version	Integer	Provider version (1)	No
events	List of Dict	Aggregated beacon content	No
events/rssi	String	RSSI of the beacon packet (extracted from the physical layer)	No
events/data	String (Hex)	Beacon data as-is received from the beacon source	No
events/srData	String (Hex)	Beacon srData as-is received from the beacon source	Yes
events/timestamp	Integer	Beacon timestamp when received by the IoT AP	No

**TABLE 2 Beacon Payload Parameter Descriptions (continued)**

Parameter	Type	Description	Optional
events/device_euid	string	Device MAC address (8 bytes in length). First two bytes are reserved/proprietary	No

<sup>1</sup>These parameters can be configured per Gateway (IoT AP) from the vSZ controller.

# Vendor Connector Plugin Configuration

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The generic BLE iBeacon and Eddystone plugins in the Ruckus IoT Controller support the following configuration parameters. These parameters define the location, port, and keys used by the Ruckus IoT Controller to send the beacon payload information to the BLE beacon vendor's cloud service.

- API URL

The Ruckus IoT Controller connects to the vendor/connector URL to send the beacon messages. The plugin supports HTTP and HTTPS modes. The URL can be an IP address or a DNS-resolvable, FQDN-based address.

- API Endpoint

This is the API route where the BLE beacon vendor's cloud services receive the beacon payload.

- Port Number

This is the port number on which the vendor/connector web server is running. No default values are provided.

- API Key

The Ruckus IoT Controller posts the beacon messages using the API Key provided (at the `APIURL:port/APIENDPOINT` location). The vendor application is responsible for authenticating the API Keys.

These parameters can be configured by way of the IoT Controller UI or the IoT Controller REST API. Refer to the *Ruckus IoT Controller Configuration Guide* and the *Ruckus IoT Controller REST API Document* for more information.





# Vendor Connector Plugin API

## REQUEST HEADERS

Key	Value
Content-Type	application/json
Content-Encoding <sup>1</sup>	gzip
Connection <sup>2</sup>	keep-alive
Api-Key	Vendor-defined API Key
Accept <sup>3</sup>	applicaton/json

<sup>1</sup> Gzip compression is used to compress the complete beacon payload.

<sup>2</sup> This is not mandatory and keep-alive will not be enabled for asynchronous requests.

<sup>3</sup> This is not mandatory because a response payload from the vendor responses is not expected.

## REQUEST PAYLOAD

Payload is the beacon content. The beacon payload is aggregated and compressed.

## RESPONSE PAYLOAD

Response payload is empty.

## RESPONSE CODE

Status Code	Response
2XX	Success (recommended 200)
401	Authorization Error (Unauthorized)
404	Not found
500	Critical Server Error

Other responses are not explicitly handled by the Ruckus IoT Controller Connector.

## Example CURL

```
curl -X POST -H "Content-Type: application/json" -H "Content-Encoding: gzip" -H "Api-Key: {api-key}" -d '<REQUEST PAYLOAD>' {HOST}
```



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