Release Notes for Catalyst 4000 Family Layer 3 Services Module Cisco IOS
Release 12.0(7)W5(15d)

June 7, 2000

Current Release:
12.0(7)W5(15d)

These release notes describe the features, modifications, and caveats for the Catalyst 4000 family Layer 3 Services module WS-X4232-L3. These release notes apply to the 12.0(7)W5(15d) Cisco IOS release. For features, modifications, and caveats for the Catalyst 4000 family supervisor engine software, refer to the Release Notes for Catalyst 4000 Family Software Release 5.x.

Note
The Catalyst 4000 family includes the Catalyst 4003 and the Catalyst 4006 switches. Throughout this publication and all Catalyst 4000 family documents, the phrase Catalyst 4000 family switches refers to all Catalyst 4000 family switches, unless otherwise noted.

Note
The Catalyst 4000 Layer 3 Services module ships with Cisco IOS software installed. However, before this module can run in your Catalyst 4000 family switch, be sure that the Catalyst 4000 family supervisor engine is running supervisor engine software release 5.5(1) or later. Software images are available through Cisco Connection Online (CCO); see the "Cisco Connection Online" section for details.

Contents

This document consists of these sections:
- Memory Requirements, page 2
- Software Ordering Information, page 2
Memory Requirements

The Catalyst 4000 Layer 3 Services module has a 64-MB synchronous dynamic random-access memory (SDRAM) and requires a 16-MB Flash memory.

Software Ordering Information

Table 1 lists the software version and applicable ordering information for the Catalyst 4000 family Layer 3 Services module software.

<table>
<thead>
<tr>
<th>Software Version</th>
<th>Filename</th>
<th>Orderable Product Number</th>
<th>Orderable Product Number Spare Upgrade (Floppy Media)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.0(7)W5(15d)</td>
<td>cat4232-in-mz.bin</td>
<td>SC42Z-12.0.7W</td>
<td>SC42Z-12.0.7W=</td>
</tr>
</tbody>
</table>

Features in Release 12.0(7)W5(15d)

The Catalyst 4000 Layer 3 Services module provides multilprotocal switching and routing for the Catalyst 4000 family switches.

The 32 10/100 Ethernet interfaces on the module provide full Layer 2 feature support and are configurable from the Catalyst 4000 family switch supervisor engine. Refer to the Software Configuration Guide—Catalyst 5000 Family, 4000 Family, 2926G Series, 2980G and 2948G Switches, Software Release 5.5(1) for information on feature support on the Catalyst 4000 family switches.

Table 2 lists the Cisco IOS features available for the Catalyst 4000 Layer 3 Services module.

<table>
<thead>
<tr>
<th>Layer 2 Bridging Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer 2 transparent bridging</td>
</tr>
<tr>
<td>Layer 2 MAC learning, aging, and switching by hardware</td>
</tr>
<tr>
<td>Spanning Tree Protocol (IEEE802.1D) on each bridge group</td>
</tr>
<tr>
<td>A maximum of 16 active bridge groups</td>
</tr>
<tr>
<td>Up to 4000 MAC addresses</td>
</tr>
<tr>
<td>24K CAM is shared by Layer 2 entries, IP routing, IP multicast routing, and Novell IPX routing</td>
</tr>
</tbody>
</table>
### VLAN Features
- ISL²-based VLAN trunking on the front panel Gigabit Ethernet ports
- 802.1Q-based VLAN trunking on all ports

### Layer 3 Routing, Switching, and Forwarding
- IP, IPX, and IP multicast routing and switching between Ethernet ports
- Constrained multicast flooding (CMF)
- Load balancing among equal cost paths based on source and destination IP and IPX addresses
- 24,000 CAM is shared by Layer 2 entries, IP routing, IP multicast routing, and Novell IPX routing
  - Up to 18,000 IP routes
  - Up to 20,000 IP host entries
  - Up to 20,000 IPX routes
  - Up to 20,000 IPX host entries
  - Up to 128,000 IP multicast groups

### Supported Routing Protocols
- RIP and RIP II³
- IGRP⁴
- EIGRP⁵
- OSPF⁶
- IPX RIP and EIGRP⁷
- PIM⁸—sparse and dense mode
- Secondary addressing
- Static routes

### Gigabit EtherChannel Features
- Bundling of up to two Gigabit Ethernet ports
- Load sharing for bridge traffic based on MAC address
- Load sharing based on source and destination IP and IPX addresses of unicast packets
- ISL trunking supported on the external Gigabit EtherChannel
- 802.1Q trunking supported on the external and internal Gigabit EtherChannel
- Two active GEC⁹ port channels

### Additional Protocols and Features
- Layer 3 QoS¹⁰
- SDM¹¹
- BOOTP¹²
- CDP¹³ support on Ethernet ports
- CGMP¹⁴ server support
- DHCP¹⁵ relay
- HSRP¹⁶

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**Table 2  Cisco IOS Features (continued)**

