COMMSCOPE®
RUCKUS®

Ruckus LTE AP Support Guide SC 04.01.00

Copyright, Trademark and Proprietary Rights Information

Contents

Preface

Document Conventions

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

TABLE 1 Text Conventions

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

Notes, Cautions, and Safety Warnings

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

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

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

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

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

Command Syntax Conventions

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

Convention	Description
bold text	Identifies command names, keywords, and command options.

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

Document Feedback

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

You can email your comments to RUCKUS at #Ruckus-Docs@commscope.com.

When contacting us, include the following information:

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

For example:

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

RUCKUS Product Documentation Resources

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

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

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

Online Training Resources

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

Contacting RUCKUS Customer Services and Support

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

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

What Support Do I Need?

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

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

Open a Case

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

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

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

Self-Service Resources

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

- Technical Documentation—https://support.ruckuswireless.com/documents
- Community Forums—https://forums.ruckuswireless.com/ruckuswireless/categories
- Knowledge Base Articles—https://support.ruckuswireless.com/answers
- Software Downloads and Release Notes—https://support.ruckuswireless.com/#products_grid
- Security Bulletins—https://support.ruckuswireless.com/security

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

About This Document

Purpose of the Document

This document provides information on Ruckus Command Line Interface and KPI Visualization tool. It provides details of CLI commands and guidelines to create, save, and print various reports and graphs using KPI Visualization GUI.

Audience

The target audience for this document is Ruckus LTE AP users.

Related Document

Ruckus LTE AP KPI Reference Guide

Command Line Interface

Overview of Command Line Interface

The Ruckus LTE AP Command Line interface (CLI) is a software tool that enables you to configure and manage LTE APs.

Using the Command Line interface, you can issue commands from an operating system prompt, such as the Microsoft Windows command prompt or a Linux operating system terminal. Each command performs a specific action for configuring device settings or returning information about the status of a specific device feature.

This section describes the Ruckus LTE AP Production CLIs and the requirements for accessing these CLIs.

Production CLI

Based on the network from which CLI is invoked, CLI can operate either as a Production CLI or a Debug CLI. Production CLI provides a limited set of commands when the CLI is invoked from the Enterprise network. On the other hand, if, CLI is invoked from Management Cloud network, a debug CLI with a comprehensive list of commands is invoked. At any given point of time, only one instance of CLI can be invoked per LTE AP.

Requirements

To access the LTE AP CLI, you need the following:

- A computer that you want to designate as administrative computer.
- A network connection to LTE AP.
- An RS-232 serial cable (type depends on the model).

> **NOTE**
> It is optional.

- An SSH (secure shell) client program.

Development CLI

D-CLI is available only in development images of RSC. For all the RSC development images, an extended list of commands is supported to help the Ruckus Engineering and Support team to debug different functionalities and operations of RSC. D-CLI remains always active and accessible when RSC is running.

D-CLI access control is based on a fixed username/password (super/sp-admin). Since the scope of D-CLI is limited to development images, a fixed password is acceptable from the security viewpoint.

D-CLI supports an extended list of debug capabilities which can allow the RSC Engineering or Support teams to read/write any or every parameter on RSC. List D-CLI capability is defined separately as part of the development process.

NOTE

You can launch only one CLI instance per RSC.

SCTP MTU

To check the current SCTP path MTU discovered and set for S1AP.

Syntax

get LteS1SctpPMTU

Examples

```
RSC_D-CLI #>get LteS1SctpPMTU
------------------------------
SCTP Path MTU : 1412
------------------------------
```

Access to LTE AP Command Line Interface

The LTE AP Command Line Interface can be accessed in one of the two ways:

- Using SSH
- Using a Serial Connection

Using SSH

Ensure that the administrative computer and LTE AP are on the same subnet or broadcast domain.

To start and configure the SSH client, perform the following steps.

1. Start PuTTY.

   The **PuTTY Configuration** dialog box appears showing the Session screen.

2. In the **Connection Type** field, select SSH.

3. In the **Host Name (or IP address)** field, enter the LTE AP IP address.

4. Click **Open**.

   The **PuTTY console** appears displaying the login prompt.

5. After successful login to the terminal, write LTE_CLI and press **Enter** to launch the CLI.

6. To access LTE AP P-CLI from enterprise network, at the Login prompt, type "super" as the default username and press **Enter.**

Using a Serial Connection

To start and configure the SSH client, perform the following steps.

1. Start PuTTY.

   The **PuTTY Configuration** dialog box appears showing the Session screen.

2. In **Connection** type, select **Serial** if you are connecting through serial cable.

3. Click **Open**.

   The **PuTTY Console** appears displaying the login prompt.

4. After successful login to the terminal, write RSC_CLI and press **Enter** to launch the CLI.

5. To access LTE AP P-CLI from enterprise network, at the Login prompt, type "super" as the default username and press **Enter.**

Debug CLI

When user accesses CLI via management cloud network then a login prompt is displayed.

Based on the login used, the commands available to the user differs. Following logins are currently supported:

1. super - with this login the user is provided a detailed set of commands.
2. user - with this login the user is provided only a subset of commands. The list of commands is similar to the commands provided to the user in the P-CLI

D-CLI access using SSH from the Cloud Network

Ensure that the administrative computer is in the Cloud network.

To access the D-CLI, perform the following steps:

1. Start PuTTY.

   The PuTTY configuration dialog box displays `Session` screen.

2. In the **Connection Type** field, select **SSH**, In the **Host Name or IP address** field, enter the **Virtual IP address** of the AP.
3. Click **Open**.

   The PuTTY console displays the login prompt. Write **RSC_CLI** and and press **Enter** to launch the CLI.

4. At the **Login** prompt, type the login name **super/user**.
5. At the **Password** prompt, enter the **password**. The PuTTY displays Ruckus LTE AP CLI interface welcome message and the Ruckus prompt.

Top-Level P-CLI Commands

The following table lists the top-level CLI commands available in the privileged mode.

TABLE 2 Top Level Commands

Command	Description
Get	To get the status/statistics.
Set	To configure/change LTE AP parameters.
Control	Control commands.
exit	Ends the CLI session.
help	Shows available commands.

Get Commands

The following are Get commands for Production CLI.

TABLE 3 Dynamic Host Configuration Protocol (DHCP) Parameters

Syntax	Get DHCPParams
Description	To get details of IP Address, Subnet mask, Gateway IP and DNS server IPs of all the LTE AP interfaces. This command takes no input.

