

Ruckus Wireless™ vSPoT™ Release 3.4.1

Installation Guide

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www.ruckuswireless.com

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About This Guide

This Installation Guide provides instructions for installing, setup and administration of the Ruckus Wireless[™] virtual SmartPositioning Technology (SPoT[™]) application.

This guide is intended for use by those responsible for managing Ruckus Wireless network equipment. Consequently, it assumes a basic working knowledge of local area networking, wireless networking, and wireless devices.

NOTE Refer to the release notes shipped with your product to be aware of certain challenges when upgrading to this release.

Most user guides and release notes are available in Adobe Acrobat Reader Portable Document Format (PDF) or HTML on the Ruckus Wireless Support Web site at https://support.ruckuswireless.com/contact-us.

Document Conventions

Table 1: Text conventions on page 5 and Table 2: Notice conventions on page 6 list the text and notice conventions that are used throughout this guide.

Convention	Description	Example
message phrase	Represents messages displayed in response to a command or a status	[Device Name] >
user input	Represents information that you enter	[Device Name] > set ipaddr 10.0.0.12
user interface controls	Keyboard keys, software buttons, and field names	Click Create New
Start > All Programs	Represents a series of commands, or menus and submenus	Select Start > All Programs
ctrl+V	Represents keyboard keys pressed in combination	Press ctrl + V to paste the text from the clipboard.
screen or page names		Click Advanced Settings . The Advanced Settings page appears.
command name	Represents CLI commands	
parameter name	Represents a parameter in a CLI command or UI feature	

Table 1: Text conventions

Convention	Description	Example
variable name	Represents variable data	{ZoneDirectorID}
filepath	Represents file names or URI strings	http://ruckuswireless.com

Table 2: Notice conventions

Notice type	Description	
NOTE	Information that describes important features or instructions	
CAUTION!	 Information that alerts you to potential loss of data or potential damage to an application, system, or device 	
WARNING!	Information that alerts you to potential personal injury	

Online Training Resources

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

Related Documentation

For a complete list of documents that accompany this release, refer to the Release Notes.

In addition to this Installation Guide, the SmartPositioning documentation set includes the following:

- **Release Notes**: Provide information about the current software release, including new features, enhancements, and known issues.
- **SPoT User Guide**: Provides information on administration, maintenance and troubleshooting of a SPoT venue. In general, configuration and administration of vSPoT is the same as for cloud-based SPoT. Where differences exist, they are described within this vSPoT Installation Guide. The SPoT User Guide provides additional information not included in the vSPoT Installation Guide.

Documentation Feedback

Ruckus Wireless is interested in improving its documentation and welcomes your comments and suggestions. You can email your comments to Ruckus Wireless at: docs@ruckuswireless.com

When contacting us, please include the following information:

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

For example:

- vSPoT Release 3.3 Installation Guide
- Part number: 800-71443-001 Revision A
- Page 52

Before You Begin

Ruckus Wireless Virtual SmartPositioning Technology (vSPoT) provides an option for deploying a virtual instance of the SPoT server on the users chosen data center. This includes on premise data centers or in AWS (Amazon Web Services)

For more comprehensive information on SPoT administration, maintenance and troubleshooting, refer to the SPoT User Guide, available from support.ruckuswireless.com.

This chapter is a prerequisite for Installing Virtual SPoT on VMware or Installing Virtual SPoT in AWS.

Differences Between SPoT and vSPoT

This section explains the differences between SPoT and vSPoT.

- Installation on the user's chosen data center including on premise data center or on AWS
- Administration pages include additional Diagnostics and Network Settings pages, on which you can view hardware utilization and traffic statistics, as well as configure NTP servers.
- A single vSPoT instance can support multiple venues. Ruckus Wireless recommend up to 500 Access Points (APs) in a single virtual machine even though a maximum of 1,000 APs is possible. This is to optimize the management of vSPoT and as a safeguard to minimize disruption of location services in multiple venues when technical issues arise.

System Specifications

This section explains the system specifications required for a vSPoT installation.

Please ensure that your vSPoT installation platform meets the following minimum hardware and software specifications.

Server Requirements

vSPoT server requirements are affected by the number of tracked devices, and to a certain extent, the number of Access Points (APs).

There is a positive correlation between the number of APs and the number of tracked devices, although there may not always be a direct relation.

Ruckus Wireless recommends up to 500 APs in a single virtual machine though a maximum of 1,000 APs is possible. This is to optimize the management of vSPoT and as a safeguard to minimize disruption of location services in multiple venues if and when technical issues arise.

The actual usage depends heavily on the number of clients detected within the venue. For historical data storage, provision of at least 250kB per 1,000 clients per day is required.

The table lists the server requirements. Intel® Xeon® Processor E5-2690 v2 (25M Cache, 3.00 GHz) is the base for establishing this dimensioning table. A single socket of this processor equals 10 cores.

Daily unique visitors	Expected maximum real time WiFi unique client load on the system (per minute)	Expected maximum real time location calculations (per minute)	SPoT point CPU and RAM (minimum requirement of 3 APs)	SPoT presence vCPU and RAM (minimum requirement of 1 AP)
1000	100	1000	2 vCPU , 4 GB	1 vCPU, 2 GB
5000	500	5000	4 vCPU , 8 GB	2 vCPU, 4 GB
10000	1000	10000	8 vCPU , 12 GB	4 vCPU, 6 GB
20000	2000	20000	8 vCPU , 16 GB	8 vCPU, 8 GB
30000	3000	30000	12 vCPU , 24 GB	8 vCPU, 16 GB
40000	4000	40000	16 vCPU , 32 GB	12 vCPU, 24 GB
50000	5000	50000	20 vCPU , 40 GB	16 vCPU, 32 GB

Table 3: Minimum Server Requirements

NOTE The thumb rule for the number of APs, is one (1) AP per 100 daily unique visitors. In terms of data aggregation, the resource requirements for the SPoT dashboard shown in the above table is based on 1 year's data.

NOTE Ruckus Wireless does not recommend using a 2 vCPU, 4GB RAM setup (or lower) for a production system. Minimum server requirement recommended for production is 4 vCPU with 8 GB RAM.

NOTE Ruckus Wireless recommends CPU family of Intel® Xeon® Processor E5-2690 v2 (25M Cache, 3.00 GHz) for optimum performance.

Virtualization Software

- VMware based installation using VMware ESXi 5.5 and later
- AWS based installation using Amazon Cloud account

NOTE Refer to Installing Virtual SPoT on VMware and Installing Virtual SPoT in AWS for installation procedures.

Network Considerations

This section describes the network considerations required for a vSPoT installation.

The following network topology factors should be taken into consideration when deploying vSPoT in your network along with your ZoneDirector or SmartZone controllers and access points.

Firewall Ports

All traffic flows are initiated from IN (behind firewall) to OUT (Internet) direction.

Typically, such flows do not require rules to be added to the firewall explicitly. However, it is always a good idea to have these firewall rules handy in case of any network connectivity issues. If you must input a "destination" name in a firewall rule instead of "any," use the same FQDN (Fully Qualified Domain Name) name that you configured on the controller's Location Services configuration page. The table below lists the firewall ports that must be open for AP/Controller/SPoT communication.

From	То	Port #
Controller	SPoT cloud engine	TCP 8883
AP	SPoT cloud engine	TCP 8883
AP	Controller	TCP 1883

Table 4: Firewall ports

Tips for Remote Controller Deployment

The following are tips for remote controller deployment.

In a typical remote deployment, the APs are deployed at a remote site and managed by a controller (SmartZone or ZoneDirector) back in the data center, and vSPoT is installed within the same data center (or VLAN).

One issue arises because both APs and SZ/ZD need to connect to the vSPoT instance, and not the other way around.

So when you need to specify the IP address of the vSPoT VM on the SmartZone or ZoneDirector Location Services configuration page you can only specify a single IP that needs to be addressable by both SZ/ZD and the APs.

For example, you configure the SZ/ZD location services settings with the vSPoT private IP address, thus SZ/ZD and vSPoT will be able to communicate directly on the local

LAN with their private IP address. However, as APs have to communicate through the public internet they will not be able to connect to vSPoT as the private address will not be routable.

On the other hand, if you set up a NAT server on your data center gateway (to let APs reach vSPoT) and specify its public IP in the SZ/ZD Location Services page, the SZ/ZD must be able to connect to the vSPoT via this public address even though they could have communicated directly.

Solutions

Solution 1

- Specify the vSPoT address with a FQDN on the SZ/ZD Location Services configuration page.
- Set up the DNS server to resolve the FQDN with the private IP address for the SZ/ZD, and with the public IP address for the APs. You may need to have two DNS addresses, once for each network.

Solution 2

- Assign a public IP to vSPoT.
- Key in the public IP of vSPoT on the SZ/ZD Location Services configuration page.
- For the SZ/ZD-vSPoT communications, the firewall can be set to redirect the public IP of vSPoT back to a private IP. And this will settle the SZ vSPoT link.
- From AP vSPoT, it will just use the public IP as usual.
- If there are not enough static public IP addresses, assign a port number to vSPoT on an existing public IP. Then the NAT in the firewall should be able to direct traffic to the vSPoT via the assigned port number.

Installing Virtual SPoT on VMware

This section describes how you can install virtual SPoT on VMware.

Virtual Machine Installation

The following instructions are on installing the virtual SPoT application as a virtual machine using VMWare ESXi 5.5 and above.

Virtual Machine Download

The Ruckus Wireless support site, https://support.ruckuswireless.com hosts the latest vSPoT software for download. The software has a free trial of 90 days with a temporary AP Capacity licenses. Users who purchase vSPoT will be able to activate their licenses by following the instructions in the section for Licensing Information.

VMware ESXi Installation

To configure the virtual server on VMware ESXi, use the following procedure:

- 1. Ensure VMware ESXi is running on a suitable host with proper network configuration.
- Download the vSPoT image. Configure the VM as required for the specific setup on site (e.g., Memory and CPU settings). Refer to the Server Requirements on page 8 table for details.
- **3.** From the VMware interface click the **Start** button to startup the Guest OS that you have just imported to kickstart vSPoT.
- 4. Allow vSPoT approximately 5 to 10 minutes to complete boot-up and initialization.

Accessing vSPoT Using CLI

Certain technical operations require you to log into the vSPoT through the shell console using the VMware client. Follow the steps to login using CLI.

1. Login using the default credentials:

user name: admin

password: admin

Change the password as the system enforces a change on the first login. See the figure below.

Figure 1: Login Screen

```
CentOS Linux 7 (Core)
Kernel 3.10.0-327.4.4.el7.x86_64 on an x86_64
vspotappliance login: a[ 32.949810] docker0: port 1(veth9398c71) entered forwa
rding state
dmin
Password:
You are required to change your password immediately (root enforced)
Changing password for admin.
(current) UNIX password:
New password:
Retype new password:
admin@vspotappliance:~$ _
```

Setup Static IP Address

This section describes how you set up a static IP address.

By default vSPoT is configured to use DHCP based dynamic network configuration. In case you do not have a DHCP server on your network segment or you prefer setting a static IP configuration follow these steps.

- 1. Login to the server through the system console as described in the above section Accessing vSPoT Using CLI on page 13.
- 2. Run the following command with the specified IP address.

```
admin@vspotappliance:~$ sudo nmtui edit 'Wired connection 1'
```

a. Specify the IPv4 address required as seen in the figure below.

Figure 2: Specifying IP address



- b. Save the configuration settings by clicking OK.
- 3. Run the command

admin@vspotappliance:~\$ sudo ifdown eth0; sudo ifup eth0

Adding a Second Interface

This section explains how you can add a second interface using VMware ESXi client.

Follow the steps below to add a second interface using VMware ESXi client.

1. Add the network interface to the vSPoT VM in the VMware ESXi client. Locate the VM and edit the VM settings as seen in the figure below.

Figure 3: VMware Edit Page

vSPoT2-build-380_vmx_2.4.4 - Virtual Machine Properties Hardware Options Resources Profiles VServices Virtual Machine Version: 7 Device Status Show All Devices Add.... Remove Connected Connect at power on Hardware Summary Memory 4096 MB Adapter Type CPUs 4 Current adapter: E1000 📃 Video card Video card VMCI device Restricted MAC Address SCSI controller 0 LSI Logic Parallel 00:50:56:8a:8c:73 Hard disk 1 Virtual Disk Automatic Hard disk 2 Virtual Disk C Manual Hard disk 3 Virtual Disk DirectPath I/O Network adapter 1 VM Network Status: Not supported 🕕 Network Connection Network label: VM Network -

- 2. Click Add.
- 3. Add the device type as Ethernet adapter as seen in the figure below.

Figure 4: Select the Ethernet adapter



- 4. Click Next.
- 5. Select the network for the second interface as seen in the figure below.

Figure 5: Adding the network interface

What type of network do	you want to add?
Device Type Network connection Ready to Complete	Adapter Type Type: E1000 Adapter choice can affect both networking performance and migration compatibilit Consult the VMware KnowledgeBase for more information on choosing among the network adapters supported for various guest operating systems and hosts. Network Connection Named network with specified label: VSCG Legacy network: Legacy network types are not fully compatible with migration between hosts. Device Status Connect at power on
	< [

6. Click Next.

7. Review the selected options.

Figure 6: Reviewing the configuration settings

Add Hardware			-		×
Ready to Complete Review the selected opt	tions and dick Finish to add t	he hardware.			
Device Type Network connection	Options:				
Ready to Complete	Hardware type: Adapter type: Network Connection: Connect at power on:	Ethernet Adapter E1000 vSCG Yes			
Help			< Back	Finish	Cancel

- 8. Click Finish to add the second interface.
- 9. View the second interface as seen in the figure below.

Figure 7: View the second interface

🖉 vS	PoT2-build-380_vmx_2.4.4 - Virt	ual Machine Properties		
Hard	ware Options Resources Profile	es VServices		Virtual Machine Version: 7
_	с Г		Device Status	
	Show All Devices	Add Remove	Connected	
Haro	dware	Summary	Connect at power on	
1	Memory	4096 MB	- Adapter Type	
	CPUs	4	Ourrent adapter: E1000	
	Video card	Video card	current adapter. E1000	
	VMCI device	Restricted	MAC Address	
📀	SCSI controller 0	LSI Logic Parallel		
	Hard disk 1	Virtual Disk		
	Hard disk 2	Virtual Disk	Automatic C Manual	
	Hard disk 3	Virtual Disk	DirectPath I/O	
	Network adapter 1	VM Network	Status:	
	New NIC (adding)	VSCG	Status.	
			Network Connection	
			Network label:	
			VSCG	•
			· · · · · · · · · · · · · · · · · · ·	
•		•		
	Help		0	K Cancel

Edit the Second Interface

Follow the below steps to edit the second interface.

- 1. Boot-up vSPoT VM if it is not running
- 2. Login to the CLI console (Refer to Accessing vSPoT Using CLI on page 13).
- Execute the following CLI command to view and edit the second interface. In this example System eth1 is the second interface as seen in the figure below. admin@vspotappliance:~\$ sudo nmtui edit

Figure 8: Viewing and editing the second interface



4. Ensure the interface is enabled by executing the following CLI command.

admin@vspotappliance:~\$ sudo ifup eth1

Checklist

Checklist to ensure that the second interface is added successfully.

