Monitoring EasyQoS

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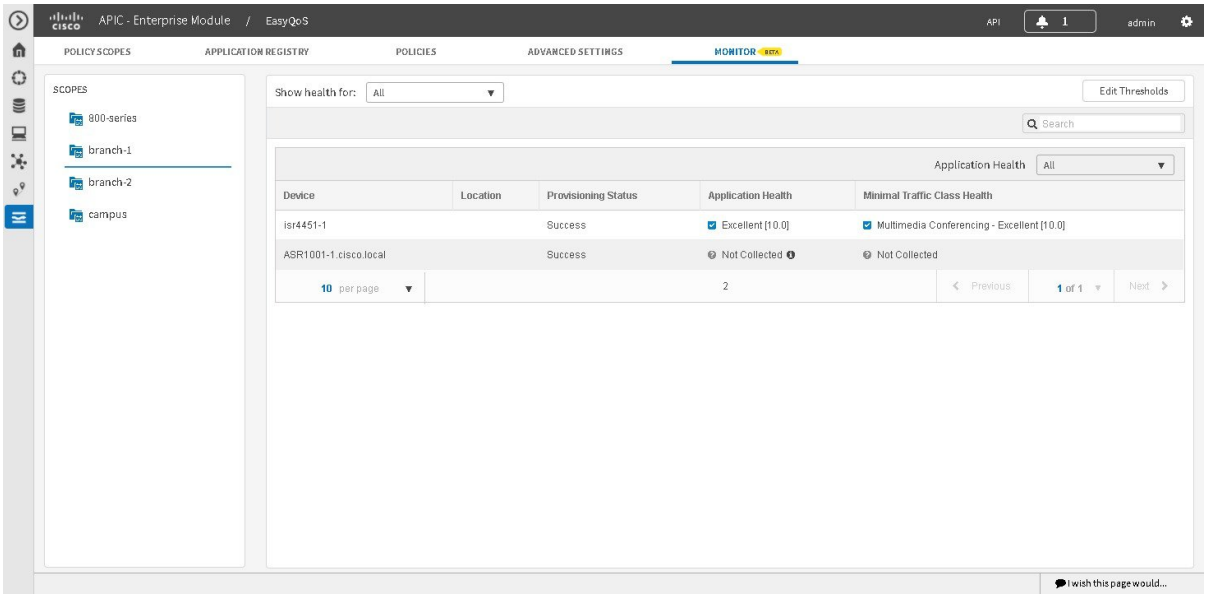
Information about Monitoring EasyQoS

Cisco EasyQoS permits you to monitor an application's health on router WAN interfaces in your network for troubleshooting purposes. You view this data from the **Monitoring** window.

Note For this release, EasyQoS monitoring is provided as a beta functionality. The supported scale for this feature is 4000 managed devices including 400 monitored interfaces (200 routers with 2 interfaces each.)

The network devices are polled every 10 minutes to obtain the monitoring statistics.

