



Cisco Network Planning Solution Design and Analysis MVI User Guide for IT Guru

Software Release 11.5

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Design and Analysis
MVI User Guide for IT Guru*

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Title: MVI User Guide for IT Guru
Part Number: D00190
Version: 12

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Product Name: IT Guru
Product Release: 11.5

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Documentation Conventions

OPNET documentation uses specific formatting and typographic conventions to present the following types of information:

- Objects, examples, and system I/O
- Object hierarchies, notes, and warnings
- Computer commands
- Lists and procedures

Objects, Examples, and System I/O

- Directory paths and file names are in plain Courier typeface:

```
opnet\release\models\std\ip
```

- Function names in body text are in italics:

```
op_dist_outcome()
```

- The names of functions of interest in example code are in bolded Courier typeface:

```
/* determine the object ID of packet's creation module */  
src_mod_objid = op_pk_creation_mod_get (pkptr);
```

- Variables are enclosed in angle brackets (< >):

```
<opnet_user_home>/op_admin/err_log
```

Object Hierarchies, Notes, and Warnings

Menu hierarchies are indicated by right angle brackets (>); for example:

```
Open File > Print Setup > Properties...
```

Attribute hierarchies are represented by angled arrows (▲) that indicate that you must drill down to a lower level of the hierarchy:

Attribute level 1 ▶ Attribute level 2 ▶ Attribute level 3

Note—Notes are indicated by text with the word Note at the beginning of the paragraph. Notes advise you of important supplementary information.

WARNING—Warnings are indicated by text with the word WARNING at the beginning of the paragraph. Warnings advise you of vital information about an operation or system behavior.

Computer Commands

These conventions apply to Windows systems and navigation methods that use the standard graphical-user-interface (GUI) terminology such as click, drag, and dialog box.

- Key combinations appear in the form “press <button>+x”; this means press the <button> and x keys *at the same time* to do the operation.
- The mouse operations *left-click* (or *click*) and *right-click* indicate that you should press the left mouse button or right mouse button, respectively.

Lists and Procedures

Information is often itemized in bulleted (unordered) or numbered (ordered) lists:

- In bulleted lists, the sequence of items is not important.
- In numbered lists, the sequence of items is important.

Procedures are contained within procedure headings and footings that indicate the start and end of the procedure. Each step of a procedure is numbered to indicate the sequence in which you should do the steps. A step may be followed by a description of the results of that step; such descriptions are preceded by an arrow.

Procedure FM-1 Sample Procedure Format

- 1 Procedure step.
 - ➔ Result of the procedure step.

- 2 Procedure step.

End of Procedure FM-1

For more information about using and maintaining OPNET documentation, see the Documentation Guide.

Document Revision History

Release Date	Product Version	Chapter	Description of Change
August 2005	11.5	Importing Topologies	<ul style="list-style-type: none"> Revised Procedure 2-2 Importing a Topology from Device Configuration Files on page MVI-2-20 to reflect changes in dialog box. Added Importing Cisco 6500 Multi-Layer Switches with Dual MSFCs on page MVI-2-9. Updated Table 2-2 to reflect new show commands and support for Dual MSFCs. Added section on Network Clouds on page MVI-2-18. Added section on Inferring Layer-3 IP Clouds on page MVI-2-14; updated related troubleshooting section and preference Procedure A-6.
February 2005	11.0 PL3	Overview	<ul style="list-style-type: none"> Changed references from "Device/Link Baseline Loads" to "Baseline Loads".
November 2004	11.0 PL1	Importing Topologies	<ul style="list-style-type: none"> Split some procedures out into Appendix A. Re-organized chapter. Updated figures. Supported Commands moved to spreadsheet on Support Center website.
August 2004	11.0	Overview	<ul style="list-style-type: none"> Added Preferences on page MVI-1-3 preference.
		Importing Topologies	<ul style="list-style-type: none"> Added information about aggregate interfaces, and Frame Relay/ATM PVCs to Device Configuration Imports (DCI) on page MVI-2-2. Added section on Viewing the Import Summary Report on page MVI-2-27 . Modified and relocated flowcharts in Figure A-1 How DCI Determines the File Type of Cisco Configuration Files on page MVI-A-1 on page MVI-2-4 and Figure A-2 How DCI Determines the Type of Cisco IOS File on page MVI-A-2 on page MVI-2-5 Added section on new preference Performing an Import with DCI on page MVI-2-19.

Release Date	Product Version	Chapter	Description of Change
January 2004	10.5	Overview	<ul style="list-style-type: none"> Added section with MVI Preferences.
		Importing Device/Link Loads	<ul style="list-style-type: none"> Information about device/link load imports moved from Importing Traffic chapter Removed information about direct import from Concord eHealth Expanded coverage and procedure descriptions in Creating Concord Device/Link-Load Data Expanded coverage and procedure descriptions in Creating InfoVista Link-Load Data
		Importing Traffic	<ul style="list-style-type: none"> Enhanced procedure descriptions in Configuring NetScout nGenius and Modeler

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1 Overview

The Multi-Vendor Import (MVI) module extends the built-in traffic and topology import features of IT Guru with capabilities that include:

- Importing traffic flows from cflowd, NetScout nGenius, Sniffer and other programs
- Importing baseline (link/PVC/device) load data from Concord NetworkHealth, InfoVista, and MRTG
- Importing distributions from packet trace files such as ExpertSniffer

Multi-Vendor Import Menu

The following table summarizes the operations added to IT Guru by the MVI module and provides a reference to additional details about each operation.

Table 1-1 Multi-Vendor Import Operations

Menu item	Description	Reference
Topology > Import Topology >		
From Device Configurations...	Import a network topology from device configuration files	Device Configuration Imports (DCI) on page MVI-2-2
Traffic > Import Traffic Flows >		
From cflowd...	Import traffic flows from cflowd	Creating cflowd Data on page MVI-3-8
From NAI Distributed Sniffer/Sniffer Pro	Import traffic flows from Sniffer	Creating Distributed Sniffer/Sniffer Pro Data on page MVI-3-2
From Cisco NetFlow...	Import traffic flows from Cisco's NetFlow	Creating NetFlow Collector Data on page MVI-3-3
From NetScout nGenius...	Import traffic flows from NetScout nGenius	Configuring NetScout nGenius and IT Guru on page MVI-3-9
Traffic > Import Baseline Loads >		
From Concord NetworkHealth...	Import baseline load traffic from Concord NetworkHealth data files and databases	Concord eHealth Baseline Loads: Preparing for an Import on page MVI-4-9
From MRTG...	Import link load traffic from Multi-Router Traffic Grapher (MRTG) data files	Creating MRTG Log Files on page MVI-4-2
From InfoVista...	Import link load traffic from InfoVista reports	InfoVista Link Loads: Preparing for an Import on page MVI-4-4
End of Table 1-1		

Preferences

The MVI module adds the following preferences to IT Guru.

bgutil_hp_ov_perf_insight_bucket_size

Specifies the bucket size to be used for HP OV Performance Insight imports. This preference can be set also from the Import Link Baseline Loads from HP OpenView Performance Insight Files dialog box.

Type	string
Default Value	"As Is"

bgutil_hp_ov_perf_insight_bucket_type

Specifies the bucket mode to be used for HP OV Performance Insight imports. This preference can be set also from the Import Link Baseline Loads from HP OpenView Performance Insight Files dialog box.

Type	string
Default Value	"Average"

bgutil_hp_ov_perf_insight_file_list

Specifies a list of files to be imported as HP OV Performance Insight files. This preference can be set also from the Import Link Baseline Loads from HP OpenView Performance Insight Files dialog box.

Type	string list
Default Value	<empty>

bgutil_hp_ov_perf_insight_from_time

Specifies the start of the time window for filtering HP OV Performance Insight data. This preference can be set also from the Import Link Baseline Loads from HP OpenView Performance Insight Files dialog box.

Type	string
Default Value	"ALL VALUES"

bgutil_hp_ov_perf_insight_overwrite

Specifies whether HP OV Performance Insight imports should overwrite existing data. When TRUE, existing data is overwritten. This preference can be set also from the Import Link Baseline Loads from HP OpenView Performance Insight Files dialog box.

Type	boolean
Default Value	TRUE

bgutil_hp_ov_perf_insight_to_time

Specifies the end of the time window for filtering HP OV Performance Insight data. This preference can be set also from the Import Link Baseline Loads from HP OpenView Performance Insight Files dialog box.

Type	string
Default Value	"ALL VALUES"

bgutil_infovista_bucket_size

Specifies the bucket size to be used for InfoVista imports. This preference can be set also from the Import Link Baseline Loads from InfoVista Reports dialog box.

Type	string
Default Value	"As Is"

bgutil_infovista_bucket_type

Specifies the bucket mode to be used for InfoVista imports. This preference can be set also from the Import Link Baseline Loads from InfoVista Reports dialog box.

Type	string
Default Value	"Average"

bgutil_infovista_file_list

Specifies a list of files to be imported as InfoVista files. This preference can be set also from the Import Link Baseline Loads from InfoVista Reports dialog box.

Type	string list
Default Value	<empty>

bgutil_infovista_from_time

Specifies the start of the time window for filtering InfoVista data. This preference can be set also from the Import Link Baseline Loads from InfoVista Reports dialog box.

Type	string
Default Value	"ALL VALUES"

bgutil_infovista_overwrite

Specifies whether InfoVista imports should overwrite existing data. When TRUE, existing data is overwritten. This preference can be set also from the Import Link Baseline Loads from InfoVista Reports dialog box.

Type	boolean
Default Value	TRUE

bgutil_infovista_to_time

Specifies the end of the time window for filtering InfoVista data. This preference can be set also from the Import Link Baseline Loads from InfoVista Reports dialog box.

Type	string
Default Value	"ALL VALUES"

bgutil_mrtg_bucket_size

Specifies the bucket size to be used for MRTG imports. This preference can be set also from the Import Link Baseline Loads from MRTG Log Files dialog box.

Type	string
Default Value	"As Is"

bgutil_mrtg_bucket_type

Specifies the bucket mode to be used for MRTG imports. This preference can be set also from the Import Link Baseline Loads from MRTG Log Files dialog box.

Type	string
Default Value	"Average"

bgutil_mrtg_file_list

Specifies a list of files to be imported as MRTG files. This preference can be set also from the Import Link Baseline Loads from MRTG Log Files dialog box.

Type	string list
Default Value	<empty>

bgutil_mrtg_from_time

Specifies the start of the time window for filtering MRTG data. This preference can be set also from the Import Link Baseline Loads from MRTG Log Files dialog box.

Type	string
Default Value	""

bgutil_mrtg_overwrite

Specifies whether MRTG imports should overwrite existing data. When TRUE, existing data is overwritten. This preference can be set also from the Import Link Baseline Loads from MRTG Log Files dialog box.

Type	boolean
Default Value	TRUE

bgutil_mrtg_to_time

Specifies the end of the time window for filtering MRTG data. This preference can be set also from the Import Link Baseline Loads from MRTG Log Files dialog box.

Type	string
Default Value	""

bgutil_nethealth_file_alias

Specifies whether Networkhealth file imports should import alias files as well as data files. When TRUE, both are imported. This preference can be set also from the Import Link Baseline Loads from eHealth-Network Data Files dialog box.

Type	boolean
Default Value	TRUE

bgutil_nethealth_file_alias_file

Specifies a Networkhealth alias file to import. This preference can be set also from the Import Link Baseline Loads from eHealth-Network Data Files dialog box.

Type	string
Default Value	"As Is"

bgutil_nethealth_file_bucket_size

Specifies the bucket size to be used for Networkhealth imports. This preference can be set also from the Import Link Baseline Loads from eHealth-Network Data Files dialog box.

Type	string
Default Value	"As Is"

bgutil_nethealth_file_bucket_type

Specifies the bucket mode to be used for Networkhealth imports. This preference can be set also from the Import Link Baseline Loads from eHealth-Network Data Files dialog box.

Type	string
Default Value	"Average"

bgutil_nethealth_file_file_list

Specifies a list of files to be imported as Networkhealth files. This preference can be set also from the Import Link Baseline Loads from eHealth-Network Data Files dialog box.

Type	string list
Default Value	<empty>

bgutil_nethealth_file_from_time

Specifies the start of the time window for filtering Networkhealth data. This preference can be set also from the Import Link Baseline Loads from eHealth-Network Data Files dialog box.

Type	string
Default Value	"ALL VALUES"

bgutil_nethealth_file_overwrite

Specifies whether Networkhealth imports should overwrite existing data. When TRUE, existing data is overwritten. This preference can be set also from the Import Link Baseline Loads from eHealth-Network Data Files dialog box.

Type	boolean
Default Value	TRUE

bgutil_nethealth_file_to_time

Specifies the end of the time window for filtering Networkhealth data. This preference can be set also from the Import Link Baseline Loads from eHealth-Network Data Files dialog box.

Type	string
Default Value	"ALL VALUES"

device_import.create_ebgp_node

Specifies whether external AS Ebgp peers can be created after import. When TRUE, creation of peers is enabled.

When changed from the Preferences dialog box, the value of this preference does not change until startup. However, changes made in the Import Device Configurations dialog box are saved to this preference after each import.

Type	boolean
Default Value	FALSE

device_import.create_edge_lans

Specifies whether Edge LANs can be created during import. When TRUE, creation of Edge LANs is enabled.

When changed from the Preferences dialog box, the value of this preference does not change until startup. However, changes made in the Import Device Configurations dialog box are saved to this preference after each import.

Type	boolean
Default Value	FALSE

device_import.create_pvc

Specifies whether to create ATM or Frame Relay PVCs based on network data or to create a full mesh between all possible pairs of devices in the network. This attribute can only be changed at startup.

When changed from the Preferences dialog box, the value of this preference does not change until startup. However, changes made in the Import Device Configurations dialog box are saved to this preference after each import.

Type	boolean
Default Value	TRUE

device_import.logging

Specifies whether skipped lines and the information contained in device descriptions should be logged. When TRUE, such logging is enabled.

When changed from the Preferences dialog box, the value of this preference does not change until startup. However, changes made in the Import Device Configurations dialog box are saved to this preference after each import.

Type	boolean
Default Value	FALSE

network_health.path

Specifies the full path name of the local directory in which NetworkHealth executable files reside. OPNET looks in this directory when you import from a NetworkHealth database.

Type	string list
Default Value	""

ngenius_servers

Specifies a list of available servers (that is, hostnames or IP addresses) that have NetScout nGenius installed. OPNET looks at these servers for NetScout nGenius databases during a traffic import.

Type	string
Default Value	""

2 Importing Topologies

With the MVI module, you can import network topologies from the following sources:

Table 2-1 Topology Imports that Use the MVI Module

File Format / Program	Reference
Router and switch configuration data	Device Configuration Imports (DCI) on page MVI-2-2
End of Table 2-1	

This chapter describes how to import from each of these sources. IT Guru can import network topologies from other sources also, but only the imports that require the MVI module are described here. For information about topology imports that do not require the MVI module, refer to Chapter 10 Importing Network Topologies on page ITU-10-1 of the *Guru User Guide*.

Note—Procedures relating directly to MVI are contained within the body of this chapter. For information on how MVI parses the configuration data and how to gather the data for the import, see App A Additional DCI Procedures on page MVI-A-1.

Device Configuration Imports (DCI)

DCI lets you generate a network model by importing configuration data for

- Juniper routers
- Cisco routers
- Cisco PIX devices
- Cisco Catalyst switches

DCI uses the data in the configuration files to set the IT Guru attributes that control routing and switching behavior, including

- Connections, data rates, and interfaces (including PVCs, aggregate interfaces, loopback interfaces, tunnel interfaces, VLANs, and sub-interfaces)
- Protocol information for IP, IP Multicast, BGP, EIGRP, OSPF, RIP (versions 1 and 2), IS-IS, MPLS, IGRP, IPX, Frame Relay, ATM, RSRB, DLSW, NAT, QoS, and VPLS
- ACLs (access control lists), route maps, and Juniper firewall filters
- Static routing, default routing, policy routing, and route redistribution
- VLAN, spanning tree, and bridge configuration information
- Cisco security: AAA, TACACS+, Radius, Kerberos

Supported Commands and Features

During import, OPNET considers and parses device configurations and translates these into model attributes. Currently, not all specific configuration commands and values are supported. For information on the commands and features that are supported, see the OPNET Support Center website.

General Workflow

The general workflow to generate a topology is as follows:

- 1) Create the device configuration files for the routers, Cisco PIX devices, and switches you want to import.
- 2) Import the device configurations into IT Guru.
- 3) Specify missing interface, port, or link information such as data rate and unnumbered interface information. DCI includes an Import Assistant for you to specify this information. To see more about this feature, refer to Using the Import Assistant on page MVI-2-23.

To include supplemental information that is not in the configuration files, you can apply model assistant files during or after the import. For more information on Model Assistant files, refer to Model Assistant on page ITU-6-50. You can also do a partial or incremental import to add new devices to the topology or to update devices already in the topology.

After the network is generated and fully configured, you can run simulation studies, using discrete event or flow analysis, or validation studies using NetDoctor.

The following references point to sections of this document that describe each step in detail.

- Preparing for the Import:
 - Includes directory and file creation, creating device models, and setting import preferences
- Troubleshooting the Import
 - Includes information on common import issues and how to avoid them
- Performing an Import with DCI
- Using the Import Assistant
 - Connecting Unnumbered Interfaces
 - Specifying Data Rates
- Viewing the Import Summary Report
- Using Model Assistant Files with Imported Topologies
- After the Import
 - Includes information about generating reports and managing the network model

Preparing for the Import

This section introduces the pre-import workflow, including preferences, caveats, and troubleshooting tips that are helpful for preparation before you import your device files. Paying careful attention when planning for an import can help reduce post-import issues.

There are two basic pre-import steps:

- Create directories that are accessible to IT Guru for the configuration files
- Obtain configuration files for the devices you want to import

Creating the Configuration Files

Before importing configuration files into IT Guru, you must first generate the files from the configuration information on each device. The configuration files are created by running a few commands, which are listed in Table 2-2, on the router or switch and copying the output to a text file, as shown in Figure 2-1. To see the procedures for collecting the device configuration files, refer to the procedures in App A Additional DCI Procedures on page MVI-A-1.

Table 2-2 Show Commands Used by DCI

Command	Importance	Usefulness
show running-config	Required for Cisco routers and PIX devices	The output from this command carries the basic information about the Cisco router, PIX firewall, or IOS device, interfaces, and configuration.
show configuration	Required for Juniper routers	The output from this command carries the basic information about the Juniper device, interfaces, and configuration.
show config all	Required for Cisco Catalyst Switches	The output from this command carries the basic information about the Cisco Catalyst switch configuration.
show version ¹	Optional but recommended.	DCI uses the output from this command to determine the type of device from which it was collected.
show cdp neighbors detail	Required for Cisco switches; Optional for Cisco routers	DCI uses the output from this command to determine connectivity between neighboring devices.
show vlan	Required for Cisco switches running IOS and CatOS.	DCI uses the output from this command to determine the supported VLANs on the device.
show frame-relay map	Required to replicate static Frame Relay PVCs in model	DCI uses the output from this command to create Frame Relay PVCs in the network model.
show atm map	Required to replicate static ATM PVCs in model	DCI uses the output from this command to create ATM pvc's in the network model.
show ip route	Required to create routing tables for devices in model	DCI uses the output from this command to create routing tables that can be used during simulations. (NOTE: Must be placed at end of configuration file).

