

RUCKUS LTE AP Support Guide SC 04.03.00

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Document Conventions

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

TABLE 1 Text Conventions

Convention	Description	Example
monospace	Identifies command syntax examples	<code>device(config)# interface ethernet 1/1/6</code>
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 .
<i>italics</i>	Publication titles	Refer to the <i>RUCKUS Small Cell Release Notes</i> 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.

Preface

Document Feedback

Convention	Description
<i>italic text</i>	Identifies a variable.
[]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{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, <i>member</i> [<i>member</i> ...].
\	Indicates a "soft" line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Document Feedback

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

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

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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

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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.

Command Line Interface

Overview of Command Line Interface

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.

Command Line Interface

Debug 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	<pre>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 ----- -----</pre>

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	<pre>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 = ----- -----</pre>

TABLE 5 Alarm History

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

TABLE 5 Alarm History (continued)

<p>Example</p>	<pre>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</pre>
----------------	---

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	<pre>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-----></pre>

TABLE 7 Diagnosis NS Lookup

Syntax	Diagnosis GetNslookup
Description	To get resolved FQDN IP.
Supported Modes	PCLI
Example	<pre>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 -----</pre>

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	<pre>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-----></pre>

TABLE 9 VLAN Configuration

Syntax	Get VLANConfig
Description	To show the VLAN configuration.
Supported Modes	PCLI
Example	<pre>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 -----</pre>

TABLE 10 Bridge Configuration

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

TABLE 11 Software Version

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

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	<pre> 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 ----- </pre>
---------	---

TABLE 13 Board Information

Syntax	Get BoardInfo
Description	To get information of the Board device.
Supported Modes	PCLI
Example	<pre> 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.NIType = In band InternetGatewayDevice.DeviceInfo.X_001392_BoardInfo.RegulatoryDomain = US InternetGatewayDevice.DeviceInfo.X_001392_BoardInfo.WlanEnabled = Disabled ----- </pre>

Set Commands

Following Set command is used for Production CLI.

TABLE 14 Default Hems URL and Default Gateway

Parameters	CloudSCRQuery
Syntax	Set CloudSCRQuery
Description	<p>The command queries about SCR and provides information about the management cloud IPSec server and HeMS IP addresses. This command takes no input.</p> <p style="text-align: center;">NOTE The command is essentially a manually-invoked SCR query; the response from the SCR updates the LTE AP's data model.</p>
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'.

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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

If you have a valid support contract, you can submit a support ticket request to Technical Support through the Ruckus Support portal at:

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

The following section provides information on how to open a how to open cases for Ruckus LTE (CBRS).

1. Using your Ruckus Wireless Support credentials, log in to: <https://support.ruckuswireless.com>.
2. Click **Submit A Case**.
3. Check the type of case in the **Case Type** check box.

4. Check the the priority of the case in the **Priority** check box.
5. Select **LTE** as the **Product Name** box.

Step 1 - Case Type

Case Type ⓘ

- Administration
- Ruckus Cloud
- Software
- Hardware
- vSCG/vSPOT

Priority ⓘ

- P1 - Critical. Please [contact us](#) by phone or chat. P1 cases cannot be submitted through the web form.
- P2 - High
- P3 - Medium
- P4 - Low

Step 2 - Case Description

Product Name ⓘ

Select an Option

lte

Cloud Services

LTE

Software Version ⓘ

Description - Please provide as much detail as possible ⓘ

6. Enter the Ruckus LTE Management software verison in the **Software Version** box.
7. Provide details of the issue in the description box.
8. Check **Email** or **Phone** in the **Best way to contact me** section.
9. Click Submit to open a new case.

A new screen appears displaying the case cumber which will be used as the reference for all communications regarding the reported issue. Also, an email is sent to the originator of the case.

When reporting an issue, provide the following information:

- The AP model
- Description of the client device that has issues connecting or accessing the AP model
- Specific steps that led to the situation

In the majority of cases, the Master AP's Debug information (saved from **Administer > Diagnostics**) is helpful for the analysis of a problem.

