

NetFlow Interface Report Pack

Software Version: 3.0

HP OpenView Performance Insight

User Guide

July 2005



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1 Overview

This chapter covers the following topics:

- OVPI and network flow data
- Role of the NetFlow Preprocessor
- Role of the NetFlow Datapipe
- Folders and reports
- Package version history
- Ways to customize reports
- Sources for additional information

OVPI and Network Flow Data

HP OpenView Performance Insight (OVPI) is a performance management and reporting application. Long-term data collection, in-depth analysis, and automated web-based reporting are this application's primary strengths. If desired, OVPI can be integrated with network and system management applications, including NNM and OVO. Integration enhances fault isolation, problem diagnosis, and capacity planning.

The NetFlow Interface Report Pack installs on OVPI. The reports in the NetFlow Interface Report Pack analyze network flow data collected by flow collector applications. We recommend running the NetFlow Interface Report Pack with the Interface Reporting Report Pack. If you run Interface Reporting and NetFlow Interface concurrently, you will know which interfaces are experiencing high utilization and you will also know which clients, servers, applications, and TOS values are contributing to high utilization.

The output file produced by the flow collector application is not compatible with OVPI. Making the output compatible with OVPI is what the NetFlow Preprocessor does. Once pre-processing produces a compatible file, the NetFlow Datapipe reads the file and imports the contents. Before getting into the reports, let's look at both components in more detail.

The Role of the NetFlow Preprocessor

A flow is a sequence of packets moving in the same direction between two devices. Routers and switches that are configured to track flow data can also be configured to send data about flows to a flow collector application. The flow collector application aggregates data from multiple devices and produces an output file containing ample detail about IP traffic. This file is available for filtering and further processing.

The NetFlow Preprocessor performs the following tasks:

- Identifies well-known applications

- Allows you to specify non-standard or custom applications
- Identifies the client and server for each flow
- Groups multiple IP addresses into a single domain
- Filters out unwanted data produced by the flow collection application
- Aggregates data produced by the flow collection application
- Creates bi-directional records by matching flows from clients to flows from servers
- Reformats data for the NetFlow Interface Datapipe

Filtering is crucial. Filtering reduces the processing load on the OVPI server and eliminates a vast quantity of unnecessary data pertaining to flows you do not care about. The NetFlow Preprocessor **must** be configured for filtering. As explained in more detail in the *NetFlow Preprocessor User Guide*, the filtering you implement can take place before aggregation, after aggregation, or before *and* after aggregation. The following types of filtering take place before aggregation:

- Client/server filtering
- Application filtering

The following types of filtering take place after aggregation:

- Top x flows
- Inclusion percentile
- Minimum bytes per second



The NetFlow Interface Datapipe and the NetFlow Interface Report Pack can function only if the data produced by the flow collection application is in Cisco DetailCallRecord format. *No other format is acceptable.*

The Role of the NetFlow Interface Datapipe

The NetFlow Interface Datapipe is a separate package, and installing it is mandatory. The NetFlow Interface Datapipe performs three tasks:

- Calls the OVPI import process (ee_collect)
- Normalizes data into an internal database format required by the report pack
- Populates report pack base tables every 15 minutes (the default)

The NetFlow Interface Datapipe includes an optional translation utility. Its purpose is to map IP addresses to node names and prevent data from being lost when a device changes its IP address. By default, the translation utility is disabled. If you enable it, you must make sure that the SourceDirectory directive for the NetFlow Interface Datapipe matches the output directory for the translation utility.

For more information about modifying path directives, see [Chapter 5, Package Configuration](#).

Folders and Reports

When you view NetFlow Interface from the web, you will see five report folders. The table below lists the contents of each folder.

| Folder | Folder Contents |
|---------------|---|
| Top Ten | <ul style="list-style-type: none">• Hourly Summary• Daily Summary• Monthly Summary |
| Server | <ul style="list-style-type: none">• Hourly Server Summary• Daily Server Summary• Monthly Server Summary• Hourly Server Detail• Daily Server Detail• Monthly Server Detail• Hourly Server Detail w/0 Graphs• Daily Server Detail w/o Graphs• Monthly Server Detail w/o Graphs |
| Client | <ul style="list-style-type: none">• Hourly Client Summary• Daily Client Summary• Monthly Client Summary• Hourly Client Detail• Daily Client Detail• Monthly Client Detail• Hourly Client Detail w/0 Graphs• Daily Client Detail w/o Graphs• Monthly Client Detail w/o Graphs |
| Application | <ul style="list-style-type: none">• Hourly Application Summary• Daily Application Summary• Monthly Application Summary• Hourly Application Detail• Daily Application Detail• Monthly Application Detail• Hourly Application Detail w/o Graphs• Daily Application Detail w/o Graphs• Monthly Application Detail w/o Graphs |

| Folder | Folder Contents |
|---------------|---|
| TOS | <ul style="list-style-type: none"> • Hourly TOS Summary • Daily TOS Summary • Monthly TOS Summary • Hourly TOS Detail • Daily TOS Detail • Monthly TOS Detail • Hourly TOS Detail w/o Graphs • Daily TOS Detail w/o Graphs • Monthly TOS Detail w/o Graphs |

Generic Reports

The generic reports in NetFlow Interface are Top Ten, Summary, Detail, and Detail without Graphics. The following table outlines the purpose of each type of report

| Report | Purpose |
|---------------------|--|
| Top Ten | <ul style="list-style-type: none"> • Ranks clients, servers, applications, and TOS values by constituent utilization. • Compares current activity to historic trends. |
| Summary | <ul style="list-style-type: none"> • Ranks elements according to constituent utilization. • Monitors the following statistics over time: <ul style="list-style-type: none"> — Constituent utilization — Percentage of traffic — Bytes per hour — Packets per hour |
| Detail | <ul style="list-style-type: none"> • Investigates congestion in detail by analyzing performance at the flow level. • Ranks server/application pairs associated with each client. • Ranks client/application pairs associated with each server. • Ranks client/server pairs associated with each application. • Monitors the following statistics over time: <ul style="list-style-type: none"> — Constituent utilization — Percentage of traffic — Bytes per hour — Packets per hour |
| Detail w/o Graphics | <ul style="list-style-type: none"> • Same as Detail reports, without graphics. • Designed for rapid launching. |

Integration with NNM

If you use NNM as well as OVPI, you have the option of integrating OVPI with NNM. To do that, install the Integration Module. The Integration Module contains packages for NNM and packages for OVPI. For installation details, refer to the *NNM/Performance Insight Integration Module 2.0 User Guide*.

If NNM and OVPI are integrated, the NNM operator can access all of the reports in NetFlow Interface from the Report Launchpad window. If seeing data in the report as quickly as possible matters, the NNM operator can select the “without graphics” version of the report.

Unlike the majority of report packs, NetFlow Interface does not include a thresholds sub-package. Even if NNM and OVPI are integrated, OVPI will not monitor the database for threshold breaches pertaining to NetFlow data or send threshold traps to NNM.

Package Version History

See below for details about recent enhancements to the NetFlow Interface Report Pack.

| Version | Release Date | Enhancements |
|---------|---------------|--|
| 1.0 | May 2003 | 39 reports; Sybase support |
| 2.0 | October 2003 | OVPI Object Manager support <i>new change forms:</i> <ul style="list-style-type: none">• Update Interface Customer• Update Interface Location• Update Interface Speed• Update Interface Description UPGRADE_NetFlow_Interface_1.0_to_2.0 |
| 2.0 | April 2004 | No changes |
| 3.0 | August 2004 | Oracle support UPGRADE_NetFlow_Interface_2.0_to_3.0 |
| 3.0 | November 2004 | No changes |
| 3.0 | June 2005 | UPGRADE_NetFlow_Interface_to_3.0 |

Ways to Customize Reports

The contents of a report can be customized by applying group filters, importing interface properties, editing parameters, and editing tables and graphs. While group filters are normally used by service providers, or any organization that wants to share reports with customers, any user can apply a constraint to a report or edit tables and graphs. For details about view options for tables and graphs, see [Appendix A, Editing Tables and Graphs](#).

Group Filters

If you want to share reports with customers, you must configure OVPI to produce customer-specific reports. Here is an overview of the steps involved:

- Use Common Property Tables to import customer names and device locations
- Create a group account for all the users affiliated with each customer
- Create a group filter for each group account

For more information about group filters, refer to the *OVPI 5.1 Administration Guide*.

Importing Property Data

The reports in NetFlow Interface will display node-level property data as well as interface-level property data. Node-level properties are inherited from Common Property Tables, while interface-level properties are inherited from Interface Reporting. If you want to update node-level properties, use the update forms that come with Common Property Tables. If you want to update interface-level properties, you can either import a file that contains your updates, or you can use the property update forms that come with Interface Reporting.

Applying Constraints

A constraint filters out data you are not interested in. If you edit the Customer Name parameter, data for every customer except the customer you typed in the Customer Name field drops from the report. If you edit the Location Name, data for all locations except the location you typed in the Location Name field drops from the report.

NetFlow Interface 3.0 supports the following parameters:

- Customer ID
- Customer Name
- Device
- Location Name
- Interface
- Start-Time
- End-Time
- Client Name
- Server Name
- Application Name

If you are using the Web Access Server, edit parameters by clicking the Edit Parameters icon at the bottom right-hand corner of the report. When the Edit Parameters window opens, enter the constraint in the field and click **Submit**.

If you are using Report Viewer, select **Edit > Parameter Values** from the menu bar. When the Modify Parameter Values window opens, click the **Current Value** field. Type a new value and click **OK**.

Sources for Additional Information

This user guide includes samples of some of the reports in the package. The demo package that comes with NetFlow Interface 3.0 contains a sample of every report in the package. If you have access to the demo package and you want to know what fully-populated reports look like, install it. Like real reports, demo reports are interactive. Unlike real reports, demo reports are static.

For information regarding the latest enhancements to NetFlow Interface and any known issues affecting this package, refer to the *NetFlow Interface Report Pack 3.0 Release Statement*. You may also be interested in the following documents:

- *NetFlow Interface Datapipe 3.0 Release Statement*
- *NetFlow Preprocessor 3.0 User Guide*
- *Interface Reporting Report Pack 5.0 User Guide*
- *Interface Discovery Datapipe 2.2 User Guide*
- *Interface Reporting ifEntry Datapipe 2.2 User Guide*
- *Thresholds Module 5.0 User Guide*
- *NNM/OVPI Integration Module 2.0 User Guide*
- *OVPI Report Packs, Version 8.0: Release Notes, June 2005*

Manuals for OVPI and manuals for the reporting solutions that run on OVPI are posted to the following web site:

<http://www.managementsoftware.hp.com>

Select **Support > Product Manuals** to reach the **Product Manuals Search** page. The user guides for OVPI are listed under **Performance Insight**. The user guides for report packs and datapipes are listed under **Performance Insight Reporting Solutions**.

The manuals listed under **Performance Insight Reporting Solutions** indicate the month and year of publication. If a manual is revised and reposted, the date of publication will change even if the software version number does not change. Since we post revised manuals on a regular basis, we recommend that you search this site for updates before using an older manual that might not be the latest version available.

2 The Upgrade Install

This chapter covers the following topics:

- Guidelines for a smooth upgrade
- Using Package Manager to install upgrade packages
- Package removal

Guidelines for a Smooth Upgrade

The June 2005 report pack CD includes the latest report packs and datapipes. When you insert the CD in the CD-ROM drive and launch the package extraction program, the install script on the CD extracts every package from the CD and copies the results to the Packages directory on your system. When the extract finishes, the install script prompts you to launch OVPI and start Package Manager.

This chapter tells you how to extract packages from the CD. If the extract has already happened, you can upgrade NetFlow Interface by starting Package Manager and following the familiar on-screen instructions. Before using Package Manager, review the following guidelines:

- Prerequisites for NetFlow Interface 3.0
- Upgrading Common Property Tables
- Datapipes and remote pollers
- Custom table view
- Distributed environments

Prerequisites for NetFlow Interface 3.0

Verify that the following software is already installed:

- OVPI 5.0 or higher
- All Service Packs available for the version of OPVI (5.0 or 5.1) you are running
- NetFlow Interface Report Pack 2.0
- NetFlow Interface Datapipe 2.0

If you need help installing a Service Pack for OVPI, refer to the release notes issued with the Service Pack.

Upgrading Common Property Tables

If you are running an earlier version of Common Property Tables, version 2.2 or version 3.0, upgrade to the latest version. Observe these guidelines:

- Upgrade Common Property Tables before upgrading NetFlow Interface.
- Do not upgrade Common Property Tables and other packages at the same time.

If you need help upgrading Common Property Tables, refer to the *Common Property Tables 3.5 User Guide*.

Datapipes and Remote Pollers

The NetFlow Interface Datapipe cannot be upgraded. You must uninstall the old datapipe and then install the new datapipe once the report pack has been upgraded. When you uninstall an existing datapipe, the following information is lost:

- Single polling policy for a remote poller
- Cloned polling policies for multiple remote pollers
- Customized polling groups

To prevent this information from being lost, you can export existing polling policy configurations and customized polling groups by using the following commands:

- `collection_manager`
- `group_manager`

Exporting Polling Policy Configurations

If your environment contains polling policies for remote pollers, use the `collection_manager` command to export existing policy configurations to a file.

UNIX: As user `trendadm`, run the following command:

```
cd $DPIPE_HOME  
./bin/collection_manager -export -file /tmp/savePollingPolicy.lst
```

Windows: As Administrator, launch a command window. Navigate to the OVPI install directory and execute the following command:

```
bin\collection_manager -export -file \temp\savePollingPolicy.lst
```

Exporting Polling Group Configurations

If your environment contains customized polling groups, use the `group_manager` command to export groups to individual `.xml` files.

UNIX: As user `trendadm`, execute the following command:

```
cd $DPIPE_HOME  
./bin/group_manager -export_all -outfile /tmp/savePollingGroups
```

Windows: As Administrator, launch a command window, then navigate to the OVPI install directory and execute the following command:

```
bin\group_manager -export_all -outfile \temp\savePollingGroups
```


Deleting Custom Table Views

If you created custom table views, the views you created may interfere with the report pack upgrade process, causing the upgrade to fail. Whether or not your custom table views interfere with the upgrade depends on how you created them. If you created them using SQL, the upgrade will succeed but your custom views will not be available once the upgrade is complete. If you created them using Datapipe Manager, the upgrade is likely to fail. To prevent the upgrade from failing, delete custom table views before you upgrade the report pack, then recreate these views after the report pack is upgraded.

Distributed Environments

If you are currently running NetFlow Interface 2.0 in a distributed environment, upgrading is more complicated. Keep the following rules in mind:

- The central server and every satellite server must be running OVPI 5.0 or higher and all available service packs for OVPI 5.0 or higher.
- The NetFlow Interface Datapipe must be installed on any server that receives data from a NetFlow Preprocessor. This includes the central server, if the central server receives data from a NetFlow Preprocessor.

Here is an overview of the installation process for distributed environments:

- 1 Central server:
 - a Disable trendcopy.
 - b If necessary, upgrade Common Property Tables.
 - c Install UPGRADE_NetFlow_Interface_to_3.0; deploy reports.
- 2 Satellite servers:
 - a Uninstall NetFlow Interface Datapipe 2.0.
 - b If necessary, upgrade Common Property Tables.
 - c Install UPGRADE_NetFlow_Interface_to_3.0.
 - d Install NetFlow Interface Datapipe 3.0.
- 3 Enable trendcopy on the central server.

If you installed NetFlow Interface 2.0 on multiple servers running OVPI 4.6, you used DS EDIT to set up connections with satellite server databases. You also configured trendcopy pull commands. If you recently upgraded from OVPI 4.6 to 5.1, you have to repeat these tasks, this time using the Add Database Wizard. For details, see [Chapter 5, Package Configuration](#).

If you installed NetFlow Interface 2.0 as a distributed system on servers running OVPI 5.0, you do not have to repeat anything. The changes you made when you installed NetFlow Interface 2.0 will still be in effect when the upgrade to NetFlow Interface 3.0 is complete.

Upgrading to NetFlow Interface 3.0

Perform the following tasks to upgrade to version 3.0:

- Task 1: Stop OVPI Timer and extract packages from the report pack CD
- Task 2: If necessary, upgrade Common Property Tables

- Task 3: Install UPGRADE_NetFlow_Interface_to_3.0
- Task 4: Uninstall NetFlow Interface Datapipe 2.0
- Task 5: Install NetFlow Interface Datapipe 3.0 and restart OVPI Timer.

Task 1: Stop OVPI Timer and extract packages from the report pack CD

- 1 Log in to the system. On UNIX systems, log in as root.
- 2 Stop OVPI Timer and wait for processes to terminate.

Windows: Select **Settings > Control Panel > Administrative Tools > Services**.

UNIX: As root, type one of the following:

HP-UX: `sh /sbin/ovpi_timer stop`

Solaris: `sh /etc/init.d/ovpi_timer stop`

- 3 Insert the June 2005 report pack CD in the CD-ROM drive. On Windows, a Main Menu displays automatically; on UNIX, mount the CD if the CD does not mount automatically, navigate to the top level directory on the CD, and run the `./setup` command.
- 4 Type **1** in the choice field and press **Enter**. The install script displays a percentage complete bar. When the copy is complete, the install script starts Package Manager. The Package Manager welcome window opens.

When the copy to the Packages directory is complete, you can see the results by navigating to the Packages directory. The Packages directory contains a folder for NetFlow Interface and a separate folder for NetFlow Interface Datapipe. These folders are under the NetFlow Interface folder:

- NetFlow_Interface.ap
- NetFlow_Interface_Demo.ap
- UPGRADE_NetFlow_Interface_to_3.ap

Under NetFlow Interface Datapipe, you will see the following folder:

- NetFlow_Interface_Datapipe.ap

Installing the demo package is optional. You may install the demo package by itself, with no other packages, or you may install the demo package along with everything else.

Task 2: Upgrade to Common Property Tables 3.5

NetFlow Interface 2.0 required Common Property Tables 2.2. NetFlow Interface 3.0 requires Common Property Tables 3.5. If you have not already upgraded Common Property Tables, upgrade now by installing the “to_3.5” upgrade package. Do not install other packages at the same time. Install the upgrade package for Common Property Tables and *only* the upgrade package for Common Property Tables. When Package Manager indicates that installation of the upgrade package is complete, click **Done** to return to the Management Console.

Task 3: Install the upgrade package for NetFlow Interface

- 1 Start Package Manager. The Package Manager welcome window opens.
- 2 Click **Next**. The Package Location window opens.
- 3 Click **Install**. Approve the default installation directory or select a different directory if necessary.