Table 2-2 Show Commands Used by DCI

Command	Importance	Usefulness
Multi-Layer Switches with Dual MSFC		
show module	Required on switches with Native IOS and on supervisor engine for switches with Hybrid OS	DCI uses the output from this command to determine the presence and serial numbers of MSFCs.
show version	Required on supervisor engine and MSFC(s) for switches with Hybrid OS	DCI uses the serial number from the output of this command to correlate the MSFCs to the switch.
show redundancy	Required on MSFC(s) for switches with Hybrid OS	DCI uses the output from this command to determine which of two MSFCs is designated.
End of Table 2-2		

1. Show version is now supported for PIX firewall.

Figure 2-1 Creating Device Configuration Files

```

C:\WINNT\System32\telnet.exe
Router_D>
Router_D>enable
Router_D#
Router_D#show running-config
Building configuration...

Current configuration : 627 bytes
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname "Router_D"
!
!
ip subnet-zero
!
!
policy-map rho
!
!
interface Tunnel0
no ip address
!
interface Ethernet0

Router_D#show version
Cisco Internetwork Operating System Software
IOS (tm) 2500 Software (C2500-IS-L), Version
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2002 by cisco Systems, Inc
Compiled Sat 16-Nov-02 07:47 by ccai
Image text-base: 0x0307A6E8, data-base: 0x0
ROM: System Bootstrap, Version 11.0(10c)XB2
(fc1)
BOOTLDR: 3000 Bootstrap Software (IGS-BOOT-
ECIFIC RELEASE SOFTWARE (fc1)

Router_D uptime is 2 weeks, 3 days, 1 hour,
System returned to ROM by power-on
System image file is "flash:/c2500-is-1.122

cisco 2500 (68030) processor (revision L) w
Processor board ID 21583630, with hardware
Bridging software.
X.25 software, Version 3.0.0.
2 Ethernet/IEEE 802.3 interface(s)
2 Serial network interface(s)
32K bytes of non-volatile configuration mem

Router_D#show cdp neighbors
Capability Codes: R - Router, I - Trans Bri
S - Switch, H - Host, I -

Device ID      Local Intrfce  Holdtme
Router_D#
Router_D#
Router_D#

Router_D>
Router_D>enable
Router_D#
Router_D#show running-config
Building configuration...

Current configuration: 627 bytes
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname "Router_D"
!
!
ip subnet-zero
!
!
policy-map rho
!
!
interface Tunnel0
no ip address
!
interface Ethernet0

Router_D#show version
Cisco Internetwork Operating System Software
IOS (tm) 2500 Software (C2500-IS-L), Version 12.2(13)T, RELEASE SOFTWARE (fc1)
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Sat 16-Nov-02 07:47 by ccai
Image text-base: 0x0307A6E8, data-base: 0x00001000
ROM: System Bootstrap, Version 11.0(10c)XB2, PLATFORM SPECIFIC RELEASE SOFTWARE
(fc1)
BOOTLDR: 3000 Bootstrap Software (IGS-BOOT-R), Version 11.0(10c)XB2, PLATFORM SP
ECIFIC RELEASE SOFTWARE (fc1)

Router_D uptime is 2 weeks, 3 days, 1 hour, 51 minutes
System returned to ROM by power-on
System image file is "flash:/c2500-is-l.122-13.T.bin"

cisco 2500 (68030) processor (revision L) with 14336K/2048K bytes of memory.
Processor board ID 21583630, with hardware revision 00000000
Bridging software.
X.25 software, Version 3.0.0.
2 Ethernet/IEEE 802.3 interface(s)
2 Serial network interface(s)
32K bytes of non-volatile configuration memory.

Router_D#show cdp neighbors detail
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
S - Switch, H - Host, I - IGMP, r - Repeater
Device ID      Local Intrfce  Holdtme  Capability Platform Port ID
Router_D#
    
```

Creating Device Models (Optional)

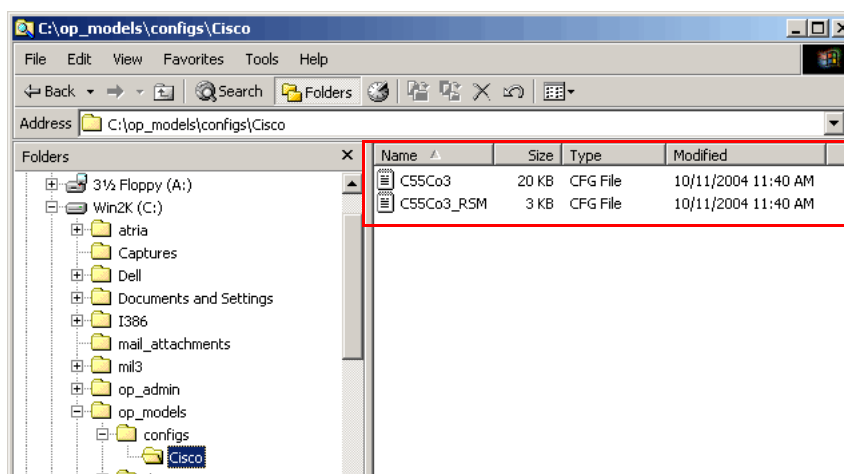
During the import, DCI searches the model directories for the device model that best matches each configuration file. Typically, this model has more interfaces or ports than the actual device. You can create a set of device models with the same number and type of interfaces as the devices you are importing. Doing this ensures that the models chosen during import match the actual routers or switches exactly.

You can use the Device Creator to create these models, as described in *Creating Custom Models with Device Creator* on page ITU-6-73 of the Guru User Guide. This step is optional, but it gives you the greatest control over the devices chosen by DCI to represent the imported devices.

Importing Multi-Layer Switch Configurations

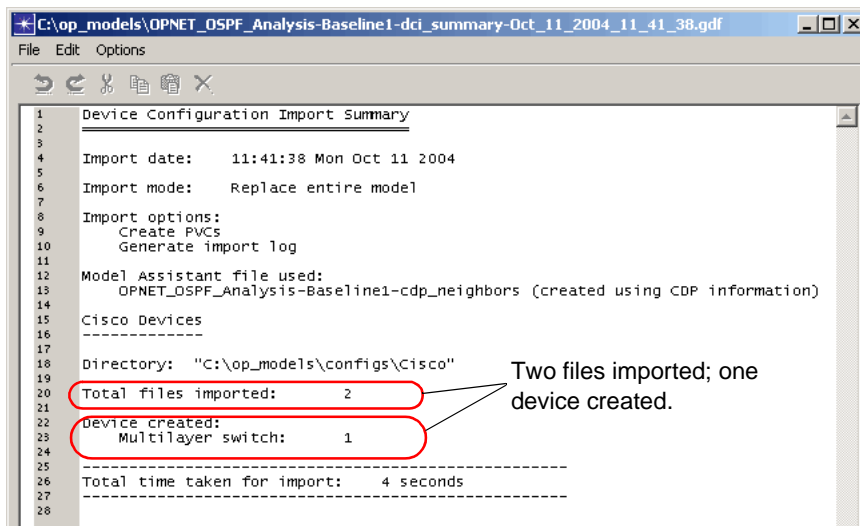
In preparation for any device configuration import, you must be sure to gather all the device configuration files necessary to build an accurate topology. It is default DCI behavior to skip a device for which a partial configuration is found. For import of a Layer-3 switch, two device configuration files are required.

Figure 2-2 Configuration Files Required for Multi-Layer Switch



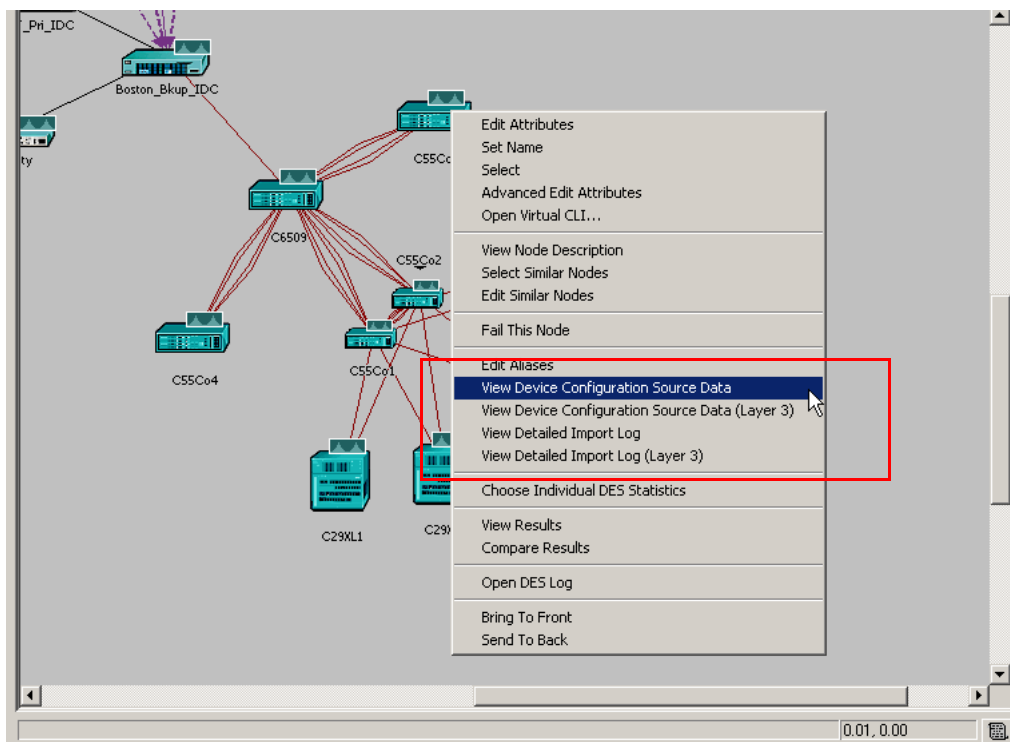
After import, the files create one device in the network model, as shown in Figure 2-3.

Figure 2-3 Import Summary - Multi-Layer Switch



When you want to view the source files for the device, the menu choices include both files. You can view source files for both the Layer-2 portion of the device and the Layer-3 portion. Similarly, you can view the import log generated by the import of each configuration file, as shown in Figure 2-4, yet the two files make one node in the model:

Figure 2-4 Source Files and Import Log - Multi-Layer Switch



If a multi-layer switch configuration file is examined during import and found to have an active (not shutdown) VLAN interface for which no corresponding switch configuration file is located, however, DCI will skip the import of the entire device with an error message: “File name: *my-file-name.txt* File skipped because Layer 2 configuration file is not available for the multi-layer switch ‘*my-host-name*’.”

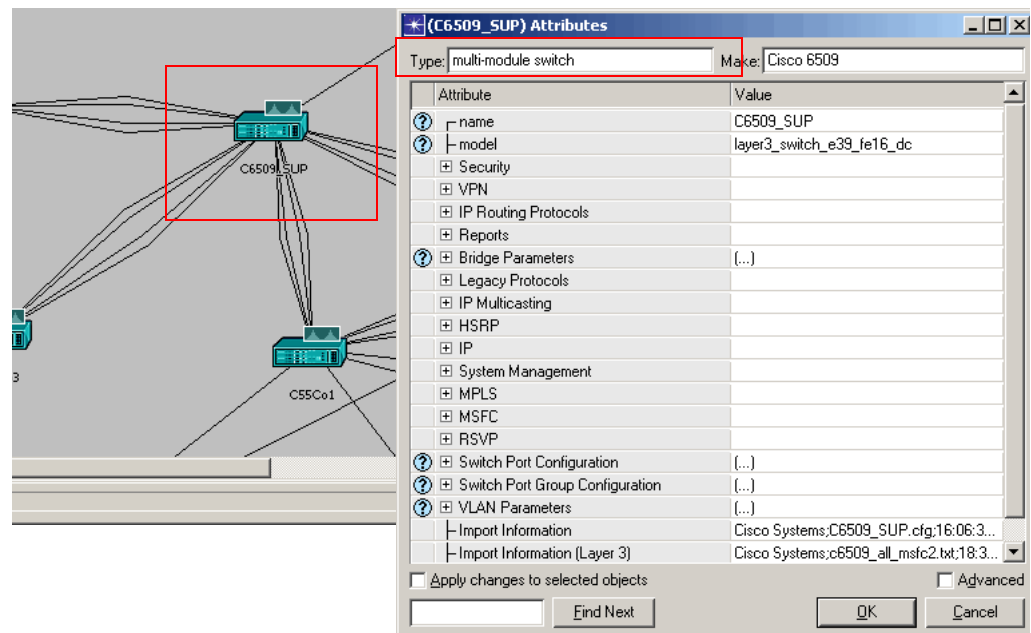
Note—Device import preferences are not visible until you have performed at least one device configuration import. If you have not done an import, you can begin an import and cancel out. The preferences then become available.

If you want to change the default behavior, so no devices will be skipped during import, you need to change an import preference, as described in Setting Import Preference to Allow Partial Import on page MVI-A-6.

Importing Cisco 6500 Multi-Layer Switches with Dual MSFCs

IT Guru supports Cisco 6500 series multi-layer switches with dual Multilayer Switch Feature Cards (MSFC). These switch types are imported into the network model as multi-module switches, as shown in Figure 2-5.

Figure 2-5 Multi-Module Switch in Network Model



The MSFC adds routing functionality to the switch. With dual MSFCs, the multi-layer switch has redundancy capabilities that can be configured in different ways, depending upon the OS type: Native IOS or Hybrid OS. Table 2-3 describes the various configurations and the files required during import:

Table 2-3 Required Files per Configuration Type in Cisco Catalyst 6000 Switches

OS Type	Router Mode	Redundancy Mode	# of Active Routing MSFCs	Config Files Required
Hybrid OS	Dual	Config Sync Enabled	2	<ul style="list-style-type: none"> • One IOS Config File • One CatOS Config File
		Config Sync Disabled	2	<ul style="list-style-type: none"> • Two IOS Config Files • One CatOS Config File
	Single	Not Configured	1	<ul style="list-style-type: none"> • One IOS Config File • One CatOS Config File
Native IOS	Single	SSO—Stateful Switchover	1	<ul style="list-style-type: none"> • One IOS Config File
		RPR—Route Processor Redundancy	1	<ul style="list-style-type: none"> • One IOS Config File
		RPR+—Route Processor Redundancy Plus	1	<ul style="list-style-type: none"> • One IOS Config File
End of Table 2-3				

Note—Cisco Catalyst 5500 multi-layer switches with dual route switch modules (RSM) are imported as multi-module switches with only one RSM configuration file.

Note—For hybrid dual router mode (config sync disabled), only the configuration for the designated MSFC is imported.

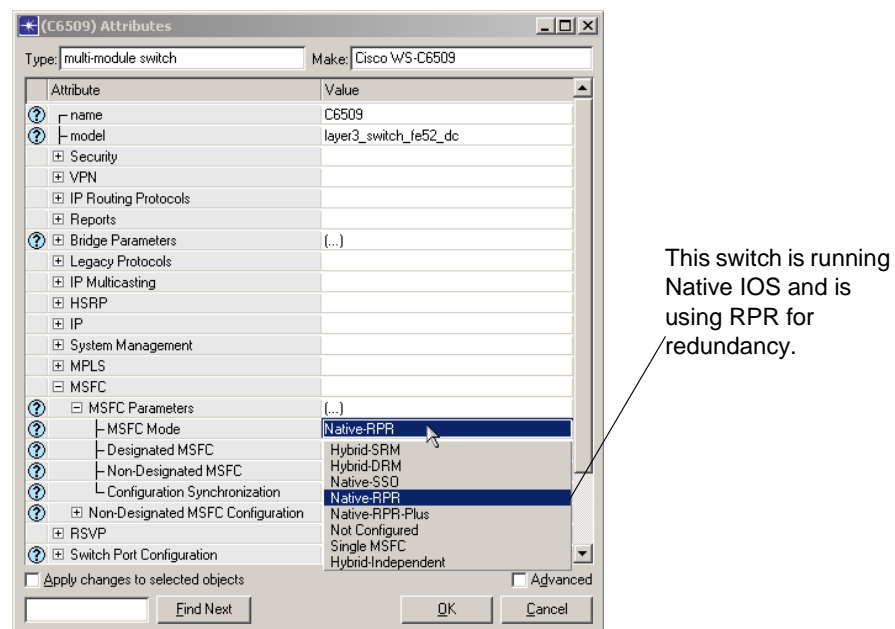
Once the dual-MSFC devices are imported, the network model reflects the configurations in the following way.

Table 2-4 Model Attributes for Device Configurations

OS Type	MSFC Parameters.MSFC Mode	Non-Designated Router Compound Attribute
Native IOS (Single Router)	<ul style="list-style-type: none"> • Native-SSO • Native-RPR • Native-RPR+ 	Not applicable.
Hybrid OS, Single Router Mode	Hybrid-SRM	Not applicable.
Hybrid OS, Dual Router Mode (Config Sync Enabled)	Hybrid-DRM Configuration Synchronization: Enabled	Contains the configuration for the non-designated MSFC.
Hybrid OS, Dual Router Mode (Config Sync Disabled)	Hybrid-DRM Configuration Synchronization: Disabled	Not configured. Only the configuration for the designated MSFC is imported.
Hybrid OS, Independent MSFC Devices (No redundancy)	Hybrid-Independent	Not configured. Only the configuration for the designated MSFC is imported.
End of Table 2-4		

After import, you can see the type of redundancy that is configured by examining the MSFC Mode attribute, shown in Figure 2-6.

Figure 2-6 MSFC Mode Attribute



Hybrid OS As you can see from Table 2-3, in a multi-layer switch using Hybrid OS, you can configure redundancy on a switch that is in *dual router mode* (DRM) by enabling or disabling config sync. When config sync is enabled, one configuration file serves both MSFCs, with the “alt” keyword separating one MSFC configuration from the other. A sample configuration is shown in Figure 2-7. In this case, both the designated and non-designated router configurations are imported and available.

Figure 2-7 Sample Configuration—Dual MSFC/Config Sync Enabled

```
ip subnet-zero
!
ip default-gateway 9.9.9.9 alt ip default-gateway 10.10.10.10
!
no ip domain-lookup
!
ip ssh time-out 120
ip ssh authentication-retries 3
redundancy
high-availability
config-sync
!
!
!
!
!
interface Vlan1
ip address 10.0.3.18 255.255.255.0 alt ip address 10.0.3.19 255.255.255.0
```

When config sync is disabled, each MSFC has its own configuration file, although both files must share some attributes in common, per Cisco requirements. In this case, only the designated MSFC configuration is imported and available.

Import considers dual MSFCs in terms of designated and non-designated status. The designated MSFC is the one that came up first or has been up the longest. The non-designated MSFC is actively building routing tables but does not control the forwarding table.

When a switch is in *single router mode*, only one MSFC is active and visible to the network. The other MSFC provides hardware redundancy only.

