Managing the Server

This chapter includes the following sections:

Toggling the Locator LED

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters chassis command mode.
Step 2	Server /chassis # **set locator-led** {**on** | **off**}	Enables or disables the chassis locator LED.
Step 3	Server /chassis # **commit**	Commits the transaction to the system configuration.

This example disables the chassis locator LED and commits the transaction:

```
Server# scope chassis
Server /chassis # set locator-led off
Server /chassis *# commit
```

```
Server /chassis #
```

Configuring the Server Boot Order

Note Do not change the boot order while the host is performing BIOS power-on self test (POST).

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope bios**	Enters bios command mode.
Step 2	Server /bios # **set boot-order** *device1*[,*device2*[,*device3*[,*device4*[,*device5*]]]]	Specifies the boot device options and order. You can select one or more of the following: • cdrom—Bootable CD-ROM • fdd—Floppy disk drive • hdd—Hard disk drive • pxe—PXE boot • efi—Extensible Firmware Interface
Step 3	Server /bios # **commit**	Commits the transaction to the system configuration.

The new boot order will be used on the next BIOS boot.

This example sets the boot order and commits the transaction:

```
Server# scope bios
Server /bios # set boot-order hdd,cdrom,fdd,pxe,efi
Server /bios *# commit
Server /bios #  show detail
BIOS:
    Boot Order: HDD,CDROM,FDD,PXE,EFI

Server /bios #
```

Resetting the Server

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters chassis command mode.
Step 2	Server /chassis # **power hard-reset**	After a prompt to confirm, resets the server.

This example resets the server:

```
Server# scope chassis
Server /chassis # power hard-reset
This operation will change the server's power state.
Continue?[y|N]
```

Shutting Down the Server

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters chassis mode.
Step 2	Server /chassis # **power shutdown**	Shuts down the server.

The following example shuts down the server:

```
Server# scope chassis
Server /chassis # power shutdown
```

Managing Server Power

Powering On the Server

Note If the server was powered off other than through the CIMC, the server will not become active immediately when powered on. In this case, the server will enter standby mode until the CIMC completes initialization.

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters chassis command mode.
Step 2	Server /chassis # **power on**	Turns on the server.

This example turns on the server:

```
Server# scope chassis
Server /chassis # power on
This operation will change the server's power state.
Continue?[y|N]y

Server /chassis # show
Power Serial Number Product Name  UUID
----- ------------- ------------- ------------------------------------
on    Not Specified Not Specified 208F0100020F000000BEA80000DEAD00
```

Powering Off the Server

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters chassis command mode.
Step 2	Server /chassis # **power off**	Turns off the server.

This example turns off the server:

```
Server# scope chassis
Server /chassis # power off
This operation will change the server's power state.
Continue?[y|N]y

Server /chassis # show
Power Serial Number Product Name  UUID
----- ------------- ------------- ------------------------------------
off   Not Specified Not Specified 208F0100020F000000BEA80000DEAD00
```

Power Cycling the Server

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters chassis command mode.
Step 2	Server /chassis # **power cycle**	Power cycles the server.

This example power cycles the server:

```
Server# scope chassis
Server /chassis # power cycle
```

Configuring Power Policies

Viewing the Power Statistics

Procedure

	Command or Action	Purpose
Step 1	Server# **show power-cap [detail]**	Displays the server power consumption statistics and the power cap policy.

The displayed fields are described in the following table:

Name	Description
Current Consumption	The power currently being used by the server, in watts.
Maximum Consumption	The maximum number of watts consumed by the server since the last time it was rebooted.
Minimum Consumption	The minimum number of watts consumed by the server since the last time it was rebooted.
Minimum Configurable Limit	The minimum amount of power that can be specified as the peak power cap for this server, in watts.
Maximum Configurable Limit	The maximum amount of power that can be specified as the peak power cap for this server, in watts.

Additional fields are described in the following table:

Name	Description
Enable Power Capping	If power capping is enabled, the system monitors how much power is allocated to the server and takes the specified action if the server goes over its maximum allotment.
Peak Power	The maximum number of watts that can be allocated to this server. If the server requests more power than specified in this field, the system takes the action defined in the **Non-Compliance Action** field. Enter a number of watts within the range defined by the **Minimum Configurable Limit** field and the **Maximum Configurable Limit** field.
Non-Compliance Action	The action the system should take if power capping is enabled and the server requests more than its peak power allotment. This can be one of the following: • **force-power-reduction**—The server is forced to reduce its power consumption by any means necessary. This option is available only on some C-Series servers. • **none**—No action is taken and the server is allowed to use more power than specified in the **Peak Power** field. • **power-off-host**—The server is shut down. • **throttle**—Processes running on the server are throttled to bring the total power consumption down.