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 Adding an AP document.

By default, Ruckus 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.
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.

Troubleshooting

Venue Status Check using Alarms

TABLE 19 LED Labels (continued)

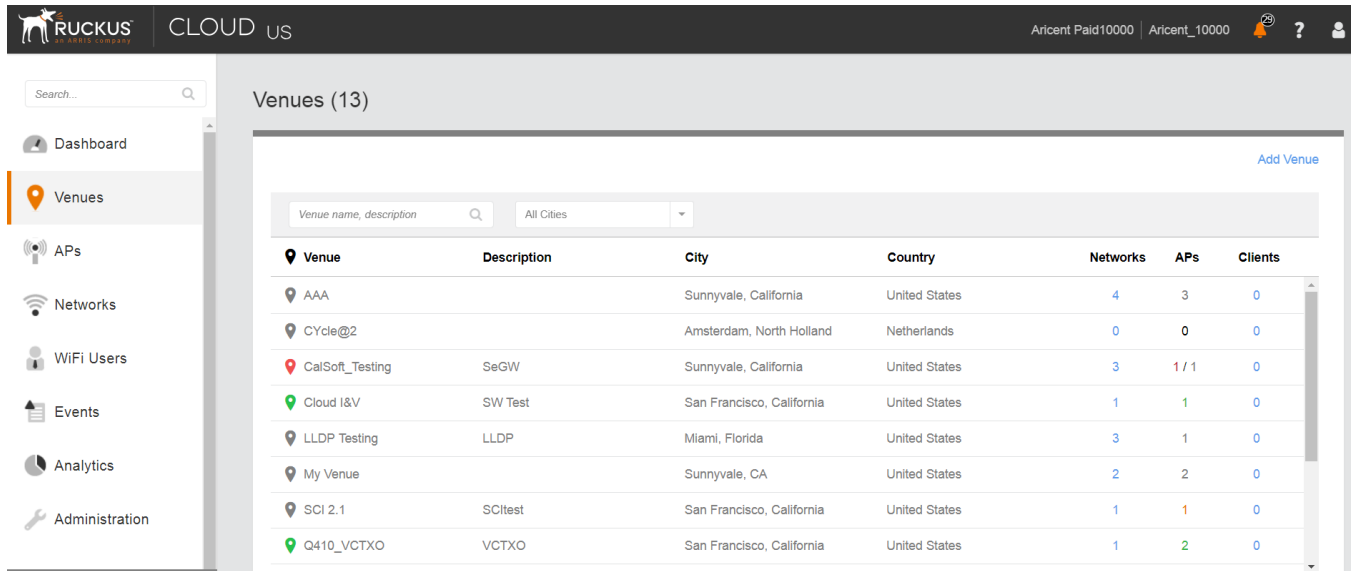
LED Label	Time Duration	LED Color/Behavior	Corrective Action
EPC	May be up to 60 minutes.	OFF: AP is not configured with the Network (EPC) connectivity information.	Make sure that the network configuration is accurate and a Network is turned ON for the AP Venue . Also, check the PTP status under AP Details . 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. From the Ruckus Cloud LTE dashboard, click **Venues**.
The **Venue** page appears displaying the list of venues.

