Ruckus Wireless

Smart Positioning Technology (SPoT)

Frequently Asked Questions

For more detailed information on Cloud Based SPoT refer to the SPoT User Guide, available from the Ruckus Wireless Support website:

https://support.ruckuswireless.com/documents

This document will cover the FAQ for:

- SPoT Point
  - With Calibration
  - Without Calibration
- SPoT Presence (Beta)

Introduction

1) What is SPoT

SPoT is Ruckus Wireless Inc's proprietary Location Technology. It uses Ruckus Controllers and Access Points to provide customers with location intelligence for purposes such as Location Analytics, Marketing, Operations planning etc.

2) What is SPoT Point

For customers that would like a high level of location accuracy in their venue, SPoT point offers 2 options. SPoT Point with Calibration andSPoT Point Without Calibration

SPoT Point with Calibration has an expected accuracy of 5-8m with 90% confidence (venue specific dependencies such as types of venue, AP placement and AP density will impact overall system accuracy)

SPoT Point without Calibration has an expected accuracy of 8m with 90% confidence (venue specific dependencies such as types of venue, AP placement and AP density will impact overall system accuracy)

The SPoT analytics Dashboard and SPoT API are available for both options

3) What is SPoT Presence (Beta)

SPoT Presence is ideal for venues that want the benefits of Location but do not have ideal AP density. (Eg 1-2 AP venues or large indoor / outdoor venues that have a sparse AP density

Regarding location accuracy, WiFi devices detected by SPoT Presence will be positions at the location of the nearest AP.

The Analytics Dashboard and SPoT API will be available for SPoT Presence customers.

Prepare

1) How should APs be plotted for optimal SPoT results?

For optimal location accuracy, LBS needs client RSSI from 3 or more Aps

- RSSI > -75dBm
- Place APs 20 – 30 meters apart
- Avoid single-file placement

2) What's the communication protocol between the ZD/AP and the Location Server?

SPoT uses the MQTT message passing protocol with TLS encryption.

There is a TCP connection between the ZD and the location server in the cloud, and a separate TCP connection between each AP and the location server. Make sure that both ZD and the AP can reach the location server/internet.

Finally, make sure that ZD and APs have been time synchronized with a NTP server and configured with the right timezone. Without timing synchronization, the ZD/AP may not be able to establish a connection with the location server – and you would see a "red light" status on the SPoT admin portal against those APs.

3) What is the minimum recommended bandwidth and latency to run SPoT per AP?

For each report from a single AP (every 6 seconds), the header is 17 bytes and 10 bytes for each client. Thus presuming there is a single client and it is heard by 4 APs, the data consumption will be 17+10 = 27bytes for EACH AP. So in total, it will be 27 x 4 = 108 bytes every 6 seconds. Averaging this out to a per second metric, it will be 18 bytes per second.

In our current deployments, say in a mall with about 30 APs, uplink bandwidth requirement is about 100kbps – 200kbps max. For latency, QA has tested up to 500ms and the system still performs fine.

4) If the venue's APs operate in mesh mode, via 5Ghz, would it have any implication on SPoT?

No, there will not be any implications on SPoT.

Accounts

1) **What are the Available Public Clouds that I can set up my Account and Venue in?**

We currently have Data Centers in the US, Europe and Singapore. Ruckus will continue to build Data Centers as SPoT grows. The following are the sites to access them.

- Https://us-sys.ruckuslbs.com
- Https://eu-sys.ruckuslbs.com
- Https://sg-sys.ruckuslbs.com

2) **Which Public Cloud should I set up my Account and Venue in?**

We suggest you set up your Account and Venue in the Data Center that is in your Region.

If for example, you have a few branches in US and a few branches in EU, you may want to consider putting all venues under a single DC so that managing all Venues would be easier. This is because, Accounts and Venues set up in One Public Cloud will not be available in another Public Cloud.

Map

1) **What information is needed in the Map?**

We would need the following:

- A map drawn to scale.
- The SPoT coverage area and zones.
- AP positions
- Some dimensions of the Venue.
- Maps can be created with any map image (jpg, jpeg and png format)

2) **How long will it take to Process the map?**

Create Your Own Map (CYOM) is a tool that can be used to process a map to a format compatible with SPoT. With the required information at hand, it would take a couple of minutes or more to create the map, depending on the size and complexity of the map.

