D2619 BIOS Setup Utility for PRIMERGY RX300 S5 and TX300 S5

Reference Manual

Edition April 2009

Comments… Suggestions… Corrections…

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Feel free to send us your comments by e-mail to manuals@ts.fujitsu.com.

Certified documentation according to DIN EN ISO 9001:2000

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2000.

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Contents

1 Introduction

BIOS setup provides settings for system functions and the hardware configuration for your system. Any changes you make take effect as soon as you save the settings and quit BIOS setup. The individual menus in BIOS setup provide settings for the following areas:

- *Main* – System functions
- *Advanced* – Advanced system configuration
- *Security* – Security functions
- *Power* – Power management functions
- *Server* – Server management
- *Boot* – Configuration of the start-up sequence
- *Exit* – Save and quit

The setting options depend on the hardware configuration of your system.

Menus or certain setting options may therefore not be available in your system's BIOS setup, or the menus may be in a different place, depending on the BIOS revision.

Notational conventions

The meanings of fonts and symbols used in this manual are as follows:

Italics	indicates menus and menu entries, path names, file names, and program names
`fixed font`	indicates system output
`semi-bold fixed font`	indicates text you have to enter via the keyboard
►	indicates activities that must be performed
Abc	indicates a key on the keyboard
	indicates supplementary information
 **CAUTION!**	indicates references, during their neglect your health, the operability of your system, or the security of your data is endangered.

2 Navigating the BIOS setup

2.1 Open the BIOS setup

- ► Start the system and wait until the screen output appears.
- ► Press the F2 function key.
- ► If a setup password is assigned, enter this password and confirm with the Enter key.
  The BIOS setup *Main* menu will be displayed on the screen.
- ► Press the F1 function key.
  The BIOS release information will be displayed:
  - – BIOS release (e.g. Version 1.00.2619)

    The final digits refer to the number of the system board. This number is necessary to locate the appropriate manual for the system board on the Drivers & Utilities or ServerStart DVD/CD; it is also required for identifying the appropriate BIOS update to download from the Internet.

2.2 Open the Boot menu immediately

Use this function if you do not want to start your system from the first drive that is set in the *Boot* menu.

- ► Start the system and wait until the screen output appears.
- ► Press the F12 function key.
  The boot menu will be displayed as a popup window.
- ► Use the ↑ or ↓ cursor keys to select the drive from which you want to start the operating system, and confirm your selection by pressing the Enter key.
  The selection options are the same as in the *Boot* menu.

  If a drive is marked with an exclamation mark (!), you cannot select it for booting.

  i The selected option applies to the current system start. The next time you start the system, the settings in the *Boot* menu will apply again.
- ► To start the BIOS setup, select the *Setup* parameter and confirm your selection with the Enter key.

2.3 Screen design

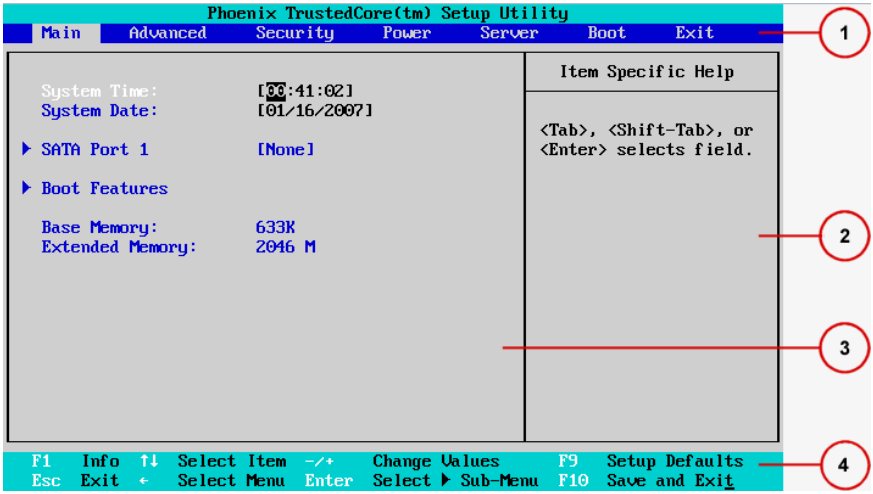

Figure 1: Example for a BIOS setup screen

The BIOS setup screen is divided into the following areas:

1 Menu bar

The menu bar is used to select the different BIOS setup menus.

2 Help area

Brief information is displayed in the help area.

3 Working area

In the working area the parameters of the selected menu are displayed with their current values. You can modify the parameter values according to your requirements (if the appropriate fields are not greyed out).

- ► Indicates parameters containing submenus.
- * Indicates configuration conflicts that must be resolved to ensure that the system functions correctly.

4 Operations bar

The operations bar lists the keys available for use with BIOS setup.

2.4 BIOS setup with incorrect settings

If an incorrect setting in BIOS setup prevents the system boot and the system cannot be booted three times in a row, the default BIOS setup settings will be applied once, the next time the system is started.

The following error message will appear:

```
Previous boot incomplete - Default configuration used
```

Pressing the F2 key allows you to check and correct the settings in BIOS setup. After the correction an error free system start is possible again.

2.5 Exiting the BIOS setup

- In the *Exit* menu select the required parameter and press the Enter key.

3 Main menu

The following parameters can be set in this menu. Some of them are only available under special preconditions.

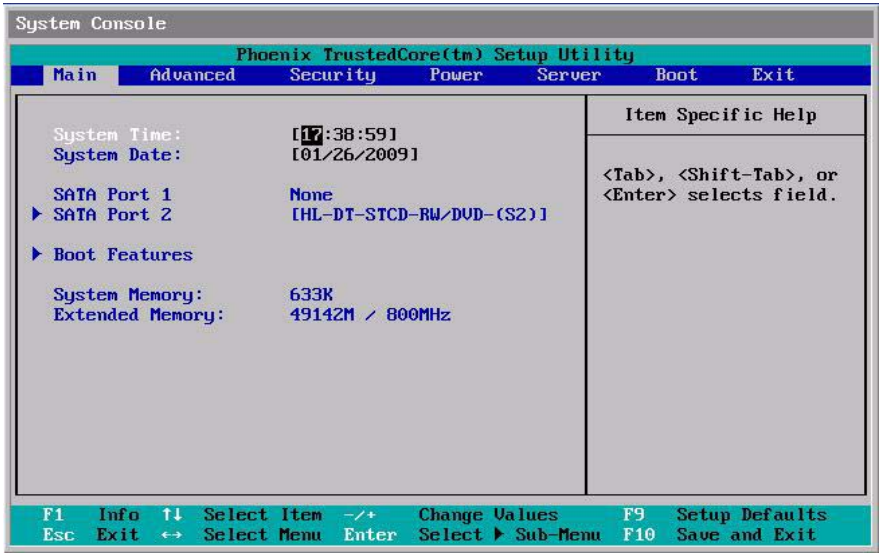

Figure 2: Example: Screenshot for the "Main" menu

System Time / *System Date*

Displays the current date/time set on the system.

The system time has the format *HH*:*MM*:*SS*, and the system date has the format *MM*/*DD*/*YYYY*.

To change the current time/date settings enter the new time/date in the *System Time*/*System Date* fields respectively. Use the Tab key to move the cursor within the *System Time* and the *System Date* fields.

If the system time and date are lost after you switch the system off and back on again, the lithium battery is empty and needs to be replaced.

Refer to the system board manual for information on how to replace the lithium battery.

SATA Port 1/SATA Port 2
Calls a submenu containing the settings for the corresponding SATA device (see page 12).

Boot Features
Calls a submenu used to select system boot settings (see page 14).

System Memory
Displays the size of the available base memory below 1 MByte in KByte units.

