



# WCCP VRF Support

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and 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 module.

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## Information About WCCP VRF Support

- [WCCP VRF Support, page 1](#)
- [WCCP VRF Tunnel Interfaces, page 2](#)

## WCCP VRF Support

The WCCP VRF Support feature enhances the WCCPv2 protocol by implementing support for virtual routing and forwarding (VRF).

The WCCP VRF Support feature allows service groups to be configured on a per-VRF basis in addition to those defined globally.



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Along with the service identifier, the VRF of WCCP protocol packets arriving at the router is used to associate cache-engines with a configured service group.

The same VRF must have the interface on which redirection is applied, the interface which is connected to cache engine, and the interface on which the packet would have left if it had not been redirected.

## WCCP VRF Tunnel Interfaces

In Cisco IOS releases that support the WCCP VRF Support feature, the use of GRE redirection results in the creation of new tunnel interfaces. You can display these tunnel interfaces by entering the **show ip interface brief | include tunnel** command:

```
Device# show ip interface brief | include tunnel

Tunnel0          172.16.0.1      YES unset  up
Tunnel1          172.16.0.1      YES unset  up
Tunnel2          172.16.0.1      YES unset  up
Tunnel3          172.16.0.1      YES unset  up
Device#
```

The tunnel interfaces are automatically created in order to process outgoing GRE-encapsulated traffic for WCCP. The tunnel interfaces appear when a content engine connects and requests GRE redirection. The tunnel interfaces are not created directly by WCCP, but are created indirectly via a tunnel application programming interface (API). WCCP does not have direct knowledge of the tunnel interfaces, but can redirect packets to them, resulting in the appropriate encapsulation being applied to the packets. After the appropriate encapsulation is applied, the packet is then sent to the content engine.



### Note

The tunnel interfaces are not used to connect with incoming WCCP GRE return packets.

One tunnel is created for each service group that is using GRE redirection. One additional tunnel is created to provide an IP address that allows the other tunnel group interfaces to be unnumbered but still enabled for IPv4.

You can confirm the connection between the tunnels and WCCP by entering the **show tunnel groups wccp** command:

```
Device# show tunnel groups wccp

WCCP : service group 0 in "Default", ver v2, assgnmnt: hash-table
      intf: Tunnel0, locally sourced
WCCP : service group 317 in "Default", ver v2, assgnmnt: hash-table
      intf: Tunnel3, locally sourced
WCCP : service group 318 in "Default", ver v2, assgnmnt: hash-table
      intf: Tunnel2, locally sourced
```

You can display additional information about each tunnel interface by entering the **show tunnel interface interface-number** command:

```
Device# show tunnel interface t0

Tunnel0
  Mode:multi-GRE/IP, Destination UNKNOWN, Source 10.1.1.80
  Application ID 2: WCCP : service group 0 in "Default", ver v2, assgnmnt: hash-table
  Linestate - current up
  Internal linestate - current up, evaluated up

Device# show tunnel interface t1

Tunnel1
  Mode:multi-GRE/IP, Destination UNKNOWN, Source 172.16.0.1
  Application ID 2: unspecified
```

```

Linestate - current up
Internal linestate - current up, evaluated up

```

```
Device# show tunnel interface t2
```

```

Tunnel2
Mode:multi-GRE/IP, Destination UNKNOWN, Source 10.1.1.80
Application ID 2: WCCP : service group 318 in "Default", ver v2, assgnmnt: hash-table
Linestate - current up
Internal linestate - current up, evaluated up

```

```
Device# show tunnel interface t3
```

```

Tunnel3
Mode:multi-GRE/IP, Destination UNKNOWN, Source 10.1.1.80
Application ID 2: WCCP : service group 317 in "Default", ver v2, assgnmnt: hash-table
Linestate - current up
Internal linestate - current up, evaluated up

```

```
Device#
```

Note that the service group number shown in the examples is the internal tunnel representation of the WCCP service group number. Group 0 is the web-cache service. To determine the dynamic services, subtract 256 from the displayed service group number to convert to the WCCP service group number. For interfaces that are used for redirection, the source address shown is the WCCP router ID.

