First Steps to Using a PacketShaper
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Overview

This “first steps” guide will show you how to use a PacketShaper to:

• Classify network traffic
• Analyze network and application performance
• Solve performance problems
Classifying Traffic on the Network

PacketShaper’s traffic discovery feature detects and identifies the traffic running on a network and automatically creates traffic classes for each application, service, or protocol that it discovers. These classes are organized into a class tree. Classification is a prerequisite for other PacketShaper functions. To analyze a particular application’s performance, you must first identify that application’s traffic. Likewise, to control an application’s performance, you isolate its traffic to adequately ration and assign resources.

Note that traffic discovery is not appropriate for all situations. If PacketShaper units are at branch office deployments where you are monitoring and controlling application performance, you can use the traffic discovery feature to create application-based traffic trees. In deployments where the PacketShaper is located at the main site’s WAN or Internet link, you will want a location-based traffic tree that has traffic classes for each branch office; in this situation, you would not want to use automatic traffic discovery. For a detailed explanation of these traffic tree strategies, see Enterprise Deployment Topologies in PacketGuide.

Discover Traffic

Automatic traffic discovery may already be enabled. To check the status of the Traffic Discovery setting:

1. Log in to your PacketShaper by entering its IP address in your browser, and entering the password at the Login prompt. The Blue Coat Sky dashboard appears.

2. Check the status line at the top. If it says Discovery on, you can skip the following steps.

3. Click the Advanced UI link. (The Advanced UI is used for all setup and configuration.)

4. Click the Setup tab. The Basic Settings screen appears.

5. To enable automatic traffic discovery, select on for Traffic Discovery.

6. Click apply changes.

Traffic needs to run through the PacketShaper over time before you can see trends and decide on a course of action. We suggest you collect data for at least three days.
Note: Make sure the mission-critical applications are being accessed during this time so that the protocols, services, and/or applications will be auto-discovered.

View the Class Tree
The traffic discovery process creates traffic classes automatically, based on the traffic types it detects. For example, web surfing is categorized in the HTTP traffic class.

To see what classes the PacketShaper has auto-discovered, display the traffic tree:

1. If you aren’t already in the Blue Coat Sky user interface, click the Blue Coat Sky link at the top of the screen.

2. Click the Traffic Management tab. The discovered classes appear in an alphabetical list.

3. To see the type of traffic on your network, use the scroll bar to look through the discovered classes.

4. By looking at the class tree, you can answer the following types of questions:
   • How many times has FTP been used? (Look at the Hits column for the FTP class.)
   • What was the peak rate for web traffic? (Look at the Peak bps column for the HTTP class.)
   • What type of traffic is currently using the most bandwidth? (Click the Current bps column heading to sort by rate. The class with the highest rate appears at the top of the list.)
Problems?

<table>
<thead>
<tr>
<th>What’s wrong?</th>
<th>What might fix it:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The class tree is empty.</td>
<td>Is traffic discovery turned on? Look at the status line to make sure it says Discovery on.</td>
</tr>
</tbody>
</table>
| The class tree doesn’t have classes for some of the applications I know are on the network. | ● Have users initiated new sessions after connecting the unit to the network and configuring the PacketShaper? A PacketShaper can’t discover traffic classes until it sees the traffic. Make sure users are accessing the critical applications and establishing new sessions on the network.  
  ● To avoid creating classes needlessly, the PacketShaper must see at least three* distinct flows of an application before it deems the flows significant enough to warrant auto-discovery. The flows must begin within the same time-out interval, typically one minute, and should have different source/destination address pairs. If you're performing tests and want a specific application to be auto-discovered, it may be necessary to open a session, quit, and then re-open the application so that PacketShaper sees another session.  
  ● Is the PacketShaper installed on an Internet link between the VPN gateway and the router? If so, the unit sees encrypted traffic, not individual applications; consequently, the applications will not appear in the traffic tree. In order to differentiate between encrypted applications, the unit must be positioned between the LAN and the VPN gateway.  
  ● Although PacketShaper classifies hundreds of applications, there could be custom or unique applications that do not get auto-classified. To accommodate these situations, PacketShaper provides the ability to create classes manually. |
Analyzing Network Traffic

Look at the Dashboard
The Blue Coat Sky Dashboard displays several real-time graphs that allow you to get a picture of the type of traffic running on your network as well as the current link utilization.

