Configuring Application Visibility and Control

Application Visibility and Control

Application Visibility and Control (AVC) classifies applications using deep packet inspection techniques with the Network-Based Application Recognition (NBAR) engine, and provides application-level visibility and control (QoS) in wireless networks. After the applications are recognized, the AVC feature enables you to either drop, mark, or police the data traffic.

Using AVC, we can detect more than 1000 applications. AVC enables you to perform real-time analysis and create policies to reduce network congestion, costly network link usage, and infrastructure upgrades.

Note You can view list of 30 applications in Top Applications in Monitor Summary section of the UI.

AVC DSCP marks only the DSCP of the original packet in the controller in both directions (upstream and downstream). It does not affect the outer CAPWAP DCSP. AVC DSCP is applicable only when the application is classified. For example, based on the AVC profile configuration, if an application is classified as ftp or http, the corresponding DSCP marking is applied irrespective of the WLAN QoS. For downstream, the DSCP value of outer CAPWAP header and inner packet's DSCP are taken from AVC DSCP. WLAN QoS is only applicable for all traffic from controller to AP through CAPWAP. It does not change the DSCP of the original packet.

Using AVC rule, you can limit the bandwidth of a particular application for all the clients joined on the WLAN. These bandwidth contracts coexist with per-client downstream rate limiting with per client downstream rate limits that takes precedence over the per-application rate limits.

AVC is supported in central switching mode on the following controller platforms: Cisco 2504 WLCs, Cisco 5508 WLCs, Cisco Flex 7510 WLCs, Cisco 8510 WLCs, and Cisco Wireless Services Module 2 (WiSM2).

The number of concurrent flows supported for AVC classification on different controller platforms are noted in the following table.

Controller Platform	Flow
Cisco 2504 Wireless Controller	26,250
Cisco 5508 Wireless Controller	183,750
Cisco WiSM2	393,750
Cisco 8510 Wireless Controller	336,000
Cisco 5520 Wireless Controller	336,000
Cisco 8540 Wireless Controller	336,000

This section contains the following subsections:

Restrictions for Application Visibility and Control

- IPv6 packet classification is not supported.
- Layer 2 roaming is not supported across controllers.
- Multicast traffic is not supported.
- The number of applications that you can apply rate limit is 3.
- Only one rule can be configured per application. An application cannot have both a rate limit as well as a Mark rule.
- AVC rate limiting is not supported on Cisco 2504 WLC.

Configuring Application Visibility and Control (GUI)

Step 1 Create and configure an AVC profile by following these steps:

a) Choose **Wireless** > **Application Visibility and Control** > **AVC Profiles**.
b) Click **New** and enter the AVC profile name.
c) Click **Apply**.
d) On the AVC Profile Name page, click the AVC profile name to open the AVC Profile > Edit page.
e) Click **Add New Rule**.
f) Choose the application group and the application name from the respective drop-down lists.

   See the list of default AVC applications available by choosing **Wireless** > **Application Visibility and Control** > **AVC Applications**.

g) From the Action drop-down list, choose either of the following:

   - **Drop**—Drops the upstream and downstream packets that correspond to the chosen application.
   - **Mark**—Marks the upstream and downstream packets that correspond to the chosen application with the Differentiated Services Code Point (DSCP) value that you specify in the DSCP (0 to 63) drop-down list. The DSCP value helps you provide differentiated services based on the QoS levels.

Note The default action is to permit all applications.

h) If you choose **Mark** from the Action drop-down list, choose a DSCP value from the DSCP (0 to 63) drop-down list.

The DSCP value is a packet header code that is used to define quality of service across the Internet. The DSCP values are mapped to the following QoS levels:

- **Platinum (Voice)**—Assures a high QoS for Voice over Wireless.
- **Gold (Video)**—Supports the high-quality video applications.
- **Silver (Best Effort)**—Supports the normal bandwidth for clients.
- **Bronze (Background)**—Provides the lowest bandwidth for guest services.

You can also choose **Custom** and specify the DSCP value. The valid range is from 0 to 63.

i) Click **Apply**.
j) Click **Save Configuration**.

Step 2 Associate an AVC profile to a WLAN by following these steps:

a) Choose **WLANs** and click the WLAN ID to open the WLANs > Edit page.
b) In the QoS tab, choose the AVC profile from the AVC Profile drop-down list.
c) Click **Apply**.
d) Click **Save Configuration**.