- 4 Click **Next**. The Report Deployment window opens. Accept the default for Deploy Reports; accept the defaults for application server name and port; type your user name and password for the OVPI Application Server.
- 5 Click **Next**. The Package Selection window opens.
- 6 Click the check box next to:

UPGRADE_NetFlow_Interface_to_3
- 7 Click **Next**. The Type Discovery window opens. Disable the default.
- 8 Click **Next**. The Selection Summary window opens.
- 9 Click **Install**. The Installation Progress window opens. When the install finishes, a package install complete message appears.
- 10 Click **Done**.



Do not be surprised if the upgrade package you just installed disappears from view. Package Manager will display what you just installed as *NetFlow Interface 3.0*. This is not an error.

Task 4: Remove NetFlow Interface Datapipe 2.0

- 1 Start Package Manager. The Package Manager welcome window opens.
- 2 Click **Next**. The Package Location window opens.
- 3 Click **Uninstall**.
- 4 Click **Next**. The Report Undeployment window opens.
- 5 Click the check box next to:

NetFlow_Interface_Datapipe 2.0
- 6 Click **Next**. The Uninstall Packages window opens.
- 7 Click **Uninstall**. The Progress window opens. When the uninstall finishes, a package removal complete message appears.
- 8 Click **Done**.

Task 5: Install NetFlow Interface Datapipe 3.0 and restart OVPI Timer

- 1 Start Package Manager. The Package Manager welcome window opens.
- 2 Click **Next**. The Package Location window opens.
- 3 Click **Install**.
- 4 Click **Next**. The Report Deployment window opens. Disable the default for Deploy Reports.
- 5 Click **Next**. The Package Selection window opens.
- 6 Click the check box next to:

NetFlow_Interface_Datapipe 3.0
- 7 Click **Next**. The Type Discovery window opens. Keep the default.
- 8 Click **Next**. The Selection Summary window opens.
- 9 Click **Install**. The Installation Progress window opens. When the install finishes, a package install complete message appears.
- 10 Click **Done**.
- 11 Restart OVPI Timer.

Windows: Select **Settings > Control Panel > Administrative Tools > Services**.

UNIX: As root, type one of the following:

HP-UX: `sh /sbin/ovpi_timer start`

Solaris: `sh /etc/init.d/ovpi_timer start`

Package Removal

If you uninstall NetFlow Interface 3.0, Package Manager will automatically remove the NetFlow Interface Datapipe. Follow these steps to uninstall NetFlow Interface 3.0:

- 1 Log in to the system. On UNIX systems, log in as root.
- 2 Stop OVPI Timer and wait for processes to terminate.

Windows: Select **Settings > Control Panel > Administrative Tools > Services**.

UNIX: As root, type one of the following:

HP-UX: `sh /sbin/ovpi_timer stop`

Solaris: `sh /etc/init.d/ovpi_timer stop`

- 3 Start Package Manager. The Package Manager welcome window opens.
- 4 Click **Next**. The Package Location window opens.
- 5 Click **Uninstall**.
- 6 Click **Next**. The Report Undeployment window opens.
- 7 Click the check box next to the following packages:
NetFlow_Interface
- 8 Click **Next**. The Selection Summary window opens.
- 9 Click **Uninstall**. The Progress window opens. When the uninstall finishes, a package removal complete message appears.
- 10 Click **Done** to return to the Management Console.
- 11 Restart OVPI Timer.

Windows: Select **Settings > Control Panel > Administrative Tools > Services**.

UNIX: As root, type one of the following:

HP-UX: `sh /sbin/ovpi_timer start`

Solaris: `sh /etc/init.d/ovpi_timer start`

3 The New Install

This chapter covers the following topics:

- Guidelines for a smooth installation
- Using Package Manager to install NetFlow Interface 3.0
- Accessing deployed reports
- Package removal

Guidelines for a Smooth Installation

Each reporting solution that runs on OVPI consists of a report pack and one datapipe, or sometimes a report pack and multiple datapipes. When you install a datapipe, you configure OVPI to collect a specific type of performance data at a specific polling interval. When you install the report pack, you configure OVPI to summarize and aggregate the data collected by the datapipe.

The June 2005 report pack CD includes the latest report packs and datapipes. When you insert the CD in the CD-ROM drive and launch the package extraction program, the install script extracts every package from the CD and copies the results to the Packages directory on your system. After the extract finishes, the install script prompts you to launch OVPI and start Package Manager. Before using Package Manager, review the following guidelines.

Prerequisites

Make sure the following software is already installed:

- OVPI 5.0 or higher
- All Service Packs available for the version of OVPI (5.0 or 5.1) you are running

If you need help installing a Service Pack, refer to the release notes for the Service Pack.

Common Property Tables

If you are running an older version of Common Property Tables, version 2.2 or 3.0, upgrade to version 3.5. If you are not running any version of Common Property Tables, let Package Manager install Common Property Tables for you, automatically.

If you upgrade Common Property Tables, do not install other packages at the same time. Install the upgrade package for Common Property Tables and *only* the upgrade package for Common Property Tables. For more information about installing and using Common Property Tables, refer to the *Common Property Tables 3.5 User Guide*.



Common Property Tables includes forms, which deploy in the same way that reports deploy. When you install the upgrade package for Common Property Tables, accept the option to Deploy Reports.

Resolving Directory Issues

Resolve the following directory issues before proceeding with installation:

- 1 Select a directory where NetFlow Preprocessor will deposit data. (This information will also be needed for proper configuration of the NetFlow Preprocessor.) If this directory does not already exist, create it.
- 2 Decide whether you will use the optional IP-address-to-node-name conversion utility. If you are going to use it, you must select or create a second directory.
- 3 Decide whether you will archive output from the NetFlow Preprocessor. If you are going to archive this data, you must select or create a third directory.

None of these directories should be used for any other purpose. For details about how to accomplish steps 1 through 3, see [Chapter 5, Package Configuration](#).

Distributed Environments

If you intend to run NetFlow Interface as a distributed system across multiple servers, installation is more complex. Keep these rules in mind:

- The central server and every satellite server must be running the same version of OVPI and all the service packs available for that version.
- The NetFlow Interface Datapipe belongs on any server that receives data from a NetFlow Preprocessor. This includes the central server, if the central server receives data from a NetFlow Preprocessor.

Here is an overview of the installation procedure:

- 1 Disable trendcopy on the central server.
- 2 Install the NetFlow Interface 3.0 on the central server; deploy reports.
- 3 For each satellite server, install:
 - NetFlow Interface 3.0
 - NetFlow Interface Datapipe 3.0
- 4 Enable trendcopy on the central server.

After completing the installation, set up connections between the central server and satellite server databases and configure trendcopy pull commands. For details, see [Chapter 6, Setting Up a Distributed System](#).

Installing NetFlow Interface 3.0

Perform the following tasks to install NetFlow Interface 3.0:

- Task 1: Extract packages from the report pack CD.
- Task 2: If necessary, upgrade to Common Property Tables 3.5.
- Task 3: Install NetFlow Interface and NetFlow Interface Datapipe.

Task 1: Extract packages from the report pack CD

- 1 Log in to the system. On UNIX systems, log in as root.
- 2 Stop OVPI Timer and wait for processes to terminate.

Windows: Select **Settings > Control Panel > Administrative Tools > Services**.

UNIX: As root, do one of the following:

HP-UX: `sh /sbin/ovpi_timer stop`

Sun: `sh /etc/init.d/ovpi_timer stop`

- 3 Insert the report pack CD in the CD-ROM drive. On Windows, a Main Menu appears automatically; on UNIX, mount the CD if the CD does not mount automatically, navigate to the top level directory on the CD, and run the `./setup` command.
- 4 Type **1** in the choice field and press **Enter**. The install script displays a percentage complete bar. When the copy is complete, the install script starts the Package Manager install wizard. The Package Manager welcome window opens.

When the extraction of packages to the Package directory finishes, you can navigate to the Packages directory to see the results. The Packages directory will include a folder for NetFlow Interface and a separate folder for NetFlow Interface Datapipe. The following folders appear under NetFlow Interface:

- NetFlow_Interface.ap
- NetFlow_Interface_Demo.ap

The following folder appears under the NetFlow Interface Datapipe folder:

- NetFlow_Interface_Datapipe.ap

Installing the demo package is optional. You can install the demo package by itself, with no other packages, or you can install the demo package along with everything else.

Task 2: Upgrade to Common Property Tables 3.5

If necessary (if you are running an earlier version) upgrade Common Property Tables by installing the “to_3.5” upgrade package. When you install this package, enable the Deploy Reports option. If the Deploy Reports option is not enabled, the forms will not deploy. When the install finishes, click **Done** to return to the Management Console.

Task 3: Install NetFlow Interface and NetFlow Interface Datapipe

- 1 From the Management Console, select **Tools > Package Manager**. The Package Manager welcome window opens.
- 2 Click **Next**. The Package Location window opens.
- 3 Click **Install**. Approve the default installation directory or select a different directory if necessary.

- 4 Click **Next**. The Report Deployment window opens. Accept the default for Deploy Reports; accept the defaults for application server name and port; type your user name and password for the OVPI Application Server.
- 5 Click **Next**. The Package Selection window opens.
- 6 Click the check box next to the following packages:
 - NetFlow_Interface 3.0*
 - NetFlow_Interface_Datapipe 3.0*
- 7 Click **Next**. The Type Discovery window opens. Disable the default.
- 8 Click **Next**. The Selection Summary window opens.
- 9 Click **Install**. The Installation Progress window opens and the install begins. When the install finishes, a package install complete message appears.
- 10 Click **Done**.
- 11 Restart OVPI Timer.

Windows: Select **Settings > Control Panel > Administrative Tools > Services**.

UNIX: As root, type one of the following:

HP-UX: `sh /sbin/ovpi_timer start`

Sun: `sh /etc/init.d/ovpi_timer start`

Accessing Deployed Reports

When you installed NetFlow Interface, you enabled the Deploy Reports option. As a result, the reports in this package (as well as any forms that come with it) were deployed to the OVPI Application Server. Once reports reside on the OVPI Application Server, you have two ways to view them:

- OVPI client applications
- Web browser

If you have the client applications, you have access to Report Viewer, Report Builder, and the Management Console. If you do not have the client applications, using a web browser to view reports is the only way you can view reports.

For more information about the clients, refer to the *OVPI 5.1 Installation Guide*. For details about the Management Console, including how to use the Object/Property Management view to launch reports specific to a selected object, refer to the *OVPI 5.1 Administration Guide*.

Package Removal

If you uninstall the NetFlow Interface package, Package Manager will automatically uninstall the NetFlow Interface Datapipe. Follow these steps to uninstall NetFlow Interface:

- 1 Log in to the system. On UNIX systems, log in as root.
- 2 Stop OVPI Timer and wait for processes to terminate.

Windows: Select **Settings > Control Panel > Administrative Tools > Services**.

UNIX: As root, type one of the following:

HP-UX: `sh /sbin/ovpi_timer stop`

Sun: `sh /etc/init.d/ovpi_timer stop`

- 3 Start Package Manager. The Package Manager welcome window opens.
- 4 Click **Next**. The Package Location window opens.
- 5 Click **Uninstall**.
- 6 Click **Next**. The Report Undeployment window opens.
 - a If NetFlow Interface reports were deployed from this server, accept the defaults for Undeploy Reports, Application Server Name, and Port. If NetFlow Interface reports were **not** deployed from this server, clear the check box and skip to step 9.
 - b Type the username and password for the OVPI Application Server.
- 7 Click **Next**. The Package Selection window opens.
- 8 Click the check box next to the following packages:
 - NetFlow Interface*
 - NetFlow Interface Demo* (if installed)
- 9 Click **Next**. The Selection Summary window opens.
- 10 Click **Uninstall**. The Progress window opens and the removal process begins. When removal finishes, a package removal complete message appears.
- 11 Click **Done**.
- 12 Restart OVPI Timer.

Windows: Select **Settings > Control Panel > Administrative Tools > Services**.

UNIX: As root, type one of the following:

HP-UX: `sh /sbin/ovpi_timer start`

Sun: `sh /etc/init.d/ovpi_timer start`

4 Performance Considerations

If a single interface can generate a staggering quantity of network flow data, consider for a moment the amount of network flow data generated by a thousand interfaces. Well, that's a lot of network flow data, far more data than OVPI can handle. But what if a small subset of interfaces is producing network flow data, but filtering is not implemented? Well, that's still a lot of network flow data, far more data than OPVI can handle.

Monitoring a Limited Number of Interfaces

Under normal circumstances, most of the interfaces in a network have light to moderate loading, while just a few interfaces are congested. If the goal of analyzing network flow data is to help troubleshoot network problems, then generating, collecting, and reporting a lot of information about interfaces that are not congested might be unwise.

Since Interface Reporting focuses on interface utilization levels, you could let Interface Reporting monitor interface performance, initiate network flow data for a particular interface or router only when problems arise, and then turn to the NetFlow Interface Report Pack to analyze those flows in detail. This approach is efficient, but not especially proactive.

If certain interfaces are critical and if they deserve constant monitoring, you could configure those interfaces to generate network flow data continuously. However, if you are continuously generating flow data from a limited number of interfaces, you still need to take advantage of the filtering and aggregation performed by the NetFlow Preprocessor.

Preprocessor Filtering and Aggregation

If you intend to collect network flow data from a subset of interfaces, you must do something about insignificant flows; otherwise, insignificant flows will cripple performance. To prevent that from happening, configure the NetFlow Preprocessor to apply one or more of the filtering and aggregation techniques described below. (For more detail about each technique, refer to the *NetFlow Preprocessor User Guide*.)

Client/Server Filtering

The preprocessor can filter and aggregate based on the IP addresses of the clients and servers. For example, you could configure the preprocessor to limit output to flows that originate or terminate at one IP address within a specified set of IP addresses. The other flows would be discarded or grouped into a DEFAULT flow.

In addition, you can group multiple IP addresses and/or address ranges together and treat them as if they were a single device. For example, the flows from all devices in a single location or sub-net could be grouped together and reported on as if they originated from a single device. This would allow you to look at capacity between sites or sub-nets at a higher level, without getting lost in all the individual clients and servers.

Application Filtering

The NetFlow Preprocessor determines the application associated with a flow by looking up the protocol and port number from a list of “well-known” and registered applications. This list can be expanded to include additional applications, and shortened so that it includes only the applications that interest you. Flows for unknown applications can be discarded or grouped together as a DEFAULT application. Although doing so is **not** recommended, the preprocessor can also create arbitrary applications based on the protocol and port numbers for flows with unknown applications. Create such applications only when absolutely necessary.

Top X Flows

The NetFlow Preprocessor can restrict the number of rows of output generated for each reporting period for each router. If you configure this restriction, the preprocessor will order the flows from largest to smallest and output only the number of rows specified. The remaining flows are discarded. Since the majority of traffic through a router is generated by a relatively small number of flows, this feature allows you to retain high-impact flows and discard low-impact flows.

Include Percentile

This filter allows you to specify the percentage of the traffic to report on. Typically, the traffic in a network consists of a small number of flows that account for a high percentage of traffic and a large number of flows that constitute a small percentage of traffic. When this feature is enabled, the preprocessor will output flows, starting with the largest and descending, until the percentage of total traffic you specified has been reached. The remaining flows are discarded.

Minimum Bps

This filter eliminates all flows that do not generate a minimum amount of traffic (bytes per second) during the reporting period.

5 Package Configuration

This chapter will help you with the following tasks:

- Supplying SourceDirectory information to the NetFlow Interface Datapipe
- Supplying SourceDisposition information to the NetFlow Interface Datapipe
- Activating IP address-to-node name mapping
- Adding property information to reports
- Using change forms to update properties

Specifying a Source Directory and Source Disposition

Before it can begin to collect data, the NetFlow Interface Datapipe must know:

- Where the NetFlow Preprocessor is storing its output
- What to do with the output after data collection is complete

This information is contained in the `NetFlowIFDP.teel` file. The `SourceDirectory` directive in this file indicates where the data files are located, while the `SourceDisposition` in this file indicates what to do with the data files after they have been imported. The default for `SourceDirectory` is not valid, you *must* change it. The default for `SourceDisposition` is to delete source data files once they have been collected. This default is valid. If desired, instead of deleting source data files, you can archive the files by moving them to another directory.

The scope of this task, changing directives, is affected by when you are doing it. If you are changing directives before you install the NetFlow Interface package, you have less to do, since the `NetFlowIFDP.teel` file is located in one place only:

```
{DPIPE_HOME}/packages/NetFlow_Interface_Datapipe/  
NetFlow_Interface_Datapipe.ap
```

If you are performing this task after you install the NetFlow Interface package, you have more to do, since the `TEEL` file is now in two places:

```
NetFlow_Interface_Datapipe.ap  
  
{DPIPE_HOME}/lib
```

If you are changing directives after installation, make sure that you modify both instances of the `TEEL` file.

Specifying a Valid Source Directory

Follow these steps to change the `SourceDirectory` directive:

- 1 Navigate to the appropriate directory and open the directory.

- 2 Locate the `NetFlowIFDP.teel` file.
- 3 Locate the `SourceDirectory` default path; look for the line beginning with `SourceDirectory =`
- 4 Change the path; replace the existing path with the complete path name to the new directory; begin the new path name just after the equals sign (`=`). For example:

Windows

```
SourceDirectory=C:\PreProcessorOutputDir\NETFLOW-PP*
```

UNIX

```
SourceDirectory=/home/OVPI/PreProcessorOutputDir/NETFLOW-PP*.
```



- ▶ Leave the file filter as specified in the original `SourceDirectory`.
- ▶ If you enable the optional IP address-to-node name translation utility, the `SourceDisposition` *must* point to the output directory for the translation utility.

Source Disposition

Follow these steps to change the `SourceDisposition` directive:

- 1 Navigate to the appropriate directory and open the directory.
- 2 Locate the `NetFlowIFDP.teel` file.
- 3 Locate the `SourceDisposition` directive; look for the line beginning with `SourceDisposition = delete`
- 4 Change this line to `SourceDisposition = move, [archive path]` where *archive path* is the full path to the archive directory.

Activating IP Address to Node Name Mapping

Network flow data uses IP addresses to identify clients and servers. If an IP address for a particular device changes, what happens? Unless some means of IP address-to-node-name translation is available, the link between old performance data (linked to the old IP address) and new performance data (linked to the new IP address) will be lost.

The NetFlow Interface Datapipe includes a mapping utility that translates IP addresses to node names. Translation is accomplished by looking up the IP address in the HOSTS file (or a mapping file you produce yourself) and replacing the IP address with the corresponding node name, assuming the IP address is found.