This example displays the detailed power statistics:

```
Server# show power-cap detail
    Cur Consumption (W): 247
    Max Consumption (W): 286
    Min Consumption (W): 229
    Minimum Configurable Limit (W): 285
    Maximum Configurable Limit (W): 1250
    Power Cap Enabled: yes
    Peak Power: 0
    Non Compliance Action: throttle

Server#
```

Power Capping Policy

The power capping policy determines how server power consumption is actively managed. When power capping is enabled, the system monitors how much power is allocated to the server and attempts to keep the power consumption below the allocated power. If the server exceeds its maximum allotment, the power capping policy triggers the specified non-compliance action.

Configuring the Power Cap Policy

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope power-cap**	Enters the power cap command mode.
Step 2	Server /power-cap # **set enabled** {**yes** | **no**}	Enables or disables the capping of power to the server.
Step 3	Server /power-cap # **set peak-power** *watts*	Specifies the maximum number of watts that can be allocated to this server. Enter a number of *watts* within the range defined by the **Minimum Configurable Limit** field and the **Maximum Configurable Limit** field of the **show power-cap detail** command output. These fields are determined by the server model. If the server requests more power than specified in this command, the system takes the action defined by the **set non-compliance-action** command.
Step 4	Server /power-cap # **set non-compliance-action** {**force-power-reduction** | **none** | **power-off-host** | **throttle**}	Specifies the action the system should take if power capping is enabled and the server requests more than its peak power allotment. This can be one of the following: • **force-power-reduction**—The server is forced to reduce its power consumption by any means necessary. This option is not available on some server models. • **none**—No action is taken and the server is allowed to use more power than specified in the peak power setting. • **power-off-host**—The server is shut down. • **throttle**—Processes running on the server are throttled to bring the total power consumption down.
Step 5	Server /power-cap # **commit**	Commits the transaction to the system configuration.

This example enables and configures a power cap policy and commits the transaction:

```
Server# scope power-cap
Server /power-cap # set enabled yes
Server /power-cap *# set peak-power 1000
Server /power-cap *# set non-compliance-action throttle
Server /power-cap *# commit
Server /power-cap #  show detail
    Cur Consumption (W): 688
    Max Consumption (W): 1620
    Min Consumption (W): 48
    Minimum Configurable Limit (W): 500
    Maximum Configurable Limit (W): 2000
    Power Cap Enabled: yes
```

```
    Peak Power: 1000
    Non Compliance Action: throttle

Server /power-cap #
```

Configuring the Power Restore Policy

The power restore policy determines how power is restored to the server after a chassis power loss.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **set policy** {**power-off** | **power-on** | **restore-last-state**}	Specifies the action to be taken when chassis power is restored. Select one of the following: • **power-off**—Server power will remain off until manually turned on. This is the default action. • **power-on**—Server power will be turned on when chassis power is restored. • **restore-last-state**—Server power will return to the state before chassis power was lost. When the selected action is **power-on**, you can select a delay in the restoration of power to the server.
Step 3	Server /chassis # **set delay** {**fixed** | **random**}	(Optional) Specifies whether server power will be restored after a fixed or random time. The default is **fixed**. This command is accepted only if the power restore action is **power-on**.
Step 4	Server /chassis # **set delay-value** *delay*	(Optional) Specifies the delay time in seconds. The range is 0 to 240; the default is 0.
Step 5	Server /chassis # **commit**	Commits the transaction to the system configuration.

