

topic

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Split Detection Behavior in a Virtual Chassis

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If there is a disruption to a *Virtual Chassis* configuration for MX Series 5G Universal Routing Platforms or EX9200 Switches due to the failure of a member router or switch or one or more Virtual Chassis port interfaces, the resulting connectivity loss can cause a split in the Virtual Chassis configuration. *Split detection* identifies the split and can minimize further network disruption.

BEST PRACTICE: Starting Junos release version 14.1R1 it is mandatory to use the heartbeat connection instead of the split detection feature in an MX Series Virtual Chassis. This is to avoid unnecessary primary role changes during an adjacency disruption or split, and to provide additional member health information for the primary-role election process. No-split-detection can lead to issues like creation of two virtual chassis masters on the network.

This topic covers:

How Split Detection Works in a Virtual Chassis

Split detection is enabled by default in an EX9200 or MX Series Virtual Chassis. You can disable split detection by including the `no-split-detection` statement at the `[edit virtual-chassis]` hierarchy level. Disabling split detection can be useful in certain Virtual Chassis configurations.

NOTE: Using the `no-split-detection` statement is prohibited when you configure a heartbeat connection, and the software prevents you from configuring both the `no-split-detection` and `heartbeat-address` statements at the same time. If you attempt to do so, the software displays an error message and causes the commit operation to fail. Please configure the `heartbeat-address` statement rather than the `no-split-detection` statement.

For example, if the backup router or switch fails in a two-member Virtual Chassis configuration and split detection is enabled (the default behavior), the primary router or switch takes a line-card role, and the line cards (FPCs) that do not host Virtual Chassis ports go offline. This state effectively halts routing and disables the Virtual Chassis configuration. By contrast, if the backup router or switch fails in a two-member Virtual Chassis configuration and split detection is disabled, the primary router or switch retains primary role and maintains all of the Virtual Chassis ports, effectively resulting in a single-member Virtual Chassis consisting of only the primary router or switch.

Effect of Split Detection on Virtual Chassis Failure Scenarios

The behavior of a Virtual Chassis during certain failure scenarios depends on whether split detection is enabled or disabled. No Link Title describes the effect of the split detection setting on common failure scenarios in a two-member MX Series Virtual Chassis.

Table 1: Effect of Split Detection on Common Virtual Chassis Failure Scenarios

Type of Failure	Split Detection Setting	Results
Virtual Chassis port interfaces go down	Enabled	<ul style="list-style-type: none"> VC-B takes VC-P role. Previous VC-P takes line-card (VC-L) role. The line-card role isolates the router or switch and removes it from the Virtual Chassis until connectivity is restored. Result is a single-member Virtual Chassis consisting of only a single VC-P. The VC-P continues to maintain subscriber state information and route traffic. <p>When Virtual Chassis port interfaces are reconnected:</p> <ul style="list-style-type: none"> VC-P retains VC-P role. VC-L takes VC-B role. Subscribers are not affected.

Table 1: Effect of Split Detection on Common Virtual Chassis Failure Scenarios (Continued)

Type of Failure	Split Detection Setting	Results
Virtual Chassis port interfaces go down	Disabled	<p>When Virtual Chassis port interfaces are disconnected:</p> <ul style="list-style-type: none"> • VC-P retains VC-P role, and VC-B also takes VC-P role. The result is a Virtual Chassis with two VC-P routers or switches, each of which maintains subscriber state information. • Initially, both VC-P routers or switches have a complete list of subscribers. Because the two routers or switches have the same configuration, the effect on subscribers, traffic patterns, behavior of external applications, and subscriber login and logout operations is unpredictable while the Virtual Chassis port interfaces are disconnected. <p>When Virtual Chassis port interfaces are reconnected:</p> <ul style="list-style-type: none"> • Original VC-P before the disconnection resumes VC-P role, and original VC-B before the disconnection resumes VC-B role. • Subscribers on the VC-P are preserved. • Subscribers on the VC-B are purged. • The subscribers preserved on the VC-P are unaffected, and all remaining subscribers are able to log back in to the router or switch.