TABLE 3 Dynamic Host Configuration Protocol (DHCP) Parameters (continued)

Supported Modes	PCLI
Example	RSC_P-CLI #>Get DHCPParams -- -- InternetGatewayDevice.X_001392_DhcpParams.EpcPlaneDNSServerAddress1 = 10.203.171.38 InternetGatewayDevice.X_001392_DhcpParams.EpcPlaneDNSServerAddress2 = 172.19.61.3 InternetGatewayDevice.X_001392_DhcpParams.EpcPlaneDNSServerAddress3 = 192.168.151.46 InternetGatewayDevice.X_001392_DhcpParams.EpcPlaneGatewayIpAddress = 192.168.151.1 InternetGatewayDevice.X_001392_DhcpParams.EpcPlaneIpAddress = 192.168.151.122 InternetGatewayDevice.X_001392_DhcpParams.EpcPlaneSubnetMask = 255.255.255.0 InternetGatewayDevice.X_001392_DhcpParams.MgtPlaneDNSServerAddress1 = 10.203.171.38 InternetGatewayDevice.X_001392_DhcpParams.MgtPlaneDNSServerAddress2 = 172.19.61.3 InternetGatewayDevice.X_001392_DhcpParams.MgtPlaneDNSServerAddress3 = 192.168.151.46 InternetGatewayDevice.X_001392_DhcpParams.MgtPlaneGatewayIpAddress = 192.168.151.1 InternetGatewayDevice.X_001392_DhcpParams.MgtPlaneIpAddress = 192.168.151.122 InternetGatewayDevice.X_001392_DhcpParams.MgtPlaneSubnetMask = 255.255.255.0 InternetGatewayDevice.X_001392_DhcpParams.PtpPlaneDNSServerAddress1 = 10.203.171.38 InternetGatewayDevice.X_001392_DhcpParams.PtpPlaneDNSServerAddress2 = 172.19.61.3 InternetGatewayDevice.X_001392_DhcpParams.PtpPlaneDNSServerAddress3 = 192.168.151.46 InternetGatewayDevice.X_001392_DhcpParams.PtpPlaneGatewayIpAddress = 192.168.151.1 InternetGatewayDevice.X_001392_DhcpParams.PtpPlaneIpAddress = 192.168.151.122 InternetGatewayDevice.X_001392_DhcpParams.PtpPlaneSubnetMask = 255.255.255.0 --

TABLE 4 Local SCR Query

Syntax	Get LocalSCRQuery
Description	To get details of the local LTE AP configuration. It provides information about the management cloud IPSec server and HeMS IP addresses. This command takes no input.
Supported Modes	PCLI
Example	RSC_P-CLI #>Get LocalSCRQuery -- -- InternetGatewayDevice.ManagementServer.URL = http://10.98.63.202:8080/ftacs/ACS -- -- InternetGatewayDevice.X_001392_FAPMgmtSecGW.SecGWServer1 = 104.197.162.14 InternetGatewayDevice.X_001392_FAPMgmtSecGW.SecGWServer2 = InternetGatewayDevice.X_001392_FAPMgmtSecGW.SecGWServer3 = --

TABLE 5 Alarm History

Syntax	Get AlarmHistory
Description	To display the historical details of past alarms.
Supported Modes	PCLI

TABLE 5 Alarm History (continued)

Example	RSC_P-CLI #>Get AlarmHistory
	--
	--
	InternetGatewayDevice.FaultMgmt.HistoryEvent.1.AdditionalInformation = Alarm is triggered when GPS session could not be maintained
	InternetGatewayDevice.FaultMgmt.HistoryEvent.1.AdditionalText =
	InternetGatewayDevice.FaultMgmt.HistoryEvent.1.AlarmIdentifier = 901
	InternetGatewayDevice.FaultMgmt.HistoryEvent.1.EventTime = 2017-10-01T01:26:27
	InternetGatewayDevice.FaultMgmt.HistoryEvent.1.EventType = Equipment Alarm
	InternetGatewayDevice.FaultMgmt.HistoryEvent.1.ManagedObjectInstance = eNB.Loc.gpsLost
	InternetGatewayDevice.FaultMgmt.HistoryEvent.1.NotificationType = ClearedAlarm
	InternetGatewayDevice.FaultMgmt.HistoryEvent.1.PerceivedSeverity = CLEARED
	InternetGatewayDevice.FaultMgmt.HistoryEvent.1.ProbableCause = Location source is missing or lost
	InternetGatewayDevice.FaultMgmt.HistoryEvent.1.SpecificProblem = GPS session could not be established or maintained
	InternetGatewayDevice.FaultMgmt.HistoryEvent.2.AdditionalInformation = Alarm is triggered when GPS session could not be maintained
	InternetGatewayDevice.FaultMgmt.HistoryEvent.2.AdditionalText = Location source is missing or lost.
	InternetGatewayDevice.FaultMgmt.HistoryEvent.2.AlarmIdentifier = 901
	InternetGatewayDevice.FaultMgmt.HistoryEvent.2.EventTime = 2017-10-01T02:42:48
	InternetGatewayDevice.FaultMgmt.HistoryEvent.2.EventType = Equipment Alarm
	InternetGatewayDevice.FaultMgmt.HistoryEvent.2.ManagedObjectInstance = eNB.Loc.gpsLost
	InternetGatewayDevice.FaultMgmt.HistoryEvent.2.NotificationType = NewAlarm
	InternetGatewayDevice.FaultMgmt.HistoryEvent.2.PerceivedSeverity = Major
	InternetGatewayDevice.FaultMgmt.HistoryEvent.2.ProbableCause = Location source is missing or lost
	InternetGatewayDevice.FaultMgmt.HistoryEvent.2.SpecificProblem = GPS session could not be established or maintained
	InternetGatewayDevice.FaultMgmt.HistoryEvent.3.AdditionalInformation = Alarm is triggered when GPS session could not be maintained
	InternetGatewayDevice.FaultMgmt.HistoryEvent.3.AdditionalText =
	InternetGatewayDevice.FaultMgmt.HistoryEvent.3.AlarmIdentifier = 901
	InternetGatewayDevice.FaultMgmt.HistoryEvent.3.EventTime = 2017-10-01T02:50:02
	InternetGatewayDevice.FaultMgmt.HistoryEvent.3.EventType = Equipment Alarm
	InternetGatewayDevice.FaultMgmt.HistoryEvent.3.ManagedObjectInstance = eNB.Loc.gpsLost
	InternetGatewayDevice.FaultMgmt.HistoryEvent.3.NotificationType = ClearedAlarm
	InternetGatewayDevice.FaultMgmt.HistoryEvent.3.PerceivedSeverity = CLEARED
	InternetGatewayDevice.FaultMgmt.HistoryEvent.3.ProbableCause = Location source is missing or lost
	InternetGatewayDevice.FaultMgmt.HistoryEvent.3.SpecificProblem = GPS session could not be established or maintained
	InternetGatewayDevice.FaultMgmt.HistoryEvent.4.AdditionalInformation = Alarm is triggered when GPS session could not be maintained
	InternetGatewayDevice.FaultMgmt.HistoryEvent.4.AdditionalText = Location source is missing or lost.
	InternetGatewayDevice.FaultMgmt.HistoryEvent.4.AlarmIdentifier = 901
	InternetGatewayDevice.FaultMgmt.HistoryEvent.4.EventTime = 2017-10-01T03:46:12
	InternetGatewayDevice.FaultMgmt.HistoryEvent.4.EventType = Equipment Alarm
	InternetGatewayDevice.FaultMgmt.HistoryEvent.4.ManagedObjectInstance = eNB.Loc.gpsLost
	InternetGatewayDevice.FaultMgmt.HistoryEvent.4.NotificationType = NewAlarm
	InternetGatewayDevice.FaultMgmt.HistoryEvent.4.PerceivedSeverity = Major

