

Technology Overview

Retrieving Virtual Private Network Information Using SNMP

Release

11.4



Published: 2011-11-08

Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net

This product includes the Envoy SNMP Engine, developed by Epilogue Technology, an Integrated Systems Company. Copyright © 1986-1997, Epilogue Technology Corporation. All rights reserved. This program and its documentation were developed at private expense, and no part of them is in the public domain.

This product includes memory allocation software developed by Mark Moraes, copyright © 1988, 1989, 1993, University of Toronto.

This product includes FreeBSD software developed by the University of California, Berkeley, and its contributors. All of the documentation and software included in the 4.4BSD and 4.4BSD-Lite Releases is copyrighted by the Regents of the University of California. Copyright © 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994. The Regents of the University of California. All rights reserved.

GateD software copyright © 1995, the Regents of the University. All rights reserved. Gate Daemon was originated and developed through release 3.0 by Cornell University and its collaborators. Gated is based on Kirton's EGP, UC Berkeley's routing daemon (routed), and DCN's HELLO routing protocol. Development of Gated has been supported in part by the National Science Foundation. Portions of the GateD software copyright © 1988, Regents of the University of California. All rights reserved. Portions of the GateD software copyright © 1991, D. L. S. Associates.

This product includes software developed by Maker Communications, Inc., copyright © 1996, 1997, Maker Communications, Inc.

Juniper Networks, Junos, Steel-Belted Radius, NetScreen, and ScreenOS are registered trademarks of Juniper Networks, Inc. in the United States and other countries. The Juniper Networks Logo, the Junos logo, and JunosE are trademarks of Juniper Networks, Inc. All other trademarks, service marks, registered trademarks, or registered service marks are the property of their respective owners.

Juniper Networks assumes no responsibility for any inaccuracies in this document. Juniper Networks reserves the right to change, modify, transfer, or otherwise revise this publication without notice.

Products made or sold by Juniper Networks or components thereof might be covered by one or more of the following patents that are owned by or licensed to Juniper Networks: U.S. Patent Nos. 5,473,599, 5,905,725, 5,909,440, 6,192,051, 6,333,650, 6,359,479, 6,406,312, 6,429,706, 6,459,579, 6,493,347, 6,538,518, 6,538,899, 6,552,918, 6,567,902, 6,578,186, and 6,590,785.

Technology Overview Retrieving Virtual Private Network Information Using SNMP

Release 11.4

Copyright © 2011, Juniper Networks, Inc.

All rights reserved.

Revision History

October 2011—R1 Junos OS 11.4

The information in this document is current as of the date listed in the revision history.

YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

END USER LICENSE AGREEMENT

The Juniper Networks product that is the subject of this technical documentation consists of (or is intended for use with) Juniper Networks software. Use of such software is subject to the terms and conditions of the End User License Agreement ("EULA") posted at <http://www.juniper.net/support/eula.html>. By downloading, installing or using such software, you agree to the terms and conditions of that EULA.

Table of Contents

Introduction	1
SNMP Overview	3
Example: Retrieving VRF VPN Information Using SNMP	5

Introduction

This document describes how to retrieve and interpret Layer 3 VPN routing and forwarding information by using SNMP.

SNMP Overview

SNMP enables users to monitor network devices from a central location. Many network management systems (NMS) are based on SNMP, and support for this protocol is a key feature of most network devices.

Juniper Networks provides many different platforms that support SNMP on the Junos OS. The Junos OS includes an onboard SNMP agent that provides remote management applications with access to detailed information about the devices on the network.

A typical SNMP implementation contains three components:

- Managed devices – Such as routers and switches.
- SNMP agent – Process that resides on a managed device and communicates with the NMS.
- NMS – A combination of hardware and software used to monitor and administer the network; network device that runs SNMP manager software. Also referred to as an SNMP manager.

The SNMP agent exchanges network management information with the SNMP manager (NMS). The agent responds to requests for information and actions from the manager. The SNMP manager collects information about network connectivity, activity, and events by polling managed devices.

SNMP implementation in the Junos OS uses a master SNMP agent (known as the SNMP process or `snmpd`) that resides on the managed device. Various subagents reside on different modules of the Junos OS as well (such as the Routing Engine), and these subagents are managed by the `snmpd`.

Example: Retrieving VRF VPN Information Using SNMP

This example describes how to retrieve and interpret Layer 3 VPN routing and forwarding information by using SNMP and includes the following sections:

- [Requirements on page 5](#)
- [Overview on page 5](#)
- [Configuration on page 6](#)
- [Verifying VRF VPN Information by Using SNMP on page 6](#)

Requirements

The routers used in this example are Juniper Networks M Series Multiservice Edge Routers, T Series Core Routers, or MX Series 3D Universal Edge Routers. The network management system (NMS) is a workstation running the UNIX operating system with the standard SNMP application available in UNIX.

