30 April 2020

16000, 26000, AND 28000 APPLIANCES REPLACING MEMORY
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**Check Point 16000, 26000, and 28000 Appliances Replacing Memory**
For more about this release, see the [home page](#).

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### Revision History

<table>
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</tr>
</thead>
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<tr>
<td>30 April 2020</td>
<td>Updates made for 16200 and 28000 appliances</td>
</tr>
<tr>
<td>02 October 2019</td>
<td>First release of this document</td>
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16000, 26000, and 28000 Appliances Installing and Removing Memory

<table>
<thead>
<tr>
<th>Security Appliance</th>
<th>In This Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>16600 Hyperscale Security Appliances (1U)</td>
<td>16600HS</td>
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<tr>
<td>16000 Base/Plus/Turbo Security Appliances (2U)</td>
<td>16000</td>
</tr>
<tr>
<td>16200 Base/Plus (2U)</td>
<td>16200</td>
</tr>
<tr>
<td>26000 Base/Plus/Turbo Security Appliances (3U)</td>
<td>26000</td>
</tr>
<tr>
<td>28000 Base/Plus (3U)</td>
<td>28000</td>
</tr>
</tbody>
</table>

This document applies to these Check Point appliances:

- 16000 Appliances (excluding 16000THS)
- 26000 Appliances
- 28000 Appliances

**Important** - We recommend that only experienced personnel install or remove hardware components. Installing or removing components incorrectly can permanently damage the appliance.

**Preparing the Appliance**

Before you start to install or remove DIMMs, make sure that:

- The appliance is shut down and you unplug the power cables.
- The appliance is in a clean environment and on a level surface.
- You can physically access and open the cover of the appliance.
- You have the Check Point memory kit.
Important

- To protect the appliance and the memory modules from electrostatic discharge, make sure that you are properly grounded before you touch these components.

- For more information, read the Health and Safety Information in the applicable Getting Started Guide:
  
  16000 Appliances Getting Started Guide
  
  26000 and 28000 Appliances Getting Started Guide

- We recommend that you use the grounding wrist strap that is included in the memory kit. The grounding plug on the rear of the appliance provides a chassis grounding point.

Memory Kit Contents

- Installation guide - Installing and Removing Memory in Check Point 16000, 26000, and 28000 Security Appliances

- Memory DIMMs

- ESD grounding strap (anti-static)

To prepare the appliance:

1. Shut down the appliance from the Gaia Portal, CLI, or by pressing and releasing the power switch quickly.
   
   Note that pressing and holding the power switch is not recommended as it results in a forced and immediate shut down.

2. Remove the power cords from the appliance.

3. Put on the ESD strap and attach the other end to a grounding point.

4. Loosen the appliance cover screws.

5. Remove the top cover from the appliance.
To remove the top cover:

1. Unscrew the cover screws (number 2 below).
2. Pull the top cover back in the direction of the arrows.
3. Pull the cover up to remove it completely.

The 26000 appliance is shown above. Removal of the top cover is the same in the 16000 and 28000 appliances.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Appliance cover</td>
</tr>
<tr>
<td>2</td>
<td>Appliance cover screws</td>
</tr>
<tr>
<td>3</td>
<td>ESD grounding point</td>
</tr>
</tbody>
</table>
About DIMM Sockets

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Appliance front panel</td>
</tr>
<tr>
<td>2</td>
<td>Appliance rear panel</td>
</tr>
<tr>
<td>3</td>
<td>CPU1 DIMM sockets</td>
</tr>
<tr>
<td>4</td>
<td>CPU0 DIMM sockets</td>
</tr>
</tbody>
</table>
The memory sockets are colored black and blue. In the appliance configuration diagrams note that:

- The view shown is always from the top
- The front panel of the appliance is always at the bottom of the diagram

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Socket 1" /></td>
<td>Memory socket with DIMM installed</td>
</tr>
<tr>
<td><img src="image2.png" alt="Socket 2" /></td>
<td>Memory socket without DIMM installed</td>
</tr>
</tbody>
</table>
16000 Base Appliance DIMM Configuration

The 16000 Base appliance has a default memory configuration of 32 GB: 4 x 8GB.
You can upgrade to 64GB or 128GB. Use the applicable upgrade procedure below.