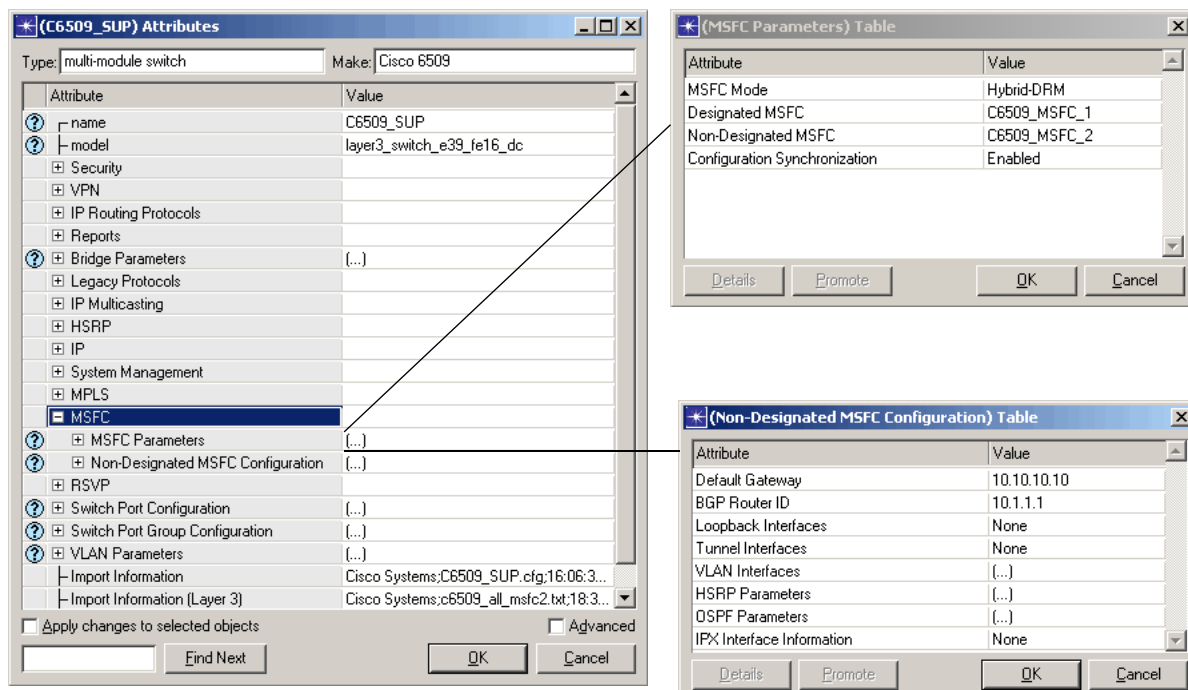
Native IOS A multi-layer switch using Native IOS is always in SRM and has redundancy configured in one of three ways:

- Stateful switchover (SSO)
- Route processor redundancy (RPR)
- Route processor redundancy plus (RPR+)

Note—Figure 2-6 shows the supported redundancy modes.

Figure 2-8 shows that a multi-layer switch with dual MSFCs contains two compound attributes: MSFC Parameters and Non-Designated MSFC Configuration.

Figure 2-8 MSFC Configuration



The exact attribute mapping and supported commands are described on the OPNET Support website, located here: <http://www.opnet.com/support/home1.html>. Click on Supported Vendor Protocols and Commands.

For information on the “show” commands required to properly import devices with dual MSFCs, refer to Table 2-2.

Restricting Import to Layer-3 Devices

You can set a preference to import Layer-3 devices only. When this preference is enabled, DCI will include these devices types in the imported topology:

- Routers/Layer-3 modules (IOS/JUNOS)
- Router-Switches (Hybrid OS/Native IOS)
- PIX Firewalls

It will not include

- Catalyst Switches (CatOS)
- IOS Switches

To enable this preference, follow the steps in Setting Import Preference for Layer-3 Devices Only on page MVI-A-5, selecting the preference:
`device_import.layer3_only_import`.

Note—Router-Switches will only have the Layer-3 components imported when this preference is enabled.

Inferring Layer-3 IP Clouds

Tunnel interfaces in your network can have physical connectivity through Layer-2 devices where you do not have network access. During a DCI import, Layer-3 IP clouds are inferred for these tunnel interfaces when there is sufficient IP tunnel information in your available configuration files. This is often true when Frame Relay or ATM is configured in a network and the physical path of the link goes through a leased ISP network. By default, DCI will include these inferred Layer-3 IP clouds in the imported topology.

Note—During import, if you choose “Reimport configuration for selected devices” or “Reimport configuration for modified devices” in the Import Device Configuration dialog box, the Layer-3 IP clouds will not be inferred.

To change this preference, follow the steps in Procedure A-6 Disable Import Preference to Infer Layer-3 IP Tunnel Cloud on page MVI-A-6, selecting the preference: `device_import.tunnel_cloud_import`.

Importing VoIP Devices

You can control how your Voice over IP (VoIP) devices are imported by setting the `device_import.import_voip_configuration` preference.

- **ENABLED**—(default) When the preference is set to ENABLED, the VoIP device is imported as a multi-service switch. All attributes are mapped as expected.
- **DISABLED**—When the preference is set to DISABLED, the VoIP device is imported as a router. All VoIP configurations are ignored, and a message is written to the import log.

Troubleshooting the Import

The initial network model is built from the imported device files. If adequate planning is not done before the import, the network model might not appear as expected. It is important to understand these issues prior to performing an import, so you may avoid surprises in the resulting topology. After the import, you may notice some of the following issues:

- Missing Devices—Expected devices not showing up in model
- Phantom Devices—Unexpected devices appear in model
- Inferred Layer-3 IP Clouds—Unexpected Layer-3 IP Clouds in model
- Differences in Connectivity—Physical connectivity is not as expected
- Network Clouds—Multiple subnets represented as one or more clouds
- Differences in Devices—Devices are not as expected
- Post-Import Caveats

Missing Devices

You may notice that some expected devices are missing from the network model after an import. Missing devices can be caused by the following expected behavior:

- If a configuration file is not provided for a device, the device is not imported into the network model. Be sure to include all device configurations in the appropriate directory.
- If the `show version` command is not executed for a device, it may not appear in the network model.
- If a VLAN interface is encountered during import, DCI will expect to have a corresponding switch configuration file. If none is found, DCI will skip the device with that interface with an error message. For more information on changing this behavior, see [Importing Multi-Layer Switch Configurations](#) on page MVI-2-7.
- If you have a multi-layer switch with dual Multi-Service Feature Cards and did not include the output of `show module`, `show version`, and `show redundancy`, depending on your OS version, import may skip the device. See [Table 2-2](#) on page MVI-2-4 for more information on required commands.
- If you have a multi-layer switch but did not include the output of `show cdp neighbors detail`, you may have two separate devices appearing in the network model (or neither, as mentioned in the previous bullet). If you choose not to re-import with the `cdp` information appended, you can create a model assistant file to couple the two devices, using [Procedure 2-1](#). When you perform your next import, be sure to specify the model assistant file you created. The multi-layer switch will appear as one device.

Procedure 2-1 Create a Model Assistant File to Join Multi-Layer Switch

- 1 Select Topology > Model Assistant > Edit File...
 - ➔ The Edit Model Assistant dialog box opens.
- 2 Click on the Router/Switch Coupling tab.

Note—You may need to scroll to the right to see this tab. Use the directional arrow in the upper right corner.
- 3 Click in the Rows box, in the lower left corner, and increment the number by one to add a row.
- 4 Click on Specify... under Router Name, and enter the name of the Layer-3 device.

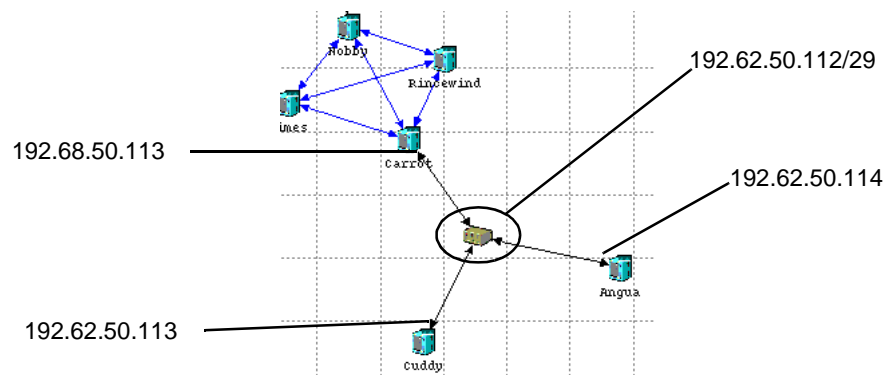
Note—This is the name of the RSM/MSFC/RSFC.
- 5 Click on Specify... under Switch Name, and enter the name of the Layer-2 device.
- 6 Save the Model Assistant file for use with future imports.

End of Procedure 2-1

Phantom Devices

After an import, the network model may contain devices that you did not include in the configuration data. These inferred devices are created when two or more routers have interfaces to the same IP subnet. In this case, DCI uses a generic cloud model to connect the interfaces. The cloud model used to represent the IP subnet corresponds to the type of interfaces being connected and each cloud node is given the name of the IP subnet it represents.

In the following example network, DCI inferred and created an Ethernet switch between three router interfaces. This occurred because three configuration files specified interfaces that connect to the same IP subnet. All other interface data specified one-to-one connections, so DCI did not create additional switching devices.

Figure 2-9 IP Interface Connections in a Generated Topology


Inferred Layer-3 IP Clouds

After an import, the network model may contain Layer-3 IP clouds that were not in your configuration. These inferred IP clouds are created when there is no information about Layer-2 connectivity, but there is sufficient IP tunnel information to infer an IP connection between two interfaces. DCI uses an IP cloud model to connect the interfaces.

The IP clouds that appear in your network model after an import are created based on imported configuration files and the setting for the environment preference `device_import.tunnel_cloud_import`. There are two possible settings for this preference:

- TRUE—This is the default value, which will infer Layer-3 IP clouds based on the tunnel interface information in the import file.
- FALSE—This option will not infer Layer-3 IP Clouds. Tunnel interfaces will not be connected in the network model when there is no information about Layer-2 connectivity between the interfaces.

Differences in Connectivity

DCI depends on certain information in the configuration files to make decisions about link names, connections, link types, and link speeds between end-points. The information in this section describes how the connectivity decisions are made.

- When importing router configuration data, DCI relies on the IP, Frame Relay or ATM information in your configuration files to configure router connections.
- By default, DCI names all interfaces based on the names found in the configuration files. If an inferred router model is used to represent the imported device and has extra interfaces, the interfaces are shutdown by default and have generic names in the format “IF*n*” (IF0, IF1, and so on).
- Interfaces that are part of an aggregate interface, such as EtherChannel, are connected based on the configuration of the aggregate interface.
- DCI colors each link according to its underlying technology (Ethernet, Frame Relay, ATM, etc.) and auto-assigns a name that indicates both interfaces to which it is connected.
- DCI treats all DPT/SRP interfaces as serial (PPP) interfaces.
- If the import process cannot determine an interface data rate from a configuration file, and you do not specify a data rate in the Import Assistant, DCI assigns default rates of T1 for serial interfaces and OC3 for ATM interfaces.
- Frame Relay and ATM interfaces that are connected through a homogeneous Layer-2 network are imported as Frame Relay and ATM interfaces. If these interfaces are connected through a Frame Relay-ATM Service Interworking (FRASI) switch, using a mixture of Frame Relay and ATM, the switch is modeled as an FRF.8 FRASI switch in the network.

However, if these interfaces are connected through a heterogeneous Layer-2 network (containing Ethernet, as well as Frame Relay and ATM, within the same IP subnetwork), the interfaces are imported as serial interfaces to allow for connectivity.

- You can control whether or not DCI creates a serial cloud for mixed technologies by setting the preference `device_import.create_serial_cloud`. Possible selections are
 - TRUE: The following mix of interfaces is converted to a serial cloud—ATM + Frame Relay, ATM + Frame Relay + Serial, ATM + Serial, or Frame Relay + Serial.
 - FALSE: ATM + Frame Relay is imported as a combined FR/ATM switch. Other connectivity is not inferred.
 - PARTIAL (default): ATM + Frame Relay + Serial, ATM + Serial, or Frame Relay + Serial are converted to a serial cloud. ATM + Frame Relay is imported as a FR/ATM switch with no conversion necessary.
- For Frame Relay PVCs, the output from the **show frame-relay map** command will override PVCs configured in interface mode using the command **frame-relay map ip**.
- For ATM PVCs, the output from the **show atm map** command will override PVCs configured in interface mode using the command **pvc** along with the **protocol** command.

Network Clouds

The clouds that appear in your network model after an import are created based on imported configuration files and the setting for the environment preference `device_import.collapse_clouds`. There are three possible settings for this preference:

- Don't Collapse—This is the default value, which specifies that no clouds are collapsed during import. The result is that devices belonging to different subnets are imported as separate clouds. This may not be an accurate view of your network.
- Collapse All—This option causes all imported clouds to be collapsed into a single cloud called “Network Cloud”.
- Collapse per Protocol—This option causes clouds to be collapsed per protocol—ATM, Frame Relay, and serial—into either a cloud called “ATM Cloud” or a cloud called “Serial Cloud”, which comprises both Frame Relay and serial links.

Changing this preference changes the appearance of your network model after import.

Differences in Devices

DCI searches the model directories during the import for the device model that best matches each configuration file. If a matching device is not found, you may discover that the representative device does not suit your needs.

For example, the default device for a Cisco 12012 has 10 ATM ports, 8 Fast Ethernet ports, and so on. Suppose your specific router has no ATM ports but is loaded with Gigabit Ethernet and Fast Ethernet ports. Rather than showing too many ATM ports (in a shutdown status), it is better to define your unique devices in advance of the import.

Adding devices is described in *Creating Device Models (Optional)* on page MVI-2-7.

Missing VLANs

If a Cisco switch is configured as a VTP client, the configuration file may not contain all of the VLANs supported on the device. This results in an incomplete network model upon import. To avoid this problem, include the output of the “show vlan” command in the device configuration files, as described in Table 2-2. The concise import summary report, shown in Figure 2-15, reports devices for which the “show vlan” output is missing.

Post-Import Caveats

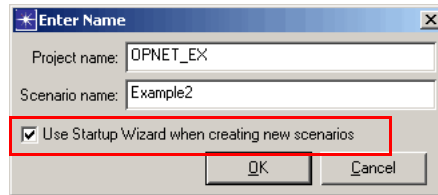
If you plan to import traffic into the network model, there are some things to bear in mind with regard to expected DCI behaviors:

- DCI creates a list of aliases for each router that includes all IP addresses for which that router is responsible. With the exception of switches that have a Layer-3 card, no aliases are created for Layer-2 objects such as switches and clouds.
- By default, the import process does not create any traffic source or destination nodes (such as workstations or LANs). You can create LAN nodes at the edge of the network model by enabling the Create Edge LANs option in the Import Device Configurations dialog box. See *Performing an Import with DCI* on page MVI-2-19 for details. This option automatically creates Ethernet, Frame Relay, serial, ATM LANs, FDDI, or Token Ring.

Performing an Import with DCI

When you have completed your preparations for an import, you can continue with an import, as described in Procedure 2-2.

Note—Be sure to check the box to “Use Startup Wizard when creating new scenarios” when you create a new project or scenario, as shown in Figure 2-10.

Figure 2-10 Enable Startup Wizard

Procedure 2-2 Importing a Topology from Device Configuration Files

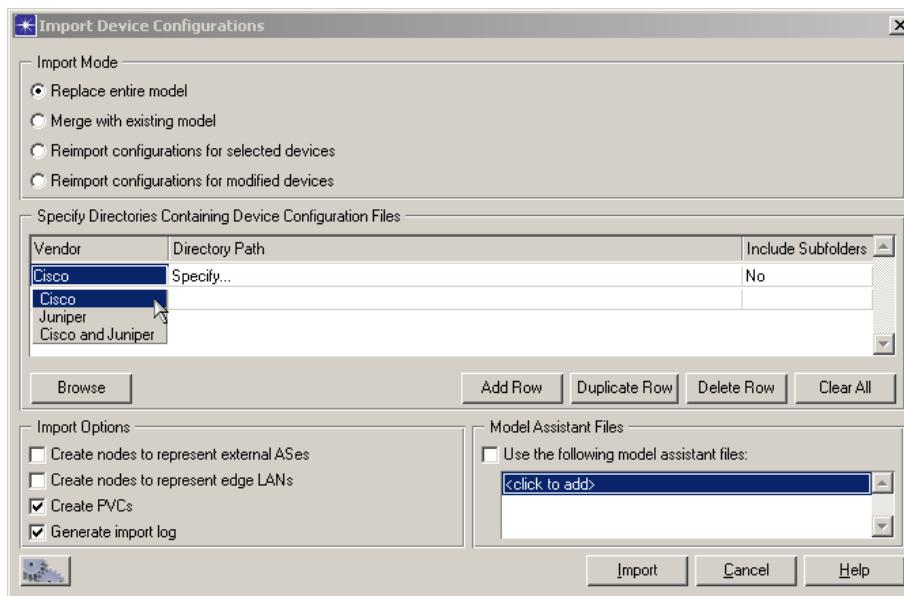
- 1 Open the Import Device Configurations dialog box. You can open this dialog box in one of two ways:
 - To import into a new scenario, choose Import From Device Configurations in the Initial Topology window of the Startup Wizard.

Note—Be sure to check **Use Startup Wizard when creating new scenarios**, or the Startup Wizard will not appear.

Figure 2-11 Enable Startup Wizard

- To import into an existing scenario, choose Topology > Import Topology > From Device Configurations...

Either action opens the Import Device Configurations dialog box, shown in Figure 2-12.

Figure 2-12 Import Device Configurations Dialog Box

2 Select one of the following import modes.

- **Replace Entire Model**—Use this option when creating a new project or scenario, or when you want to overwrite the existing topology.
- **Merge with Existing Model**—Use this option to add devices to the existing topology. If some of the devices are already in the topology, these devices are replaced (that is, reimported) using the configuration files of this import. DCI matches the devices based on the hostname of the node.
- **Reimport Configurations for Selected Devices**—Use this option to update the configuration files of a few devices in the existing topology. The devices must already be selected in the workspace. If the devices you want to update are not currently selected, cancel this operation, select the devices, and start over.

In this mode, you do not need to specify the location of the configuration files in step 3, DCI uses the file specified in the Import Information attribute on the device. During the first import, DCI creates a new directory and copies the config files into that directory. Upon subsequent imports, the new directory is referenced.

- **Reimport Configuration for Modified Devices**—When you select this option, DCI will reimport configuration files for any devices that have been modified since the last import, based on comparison of the timestamp of the last import and the current time.

3 For each directory from which you want to import, use the following steps to specify where the configuration files are located.

3.1 Click the Add Row button.

- 3.2** Select the appropriate vendor(s) in the new row, using the drop-down menu. Choices include Cisco, Juniper, or Cisco and Juniper.

3.3 Enter the directory path in which the files are located.

Note—Alternately, you can browse and select in a directory chooser using the Browse button.

3.4 Select Yes or No in the Include Subfolders column.

3.5 To specify additional directories or to remove information

- To add more directories, select Duplicate Row or Add Row.
- To remove a row, select Delete Row.
- To remove all directory information, select Clear All.

