Important Information

Latest Software
We recommend that you install the most recent software release to stay up-to-date with the latest functional improvements, stability fixes, security enhancements and protection against new and evolving attacks.

Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 February 2015</td>
<td>Updated version limitations</td>
</tr>
<tr>
<td>28 January 2015</td>
<td>Updated release version to R76SP.10_VSLS</td>
</tr>
<tr>
<td></td>
<td>Updated links to R76SP.10 Home Page</td>
</tr>
<tr>
<td></td>
<td>Updated and clarified the Upgrade procedures (&quot;Upgrading to Chassis VSLS&quot; on page 6)</td>
</tr>
<tr>
<td></td>
<td>Minor clarifications and textual corrections</td>
</tr>
<tr>
<td>10 September 2014</td>
<td>First release of this document</td>
</tr>
</tbody>
</table>

Feedback
Check Point is engaged in a continuous effort to improve its documentation.
Please help us by sending your comments (mailto:cp_techpub_feedback@checkpoint.com?subject=Feedback on Chassis VSLS for 61000 R76SP.10_VSLS Release Notes).
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Introduction

This release is based on R76, R76SP and R76SP.10.

For more information about R76SP.10, see the R76SP.10 Home page (http://supportcontent.checkpoint.com/solutions?id=sk102788).

For more information about R76SP, see the R76SP Home Page (http://supportcontent.checkpoint.com/solutions?id=sk94686).

For more information about R76, see the R76 Home page (http://supportcontent.checkpoint.com/solutions?id=sk91140).

For the latest firmware versions, see sk93332 (http://supportcontent.checkpoint.com/solutions?id=sk93332).

System Requirements

Management Requirements

You can manage Chassis VSLS for 61000 with a Security Management Server or a Multi-Domain Security Management version R76 or higher. For Management requirements, see the R76 Release Notes (http://supportcontent.checkpoint.com/documentation_download?ID=22933).

The standard SmartDashboard client is not supported for this release. You must install the special SmartDashboard hotfix, as described in sk98423 (http://supportcontent.checkpoint.com/solutions?id=sk98423).

When you configure a VSX object in SmartDashboard, you must select R76 in General Properties > Platform > Version.

Gateway Requirements

Supported Software Blades

<table>
<thead>
<tr>
<th>Blade</th>
<th>VSX Gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firewall</td>
<td>✓</td>
</tr>
<tr>
<td>IPS</td>
<td>✓</td>
</tr>
<tr>
<td>Application Control</td>
<td>✓</td>
</tr>
<tr>
<td>Identity Awareness</td>
<td>✓</td>
</tr>
<tr>
<td>DLP</td>
<td>Not supported</td>
</tr>
<tr>
<td>URL Filtering</td>
<td>✓</td>
</tr>
<tr>
<td>IPSec VPN</td>
<td>✓</td>
</tr>
<tr>
<td>Anti-Bot</td>
<td>✓</td>
</tr>
<tr>
<td>Anti-Virus</td>
<td>✓</td>
</tr>
<tr>
<td>Mobile Access</td>
<td>Not supported</td>
</tr>
</tbody>
</table>
Compatibility with Clients

For the list of Endpoint clients that are supported by this release, see the R76 Release Notes (http://supportcontent.checkpoint.com/documentation_download?ID=22933).

Maximum Number of Supported Interfaces

<table>
<thead>
<tr>
<th>Mode</th>
<th>Max Interfaces</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSX Gateway</td>
<td>4096</td>
<td>Includes these interface types: physical, VLAN, and Bond</td>
</tr>
<tr>
<td>VSX Gateway Virtual System</td>
<td>128</td>
<td>Includes these interface types: physical, VLAN, and Bond</td>
</tr>
</tbody>
</table>

Upgrading to Chassis VSLS

This procedure is only applicable for a minor (R76SP.x) version upgrade that adds Chassis VSLS support for the 61000 Security System. You cannot use this procedure to add Chassis VSLS support for versions earlier than R76SP.

To upgrade your dual Chassis system, set the Standby Chassis to Admin Down and then do the upgrade procedure. After the upgrade completes, restore that Chassis to Admin UP. Then set the Active Chassis to Admin Down, which now becomes the Standby Chassis. Run the upgrade procedure and then restore the Chassis to Admin UP.

If a Virtual System cannot fail over to the other Chassis, it will not have connectivity during the upgrade. For this reason, we recommend that you resolve all Virtual System problems before you upgrade the system.