32GB Default Configuration

Top View
(front panel of the 16000 Base appliance is at the bottom of the diagram)

<table>
<thead>
<tr>
<th>To upgrade to</th>
<th>Use DIMMs</th>
<th>Procedure</th>
<th>Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>64GB</td>
<td>8 x 8GB</td>
<td>Install eight 8GB DIMMs</td>
<td>In socket numbers 2, 4, 7, 9, 12, 14, 17, and 19</td>
</tr>
</tbody>
</table>

64GB Upgraded Configuration

Top View
(front panel of the 16000 Base appliance is at the bottom of the diagram)
<table>
<thead>
<tr>
<th>To upgrade to</th>
<th>Use DIMMs</th>
<th>Procedure</th>
<th>Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>128GB</td>
<td>16 x 8GB</td>
<td>Install sixteen 8GB DIMMs</td>
<td>In socket numbers 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 18, and 19</td>
</tr>
</tbody>
</table>

**128GB Upgraded Configuration**

Top View
(front panel of the 16000 Base appliance is at the bottom of the diagram)
16000 Turbo/Plus and 16200 Plus Appliance
DIMM Configuration

The 16000 Turbo/Plus and 16200 Plus appliance have a default memory configuration of 64GB: 8 x 8GB.

You can upgrade to 128GB.

64GB Default Configuration

To upgrade to | Use DIMMs | Procedure | Slots
---|---|---|---
128GB | 16 x 8GB | Install sixteen 8GB DIMMs | In socket numbers 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 18, and 19

128 GB Upgraded Configuration
16200 Base Appliance DIMM Configuration

The 16200 Base appliance has a default memory configuration of 48 GB: 6 x 8GB. You can upgrade to 64GB or 128GB. Use the applicable upgrade procedure below.

### 48GB Default Configuration

To upgrade to | Use DIMMs | Procedure | Slots
--- | --- | --- | ---
64GB | 8 x 8GB | Install eight 8GB DIMMs | In socket numbers 2, 4, 7, 9, 12, 14, 17, and 19

### 64GB Upgraded Configuration

Top View
(front panel of the 16200 Base appliance is at the bottom of the diagram)
## To upgrade to
<table>
<thead>
<tr>
<th>Use DIMMs</th>
<th>Procedure</th>
<th>Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 x 8GB</td>
<td>Install sixteen 8GB DIMMs</td>
<td>In socket numbers 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 18 and 19</td>
</tr>
</tbody>
</table>

### 128 GB Upgraded Configuration

![Diagram of memory configuration](image)

*Top View*
(front panel of the 16200 Base appliance is at the bottom of the diagram)
26000 Base Appliance DIMM Configuration

The 26000 Base appliance has a default memory configuration of 48GB: 6 x 8GB.
You can upgrade to 96GB or 128GB. Use the applicable upgrade procedure below.

### 48GB Default Configuration

Top View
(front panel of the 26000 Base appliance is at the bottom of the diagram)

<table>
<thead>
<tr>
<th>To upgrade to</th>
<th>Use DIMMs</th>
<th>Procedure</th>
<th>Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>96GB</td>
<td>12 x 8GB</td>
<td>Install twelve 8GB DIMMs</td>
<td>In socket numbers 1, 2, 4, 7, 9, 10, 11, 12, 14, 17, 19, and 20</td>
</tr>
</tbody>
</table>

### 96GB Upgraded Configuration

Top View
(front panel of the 26000 Base appliance is at the bottom of the diagram)
### 16000, 26000, and 28000 Appliances Installing and Removing Memory

<table>
<thead>
<tr>
<th>To upgrade to</th>
<th>Use DIMMs</th>
<th>Procedure</th>
<th>Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>128GB</td>
<td>16 x 8GB</td>
<td>Install sixteen 8GB DIMMs</td>
<td>In socket numbers 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 18, and 19</td>
</tr>
</tbody>
</table>

#### 128GB Upgraded Configuration

Top View
(front panel of the 26000 Base appliance is at the bottom of the diagram)
The 26000 Plus/Turbo and 28000 Plus appliances have a default memory configuration of 96GB: 12 x 8GB. You can upgrade to 128GB.

### 96GB Default Configuration

<table>
<thead>
<tr>
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<th>20</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CPU 0</td>
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</tbody>
</table>

#### Top View

(front panel of the 26000 Plus/Turbo or 28000 Plus appliance is at the bottom of the diagram)

<table>
<thead>
<tr>
<th>To upgrade to</th>
<th>Use DIMMs</th>
<th>Procedure</th>
<th>Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>128GB</td>
<td>16 x 8GB</td>
<td>Install sixteen 8GB DIMMs</td>
<td>In socket numbers 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 18, and 19</td>
</tr>
</tbody>
</table>

### 128GB Upgraded Configuration

<table>
<thead>
<tr>
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<th>18</th>
<th>19</th>
<th>20</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CPU 0</td>
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</tr>
</tbody>
</table>

#### Top View

(front panel of the 26000 Plus/Turbo appliance is at the bottom of the diagram)
28000 Base Appliance DIMM Configuration

The 28000 Base appliance has a default memory configuration of 64GB: 8 x 8GB. You can upgrade to 96GB or 128GB. Use the applicable upgrade procedure below.

