

## 3.5.6 CPU Installation Facts

Remember the following when installing a CPU:

| Installation Step         | Description   |
|---------------------------|---|
| Prepare for Installation  | <p>Preparing for a CPU installation will help to ensure that your new components are not damaged before installation.</p> <ul style="list-style-type: none"> <li>Use anti-static protection when installing a CPU.</li> <li>Ensure that the CPU and motherboard socket type match. The socket identifies the number and layout of pins.</li> <li>Verify that the motherboard supports the processor speed.</li> <li>Verify how heat connectivity will be established between the CPU and heatsink.</li> </ul>   |
| Insert CPU                | <p>Inserting the CPU is simple.</p> <ul style="list-style-type: none"> <li>Handle the CPU by the edges without touching the underneath connectors.</li> <li>Drop the processor into place, then push down on the lever to lock the processor into place when using a Zero Insertion Force (ZIF) socket that uses a lever to allow installation of the processor.</li> <li>Be sure to orient the CPU appropriately with the socket. <ul style="list-style-type: none"> <li>In most cases, the pin array is keyed so that the CPU can be inserted in only one way.</li> <li>For processors that can be inserted multiple ways, be sure to line up pin 1 on the processor with pin 1 in the processor slot. Pin 1 is typically identified with a dot or a triangle.</li> </ul> </li> <li>Fill unused processor slots with a special terminating resistor when installing a processor in a multi-processor system.</li> <li>Be sure that the speed of the processors are the same when adding multiple processors in a multi-processor system, .</li> </ul>   |
| Install Heat Sink and Fan | <p>The heat sink and fan are installed on top of the CPU.</p> <ul style="list-style-type: none"> <li>CPUs require a heat sink and most desktop systems also use a fan for cooling.</li> <li>When installing a heat sink, use thermal grease or a thermal pad between the processor die and the heat sink. This maximizes heat transfer between the processor and the CPU.</li> </ul>  |
| Connect Fan Power         | <p>When the CPU includes a fan, be sure to connect the fan power to the motherboard.</p>  |
| Configure CMOS Settings   | <p>Most motherboards automatically detect the processor speed. If not, you might need to use jumpers or edit the CMOS to configure the processor speed. For newer processors released after the motherboard, you might be able to add support for the processor by updating the BIOS.</p> <ul style="list-style-type: none"> <li>Typically, the processor will run at a speed lower than its rating if the motherboard does not support the higher speed.</li> <li>As a best practice, you should update the BIOS shortly after installing the processor (you must have a processor and memory installed to update the BIOS).</li> </ul> <p>An important feature in the BIOS/UEFI is the Execute Disable Bit. Execute Disable Bit (EDB) is an Intel hardware-based security feature that can help reduce system exposure to viruses and malicious code. EDB allows the processor to classify areas in memory where application code can or cannot execute. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage and worm propagation.</p> <p>To use Execute Disable Bit, you must have a PC or server with a processor with Execute Disable Bit capability and a supporting operating system. EDB-enabled processors by Intel are indicated by a "J" after the CPU model number. Execute Disable Bit is abbreviated as EDB (by Intel) or XDB.</p>  |
| Troubleshoot              | <p>Use the following troubleshooting tips if you are having problems with your installation:</p> <ul style="list-style-type: none"> <li><b>Spontaneous reboot or intermittent system crashes:</b> An overheated CPU will cause a spontaneous reboot or intermittent system crashes. A spontaneous reboot can also be caused by a bad power supply or device driver. A clicking noise when reading or writing data from the hard disk is an early sign of a failing drive.</li> <li><b>System lockups and restarts:</b> Because you have just replaced the processor, the most likely cause of the problem is related to the CPU. System lockups and restarts can be caused by an overheated processor. Make sure the CPU fan is running, and that you have used thermal paste between the CPU and the heat sink.</li> <li><b>System beeps regularly, nothing is shown on the screen and it doesn't start:</b> Flashing the BIOS is often required to upgrade system components that are part of the motherboard, such as to upgrade to a faster processor. If the motherboard lists the processor as supported but it is not correctly recognized, update the BIOS to the latest version. Before you can do this, you must reinstall the old processor in the system to get it back up and running again. Press F8 while booting to enter the advanced boot menu when Windows loads. However, this option assumes the BIOS has loaded correctly and the computer passed the POST tests. Replacing the motherboard is likely not required as the motherboard was working correctly and the documentation states the CPU is compatible with the motherboard. Replace the CPU only after you have determined that it is faulty.</li> </ul> |