Table 1: Effect of Split Detection on Common Virtual Chassis Failure Scenarios (Continued)

Type of Failure	Split Detection Setting	Results
Virtual Chassis backup router or switch (VC-B) goes down	Enabled	<ul style="list-style-type: none"> VC-P takes line-card (VC-L) role, which causes all line cards (FPCs) that do not host Virtual Chassis ports to go offline. Previous VC-B is out of service. The line-card role isolates the primary router or switch and removes it from the Virtual Chassis until connectivity is restored. As a result, the Virtual Chassis is left without a primary router or switch, which halts interchassis routing and effectively disables the Virtual Chassis configuration. <p>When the failed router or switch is brought back into service:</p> <ul style="list-style-type: none"> The primary-role election algorithm is run to determine whether the router or switch takes a VC-P or VC-B role. The Virtual Chassis then becomes operational. All subscribers can log back in to the router or switch. Previous subscriber state information is not preserved.
Virtual Chassis backup router or switch (VC-B) goes down	Disabled	<ul style="list-style-type: none"> VC-P retains VC-P role and maintains all Virtual Chassis ports. Previous VC-B is out of service. Result is a single-member Virtual Chassis consisting of only a single VC-P. The VC-P continues to maintain subscriber state information and route traffic.

Table 1: Effect of Split Detection on Common Virtual Chassis Failure Scenarios (Continued)

Type of Failure	Split Detection Setting	Results
Virtual Chassis primary router or switch (VC-P) goes down	Split detection setting has no effect on behavior	<ul style="list-style-type: none"> VC-B takes over VC-P role regardless of whether split detection is enabled or disabled. Previous VC-P is out of service. Result is a single-member Virtual Chassis consisting of only a single VC-P. The new VC-P continues to maintain subscriber state information and route traffic. <p>When the original VC-P is brought back into service, or when the original VC-P is replaced with a new router or switch:</p> <ul style="list-style-type: none"> Original VC-P or its replacement takes VC-B role. Subscribers are not affected.
Active access link between the VC-P and the access node, such as a digital subscriber line access multiplexer (DSLAM), goes down	Split detection setting has no effect on behavior	<ul style="list-style-type: none"> Previous standby access link becomes the active access link between the VC-B and the access node. Traffic is routed through the new active access link. The VC-P continues to maintain subscriber state information and route traffic.

RELATED DOCUMENTATION

[*Virtual Chassis Components Overview*](#)

[*Global Roles and Local Roles in a Virtual Chassis*](#)

[*Primary-role Election in a Virtual Chassis*](#)

[*Switchover Behavior in an MX Series Virtual Chassis*](#)

[*Disabling Split Detection in a Virtual Chassis Configuration*](#)

Disabling Split Detection in a Virtual Chassis Configuration

If there is a disruption to a Virtual Chassis due to failure of a member device or one or more Virtual Chassis port links, the resulting connectivity loss can cause a split in the Virtual Chassis configuration. Split detection, which is enabled by default in an MX Series and EX9200 Virtual Chassis, identifies the split and minimizes further network disruption.

You can disable split detection by including the `no-split-detection` statement at the `[edit virtual-chassis]` hierarchy level. Disabling split detection can be useful in certain Virtual Chassis configurations.

For example, if the backup device fails in a two-member Virtual Chassis configuration and split detection is enabled (the default behavior), the primary device takes a line-card role, and the line cards (FPCs) that do not host Virtual Chassis ports go offline. This state effectively isolates the primary router or switch and removes it from the Virtual Chassis until connectivity is restored. As a result, routing or switching is halted and the Virtual Chassis configuration is disabled. By contrast, if the backup router or switch fails in a two-member Virtual Chassis configuration and split detection is disabled, the primary router or switch retains primary role and maintains all of the Virtual Chassis ports, effectively resulting in a single-member Virtual Chassis consisting of only the primary device.

BEST PRACTICE: We recommend that you disable split detection for a two-member Virtual Chassis configuration if you think the backup router or switch is more likely to fail than the Virtual Chassis port interfaces to the backup router or switch. Configuring redundant Virtual Chassis ports on different line cards in each member router or switch reduces the likelihood that all Virtual Chassis port interfaces to the backup router or switch can fail.

To disable split detection:

1. Specify that you want to disable the default detection of splits in the Virtual Chassis.

```
[edit virtual-chassis]
user@host# set no-split-detection
```

2. Commit the configuration.

Disabling split detection causes different results for different types of Virtual Chassis failures. For information, see *Split Detection Behavior in a Virtual Chassis*.

RELATED DOCUMENTATION

Split Detection Behavior in a Virtual Chassis

Global Roles and Local Roles in a Virtual Chassis

Switchover Behavior in an MX Series Virtual Chassis

Virtual Chassis Components Overview

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