Extended Memory
Displays the size of the main memory above 1 MByte in MByte units and the memory frequency in GHz.

3.1 SATA Port

All parameters in this submenu can only be viewed, no selection is possible. Also no default values are available. The menus show the parameters of the SATA device.

Total sectors
Displays the number of sectors on the hard disk.

Not for optical media.

Maximum Capacity
Shows the capacity of the hard disk as an LBA value. The LBA (Logical Block Addressing) value is the capacity calculated by the BIOS based on the maximum possible number of sectors reported by the hard disk.

Not for optical media.

Multi-Sector Transfers
Shows the number of sectors per block which are automatically detected by the BIOS.

Disabled
2 sectors
4 sectors
8 sectors
16 sectors

LBA Mode Control

Sets the addressing mode using serial sector numbers (LBA).

Disabled

The BIOS uses the hard disk parameters and consequently supports a storage capacity of up to 528 MB.

Enabled

If the hard disk supports LBA mode and its storage capacity is greater than 528 MB, the BIOS uses converted hard disk parameters. This permits the full storage capacity of the hard disk to be used.

32 Bit I/O

Defines the bus width for data transfer between the processor and the hard disk controller.

Disabled

Data transfer takes place with a width of 16 bits.

Enabled

Data transfer takes place on the PCI bus with a width of 32 bits. This enhances the performance.

Transfer Mode

Defines the transfer mode for transferring data from the hard disk to the main memory.

Standard
Fast PIO_1
Fast PIO_2
Fast PIO_3
Fast PIO_4
FPIO 3/DMA 1
FPIO 4/DMA 2

Ultra DMA Mode

Defines a high-speed Ultra DMA transfer mode for the hard disk drive.

Disabled

No high-speed Ultra DMA transfer mode is set.

Mode 0, 1, 2, 3, 4, 5, 6

A high-speed Ultra DMA transfer mode is set.

SMART Monitoring

Shows whether SMART (Self Monitoring Analysis Reporting Technology) monitoring is activated for the hard disk drive (ReadOnly).

Disabled

SMART monitoring is deactivated.

Enabled

SMART monitoring is activated. That means the *SMART Device Monitoring* parameter is set to *Enabled* and the corresponding hard disk drive supports SMART.

Firmware

Shows the firmware version number of the attached SATA device.

3.2 Boot Features

The following parameters can be set in this menu. Some of them are only available under special preconditions.

POST Errors

Defines whether the system boot process is aborted and the system is halted when an error is detected.

Disabled

The system boot is not aborted. The error is ignored, depending on the severity.

Enabled

If the self-test detects an error, system boot is aborted after the self-test and the system is halted.
The system boot can be continued by pressing the F1 key or the setup utility can be entered by pressing the F2 key.

Fast Boot

Reduces the scope of the self-test and thus accelerate the boot process.

Disabled

When the system is switched on the complete self-test is performed.

Enabled

When the system is switched on the quick self-test is performed.

POST Diagnostic Screen

Defines whether the boot logo or the start information will be displayed on the screen.

Enabled

The start information is displayed.

Disabled

The boot logo is displayed on the screen. The system will switch to displaying the start information if the ESC key is pressed or errors occur.

Boot Menu

Specifies whether the boot menu can be invoked during the POST process by pressing the F12 key.

Disabled

The *Boot* menu cannot be invoked.

Enabled

The *Boot* menu can be invoked.

NumLock

Defines the functionality of the numeric keypad area on the keyboard at system start-up.

On

The numeric keypad area on the keyboard is used for numeral input at system start-up.

Off

The numeric keypad area on the keyboard is used for the arrow keys at system start-up.

The *Num* indicator on the keyboard reports the current status. The Num key on the keyboard allows to toggle between *On* and *Off*.

4 Advanced menu

CAUTION!

Only change the default settings if required for a special purpose. Incorrect settings in this menu can result in malfunctions on your computer!

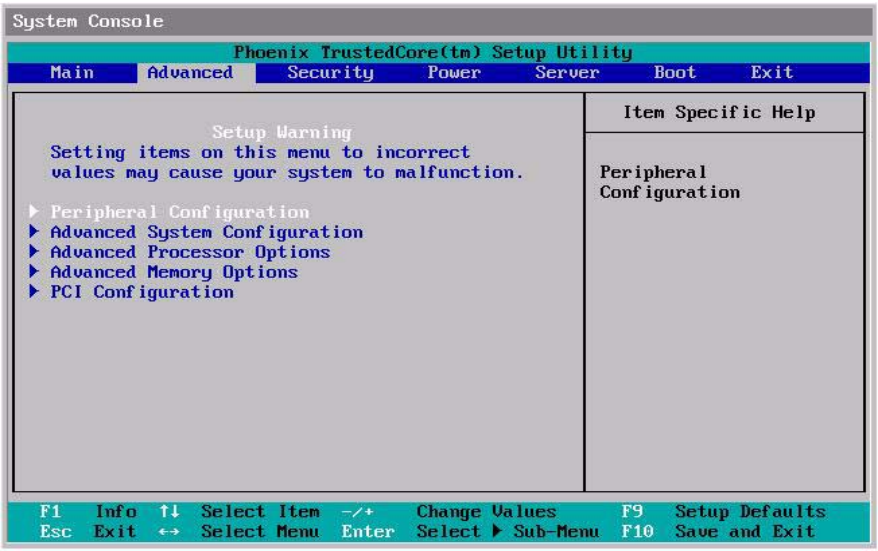

Figure 3: Example: Screenshot for the "Advanced" menu

Peripheral Configuration

Calls a submenu used to adjust settings for ports and controllers (see page 18).

Advanced System Configuration

Calls a submenu used to make additional system settings (see page 21).

Advanced Processor Options

Calls a submenu used to make additional processor settings (see page 24).

The adjustment options available in this submenu depend on the processor being used.

Advanced Memory Options

Calls a submenu used to make additional memory settings (see page 29).

PCI Configuration

Calls a submenu used to set up the PCI slots and PCI components on the system board (see page 30).

4.1 Peripheral Configuration

The following parameters can be set in this submenu. Some of them are only available under special preconditions.

Serial 1

Selects the address and the interrupt used to access the corresponding serial interface.

Disabled

The serial interface is disabled.

Enabled

The serial interface is set to the indicated address and interrupt. If you select *Enabled*, additional lines are displayed for the configuration settings.

Auto

The serial interface will be selected automatically by the BIOS or operating system.

Serial 1 Address

Defines the base I/O address and the interrupt for the serial interface.
3F8h/IRQ4, *2F8h/IRQ3, 3E8h/IRQ4, 2E8h/IRQ3*

The serial interface uses the selected address and interrupt.

Serial Multiplexer (Serial 1)

Specifies whether the serial interface can be used by the system.

System

The serial interface can be used by the system or the operating system.

iRMC

The serial interface can only be used by the iRMC. The operating system cannot use this serial interface.

Serial 2

Selects the address and the interrupt used to access the corresponding serial interface.

Disabled

The serial interface is disabled.

Enabled

The serial interface is set to the indicated address and interrupt. If you select *Enabled*, additional lines are displayed for the configuration settings.

Auto

The serial interface will be selected automatically by the BIOS or operating system.

Serial 2 Address

Defines the base I/O address and the interrupt for the serial interface. *3F8h/IRQ4*, *2F8h/IRQ3*, *3E8h/IRQ4*, *2E8h/IRQ3*

The serial interface uses the selected address and interrupt.

USB Host Controller

Specifies whether the USB controller is enabled or disabled. If this function is disabled, the USB controller will not be recognized by any operating system. As a result, no USB devices can be operated.

Disabled

USB host controller is disabled after BIOS POST. It is still possible to use USB keyboard and USB mouse for the BIOS setup utility.