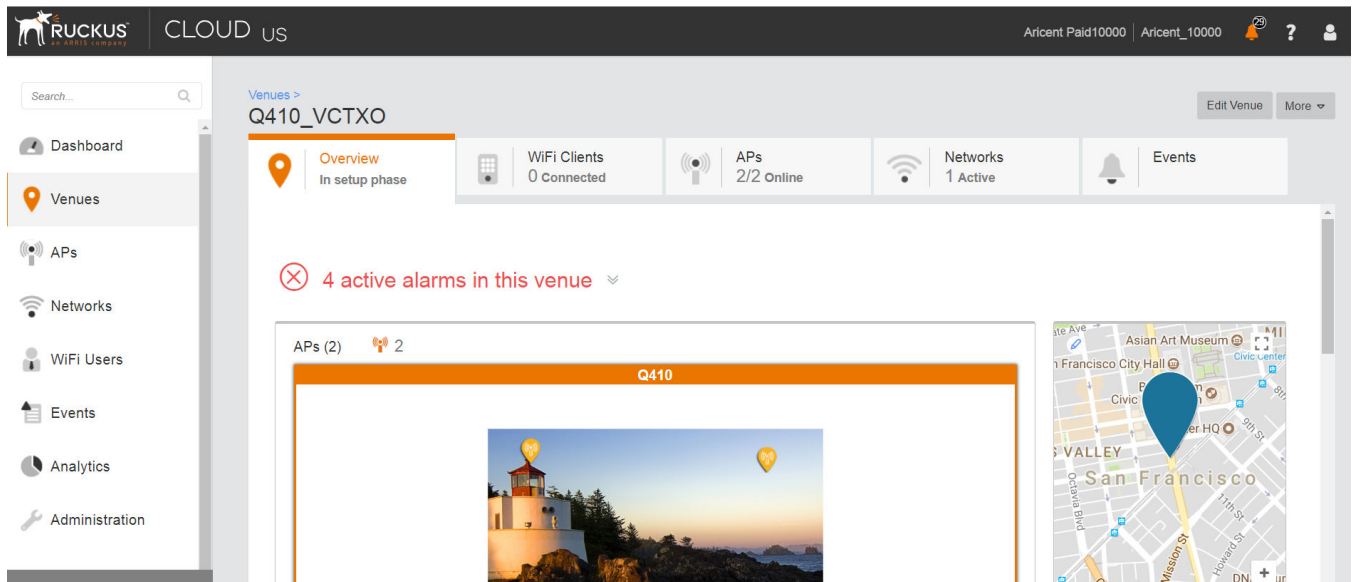
FIGURE 1 Venue Page



2. Click the desired venue to view its status.

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

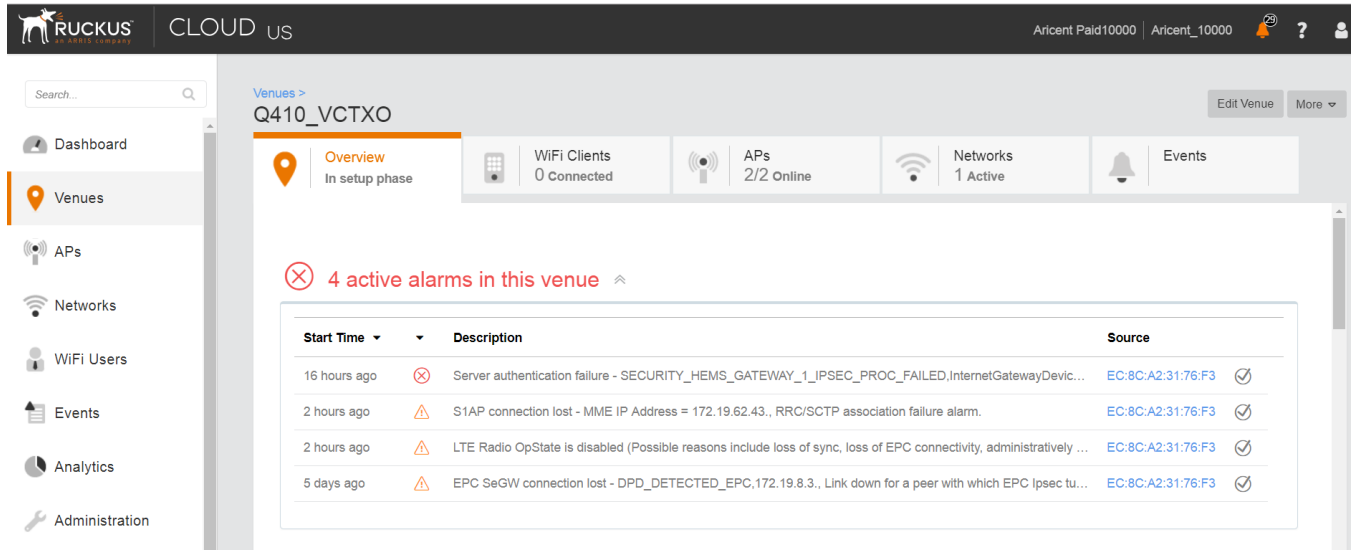
FIGURE 2 Venue Page Showing Number of Active Alarms



