Service Control EasyApp - Time Shifting Traffic

Summary

This Cisco® Service Control Engine (SCE) EasyApp guide explains how you can use Cisco SCE to "shift" non-interactive, peer-to-peer (P2P) file transfer traffic to off-peak hours in order to reduce network congestion and improve the quality of experience for interactive applications, all without sacrificing P2P performance.

EasyApp Category	SCE Equipment and Software Version	Type of Effort
Bandwidth Optimization	**Hardware:** Cisco SCE 2000 and 8000 Series Service Control Engine. **Software:** Release 3.5 or later.	A few hours of configuration and policy setup. We recommend that you monitor the implementation on an ongoing basis to ensure it is performing as expected.

Managing Traffic with a Time-Shift Policy

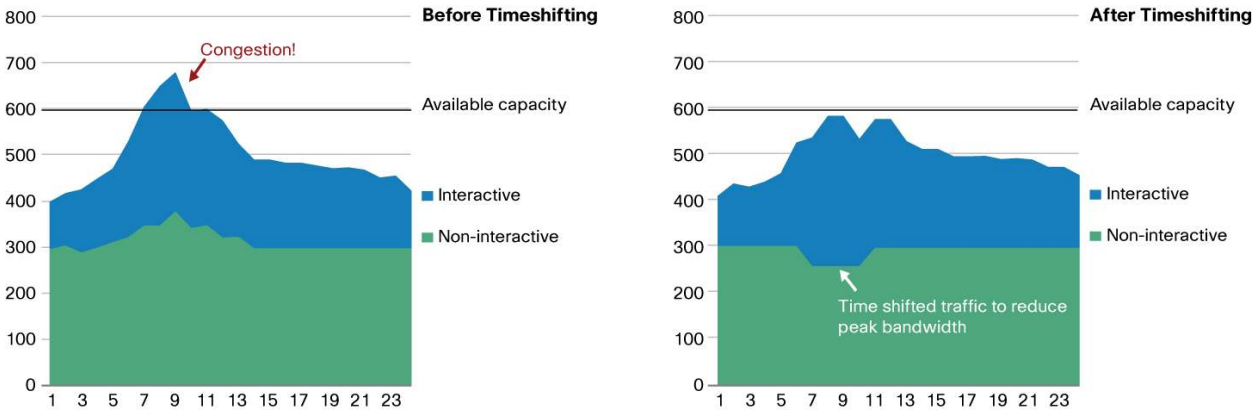
When it comes to network congestion in service provider networks, there is a common paradox: When you look at daily consumption, there is usually more network bandwidth available than users demand, yet there are almost always problems with congestion and poor performance. Congestion occurs because at a given moment, there is more demand than bandwidth available, while at other times there is bandwidth that remains unused.

Another attribute of the typical traffic mix in service provider networks is that traffic is comprised of two types of applications: Interactive applications - such as gaming, video, or web browsing - that are highly sensitive to packet drops and network congestion, and non-interactive applications, such as file downloads and backups, that tend to run in the background, uninterrupted, over a long period.

Given these insights into the nature of network traffic, you can use a network implementation of Cisco SCE appliances to effectively remove peak-hour congestion without expanding network capacity. In this way, you can defer costly network upgrades while providing a better network experience to your subscribers.

Figure 1 shows a comparison between unmanaged network congestion, before a time-shift policy is set, and traffic that is managed through time-shifting.

Figure 1. Before and After Time-Shifting



Implementation

It is possible to time-shift P2P traffic from peak hours to off-peak periods without affecting P2P downloads substantially or at all. This is because in most networks, the amount of data that must be transferred through file transfers is fairly stable. Shifting this traffic to off-peak hours frees up more bandwidth for interactive traffic during peak hours.

Follow these general steps to define a time-shift policy that makes sense for your network.

Step 1: Identify Peak Hours

The first step is to identify and understand traffic patterns during peak hours. The Global Bandwidth Per Service report, available as part of the Cisco Insight reporting solution for the SCE, provides this visibility into your network.

Execute Global Bandwidth Per Service report for several days and answer the following questions:

- What are the peak usage hours every day? Typically peak usage occurs during early evening hours, but may vary depending on your user base.
- How much interactive traffic - including browsing, gaming, instant messaging, voice, and video services - is there on the network during the peak period?
- What is the available capacity for Internet traffic? While this information is not part of the Global Bandwidth report, consider your network architecture and other traffic management policies in answering this question.
- How much bandwidth should be made available for non-interactive traffic during the peak hours? To find this number, subtract the interactive traffic detected during the peak hours from the available capacity.

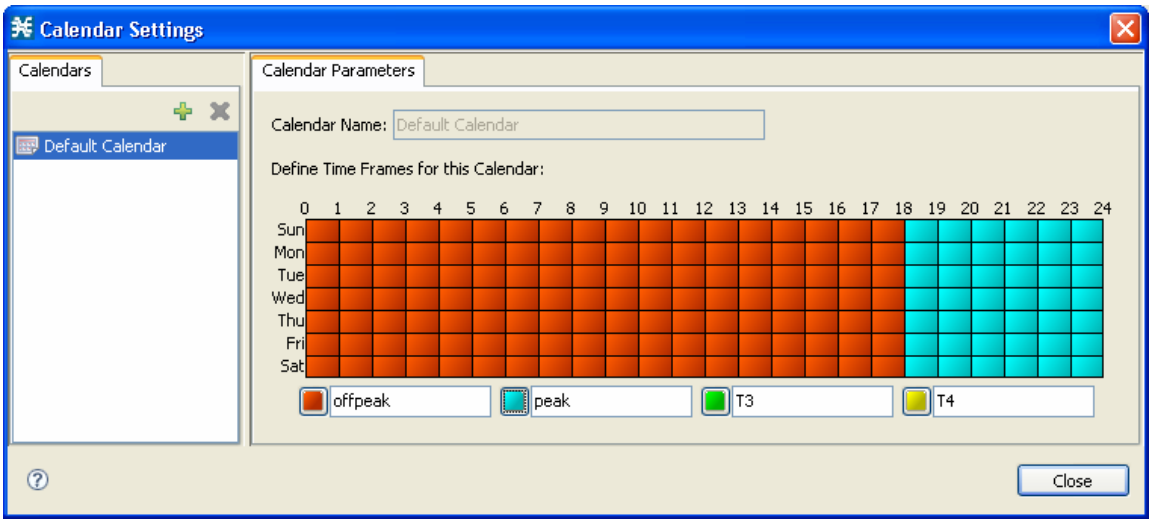
Use this information to set up a time-shift policy, as described next.