Enabled

USB host controller is enabled.

USB Speed

Defines which USB host controller speeds are supported.

USB 1.1

Only the USB 1.1 host controller is enabled.

USB 1.1 AND USB 2.0

The USB 1.1 and USB 2.0 controllers are enabled.

USB Devices

Defines the USB devices for which legacy support is available. Legacy support allows you to use a USB keyboard, a USB mouse and USB mass storage devices without any operating system USB driver, by legacy BIOS interfaces.

None No USB legacy support is provided.

Keyboard And Mouse Only
USB legacy support is only enabled for keyboard and mouse.

All USB legacy support is enabled for all devices, supported by the BIOS.

USB Front
Enables or disables the external front USB ports.

Enabled
The external front USB ports are enabled.

Disabled
The external front USB ports are disabled.

USB Rear
Enables or disables the external rear USB ports.

Enabled
The external rear USB ports are enabled.

Disabled
The external rear USB ports are disabled.

USB BIOS Hot-Plug
Specifies if attachment or removal of USB mouse and USB keyboard devices after power on are detected at BIOS level.

Disabled
Newly connected USB devices at BIOS level are not recognized.

Enabled
Newly connected USB devices at BIOS level are recognized.

Set this parameter to *Disabled* if the operating system reports a problem with the system timer during the boot process.

LAN Controller
Specifies which LAN controllers are operational.

Disabled
Both LAN controllers are disabled.

Lan 1
LAN controller 1 is enabled, LAN controller 2 is disabled.

LAN 1 & 2
Both LAN controllers are enabled.

LAN 1 Oprom
LAN controllers can be used as boot devices if a suitable Option ROM is started during BIOS POST. This parameter specifies whether an Option ROM should be started and if so which type of Option ROM.

Disabled
Do not start any Option ROM.

PXE
Starts the PXE Option ROM to provide the functionality for booting via PXE.

iSCSI
Starts the iSCSI Option ROM to provide the functionality for booting via iSCSI.

LAN 2 Oprom
LAN controllers can be used as boot devices if a suitable Option ROM is started during BIOS POST. This parameter specifies whether an Option ROM should be started and if so which type of Option ROM.

Disabled
Do not start any Option ROM.

PXE
Starts the PXE Option ROM to provide the functionality for booting via PXE.

iSCSI
Starts the iSCSI Option ROM to provide the functionality for booting via iSCSI.

4.2 Advanced System Configuration

The following parameters can be set in this submenu. Some of them are only available under special preconditions.

Onboard Video
The graphics controller on the system board can be deactivated if a display card is installed in the system.

Disabled

The graphics controller on the system board is disabled.

Enabled

The graphics controller on the system board is enabled.

High Precision Event Timer

Provided that it is enabled, the operating system is able to make use of the High Precision Event Timer, which allows it to meet the requirements of time-critical applications.
The advanced timer is also known as the Multimedia Timer.

Disabled

High Precision Event Timer is disabled.

Enabled

High Precision Event Timer is enabled.

I/OAT

Used to support I/OAT (Intel® I/O Acceleration Technology) for a network controller. Additional hardware capabilities will improve the application performance and application response time.
Requires also support from the drivers and the operating system.

Disabled

A network controller cannot utilize the additional hardware capabilities.

Enabled

A network controller can utilize the additional hardware capabilities.

SMART Device Monitoring

Activates and deactivates SMART (Self Monitoring Analysis Reporting Technology) for all attached SATA devices.

SMART can be used in order to predict hard disk malfunctions.

Disabled

SMART is disabled for all SATA devices.

Enabled

SMART is enabled for all SATA devices.

Supported SATA Modes

The following modes are supported by the SATA controller:

- Compatible Mode

  Only predefined legacy resources (I/O ports, IRQ) will be assigned to the SATA controller. This mode should be used for older operating systems if Native Mode or AHCI Mode are not supported.

  – *SATA0 Compatible Mode* set to *Auto*

  – *SATA AHCI Enable* set to *Disabled*

- Native Mode

  The resources assigned to the SATA controller are not limited to the legacy resources. Depending on the operating system the performance may be better than in Compatible Mode.

  – *SATA0 Compatible Mode* set to *Disabled*

  – *SATA AHCI Enable* set to *Disabled*

- AHCI Mode

  Offers an advanced interface for the SATA controller, optimized for best performance. In order to operate the system in AHCI mode, both the operating system and the drivers must support it.

  – *SATA0 Compatible Mode* set to <don't care>

  – *SATA AHCI Enable* set to *Enabled*

SATA0 Compatible Mode

Defines if legacy resources can be made available to the primary hard disk controller.

Auto

If available, legacy resources are made available to the hard disk controller, i.e. it is running in Compatible Mode.

Disabled

The hard disk controller does not use any legacy resources.

SATA AHCI Enable

Specifies whether the SATA interface is in the AHCI (Advanced Host Controller Interface) operating mode. Functions like NCQ (Native Command Queuing) are supported in this operating mode. An NCQ-capable hard disk is required for this mode.

In order to operate the system in AHCI mode, both the operating system and the drivers must support the AHCI Mode.

Disabled

The SATA interface is operated in Native or Compatible Mode.

Enabled

The SATA interface is operated according to the AHCI specification. In this case a special SATA driver is required.

4.3 Advanced Processor Options

The following parameters can be set in this submenu. Some of them are only available under special preconditions.

CPU Mismatch Detection

Checking of the processor data (processor type and speed) can be enabled or disabled. The check ascertains whether the processor data has changed between two system starts. In multiprocessor systems a check is also made to ascertain whether the processor data of all processors are identical.

An error message is displayed if the processor data differs.

Disabled

CPU Mismatch Detection is disabled.

Enabled

CPU Mismatch Detection is enabled.

QPI Bus Speed

QPI bus links provide the connection between the CPU(s) and the chip set. In multi socket systems, they also connect the CPUs among each other. Depending on the CPU(s) and the chipset, QPI bus links can be run at different speeds. This parameter controls the speed of the QPI bus links in your system.

Automatic

BIOS will find out the maximum speed depending on the CPU(s) and chipset present in your system.

Other options

(CPU dependent)
Possible speed settings vary with CPU(s) and chipset so different values are displayed depending on your system. Choose one of the values to explicitly set the speed the QPI bus links will be run at.

Enhanced SpeedStep

Defines the processor voltage and frequency. EIST (Enhanced Intel SpeedStep® Technology) is an energy saving function.

The processor voltage is adapted to the respective system requirements. A reduction in the clock frequency causes less power to be required by the system.

Disabled

Enhanced SpeedStep functionality is disabled.

Enabled

Enhanced SpeedStep functionality is enabled.

Enhanced Idle Power State

If supported by the operating system, the CPU is stopped if possible to save energy.

Disabled

Enhanced Idle Power State functionality is disabled.

Enabled

Enhanced Idle Power State functionality is enabled.

Turbo Boost Technology

Allows the processor to run faster than the marked frequency if the OS requests a higher performance state (P0).

Disabled

Turbo Boost Technology is disabled.

Enabled

Turbo Boost Technology is enabled.

Core Multi-Processing

For processors that contain multiple processor cores, all but one processor core can be deactivated.

Disabled

All but one processor core are deactivated.

Enabled

All available processor cores are active.

Hyper-Threading

Hyper-threading technology allows a single physical processor core to appear as several logical processors. With this technology the operating system can better utilize the internal processor resources, which in turn

leads to increased performance. The advantages of this technology can only be used by an operating system which supports ACPI. This setting has no effect on operating systems which do not support ACPI.

Disabled

An ACPI operating system can only use the first logical processor of the physical processor. This setting should only be used if hyper-threading technology has not been correctly implemented in the ACPI operating system.