SNMP applications are preinstalled on Linux and Solaris OS versions of UNIX. SNMP applications are available in open source code and can be installed on any operating system, including Windows systems. Network management applications, such as IBM Tivoli, provide their own SNMP tools.

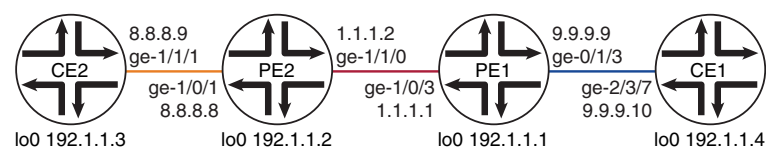
Overview

This example shows how to retrieve virtual private network (VPN) routing and forwarding (VRF) information using SNMP to display management information base (MIB) objects.

In [Figure 1 on page 5](#):

- Provider edge (PE) routers PE1 and PE2 are configured with a VRF routing instance named `jnp13vpn`.
- Customer edge (CE) routers CE1 and CE2 communicate across the VPN service using subnetwork 192.1.1.0.

Figure 1: VRF VPN Example Topology



g040549

Configuration

The network is preconfigured with a VRF VPN named **jnprl3vpn** and uses the interfaces and IP addresses shown in [Figure 1 on page 5](#). This example describes how to retrieve the VPN configuration and status information by using SNMP.

Verifying VRF VPN Information by Using SNMP

To confirm the configuration of the VRF VPN, perform these tasks:

- [Display the MPLS VPN MIB on page 6](#)
- [Display the VPN Interface Index Information on page 7](#)
- [Display the VRF Route Table Information on page 9](#)
- [Display the Interface Name for an Interface Index on page 15](#)
- [Display the Interface Index for Interfaces Configured for a VRF Routing Instance on page 15](#)

Display the MPLS VPN MIB

Purpose Retrieve and display a table of information describing the VRF routing instance and the associated attributes on a PE router.

Action To display the VRF routing instance information, use the **snmpwalk** command on a network management station. Specify the SNMP read community string, the router IP address, and the MIB object identifier (OID) to identify which portion of the object identifier space is searched using SNMP GET NEXT requests. In the following example, the SNMP read community string is **petblr**, the IP address is **116.197.178.2**, and the MIB OID is **mplsVpnMIB**. For more information about the **snmpwalk** command, see the man pages on your workstation.



NOTE: The IP address specified in the **snmpwalk** command can be the fxp0 Ethernet console port, the lo0.0 loopback interface, or any transit interface that is configured to respond to SNMP requests. By default, all interfaces are configured to respond to SNMP requests.

```
user@host_shell>snmpwalk -v1 -c petblr 116.197.178.2 mplsVpnMIB
```

```
MPLS-VPN-MIB::mplsVpnConfiguredVrfs.0 = Gauge32: 1
MPLS-VPN-MIB::mplsVpnActiveVrfs.0 = Gauge32: 1
MPLS-VPN-MIB::mplsVpnConnectedInterfaces.0 = Gauge32: 2
MPLS-VPN-MIB::mplsVpnNotificationEnable.0 = INTEGER: false(2)
MPLS-VPN-MIB::mplsVpnVrfConfMaxPossibleRoutes.0 = Gauge32: 0
MPLS-VPN-MIB::mplsVpnVrfConfRouteMaxThreshTime.0 = Gauge32: 0 seconds
MPLS-VPN-MIB::mplsVpnVrfVpnId."jnprl3vpn" = ""
MPLS-VPN-MIB::mplsVpnVrfDescription."jnprl3vpn" = STRING: jnprl3vpn
MPLS-VPN-MIB::mplsVpnVrfRouteDistinguisher."jnprl3vpn" = STRING: "1234:1"
MPLS-VPN-MIB::mplsVpnVrfCreationTime."jnprl3vpn" = Timeticks: (114092600) 13 days, 4:55:26.00
MPLS-VPN-MIB::mplsVpnVrfOperStatus."jnprl3vpn" = INTEGER: up(1)
MPLS-VPN-MIB::mplsVpnVrfActiveInterfaces."jnprl3vpn" = Gauge32: 2
```

```

MPLS-VPN-MIB::mplsVpnVrfAssociatedInterfaces."jnprl3vpn" = Gauge32: 2
MPLS-VPN-MIB::mplsVpnVrfConfMidRouteThreshold."jnprl3vpn" = Gauge32: 0
MPLS-VPN-MIB::mplsVpnVrfConfHighRouteThreshold."jnprl3vpn" = Gauge32: 0
MPLS-VPN-MIB::mplsVpnVrfConfMaxRoutes."jnprl3vpn" = Gauge32: 0
MPLS-VPN-MIB::mplsVpnVrfConfLastChanged."jnprl3vpn" = Timeticks: (114095300) 13 days, 4:55:53.00
MPLS-VPN-MIB::mplsVpnVrfConfRowStatus."jnprl3vpn" = INTEGER: active(1)
MPLS-VPN-MIB::mplsVpnVrfConfStorageType."jnprl3vpn" = INTEGER: readOnly(5)
MPLS-VPN-MIB::mplsVpnVrfRouteTarget."jnprl3vpn".0.both = STRING: "1234:1"
MPLS-VPN-MIB::mplsVpnVrfRouteTargetDescr."jnprl3vpn".0.both = STRING:
MPLS-VPN-MIB::mplsVpnVrfRouteTargetRowStatus."jnprl3vpn".0.both = INTEGER: active(1)
MPLS-VPN-MIB::mplsVpnVrfPerfRoutesAdded."jnprl3vpn" = Counter32: 19
MPLS-VPN-MIB::mplsVpnVrfPerfRoutesDeleted."jnprl3vpn" = Counter32: 0
MPLS-VPN-MIB::mplsVpnVrfPerfCurrNumRoutes."jnprl3vpn" = Gauge32: 19

