intel® Technical Advisory

TA-2000-1

15220 N.W. Greenbrier Parkway
Beaverton, OR 97006

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Some ISP1100 servers may experience multiple-bit ECC memory errors with unbuffered SDRAM ECC DIMMs

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Products Affected
ISP1100

Description
Intel's Internet Management and Appliance Division (IMAD) has reproduced intermittent multiple-bit ECC memory errors on some ISP1100 server platforms when using unbuffered SDRAM ECC DIMM devices. The multiple-bit ECC errors manifest themselves as a Non-Maskable Interrupt (NMI) resulting in a system hardware error message and have been seen to occur while running a system stress program. For example, when running a system stress test under Windows NT* 4.0, the failing systems displayed a blue screen along with the following message:

```
*** Hardware Malfunction
Call your hardware vendor for support
NMI: Channel Check / IOCHK
*** The system has halted ***
```

Engineering analysis confirms that the multiple-bit ECC errors are correctly generated based on valid ECC data and occur as a result of soft multi-bit read errors from memory.

This issue is not OS-dependent, and does not occur when *registered* SDRAM ECC DIMM devices are used.

Root Cause
Intel has determined that the memory buffer strength control register values in the 440BX chipset are improperly initialized by the system BIOS when unbuffered SDRAM ECC DIMM devices are installed. The improper memory buffer strength settings create a marginal condition between the memory sub-system and unbuffered SDRAM ECC DIMMs on some ISP1100 servers.

Intel believes that ISP1100 systems using *registered* SDRAM ECC DIMMs only are not affected.

Corrective Action
Intel is working to release a new BIOS revision (P07) with modified memory buffer strength settings that will fully address this issue. The P07 BIOS revision is currently undergoing validation testing and is expected to be available from Intel's support web site at http://support.intel.com/support/ no later than August 18, 2000.

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Intel Recommendations

Intel recommends not using unbuffered SDRAM ECC DIMM devices with ISP1100 servers that contain BIOS revision P06, or earlier.

Anyone encountering this issue with any of their existing ISP1100 servers should upgrade their system BIOS to revision P07, or later. BIOS revision P07 will fully support both unbuffered and registered SDRAM ECC DIMM devices. Refer to the ISP1100 support web site at http://support.intel.com/support/ for a complete list of Intel-qualified DIMMs.

Please contact your Intel Sales Representative if you require more specific information about this issue.

Internet Management and Appliance Division (IMAD)
Intel Corporation

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