This example sets the power restore policy to power-on with a fixed delay of 180 seconds (3 minutes) and commits the transaction:

```
Server# scope chassis
Server /chassis # set policy power-on
Server /chassis *# set delay fixed
Server /chassis *# set delay-value 180
Server /chassis *# commit
Server /chassis #  show detail
Chassis:
    Power: on
    Serial Number: QCI1404A1IT
    Product Name: UCS C200 M1
```

```
    PID : R200-1120402
    UUID: 01A6E738-D8FE-DE11-76AE-8843E138AE04
    Locator LED: off
    Description: Testing power restore
    Power Restore Policy: power-on
    Power Delay Type: fixed
    Power Delay Value(sec): 180

Server /chassis #
```

Managing the Flexible Flash Controller

Cisco Flexible Flash

Some C-Series Rack-Mount Servers support an internal Secure Digital (SD) memory card for storage of server software tools and utilities. The SD card is hosted by the Cisco Flexible Flash storage adapter.

The SD storage is available to CIMC as four virtual USB drives. Three are preloaded with Cisco software and the fourth can hold a user-installed hypervisor or other content. The four virtual drives are as follows:

- Cisco UCS Server Configuration Utility (bootable)
- User-installed (may be bootable)
- Cisco drivers (not bootable)
- Cisco Host Upgrade Utility (bootable)

For information about the Cisco software utilities and packages, see the *Cisco UCS C-Series Servers Documentation Roadmap* at this URL:

http://www.cisco.com/go/unifiedcomputing/c-series-doc

Configuring the Flexible Flash Controller Properties

Before You Begin

- You must log in with admin privileges to perform this task.
- Cisco Flexible Flash must be supported by your platform.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **scope flexflash** *index*	Enters the Cisco Flexible Flash controller command mode for the specified controller. At this time, the only permissible *index* value is **FlexFlash-0**.
Step 3	Server /chassis/flexflash # **scope operational-profile**	Enters the operational profile command mode.

	Command or Action	Purpose
Step 4	Server /chassis/flexflash/operational-profile # **set error-count-threshold**	Specifies the number of read/write errors that are permitted while accessing the Cisco Flexible Flash card. If the number of errors exceeds this threshold, the Cisco Flexible Flash card is disabled and you must reset it manually before CIMC attempts to access it again. To specify a read/write error threshold, enter an integer between 1 and 255. To specify that the card should never be disabled regardless of the number of errors encountered, enter 0 (zero).
Step 5	Server /chassis/flexflash/operational-profile # **set raid-primary-member** {**slot1** | **slot2**}	The slot in which the primary copy of the data resides. **Important** Currently, Cisco Flexible Flash cards are supported only in slot 1. Therefore, this field must be set to **slot1**.
Step 6	Server /chassis/flexflash/operational-profile # **set virtual-drives-enabled** *list*	Specifies a list of virtual drives to be made available to the server as a USB-style drive. The options are as follows: • **SCU**—The server can access the Cisco UCS Server Configuration Utility. • **DRIVERS**—The server can access the Cisco drivers volume. • **HV**—The server can access a user-installed hypervisor. • **HUU**—The server can access the Cisco Host Upgrade Utility. When specifying more than one option, you must enclose the list in quotation marks ('').
Step 7	Server /chassis/adapter # **commit**	Commits the transaction to the system configuration.

This example configures the properties of the flash controller:

```
Server# scope chassis
Server /chassis # scope flexflash FlexFlash-0
Server /chassis/flexflash # scope operational-profile
Server /chassis/flexflash/operational-profile # set error-count-threshold 100
Server /chassis/flexflash/operational-profile *# set raid-primary-member slot1
Server /chassis/flexflash/operational-profile *# set virtual-drives-enabled "SCU HUU"
Server /chassis/flexflash/operational-profile *# commit
Server /chassis/flexflash/operational-profile #
```

Booting from the Flexible Flash

You can specify a bootable virtual drive on the Cisco Flexible Flash card that will override the default boot priority the next time the server is restarted, regardless of the default boot order defined for the server. The specified boot device is used only once. After the server has rebooted, this setting is ignored.

Note Before you reboot the server, ensure that the virtual drive you select is enabled on the Cisco Flexible Flash card.

Before You Begin

- You must log in with admin privileges to perform this task.
- Cisco Flexible Flash must be supported by your platform.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope bios**	Enters the BIOS command mode.
Step 2	Server /bios # **set boot-override** {**None** | **SCU** | **HV** | **HUU**}	The virtual drive from which the server attempts to boot the next time it is restarted. This can be one of the following: • **None**—The server uses the default boot order • **SCU**—The server boots from the Cisco UCS Server Configuration Utility • **HV**—The server boots from the hypervisor virtual drive • **HUU**—The server boots from the Cisco Host Upgrade Utility
Step 3	Server /bios # **commit**	Commits the transaction to the system configuration.