TABLE 6 Ping FQDN or IP Address

Syntax	Get ping <FQDN or IP address>
Description	To get the ping response for a given server FQDN or IP address. LTE AP must verify the provided administrator input for correctness before executing the command.
Supported Modes	PCLI
Example	RSC_P-CLI #>Get ping 192.168.151.1 64 bytes from 192.168.151.1: icmp_seq=1 ttl=255 time=5.97 ms 64 bytes from 192.168.151.1: icmp_seq=2 ttl=255 time=0.588 ms 64 bytes from 192.168.151.1: icmp_seq=3 ttl=255 time=0.596 ms 64 bytes from 192.168.151.1: icmp_seq=4 ttl=255 time=0.573 ms 64 bytes from 192.168.151.1: icmp_seq=5 ttl=255 time=1.35 ms --- 192.168.151.1 ping statistics --- 5 packets transmitted, 5 received, 0% packet loss, time 3999ms rtt min/avg/max/mdev = 0.573/1.817/5.971/2.098 ms <---------------HostName : 192.168.151.1 is pingable------------------->

TABLE 7 Diagnosis NS Lookup

Syntax	Diagnosis GetNslookup
Description	To get resolved FQDN IP.
Supported Modes	PCLI
Example	RSC_P-CLI #>Diagnosis GetNslookup --- --- InternetGatewayDevice.NSLookupDiagnostics.Result.1.AnswerType = NonAuthoritative InternetGatewayDevice.NSLookupDiagnostics.Result.1.DNSServerIP = 10.203.171.38 InternetGatewayDevice.NSLookupDiagnostics.Result.1.HostNameReturned = www.google-sas.com InternetGatewayDevice.NSLookupDiagnostics.Result.1.IPAddresses = 104.197.61.50,2600:1901:0:d53c:: InternetGatewayDevice.NSLookupDiagnostics.Result.1.ResponseTime = 30 InternetGatewayDevice.NSLookupDiagnostics.Result.1.Status = Success ---

TABLE 8 Traceroute FQDN or IP Address

Syntax	Get Traceroute <FQDN or IP address>
Description	To get the trace route of the FQDN or IP address.
Supported Modes	PCLI
Example	RSC_P-CLI #>Get Traceroute 172.19.61.42 traceroute to 172.19.61.42 (172.19.61.42), 30 hops max, 38 byte packets 1 192.168.151.1 (192.168.151.1) 7.565 ms 0.508 ms 0.507 ms 2 172.19.61.42 (172.19.61.42) 0.271 ms 0.242 ms 0.243 ms <---------------Traceroute of HostName : 172.19.61.42 Success-------------------->

TABLE 9 VLAN Configuration

Syntax	Get VLANConfig
Description	To show the VLAN configuration.
Supported Modes	PCLI
Example	RSC_P-CLI #>Get VLANConfig --- --- InternetGatewayDevice.Layer2Bridging.Bridge.1.VLAN.1.VLANEnable = false InternetGatewayDevice.Layer2Bridging.Bridge.1.VLAN.1.VLANID = 1 InternetGatewayDevice.Layer2Bridging.Bridge.1.VLAN.1.VLANName = MGMT InternetGatewayDevice.Layer2Bridging.Bridge.1.VLAN.2.VLANEnable = false InternetGatewayDevice.Layer2Bridging.Bridge.1.VLAN.2.VLANID = 1 InternetGatewayDevice.Layer2Bridging.Bridge.1.VLAN.2.VLANName = EPC InternetGatewayDevice.Layer2Bridging.Bridge.1.VLAN.3.VLANEnable = false InternetGatewayDevice.Layer2Bridging.Bridge.1.VLAN.3.VLANID = 1 InternetGatewayDevice.Layer2Bridging.Bridge.1.VLAN.3.VLANName = PTP --

TABLE 10 Bridge Configuration

Syntax	Get BridgeConfig
Description	To show the Bridge Configuration details.
Supported Modes	PCLI
Example	RSC_P-CLI #>Get BridgeConfig -- bridge name bridge id STP enabled interfaces

TABLE 11 Software Version

Syntax	Get SWVersion
Description	To get software version currently installed in the CPE.
Supported Modes	PCLI
Example	RSC_P-CLI #>Get SWVersion -- InternetGatewayDevice.DeviceInfo.SoftwareVersion = 02.00.01.0014.f79aa1cd64ea

TABLE 12 Current Alarms

Syntax	Get CurrentAlarms
Description	To display the current alarms that have been generated by controller.
Supported Modes	PCLI

TABLE 12 Current Alarms (continued)

Example	RSC_P-CLI #>Get CurrentAlarms

	InternetGatewayDevice.FaultMgmt.CurrentAlarm.1.AdditionalInformation = Received Indication from LTE for OP state is disabled
	InternetGatewayDevice.FaultMgmt.CurrentAlarm.1.AdditionalText = LTE Radio OP State is disabled
	InternetGatewayDevice.FaultMgmt.CurrentAlarm.1.AlarmChangedTime =
	InternetGatewayDevice.FaultMgmt.CurrentAlarm.1.AlarmIdentifier = 105
	InternetGatewayDevice.FaultMgmt.CurrentAlarm.1.AlarmRaisedTime = 2018-01-29T08:43:49
	InternetGatewayDevice.FaultMgmt.CurrentAlarm.1.EventType = E_LTE_OP_STATE_DISABLED
	InternetGatewayDevice.FaultMgmt.CurrentAlarm.1.ManagedObjectInstance = eNB.Lte.OPStateDown
	InternetGatewayDevice.FaultMgmt.CurrentAlarm.1.PerceivedSeverity = Minor
	InternetGatewayDevice.FaultMgmt.CurrentAlarm.1.ProbableCause = OP State is disabled
	InternetGatewayDevice.FaultMgmt.CurrentAlarm.1.SpecificProblem = LTE Radio OpState is disabled
	---

