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L440GX+ & C440GX+ Server Board
Platform Event Paging (PEP)
Configuration and Operating Summary

intel ®

Revision History		
Date	Rev	Modifications
4/7/99	1.0	Initial Release

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1. Introduction

This document is intended to serve as a "quick start guide" to the configuration of the Platform Event Paging (PEP) feature on the Intel® L440GX+ and C440GX+ server board based systems . The Product Guide or Technical Product Specification (TPS) for these products provide additional detailed information on the PEP feature. The board Product Guide is available on the software CD-ROM that comes in the box with the server board.

PEP is a feature that is configurable in the BIOS of the L440GX+ or C440GX+ server board which allows the system to page the administrator when a specific failure has been detected in the system. There are a total of 12 events in the BIOS which can be configured by the administrator to trigger a page if a failure is detected by the Baseboard Management Controller (BMC). Examples of events which could trigger a page are: Temperature out of range, Voltage out of range, Fan Failure, Chassis Intrusion, etc.

2. Assumptions

It is assumed that the integrator has a basic familiarity with BIOS (Basic Input/Output System) Set-up, serial port and modem configuration.

It is further assumed that the integrator has configured an Intel L440GX+ or C440GX+ based server system with the following minimum components. An Intel L440GX+ or C440GX+ server board integrated in an approved chassis, a minimum of one Intel processor (Pentium® III processor or Pentium II processor for L440GX+ or Pentium III Xeon™ processors or Pentium II Xeon processors for C440GX+), a processor terminator card in the unused secondary processor connector (if uni-processor configuration), and 32MB of (SDRAM DIMM) system memory. Refer to the appropriate board Product Guide, Technical Product Specification, tested chassis and power supply document, tested memory document, and the supported Hardware and Operating System documents. These documents can be found at the Intel Corporation Support web site http://support.intel.com/support/motherboards/server/

2.1 Supplemental Hardware and Software

In order to employ the PEP feature, a Hayes* compatible external modem must be attached to the COM2 port of the L440GX+ or C440GX+ based server system. Among others, 3Com* US Robotics* Sportster*, and Courier* external modems have been demonstrated to effectively work with PEP. Additionally, all PEP configurations need to be made in BIOS.

3. PEP Overview

Platform Event Paging provides the administrator with an out of band alerting mechanism which will dial a paging service and send a page if a problem has been detected on the server. PEP operates on top of the Server Board's BIOS, independent of the Operating System and is powered by the system's 5V Standby current. PEP relies on the Baseboard Management Controller (BMC) which is the server management microcontroller built on to Intel server boards. The BMC runs independently of the system processors, operating system and server management software. It autonomously monitors the system health and collects platform events into a central System Event Log (SEL).

When PEP is enabled and the BMC receives or detects a new event, the BMC automatically performs the paging operation. Since the BMC is independent of the rest of the system, this allows pages to be sent even when the operating system is unresponsive or the system processors are down.

The following sensors are monitored and can generate a page if the BMC detects a failure from any of these:

- Temperature Sensor
- Voltage Sensor
- Fan Sensor
- Chassis Sensor
- Power Supply Sensor
- BIOS (SMI Handler)
- BIOS POST Error
- FRB Sensor
- Fatal NMI
- Watchdog Timer Reset
- System Restart

Note: The PEP has an 800mA +5V Standby power requirement. This means if the power supply used has the correct requirements for PEP the L440GX+ and C440GX+ server boards are powered whenever they are plugged in. To ensure the power supply selected fulfills this power requirement see the tested chassis and power supply summary at http://support.intel.com/support/motherboards/server/.

4. Setting up PEP

Hardware configuration used:
Intel® L440GX+ Server Board, Intel Astor II server chassis, two Intel Pentium® II Processors operating at 450MHz, 128MB PC/100-compliant 100MHz SDRAM (two 64MB 168pin Gold DIMM), 6 Seagate* ST32550WC Barracuda* Hard Disk Drives, Hitachi* 24xIDE CD-ROM, Teac* Floppy diskette drive, 3Com* US Robotics* Sportster* 28.8 external modem.

