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<tr>
<th>Item</th>
<th>Description</th>
<th>Description (French)</th>
<th>Beschreibung (German)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>An example scenario</td>
<td>Un scénario d'exemple</td>
<td>Ein Beispielszenarium</td>
</tr>
<tr>
<td>Caution:</td>
<td>Possible damage to equipment, software, or data</td>
<td>Endommagement possible de l'équipement, des données ou du logiciel</td>
<td>Mögliche Schäden an Gerät, Software oder Daten</td>
</tr>
<tr>
<td>Note:</td>
<td>Additional information</td>
<td>Informations complémentaires</td>
<td>Zusätzliche Informationen</td>
</tr>
<tr>
<td>To</td>
<td>A statement and instructions</td>
<td>Références et instructions</td>
<td>Eine Erklärung und Anweisungen</td>
</tr>
<tr>
<td>Tip:</td>
<td>A suggestion or workaround</td>
<td>Une suggestion ou solution</td>
<td>Ein Vorschlag oder eine Umgehung</td>
</tr>
<tr>
<td>Warning:</td>
<td>Possible physical harm to the operator</td>
<td>Blessure possible de l'opérateur</td>
<td>Verletzungsgefahr des Bedieners</td>
</tr>
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Chapter 1 – Introduction

Juniper Networks® Application Delivery Controller (ADC) for the MX Series 3D Universal Edge Router offers advanced router-integrated ADC functions that enables service providers and enterprises to efficiently scale service capacity and increase service performance. Routers are already ubiquitously deployed throughout the network: at the network edge, in the network core, and in the data center. Integrating the advanced ADC with the carrier-grade MX3D router promotes network consolidation and reduces the number of network elements that providers must rack, power, cool, maintain, and upgrade. Furthermore, the ADC software, which is optionally licensed, improves service resiliency by monitoring server and application health and by automatically bypassing failures.

This guide describes the diagnostic tools available for the ADC software using the command-line interface (CLI).

- For more information on learning the basic structure and operation of the CLI, see the ADC Software Reference Guide.
- For more information on troubleshooting the Juniper Networks router, see the Junos OS Baseline Operations Guide, available at the following link: https://www.juniper.net/techpubs/en_US/junos10.4/information-products/topic-collections/nog-baseline/index.html

Prerequisites

This guide is intended for network administrators with the following background:

- Basic knowledge of networks, Ethernet bridging, and IP routing
- Familiarity with networking concepts and terminology
- Basic knowledge of network topologies
- Basic knowledge of Junos OS

Acronyms

Table 1 on page 15 shows the acronyms used in this guide.

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLI</td>
<td>command-line interface</td>
</tr>
<tr>
<td>CPU</td>
<td>central processing unit</td>
</tr>
<tr>
<td>DNS</td>
<td>Domain Name System</td>
</tr>
<tr>
<td>FTP</td>
<td>File Transfer Protocol</td>
</tr>
<tr>
<td>LDAP</td>
<td>Lightweight Directory Access Protocol</td>
</tr>
<tr>
<td>MAC</td>
<td>media access control</td>
</tr>
<tr>
<td>NAT</td>
<td>Network Address Translation</td>
</tr>
<tr>
<td>OSI</td>
<td>Open Systems Interconnection</td>
</tr>
<tr>
<td>SNMP</td>
<td>Simple Network Management Protocol</td>
</tr>
</tbody>
</table>
### Table 1: Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSH</td>
<td>Secure Shell</td>
</tr>
<tr>
<td>SSL</td>
<td>Secure Sockets Layer</td>
</tr>
<tr>
<td>TCP</td>
<td>Transmission Control Protocol</td>
</tr>
<tr>
<td>UDP</td>
<td>User Datagram Protocol</td>
</tr>
</tbody>
</table>
Chapter 2 – Troubleshooting Fundamentals

This chapter provides conceptual information about the methods and tools used for troubleshooting and isolating problems in the Juniper Networks® Application Delivery Controller (ADC) software. The types of problems that typically occur with networks are connectivity and performance. The ADC software and a Juniper Networks® MX3D Universal Edge Router support a diverse range of network architectures and protocols, some of which are used to maintain and monitor connectivity and isolate the connectivity faults.

This chapter includes the following topics:

- Port Mirroring on page 17
- Interface Statistics on page 19
- System Log and Trace File on page 19

Port Mirroring

Port mirroring involves sending a copy of a data packet from a routing platform to an external host. This section includes the following topics:

- Junos OS Port Mirroring on page 17
- ADC Software Port Mirroring on page 17
- Extended Port Mirroring Overview on page 18
- Port Mirroring Configuration on page 18

Junos OS Port Mirroring

You can send a copy of an Internet Protocol version 4 (IPv4) or Internet Protocol version 6 (IPv6) packet from the routing platform to an external host address or a packet analyzer for analysis. This is known as port mirroring.

Port mirroring is different from traffic sampling. In traffic sampling, a sampling key based on the packet header is sent to the routing engine. There, the key can be placed in a file, or certain packets based on the key can be sent to a flow analysis server. In port mirroring, the entire packet is copied and sent out through a next-hop interface.

For more information on port mirroring, see the Juniper Networks documentation on port mirroring.

ADC Software Port Mirroring

The ADC software accomplishes port mirroring using port-mirroring filters that are applied to interfaces (IFLs). The port-mirroring filters can be applied to the input or output side of the IFL. However, the port-mirroring filters have an implied “accept” action that accepts all traffic that is mirrored, thus making it impossible for other filters on the same IFL to monitor or see traffic.

Because the ADC software uses filters to catch traffic, when the ADC software works with the IFL, the port-mirroring filters are applied only to the output side of the IFL.

You should fully understand applying port mirroring to the output side of an IFL; the mirrored traffic does not include the requests from this IFL. Rather, the mirrored traffic only includes the responses from the IFL, usually after being treated in the ADC software.
**Caution:** If you apply the port-mirroring filter to the input side of an IFL, which is set up in the ADC software configuration, one of the functions (either the ADC software or the mirroring) will not work on the traffic. You *should not* use this type of configuration.

**Extended Port Mirroring Overview**

This section discusses how the server-facing and client-facing interfaces perform port mirroring. This section includes the following topics:

- **Server-Facing Interfaces on page 18**
- **Client-Facing Interfaces on page 18**

**Server-Facing Interfaces**

The ADC software uses input lists to add filters to the server-facing interfaces. If you configure a port-mirroring filter, it will be first in the input list (as the rest of the filters are configured by commit script after the user configuration). This implies that the ADC software will not see the traffic from these ports.

**Client-Facing Interfaces**

The ADC software is using the Junos OS SDK API to apply input filters on the client-facing logical interfaces. When using the API to set filters on an IFL, the API filter has higher priority over user-configured filters. This implies that if the port-mirroring filter is applied to a client-facing interface input, it will not see the traffic that is sent to the ADC software.