By default, the mapping utility is disabled. Follow these steps to enable it:

- 1 Navigate to the `{DPIPE_HOME}/scripts` directory.
- 2 Open the `NetFlowIFDP_addr2name.pro` file. Locate this line:


```
{DPIPE_HOME}/bin/perl {DPIPE_HOME}/bin/addr2name.pl -m "" -i [Input Directory] -o [Output Directory]
```
- 3 Change *Input Directory* to the full path of the directory where the NetFlow Preprocessor writes its output.

- 4 Change *Output Directory* to the full path to the SourceDirectory directive specified in the preceding section.
- 5 *Optional*. If you are using a mapping file other than the HOSTS file, replace the "" after the `-m` with the full path to the file to be used.



Your mapping file must adhere to the format of a standard HOSTS file.

- 6 Navigate to the `{DPIPE_HOME}/lib` directory. Locate the following line in the `trendtimer` file:

```
#15 - - {DPIPE_HOME}/bin/trend_proc -f {DPIPE_HOME}/scripts/  
NetFlowIFDP_addr2name.pro
```

- 7 Remove the # from the beginning of the line.



The `addr2name` translation utility supports a 1-to-1 mapping between IP addresses and node names. If a node has more than one IP address, you must (1) aggregate the IP addresses (using the IP domain feature of the NetFlow Preprocessor) or (2) map each IP address to a different node name, for example: `SameNode1`, `SameNode 2`. For more information about the IP domain feature, refer to the *NetFlow Preprocessor User Guide*.

Adding Property Information to Reports

NetFlow Interface can calculate performance statistics only if it has access to special information about monitored interfaces. This special information includes interface type (full-/half-duplex) and speed. If the Interface Reporting package is installed, and if the devices monitored by Interface Reporting are also producing network flow data, NetFlow Interface will inherit this special information from Interface Reporting.

If Interface Reporting is not installed, or if the package is installed but the devices producing network flow data are not being monitored by Interface Reporting, you will have to import the missing information. *If you do not provision the missing information by importing it, reports will not display utilization and all interfaces will display as full duplex.*

Before getting to this procedure, it is important to mention that NetFlow Interface reports display owners and locations for clients and servers. Assigning owners and locations to clients and servers is handled through the Common Property Tables package, not the procedure described below. For information about the property import utility packaged with Common Property Tables, refer to the *Common Property Tables User Guide*.

Creating the Property Data File

The first step is to generate a property file that contains the interface information you want to import. There are three ways to generate this file:

- 1 Export data from a provisioning or network management system.
- 2 Create a tab-delimited property file yourself, using a text editor or a spreadsheet application such as Excel.
- 3 Use the `NetFlowIF_exportIFdata.pro` process to export existing property data from OVPI.

Method 1

The data you export must be formatted in accordance with the file format described below under Property File Format. Use all the columns shown, and make sure that the sequence of columns matches the sequence shown in the table. Do not use quotation marks. Name the file `Interface_Property.dat` and place the file here:

```
{DPIPE_HOME}/data/PropertyData
```

Method 2

Create the file in accordance with the file format described below in the Property File Format section. Use all the columns shown in the table, and make sure that the sequence of columns is correct. Do not use quotation marks. Name the file `Interface_Property.dat` and place the file in the `PropertyData` directory. The full path is:

```
{DPIPE_HOME}/data/PropertyData
```

Method 3

To generate property files using the `NetFlowIF_exportIFdata.pro` process, run the following command from the `{DPIPE_HOME}/scripts` directory:

```
trend_proc -f NetFlowIF_exportIFdata.pro
```

This command generates a tab-delimited property file, places the file in a directory, and appends the file names with a timestamp. The appended file name is:

```
Interface_Property.dat.<timestamp>.
```

and the directory is:

```
{DPIPE_HOME}/data/PropertyData
```

The file you just generated can be edited by hand in a text editor or loaded into a spreadsheet application such as Excel. If you use Excel, export the data into a tab-delimited file when you finish.



The property data columns for node name and interface name must match the corresponding values in the database, and each node name/interface combination should be listed only once in the data file. If new values, that is, values not currently in the database, are introduced into these columns, a new element will be created in the database.

Property File Format

The following table describes the format of the property file. If you are creating this file yourself, your file must adhere to this format. The sequence of fields left to right in your file must follow this sequence of attributes top to bottom, and your attributes must be delimited by tabs, not spaces. (If you export this information from OVPI, the contents of the file will be correctly formatted.)

| Column Name | Comments |
|---------------------|--|
| Node Name | A text string equal to either the node name or, if no name has been assigned, the node's IP address. This string should not be changed if it has been exported from the database. If a row is being added to the interface property file to pre-provision a new interface in the database, this string should be equal to the node name (if available) or the node IP address and, when combined with interface name, must be unique. If the node/interface name combination is the same as an existing combination, the property data for the existing record will be overwritten. The node name and interface name should form a unique combination and should appear only once in the property data file. |
| Interface Name | A text string equal to the MIB II ifIndex value for the interface. NOTE: If Interface reporting is installed, <i>interface name</i> may be set to something other than ifIndex. However, if Interface Reporting is installed, interface provisioning should be handled by the Interface Reporting Report Pack and this procedure should not be used. |
| Full/Half Duplex | An integer indicating whether the interface is full or half duplex: 1 - Half duplex 2 - Full duplex |
| Interface Type | Interface type as defined in the MIB II ifType field. Not used in the NetFlow Interface Report Pack. |
| Interface Speed | Interface speed for a half-duplex interface in bits per second (bps). |
| Interface Speed In | Interface receive speed for a full-duplex interface (bps). |
| Interface Speed Out | Interface transmit speed for a full-duplex interface (bps). |
| Customer ID | Reference number of the assigned customer. (Default = -2) |
| Customer Name | Name of the assigned owner of the interface. (Default = "Unassigned Customer") |
| Location ID | Reference number of the interface location. (Default = -2) |
| Location Name | Name of the interface location. (Default = "Unassigned Location") |

Importing the Property File

OVPI is configured to import property data every night at midnight. If desired, you can run the import manually at any time. To run the import manually, type the following command from the {DPIPE_HOME}/scripts directory:

```
trend_proc -f NetFlowIF_importIFdata.pro
```

Changing the Defaults for Property Information

The NetFlow Interface Report Pack is configured to import interface property from, and export interface property to, the following directory:

```
{DPIPE_HOME}/data/PropertyData
```

By default, the import takes place at midnight. In some situations, it may be wise to create a new import directory, create a new export directory, or change the run time. To modify the import directory, change the `SourceDirectory` directive; to modify the export directory, change the export statement; to modify the run time, change the offset that determines when the `NetFlowIF_importIFdata.pro` command runs.

Changing the Default Source Directory

The OVPI import utility uses the `NetFlowIF_Property.teel` file to locate the directory where the property import file resides. The TEEL file includes a `SourceDirectory` directive that specifies the full path to the property import file.

Before the NetFlow Interface package is installed, the `NetFlowIF_Property.teel` file is located in one place only:

```
{DPIPE_HOME}/packages/NetFlow_Interface/NetFlow_Interface.ap
```

After you install the NetFlow Interface package, the `NetFlowIF_Property.teel` file is located in two places:

```
{DPIPE_HOME}/packages/NetFlow_Interface/NetFlow_Interface.ap
{DPIPE_HOME}/lib
```

If you are modifying the `SourceDirectory` after package installation, make sure you modify both instances of this TEEL file.

Follow these steps to modify the `SourceDirectory`:

- 1 Navigate to the directory and open it.
- 2 Locate the `NetFlowIF_Property.teel` file.
- 3 Locate the `SourceDirectory` default path; look for the line beginning with `SourceDirectory =`
- 4 Change the path, replacing the existing path with the complete path name to the new directory; begin the new path name just after the equals sign (=).



Leave the file filter as specified in the original `SourceDirectory`. The `SourceDisposition` directive can be changed at this time as well. The default is to keep the data file by leaving it in the source directory. To delete the file, change the disposition to **delete**; to archive the file, change the disposition to **move**.

Changing the Default Export Directory

The default export directory is specified in the `NetFlowIF_exportIFdata.pro` file. Before installation, this file exists in one place:

```
{DPIPE_HOME}/packages/NetFlow_Interface/NetFlow_Interface.ap
```

Following installation, this file is located in two places:

```
{DPIPE_HOME}/packages/NetFlow_Interface/NetFlow_Interface.ap
```

```
{DPIPE_HOME}/scripts
```

If you are modify the default after installation, make sure that you make the change to both instances of the file.

Follow these steps to change the default export directory:

- 1 Navigate to the directory and open it.
- 2 Locate the `NetFlowIF_exportIFdata.pro` file.
- 3 Locate the `trend_export` statement; replace the existing path after the `-o` with the complete path to the new directory.

Changing the Default Run Time

The default run time for the automatic import process is 12:00 midnight. To change the default setting, do the following:

- 1 In the `{DPIPE_HOME}/lib` directory, double-click the `trendtimer.sched` file.
- 2 Scroll down the file and locate the line that defines the interval and offset for the `trend_proc` that executes the `NetFlowIF_importIFdata.pro` command. It should look like this:

```
24:00+24:00 - {DPIPE_HOME}/bin/trend_proc -f {DPIPE_HOME}/scripts/  
NetFlowIF_importIFdata.pro
```
- 3 Modify the offset indicator, the number immediately after the plus (+) sign. For example, if you change 24:00 to 18:00, the import utility will run at 18 hours after midnight, or 6:00 p.m.

Using Change Forms to Modify Properties

NetFlow Interface 3.0 provides several forms for updating interface properties. Exporting existing property data from OVPI, modifying that file, and then importing your modifications is no longer necessary. Use the forms to:

- Update the customer assigned to an interface
- Update the location assigned to an interface
- Update the description of an interface
- Update the speed of an interface



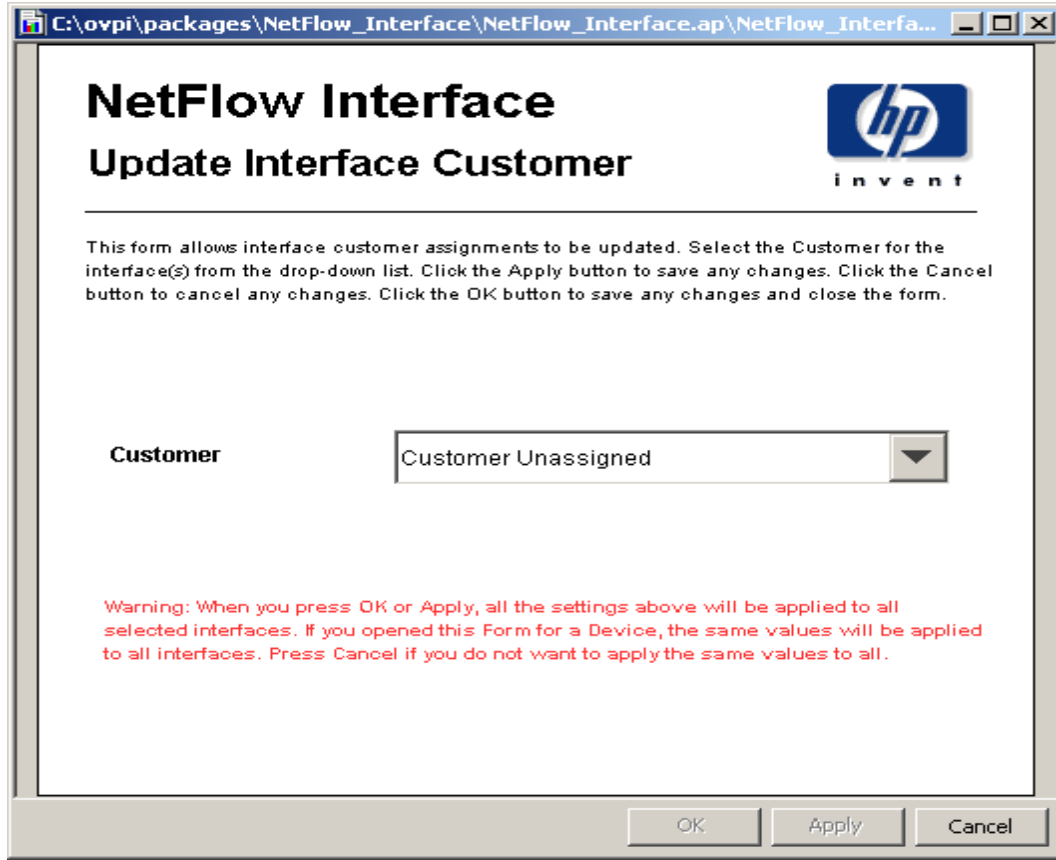
Customers and locations are imported for the first time by using the forms or the batch-mode property import that come with the *Common Property Tables* package. For details, refer to the *Common Property Tables 3.5 User Guide*.

Update Interface Customer

Follow these steps to open the form and update the customer assigned to the interface:

- 1 Select **HP OpenView > Performance Insight > Management Console**.
- 2 Click **Objects**, navigate to the interface you want to update, and select it. (If you want to update all of the interfaces on a device, navigate to a device and select it.) The Update Interface Customer form appears in a list under **Object Specific Tasks**.

- 3 Double-click **Update Interface Customer**. The form opens.



- 4 Update the customer assignment.
- 5 Click **Apply** to save changes, **OK** to save changes and close the form, or **Cancel** to close the form without saving changes.

Update Interface Location

Follow these steps to open the form and update the location assignment:

- 1 Select **HP OpenView > Performance Insight > Management Console**.
- 2 Click **Objects**, navigate to the interface you want to update, and select the interface. (If you want to update all of the interfaces on a device, navigate to the device and select it.) The Update Interface Location form appears in a list under **Object Specific Tasks**.

- 3 Double-click **Update Interface Location**. The form opens.

NetFlow Interface
Update Interface Location

This form allows interface location assignments to be updated. Select the Location for the interface(s) from the drop-down list. Click the Apply button to save any changes. Click the Cancel button to cancel any changes. Click the OK button to save any changes and close the form.

Location Location Unassigned

Warning: When you press OK or Apply, all the settings above will be applied to all selected interfaces. If you opened this Form for a Device, the same values will be applied to all interfaces. Press Cancel if you do not want to apply the same values to all.

OK Apply Cancel

- 4 Update the location assignment using the selection list.
- 5 Click **Apply** to save changes, **OK** to save changes and close the form, or **Cancel** to close the form without saving changes.

Update Interface Description

Follow these steps to open the form and update the description:

- 1 Select **HP OpenView > Performance Insight > Management Console**.
- 2 Click **Objects**, navigate to the interface you want to update, and select the interface. The Update Interface Description form is listed under **Object Specific Tasks**.

- 3 Double-click **Update Interface Description**. The form opens.

NetFlow Interface
Update Interface Description

This form allows the interface Description to be updated. Click the Apply button to save any changes. Click the Cancel button to cancel any changes. Click the OK button to save any changes and close the form.

| Target Name | InterfaceName | Description |
|-------------|---------------|-------------|
|-------------|---------------|-------------|

Description

Warning: When you press OK or Apply, all the settings above will be applied to all selected interfaces.

OK Apply Cancel

- 4 If you selected a device, all the interfaces on the device will appear in the table. To update the descriptions for multiple interfaces, select each interface, update the description, click **Apply**, and then repeat these steps for each interface.
- 5 Click **Apply** to save changes, **OK** to save changes and close the form, or **Cancel** to close the form without saving changes.


Update Interface Speed

Follow these steps to open the form and update the speed of the interface:

- 1 Select **HP OpenView > Performance Insight > Management Console**.
- 2 Click **Objects**, navigate to the interface you want to update, and select the interface. (Or navigate to a device and select the device if you want to update all interfaces on the device.) The Update Interface Speed form is listed under **Object Specific Tasks**.

- 3 Double-click **Update Interface Speed**. The form opens.

NetFlow Interface
Update Interface Speed


invent

This form allows interface information to be updated. Click the Apply button to save any changes. Click the Cancel button to cancel any changes. Click the OK button to save any changes and close the form.

Customer

Location

| Interface Speed | Speed (bps) | Speed In (bps) | Speed Out (bps) |
|---|----------------------|-----------------------|------------------------|
| Interface speed initially set from network. | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Duplex

Warning: When you press OK or Apply, all the settings above will be applied to all selected interfaces. If you opened this Form for a Device, the same values will be applied to all interfaces. Press Cancel if you do not want to apply the same values to all.

OK Apply Cancel

- 4 Update the speed of the interface.
- 5 Click **Apply** to save changes, **OK** to save changes and close the form, or **Cancel** to close the form without saving changes.

6 Setting Up a Distributed System

This chapter covers the following topics:

- Distributed processing or multiple stand-alone systems?
- Using the Add Database Wizard to set up connections with satellite databases
- Enabling pull commands for hourly data and daily data
- Synchronizing system clocks

Distributed Processing or Multiple Stand-Alone Systems?

If the amount of data generated is more than one OVPI server can handle (even though you limited the number of monitored interfaces and followed our advice regarding the need to apply at least one filtering technique), then your only option is to spread the data out over two or more OVPI servers. If you decide that multiple OVPI servers are necessary, you have two options:

- Configure one server to function as a central server
- Let stand-alone servers display reports covering a subset of interfaces

To configure one server to function as the central server, follow these steps:

- Use the Add Database Wizard to set up connections with satellite server databases
- Enable the central server to pull hourly data from each satellite server
- Enable the central server to pull daily data from each satellite server

If you have experience configuring other OVPI report packs to operate in distributed environments, you are accustomed to switching off daily aggregations at each satellite server. NetFlow Interface is different. When NetFlow Interface is running in a distributed environment, you want aggregations to be spread out, not centralized. Therefore, do not switch off daily aggregations at each satellite server.

The Add Database Wizard

Follow these steps to connect the central server to satellite server databases.

- 1 Start the Management Console.
- 2 Click the **Systems** icon on the lower left. The System/Network Administration pane opens.
- 3 Right-click the **Databases** folder. When prompted, select **Add OVPI Database**. The Add Database Wizard opens.
- 4 Click **Next**.

- 5 Type the hostname and port number for the database you want to add; click **Next**.
- 6 Review the Summary. Repeat Steps 4 and 5 for each additional database.
- 7 Click **Finish** when you finish adding databases.