```

Meaning In the sample output:

- The **mplsVpnVrfDescription** MIB object shows **jnprl3vpn** as the description of the VRF routing instance configured on the router. If the description is not configured, the MIB object displays the VRF name by default.
- The **mplsVpnVrfRouteDistinguisher** MIB object shows **1234:1** as the route distinguisher for this VPN.
- The **mplsVpnVrfOperStatus** MIB object shows **(up)1** as the operational status of the VRF routing instance.
- The **mplsVpnVrfRouteTarget** MIB object shows **1234:1** as the route target for this VPN.

Another way to display the VRF routing instance information is to use the **show snmp mib** command and specify the MPLS VPN MIB table (**mplsVpnMIB**).

For more information about the MIB objects shown in this sample output, see *draft-ietf-ppvpn-mpls-vpn-mib-05.txt*, *MPLS/BGP Virtual Private Network Management Information Base Using SMIv2*.

Display the VPN Interface Index Information

Purpose Retrieve and display a table of VRF routing instance interface information on a PE router.

Action To display the VRF routing instance interface information, use the **show snmp mib** command. Specify the **walk** option, specify the **jnxVpnMIB** VPN interface MIB table, and to display the information in a more user-friendly format, specify the **ascii** option.

```
user@PE1> show snmp mib walk jnxVpnMIB ascii
```

```

jnxVpnConfiguredVpns.0 = 1
jnxVpnActiveVpns.0 = 1
jnxVpnNextIfIndex.0 = 0
jnxVpnNextPwIndex.0 = 0
jnxVpnNextRTIndex.0 = 0
jnxVpnRowStatus.2."jnprl3vpn" = 1
jnxVpnStorageType.2."jnprl3vpn" = 5
jnxVpnDescription.2."jnprl3vpn" = jnprl3vpn
jnxVpnIdentifierType.2."jnprl3vpn" = 5
jnxVpnIdentifier.2."jnprl3vpn" = 5-1234:1
jnxVpnConfiguredSites.2."jnprl3vpn" = 0
jnxVpnActiveSites.2."jnprl3vpn" = 0

```

```
jnxVpnLocalAddresses.2."jnpr13vpn" = 0
jnxVpnTotalAddresses.2."jnpr13vpn" = 0
jnxVpnAge.2."jnpr13vpn" = 31000
jnxVpnIfRowStatus.2."jnpr13vpn".518 = 1
jnxVpnIfRowStatus.2."jnpr13vpn".536 = 1
jnxVpnIfStorageType.2."jnpr13vpn".518 = 5
jnxVpnIfStorageType.2."jnpr13vpn".536 = 5
jnxVpnIfAssociatedPw.2."jnpr13vpn".518 = 0
jnxVpnIfAssociatedPw.2."jnpr13vpn".536 = 0
jnxVpnIfProtocol.2."jnpr13vpn".518 = 0
jnxVpnIfProtocol.2."jnpr13vpn".536 = 0
jnxVpnIfInBandwidth.2."jnpr13vpn".518 = 0
jnxVpnIfInBandwidth.2."jnpr13vpn".536 = 0
jnxVpnIfOutBandwidth.2."jnpr13vpn".518 = 0
jnxVpnIfOutBandwidth.2."jnpr13vpn".536 = 0
jnxVpnIfStatus.2."jnpr13vpn".518 = 5
jnxVpnIfStatus.2."jnpr13vpn".536 = 5
jnxVpnRTRowStatus.2."jnpr13vpn".1 = 1
jnxVpnRTStorageType.2."jnpr13vpn".1 = 5
jnxVpnRTType.2."jnpr13vpn".1 = 6
jnxVpnRT.2."jnpr13vpn".1 = 1234:1
jnxVpnRTFunction.2."jnpr13vpn".1 = 3
```

Meaning In the sample output:

- The **jnxVpnDescription** MIB object shows the description of the VRF routing instance. In this example the description is the name of the VRF routing instance.
- The **jnxVpnIfRowStatus** MIB object shows the operational status of the VRF routing instance interfaces. The last index in the table identifies the interface index (ifIndex) of the interface. In this example the highlighted interface indexes are **518** and **536**.

