Real-Time Access Points Statistics

-
- Access point real-time statistics, on page 1
- SNMP traps and intervals for APs, on page 2
- Restrictions for AP radio monitoring statistics, on page 2
- Configure access point real time statistics (GUI), on page 2
- Configure access point real-time statistics (CLI), on page 3
- Configure the access point radio monitoring statistics (CLI), on page 5
- Monitor access point real-time statistics (GUI), on page 6
- Verify access point real-time statistics, on page 7

Access point real-time statistics

An access point real-time statistic is a tool that

- allows tracking of CPU utilization and memory usage of an AP,
- monitors the health of an AP, and
- generates real-time statistics from an AP.

Feature history

Release	Feature	Feature information
Cisco IOS XE 17.7.1	Real time access point statistics	The system implements this feature with AP threshold values between 0 and 50. From Cisco IOS XE Cupertino 17.7.1 onwards, you can reset radios based on the AP's real-time statistics. If Tx or Rx counters do not increment during a sampling period, a radio reset is triggered. The following commands are introduced: • **show wireless stats ap join summary** • **show wireless stats ap history**

Release	Feature	Feature information
Cisco IOS XE 17.5.1	Real time access point statistics	Starting from Cisco IOS XE 17.5.1, you can monitor both CPU utilization and memory usage to assess the health of an AP through generated real-time statistics.

Supporting reference information

SNMP traps are sent out when the threshold is crossed. The sampling period and statistics interval can be configured using SNMP, YANG, and CLI.

From Cisco IOS XE 17.7.1 release onwards, for radio monitoring, you can reset the radios based on the statistics sent by the AP for a sampling period. When you configure the radios in the controller, if there is no increment in the Tx or Rx statistics when the radio is up, then the radio reset is triggered.

SNMP traps and intervals for APs

AP real-time statistics support these capabilities:

- SNMP Traps: Triggers notifications when CPU or memory usage crosses configured thresholds for APs and controllers.
- Sampling Period and Statistics Interval: Can be configured using SNMP, YANG, and CLI to control how often statistics are collected and reported.

Restrictions for AP radio monitoring statistics

You cannot reset the radio firmware from the controller. The controller will shut and then restart the radio if the Rx or Tx count does not increase for a radio slot within a specified period.

Configure access point real time statistics (GUI)

This task helps you configure real-time statistics for access points using a graphical user interface, allowing you to effectively monitor and manage AP behavior.

Procedure

Step 1 Choose **Configuration > Tags & Profiles > AP Join**.

Step 2 Click **Add**. The **Add AP Join Profile** page is displayed.

Step 3 Under the **AP** tab, click the **AP Statistics** tab.

Step 4 In the **System Monitoring** section:

- Enable **Monitor Real Time Statistics** to get calculated statistics and alarms of the AP.
- To receive an alarm when the upper threshold is surpassed for parameters such as CPU utilization and memory, enable **Trigger Alarm for AP**.

- Enter the threshold percentage for CPU and memory usage in the **CPU Threshold to Trigger Alarm** field and **Memory Threshold to Trigger Alarm** fields, respectively. The valid range is between 0 and 50. An SNMP trap is sent out when this threshold is crossed.
- In the **Interval to Hold Alarm** field, enter the time for which the alarm is held before it gets triggered. The range is between 0 and 3600 seconds.
- In the **Trap Retransmission Time** field, enter the time between retransmissions of the alarm. The range is between 0 and 65,535 seconds.
- To define how often data should be collected from the AP, enter a value in the **Sampling Interval** field. The range is between 720 and 3600 seconds.
- To define the interval at which AP statistics are to be calculated, enter a value in the **Statistics Interval** field. The range is between 2 and 900 seconds.
- To automatically reload the AP when there is high CPU and memory usage in the defined sampling interval, select the **Reload the AP** check box.

Step 5 Under the **Radio Monitoring** section:

- Select the **Monitoring of AP Radio stuck** check box to verify that the Tx and Rx statistics of the AP are updated each time the payloads are coming in from the AP to the controller.
- To generate an alarm for the radio of the AP when there is no increment in the Tx and RX statistics for the payloads, select the **Alarms for AP Radio stuck** check box.
- Select the **Reset the stuck AP Radio** check box to recover the radio from the bad state. A radio admin state payload will be sent from the controller to toggle the radio and the radio will be shut when there is no increment in the Tx and Rx statistics.
- To define how often data should be collected from the radio, enter a value in the **Sampling Interval** field. The valid range is between 720 and 3600 seconds.