You can display information about the connected content engines and encapsulation, including software packet counters, by entering the **show adjacency [tunnel-interface] [encapsulation] [detail] [internal]** command:

```
Device# show adjacency t0
```

```

Protocol Interface          Address
IP          Tunnel0         10.1.1.82(3)

```

```
Device# show adjacency t0 encapsulation
```

```

Protocol Interface          Address
IP          Tunnel0         10.1.1.82(3)
Encap length 28
4500000000000000FF2F7D2B1E010150
1E0101520000883E00000000
Provider: TUNNEL
Protocol header count in macstring: 3
  HDR 0: ipv4
    dst: static, 10.1.1.82
    src: static, 10.1.1.80
    prot: static, 47
    ttl: static, 255
    df: static, cleared
  per packet fields: tos ident t1 chksm
  HDR 1: gre
    prot: static, 0x883E
  per packet fields: none
  HDR 2: wccpv2
    dyn: static, cleared
    sgID: static, 0
  per packet fields: alt altB priB

```

```
Device# show adjacency t0 detail
```

```

Protocol Interface          Address
IP          Tunnel0         10.1.1.82(3)
                                connectionid 1
                                0 packets, 0 bytes
                                epoch 0
                                sourced in sev-epoch 1
                                Encap length 28
                                4500000000000000FF2F7D2B1E010150
                                1E0101520000883E00000000
                                Tun endpt
                                Next chain element:

```

```

Device# show adjacency to internal IP adj out of Ethernet0/0, addr 10.1.1.82

Protocol Interface Address
IP Tunnel0 10.1.1.82(3)
connectionid 1
0 packets, 0 bytes
epoch 0
sourced in sev-epoch 1
Encap length 28
4500000000000000FF2F7D2B1E010150
1E0101520000883E00000000
Tun endpt
Next chain element:
  IP adj out of Ethernet0/0, addr 10.1.1.82
  parent oce 0x4BC76A8
  frame originated locally (Null0)
L3 mtu 17856
Flags (0x2808C4)
Fixup enabled (0x40000000)
  GRE WCCP redirection
HWIDB/IDB pointers 0x55A13E0/0x35F5A80
IP redirect disabled
Switching vector: IPv4 midchain adj oce
IP Tunnel stack to 10.1.1.82 in Default (0x0)
  nh tracking enabled: 10.1.1.82/32
  IP adj out of Ethernet0/0, addr 10.1.1.82
Adjacency pointer 0x4BC74D8
Next-hop 10.1.1.82

Device#

```

## How to Configure WCCP VRF Support

- [Configuring WCCP, page 4](#)

### Configuring WCCP

Perform this task to configure WCCP.

Until you configure a WCCP service using the **ip wccp {web-cache | service-number}** global configuration command, WCCP is disabled on the router. The first use of a form of the **ip wccp** command enables WCCP. By default WCCPv2 is used for services, but you can use WCCPv1 functionality instead.

Use the **ip wccp web-cache password** command to set a password for a router and the content engines in a service group. MD5 password security requires that each router and content engine that wants to join a service group be configured with the service group password. The password must be up to eight characters in length. Each content engine or router in the service group will authenticate the security component in a received WCCP packet immediately after validating the WCCP message header. Packets failing authentication will be discarded.

**SUMMARY STEPS**

1. **enable**
2. **configure terminal**
3. **ip wccp** [*vrf vrf-name*] {**web-cache** | *service-number*} [**group-address** *multicast-address*] [**redirect-list** *access-list*] [**group-list** *access-list*] [**password** *password* [0 | 7] ]
4. **interface** *type number*
5. **ip wccp** [*vrf vrf-name*] {**web-cache** | *service-number*} **redirect** {**in** | **out**}
6. **exit**
7. **interface** *type number*
8. **ip wccp redirect exclude in**

**DETAILED STEPS**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>ip wccp</b> [ <i>vrf vrf-name</i> ] { <b>web-cache</b>   <i>service-number</i> } [ <b>group-address</b> <i>multicast-address</i> ] [ <b>redirect-list</b> <i>access-list</i> ] [ <b>group-list</b> <i>access-list</i> ] [ <b>password</b> <i>password</i> [0   7] ]  <b>Example:</b> Device(config)# ip wccp web-cache password password1	Specifies a web-cache or dynamic service to enable on the router, specifies a VRF-name to associate with the service group, specifies the IP multicast address used by the service group, specifies any access lists to use, specifies whether to use MD5 authentication, and enables the WCCP service.
<b>Step 4</b>	<b>interface</b> <i>type number</i>  <b>Example:</b> Device(config)# interface ethernet0/0	Targets an interface number for which the web cache service will run, and enters interface configuration mode.