Figure 1: Monitoring Window



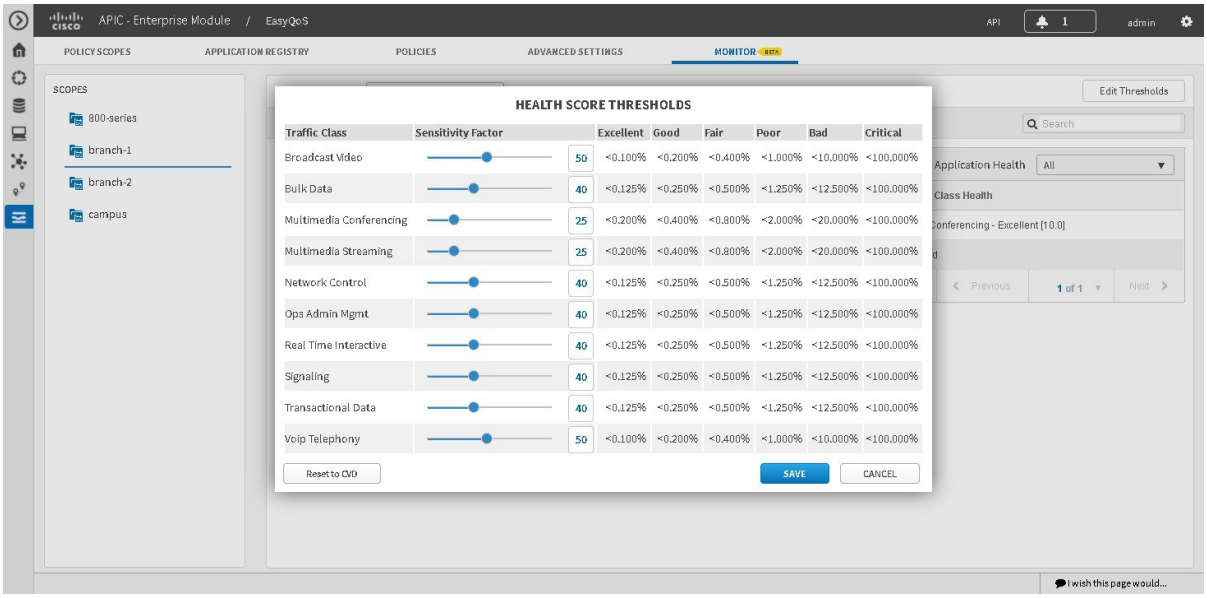
The health of each application is measured as a sensitivity to packet loss on the router's WAN interface. This sensitivity is given a numerical value. The higher the sensitivity factor the more sensitive for packet loss (e.g. factor =5 => Excellent < 1%, factor = 100 => Excellent < 0.05%). The lower the sensitivity factor the less sensitive for packet loss.

Sensitivity to packet loss is different for each traffic class; for example, broadcast video is very sensitive to packet loss as compared to other applications. For this reason, each application (within a traffic class) has a different threshold.

You can view the sensitivity factor and thresholds for the traffic class in the **Health Score Thresholds** table. The **Health Score Thresholds** table is accessible from the **Monitoring** window by clicking the **Edit Threshold** button. This table displays how the default thresholds for the different traffic classes are defined. For each traffic class row there exists a range of values that is mapped to one of the Health Score Grades (Excellent, Good, Fair, Poor, Bad, Critical). The 0-100 percentage value (score) is calculated for each grade by linerly splitting the range into two parts and deciding upon the correct score.

You are able to reconfigure the sensitivity factor for each traffic class and therefore, each application. For information, see Changing Sensitivity Factor for the Traffic Class, on page 10.

Figure 2: Health Score Thresholds

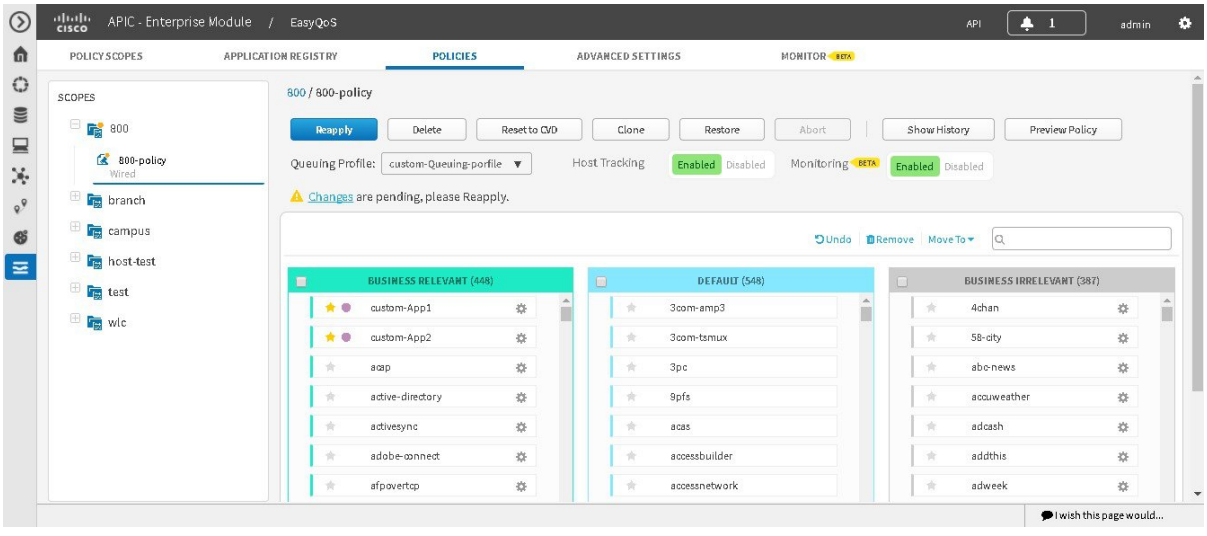


Enabling Monitoring for EasyQoS

Cisco EasyQoS permits you to monitor an application's health on the router WAN interfaces in your network. You can use this information to troubleshoot any issues with the applications and devices.