- 1. Did you use the shell console to login to the vSPoT instance?
- 2. Are you able to view the second Ethernet interface? If no, are you able to see the interface by running the CLI command ifconfig?

NOTE *Docker0* and *veth** interfaces are used by vSPoT architecture. They are not external interfaces.

3. Are you successful in setting the IP address configuration? Are you able to view the setting when using the CLI command *ifconfig*?

Enabling SSH Access

The options in this section help you enable remote SSH access on logging to the vSPoT CLI console.

- SSH key based authentication
- Enabling password based authentication

SSH Key Based Authentication

This is a preferred and secure option. Execute the following CLI commands for enabling SSH access.

1. After logging in to vSPoT CLI, create the SSH directory in the administrator's home directory.

```
admin@vspotappliance:~$ mkdir -p ~/.ssh
```

2. Obtain the SSH public key for your local machine. If you do not have a SSH public key, generate it by following Step 1 of the below reference.

https://www.centos.org/docs/5/html/5.2/Deployment Guide/s3-openssh-rsa-keys-v2.html

3. Add your local machine's SSH public key to your vSPoT instance's SSH *authorized_keys* file. This can be done in either of the following two ways:

Example 1: Copy your local machine's SSH public key into the vSPoT instance

```
admin@vspotappliance:~$ echo 'ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCjfXGGdeNsqTPPWdI6Iext/
DhZ5GrewC6yh6HZAYjlgDamdZebbAvzIwWvWJjxsOGHkhdF5eY9qGlKdZih
WVOTaM1oKrUSshAEEPQnYUBa/nF3J3q4nIX4rOiKsBrT44/
sYKbt+TKgeQ9x5RfwqjqlxCQeq4UbV8K2xfojLCjF6if8jRXYoyUNIf4t0S
mRzGkEtQ8UqnYDmOGlgu4N+kewcT1laz3ty0YfMK1HToN1+
RXL256ZDoLT8w0TAo5h/lpiLthgr8t8+UYHSeejEuoR+
zC2E+37Dr8JVbeTzXAT5zRZhxE7uLkjPCj8HKLekHqyG2225lrdKr
dWeYmrK/Xp joe' >> ~/.ssh/authorized keys
```

Example 2: From your vSPoT instance, download your SSH public key from a publicly accessible URL

```
admin@vspotappliance:~$
curl ${SSH_KEY_PUBLIC_URL} >> ~/.ssh/authorized_keys
Example: SSH_KEY_PUBLIC_URL
```

https://raw.githubusercontent.com/mitchellh/vagrant/master/keys/vagrant.pub

Enabling Password Based Authentication

This is a less secure option. Execute the following CLI commands for enabling SSH access.

```
admin@vspotappliance:~$ sudo sed
-i's/^PasswordAuthentication.*/PasswordAuthentication yes/'
/etc/ssh/sshd_config
admin@vspotappliance:~$ sudo service sshd restart
Redirecting to /bin/systemctl restart sshd.service
admin@vspotappliance:~$
```

Installing Virtual SPoT on VMware Enabling SSH Access

vSPoT on AWS

There are two options to install vSPoT on AWS:

- 1. Automated Setup using CloudFormation on page 25
- 2. Automated Setup using AWS CLI on page 33

System Requirements

The following table lists the system requirements recommended for running an instance of vSPoT.

Table 5: System Requirements

Component	Requirement
System Volume	 System volume comes from the AMI and contains the host operating system and an initial version of the vSPoT application bundle. The size depends on the maximum number of vSPoT application bundle version you desire to store any given time. The minimum size is 20GB.
Storage Volume	 Specify if you want to use the existing or want to create a new data volume. This needs to automatically mount to / or stored during the instance boot process. Minimum size is 20Gb, but Ruckus Wireless recommends a size of 100GB. The actual size depends on the AP traffic and the length of the historical data.
EC2 Instance	• The minimum instance size is t2.medium. vSPoT supports only HVM based instances, which has at least 4Gb of system memory.

Preparing to Install vSPoT in AWS

This section contains a general configuration before you install vSPoT in AWS.

1. Ensure you have a SSH public key defined for the region. If the list is empty create a new one or import your desired key. Refer to http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html

Figure 9: Inserting a SSH Key

🎁 AWS - Sen	rices 🗸 Edit 🗸
EC2 Dashboard	Create Key Pair Import Key Pair Delete
Tags	Q Filter by attributes or search by keyword
Reports	
Limits	Key pair name Fingerprint
INSTANCES	ys_and_zsolt b6:bc:30:68:97:dd:90:65:b1:bf:41:59:52:a1:50:59
Instances	
Spot Requests	
Reserved Instances	
Commands	
Dedicated Hosts	
IMAGES	0.0.0
AMIs	Key Pair: ys_and_zsolt
Bundle Tasks	Key pair name ys_and_zsolt
ELASTIC BLOCK STORE	Fingerprint b6:bc:30:68:97:dd:90:65:b1:bf:41:59:52:a1:50:59

Automated Setup using CloudFormation

Follow the steps to install vSPoT using the AWS web user interface.

Log in to your AWS web console. Navigate to AWS Services > Management Tools
 > CloudFormation to create and manage vSPoT.

Figure 10: Select Cloud Formation and Region



2. Click Create New Stack.

Figure 11: Create New Stack

🎁 AWS - Services - Edit -
Create Stack Actions - Design template
Filter: Active - By Name:
Design a template
Templates tell AWS CloudFormation which AWS resources to provision and how to provision them. When you create a CloudFormation stack, you must submit a template.
To build and view templetes you can use the data and data test called ANC Cloud Fermation
Designer, You drag-and-drop the resources that you want to add to your template and drag lines
between resources to create connections. To use Designer to create a template or to open and modify
a template, choose Design template.
Design template
Create a Stack
AWS CloudFormation allows you to guickly and easily deploy your infrastructure resources and
applications on AWS. You can use one of the templates we provide to get started quickly with
applications like WordPress or Drupal, one of the many sample templates or create your own template.
You do not currently have any stacks. Click the Create New Stack button below to create a new AWS

In the Select Template page choose the option Choose a **Template > Specify an Amazon S3 template URL**. Retrieve the URL for the vSPoT template from the Ruckus Wireless Support Web site at (https://support.ruckuswireless.com) and insert the URL as shown in the figure below.

Figure 12: Adding vSPoT template

Select Template								
Select the template that describes the stack that you want to create. A stack is a group of related resources that you manage as a single unit.								
Design a template	Use AWS CloudFormation Designer to create or modify an existing template Design template). Learn more.						
Choose a template	A template is a JSON-formatted text file that describes your stack's resources and their properties. Learn more. Select a sample template							
-	Upload a template to Amazon S3 Choose File No file chosen	,						
	Specify an Amazon S3 template URL s://s3-us-west-2.amazonaws.com/	View in Designer						

- 3. Click Next.
- 4. Specify the following in the template.
 - **a. Stack Name**: Add a unique template name, which needs to be different from the other vSPoT instances that you would be creating.
 - b. Key Name: Add a key name required for configuring EC2/keys section
 - **c.** Storage Volume ID: Add the volume identifier if you have an existing vSPoT running in AWS to automatically attach and mount to the instance.

Figure 13: Specifying Options in the Template

Specify Details									
Specify a stack name and para	Specify a stack name and parameter values. You can use or change the default parameter values, which are defined in the AWS CloudFormation templa								
Stack name	My-first-vSPoT								
Parameters									
KeyName	vs and zsolt	1	Name of an existing EC2 KeyPair to enable SSH access to the vSPoT instances						
KeyName	Jo_und_cook								
StorageVolumeId			Optional : Specify existing storage volume ID if you have one						
vSPoTInstanceType	t2.medium	\$	vSPoT EC2 Instance type						

- 5. Click Next.
- 6. Specify tags or advanced stack configuration options, if any.

Figure 14: Specify Tags and Advanced Options

Opt	Options							
Tags								
You c	an specify tags (key-value pairs) for resources in your stack. You can add up to 10 uniq	ue key-value pairs for each stack.						
	Key (127 characters maximum) Value (255 characters maximum)							
1								
Advanced								
You can set additional options for your stack, like notification options and a stack policy. Learn more.								

7. Click Next to review the configuration settings.

Figure 15: Specifying Tags

Select Template Specify Details	Review						
Options Review	Template						
	Template URL Description Estimate cost	https://s3-us-west-2.amazonaws.com/ AWS CloudFormation template to create a vSPoT deployment Cost					
	Stack details						
	Stack name	My-first-vSPoT					
	KeyName StorageVolumeId	ys_and_zsolt					
	vSPoTInstanceType Create IAM resources	t2.medium No					
	Options						
	Tags						
	No tags provided						
	Advanced						
	Notification Timeout Rollback on failure	none Yes					

8. Click **Create** to create the resources required to run a vSPoT instance in the AWS cloud. The system displays the progress and successful completion status. Navigate to the **Events** tab on the lower part of the screen to identify and troubleshoot the reason if the installation fails.

Figure 16: Creating a vSPoT instance

T AV	T AWS - Services - Edit -									
Create Stac	Create Stack Actions - Design template									
Filter: Activ	ve - By I	Name:								
Stack Na	ame	Create	d Time		Status			Descrip	ption	
My-first-	vSPoT	2016-0	2-29 12:05	:06 UTC+0100	CREATE_C	OMPLETE		AWS CI	loudFormation template to create	a vSPoT deployment
Overview	Outputs	Resources	Events	Template	Parameters	Tags	Stack Po	olicy		
2016-02-29		Status		Туре					Logical ID	Status Reason
12:06:23	UTC+0100	CREATE_COM	PLETE	AWS	::CloudFormation	on::Stack			My-first-vSPoT	
12:06:22	UTC+0100	CREATE_COM	PLETE	AWS	::EC2::Instance	1			vSPoTInstanceWithNewStorag	
									e	
▶ 12:05:35	UTC+0100	CREATE_IN_PF	ROGRESS	AWS	::EC2::Instance				vSPoTInstanceWithNewStorag e	Resource creation Initiated
12:05:34	UTC+0100	CREATE_IN_PF	ROGRESS	AWS	::EC2::Instance				vSPoTInstanceWithNewStorag	

9. You now have a running vSPoT instance in your AWS account. You now need to get the IP address of the instance by navigation to the **Outputs** tab. Additional information such as the vSPoT web interface URL and a simple command to SSH into the instance is also displayed.

Figure 17: IP address of vSPoT instance

T AWS - Services - Edit -								
Create Stack	Create Stack Actions - Design template							
Filter: Active	- By Name:							
Stack Nam	ne	Created Time		Status		Description		
My-first-vS	PoT	2016-02-29 12:05	06 UTC+0100	CREATE_C	OMPLETE	AWS CloudFormation template to create a v	SPoT deployment	
Overview	Outputs Resou	rces Events	Template P	arameters	Tags Stack	Policy		
Key				Value			Description	
vSPoTInstance	əld			i-75cea9t	7		vSPoT instance ID	
vSPoTInstance	vSPoTInstancePublicIP 54.206.20.234 vSPoT instance public IP							
vSPoTSSH ssh centos@54.206.20.234 -i {YOUR_PUBLIC_KEY_FILE} ssh command								
vSPoTURL				http://54.	206.20.234:8443		vSPoT UI/API endpoint	

10. Open the vSPoT URL (in this example, http://54.206.20.234:8443) in a web browser and login in to vSPoT

Figure 18: vSPoT login



Accessing vSPoT using AWS CLI

This section describes certain technical operations that will require you to log into vSPoT through the shell console using a SSH client.

Follow these steps to login using CLI.

- 1. Use the SSH command with your private key for the vSPoT instance.
- **2.** The generated or imported SSH key is used as the login to the system as seen in the figure below.

Figure 19: SSH Identifier

00	2. centos@ip-172-3	1-39-161:~ (ssh)	N N					
Last login: Mon Feb 29	12:20:03 on ttys014							
ysolt@ysolt-2:~\$ ssh centos@54.206.20.234 -i .ssh/id_rsa_YS_and_ZS								
The authenticity of hos	t '54.206.20.234 (54	4.206.20.234)' can't be (established.					
RSA key fingerprint is	01:94:5e:0b:0e:a3:ea	c:5e:b2:a3:cb:e8:c6:4c:7e	e:ed.					
Are you sure you want t	co continue connecti	ng (yes/no)? yes						
Warning: Permanently ad	Ided '54.206.20.234'	(RSA) to the list of kno	own hosts.					
Last login: Mon Feb 15	18:18:57 2016 from (catv-80-99-40-204.catv.bi	roadband.hu					
-bash: warning: setloca	ale: LC_CTYPE: cannot	t change locale (UTF-8):	No such file					
or directory								
centos@ip-172-31-39-161	:~\$ docker ps							
CONTAINER ID IM	AGE							
COMMAND	CREATED	STATUS	PORTS					
			NAMES					
761cd724c74b 956	737097692.dkr.ecr.u	s-east-1.amazonaws.com/ru	uckus/spot:2.4					
.0-451 "/sbin/init"	13 days ago	Up 12 minutes	0.0.0.0:80-					
>80/tcp, 0.0.0.0:8442-8443->8442-8443/tcp, 0.0.0.0:8883->8883/tcp vspotVSPOT_V								
ERSION								
centos@ip-172-31-39-161	.:~\$							

Automated Setup using AWS CLI

Follow the steps to install vSPoT using the AWS CLI.

- 1. Ensure you have AWS CLI installed. In case you do not have it installed download it from AWS website or use **homebrew** if you are running on MacOS.
- 2. Set up AWS access on your local desktop with the command:

```
$ aws configure
```

 Create the desired instance, but replace ys_and_zsolt with your own SSH key name deployed in that AWS region. Refer to step 1 of Accessing vSPoT using AWS CLI on page 32.

```
$ aws cloudformation create-stack --stack-name
vSPoT-evaluation --parameters
'[{"ParameterKey":"KeyName","ParameterValue":"ys_and_zsolt"}]'
--template-url https://s3-us-west-2.
amazonaws.com/ruckuslbs/public/vspot/vspot.template
```

The response snippet is:

```
{
"StackId":
"arn:aws:cloudformation:us-west-2:950737097692:stack
/vSPoT-evaluation/ef95b9f0-d4be-11e5-b3b1-50d5ca11b8f2"
}
```

4. Use the following command to get the IP address of the instance.

```
$ aws cloudformation describe-stacks --stack-name
vSPoT-evaluation
```

The response snippet is:

```
"Outputs": [
                 {
                    "Description": "vSPoT instance ID",
                     "OutputKey": "vSPoTInstanceId",
                     "OutputValue": "i-bb74e063"
                },
                 {
                     "Description": "vSPoT instance public
IP",
                     "OutputKey": "vSPoTInstancePublicIP",
                     "OutputValue": "54.191.101.130"
                },
                 {
                    "Description": "ssh command",
                     "OutputKey": "vSPoTSSH",
                  "OutputValue": "ssh centos@54.191.101.130
 -i {YOUR PUBLIC KEY FILE}"
                },
                 {
                    "Description": "vSPoT UI/API endpoint",
                     "OutputKey": "vSPoTURL",
                    "OutputValue":
"http://54.191.101.130:8443"
                }
            ],
. . .
```

Access the vSPoT Admin Portal

This section describes how you can access the vSPoT Admin Portal.