4 Select import options. The options are described in Table 2-5:

Table 2-5 Device Configuration Import Options

Import Option	Description
Create nodes to represent external ASes.	<p>Reads external BGP peering, and if there is no external partner, IT Guru creates another AS to connect to.</p> <p>When this option is checked, DCI imports the BGP-RIB information for EBGP connections. The RIB-in data of the border router of the local AS is used as the RIB-out on the external AS node. The RIB-out files are automatically generated and specified on the AS nodes.</p>
Create nodes to represent edge LANs.	Creates LAN nodes at the edge of the network topology. LANs are created on device edges if an IP interface is active but not connected to another device in the import.
Create PVCs	<p>Reads static PVC mapping from configuration and builds the mesh accordingly. If there are no static maps, DCI will create a full mesh of PVCs across all interfaces in the same IP subnet. When this option is not selected, DCI does not create PVCs during the import—even when static mapping is in the imported device configuration.</p> <p>NOTE: This option is new for release 11.0. Previous releases had option “Create Full Mesh PVCs,” which did not read static mapping for PVCs.</p>
Generate Import Log	Creates a log that lists the commands that were skipped (not considered) during the import. The log also contains diagnostic messages generated by the import.
End of Table 2-5	

5 Select or deselect the “Use the following model assistant files” checkbox. If this box is deselected, DCI will not consider any model assistant files specified in step 6. DCI will still use CDP information, however, to infer Layer-2 connectivity and router-switch coupling. If this box is selected (default), DCI will consider the model assistant files specified by the user in step 6.

- 6 Specify one or more model assistant files. These files can be model assistant files, which have a .ma extension, or import assistance files from releases prior to 10.0, which have a .ia extension. See Model Assistant on page ITU-6-50 for more information about model assistant files.

Note—As of release 11.0, you may select or deselect a checkbox that tells DCI whether or not to consider model assistant files when performing an import. By default the box is selected.

- 7 If you have a Sentinel or Automation license, and want to save your import settings to an automation file, click the Save Settings for Automation button and specify a name for the automation file.

- 8 Click Import.

➔ IT Guru generates a network topology and configures routing and switching attributes on the nodes according to the information in the configuration files. If additional information is needed to complete the import, a dialog box appears prompting you to open the Import Assistant. See Using the Import Assistant, for more information.

End of Procedure 2-2

The configuration files do not always contain all of the information that can be included in a network model. Although you can manually specify additional information after the import, IT Guru has two assistants that can automate the process.

- Import Assistant—When the configuration files do not have some of the information that DCI needs to complete the topology, the Import Assistant appears after the import. See Using the Import Assistant.
- Model Assistant—Unlike the Import Assistant, which prompts you for required information, Model Assistant files let you specify additional information about one, several, or all of the objects in a network. See Using Model Assistant Files with Imported Topologies on page MVI-2-29.

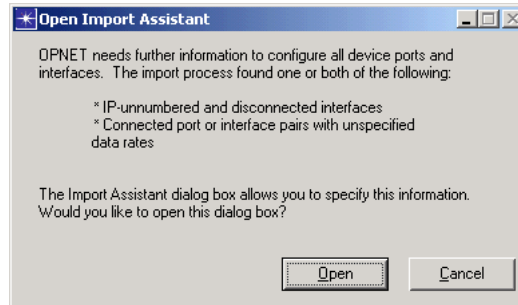
Using the Import Assistant

Sometimes the configuration files do not have all the information that DCI needs to fully configure the device models. When this happens, you need to supply the missing information after the import. The missing information that can be specified in the Import Assistant falls into the following categories:

- IP-unnumbered interfaces—DCI knows that the interface or port is connected to another but is unable to determine the identity of the other interface or port.
- Unspecified data rates—DCI connects two interfaces or ports but cannot determine the data rate of the connection.

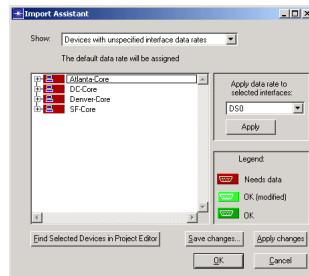
When additional import information is needed, the following dialog box appears:

Figure 2-13 Device Configuration Import: Further Information Required

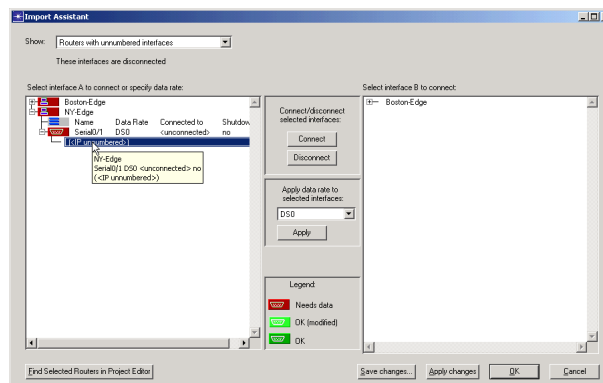


At this point, you can specify information for IP unnumbered interfaces and interfaces with unspecified data rates. Using the Show pull-down menu (top left), you can display either category of interfaces with missing information or all.

Figure 2-14 The Import Assistant



Show routers with unspecified interface data rates



Show routers with unnumbered interfaces

Connecting Unnumbered Interfaces If there are any IP-unnumbered interfaces in the network model, the Import Assistant opens with the Show menu set to Routers with unnumbered interfaces. All such routers (and their unnumbered interfaces) appear with red icons in the treeview. Follow Procedure 2-3 to connect the unnumbered interfaces.

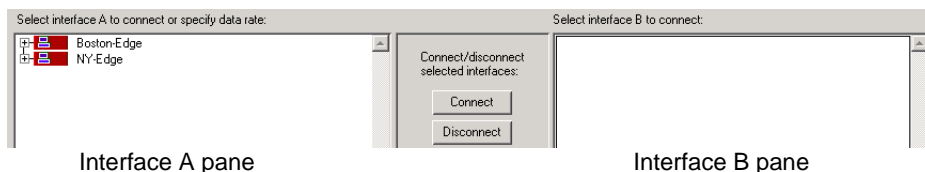
WARNING—This procedure applies only to interface connections that were missing in the configuration data; you cannot use this method to change connections that were set during the import (which appear with dark green icons in the Import Assistant).

When you have connected all unnumbered interfaces, all of the formerly red icons will be light green, indicating that the interface has been modified and is now properly connected.

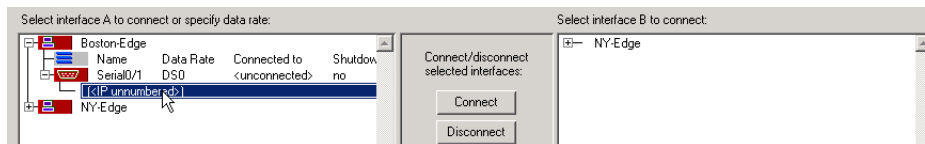
Note—You can avoid the occurrence of IP-unnumbered interfaces by ensuring that you have the output of `show cdp neighbors detail` command in your configuration files.

Procedure 2-3 Connecting Unnumbered Interfaces

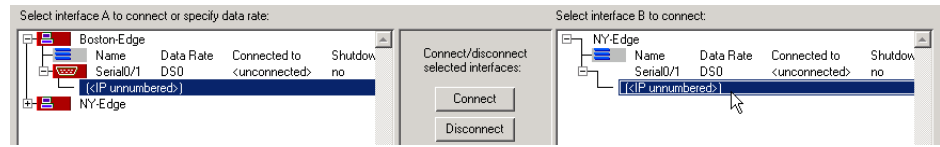
- 1 Make sure that the Show pull-down menu is set to “Routers with unnumbered interfaces”.
 - ➔ All routers with IP-unnumbered and disconnected interfaces appear in the Interface A pane.



- 2 In the Interface A pane, select an unnumbered interface. Note that clicking on the plus sign (Windows) or arrow (Solaris) next to the router icon will expand the view of the router to include its name and interfaces.
 - ➔ A list of routers with eligible interfaces appears in the Interface B pane.

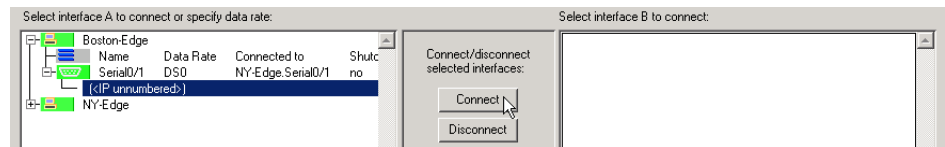


- In the Interface B pane, select the interface you want to connect to the interface selected in the Interface A pane.



- Click Connect.

➔ The two interfaces are connected. Interface B disappears from the right pane; the icons for interface A change from red (Needs data) to light green (OK, modified).

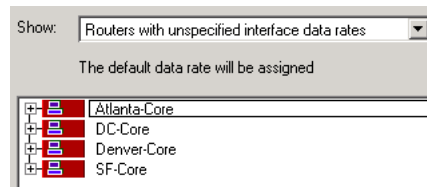


End of Procedure 2-3

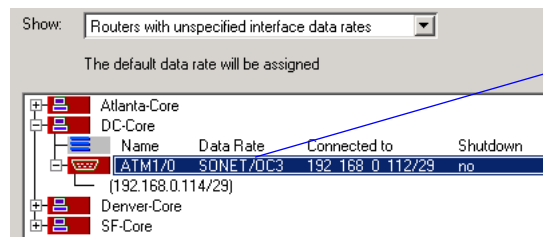
Specifying Data Rates You can set or change the data rate for any connected router interface in your network. When you set a data rate, the change affects both connected interfaces.

Procedure 2-4 Specifying the Data Rate of an Interface

- Set the Show pull-down menu to “Routers with Unspecified Data Rates” or “All routers”.
 - ➔ A list of all routers in the network appears. The routers that have interfaces with unspecified data rates appear with red icons.



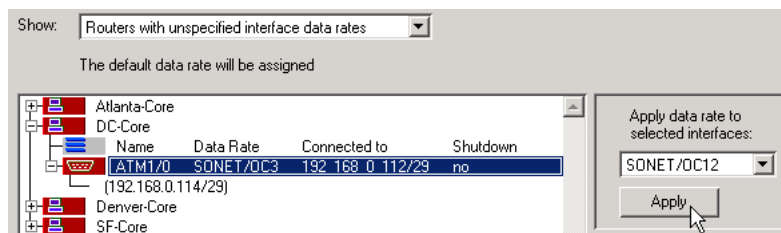
- Select the interface whose data rate you want to change. You can select multiple interfaces by holding down the Control key and clicking on multiple interfaces. The data rate indicated for an interface is the default data rate that will be assigned if you do not specify the actual data rate.



If you do not specify a data rate, the default rate is assigned. The default rate for this ATM interface is SONET/OC3.

- 3 Choose a data rate from the Data Rate pull-down menu. If the rate you want does not appear on this menu, choose Edit and specify the data rate (in bps). Then click Apply.

➔ The Data Rate fields for both interfaces are updated to reflect the change, and the interfaces now have light green (OK, modified by user) icons.



Note—If the icon for an interface is still red after you have specified a data rate, the interface is not connected. Connect the interface as described in Connecting Unnumbered Interfaces on page MVI-2-25, then set the data rate.

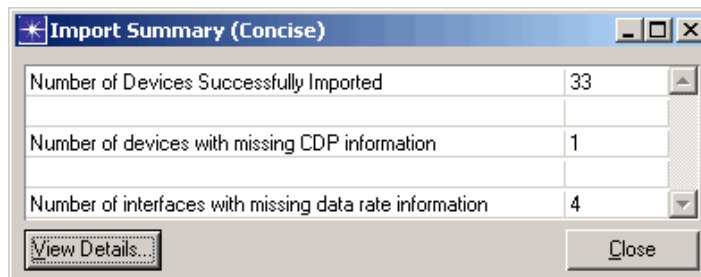
End of Procedure 2-4

You can save the changes you made to a model assistant file, which you can then use during another import. To create a model assistant file from the changes made in the Import Assistant, click Save changes after you have specified all of the missing information. The model assistant file is created in the primary models directory with the name you specify. For information about editing model assistant files, see Model Assistant on page ITU-6-50 of the Guru User Guide.

Viewing the Import Summary Report

When the import is complete, a concise import summary opens. The report contains single-line descriptions and counts of significant events that occurred during the import.

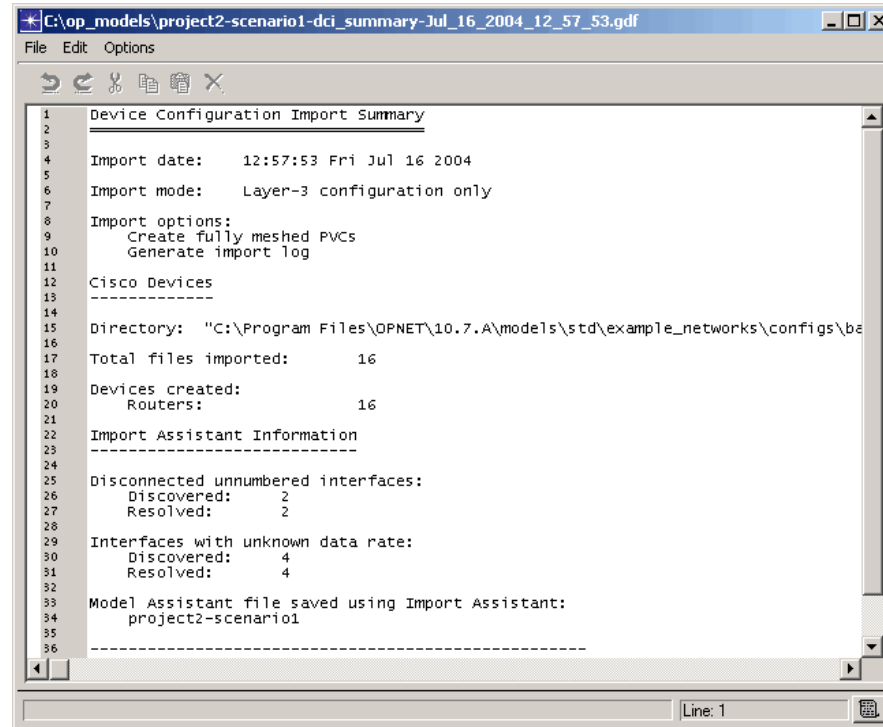
Figure 2-15 Concise Import Summary Report



By resting the cursor over each item, you can see expanded information about the event(s) in the form of a tooltip.

The View Details button, when clicked, opens a full import summary report. This report contains more information about the import including the timestamp, duration of process, specified import mode and options selected. It also shows the directory from which the device configuration files were imported and issues that were identified by the Import Assistant during the process.

Figure 2-16 Import Summary Report



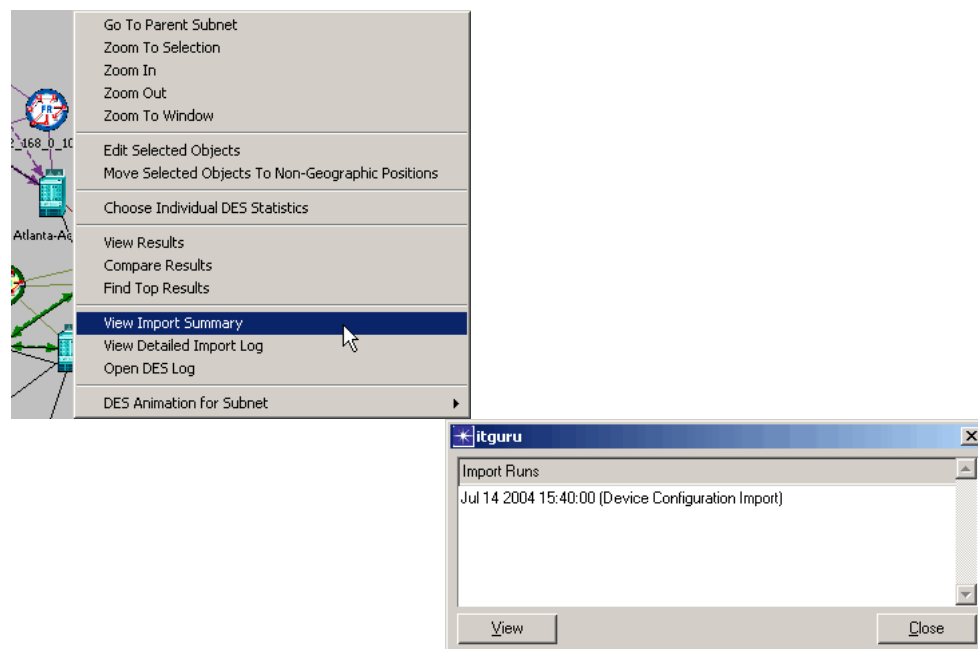
The screenshot shows a text editor window titled "C:\op_models\project2-scenario1-dci_summary-Jul_16_2004_12_57_53.gdf". The window contains the following text:

```
1 Device Configuration Import Summary
2
3
4 Import date: 12:57:53 Fri Jul 16 2004
5
6 Import mode: Layer-3 configuration only
7
8 Import options:
9   Create fully meshed PVCs
10  Generate import log
11
12 Cisco Devices
13 -----
14
15 Directory: "C:\Program Files\OPNET\10.7.A\models\std\example_networks\configs\ba
16
17 Total files imported: 16
18
19 Devices created:
20   Routers: 16
21
22 Import Assistant Information
23 -----
24
25 Disconnected unnumbered interfaces:
26   Discovered: 2
27   Resolved: 2
28
29 Interfaces with unknown data rate:
30   Discovered: 4
31   Resolved: 4
32
33 Model Assistant file saved using Import Assistant:
34   project2-scenario1
35
36 -----
```

The window also shows a status bar at the bottom right with the text "Line: 1".

If you wish to review this import summary or other import summaries for previous imports, right-click in the workspace and choose View Import Summary. A dialog box opens that contains a list of import summary reports from previous device configuration imports. You can select any of the available reports for viewing.

Figure 2-17 View Import Summary



Using Model Assistant Files with Imported Topologies

Model assistant files let you specify information about the network topology that is not included in the configuration files.

WARNING—If you do not convert your pre-11.5 model assistant files containing networks imported through DCI, they will not work in 11.5.

To apply model assistant files after importing a network, use the procedure described in Model Assistant on page ITU-6-50 of the *Guru User Guide*. You can also apply model assistant files during the import, by specifying the files in the Import Device Configurations dialog box. If you specify information about unnumbered interfaces and unspecified data rates in model assistant files, applying the files during the import lets you bypass the Import Assistant.

For general information about how to create, edit, and apply model assistant files, see Model Assistant on page ITU-6-50 of the *Guru User Guide*.

After the Import

Although you have imported a virtual model of your network, the live network continues to evolve. OPNET allows you to manage the network model along with the changes to your “real” network.

- Incremental Imports and Updates to Network Model
- Viewing the Import Log
- Viewing and Editing Configuration Files After an Import
- Using the Virtual Command Line Interface
- Network Inventory Summary Report

Incremental Imports and Updates to Network Model

You can use DCI to update an existing network topology, whether or not that topology was created with DCI. You can:

- add new devices to the network
- update the configuration files of some devices
- do a new import for the entire network

An import of a network model subsequent to an initial import is also called an *incremental import*. There are several ways to perform an incremental import. Refer to Procedure 2-2 and note the following import modes related to incremental imports:

- Merge with Existing Model—Use this option to add devices to the existing topology. If some of the devices are already in the topology, these devices are replaced (that is, reimported) using the configuration files of this import. DCI matches the devices based on the hostname of the node.
- Reimport Configurations for Selected Devices—Use this option to update the configuration files of a few devices in the existing topology. The devices must already be selected in the workspace. If the devices you want to update are not currently selected, cancel this operation, select the devices, and start over.