Enabling Pull Commands for Hourly Data

Follow these steps to configure the central server to pull hourly data from a satellite:

- 1 Open this file: `$DPIPE_HOME/scripts/NetFlowIF_Hourly.pro`
- 2 If the central server is a non-collecting central server, comment-out blocks 1 through 4 by adding the comment sign (“#”) before the word **begin** and the word **end**.
- 3 Configure trendcopy pull commands.
 - a Open this file: `$DPIPE_HOME/scripts/NetFlowIF_Hourly.pro`
 - b Make the following changes:
 - Remove “#” before each line in trendcopyblock, including the **begin** and **end** lines.
 - Replace *SATELLITE_SERVER_1_DATABASE* with the satellite server name.
 - Replace *THIS_MACHINE_DATABASE* with the central server name.
- 4 If there is more than one satellite server, create one copy of trendcopyblock for each satellite server and repeat step 3 for each trendcopyblock.
- 5 Save and close the file.

Configuring Pull Commands for Daily Data

Follow these steps to configure the central server to pull daily data from a satellite:

- 1 Open this file: `$DPIPE_HOME/scripts/NetFlowIF_Daily.pro`
- 2 Comment-out blocks 1 and 2 by adding the comment sign (“#”) before the word **begin** and the word **end**.
- 3 Configure trendcopy pull commands.
 - a Open this file: `$DPIPE_HOME/scripts/NetFlowIF_Daily.pro`
 - a Make the following changes:
 - Remove “#” before each line in trendcopyblock, including the **begin** and **end** lines.
 - Replace *SATELLITE_SERVER_1_DATABASE* with the satellite server name.
 - Replace *THIS_MACHINE_DATABASE* with the central server name.
- 4 If there is more than one satellite server, create a copy of trendcopyblock for each satellite server and repeat step 3 for each trendcopyblock.

Synchronizing System Clocks

If you are configuring one server to function as the central server, make sure that the system clock on each satellite server is synchronized with the system clock on the central server.

7 Top 10 Reports

The NetFlow Interface contains three top ten reports:

- Hourly Top Ten
- Daily Top Ten
- Monthly Top Ten

Top ten reports monitor interface traffic on an ongoing basis and provide an excellent starting point for in-depth analysis of problem interfaces. If monitoring is important to you, you will be interested in the figures for interface utilization and the breakdown of interface traffic. If you are already dealing with congested interfaces, you can use these reports to find out what might be causing the congestion.

Top ten reports allow you to select a specific time period—an hour, a day, or a month. Once the time period is selected, you can see the clients, servers, applications, and TOS values that are contributing the most to the load on an interface. Note that each time period provides some additional information:

- Hourly — average utilization for that hour
- Daily — the busy hour average for that day
- Monthly — an average of 30 busy hours for that month

The average utilization for the hour is an average of four samples. Busy hour is the highest hourly average among 24 hourly averages calculated each day. Busy hour reflects a relatively persistent event (more persistent than peak). Actual utilization during the course of the busy hour could have been far above or far below the average.

The four tables below the time period selection table look at total traffic by client, server, application, and TOS value and identify the ten elements that generated the most traffic. What you have in these tables is the “constituent usage.” For example, if interface utilization is at 10%, the list of clients will account for approximately 100% of that 10%.

If you notice that one server accounts for a large percentage of the traffic on an overutilized interface, you can probably reduce congestion by rerouting traffic from that server, as opposed to adding capacity. On the other hand, if no single element stands out as a primary source of congestion, the real problem may be a shortage of capacity, in which case the device may need to be upgraded.

Samples of all three top ten reports follow.

NetFlow Interface



Hourly Top Ten Summary

The Top Ten Summary report lists the top contributors to the total traffic on an interface. Select an interface and a time period to see the top ten clients, servers, applications and TOS values with the greatest impact on the interface utilization for the time period selected. Statistics for half-duplex interface are shown as a single value while those for full-duplex interfaces are displayed as "transmit" / "receive".

Interface List

| Router | Interface | Duplex | Utilization |
|----------|-----------|--------|-------------|
| Router01 | 7 | Full | 6.28 / 3.22 |
| Router01 | 4 | Half | 1.55 |
| Router01 | 0 | Half | 0.98 |

Hourly Utilization

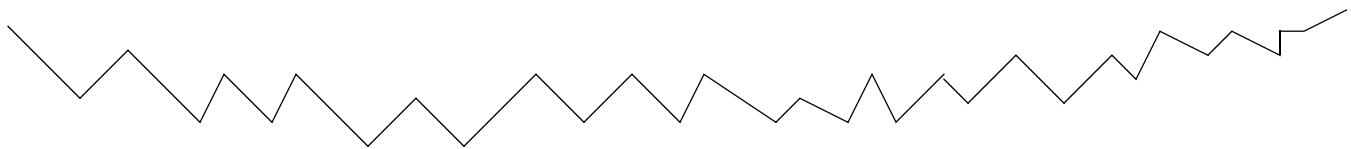
| Hour | Utilization |
|-------------------------|-------------|
| 9:00 AM, August 8, 2003 | 6.28 / 3.22 |
| 8:00 AM, August 8, 2003 | 7.14 / 4.40 |
| 7:00 AM, August 8, 2003 | 4.31 / 2.21 |
| 6:00 AM, August 8, 2003 | 4.36 / 2.41 |
| 5:00 AM, August 8, 2003 | 4.40 / 2.70 |
| 4:00 AM, August 8, 2003 | 4.65 / 2.83 |
| 3:00 AM, August 8, 2003 | 4.34 / 2.75 |
| 2:00 AM, August 8, 2003 | 3.95 / 2.63 |
| 1:00 AM, August 8, 2003 | 4.05 / 2.50 |

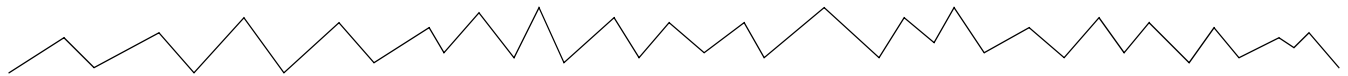
Top Ten Clients

| | Client | Utilization | % of Traffic |
|----|-----------|-------------|---------------|
| 1 | Client105 | 0.91 / 0.62 | 14.42 / 19.08 |
| 2 | Client64 | 0.73 / 0.35 | 11.69 / 10.96 |
| 3 | Client07 | 0.58 / 0.37 | 9.17 / 11.45 |
| 4 | Client132 | 0.55 / 0.10 | 8.83 / 3.05 |
| 5 | Client12 | 0.55 / 0.22 | 8.70 / 6.90 |
| 6 | Client06 | 0.54 / 0.08 | 8.62 / 2.54 |
| 7 | Client65 | 0.47 / 0.28 | 7.44 / 8.74 |
| 8 | Client03 | 0.44 / 0.20 | 7.06 / 6.12 |
| 9 | Client54 | 0.17 / 0.17 | 2.70 / 5.22 |
| 10 | Client78 | 0.16 / 0.08 | 2.58 / 2.43 |

Top Ten Servers

| | Server | Utilization | % of Traffic |
|----|-----------|-------------|---------------|
| 1 | Server164 | 1.96 / 0.67 | 31.27 / 20.75 |
| 2 | Client14 | 0.92 / 0.60 | 14.69 / 18.61 |
| 3 | Client144 | 0.40 / 0.08 | 6.41 / 2.47 |
| 4 | Server588 | 0.37 / 0.21 | 5.94 / 6.61 |
| 5 | Client155 | 0.28 / 0.04 | 4.44 / 1.09 |
| 6 | Server356 | 0.23 / 0.14 | 3.67 / 4.32 |
| 7 | Client130 | 0.17 / 0.17 | 2.70 / 5.22 |
| 8 | Client94 | 0.11 / 0.16 | 1.75 / 4.94 |
| 9 | Server187 | 0.15 / 0.08 | 2.41 / 2.40 |
| 10 | Server352 | 0.15 / 0.02 | 2.35 / 0.65 |





Top Ten Applications

| | Application / TOS | Utilization | % of Traffic |
|-----------|-------------------|-------------|---------------|
| 1 | snmp / 0 | 3.88 / 1.85 | 61.88 / 57.33 |
| 2 | netbios-ssn / 0 | 0.30 / 0.14 | 4.86 / 4.36 |
| 3 | hpidsagent / 0 | 0.20 / 0.00 | 3.26 / 0.08 |
| 4 | availant-mgr / 0 | 0.11 / 0.16 | 1.75 / 4.94 |
| 5 | tr-rsrb-p1 / 0 | 0.15 / 0.00 | 2.43 / 0.11 |
| 6 | allstorens / 0 | 0.13 / 0.00 | 2.14 / 0.06 |
| 7 | winddx / 0 | 0.07 / 0.00 | 1.09 / 0.04 |
| 8 | payrouter / 0 | 0.06 / 0.00 | 1.02 / 0.12 |
| 9 | uma / 0 | 0.06 / 0.00 | 1.00 / 0.04 |
| 10 | bullant-srap / 0 | 0.06 / 0.00 | 0.94 / 0.04 |

Top Ten TOS

| | TOS | Utilization | % of Traffic |
|----------|-----|-------------|-----------------|
| 1 | 0 | 6.28 / 3.22 | 100.00 / 100.00 |

NetFlow Interface



Daily Top Ten Summary

The Top Ten Summary report lists the top contributors to the total traffic on an interface. Select an interface and a time period to see the top ten clients, servers, applications and TOS values with the greatest impact on the interface utilization for the time period selected. Statistics for half-duplex interfaces are shown as a single value while those for full-duplex interfaces are displayed as "transmit" / "receive".

Interface List

| Router | Interface | Duplex | Busy Hour Utilization |
|-----------------|-----------|-------------|-----------------------|
| Router01 | 7 | Full | 8.06 / 9.65 |
| Router01 | 4 | Half | 7.42 |
| Router01 | 0 | Half | 6.99 |

Peak Hourly Utilization

| Day | Busy Hour Utilization |
|-----------------------|-----------------------|
| August 7, 2003 | 7.42 |
| August 6, 2003 | 9.44 |
| August 5, 2003 | 5.19 |
| August 4, 2003 | 7.47 |
| August 3, 2003 | 33.49 |
| August 2, 2003 | 3.01 |
| August 1, 2003 | 4.30 |
| Julv 31, 2003 | 6.68 |

Top Ten Clients

| | Client | Busy Hour Utilization | % of Daily Traffic |
|-----------|-----------|-----------------------|--------------------|
| 1 | Client73 | 32.77 | 63.11 |
| 2 | Client154 | 0.51 | 1.02 |
| 3 | Client91 | 0.36 | 14.76 |
| 4 | Client39 | 0.12 | 1.97 |
| 5 | Client90 | 0.11 | 0.21 |
| 6 | Client01 | 0.06 | 1.36 |
| 7 | Client07 | 0.06 | 2.67 |
| 8 | Client152 | 0.06 | 2.04 |
| 9 | Client03 | 0.06 | 1.93 |
| 10 | Client132 | 0.06 | 1.97 |

Top Ten Servers

| | Server | Busy Hour Utilization | % of Daily Traffic |
|-----------|-----------|-----------------------|--------------------|
| 1 | Client32 | 32.77 | 63.11 |
| 2 | Server553 | 0.51 | 0.98 |
| 3 | Server164 | 0.25 | 9.10 |
| 4 | Server426 | 0.12 | 1.86 |
| 5 | Server135 | 0.04 | 1.54 |
| 6 | Server132 | 0.04 | 1.51 |
| 7 | Server588 | 0.04 | 1.34 |
| 8 | Server124 | 0.03 | 1.47 |
| 9 | Server13 | 0.03 | 1.45 |
| 10 | Server127 | 0.03 | 1.49 |





Top Ten Applications

| | Application / TOS | Busy Hour Utilization | % of Daily Traffic |
|-----------|--------------------|-----------------------|--------------------|
| 1 | ftp-data / 0 | 32.77 | 63.10 |
| 2 | snmp / 0 | 0.84 | 33.74 |
| 3 | socks / 0 | 0.51 | 0.98 |
| 4 | netbios-ssn / 0 | 0.05 | 1.74 |
| 5 | rgtp / 0 | 0.02 | 0.04 |
| 6 | http / 0 | 0.01 | 0.16 |
| 7 | OTHER_APPS / 0 | 0.01 | 0.11 |
| 8 | vrml-multi-use / 0 | 0.01 | 0.01 |
| 9 | metagram / 0 | 0.00 | 0.08 |
| 10 | v-one-spp / 0 | 0.00 | 0.00 |

Top Ten TOS

| | TOS | Busy Hour Utilization | % of Daily Traffic |
|----------|-----|-----------------------|--------------------|
| 1 | 0 | 33.49 | 100.00 |

NetFlow Interface



Monthly Top Ten Summary

The Top Ten Summary report lists the top contributors to the total traffic on an interface. Select an interface and a time period to see the top ten clients, servers, applications and TOS values with the greatest impact on the interface utilization for the time period selected. Statistics for half-duplex interfaces are shown as a single value while those for full-duplex interfaces are displayed as "transmit" / "receive".

Interface List

| Router | Interface | Duplex | Busy Hour Utilization |
|----------|-----------|--------|-----------------------|
| Router01 | 7 | Full | 95.60 / 33.11 |
| Router01 | 4 | Half | 30.14 |
| Router01 | 0 | Half | 29.87 |

Peak Hourly Utilization

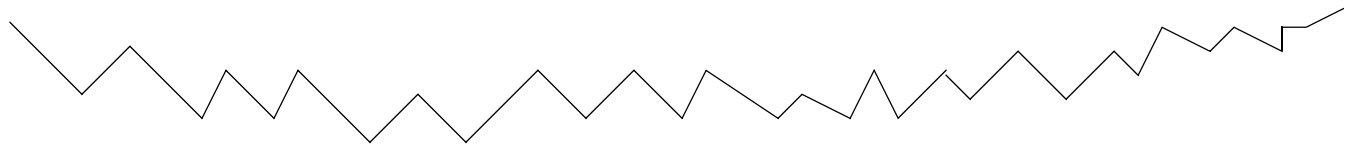
| Month | Busy Hour Utilization |
|-------------|-----------------------|
| July, 2003 | 95.60 / 33.11 |
| June, 2003 | 69.69 / 24.14 |
| May, 2003 | 56.45 / 19.55 |
| April, 2003 | 41.15 / 14.25 |

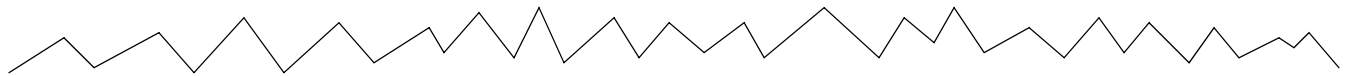
Top Ten Clients

| | Client | Busy Hour Utilization | % of Monthly Traffic |
|----|-----------|-----------------------|----------------------|
| 1 | Client142 | 84.83 / 28.13 | 17.96 / 10.71 |
| 2 | Client73 | 26.47 / 17.62 | 3.64 / 5.37 |
| 3 | Client84 | 24.25 / 0.10 | 1.93 / 0.01 |
| 4 | Client75 | 18.67 / 4.96 | 2.78 / 1.66 |
| 5 | Client155 | 18.42 / 8.20 | 3.68 / 2.53 |
| 6 | Client150 | 17.99 / 9.49 | 2.73 / 2.55 |
| 7 | Client146 | 13.87 / 9.76 | 1.63 / 1.56 |
| 8 | Client27 | 12.29 / 8.19 | 1.00 / 3.22 |
| 9 | Client54 | 9.03 / 3.62 | 2.75 / 3.24 |
| 10 | Client154 | 8.86 / 5.98 | 1.55 / 2.10 |

Top Ten Servers

| | Server | Busy Hour Utilization | % of Monthly Traffic |
|----|-----------|-----------------------|----------------------|
| 1 | Server592 | 84.81 / 28.01 | 17.40 / 10.51 |
| 2 | Server481 | 26.47 / 17.62 | 2.11 / 2.32 |
| 3 | Client73 | 24.25 / 8.19 | 3.15 / 5.80 |
| 4 | Client35 | 18.67 / 4.96 | 2.07 / 1.19 |
| 5 | Client159 | 18.34 / 12.85 | 4.55 / 4.92 |
| 6 | Server640 | 18.29 / 8.17 | 2.54 / 1.19 |
| 7 | Client138 | 17.05 / 9.00 | 1.65 / 1.43 |
| 8 | Client21 | 13.87 / 9.76 | 1.65 / 1.58 |
| 9 | Client130 | 9.03 / 3.62 | 2.73 / 2.77 |
| 10 | Server552 | 8.86 / 5.98 | 0.87 / 1.01 |





Top Ten Applications

| Application / TOS | Busy Hour Utilization | % of Monthly Traffic | TOS |
|-------------------|-----------------------|----------------------|-----|
| netbios-ssn / 0 | 85.61 / 28.66 | 27.51 / 19.73 | 1 0 |
| ftp-data / 0 | 24.25 / 8.19 | 3.18 / 6.15 | |
| OTHER_APPS / 0 | 18.69 / 8.68 | 4.92 / 4.21 | |
| vrtrapsrvr / 0 | 15.97 / 0.18 | 1.27 / 0.02 | |
| optima-vnet / 0 | 13.87 / 9.76 | 1.64 / 1.71 | |
| slinkysearch / 0 | 12.11 / 0.12 | 0.97 / 0.02 | |
| visionpyramid / 0 | 0.25 / 10.88 | 0.04 / 1.44 | |
| socks / 0 | 8.86 / 5.98 | 0.95 / 2.38 | |
| interhdl_elmd / 0 | 0.19 / 8.13 | 0.02 / 1.30 | |
| zephyr-srv / 0 | 0.16 / 6.52 | 0.01 / 0.86 | |

Top Ten TOS

| Busy Hour Utilization | % of Monthly Traffic |
|-----------------------|----------------------|
| 95.60 / 33.11 | 100.00 / 100.00 |

8 Summary Reports

NetFlow Interface includes 12 summary reports:

- Client Summary Report (Hourly / Daily / Monthly)
- Server Summary Report (Hourly / Daily / Monthly)
- Application Summary Report (Hourly / Daily / Monthly)
- TOS Summary Report (Hourly / Daily / Monthly)

Summary reports add depth to Top Ten Reports. They focus on a particular element type and plot statistical changes over time. Use these reports to find out whether recent activity appearing in a Top Ten report is a temporary condition, with no history behind it, or a longer term trend that may require further investigation.

Select an interface and a time period to display a list of elements. Select an element to display the following graphs:

- Utilization
- Percentage of traffic
- Bytes per hour
- Packets per hour

Summary Reports are useful initially in determining which element within a particular element type (which client, server, application, or TOS value) is causing excess traffic on the selected interface. After you select an element, the graphs will tell you whether the traffic generated by the element represents a solitary spike, a sudden but persistent increase in traffic, or steady growth over time.