The following MIB object definitions are from the enterprise-specific MIB files supplied by Juniper Networks. The MIB object description can be useful in understanding the meaning and purpose of a MIB object. The following sample definitions are provided for your reference.

```
jnxVpnIfEntry OBJECT-TYPE
    SYNTAX      JnxVpnIfEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Entry containing information about a particular VPN
         interface."
    INDEX { jnxVpnIfVpnType, jnxVpnIfVpnName, jnxVpnIfIndex }
    ::= { jnxVpnIfTable 1 }
```

```
jnxVpnIfIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  accessible-for-notify
    STATUS      current
    DESCRIPTION
        "The index of this interface in the VPN. Each interface
         in the VPN is given a unique index. The RowStatus says
         whether a given interface (i.e., a row in this table)
         is valid or not. Note: this index MUST NOT be zero."
```

```
::= { jnxVpnIfEntry 3 }
```

Supported MIBs are described in the *Junos OS SNMP MIBs and Traps Reference*. Juniper Networks enterprise-specific MIBs can be downloaded from http://www.juniper.net/techpubs/en_US/junos10.2/information-products/topic-collections/reference-mibs-and-traps/topic-21572.html.

For more information about the **show snmp mib** command, see the *Junos OS System Basics and Services Command Reference*.

Display the VRF Route Table Information

Purpose Retrieve and display a table of information describing the VRF routing table on a PE router.