- **Top 10 pie charts** — Shows the relative portions of bandwidth allocated to the ten most active classes on the network and aggregates traffic from all other classes into a slice called *All Others*. When mousing over a slice, a tooltip displays the class’s average bandwidth usage in bits per second and its percentage of the total bandwidth on the link. Data is refreshed every 10 seconds, showing real-time information for the most recent one-minute interval.

- **Link Utilization line graphs** — Shows the link’s bandwidth usage in bits per second. The graphs are updated every second. The graph initially shows utilization data for the last three minutes; after a period of time the x-axis scale converts to displaying the last 15 minutes of data.

Click the Dashboard tab to display the real-time Top 10 pie charts and link utilization graphs. You can use the Dashboard to answer the following types of questions:

- Which inbound traffic class is currently consuming the most bandwidth? Which outbound traffic class?
- Are you surprised by any of the classes in your Top 10 pie charts?
- Which classes (for example, recreational traffic) do you not want to see in your Top 10? These classes are candidates for traffic control. See “Solving Performance Problems.”
- Is your link utilization fairly steady or are there traffic spikes?

Display Historical Graphs
After the PacketShaper has a chance to collect data, you can create historical graphs of the link and any traffic class. Follow the steps below to look at link utilization over various time periods.

1. In Blue Coat Sky, click the Traffic Management tab. The class tree appears in the top pane.
2. In the class tree, select Root. This class represents the Inbound and Outbound links.
3. Click the Reports icon to display the Reports module in the bottom pane.
4. Select the Historical tab.
5. Make sure Utilization with Peaks (the default graph type) is selected in the Graph field.

Inbound and Outbound line graphs display in the Reports pane, showing average and peak utilization for the link. How often is utilization peaking near the link size?
The default time period is one hour.

1. Make sure the Root class is still selected in the class tree.
2. Select Network Efficiency from the Graph drop-down list.

   The Reports pane now displays Network Efficiency graphs. Is your link 100% efficient during the graphed time period? If not, how frequently are retransmissions occurring?

3. To graph network efficiency of a specific type of traffic (such as CIFS), select one of your classes in the upper pane.

   The following graph shows that CIFS experienced a high number of retransmissions (low efficiency) at several periods during the day.

The Reports module is quite flexible and has a number of other features you might want to experiment with:

- Select up to 10 classes per graph. Hold down Ctrl as you click each class you want to graph.
- Display data as lines or stacked areas. Click the Switch to Stacked Areas button to display a stacked area graph, or the Switch to Lines button to display a line graph.
- Display real-time graphs. Click the Real-Time tab to view the current real-time bandwidth utilization (in bits per second) for up to 10 classes. A line graph displays the rate at the current time (now) and tracks the rates over the last 15 minutes.
Solving Performance Problems

PacketShapers offer three ways to solve application and network performance problems: policies, DSCP, and partitions.

Policies

A policy determines how an application’s individual flows are treated in the context of competing applications and allows you to manage bandwidth on a flow-by-flow basis. With policies, you can give each flow of mission-critical traffic the bandwidth it needs for optimum performance, as well as protect it from demanding, less important traffic. In addition, policies can keep non-urgent traffic flows (such as FTP) from consuming more than an appropriate share of bandwidth or can block flows completely.

When you apply a policy to a traffic class, you define how each flow will be treated when competing with other applications. While there are several different types of policies you can create in PacketShaper, the rate policy is the most common. With this type of policy, you can:

• Guarantee each flow a minimum bits-per-second rate
• Give each flow prioritized access to excess bandwidth
• Limit each flow to a maximum amount of bandwidth
• Take advantage of Blue Coat’s TCP Rate Control technology that prevents traffic from being sent at a rate that is higher than it can be transferred and received, thereby greatly reducing queuing in router buffers and controlling inbound traffic
• Smooth bursty traffic (such as HTTP)

Priority policies, another type of PacketShaper policy, establish a priority for traffic without specifying a particular rate. Use priority policies for non-IP traffic types, or traffic that does not burst (for example, Telnet).