See below for samples of the following reports:

- Hourly Server Summary
- Daily Application Summary
- Monthly Client Summary

NetFlow Interface



Hourly Server Summary

The Server Summary Report presents a breakdown of the server devices which contribute to the total traffic on an interface. Select an interface and a time period to see a list of servers that had the most impact on the interface utilization for the time period selected. Select a server device to see graphs of its historical traffic patterns. Statistics for half-duplex interfaces are shown as a single value while those for full-duplex interfaces are displayed as "transmit" / "receive".

Interface List

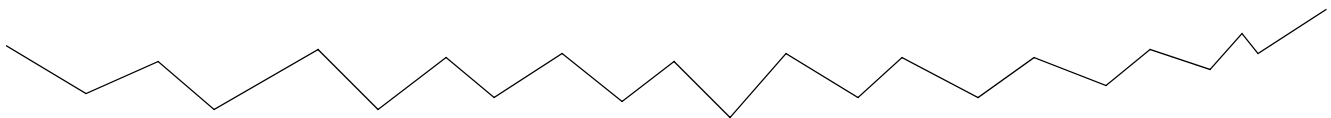
| Router | Interface | Duplex | Utilization |
|----------|-----------|--------|-------------|
| Router01 | 7 | Full | 6.28 / 3.22 |
| Router01 | 4 | Half | 1.55 |
| Router01 | 0 | Half | 0.98 |

Hourly Utilization

| Hour | Utilization |
|-------------------------|-------------|
| 9:00 AM, August 8, 2003 | 6.28 / 3.22 |
| 8:00 AM, August 8, 2003 | 7.14 / 4.40 |
| 7:00 AM, August 8, 2003 | 4.31 / 2.21 |
| 6:00 AM, August 8, 2003 | 4.36 / 2.41 |
| 5:00 AM, August 8, 2003 | 4.40 / 2.70 |
| 4:00 AM, August 8, 2003 | 4.65 / 2.83 |
| 3:00 AM, August 8, 2003 | 4.34 / 2.75 |
| 2:00 AM, August 8, 2003 | 3.95 / 2.63 |
| 1:00 AM, August 8, 2003 | 4.05 / 2.50 |

Top Talking Servers

| Server | Utilization | % of Traffic | Bytes | Average Bytes per Packet | Number of Flows |
|-----------|-------------|---------------|-----------------------|--------------------------|-----------------|
| Server164 | 1.96 / 0.67 | 31.27 / 20.75 | 4523.28 k / 2312.88 k | 302.40 / 289.62 | 24 / 17 |
| Client14 | 0.92 / 0.60 | 14.69 / 18.61 | 2125.28 k / 2073.82 k | 836.72 / 814.54 | 74 / 72 |
| Client144 | 0.40 / 0.08 | 6.41 / 2.47 | 926.42 k / 275.72 k | 1200.02 / 480.36 | 5 / 6 |
| Server588 | 0.37 / 0.21 | 5.94 / 6.61 | 859.15 k / 737.13 k | 340.53 / 338.44 | 21 / 19 |
| Client155 | 0.28 / 0.04 | 4.44 / 1.09 | 641.88 k / 121.11 k | 1154.47 / 283.64 | 15 / 14 |
| Server356 | 0.23 / 0.14 | 3.67 / 4.32 | 530.81 k / 481.82 k | 394.95 / 395.26 | 9 / 9 |
| Client130 | 0.17 / 0.17 | 2.70 / 5.22 | 389.93 k / 582.18 k | 217.71 / 299.01 | 12 / 12 |
| Client94 | 0.11 / 0.16 | 1.75 / 4.94 | 252.73 k / 550.42 k | 433.51 / 638.54 | 40 / 54 |
| Server187 | 0.15 / 0.08 | 2.41 / 2.40 | 348.13 k / 267.89 k | 281.20 / 288.68 | 19 / 14 |
| Server352 | 0.15 / 0.02 | 2.35 / 0.65 | 339.34 k / 72.47 k | 395.50 / 377.45 | 26 / 4 |



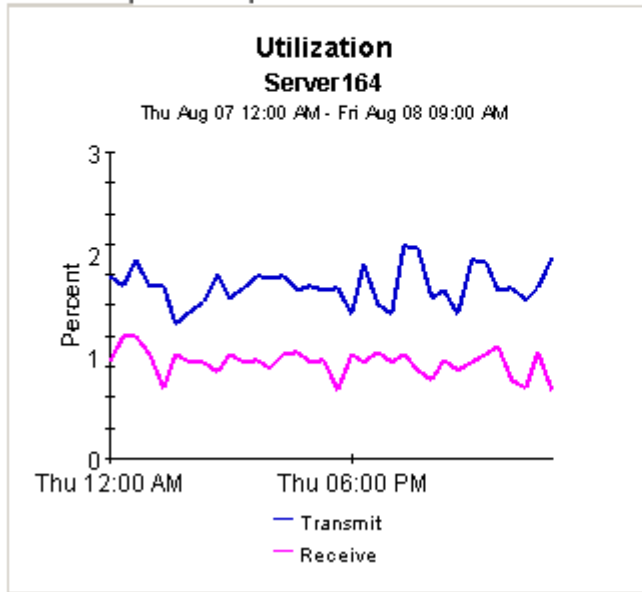
Server Owner

ACME

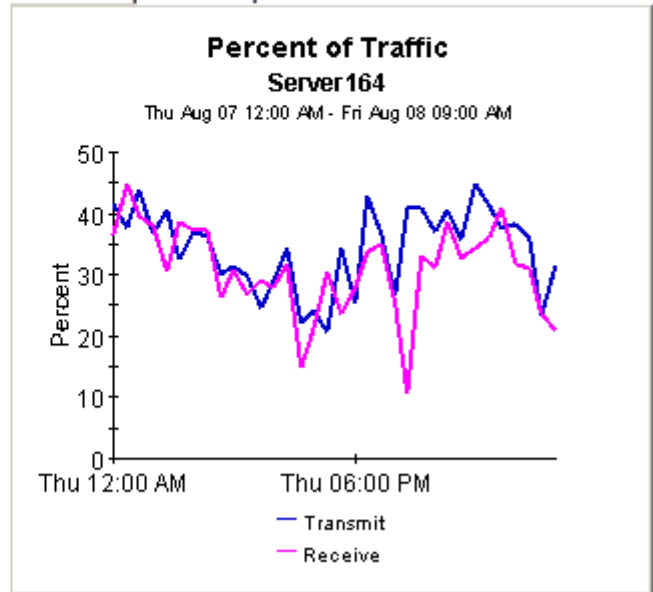
Server Location

London

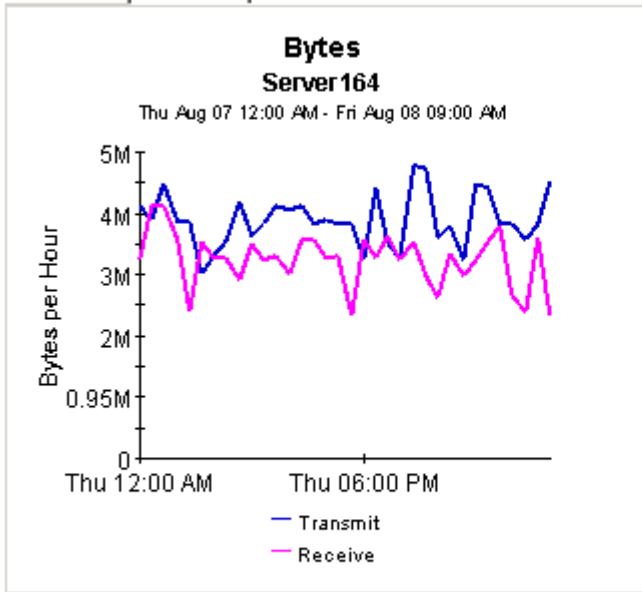
Composite | Directional



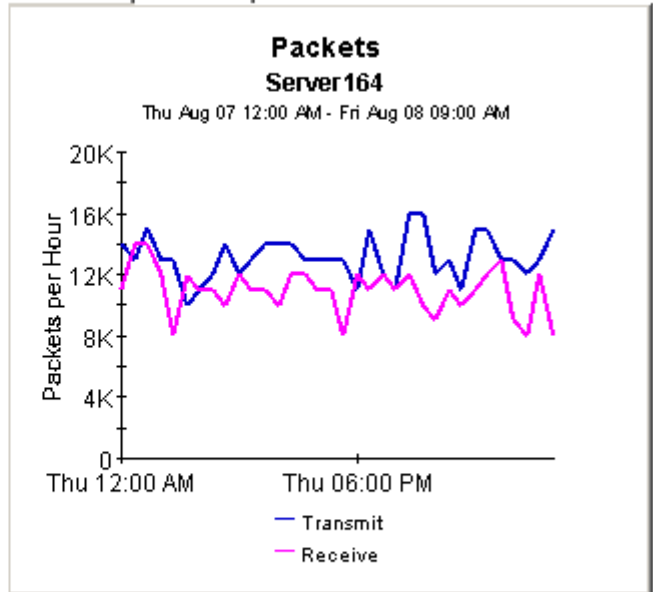
Composite | Directional



Composite | Directional



Composite | Directional



NetFlow Interface



Daily Application Summary

The Application Summary Report presents a breakdown of the applications which contribute to the total traffic on an interface. Select an interface and a time period to see a list of applications that had the most impact on the interface utilization for the time period selected. Select an application to see graphs of its historical traffic patterns. Statistics for half-duplex interfaces are shown as a single value while those for full-duplex interfaces are displayed as "transmit" / "receive".

Interface List

| Router | Interface | Duplex | Busy Hour Utilization |
|----------|-----------|--------|-----------------------|
| Router01 | 7 | Full | 8.06 / 9.65 |
| Router01 | 4 | Half | 7.42 |
| Router01 | 0 | Half | 6.99 |

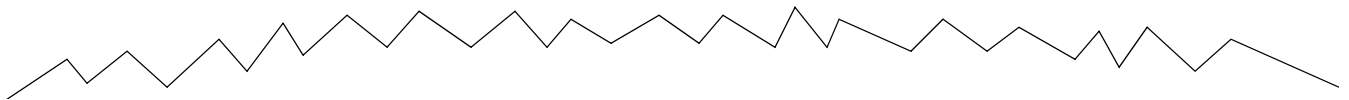
Peak Hourly Utilization

| Day | Busy Hour Utilization |
|----------------|-----------------------|
| August 7, 2003 | 8.06 / 9.65 |
| August 6, 2003 | 29.28 / 25.56 |
| August 5, 2003 | 60.38 / 35.16 |
| August 4, 2003 | 106.22 / 36.79 |
| August 3, 2003 | 4.59 / 8.77 |
| August 2, 2003 | 3.71 / 2.46 |
| August 1, 2003 | 33.06 / 29.06 |
| July 31, 2003 | 7.25 / 8.69 |
| July 30, 2003 | 26.35 / 23.01 |

Top Talking Applications

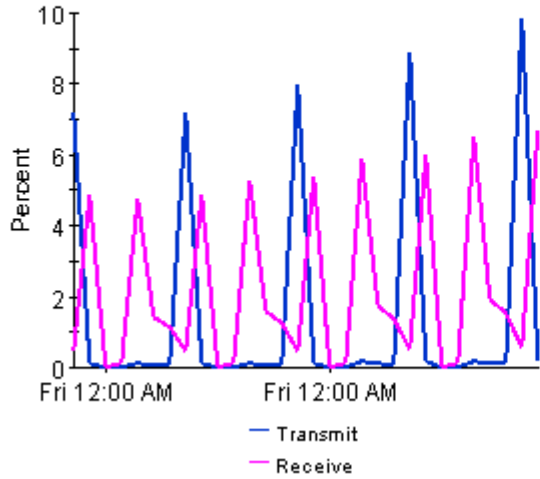
| Application | TOS | Busy Hour Utilization | % of Daily Traffic | Bytes | Average Bytes per Packet | Number of Flows |
|--------------|-----|-----------------------|--------------------|----------------------|--------------------------|-----------------|
| socks | 0 | 0.17 / 6.64 | 0.15 / 7.94 | 428.59 k / 22.96 M | 44.99 / 1313.75 | 6 / 6 |
| snmp | 0 | 4.39 / 2.77 | 72.00 / 66.22 | 209.57 M / 191.53 M | 325.58 / 321.42 | 8957 / 7395 |
| netbios-ssn | 0 | 1.92 / 1.38 | 10.22 / 10.48 | 29.76 M / 30.32 M | 436.71 / 432.12 | 996 / 1069 |
| smtp | 0 | 1.58 / 0.01 | 1.25 / 0.02 | 3642.29 k / 50.16 k | 1486.65 / 40.62 | 2 / 2 |
| symplex | 0 | 1.45 / 0.01 | 1.15 / 0.02 | 3334.93 k / 45.45 k | 1497.50 / 40.22 | 1 / 1 |
| ff-annunc | 0 | 1.31 / 0.05 | 1.04 / 0.06 | 3014.14 k / 176.45 k | 542.89 / 32.00 | 1 / 1 |
| telnet | 0 | 1.29 / 0.04 | 1.83 / 0.17 | 5339.99 k / 484.48 k | 409.07 / 43.84 | 36 / 32 |
| amt-esd-prot | 0 | 0.10 / 0.88 | 0.15 / 1.10 | 445.88 k / 3174.10 k | 74.83 / 532.30 | 19 / 19 |
| ansoft-lm-1 | 0 | 0.08 / 0.87 | 0.06 / 1.04 | 176.93 k / 3015.30 k | 32.00 / 542.71 | 1 / 1 |
| ftp-data | 0 | 0.87 / 0.14 | 0.85 / 0.17 | 2485.12 k / 494.22 k | 1348.41 / 512.15 | 4 / 5 |





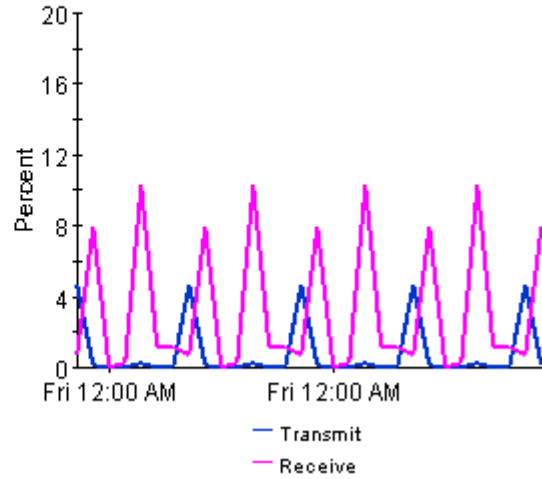
Busy Hour Utilization
socks

Wed Jul 09 2003 - Thu Aug 07 2003



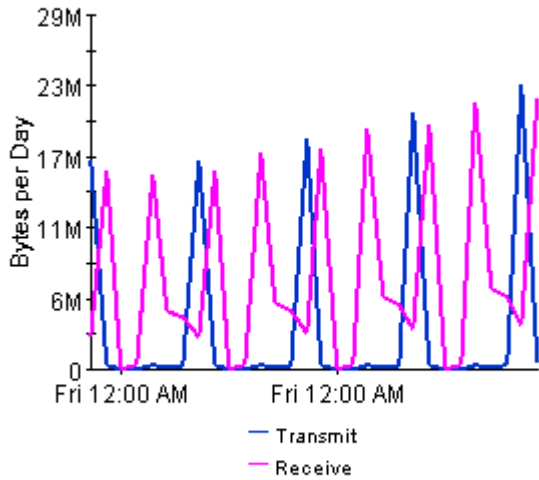
% of Daily Traffic
socks

Wed Jul 09 2003 - Thu Aug 07 2003



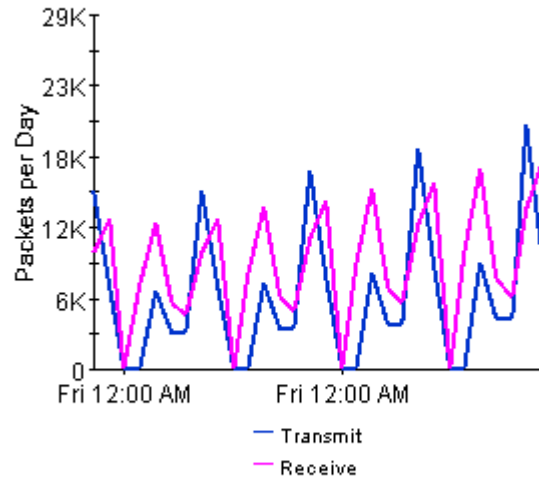
Bytes
socks

Wed Jul 09 2003 - Thu Aug 07 2003



Packets
socks

Wed Jul 09 2003 - Thu Aug 07 2003



NetFlow Interface



Monthly Client Summary

The Client Summary Report presents a breakdown of the client devices which contribute to the total traffic on an interface. Select an interface and a time period to see a list of clients that had the most impact on the interface utilization for the time period selected. Select a client device to see graphs of its historical traffic patterns. Statistics for half-duplex interfaces are shown as a single value while those for full-duplex interfaces are displayed as "transmit" / "receive".