Step 6 Click **Apply to Device** to save the configuration.

The AP monitors real-time statistics and triggers alarms based on defined thresholds to aid you in efficiently managing AP resources.

Configure access point real-time statistics (CLI)

This task provides instructions on how to configure real-time statistics for an access point using CLI commands.

This task is intended for network administrators who need to monitor and configure various system parameters on a Cisco access point, particularly real-time statistics related to performance monitoring.

Procedure

Step 1 Enter global configuration mode.

Example:

```
Device# configure terminal
```

Step 2 Configure the AP profile. The default AP join profile name is *default-ap-profile*.

Example:

```
Device(config)# ap profile doc-test
```

Step 3 (Optional) Configure the statistics timer.

Example:

```
Device(config-ap-profile)# stats-timer 60
```

This step configures the interval for the statistics reports coming from the AP, with values ranging from 0 to 65535 seconds.

Step 4 (Optional) Enable monitoring for AP system.

Example:

```
Device(config-ap-profile)# statistics ap-system-monitoring enable
```

Step 5 Enable alarms for AP system monitoring.

Example:

```
Device(config-ap-profile)# statistics ap-system-monitoring alarm-enable
```

Step 6 Define the hold time for system monitoring alarms on the AP.

Example:

```
Device(config-ap-profile)# statistics ap-system-monitoring alarm-hold-time 400
```

The values range from 0 to 3600 seconds.

Step 7 Define the retransmission interval for the trap alarms.

Example:

```
Device(config-ap-profile)# statistics ap-system-monitoring alarm-retransmit-time 100
```

Set the interval, with values from 0 to 65535 seconds, for retransmitting trap alarms when conditions persist.

Step 8 Define the CPU usage threshold for the AP to trigger alarms.

Example:

```
Device(config-ap-profile)# statistics ap-system-monitoring cpu-threshold 90
```

Note
From Cisco IOS XE 17.7.1 release onwards, the threshold value for triggering alarms is from 0 to 100%.

Step 9 Define the memory usage threshold on the AP to trigger alarms.

Example:

```
Device(config-ap-profile)# statistics ap-system-monitoring mem-threshold 90
```

The percentage threshold for memory usage on the AP to trigger is from 0 to 100%.

Note
From Cisco IOS XE 17.7.1 release onwards, the memory usage threshold to trigger alarms ranges from 0 to 100%.

Step 10 (Optional) Configure the statistics sampling interval.

Example:

```
Device(config-ap-profile)# statistics ap-system-monitoring sampling-interval 600
```

The interval can range from 2 to 65535 seconds.

Step 11 Exit from AP profile configuration mode and return to global configuration mode.

Example:

```
Device(config-ap-profile)# exit
```

Step 12 Enable sending AP-related trap flags for statistics that exceed set thresholds.

Example:

```
Device(config)# trapflags ap ap-stats
```

Traps are sent when statistics exceed the configured thresholds, enabling alerts and automated responses.

The statistics of the access point have been configured, enabling real-time monitoring and alarm triggering for system performance parameters.

```
                Device(config)# ap profile default-policy-profile
                Device(config-ap-profile)# statistics ap-system-monitoring enable
               Device(config-ap-profile)#statistics ap-system-monitoring sampling-interval
 600
                Device(config-ap-profile)#statistics ap-system-monitoring alarm-enable
                Device(config-ap-profile)#statistics ap-system-monitoring alarm-hold-time
3
                Device(config-ap-profile)#statistics ap-system-monitoring
alarm-retransmit-time 10
                Device(config-ap-profile)#statistics ap-system-monitoring cpu-threshold 90
                Device(config-ap-profile)#statistics ap-system-monitoring mem-threshold 90
                Device(config)# trapflags ap ap-stats
```

Configure the access point radio monitoring statistics (CLI)

Learn how to configure monitoring statistics for AP radios to enable stuck radio statistics, alarms, and actions for optimal performance.

These steps help configure AP radio monitoring statistics:

Procedure

Step 1 Enter global configuration mode.

Example:

```
Device# configure terminal
```

Step 2 Configure an AP profile and enter the AP profile configuration mode.

Example:

```
Device(config)# ap profile test1
```

Step 3 Enable the monitoring of AP radio stuck statistics.

Example:

```
(config-ap-profile)#statistic ap-radio-monitoring enable
```

Step 4 Enable the alarm for AP radio stuck statistics.