The health of applications is measured as a sensitivity to packet loss on the router's WAN interface. To monitor the health of applications, you must first enable this feature in the **Scopes** pane of the **Policies** window.

Figure 3: Enabling Monitoring for EasyQoS



Before you begin

You must have either administrator (ROLE_ADMIN) or policy administrator (ROLE_POLICY_ADMIN) permissions and the appropriate RBAC scope to perform this procedure.

Make sure that you have discovered your complete network topology.

From the **Topology** or **Device Inventory** window, verify that the device roles assigned to devices during discovery are appropriate for your network design. If necessary, change any of the device roles that are not appropriate.

Define the scope of devices that you want to be configured with this QoS policy. You can do this by creating a policy tag in Topology or Device Inventory or by creating a policy scope in EasyQoS.

Step 1 From the **Navigation** pane, click **EasyQoS**.

Step 2 Click the **Policies** tab.

Step 3 From the **Scopes** pane, select a policy scope.

Step 4 Click the **Enabled** button in the **Monitoring** field.

When prompted to confirm you selection, click **OK**.

What to do next

Click the **Monitor** tab to access the **Monitor** window.

Important The EasyQoS policy should be re-applied to the policy scope after enabling the Monitoring feature.

The EasyQoS monitoring feature will also apply the following interface-level configuration command to all WAN-facing interfaces on Cisco ASR 1000, ISR 4000, ISR G2, and ISR 800 series routers which support an active NBAR2 license:

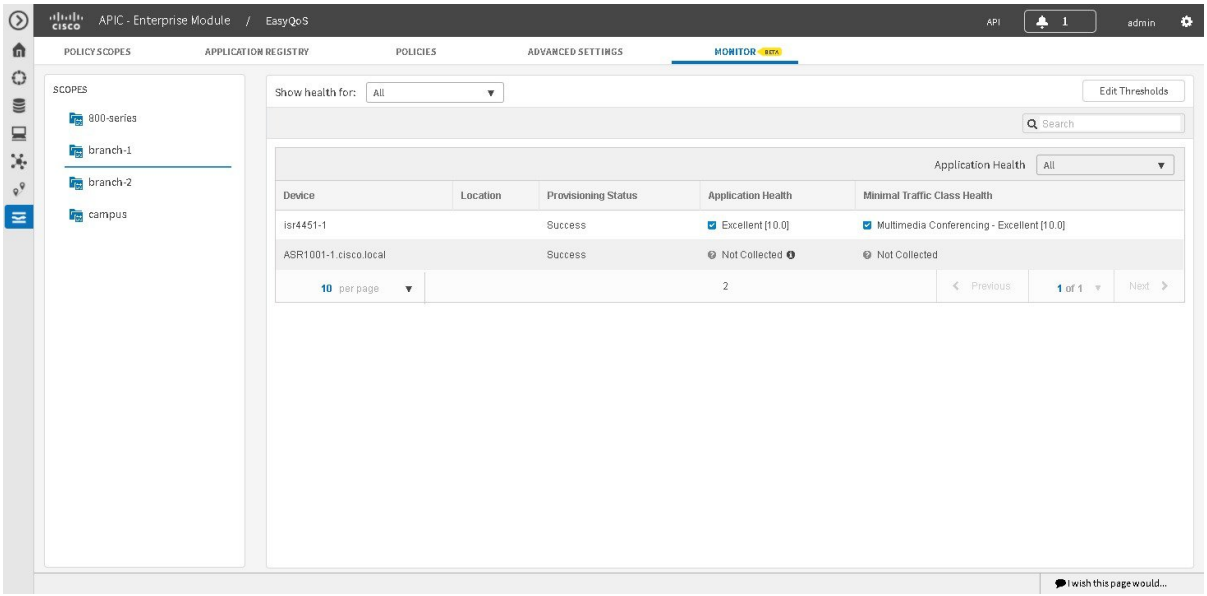
```
ip nbar protocol discovery
```

This command is applied on these routers for future EasyQoS functionality.