**Port Mirroring Configuration**

The following example illustrates how to correctly set up port mirroring for your device.

```
forwarding-options {
  port-mirroring {
    input {
      rate 1; # copy all packets
      run-length 0; # copy all packets
    }
    family inet {
      output {
        interface ge-0/0.0 { # logical interface the packets go
          # out of
          next-hop 192.168.1.233;# next-hop for the packets
        }
      }
    }
  }
}
```

To correctly set up your port mirroring configuration

1. Define the port mirroring parameters.
2. Define the port mirroring filter.

```plaintext
define the port mirroring filter.

firewall {
    filter mirroring-filter {
        term term1 {
            then {
                port-mirror;
                accept;
            }
        }
    }
}
```

3. Define the filter on the output side of an IFL (assuming this IFL is configured in the ADC configuration as a server- or client-facing interface).

```plaintext
interfaces {
    fe-1/3/0 {
        unit 0 {
            family inet {
                filter {
                    output mirroring-filter;
                }
            }
        }
    }
}
```

**Interface Statistics**

The interface statistics command lets you display information on received and transmitted packets at the ports. The command can be used on the client- and server-facing interfaces. Another option is to use the interface statistics command on the Network Processing Unit (NPU) in the Multiservices-DPC.

Like any other interface, each NPU interface in the Multiservices-DPC also has statistics. However, when viewing statistics of the NPU interfaces, you should be aware of the direction of these statistics, which is from the router point of view. The input direction is for packets coming from the Multiservices-DPC to the router. The output direction is for packets coming from the router to the Multiservices-DPC.

The interface statistics can be shown by using the following command:

```plaintext
user@host> show interface statistics <interface-name>
```

**System Log and Trace File**

You can use the system log (syslog) and trace file to discover more information about the ADC software. The syslog is used by the Multiservices-DPC to log messages, such as a real server coming up or going down, a virtual-server becoming available, and so on.

The trace file is used by the ADC software running in the routing engine (adc-mgmt) to print state and debug information.
This section includes the following topics:

- Configuring the Syslog File on page 20
- Viewing the Syslog File on page 20
- Accessing the Syslog File on page 21
- Configuring the Trace File on page 21
- Viewing the Trace File on page 21
- Accessing the Trace File on page 22

## Configuring the Syslog File

The following example illustrates how to correctly set up your syslog for your device.

To configure the syslog for the device

**Note:** In this example, the syslog file is configured globally for the router under the system hierarchy.

```
[edit]
system {
    syslog {
        file device-log {
            any any;
        }
        file adc-log {
            any any;
            match adc;
        }
    }
}
```

Alternatively, you can configure the syslog server. See your Juniper Networks documentation for more information on the syslog.

## Viewing the Syslog File

You can view the syslog file using one of the following methods:

**Note:** The syslog filename “adc-log” is a sample filename used for these examples. Your filename may be different. For more information, see "Configuring the Syslog File" on page 20.
To use the show command to view the syslog file

```
user@host> show log adc-log
```

To set a separate connection that constantly shows the new messages in the syslog file

```
user@host> monitor start adc-log
```

**Accessing the Syslog File**

The syslog file itself is located in the directory `/var/log`. You can access the file using FTP to connect to the device, and then navigating to `/var/log`.

Old files are compressed (zipped) in the same location using the filename `adc-log.#.gz`.

**Note:** The syslog filename “adc-log” is a sample filename used for these examples. Your filename may be different. For more information, see "Configuring the Syslog File" on page 20.

**Configuring the Trace File**

The trace file is configured in the ADC software using the Junos OS conventions for trace configuration.

```
[edit extensions adc]
traceoptions {
  file dynamic.txt size 500000 world-readable;
  flag all;
}
```

**Viewing the Trace File**

You can view the trace file using one of the following methods:

**Note:** The trace filename “dynamic.txt” is a sample filename used for these examples. Your filename may be different. For more information, see "Configuring the Trace File" on page 21.
To view the trace file using the show command

```bash
user@host> show log ext/radware/dynamic.txt
```

To set a separate connection that constantly shows the new messages in the trace file

```bash
user@host> monitor start ext/radware/dynamic.txt
```

### Accessing the Trace File

The trace file itself is located in `/var/log/ext/radware`. You can access the file using FTP to connect to the device and then navigating to `/var/log/ext/radware`.

Old files are compressed (zipped) in the same location using the filename `dynamic.txt.#.gz`.

**Note:** The trace filename “dynamic.txt” is a sample filename used for these examples. Your filename may be different. For more information, see "Configuring the Trace File" on page 21.
Chapter 3 – Initial Troubleshooting

This chapter describes the actions you should take before calling Juniper Networks Technical Support. This involves gathering information, assessing the situation, and collecting certain system statistics that will be helpful to technical support personnel.

This chapter includes the following topics:

- Gathering Information on page 23
- Assessing Panic on page 28
- Collecting System Statistics on page 28

Gathering Information

Before contacting technical support, gather information that can help support personnel when troubleshooting. This includes the following information:

- ADC software status
- Software version
- Saving technical support dump
- System capacity
- System configuration details
- Session entry
- System log
- Topology of the network
- A list of any changes made prior to the issue (such as software, hardware, and upgrades)

This section includes the following topics:

- Viewing Chassis Information on page 23
- Viewing General System Information on page 24
- Viewing the Software Version on page 26
- Saving Technical Support Information on page 27
- Viewing System Maintenance Information on page 27
- Providing a Network Topology Map on page 28
- Documenting System and Network Changes on page 28

Viewing Chassis Information

The first thing you will need to gather is the chassis information: which chassis is used, what are the PICs inside it, and so on.
Use the `hardware` command to show this information.

