Blue Coat® Systems

Proving How Accelerating with Mach5 Using the PacketShaper Improves Your End-User Experience

Blue☆Coat®

Document History

Date	Version	Note
January 15, 2013	v1.0	Initial release

Contents

List of Figures

Introduction

Blue Coat Mach5 combines acceleration technologies, such as protocol optimization, object and byte caching, compression, and traffic shaping to accelerate application delivery to remote locations.

The solution can achieve 300 times faster access to files, email, backup, disaster recovery, and data applications in consolidated IT environments. It will also cut bandwidth consumption by 50-90%.

The graphs on the Mach5 appliances can display how much bandwidth has been saved; however, they do not show how much faster the applications are running due to the acceleration techniques, or what benefits end-users are actually seeing.

As a result, the typical way for measuring proof of the savings is to use a stopwatch to compare how long a transaction takes both with and without the use of acceleration. While this comparison can display end-user benefits, it can be inaccurate and lends itself to error. It also means that no graphical evidence can be presented in support of the comparison values; however, the graphs generated in Blue Coat's PacketShaper reports show detailed improvement in the end-user experience.

Blue Coat PacketShaper delivers an accurate picture of network traffic by automatically discovering and establishing visibility into over 600 common applications, while providing the ability to define thousands more. Leveraging Layer 7 Plus application knowledge, as well as traditional Layer 2-4 information, PacketShaper monitors and classifies traffic based on a variety of characteristics that include application signature, URL, HTTP content type, Oracle server, Citrix Published Application, IP address, VLAN, MAC, MPLS tag, DiffServ, TOS, and more.

PacketShaper monitors performance—over 100 statistics per application class—in real time. PacketShaper tracks the bandwidth consumed by applications and Web content categories, the response times of key applications by network and server delay, and key statistics, such as TCP health, efficiency, and retransmissions to aid in troubleshooting.

Scenario

To use PacketShaper for proving the benefits to the end-user experience, it is best to have PacketShaper located at the remote site where the clients are located. This makes the reporting much easier than having PacketShapers located at the Data Center. PacketShaper needs to be installed between the Mach5 appliance and the WAN router. A sample network scenario is shown in Figure 1–1 on page 2. The key to remember here is that we want to see the traffic after it has been accelerated.
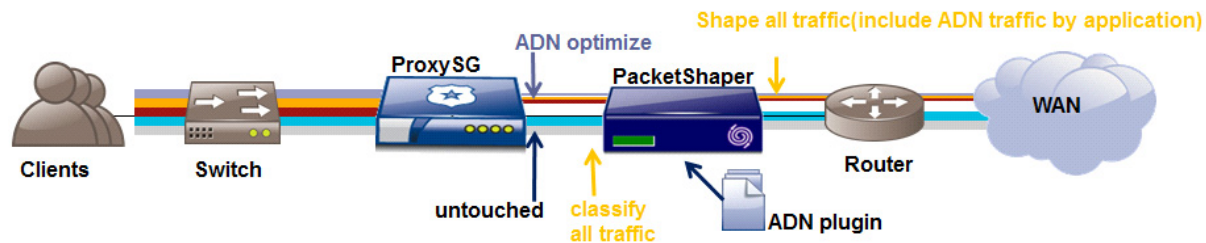
Figure 1–1   Sample network scenario 1