TABLE 13 Board Information

Syntax	Get BoardInfo
Description	To get information of the Board device.
Supported Modes	PCLI
Example	RSC_P-CLI #>Get BoardInfo

	InternetGatewayDevice.DeviceInfo.HardwareVersion = 52
	InternetGatewayDevice.DeviceInfo.ModelName = SKU B48: P01-Q910-US01
	InternetGatewayDevice.DeviceInfo.SerialNumber = 461629000067
	InternetGatewayDevice.DeviceInfo.X_001392_BoardInfo.AntennaType = Beam flex
	InternetGatewayDevice.DeviceInfo.X_001392_BoardInfo.NlType = In band
	InternetGatewayDevice.DeviceInfo.X_001392_BoardInfo.RegulatoryDomain = US
	InternetGatewayDevice.DeviceInfo.X_001392_BoardInfo.WlanEnabled = Disabled
	---

Set Commands

Following Set command is used for Production CLI.

TABLE 14 Default Hems URL and Default Gateway

Parameters	CloudSCRQuery
Syntax	Set CloudSCRQuery
Description	The command queries about SCR and provides information about the management cloud IPSec server and HeMS IP addresses. This command takes no input.
	NOTE
	The command is essentially a manually-invoked SCR query; the response from the SCR updates the LTE AP's data model.
Supported Modes	PCLI

TABLE 14 Default Hems URL and Default Gateway (continued)

Example	RSC_P-CLI #>Set CloudSCRQuery

	Command successful

TABLE 15 Diagnosis

Parameters	NA
Syntax	Diagnosis SetNslookup HostName www.google-sas.com
Description	The command diagnose FQDN and IP address.
Supported Modes	PCLI
Example	RSC_P-CLI #>Diagnosis SetNslookup HostName www.google-sas.com
	---

	Command successful

Control Commands

The following section provides information about the Control commands for Production CLI.

TABLE 16 Restart

Syntax	Control restart
Description	To restart the device.
Supported Modes	PCLI

TABLE 17 Factory Reset

Syntax	Control FactoryReset
Description	To reset LTE AP to factory defaults.
Supported Modes	PCLI

Exit Command

The following table describes the exit command.

TABLE 18 Exit Command

Syntax	exit
Description	To exit from the Command Line Interface.
Example	RSC_P-CLI #>exit

Help Command

Use the help command to display all commands that the Ruckus LTE AP CLI supports.

Using the "?" command or tab displays the list of commands that are available within a specific context.

For example:

To display commands within the debug context, enter the following command for tab:

RSC_P-CLI #>

Example of Help command:

RSC_P-CLI #>help

Control -- Control commands

Get -- To get status and statistics

Set -- To configure/change LTE AP parameters.

exit -- To exit from LTE AP CLI.

> **NOTE**
> Help command can be executed in sub-trees also.
> RSC_P-CLI #>control
> RSC_P-CLI Control#>help
> RESTART... -- To restart/shutdown LTE AP.
> FactoryReset... -- Factory Reset
> AdminState [--AdminState] <CHOICE true|false> -- To change the LTE AP Admin state.
> State… -- To exit from Control, write '.' or '..' or 'end' or 'back'.

Troubleshooting

Introduction

This section provides troubleshooting tips for resolving common issues while working with LTE Access Point (AP). All AP models have common software modules that can be used interchangeably. The document is valid for all the models.

After successful setup and commissioning, these APs are capable of transmitting 20 MHz bandwidth TDD-LTE and providing wireless coverage to relevant LTE devices.

Purpose of this document is to help users debug any setup and performance issues encountered during routine operation of the AP.

Each AP is powered by a managed PoE+ switch or a PoE injector (PoE+ desirable), or DC power adaptor (for Q710 AP) whichever is available.

APs are configured to send dhcp requests by default upon successful bootup. These rely on an external dhcp server to provide each AP, a routable IP address that will enable it to route and send connection requests to EMS (Ruckus Cloud), Network (EPC), Timing Master, and SAS.
Each AP can be configured to

- obtain its timing information from the GPS satellites, and assume the role of a Master PTP source for other APs in the network.

- assume a PTP slave role and obtain its timing information from another AP that is the designated Master (that's IP reachable) for that venue.

In the current system implementation, each venue can only have one AP assuming Timing Master source role. There can be a maximum of up to 32 devices acting as timing slaves per master. In addition, there may be multiple APs with timing source set as GPS satellites and can obtain their timing information directly via GPS satellites (if capable).

For an AP to obtain timing via GPS and/or function as Master timing source, place the AP such that it has direct line-of-sight view with open sky or as close to the outside facing windows or doors.

> **NOTE**
> The terms Ruckus LTE AP and LTE AP imply the same meaning and may be used interchangeably throughout the sections.

Reporting an Issue

Customers with a valid support contract can submit a support ticket request for further assistance to Technical Support through the Ruckus Support website:

https://support.ruckuswireless.com/contact-us

When reporting an issue, please provide the following information:

- AP model

- Description of the client device that has issues connecting or accessing the AP model

- Specific steps that led to the situation

In most cases, the Master AP's Debug info (saved from Administer >Diagnostics) would be helpful for problem analysis.

Initial Setup Issues

Q: I have installed my LTE AP, how do I configure the AP on Ruckus LTE AP Management environment?

The Management switch powers on the AP via PoE/power adapter and the AP obtains an IP address from the DHCP server. You must ensure that a DHCP server is configured to provide an IP address to the AP, and is reachable by the AP.

After powering on, Ruckus LTE AP seeks management platform environment connectivity. Ensure that this AP is added to the specific Venue and Network is applied to it on the management platform. For information on how to add an AP to a venue, refer to #unique_35.

By default, LTE AP Management initiates the following actions after an LTE AP connects:

- Checks the LTE AP software build version, and upgrade to most current version.
- Applies basic configuration (venue and network configuration, SAS Provider, and synchronization) to the LTE AP.
- Reports any alarms or events that occurred on the LTE AP.

Q: What is the sequence of AP bootup and various states of LTE AP indicated by LED illumination?