Enabled

An ACPI operating system can use all logical processors within a physical processor.

Virtualization Technology (VT-x)

Supports the virtualization of platform hardware and several software environments, based on VMX (Virtual Machine Extensions) to support the use of several software environments using virtual computers. Virtualization technology extends the processor support for virtualization purposes with the 16 Bit and 32 Bit protected modes and with the EM64T (Intel® Extended Memory 64 Technology) mode.

Disabled

A VMM (Virtual Machine Monitor) cannot use the additional hardware features.

Enabled

A VMM can use the additional hardware features.

Virtualization Technology (VT-d)

VT-d provides hardware support for sharing I/O devices between multiple virtual machines. VMMs (Virtual Machine Monitors) can use VT-d for managing multiple virtual machines accessing the same physical I/O device.

Disabled

VT-d is disabled and not available for VMMs.

Enabled

VT-d is enabled.

NX Memory Protection

Defines the protection for executable memory areas (anti-virus protection). The function is only effective if it is also supported by the operating system.

Enabled

Enables the operating system to switch on the function *Execute Disable*.

Disabled

Prevents the operating system from being able to switch on the function *Execute Disable*.

Adjacent Cache Line Prefetch

Available if the processor offers a mechanism for loading an additional adjacent 64Byte *Cache Line* during every cache request of the processor.

With this parameter you can change the performance settings for non-standard applications. It is recommended that you should adhere to the default settings for standard applications.

Enabled

The processor loads the requested cache line and the adjacent cache line.

Disabled

The processor loads the requested cache line.

Hardware Prefetch

Enables a prefetch to the hardware.

With this parameter you can change the performance settings for non-standard applications. It is recommended that you should adhere to the default settings for standard applications.

Enabled

Activates the hardware prefetcher of the CPU.

Disabled

Deactivates the hardware prefetcher of the CPU.

Limit CPUID Functions

Defines the number of CPUID functions which can be called by the processor. Some operating systems cannot process new CPUID commands which support more than three functions. This parameter should be enabled for these operating systems.

Disabled

All CPUID functions are supported.

Enabled

For reasons of compatibility with the operating system, only a reduced number of CPUID functions are supported by the processor.

CPU MC Status Clear

When a processor detects an error, the cause is marked in a status register. Some errors can be dealt with immediately, others can lead to a system failure. Now the processor can retain the MCA (Machine Check Architecture) status until switch-off. Following a reset the BIOS can deal with these CPU MC status markings during the POST phase and log detected run-time errors.

Disabled

The CPU MCA status registers are never cleared by the BIOS.

Enabled

The CPU MCA status registers are cleared by the BIOS on each system start-up.

Next Boot

The CPU MCA status registers are cleared by the BIOS on the subsequent start-up after the start-up, that has detected an error status. This allows to still analyze MC errors on the next reboot after an error has happened.

CPU Timeout Counter

Internal time monitoring of the processor can be enabled or disabled here.When internal time monitoring is enabled, the processor detects both internal time-outs and time-outs on the CPU bus. The processor signals this with an external signal. In this case, the system is rebooted.

If time monitoring is disabled, the system may remain inoperable.

Disabled

Internal time monitoring of the processor is disabled.

Enabled

Internal time monitoring of the processor is enabled.

4.4 Advanced Memory Options

The following parameters can be set in this submenu. Some of them are only available under special preconditions.

Memory Scrubbing

Specifies whether the full memory will periodically be screened in the background. Correctable memory error will be detected and corrected before an accumulation of such errors may lead to an uncorrectable memory error.

Disabled

No background memory screening will be performed, resulting in increased performance.

Enabled

Background memory screening will be performed, resulting in increased reliability.

CAUTION!

The cause of correctable memory errors may be inappropriate environmental conditions, e.g. high temperature.

Memory Redundancy

Memory capacity can be reserved for possible error treatment.

Disabled

Deactivates this function.

Sparing

The BIOS uses a memory bank as a reserve for the case that too many correctable errors occur in another memory bank. Before some uncorrectable error occurs, the content of this memory bank is routed back into the sparing bank. The potentially defective memory bank is not used anymore. This procedure is executed while working. At the same time, the memory error is reported to the administrator.

Mirroring

The BIOS divides the system memory in half and retains two copies of all data in the memory. It prevents a system crash when uncorrectable errors occur. In seldom cases in which uncorrectable errors occur, data cannot be collected from the first copy, the data is immediately called from the second copy. At the same time, the memory error is reported to the administrator.

NUMA Optimisation

NUMA (Non-Uniform Memory Access) is a memory architecture for multiprocessor systems. Each processor has its own local memory, but it may also access the local memory of the other processors (shared memory). The access to the local memory is faster than to the shared memory.

Disabled

The full system memory is divided into many small areas of interleaved local and shared memory.

Should be selected if the operating system does not support NUMA.

Enabled

The full system memory is divided into areas of non-interleaved local and shared memory. Best performance with a NUMA aware ACPI operating system.

4.5 PCI Configuration

The following parameters can be set in this submenu. Some of them are only available under special preconditions.

PCI SLOTS Configuration

Calls the submenu *Option ROM Scan*.

Option ROM Scan

Controls if Option ROMs of expansion cards mounted in this slot shall be started.

Disabled

Do not start Option ROMs of expansion cards in this slot.

Enabled

Starts Option ROMs of expansion cards in this slot.

PCI IRQ Line 1 to 8

Establishes which ISA interrupts will be used for the individual PCI slots and which controller (device) of the system board shares this PCI interrupt with the PCI slots (e.g. USB, SCSI). Multifunctional expansion cards or expansion cards with an integrated PCI-to-PCI bridge can use several PCI interrupts (INTA#, INTB#, INTC#, INTD#). Monofunctional

expansion cards (default) only use one PCI interrupt (INTA#) per PCI slot. The PCI interrupts INTA#, INTB#, INTC# and INTD# are available for every PCI slot.

Allowed values are:
Disabled, *Autoselect*, *3, 4, 5, 7, 9, 10, 11, 12, 14, 15*.

Different IRQ combinations may be displayed depending on the configuration.

5 Security menu

The following parameters can be set in this menu. Some of them are only available under special preconditions.

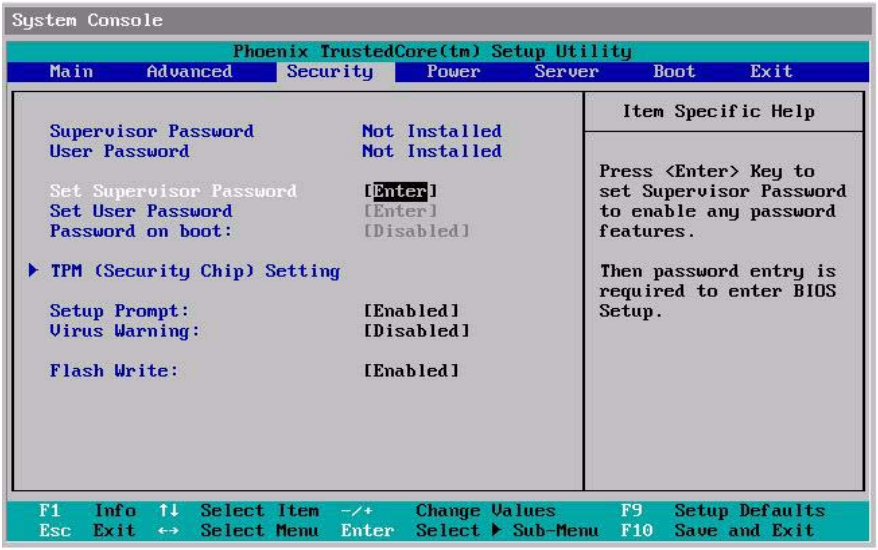

Figure 4: Example: Screenshot for the "Security" menu

Supervisor Password

Indicates the current status of the supervisor password.