If the Mach5 is virtually in path, PacketShaper still needs to be upstream of the Mach5 tunnel and still needs to see the accelerated traffic, as shown in Figure 1–2.
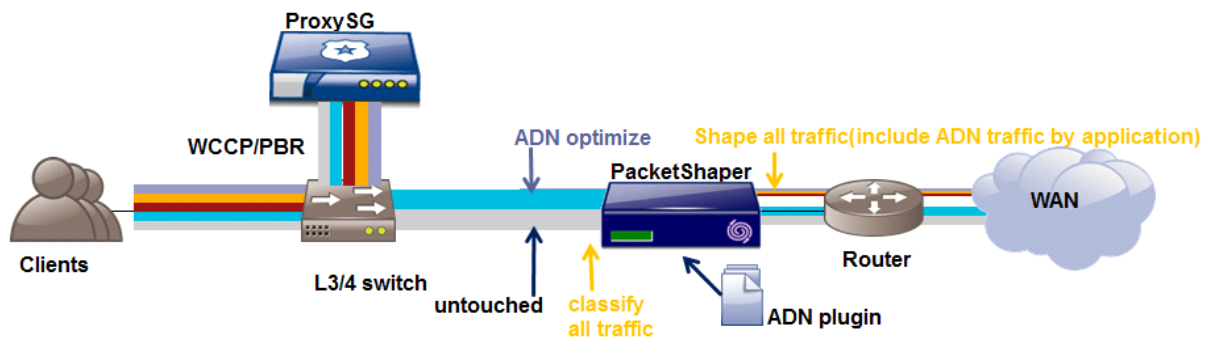
Figure 1–2   Sample network scenario 2

Requirements

❐   PacketShaper must be running Packetwise 8.3.1 or later.

❐   You must install the appropriate ADN plugin onto the PacketShaper using the process detailed in the following URL:
https://bto.bluecoat.com/packetguide/9.1/nav/tasks/configure/download-plugins-website.htm.

Figure 1–3 shows the link for downloading Mach5 v2.0.0.

Figure 1–3   ProxySG Mach5 link

Configuration Steps

The following procedure describes how to create graphs that display acceleration results. Configuration is performed on PacketShaper and optionally, the ProxySG appliance. In this procedure, you will turn on Traffic Discovery in the PacketShaper, then generate reports.

Procedure:

1. From the Legacy user interface Management Console, select the **Setup** tab.

2. Locate **Traffic Discovery**, then select **on** from the list box. (See Figure 1–4.)
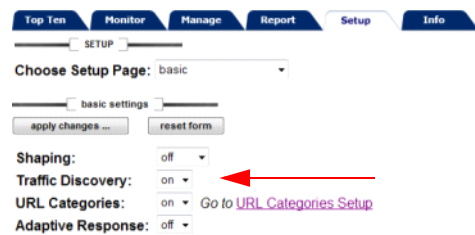
Figure 1–4   Setup tab

This automatically creates the **ProxySG-ADN** class in the traffic tree. (See Figure 1–5.)
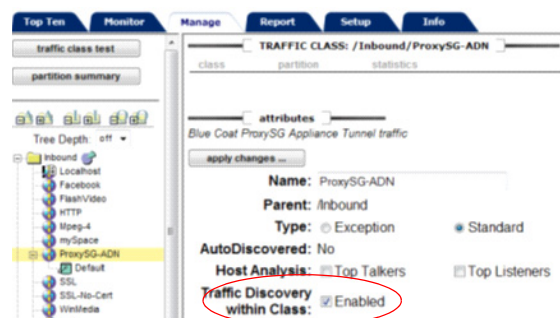

Figure 1–5   Manage tab

3. Select the **Manage** tab to ensure that traffic discovery is also turned on within this class.

4. Generate traffic through the ADN tunnel; PacketShaper automatically populates the ADN traffic that it sees.

   For known applications, class is created by name; for traffic that is intercepted with TCP tunnel, class is created using the port number of the application. (See Figure 1–6.)

   Note: If secure ADN is used, all traffic appears in PacketShaper as SSL.
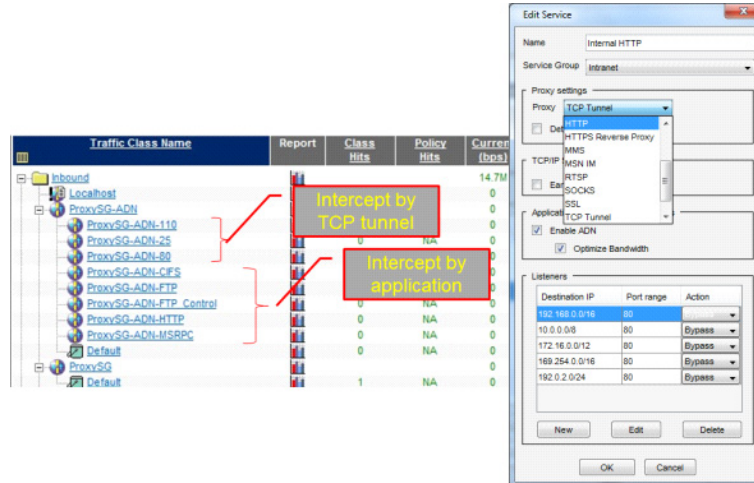
Figure 1–6   Intercepted traffic results

Comparing Performance Results With and Without Acceleration

The following procedure describes how to generate graphs that visually display performance results both with and without acceleration turned on.