Step 2: Set a Time-Shift Policy

Using the information gathered in Step 1, perform the following tasks to build a time-shift policy. Please refer to the Cisco Service Control Solution for Broadband User Guide documentation at http://www.cisco.com/en/US/products/ps6135/products_user_guide_list.html for a more complete explanation of each task.

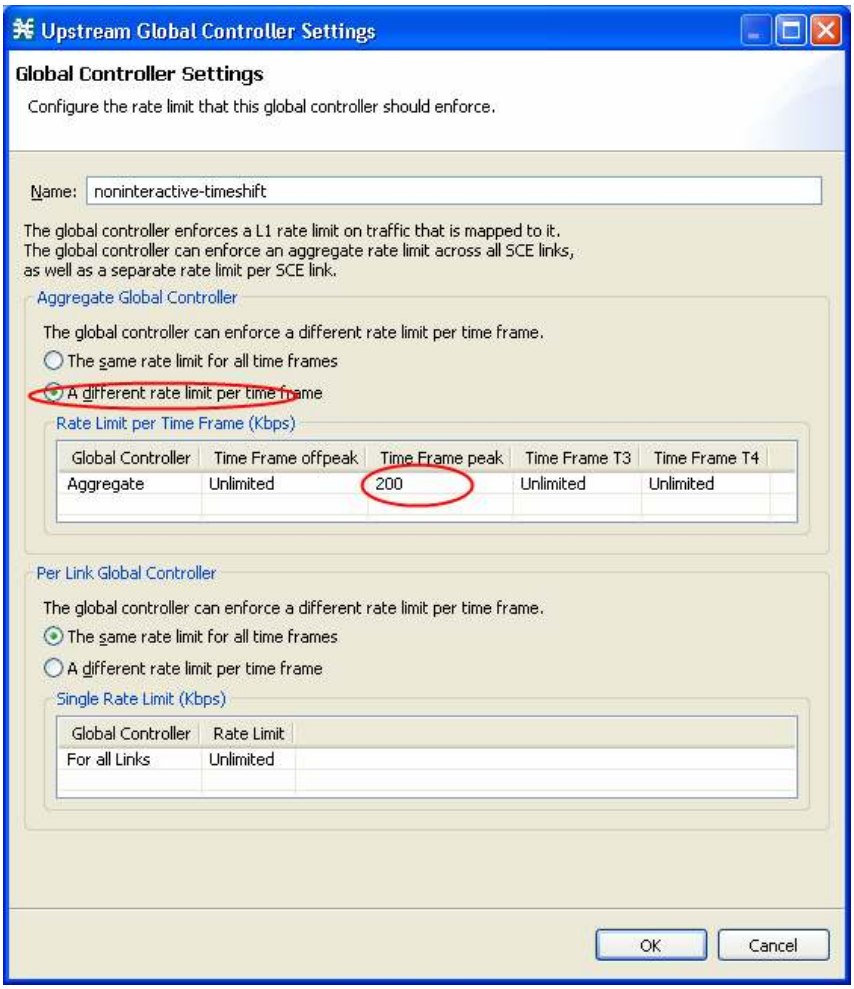
1. In the application of interest, select Configuration, and then select Policies. Next, select Calendar Settings and define a weekly calendar. Name the default timeframe **off-peak** and name a second timeframe **peak**, as shown in Figure 2. Make sure to mark all the hours you identified as peak hours in Step 1.

Figure 2. Defining Peak and Off-Peak Hours in a Weekly Calendar



2. Under Global Policy, create a new Bandwidth Controller and name it **non-interactive-timeshift**. Select the option “A different rate limit for each time frame.” Enter a limit for non-interactive use during the peak timeframe. This should be the amount of bandwidth you would let non-interactive applications consume based on the information from Step 1. In the example shown in Figure 3, this limit has been defined as 200 Mbps.

Figure 3. Creating a Bandwidth Controller for Non-interactive Applications



3. Assign the newly created non-interactive-timeshift bandwidth controller to the P2P service.

   The SCE will now control P2P traffic through the non-interactive-timeshift bandwidth controller, limiting it to the set limit during peak hours. This should free capacity for other applications and improve the overall perceived network performance during these peak hours. During off-peak hours, the controller will impose no limits on P2P traffic, at which point they will re-accelerate to the maximum download speeds.

For More Information

Time-shifting is just one of many traffic management techniques SCE customers use in order to improve network performance, reduce costs, and manage overuse of Internet-bound resources. Look for other Service Control EasyApp guides about bandwidth optimization for more information on these field-proven techniques. Browse the full selection of Cisco Service Control EasyApp guides at http://www.cisco.com/go/servicecontrol to optimize the network's behavior and provide a superior experience for your users.

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