3. Click .

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

FIGURE 3 Venue Page Showing Active Alarms



NOTE

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

- Check all the alarms for each AP to identify any critical alarms that need to be addressed.
- Typical alarms indicates the component.
- When a specific connectivity issue occurs, it will impact the corresponding functionality and this may also be indicated on the AP LEDs. If EPC IP is unreachable or the S1 connection fails to establish, the EPC LED keeps blinking (For more information, refer to [Initial Setup Issues](#) on page 24).
- You must take appropriate action items to rectify the error as mentioned in the alarms.

Collecting LTE AP Logs via LTE AP Management

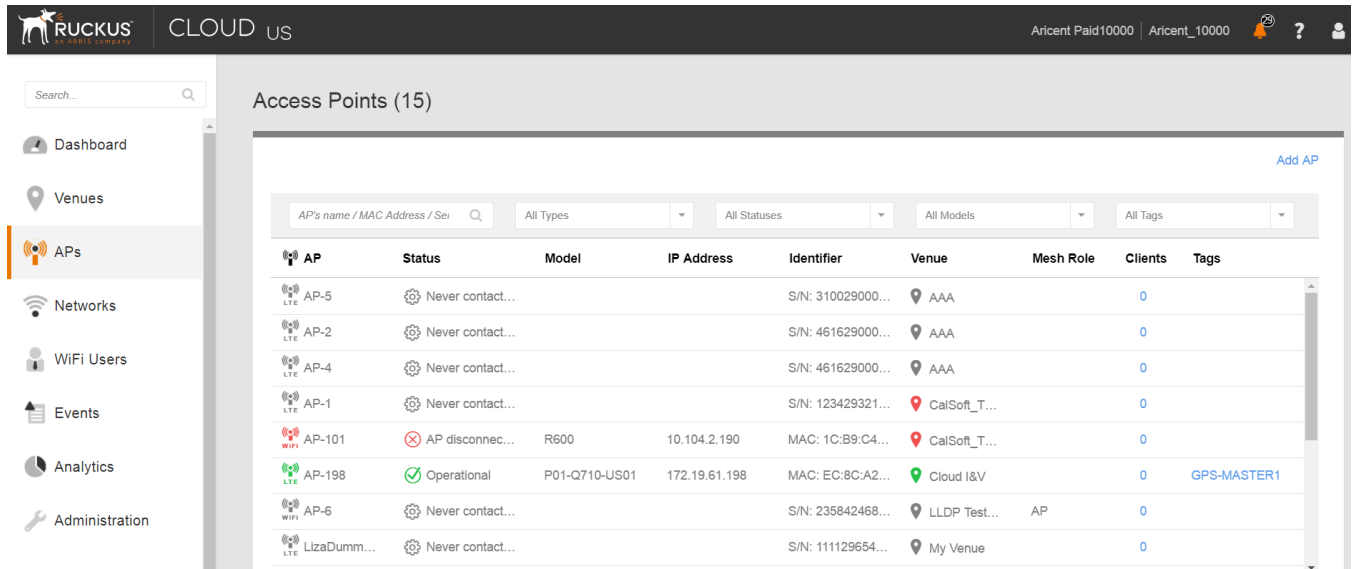
Q: How can I collect LTE AP logs through LTE AP Management?

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

1. Log in to LTE AP Management and click **APs** on the left side of the screen.

The **Access Points** page appears showing the list of all APs.

