



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
- SPoT Presence
- vSPoT

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 and SPoT Point Without Calibration

SPoT Point with Calibration has an expected accuracy of 5-8m with 80% confidence. SPoT Point without Calibration has an expected accuracy of 10m 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

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 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.

4) What is vSPoT

vSPoT is a virtualized instance of SPoT that users can deploy on premise. With vSPoT, users need not use Cloud Hosted SPoT if they prefer to run the service in a location of their choice.

vSPoT has both SPoT Point and SPoT Presence available for user selection.

PREPARE

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

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

- RSSI > -75dBm
- Place APs 20 – 25 meters apart
- Avoid single-file placement

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

SPoT uses the MQTT message passing protocol with TLS encryption.

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

Finally, make sure that Controller and APs have been time synchronized with a NTP server and configured with the right timezone. Without timing synchronization, the Controller/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 $17+10 = 27$ bytes for EACH AP. So in total, it will be $27 \times 4 = 108$ bytes every 6 seconds. Averaging this out to a per second metric, it will be 18 bytes per second.

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

4) Is there a maximum number of AP or AP Groups that can connect to SPoT in SmartZone?

As long as SmartZone is able to handle the number of APs and AP Groups, SPoT will be able to support them.

5) 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. Note that SZ 3.2 does not support SPoT with Mesh the fix will be in SZ3.2.1

6) In SmartZone, will different AP Zone be able to connect to different SPoT Servers?

Yes, as long as each AP group is representative of a Venue, input the respective VenueID and FQDN (provided in the SPoT Admin Portal under the Confi Tab) in the SmartZone configuration for Location Services to differentiate between different Venues.

7) Must Location Server initialize the MQ connection for every AP Zone one by one?

Yes it does.

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.

Consider having all venues in a single DC as 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, users may skip the step for plotting Calibration Points.

CYOM is available in Cloud Hosted SPoT and vSPoT

3) How can I manage Radio Maps?

If you have uploaded the wrong file or made any mistakes, don't worry they can be deleted. The CYOM tool also allows users to edit the radio map to include changes such as movement of Access Point or adding/deleting Zones.

LICENSES

1) What licenses do I need to purchase for vSPoT

You will need to purchase an Instance License for the Base vSPoT software and AP Licenses for all APs enabled with vSPoT. You are strongly advised to purchase Support licenses for both the Instance and the APs. The Instance and AP licenses are one time purchases while the Support Licenses are subscriptions.

2) What licenses do I need to purchase for Cloud Hosted SPoT Point

You will need to purchase Client Capacity licenses for SPoT Point in multiples of 10Clients/min for each venue. As a guide, 10 Clients/min roughly equates to 100 visitors a day but is subject to parameters including Percentage of visitors with WiFi enabled.

SPoT Point Client Capacity Licenses come in 1 year, 3 year and 5 year subscriptions. SPoT Point has 90 days worth of storage for Analytics

3) What licenses do I need to purchase for SPoT Presence

You will need to purchase Client Capacity licenses for SPoT Presence in multiples of 10Clients/min for each venue. As a guide, 10 Clients/min roughly equates to 100 visitors a day but is subject to parameters including Percentage of visitors with WiFi enabled.

SPoT Presence Client Capacity Licenses come in 1 year, 3 year and 5 year subscriptions. SPoT Presence has 30 days worth of storage for Analytics

4) How do I determine the number of Client licenses to purchase for a Venue

Look at the number of visitors in your venue for the busiest period and size the venue capacity according to that number. Alternatively if you have an estimate of the daily visitorship of the venue, follow the guide of 100 clients a day for 10clients/minute.

In the SPoT Admin Portal for Cloud Hosted SPoT, there is a Utilization graph which shows the Peak number of Clients detected every hour for 2 weeks in Blue and the Client capacity allocated for the venue in Orange.

Should there be less Client capacity than number of Clients in the venue, SPoT places a

performance cap to the Client capacity allocated. The access Client devices detect will be disregarded. To ensure that all Clients detected is processed by the SPoT Engine, ensure that the Client Capacity allocated is higher than the Clients detected within the venue.

Users may reallocate Client Licenses within the venue by going to the Details page and updating the number of Clients Capacity to be allowed for the venue.

ENABLE

1) When will the SPoT server be created?

When the Map has been digitized, the SPoT service will be instantiated within 24hours
For vSPoT users, wait 5 minutes after the Map has been completed.

2) When can we have the Controller configuration information?

The Controller configuration information is available in the Admin portal under "Config". In Cloud Hosted SPoT The configuration will only be successful after the SPoT server has been provisioned. In vSPoT the Controller may be Configured once the map is completed.

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.

However, Location accuracy increases with more calibrated Calibration Points.

It is better to plot more Calibration Points in CYOM on the onset, so that users have the choice of whether they would like to calibrate the Calibration Point during calibration, without needing to go back to make edits to the map in CYOM

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

Yes you will be able to. Go to Settings on the Calibration App and change the site to US, EU or SG (depending on where your Account is set up).

If you are using vSPoT point the server to [http://\[vSPoT IP address\]:8443](http://[vSPoT IP address]:8443)

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).

SECURITY

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

Data backup

We have 3 databases (DB) for redundancy.

- The 1st is a Redis cache memory that stores data for a particular venue up to 1 hour.
- The 2nd is the main DB which synchs with the Redis cache every hour.
- The 3rd 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.
- 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.

2) What security protocols are there for SPoT?

- SPoT Cloud Services are certified by Qualys.
- The Controller 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.

OTHERS

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

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. 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.

5) In the AP Status Page, what does the colors Red, Green and Amber mean?

Green: SPoT is working well

Amber: The time sync is off in the AP by more then +/- 5 Sec. Sync the controller to a valid NTP server after that, sync the AP and the Controller

Red: Troubleshooting Steps need to be taken or contact Customer Service for assistance

6) I would like to exclude certain Mac Addresses from being included in the Location Analytics. How would I do that?

In a CSV file, list the Mac Addresses that you would like to exclude and upload this list into the Admin Portal -> Config -> Mac Exclusion List. Once uploaded, SPoT will cease to include those Mac Addresses in it's Analytics. If there are incorrect Mac Addresses in the CSV file, the system will intelligently surface them in the CSV file for your action.

7) I have WiFi assets that I want to track. Can SPoT help me?

Yes SPoT can help track WiFi enabled assets. Uploading a csv list of devices to be tracked on to Admin Portal -> Config -> Catalogue Devices. In the Analytics Dashboard -> Real Time -> Tracking. You can select the device or Group of Devices you are looking for and

SPoT will show it's position on the Map.

The Tracking feature is able to show the last known position of the WiFi device 7 days back. It can also show the real time position of non-catalogue devices in the venue.

8) What is the accuracy of SPoT compared to the solutions provided by WiFi tag providers such as Aeroscout or Ekahau?

Generally, solutions that have their own tags will be more accurate. This is because the tags are designed to consistently send out WiFi packets which are used specifically for positioning. As compared to SPoT which picks up Probes and Data Packets from client devices.

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