Procedure:

1. Turn off acceleration on the Mach5 appliances and run some tests to determine how long data transfers take without using acceleration. Bypassing all traffic on the remote appliance is the easiest method for conducting this test. Sample results are shown in Figure 1–7.
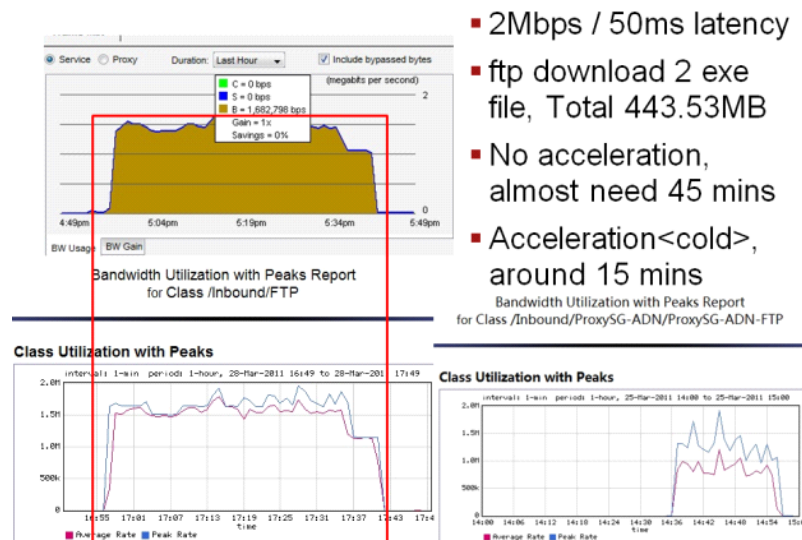
Figure 1–7   Sample results without acceleration

2. Turn on acceleration and run the data transfers again to show the benefits that the end-user will see on a cold pass (where nothing is cached and protocol-only techniques are used).

    In the example shown in Figure 1–7, the file tested took 45 minutes to transfer without acceleration, but only 17 minutes with acceleration turned on.

    Graphs from the ProxySG appliance can also be correlated with graphs from the PacketShaper for further evidence.

3. (Optional). To view Traffic Details using the ProxySG appliance, select the **Statistics** tab, then select **Traffic Details**. (See Figure 1–8.)
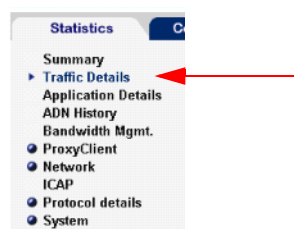
Figure 1–8   ProxySG Statistics tab - Traffic Details option

4. To view the graphs from the PacketShaper, using the Legacy user interface, select the relevant class from the **Manage** tab, then select **statistics > graph**. (See (Figure 1–9.)

Figure 1–9   Legacy user interface Manage tab

5. Select **Class Utilization with Peaks** from the drop-down list, then click **Create Report**. (See Figure 1–10.)

Figure 1–10 Statistics Reports - graph selector

5

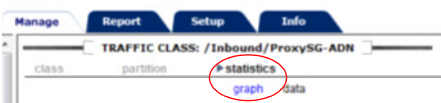## Proving WAN Performance with the PacketShaper

The PacketShaper shows all bits traversing the WAN link. Correlating the class utilization reports on the PacketShaper with the application history reports on the ProxySG appliance is useful in conveying to end-users as to what is happening on their WAN.