This example specifies that the server boots from the Cisco UCS Server Configuration Utility the next time it is restarted:

```
Server# scope bios
Server /bios # set boot-override SCU
Committing the boot override BIOS will try boot to
the specified boot device first. Failure to detect
the boot device BIOS will boot from the list
configured in the BIOS boot order.
Server /bios *# commit
Server /bios #
```

Resetting the Flexible Flash Controller

In normal operation, it should not be necessary to reset the Cisco Flexible Flash. We recommend that you perform this procedure only when explicitly directed to do so by a technical support representative.

Note This operation will disrupt traffic to the virtual drives on the Cisco Flexible Flash controller.

Before You Begin

- You must log in with admin privileges to perform this task.
- Cisco Flexible Flash must be supported by your platform.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **scope flexflash** *index*	Enters the Cisco Flexible Flash controller command mode for the specified controller. At this time, the only permissible *index* value is **FlexFlash-0**.
Step 3	Server /chassis/flexflash # **reset**	Resets the Cisco Flexible Flash controller.

This example resets the flash controller:

```
Server# scope chassis
Server /chassis # scope flexflash FlexFlash-0
Server /chassis/flexflash # reset
This operation will reset Cisco Flexible Flash controller.
Host traffic to VDs on this device will be disrupted.
Continue?[y|N] y

Server /chassis/flexflash #
```

Configuring BIOS Settings

Viewing BIOS Status

Procedure

	Command or Action	Purpose
Step 1	Server# **scope bios**	Enters the BIOS command mode.
Step 2	Server /bios # **show detail**	Displays details of the BIOS status.

The BIOS status information contains the following fields:

Name	Description
BIOS Version	The version string of the running BIOS.
Boot Order	The order of bootable target types that the server will attempt to use.
Boot Override Priority	This can be None, SCU, HV, or HUU.

Name	Description
FW Update/Recovery Status	The status of any pending firmware update or recovery action.
FW Update/Recovery Progress	The percentage of completion of the most recent firmware update or recovery action.

This example displays the BIOS status:

```
Server# scope bios
Server /bios # show detail
    BIOS Version: "C460M1.1.2.2a.0 (Build Date: 01/12/2011)"
    Boot Order: EFI,CDROM,HDD
    Boot Override Priority:
    FW Update/Recovery Status: NONE
    FW Update/Recovery Progress: 100

Server /bios #
```

Configuring Main BIOS Settings

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope bios**	Enters the BIOS command mode.
Step 2	Server /bios # **scope main**	Enters the main BIOS settings command mode.
Step 3	Configure the BIOS settings.	For the CLI commands, descriptions and information about the options for each BIOS setting, see the following topic: • Main BIOS Settings, on page 16
Step 4	Server /bios/main # **commit**	Commits the transaction to the system configuration. Changes are applied on the next server reboot. If server power is on, you are prompted to choose whether to reboot now.

This example configures the BIOS to pause the boot upon a critical POST error and commits the transaction:

```
Server# scope bios
Server /bios # scope main
Server /bios/main # set POSTErrorPause Enabled
Server /bios/main *# commit
Changes to BIOS set-up parameters will require a reboot.
Do you want to reboot the system?[y|N] n
Changes will be applied on next reboot.
Server /bios/main #
```

Configuring Advanced BIOS Settings

Note Depending on your installed hardware, some configuration options described in this topic may not appear.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope bios**	Enters the BIOS command mode.
Step 2	Server /bios # **scope advanced**	Enters the advanced BIOS settings command mode.
Step 3	Configure the BIOS settings.	For the CLI commands, descriptions and information about the options for each BIOS setting, see the following topics: • Advanced: Processor BIOS Settings, on page 16 • Advanced: Memory BIOS Settings, on page 22 • Advanced: Mass Storage Controller BIOS Settings, on page 24 • Advanced: Serial Port BIOS Settings, on page 24 • Advanced: USB BIOS Settings, on page 25 • Advanced: PCI BIOS Settings, on page 25
Step 4	Server /bios/advanced # **commit**	Commits the transaction to the system configuration. Changes are applied on the next server reboot. If server power is on, you are prompted to choose whether to reboot now.