Filtering for the Device and Application Health

You can filter for a specific device and view its application health using the monitoring function of EasyQoS. Follow the procedures described below to perform this task.

Figure 4: Monitoring Window



Note For device and its application data to appear in the **Monitoring** window, the following requirements must be met:

- The device is a router. Only Cisco router data appears in the **Monitoring** window.
- The device has an active NBAR license.
- The device's interface is a WAN interface.
- Monitoring has been enabled for the scope. For information about this procedure, see Enabling Monitoring for EasyQoS, on page 3.

Before you begin

You must have either administrator (ROLE_ADMIN) or policy administrator (ROLE_POLICY_ADMIN) permissions and the appropriate RBAC scope to perform this procedure.

Make sure that you have discovered your complete network topology.

From the **Topology** or **Device Inventory** window, verify that the device roles assigned to devices during discovery are appropriate for your network design. If necessary, change any of the device roles that are not appropriate.

Define the scope of devices that you want to be configured with this QoS policy. You can do this by creating a policy tag in Topology or Device Inventory or by creating a policy scope in EasyQoS.

Step 1 From the **Navigation** pane, click **EasyQoS**.

Step 2 Click the **MONITOR** tab.

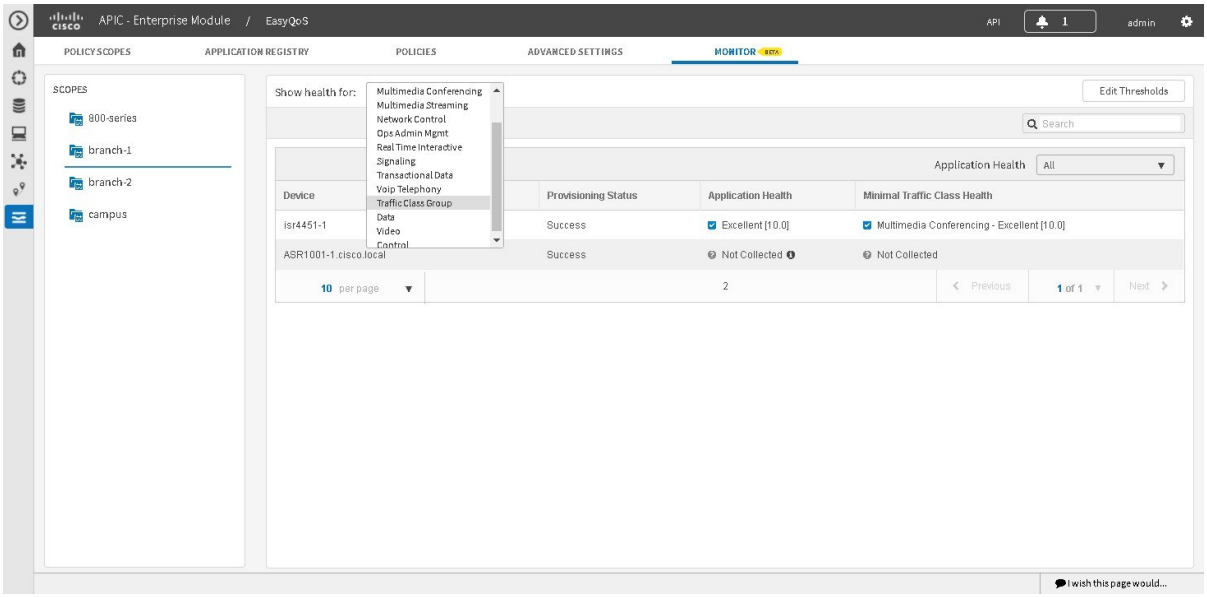
The EasyQoS **Monitoring** window opens.

Step 3 In the **Scopes** pane, click the specific scope for the health of the devices.

Step 4 In the **Show health for:** field, click the drop-down arrow and select a traffic class.