1. Launch a web browser and browse to the vSPoT Admin Portal (http://[vSPoT IP address]:8443).

- **2.** Login to the vSPoT Admin Portal:
 - Username: super_admin@ruckuswireless.com
 - Password: 123123123

NOTE At this point, ensure that you change the admin password by clicking **Edit Account** on the top right corner of the screen.

Deleting vSPoT on AWS

To delete a vSPoT instance navigate to **Actions** drop down and click the **Delete Stack** button.

Figure 20: Delete AWS CloudFormation Stack

T AWS - Services - Edit -							
Create Stack	Actions - Design template						
Filter: Active -	Update Stack						
Stock Name	Delete Stack	d Time	Status				
Stack Name	View in Designer	d Time					
My-first-vSPo	201	0-02-29 12:05:06 UTC+0100	CREATE_COMPLET				



Delete stack retains data storage volume that has been created. To retain the previous historical data navigate to Amazon Web Services > Compute > EC2 > Elastic Block Store > Volumes to store or delete the vSPoT data storage volume.

Figure 21: AWS Data Storage Volume

Create Volume Actions ~												
Q Filter by tags and attributes or search by keyword												
Name	✓ Volume ID ✓	Size -	Volume Type ~	IOPS -	Snapshot ~	Created -	Availability Zone ~	State	*			
	vol-8b6c8550	100 GiB	gp2	300 / 3000	snap-0b4463e3	February 29, 2016	ap-southeast-2c	 availal 	ble			
Configuring Virtual SPoT Application 4

This section describes the system configuration required for a virtual SPoT application.

System Configuration

System configuration steps.

NTP Server

To modify the NTP server configuration for the vSPoT host operating system, login to the server through the system console or by using the SSH remote access. Run the following command and include the NTP server name.

```
admin@vspotappliance:~$ spot config ntp
<your preferred ntp server fqdn or ip>
example: ntp.ruckuswireless.com
```

vSPoT Administration

In general, vSPoT administration procedures are the same as or similar to a typical SPoT deployment (using Ruckus' cloud-based SPoT servers).

For detailed information on SPoT venue administration, see the SPoT User Guide.

Admin Password

NOTE Super Administrators need to keep records of the user name and password. The virtual machine will need to be reinstalled if either user name or password are lost or forgotten.

vSPoT Admin Portal

The majority of the Admin Portal feature for vSPoT are the same as those for SPoT. For more information on management options and procedures, refer to the SPoT User Guide, available from support.ruckuswireless.com.

The following sections describe the aspects of vSPoT administration that are different from SPoT.

Access the vSPoT Admin Portal

- 1. Launch a web browser and browse to the vSPoT Admin Portal (http://[vSPoT IP address]:8443).
- 2. Login to the vSPoT Admin Portal:

Username: super_admin@ruckuswireless.com

Password: 123123123

NOTE At this point, ensure that you change the admin password by clicking **Edit Account** on the top right corner of the Admin Portal screen.

Licensing Information

vSPoT Base software comes pre-shipped with temporary AP Capacity Licenses, valid for a period of 90 days.

Ruckus Wireless recommends a setup up to 500 APs in a single virtual machine. The countdown begins when vSPoT has been configured via the initial setup configuration and the user log in for the first time. For operation beyond 90 days, you can either request for a Trial SKU from Ruckus Sales or Ruckus Support or buy permanent Right to Use Licenses and permanent AP Capacity Licenses. The trial and purchased licenses MUST be activated for them to become valid.

Management of AP Capacity Licenses and activation of permanent Right to Use Licenses is performed using the Ruckus Wireless Support Portal

(https://support.ruckuswireless.com). An email will be sent to the user identified on the Purchase Order providing full instructions on activating your Right to Use and AP Capacity Licenses.

Using the LiMAN (Smart License Management) portal on the Ruckus Wireless Support website, you can assign licenses to or from a vSPoT Virtual Machine (VM) (see the table for a summary of LiMAN features).

It is not necessary for vSPoT to be connected to the Internet to manage licenses.

Table 6: LiMAN features and how to activate them on the vSPoT VM

Lil	MAN Features	vSPoT
•	Register vSPoT software, AP capacity and Support Entitlement licenses. Add AP capacity licenses to vSPoT. Remove licenses from one vSPoT Virtual Machine and add to another.	 Three steps required: Download the license file from LiMAN. Log on to the vSPoT Virtual Machine. Upload the license file from LiMAN.

Figure 22: License page with free temporary licenses

	ckus [°] Si	PoT Adm	iin			Edit Acc	ount Analytic	s API Explorer	Log Out
Venues	Accounts	Diagnostics	Settings						
		vSPoT is	free to use with	10 Access Points u	ntil October 01	, 2015. <u>More de</u>	tails.		
Network	License								
Licens	se						l	Jpload Smart Lice	nse 🕜
Feature	Сар	acity	Description	Start D	ate	Status	Expiration	Date	
			No lice	ense. Please contact	our support tear	n.			
			© 2014–201 vSPoT Versior	5 Ruckus Wireless, Inc. n: ENV VAR \$VSPOT_4	World Rights Re	eserved. Indefined!			

vSPoT Licenses

This section describes the licenses that you need for vSPot.

You must have a Ruckus Support portal account (including user name and password). You can use this account to access general Support site content including software upgrades, knowledge base articles and technical documents. If you do not have a Support portal account, you will be required to register one before continuing with your product and license activation.

Every capacity and support license that you have purchased will have its own unique activation code and each must be activated for the license to become valid. You will receive the activation code in a separate Support Purchase Acknowledgment (SPA) email for each license/support license.

Depending on the product, you may receive up to three (3) different SPA emails for all of your licenses. The first three characters of the activation code indicate the license type to which the code is applicable.

- RTU: Base Software License
- LIC: AP Tunnel License
- SUP: Support License

Activating vSPoT Licenses and Support Licenses

This section explains the procedure to activate your licenses for your vSPoT deployment.

1. Open the SPA email that you received from Ruckus Wireless.

Figure 23: SPA email

Dear Valued Customer:

Thank you for purchasing Ruckus Wireless License(s).

What is this?

This is the License Activation e-mail. Follow instructions below to activate your newly purchased license(s). If you purchased Support you will receive a separate Support Activation e-mail.

What to do?

1. If you don't have a support account yet, create one now "Sign Up".

2. Have your Controller/vSCG/vSPoT/SCI software serial# ready.

3. Click on the "Activation Code" link in the table below. If you have more than one, click and complete each of those activation links.

Purchased License(s) Details							
Distributor:	VAR:	End User:					
Ruckus Test Disty	GH-VAR-1	ABC Company					

Product	Serial Numbers	Activation Code					
Right to Use License: RTU							
Virtual Ruckus SPoT positonin	g software, 1 instance license						
L09-VSPT-WW00		Click here RTU-00395679-APE-ACT-AXE					

Best Regards, Ruckus Wireless

2. Log into the Ruckus Support portal at https://support.ruckuswireless.com.

Figure 24: Logging into the Support portal



 In the vSPoT Admin Portal, go to Settings > License > Upload License, click Generate to obtain a Serial Number for the virtual machine. Have the Serial Number of your vSPoT VM device ready.

Figure 25: Generate Serial Number

Network	License			
License	e - Upload	_icense		
SERIAL N	IUMBER I mber: enerate serial nu	mber		
Genera	te			
				Back

- **4.** Click the link in the SPA email.
- **5.** Follow the on-screen instructions to activate the licenses purchased. When required, you will be prompted for your vSPoT serial number.

- 6. It is important that you repeat steps #1 to #5 above for all licenses that you have purchased as this will simplify the "+License" workflow in step 7 below.
- 7. After you finish activating all of your licenses, you need to assign them to your Support portal account. Click the LiMAN button, which appears after a license has been successfully activated. If your device is listed, click its serial number and proceed to step 8. If your device is NOT listed, click the Register Smart Device button enter your device's serial number, and then click the Register Smart Device button.
- 8. Click the + License button enter the number of licenses to add in Qty to add, and then click the Add License button.
- **9.** Repeat for all licenses.

Figure 26: Click + License to add licenses to this device

Serial #: ABCDEFGHABCDEFGH Product Name: vSPOT Admin SKU - Software Product Line Product Type: SmartCell Gateway Support Type: End User Support Expires: 2020-02-01 Warranty Info: Click here for details.	Type or click here to add tag Tags: Account Owner: ABC Company End User: ABC Company VAR: Distributor:
This is a Smart Device. It can use licenses from your Smart License Po	ool. Click ' + License/- License ' button above to configure licenses.
Licenses	🕂 License 🗕 License 🛃 License 🏦 License
Name	AP Count
vSPOT - 1 AP Capacity License	30
vSPoT , 1 Instance License	1
Support Entitlements	
Name	Expiration

Figure 27: Enter quantity of licenses to add

Add License

Serial Number ID Type Device Description	ABCDEFGHABCDEFGH STRING vSPOT Admin SKU - Software Product Line										
Add-On Name	Entitlement	Expiration	Available Units in Line Item	Total Units in Line Item	Maximum Add-On Units Allowed on Device	Units on Device Now					
vSPOT - 1 AP Capacity License	LIC-00395680- APE-ACT-BAG L09-0001-VSPT a1DW00000000fSA oMAM (93876143)	Permanent	30	30	30						
vSPOT - 1 AP Capacity License	LIC-00394822- YAK-JAM-EYE L09-0001-VSPT a1DW0000000fNsa MAE (93772553)	Permanent	40	40	40						
WD Premium Support - vSPoT- RTU, 5 YR	SUP-00312823- ANT-AIM-CAB S01-VSPT-5L00 a0EW00000011W6 HMAW (93735633)	Jan 5, 2020	1	1	1						

Syncing Licenses on a vSPoT VM

After your licenses have been allocated to your vSPoT instance using LiMAN, you must sync the vSPoT instance with the license information on LiMAN.

Use the following procedure to do so:

- 1. On the Add License page of LiMAN, click the vSPoT's serial number. The View Device page appears.
- 2. Click Download License File. The license file is saved to the client.
- 3. On the vSPoT Admin Portal, go to Settings > License, and click the Upload Smart License button

Figure 28: Click Upload Smart License

	ckus ° S	PoT Adm	nin		Edit A	Account Analytics A	API Explorer Log Out
Venues	Accounts	Diagnostics	Settings				
		vSPoT is	s free to use with 10	D Access Points until Octob	oer 01, 2015. <u>More d</u>	letails.	
Network	License						
Licens	se					Uploa	d Smart License 🛛 🔞
Feature	Caj	pacity	Description	Start Date	Status	Expiration Date	
			No licens	e. Please contact our suppor	rt team.		
			© 2014–2015 F vSPoT Version: E	Ruckus Wireless, Inc. World Rigi ENV VAR \$VSPOT_APP_VERS	ihts Reserved. SION undefined!		

4. In the Upload License section, click the **Choose File** button, and then select the license file from your client to upload it to the vSPoT VM.

Figure 29: Click Upload Smart License

1	Ruckus' SPoT Admin	Edit Account Analytics API Explorer Log Out
	Venues Accounts Diagnostics Settings	
	vSPoT is free to use with 10 Access Points until October 01, 2015	5. More details.
	Network License	
	License - Upload Smart License Serial number B96625FCAA2AC6AEC12BF657B968 Regenerate	
	LICENSE FILE Do note that if the number of AP licenses is less than the total number of APs provisioned in all automatically cleared off from your existing venues based on alphabetical order. Upload license file: Choose File No file chosen	I venues, AP MAC address(es) will be
		Upload Back

5. Once your license is successfully uploaded, you will see the license displayed on the License page of the vSPoT Admin Portal.

Figure 30: License successfully uploaded

Ruckus	SPoT Admin ×							tor	nmyog	prk
← → C 🗋 172.3	30.65.184:8443/admin/settings	s/license					53	C	1	Ξ
		PoT Adm	lin	Edit	Account An	alytics API Explorer Log Out				
	Venues Accounts	Diagnostics	Settings							
			License was successfully	uploaded.						
	Network License									
	License					Upload Smart License				
	Feature	Capacity	Description	Start Date	Status	Expiration Date				
	INSTANCE-vSPOT	1	vSPoT , 1 Instance License	April 18, 2015	Valid	Permanent				
	CAPACITY-vSPOT	25	vSPOT - 1 AP Capacity License	April 18, 2015	Valid	Permanent				
			© 2014–2015 Ruckus Wireless, Inc. W	orld Rights Reserved.						