In the example shown in Figure 1–11, a file was passed three times. The first time was a cold first-pass, followed by two more transfers. The ProxySG appliance report shows the cached data being transmitted to the client and the resulting bandwidth savings; however, the PacketShaper utilization report gives a clearer indicator as to how long the transfers took, and how much data was actually sent over the WAN.
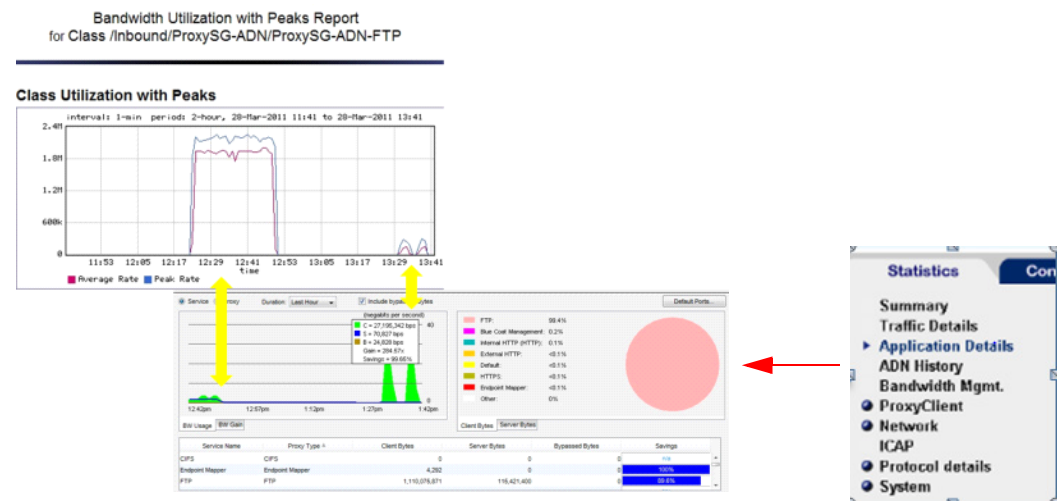
Figure 1–11   WAN performance results

Using Real-time Graphs to Depict the End-user Experience

The Sky user interface in the PacketShaper supports real-time utilization graphs. These graphs can be used to accurately depict the impact of acceleration on the performance of applications.

The Sky user interface is the first interface presented on login to the PacketShaper. If you are in the Legacy user interface, you can browse to it by clicking **BLUE COAT SKY** in the top right menu. If there is no other traffic traversing the link, you can use the main dashboard, and the inbound and outbound real-time graphs. (See Figure 1–12.)
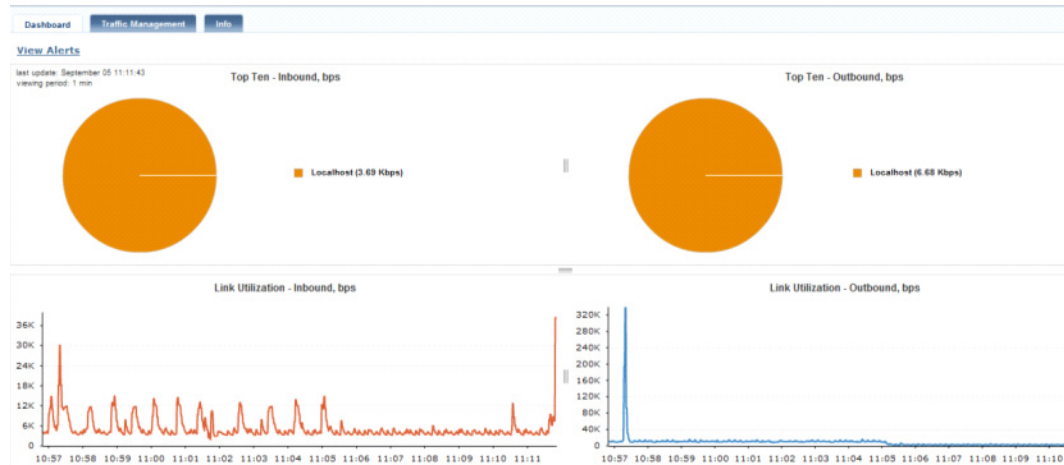
Figure 1–12   SKY user interface inbound/outbound real-time graphs

