15000 and 23000 Appliances
Installing and Removing Memory

This document applies to these appliances:

- 15000 Appliances
- 23000 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 damage, make sure that you are properly grounded before you touch these components. For more, see the Health and Safety Information in the 15000 and 23000 Appliances Getting Started Guide [http://supportcontent.checkpoint.com/documentation_download?ID=45733](http://supportcontent.checkpoint.com/documentation_download?ID=45733).

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 - *15000 and 23000 Appliances Installing and Removing Memory*
- Memory DIMMs
- ESD grounding strap (anti-static)

To prepare the appliance:

1. Shut down the appliance from the WebUI, 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.

<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>
15400 Appliance DIMM Configuration

<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>Sockets for DIMMs</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="image" alt="Memory socket with DIMM installed" /></td>
<td>Memory socket with DIMM installed</td>
</tr>
<tr>
<td><img src="image" alt="Memory socket without DIMM installed" /></td>
<td>Memory socket without DIMM installed</td>
</tr>
</tbody>
</table>
The 15400 appliance has a default memory configuration of 8 GB: 1 x 8 GB, with one DIMM in memory socket number 3.

You can upgrade to 24 GB or 64 GB. Use the applicable upgrade procedure below.

### Default Configuration
![Top View](image)
(front panel of the 15400 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>24 GB</td>
<td>3 x 8 GB</td>
<td>Install additional DIMMs for a total of three 8 GB DIMMs</td>
<td>In blue memory socket numbers 1, 3, and 6</td>
</tr>
</tbody>
</table>

### Upgraded Configuration
![Top View](image)
(front panel of the 15400 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>64 GB</td>
<td>8 x 8 GB</td>
<td>Install additional DIMMs for a total of eight 8 GB DIMMs</td>
<td>In all sockets (numbers 1 through 8)</td>
</tr>
</tbody>
</table>

**Upgraded Configuration**

Top View
(front panel of the 15400 appliance is at the bottom of the diagram)
15600, 23500, 23800, and 23900 DIMM Configuration

<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="memory_socket_1.png" alt="Image" /></td>
<td>Memory socket with DIMM installed</td>
</tr>
<tr>
<td><img src="memory_socket_2.png" alt="Image" /></td>
<td>Memory socket without DIMM installed</td>
</tr>
</tbody>
</table>
15600 Appliance DIMM Configuration

The 15600 appliance has a default memory configuration of 16 GB: 2 x 8 GB, with two DIMMs in memory socket numbers 3 and 9.

You can upgrade to 32 GB or 64 GB. Use the applicable upgrade procedure below.

**Default Configuration**

To upgrade to 32 GB, use 4 DIMMs (4 x 8 GB) and install additional DIMMs for a total of four 8 GB DIMMs in blue memory socket numbers 3, 6, 9 and 11.

**Upgraded Configuration**

To upgrade to 64 GB, use 8 DIMMs (8 x 8 GB) and install additional DIMMs for a total of eight 8 GB DIMMs in blue memory socket numbers 3, 6, 9 and 11.
### To upgrade to

<table>
<thead>
<tr>
<th>Use DIMMs</th>
<th>Procedure</th>
<th>Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 x 8 GB</td>
<td>Install additional DIMMs for a total of eight 8 GB DIMMs</td>
<td>In all blue memory sockets (numbers 1, 3, 6, 8, 9, 11, 14, and 16)</td>
</tr>
</tbody>
</table>

**Upgraded Configuration**

![Top View](front panel of the 15600 appliance is at the bottom of the diagram)
23500 Appliance DIMM Configuration

The 23500 appliance has a default memory configuration of 16 GB: 2 x 8 GB, with two DIMMs in memory socket numbers 6 and 14.

You can upgrade to 64 GB or 128 GB. Use the applicable upgrade procedure below.

<table>
<thead>
<tr>
<th>To upgrade to</th>
<th>Use DIMMs</th>
<th>Procedure</th>
<th>Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>64 GB</td>
<td>8 x 8 GB</td>
<td>Install additional DIMMs for a total of eight 8 GB DIMMs</td>
<td>In blue memory socket numbers 1, 3, 6, 8, 9, 11, 14, and 16 (all blue sockets will have DIMMs installed)</td>
</tr>
</tbody>
</table>
To upgrade to | Use DIMMs | Procedure | Slots
--- | --- | --- | ---
128 GB | 16 x 8 GB | Install additional DIMMs for a total of sixteen 8 GB DIMMs | In all sockets (numbers 1 through 16)

Upgraded Configuration

![Diagram showing the upgraded configuration](front view diagram)

Top View
(front panel of the 23500 appliance is at the bottom of the diagram)
The 23800 appliance has a default memory configuration of 32 GB: 4 x 8 GB, with four DIMMs in memory socket numbers 3, 6, 11, and 14.

You can upgrade to 64 GB or 128 GB. Use the applicable upgrade procedure below.

### Default Configuration

![Top View](image)

### Upgrade Configuration

<table>
<thead>
<tr>
<th>To upgrade to</th>
<th>Use DIMMs</th>
<th>Procedure</th>
<th>Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>64 GB</td>
<td>8 x 8 GB</td>
<td>Install additional DIMMS for a total of eight 8 GB DIMMs</td>
<td>In blue memory socket numbers 1, 3, 6, 8, 9, 11, 14, and 16 (all blue sockets will have DIMMs installed)</td>
</tr>
</tbody>
</table>

![Top View](image)
To upgrade to  | Use DIMMs | Procedure                          | Slots                  |
-------------|-----------|------------------------------------|------------------------|
128 GB       | 16 x 8 GB | Install additional DIMMs for a total of sixteen 8 GB DIMMs | In all sockets (numbers 1 through 16) |

Upgraded Configuration

![Top View](front panel of the 23800 appliance is at the bottom of the diagram)
23900 Appliance DIMM Configuration

The 23900 appliance has a default memory configuration of 48 GB: 6 x 8 GB, with six DIMMs in blue memory socket numbers 1, 3, 6, 9, 11, and 14.

You can upgrade to 64GB or 128 GB. Use the applicable upgrade procedure below.

### Default Configuration

![Top View](front panel of the 23900 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>64 GB</td>
<td>8 x 8 GB</td>
<td>Install additional DIMMs for a total of eight 8 GB DIMMs</td>
<td>In sockets 1, 3, 6, 8, 9, 11, 14, and 16 (all blue sockets will have DIMMs installed)</td>
</tr>
</tbody>
</table>

### Upgraded Configuration

![Top View](front panel of the 23900 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>128 GB</td>
<td>16 x 8 GB</td>
<td>Install additional DIMMs for a total of sixteen 8 GB DIMMs</td>
<td>In all sockets (numbers 1 through 16)</td>
</tr>
</tbody>
</table>

**Upgraded Configuration**

![Diagram showing Top View](image)

*Top View (front panel of the 23900 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 1).

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 and the LCD screen shows the appliance model number when the OS is up (may take a few minutes).

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 and the LCD screen shows the appliance model number when the OS is up (may take a few minutes).

10. Use the appliance cover screws to secure the cover on the appliance.
Verifying the Memory Configuration

To make sure that the memory configuration is correct:

1. In the CLI, enter Expert mode.
2. Run: # free -g -o

Sample output for a 23500 appliance with 16 GB of memory:

```
[Expert@gw-419463:0]# free -g -o

Mem:      15      0      15      0      0      0
Swap:     16      0      16
```

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.

In the above example, 16 GB of RAM are installed on the system. This corresponds to the 15 GB of total memory shown in the free utility.