Figure 31: Trial License successfully uploaded

	● ● ● ● ■ Ruckus	SPoT Admin ×	s/license					~	to	mmyo	gprk =
Vervee Accounts Diagnostics Settings Trial license will expire on October 19, 2015. <u>More details.</u> License Licenses License Network License Upload Smart License Capacity Description Start Date Status Expiration Date October 19, 2015. <u>Valid</u> October 19, 2015. More Application 1 (v)SPoT 1 Instance 6 month trial license April 21, 2015 Valid October 19, 2015 Application 25 (v)SPoT 1 Instance 6 month trial license for 1 AP April 21, 2015 Valid October 19, 2015 Capacity Description Status Expiration Date October 19, 2015 Application 25 (v)SPoT 6 month trial license for 1 AP April 21, 2015 Valid October 19, 2015			SPoT Ad	min	Edit A	ccount Ana	alytics API Explorer Log Out	2			
Tel license will expire on October 19, 2015. More details. License Start Date Start Date Start Date NSTANCE-vSPOT 1 (v)SPOT 1 Instance 6 month trial license for 1 AP April 21, 2015 Valid October 19, 2015 CAPACITY-vSPOT 25 (v)SPOT 6 month trial license for 1 AP April 21, 2015 Valid October 19, 2015 V2014-2015 Ruckus Wirelese, Inc. World Rights Reserved.		Venues Accounts	Diagnostic	s Settings							
License Upload Smart License Peature Capacity Description Startus Expiration Date INSTANCE-vSPOT 1 (v)SPoT 1 Instance 6 month trial license April 21, 2015 Valid October 19, 2015 CAPACITY-vSPOT 25 (v)SPoT 6 month trial license for 1 AP April 21, 2015 Valid October 19, 2015 V2014-2015 Ruckus Wireless, Inc. World Rights Reserved.				Trial license will expire on October 19, 20	015. More details.						
License Uplead Smart License Feature Capacity Description Start Date Start Date Expiration Date INSTANCE-vSPOT 1 (v)SPoT 1 Instance 6 month trial license April 21, 2015 Valid October 19, 2015 CAPACITY-vSPOT 25 (v)SPoT 6 month trial license for 1 AP April 21, 2015 Valid October 19, 2015 V2014-2015 Ruckus Wireless, Inc. World Rights Reserved. V2014-2015 Ruckus Wireless, Inc. World Rights Reserved. V2014-2015 Ruckus Wireless, Inc. World Rights Reserved.				License was successfully uplo	baded.						
License Upload Smat License Feature Capacity Description Start Date Starts Expiration Date INSTANCE-vSPOT 1 (v)SPoT 1 Instance 6 month trial license April 21, 2015 Valid October 19, 2015 CAPACITY-vSPOT 25 (v)SPoT 6 month trial license for 1 AP April 21, 2015 Valid October 19, 2015 v2014-2015 Ruckus Wireless, Inc: World Rights Reserved. Secure 4 Secure 4		Network Licens	e								
FeatureCapacityDescriptionStart DateStartsExpiration DateINSTANCE-vSPOT1(v)SPoT 1 Instance 6 month trial licenseApril 21, 2015ValidOctober 19, 2015CAPACITY-vSPOT25(v)SPoT 6 month trial license for 1 APApril 21, 2015ValidOctober 19, 2015Capacity USPOT 6 month trial license for 1 APApril 21, 2015ValidOctober 19, 2015Capacity USPOT 6 month trial license for 1 APApril 21, 2015ValidOctober 19, 2015Capacity USPOT 6 month trial license for 1 APApril 21, 2015ValidOctober 19, 2015Capacity USPOT 6 month trial license for 1 APApril 21, 2015ValidOctober 19, 2015Capacity USPOT 6 month trial license for 1 APApril 21, 2015ValidOctober 19, 2015Capacity USPOT 6 month trial license for 1 APApril 21, 2015ValidOctober 19, 2015Capacity USPOT 6 month trial license for 1 APApril 21, 2015ValidOctober 19, 2015Capacity USPOT 6 month trial license for 1 APApril 21, 2015ValidOctober 19, 2015Capacity USPOT 6 month trial license for 1 APApril 21, 2015ValidOctober 19, 2015Capacity USPOT 6 month trial license for 1 APApril 21, 2015ValidNational April 21, 2015Capacity USPOT 6 month trial license for 1 APApril 21, 2015ValidCapacity USPOT 6 month trial license for 1 APCapacity		License					Upload Smart License				
INSTANCE-vSPOT 1 (v)SPoT 1 Instance 6 month trial license April 21, 2015 Valid October 19, 2015 CAPACITY-vSPOT 25 (v)SPoT 6 month trial license for 1 AP April 21, 2015 Valid October 19, 2015 vSide 02014-2015 Ruckus Wireless, Inc. World Rights Reserved. Valid October 19, 2015		Feature	Capacity	Description	Start Date	Status	Expiration Date				
CAPACITY-vSPOT 25 (v)SPoT 6 month trial license for 1 AP April 21, 2015 Valid October 19, 2015		INSTANCE-vSPOT	1	(v)SPoT 1 Instance 6 month trial license	April 21, 2015	Valid	October 19, 2015				
© 2014–2015 Ruckus Wireless, Inc. World Rights Reserved.		CAPACITY-vSPOT	25	(v)SPoT 6 month trial license for 1 AP	April 21, 2015	Valid	October 19, 2015				
© 2014–2015 Ruckus Wireless, Inc. World Rights Reserved.											
				© 2014–2015 Ruckus Wireless, Inc. World F	Rights Reserved.						

You have completed activating licenses on a vSPoT VM.

NOTE When Upgrading from a Trial license to a Purchased License, regenerate the Serial Number of the VM and repeat the steps in Activating vSPoT Licenses and Support Licenses and Syncing Licenses on a vSPoT VM.

CAUTION! When updating vSPoT within the trial period, do not regenerate the Serial Number of the VM. You will need to access LiMan to download the existing Trial license file and upload it to the updated vSPoT VM.

Venue Setup

The default venue provided out of the box is 'vspot' with an initial 'production active' radio map named 'demo', with 23 AP slots with randomly generated AP MAC addresses.

To upload and use your own venue map from the Admin Portal, go to Radio Maps
 > Create Radio Maps. Specify the radio map Name, then click Create Own Map
 and follow the directions. When the map is completed, click Save.

- 2. Wait approximately 3 to 10 minutes for the created map to be batch processed.
- **3.** Go to **Radio Map > Details**. Set the new radio map created as 'Production', with the **Start timestamp** being the current date time.
- 4. Leave the End timestamp empty as this is your first production radio map.
- 5. From the Radio Maps tab, click on the Files link, click and choose the 'floor_1_annotated.png' file link and review the map.
- 6. With the above map, go to the Access Points tab, and update the MAC addresses of the APs that will be connected to vSPoT (use the AP location and ID overlay from the map as a guide).
- 7. Go to Venue Details > Locality and update Address and Timezone to the correct timezone for your venue.
- To Add a new venue to vSPoT, go to Venues, click on New and repeat steps 1 to 7.

Additional Information

For additional information on vSPoT administration, see the SPoT User Guide, available from https://support.ruckuswireless.com.

Controller Configuration

To configure your venue, you must perform several steps on the ZoneDirector or SmartZone controller that is deployed at your venue.

See the following section depending on which controller your venue is using:

- To Configure ZoneDirector
- To Configure SmartZone

To Configure ZoneDirector

This section describes how to configure ZoneDirector as your controller for your venue.

NOTE To manage multiple vSPoT venues on a single Zone Director controller, use firmware 9.12.2 and above. This will allow the controller to manage multiple vSPoT Venue IDs using a single IP.

- 1. Log into ZoneDirector to point your ZoneDirector and APs to the vSPoT virtual machine.
- 2. On the ZD web interface, go to **Configure > Location Services**. On the **Create New** venue form, enter the following information:
 - Server FQDN or IP Address: Enter the IP address of the machine on which you are running the vSPoT VM.
 - **Server Port**: Enter the Port number as displayed on the vSPoT Admin portal Config page.

• **Password**: Enter the password as displayed on the vSPoT Admin portal Config page.

NOTE This information is available on http://[vSPoT IP Address]:8443/admin/venues/vspot/edit_config.

- On the ZD web interface, go to Access Point Groups > Editing (System Default)
 > Location Services, and configure the following settings:
 - Enable/Disable: Enable.
 - Venue Name: Select the venue you created on the Location Services page from the drop-down list.
- 4. Go to Monitor > Location Services in ZD to check that AP-LS Status and ZD-LS Status is connected.
- Go to Monitor > Access Points to view status lights of the AP. If Green, vSPoT is now running successfully in your venue. You may proceed to calibration (if using SPoT Point with Calibration). If Red, contact Customer Service for assistance.
- 6. You can configure the vSPoT Locator parameters via the Config page on the vSPoT Admin Portal (http://[vSPoT IP address]:8443/admin/venues/vspot/edit_config).
- 7. Detailed vSPoT VM diagnostics are also available at http://[vSPoT IP address]:8442 in case you would like to investigate your hardware resource consumption. A summary is provided on the Diagnostics page.
- 8. Proceed to perform the calibration using the SPoT Calibrator app.
- 9. Analytics functionality will be available by clicking SPoT Analytics.

To Configure SmartZone

This section describes how to configure SmartZone as your controller for your venue.

NOTE To manage multiple vSPoT venues on a single SmartZone controller, use firmware 3.1.1 patch 1 and above. This will allow the controller to manage multiple vSPoT Venue IDs using a single IP.

- On the controller web interface, go to Configuration > Services & Profiles > Services > Location Services.
- 2. Click Create New. The Create New LBS Server form appears.
- Configure with the cloud LBS parameters that you obtain from the SPoT Admin Portal -> Config page. And Click OK to Save Changes.
- 4. Next, configure the controller to use the LBS server. There are 2 methods:
 - Set an entire AP zone to use an LBS server: When you create or edit an AP zone, you can enable the LBS service for the entire zone by selecting the Enable LBS Service check box, and then selecting an LBS server to use.
 - Set an AP group to override the LBS settings of a zone: If you want APs that belong to an AP group to use a different LBS server, you can override the LBS settings at the AP group level. Follow these steps.

- 5. Go to **Configuration > AP Zones**. In the AP Zone List, click the zone name to which the AP group you want to configure belongs.
- 6. On the sidebar, click **AP Group**. Click **Create New** to create a new AP group, or click the AP group name to edit it.
- 7. In the form that appears, scroll down to the Advanced Options section. Click the plus

 (+) sign to display all options. In Location Based Service, select the Override zone config check box.
- 8. Configure the LBS settings as required.
 - To disable the LBS service for this AP group, clear the **Enable LBS service** check box.
 - To use a different LBS server for this AP group, select the **Enable LBS service** check box, and then select the LBS server that you want to use from the drop-down list.
- **9.** Configure the other AP group settings as required. Click **OK**. You have completed setting an AP group to override the LBS settings of its zone.

NOTE For more information on ZoneDirector or SmartZone configuration, refer to their respective User Guides available on the Ruckus support site.

Configuring Virtual SPoT Application Controller Configuration

Managing Virtual SPoT Application

5

This chapter explains how you can manage the vSPoT application and has the following sections.

- Diagnostics on page 52
- Remote Support on page 55
- Backup and Restore on page 56
- Upgrading to a New Version on page 57
- Upload and Rollback of Self Signed SSL Certificate on page 90
- How to Increase vSPoT Historical Data Collection Capacity on page 93

Diagnostics

The Diagnostics tab in the vSPoT Administrator user interface provides charts to enable users to track the health of the resource utilization by vSPoT, in terms of:

- CPU
- Memory
- Storage
- Network

You can view daily and weekly charts.

Figure 32: Diagnostics page



Insufficient Server Resources

If there is a drastic and sustained increase in the resource utilization (as viewed from the Diagnostics tab) or a drastic and sustained decrease in location analytics numbers (as viewed from the Analytics dashboard), there could be insufficient server resources for vSPoT to handle the incoming data load. Users are recommended to increase the server resources allocated to vSPoT.

Configuring the Number of vSPoT Processing Workers

CAUTION! This section is only applicable to vSPoT version 3.2 and above.

The collators processes receive raw data streams from the APs, and transforms the data accordingly for the location engine. The pas_workers processes run in the location engine and generates the location coordinates for the WiFi clients detected. As you scale

up the server with hardware resources, to ensure that vSPoT is able to efficiently utilize the server resources, you would also need to configure the number of collators and pas_workers processes. Follow the below procedure

1. Login to the vSPoT CLI using the console access or through SSH using the 'admin' user. Refer to if you have not yet configured SSH access.

```
ssh admin@<vspot host os public ip>
```

For example:

ssh admin@192.168.0.5

- 2. Ensure NTP server synchronization between Controller, APs and vSPoT Host OS.
- 3. Enter the vSPoT docker container

admin@vspotappliance:~\$ spot enter

4. Stop the rk-venue server processes

root@vspot:~# systemctl stop rk-venue.target

5. Run the CLI command to change the number of workers. For example, 10 collators and 16 pas_workers.

root@vspot:~# cd \$RK VENUE ROOT

```
root@vspot:~# bundle exec rake
bootstrap:generate init scripts[,collator=10,pas worker=16]
```

6. Start the rk-venue server processes

root@vspot:~# systemctl start rk-venue.target

The following table provides a guideline for specifying the number of collators and pas_workers processes, based on the number of vCPUs available from your server.

Table 7: Number of Worker Processes

vCPU	Number of collators	Number of pas_workers
40	36	60
20	15	25
16	10	10
8	3	5
4	2	5

vCPU	Number of collators	Number of pas_workers
2	2	3

Remote Support

For troubleshooting purposes, you can establish a reverse SSH connection to the Ruckus vSPoT support server, so that a Ruckus Customer Support representative can access your vSPoT VM remotely and assist with troubleshooting.

There are two methods to access vSPoT remotely.

- Using the vSPot User Interface
- Using the CLI Console on page 56

Using the vSPoT User Interface

This section explains how you can access vSPoT remotely using the vSPoT User Interface.

Follow the steps for allowing remote access through the user interface.

1. Go to Settings > Support.

Figure 33: Remote Support page

		PoT Admi	n		Ed	lit Account	Analytics	API Explorer	Log Out
Venues	Accounts	Diagnostics	Settings						
		vSPoT is fr	ee to use wil	th 10 Access Points until Octo	ober 01, 2015. <u>Mor</u>	e details.			
Health	Support								
Sup	port								
REM Sup Pleas	DTE SUPPORT	number: ort team for a suppor	t connection n	umber.				Соп	Inect
			© 2014–20 vSPoT Versi	015 Ruckus Wireless, Inc. World R ion: ENV VAR \$VSPOT_APP_VEF	ights Reserved. RSION undefined!				

- 2. Contact Ruckus Customer Support at https://support.ruckuswireless.com.
- **3.** The support representative will give you a 4-digit support connection number. Enter this number in **Support Connection Number** and click **Connect**.

4. Click **Disconnect** after the support session has ended to end the SSH connection.

NOTE In order for the remote support functionality to work properly, please ensure the following:

- 1. The vSPoT VM has access to a DNS server that is able to resolve public URLs.
- 2. The firewall, if any, allows outbound traffic on port 50000.

Using the CLI Console

This section explains how you can access vSPoT using the CLI console.

Follow the steps for allowing remote access using the vSPoT console.

- 1. Login to the vSPoT CLI using the console access or through SSH using the 'admin' user
- **2.** Enable remote SSH support connection by executing the CLI command. By default this option is disabled.

admin@vspotappliance:~\$ spot support on

- **3.** Set up a NAT rule or open port to enable inbound network communication on TCP/22 port.
- 4. To disable remote SSH support connection execute the CLI command:

```
admin@vspotappliance:~$ spot support off
```

Backup and Restore

Backup is performed through VMware vSphere by copying the database volume to a separate server. When a new VM is provisioned, data can be restored by pointing the new VM to the desired database volume. Again, this is done through VMware.

Upgrading to a New Version

This chapter lists important information that you must be aware of when upgrading vSPoT.

- Key Features on page 57
- Full Upgrade on page 58

NOTE A full HOST OS upgrade is required for vSPoT 3.2 since it includes changes related to CentOS7 based docker container with systemd support. System commands to start and stop application data services is different for systemd in comparison to previous vSPoT versions.

• Rolling Upgrade for vSPoT 3.x to latest on page 83

Key Features

The following is the distinction between the two upgrade procedures.

Full Upgrade

NOTE Full upgrade refers to vSPoT on VMware Upgrade from Version 3.x to Latest on page 59, vSPoT on VMware Upgrade Version 2.4.x to 3.x (Latest) on page 62 or vSPoT on AWS Upgrade on page 76

- Provides better security since it contains host operating system improvements and security updates
- Provides a more atomic upgrade since the host operating system and application containers are built and tested together as part of the release process
- Easier for VMware administrators

Rolling Upgrade

NOTE If you are upgrading to vSPoT 3.x from vSPoT 2.4.0 or earlier versions, Ruckus Wireless highly recommends that you do a full upgrade to take advantage of the security and performance improvements to the Host OS.

NOTE vSPoT upgrades from version 3.x onwards can be performed via rolling upgrades.

- Decreased downtime during the upgrade procedure since there is no switch to virtual disks or having to restart the VM. This saves an enormous amount of downtime
- Easier upgrade procedure since access and storage configuration of VMware is not required
- Decreased manual configuration since networking and NTP server configuration is persisted within the VM, therefore this does not require reconfiguration
- Easier for Linux administrators

Full Upgrade

The following is the upgrade procedure based on the installation type.