Not Installed

No supervisor password is assigned.

Installed

A supervisor password is assigned.

User Password

Indicates the current status of the user password.

Not Installed

No user password is assigned.

Installed

A user password is assigned.

Set Supervisor Password

When you press the Enter key, a window opens where you can define the supervisor password. Enter a character string to define a password. If you confirm an empty password field, the password will be deleted.

To call up the complete BIOS setup, you need the supervisor password. The user password allows only a very limited access to the BIOS setup.

Setup Password Lock

If a supervisor password is defined this field establishes the effect of the password.

Standard

The supervisor password prevents unauthorized opening of the BIOS setup utility.

Extended

The supervisor password prevents unauthorized opening of the BIOS setup utility and locks the keyboard during the system initialization phase. This prevents unauthorized access to settings for installed expansion cards with an own BIOS.

Set User Password

For assigning the user password, a supervisor password must already be assigned. The user password prevents unauthorized access to your system.

When you press the Enter key, a window opens where you can assign the user password.Enter a character string to define a password. If you confirm an empty password field, the password will be deleted.

If you call up the BIOS setup with the user password, you cannot change most menu options.

Password on Boot

Defines if the supervisor or user password must be entered before the boot process.

Disabled

The system boots without a password having to be entered.

First Boot

Password has to be entered before OS boot just once after power on.

Every Boot

Password has to be entered on every boot.

System Password Lock

Establishes whether the system password is bypassed or must be entered when booting with *Wake On LAN*.

Standard

The system password must be entered via the keyboard when booting the operating system.

WOL Skip

The system password is deactivated when booting with Wake On LAN.

TPM (Security Chip) Settings

Opens the submenu used to activate TPM (Trusted Platform Module) and adjust TPM settings (see page 36).

If this setup menu is available, then the system board includes a security and encryption chip (TPM) that complies with TCG (Trusted Computing Group) Specification 1.2. The menu is **not** displayed on systems without a TPM.

Similarly to a SmartCard, this chip allows security-relevant data (passwords etc.) to be stored securely.

Setup Prompt

Specifies whether the message `Press <F2> to enter SETUP` is displayed during BIOS POST.

Disabled

The message `Press <F2> to enter SETUP` is not displayed.

Enabled

The message `Press <F2> to enter SETUP` is displayed.

Virus Warning

Checks the boot sectors of the hard disk drive to see if any changes have been made since the previous system start-up. If the boot sectors have been changed and the reason for this is unknown, a suitable computer virus detection program should be run.

Disabled

The boot sectors are not checked.

Enabled

Displays a warning if the boot sector has been changed since the previous system start-up (e.g. new operating system or virus attack). The warning will stay on the screen until you acknowledge the changes or deactivate the function.

Confirm

Confirms a required change to a boot sector (e.g. new operating system).

Flash Write

Assigns write protection to the system BIOS.

Disabled

The system BIOS cannot be written. Flash-BIOS update is not possible.

Enabled

The system BIOS can be written if the appropriate switch option (see manual for the system board) is set accordingly. Flash BIOS update is possible.

5.1 TPM (Trusted Platform Module) Configuration

The TPM is available as a secure memory for secret keys. For example, data can be generated, which can only be read or run on this system. Security protocols such as SSL (Secure Socket Layer) for Internet connections, IPSec (LAN encryption), S-MIME (e-mail encryption), WLAN encryption, etc. can also be supported.

The following parameters can be set in this submenu. Some of them are only available under special preconditions.

Security Chip

Activates/deactivates support for the TPM (Trusted Platform Module). This parameter enables or disables the TPM on the hardware level. If the TPM is disabled, it behaves as if it was not there and is neither detectable nor does it not react to any command.

Disabled

TPM support is deactivated.

Enabled
TPM support is activated.

Current TPM State
Indicates the current state of the TPM.

The state can take the following values:
Disabled and Activated
Disabled and Deactivated
Enabled and Activated
Enabled and Deactivated.

If the TPM is disabled by the *Security Chip* parameter (see above), the TPM state will always be *Disabled and Deactivated*.

Change TPM State
Changes the state of the TPM (Security Chip).

After changing the TPM state the system will perform the following steps:

- System Reset
- The system automatically displays the *TPM Physical Presence Operations* setup page (see below).
- System Reset
- According to the user's selection in the *TPM Physical Presence Operations* setup page, the change of the TPM state is either executed or discarded.

No Change
Leaves current security chip state unchanged.

Enable & Activate
Enables and activates the security chip for use by application.

Disable & Deactivate
Disables and deactivates the security chip.

CAUTION!

Deactivating the TPM may affect other security applications.

Clear
Clears all user generated keys stored in the security chip.

CAUTION!

If *Clear* is selected all user generated keys stored in the security chip will be deleted. Accessing of encrypted data may not be possible furthermore.

TPM Physical Presence Operations

This setup page is only displayed during the process of executing restricted operations requiring the physical presence of an operator. One example of a physical presence operation is changing the TPM state. The TCG security provisions stipulate that physical presence operations must be confirmed by the operator.

Physical presence operations can be initiated by the BIOS setup (see *Change TPM State* parameter) or other software using the TPM (e.g. the operating system). The intention of displaying this setup page automatically is to prevent malicious software from executing restricted operations "silently" without notifying the user. It allows you to reject unwanted changes of the TPM state.

Reject

Discards the physical presence operation (for example clearing the TPM).

Execute

Confirms the execution of the physical presence operation (for example changing the TPM state to *Enable & Activate).*

6 Power menu

The following parameters can be set in this menu. Some of them are only available under special preconditions.

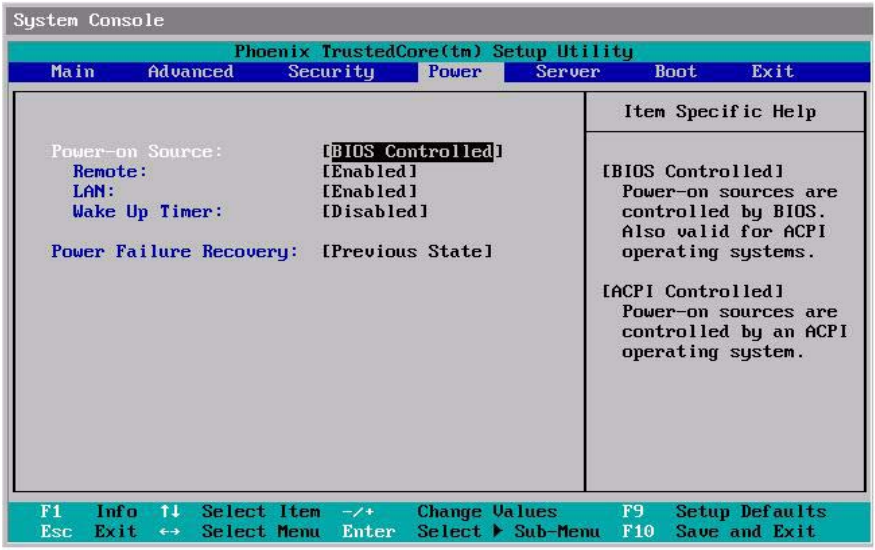

Figure 5: Example: Screenshot for the "Power" menu

Power-on Source

Specifies whether the switch-on sources for the system are managed by the BIOS or the ACPI operating system.

BIOS Controlled

The switch-on sources are managed by the BIOS.

ACPI Controlled

The switch-on sources are managed by the ACPI operating system.

Power-on Source: Remote

Determines whether the system can be switched on via serial interface.

Disabled

The system cannot be switched on via serial interface.

Enabled

The system can be switched on via serial interface.