You do not need to specify the location of the configuration files; DCI uses the file specified in the Import Information attribute on the device. By default, this is the location specified in the original import.

- Reimport Configuration for Modified Devices—When you select this option, DCI will reimport configuration files for any devices that have been modified since the last import, based on comparison of the timestamp of the last import and the current time.

Note—No changes affecting network topology (i.e., addition/deletion of interfaces, IP address change, or change in interface status) as created during import from VNE Server are applied during increment DCI.

The import mode, Reimport Configuration for Modified Devices, is the fastest method, especially for large networks. If the network is relatively small, or if you have many changes, consider replacing the entire model. All options use the basic import procedure described in Procedure 2-2. They differ only in the import mode used in the Import Device Configurations dialog box.

Table 2-6 Import Mode Usage for Updating Imported Topologies

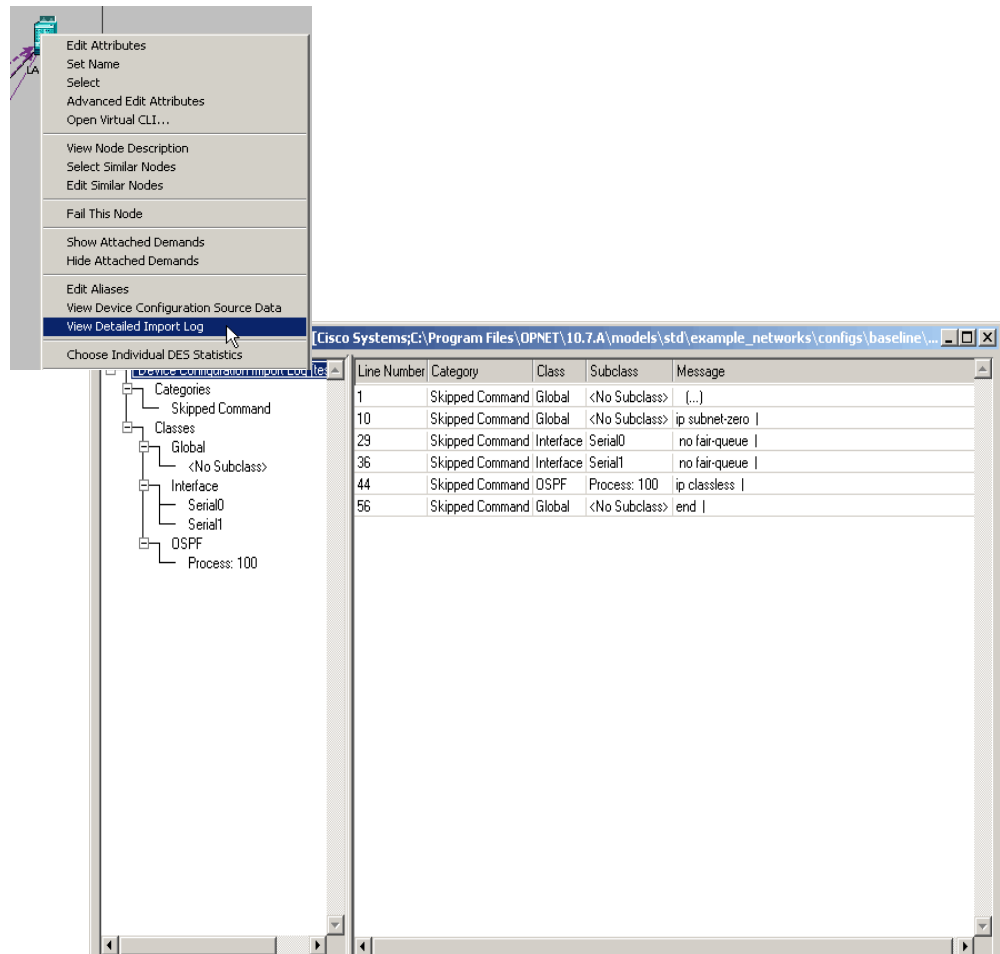
To...	Use This Import Mode...
Add new devices to an existing network	Merge with Existing Model
Update the configuration files of some nodes	Reimport Configurations for Selected Devices
Perform incremental import of changes in the network model	Reimport Configuration for Modified Devices
Reimport the files of all devices in the network	Replace Entire Model
End of Table 2-6	

When adding new devices to an existing network or updating the configuration files for a few devices in the network, create a directory that contains only the configuration files of the new devices you want to import. Specify this directory in the Import Device Configurations dialog box and make sure that you are using the import mode specified in Table 2-6.

Viewing the Import Log

During the import, some commands in the device configuration files may have been skipped or ignored. You can see which commands were skipped during the import by selecting View Device Configuration Import Log from the Workspace pop-up menu. You can view the import log for an individual node by selecting View Device Configuration Import Log from the node's Object pop-up menu.

Figure 2-18 DCI Import Log



Viewing and Editing Configuration Files After an Import

After an import, you can view the configuration file that DCI used to create a node in the Project Editor. To do this, select View Device Configuration Source Data from the node's object pop-up menu.

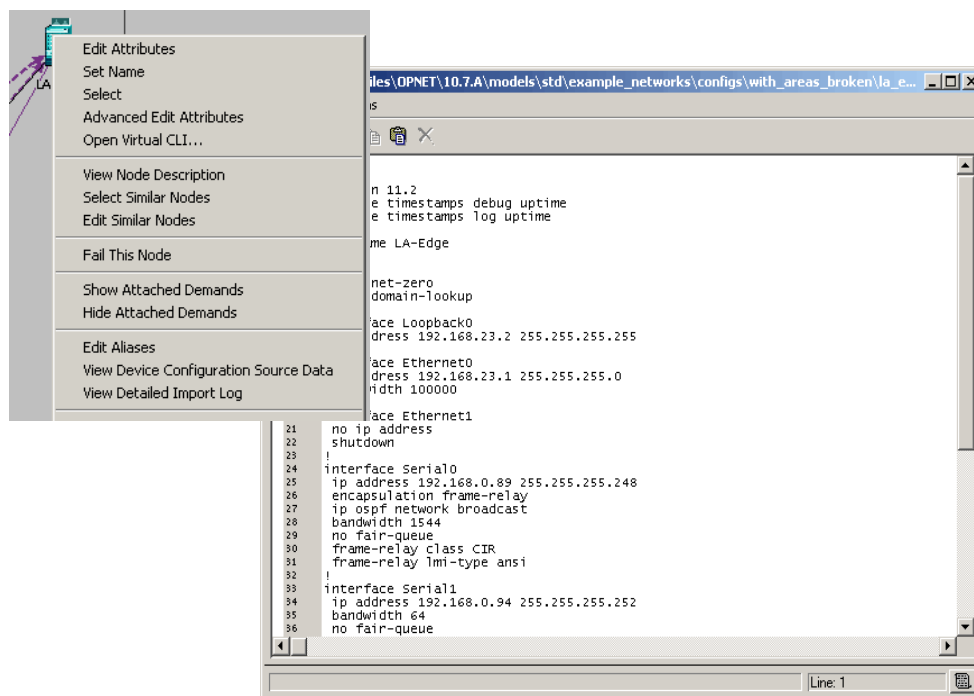
Procedure 2-5 Editing a Configuration File of a Device

- 1 Right-click on the device in the Project Editor workspace and select View Device Configuration Source Data from the pop-up menu.
 - ➔ The configuration file appears in a text edit pad (see Figure 2-19 on page MVI-2-33).
- 2 Edit the configuration file.
- 3 Choose File > Save to save your changes.
- 4 Close the text edit pad.

End of Procedure 2-5

After editing a configuration file in IT Guru, you need to import the updated configuration file so that the changes you made are included in the topology. See Incremental Imports and Updates to Network Model on page MVI-2-30 for more information.

Figure 2-19 Viewing the Device Configuration File After Import



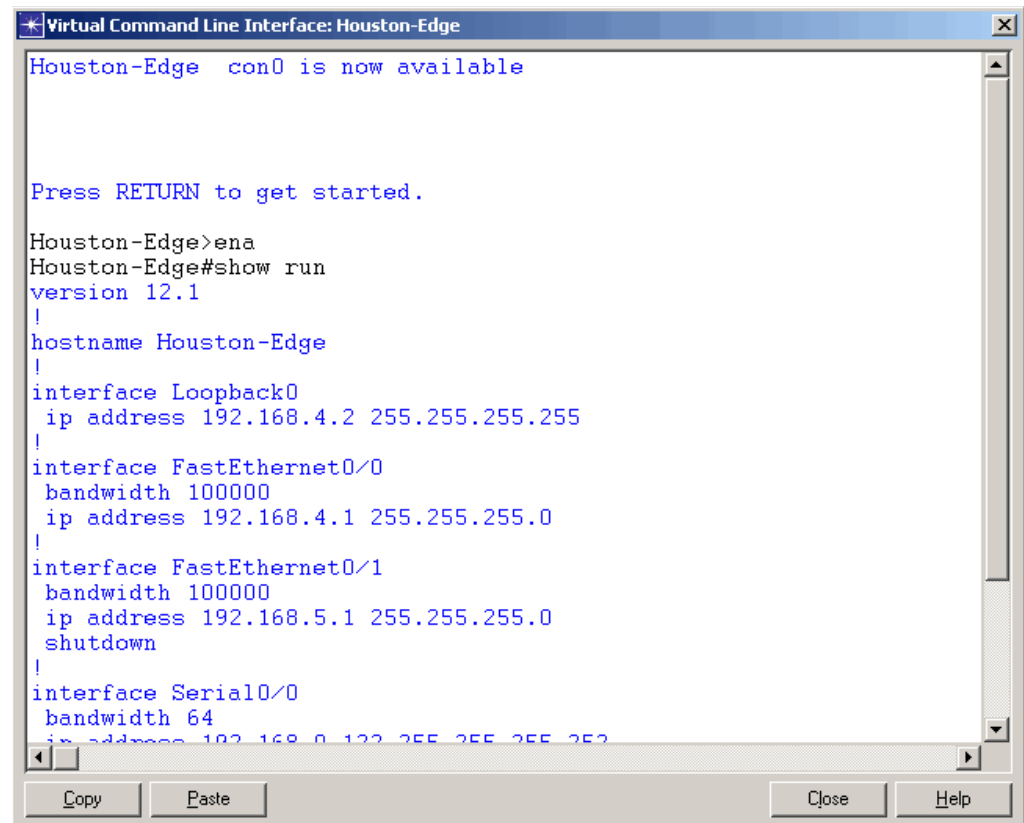
Using the Virtual Command Line Interface

The last section described how to permanently edit your configuration files through a text editor. If you want to edit the devices only for a particular project, you can use Virtual Command Line Interface (Virtual CLI), which allows you to edit Cisco routers and switches within the network model. The changes made with Virtual CLI are specific to the project within which you are working and do not affect the underlying source files.

The Virtual CLI has the same look and feel as the Cisco CLI, although it supports a sub-set of Cisco commands. Virtual CLI supports familiar Cisco CLI usage including shortcuts (such as typing `ena` instead of `enable`), command help access via `?`, and tab completion of a command.

To access the Virtual CLI, right-click on a Cisco router or switch and select Open Virtual CLI... Figure 2-20 shows an example of a Virtual CLI session.

Figure 2-20 Virtual Command Line Interface



```
Virtual Command Line Interface: Houston-Edge
Houston-Edge con0 is now available

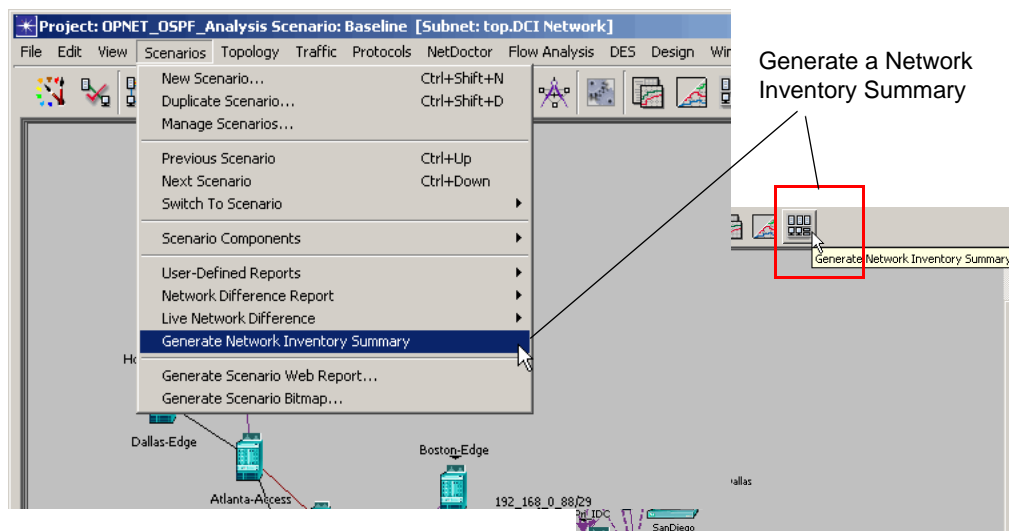
Press RETURN to get started.

Houston-Edge>ena
Houston-Edge#show run
version 12.1
|
hostname Houston-Edge
|
interface Loopback0
ip address 192.168.4.2 255.255.255.255
|
interface FastEthernet0/0
bandwidth 100000
ip address 192.168.4.1 255.255.255.0
|
interface FastEthernet0/1
bandwidth 100000
ip address 192.168.5.1 255.255.255.0
shutdown
|
interface Serial0/0
bandwidth 64
ip address 192.168.0.122 255.255.255.252
```

Network Inventory Summary Report

After an import, and on a periodic basis, you may want to see how many devices are in your network and of what type. If you have a rather small imported network model, it is a simple task to visually gather this information. For larger networks, however, it is a time-consuming, error-prone task to take inventory. The Network Inventory Summary report is available at any time after an import. Running a Network Inventory Summary report after an incremental import allows you to keep your inventory files up-to-date. In Figure 2-21 you can see that there are two ways to generate the report: through the drop-down menus or through the toolbar.

Figure 2-21 Generating a Network Inventory Summary



An example of a Network Inventory Summary report is shown in Figure 2-22. The summary includes

- Devices—A total count of devices, and a breakdown by device type
- Vendors—A count by vendor
- Physical Links—A total count of physical links, and a breakdown by type
- Virtual Links—A total count of virtual links, and a breakdown by type
- Other—A total count of other types of devices in the model, including network clouds, application models, configuration utilities, etc.

Figure 2-22 Network Inventory Summary

	Element	Type	Count
1	Devices	Total	34
2		Routers	23
3		Switches	5
4		Layer-3 Switches	5
5		Other	1
6			
7	Vendors	Cisco Systems	33
8			
9	Physical Links	Total	60
10		Frame Relay	14
11		Serial	8
12		Ethernet	38
13			
14	Virtual Links	Total	19
15		Frame Relay PVCs	19
16			
17	Other	Network Clouds	2
18		Configuration Utilities	1
19			

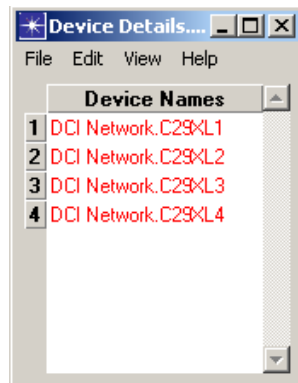
If a count listing is in blue text, there are further actions you can take. In the example shown here, you can also drill down into the Cisco listing for specifics about the devices found. Notice in the Device Details dialog box, shown in Figure 2-23, more counts are in blue text.

Figure 2-23 Vendor Detail

	Device Type	Count
1	Cisco WS-C2924M-XL	4
2	Cisco 6000	1
3	Cisco 2500	2
4	Cisco 3620	1
5	Cisco 2621	13
6	Cisco 3640	4
7	Cisco 7204	3
8	Cisco 5505	4
9	Cisco Systems Generic	1

To drill down even further, you can click on any number in blue. In the example shown in Figure 2-24, the four Cisco WS-C2924M-XL switches are listed.

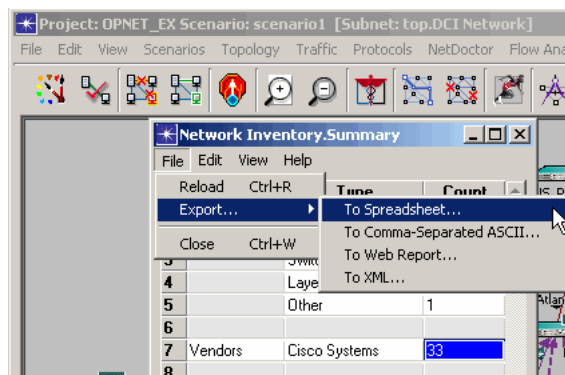
Figure 2-24 Detail of Cisco Model WS-C2924M-XL



At any point in the summary, you can also export the report to any of the following file types:

- Spreadsheet (for example, MS-Excel)
- Comma-Separated ASCII
- Web Report
- XML

Figure 2-25 Export Network Inventory Summary



Exporting the report makes it easier to use the information for analysis, management reporting, and other requirements. Figure 2-26 shows an example of this Network Inventory Summary report exported to a web report format.

Figure 2-26 Export to a Web Report

Category: Network Inventory			
Report: Summary			
	Element	Type	Count
1	Devices	Total	34
2		Routers	23
3		Switches	5
4		Layer-3 Switches	5
5		Other	1
6			

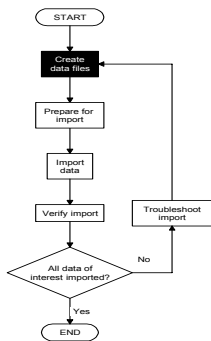
3 Importing Traffic Flows

This chapter describes the traffic-flow data formats you can import with the MVI module, and includes information specific to each format. For general information about importing traffic flows, see Chapter 11 Importing Traffic Flows on page ITU-11-1 of the *Guru User Guide*.

Table 3-1 MVI Module: Supported Traffic-Flow Imports

File Format / Program	Reference
cflowd	Creating cflowd Data on page MVI-3-8
NAI Distributed Sniffer NAI Sniffer Prof	Creating Distributed Sniffer/Sniffer Pro Data on page MVI-3-2
Fluke OptiView	Creating OptiView Console Traffic Files on page MVI-3-5
Netflow Collector	Creating NetFlow Collector Data on page MVI-3-3
End of Table 3-1	

Creating Distributed Sniffer/Sniffer Pro Data



This section describes the special requirements for creating traffic data files in Distributed Sniffer and Sniffer Pro. To see if your version of Sniffer is supported by IT Guru, go to <http://www.opnet.com/support> and follow the “System Requirements” link.

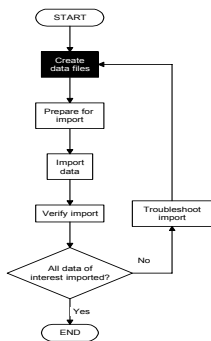
For information about importing traffic flows, see Chapter 11 Importing Traffic Flows on page ITU-11-1 of the *Guru User Guide*.