Example:

```
(config-ap-profile)#statistic ap-radio-monitoring alarm-enable
```

Step 5 Specify the sampling interval in seconds.

Example:

```
(config-ap-profile)# statistic ap-radio-monitoring action reload-ap interval850
```

The values range from 720 to 3,600 seconds.

Step 6 Generate an alarm and reset the radio if the radio is stuck.

Example:

```
(config-ap-profile)# statistic ap-radio-monitoring action radio-reset
```

Step 7 Reload the AP.

Example:

```
(config-ap-profile)# statistic ap-system-monitoring action reload-ap
```

The AP radio monitoring statistics help identify stuck radios and automatically take corrective actions to ensure optimal performance.

```
Device(config)# ap profile test1
Device(config-ap-profile)# statistics ap-radio-monitoring enable
Device(config-ap-profile)#statistic ap-radio-monitoring alarm-enable
Device(config-ap-profile)#statistic ap-radio-monitoring sampling-interval 750
Device(config-ap-profile)# statistic ap-radio-monitoring action radio-reset
Device(config-ap-profile)#statistic ap-system-monitoring action reload-ap
```

Monitor access point real-time statistics (GUI)

This task enables network administrators to monitor access point performance and diagnose potential issues by viewing real-time statistics.

Procedure

Step 1 Choose **Monitoring** > **Wireless** > **AP Statistics**.

Step 2 Click the **General** tab.

Step 3 Click an AP name. The **General** window is displayed.

Step 4 To view the AP Statistics data, click the **AP Statistics** tab.

These types of information are displayed:

- **Memory alarm last send time**: Displays the time of the last memory trap sent.
- **Memory Alarm Status**: Displays the state of the memory alarm. An alarm can be **ACTIVE**, **INACTIVE**, **INACTIVE_SOAKING**, **ACTIVE_SOAKING**. An alarm is soaked until the configured hold time has passed.
- **Memory alarm raise time**: Displays the last time the memory alarm was active.
- **Memory alarm clear time**: Displays the last time the memory alarm was inactive.
- **Last statistics received**: Displays the time of the last statistics report received from the AP.
- **Current CPU Usage**: Displays the latest percentage of CPU usage reported.
- **Average CPU Usage**: Displays the average CPU usage calculated.
- **Current Memory Usage**: Displays the latest percentage of memory usage reported.
- **Average Memory Usage**: Displays the average memory usage calculated.
- **Current window size**: Displays the window size. The window size is calculated by dividing the statistics interval by the sampling interval. The average CPU and memory usage is calculated by the window size.
- **CPU alarm last send time**: Displays the time of the last CPU trap sent.
- **CPU Alarm Status**: Displays the state of the CPU alarm. An alarm can be **ACTIVE**, **INACTIVE**, **INACTIVE_SOAKING**, **ACTIVE_SOAKING**. An alarm is soaked until the configured hold time has passed.
- **CPU alarm raise time**: Displays the last time the CPU alarm was active.
- **CPU alarm clear time**: Displays the last time the CPU alarm was inactive.

Step 5 Click **OK**.

The current statistics for the selected access point are displayed, allowing for comprehensive monitoring and analysis of AP performance metrics.

Verify access point real-time statistics

To verify AP real-time statistics, run this command:

```
Device# show ap config general | section AP statistics
!Last Statistics
AP statistics : Enabled
Current CPU usage : 4
Average CPU usage : 49
Current memory usage : 35
Average memory usage : 35
Last statistics received : 03/09/2021 15:25:08
!Statistics Configuration
Current window size : 1
Sampling interval : 30
Statistics interval : 300
AP statistics alarms : Enabled
!Alarm State - Active, Inactive, Inactive_Soaking, Inactive_Soaking
Memory alarm status : Active
```

```
Memory alarm raise time : 03/09/2021 15:24:29
Memory alarm clear time : NA
Memory alarm last send time : 03/09/2021 15:24:59
CPU alarm status : Inactive
CPU alarm raise time : 03/09/2021 15:24:25
CPU alarm clear time : 03/09/2021 15:25:05
CPU alarm last send time : 03/09/2021 15:25:05
!Alarm Configuration
Alarm hold time : 6
Alarm retransmission time : 30
Alarm threshold cpu : 30
Alarm threshold memory : 32
```

To verify that the statistics reporting period is accurate, run this command:

```
Device# show ap config general | i Stats Reporting Period
Stats Reporting Period : 10
```