Power-on Source: LAN

Determines whether the system can be switched on via a LAN controller (on the system board or expansion card).

Disabled

The system cannot be switched on via a LAN controller.

Enabled

The system can be switched on via a LAN controller.

Power-on Source: Wake Up Timer

Specifies whether the system can be set to switch on at a particular time or after a particular period of time. The switch-on date cannot be specified in BIOS setup. A suitable application is required in order to set the switch-on date.

Disabled

The system cannot be switched on using timer control.

Enabled

The system can be switched on using timer control.

Rebooting after a critical system error is not affected by this setting.

Power Failure Recovery

Specifies the system restart behavior after a power failure.

Always Off

The system performs a status check and then switches off.

Always On

The system performs a status check and then switches on.

Previous State

The system performs a status check and then returns the mode it was in before the power failure occurred (*On* or *Off*).

All wake up sources are reconfigured during the short initialization process. The system can be *woken up* via LAN etc. When *Disabled* is set, the system can only be *woken up* using the power-on button.

7 Server menu

The following parameters can be set in this menu. Some of them are only available under special preconditions.

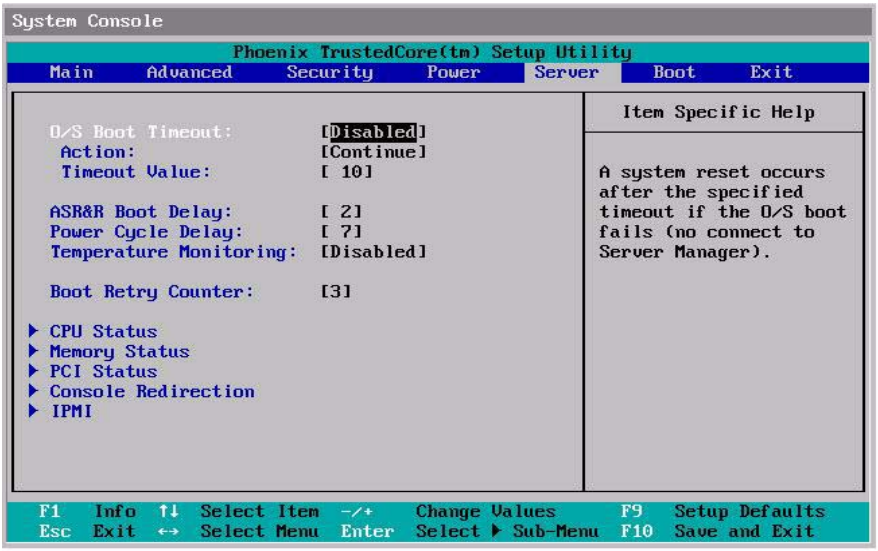

Figure 6: Example: Screenshot for the "Server" menu

O/S Boot Timeout

Specifies whether the system is restarted if the server management process (*ServerView* agent) is unable to establish a connection with the iRMC. After a successful operating system start-up the *ServerView* agent starts the communication with the iRMC within a specified period. The iRMC assumes a start-up error if a timeout occurs and may restart the system to recover from this error.

Disabled

The iRMC does not restart the system on *O/S Boot Timeout*. This selection must be used if *ServerView* is not installed to avoid inadvertently system restarts by the iRMC.

Enabled

The iRMC restarts the system on *O/S Boot Timeout*, because it assumes an operating system start-up error.

Action

Determines the action taken after the boot watchdog expires.

Continue

The system continues to run.

Reset

The system is restarted by a system reset.

Power Cycle

The system is restarted by a power cycle, (see page 44).

Timeout Value

Specifies the time after which the system is rebooted if enabled via *O/S Boot Timeout*.
Allowed values are 0...100

0

Time monitoring is disabled.

1...100

The system is rebooted after the selected time (in minutes) has expired.

Pressing the [+] key or the [-] key increases or decreases this value.

ASR&R Boot Delay

Specifies the system reboot delay after the system shuts down as a result of an error (e.g. excessively high temperature). The system is rebooted after the set wait time has expired.
Allowed values are:
1 min. to 30 min.

Pressing the [+] key or the [-] key increases or decreases this value.

Power Cycle Delay

Specifies the minimum time that must be expired before the system can be switched on again after it has been switched off.
Allowed values are:
0 sec. to 15 sec.

Pressing the [+] key or the [-] key increases or decreases this value.

Temperature Monitoring

Specifies whether the system is disabled if the ambient temperature or the temperature of a processor exceeds the critical value. This protects against damage to the system or data. If the operating system has an active server management process, it takes over the temperature monitoring function and shuts the system down if the temperature values reach a critical level.
Depending on the *Boot Retry Counter*, the system is enabled again after the time set under *ASR&R Boot Delay* has expired. The system should have cooled down again during this period.

Disabled

The system does not switch off itself if the temperature exceeds the critical value.

Enabled

The system switches off itself if the temperature exceeds the critical value.

Boot Retry Counter

Specifies the maximum number of attempts to boot the operating system. Each failed attempt is followed by a system reboot after the time set in *O/S Boot Timeout* has expired. Other critical system errors also result in a system reboot and a counter decrement. After the last attempt, the system is ultimately disabled.

Allowed values are:
0 to *7* number of possible retries

CPU Status

Calls a submenu used to make settings for the CPU status (see page 46).

Memory Status

Calls a submenu used to make settings for the memory status (see page 47).

PCI Status

Calls a submenu used to make settings for the PCI status (see page 47).

Console Redirection

Calls a submenu used to make settings for the terminal communication (see page 48).

IPMI Calls a submenu used to make settings for the Intelligent Platform Management Interface (see page 49).

7.1 CPU Status

The following parameters can be set in this submenu. Some of them are only available under special preconditions.

CPU # Status

Specifies whether the processor can or cannot be used. Only disable a processor if it has reported an internal malfunction. The malfunction is recorded in the error log, which you can view using the SCU (Server Configuration Utility), *RemoteView* or *ServerView* program.

Failed

The operating system cannot use the processor. It was disabled automatically by the system after an internal malfunction.

Disabled

The operating system cannot use the processor. It was manually disabled.

Enabled

The operating system can use the processor.

Empty

There is no processor populated.

Actual Bootstrap CPU

Displays which CPU is currently used for running the BIOS POST (Bootstrap CPU).

Bootstrap CPU Selection

Controls which CPU will be used for running the BIOS POST (Bootstrap CPU).

CPU1 CPU 1 will be used as bootstrap CPU unless CPU 1 is disabled, failed or not available.

CPU2 CPU 2 will be used as bootstrap CPU unless CPU 2 is disabled, failed, or not available.

Automatic

Bootstrap CPU will be automatically selected.

7.2 Memory Status

In this submenu the memory modules can be marked as faulty. Faulty memory modules are no longer used when the system is rebooted if at least one error-free bank is available. The memory capacity is reduced accordingly.

DIMM #

Shows the current status of the memory modules.

Failed

The system does not use the memory module. It was disabled automatically by the system after a memory error. If you have replaced a defective memory module, you must set the entry to *Enabled* again.

Disabled

The system does not use the memory module. It was manually disabled.

Enabled

The system uses the memory module.

Empty

There is no memory module populated.

7.3 PCI Status

This submenu shows the current status of the expansion card in the slots.

Slot #

Shows the current status of the expansion card in this slot.

Failed

An error was detected for this slot. The expansion card in this slot may have a problem.

Enabled

No errors were reported for this slot. The expansion card in this slot can be used without restriction.

Empty

There is no expansion card in this slot.

7.4 Console Redirection (CR)

The following parameters can be set in this submenu. Some of them are only available under special preconditions.

Com Port Address

Specifies the interface used for communication with the terminal.

Disabled

The terminal interface is disabled.

COM A

The terminal uses the first serial interface.