Preliminary Steps

Do these steps before you start the upgrade:

1. Make sure there is a console cable connected to at least one SGM in each Chassis.
2. Make sure all SGMs and SSMs on both Chassis are UP and that your system is configured correctly:
   > asg diag verify
   Resolve all issues before you continue.
3. Make sure the same policy is installed on all SGMs:
   > asg policy -vs all verify
4. Activate the gcopY legacy mode:
   # g_all touch /var/log/gcopy_legacy
   Note: This step is only applicable if you upgrade from R76SP or earlier.

Upgrading the Chassis

To upgrade the Chassis:

1. Set the Standby Chassis to Admin Down:
   > asg chassis_admin -c <standby_chassis> down
2. Use one of these procedures to upgrade the Standby Chassis:
   - or
• Install the minor release snapshot:

   # g_snapshot -b [chassis1 | chassis 2] revert <snapshot_name>

   Write the snapshot name without the .tar suffix.

   Wait until the all SGMs in the Standby Chassis are UP before you continue.

   Run: > asg monitor to see the SGM status.

3. Enable the legacy bond slave counting mode:

   # g_fw -b chassis <standby_chassis> ctl set int

   fwha_mbs_iface_monitor_ignore_non_vs0_slaves 1

4. Connect to the console on one of the Standby Chassis SGMs.

5. To see the Standby Chassis SSM firmware that is installed now:

   # asg_version -v

6. If necessary, upgrade the Standby Chassis SSM firmware:

   # asg_ssm_upgrade ssm all

   Wait until the SSM reboots.

7. Make sure that a valid license is installed on all SGMs:

   # g_cplic print

8. Make sure that the routes are the same on all SGMs:

   > asg_route --vs all

9. Make sure that the same policy is installed on all SGMs:

   > asg policy verify --vs all

   **Note:** If you see errors for the Active Chassis, this is normal. You can continue safely.

   **Important:** If the upgraded Standby Chassis generates other errors during the verification steps, resolve them and then do steps 3 through 9 again.

10. Set the newly upgraded Standby Chassis to Admin UP:

    > asg chassis_admin -c <standby_chassis> up

11. Make sure that the distribution settings are correct for all SGMs:

    > show distribution verification verbose

12. Set the Active Chassis to Admin DOWN:

    > asg chassis_admin -c <active_chassis> down (This becomes the new Standby Chassis)

13. Make sure that all SGMS are UP and that traffic flows normally:

    > asg monitor

    > asg perf

14. Run this command to configure the database for VSLS:

    # asg_blade_config upgrade_vsls <old_version> <active_chassis>

    The <old_version> parameter can be R76SP or R76SP.10.

15. Upgrade new Standby Chassis and do steps 4 through 9 on the Standby Chassis.

16. Set the Standby Chassis to UP:

    > asg chassis_admin -c <standby_chassis> up

   **Note:** The system is still in the HA mode.

---

**Working with Chassis VSLS**

Chassis VSLS is a Chassis Virtual System Load Sharing solution for the 61000 Security System that uses both Chassis to handle traffic. Each Virtual System works as an independent cluster. For each Virtual System, one Chassis is Active and the other Chassis becomes the Standby. The selection of the Active Chassis is based on interface availability, SGM availability, and Virtual System stability.

A Virtual System in the DOWN state fails over to the Standby Virtual System in the other Chassis. By default, a Virtual System in the DOWN state does not put the SGM in the DOWN state. Because of this, there is no effect on other Virtual System states.
The SGM continues to receive traffic from the SSM. This behavior is different from Chassis High Availability, where a Virtual System in the DOWN state causes the SGM to go DOWN.

Notes:
- If VS0 goes DOWN, its related SGM also goes DOWN.
- Run this command (in gclish) to change the Chassis VSLS behavior so that a Virtual System in the DOWN state causes the SGM to go DOWN:
  > g_update_conf_file fwkern.conf fwha_mbs_vsls_only_vs0_decide_state=0
  Reboot the Chassis.
  This behavior is now the same as for standard Chassis High Availability.
- When an SGM contains a DOWN Virtual System, the SMO and Chassis Monitor tasks move to a different valid SGM. Because these tasks can move to a different SGM, connections to the Virtual Systems can become disconnected.
- We recommend that you work with UIPC. This is because the UIPC task does not move to a different SGM.

Activating Chassis VSLS
To use Chassis VSLS features, you must first activate the Chassis VSLS High Availability mode.

To activate Chassis VSLS:
Run: > set chassis high-availability mode 4

Note - This command can cause Chassis failover.

Selecting the Active Chassis for a Virtual System
Chassis VSLS dynamically assigns an Active Chassis to each Virtual System based on criteria in this order of priority:

1. Availability of functional interfaces for the Virtual System
   Chassis VSLS selects the Chassis with the most connected interfaces to be the Active Chassis.