Procedure 3-1 Creating Sniffer Data Files

- 1 Open Sniffer Pro or Distributed Sniffer if it is not already open.
- 2 Create one or more Sniffer data files. Sniffer Pro and Distributed Sniffer capture traffic as a collection of connection objects (row type **0::400::3::XX** in Sniffer traffic files). For more information, see the Sniffer documentation.
 - 2.1 Click the **Start** button on the Sniffview toolbar.
 - 2.2 Click the **Stop and Display** button on the Sniffview toolbar, when finished capturing.
- 3 Export the contents of each data file to a comma separated vector (.csv) file. Make sure you export the Overview, Title Heading and Object Summary fields in the Sniffer data; the .csv file must include these fields to be imported into IT Guru.
 - 3.1 Click the **Export CSV** button in the dialog box, which says Ethernet Frames in the title.
 - 3.2 In the **Export Expert Objects into CSV** dialog box, select as follows:
 - Select a target directory where you wish to save the file.
 - Specify a file name.
 - Uncheck the following: Symptom Summary, Symptom Detail, Diagnosis Summary, Diagnosis Detail
 - Click the **Save** button.
- 4 Prepare for the traffic import as described in Preparing for a Traffic or Link-Load Import on page ITU-11-9 of the *Guru User Guide*.

End of Procedure 3-1

Creating NetFlow Collector Data



This section describes the special requirements for creating NetFlow Collector data files that you can import into IT Guru. To see if your version is supported by IT Guru, go to <http://www.opnet.com/support> and follow the “System Requirements” link.

For information about importing traffic flows, see Chapter 11 Importing Traffic Flows on page ITU-11-1 of the *Guru User Guide*.

Note—More information about configuring NetFlow export is available on the Cisco Systems web page at this location:
http://www.cisco.com/en/US/products/sw/iosswrel/ps1829/products_feature_guide09186a00800871a8.html#1015363

Procedure 3-2 Creating NetFlow Collector Data Files

1 In NetFlow Collector, you must create a data file that uses one of the following aggregation schemes:

- RouterAS or RouterPrefix
- CallRecord or DetailCallRecord
- AsHostMatrix or DetailHostMatrix

The file must be in either Format A or Format 2.

For more information about NetFlow data file formats, see the Netflow documentation.

2 MVI can import uncompressed ASCII files only. You might need to manually uncompress a file and/or convert it from binary to ASCII before you can import it.

3 After you create your data files, prepare for the traffic import as described in Preparing for a Traffic or Link-Load Import on page ITU-11-9 of the *Guru User Guide*.

End of Procedure 3-2

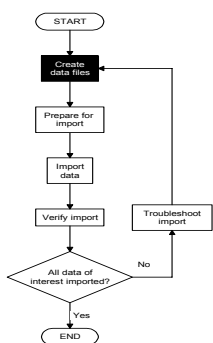
Importing Socket, Transport Protocol, and TOS Data

You can configure IT Guru to import socket, transport-protocol, or TOS information from NetFlow data files, and to create separate traffic flows for specific types of data. The type of data you can import depends on the type of aggregation used in the Netflow data file, as illustrated in Table 3-2. For more information, see Aggregating Traffic Flows on page ITU-11-19 of the *Guru User Guide*.

Table 3-2 Supported Aggregation Options for NetFlow Collector Imports

NetFlow Aggregation	Transport Protocol	Socket	Type of Service
CallRecord	X	X	X
DetailHostMatrix	X	X	
AsHostMatrix			
DetailCallRecord	X	X	X
RouterAS			
RouterPrefix			
End of Table 3-2			

Creating OptiView Console Traffic Files



This section describes the procedures for creating OptiView traffic data files that you can import into IT Guru. To see if your version of OptiView Console is supported by IT Guru, go to <http://www.opnet.com/support> and follow the “System Requirements” link.

For information about importing traffic flows, see Chapter 11 Importing Traffic Flows on page ITU-11-1 of the *Guru User Guide*.

OptiView Console can generate traffic data files subject to the following restrictions:

- OptiView Console can export IP-V4 traffic flows only.
- OptiView Console can export traffic from Fluke OC-3 WAN Analyzers only.
- OptiView Console can export a traffic flow only if it is among the 50 flows with the highest traffic levels (in packets/PDU and octets) visible to the WAN Analyzers.
- Traffic data is available for the previous seven days if imports have been enabled and the Import Service is running on OptiView Console. To import data for time windows earlier than the previous seven days, you must load archive data from the OptiView traffic agent. For more information, refer to the online documentation included with OptiView Console.

There are two methods for generating OptiView traffic files:

- Manual generation, using the Optiview user interface—See *Creating OptiView Traffic Files Manually (Graphical Interface)* on page MVI-3-6)
- Automatic generation, using a command-line interface—See *Creating OptiView Traffic Files Automatically (Command-Line Interface)* on page MVI-3-7)

Creating OptiView Traffic Files Manually (Graphical Interface)

To generate traffic files, open the OptiView Console Viewer and choose Tools > Export Flow Records to OPNET. This opens the Export Flow Data to OPNET dialog box, described in Table 3-3.

Figure 3-1 Export FLOW Data to OPNET Dialog Box

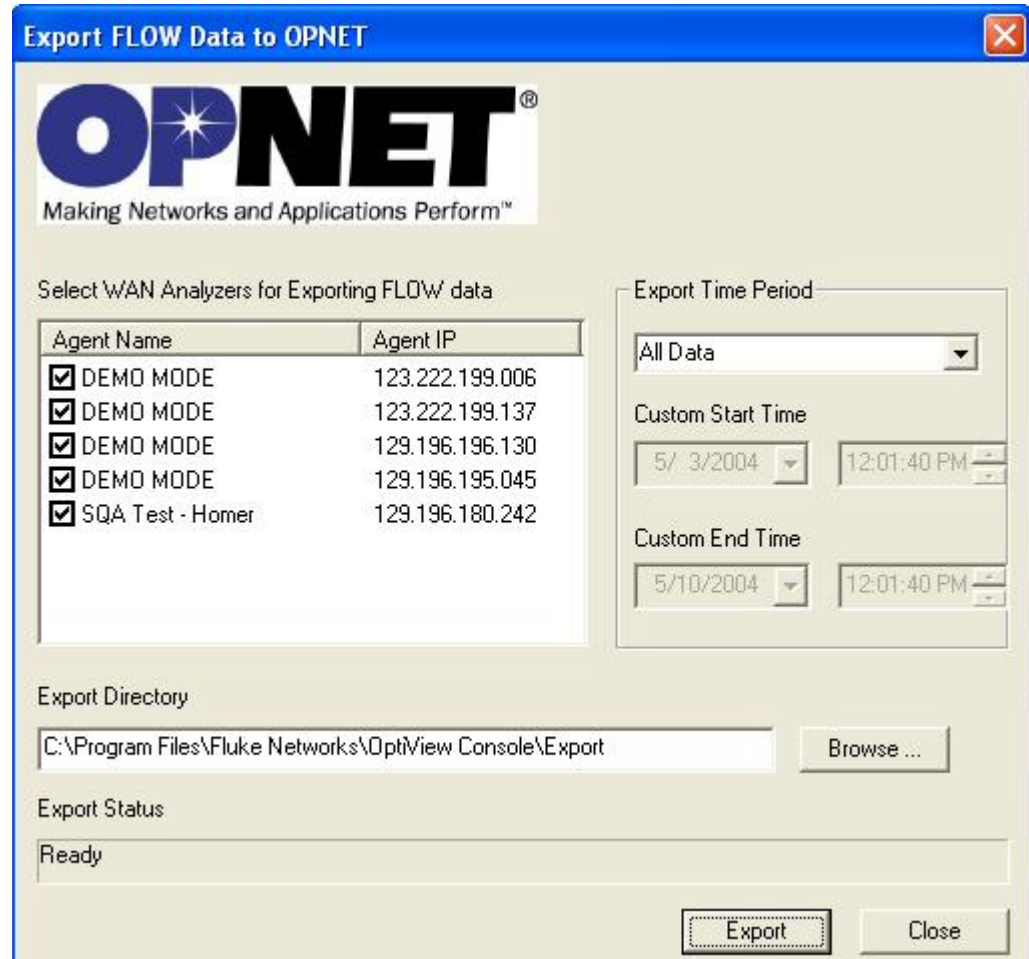


Table 3-3 Export FLOW Data to OPNET Dialog Box (OptiView Console)

Option	Description
Select WAN Analyzers for Exporting FLOW Data	Select the WAN analyzers that you want to generate traffic data for Exporting FLOW Data
Export Time Period	Select the time window for the traffic you want to export.
Export Directory	Destination directory for the OptiView data files. To automate the process of importing data into IT Guru, this directory should be listed in your traffic_archive_dir preference (to set this preference, open IT Guru and choose Edit > Preferences).
End of Table 3-3	

Creating OptiView Traffic Files Automatically (Command-Line Interface)

You can generate OptiView data files using batch files or a command-line interface. This option is useful for generating data files automatically. You can create a batch file with one or more OptiView commands, then configure a scheduler to run the script at regular intervals (for example, once a night).

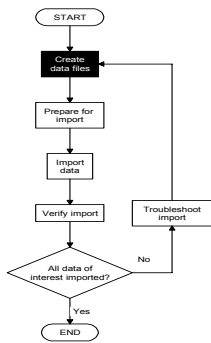
The **OpnetExporter** command generates IT Guru-compatible OptiView data files. The format for this command is:

```
OpnetExporter -exportDir <directory> [-agents <agent_list>] [-<time_options>]
```

Table 3-4 OpnetExport Command-Line Arguments

Argument	Description
-exportDir <directory>	Destination directory for the OptiView data files. To automate the process of importing data into IT Guru, this directory should be listed in your traffic_archive_dir preference (to set this preference, open IT Guru and choose Edit > Preferences).
-agents <agent_list>	A space-delimited list of WAN Analyzers. You can enter the Agent Name or Agent IP as it appears in the Export FLOW Data to OPNET Dialog Box (OptiView Console). If this argument is not specified, OptiView generates data files from all listed agents.
-<time_argument>	The time window of the traffic data to export. You can specify one of the following arguments: -allTime -lastHour -last2Hours -last4Hours -last8Hours -last12Hours -last24Hours -customTime mm/dd/ccyy-hh:mm mm/dd/ccyy-hh:mm If this argument is not specified, OptiView generates data for all available traffic.
End of Table 3-4	

Creating cflowd Data



This section describes the special requirements for creating cflowd data files that you can import into IT Guru. To see if your version is supported by IT Guru, go to <http://www.opnet.com/support> and follow the “System Requirements” link.

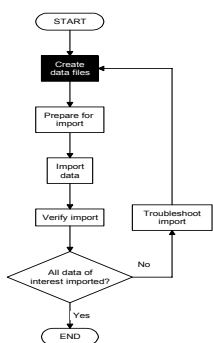
For information about importing traffic flows, see Chapter 11 Importing Traffic Flows on page ITU-11-1 of the *Guru User Guide*.

Procedure 3-3 Creating cflowd Data Files

- 1 Create your cflowd data files using normal mode. IT Guru cannot import cflowd data that uses AS aggregation. For more information, see the cflowd documentation.
- 2 Run the flowdump utility on each cflowd traffic file. This utility is included with cflowd.
- 3 After you configure IT Guru, prepare for the traffic import as described in Preparing for a Traffic or Link-Load Import on page ITU-11-9 of the *Guru User Guide*.

End of Procedure 3-3

Configuring NetScout nGenius and IT Guru



This section describes how to configure IT Guru and NetScout nGenius version 1.3 so you can import traffic flows. Procedures might differ for other versions of nGenius. To see if your version is supported by IT Guru, go to <http://www.opnet.com/support> and follow the “System Requirements” link.

This section also includes troubleshooting information specific to nGenius; for more information, see [Troubleshooting nGenius Imports](#) on page MVI-3-13.

The workflow for nGenius imports is similar to most other types of traffic imports, with the following exceptions:

- The nGenius import reads from a database, so you do not need to create individual files.
- You must do Procedure 3-4 to set up nGenius and IT Guru.
- When you import traffic, you must also log in to the nGenius database (Procedure 3-7 on page MVI-3-12)

For information about importing traffic flows, see [Chapter 11 Importing Traffic Flows](#) on page ITU-11-1 of the *Guru User Guide*.

Procedure 3-4 Configuring nGenius and IT Guru

- 1 Place the nGenius probe(s) on the network segment(s) to be monitored.
- 2 Configure the nGenius probe(s) to speak with NetScout. For more information about configuring NetScout nGenius, see the nGenius documentation .
- 3 Set nGenius preferences to specify the traffic you want to collect. For more information, see [Setting nGenius Preferences](#) on page MVI-3-10.
- 4 If you are using nGenius version 1.3 or 1.4, you must install special patch files to be able to import traffic data into IT Guru. These requirements are described in the following FAQs (Frequently Asked Questions):
 - FAQ # 740 (nGenius version 1.3)
 - FAQ # 908 (nGenius version 1.4)

These FAQs are available at the OPNET Support Center. Point your web browser to the OPNET Support Center (www.opnet.com/support) and follow the “FAQ” link. To access a specific FAQ, search for the FAQ number. To obtain a list of all relevant FAQs, search for the string "nGenius."

- 5 Set the preferences on your IT Guru computer, as described in [Setting Preferences on Your IT Guru Computer](#) on page MVI-3-11.

End of Procedure 3-4

Setting nGenius Preferences This section describes several nGenius preferences that control the amount of data collected by Netscout probes and the amount of data stored in the nGenius database. To view and set these values:

- 1) Open the main nGenius Performance Manager window.
- 2) Go to the Administration page.
- 3) Choose Device > Global Settings.

Maximum Convs and Maximum Hosts This Maximum Convs [conversations] setting controls the maximum number of conversations (end-to-end traffic flows) that each probe interface logs to the database. The Maximum Hosts setting controls the maximum number of hosts logged by each probe interface. (These settings are located on the Logging Table Sizes tabbed page, under Maximum Number of Hosts and Conversations Logged.)

The Maximum Conversations limit is applied in conjunction with the Collection Threshold (%) setting. For example, assume a maximum of 50 conversations and a collection threshold of 80 percent. nGenius does the following:

- 1) Polls each probe interface for its conversations
- 2) Uses these metrics to determine what is logged
- 3) Sorts the conversations by utilization
- 4) Applies the following rule: Log 50 conversations, unless 80 percent of the visible traffic can be accounted for in fewer than 50 conversations

In a second example, assume a 100MB ethernet link with 10 percent average utilization for the polling interval. Assume this utilization is made up of eight conversations at 1 percent utilization each, and 200 smaller conversations that contribute the remaining 2 percent. If the collection threshold is 80 percent, nGenius logs only the eight conversations.

If the collection threshold is set to 100%, it has no effect on the Maximum Conversations setting.

Minimum Utilization The Minimum Utilization (%) setting specifies the minimum link utilization that must be consumed for a conversation to be logged. By default, it is set to 0.005%. Thus, any conversation that consumes less than this percentage of the link's total bandwidth is not logged. If you want nGenius to log all conversations, set the minimum utilization to 0. (This setting is located on the Logging Table Sizes tabbed page, under Minimum Utilization of Hosts and Conversations Logged.)

Device Table Sizes The Device Table Sizes tabbed page contains settings that control the size of the tables used to store data. If the Maximum Convs setting for the Network Layer table size is set to 8000, nGenius will set the RMON2 Network Layer Conv table size on your probes to 8000.

If the number of conversations in the Device Table Size for an interface is smaller than the Max. Convs setting, only the Device Table Size value will be stored.

Each device table can have a maximum size of up to 200,000. However, a probe might not have enough physical memory to allocate tables to their maximum sizes. You might see messages in the probe event log indicating that there was not enough memory to allocate tables of the requested sizes.

Setting Preferences on Your IT Guru Computer

The IT Guru system software installed on your hard drive or server includes an interfaces data file (interfaces in UNIX, sql.ini in Windows) with information that IT Guru uses during the nGenius import. You must set your preferences so that IT Guru can find the directory where this file is located.

Note—To import from nGenius, you must have read/write privileges for the interfaces file.

Procedure 3-5 Setting the SYBASE preference (UNIX)

- 1 Enter the following command from a UNIX command line:

```
cmd> setenv SYBASE <reldir>/sys/etc/sybase
```

<reldir> is the top-level directory where your IT Guru software resides on your hard drive or server; for example: /opt/OPNET/10.0.A.

End of Procedure 3-5

Procedure 3-6 Setting the SYBASE and SYBASE_OCS preferences (Windows NT/2000)

- 1 Right-click on My Computer and choose Properties. (The My Computer icon is usually located in the top-left corner of the Windows desktop.)
 - ➔ The System Properties dialog box appears.
- 2 Click on the Environment tab to see your system and user variables.
- 3 Click in the System Variables field.
- 4 Enter "SYBASE" in the Variable field, and <reldir>\sys\etc\sybase in the Value field.

<reldir> is the top-level directory where your IT Guru software resides on your hard drive or server; for example: C:\Program Files\OPNET\10.0.A.

- 5 Click in the System Variables field again.
- 6 Enter “SYBASE_OCS” in the Variable field and \ in the Value field.
- 7 Click the Set button, and then OK to close the System Properties dialog box.

End of Procedure 3-6

nGenius Import Procedure

The import procedure for nGenius differs slightly from other traffic-flow imports.

Procedure 3-7 Importing Traffic Data from a NetScout nGenius Database

- 1 Add the nGenius databases’s host name or IP address to the ngenius_servers preference if this preference is not already set.
- 2 Open the IT Guru project and scenario into which you want to import traffic.
- 3 Choose Traffic > Import Traffic Flows > From NetScout nGenius.
 - ➔ IT Guru prompts for the nGenius server name and your username/password.
The Database Host field specifies the logical nGenius database name specified in your interfaces file. The Username and Password fields specify the Sybase user name and password required for accessing the database.
- 4 Enter the user name and password for the nGenius database from which you want to import. Then click OK.
 - ➔ The Traffic Import dialog box opens, showing all the traffic archives that can be imported.
- 5 Click on the icon for the nGenius archive in the traffic-servers pane; this is grouped under the computer running nGenius.
- 6 Enter the starting and ending times for the imported traffic in the Start and End fields, or leave the fields blank to import all traffic in the database. Then press Import.
 - Note**—If you have an MVI license and this is your first time importing from an nGenius database, you may be notified that your license is not configured correctly. If this occurs, follow the steps presented in IT Guru and the license will configure itself. You must then restart IT Guru for the configuration changes to take effect.
- 7 When the Traffic Flows Import dialog box appears, proceed with the import starting with step 4 in Procedure 11-8 Importing Traffic Flows on page ITU-11-15 of the *Guru User Guide*.

End of Procedure 3-7

Troubleshooting nGenius Imports

This section describes some potential problems you might encounter when you try to import traffic flows from nGenius.

- Incorrect SYBASE preference—The SYBASE preference should point to the appropriate SYBASE client configuration directory. By default, this directory is located in

- `<rel_dir>/sys/etc/sybase` (Solaris)

- `<rel_dir>\sys\etc\sybase` (Windows)

Make sure that the directory set in the preference indeed exists and that the path does not include quotes.

- Incorrect file permissions—You must have the correct file permissions for the Sybase "interfaces" file. On Solaris, `$SYBASE` should be readable/executable, and `$SYBASE/interfaces` should be readable/writable. On Windows, `%SYBASE%` should be listable/readable, `%SYBASE%/ini` should be listable/readable/changeable, and `%SYBASE%/ini/sql.ini` should be readable/changeable.
- User authentication—Verify that you are entering the username/password that was created with the Sybase read-only user creation "patch" as described in FAQ 740 (for nGenius version 1.3) or FAQ 908 (for nGenius version 1.4 or higher). For information about these FAQs, see Procedure 3-4 on page MVI-3-9.
- Network connectivity—Your IT Guru computer requires TCP/IP network connectivity to the nGenius database server. Use the "ping" command to see if your IT Guru computer can communicate with the nGenius server.
- For information about other problems and potential solutions, see Troubleshooting Traffic-Flow Imports on page ITU-11-29 of the *Guru User Guide*.