For example, select BROADCAST_VIDEO from the menu.

Figure 5: Option for Traffic Class Selection



Step 5 In the **Search** field, enter the device name to display the device in the **Monitoring** window.

Step 6 Proceed to review the device and its application health.

The following information is displayed:

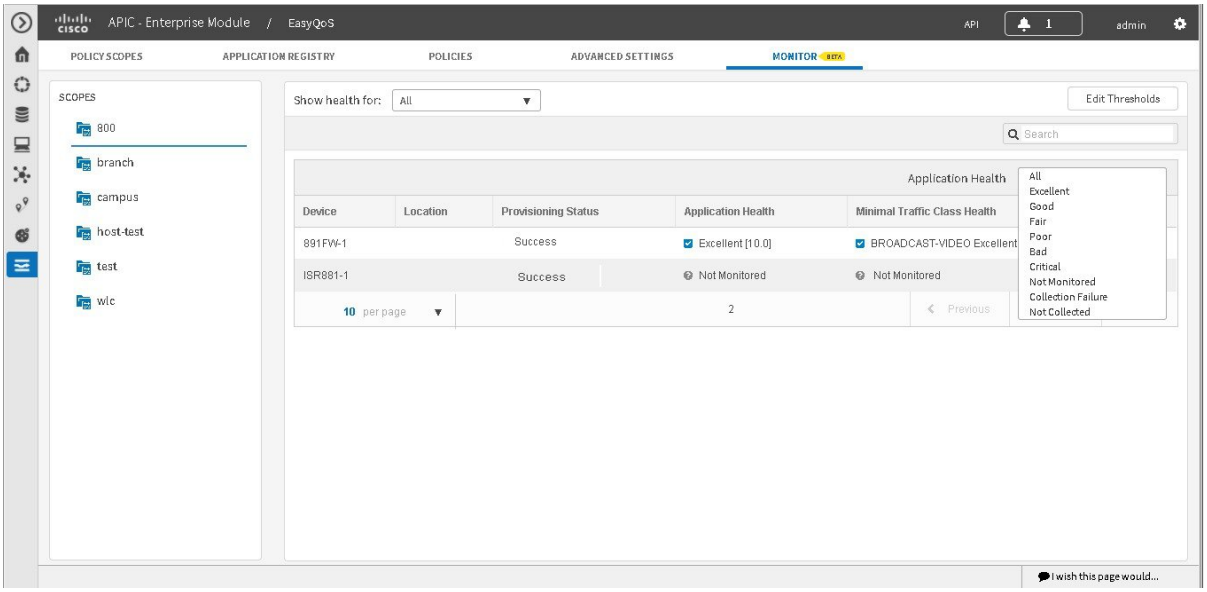
- **Device**
- **Location**
- **Provisioning Status**
- **Application Health**
- **Minimal Traffic Class Health**

Note The interface can have traffic from multiple traffic classes flowing through it. The **Monitoring** tool captures packet loss for each traffic class and aggregates this information for an application health score for the interface. Due to this aggregation, one or more traffic classes can actually have packet loss, but this fact could be hidden at this level since the rest of the traffic classes health are good. Therefore to provide additional information, the minimal traffic class health provides the health of the traffic class with the lowest traffic score.

Step 7 Select the appropriate filter in the **Application Health** field.

Note The application health filters (and values) are determined by pre-configured thresholds for packet sensitivity. You can reconfigure these pre-configured thresholds. For information about this procedure, see Changing Sensitivity Factor for the Traffic Class, on page 10.