The following is the setup sequence for each AP:

PWR > EMS > SYNC > EPC > LTE

Review the following table to understand the different LTE AP states indicated by LED illumination and its approximate duration in each state along with any recommended corrective actions based on LED patterns observed during the initial AP/venue setup stage.

TABLE 19 LED Labels

LED Label	Time Duration	LED Color/Behavior	Corrective Action
PWR	Until corrective action is executed.	**OFF:** AP is not powered on.	Check the AP power source.
	Less than 5 minutes.	**RED:** Boot up in process. The LED remains red if AP does not successfully boot and begin operation.	If longer than 5 minutes, check adequate power is supplied (PoE+/ 802.3at), toggle the power source connection, check cables. If the LED is still RED, contact Ruckus support.
	Until corrective action is executed	**AMBER:** AP does not have sufficient Power levels	Check adequate power is provided through appropriate PoE cables.
	Few minutes. Until corrective action is executed.	**Slow-flashing GREEN:** AP does not have a routable IP address (IP address has not been allocated from a DHCP server).	If slow-flashing green is non-stop, check the DHCP settings as the LTE AP is unable to obtain an IP address.
	Perpetual (until default)	**SOLID GREEN:** AP has booted successfully and obtained a routable IP address.	No action is required.

TABLE 19 LED Labels (continued)

| LED Label	Time Duration	LED Color/Behavior	Corrective Action
EMS	Until PWR LED turns Solid Green.	**OFF:** AP is not being managed by an EMS (Ruckus LTE AP Management).	After PWR LED is in solid green, the EMS LED either starts**fast**-**flashing** green autonomously, or **solid green** immediately. If not, check the reachability of the LTE AP IP to the AP Management.
	Until IP reachability is resolved for LTE AP IP.	**Slow-flashing GREEN:** AP is unable to communicate with LTE AP Management/ EMS' SecGW.	Check the IP reachability to the Internet and LTE AP Management. Make sure that the AP is accurately created and added to a venue on LTE AP Management.
	Usually less than ~ 10-15 minutes.	**Fast-flashing GREEN:** AP is being managed by the EMS and is receiving a configuration or a firmware update.	Until the time required to download firmware or configuration. Depends on internet connection speed, do NOT unplug or change anything as this might corrupt the Ruckus Cloud LTE software and needs factory reset.
	Perpetual.	**SOLID GREEN:** AP is being managed by the EMS. For example, AP successfully connected to AP management.	EMS-AP connection should be always ON.
EPC	May be up to 60 minutes.	**OFF:** AP is not configured with the Network (EPC) connectivity information.	Make sure that the network configuration is accurate and a **Network** is turned ON for the AP **Venue**. Also, check the PTP status under **AP Details**. If unknown/ link lost EPC connection is not attempted, wait until the PTP sync is acquired which takes up to 60 minutes.
	~ few moments after ptp sync obtained AND S1 parameters match else see Corrective Action.	**Slow-flashing GREEN:** AP is unable to connect to the EPC.	Check if SecGW configuration is accurate (if enabled). Attempting S1 connection to MME but unable connect. Check the reachability or even if reachable, S1 is failing to establish. Check the S1 parameters on network settings. Note that the MME IP, PLMNID, TAC, and Cell ID have to be unique per venue.
	Perpetual	**SOLID GREEN:** AP is connected to the EPC.	
SYNC	Perpetual	**OFF:** Timing source is VCTXO/standalone.	**Stand-alone mode:** Removes Timing dependency for operation. No action needed.
	Until Corrective Action is executed.	**Slow-flashing GREEN:** Not Timing synced and the AP is not receiving a GPS signal, a macro cell signal (NL) or a PTP signal.	**Timing Master:** Check the line-of-sight visibility to Timing satellites. Place the AP closer to a window or open sky. **Timing Slave:** Check the IP reachability between the Timing Slave and the Timing Master.
	May be up to ~ 2 hrs. or more; depends on weather conditions and AP placement.	**Fast-flashing GREEN:** AP is in the process of acquiring sync, but has not yet acquired sync lock. AP is receiving a GPS signal or a PTP signal.	The sync process is dependent on the GPS signal strength and precision so it takes up to 2 hours. Avoid changing anything during this phase.
	Perpetual until sync is lost.	**GREEN:** Time synchronization achieved.	If sync synchronization lost, debug the IP connectivity or any other local issues.
LTE	Perpetual or until corrective action is executed.	**OFF:** LTE transmitter is disabled.	AP service is set to **OFF** on LTE AP Management or a Grant is not received from SAS to transmit. If the later is true, check the SAS availability, CBSD Registration parameters (SAS URL, CBSD User ID, and so on) under AP Properties > More.
	Perpetual until at least one UE registers with AP.	**AMBER:** LTE transmission is ON, no UEs are attached.	No UE is registered, check UE settings.
	Perpetual until all UEs de-register from AP.	**SOLID GREEN:** LTE transmission is ON and one or more UEs are attached to the cell.	—

Venue Status Check using Alarms

Q: How can I check status of a venue using alarms?

1. To check current venue conditions, go to Menu options on the left side of the screen and click **Venues**.

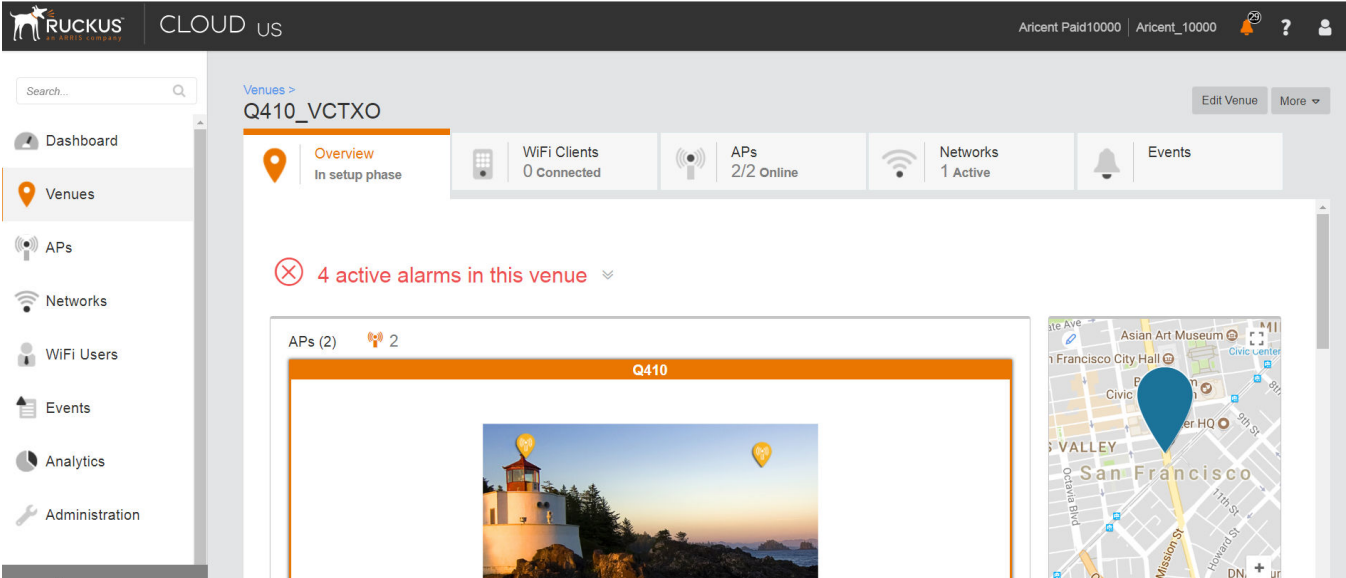   The **Venue** screen appears displaying the list of venues.