1. Connect the external modem to the server's COM2 port.
2. Power on the L440GX+ server system, pressing **<F2>** prior to completion of POST (Power On Self-Test) in order to enter BIOS Set-up.
3. Using the left/right cursor arrow keys select the tab menu labeled "**Server**." Refer to Figure 1.
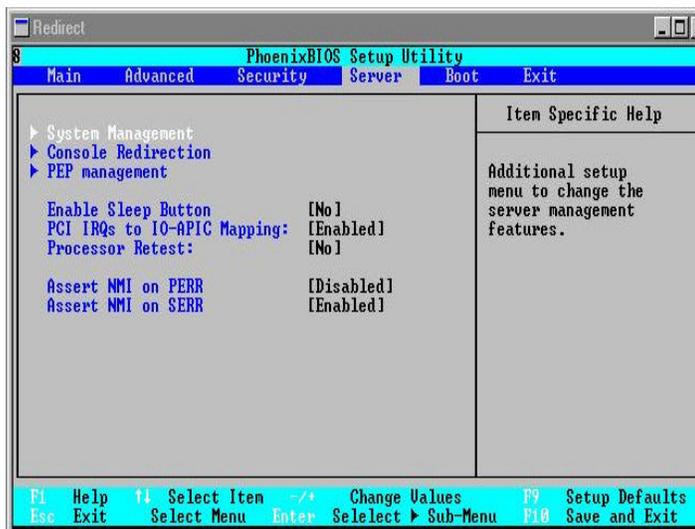

Figure 1: Server Menu Tab in BIOS setup

4. Using the down cursor arrow key select "**PEP Management**" and press **<Enter>**. Refer to Figure 2.
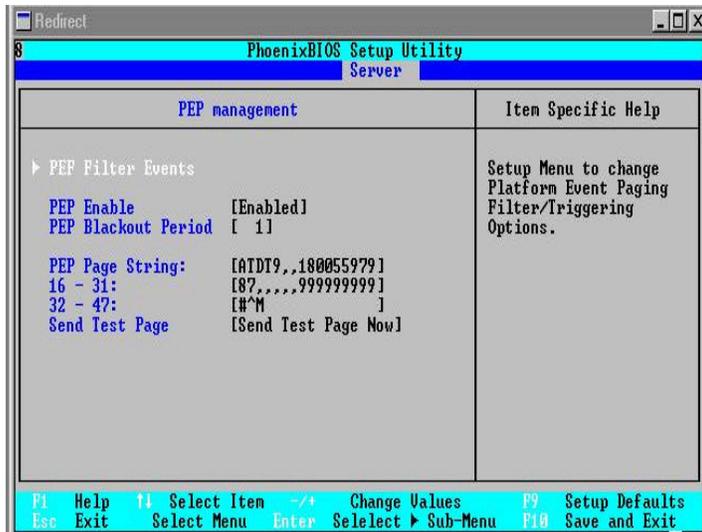
Figure 2: PEP Management Screen

5. Ensure the "**PEP Enable**" option is set to [**Enabled**].

6. Set the "**PEP Blackout Period**" to the number of minutes you desire. The PEP blackout period is the amount of time that the system waits between sending pages. For example, if the blackout period is set to 3 minutes and there are 4 events that happen in the system during those three minutes, then only one page will be sent.

7. Next, fill in the **"PEP Page String**" with the appropriate modem commands, pager number and numeric message string you wish to be paged with. Each line will accept up to 16 characters. If you type more than 16 characters, your text will wrap to the next line. A total of 64 characters may be entered (on 4 lines).

   Example Text String: ATDT9,,180055979
           87,,,,,999999999
           #^M

   First, the standard modem command ATDT is issued which takes the modem off hook and senses the dial tone. Next a 9 is dialed to get an outside line followed by a 4 second pause (2 seconds per comma). The pager number, 1-800-559-7987, is dialed followed by a 10 second pause before the text string 999999999 is sent. Then the modem command #^M is sent to ensure the modem is hung up.

8. Also on this screen is the "**Send Test Page**" option. When selected, the server will immediately dial out and send a page using the previously entered "**PEP Page String**". Do this now to test your paging string and make sure it is set up properly.