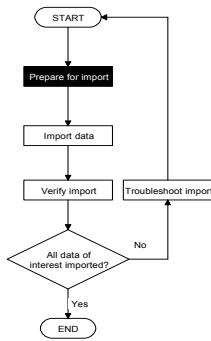
4 Importing Baseline Loads

This chapter describes the baseline load data formats you can import with the MVI module, and includes information specific to each format. For general information about importing baseline loads, see Chapter 12 Importing Baseline Loads on page ITU-12-1 of the *Guru User Guide*.

Table 4-1 MVI Module: Supported Baseline-Load Imports

File Format / Program	Reference
MRTG (Multi-Router Traffic Grapher) configuration files	MRTG Link Loads: Preparing for an Import on page MVI-4-2
InfoVista	InfoVista Link Loads: Preparing for an Import on page MVI-4-4
HPOV Performance Insight	Performance Insight Link Loads: Preparing for an Import on page MVI-4-8
Concord eHealth–Network	Concord eHealth Baseline Loads: Preparing for an Import on page MVI-4-9
End of Table 4-1	

MRTG Link Loads: Preparing for an Import



IT Guru can import link loads from MRTG. Table 4-2 lists the steps to do before you import MRTG data. After you do these steps, proceed to Importing Baseline Load Data on page ITU-12-9 of the *Guru User Guide*.

Table 4-2 MRTG Link Loads: Pre-Import Checklist

Step	When Required	Reference
Specify aliases	Once per scenario. Required for nodes or links that meet both these conditions: <ul style="list-style-type: none"> • Were created manually • Are referenced by the imported data 	Working with Aliases on page ITU-11-11
Create data files	As needed. IT Guru cannot generate MRTG data files automatically.	Creating MRTG Link-Load Data on page MVI-4-2
End of Table 4-2		

Creating MRTG Link-Load Data

This section describes how to generate IT Guru-compatible data files in MRTG version 2.9. Procedures might differ for other versions of MRTG. To see if your version is supported by IT Guru, go to <http://www.opnet.com/support> and follow the “System Requirements” link.

To create log files that IT Guru can read, you must use one of the following identifiers.

Table 4-3 MRTG Identifiers

MRTG Identifier	Description	Example
ip_if#	IP address and interface number	172.16.10.150.1
ip_ifDescr	IP address and interface description	172.16.10.150.Serial1_0
End of Table 4-3		

For information about importing baseline loads, see Chapter 12 Importing Baseline Loads on page ITU-12-1 of the *Guru User Guide*.

Procedure 4-1 Creating MRTG Log Files

- 1 Specify the targets using one of the identifiers listed in Table 4-3. This ensures that the MRTG configuration file contains data in a form that IT Guru can import.
- 2 Verify that the log file names are in the correct format. By default, log file names have the format `<mrtg_identifier>.log`. For example, if you chose to identify MRTG targets using `ip_if#`, the log file name for one interface might be `172.16.10.150.1.log`.

- 3 If an MRTG log file corresponds to a network object that was created manually, you must create aliases for the IP address and interface as described in Mapping MRTG Files to IT Guru Interfaces,
- 4 After you create data files and create aliases (if necessary), go to Preparing for a Baseline Load Import on page ITU-12-3 of the *Guru User Guide*.

End of Procedure 4-1

Mapping MRTG Files to IT Guru Interfaces

You must specify aliases for every object that meets both of these conditions:

- Has load data specified in an imported MRTG files
- Was created manually (that is, was not imported from device configuration files or an external program)

If these conditions are true for an object, you must specify aliases for both the IP address and the interface as specified in the MRTG log file name. Suppose you have an MRTG log file named `10.1.1.1.1.log`. Your network must have aliases for both the IP address (`IP: 10.1.1.1`) and the interface number (`IF: 1`). You can specify these aliases in either of the following ways:

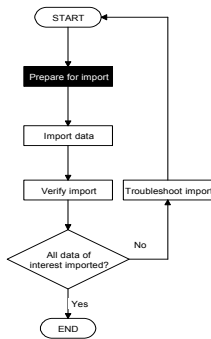
- IP address and interface as aliases on the same link interface
- IP address as a node alias, and interface as an alias on the connected link interface

Table 4-4 lists the supported formats for MRTG aliases. For information about how to create node and interface aliases, see *Working with Aliases* on page ITU-11-11 of the *Guru User Guide*.

Table 4-4 Interface Aliases Used for MRTG Imports

Alias Format	Specified As	Example
<code>IP:<node_name></code>	Node or interface alias	<code>IP:172.16.10.150</code>
<code>IP:<ip_number></code>		<code>IP: wtn150.acme.com</code>
<code>IP:<domain_name></code>		<code>IP: ita.acme.com</code>
<code>IP:<mrtg_log_file_name></code>		<code>IP:ita.acme.com.2.log</code>
<code>IF:<interface_number></code>	Interface alias	<code>IF:1</code>
<code>IFName:<interface_description></code>	Interface alias	<code>IFName:Serial1/0</code>
End of Table 4-4		

InfoVista Link Loads: Preparing for an Import



IT Guru can import link loads from InfoVista. Table 4-5 lists the steps to do before you import InfoVista data. After you do these steps, proceed to Importing Baseline Load Data on page ITU-12-9 of the *Guru User Guide*.

Table 4-5 InfoVista Link Loads: Pre-Import Checklist

Step	When Required	Reference
Install OPNET report template	Once. Do this step first.	Installing the IT Guru Report Template on page MVI-4-4
Define a new report	Once, after you install the template.	Defining an InfoVista Report on page MVI-4-5
Create data files	As needed. This step is required only if the OPNET computer cannot communicate with the InfoVista computer using telnet and ftp.	Creating InfoVista Data Files Manually on page MVI-4-7
Specify aliases	Once per scenario. Required for nodes or links that meet both these conditions: <ul style="list-style-type: none"> • Were created manually • Are referenced by the imported data 	Working with Aliases on page ITU-11-11
End of Table 4-5		

Installing the IT Guru Report Template

You must do this task once, before you define a report template and generate reports. This step is required to ensure that InfoVista generates reports in the correct format.

Procedure 4-2 Installing the IT Guru Report Template in InfoVista

- 1 If InfoVista and IT Guru are installed on different computers, copy the following IT Guru file to a directory on the InfoVista computer:

```
<reldir>/sys/etc/mvi_infovista_template_v2.ivl
```

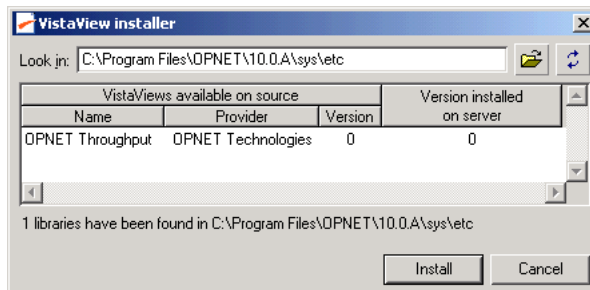
- 2 In InfoVista, choose File > Install VistaViews.

➔ A directory browser opens and prompts you to select the VistaView source directory.

- 3 Select the directory where the `mvi_infovista_template_v2.ivl` file is located. (If you have IT Guru and InfoVista installed on the same computer, this file is located in `<reldir>/sys/etc`.)

➔ The “VistaView Installer” window opens.

Figure 4-1 “VistaView installer” Window



- 4 Select the VistaView named “OPNET Throughput” and click Install.

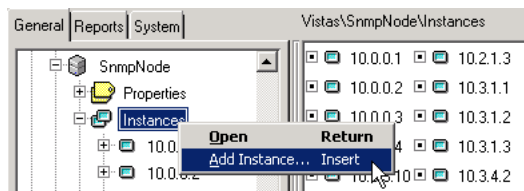
End of Procedure 4-2

Defining an InfoVista Report

You must do this task once, after you install the OPNET template (as described in Procedure 4-3). This report specifies the interfaces and links for which you want to collect data.

Procedure 4-3 Defining a New InfoVista Report

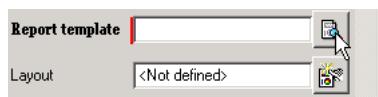
- 1 Ensure that the instances for SNMP include all the interfaces or IP addresses you want to poll:
 - 1.1 In the main InfoVista window, click the General tab.
 - 1.2 Expand the treeview so the following category is expanded:
Vistas ▶ SnmpNode ▶ Instances
 - 1.3 If this category is missing any instances, Right-click on the “Instances” branch and choose Add Instance. Then enter the instance name and click OK.



- 1.4 Repeat step 1.3 for each instance you want to add.
- 2 Choose Reports > Running.
 - ➔ The Found Reports Running dialog box appears.
- 3 Choose Edit > Add Report.
 - ➔ The “<report_name> Report” dialog box appears.
- 4 Enter a report name in the Name field.

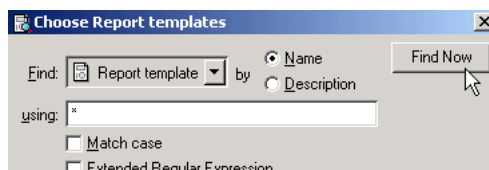
5 Apply the OPNET template:

5.1 In the “<report_name> Report” dialog box, click the button next to the “Report Template” field:



➔ The Choose Report Templates dialog box appears.

5.2 Search on the string “*” (one asterisk) to find all available templates.



5.3 Select the “Opnet Traffic/Throughput” report template and click Add.

➔ The Choose Report Templates dialog box closes.

6 Add one or more instances to the report:

6.1 In the (unnamed) (Report) dialog box, click on the button next to the Instances field.

➔ The “Instances of <report_name>” dialog box appears.

6.2 Choose Edit > Add.

➔ The “Choose Instances to add” dialog box appears.

6.3 Search on the string “*” (one asterisk) to find all available instances.

6.4 Select the instance you want to add to the report, then click Add.

➔ The “Choose instances to add” dialog box closes and the instance is added to the report.

6.5 Repeat steps step 6.1 through step 6.5 for each instance you want to add.

6.6 After you add all instances, click OK in the “Instances of <report_name>” dialog box.

7 In the “<report_name> (Report)” dialog box, verify that the State field is set to Running, then click OK

End of Procedure 4-3

Creating InfoVista Data Files Manually

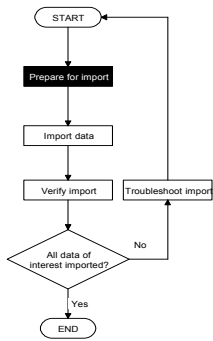
Required only if the OPNET computer cannot communicate with the InfoVista computer using telnet and ftp. Before you generate a report, you must complete Procedure 4-2 and Procedure 4-3.

Procedure 4-4 Generating an InfoVista Data File

- 1 Make sure that you have collectors installed on all hosts for which you want to capture data. For more information, see the InfoVista documentation.
- 2 If the OPNET template is not installed, do Procedure 4-2 Installing the IT Guru Report Template in InfoVista on page MVI-4-4.
- 3 If there is no report (based on the OPNET template) defined, do Procedure 4-3 Defining a New InfoVista Report on page MVI-4-5.
- 4 Generate an InfoVista report:
 - 4.1 Choose Reports > Running.
 - The Found Reports Running dialog box opens.
 - 4.2 Double-click on the report you want to generate.
 - The “<report_name> Report” widow opens and shows the data collected.
- 5 Export your report data to one or more text files:
 - 5.1 In the Report window, choose Report > Export.
 - 5.2 Choose Data (text) format. This is the data file that you will import into IT Guru.
- 6 After you create data files, go to Preparing for a Baseline Load Import on page ITU-12-3 of the Guru *User Guide*.

End of Procedure 4-4

Performance Insight Link Loads: Preparing for an Import



IT Guru can import link loads from HP OpenView Performance Insight. Table 4-6 lists the steps to do before you import Performance Insight data. After you do these steps, proceed to Importing Baseline Load Data on page ITU-12-9 of the *Guru User Guide*.

Table 4-6 HP OV Performance Insight Link Loads: Pre-Import Checklist

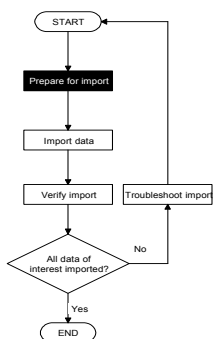
Step	When Required	Reference
Install the OPNET package Configure PI to generate data files	Once. Do these steps first.	Configuring Performance Insight on page MVI-4-8
Move data files to OPNET computer	As needed. This step is required only if the OPNET computer cannot communicate with the Performance Insight computer using telnet and ftp.	
Specify aliases	Once per scenario. Required for nodes or links that meet both these conditions: <ul style="list-style-type: none"> • Were created manually • Are referenced by the imported data 	Working with Aliases on page ITU-11-11
End of Table 4-6		

Configuring Performance Insight

To configure Performance Insight, you must install the IR_OPNET_Export_Datapipe package. You can install this package from the Performance Insight CD or download it from the HP website.

After you install the OPNET reporting package, configure Performance Insight to generate OPNET reports using this package. For more information, see the Performance Insight documentation.

Concord eHealth Baseline Loads: Preparing for an Import



IT Guru can import link loads from Concord eHealth. Table 4-7 lists the steps to perform before you import Concord eHealth data. When finished, proceed to Importing Baseline Load Data on page ITU-12-9 of the *Guru User Guide*.

Note—This section describes how to generate IT Guru-compatible data files in Concord eHealth-Network version 5.0 (on Solaris) and version 5.6 (on Windows). Procedures might differ for other versions of eHealth-Network. To see if your version is supported by IT Guru, go to <http://www.opnet.com/support> and follow the “System Requirements” link.

Table 4-7 Concord eHealth Baseline Loads: Pre-Import Checklist

Step	When Required	Reference
Create one or more object groups	This step is required if you want to collect on a subset of objects and do not have an object group defined. If you want to collect data on all objects, this step is optional.	Creating CeH Object Groups on page MVI-4-9
Create a Concord alias file	Required if you have objects in your network that are not referenced by a CeH alias file.	Creating a CeH Alias File on page MVI-4-11
Create data files Move data files to OPNET computer	As needed. These steps are required only if the OPNET computer cannot communicate with the Concord eHealth computer using telnet and ftp.	Creating CeH Data Files on page MVI-4-12
Specify node and/or interface aliases	Once per scenario. Required for nodes or links that meet both these conditions: <ul style="list-style-type: none"> • Were created manually • Are referenced by the imported data 	Working with Aliases on page ITU-11-11
End of Table 4-7		

Creating CeH Object Groups

You must do this task if both of these conditions are true:

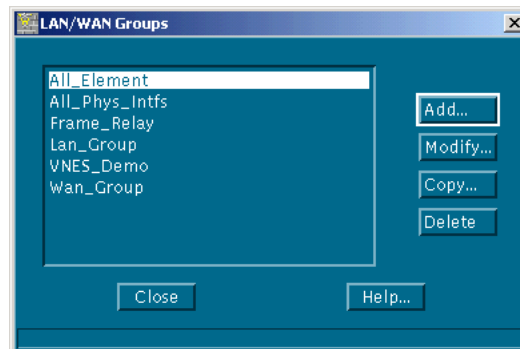
- You want to collect data for some (not all) objects in your network
- You have not yet created an object group, or you want to group a new set of objects

An object group is a collection of Concord objects for which you want to collect data. If you have objects of interest collected in groups, you can specify group names when you create alias and data files. This limits file sizes and speeds up data-collection and import times, because Concord excludes irrelevant data.

Procedure 4-5 Creating an Object Group in Concord eHealth

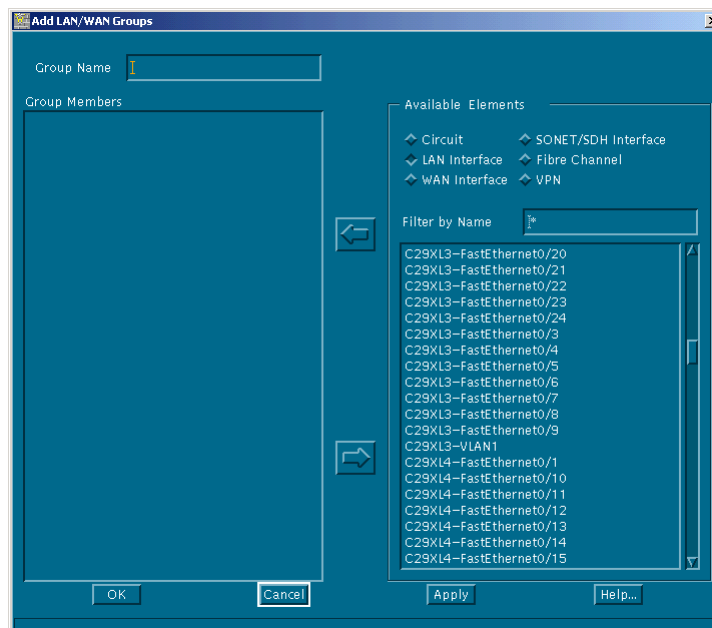
- 1 Log in to the eHealth–Network system.
- 2 From the main Concord eHealth window, choose Reports > Edit Groups > LanWan Groups.

→ The LAN/WAN Groups dialog box opens.



- 3 Click Add.

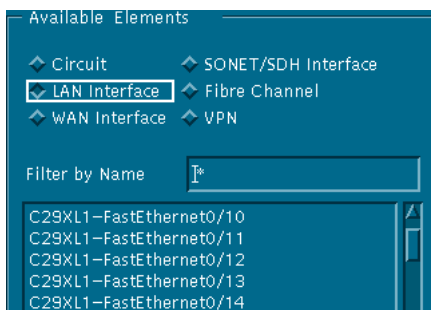
→ The Add LAN/WAN Groups dialog box opens.



- 4 To add an interface to the group:

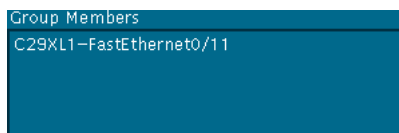
4.1 Under Available Elements, click LAN Interface or WAN Interface.

➔ The interface list shows all polled interfaces of the specified type.



4.2 To add an interface to the group, select it in the list and click the left-arrow button.

➔ The interface appears in the Group Members list.



- 5 When the group includes all interfaces for which you want to collect data, enter a name in the Group Name field.
- 6 Click OK to close the Modify LAN/WAN Groups dialog box, then click Close to close the LAN/WAN Groups dialog box.

End of Procedure 4-5

Creating a CeH Alias File

You must do this task if:

- You have not yet created an alias file
- You have an alias file, but it does not include objects of interest

You must generate a file that contains the CeH aliases of all objects for which you want to import data. A CeH alias is a name assigned by CeH, which can be different from the name obtained while querying the device using SNMP. You must include this file (along with the Concord data files) the first time you import from Concord into IT Guru.

An ideal alias file contains only aliases for objects of interest. There are a number of arguments that allow you to limit the contents of the alias file. For example, you can define a group for a subset of objects and then output the aliases for this group; for more information, see Procedure 4-5 Creating an Object Group in Concord eHealth on page MVI-4-10.