CAUTION! In order to upgrade to vSPoT version 3.x, you need to first ensure that the existing vSPoT is on version 2.4.0 and above. If your vSPoT version is below 2.4.0, you **cannot directly upgrade** to vSPoT 3.x. Do refer to *vSPoT 2.4.4 Installation Guide* on the support website (https://support.ruckuswireless.com) to **first** upgrade to vSPoT 2.4.4 before upgrading to 3.x.

- 1. vSPoT on VMware Upgrade from Version 3.x to Latest on page 59
- 2. vSPoT on VMware Upgrade Version 2.4.x to 3.x (Latest) on page 62
- 3. vSPoT on AWS Upgrade on page 76

vSPoT on VMware Upgrade from Version 3.x to Latest

The following is the procedure for a full upgrade of vSPoT from version 3.x to the latest version.

- 1. Log in to the vSphere Client:
 - **a.** Launch an instance of VMWare vSphere Client (e.g. Windows VMWare vSphere Client).
 - b. In the VMWare vSphere Client, enter the IP Address (or Hostname) and administrative credentials to login to your instance of ESXi server running the source and target vSPoT instances where you want to migrate the data storage volume.
- Copy the AP MAC addresses seen on the Access Points page (navigate to SPoT Admin Portal > Access Points), in order to retain a backup of all the AP MAC addresses.
- 3. Power Off Source and Target vSPoT instances:

NOTE As an example, the source instance is vSPoT 3.0.0 and the target instance is vSPoT 3.2.

- **a.** On the left panel, expand the list of installed VM instances, and locate the source and target vSPoT instances that will be swapping data storage volumes.
- b. Right click on each and Power-Off each instance successively (shortcut: Ctrl-E).
- 4. Detach source vSPoT instance data storage volume:
 - a. Once both source and target instances have been Powered Off, navigate to the source VM instance (note the name of the source vSPoT instance this will be used to relocate and mount the storage from the source to the target vSPoT instance in later steps). Right-click and choose the 'Edit Settings...' menu item.
 - **b.** On the child window that appears, on the left panel, locate and identify the item under the 'Hardware' column, named '**Hard disk 3**', and click to select it.
 - **c.** From the same child window, with the 'Hard disk 3' item selected, locate the '**Remove**' button at the top of the left panel of the child window.

CAUTION! On **Removal Options** displayed on the right panel, select '**Remove** from virtual machine' <u>ONLY</u>. (Do Not use the other option, as this would wipe out the data and therefore make it impossible to migrate the data volume to the new target instance.)

- d. Notice that the 'Hard disk 3' item is struck out and the 'Summary' column indicates it as 'Removed'; Click 'OK' at the bottom right hand corner of the child window to proceed.
- 5. Remove target vSPoT instance data storage volume:

- **a.** From the list of VM instances on the parent window left panel, locate the target vSPoT instance item, and select and right click on the '**Edit Settings...**' menu item.
- b. Repeat Steps (3b) to (3d) above but for the target vSPoT instance, and click 'OK' to end the disk removal process, so that the data storage volume to be attached may take its place.
- 6. Attach source vSPoT instance data storage volume to target vSPoT instance:
 - **a.** From the list of VM instances on the parent window left panel, again locate the target vSPoT instance item, right-click and select the '**Edit Settings...**' menu item.
 - **b.** On the 'Virtual Machine Properties' child window, now locate and click the '**Add...**' button at the top of the left panel of the child window.
 - c. On the new 'Add Hardware' child window, select the 'Hard Disk' item in the middle panel of this child window and click on the 'Next' button located at the bottom of this child window.
 - d. In the 'Select a Disk' option under the 'Add Hardware' child window, select the option 'Use an existing virtual disk Reuse a previously configured virtual disk' in the 'Disk' option, then click on the 'Next' button located at the bottom of this child window.
 - e. On the 'Select Existing Disk' option under the 'Add Hardware' child window, click on the 'Browse...' button next to the 'Disk File Path' text entry field.
 - f. From the new Windows file explorer dialog, locate and select the 'Datastores' file type that was created for your ESXi server, (e.g. esxi-local-storage-1), select the item, then click 'Open'.
 - g. From the expanded list in the 'Browse Datastores' dialog, scroll to and locate the 'Name' identical to your source vSPoT instance that you recorded in Step (3a) above (e.g. vSPoT2-3.0.0-build-543_vmx), and select the item, then click 'Open'.
 - h. From the refreshed 'Browse Datastores' dialog, locate and select the item ending with '_vmx_2.vmdk', and click 'OK'.
 - i. Back in the parent 'Add Hardware' -> 'Select Existing Disk' child window, notice the filled out 'Disk File Path' file based on your selections from the above steps, then click the 'Next' button.
 - j. On the 'Add Hardware' -> 'Advanced Options' child window, right side panel, locate the 'Virtual Device Node' section, and select the item directly beneath the 'SCSI (0:1) Hard disk 2' item (e.g. 'SCSI (0:2)'), then click the 'Next' button.
 - k. Review the 'Add Hardware' -> 'Ready to Complete' -> 'Options' summary information, and click the 'Finish' button to complete the data storage volume transfer action, OR, click 'Back' to alter/edit any previously entered values/choices, OR, click 'Cancel' to ABORT the operation.
 - I. Finally, click the 'OK' button at the bottom right-hand corner of the 'Virtual Machine Properties' window to finish the VM settings changes applied/changed/aborted.

Power On your target vSPoT instance VM and verify the data volume migration action has successfully completed.

- 7. Verify successful upgrade.
 - **a.** Verify that the web service is running.
 - **b.** View and validate application state from *http://<vSPoT VM IP>:8443*.
 - **c.** Check the application version (example, latest version), and login to the vSPoT administration dashboard using a valid user account and admin account.
- 8. Verify admin and analytics dashboards.
 - **a.** From the Admin pages, validate the data presence of radio maps, access points, venues, etc.
 - **b.** From the analytics page, verify real-time and historical data (heat maps and daily visit counts)

NOTE Refer to Upload and Rollback of Self Signed SSL Certificate on page 90 to upload or revert the pre-bundled self-signed SSL certificate.

vSPoT on VMware Upgrade Version 2.4.x to 3.x (Latest)

The following is the procedure to upgrade a vSPoT deployment from version 2.4.x to vSPoT 3.x (latest).

NOTE This upgrade process will result in application downtime due to the need for migrating data across different and incompatible storage engines. During the migration process, vSPoT should not be running, otherwise data could be lost during migration.

CAUTION! In order to upgrade to vSPoT version 3.x, you need to first ensure that the existing vSPoT is on version 2.4.0 and above. If your vSPoT version is below 2.4.x, you **cannot directly upgrade** to vSPoT 3.x. Do refer to *vSPoT 2.4.4 Installation Guide* on the support website (https://support.ruckuswireless.com) to **first** upgrade to vSPoT 2.4.4 before upgrading to 3.x.

Prerequisites

• You are required to open port 22 of your vSPoT host operating system (Host OS) on a public facing IP address.

Upgrade Procedure

The upgrade procedure has the following list of instructions.

NOTE Ruckus Wireless recommends that you follow the procedure for a successful upgrade.

Backup the Current vSPoT

This section describes the procedure to backup the current vSPoT.

- 1. Login to the vSPoT vCenter
- 2. Using the VMWare ESXi web interface navigate to select Virtual Machines > VMware instance for a backup.

Figure 34: Selecting Virtual Machine Instance

Upgrading to a New Version

		esxi.video54.local - VMware ESXi					
nware [,] ESXi [*]			root@172.3	0.65.152 - Help - Q Search			
Navigator 🛛	🕤 esxi.video54.local - Virtual Machines						
Host Manage	😘 Create / Register VM 📑 Console 🛛 🕨	Power on 🗧 Shut down 🔢 Suspend 🥑 Refre	sh 🏠 Actions	Q Search			
Monitor	Virtual machine	✓ Status	Used space ~ Host name	✓ Host CPU ✓ Host memory ✓			
🎒 Virtual Machines	SPoT2-build-392_vmx_spot_3.5.0_mon	go32_WT_soak @ Question pending	33.15 GB vspotappliance	1 MHz 7.89 GB			
 vSPoT2-2.4.4-TO-2.5.1 	Image: Sector of the sector	🕐 Normal	12.25 GB vspotappliance	65 MHz 6.32 GB			
Monitor	Image: Sector of the sector	Normal	121.05 GB vspotappliance	14.1 GHz 15.94 GB			
More VMs	SPoT2-build-392_vmx_2.4.4-QIC_tappe	ed 📀 Normal	204.99 GB Unknown	0 MHz 0 MB			
Storage	B vSPoT2-2.5.1-build-341_vmx	O Normal	3.68 GB Unknown	0 MHz 0 MB			
2 Networking	B vSPoT2-2.5.1-build-342_vmx	Normal	3.58 GB Unknown	0 MHz 0 MB			
	Image: Sector	T 📀 Normal	249.6 GB vspotappliance	6.9 GHz 10.95 GB			
	SPoT2-2.4.4-TO-2.5.1_VMSnapshot_Ex	speriment O Normal	20.89 GB Unknown	1.8 GHz 3.39 GB			
				40 items			
VSPoT2-2.4.4-TO-2.5.1_VMSnapshot_Experiment Guest OS Centod 44507 (44-b) Comedia (5.5 and later (VM version 10)							
	VMware Tools CPUs	Yes 4		MEMORY 3.39 GB			
	Memory	4 GB		STORAGE 20.89 GB			

- **3.** Ensure that your shared storage mounted for vCenter or ESXi has sufficient disk space for the snapshot backup. If vSPoT is using around 1TB, ensure you have at least 1TB additional free storage space for the snapshot backup.
- 4. In the tab menu navigate to select Actions > Snapshots > Take snapshot

Figure 35: Selecting the Snapshot Option

🔂 es	🔁 esxi.video54.local - Virtual Machines												
*	p (Create / Register VM 💕 Console 🕨 Power on 😑 Shut	down	II Suspend C Refres	h	۰.	Actions						
		Virtual machine	,	 Status 	Use	ß	vSPoT2-2.4.4	4-TO-2.5.1_VMSnapshot_Experiment					
				-		6	Power))					
		2 vSPoT2-build-392_vmx_spot_3.5.0_mongo32_WT_soak		Question pending	33.	r 🕞	Guest OS						
		vSPoT2-build-392-venue_load_test_vmx		Take energehet	10		Cronobata	,					
C	כ	vSPoT2-build-392_vmx_Zsolt_perftest	TO	Take snapshot		192	Snapsnots	ŀ					
	כ	vSPoT2-build-392_vmx_2.4.4-QIC_tapped	-	Restore snapshot		Ē	Console)					
C		B vSPoT2-2.5.1-build-341_vmx	i 🖗	Manage snapshots		6	Autostart	S, >					
C		B vSPoT2-2.5.1-build-342_vmx		Consolidate disks	_	B	Upgrade VN	1 Compatibility					

5. Enter a name for snapshot backup.

For example, vSPoT-2.4.4-VMSnapshotBackup-04Jul2016 1450.

Also, select the option, Quiesce guest file system (needs VMware tools installed).

Figure 36: Snapshot Name

Take snapshot for vSPoT2-2.4.4-TO-	2.5.1_VMSnapshot_Experiment
Name	vSPoT-2.4.4-VMSnapshotBackup-04Jul2016_1450
Description	
Snapshot the virtual machine's memor	у.
Quiesce guest file system (needs VMw)	are tools installed).
	Take snapshot Cancel

- 6. Click on the Take snapshot button to complete the snapshot.
- 7. Check the **Recent tasks** tab at the bottom panel to ensure that the snapshot is complete. This could potentially be a long running task from 5 minutes to around 30 minutes depending on the size of your Vmdk, mounted storage, storage type and performance.

Figure 37: Check Status of Snapshot

Upgrading to a New Version

5	Create / Register VM 🛛 💕 Co	nsole 🕨 Powe	r on 🗧 Shut do	wn 📙 Suspend C	Refresh 🛟 Actions		(Q Search
	Virtual machine			~ Status	 Used space 	 Host name 	 Host CPU 	 Host memory
	VSPoT2-build-392_vmx_sp	oot_3.5.0_mongo32,	_WT_soak	(1) Question pendir	ng 33.15 GB	vspotappliance	1 MHz	7.89 GB
	b vSPoT2-build-392-venue	load_test_vmx		Normal	12.25 GB	vspotappliance	65 MHz	6.32 GB
	b vSPoT2-build-392_vmx_Z	solt_perftest		Normal	121.05 GB	vspotappliance	14.1 GHz	15.94 GB
	vSPoT2-build-392_vmx_2.	4.4-QIC_tapped		Normal	204.99 GB	Unknown	0 MHz	0 MB
	B vSPoT2-2.5.1-build-341_v	mx		Normal	3.68 GB	Unknown	0 MHz	0 MB
	VSPoT2-2.5.1-build-342_v	mx		Normal	3.58 GB	Unknown	0 MHz	0 MB
	yspot2.QIC.2.5.1.UPGRA	DE.SOAK.TEST		Normal	249.6 GB	vspotappliance	6.9 GHz	10.95 GB
2	b vSPoT2-2.4.4-TO-2.5.1_VI	MSnapshot_Experim	nent	Normal	20.89 GB	Unknown	1.8 GHz	3.39 GB
								40 item
111		vSPoT2-2.4.4-T	0-2.5.1_VMSna	apshot_Experiment				CPU
	Str. et al. (1997) Annual Str. C. Salari, M. S. S. Salari, S. Sa	Compatibility	ESXi 5.5 and late	er (VM version 10)				1.8 GHz
	[2] And A. A. C.	VMware Tools CPUs	Yes 4					3.39 GB
	a	Memory	4 GB					STORAGE 20.89 GB

8. Check that your created snapshot is visible in the list of snapshots by navigating to Actions > Snapshots > Manage snapshots. You should be able to see your created snapshot in the list pop-up window.

Figure 38: Created Snapshot

Managing Virtual SPoT Application

Upgrading to a New Version

Manage snapshots - vSPoT2-2.4.4-TO-2.5.1_VMSnapshot_Experiment					
🔞 Take snapshot 🛛 🦗 Restore snapshot 🛛 👸 Delete snapshot 🛛 🗙 Delete all 🛛 🖧	Edit snapshot	C Refresh			
 WSPoT2-2.4.4-TO-2.5.1_VMSnapshot_Experiment WSPoT2-2.4.4-Snapshot04Jul2016_1230 VSPoT2-2.4.4_VMSnapshot_04Jul2016_1410 VSPoT2-2.4.4_VMSnapshotBackup-04Jul2016_1450 You are here 		 Martin C. M. (1997) Annual Control of Martin Control			
	Name	vSPoT-2.4.4-VMSnapshotBackup-04Jul2016_1450			
	Description				
	Created	Monday, July 04, 2016, 14:54:03 +0800			
			Close		

In the event that you need to restore a previous snapshot, follow the Procedure to Restore VMWare Snapshots (Optional) on page 75

Venue Identifiers

After a successful backup of the vSPoT instance, ensure you have an updated list of Venue identifiers. This is required during migration.

Download vSPoT 3.x

Download the latest vSPoT build version 3.x (example -vSPoT-3.2.0-build-985.tar) from the support site (https://support.ruckuswireless.com)

Stop VM Server Running vSPoT

Stop the existing VM server running vSPoT version 2.4.4 by running the following CLI commands.