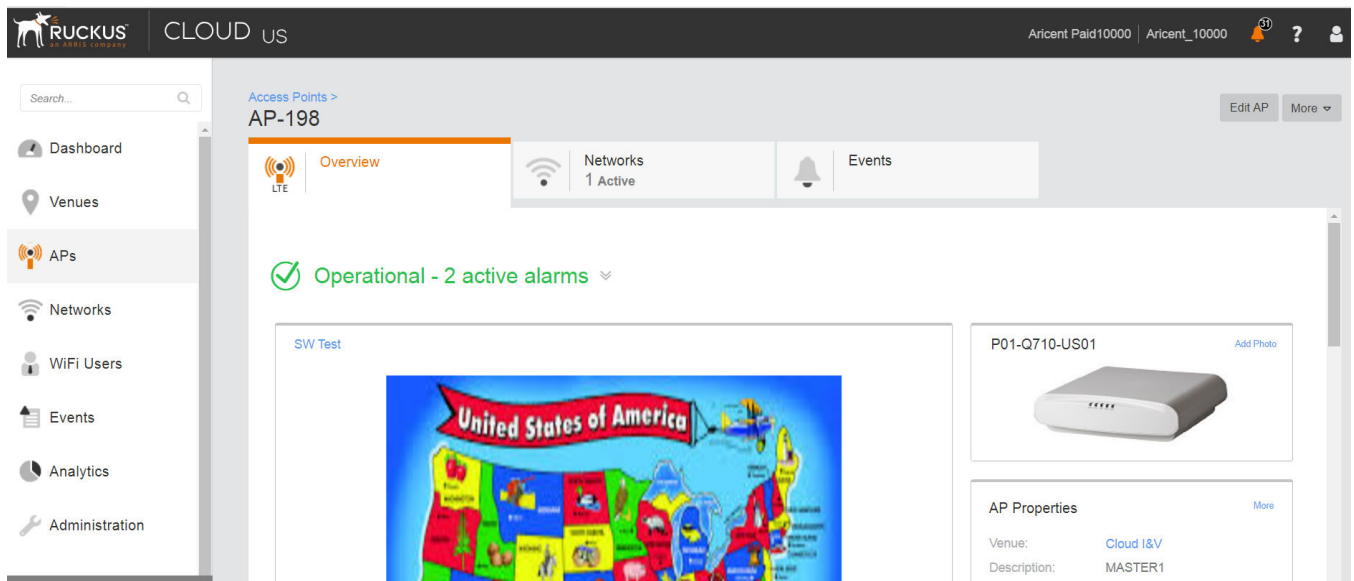
FIGURE 4 Access Points Page



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

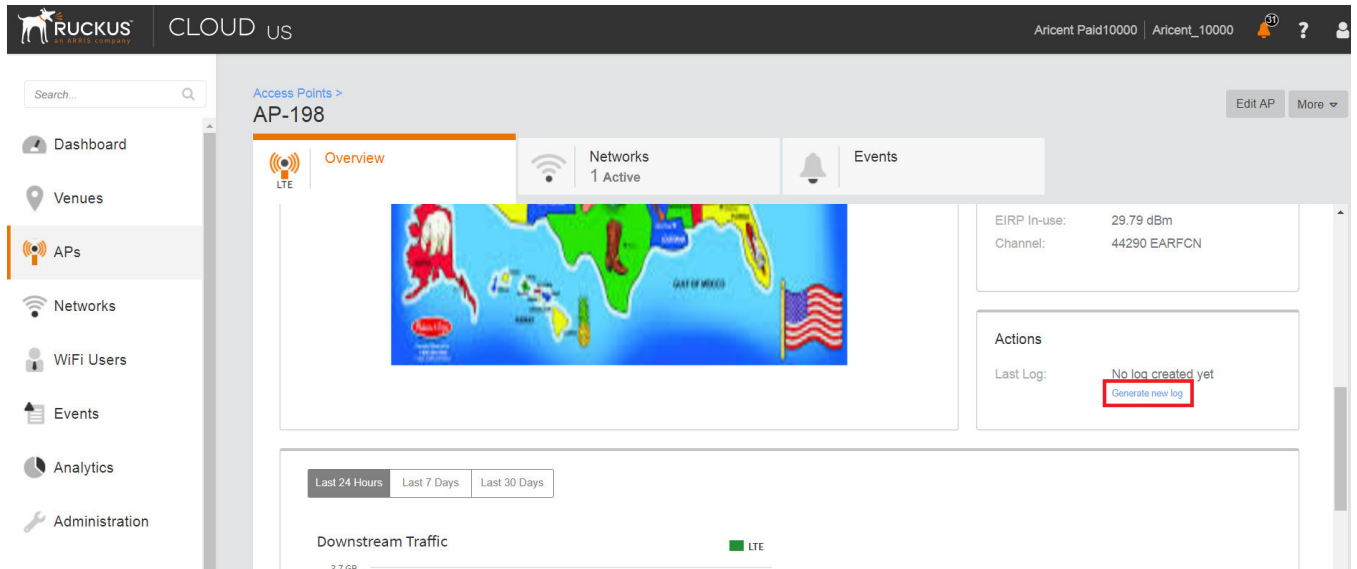
The details of the selected AP appears.


FIGURE 5 Access Point Details



3. Scroll down and click **Generate new log** under **Actions** right side, as shown in the following figure.

FIGURE 6 Generate AP Log



4. Click  that is located next to **Last Log**: to download the .tar file to the local Downloads directory with all the relevant logs.

Debugging Performance Issues

Q: What are the commonly reported issues?

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

The following table is a list of typical performance issues and suggested corrective actions.

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.	<ol style="list-style-type: none"> 1. Check the backhaul capacity/throughput rating. 2. Obtain the RF logs and check sources of interference (RSRP/RSRQ values). 3. Check for UE handing off multiple times (also known as ping-pong effect) between more than one LTE AP.
2	UE disconnects frequently from network.	UE connection is dropped frequently and reconnects after unplugging.	If using a USB dongle/Wi-Fi Device over USB, check the dongle USB connection.

TABLE 20 Performance Issues and Corrective Actions (continued)

ID	Issue	Details	Corrective Action
3	EPC connection down.	S1 connection disconnected after successful connection during initial setup.	<ol style="list-style-type: none"> 1. Check the S1 status via get S1APConfigParam command to match EPC parameters. 2. Check the IP reachability (try pinging the MME IP address from the AP). 3. Capture the 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 or setup failure.