Configuring Application Visibility and Control (CLI)

- Create or delete an AVC profile by entering this command:

  config avc profile *avc-profile-name* {**create** | **delete**}
- Add a rule for an AVC profile by entering this command:

  config avc profile *avc-profile-name* **rule add application** *application-name* {**drop** | **mark** *dscp-value* | **ratelimit** *Average Ratelimit value Burst Ratelimit value*}
- Remove a rule for an AVC profile by entering this command:

  config avc profile *avc-profile-name* **rule remove application** *application-name*
- Configure an AVC profile to a WLAN by entering this command:

  config wlan avc *wlan-id* **profile** *avc-profile-name* {**enable** | **disable**}
- Configure application visibility for a WLAN by entering this command:

  config wlan avc *wlan-id* **visibility** {**enable** | **disable**}

Note Application visibility is the subset of an AVC profile. Therefore, visibility is automatically enabled when you configure an AVC profile on the WLAN.

- View information about all AVC profile or a particular AVC profile by entering this command:

show avc profile {**summary** | **detailed** *avc-profile-name*}

- View information about AVC applications by entering these commands:
  - **show avc applications** [*application-group*]—Displays all the supported AVC applications for the application group.
  - **show avc statistics application** *application_name* **top-users** [**downstream wlan** | **upstream wlan** | **wlan**] [*wlan_id*]} —Displays AVC statistics for the top users of an application.
  - **show avc statistics top-apps** [**upstream** | **downstream**]—Displays the AVC statistics for the most used application.
  - **show avc statistics wlan** *wlan_id* {**application** *application_name* | **top-app-groups** [**upstream** | **downstream**] | **top-apps** [**upstream** | **downstream**]}—Displays the AVC statistics of a WLAN per application or top applications or top application groups.
  - **show avc statistics client** *client_MAC* {**application** *application_name* | **top-apps** [**upstream** | **downstream**]}—Displays the client AVC statistics per application or top applications.

Note You can view list of 30 applications using the **show avc applications** and **show avc statistics** commands.

- Configure troubleshooting for AVC events by entering this command:

  debug avc events {**enable** | **disable**}
- Configure troubleshooting for AVC errors by entering this command:

  debug avc error {**enable** | **disable**}

Configuring NetFlow

NetFlow

NetFlow is an embedded instrumentation within the controller software to characterize wireless network flows. NetFlow monitors each IP flow and exports the aggregated flow data to the external NetFlow collectors.

The NetFlow architecture consists of the following components:

- Collector: Entity that collects all the IP traffic information from various NetFlow exporters.
- Exporter: Network entity that exports the template with the IP traffic information. The controller acts as an exporter.

Note Controller does not support IPv6 address format when acting as an exporter for NetFlow.

Configuring NetFlow (GUI)

Step 1 Configure the Exporter by performing these steps:

a) Choose **Wireless** > **Netflow** > **Exporter.**
b) Click **New**.
c) Enter the Exporter name, IP address, and the port number.

The valid range for the port number is from 1 to 65535.

d) Click **Apply**.
e) Click **Save Configuration**.

Step 2 Configure the NetFlow Monitor by performing these steps:

a) Choose **Wireless** > **Netflow** > **Monitor.**
b) Click **New** and enter a Monitor name.
c) On the Monitor List window, click the Monitor name to open the **Netflow Monitor** > **Edit** window.
d) Choose the exporter name and the record name from the respective drop-down lists.

- Client App Record—Better Performance

e) Click **Apply**.
f) Click **Save Configuration**.

Step 3 Associate a NetFlow Monitor to a WLAN by performing these steps:

a) Choose **WLANs** and click a WLAN ID to open the **WLANs** > **Edit page.**
b) In the QoS tab, choose a NetFlow monitor from the **Netflow Monitor** drop-down list.
c) Click **Apply**.
d) Click **Save Configuration**.

Configuring NetFlow (CLI)

- Create an Exporter by entering this command:

  config flow create exporter *exporter-name ip-addr port-number*
- Create a NetFlow Monitor by entering this command:

  config flow create monitor *monitor-name*
- Associate or dissociate a NetFlow monitor with an exporter by entering this command:

  config flow {**add** | **delete**} **monitor** *monitor-name* **exporter** *exporter-name*
- Associate or dissociate a NetFlow monitor with a record by entering this command:

  config flow {**add** | **delete**} **monitor** *monitor-name* **record ipv4_client_app_flow_record**
- Associate or dissociate a NetFlow monitor with a WLAN by entering this command:

  config wlan flow *wlan-id* **monitor** *monitor-name* {**enable** | **disable**}
- View a summary of NetFlow monitors by entering this command:

  show flow monitor summary
- View information about the Exporter by entering this command:

show flow exporter {**summary** | **statistics**}

- Configure NetFlow debug by entering this command:

  debug flow {**detail** | **error** | **info**} {**enable** | **disable**}