To view the chassis information

```
user@host> show chassis hardware
```

<table>
<thead>
<tr>
<th>Item</th>
<th>Version</th>
<th>Part number</th>
<th>Serial number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis</td>
<td></td>
<td>JN1111111111</td>
<td>MX240</td>
<td></td>
</tr>
<tr>
<td>Midplane</td>
<td>REV 07</td>
<td>760-021404</td>
<td>ABAA8888</td>
<td>MX240 Backplane</td>
</tr>
<tr>
<td>FPM Board</td>
<td>REV 04</td>
<td>760-021392</td>
<td>YB2459</td>
<td>Front Panel Display</td>
</tr>
<tr>
<td>PEM 1 240V AC in</td>
<td>Rev 01</td>
<td>740-022697</td>
<td>QCS1002C0A1</td>
<td>PS 1.2-1.7kW; 100-240V AC in</td>
</tr>
<tr>
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<td>Rev 01</td>
<td>740-022697</td>
<td>QCS1002C02E</td>
<td>PS 1.2-1.7kW; 100-240V AC in</td>
</tr>
<tr>
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<td>740-015113</td>
<td>9009015040</td>
<td>RE-S-1300</td>
</tr>
<tr>
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<td>REV 07</td>
<td>710-021523</td>
<td>YC1029</td>
<td>MX SCB</td>
</tr>
<tr>
<td>FPC 0</td>
<td>REV 18</td>
<td>750-022766</td>
<td>XY4672</td>
<td>DPCE 20x 1GE + 2x</td>
</tr>
<tr>
<td>10GE X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU</td>
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<td>710-022351</td>
<td>XX1139</td>
<td>DPC PMB</td>
</tr>
<tr>
<td>PIC 0</td>
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<td>BUILTIN</td>
<td>10x 1GE(LAN)</td>
<td></td>
</tr>
<tr>
<td>PIC 1</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>10x 1GE(LAN)</td>
<td></td>
</tr>
<tr>
<td>Xcvr 0</td>
<td>REV 02</td>
<td>740-011613</td>
<td>PH25T3E</td>
<td>SFP-SX</td>
</tr>
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<td>NON-JNPR</td>
<td>A0507085508</td>
<td>SFP-SX</td>
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</tr>
<tr>
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<td>BUILTIN</td>
<td>1x 10GE(LAN/WAN)</td>
<td></td>
</tr>
<tr>
<td>Xcvr 0</td>
<td>REV 03</td>
<td>740-014289</td>
<td>CA05BQ035</td>
<td>XFP-10G-SR</td>
</tr>
<tr>
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<td>1x 10GE(LAN/WAN)</td>
<td></td>
</tr>
<tr>
<td>Xcvr 0</td>
<td>REV 03</td>
<td>740-014289</td>
<td>CA05BQ039</td>
<td>XFP-10G-SR</td>
</tr>
<tr>
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<td>REV 07</td>
<td>750-024064</td>
<td>XT0653</td>
<td>MS-DPC</td>
</tr>
<tr>
<td>CPU</td>
<td>REV 07</td>
<td>710-013713</td>
<td>XT4129</td>
<td>DPC PMB</td>
</tr>
<tr>
<td>PIC 0</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>MS-DPC PIC</td>
<td></td>
</tr>
<tr>
<td>PIC 1</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>MS-DPC PIC</td>
<td></td>
</tr>
<tr>
<td>FPC 2</td>
<td>REV 07</td>
<td>750-024064</td>
<td>XR6311</td>
<td>MS-DPC</td>
</tr>
<tr>
<td>CPU</td>
<td>REV 07</td>
<td>710-013713</td>
<td>XR6176</td>
<td>DPC PMB</td>
</tr>
<tr>
<td>PIC 0</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>MS-DPC PIC</td>
<td></td>
</tr>
<tr>
<td>PIC 1</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>MS-DPC PIC</td>
<td></td>
</tr>
<tr>
<td>Fan Tray 0</td>
<td>REV 01</td>
<td>710-030216</td>
<td>XV8381</td>
<td>Enhanced Fan Tray</td>
</tr>
</tbody>
</table>

**Viewing General System Information**

The `adc status` command displays technical information about the ADC software status. When troubleshooting a problem, use this command to obtain useful information about the ADC software.

The `adc status` command also has a "detail" option that shows more information on the adc-mgmt daemon.

**Note:** After the Multiservices-DPC is online, the Multiservices-DPC is starting to load the ADC software. This process takes some time. If the Multiservices-DPC is online but appears as down in the `adc status` command, it is probably loading the software.
To view the general system information

```
user@host> show extensions adc status
SLB daemon status : Up
Up Since Wed Mar 14 12:45:22 2012
adc instance lb1:
Interface    Status     Control Daemon   #Data Daemons up  #Disconnections
License
-----------+----------+----------------+-----------------+----------------
-+------------
ms-1/0/0     Up         Up               21                0
Licensed
- OR -
user@host> show extensions adc status detail
SLB daemon status : Up
Up Since Wed Mar 14 12:45:22 2012
SLB daemon to SDK Services daemon (SSD) connection:
current status: Up
number of disconnections: 0

SLB daemon to Dynamic Firewall Filters Daemon (DFWD) connection:
current status: Up
number of disconnections: 0

Interface status:
Interfaces running adc: ms-1/0/0, ms-1/1/0
Interfaces that appear in the configuration: ms-1/0/0

adc instance lb1:
Interface    Status     Control Daemon   #Data Daemons up  #Disconnections
License
-----------+----------+----------------+-----------------+----------------
-+------------
ms-1/0/0     Up         Up               21                0
Licensed

Unattached:
Interface    Status
-------------+----------
ms-1/1/0     Down
```
Viewing the Software Version

The following examples illustrate how to view the software version on the device.

To view the software version

Note: The `show version` command displays the software version for all software running on the device.

```
user@host> show version
Hostname: host
Model: mx240
JUNOS Base OS boot [11.1R1.14]
JUNOS Base OS Software Suite [11.1R1.14]
JUNOS Kernel Software Suite [11.1R1.14]
JUNOS Packet Forwarding Engine Support (M/T Common) [11.1R1.14]
JUNOS Packet Forwarding Engine Support (MX Common) [11.1R1.14]
JUNOS Online Documentation [11.1R1.14]
JUNOS Voice Services Container package [11.1R1.14]
JUNOS Border Gateway Function package [11.1R1.14]
JUNOS Services AACL Container package [11.1R1.14]
JUNOS Services LL-PDF Container package [11.1R1.14]
JUNOS Services PTSP Container package [11.1R1.14]
JUNOS Services Stateful Firewall [11.1R1.14]
JUNOS Services NAT [11.1R1.14]
JUNOS Services Application Level Gateways [11.1R1.14]
JUNOS Services Captive Portal and Content Delivery Container package [11.1R1.14]
JUNOS Services RPM [11.1R1.14]
JUNOS AppId Services [11.1R1.14]
JUNOS IDP Services [11.1R1.14]
JUNOS Runtime Software Suite [11.1R1.14]
JUNOS Routing Software Suite [11.1R1.14]
ADC MGMT Daemon [11.1R1.14_1.4R0.0_int092]
ADC Control Component [11.1R1.14_1.4R0.0_int092]
ADC Dataplane Component [11.1R1.14_1.4R0.0_int092]
```
To view additional information about the software version

**Note:** The `adc internal software-version` command displays detailed information about the current ADC software version.

```
user@host> show extensions adc internal software-version
Software Build Information:
  Software Version: 1.4R0.0
  Build ID: 092
```

**Saving Technical Support Information**

You can save the technical support file and send it to your technical support personnel for debugging purposes. The file contains device information, statistics, and configuration. The output of the support command is directed to the console screen. You can transfer the output into a file in order to save it.