Interface List

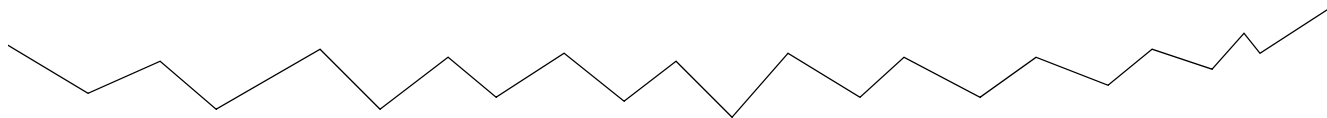
| Router | Interface | Duplex | Busy Hour Utilization |
|----------|-----------|--------|-----------------------|
| Router01 | 7 | Full | 95.60 / 33.11 |
| Router01 | 4 | Half | 30.14 |
| Router01 | 0 | Half | 29.87 |

Peak Hourly Utilization

| Month | Busy Hour Utilization |
|-------------|-----------------------|
| July, 2003 | 95.60 / 33.11 |
| June, 2003 | 69.69 / 24.14 |
| May, 2003 | 56.45 / 19.55 |
| April, 2003 | 41.15 / 14.25 |

Top Talking Clients

| Client | Busy Hour Utilization | % of Monthly Traffic | Bytes | Average Bytes per Packet | Number of Flows |
|-----------|-----------------------|----------------------|----------------------|--------------------------|-----------------|
| Client142 | 84.83 / 28.13 | 17.96 / 10.71 | 1827.25 M / 987.30 M | 1034.21 / 682.37 | 1953 / 2040 |
| Client73 | 26.47 / 17.62 | 3.64 / 5.37 | 370.49 M / 494.79 M | 753.41 / 941.03 | 432 / 451 |
| Client84 | 24.25 / 0.10 | 1.93 / 0.01 | 196.66 M / 1236.67 k | 1405.20 / 40.00 | 6 / 3 |
| Client75 | 18.67 / 4.96 | 2.78 / 1.66 | 282.80 M / 153.25 M | 1099.60 / 1181.89 | 141 / 99 |
| Client155 | 18.42 / 8.20 | 3.68 / 2.53 | 374.88 M / 233.55 M | 749.18 / 612.29 | 6878 / 7318 |
| Client150 | 17.99 / 9.49 | 2.73 / 2.55 | 278.14 M / 235.05 M | 319.69 / 293.81 | 1683 / 1090 |
| Client146 | 13.87 / 9.76 | 1.63 / 1.56 | 166.13 M / 144.03 M | 874.97 / 785.72 | 15 / 15 |
| Client27 | 12.29 / 8.19 | 1.00 / 3.22 | 101.95 M / 296.93 M | 635.37 / 1212.79 | 19 / 16 |
| Client54 | 9.03 / 3.62 | 2.75 / 3.24 | 280.02 M / 298.55 M | 347.69 / 365.75 | 2621 / 2587 |
| Client154 | 8.86 / 5.98 | 1.55 / 2.10 | 157.89 M / 193.28 M | 532.14 / 564.90 | 1656 / 1773 |



Client Owner

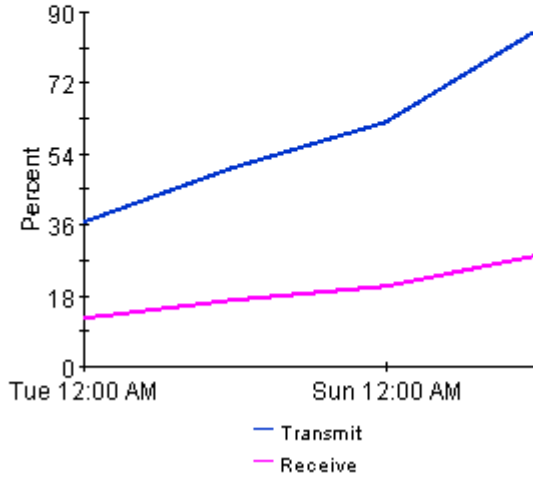
HP

Client Location

Chicago

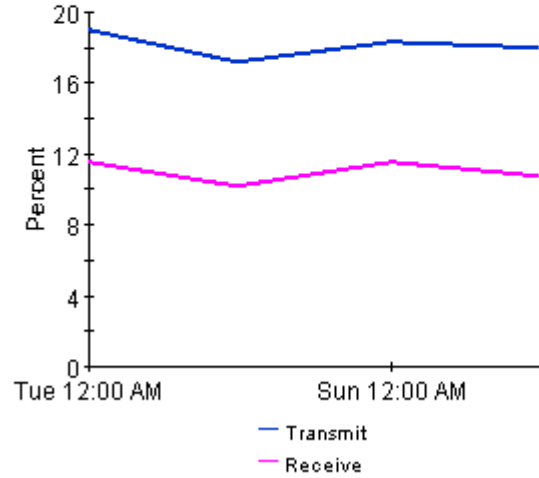
Busy Hour Utilization
Client142

Tue Apr 01 2003 - Tue Jul 01 2003



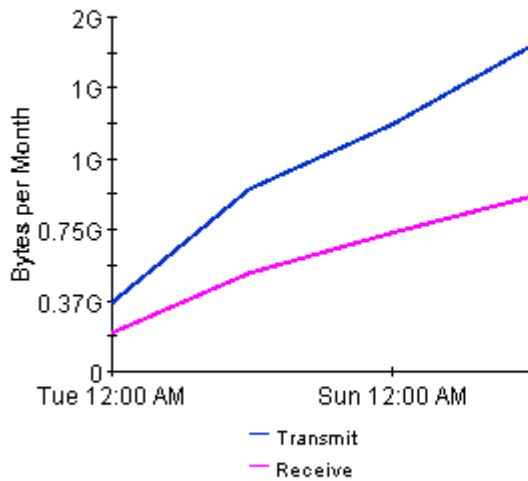
% of Monthly Traffic
Client142

Tue Apr 01 2003 - Tue Jul 01 2003



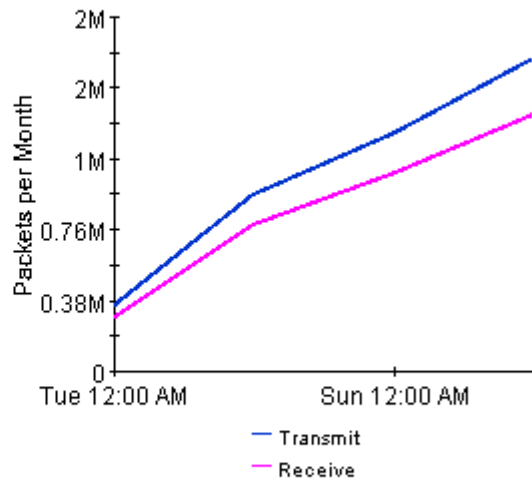
Bytes
Client142

Tue Apr 01 2003 - Tue Jul 01 2003



Packets
Client142

Tue Apr 01 2003 - Tue Jul 01 2003



9 Detail Reports

NetFlow Interface includes 12 detail reports:

- Client Detail Report (Hourly, Daily, Monthly)
- Server Detail Report (Hourly, Daily, Monthly)
- Application Detail Report (Hourly, Daily, Monthly)
- TOS Detail Report (Hourly, Daily, Monthly)

Detail reports are available in two versions, one with graphs and one without graphs. The graph-less version populates faster. If you are launching NetFlow reports from the Report Launchpad, and if speed matters, you may want to launch the graph-less version.

Detail reports add depth to Summary Reports. Each report starts with the information in the summary report—showing which elements (servers, clients, applications) are contributing the most to interface utilization—then drills down from an individual element to the flow level, for example, from a server to the various client/application pairs that were accessing the server.

At the flow level you can view graphs that show how the following metrics have changed:

- Utilization
- Percentage of traffic
- Bytes per hour
- Packets per hour

Use the graphs to spot trends and compare current performance to past performance. In the hourly detail, “past” performance means all of yesterday and part of today; in the daily detail, past performance means the last thirty days; and in the monthly detail, past performance will show every month that you have been collecting data.

See below for samples of the following reports:

- Hourly Server Detail
- Daily Application Detail
- Monthly Client Detail

NetFlow Interface



Hourly Server Detail

The Server Detail Report presents a breakdown of the servers, clients and applications which contribute to the total traffic on an interface. Select an interface and a time period to see a list of servers that had the most impact on the interface utilization for the time period selected. Select a server device to see a list of clients / applications which accessed the server through the selected interface. Select a client / application combination to see graphs of its historical traffic patterns. Statistics for half-duplex interfaces are shown as a single value while those for full-duplex interfaces are displayed as "transmit" / "receive".

Interface List

| Router | Interface | Duplex | Utilization |
|----------|-----------|--------|-------------|
| Router01 | 7 | Full | 6.28 / 3.22 |
| Router01 | 4 | Half | 1.55 |
| Router01 | 0 | Half | 0.98 |

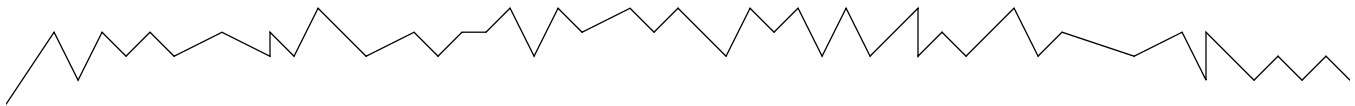
Hourly Utilization

| Hour | Utilization |
|-------------------------|-------------|
| 9:00 AM, August 8, 2003 | 6.28 / 3.22 |
| 8:00 AM, August 8, 2003 | 7.14 / 4.40 |
| 7:00 AM, August 8, 2003 | 4.31 / 2.21 |
| 6:00 AM, August 8, 2003 | 4.36 / 2.41 |
| 5:00 AM, August 8, 2003 | 4.40 / 2.70 |
| 4:00 AM, August 8, 2003 | 4.65 / 2.83 |
| 3:00 AM, August 8, 2003 | 4.34 / 2.75 |
| 2:00 AM, August 8, 2003 | 3.95 / 2.63 |
| 1:00 AM, August 8, 2003 | 4.05 / 2.50 |

Top Talking Servers

| Server | Utilization | % of Traffic | Bytes | Average Bytes per Packet | Number of Flows |
|-----------|-------------|---------------|-----------------------|--------------------------|-----------------|
| Server164 | 1.96 / 0.67 | 31.27 / 20.75 | 4523.28 k / 2312.88 k | 302.40 / 289.62 | 24 / 17 |
| Client14 | 0.92 / 0.60 | 14.69 / 18.61 | 2125.28 k / 2073.82 k | 836.72 / 814.54 | 74 / 72 |
| Client144 | 0.40 / 0.08 | 6.41 / 2.47 | 926.42 k / 275.72 k | 1200.02 / 480.36 | 5 / 6 |
| Server588 | 0.37 / 0.21 | 5.94 / 6.61 | 859.15 k / 737.13 k | 340.53 / 338.44 | 21 / 19 |
| Client155 | 0.28 / 0.04 | 4.44 / 1.09 | 641.88 k / 121.11 k | 1154.47 / 283.64 | 15 / 14 |
| Server356 | 0.23 / 0.14 | 3.67 / 4.32 | 530.81 k / 481.82 k | 394.95 / 395.26 | 9 / 9 |
| Client130 | 0.17 / 0.17 | 2.70 / 5.22 | 389.93 k / 582.18 k | 217.71 / 299.01 | 12 / 12 |
| Client94 | 0.11 / 0.16 | 1.75 / 4.94 | 252.73 k / 550.42 k | 433.51 / 638.54 | 40 / 54 |
| Server187 | 0.15 / 0.08 | 2.41 / 2.40 | 348.13 k / 267.89 k | 281.20 / 288.68 | 19 / 14 |
| Server352 | 0.15 / 0.02 | 2.35 / 0.65 | 339.34 k / 72.47 k | 395.50 / 377.45 | 26 / 4 |





Server Owner

ACME

Server Location

London

Top Talking Client / Application Pairs

| Client | Application | Utilization | % of Traffic | Bytes | Average Bytes per Packet | Number of Flows |
|-----------|-------------|-------------|--------------|-----------------------|--------------------------|-----------------|
| Client06 | snmp | 0.54 / 0.08 | 8.62 / 2.54 | 1246.86 k / 282.56 k | 312.65 / 281.44 | 6 / 5 |
| Client07 | snmp | 0.53 / 0.33 | 8.40 / 10.36 | 1215.12 k / 1154.61 k | 305.00 / 289.81 | 4 / 4 |
| Client132 | snmp | 0.50 / 0.08 | 7.99 / 2.54 | 1156.20 k / 282.91 k | 289.63 / 281.78 | 8 / 5 |
| Client03 | snmp | 0.39 / 0.17 | 6.26 / 5.32 | 905.11 k / 592.80 k | 302.31 / 297.29 | 6 / 3 |

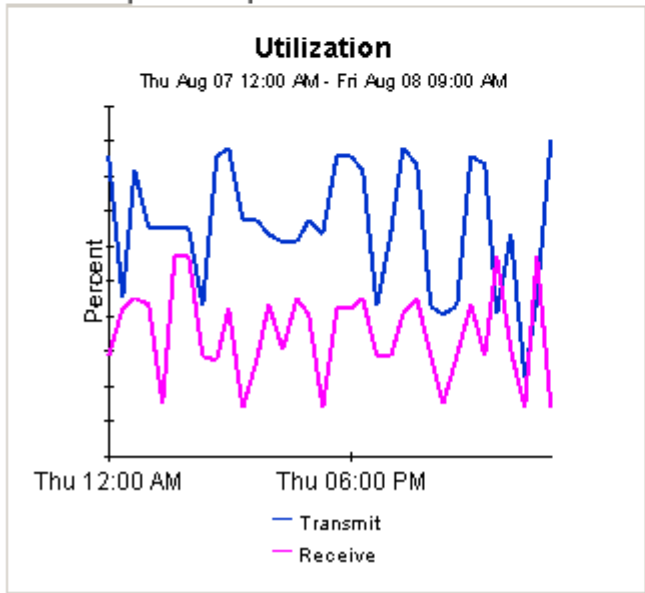
Client Owner

HP

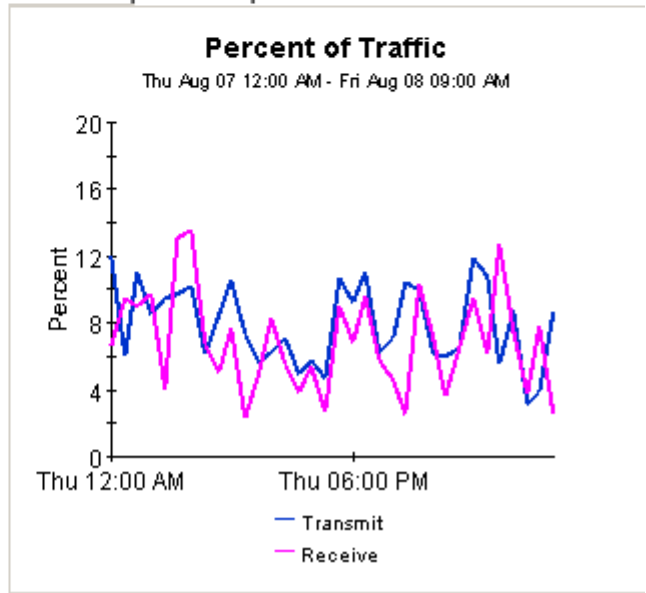
Client Location

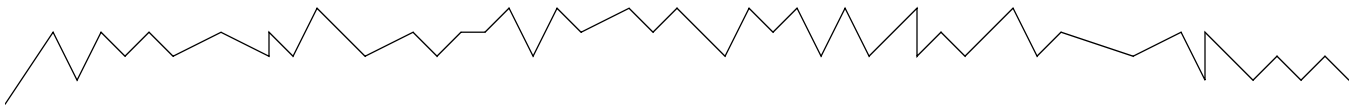
Reston

Composite | Directional

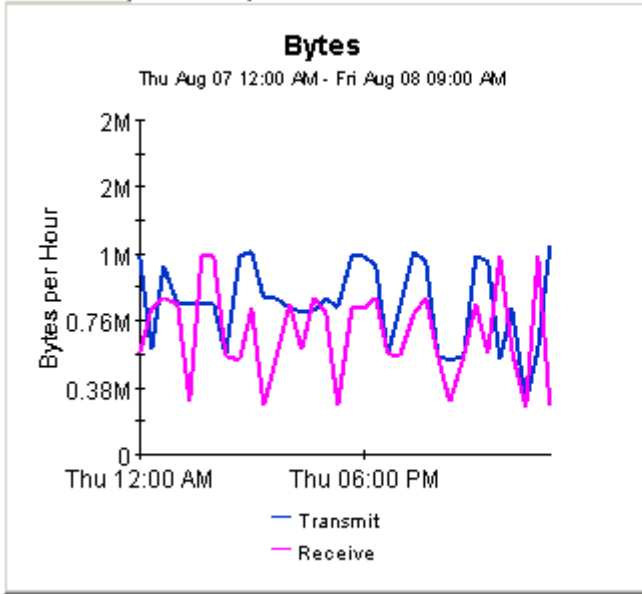


Composite | Directional

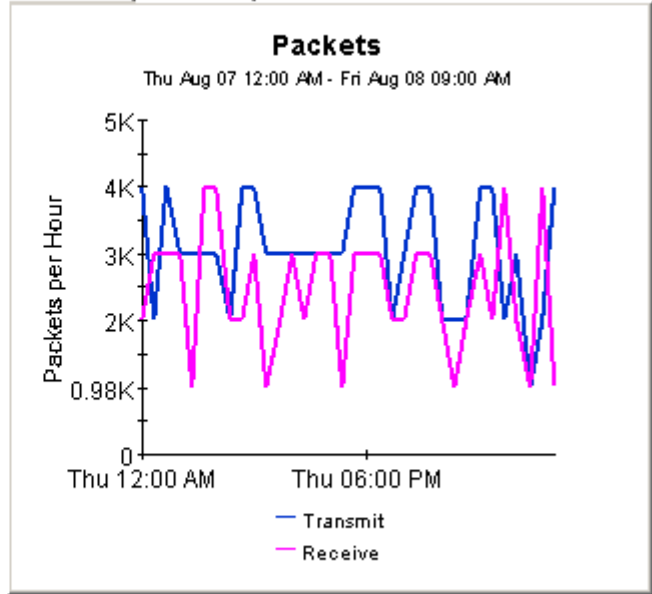




Composite | Directional



Composite | Directional



NetFlow Interface



Daily Application Detail

The Application Detail Report presents a breakdown of the applications, clients and servers which contribute to the total traffic on an interface. Select an interface and a time period to see a list of applications that had the most impact on the interface utilization for the time period selected. Select an application to see a list of clients / servers utilizing the application through the selected interface. Select a client / server combination to see graphs of its historical traffic patterns. Statistics for half-duplex interfaces are shown as a single value while those for full-duplex interfaces are displayed as "transmit" / "receive".