Note: You might need to narrow down the traffic analyzed in real time.
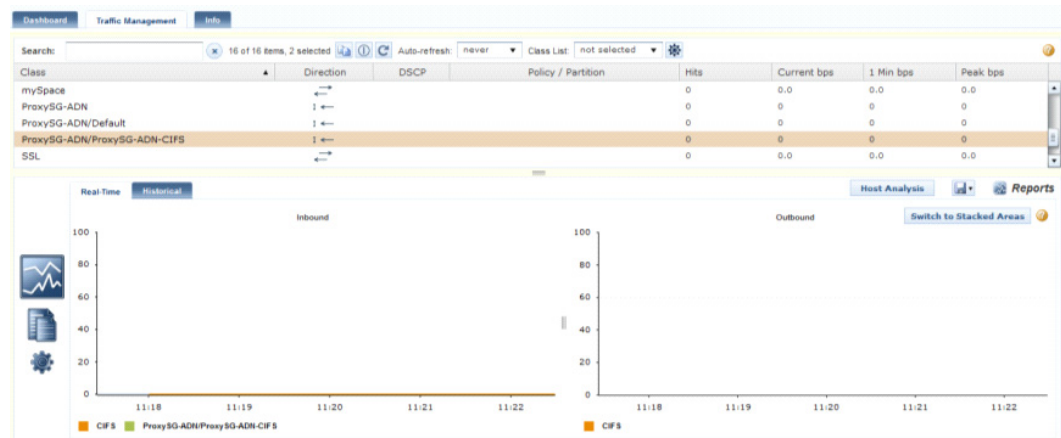
Figure 1–13   Real-time traffic analysis

1. To narrow results, select the **Traffic Management** tab.

2. Hold down the **ctrl** key while selecting the required classes. For example, Figure 1–13 shows CIFS and ProxySG-ADN-CIFS selected, so we can graph in real-time accelerated and non-accelerated CIFS traffic.

   After you have the real-time information displayed, run a series of tests and include a screen capture of the data being transferred in real time. This enables you to present to the customer what the network is doing in real time, in addition to the benefits that the end-user is experiencing.

The following tests were completed using CIFS to show a customer the impact of acceleration on file transfers and can be used as a good template for a running order to complete file transfer tests. (See Figure 1–14 and Figure 1–15.)

Figure 1–14 CIFS test results 1

Figure 1–15 CIFS test results 2

The following procedure was used for testing traffic results.

Procedure used for testing:

1. Acceleration was turned off and a file was downloaded using the CIFS protocol.

2. Acceleration was then turned on, and the file was downloaded again. The file was not in cache and therefore, the cache was cold. Savings on the first pass measured 65%, as shown in Figure 1–16. The recommended acceleration techniques would be protocol optimization and compression.
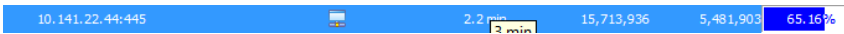
Figure 1–16 Acceleration on - first-pass (cold cache)

3. With acceleration turned on, the file was downloaded again. This time, the file was in cache (warm cache) and therefore, no data was sent across the WAN. Savings of this transfer was in excess of 99%. (Figure 1–17 shows an extra 15 MB being sent to the client, while only an extra 100 k was sent across the WAN. This was taken from the active sessions before (Figure 1–16) and after (Figure 1–17) the transfer in the ProxySG appliance). The file here would have been served from object cache.

Figure 1–17 Acceleration on - second pass (warm cache)

4. Acceleration was turned off again so that the file could be altered without updating the cache. The full file is being downloaded again without acceleration. The file was then altered by inserting an image into the document.

5. The file was saved. Acceleration was still turned off. The file was closed.

6. Acceleration was turned on again and the file was downloaded. Here you can see the small amount of data that was downloaded. The Mach5 reported a savings of 97%. This would have been from bandwidth savings presented by the byte cache.

In terms of the end-user experience, it can be seen that:

❐ Even with cold cache, the file still opens twice as quickly, when compared to opening the file without acceleration.

❐ With warm cache, the file opens instantaneously.

❐ With alterations, the file's opening time is still negligible when compared to no acceleration or cold cache.