**To print the maintenance information to the console screen**

```
user@host> request extensions radware maintenance information
```

**To save the maintenance information to a file**

```
user@host> request extensions radware maintenance information | save <filename>
```

**Viewing System Maintenance Information**

The `maintenance` command displays information about the maximum and currently enabled capacity for the connection table, as well as various counters from Layer 3 to Layer 7, per Multiservices-DPC NPU.

**To view system maintenance information**

```
user@host> show extensions adc internal maintenance <Multiservices-DPC PIC name>
```
Providing a Network Topology Map

Every network is designed differently. You should maintain a detailed and accurate topology diagram of your network showing the nodes and connections. This visual depiction of your network is very helpful to technical support personnel when they assess your problem.

Documenting System and Network Changes

When troubleshooting a problem, verify if anything has changed in the network recently. The following are a few questions that help you analyze and document changes to your system network:

- Have you recently changed or upgraded your system, your network, or a custom application? (For example, has any configuration or code been changed?)
- When were these changes made? Provide the date and time.
- Who made these changes? Were the changes made by a partner or customer? Provide the names of the individuals who made the changes.
- Which events, such as an upgrade, a LAN change, increased traffic, or new hardware, can be identified prior to the trouble occurring?

Assessing Panic

An ADC software crash is also called a “panic.” When a panic happens, the core-dump file saves the ADC software status in the file system prior to the panic. This is useful in backtracing the events which led to the panic. The information is held in core-dump files according to the process that had the panic. The files are numbered, starting from 0, for each process.

The files are created under the directory `/var/tmp` in the router.

The ADC software running in the routing engine (adc-mgmt) core-dump file is called `adc-mgmt.core-tarball.X.tgz`.

The Multiservices-DPC NPU core-dump file is called `adc-ctrl.core.msXX.X.gz` AND/OR `adc-data.core.msXX.X.gz`. In many cases, both are created.

Caution: After the panic happens, the core-dump file is created. It can take up to 20 minutes before the file is ready.

Collecting System Statistics

In each Multiservices-DPC NPU, there is 1 control processor (CP) and 21 data processors (DP). While in the Junos OS these numbers are configurable, the ADC software only uses these specific numbers (1 control core and 7 data cores are translated into 1 control processor and 21 data processors). This section explains in detail how to capture these statistics for troubleshooting. It includes the following topics:

- Control Processor CPU Use on page 29
- Switch Processor on page 29
Control Processor CPU Use

You can capture Controller Processor (CP) CPU use by using the `cpu` command.

To capture CP CPU information

```
user@host> show extensions adc cpu
CPU Utilization for interface ms-1/0/0
    CP average for last 64 seconds: 15
    DP average for last 64 seconds: 40, max: 50, min: 31

CPU Utilization for interface ms-2/0/0
    CP average for last 64 seconds: 2
    DP average for last 64 seconds: 41, max: 60, min: 31

CPU Utilization for interface ms-2/1/0
    CP average for last 64 seconds: 2
    DP average for last 64 seconds: 44, max: 60, min: 37
```

Switch Processor

DP CPU is the main data-path processor for the ADC software. There are 21 DPs per Multiservices-DPC NPU. This section explains how to view DP statistics and trace the reasons for high DP CPU use.

High DP CPU use is usually due to high traffic volume or a denial of service (DoS) attack to client-facing interfaces. To verify that, check the interface statistics.

This section includes the following topics:

- [DP CPU Statistics](#) on page 30
- [DP Maintenance Statistics](#) on page 31
**DP CPU Statistics**

You can display statistics for all DP CPUs in a certain Multiservices-DPC NPU using the `cpu` command.

To display DP CPU statistics

```bash
user@host> show extensions adc cpu ms-1/0/0

CPU Utilization for interface ms-1/0/0
  DP average for last 64 seconds: 40
  DP max for last 64 seconds: 50
  DP min for last 64 seconds: 31

cpu threshold: 85
Alert is triggered when atleast half DPs cross this threshold

<table>
<thead>
<tr>
<th></th>
<th>1 second</th>
<th>4 seconds</th>
<th>64 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP</td>
<td>16</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>DP 1</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>DP 2</td>
<td>46</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>DP 3</td>
<td>40</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>DP 4</td>
<td>41</td>
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<td>DP 5</td>
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<td>39</td>
<td>39</td>
</tr>
<tr>
<td>DP 6</td>
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</tr>
<tr>
<td>DP 7</td>
<td>41</td>
<td>41</td>
<td>42</td>
</tr>
<tr>
<td>DP 8</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>DP 9</td>
<td>36</td>
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</tr>
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<td>DP 10</td>
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</tr>
<tr>
<td>DP 11</td>
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</tr>
<tr>
<td>DP 12</td>
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</tr>
<tr>
<td>DP 13</td>
<td>38</td>
<td>39</td>
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</tr>
<tr>
<td>DP 14</td>
<td>44</td>
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<tr>
<td>DP 15</td>
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<td>DP 16</td>
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</tr>
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<td>DP 19</td>
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</tr>
<tr>
<td>DP 20</td>
<td>44</td>
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</tr>
<tr>
<td>DP 21</td>
<td>40</td>
<td>41</td>
<td>41</td>
</tr>
</tbody>
</table>
```
**DP Maintenance Statistics**

The `maintenance` command displays DP maintenance statistics per DP.

To display DP maintenance statistics

```
user@host> show extensions adc internal maintenance ms-1/0/0 dp 12
```

<table>
<thead>
<tr>
<th></th>
<th>RCV Success from</th>
<th>RCV Errors from</th>
<th>SND Success to</th>
<th>SND failures to</th>
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<tbody>
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</tr>
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<td>1532456</td>
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<td>0</td>
<td>742807</td>
<td>0</td>
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<td>478408</td>
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</tr>
<tr>
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</table>

learn-err-noddw: 0 resolve-err-noddw: 0
age-mp-noddw: 0 delete-miss: 0
pfdb-free-empty: 0
tcp-discards: 0 udp-discards: 0

Dynamic Memory Statistics

```
Total memory in bytes 0
Current memory in bytes 0
allocs 0
trees 0
allocate failures 0
bytes hiwait 0
```
Chapter 4 – Extended Troubleshooting

This chapter explains extended troubleshooting using a step-by-step model to systematically identify and rule out problems with hardware, software layers, and different software features. Therefore, it is recommended to follow the procedures in this chapter in the order they appear. This approach helps you to maximize your time by minimizing the chance that the problem you are attempting to resolve resides in a different troubleshooting layer than the layer you are currently analyzing.

This chapter includes the following topics:
- System and Hardware Troubleshooting on page 33
- Troubleshooting OSI layers on page 34
- Troubleshooting Tools on page 38

System and Hardware Troubleshooting

This section explains troubleshooting that is related to the device system and the device hardware. This section is only a small portion of the possible troubleshooting actions for such issues. For more information, see your Juniper Networks troubleshooting documentation.