Interface List

| Router | Interface | Duplex | Busy Hour Utilization |
|----------|-----------|--------|-----------------------|
| Router01 | 7 | Full | 8.06 / 9.65 |
| Router01 | 4 | Half | 7.42 |
| Router01 | 0 | Half | 6.99 |

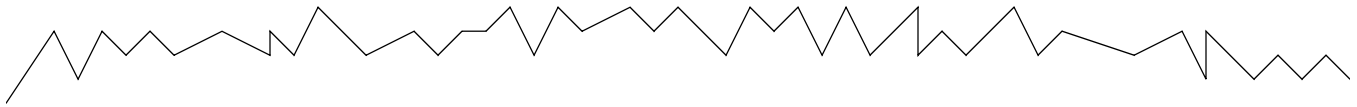
Peak Hourly Utilization

| Day | Busy Hour Utilization |
|----------------|-----------------------|
| August 7, 2003 | 7.42 |
| August 6, 2003 | 9.44 |
| August 5, 2003 | 5.19 |
| August 4, 2003 | 7.47 |
| August 3, 2003 | 33.49 |
| August 2, 2003 | 3.01 |
| August 1, 2003 | 4.30 |
| Julv 31, 2003 | 6.68 |

Top Talking Applications

| Application | TOS | Busy Hour Utilization | % of Daily Traffic | Bytes | Average Bytes per Packet | Number of Flows |
|--------------|-----|-----------------------|--------------------|-----------|--------------------------|-----------------|
| ftp-data | 0 | 5.31 | 9.93 | 241.71 M | 1280.34 | 11 |
| snmp | 0 | 2.05 | 82.53 | 2008.97 M | 371.78 | 61.25 k |
| socks | 0 | 0.52 | 0.96 | 23.39 M | 866.13 | 12 |
| netbios-ssn | 0 | 0.20 | 2.47 | 60.08 M | 434.38 | 2065 |
| OTHER_APPS | 0 | 0.08 | 0.42 | 10.18 M | 176.80 | 620 |
| smtp | 0 | 0.08 | 0.15 | 3692.45 k | 1002.02 | 4 |
| symplex | 0 | 0.08 | 0.14 | 3380.38 k | 1006.97 | 2 |
| amt-esd-prot | 0 | 0.07 | 0.15 | 3619.99 k | 303.64 | 38 |
| ansoft-lm-1 | 0 | 0.07 | 0.13 | 3192.22 k | 287.98 | 2 |
| ff-annunc | 0 | 0.07 | 0.13 | 3190.59 k | 288.32 | 2 |





Top Talking Client / Server Pairs

| Client | Server | Busy Hour Utilization | % of Daily Traffic | Bytes | Average Bytes per Packet | Number of Flows |
|----------|-----------|-----------------------|--------------------|----------|--------------------------|-----------------|
| Client39 | Server426 | 0.37 | 14.93 | 363.34 M | 367.96 | 38.82 k |
| Client69 | Server128 | 0.10 | 4.37 | 106.35 M | 391.90 | 273 |
| Client69 | Server159 | 0.10 | 4.21 | 102.45 M | 391.90 | 263 |
| Client69 | Server127 | 0.10 | 4.26 | 103.62 M | 391.91 | 266 |
| Client69 | Server165 | 0.10 | 4.31 | 104.87 M | 391.89 | 270 |
| Client69 | Server161 | 0.10 | 4.33 | 105.31 M | 391.90 | 271 |

Client Owner

HP

Client Location

New York

Server Owner

OVPI

Server Location

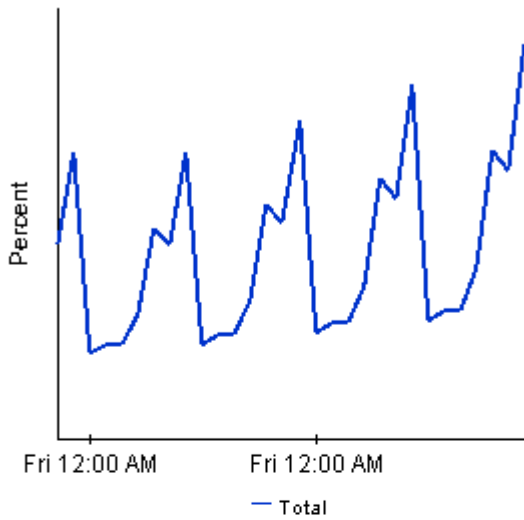
Chicago





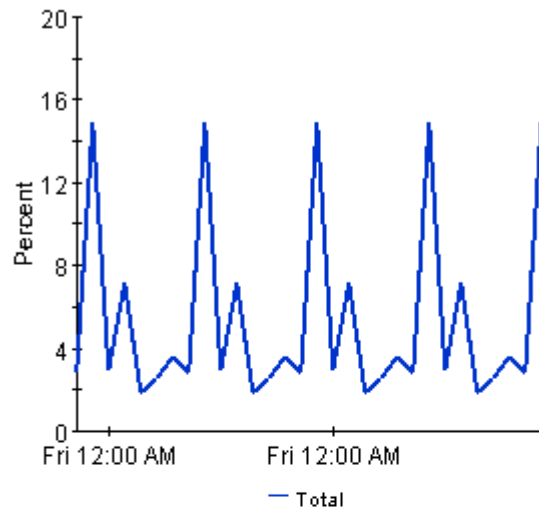
Busy Hour Utilization

Wed Jul 09 2003 - Thu Aug 07 2003



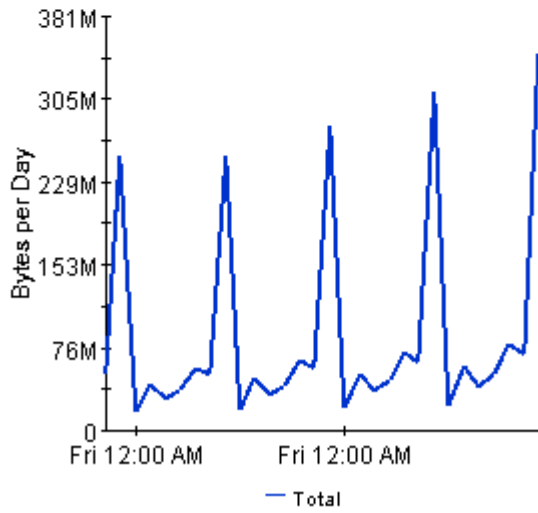
% of Daily Traffic

Wed Jul 09 2003 - Thu Aug 07 2003



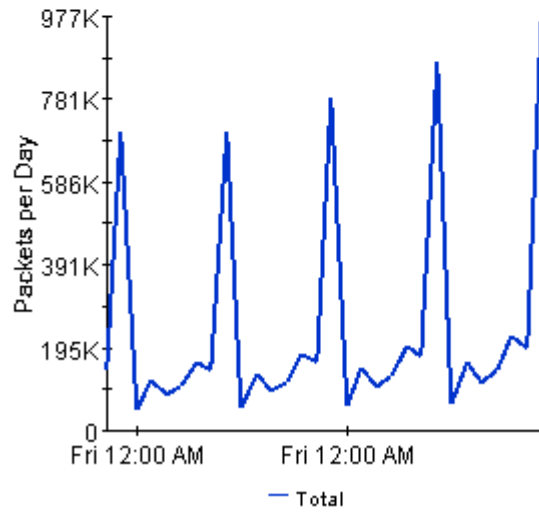
Bytes

Wed Jul 09 2003 - Thu Aug 07 2003



Packets

Wed Jul 09 2003 - Thu Aug 07 2003



NetFlow Interface



Monthly Client Detail

The Client Detail Report presents a breakdown of the clients, servers and applications which contribute to the total traffic on an interface. Select an interface and a time period to see a list of clients that had the most impact on the interface utilization for the time period selected. Select a client device to see a list of servers / applications accessed by the client through the selected interface. Select a server / application combination to see graphs of its historical traffic patterns. Statistics for half-duplex interfaces are shown as a single value while those for full-duplex interfaces are displayed as "transmit" / "receive".

Interface List

| Router | Interface | Duplex | Busy Hour Utilization |
|----------|-----------|--------|-----------------------|
| Router01 | 7 | Full | 95.60 / 33.11 |
| Router01 | 4 | Half | 30.14 |
| Router01 | 0 | Half | 29.87 |

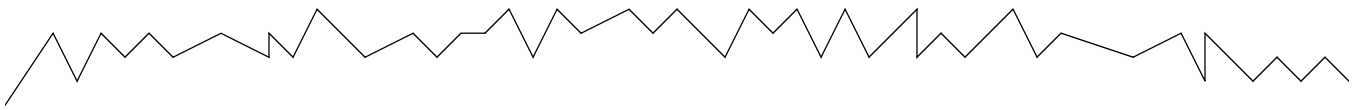
Peak Hourly Utilization

| Day | Busy Hour Utilization |
|---------------|-----------------------|
| July 1, 2003 | 95.60 / 33.11 |
| June 1, 2003 | 69.69 / 24.14 |
| May 1, 2003 | 56.45 / 19.55 |
| April 1, 2003 | 41.15 / 14.25 |

Top Talking Clients

| Client | Busy Hour Utilization | % of Monthly Traffic | Bytes | Average Bytes per Packet | Number of Flows |
|-----------|-----------------------|----------------------|----------------------|--------------------------|-----------------|
| Client142 | 61.84 / 20.50 | 18.34 / 11.47 | 1384.62 M / 779.42 M | 1029.48 / 693.82 | 1464 / 1530 |
| Client73 | 19.29 / 12.85 | 4.29 / 5.92 | 323.78 M / 401.92 M | 791.02 / 936.49 | 300 / 313 |
| Client84 | 17.68 / 0.07 | 2.49 / 0.02 | 187.76 M / 1180.70 k | 1405.20 / 40.00 | 6 / 3 |
| Client75 | 13.61 / 3.62 | 2.32 / 1.40 | 175.16 M / 94.92 M | 1099.60 / 1181.89 | 88 / 62 |
| Client155 | 13.43 / 5.98 | 4.16 / 2.58 | 313.95 M / 175.24 M | 765.87 / 598.02 | 5133 / 5443 |
| Client150 | 13.11 / 6.92 | 2.28 / 2.14 | 172.27 M / 145.58 M | 319.69 / 293.81 | 1042 / 675 |
| Client146 | 10.11 / 7.12 | 1.36 / 1.31 | 102.90 M / 89.21 M | 874.97 / 785.72 | 9 / 9 |
| Client27 | 8.96 / 5.97 | 1.04 / 3.63 | 78.51 M / 246.60 M | 614.62 / 1225.33 | 16 / 13 |
| Client54 | 6.58 / 2.64 | 2.30 / 2.72 | 173.49 M / 184.91 M | 347.73 / 365.71 | 1626 / 1604 |
| Client154 | 6.46 / 4.36 | 1.37 / 2.15 | 103.78 M / 146.31 M | 495.96 / 584.13 | 1222 / 1307 |





Client Owner

HP

Client Location

Paris

Top Talking Server / Application Pairs

| Server | Application | TOS | Busy Hour Utilization | % of Monthly Traffic | Bytes | Average Bytes per Packet | Number of Flows |
|-----------|---------------|-----|-----------------------|----------------------|----------------------|--------------------------|-----------------|
| Client159 | vrstrapserver | 0 | 11.64 / 0.13 | 1.32 / 0.02 | 99.53 M / 1678.69 k | 1405.29 / 40.00 | 2 / 2 |
| Server481 | slinkysearch | 0 | 8.83 / 0.09 | 1.24 / 0.02 | 93.76 M / 1404.83 k | 1405.20 / 40.00 | 3 / 3 |
| Server481 | visionpyramid | 0 | 0.18 / 7.93 | 0.03 / 1.86 | 1915.14 k / 126.33 M | 40.00 / 1405.17 | 3 / 3 |
| Server430 | interhdl_elmd | 0 | 0.14 / 5.93 | 0.02 / 1.09 | 1174.24 k / 73.96 M | 40.00 / 1405.80 | 2 / 2 |
| Client159 | zephyr-srv | 0 | 0.12 / 4.74 | 0.01 / 0.90 | 1018.07 k / 60.82 M | 40.00 / 1405.32 | 2 / 2 |

Server Owner

HP

Server Location

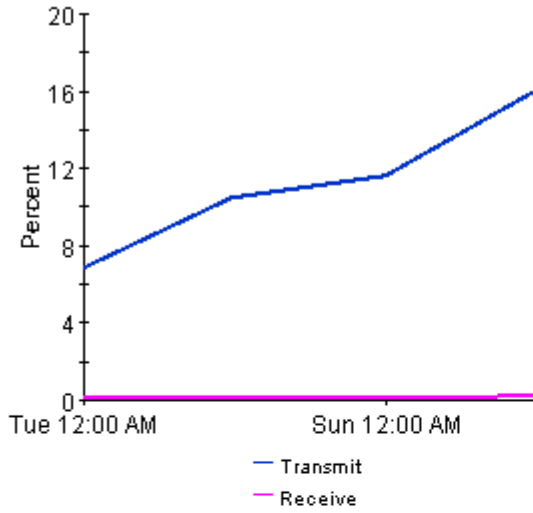
Chicago





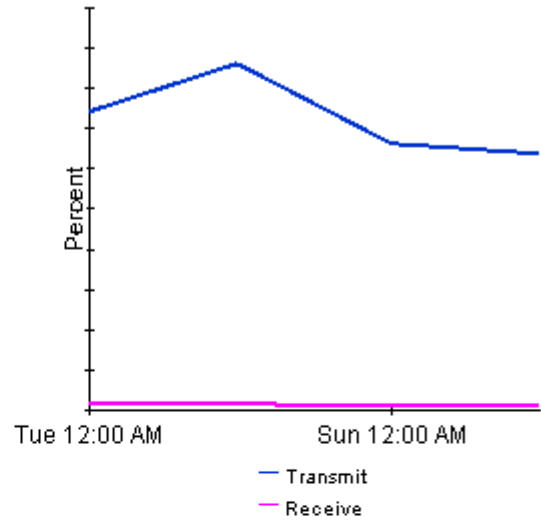
Busy Hour Utilization

Tue Apr 01 2003 - Tue Jul 01 2003



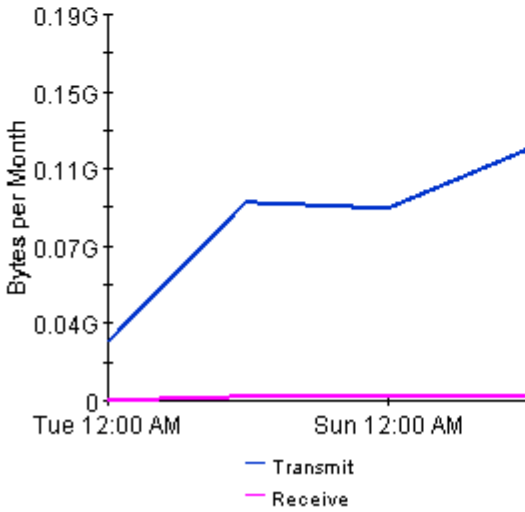
% of Monthly Traffic

Tue Apr 01 2003 - Tue Jul 01 2003



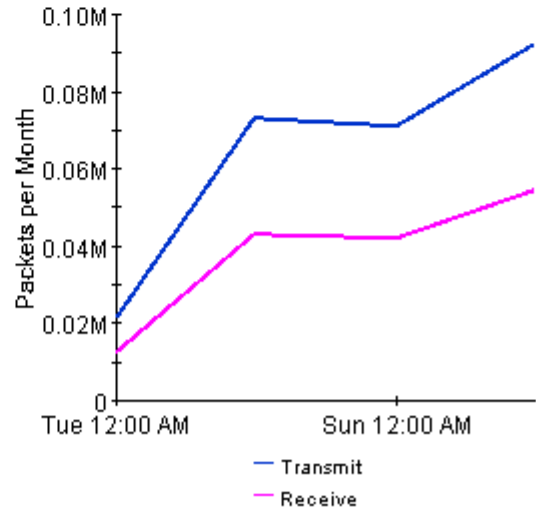
Bytes

Tue Apr 01 2003 - Tue Jul 01 2003



Packets

Tue Apr 01 2003 - Tue Jul 01 2003



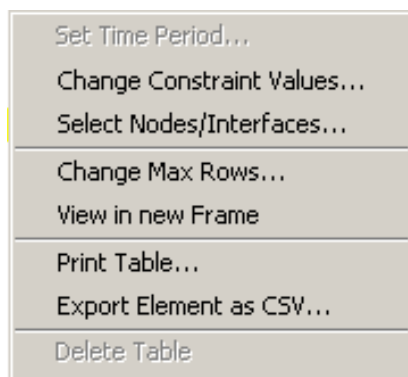
A Editing Tables and Graphs

Any table or graph can be viewed in several ways. While the default view is usually adequate, you can easily change to a different view. If you are using Report Viewer, right-click the object to open a list of view options. If you are using the Web Access Server, follow these steps to change the default view of a table or graph:

- 1 Click **Preferences** on the links bar.
- 2 Expand **Reports** in the navigation frame.
- 3 Click **Viewing**.
- 4 Select the **Allow element editing** box.
- 5 Click **Apply**.
- 6 Click the Edit icon next to the table or graph.

View Options for Tables

Right-clicking a table, or selecting the Edit Table icon if you are using the Web Access Server, opens a list of table view options.



Select **Set Time Period** to alter the relative time period (relative to now) or set an absolute time period. The Set Time Period window opens.

You may shorten the period of time covered by the table from, for example, 42 days to 30 days or to 7 days. If you are interested in a specific period of time that starts in the past and stops *before* yesterday, click **Use Absolute Time** and select a Start Time and an End Time.

Select **Change Constraint Values** to loosen or tighten a constraint, thereby raising or lowering the number of elements that conform to the constraint. The Change Constraint Values window opens. To loosen a constraint, set the value lower; to tighten a constraint, set the value higher.

The **Select Nodes/Interfaces** allows you to change the scope of the table by limiting the table to specific nodes, specific interfaces, or a specific group of nodes or interfaces. The Select Node Selection Type window opens.

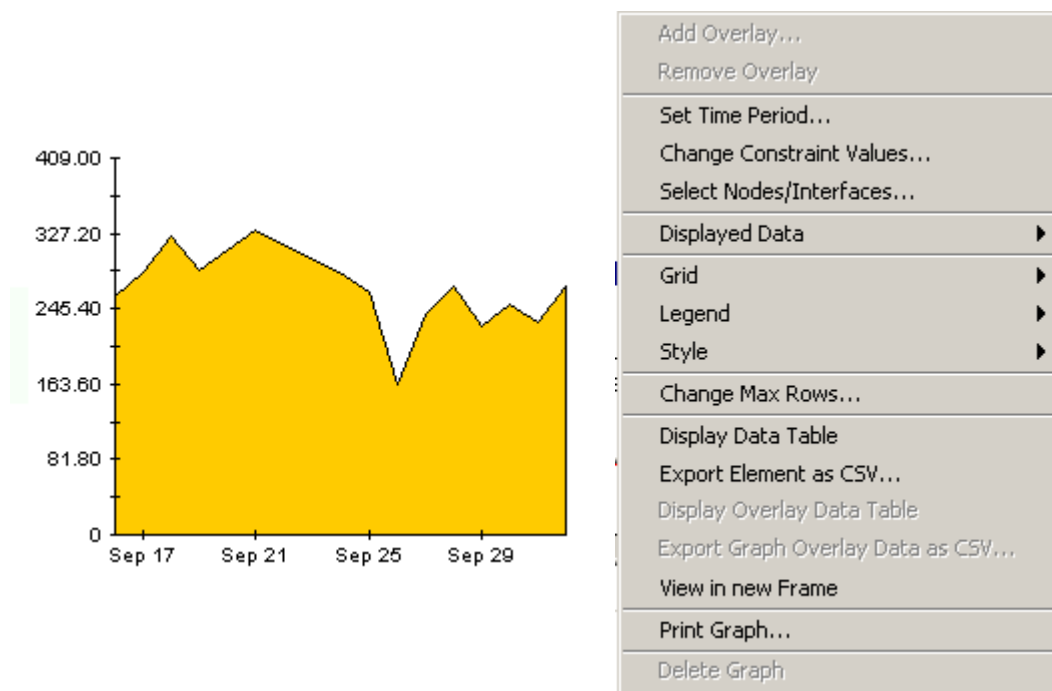
Change Max Rows increases or decreases the number of rows in a table. The default is 50. If you expand the default, the table may take more time to open. If you are trending a large network, using the default ensures that the table opens as quickly as possible.