This example enables low voltage DDR memory mode and commits the transaction:

```
Server# scope bios
Server /bios # scope advanced
Server /bios/advanced # set LvDDRMode Enabled
Server /bios/advanced *# commit
Changes to BIOS set-up parameters will require a reboot.
Do you want to reboot the system?[y|N] n
Changes will be applied on next reboot.
Server /bios/advanced #
```

Configuring Server Management BIOS Settings

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope bios**	Enters the BIOS command mode.
Step 2	Server /bios # **scope server-management**	Enters the server management BIOS settings command mode.
Step 3	Configure the BIOS settings.	For the CLI commands, descriptions and information about the options for each BIOS setting, see the following topic: • Server Management BIOS Settings, on page 27
Step 4	Server /bios/server-management # **commit**	Commits the transaction to the system configuration. Changes are applied on the next server reboot. If server power is on, you are prompted to choose whether to reboot now.

This example enables automatic detection of the BMC and commits the transaction:

```
Server# scope bios
Server /bios # scope server-management
Server /bios/server-management # set BMCPnP Enabled
Server /bios/server-management *# commit
Changes to BIOS set-up parameters will require a reboot.
Do you want to reboot the system?[y|N] n
Changes will be applied on next reboot.
Server /bios/server-management #
```

Restoring BIOS Defaults

Before You Begin

You must log in as a user with admin privileges to perform this task.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope bios**	Enters the BIOS command mode.
Step 2	Server /bios # **bios-setup-default**	Restores BIOS default settings. This command initiates a reboot.

This example restores BIOS default settings:

```
Server# scope bios
Server /bios # bios-setup-default
This operation will reset the BIOS set-up tokens to factory defaults.
All your configuration will be lost.
Changes to BIOS set-up parameters will initiate a reboot.
Continue?[y|N]y
```

Server BIOS Settings

The tables in the following sections list the server BIOS settings that you can view and configure.

For each setting, the CLI **set** command appears below the setting name in the table, and the command options are listed in the setting description. To view the default for each setting, type the **set** command followed by a question mark. In the displayed option keywords, the default option is marked with an asterisk. In this example, the default option is **Disabled**:

```
Server /bios/main # set BootOptionRetry ?
  <VALUE>  Disabled* | Enabled
```

Note We recommend that you verify the support for BIOS settings in your server. Depending on your installed hardware, some settings may not be supported.

Main BIOS Settings

Name	Description
POST Error Pause **set POSTErrorPause**	What happens when the server encounters a critical error during POST. This can be one of the following: • **Enabled**—The BIOS pauses the attempt to boot the server and opens the Error Manager when a critical error occurs during POST. • **Disabled**—The BIOS continues to attempt to boot the server.
USB Boot Priority **set USBBootPriority**	Whether the BIOS tries to boot from any available USB device before it tries to boot from the server hard drive. This can be one of the following: • **Enabled**—The server attempts to boot from a USB device if one is available. In addition, when a USB device is discovered, it is put at the top of its boot category. • **Disabled**—The server attempts to boot from the server hard drive before it tries USB devices. In addition, when a USB device is discovered, it is put at the bottom of its boot category.

Advanced: Processor BIOS Settings

Name	Description
Intel Turbo Boost Technology **set IntelTurboBoostTech**	Whether the processor uses Intel Turbo Boost Technology, which allows the processor to automatically increase its frequency if it is running below power, temperature, or voltage specifications. This can be one of the following: • **Disabled**—The processor does not increase its frequency automatically.

Name	Description
	• **Enabled**—The processor utilizes Turbo Boost Technology if required.
Enhanced Intel Speedstep Technology **set EnhancedIntelSpeedStep**	Whether the processor uses Enhanced Intel SpeedStep Technology, which allows the system to dynamically adjust processor voltage and core frequency. This technology can result in decreased average power consumption and decreased average heat production. This can be one of the following: • **Disabled**—The processor never dynamically adjusts its voltage or frequency. • **Enabled**—The processor utilizes Enhanced Intel SpeedStep Technology and enables all supported processor sleep states to further conserve power. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Intel Hyper-Threading Technology **set IntelHyperThread**	Whether the processor uses Intel Hyper-Threading Technology, which allows multithreaded software applications to execute threads in parallel within each processor. This can be one of the following: • **Disabled**—The processor does not permit hyperthreading. • **Enabled**—The processor allows for the parallel execution of multiple threads. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Number of Enabled Cores **set CoreMultiProcessing**	Sets the state of logical processor cores in a package. If you disable this setting, Hyper Threading is also disabled. This can be one of the following: • **All**—Enables multi processing on all logical processor cores. • **1** through *n*—Specifies the number of logical processor cores that can run on the server. To disable multi processing and have only one logical processor core running on the server, select 1. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Execute Disable **set ExecuteDisable**	Classifies memory areas on the server to specify where application code can execute. As a result of this classification, the processor disables code execution if a malicious worm attempts to insert code in the buffer. This setting helps to prevent