   FIGURE 1 Venue screen
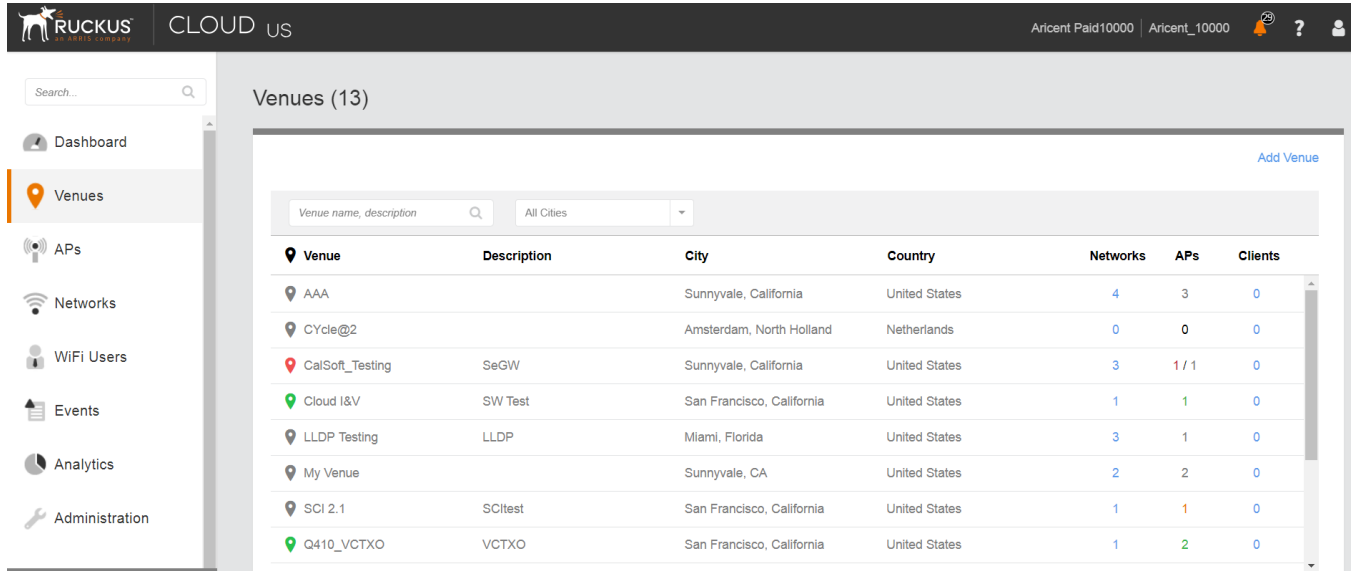
2. Click a specific venue for which you want to view the details.

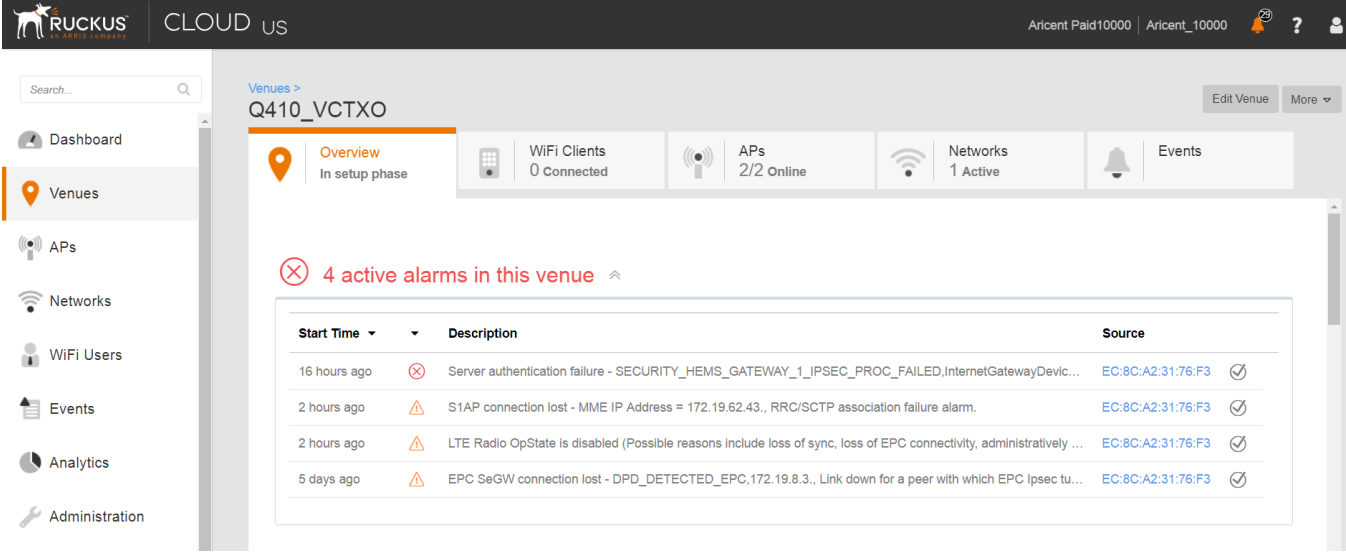   The Overview screen appears displaying an informational message about the active alarms.

FIGURE 2 Venue screen showing number of active alarms

3. Click ⯆ .

    The screen displays details of all the active alarms in the venue.

FIGURE 3 Venue screen showing active alarms

NOTE

If there are alarms that have occurred in past/or not critical to be addressed for normal AP functions (as indicated by Operational status); "All good" will be indicated under Overview. In such a case, you may choose to ignore the alarms or clear these from the drop-down menu option against each AP on the leftmost column.