View in new Frame opens the table in a Table Viewer window, shown below. If necessary, make the data in the table more legible by resizing the window.

| Table Viewer | | | | | |
|--|--------------|----------------|---------------|---------------------|--|
| Polled IP QoS Statistics Data - Input Over Previous 6 Hours | | | | | |
| Direction | IpPrecedence | Switched Bytes | Switched Pkts | Time Period | |
| Input | 0 | 105,888 | 675 | Tue Oct 29 07:00 AM | |
| Input | 1 | 0 | 0 | Tue Oct 29 07:00 AM | |
| Input | 2 | 0 | 0 | Tue Oct 29 07:00 AM | |
| Input | 3 | 0 | 0 | Tue Oct 29 07:00 AM | |
| Input | 4 | 0 | 0 | Tue Oct 29 07:00 AM | |
| Input | 5 | 0 | 0 | Tue Oct 29 07:00 AM | |
| Input | 6 | 600 | 5 | Tue Oct 29 07:00 AM | |
| Input | 7 | 0 | 0 | Tue Oct 29 07:00 AM | |
| Input | 0 | 98,334 | 638 | Tue Oct 29 06:45 AM | |
| Input | 1 | 0 | 0 | Tue Oct 29 06:45 AM | |
| Input | 2 | 0 | 0 | Tue Oct 29 06:45 AM | |
| Input | 3 | 0 | 0 | Tue Oct 29 06:45 AM | |
| Input | 4 | 0 | 0 | Tue Oct 29 06:45 AM | |
| Input | 5 | 0 | 0 | Tue Oct 29 06:45 AM | |
| Input | 6 | 0 | 0 | Tue Oct 29 06:45 AM | |
| Input | 7 | 0 | 0 | Tue Oct 29 06:45 AM | |
| Input | 0 | 97,539 | 648 | Tue Oct 29 06:30 AM | |
| Input | 1 | 0 | 0 | Tue Oct 29 06:30 AM | |
| Input | 2 | 0 | 0 | Tue Oct 29 06:30 AM | |
| Input | 3 | 0 | 0 | Tue Oct 29 06:30 AM | |
| Input | 4 | 0 | 0 | Tue Oct 29 06:30 AM | |
| Input | 5 | 0 | 0 | Tue Oct 29 06:30 AM | |
| Input | 6 | 120 | 1 | Tue Oct 29 06:30 AM | |
| Input | 7 | 0 | 0 | Tue Oct 29 06:30 AM | |
| Input | 0 | 90,744 | 564 | Tue Oct 29 06:15 AM | |
| Input | 1 | 0 | 0 | Tue Oct 29 06:15 AM | |
| Input | 2 | 0 | 0 | Tue Oct 29 06:15 AM | |
| Input | 3 | 0 | 0 | Tue Oct 29 06:15 AM | |
| Input | 4 | 0 | 0 | Tue Oct 29 06:15 AM | |
| Input | 5 | 0 | 0 | Tue Oct 29 06:15 AM | |
| Input | 6 | 0 | 0 | Tue Oct 29 06:15 AM | |
| Input | 7 | 0 | 0 | Tue Oct 29 06:15 AM | |
| Input | 0 | 103,775 | 656 | Tue Oct 29 06:00 AM | |
| Input | 1 | 0 | 0 | Tue Oct 29 06:00 AM | |
| Input | 2 | 0 | 0 | Tue Oct 29 06:00 AM | |
| Input | 3 | 0 | 0 | Tue Oct 29 06:00 AM | |
| Input | 4 | 0 | 0 | Tue Oct 29 06:00 AM | |

View Options for Graphs

Right-clicking a graph, or clicking the Edit Graph icon if you are using the Web Access Server, opens the following list of view options.



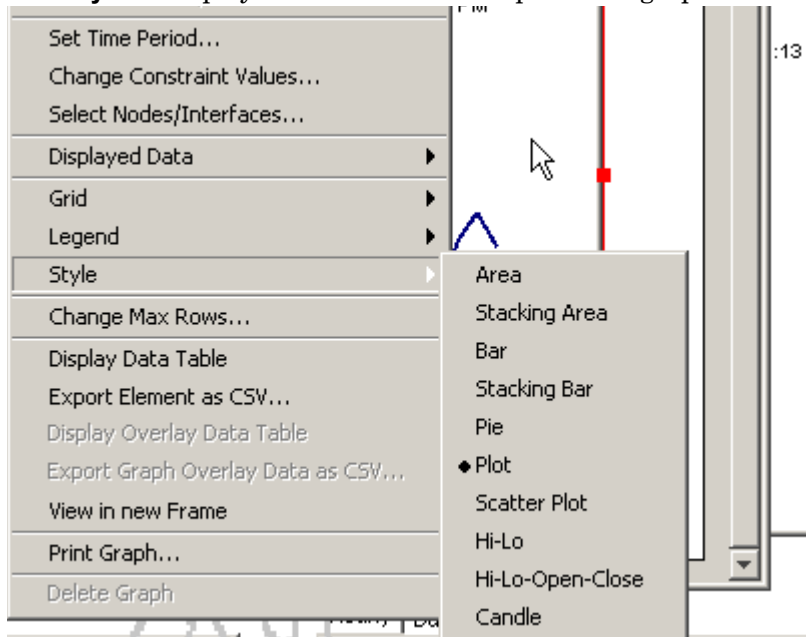
The following table provides details about each option.

| Option | Function |
|--------------------------|--|
| Set Time Period | Same as the table option shown above. |
| Change Constraint Values | Same as the table option shown above. |
| Select Nodes/Interfaces | Same as the table option shown above. |
| Displayed Data | For every point on a graph, display data in a spreadsheet. |
| Grid | Add these to the graph: X axis grid lines Y axis grid lines X and Y axis grid lines |
| Legend | Delete or reposition the legend. |
| Style | See the illustrations below. |
| Change Max Rows... | Same as the table option shown above. |
| Display Data Table | See below. |

| Option | Function |
|--------------------------|---------------------------------------|
| Export Element as CSV... | Same as the table option shown above. |
| View in New Frame | Opens graph in a Graph Viewer window. |
| Print Graph | Same as the table option shown above. |

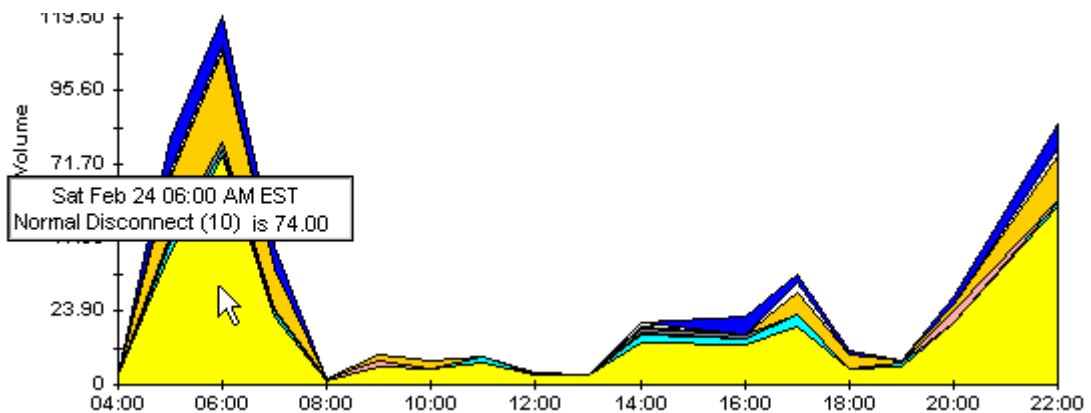
Style Options

Select **Style** to display a list of seven view options for graphs.



Style > Area

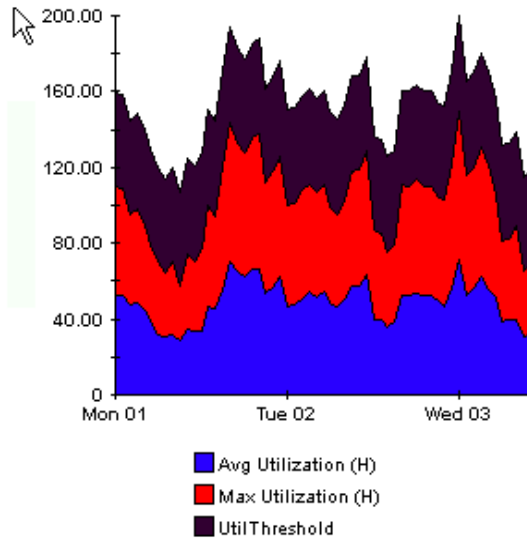
The plot or bar chart changes to an area graph. While relative values and total values are easy to view in this format, absolute values for smaller data types may be hard to see. Click anywhere within a band of color to display the exact value for that location



To shorten the time span of a graph, press SHIFT+ALT and use the left mouse button to highlight the time span you want to focus on. Release the mouse button to display the selected time span.

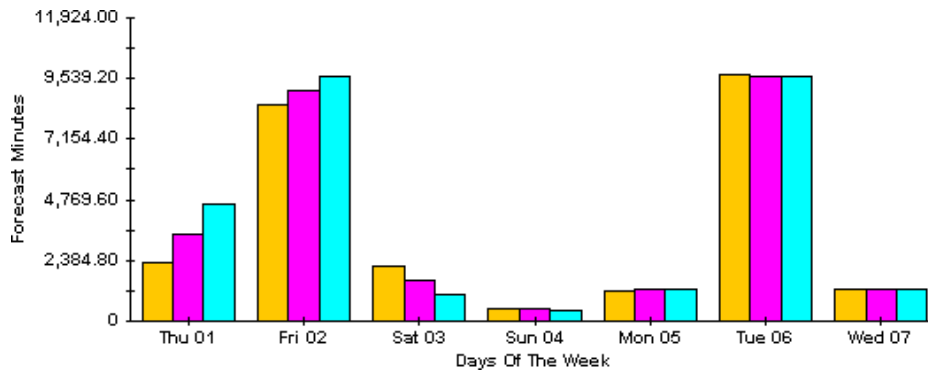
Style > Stacking Area

The area or plot graph changes to a stacking area graph. This view is suitable for displaying a small number of variables.



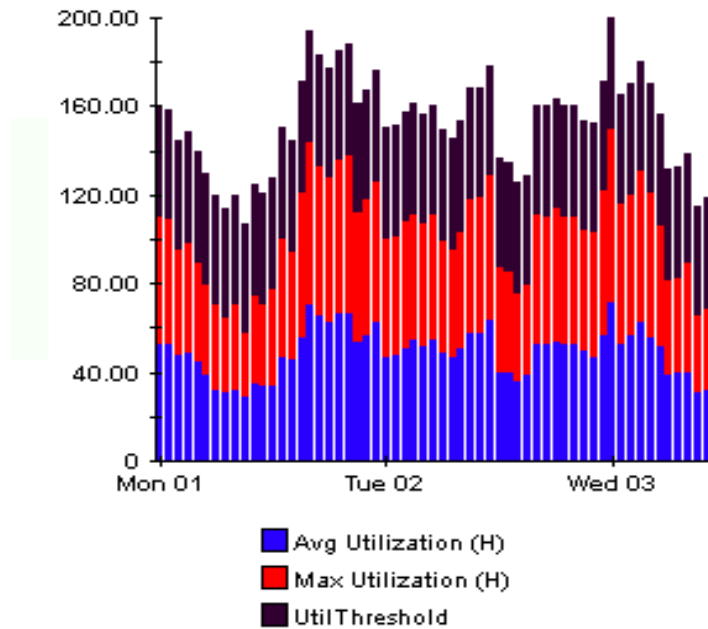
Style > Bar

The graph changes to a bar chart. This view is suitable for displaying relatively equal values for a small number of variables. There are three variables in the graph below.



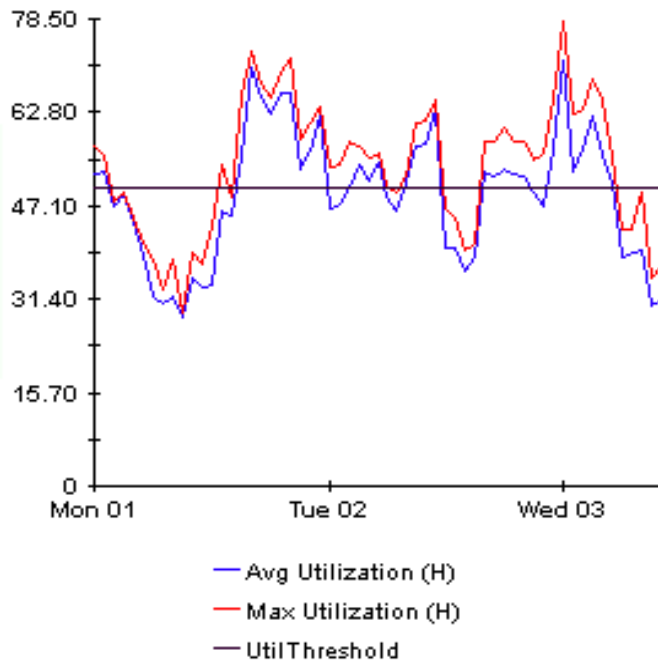
Style > Stacking Bar

The plot or area graph changes to a stacking bar chart. If you increase the width of the frame, the time scale becomes hourly. If you increase the height of the frame, the call volume shows in units of ten.



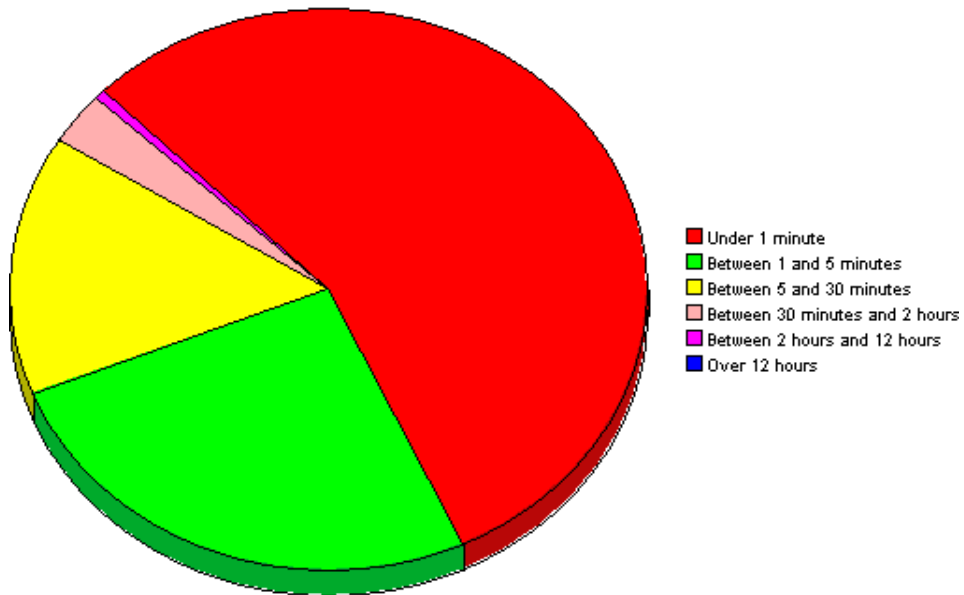
Style > Plot

Bands of color in an area graph change to lines. If you adjust the frame width, you can make the data points align with hour; if you adjust the frame height, you can turn call volume into whole numbers.



Style > Pie

An area graph becomes a pie chart. Bands in an area graph convert to slices of a pie and the pie constitutes a 24-hour period. This view is helpful when a small number of data values are represented and you are looking at data for one day.



If you are looking at data for more than one day, you will see multiple pie graphs, one for each day.

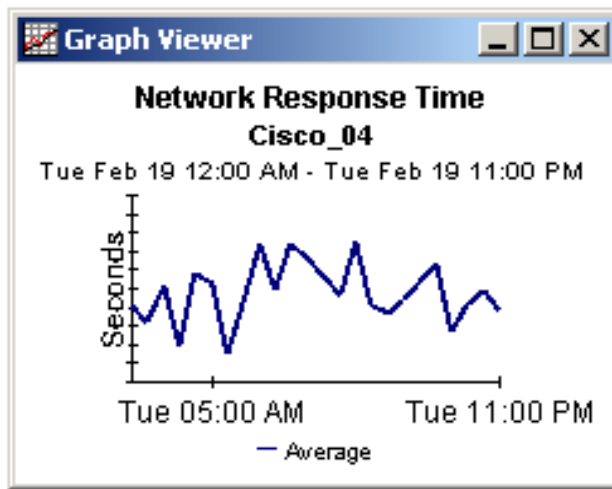
Display Data Table

This option changes a graph into a spreadsheet.

| X Axis | Average |
|----------------|---------|
| Tue Feb 19 ... | 0.809 |
| Tue Feb 19 ... | 0.621 |
| Tue Feb 19 ... | 1.026 |
| Tue Feb 19 ... | 0.362 |
| Tue Feb 19 ... | 1.171 |
| Tue Feb 19 ... | 1.051 |
| Tue Feb 19 ... | 0.284 |
| Tue Feb 19 ... | 0.826 |
| Tue Feb 19 ... | 1.483 |
| Tue Feb 19 ... | 0.967 |
| Tue Feb 19 ... | 1.471 |
| Tue Feb 19 ... | 1.308 |
| Tue Feb 19 ... | 1.123 |

View in New Frame

The graph opens in a Graph Viewer window. Improve legibility by resizing the window.



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