Action To display the VRF routing table information, use the **snmpwalk** command on a network management station. Specify the name of the VRF routing instance and the SNMP read community string in the format **vrfname@communitystring**. Also specify the router IP address and the MIB OID. In the following example, the routing instance is **jnprl3vpn**, the SNMP read community string is **petblr**, the IP address is **116.197.178.2**, and the OID is **1.3.6.1.2.1.4**.

```
user@host_shell>snmpwalk -v1 -c jnprl3vpn@petblr 116.197.178.2 1.3.6.1.2.1.4
```

```
IP-MIB::ipForwarding.0 = INTEGER: forwarding(1)
IP-MIB::ipDefaultTTL.0 = INTEGER: 64
IP-MIB::ipInReceives.0 = Counter32: 2786616
IP-MIB::ipInHdrErrors.0 = Counter32: 0
IP-MIB::ipInAddrErrors.0 = Counter32: 0
IP-MIB::ipForwDatagrams.0 = Counter32: 9600
IP-MIB::ipInUnknownProtos.0 = Counter32: 12
IP-MIB::ipInDiscards.0 = Counter32: 0
IP-MIB::ipInDelivers.0 = Counter32: 2778416
IP-MIB::ipOutRequests.0 = Counter32: 2835725
IP-MIB::ipOutDiscards.0 = Counter32: 0
IP-MIB::ipOutNoRoutes.0 = Counter32: 0
IP-MIB::ipReasmTimeout.0 = INTEGER: 60
IP-MIB::ipReasmReqds.0 = Counter32: 0
IP-MIB::ipReasmOKs.0 = Counter32: 0
IP-MIB::ipReasmFails.0 = Counter32: 0
IP-MIB::ipFragOKs.0 = Counter32: 0
IP-MIB::ipFragFails.0 = Counter32: 0
IP-MIB::ipFragCreates.0 = Counter32: 0
IP-MIB::ipAdEntAddr.8.8.8.8 = IpAddress: 8.8.8.8
IP-MIB::ipAdEntIfIndex.8.8.8.8 = INTEGER: 518
IP-MIB::ipAdEntNetMask.8.8.8.8 = IpAddress: 255.255.255.0
IP-MIB::ipAdEntBcastAddr.8.8.8.8 = INTEGER: 1
IP-MIB::ipAdEntReasmMaxSize.8.8.8.8 = INTEGER: 65535
IP-MIB::ipNetToMediaIfIndex.518.8.8.8.8 = INTEGER: 518
IP-MIB::ipNetToMediaIfIndex.518.8.8.8.9 = INTEGER: 518
IP-MIB::ipNetToMediaPhysAddress.518.8.8.8.8 = STRING: 0:22:83:15:bc:7f
IP-MIB::ipNetToMediaPhysAddress.518.8.8.8.9 = STRING: 0:21:59:ad:53:3b
IP-MIB::ipNetToMediaNetAddress.518.8.8.8.8 = IpAddress: 8.8.8.8
IP-MIB::ipNetToMediaNetAddress.518.8.8.8.9 = IpAddress: 8.8.8.9
IP-MIB::ipNetToMediaType.518.8.8.8.8 = INTEGER: static(4)
IP-MIB::ipNetToMediaType.518.8.8.8.9 = INTEGER: dynamic(3)
```

```
IP-MIB::ipRoutingDiscards.0 = Counter32: 0
IP-FORWARD-MIB::ipCidrRouteNumber.0 = Gauge32: 19
IP-FORWARD-MIB::ipCidrRouteDest.1.1.1.0.255.255.255.0.0.8.8.8.9 = IpAddress: 1.1.1.0
IP-FORWARD-MIB::ipCidrRouteDest.6.6.6.1.255.255.255.255.0.8.8.8.9 = IpAddress: 6.6.6.1
IP-FORWARD-MIB::ipCidrRouteDest.7.7.7.0.255.255.255.0.0.8.8.8.9 = IpAddress: 7.7.7.0
IP-FORWARD-MIB::ipCidrRouteDest.8.8.8.0.255.255.255.0.0.0.0.0.0 = IpAddress: 8.8.8.0
IP-FORWARD-MIB::ipCidrRouteDest.8.8.8.255.255.255.255.0.0.0.0.0.0 = IpAddress: 8.8.8.8
IP-FORWARD-MIB::ipCidrRouteDest.9.9.9.0.255.255.255.0.0.8.8.8.9 = IpAddress: 9.9.9.0
IP-FORWARD-MIB::ipCidrRouteDest.10.250.1.0.255.255.255.252.0.8.8.8.9 = IpAddress: 10.250.1.0
IP-FORWARD-MIB::ipCidrRouteDest.10.250.1.4.255.255.255.252.0.8.8.8.9 = IpAddress: 10.250.1.4
IP-FORWARD-MIB::ipCidrRouteDest.10.250.1.8.255.255.255.252.0.8.8.8.9 = IpAddress: 10.250.1.8
IP-FORWARD-MIB::ipCidrRouteDest.10.250.1.16.255.255.255.252.0.8.8.8.9 = IpAddress: 10.250.1.16
IP-FORWARD-MIB::ipCidrRouteDest.10.250.1.20.255.255.255.252.0.8.8.8.9 = IpAddress: 10.250.1.20
IP-FORWARD-MIB::ipCidrRouteDest.10.250.1.24.255.255.255.252.0.8.8.8.9 = IpAddress: 10.250.1.24
IP-FORWARD-MIB::ipCidrRouteDest.10.250.1.28.255.255.255.252.0.8.8.8.9 = IpAddress: 10.250.1.28
IP-FORWARD-MIB::ipCidrRouteDest.192.1.1.1.255.255.255.255.0.8.8.8.9 = IpAddress: 192.1.1.1
IP-FORWARD-MIB::ipCidrRouteDest.192.1.1.2.255.255.255.255.0.8.8.8.9 = IpAddress: 192.1.1.2
IP-FORWARD-MIB::ipCidrRouteDest.192.1.1.3.255.255.255.255.0.8.8.8.9 = IpAddress: 192.1.1.3
IP-FORWARD-MIB::ipCidrRouteDest.192.1.1.4.255.255.255.255.0.8.8.8.9 = IpAddress: 192.1.1.4