Advanced Features

The PacketShaper also collects response time metrics that can be used to show the improvement to the end-user experience gained by use of acceleration with Mach5.

Response times are recorded only in the client-to-server direction, and the application response times involve bi-directional traffic. When looking at RTM statistics, you need to determine which statistics represent the activity you are trying to capture.

If you want to analyze the performance data for the traffic being accelerated at your branch office with the servers at your core, then the utilization graphs will be represented by the **/Inbound/ProxySG-ADN** class and the **/Outbound/ProxySG-ADN** class; however, the response times that tell the performance story are displayed in the **/Outbound/ProxySG-ADN** traffic class because it represents client-to-server traffic.

To view the response time graphs for the accelerated application for which you want to show the benefits, click on the **outbound** class of the **ProxySG-ADN** class of that application, then click **graph**. (See)

Note: Response Time Measurement statistics are only stored for leaf classes.
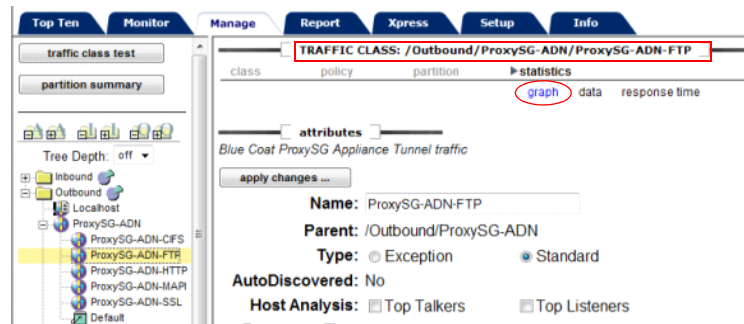
Figure 1–18 Response time graph for accelerated outbound ADN/ProxySG-ADN-FTP traffic

Procedure:

1. Select **Transaction Delay** and **Packet Round Trip Time** from the drop-down lists. (See .)
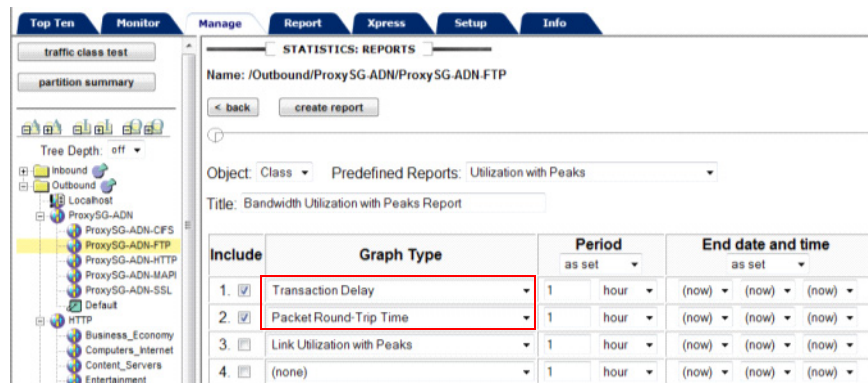

