



Configuring the VRF-Aware Software Infrastructure Scale

Last Updated: January 20, 2012

This module describes how to configure the VRF-Aware Software Infrastructure Scale feature. The VRF-Aware Software Infrastructure (VASI) Scale feature allows you to apply services such as access control lists (ACLs), Network Address Translation (NAT), policing, and zone-based firewalls to traffic that is flowing across two different Virtual Routing and Forwarding (VRF) instances. The VASI interfaces support redundancy of the Route Processor (RP) and Forwarding Processor (FP). This feature supports Multiprotocol Label Switching (MPLS) traffic over VASI interfaces and IPv4 and IPv6 unicast traffic on VASI interfaces.

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.



Americas Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Restrictions for Configuring the VRF-Aware Software Infrastructure Scale

VASI interfaces do not support the attachment of queue-based features. The following commands are not supported on a modular quality of service (QoS) CLI (MQC) policy that is attached to VASI interfaces:

- **bandwidth (policy-map class)**
- **fair-queue**
- **priority**
- **queue-limit**
- **random-detect**
- **shape**

Information About Configuring the VRF-Aware Software Infrastructure Scale

- [VASI Overview, page 2](#)

VASI Overview

VASI is implemented by using virtual interface pairs, where each of the interfaces in the pair is associated with a different VRF. The VASI virtual interface is the next hop interface for any packet that needs to be switched between these two VRFs. VASI interfaces provide the framework necessary to configure a firewall or a NAT between VRF instances.

Each interface pair is associated with two different VRF instances. The two virtual interfaces, called **vasileft** and **vasiright**, in a pair are logically wired back-to-back and are completely symmetrical. Each interface has an index. The association of the pairing is done automatically based on the two interface indexes such that **vasileft** automatically gets paired to **vasiright**. You can configure either static routing or dynamic routing with Border Gateway Protocol (BGP), Enhanced Interior Gateway Routing Protocol (EIGRP), or Open Shortest Path First (OSPF). BGP dynamic routing protocol restrictions and configuration are valid for BGP routing configurations between VASI interfaces.

How to Configure VASI

- [Configuring the VASI Interface, page 2](#)

Configuring the VASI Interface

VASI must be enabled on both interfaces of the VASI pair (**vasileft** and **vasiright**). You can configure VRF on any VASI interface. Perform the following task to configure the VASI interfaces.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface vasileft** *number*
4. **vrf forwarding** *table-name* [**downstream** *table-name*]
5. **ip address** {*ip-address mask* [**secondary**] | **pool** *pool-name*}
6. **exit**
7. **interface vasiright** *number*
8. **vrf forwarding** *table-name* [**downstream**
9. **ip address** {*ip-address mask* [**secondary**] | **pool** *pool-name*}
10. **exit**
11. **ip route** [**vrf** *vrf-name*] *destination-prefix destination-prefix-mask* {**vasileft** | **vasiright**} *number*
12. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	interface vasileft <i>number</i> Example: Router(config)# interface vasileft 200	Configures the vasileft interface and enters interface configuration mode. <ul style="list-style-type: none"> <i>number</i> --A number for the vasileft interface. Range is from 1 to 1000.
Step 4	vrf forwarding <i>table-name</i> [downstream <i>table-name</i>] Example: Router(config-if)# vrf forwarding table1	Configures the VRF table. Note You can configure VRF forwarding on any VASI interface. It is not mandatory to configure VRF instances on both VASI interfaces.

	Command or Action	Purpose
Step 5	ip address { <i>ip-address mask</i> [secondary] pool pool-name} Example: Router(config-if)# ip address 192.168.0.1 255.255.255.0	Configures a primary or secondary IP address for an interface.
Step 6	exit Example: Router(config-if)# exit	Exits interface configuration mode and enters global configuration mode.
Step 7	interface vasiright <i>number</i> Example: Router(config)# interface vasiright 200	Configures the vasiright interface and enters interface configuration mode. <ul style="list-style-type: none"> <i>number</i> --A number for the vasiright interface. Range is from 1 to 1000.
Step 8	vrf forwarding <i>table-name</i> [downstream] Example: <i>table-name</i>] Example: Router(config-if)# vrf forwarding table	Configures the VRF table.
Step 9	ip address { <i>ip-address mask</i> [secondary] pool pool-name} Example: Router(config-if)# ip address 192.168.1.1 255.255.255.0	Configures a primary or secondary IP address for an interface.
Step 10	exit Example: Router(config-if)# exit	Exits interface configuration mode and enters global configuration mode.