Make sure that you export all aliases for the objects of interest. If the network is large, this command might take some time to complete. If you specify arguments that limit the output set of aliases, you can reduce the execution time for this command.

The “nhExportConfig” command is used to generate alias files. Use the command “nhExportConfig –help” and study the various options available. Refer to CNH documentation for more information about this command.

The alias file should have an extension *.dco. When you specify the output filename as the argument, make sure that you append the extension. Otherwise, you can modify the filename to include the extension after it has been generated.

Note—The alias file is the key to the link-load data that is imported into IT Guru. If you import load data for an object for which there is no alias, IT Guru will not import that data.

Procedure 4-6 Creating an eHealth-Network Alias File

- 1 Log in to the eHealth–Network system.
- 2 Generate the config (.dco) file by typing the following command:

```
nhExportConfig -dciOut <file_name>.dco
```

Note—You might want to include additional command-line arguments to limit the number of objects included in the alias file.

- 3 If Concord and IT Guru are running on different computers, copy the .dco file to your IT Guru computer.

End of Procedure 4-6

Creating CeH Data Files

This step is optional. By default, generates data files automatically whenever you do an import.

The “nhExportData” command is used to generate a file that contains load data. By default, this command exports all traffic generated by the polled objects. Therefore, this file might be very large depending on the number of objects and the poll rate. You can reduce the length of this file by eliminating objects for which you do not want to export traffic. You can create a group that contains only the objects of interest and specify this group as an argument (for more information, see Procedure 4-5 on page MVI-4-10.) Use the “nhExportData –help” command to obtain a list of the arguments and refer to the CNH documentation for instructions on using them.

By default, Concord exports all traffic generated by all polled objects. Because this can result in very large data files, it is good practice to collect data for objects of interest only.

If the files are large, you can distribute traffic information into multiple files by distributing devices into different groups. You can import multiple traffic files in a single operation within IT Guru.

The data file should have an extension *.dci. When you specify the output filename as the argument, be sure to append the extension. Otherwise, modify the filename to include the extension after it has been generated.

Procedure 4-7 Creating an eHealth-Network Data File

- 1 Log in to the eHealth–Network system.
- 2 Generate the data files that contain the utilization data for the objects of interest. These are standard-format eHealth–Network data (.dci) files. You can generate a data file for a single eHealth–Network object, a group of objects, or all polled objects using the `nhExportData` command. Enter the `nhExportData -help` command to obtain a list of the available arguments and refer to the CNH documentation for information about their use.

CAUTION—A data file for all polled objects might be very large depending on the number of objects and the poll rate. For this reason, it is good practice to create data files only for objects of interest.

You can generate a data file for a single object or group of objects by entering the following command:

```
nhExportData -subjName <name> -fromDate mm/dd/yyyy -fromTime  
hh:mm:ss -toDate mm/dd/yyyy -toTime hh:mm:ss -subjType  
<subject_type> -techType <technology_type> -vars <variable> -outFile  
<file_name>.dci
```

where

- <name> is the name of a single element or group of objects for which to extract data. For more information about Concord object groups, see [Creating CeH Object Groups](#) on page MVI-4-9.
- <subject_type> is **element** if the `subjName` argument specifies one element, or **group** if the `subjName` argument specifies a group of elements
- <technology_type> is **lanWan** for links and **server** for servers
- <variable> can be one of the following:
 - **bitsIn** or **bitsOut** for links
 - **bandwidthIn** or **bandwidthOut** for links (CeH version 5.6 on Windows)
 - **bandwidthIn**, **bandwidthOut**, or **"bandwidthIn,bandwidthOut"** for links (CeH version 5.0.2 on Solaris)
 - **CpuUtilization** for servers

For more information about the other fields, type `nhExportData -help`.

- 3 If Concord and IT Guru are running on different computers, copy the .dco file to your IT Guru computer.
- 4 After you create data files, go to Preparing for a Baseline Load Import on page ITU-12-3 of the *Guru User Guide*.

End of Procedure 4-7

App A Additional DCI Procedures

This appendix contains procedures and flowcharts related to using Device Configuration Import (DCI) as part of the Multi Vendor Import (MVI) module.

Determining Cisco Device Type

The following flowchart describes the way in which DCI determines the validity of a file to be imported and the type of Cisco device from which it was taken—router, switch, or PIX firewall. In this way, Modeler can match the configuration file to the correct node type.

Figure A-1 How DCI Determines the File Type of Cisco Configuration Files

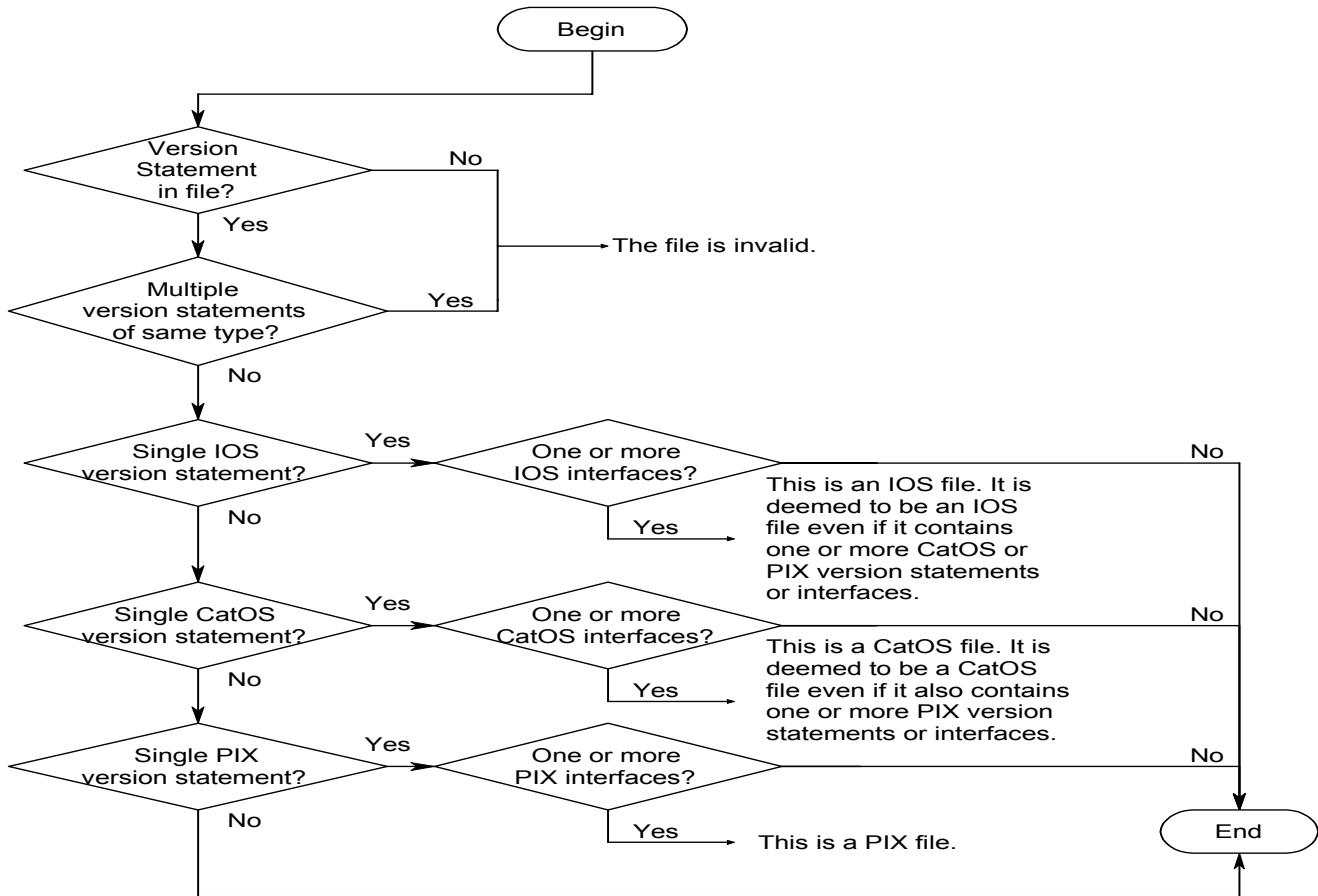
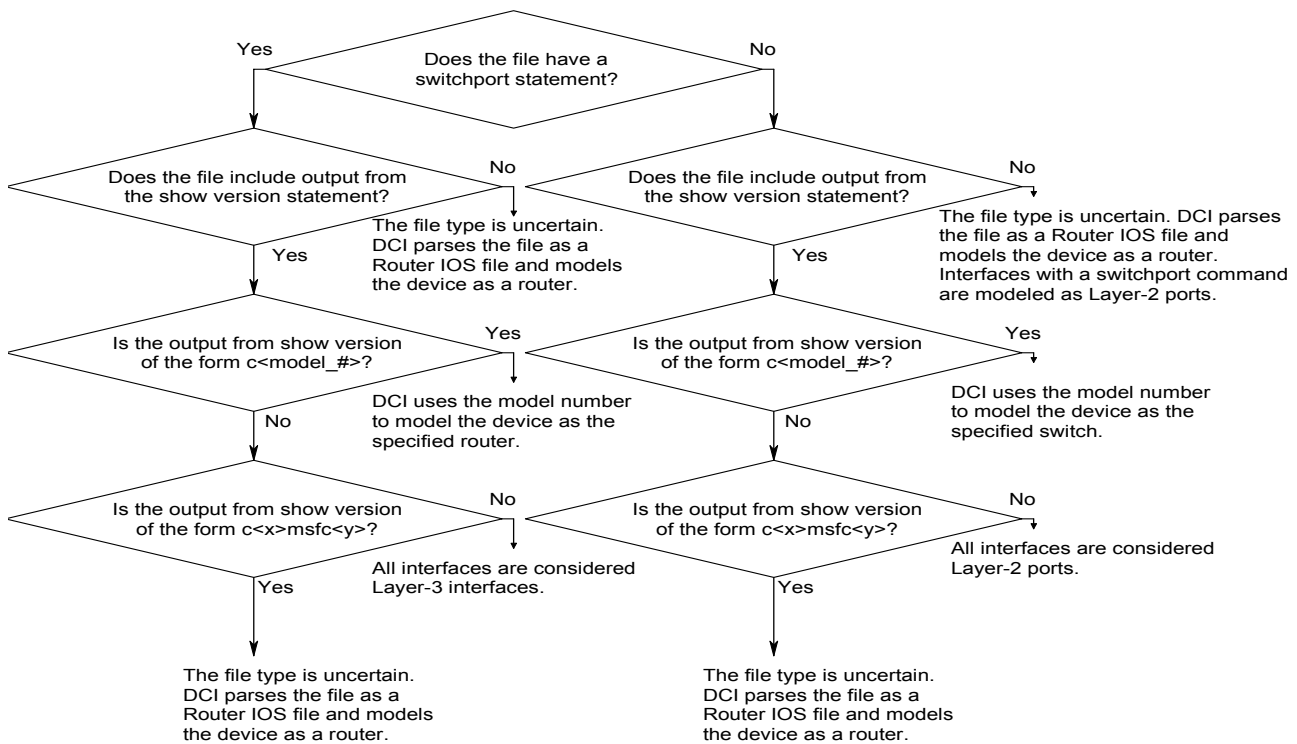


Figure A-2 How DCI Determines the Type of Cisco IOS File

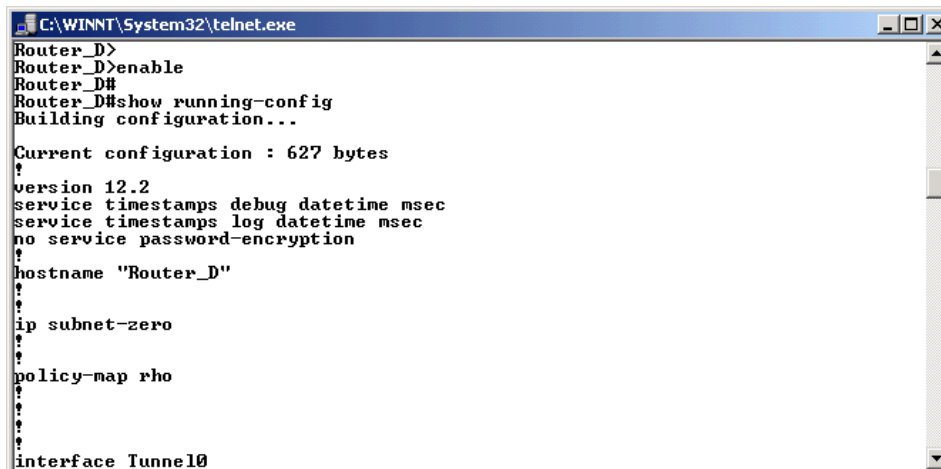
Creating Configuration Files for DCI

This section of the appendix describes the procedures for capturing the devices files to be imported with DCI.

Procedure A-1 Creating Configuration Files for Cisco Devices (excluding Catalyst Switches)

- 1 Log in to the device for which you want to create a configuration file.
- 2 Enter the following command at the login prompt to disable pauses for page breaks in output: `terminal length 0`.
 - ➔ The command will not pause after a given number of line or include “`--more--`” in the `show` command output.
- 3 Create a new text file in any text editor. Make sure that text wrapping is not enabled.
- 4 Enter the following command at the prompt (and your password, if applicable): `enable`
 - ➔ The command prompt changes to a number sign (#).
- 5 Enter the following command at the prompt: `show running-config`

6 Paste the output of the command in step 5 to the text file.



```

C:\WINNT\System32\telnet.exe
Router_D>
Router_D>enable
Router_D#
Router_D#show running-config
Building configuration...

Current configuration : 627 bytes
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname "Router_D"
!
!
ip subnet-zero
!
!
policy-map rho
!
!
!
interface Tunnel0

```

7 Repeat step 5 and step 6 for the following commands.

- show version
- show frame-relay map
- show atm map
- show cdp neighbors detail
- show vlan

Note—This step is optional for PIX devices and routers running IOS. The information from the show version command helps DCI match the device type. The information from the show cdp neighbors detail command helps DCI identify neighbors for switch port connectivity or when there are unnumbered interfaces. The static mapping information from the show atm map and show frame-relay map commands is needed for the importing of actual PVC topology, rather than the creation of a full-mesh of PVCs.

➔ You should now have a text file that consists of the output of all five commands. Make sure that the output from the show running-config command appears before the output of any other commands.

8 Save the text file. This is the configuration file that DCI needs to import information about the router.

9 Log out of the router.

End of Procedure A-1

Procedure A-2 Creating Configuration Files for Cisco Catalyst Switches (Running CatOS)

1 Log in to the switch for which you want to create a configuration file.

- 2 Enter the following command at the login prompt to disable pauses for page breaks in output: `set length 0`.
 - ➔ The command will not pause after a given number of line or include “--more--” in the `show` command output.
- 3 Create a new text file in any text editor. Make sure that text wrapping is not enabled.
- 4 Enter the following command at the prompt (and your password, if applicable): `enable`
 - ➔ “(enable)” appears in the command prompt.
- 5 Enter the following command at the prompt: `show config all`
- 6 Paste the output of the command in step 5 to the text file.

Figure A-3 Creating a Configuration File for a Cisco Switch

```

C:\WINNT\System32\telnet.exe
C5505_1
C5505_1 enable

Enter password:
C5505_1 (enable) show config all
.....
.....
.....

..

begin
#
# ***** ALL (DEFAULT and NON-DEFAULT) CONFIGURATION *****
#
#time: Mon Jul 19 2004, 01:47:37
#
#version 6.4(2)
#
set option fddi-user-pri enabled
set feature fw-disable disable
set feature no-isl-entries disable

```

- 7 Enter the following command at the prompt: `show cdp neighbors detail`. DCI needs the output of this command to establish layer-2 connectivity.
- 8 Paste the output of the command in step 7 to the text file.
- 9 Save the text file. This is the configuration file that DCI needs to import information about the switch.
- 10 Log out of the switch.

End of Procedure A-2

Procedure A-3 Creating Configuration Files for Juniper Routers

- 1 Log in to the router for which you want to create a configuration file.
- 2 Create a new text file in any text editor. Make sure that text wrapping is not enabled.

- 3 Enter the following command at the prompt: `show configuration`
- 4 Paste the output of the command in step 3 to the text file.

Figure A-4 Creating a Configuration File for a Juniper Router

```

C:\WINNT\system32\telnet.exe
-- JUNOS 6.0R1.3 built 2003-07-24 02:20:37 UTC

opnet@juniper_lsr>
opnet@juniper_lsr> show configuration
version 6.0R1.3;
groups <
  mpls-lsp-group <
    protocols <
      mpls <
        label-switched-path juniper_lsr-cisco_lsr <
          primary juniper_cisco_lsr;
          secondary juniper_cisco_lsr_1;
        >
      >
    >
  >
  mpls-er-group <
    protocols <
      mpls <
        path juniper_cisco_lsr <
          10.1.1.21 strict;
          10.1.1.9 strict;
        >
      >
    path juniper_cisco_lsr_1 <

```

- 5 Enter the following command at the prompt: `show version`
- 6 Paste the output of the command in step 5 to the text file.
- 7 Save the text file. This is the configuration file that DCI needs to import information about the router.
- 8 Log out of the router.

End of Procedure A-3

Setting Import Preferences

Procedure A-4 Setting Import Preference for Layer-3 Devices Only

- 1 Choose Edit > Preferences.
- 2 Type 'device' into the Find input area at the top of the dialog, and click on the Find button. You will see a list of device_import options.
- 3 Look for the option named 'device_import.layer3_only_import', and change the value from FALSE to TRUE. Click OK.

Note—The default value for this preference is FALSE, permitting import of all device types. To enable the importing of Layer-3 devices only, set the value to TRUE. You must restart IT Guru for the change to become effective

- 4 Quit and restart OPNET to enact the change.

Note—You can also edit preferences by opening the env_db file in a text editor.

Procedure A-5 Setting Import Preference to Allow Partial Import

- 1 Choose Edit > Preferences.
- 2 Type 'device' into the Find input area at the top of the dialog, and click on the Find button. You will see a list of device_import options.
- 3 Look for the option named 'device_import.skip_partial_devices', and change the value from FALSE to TRUE. Click OK.

Note—The default value for this preference is FALSE, permitting import of partial devices. To skip importing partial devices, set the value to TRUE. You must restart IT Guru for the change to become effective.

- 4 Quit and restart OPNET to enact the change.

Note—You can also edit preferences by opening the env_db file in a text editor.

End of Procedure A-5

Procedure A-6 Disable Import Preference to Infer Layer-3 IP Tunnel Cloud

- 1 Choose Edit > Preferences.
- 2 Type 'device' into the Find input area at the top of the dialog, and click on the Find button. You will see a list of device_import options.
- 3 Look for the option named 'device_import.tunnel_cloud_import', and change the value from TRUE to FALSE. Click OK.

Note—The default value for this preference is TRUE, permitting OPNET to infer Layer-3 IP clouds from IP tunnel configurations when there is no Layer-2 connectivity. To disable the inference of Layer-3 IP tunnel clouds, set the value to FALSE. You must restart IT Guru for the change to become effective.

- 4 Quit and restart OPNET to enact the change.

Note—You can also edit preferences by opening the env_db file in a text editor.

End of Procedure A-6

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