This section includes the following topics:
- System Troubleshooting on page 33
- Hardware Troubleshooting on page 34
- Multiservices-DPC NPU Troubleshooting on page 34

System Troubleshooting

Use the following commands to troubleshoot system issues:

- To verify general system-related issues

  `user@host> show hardware ?`

- To ensure no alarms are raised for your device

  `user@host> show chassis alarms`
Hardware Troubleshooting

Use the following command to troubleshoot hardware issues:

To verify chassis and hardware issues

```
user@host> show chassis ?
```

Multiservices-DPC NPU Troubleshooting

Use the following commands to troubleshoot issues with the Multiservices-DPC NPU:

To verify the Multiservices-DPC status

```
user@host> show chassis fpc pic-status
```

Note: This command may show a Multiservices-DPC as being “up,” but that does not mean that it is ready to run ADC traffic. It may mean that it is in the process of loading the ADC software and is not yet ready to process traffic. Use the `adc status` command to verify the status of the ADC software.

To change the Multiservices-DPC status between offline and online

```
user@host> request chassis pic offline fpc-slot <slot #> pic-slot <pic #>
user@host> request chassis pic online fpc-slot <slot #> pic-slot <pic #>
```

Troubleshooting OSI layers

This section explains troubleshooting using the Open Systems Interconnection (OSI) model to systematically identify and rule out problems at Layers 1 through 4 and Layer 7.

This section includes the following topics:

- Layer 1 and Layer 2 on page 34
- Layer 3 on page 35
- Layer 4 on page 36
- Layer 7 on page 38

Layer 1 and Layer 2

Use the following commands to diagnose the Layer 1 and Layer 2 issues:
To verify which interfaces exist in the device and what their status is

```
user@host> show interface terse
```

To verify packet statistics on a specific interface

```
user@host> show interface <interface-name>
```

To verify errors and extensive statistics on a specific interface

```
user@host> show interfaces extensive <interface name>
```

To verify spanning tree issues

```
user@host> show spanning-tree ?
```

To verify link-aggregation and LACP issues

```
user@host> show lacp ?
```

**Layer 3**

Check the following to diagnose issues in Layer 3:

- The interfaces are up and assigned to the correct VLAN.
- Local networks are defined for any route or interface. Check if they are defined for all interfaces and each static route. Otherwise all non-local, net-defined traffic is sent to the default gateway.
- The routing table uses the correct next-hops and interfaces. Also, ensure that local networks are defined for each static route and that the routes for dynamic networks appear in the routing table.

Use the following commands to diagnosis issues with Layer 3:
To verify the interfaces configuration and status

```
user@host> show configuration interface
-AND-
user@host> show interface terse
```

To verify that the routing table uses the correct next hops and interfaces

```
user@host> show route ?
```

To display information on the routes in the device

```
user@host> show route table <all>
-AND-
user@host> show route forwarding-table
```

To verify VRRP issues

```
user@host> show vrrp ?
```

Layer 4

Check the following to diagnose issues in Layer 4:

- The correct interfaces are configured as client and server interfaces
- There are failed or blocked services. Blocked services indicate that another real service is failing a health check within the same group.
- Real servers are up.
- Real servers are part of the desired group.
- The correct Layer 4 configuration (client, server, NAT, hot-standby, and filtering) is configured.
- Verify the virtual server and service status. If the status of the services is "down," then make sure that the associated real-server status is "up" and functioning.
- Verify the virtual-server routes are added to the front-end routing-instance (fe-ri).
- Verify if the real servers are passing health checks. If the health check fails, then do the following:
  - Confirm that the appropriate gateway is on the real server. The gateway needs to be the device interface or next-hop toward the device.
— Confirm that health check replies are forwarded by the appropriate interface for a multihomed real server.
— Confirm that there are no routing loops between the real server and the router.

Use the following commands to diagnose issues with Layer 4:

**To verify correct interfaces are configured as client- and server-interfaces**

```
user@host> show configuration extensions adc adc-instance <name> router-interfaces
```

**To verify real server and failed or blocked services (per server name)**

```
user@host> show extensions adc real-server <server name>
```

**To verify group status and traffic distribution**

```
user@host> show extensions adc group [group name]
```

**To verify the virtual server status**

```
user@host> show extensions adc virtual-server [virtual-server-name]
```

**To verify the virtual service status and statistics**

```
user@host> show extensions adc <protocol> virtual-server <virtual-server-name>
```

**To verify the virtual server routes and automatic configuration**

```
user@host> show extensions adc internal generated-configuration
```
Layer 7

Verify Layer 7 to diagnose issues in Secure Sockets Layer ID (SSL ID), URL parsing, scripted and content-based health check, and Domain Name System (DNS) load balancing.

- Check SSL ID persistency.
  Sniff the connection and check the server logs for the SSL IDs. Correlate this information. For example, if a client connects to the device, check the initial request to the real server coming on a 0 valued Session ID. The server issues an SSL ID back to the client. As long as the client uses the same SSL ID for incoming connections, the session is bound to the same real server. If there is a change in SSL ID (due to a client or server issue), it is easily captured in the sniffer traces.

- Check URL parsing.
  Configure content-match strings. Map the requests and verify them using a sniffer to ensure that the correct content is specified.

- Perform script- and content-based health checks.
  Check if there is any configuration error in the script or content. Verify the script using a telnet client to ensure that you are getting a 200 OK (or the expected response in the script) back from the server.

- Check DNS-based load balancing.
  Verify the string associated with the DNS name specified.

- Check URL hashing and header-hash load balancing.

Troubleshooting Tools

This section explains how to use specific troubleshooting tools available in the ADC software.

This section includes the following topics:

- Filter Log Action on page 38
- Server Operational Status on page 39
- Connection Table Troubleshooting on page 39

Filter Log Action

When working with filters (transparent load balancing), you can add a “log” action to a filter. This will cause each packet that matched the filter conditions send a syslog message. The log action can be configured in parallel with other filter actions.

**Caution:** Using the log action on filters has a severe impact on performance as it sends a syslog message for every relevant packet.

To configure filter log action

```
[edit extensions adc adc-instance <name> filters term <name>]
user@host# set then log
```
Server Operational Status

While debugging, you may want to disable or enable a server. This is called changing the server operational status. Changing the server operational status also lets you replace a server or put it into a temporary down state.

**Note:** The disable and enable states are not saved after reboot. After reboot, all servers are considered enabled. If you want the server not to participate in load balancing after reboot, you should deactivate the server in configuration mode.