1. SSH to the vSPoT host operating system and to the vSPoT docker container.

NOTE Refer to SSH Key Based Authentication if you have not yet configured SSH access.

```
ssh admin@<vspot_host_os_public_ip>
admin@vspotappliance:~$ spot enter
```

2. Shut down all the running services other than Mongod server.

NOTE Keep the Mongod server process up and running.

root@vspot:~# stop rk-venue root@vspot:~# stop resque root@vspot:~# service nginx stop

Exit from the docker container and return to the vSPoT host operating system (Host OS).

Backup the MongoDB

Backup the MongoDB data directory and clean the existing MongoDB data directory contents with the following steps.

 From vSPoT Host OS, enter the container and download the scripts vspot_venue_dump.sh and vspot_venue_restore.sh from Ruckus vSPoT AWS S3 migration_scripts, and give the scripts execution rights.

```
admin@vspotappliance:~$ spot enter
root@vspot:~# wget -0 /storage/vspot_venue_dump.sh
https://s3-us-west-2.amazonaws.com/ruckuslbs/public/vspot/vspot_venue_dump.sh
root@vspot:~# wget -0 /storage/vspot_venue_restore.sh
https://s3-us-west-2.amazonaws.com/ruckuslbs/public/vspot/vspot_venue_restore.sh
root@vspot:~# wget -0 /usr/bin/mongodump32
https://s3-us-west-2.amazonaws.com/ruckuslbs/public/vspot/mongodump32
root@vspot:~# chmod +x
/storage/{vspot_venue_dump.sh,vspot_venue_restore.sh}
/usr/bin/mongodump32
```

2. Backup the MongoDB data for a specified venue (example *rksg-dev*) by using the below procedure.

NOTE If you have more than one venue to migrate, repeat this step for each venue as per your list of Venue Identifiers on page 66.

```
root@vspot:~# bash /storage/vspot_venue_dump.sh rksg-dev
--full-dump
```

```
Response:
THIS SCRIPT MUST BE RUN IN vSPoT docker container!
IT IS MEANT TO DO A vSPoT MongoDB and radio maps dump for
a vSPoT data migration purpose!
+ '[' '!' -f /etc/envvars ']'
+ source /etc/envvars
Creating /storage/venue_dump/dump_mongo and
/storage/venue dump/dump radio maps directories ...
```

DONE.

```
Proceed to dump groups ...
+ /usr/bin/mongodump32 --gzip --port 27017 --db
rk-system_production --query '{'\'' id'\'':
ObjectId("562677639180054fd7000002") --collection groups
--out /storage/venue dump/dump mongo
2016-07-26T14:52:43.841+0800
                               writing
rk-system production.groups to
2016-07-26T14:52:43.843+0800
                             done dumping
rk-system production.groups (1 document)
DONE.
Proceed to dump venue rksg-dev ...
+ /usr/bin/mongodump32 --qzip --port 27017 --db
rk-system production --query '{'\'' id'\'':
'\''rksg-dev'\''}' --collection venues --out
/storage/venue dump/dump mongo
2016-07-26T14:52:43.862+0800
                               writing
rk-system production.venues to
2016-07-26T14:52:43.863+0800
                               done dumping
rk-system production.venues (1 document)
DONE.
Proceed to dump venue rksg-dev access points ...
2016-07-26T15:09:20.821+0800
rk-system_production.impressions 28173377
2016-07-26T15:09:21.962+0800
rk-system production.impressions 28285371
2016-07-26T15:09:21.963+0800 done dumping
rk-system production.impressions (28285371 documents)
DONE.
Analytics data dump completed DONE.
Copying radio maps for rksg-dev into
/storage/venue dump/dump radio maps ...
+ cp -rpfv /opt/spot/system/private/venues/rksg-dev
/storage/venue dump/dump_radio_maps
`/opt/spot/system/private/venues/rksg-dev' ->
`/storage/venue dump/dump radio maps/rksg-dev/foreground maps'
DONE.
+ cd /storage/venue dump
Creating gzip tarball at /storage/rksg-dev dump.tar.gz of
above mongodumps and radio maps ...
```

```
+ tar -zcvf /storage/rksg-dev_dump.tar.gz dump_mongo
dump_radio_maps
dump_mongo/
dump_mongo/rk-system_production/
dump_mongo/rk-system_production/groups.metadata.json.gz
```

dump_radio_maps/rksg-dev/radio_maps/56383dbb3d6ae907d7000012/floor_6.png dump_radio_maps/rksg-dev/radio_maps/56383dbb3d6ae907d7000012/floor_3.png dump_radio_maps/rksg-dev/radio_maps/56383dbb3d6ae907d7000012/floor_6_annotated.png

```
DONE.
Deleting mongodumps and radio maps dump temp dir
/storage/venue_dump ...
+ rm -rf /storage/venue_dump
+ ls -alrth /storage/rksg-dev_dump.tar.gz
-rw-r--r-- 1 root root 919M Jul 26 15:10
/storage/rksg-dev_dump.tar.gz
```

```
ALL DONE.
```

3. Verify the existence of non-empty archive file.

root@vspot:~#ls -lah /storage/rksg-dev dump.tar.gz

Remove Redis Append Only File (AOF)

Upgraded version of vSPoT does not use Redis AOF.

1. This must be removed to prevent data corruption during Redis server startup by executing the following command:

```
admin@vspotappliance:~$ sudo rm -f
/storage/redis/data/rk venue.aof
```

2. Exit and return to the vSPoT Host OS.

Prepare the Existing MongoDB Data Directories

Prepare existing MongoDB data directories by executing the following commands.

1. From vSPoT Host OS, enter vSPoT docker container and stop the MongoDB server process.

```
admin@vspotappliance:~$ spot enter
root@vspot:~# service mongod stop
```

 Prepare a new MongoDB data directory from the vSPoT docker container and a new working directory.

```
root@vspot:~# mv /storage/mongo /storage/mongo24
root@vspot:~# mkdir -p /storage/mongo/{data,log}
root@vspot:~# chown mongod:mongod -R /storage/mongo
```

3. Exit back to vSPoT Host OS and shut down vSPoT docker container.

admin@vspotappliance:~\$ spot stop 244

Detach Storage from vSPoT

From vSphere user interface, detach the storage volume for the current VM running vSPoT version 2.4.4.

CAUTION! Do not delete the detached storage volume.

Install and Import the vSPoT 3.x VM Image

Install and import the VMDK image into your existing vSphere.

The procedure is similar to that described in vSPoT on VMware Upgrade from Version 3.x to Latest on page 59 but keep in mind that this installation is for vSPoT 3.x.

Attach Storage to vSPoT

From vSphere user interface, attach the storage volume to the current VM running the installed vSPoT 3.x.

Start vSPoT 3.x

Start the vSPoT 3.x VM after the storage volume has been successfully attached.

Migrate Data to New Storage Engine Format

Migrate MongoDB data to be compatible with the new storage engine used in vSPoT 3.x by following the below procedure.

1. Check vSPoT 3.x docker container is running by running the command:

```
admin@vspotappliance:~$ spot list
```

```
admin@vspotappliance:~≸ spot list
CONTAINER ID IMAGE COMMAND CREATED STATUS
847391fb7cfb registry.internal.ruckuslbs.com/ruckus/vspot:3.2.0-999 "/sbin/init" 2 weeks ago Up 18 hours 0.0
admin@vspotappliance:~$ spot enter
```

2. Shut down all the running services other than Mongod server.

```
root@vspot:~# systemctl stop rk-venue.target
root@vspot:~# systemctl stop resque.target
root@vspot:~# service nginx stop
root@vspot:~# service redis-rk_venue stop
root@vspot:~# service redis-rk_system stop
root@vspot:~# service mosquitto stop
```

3. Check that all processes that was stopped in the above step have been terminated

#The following should not return any lines

```
root@vspot:~# ps -ef | grep -E 'ruby|redis|mosquitto|nginx'
| grep -v grep
# If any process is returned, repeat the commands to shutdown
the respective process.
```

Restore the Data

Restore the MongoDB data with the following steps.

1. Enter the Docker container

admin@vspotappliance:~\$ spot enter

 Run the data restore script to first restore the MongoDB data, then subsequently create database indexes.

NOTE This may take a long time to complete, based on the migration data set.

```
root@vspot:~# bash /storage/vspot_venue_restore.sh
/storage/rksg-dev dump.tar.gz
```

NOTE If you had previously exported more than one venue, you will need to repeat this data restore step for each venues as per your list of venue identifiers.

```
Response
> THIS SCRIPT MUST BE RUN IN vSPoT docker container!
> ONLY A MongoDB and radio maps restore from a valid vSPoT
venue dump will be performed from
/storage/rksg-dev dump.tar.gz file.
> .
> ADDITIONAL MONGODB DATA CHANGES MUST BE PERFORMED FOR AN
AWS SPOT to vSPoT data restoration!
> .
> .
> Deleting any previous /storage/venue dump dir and
contents...
> + rm -rf /storage/venue dump
> .
> DONE.
> + cd /storage
> + '[' -f /storage/rksg-dev dump.tar.gz ']'
> + mkdir -p /storage/venue dump
> .
> Exploding /storage/rksg-dev dump.tar.gz into
/storage/venue_dump ...
> + tar -zxvf /storage/rksg-dev dump.tar.gz -C
/storage/venue dump
> dump mongo/
```

Managing Virtual SPoT Application

Upgrading to a New Version

```
> dump mongo/rk-system production/
> dump mongo/rk-system production/groups.metadata.json.gz
> dump mongo/rk-system production/visits.metadata.json.gz
> dump mongo/rk-system production/locations.bson.gz
> .
>
> dump mongo/rk-system production/groups.bson.gz
>
dump mongo/rk-system production/access points.metadata.json.gz
> dump radio maps/
> dump radio maps/rksg-dev/
> dump radio maps/rksg-dev/foreground maps/
>
dump radio maps/rksg-dev/foreground maps/pPEVNY51Jtutq2vW8Yxq2w.png
>
dump radio maps/rksq-dev/foreground maps/hjiaM6CtqdqMBLb96YkxqA.jpq
> .
> .
>
dump radio maps/rksg-dev/radio maps/56383dbb3d6ae907d7000012/flcor 6 annotated.png
> .
> DONE.
> .
> Restoring DB data dump ...
> + mongorestore --gzip --port 27017 --noIndexRestore
/storage/venue dump/dump mongo
> 2016-07-26T16:11:54.938+0800
                               building a list of dbs
and collections to restore from
/storage/venue dump/dump mongo dir
> 2016-07-26T16:11:54.940+0800
                               reading metadata for
rk-system production.visits from
/storage/venue dump/dump mongo/rk-system production/visits.metadata.json.gz
> .
>
> 2016-07-26T16:26:54.940+0800
                               rk-system production.visits 4.2 GB/393.5 MB
(1100.9%)
> 2016-07-26T16:26:54.940+0800
                              rk-system production.impressions 7.4 GB/267.1 MB
(2848.0%)
> 2016-07-26T16:26:54.940+0800
> 2016-07-26T16:26:57.356+0800
                              rk-system production.impressions 7.4 GB/267.1 MB
(2853.7%)
> 2016-07-26T16:26:57.356+0800
                              no indexes to restore
> 2016-07-26T16:26:57.356+0800 finished restoring
rk-system production.impressions (28285371 documents)
rk-system production.visits 4.2 GB/393.5 MB (1104.0%)
>
>
rk-system production.visits 7.9 GB/393.5 MB (2062.0%)
```
```
> 2016-07-26T16:48:15.702+0800 no indexes to restore
> 2016-07-26T16:48:15.702+0800 finished restoring
rk-system production.visits (28138897 documents)
> 2016-07-26T16:48:15.702+0800
                                         done
> .
> DONE.
> + cd /opt/spot/system
>
> Create indexes for Analytics DB ...
> + bundle exec rake mi:create indexes
> Run options: --seed 10490
> # Running:
>
> Finished in 0.002529s, 0.0000 runs/s, 0.0000 assertions/s.
> 0 runs, 0 assertions, 0 failures, 0 errors, 0 skips
> .
> DONE.
> .
> Restoring radio maps dump ...
> + cp -rpfv /storage/venue dump/dump radio maps/rksg-dev
/opt/spot/system/private/venues/
>
`/storage/venue dump/dump radio maps/rksg-dev/foreground maps/xIhaFqPniklXPImRYIdewg.png'
->
`/opt/spot/system/private/venues/rksg-dev/foreground_maps/xIhaFqAniklXPImRYldewg.png'
> .
> .
>
`/storage/verue dump/dump radio maps/rksg-dev/radio maps/56383db3dbae907d7000012/verue.svg'
->
`/qpt/spot/system/private/venues/rksg-dev/radio maps/56383db3dbæ907d7000012/venue.svg'
>
"/storage/verue dump/dump radio maps/rksg-dev/radio maps/56383ddb3dfæ907d7000012/floor 3 inside.prg"
 ->
`/qpt/spot/system/private/venues/rksg-dev/radio maps/56383dbb3d6æ907d7000012/floor_3_insid
e.png'
> .
> DONE.
>
> ALL DONE.
root@vspot:~#
```

Verify Successful Migration

Start the required services for verification.

```
root@vspot:~# service mosquitto start
root@vspot:~# service redis-rk_venue start
root@vspot:~# service redis-rk_system start
root@vspot:~# service nginx start
```

View and validate application state from http://<vSPoT VM IP>:8443. Check the application version, and its ability to login to vSPoT version 3.x administration dashboard using a valid user account and admin account.

Start Data Services

Start the data services and background services.

```
root@vspot:~# systemctl start rk-venue.target
root@vspot:~# systemctl start resque.target
```

NOTE This will begin to receive live data from the access points.

From the Admin pages, validate the data presence of radio maps, access points, venues, etc. From the analytics page, verify real-time and historical data (heat maps and daily visit counts).

Clean Directories and Backup Snapshots

After successfully migrating to vSPoT version 3.x follow the below procedure

1. Clean the earlier database directory by running the below command.

```
admin@vspotappliance:~$ sudo rm -fr /storage/mongo24
```

- 2. Exit to vSPoT Host OS and from VMWare vCenter web interface.
- **3.** You may want to delete or cleanup your VMWare snapshots after you have ascertained that the upgrade is successful. You may no longer need to revert to the previous version of vSPoT VM.

Re-Import vSPoT License File

Re-import the vSPoT license to get the full working license purchased for your vSPoT instance.

Procedure to Restore VMWare Snapshots (Optional)

Follow the below procedure to restore the vSPoT backup.

- **1.** Login to the vSPoT vCenter.
- Using the VMWare ESXi web interface navigate to select Virtual Machines > VMware backup instance for restoration. Ensure that the backup is a good valid working snapshot.
- 3. In the tab menu navigate to select Actions > Snapshots > Restore snapshot.