COM B

The terminal uses the second serial interface.

Baud Rate

Specifies the transfer rate for communication with the terminal. This setting must be identical on both terminal and server.

Allowed values are:
300, 1200, 2400, *9600*, *19.2 k, 38.4 K, 57.6 K, 115.2 K*

The data is transferred to the terminal at the rate set.

Console Type

Shows the assigned console type.
This setting must be identical on both terminal and server.

Allowed values are:
VT 100, VT100 8bit, PC-ANSI, 7bit, PC ANSI, *VT100+*, *VT-UTF8, ASCII*

The assigned console is used to transfer the data to the terminal.

Flow Control

This setting determines how the transfer via the interface is controlled. This setting must be identical on both terminal and server.

None The interface is operated without transfer control.

XON/XOFF

The interface transfer control is performed by the software.

CTS/RTS

The transfer control is performed by the hardware. This mode must also be supported by the cable.

Continue C.R. after POST

Specifies whether or not the *Console Redirection* function is executed after the BIOS POST (Power-On-Self-Test).

Off The *Console Redirection* does not continue to run after the POST.

On The *Console Redirection* continues to run after the POST.

7.5 IPMI

The following parameters can be set in this submenu. Some of them are only available under special preconditions.

SM Error Halt

Configures the system behavior during the self-test if a system monitoring error is reported by the iRMC (e. g. fan monitoring, temperature monitoring). This setting is only effective if the *POST Errors* parameter has been enabled in the *Boot Features* menu.

Disabled

The system start-up is not stopped when the iRMC reports an error to the BIOS. The error is only displayed.

Enabled

If the iRMC reports an error to the BIOS, the system start-up is stopped after the self-test.

iRMC Time Sync

Specifies whether the internal iRMC time is synchronized with the system time during each system start-up. The system clock and the clock in the iRMC work independently of each other. This makes it necessary to synchronize the times on a regular basis. Furthermore, the clock must be synchronized again on leap days and when changing over to/from summer time. The *ServerView* program normally performs this task.

Disabled

The system time and the internal iRMC time are not synchronized during the system start-up (exception: The iRMC clock reports an invalid time).

Enabled

The iRMC accepts the system time during each system start-up.

Load iRMC Default Values

Specifies whether the iRMC default values are loaded or not.

No No action is taken.

Yes The iRMC default values are loaded when you choose *Save Changes & Exit* to exit the BIOS setup. Any BIOS setup settings that affect the iRMC are not lost by this setting. They are sent to the iRMC after the iRMC default values are loaded and therefore overwrite the corresponding values again.

The setting is automatically set to *No* after the default values are loaded.

Clear System Event Log

Specifies whether the System Event Log is to be cleared during the next system start-up. All system events and errors are entered in this log.

Disabled

The System Event Log is not cleared.

Enabled

The System Event Log is cleared during the next system start-up. Afterwards this selection is automatically set to *Disabled* again.

Event Log Full Mode

Specifies whether or not the System Event Log can be overwritten.

Overwrite

If the System Event Log is full, additional events overwrite the oldest entries in the System Event Log. In this case, newer events are more important than older events.

Maintain

If the System Event Log is full, no further events are entered. The System Event Log file must be cleared first before additional events can be entered. In this case, older events are more important than newer events.

Date Format to show

Specifies the format in which the date is displayed for System Event Log entries.

MM DD YYYY

The date is displayed in the following format: month, day, and year.

DD MM YY

The date is displayed in the following format: day, month, and year.

YYYY MM DD
The date is displayed in the following format: year, month, and day.

Date Separator
Specifies the separator used to separate the individual date fields from each other.

. The date fields are separated by "."

/ The date fields are separated by "/".

System Event Log
Opens the System Event Log Browser. All events and errors are displayed that occurred in the system.

SEL Entry Number
Shows the number of the current SEL entry.

The - or + keys in the keypad are used to switch to the previous/next entry.

SEL Record ID
Shows the unique entry number.

SEL Record Type
Shows the entry type.

Timestamp
Shows the date and time when the current event occurred.

Generator Id
Shows the ID number of the instance that reported the entry.

SEL Message Rev
Shows the version number of the IPMI specification in which the current event is defined.

Sensor Type
Shows the sensor type that triggered the current event.

Sensor Number
Shows the sensor that triggered the current event.

SEL Event Type
Shows the current event type.

Event Description
Shows the current event in plain text. The data from *SEL Event Data* is evaluated for this purpose.

SEL Event Data

Shows the data for the current event as a numeric code.

System Event Log (list mode)

Opens the System Event Log viewer in list mode. In this mode, the entries are shown in abbreviated form. Therefore, up to 6 entries can be viewed at once.

Use the PageUp key or the PageDown key to view the additional entries.

Realtime Sensor Data

Calls a submenu in which a selection of system sensors is shown.

Use the PageUp key or the PageDown key to view the additional entries.

LAN Settings

Calls a submenu, where you can make the following LAN settings for iRMC.

Management LAN

Enables the LAN interface, which can be used by the iRMC.

Disabled

The iRMC LAN interface is disabled.

Enabled

The iRMC LAN interface is enabled.

Management LAN Port

Specifies which LAN interface can be used by the iRMC. The iRMC and the onboard LAN can share the LAN interface or the iRMC can use a separate LAN interface. The Management LAN interface is indicated by the a screw-wrench icon.

Management

The iRMC uses a separate LAN interface.

Shared

The iRMC and the onboard LAN share the LAN interface.

DHCP

Specifies whether DHCP (Dynamic Host Configuration Protocol) support for the iRMC is enabled or disabled. An IP address can automatically be assigned to iRMC from a DHCP server in the network via the DHCP network protocol.

Disabled

The DHCP support for the iRMC is disabled. *Local IP Address*, *Subnet Mask*, and *Gateway Address* have to be entered manually.

Enabled

The DHCP support for the iRMC is enabled. *Local IP Address*, *Subnet Mask,* and *Gateway Address* will be requested from the DHCP server.

Local IP Address

Specifies IP address of the iRMC.
Numeric values from 0 to 255 are possible.

Subnet Mask

Specifies the subnet mask of the iRMC. Uses the same subnet mask as in the operating system.
Numeric values from 0 to 255 are possible.

Gateway Address

Specifies the gateway address of the iRMC.
Numeric values from 0 to 255 are possible.

IPMI Status

Opens a window in which the current IPMI state is displayed.

IPMI Specification Version

Provides information about the version of the IPMI specification the system implements.

iRMC Hardware/Firmware Version

Provides technical version information about the iRMC hardware and firmware.

iRMC Firmware Version

Provides additional version information about the iRMC firmware.

SDRR Version

Provides technical version information about the format of sensor data.

SEL Load

Provides information about the space of the System Event Log which is already used for log entries.

Existing Event Log Number

Holds the number of the last System Event Log entry.

Remaining Event Log Number

Displays the number of free System Event Log entries.

8 Boot menu

The following parameters can be set in this menu.