Figure 6: Option for Application Health Selection



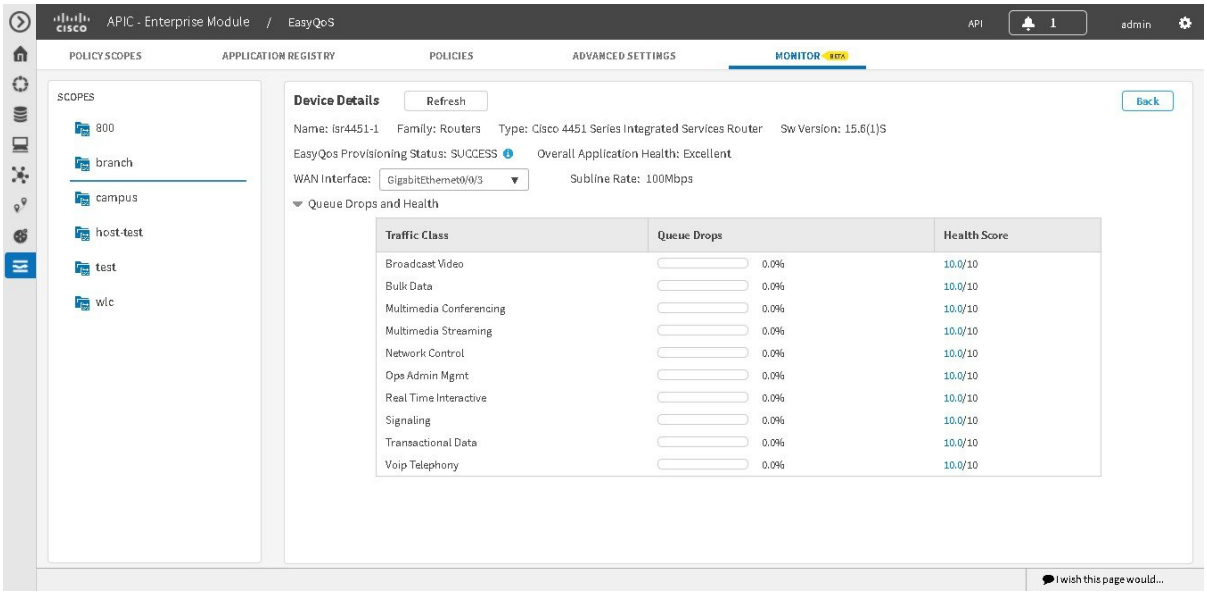
The following table describes the application health filters that are available.

Excellent	An application health score of *excellent* is being generated for the router platform. This indicates that monitoring statistics are being collected on one or more interfaces on the router and that the drop percentage is under the Health Score Thresholds for an excellent score. See Figure 2: Health Score Thresholds, on page 3. **Note** Application health scores are calculated based upon the percentage of drops within each traffic class over the previous collection interval. By default, the collection interval is 10 minutes. Therefore, the application health score shows the health over the past collection interval only. There is currently no history, regarding application health scores, maintained within Cisco APIC-EM. Future versions of the **Monitoring** feature may extend this functionality to provide the network operator the ability to view historical health scores over selected time periods.
Good	An application health score of *good* is being generated for the router platform. This indicates that monitoring statistics are being collected on one or more interfaces on the router and that the drop percentage is under the Health Score Thresholds for a good score. See Figure 2: Health Score Thresholds, on page 3.

Fair	An application health score of *fair* is being generated for the router platform. This indicates that monitoring statistics are being collected on one or more interfaces on the router and that the drop percentage is under the Health Score Thresholds for a fair score. See Figure 2: Health Score Thresholds, on page 3.
Bad	An application health score of *bad* is being generated for the router platform. This indicates that monitoring statistics are being collected on one or more interfaces on the router and that the drop percentage is under the Health Score Thresholds for a bad score. See Figure 2: Health Score Thresholds, on page 3.
Poor	An application health score of *poor* is being generated for the router platform. This indicates that monitoring statistics are being collected on one or more interfaces on the router and that the drop percentage is under the Health Score Thresholds for a poor score. See Figure 2: Health Score Thresholds, on page 3.
Critical	An application health score of *critical* is being generated for the router platform. This indicates that monitoring statistics are being collected on one or more interfaces on the router and that the drop percentage is under the Health Score Thresholds for a critical score. See Figure 2: Health Score Thresholds, on page 3.
Not Monitored	This status indicates the router is not being monitored. This status occurs if the router does not support NBAR – meaning it does not have an active NBAR license or does not have any WAN-connected interfaces.
Collection Failure	This status indicates there was an error in collecting statistics from the device for the previous cycle. Therefore, the health score could not be calculated.
Not Collected	This status indicates that no monitoring statistics are being collected for the router. In this situation, the router is capable of being monitored; however, monitoring statistics are not available. This is due to either the first health data sample not being collected or the number of monitored interfaces exceeds the supported number of 1,000 interfaces.