- Check all the alarms per AP to identify any critical alarms that need to be addressed.
- Typical alarms will indicate the component.
- When a specific connectivity issue occurs, it will impact the corresponding functionality and this may also be reflected on the AP LEDs. If EPC IP is unreachable/S1 connection is failing to establish, the EPC LED will be blinking (For more information, see **Table: LED Labels**).
- Take corresponding action items to rectify the error mentioned on the alarms.

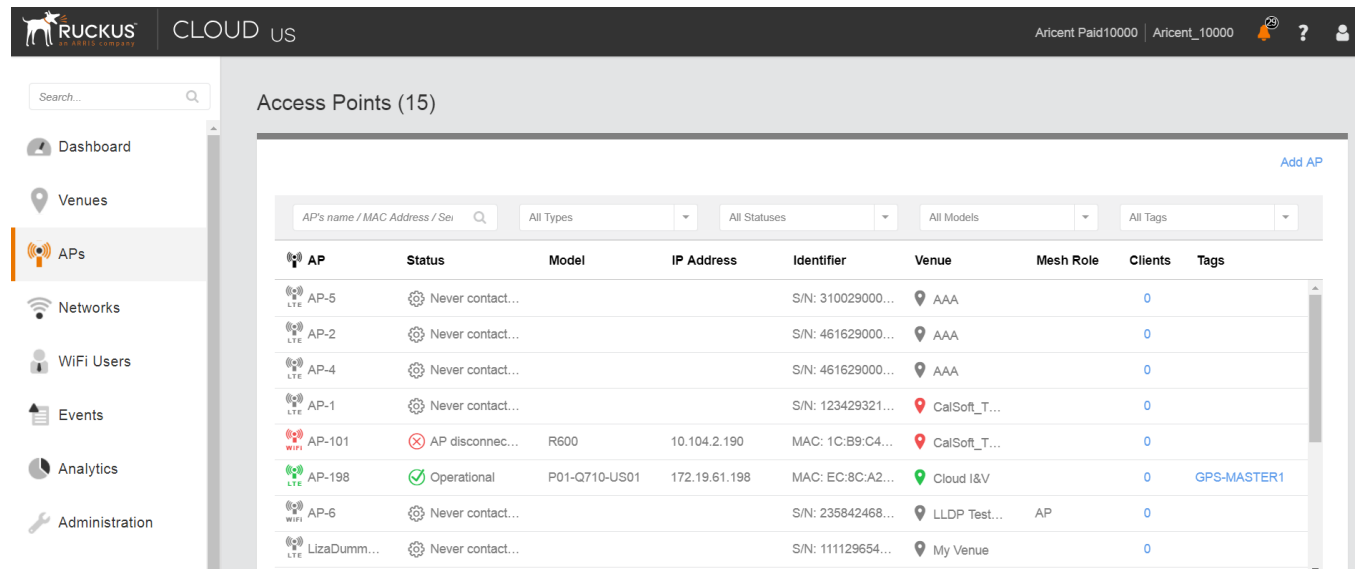# Collecting LTE AP Logs via LTE AP Management Service

Q: How can I collect LTE AP logs through LTE AP Management Service?

To collect LTE AP logs through LTE AP Management Service, perform the following steps:

1. Log onto the LTE AP Managementscreen and click APs on the left side of the screen.

   The Access Points screen appears showing the list of all APs.
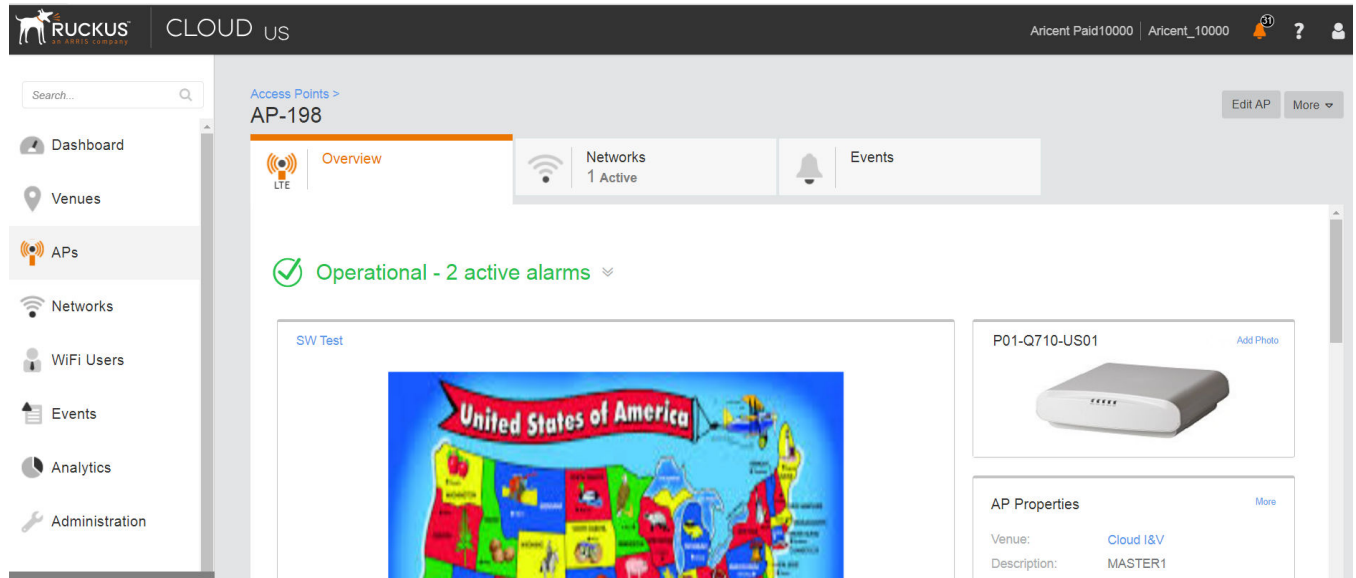
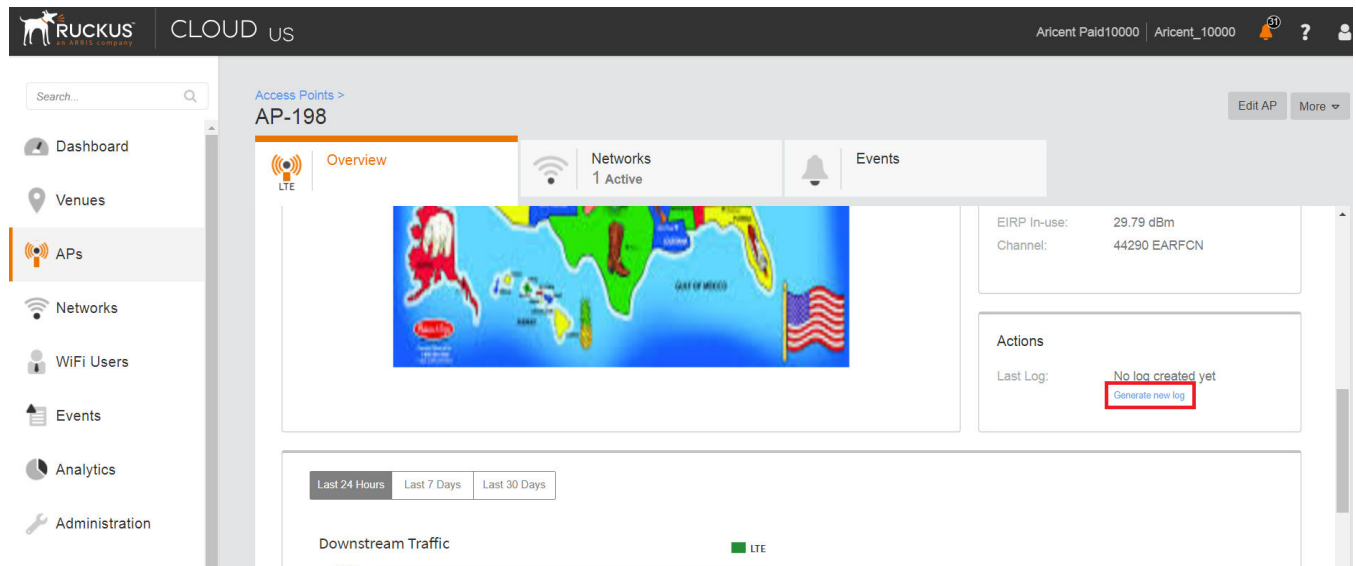   **FIGURE 4** Access Points screen