<table>
<thead>
<tr>
<th>VLAN Features</th>
<th>Layer 3 Routing, Switching, and Forwarding</th>
<th>Supported Routing Protocols</th>
<th>Gigabit EtherChannel Features</th>
<th>Additional Protocols and Features</th>
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<td></td>
<td>Load balancing among equal cost paths based on source and destination IP and IPX addresses</td>
<td>EIGRP⁵</td>
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<td>BOOTP¹²</td>
</tr>
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<td>24,000 CAM is shared by Layer 2 entries, IP routing, IP multicast routing, and Novell IPX routing</td>
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<td>Up to 20,000 IP host entries</td>
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Features in Release 12.0(7)W5(15d)

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<td></td>
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<tr>
<td>IGMP(^{18})</td>
<td></td>
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<tr>
<td>IPX SAP and SAP(^{19}) filtering</td>
<td></td>
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<tr>
<td>SNMP(^{20})</td>
<td></td>
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<tr>
<td>TACACS+(^{21})</td>
<td></td>
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</tbody>
</table>

1. CAM=content addressable memory
2. ISL=Inter-Switch Link
3. RIP=Routing Information Protocol
4. IGRP=Interior Gateway Routing Protocol
5. EIGRP=Enhanced Interior Gateway Protocol
6. OSPF=Open Shortest Path First
7. IPX=Internet Packet Exchange
8. PIM=Protocol Independent Multicast
9. GEC=Gigabit EtherChannel
10. QoS=Quality of Service
11. SDM=Switching Database Manager
12. BOOTP=Bootstrap Protocol
13. CDP=Cisco Discovery Protocol
14. CGMP=Cisco Group Management Protocol
15. DHCP=Dynamic Host Configuration Protocol
16. HSRP=Hot Standby Router Protocol
17. ICMP=Internet Control Message Protocol
18. IGMP=Internet Group Management Protocol
19. Internet Packet Exchange Service Advertisement Protocol
20. SNMP=Simple Network Management Protocol
21. TACACS+=Terminal Access Controller Access Control System Plus

Unsupported Features

The following major features are not supported on the Catalyst 4000 Layer 3 Services module:

- Multilayer switching (MLS).
- Access control lists (ACLs).
- Integrated routing and bridging (IRB), and concurrent routing and bridging (CRB).
- Border Gateway Protocol (BGP).
- AppleTalk.

If a feature does not appear in the list of supported features in this document or in the list of supported features in these release notes, that feature is not supported on the Catalyst 4000 Layer 3 Services module.

We do not recommend that you configure unsupported features even if you can configure them with the CLI.
Usage Guidelines and Restrictions

This section provides usage guidelines for the Catalyst 4000 Layer 3 Services module hardware and software:

- Do not configure the 10/100 management port for HSRP because this action might make the Layer 3 Services module the active router in the network.
- When you configure a native VLAN for 802.1Q trunking, make sure you are using the native VLAN only for management traffic and not for data traffic. If you have data traffic on a native VLAN, you will see a performance drop for this traffic because all traffic coming in over the native VLAN on an 802.1Q trunk is sent to the CPU to be processed by software instead of routed in hardware.

Open Caveats in Release 12.0(7)W5(15d)

This section describes open caveats in software release 12.0(7)W5(15d):

- If the native VLAN on a port is cleared from the allowed range of VLANs for the port's trunk link, the port will not appear to be in the native VLAN in the configuration file. (CSCdr31412)
- When the Layer 3 Services module acts as a relay agent, it sends DHCP discover packets (with its Primary IP address) to the DHCP server requesting an IP address for the DHCP client in the same subnet. If the primary pool of IP addresses is excluded and only the secondary pool is available on the DHCP server, the DHCP discover packet with the primary IP address should be rejected, but it is not. The functionality to resend DHCP requests with the secondary IP address when the primary IP address fails will be available in a later release. (CSCdr23558)
- When the Layer 3 Services module is configured as a DHCP relay agent, it fails to drop DHCP packets with hop counts over 16. (CSCdr21806)
- Under normal circumstances, heavy data traffic is routed by the XPIFs within the switch fabric without involving the CPU. But when the XPIFs get packets they don't know how to handle, they send those packets to the main CPU. Such packets include CDP packets, unreachable network packets, and packets coming in on a native VLAN on a 802.1Q trunked interface. When the CPU receives too much traffic, packet loss can occur causing CDP to fail and the Layer 3 Services module to become unreachable through the session command. (CSCdr49762)
- TACACS+ authentication does not work properly if a banner is configured. Either the banner does not display, or if the banner displays, it does not prompt for user name and password and as a result authentication fails.
  
  **Workaround:** Do not configure TACACS+ authentication with a banner. (CSCdr46740)
- Integrated Routing and Bridging (IRB) and Concurrent Routing and Bridging (CRB) are not supported. (CSCdr31970)
- Border Gateway Protocol (BGP) is not supported. (CSCdr32464)
- AppleTalk routing is not supported. (CSCdr30658)

Additional Documentation

The following documents are available for Catalyst 4000 family switches:

- *Catalyst 4003 and 4006 Installation Guide*
Obtaining Documentation

World Wide Web


Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM is updated monthly. Therefore, it is probably more current than printed documentation. The CD-ROM package is available as a single unit or as an annual subscription.

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  - From Europe, call 33 1 64 46 40 82

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<table>
<thead>
<tr>
<th>Language</th>
<th>E-mail Address</th>
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<tbody>
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<td>English</td>
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