Step 8 Click the device name in the table to view its device data.

Figure 7: Device Details



The following device data appears:

- **Name**
- **Family**
- **Type**
- **Software Version**
- **EasyQoS Provisioning Status**
- **Overall Application Health**
- **WAN Interface**

  Based on the interface selection, you are able to view the queue drops and health for all traffic classes.
- **Subline Rate**
- **Queue Drops and Health** (by Traffic Class)

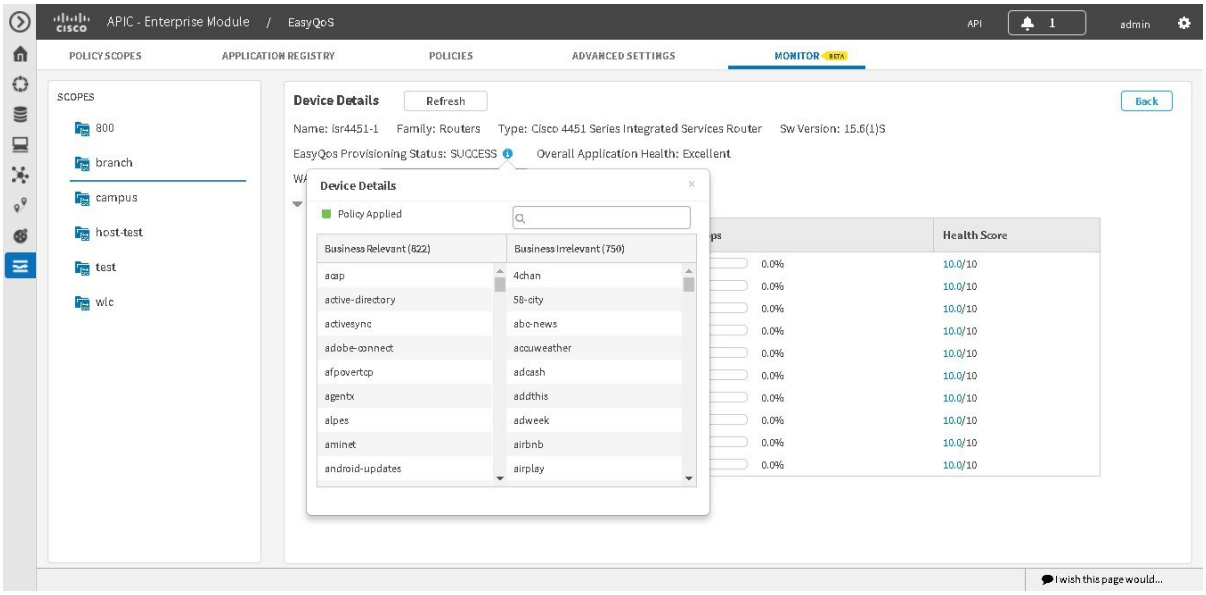
  Based on the health score values, the progress bar displays the appropriate color.

Note In case of a Cisco router with Cisco IOS Polaris greater than or equal to 16.3, then this GUI view also includes a WebUI link.

Clicking **Back** closes the device data pop-up.

Step 9 Clicking the information icon (**i**), displays EasyQoS policies on the device.