IP-FORWARD-MIB::ipCidrRouteDest.192.1.1.6.255.255.255.255.0.8.8.8.9 = IpAddress: 192.1.1.6
IP-FORWARD-MIB::ipCidrRouteDest.224.0.0.5.255.255.255.255.0.0.0.0.0.0 = IpAddress: 224.0.0.5
IP-FORWARD-MIB::ipCidrRouteMask.1.1.1.0.255.255.255.0.0.8.8.8.9 = IpAddress: 255.255.255.0
IP-FORWARD-MIB::ipCidrRouteMask.6.6.6.1.255.255.255.255.0.8.8.8.9 = IpAddress: 255.255.255.255
IP-FORWARD-MIB::ipCidrRouteMask.7.7.7.0.255.255.255.0.0.8.8.8.9 = IpAddress: 255.255.255.0
IP-FORWARD-MIB::ipCidrRouteMask.8.8.8.0.255.255.255.0.0.0.0.0.0 = IpAddress: 255.255.255.0
IP-FORWARD-MIB::ipCidrRouteMask.8.8.8.255.255.255.255.0.0.0.0.0.0 = IpAddress: 255.255.255.255
IP-FORWARD-MIB::ipCidrRouteMask.9.9.9.0.255.255.255.0.0.8.8.8.9 = IpAddress: 255.255.255.0
IP-FORWARD-MIB::ipCidrRouteMask.10.250.1.0.255.255.255.252.0.8.8.8.9 = IpAddress: 255.255.255.252
IP-FORWARD-MIB::ipCidrRouteMask.10.250.1.4.255.255.255.252.0.8.8.8.9 = IpAddress: 255.255.255.252
IP-FORWARD-MIB::ipCidrRouteMask.10.250.1.8.255.255.255.252.0.8.8.8.9 = IpAddress: 255.255.255.252
IP-FORWARD-MIB::ipCidrRouteMask.10.250.1.16.255.255.255.252.0.8.8.8.9 = IpAddress: 255.255.255.252
IP-FORWARD-MIB::ipCidrRouteMask.10.250.1.20.255.255.255.252.0.8.8.8.9 = IpAddress: 255.255.255.252
IP-FORWARD-MIB::ipCidrRouteMask.10.250.1.24.255.255.255.252.0.8.8.8.9 = IpAddress: 255.255.255.252
IP-FORWARD-MIB::ipCidrRouteMask.10.250.1.28.255.255.255.252.0.8.8.8.9 = IpAddress: 255.255.255.252
IP-FORWARD-MIB::ipCidrRouteMask.192.1.1.1.255.255.255.255.0.8.8.8.9 = IpAddress: 255.255.255.255
IP-FORWARD-MIB::ipCidrRouteMask.192.1.1.2.255.255.255.255.0.8.8.8.9 = IpAddress: 255.255.255.255
IP-FORWARD-MIB::ipCidrRouteMask.192.1.1.3.255.255.255.255.0.8.8.8.9 = IpAddress: 255.255.255.255
IP-FORWARD-MIB::ipCidrRouteMask.192.1.1.4.255.255.255.255.0.8.8.8.9 = IpAddress: 255.255.255.255
IP-FORWARD-MIB::ipCidrRouteMask.192.1.1.6.255.255.255.255.0.8.8.8.9 = IpAddress: 255.255.255.255
IP-FORWARD-MIB::ipCidrRouteMask.224.0.0.5.255.255.255.255.0.0.0.0.0.0 = IpAddress: 255.255.255.255
IP-FORWARD-MIB::ipCidrRouteTos.1.1.1.0.255.255.255.0.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.6.6.6.1.255.255.255.255.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.7.7.7.0.255.255.255.0.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.8.8.8.0.255.255.255.0.0.0.0.0.0 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.8.8.8.255.255.255.255.0.0.0.0.0.0 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.9.9.9.0.255.255.255.0.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.10.250.1.0.255.255.255.252.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.10.250.1.4.255.255.255.252.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.10.250.1.8.255.255.255.252.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.10.250.1.16.255.255.255.252.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.10.250.1.20.255.255.255.252.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.10.250.1.24.255.255.255.252.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.10.250.1.28.255.255.255.252.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.192.1.1.1.255.255.255.255.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.192.1.1.2.255.255.255.255.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.192.1.1.3.255.255.255.255.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.192.1.1.4.255.255.255.255.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.192.1.1.6.255.255.255.255.0.8.8.8.9 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteTos.224.0.0.5.255.255.255.255.0.0.0.0.0.0 = INTEGER: 0
IP-FORWARD-MIB::ipCidrRouteNextHop.1.1.1.0.255.255.255.0.0.8.8.8.9 = IpAddress: 8.8.8.9
IP-FORWARD-MIB::ipCidrRouteNextHop.6.6.6.1.255.255.255.255.0.8.8.8.9 = IpAddress: 8.8.8.9
```