2. Click an AP from which you want to collect the logs.

   The details of the selected AP appears.

FIGURE 5 Access Point Details

3.   Scroll down and click **Generate new log** on the right hand side as shown below.

4.   Once **Last Log:** appears with current date and time, click [icon] to download a tar file to the local Downloads directory with all the relevant logs.

Debugging Performance Issues

Q: What are the commonly reported issues? (drop BAU)

After successfully provisioning LTE AP and enabling transmission, there may be some rare but typical scenarios that can cause some performance issues.

Below is a list of such typical performance issues and suggested corrective actions to be taken to mitigate:

TABLE 20 Performance Issues and Corrective Actions

ID	Issue	Details	Corrective Action
1	Poor data rate	Poor data rate measured in DL/UL or both directions compared to expected throughput.	1. Check Backhaul capacity/throughput rating. 2. Obtain RF logs and check sources of interference (RSRP/RSRQ values). 3. Check for UE handing off multiple times (a.k.a ping-pong effect) between more than one LTE AP.
2	UE disconnects frequently from network.	UE connection is dropped frequently and reconnects after unplugging.	Check the ZTE dongle USB connection. There is a known issue with the dongle which causes frequent disconnects with MACs.
3	EPC connection down.	S1 connection disconnected after successful connection during initial setup.	1. Check S1 status via get S1APConfigParam command to match EPC parameters. 2. Check IP reachability (try pinging MME IP from AP). 3. Capture Wireshark trace (or tcpdump) on the switch via port mirroring. 4. Open the "S1AP" messages and follow the sequence to learn the reason for rejection/ setup failure.
4	AP not transmitting despite all connection are successful.	All LEDs are solid Green but LTE is dark - transmission stopped.	1. Check whether the AP service button is ON. 2. Check alarms to detect if there are any issues reported with SAS availability/ response. 3. Check the statistics to obtain the CurrentGrant status. 4. Check the logs for SAS-CBSD communication and check for any error codes reported.
5	Timing sync lost/ SYNC LED starts to blink.	Typically when a timing sync is lost, the SYNC LED is dark/ blinking indicating it is trying to regain connection with timing master/GPS.	1. When in PTP-slave mode: Check conection with Timing Master AP via IP address. 2. When in PTP-Master mode: Check visibility to satellites/ line of sight to open sky, and relocate to a new position as close to the window/ door as possible.

AP States in LTE AP Management Service

Q: What are the AP states in LTE AP Management Service?

Following are the AP states in the LTE AP Management Service:

- Never Contacted
- Contacted
- Connected
- Operational
- Disconnected

Q: Why does AP state shows Never Contacted in LTE AP Management Service?

Possible reasons for AP state to be Never Contacted are:

- AP IP unreachability to the Internet.

    – Make sure AP connected to IP network can reach the Internet and has DNS Server setup to reach the Internet (google.com/yahoo.com) to test it out.

    – Do DNS resolution to 'https://sc-registrar.ruckuswireless.com/api/v2/scr/action" and select a certificate' to ensure the AP can resolve it to 'sc-registrar.ruckuswireless.com'.

- IPsec ports are not open in firewall.

    Open ports 4500, 50, 500, 443, 80...etc. in firewall to the Internet.

- AP is not in factory state.

    If AP is not in factory state, it will not connect to SCR and get the AP Management Security GW and Management server as it is already holding some management configuration. Reset AP to factory settings using the Reset button behind the AP. Press and hold for 10 seconds to trigger factory reset.

Q: Why AP state is Contacted but not Connected/Operational?

Check the following:

- whether AP to Management SecGW connection is flapping.
- whether there are AP alarms/event in AP and check whether IPsec tunnel is up.
- whether HeMS connection is up (using show RSCStatus CLI command) in case IPsec tunnel to SecGW is up.

Q: Why does AP state shows Connected but not Operational?

The possible reasons for this are as follows:

- AP admin state is disabled.

    Check whether AP has been administratively disabled from UI by clicking AP > More > Operation status Disable/Enable.

- AP lost sync.

    – If AP is GPS source, AP may have lost GPS satellite.
    – If AP is PTP source, AP may have lost to PTP master.

- AP to EPC connection is lost.

    – SCTP connection timeout to EPC.
    – AP-EPC connection is lost.
    – EPC is not reachable.
    – If there is SecGW before EPC, AP-SecGW connection is lost.

- AP lost the grant.

    – AP may have relinquished the Grant due to timing sync failure or lost connection to EPC.
    – AP-SAS heartbeat failed/Communication failed.
    – AP-SAS grant conflict.
    – AP-SAS registration error.
    – SAS revoked the grant.