Figure 1–19 Statistics Reports - selecting graph types
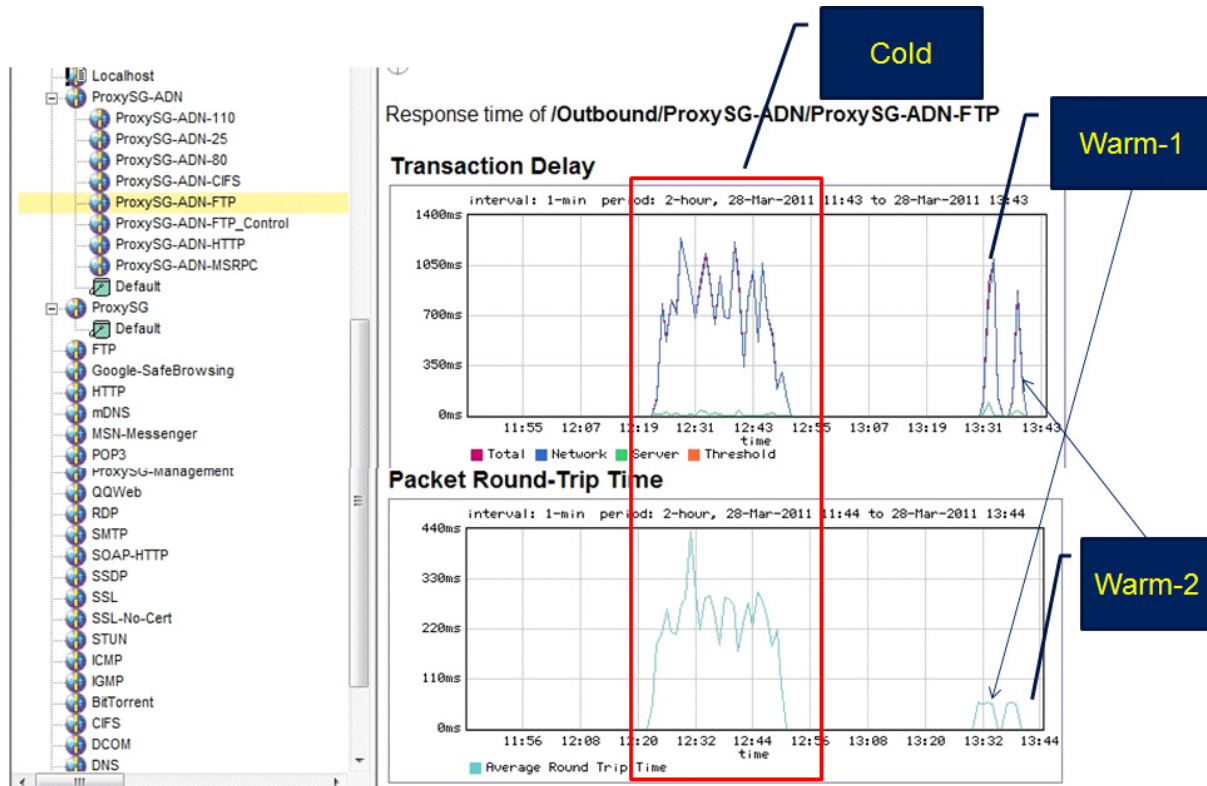
2. Click **Create Report**. (See .)

Figure 1–20 Report results - Transaction Delay and Packet RTT

The report results in Figure 1–20 show how objects in cold cache versus warm cache affect response times.

If you were testing file transfers through Windows Explorer, you can also compare the response time graphs with no acceleration (Outbound/CIFS) to the response times graphs with acceleration on (Outbound/ProxySG-ADN/ProxySG-ADN-CIFS).

Conclusion

Without a PacketShaper, you can use the graphs on the Mach5 to show bandwidth saved for empirical evidence, and you can use stopwatch timings to convey how much faster acceleration has made an application.

By providing the graphical evidence noted above, you can provide a detailed report that measures the gains the end-user will experience using acceleration on Mach5.

Appendix

Recommended Reading

❐ Analysis and monitoring with the PacketShaper:

https://bto.bluecoat.com/packetguide/9.1/solutions/solutions-analysis-monitoring.htm

❐ Class utilization reports:

https://bto.bluecoat.com/packetguide/9.1/nav/tasks/reports/create-graphs.htm

❐ Blue Coat Sky Dashboard:

https://bto.bluecoat.com/packetguide/9.1/nav/tasks-sky/reports/view-dashboard.htm

❐ Class-specific real-time graphs:

https://bto.bluecoat.com/packetguide/9.1/nav/tasks-sky/reports/display-realtime-graphs.htm

❐ Response Time Measurement graphs:

https://bto.bluecoat.com/packetguide/9.1/nav/tasks/rtm/view-rtm-graphs.htm

About Technical Briefs

Technical briefs are designed to illustrate the features and capabilities of Blue Coat products. By describing generic solutions, technical briefs provide a foundation that Blue Coat customers can use to understand how Blue Coat products can be used to solve specific problems.

These technical briefs are not intended to solve customer-specific requests; if you need a customized solution to address a specific concern, contact Blue Coat Professional Services at professional-services@bluecoat.com.