Figure 8: Device Details - Policy Applied

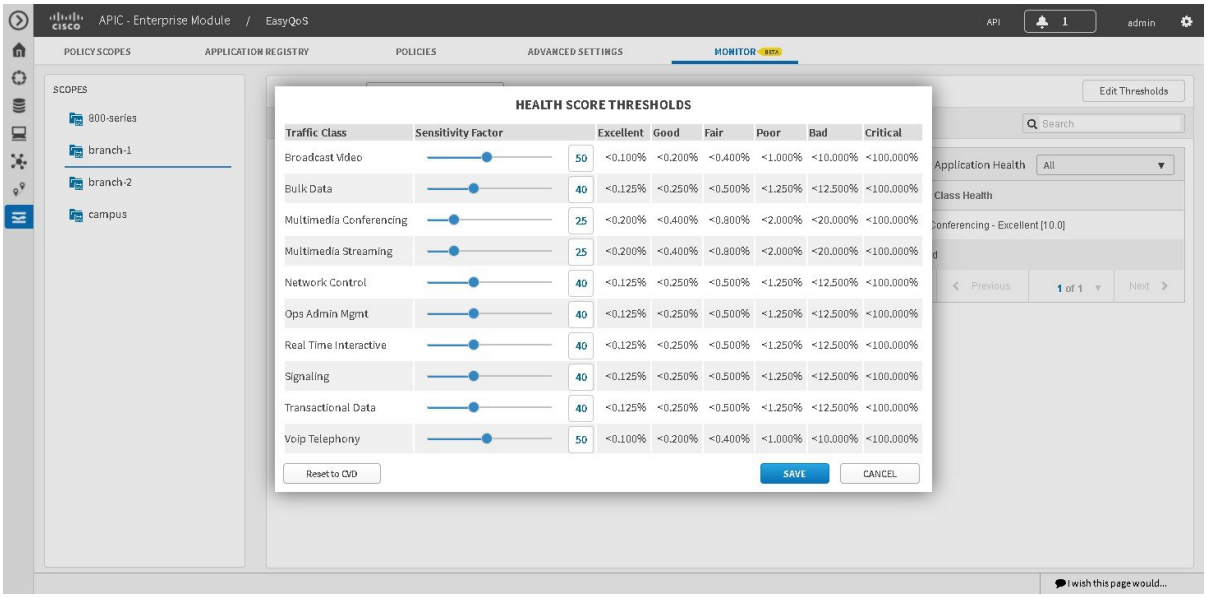


Changing Sensitivity Factor for the Traffic Class

You can change the default sensitivity factor for a traffic class to assist in monitoring an application's health. Follow the procedures described below to perform this task.

Note The default values for the sensitivity factor for each traffic class are derived from industry standards. In particular, IETF RFC 4594 specifies the expected tolerances to packet loss for each of the 12 traffic classes. Based upon IETF RFC 4594, the tolerance to packet loss for the Default (Best Effort) traffic-class is not specified. Additionally, the tolerance to packet loss for the Scavenger traffic classes is high. Application health scores for these two traffic classes are therefore not collected, and there is no Sensitivity Factor setting for these two traffic classes.

Figure 9: Health Score Thresholds



Before you begin

You must have either administrator (ROLE_ADMIN) or policy administrator (ROLE_POLICY_ADMIN) permissions and the appropriate RBAC scope to perform this procedure.

Make sure that you have discovered your complete network topology.

From the **Topology** or **Device Inventory** window, verify that the device roles assigned to devices during discovery are appropriate for your network design. If necessary, change any of the device roles that are not appropriate.

Define the scope of devices that you want to be configured with this QoS policy. You can do this by creating a policy tag in Topology or Device Inventory or by creating a policy scope in EasyQoS.

Step 1 From the **Navigation** pane, click **EasyQoS**.

Step 2 Click the **MONITOR** tab.

The EasyQoS **Monitoring** window opens.

Step 3 In the **Scopes** pane, click the specific scope for the health of the devices.

Step 4 Click the **Edit Threshold** button at the upper right of this window.

The **Health Scores Thresholds** window then appears.

The **Health Score Thresholds** table displays how the default thresholds for the different traffic classes are defined. For each row there exists a range of values that is mapped to one of the Health Score Grades (Excellent, Good, Fair, Poor, Bad, Critical). The 0-100 percentage value (score) is calculated by linerly splitting the range into two parts and deciding upon the correct score.

Note Only Cisco router data appears in the **Health Score Thresholds** table. When applying an EasyQoS policy, relevant interfaces on the devices in the scope are registered or unregistered to display in this table. The criteria for registering an interface (and displaying in the table) is as follows: the device is a router, the device supports NBAR, the device interface is a WAN interface, and monitoring is enabled for the scope.

Step 5 To adjust the sensitivity for a traffic class, click on the blue circle icon in the sensitivity column and move it (with the bar) to either increase to decrease sensitivity.

All of the information in the table is read-only, except for the sensitivity factor for each traffic class which can be modified to be any number between 1-100 by adjusting the bar.

Step 6 Click the **Save** button to save the changes and exit the menu pop-up.

To cancel and exit the menu pop-up, click **Cancel**. You can also reset to the defaults, by clicking **Reset to CD**.