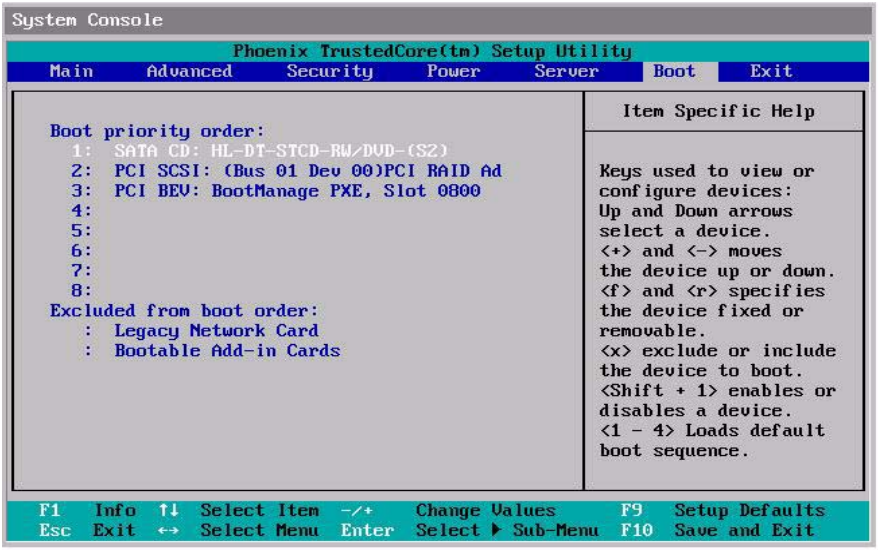

Figure 7: Example: Screenshot for the "Boot" menu

This menu can be used to define the sequence of the drives from which the system is booted. Up to eight drives (and also, for example, USB interfaces) can be listed.

For references to the operation please see the help area in this menu.

Boot priority order

Displays the current boot order.

- Press the cursor keys [↑] or [↓] to select the device for which you want to change the boot order.
- Press the [+] key to increase the priority and the [-] key to decrease the priority for the selected device.
- Press the [x] key to remove the selected device from the boot order. The device removed from the boot order will be added to the *Excluded from boot order* list.

► Select between the four different standard boot order settings by pressing the keys [1] to [4].

Excluded from boot order

Shows which devices are excluded from the boot order. Devices listed here cannot be used as boot devices.

► Press the cursor keys [↑] or [↓] to select the device.

► Press the [x] key to reinsert the device as the last entry in the *Boot priority* o*rder* list.

9 Exit menu

The following parameters can be set in this menu.

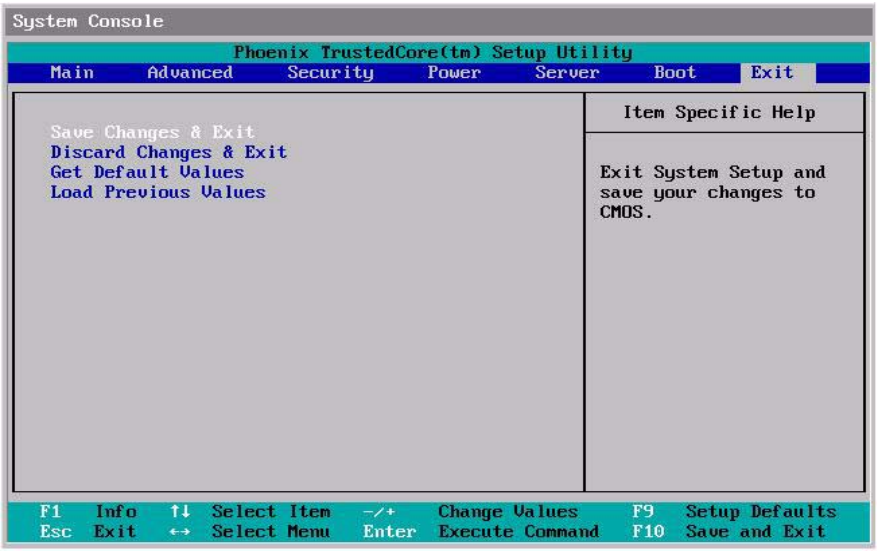

Figure 8: Example: Screenshot for the "Exit" menu

Save Changes & Exit

To save the current menu entries and exit the BIOS setup, select *Save Changes & Exit* and *Yes*.

The system will be rebooted and the new settings will be effective.

Discard Changes & Exit

To discard the changes you have made, select *Discard Changes & Exit* and *Yes.*

The settings that were in use when the BIOS setup was opened will remain effective. BIOS setup will be closed and the system rebooted.

i On some systems a reset is initiated.

Get Default Values

To reset all BIOS setup menus to use default values, select *Get Default Values* and *Yes.*

To exit the BIOS setup with these settings, select *Save Changes & Exit* and *Yes*.

Load Previous Values

To load the values for all menus that were active when BIOS setup was started, select *Load Previous Values* and *Yes*.

To exit the BIOS setup with these settings, select *Save Changes & Exit* and *Yes*.

10 Flash BIOS Update

To perform a Flash BIOS update you must first download the necessary files from the internet.

You can download the files from *www.ts.fujitsu.com.* Choose your language by *Select country/region* and proceed with *Download drivers/manuals*.

You need a diskette or a USB stick on which the BIOS update files will be stored. This diskette or USB stick is then called the Flash BIOS media. The data on this media will be fully erased and overwritten.

CAUTION!

The BIOS is stored in a flash memory device. If an error occurs during the Flash BIOS update procedure, the BIOS image in the flash memory may be destroyed. You can then only restore the BIOS using the *Flash Memory Recovery Mode*, see page 60. If this is also not possible, the flash memory device has to be replaced. Contact your customer support *Help Desk*.

- Preventively note down the settings in the BIOS setup.

  A Flash BIOS update does not normally affect the settings in the BIOS setup.

- Boot the system with the inserted Flash BIOS floppy media.

- Proceed with:
  Y + Enter

- The *BIOFLASH.EXE* utility first reads in the BIOS update files.

  Once the flash memory type has automatically been recognized, programming begins. The previous BIOS revision will be deleted and overwritten with the contents of the BIOS update file.

  During programming, the progress is displayed on the screen. When the Flash BIOS update is completed, a corresponding message will also be displayed.

- Switch-off the system and remove the Flash BIOS media.
  The next time the system is switched-on, it will be booted with the new BIOS revision.

- Check the settings in the BIOS setup utility. If necessary, reconfigure the settings again.

CAUTION!

The system must not be switched off or reset while programming is still in progress.

- Do not press the RESET button or the key combination Ctrl + Alt + Del during this operation.
- Do not switch off the computer or disconnect the power plug.

These actions would interrupt the Flash BIOS update and destroy the BIOS image.

Error message after a Flash BIOS update

```
Patch for installed CPU not loaded. Please run the BIOS flash
update diskette.
```

If this error message is displayed at the next system boot, the microcode update for the populated processor(s) must still be loaded.

- Boot the system from the inserted Flash BIOS media.
- Abort the normal Flash BIOS update by answering the question about whether you want to perform the update with:
  n + Enter
- To perform the microcode update, enter:
  `bioflash /p6` + Enter.

10.1 Flash Memory Recovery Mode

CAUTION!

The BIOS is stored in a flash memory device. If an error occurs during the Flash BIOS update procedure, the BIOS image in the flash memory may be destroyed. You can then only restore the BIOS using the *Flash Memory Recovery Mode*. If this is also not possible, the flash memory device has to be replaced. Contact your customer support *Help Desk*.

- Switch-off the system and disconnect the power plug.
- Open the chassis and switch-on "Recovery" (RCV) using the DIP switch on the system board.

Normally no screen outputs are available in recovery mode.

On some systems you may also switch-on the "PWD Skip" (SKP) DIP switch on the system board to watch the update progress on screen (refer to the technical manual for the system board).

- ► Reconnect the power plug and switch-on the system.
- ► Boot the system from the inserted Flash BIOS media.
- ► Observe the signals issued from the loudspeaker. You have successfully restored the system if you can hear the signal sequence "short-short-long-long" and the media access indicator is off. The recovery update may take several minutes.
- ► Switch-off the system and disconnect the power plug.
- ► Remove the Flash BIOS media.
- ► Return all DIP switches which have been changed to the initial position.
- ► Reconnect the power plug and switch-on the system.
  The system will be booted with the new BIOS revision.
- ► Check the settings in the BIOS setup utility. If necessary, reconfigure the settings again.

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