4	AP not transmitting although all connection are successful.	All LEDs are solid Green but LTE is dark - transmission stopped.	<ol style="list-style-type: none"> 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 that have been reported.
5	Timing sync lost/ SYNC LED starts to blink.	In general, when a timing sync is lost, the SYNC LED is dark/ blinking indicating it is trying to regain connection with timing master/GPS.	<ol style="list-style-type: none"> 1. When in PTP-slave mode: Check connection with the Timing Master AP using the IP address. 2. When in PTP-Master mode: Check visibility to satellites/ line of sight to open sky, and relocate to a new position closer to the window or door.

Case 1: LTE AP is in sync but has disconnected from the ACS and/or Mgmt SecGW

Review the following information.

1. An AP reboots 24 hours after disconnection with the AP management platform when it is unable to reach LTE AP Management.
2. After reboot, an AP connects to the SC-R.
3. The SC-R sets relevant IP address of the SecGW and LTE AP management (ACS) on an LTE AP.
4. The LTE AP attempts to connect to the LTE AP Management
5. If an LTE AP is unable to connect, it keeps on retrying for 24 hours. On completion of 24 hours, steps 1, 2, and 3 mentioned above are repeated.
6. An AP repeats the above steps for a total of 3 times, one each reboot after 24 hours.
7. After a total of 96 hours from the first disconnection, AP reverts to the factory reset. In this case, any configuration that was set from ACS or using the CLI, get reset and in this case the earlier AP configuration is erased.