For SPoT Point without Calibration and SPoT Presence (Beta), users may skip the step for plotting Calibration Points.

3) **How can I manage Radio Maps?**

The concept of managing Radio Maps is similar to software versioning - you don't delete the old version, but just create a new one. For radio maps, if you have uploaded the wrong file or made any mistakes, don't worry, just create a new one.

Enable

1) **When will the SPoT server be created?**

When the Map has been digitized and processed, the SPoT service will be instantiated within 24hours

2) **When can we have the ZD or RuckOS configuration information?**

The ZD configuration information is available in the SPoT Admin portal under "Details". The configuration will only be successful in ZD after the SPoT server has been provisioned

Calibration

1) If I use SPoT Point Without Calibration or SpoT Presence will I need to perform Calibration?

   No, you will not be required to

2) **If each Calibration Point takes 30sec to calibrate, how many rotations of 360degrees does it take?**

Make at least 1 full turn per calibration point.

3) **Do I have to calibrate every Calibration Point?**

No, you do not have to do so. However, there is a trade off between number of Calibration Points that have been calibrated and accuracy. Location accuracy increases with more calibrated Calibration Points.

4) **Will I be able manage my Venues set up in different Pubic Clouds on the Calibration App?**

Yes you will definitely be able to. Simply go to the Calibration App Settings on your WiFi device and change the default site from US to EU or SG (depending on which Cloud your Account is set up).

Others

1) **Do APs have to be on the same channel to operate SPoT?**

No. APs do not have to be on the same channel to operate SPoT. They can be on 3 channels, for example 1, 6, 11.

For calibration, the APs have to be on a single channel for both 2.4Ghz and 5Ghz. After calibration is complete, place the APs on 3-Channel configuration mode for 2.4 GHz and 5Ghz.

2) **Will there be performance differentiation using Channelfly?**

There is no need to change channelfly settings. SPoT works with a 3-channel AP configuration and channelfly (enabled) will identify the best channel for each AP within those configured 3-channel range.

3) **What if there is a need to change an AP, do we need to re-calibrate the venue?**

If there's a need to switch out an AP, you do not need to recalibrate the venue if the AP is of the same model. If it is of a different model, then Yes, there needs to be a re-calibration. But, there is no reason to re-calibrate those locations where that new AP signals couldn't have reached. With a new or different type of AP, an area wide enough for the AP signal to reach would need to be re-calibrated. The same is true if an AP is moved to a different location. Both the old area and the new area that the AP could potentially cover needs to be re-calibrated for best results.

AP MAC address can be edited on the "Access Point" page of the SPoT Admin Portal.

4) **If I have SSID hidden, would it affect SPoT?**

No, it will not affect SPoT.

SECURITY

1) **What security protocols are there for SPoT?**

- SPoT Cloud Services are certified by Qualys.
- The Zone Director and AP MQTT links to the SPoT servers are encrypted by PSK-TLS.
- The Post Engine APIs are HTTPS encrypted and access is restricted through API keys.

2) **What redundancy or back up has been designed into SPoT?**

Data backup

We have 3 databases (DB) for redundancy.

- The 1st one is a Redis cache memory that stores data for a particular venue up to 7 days.
- The 2nd one is the main DB which synchs with the Redis cache every hour.
- The 3rd one is a backup DB with snapshots of the main DB which is synched every day.

In summary, data up to 7 days ago are saved in all 3 DB. And data which are more than 7 days ago are saved in the main DB and backup DB.

Application backup

- Since SPoT is an SaaS, the application is the same for every customer. Thus the only thing that needs backup is only the customer's data.
- In terms of redundancy, all our application servers are stored as templates, and because SPoT is the cloud, we can spin up a new server and restore the application templates in within minutes.
- We have live monitoring of all servers.
- Thus, if a server crashes, we can spin up a new one and restore services within minutes

Please note that technology and process enhancements are always made as part of continuous improvements to our products and services. The above methodologies may change at any time.

PRIVACY

1) **What are the Privacy measures in Place**

We employ a number of methods to ensure Privacy is protected.

- SPoT provides the option to the SPoT admin to hash all MAC addresses prior to storing them in our Cloud,
- There is an option to store all data in-region (US, Europe, China, Singapore).
- Only customers have access to their data (except during Maintenance or troubleshooting).

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