To disable a server from an ADC instance

```plaintext
user@host> request extensions adc disable real-server <server name>
```

To enable a server from an ADC instance

```plaintext
user@host> request extensions adc enable real-server <server name>
```

To disable all servers from an ADC instance

```plaintext
user@host> request extensions adc disable adc-instance <adc-name>
```

To enable all servers from an ADC instance

```plaintext
user@host> request extensions adc enable adc-instance <adc-name>
```

Connection Table Troubleshooting

The connection table contains all tracked connections in the ADC software. Each connection that is not part of a "per-packet-load-balance" service or filter will appear in the connection table. Information in the connection table can help you determine if a session is recognized by the ADC software. Each connection table entry displays information on which server was chosen for the connection, and if the connection is involved in extended processing such as NAT or persistency.

To show connection table counters for an open connections

```plaintext
user@host> show extensions adc connection-table
```
To show the connection table entries

```
user@host> show extensions adc connection-table extensive adc-instance lb1
```

Connection table entries can be filtered by each of the following parameters:
- destination-address
- destination-port
- destination address and port
- filter-term
- nat-address
- real-server
- source-address
- source-port

To delete an entry in the connection table

```
user@host> clear extensions adc connection-entry <instance-name> <destination-address> <destination-port> <source-address> <source-port> <tcp|udp>
```

To delete the entire connection table for an ADC instance

```
user@host> clear extensions adc connection-table <instance-name>
```
Chapter 5 – Feature-Specific Troubleshooting

This chapter describes the feature-specific troubleshooting tools available in the ADC software. It includes the following topics:

- ADC Automatic Configuration on page 41
- NAT IP Addresses on page 45
- High Availability on page 46
- License Information on page 50

ADC Automatic Configuration

The ADC software uses automatic configuration to handle packet receiving and sending to and from the device. This section describes how to troubleshoot the automatic configuration and how to use it for further troubleshooting.

This section includes the following topics:

- Commit-Script Automatic Configuration on page 41
- Junos OS SDK API Automatic Configuration on page 43

Commit-Script Automatic Configuration

The ADC software uses the commit-script to configure static automatic configuration.

To view the automatic configuration set up using the commit-script

```
user@host> show configuration | display commit script
```

Note: The ADC automatic configuration added by the commit-script is marked using the "apply macro" attribute.
Example

```plaintext
user@host> show configuration interfaces | display commit-scripts
ge-0/2/0 {
    unit 0 {
        family inet {
            filter {
                apply-macro "Input was added by automatic script";
                input-list rdwr-default-accept;
            }
            address 100.0.0.1/16;
        }
    }
}
ge-0/3/0 {
    unit 0 {
        family inet {
            filter {
                apply-macro "Input was added by automatic script";
                input-list [ rdwr-lb1-be-filt rdwr-default-accept ];
            }
            address 200.0.0.1/16;
        }
    }
}
ms-1/0/0 {
    unit 0 {
        family inet;
    }
    unit 10000 {
        family inet {
            filter {
                apply-macro "This term was added by a commit script";
                input rdwr-ms-100-filt;
            }
        }
    }
}
```
Junos OS SDK API Automatic Configuration

The ADC software uses the dynamic Junos OS SDK API for automatic configuration. A firewall filter is added to the client-facing interfaces using the Junos OS SDK API. This firewall filter is dynamic since it only catches ("from" container) traffic with destination IP as VIP, and only when the VIP is marked as up in the ADC software.

To view the firewall filter that is added on the client-facing interfaces

```plaintext
user@host> show extensions adc internal generated-configuration
Front End firewall Filter name: rdwr-fe-filt
    Related interfaces: ge-0/2/0.0
    Adc instance lb1:
        Active VIPs: 150.0.0.120 (routes added)
        Non-active VIPs: None
        Routing instance: rdwr-lb1-fe-ri
        Packet counter: 0
        Total Bytes: 0
```

The ADC software also adds routes to the routing instances on the device. These routes can be displayed, as well as all other routes, using the appropriate command.

To view the routes on the device

```plaintext
user@host> show route all
```

The debug-enable Command

The `debug-enable` command is a hidden debug command under the ADC hierarchy. When the `debug-enable` command is set, the ADC software does two additional activities for debugging purposes:

- The ADC software sends more syslog messages with debug information on the internal ADC software processes.
- The ADC software configures counters per firewall filter term to count the traffic that is caught by each term. This configuration is performed both for the `commit-script` filters and for the Junos OS SDK API filters.

As a result of the above additional activities, the `debug-enable` command results in a performance penalty, and reduces the capacity of the Multiservices-DPC NPUs running the ADC software.

To configure the debug-enable flag

```plaintext
[edit extensions adc]
user@host# set debug-enable
```
Since the commit-script uses an input list to bind filters to the device interfaces, the counter names for these filters are changed by the Junos OS. The relevant counter name is always the interface name followed by an "-i" string.

**Example**

A  To view the firewall filters counters configured by the commit-script for fe-1/3/3:

```plaintext
user@host> show firewall filter fe-1/3/3.0-i
Filter: fe-1/3/3.0-i
Counters:
    Name                        Bytes  Packets
default-accept-fe-1/3/3.0-i  0       0
demo-accept-to-serv-if-fe-1/3/3.0-i  0       0
demo-first-fragment-fe-1/3/3.0-i  0       0
demo-icmp-fe-1/3/3.0-i       0       0
demo-non-first-fragment-fe-1/3/3.0-i  0       0
rdwr-ms-100-be-counter-fe-1/3/3.0-i  13398625  186045
```

B  To view the counters for the firewall filters configured by the Junos OS SDK API:

```plaintext
user@host> show extensions adc internal generated-configuration
Front End firewall Filter name: rdwr-fe-filt
    Related interfaces: ge-0/2/0.0
    Adc instance lb1:
        Active VIPs: 150.0.0.120 (routes added)
        Non-active VIPs: None
        Routing instance: rdwr-lb1-fe-ri
        Packet counter: 10
        Total Bytes: 1244
```
NAT IP Addresses

Use the following procedure to troubleshoot NAT addresses in the ADC software.

To troubleshoot NAT addresses for the ADC software

1. Check that the client-nat parameter is enabled for the servers.

```
user@host> show configuration extensions adc adc-instance lb1 real-servers
r1 {
    address 200.0.0.10;
    client-nat;
}
r2 {
    address 200.0.0.11;
    client-nat;
}
```

**Note:** The client-nat parameter must be enabled on the servers.

2. For filters with action load balancing, client-nat should be configured per each filter.

```
user@host> show configuration extensions adc adc-instance <adc-name> filters term <name> then
load-balance {
    group g1;
    client-nat;
}
```
3. Check the number of NAT addresses configured on all Multiservices-DPC CPUs. At least one NAT address must be configured per NPU.

```plaintext
user@host> show configuration extensions adc adc-instance lb1 router-interfaces ms-interfaces

ms-1/0/0 {
    unit 0 {
        family {
            inet {
                nat-address 1.1.1.1;
            }
        }
    }
}

Or:

ms-1/0/0 {
    unit 0 {
        family {
            inet {
                nat-address-range 1.1.1.2 to 1.1.1.5;
            }
        }
    }
}
```

**Note:** The configured NAT address cannot be the same as to any other IP address defined in the configuration (such as a real-server address, virtual-server address, and so on).