Figure 39: Selecting Restore Snapshot Option

							root@172.30.65.152		
😚 es:	🗈 esxi.video54.local - Virtual Machines								
						_			
1	I Create / Register VM \mid 📑 Console 📋 🕨 Power on 🗧 Shu	it down	Suspend	Refres	h	¢.	Actions		
	Virtual machine	~	Status	~	Use	S D	vSPoT2-2.4.4-TO-2.5.1_VMSnapshot_Experiment		
			-			-	Power >>		
	2 vSPoT2-build-392_vmx_spot_3.5.0_mongo32_WT_soak		Question pen	ding	33.	6	Guest OS		
	vSPoT2-build-392-venue_load_test_vmx	•> Ts	ke snanshot			8	Snanshote		
	vSPoT2-build-392_vmx_Zsolt_perftest		ine snapsnot			4			
	vSPoT2-build-392_vmx_2.4.4-QIC_tapped	R R	estore snapshot			5	Console		
	🔁 vSPoT2-2.5.1-build-341_vmx	🕼 М	anage snapshots			6	Autostart		
	IVSPoT2-2.5.1-build-342_vmx	🙆 C	onsolidate disks			8	Upgrade VM Compatibility		
	VSPoT2.QIC.2.5.1.UPGRADE.SOAK.TEST		Normal		249	12	Export		
	VSPoT2-2.4.4-TO-2.5.1_VMSnapshot_Experiment		📀 Normal		24.		-		

- 4. To start the restore click the **Restore** button in the pop-up confirmation window.
- 5. Check the state of the snapshot restoration from the **Recent tasks** panel at the bottom panel. Your vSPoT restored instance should be up and running on successful completion.

Figure 40: View the Restored Snapshot

				7						mot@172 30 65	152 - I Halo -		O Search	-
_		_								10010112.30.03.			Q Search	-
esxi.	video54.local - Virtual Mach	ines												
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60 C	Create / Register VM 📑 C	Conse	ble 🕨 Powe	on EShut	down II Suspen	d C Refres	sh 🚭 Act	ions			(Q Searc	h	_
	Virtual machine				~ Status	~	Used space	~	Host name	~	Host CPU	~ H	ost memory	~
	VSPoT2-build-392_vmx_	spot,	3.5.0_mongo32	WT_soak	🚰 Quest	tion pending	33.15 GB		vspotapplia	nce	3 MHz	7.	89 GB	
	ysPoT2-build-392-venue	loa	d_test_vmx		Norm	al	12.25 GB		vspotapplia	ince	68 MHz	6.	32 GB	
	build-392_vmx_	Zsolt	perftest		Norm	al	121.05 GB		vspotapplia	nce	15.5 GHz	15	5.94 GB	
	b vSPoT2-build-392_vmx_	2.4.4	-QIC_tapped		Norm	al	204.99 GB		Unknown		0 MHz	0	MB	
	B vSPoT2-2.5.1-build-341	,vmx			Norm	al	3.68 GB		Unknown		0 MHz	0	MB	
	B vSPoT2-2.5.1-build-342	vmx			Norm	al	3.58 GB		Unknown		0 MHz	0	MB	
	VSPoT2.QIC.2.5.1.UPGR	ADE.	SOAK.TEST		Norm	al	249.6 GB		vspotapplia	nce	6.9 GHz	11	1.91 GB	
2	B vSPoT2-2.4.4-TO-2.5.1_	VMS	napshot_Experim	ent	Norm	al	24.99 GB		vspotapplia	ince	24 MHz	3.	48 GB	
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	Normanian NG 1200 CONTRACTORIA Anna A	vS	PoT2-2.4.4-T	0-2.5.1_VMS	napshot_Experi	iment							CP	
	The Area and a second s	Gu	noatibility	ESXI 5.5 and	7 (64-bit) ater (VM version 10)								24 MH	<u>،</u> ۱
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lece	ent t yks													
		~	Target	Ý	Initiator	Queued	~	Started	~	Result		~	Completed	۳
rt To	Current Snapshot		VSPoT2-2.4.4-	ro-2.5.1_VMS	root	07/04/2016 18	5:36:08	07/04/2016 15	:36:08				Running 9	5 %
vire C	im Services Ticket		esxi.video54.local		VC Internal	07/04/2016 18	5:34:42	07/04/2016 15	:34:42	Completed su	coessfully		07/04/2016	5:34
roy			Corecs_produc	tion_vmware_o	root	07/04/2016 18	5:30:20	07/04/2016 15	:30:20	Completed su	coessfully		07/04/2016	5:30
			The correct produc	tion unsume o	mot	07/04/2016 10	50.02	07/04/0010 15	00.00	O Completed au	coase fully		07/04/2016	10.00

vSPoT on AWS Upgrade

Virtual SPoT in AWS can be upgraded with the following steps for version 2.4.4 to 3.x latest.

CAUTION! This upgrade process will result in application downtime due to the need for data migration across different and incompatible storage engines. During the migration process, vSPoT should not be running, otherwise data could be lost during migration.

Prerequisite

You are required to get full administration access to AWS billing account and management console.

Upgrade Procedure

The following are the steps for upgrading vSPoT in AWS for version 2.4.4 to 3.x.

Backup the Current vSPoT

This section describes the procedure to backup the current vSPoT.

- 1. Login to the AWS EC2 management console and obtain the identifier **INSTANCE ID** of your vSPoT instance, which is in the format *i-ffffffff*.
- 2. Navigate to Elastic Block Store > Volumes to search for volumes using the identifier INSTANCE ID obtained in Step 1. In this example, the identifier is *i-baf7cda2*.

Figure 41: Create Snapshot

🎁 AWS - Serv	ices 🗸 🛛 Edit 👻				
EC2 Dashboard	Create Volume	Actions V			
Events 4					
Tags	Q search : i-b	af7cda2 💿 Add filter			
Reports					
Limits	Name	✓ Volume ID ✓	Size Volume Type	IOPS -	Snapshot
INSTANCES		vol-a490fa16	Delete Volume	00 / 3000	snap-354d79cf
Instances		vol-d98d3d6d		00 / 3000	snap-41063f6c
Spot Requests			Detach Volume		
Reserved Instances			Force Detach Volume		
Scheduled Instances			Create Snapshot		
Dedicated Hosts			Change Auto-Enable IO Setting		
IMAGES			Add/Edit Tags		
AMIs					
Bundle Tasks					
ELASTIC BLOCK STORE					
Volumes					
Snapshots					

- 3. Select the vSPoT instance and right-click to select Create Snapshot.
- **4.** After snapshot creation is triggered, the process will run in the background. You can proceed to the next step.

Venue Identifiers

After a successful backup of the vSPoT instance, ensure you have an updated list of Venue identifiers. This is required during migration.

Download vSPoT 3.x Template

Download the latest **Ruckus vSPoT Software Release** template for AWS from (https://support.ruckuswireless.com)

Figure 42: Download Details

Software Image Download for vSPoT 3.2.0 The software is now available for download from the AWS website:
 Click 'releases' Click 'vspot-3.2.0' Download the VM Image: https://s3.amazonaws.com/ruckuslbs-vspot/releases/vSPoT-3.2.0/<u>vSPoT-3.2.0-build-985.tar</u> The .md5 file that contains the checksum: https://s3.amazonaws.com/ruckuslbs-vspot/releases/vSPoT-3.2.0/vSPoT-3.2.0/vSPoT-3.2.0-build-985.md5
NOTE: There will not be a container image released for vSPoT 3.2.0 as this release requires a full upgrade for the Host OS

Stop vSPoT Server

Stop the existing server running vSPoT version 2.4.4 by using the following CLI commands.

NOTE Ensure you have the IP address and SSH private key file for accessing your AWS EC2 instance.

1. Refer to Accessing vSPoT using AWS CLI on page 32 to login using SSH to the vSPoT AWS EC2 instance host operating system (Host OS). Enter the vSPoT docker container.

```
ssh centos@IP_ADDR -i $SSH_PRIVATE_KEY_FILE
centos@ip-addr:~$ spot enter
```

2. Shut down all the running services other than Mongod server.

```
root@vspot:~# stop rk-venue
root@vspot:~# stop resque
root@vspot:~# service nginx stop
```

Backup the MongoDB

Backup the MongoDB data directory and clean the existing MongoDB data directory contents with the following steps.

1. From the vSPoT docker container, download the Ruckus vSPoT AWS S3 migration scripts, and give it execution rights.

```
admin@vspotappliance:~$ spot enter
root@vspot:~# wget -0 /storage/vspot_venue_dump.sh
https://s3-us-west-2.amazonaws.com/ruckuslbs/public/vspot/vspot_venue_dump.sh
root@vspot:~# wget -0 /storage/vspot_venue_restore.sh
https://s3-us-west-2.amazonaws.com/ruckuslbs/public/vspot/vspot_venue_restore.sh
root@vspot:~# wget -0 /usr/bin/mongodump32
https://s3-us-west-2.amazonaws.com/ruckuslbs/public/vspot/mongodump32
root@vspot:~# chmod +x
/storage/{vspot_venue_dump.sh,vspot_venue_restore.sh}
/usr/bin/mongodump32
```

2. Backup the MongoDB data for a specified venue (example *rksg-dev*) by using the below procedure.

NOTE If you have more than one venue to migrate, repeat this step for each venue as per your list of Venue Identifiers on page 66.

```
root@vspot:~# bash /storage/vspot_venue_dump.sh rksg-dev
--full-dump
```

3. Verify the existence of non-empty archive file.

```
root@vspot:~#ls -lah /storage/rksg-dev dump.tar.gz
```

Remove Redis Append Only File (AOF)

Upgraded version of vSPoT does not use Redis AOF.

1. This must be removed to prevent data corruption during Redis server startup by executing the following command:

```
root@vspot:~# rm -f /storage/redis/data/rk venue.aof
```

Prepare the Existing MongoDB Data Directories

Prepare existing MongoDB data directories by executing the following commands.

 From vSPoT Host OS, enter vSPoT docker container and stop the MongoDB server process.

```
admin@vspotappliance:~$ spot enter
root@vspot:~# service mongod stop
```

2. Prepare a new MongoDB data directory from the vSPoT docker container and a new working directory.

```
root@vspot:~# mv /storage/mongo /storage/mongo24
root@vspot:~# mkdir -p /storage/mongo/{data,log}
root@vspot:~# chown mongod:mongod -R /storage/mongo
```

3. Exit back to vSPoT Host OS and shut down vSPoT docker container.

```
admin@vspotappliance:~$ spot stop 244
```

Remove vSPoT 2.4.4. Stack Template

CAUTION! Do not delete the detached storage volume from AWS EC2 management console.

1. Refer to Deleting vSPoT on AWS on page 35 to remove the vSPoT 2.4.4 stack. This will also detach the storage volume. Do make a note of the storage volume identifier for later use.

Create a new EC2 Instance with vSPoT 3.x Stack Template

To create a new EC2 instance:

Select Template							
Select the template that describes the stack that you want to create. A stack is a group of related resources that you manage as a single unit.							
Design a template Use AWS CloudFormation Designer to create or modify an existing template. Learn more. Design template							
Choose a template	A template is a JSON-formatted text file that describes your stack's resource	es and their properties. Learn more.					
	Select a sample template						
	\$						
	Upload a template to Amazon S3						
г							
	Speciry an Amazon S3 template UHL						
	s://s3-us-west-2.amazonaws.com/	View in Designer					

Figure 43: Specifying Options in the Template

Migrate Data to New Storage Engine Format

Migrate MongoDB data to be compatible with the new storage engine used in vSPoT 3.x by following the below procedure.

1. Check vSPoT 3.x docker container is running by running the command:

```
centos@ip-addr:~$ spot list
```

2. Shut down all the running services other than Mongod server.

```
centos@ip-addr:~# spot enter
root@vspot:~# systemctl stop rk-venue.target
root@vspot:~# systemctl stop resque.target
root@vspot:~# service nginx stop
root@vspot:~# service redis-rk_venue stop
root@vspot:~# service redis-rk_system stop
root@vspot:~# service mosquitto stop
```

3. Check that all processes that was stopped in the above step have been terminated.

```
root@vspot:~# ps -ef | grep -E 'ruby|redis|mosquitto|nginx'
| grep -v grep
```

NOTE If any process is returned, repeat the commands to shutdown the processes.

Restore the Data

Restore the MongoDB data with the following steps.

1. Run the data restore script to first restore the MongoDB data, then subsequently create database indexes.

NOTE This may take a long time to complete, based on the migration data set.

```
root@vspot:~# bash /storage/vspot_venue_restore.sh
/storage/rksg-dev dump.tar.gz
```

NOTE If you had previously exported more than one venue, you will need to repeat this data restore step for each venues as per your list of venue identifiers.

Verify Successful Migration

Start the required services for verification.

```
root@vspot:~# service mosquitto start
root@vspot:~# service redis-rk venue start
```

```
root@vspot:~# service redis-rk_system start
root@vspot:~# service nginx start
```

View and validate application state from http://<vSPoT VM IP>:8443. Check the application version, and its ability to login to vSPoT version 3.x administration dashboard using a valid user account and admin account.

Start Data Services

Start the data services and background services.

```
root@vspot:~# systemctl start rk-venue.target
root@vspot:~# systemctl start resque.target
```

NOTE This will begin to receive live data from the access points.

From the Admin pages, validate the data presence of radio maps, access points, venues, etc. From the analytics page, verify real-time and historical data (heat maps and daily visit counts).

Clean Directories and Backup Snapshots

After successfully migrating to vSPoT version 3.x follow the below procedure.

1. Clean the earlier database directory by running the below command.

admin@vspotappliance:~\$ sudo rm -fr /storage/mongo24

- 2. Exit from the SSH terminal session.
- You may want to delete or cleanup your EC2 EBS snapshots after you have ascertained that the upgrade is successful and you may no longer need to revert to the previous version of vSPoT VM.

Re-Import vSPoT License File

Re-import the vSPoT license to get the full working license purchased for your vSPoT instance.

Rolling Upgrade for vSPoT 3.x to latest

The rolling upgrade functionality provides a simplified and faster application upgrade procedure for an existing vSPoT deployment.

This feature removes the need for any post-configuration steps. For example, IP address or NTP server configuration for a vSPoT upgrade. For example, IP address or NTP server configuration for a vSPoT upgrade.

NOTE Rolling upgrades was introduced from 2.4.0 release and continues to 3.x. and later releases.

This procedure can be used to upgrade vSPoT 3.x to the latest version of vSPoT. However, if you are upgrading from vSPoT 2.4.0 to vSPoT 3.x, Ruckus Wireless highly recommends that you perform a Full Upgrade on page 58 to take advantage of the security and performance improvements to the Host OS.

NOTE To upgrade to vSPoT 3.2, perform a full upgrade.

vSPoT Architecture

From 2.4.x releases, the new vSPoT internal architecture (as seen in the figure below) relies on docker container technology, which provides a means to decouple the virtual machine (VM) runtime environment from the vSPoT application. Each vSPoT application version is distributed as a separate container image and additional CLI tools are provided to enable switching between different vSPoT application versions. Due to network and storage configurations, at any given time only one application version can be active or running within a single vSPoT VM.





Prerequisites

The following are the prerequisites for using rolling upgrade.

- This upgrade procedure works with vSPoT version 2.4.0 and higher.
- This procedure is a CLI based solution, which requires a console or SSH access to the vSPoT VM.
- The license file needs to be uploaded after every upgrade.

Upgrade Procedure

Ensure you have a running vSPoT instance and follow these steps to upgrade vSPoT.