Copyright © 2011, Juniper Networks, Inc. 11

Copyright © 2011, Juniper Networks, Inc. 13

IP-FORWARD-MIB::ipCidrRouteStatus.192.1.1.6.255.255.255.255.0.8.8.8.9 = INTEGER: active(1)
 IP-FORWARD-MIB::ipCidrRouteStatus.224.0.0.5.255.255.255.255.0.0.0.0.0 = INTEGER: active(1)

Meaning In the sample output:

- The IP-MIB::ipNetToMediaPhysAddress.518.8.8.8.9 MIB object shows the Ethernet MAC address of the interface that has IP address 8.8.8.9, and is directly connected to the interface with interface index 518.
- The IP-MIB::ipNetToMediaNetAddress.518.8.8.8.9 MIB object shows the IP address of the interface directly connected to the interface with interface index 518.
- The IP-FORWARD-MIB::ipCidrRouteDest.192.1.1.3.255.255.255.255.0.8.8.8.9 MIB object shows there is a route to reach IP address 192.1.1.3, which is the address configured on the loopback interface (lo0) of Router CE1.
- The IP-FORWARD-MIB::ipCidrRouteNextHop.192.1.1.3.255.255.255.255.0.8.8.8.9 MIB object shows the next hop for reaching IP address 192.1.1.3 through the interface with interface index 518.
- The IP-FORWARD-MIB::ipCidrRouteIfIndex.1.1.1.0.255.255.255.0.0.8.8.8.9 MIB object shows the interface index for the interface used to reach IP subnet 1.1.1.0.
- The IP-FORWARD-MIB::ipCidrRouteIfIndex.8.8.8.0.255.255.255.0.0.0.0.0 MIB object shows the interface index for the interface used to reach IP subnet 8.8.8.0.
- The IP-FORWARD-MIB::ipCidrRouteIfIndex.192.1.1.3.255.255.255.255.0.8.8.8.9 MIB object shows the interface index for the interface used to reach IP address 192.1.1.3.

Display the Interface Name for an Interface Index

Purpose Retrieve and display the interface name for a given interface index.

Action To display the interface name for a given interface index, use the **show snmp mib** command and specify the interface index number:

Sample Output

```
user@PE2> show snmp mib get ifName.518
ifName.518      = ge-1/0/1.0
```

Meaning In the sample output interface index 518 is identified as the ge-1/0/1.0 interface.

Display the Interface Index for Interfaces Configured for a VRF Routing Instance

Purpose Retrieve and display the interface index for a given VRF routing instance.