Command or Action	Purpose
<p><b>Step 5</b> <code>ip wccp [vrf vrf-name] {web-cache   service-number} redirect {in   out}</code></p> <p><b>Example:</b></p> <pre>Device(config-if)# ip wccp web-cache redirect in</pre>	<p>Enables packet redirection on an outbound or inbound interface using WCCP.</p> <ul style="list-style-type: none"> <li>As indicated by the <b>out</b> and <b>in</b> keyword options, redirection can be specified for outbound interfaces or inbound interfaces.</li> </ul>
<p><b>Step 6</b> <code>exit</code></p> <p><b>Example:</b></p> <pre>Device(config-if)# exit</pre>	<p>Exits interface configuration mode.</p>
<p><b>Step 7</b> <code>interface type number</code></p> <p><b>Example:</b></p> <pre>Device(config)# interface GigabitEthernet 0/2/0</pre>	<p>Targets an interface number on which to exclude traffic for redirection, and enters interface configuration mode.</p>
<p><b>Step 8</b> <code>ip wccp redirect exclude in</code></p> <p><b>Example:</b></p> <pre>Device(config-if)# ip wccp redirect exclude in</pre>	<p>(Optional) Excludes traffic on the specified interface from redirection.</p>

## Configuration Examples for WCCP VRF Support

### Additional References

#### Related Documents

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Commands List, All Releases</a>
Cisco ACNS software configuration information	<ul style="list-style-type: none"> <li><a href="#">Cisco ACNS Software Caching Configuration Guide, Release 4.2</a></li> <li><a href="#">Cisco ACNS Software</a> listing page on Cisco.com</li> </ul>

Related Topic	Document Title
IP access list overview, configuration tasks, and commands	<i>Cisco IOS Security Command Reference</i>
IP addressing and services commands and configuration tasks	<ul style="list-style-type: none"> <li>• <i>Cisco IOS IP Addressing Services Configuration Guide</i></li> <li>• <i>Cisco IOS IP Addressing Services Command Reference</i></li> </ul>
WCCP commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	<i>Cisco IOS IP Application Services Command Reference</i>

### Standards

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

### MIBs

MIB	MIBs Link
No new or modified MIBs are supported, and support for existing MIBs has not been modified.	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

### RFCs

RFC	Title
No new or modified RFCs are supported, and support for existing RFCs has not been modified.	—

**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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Additional References

**Related Documents**

Related Topic	Document Title
Cisco ACNS software configuration information	<ul style="list-style-type: none"> <li>• Cisco ACNS Software Caching Configuration Guide, Release 4.2</li> <li>• <a href="http://www.cisco.com/en/US/products/sw/conntsw/ps491/products_installation_and_configuration_guides_list.html">http://www.cisco.com/en/US/products/sw/conntsw/ps491/products_installation_and_configuration_guides_list.html</a></li> <li>• <a href="#">Cisco ACNS Software</a> listing page on Cisco.com</li> </ul>
Deploying and Troubleshooting WCCP on Cisco ASR 1000 Series Routers	<a href="#">Deploying and Troubleshooting Web Cache Control Protocol Version 2 on Cisco ASR 1000 Series Aggregation Services Routers</a>
IP Access List overview, configuration tasks, and commands	<ul style="list-style-type: none"> <li>• <i>Cisco IOS XE Security Configuration Guide: Securing the Data Plane</i></li> <li>• <i>Cisco IOS Security Command Reference</i></li> </ul>
IP addressing and services commands and configuration tasks	<ul style="list-style-type: none"> <li>• <i>Cisco IOS XE IP Addressing Services Configuration Guide</i></li> <li>• <i>Cisco IOS IP Addressing Services Command Reference</i></li> </ul>
WCCP commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	<i>Cisco IOS IP Application Services Command Reference</i>



**Standards**

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No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	

**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: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

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**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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for WCCP VRF Support

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.

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**Table 1**      **Feature Information for WCCP VRF Support**

Feature Name	Releases	Feature Information
WCCP VRF Support	12.2(33)SRE 12.2(50)SY 15.0(1)M Cisco IOS XE Release 3.1S Cisco IOS XE Release 3.2SE	The WCCP VRF Support feature provides enhancements to the existing WCCPv2 protocol, which supports VRF awareness.  The following commands were introduced or modified: <b>clear ip wccpshow debug ip wccpshow ip wccpshow ip wccp group-listenshow ip wccp redirect show show ip wccp.</b>

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