Command or Action	Purpose
Step 11 ip route [<i>vrf vrf-name</i>] <i>destination-prefix destination-prefix-mask</i> { <i>vasileft</i> <i>vasiright</i> } <i>number</i> Example: Router(config)# ip route vrf t1 10.0.0.1 255.255.0.0 vasileft 200	Establishes static routes for a VRF instance and VASI interface. Note If you want to add an IP route for a VRF instance, you must specify the vrf keyword.
Step 12 end Example: Router(config)# end	Exits global configuration mode.

Configuration Examples for VASI

- [Example Configuring the VASI Interface, page 5](#)

Example Configuring the VASI Interface

The following example shows how to configure the VASI interface. VASI must be enabled for each interface of the VASI pair (vasileft and vasiright). You can configure VRF on any VASI interface. See the Configuring the VASI Interface section for configuration information.

```
Router(config)# interface vasileft 200
Router(config-if)# vrf forwarding table1

Router(config-if)# ip address 192.168.0.1 255.255.255.0

Router(config-if)# exit

Router(config)# ip route vrf t1 10.0.0.1 255.255.0.0 vasileft 200

Router(config)# interface vasiright 200
Router(config-if)# vrf forwarding table2

Router(config-if)# ip address 192.168.1.1 255.255.255.0

Router(config-if)# exit

Router(config)# ip route 10.0.0.2 255.255.255.0 vasiright 200
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
Security commands	<i>Cisco IOS Security Command Reference</i>
Configuring NAT for IP Address Conservation feature	“Configuring NAT for IP Address Conservation” module of the <i>IP Addressing Configuration Guide</i>
IP routing: BGP	<i>IP Routing: BGP Configuration Guide, Cisco IOS XE Release</i>
IP routing: EIGRP	<i>IP Routing: EIGRP Configuration Guide, Cisco IOS XE Release</i>
IP routing: OSPF	<i>IP Routing: OSPF Configuration Guide, Cisco IOS XE Release</i>
VRF Aware Cisco IOS Firewall feature	“VRF Aware Cisco IOS Firewall” module of the <i>Security Configuration Guide: Securing the Control Plane</i>
Zone-based Policy Firewall feature	“Zone-based Policy Firewall” module of the <i>Security Configuration Guide: Securing the Control Plane</i>

Standards

Standard	Title
No new or modified standards are supported, and support for existing standards has not been modified.	--

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
None	--

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Configuring VRF-Aware Software Infrastructure Scale

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1 Feature Information for Configuring the VRF-Aware Software Infrastructure Scale

Feature Name	Releases	Feature Information
Configuring VRF-Aware Software Infrastructure Scale	Cisco IOS XE Release 2.6	<p>The VRF-Aware Software Infrastructure (VASI) Scale feature allows you to apply services such as ACLs, NAT, policing, and zone-based firewalls to traffic that is flowing across two different VRF instances. The VASI interfaces support redundancy of the RP and FP. This feature supports MPLS traffic over VASI interfaces and IPv4 and IPv6 multicast and unicast traffic on VASI interfaces.</p> <p>The following sections provide information about this feature:</p>

Feature Name	Releases	Feature Information
VASI (VRF-Aware Software Infrastructure) Enhancements Phase I	Cisco IOS XE Release 3.1S	<p>This feature provides the following enhancements to VASI:</p> <ul style="list-style-type: none"> • Support for 500 VASI interfaces. • Support for BGP dynamic routing between VASI interfaces.
VASI (VRF-Aware Software Infrastructure) Enhancements Phase II	Cisco IOS XE Release 3.2S	<p>This feature provides the following enhancements to VASI:</p> <ul style="list-style-type: none"> • Support for IPv6 unicast traffic over VASI interfaces. • Support for OSPF and EIGRP dynamic routing between VASI interfaces.
VASI (VRF-Aware Software Infrastructure) Scale	Cisco IOS XE Release 3.3S	<p>This feature provides support for 1000 VASI interfaces.</p> <p>The following commands were introduced or modified: interface (VASI).</p>

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