### 64GB Default Configuration

![Top View](image)

(front panel of the 28000 Base appliance is at the bottom of the diagram)

### To upgrade to | Use DIMMs | Procedure | Slots
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>96GB</td>
<td>12 x 8GB</td>
<td>Install twelve 8GB DIMMs</td>
<td>In socket numbers 1, 2, 4, 7, 9, 10, 11, 12, 14, 17, 18, 19, and 20</td>
</tr>
</tbody>
</table>

### 96GB Upgraded Configuration

![Top View](image)

(front panel of the 28000 Base appliance is at the bottom of the diagram)
### 16000, 26000, and 28000 Appliances Installing and Removing Memory

<table>
<thead>
<tr>
<th>To upgrade to</th>
<th>Use DIMMs</th>
<th>Procedure</th>
<th>Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>128GB</td>
<td>16 x 8GB</td>
<td>Install sixteen 8GB DIMMs</td>
<td>In socket numbers 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 18, and 19</td>
</tr>
</tbody>
</table>

### 128GB Upgraded Configuration

![Top View Diagram](diagram_url)  
*Top View*  
(front panel of the 28000 Base appliance is at the bottom of the diagram)
Removing DIMMs

**Important** - The appliance contains sharp metal parts such as the heat sink fin and bracket that can cause injury or damage the DIMMs.

Make sure that you prepare the appliance before you remove DIMMs. For more information, see "Preparing the Appliance" on page 5.

**To remove DIMMs from the appliance:**

1. Remove the power cords from the appliance.
2. Put on the ESD strap and attach the other end to a grounding point.
3. Press the two retaining clips outward.
4. Carefully pull the DIMM up.

**Important** - Only touch the rear corners of the DIMM. Pressing on the heat sink or other DIMM components can damage the hardware.
If necessary, pull one end of the DIMM, then the other, to gradually release it from the contact pins.

**Important** - Make sure that there are no leftover parts inside the appliance.

5. Make sure the DIMMs are installed correctly.
   a. Replace the appliance cover without tightening the appliance cover screws.
   b. Connect the power cords to the appliance.
      The appliance turns on.

6. Tighten the appliance cover screws to secure the cover on the appliance.

## Installing DIMMs

You can add more DIMMs to the memory sockets.

**Important** - The appliance contains sharp metal parts such as the heat sink fin and bracket that can cause injury or damage the DIMMs.

**To install DIMMs in the appliance:**

1. Find the DIMM slots on the system board.
2. Press on the two white retaining clips outward.
3. Align the new DIMM above the socket.

The top of the DIMM is smooth. The bottom edge has two different-length sets of contacts, which connect to the slots on the socket.

**Important:**
- Only touch the top corners of the DIMM. Pressing on the heat sink or other DIMM components can damage the hardware.
- DIMMs are not symmetrical. Use the hole in the DIMM to guide the DIMM into the raised tooth in the slot.

4. Press the new DIMM into the socket until it clicks into position.

The retaining clips move into the lock position as you press the DIMM into position.

5. Do steps 1 - 4 again for the other DIMMs.
6. Make sure that there are no leftover parts in the appliance.
7. Make sure the DIMM(s) are installed correctly.
8. Replace the appliance cover without using the appliance cover screws.
9. Connect the power cords to the appliance.
   The appliance turns on.
10. Use the appliance cover screws to secure the cover on the appliance.

Verifying the Memory Configuration

To verify memory configuration using the free command:

1. In the CLI, enter Expert mode.
2. Run: `# free -wht`
Sample output for a 26000 Base appliance with 48GB of memory:

<table>
<thead>
<tr>
<th>Mem:</th>
<th>total</th>
<th>used</th>
<th>free</th>
<th>shared</th>
<th>buffers</th>
<th>cache</th>
<th>available</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45G</td>
<td>6.8G</td>
<td>35G</td>
<td>5.4M</td>
<td>2.0M</td>
<td>3.2G</td>
<td>36G</td>
</tr>
<tr>
<td>Swap:</td>
<td>31G</td>
<td>6.8G</td>
<td>31G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>77G</td>
<td>6.8G</td>
<td>67G</td>
<td>5.4M</td>
<td>2.0M</td>
<td>3.2G</td>
<td>36G</td>
</tr>
</tbody>
</table>

**Note** - The amount of installed memory is shown in the row named Mem under the column named total.
For reasons related to available memory address space, the total installed memory shown in the free utility is similar but not identical to the actual installed memory.

To verify memory configuration using Clish:

1. In Clish, run: `>show asset memory`

Sample output for a 26000 Base appliance with 48GB of memory:

```
Total Memory: 49152 MB
Memory Slot 1 Size: 8192 MB
Memory Slot 2 Size: 8192 MB
Memory Slot 3 Size: 8192 MB
Memory Slot 4 Size: 8192 MB
Memory Slot 5 Size: 8192 MB
Memory Slot 6 Size: 8192 MB
```

2. Make sure the total memory reflects the installed memory. The slot numbers reflect the number of DIMMs installed.