1. Login to the vSPoT console (see: Using the CLI Console on page 56). SSH to the vSPoT host operating system (Host OS) using the below command.

```
ssh admin@<vspot_host_os_public_ip>
```

- 2. Logout from the vSPoT web application.
- **3.** Navigate to the Ruckus support website https://support.ruckuswireless.com/ to obtain the download URL for the vSPoT application bundle
 - a. Login in with your user credentials (login name and password)
 - b. Navigate to vSPoT download section to locate the download URL for the application bundle image. For example, rolling upgrade for vSPoT 3.1.3 requires \${APPLICATION_BUNDLE_FILE} 'vspot-container-3.1.3-1037.tar.bz2 as seen in the figure below.

Figure 45: File Location



4. Click on the file name or the Download Software button to begin the application bundle download. Depending on your web browser, the download progress indicator will show up in the lower left corner, or appear as a pop-up window.

Figure 46: Software Download



- **5.** Transfer the application bundle to your vSPoT instance. There are two possible approaches:
 - a. Option A, If your vSPoT instance has Internet access
 - **a.** Open your web browser's download manager. You will see the download in progress.

Figure 47: Download Progress

Downloads			۹	
Today				
	vspot-container-3.1.3-1037.tar.bz2 https://ruckus-support.s3.amazonaws.com 0 B/s - 183 MB of 421 MB, Paused	Open Link in New Tab Open Link in New Window Open Link in Incognito Window		
	RESUME CANCEL	Save Link As Cogy Link Address		
		Codv		-

- **b.** Right-click on the download URL and select **Copy Link Address** from the pop-up menu.
- **c.** In a terminal console within the vSPoT Host OS, use the *wget* command and paste the download URL (using *Ctrl+V* or *Cmd+V*) within single-quotes. This will download the application bundle from within vSPoT Host OS.

admin@vspotappliance:~\$ wget `\${FILE_DOWNLOAD_URL}'

```
The FILE_DOWNLOAD_URL should look similar to:

'https://ruckus-support.s3.amazonaws.com/private/software/931/

vspot-container-3.1.3-1037.tar.bz2?AWSAccessKeyId=AKIAJM3QLNNK-

LOV235TQ&Expires=1464965029&Signature=k9LS0cENQ5ooDa9HWW-

mPEdgGSr0%3D'
```

NOTE The download URL needs to be placed within single quotes in the command line. An incorrect download URL will result in a '403 Forbidden' error.

NOTE As a security feature, the download URL is only valid for the next 15 minutes from the time of starting the download. You should download the application bundle immediately.

If you encounter an expiry notification, you will need to restart the download process from Step 4, which is to press the *Download Software* button again to generate a new download URL.

- **b.** Option **B**, If your vSPoT instance does not have Internet access, but your local machine has Internet access
 - a. Wait for the file download (initiated in Step 4) to complete.
 - b. Use a file transfer client (SCP or SFTP) to copy the application bundle to your vSPoT instance home directory. If you are using Windows, you can use WinSCP (https://winscp.net)

\$ scp \${APPLICATION BUNDLE FILE} admin@VSPOT IP ADDR

- **6.** Verify vSPoT application bundle by navigating to the home directory of your vSPoT Host OS. The application bundle file should be present in this directory.
- 7. Load the vSPoT application image from the new application bundle. This will take quite a few minutes.

```
admin@vspotappliance:~$ spot load ${APPLICATION_BUNDLE_FILE}
```

Figure 48: SPoT Application Image

8. Verify vSPoT images by executing the command:

```
admin@vspotappliance:~$ spot images
```

Figure 49: SPoT Images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
registry.internal.ruckuslbs.com/ruckus/vspot	3.1.3-1037	9076f4c70a63	7 days ago	1.463 GB
registry.internal.ruckuslbs.com/ruckus/vspot	3.0.0-863	9cf108e16fd7	5 weeks ago	1.483 GB

9. Verify the current running vSPoT application version. This should be lower than the new vSPoT application version that you have just loaded.

```
admin@vspotappliance:~$ spot list
```

Figure 50: SPoT List

CONTRINER ID	IMAGE	COMMAND	CREATED	STATUS
PORTS		NAMES		
826e797fda1d	registry.internal.ruckuslbs.com/ruckus/vspot:3.0.0-863	"/bin/sh -c /sbin/i	ni" 6 minutes ago	Up б minutes
0.0.0.0:80-	>80/tcp, 0.0.0.0:8442-8443->8442-8443/tcp, 0.0.0.0:8883->	8883/tcp vspot300	-	

In this example, the current running vSPoT application version number is 3.0.0-863, and the most recent application version is 3.1.3-1037.

10. Stop the current running vSPoT application by using the application version number.

admin@vspotappliance:~\$ spot stop 3.0.0-863

11. Start the new vSPoT application.

admin@vspotappliance:~\$ spot start 3.1.3-1037

12 Verify the currently running application version.

```
admin@vspotappliance:~$ spot list
```

Figure 51: SPoT List

CONTRINER ID	IMAGE	COMMAND	CREATED	STATUS
PORTS		NAMES		
e130d7133493	registry.internal.ruckuslbs.com/ruckus/vspot:3.1.3-1037	"/bin/sh -c /sbin/i	ini" 7 seconds ago	Up 5 seconds
0.0.0.0:80-	>80/tcp, 0.0.0.0:8442-8443->8442-8443/tcp, 0.0.0.0:8883->8	3883/tcp vspot313		

- **13** Login to the vSPoT web application Administration user interface and upload the licenses.
- 14. Verify that the new vSPoT application works correctly by ensuring that the:
 - a. Access Points on the Administration user interface indicate a green status
 - **b.** Analytics user interface shows real-time heat maps and historical charts such as unique visitors.
- **15.** Delete any outdated vSPoT application images based on the image identifier. In this example, the outdated application image tag is 3.0.0-863 and the image identifier to remove it is 9cf108e16fd7.

admin@vspotappliance:~\$ docker rmi \${IMAGE ID}

16. Verify the current available application images by executing the command:

```
admin@vspotappliance:~$ spot images
```

Upload and Rollback of Self Signed SSL Certificate

From vSPoT version 3.3 onwards, vSPoT ships with a default temporary unverified SSL certificate for HTTPS support. This section gives you the procedure for replacing the default certificate with a valid CA (Certificate Authority) signed SSL certificate.

For vSPoT installations accessed with FQDN (Fully Qualified Domain Name) or DNS hostname (for example, https://www.vspot.ruckuslbs.com), it is mandatory to update with a C.A. signed SSL certificate corresponding to their domain or sub-domain name. Without a valid SSL certificate for the domain name, it may not be possible to access the vSPoT login page using the FQDN URL. However, you can still access vSPoT using its IP address (for example, https://54.206.20.234).

CAUTION! This upgrade process will restart the *nginx* process, which could cause a system server failure during startup if the certificate related files are invalid or corrupt. Do ensure necessary arrangements are made for required downtime of vSPoT admin dashboard.

Prerequisites

- 1. Network port 443 needs to be open on the corporate firewall.
- 2. Valid SSL certificate files (*.key, *.crt) are required.
- 3. Valid intermediate CA certificates (*.crt) if any.

Update the SSL Certificate

Follow the below steps to update the SSL certificate.

1. Check vSPoT 3.3.x docker container is running by using the below command.

```
admin@vspotappliance:~$ spot list
```

admin@vspotappliance:~\$ spot list				
CONTAINER ID IMAGE	COMMAND	CREATED	STATUS	PORTS
NAMES				
e38dc222d08b registry.internal.ruckuslbs.com/ruckus/vspot:3.2.2-5-g86a5c2a-139	"/bin/sh -c /sbin/ini"	18 hours ago	Up 29 minutes	0.0.0.0:80->80/tcp, 0.0.0.0
:443->443/tcp, 0.0.0.0:8442-8443->8442-8443/tcp, 0.0.0.0:8883->8883/tcp vspot322				
admin@vspotappliance:~\$				

2. If you have a domain SSL certificate with intermediate CA certificates, you would need to merge them as one certificate file using your local machine.

```
bash:~$ cat vspot.client.com.crt intermediate_ca.crt >
my.crt
```

This merged certificate file (in this example, *my.crt*) should be used as the *.crt file in the next step.

NOTE If the intermediate certificates are not merged with the issued SSL certificate, the trusted-chain certificate might not be established. This means that when users attempt to access the site, errors such as *Security Alert* or *Not Secure* can been seen in the site's certificate chain.

 From your local machine, copy the SSL certificate files *.key and *.crt file (merged certificate file in case of intermediate CA's) to the vSPoT host machine's home directory. For example, */home/admin/ssl/*.

```
bash:~$ scp my.crt admin@VSPOT_IP_ADDR:/home/admin/ssl
```

bash:~\$ scp my.key admin@VSPOT_IP_ADDR:/home/admin/ssl

 SSH into your vSPoT host machine to run the following command to update the SSL certificate. Ensure the order of the files as per the below example.

```
admin@vspotappliance:~$ spot config ssl-upload
/home/admin/ssl/my.crt /home/admin/ssl/my.key
```

admin@vspotappliance:~\$ spot config ssl-upload /home/admin/ssl/my.crt /home/admin/ssl/my.key Restarting nginx (via systemctl): [OK] admin@vspotappliance:~\$

- 5. Open the vSPoT URL (in this example, https://54.206.20.234) in a web browser to verify whether the *nginx server* is working with the updated certificate.
- 6. For vSPoT installations accessed with FQDN or DNS hostname (for example, https://www.vspot.ruckuslbs.com), access the domain name in a web browser to verify if the browser accepts the updated SSL certificate as a valid certificate. For example, on Google Chrome it is seen as a green lock icon. Other browser exhibit it differently.
- 7. You should be able to view the vSPoT login page to login using the user credentials.

Rollback the Updated SSL Certificate

This step is useful in case the updated SSL certificate fails to bring up the vSPoT login page. Run the following command to rollback to the default SSL certificate.

admin@vspotappliance:~\$ spot config ssl-rollback

```
admin@vspotappliance:~$ spot config ssl-rollback
Restarting nginx (via systemctl): [ OK ]
admin@vspotappliance:~$ ■
```

How to Increase vSPoT Historical Data Collection Capacity

If you need to increase the capacity of vSPoT to store historical data for a longer period of time, you can use the procedure in this section.

If you need to increase the capacity of vSPoT to store historical data for a longer period of time, you can use the following procedure.

Change the Volume Size on the vSPoT Instance

- On VMware Installation
- On AWS Installation

On VMware Installation

1. First, make sure your vSPoT instance is in the power off state (see Initialize shutdown command in case the vSPoT virtual machine is still running).

Figure 52: Make sure vSPoT is powered off

vSPoT-version-355_vmx	C_1.6.0 Actions -	'E*
Getting Started Summary	Monitor Manage Related Objects	
Powered Off	vSPoT-versionvmx_1.6.0 Guest OS: Other Linux (64-bit) Compatibility: ESX/ESXI 4.0 and later (VM version 7) VM ware Tools: est Managed) DNS Name: IP Addresses:	CPU USAGE 0 Hz MEMORY USAGE 0 B STORAGE USAGE 6.25 GB
Launch Console Open with VMRC 1 Download VMRC 1	Host:	

2. Click the Edit settings link.

Figure 53: Click Edit Settings

vSPoT-version-355_vmx_1.6.0 Actions -					
Getting Started Summ	ary Monitor Manage Related Obje	cts			
Powered Off Launch Console Open with VMRC ① Download VMRC ①	it) 1 later (VM version 7 ion:2147483647 (Gu	7) lest Managed)			
✓ VM Hardware		▼ VM Storage	Policies		
▶ CPU	4 CPU(s), 0 MHz used	VM Storage Po	licies		
Memory	4096 MB, 0 MB used	VM Storage Policy Complian			
Hard disk 1	19.72 GB	Last Checked Date			
Hard disk 2	1.2 GB				
Hard disk 3	100 GB				
Network adapter 1	VM Network (disconnected)	- Tags			
▶ Video card	4 MB	Assigned Tag	Category This list is e		
▶ Other	Additional Hardware		THIS HOLES		
Compatibility	ESX/ESXi 4.0 and later (VM version 7)				
	Edit Settings]			

3. Select Hard disk 3 and increase the storage size to the desired new size, e.g., 500GB. Please keep in mind that only "grow" operation is available on the storage resize.

Figure 54: Select Hard Disk 3 and choose new storage size

vSPoT-version-355_vmx_1.6.0 - Edit Settings			
Virtual Hardware VM Opt	ions SDRS Rules	vApp Options	
F 🔲 CPU	4	• 0	
Memory	4096	▼ MB ▼	
▶ 🛄 Hard disk 1	19.71875	GB V	
▶ 🛄 Hard disk 2	1.197265625	GB V	
▶ 🛄 Hard disk 3	100	GB 🗸	8
▶ SCSI controller 0	LSI Logic Parallel		
Network adapter 1	VM Network	🔹 🗹 Connect	
Video card	Specify custom se	ettings 🗸 👻	
VMCI device			
 Other Devices 			
▶ Upgrade	Schedule VM C	compatibility Upgrade	
New device:	Selec	t Add	
Compatibility: ESX/ESXi 4.0 and later (VM version 7) OK Cancel			

Figure 55: Choose, for example, 500 GB

Provide a straight of the setting and the					
Virtual Hardware VM Option	ons SDRS Rules	vApp Options			
▶ 🔲 CPU	4	• 0			
► III Memory	4096	▼ MB ▼			
▶ ☐ Hard disk 1	19.71875	GB V			
▶ ☐ Hard disk 2	1.197265625	GB v			
▶ 🛄 *Hard disk 3	500	GB V			
▶ G SCSI controller 0	LSI Logic Parallel				
Network adapter 1	VM Network	Connect	\otimes		
Video card	Specify custom sett	ings 🛛 🖵			
VMCI device					
 Other Devices 					
Upgrade	Schedule VM Cor	mpatibility Upgrade			
New device:	Select -	Add			
Compatibility: ESX/ESXi 4.0 and later (VM version 7) OK Cancel					

- 4. Click OK.
- 5. Power on the virtual machine using the Actions drop-down menu.

Figure 56: Power on the virtual machine

🔁 vSPoT-version-355_v	/mx_1.6.0	Actions -
Getting Started Summ	ary Monito	Actions - vSPoT-version-355_vmx_1.6.0
 Hard disk 2 Hard disk 3 	1.2 GB	Power On Shut Down Guest OS
 Network adapter 1 	VM Network	Restart Guest OS
 Video card Other 	4 MB Additional H	Take Snapshot 🕒 👔 Revert to Latest Snapshot
Compatibility	ESX/ESXi 4	Manage Snapshots Manage Snapshots Clone to Virtual Machine Cone to Template
Advanced Configuration		Edit Settings
EVC Mode N/A		Move To Rename
▼ Notes		Assign Tag (
		Alarms All vCenter Actions

- 6. Login to the vSPoT CLI. Refer to Accessing vSPoT using CLI
- 7. Execute the following CLI command

admin@vspotappliance:~\$ sudo resize2fs /dev/sdc

Managing Virtual SPoT Application How to Increase vSPoT Historical Data Collection Capacity

Managing Virtual SPoT Application How to Increase vSPoT Historical Data Collection Capacity

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