9. To configure which events you want to be paged on, use the arrow keys to move back up the screen, select the "**PEF Filter Events**" and press <**ENTER**>. See Figure 3.
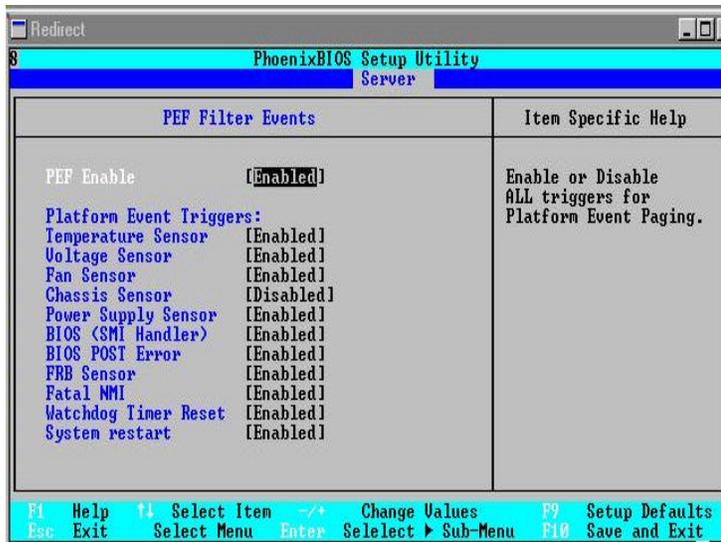
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Figure 3: PEF Filter Events Screen

10. PEF stands for Platform Event Filtering and it is a layer of filtering below PEP. PEF is what allows the system to filter the events and only page you on the events you have enabled for paging. In order for PEP to function, you need to ensure the "**PEF Enable**" option is set to [**Enabled**].

11. Next, using the down arrow, select each Event Trigger and either set it to [**Enabled**] or [**Disabled**] depending on whether or not you wish to be paged if a system failure is detected for that event.

12. Once you have enabled all the events you wish to be paged on, you are finished setting up PEP. Press <**F10**> to save your changes and exit BIOS setup.

5. PEP Tips, Tricks and Limitations

- The paging string is limited to 64 characters including all modem commands. This has been found to be enough space for all necessary characters for most paging services. However, paging services which require a lot of numeric navigation before sending the page or require long pauses between numeric strings, may run out of space. If this is the case, consider truncating the numeric message that is sent by the server to try and save space.

- Though PEP uses a modem to dial the paging service, it cannot complete modem "handshakes" used by GSM (Global System for Mobile Communications) networks utilizing SMS (Short Message Service). This limitation makes functionality of PEP on any GSM network dependent on the carrier's ability to support touch tone inputs from a POTS. This mainly affects certain areas in Europe and Asia, however check with your paging service to ensure you can support PEP.

6. Troubleshooting

This section is not intended to be a tutorial on repair and system troubleshooting. It is intended to provide hints for the technician. If the problem system has just been assembled, a first step should be to check the system against the assembly procedures in the printed appropriate server board "Quick Start Guide," and the electronic server board Product Guide. Both guides are provided on the software CD in the server board kit, and on the Intel Corporation's support website.

Trouble Shooting Information	
Problem	**Possible Solution**
System fails to boot	General: Check power. Check cabling, connectors and socketed components are properly seated. Remove all components except minimal memory and a processor and reboot. If possible check individual components (especially processors and memory) in a known good system. 1. Check for processor termination card in empty processor connector. 2. Check for approved memory DIMM modules. 3. Check to assure that the power supply connector is correctly attached to the L440GX+/C440GX+ server board 24 pin (ATX 20pin +4) power connector. The Intel Astor II and Cabrillo-C Server Chassis use a 24 pin "Modified ATX" power connector, however, most third party chassis use a 20 pin ATX power connector. In the case of an ATX 20 pin power connector, it plugs into the first 20 pins of the L440GX+/C440GX+ server board 24 pin power connector. Refer to the printed "Quick Start Guide" or the Electronic Product Guide for the appropriate board for further details. 4. Ensure the Power Supply is providing at least 800mA of +5V standby current to support WOL* and EMP or PEP. If the power supply does not provide enough stand by current, disable WOL via jumper otherwise the system will not boot.
System will not boot from the L440GX+ or C440GX+ Server Board Resource CDROM	Incorrect BIOS Boot priority order. Press <F2> during the server's POST and configure in BIOS set-up under the Boot menu.
PEP not finding modem when trying to dial out.	Ensure modem is connected to the COM2 port on the server. For the L440GX+ server board, the COM2 port is closest to the stacked mouse and keyboard connectors. On the C440GX+ server board, the COM2 port is closest to the RJ-45 NIC connector.
Other	For further support information, check the following URLs: http://support.intel.com/support/motherboards/server/l440gx or http://support.intel.com/support/motherboards/server/c440gx