Action To display the interface index for a given VRF routing instance, use the **snmpwalk** command on a network management station. Specify the name of the VRF routing instance and the SNMP read community string in the format **vrfname@communitystring**. Also specify the IP address of the router and the MIB object identifier (OID). In the following example, the routing instance name is **jnpri3vpn**, the SNMP read community string is **petblr**, the IP address is **116.197.178.2**, and the MIB OID is **1.3.6.1.2.1.2**.

```
user@host_shell>snmpwalk -v1 -c jnprl3vpn@petblr 116.197.178.2 1.3.6.1.2.1.2
Did not find 'ifIndex' in module RFC1213-MIB (D:\usr\share\snmp\mibs/rfc1215.mib)
Did not find 'egpNeighAddr' in module RFC1213-MIB
(D:\usr\share\snmp\mibs/rfc1215.mib)
Did not find 'sysName' in module RFC1213-MIB
(D:\usr\share\snmp\mibs/mib-ex2500-priv.txt)
Did not find 'sysLocation' in module RFC1213-MIB
(D:\usr\share\snmp\mibs/mib-ex2500-priv.txt)
Did not find 'sysContact' in module RFC1213-MIB
(D:\usr\share\snmp\mibs/mib-ex2500-priv.txt)
Did not find 'ifIndex' in module RFC1213-MIB
(D:\usr\share\snmp\mibs/mib-ex2500-priv.txt)
IF-MIB::ifNumber.0 = INTEGER: 59
IF-MIB::ifIndex.4 = INTEGER: 4
IF-MIB::ifIndex.516 = INTEGER: 516
IF-MIB::ifIndex.518 = INTEGER: 518
IF-MIB::ifIndex.536 = INTEGER: 536
IF-MIB::ifDescr.4 = STRING: lsi
IF-MIB::ifDescr.516 = STRING: ge-1/0/1
IF-MIB::ifDescr.518 = STRING: ge-1/0/1.0
IF-MIB::ifDescr.536 = STRING: lsi.512
IF-MIB::ifType.4 = INTEGER: mplsTunnel(150)
IF-MIB::ifType.516 = INTEGER: ethernetCsmacd(6)
IF-MIB::ifType.518 = INTEGER: propVirtual(53)
IF-MIB::ifType.536 = INTEGER: propVirtual(53)
IF-MIB::ifMtu.4 = INTEGER: 1496
IF-MIB::ifMtu.516 = INTEGER: 1514
IF-MIB::ifMtu.518 = INTEGER: 1500
IF-MIB::ifMtu.536 = INTEGER: 1496
IF-MIB::ifSpeed.4 = Gauge32: 0
IF-MIB::ifSpeed.516 = Gauge32: 1000000000
IF-MIB::ifSpeed.518 = Gauge32: 1000000000
IF-MIB::ifSpeed.536 = Gauge32: 4294967295
IF-MIB::ifPhysAddress.4 = STRING:
IF-MIB::ifPhysAddress.516 = STRING: 0:22:83:15:bc:7f
IF-MIB::ifPhysAddress.518 = STRING: 0:22:83:15:bc:7f
IF-MIB::ifPhysAddress.536 = STRING:
IF-MIB::ifAdminStatus.4 = INTEGER: up(1)
IF-MIB::ifAdminStatus.516 = INTEGER: up(1)
IF-MIB::ifAdminStatus.518 = INTEGER: up(1)
IF-MIB::ifAdminStatus.536 = INTEGER: up(1)
IF-MIB::ifOperStatus.4 = INTEGER: up(1)
IF-MIB::ifOperStatus.516 = INTEGER: up(1)
IF-MIB::ifOperStatus.518 = INTEGER: up(1)
IF-MIB::ifOperStatus.536 = INTEGER: up(1)
IF-MIB::ifLastChange.4 = Timeticks: (572) 0:00:05.72
IF-MIB::ifLastChange.516 = Timeticks: (105781905) 12 days, 5:50:19.05
IF-MIB::ifLastChange.518 = Timeticks: (114092494) 13 days, 4:55:24.94
IF-MIB::ifLastChange.536 = Timeticks: (114095045) 13 days, 4:55:50.45
IF-MIB::ifInOctets.4 = Counter32: 0
IF-MIB::ifInOctets.516 = Counter32: 1324274
IF-MIB::ifInOctets.518 = Counter32: 1277110
IF-MIB::ifInOctets.536 = Counter32: 0
IF-MIB::ifInUcastPkts.4 = Counter32: 0
IF-MIB::ifInUcastPkts.516 = Counter32: 49
IF-MIB::ifInUcastPkts.518 = Counter32: 11583
IF-MIB::ifInUcastPkts.536 = Counter32: 0
IF-MIB::ifInNUcastPkts.4 = Counter32: 0
IF-MIB::ifInNUcastPkts.516 = Counter32: 11632
IF-MIB::ifInNUcastPkts.518 = Counter32: 0
IF-MIB::ifInNUcastPkts.536 = Counter32: 0
```

```

IF-MIB::ifInDiscards.4 = Counter32: 0
IF-MIB::ifInDiscards.516 = Counter32: 0
IF-MIB::ifInDiscards.518 = Counter32: 0
IF-MIB::ifInDiscards.536 = Counter32: 0
IF-MIB::ifInErrors.4 = Counter32: 0
IF-MIB::ifInErrors.516 = Counter32: 6
IF-MIB::ifInErrors.518 = Counter32: 0
IF-MIB::ifInErrors.536 = Counter32: 0
IF-MIB::ifInUnknownProtos.4 = Counter32: 0
IF-MIB::ifInUnknownProtos.516 = Counter32: 0
IF-MIB::ifInUnknownProtos.518 = Counter32: 0
IF-MIB::ifInUnknownProtos.536 = Counter32: 0
IF-MIB::ifOutOctets.4 = Counter32: 0
IF-MIB::ifOutOctets.516 = Counter32: 787040
IF-MIB::ifOutOctets.518 = Counter32: 745362
IF-MIB::ifOutOctets.536 = Counter32: 0
IF-MIB::ifOutUcastPkts.4 = Counter32: 0
IF-MIB::ifOutUcastPkts.516 = Counter32: 52
IF-MIB::ifOutUcastPkts.518 = Counter32: 9145
IF-MIB::ifOutUcastPkts.536 = Counter32: 0
IF-MIB::ifOutNUcastPkts.4 = Counter32: 0
IF-MIB::ifOutNUcastPkts.516 = Counter32: 9132
IF-MIB::ifOutNUcastPkts.518 = Counter32: 0
IF-MIB::ifOutNUcastPkts.536 = Counter32: 0
IF-MIB::ifOutDiscards.4 = Counter32: 0
IF-MIB::ifOutDiscards.516 = Counter32: 0
IF-MIB::ifOutDiscards.518 = Counter32: 0
IF-MIB::ifOutDiscards.536 = Counter32: 0
IF-MIB::ifOutErrors.4 = Counter32: 0
IF-MIB::ifOutErrors.516 = Counter32: 0
IF-MIB::ifOutErrors.518 = Counter32: 0
IF-MIB::ifOutErrors.536 = Counter32: 0
IF-MIB::ifOutQLen.4 = Gauge32: 0
IF-MIB::ifOutQLen.516 = Gauge32: 0
IF-MIB::ifOutQLen.518 = Gauge32: 0
IF-MIB::ifOutQLen.536 = Gauge32: 0
IF-MIB::ifSpecific.4 = OID: SNMPv2-SMI::zeroDotZero
IF-MIB::ifSpecific.516 = OID: SNMPv2-SMI::zeroDotZero
IF-MIB::ifSpecific.518 = OID: SNMPv2-SMI::zeroDotZero
IF-MIB::ifSpecific.536 = OID: SNMPv2-SMI::zeroDotZero

```

Meaning In the sample output:

- Interface index **516** is physical interface **ge-1/0/1**.
- Interface index **518** is logical interface **ge-1/0/1.0**.
- Interface index **536** is label-switched interface **lsi.512**

Related Documentation

- Understanding SNMP Implementation in the Junos OS
- Configuring SNMP on Devices Running the Junos OS