2. Availability of UP SGMs
   If both Chassis have the same number of connected interfaces, Chassis VSLS uses this ratio to select the Active Chassis:
   \[
   \text{SGM Ratio} = \frac{\text{Fewest_UP_SGMS}}{\text{Most_UP_SGMS}}
   \]
   If the SGM Ratio is less than the predefined threshold (default=50%), Chassis VSLS selects the Chassis with the most available SGMs. If the SGM Ratio is greater or equal to the threshold, Chassis VSLS does not select an Active Chassis based on SGM availability.
   Example:
   Chassis 1 has two UP SGMs and Chassis 2 has five UP SGMS. The ratio is 2/5 (40%), which is less than the default threshold of 50%. Chassis VSLS selects Chassis 2 as the Primary Chassis.

3. Virtual System with a problem
   When a Virtual System fails, Chassis VSLS automatically fails over to the related Virtual System on the other Chassis, which becomes the Active Chassis.

4. Primary Chassis
   If none of the above criteria causes Chassis VSLS to select an Active Chassis, the Primary Chassis automatically becomes the Active Chassis.

To change the SGM threshold value:
Run:
> set chassis vsls sgm_ratio <percent_value>
Virtual System Failover

With Chassis VSLS, a Virtual System can fail over to the Standby Chassis independently of the other Virtual Systems. When Chassis VSLS selects a different Chassis for a Virtual System based on the selection criteria, only that Virtual System fails over. There is no effect on the other Virtual Systems.

Virtual System failovers work the same way as a regular layer2/layer3 failovers. The Virtual System sends GARP/NDS packets in layer 3 and MAC learning packets in Layer 2.

Example:

For VS1, Chassis 2 is both the Active and the Primary Chassis. If an interface used by VS1 on Chassis 2 is disconnected, VS1 fails over to Chassis 1 based on the dynamic selection procedure. When the port is reconnected, VS1 fails back to Chassis 2.

SGM Failover

When an SGM fails, it no longer receives traffic. When a single Virtual System fails on an SGM, this Virtual System can do a Virtual System Chassis Failover. If a Virtual System Chassis failover does not occur, the failed Virtual System on the SGM continues to receive traffic.

Configuring the Chassis VSLS Primary Chassis

When you create a new Virtual System, Chassis VSLS automatically assigns a Primary Chassis based on the system default. You can change the default Primary Chassis as necessary. When you change the default Primary Chassis, it changes for all Virtual Systems that do not have a manually defined Primary Chassis. This can cause Virtual Systems to fail over to a different Active Chassis.

You can manually define the Primary Chassis for specified Virtual Systems. Manually defined Virtual Systems do not change their Primary Chassis when you change the default Primary Chassis.

To change the system default Primary Chassis:

1. Change the context to VS0:
   
   > set virtual-system 0

2. Run:
   
   > set chassis vsls system primary_chassis <option>

   <option> is an integer between 0 and 2:
   
   0 - Automatic (Chassis VSLS automatically assigns the Primary Chassis)
   1 - Define Chassis 1 as the default Primary Chassis
   2 - Define Chassis 2 as the default Primary Chassis

To manually define a Primary Chassis for a Virtual System:

1. Go to the Virtual System context that is to be changed.
   
   > set virtual-system <vsid>

2. Run:
   
   > set chassis vsls vs primary_chassis <option>

   <option> is an integer between 0 and 2:
   
   0 - Use the system default Primary Chassis
   1 - Define Chassis 1 as the Primary Chassis
   2 - Define Chassis 2 as the Primary Chassis

To show the Primary Chassis for all Virtual Systems

Run:

> show configuration vsls

<table>
<thead>
<tr>
<th>Default Mode:</th>
<th>Automatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual Systems:</td>
<td>10</td>
</tr>
</tbody>
</table>
Working with Chassis VSLS

<table>
<thead>
<tr>
<th>VS</th>
<th>VS-Name</th>
<th>Chassis 1</th>
<th>Chassis 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>61000-VSLS</td>
<td>Default</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>VS1</td>
<td>Manual</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>VS2</td>
<td>Default</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>VS3</td>
<td></td>
<td>Default</td>
</tr>
<tr>
<td>4</td>
<td>VS4</td>
<td>Default</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>VS5</td>
<td></td>
<td>Default</td>
</tr>
<tr>
<td>6</td>
<td>VS6</td>
<td>Default</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>VS7</td>
<td></td>
<td>Default</td>
</tr>
<tr>
<td>8</td>
<td>VS8</td>
<td>Default</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>VS9</td>
<td>Manual</td>
<td></td>
</tr>
</tbody>
</table>

| Total: | 6 | 4 |

This example shows that:

- The default Primary Chassis mode is Automatic (0).
- The deployment has 10 Virtual Systems including VS0.
- VS1 and VS9 have manually assigned Primary Chassis (Chassis 1 and Chassis 2 respectively)
- All others use the default Primary Chassis, which are assigned to different chassis to effectively distribute the traffic load.
- Chassis 1 is configured as the Primary Chassis for VS0, VS1, VS2, VS4, VS6, and VS8.
- Chassis 2 is configured as the Primary Chassis for VS3, VS5, VS7, and VS9.

Monitoring Chassis VSLS

Using asg stat

Use `asg stat` without arguments to see general VSX and system information. You can run this command from gclish or the Expert mode.

Note - Chassis VSLS does not support `asg stat -v`.

> asg stat

<table>
<thead>
<tr>
<th>VSX System Status - 61000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis Mode</td>
</tr>
<tr>
<td>Up time</td>
</tr>
<tr>
<td>SGMs</td>
</tr>
<tr>
<td>Virtual Systems</td>
</tr>
<tr>
<td>Version</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chassis 1</th>
<th>Chassis 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP / Required</td>
<td>UP / Required</td>
</tr>
<tr>
<td>SGMs</td>
<td>4 / 4 (!)</td>
</tr>
<tr>
<td>Ports</td>
<td>3 / 3</td>
</tr>
<tr>
<td>Bonds</td>
<td>2 / 2</td>
</tr>
<tr>
<td>Fans</td>
<td>3 / 4 (!)</td>
</tr>
<tr>
<td>SSMs</td>
<td>2 / 2</td>
</tr>
<tr>
<td>CMMs</td>
<td>1 / 2 (!)</td>
</tr>
<tr>
<td>Power Supplies</td>
<td>4 / 5 (!)</td>
</tr>
</tbody>
</table>
The output shows that:

- System is running in Chassis VSLS mode.
- System has 10 Virtual Systems configured, including VS0.
- System has eight SGMs in Security Group.
- System has five SGMs in UP state.
- All SGMs on Chassis 1 are UP.
- Only one SGM on Chassis 2 is UP.

**Using `asg stat vsls`**

Use the `asg stat vsls` command to see which Virtual Systems are Active on each Chassis and their health status. You can run this command from gclish or the Expert mode.

```
> asg stat vsls
```

```
<table>
<thead>
<tr>
<th>Chassis Mode</th>
<th>VSLS</th>
<th>Up time</th>
<th>22:45:23 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGMs</td>
<td>8 / 8</td>
<td>Virtual Systems</td>
<td>10</td>
</tr>
<tr>
<td>Version</td>
<td>R76SP.10_VSLS (Build Number 20)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VSID</th>
<th>VS Type &amp; Name</th>
<th>Chassis 1</th>
<th>Chassis 2</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>V 61000-VSLS</td>
<td>ACTIVE (P)</td>
<td>STANDBY</td>
<td>OK</td>
</tr>
<tr>
<td>1</td>
<td>S VS1</td>
<td>STANDBY (P)</td>
<td>ACTIVE</td>
<td>Problem</td>
</tr>
<tr>
<td>2</td>
<td>S VS2</td>
<td>ACTIVE (P)</td>
<td>STANDBY</td>
<td>OK</td>
</tr>
<tr>
<td>3</td>
<td>S VS3</td>
<td>STANDBY</td>
<td>ACTIVE (P)</td>
<td>OK</td>
</tr>
<tr>
<td>4</td>
<td>S VS4</td>
<td>ACTIVE (P)</td>
<td>STANDBY</td>
<td>OK</td>
</tr>
<tr>
<td>5</td>
<td>S VS5</td>
<td>STANDBY</td>
<td>ACTIVE (P)</td>
<td>OK</td>
</tr>
<tr>
<td>6</td>
<td>S VS6</td>
<td>ACTIVE (P)</td>
<td>STANDBY</td>
<td>OK</td>
</tr>
<tr>
<td>7</td>
<td>S VS7</td>
<td>STANDBY</td>
<td>ACTIVE (P)</td>
<td>OK</td>
</tr>
<tr>
<td>8</td>
<td>S VS8</td>
<td>ACTIVE (P)</td>
<td>STANDBY</td>
<td>OK</td>
</tr>
<tr>
<td>9</td>
<td>S VS9</td>
<td>STANDBY</td>
<td>ACTIVE (P)</td>
<td>OK</td>
</tr>
</tbody>
</table>

Active Virtual Systems: 5

Errors:
Active VSs not on Primary chassis: 1

Synchronization

  | Within chassis: | Enabled | (Default) |
  | Betwee n chassis: | Enabled | (Default) |
  | Exception Rules: | (Default) |

(P) - VS Primary Chassis

The output shows that:

- Virtual Systems 0, 2, 4, 6, and 8 are Active on Chassis 1
- Virtual Systems 1, 3, 5, 7, and 9 are Active on Chassis 2
- Virtual System 1 has a Problem
- Virtual System is Active on its Secondary Chassis
- (P) = Primary Chassis
- The VS1 Primary Chassis is Chassis 1, but it is now Active on Chassis 2.
Health status:

- **OK** - This Virtual System does not have problems.
- **OK(!)** - This Virtual System has a problem with at least one SGM.
- **Freeze** - This Virtual System is in the frozen state.
- **Problem** - This Virtual System has a problem. This is frequently a port issue, problem notification (pnote) or a Firewall kernel issue.

**Using asg stat vs**

The `asg stat vs` command shows status information, SGM states and problems for a specified Virtual System. You can run this command from gclish or the Expert mode. Select the Virtual System context before you run this command.

In gclish, run:

```bash
> set virtual_system <context>
> asg stat vs
```

In the Expert mode, run:

```bash
# vsenv <context>
# asg stat vs
```

<table>
<thead>
<tr>
<th>VSX System Status - 61000</th>
</tr>
</thead>
<tbody>
<tr>
<td>VS ID</td>
</tr>
<tr>
<td>VS Name</td>
</tr>
<tr>
<td>Chassis Mode</td>
</tr>
<tr>
<td>FW Policy Date</td>
</tr>
<tr>
<td>Chassis 1 (Primary)</td>
</tr>
<tr>
<td>SGM ID</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2 (local)</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>Chassis 2</td>
</tr>
<tr>
<td>SGM ID</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

This example shows that:

- VS1 on Chassis1- SGM1 is DOWN.
- The Primary Chassis for this Virtual System (Chassis 1) has a problem with the Firewall, but is otherwise working properly.
- VS1 failed over to Chassis 2, which is not the defined Primary Chassis for this Virtual System.
- All other SGMs are working properly.
SGM health status:
- **OK** - This SGM does not have problems.
- **SGM** - The SGM has a problem.
- **fwk** - The Firewall kernel has a problem.
- **Policy** - The policy date for this SGM is different from the Firewall policy date.
- **Interface** - The number of interface on this SGM is different from the related SGM on the other Chassis.
- **Problem** - This SGM has one or more problems.
- **Pnote** - This SGM has a problem that generated a pnote.

The bottom section shows the Active Chassis and the reason why the Primary Chassis is not Active, if applicable. Possible reasons:
- Primary chassis health is good.
- Primary chassis has a problem. Secondary chassis health is better.
- Primary chassis is above Active SGM threshold.
- Primary chassis is below Active SGM threshold.
- Both chassis have fwk problems. Continue using Primary chassis.
- Both chassis have fwk problems. Primary chassis health is better.
- Both chassis have fwk problems. Secondary chassis health is better.
- Both chassis have interface problems. Continue using Primary chassis.
- Both chassis have interface problems. Primary chassis health is better.
- Both chassis have interface problems. Secondary chassis health is better.
- Both chassis have problems. Continue using Primary chassis.
- Both chassis have problems. Secondary chassis health is better.

**Using SNMP**

SNMP information for VSLS is located under

`iso.org.dod.internet.private.enterprise.checkpoint.products.asg.asgVSX.asgVslsInfo` (OID 1.3.6.1.4.1.2620.1.48.30.20)

VSLS SNMP monitors:
- SGM ratio threshold value
- System primary chassis
- Active chassis for each Virtual System
- Primary chassis for each Virtual System
- Number of configured interfaces for each Virtual System
- Number of up interfaces for each Virtual System
- Number of working FWK instances for each Virtual System
- Total number of FWK instances for each Virtual System

SNMP for VSLS supports these modes:
- Default - SNMP collects data from all SGMs for all Virtual Systems
- Virtual Systems - SNMP monitors each Virtual System separately
# Known Limitations

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01527874</td>
<td>Virtual Switches without physical interface are not supported for Chassis VSLS.</td>
</tr>
<tr>
<td>01399163</td>
<td>IPv6 is not supported.</td>
</tr>
</tbody>
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