4. Check NAT statistics.

```plaintext
user@host> show extensions adc nat
```

**High Availability**

The ADC software uses the Junos OS based high-availability mechanism called Redundant Multiservices-PIC (RMS) for high availability. As part of the high-availability solution, the ADC software passes the connection-table data from the active Multiservices-DPC NPU in the RMS to the backup Multiservices-DPC NPU. This process is called connection synchronization. This section explains how to troubleshoot the RMS and connection synchronization mechanisms.

This section includes the following topics:
- [RMS Troubleshooting on page 47](#)
- [Connection Synchronization Troubleshooting on page 49](#)
**RMS Troubleshooting**

Use the following procedure to troubleshoot RMS issues:

- **To troubleshoot high availability for the ADC software**
  1. Check that the RMS configuration is set up correctly in Junos OS.

```
user@host> show configuration interfaces
rms0 {
    redundancy-options {
        primary ms-0/2/0;
        secondary ms-0/3/0;
        hot-standby;
    }
}
```

2. Check that the adc-instance is configured to use the RMS and not the Multiservices-DPCs.

```
user@host> show configuration extensions adc
adc-instance demo {
    router-interfaces {
        ms-interfaces {
            rms0;
        }
    }
}
```

3. Verify that the RMS appears in the ADC status command as an active interface.

```
user@host> show extensions adc status
SLB daemon status : Up
Up Since Tue Mar 15 18:56:33 2011
adc instance kobis:
Interface  Status  Control Daemon  #Data Daemons up  #Disconn License
----------+----------+----------------+----------------+---------+------
rms0  Up  Up  21  0  Licensed
```
4. Verify that the routes in the front-end routing instance point to the RMS and not to the Multiservices-DPCs. Look for the virtual server routes in the `rdwr-<adc-instance-name>-fe-ri`. The following example uses the adc-instance name "demo" and the virtual-server address 6.2.2.50.

**Example**

```
user@host> show route all

rdwr-demo-fe-ri.inet.0: 6 destinations, 7 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2.2.2.0/24         *[Direct/0] 22:49:28
    > via fe-0/0/1.0
2.2.2.1/32         *[Local/0] 22:49:28
    Local via fe-0/0/1.0
3.3.3.0/24         *[Direct/0] 22:49:28
    > via fe-0/0/3.0
    [Direct/0] 22:49:28
    > via fe-0/0/3.0
3.3.3.1/32         *[Local/0] 22:49:28
    Local via fe-0/0/3.0
3.3.3.44/32        *[Local/0] 22:49:28
    Local via fe-0/0/3.0
6.2.2.50/32        *[Static/1] 14:57:40
    > via rms0.0
```

5. Verify the RMS filter counter is defined and catching traffic.

**Note:** The counters are defined only when the `debug-enable` command is set. For more information, see "The `debug-enable` Command" on page 43.

```
user@host> show firewall filter rdwr-rms0-filt

Filter: rdwr-rms0-filt
Counters:
Name  Bytes  Packets
all   0       0
```
Connection Synchronization Troubleshooting

Use the following procedure to troubleshoot issues relating to connection synchronization.

To troubleshoot connection synchronization for the ADC software

1. When using virtual-server load balancing, verify the connection synchronization is configured for your virtual service.

   ```
   user@host# show extensions adc adc-instance <adc-name> virtual-server <name>
   http-virtual-service <name> {
       ...
       sync-connections;
   }
   ```

2. When using filter load balancing, verify the `sync-connections` parameter is configured for your filter.

   ```
   user@host# show extensions adc adc-instance <adc-name> filters term <name>
   then {
       load-balance {
           ...
           sync-connections;
       }
   }
   ```

3. Verify connection synchronization is not disabled for the entire ADC instance. Do this by ensuring the `no-connections-sync` parameter is not set in the `adc-instance`.

   ```
   user@host# show extensions adc adc-instance <adc-name> {
       ...
       no-connections-sync;
   }
   ```

   **Caution:** If the `no-connections-sync` parameter is used at the `adc-instance` level, the `sync-connections` parameter at any other level of the hierarchy will not function.

4. Use the hidden `passive` switch to find the connection table that is synchronized. When using this switch with the connection table, the ADC software takes the connection-table information from the backup Multiservices-DPC NPU inside the RMS. This lets you view the synchronized data.

   ```
   user@host> show extensions adc connection-table extensive passive adc-instance <adc-name>
   ```
License Information

The ADC software must be licensed in order to run on your Multiservices-DPC. The license is set per chassis serial number, and determines the maximum number of Multiservices-DPC NPUs that can run the ADC software.