In addition to creating policies for mission-critical applications, you may also want to place controls on some of the most active services and applications on the network (such as HTTP or FTP).

DSCP

Network routers can apply differentiated grades of service to packet streams based on a Diffserv Code Point (DSCP) marker in an IP packet header. PacketShaper is able to mark applications with a specific DSCP marker (0-63).

Partitions

A partition manages bandwidth for a traffic class’ aggregate flows, so that all of the flows for the class are controlled together as one. You can use partitions to protect mission-critical traffic by guaranteeing that a traffic class always gets a defined amount of bandwidth. In addition, you can use partitions to limit aggressive, non-critical traffic by allowing that traffic class to consume only a defined amount of bandwidth.

A partition is a virtual pipe that you can create for a given traffic class. This virtual pipe reserves bandwidth for all flows of a given type — the traffic class aggregate. Partitions can protect traffic by guaranteeing a defined amount of bandwidth for the mission-critical traffic classes. For example, you could set a 128 Kbps partition for SNA traffic. This partition ensures that SNA will always have at least 128 Kbps of bandwidth.

Partitions can also limit less important traffic by putting a cap on the amount of bandwidth a traffic class can use. For example, you can assign a 64 Kbps partition to FTP traffic. This prevents FTP traffic from consuming your entire link and blocking more important traffic.
Control Traffic
Based on the type of traffic on your network and your company’s priorities, you can begin to set controls on your traffic classes. In the following example, you will limit the amount of Gnutella peer-to-peer traffic on your network by setting a small partition and a low-priority rate policy.

1. Click the Traffic Management tab. The class tree appears in the upper pane.
2. Select the Gnutella class.
3. Click the Policy Manager icon.
4. Click the Class Operations tab.
5. Click Control Traffic.
6. Fill in the policy and partition settings as shown below.

![Control Traffic](image)

7. Click Apply.

Turn Shaping On
Traffic control settings have no effect unless traffic shaping is turned on. To do this:

1. Switch to the Advanced UI.
2. Click the setup tab.
3. Turn Shaping on.
4. Click apply changes.

The status line now says Shaping on.

Verify that the Policies are Working
To verify that a traffic class and its control settings are working as expected, you can:

1. First, make sure traffic is being generated for the type of traffic you created policy and partition settings for.
2. In Blue Coat Sky, look at the class tree in the Traffic Management tab. Locate the class and compare the settings in the Policy/Partition column to the rate statistics (1 Min bps and Peak bps). For example, if you created a non-burstable 500 kbps partition for the class, the rate should not exceed 500 kbps. (You should reset the statistics and then refresh them periodically.)
3. Create a historical Utilization with Peaks graph for the class. Be sure to specify a time period that includes before and after the creation of the control settings.
## Problems?

<table>
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<tbody>
<tr>
<td>My graphs look strange: the data can’t be correct.</td>
<td>Do you have the date set correctly? Check the <strong>date &amp; time</strong> page under the <strong>Setup</strong> tab in the Advanced UI.</td>
</tr>
</tbody>
</table>
| The LEDs show link activity but the traffic tree is empty.                  | - Is traffic discovery turned on? Look at the status line to make sure it says **Discovery on**.  
- Is your browser set to reread the HTML page source every time? This is a PacketShaper requirement.  |
| Performance hasn’t improved since I set policies and created partitions.    | - Is shaping turned on? Policies and partitions are only applied if shaping is on. Look at the status line to make sure it says **Shaping on**.  
- Did you set too many policies? Try just setting policies for your most critical and most bandwidth-greedy classes. |
| Statistics in the class tree don’t seem to be consistent with the policies I set. | - Is shaping turned on? Policies and partitions are only applied if shaping is on. Look at the status line to make sure it says **Shaping on**.  
- Are you looking at current data? Are you looking at current data? Use the Refresh button  
the Reset button to zero out the values and begin displaying new (post-policy) data. |