NOTE

The above-mentioned behavior is for the disconnection/not reachable case only. SC-R: sc-registrar - A database/ service in the management platform that provides each AP important connectivity information upon power up.

Case 2: LTE AP is not in sync and has disconnected from the ACS and/or Mgmt SecGW:

Review the following information.

1. If after startup, the PTP hard sync does not occur, the behavior for network disconnection mentioned in case 1 above should be used.

Troubleshooting

AP States in LTE AP Management

2. If an external PTP device is configured (not using a Ruckus AP as the Timing Master) to provide timing information to the network, ensure that the following settings are set on the PTP source:
 - a. Ensure that the PTP source and rest of the APs are on the same Layer 2 network and the PTP traffic is allowed on any firewalls in between.
 - b. Select the 8275.2 profile on your timing source administration/ configuration page.
 - c. Set Domain to 44.
3. If GPS synchronization is does not occur from startup or the PTP phase sync is not achieved (but the PTP hard sync has been achieved), RSC reboots every hour till the synchronization is achieved. The timers mentioned in case I above does not apply in this case that is the LTE AP does not go to SC-R or perform a factory reset.
4. If AP was already synchronized when the network disconnected, and if it loses synchronization that it goes into holdover.
 - a. LTE AP reboots after 1 hour in the case of the PTP master assuming that 24 hours of the network disconnection have not occurred
 - b. LTE AP reboots after 2 hours in the case of the PTP slave assuming that 24 hours of the network disconnection have not occurred
5. If after reboot, AP achieves synchronization, but is still disconnected from the network, in that case behavior for network disconnection mentioned in case I above shall be used. Note that the disconnect reboot timer is applicable from the reboot in such a case.
6. If after a reboot, AP does not achieve synchronization, the behavior mentioned in this case II is applicable.

AP States in LTE AP Management

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

The following are the AP states in the LTE AP Management:

- Never Contacted
- Contacted
- Connected
- Operational
- Disconnected

Q: Why does the AP state show Never Contacted in LTE AP Management?

The following are reasons for AP state to be Never Contacted:

- AP cannot connect to the internet.
 - Ensure that the AP connected IP network has access to the Internet and also has DNS server setup to resolve domain names such as www.google.com or www.yahoo.com.
 - Try connecting a laptop to the same network as the AP and use a browser to go to <https://sc-registrar.ruckuswireless.com>.
- Check if the requested ports are allowed on the network (firewall ports 4500...etc.)
- The AP is not in the factory reset state.

If an AP is not in the factory default (reset) state, it may not connect to the AP Management due to an incorrect resident configuration. Reset the AP to its factory defaults using the button located near the RJ45 port. A long press on this button for over 20 seconds will cause the AP restore to its factory default firmware and configuration. Power LED will be RED. AP will resume its boot-up procedures upon release of the reset button.

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

Check the following:

- Whether the AP to Management SecGW connection is flapping.
- Whether there are AP alarms or events on the AP and check that the IPsec tunnel is up.

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

The possible reasons for this issue could be one of the following.

- The AP admin state is disabled.

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

- The AP lost synchronisation.
 - If the AP is GPS source, AP may have lost connection to the GPS satellite.
 - If the AP is PTP source, AP may have lost connection to the PTP master.
- The AP to Network (EPC) connection is lost.
 - The SCTP connection timeout to EPC occurred.
 - The AP-EPC connection is lost.
 - The EPC is not reachable.
 - If a SecGW is configured for the EPC connection, the AP to SecGW connection may be lost. (All Ruckus-offered networks/ EPC services have a SecGW)
- The AP lost the grant.
 - The AP relinquished the Grant because of a timing sync failure or lost connection to EPC.
 - The AP-SAS heartbeat failed or communication failed.
 - An AP-SAS grant conflict occurred.
 - An AP-SAS registration error occurred.
 - SAS revoked the grant.