To verify the chassis serial number

```bash
user@host> show chassis hardware
Hardware inventory:
<table>
<thead>
<tr>
<th>Item</th>
<th>Version</th>
<th>Part number</th>
<th>Serial number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis</td>
<td>REV 07</td>
<td>760-021404</td>
<td>ABAA8888</td>
<td>MX240 Backplane</td>
</tr>
<tr>
<td>Midplane</td>
<td>REV 04</td>
<td>760-021392</td>
<td>YB2459</td>
<td>Front Panel Display</td>
</tr>
<tr>
<td>FPM Board</td>
<td>Rev 01</td>
<td>740-022697</td>
<td>QCS1002C0A1</td>
<td>PS 1.2-1.7kW; 100-240V AC in</td>
</tr>
<tr>
<td>PEM 1</td>
<td>Rev 01</td>
<td>740-022697</td>
<td>QCS1002C02E</td>
<td>PS 1.2-1.7kW; 100-240V AC in</td>
</tr>
<tr>
<td>Routing Engine 0</td>
<td>REV 09</td>
<td>740-015113</td>
<td>9009015040</td>
<td>RE-S-1300</td>
</tr>
<tr>
<td>CB 0</td>
<td>REV 07</td>
<td>710-021523</td>
<td>YC1029</td>
<td>MX SCB</td>
</tr>
<tr>
<td>FPC 0</td>
<td>REV 18</td>
<td>750-022766</td>
<td>XY4672</td>
<td>DPCE 20x 1GE + 2x 10GE X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CPU</td>
<td>REV 03</td>
<td>710-022351</td>
<td>XX1139 DPC PMB</td>
</tr>
<tr>
<td></td>
<td>PIC 0</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>10x 1GE (LAN)</td>
</tr>
<tr>
<td></td>
<td>PIC 1</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>10x 1GE (LAN)</td>
</tr>
<tr>
<td></td>
<td>Xcvr 0</td>
<td>REV 02</td>
<td>740-011613</td>
<td>PH25T3E SPP-SX</td>
</tr>
<tr>
<td></td>
<td>Xcvr 1</td>
<td>REV 02</td>
<td>740-011613</td>
<td>PH25T3Y SPP-SX</td>
</tr>
<tr>
<td></td>
<td>Xcvr 2</td>
<td>NON-JNPR</td>
<td>PT5342883</td>
<td>SPP-SX</td>
</tr>
<tr>
<td></td>
<td>Xcvr 3</td>
<td>NON-JNPR</td>
<td>A0507085508</td>
<td>SPP-SX</td>
</tr>
<tr>
<td></td>
<td>PIC 2</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>1x 10GE (LAN/WAN)</td>
</tr>
<tr>
<td></td>
<td>Xcvr 0</td>
<td>REV 03</td>
<td>740-014289</td>
<td>CA05B035 XFP-10G-SR</td>
</tr>
<tr>
<td></td>
<td>PIC 3</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>1x 10GE (LAN/WAN)</td>
</tr>
<tr>
<td></td>
<td>Xcvr 0</td>
<td>REV 03</td>
<td>740-014289</td>
<td>CA05B039 XFP-10G-SR</td>
</tr>
<tr>
<td></td>
<td>FPC 1</td>
<td>REV 07</td>
<td>750-024064</td>
<td>XT0653 MS-DPC</td>
</tr>
<tr>
<td></td>
<td>CPU</td>
<td>REV 07</td>
<td>710-013713</td>
<td>XT4129 DPC PMB</td>
</tr>
<tr>
<td></td>
<td>PIC 0</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>MS-DPC PIC</td>
</tr>
<tr>
<td></td>
<td>PIC 1</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>MS-DPC PIC</td>
</tr>
<tr>
<td></td>
<td>FPC 2</td>
<td>REV 07</td>
<td>750-024064</td>
<td>XR6311 MS-DPC</td>
</tr>
<tr>
<td></td>
<td>CPU</td>
<td>REV 07</td>
<td>710-013713</td>
<td>XR6176 DPC PMB</td>
</tr>
<tr>
<td></td>
<td>PIC 0</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>MS-DPC PIC</td>
</tr>
<tr>
<td></td>
<td>PIC 1</td>
<td>BUILTIN</td>
<td>BUILTIN</td>
<td>MS-DPC PIC</td>
</tr>
<tr>
<td></td>
<td>Fan Tray</td>
<td>REV 01</td>
<td>710-030216</td>
<td>XV8381 Enhanced Fan Tray</td>
</tr>
</tbody>
</table>
```

To verify the license installed in your chassis

```bash
user@host> show system license
```
To verify the license defined and Multiservices PICs allowed by the license

```
user@host> show extensions adc license-info
```
Chapter 6 – Emergency Recovery Tree

This chapter outlines the procedures for recovering as quickly as possible from field outages. It includes the following topics:

- VIP Is Not Working on page 53
- ADC Software Panic on page 58
- Real Server Down on page 59

VIP Is Not Working

Figure 1 on page 54 through Figure 4 on page 57 illustrate the emergency recovery tree to follow when the VIP is not working.
Figure 1: VIP Not Working Recovery Diagram 1

1. Start

2. Ensure virtual services are configured for the VIP (show configuration adc-instance)

3. Find the group that is configured for the virtual service (show configuration adc-instance)

4. Is there any real server in the group that is up? (show extensions adc real-servers)
   - No: Perform ERT “real server down”
   - Yes: Proceed to next step

5. Ensure server-facing interfaces are defined for the adc-instance (show configuration adc-instance)

6. VIP working?
   - No: Return to the previous step
   - Yes: Proceed to next step

7. End
Figure 2: VIP Not Working Recovery Diagram 2

A

Is Server facing interface up? (show interface terse)

No

Handle port down situation (not an ADC issue)

VIP working?

Yes

End

No

Interface is on the same subnet or VLAN as real server?

Yes

Real server is reachable (using ping)

No

Is next hop assigned to the server associated route entry up?

Yes

Use traceroute to verify point of failure (not an ADC issue)

VIP working?

No

Handle next hop down (not an ADC issue)

Yes

End
Figure 3: VIP Not Working Recovery Diagram 3

- Ensure real server is operationally enabled (request extensions to enable real-server).
- Is service using persistency configuration? (show configuration adx).
- Ensure requests are directed to the correct server.
- Is direct server-redirect configured for the group? (show configuration adx).
- Real server response path is through the router?
- Configure Proxy.
- Charge route path (real server gateway).
- VIP working?
- Collect traces and maintenance information.
- Contact JTAC.
- End.
Figure 4: VIP Not Working Recovery Diagram 4

Use firewall filter counters to determine if the traffic from real server to the clients ingresses the router on the correct interface.

Correct interface?

Make sure nothing blocks traffic to and from the router.

VIP working?

End

Check if the virtual service port is the same port as used by the real server to listen to connections (telnet <server address> port <port num>)

Is TCP response reset?

Configure either server-listening-port under virtual service or listening-port under real server to match the right port number (in the second case server-listening-port under virtual service should 0)
ADC Software Panic

Figure 5 on page 58 illustrates the emergency recovery tree for switch panics.

Figure 5: Switch Panic Recovery Diagram
Real Server Down

Figure 6 on page 59 through Figure 9 on page 62 illustrate the emergency recovery tree to follow when a real server becomes unavailable.

Figure 6: Real Server Down Recovery Diagram 1
Figure 7: Real Server Down Recovery Diagram 2

A

Is there a firewall that drops health-check packets?

No

Yes

Identify the hop where the drops occur and resolve (non-ADC issue)

Real server up?

Yes

End

No

B

Is server port in blocked or active state?

active

blocked

If buddy servers are configured, ensure they are all up

C

Is CP utilization on the NS-PICs 100% or high?

No

Yes

Check if service is affected by the state of a dependent service. Either assign a new group or bring up the dependent service that is down
Figure 8: Real Server Down Recovery Diagram 3

B

Real server working? No → Non-ADG issue. Investigate other possibilities → End

Yes → Check if the virtual service port is the same port as used by the real server to listen to connections (e.g., `inet <server address> port <port num>`)

No → C

Is TCP response reset? No → End

Yes → Configure either server-listening-port under virtual service or listening-port under real server to match the right port number (in the second case server-listening-port under virtual service should 0)

Real server up? No → End

Yes → End
Figure 9: Real Server Down Recovery Diagram 4

1. Check that the real server supports the configured health check for that server group.

2. Real server up?
   - No: Is any device that is using the same interface as used by the real server dropping packets?
     - No: Collect traces and maintenance information.
     - Yes: Resolve port or device issue.
   - Yes: Is the real server up?
     - Yes: End.
     - No: Contact JTAC.
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