Name	Description
	damage, worm propagation, and certain classes of malicious buffer overflow attacks. This can be one of the following: • **Disabled**—The processor does not classify memory areas. • **Enabled**—The processor classifies memory areas. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Intel Virtualization Technology **set IntelVT**	Whether the processor uses Intel Virtualization Technology (VT), which allows a platform to run multiple operating systems and applications in independent partitions. This can be one of the following: • **Disabled**—The processor does not permit virtualization. • **Enabled**—The processor allows multiple operating systems in independent partitions. **Note** If you change this option, you must power cycle the server before the setting takes effect.
Intel VT for Directed IO **set IntelVTD**	Whether the processor uses Intel Virtualization Technology for Directed I/O (VT-d). This can be one of the following: • **Disabled**—The processor does not use virtualization technology. • **Enabled**—The processor uses virtualization technology.
Intel VT-d Interrupt Remapping **set InterruptRemap**	Whether the processor supports Intel VT-d Interrupt Remapping. This can be one of the following: • **Disabled**—The processor does not support remapping. • **Enabled**—The processor uses VT-d Interrupt Remapping as required.
Intel VT-d Coherency Support **set CoherencySupport**	Whether the processor supports Intel VT-d Coherency. This can be one of the following: • **Disabled**—The processor does not support coherency. • **Enabled**—The processor uses VT-d Coherency as required.
Intel VT-d Address Translation Services **set ATS**	Whether the processor supports Intel VT-d Address Translation Services (ATS). This can be one of the following: • **Disabled**—The processor does not support ATS. • **Enabled**—The processor uses VT-d ATS as required.

Name	Description
Intel VT-d PassThrough DMA **set PassThroughDMA**	Whether the processor supports Intel VT-d Pass-through DMA. This can be one of the following: • **Disabled**—The processor does not support pass-through DMA. • **Enabled**—The processor uses VT-d Pass-through DMA as required.
Direct Cache Access **set DirectCacheAccess**	Allows processors to increase I/O performance by placing data from I/O devices directly into the processor cache. This setting helps to reduce cache misses. This can be one of the following: • **Disabled**—Data from I/O devices is not placed directly into the processor cache. • **Enabled**—Data from I/O devices is placed directly into the processor cache.
Processor C3 Report **set ProcessorC3Report**	Whether the processor sends the C3 report to the operating system. This can be one of the following: • **Disabled**—The processor does not send the C3 report. • **ACPI_C2**—The processor sends the C3 report using the ACPI C2 format. • **ACPI_C3**—The processor sends the C3 report using the ACPI C3 format.
Processor C6 Report **set ProcessorC6Report**	Whether the processor sends the C6 report to the operating system. This can be one of the following: • **Disabled**—The processor does not send the C6 report. • **Enabled**—The processor sends the C6 report.
Processor C7 Report **set ProcessorC7Report**	Whether the processor sends the C7 report to the operating system. This can be one of the following: • **Disabled**—The processor does not send the C7 report. • **Enabled**—The processor sends the C7 report.
CPU Performance **set CPUPerformance**	Sets the CPU performance profile for the server. The performance profile consists of the following options: • Data Reuse Optimization • DCU Streamer Prefetcher • DCU IP Prefetcher

Name	Description
	• Hardware Prefetcher • Adjacent Cache-Line Prefetch This can be one of the following: • **Enterprise**—Only the DCU IP Prefetcher is enabled. The rest of the options are disabled. • **High_Throughput**—All options are enabled. • **HPC**—Data Reuse Optimization is disabled and all other options are enabled. This setting is also known as high performance computing. • **Custom**—All performance profile options can be configured from the BIOS setup on the server. In addition, the Hardware Prefetcher and Adjacent Cache-Line Prefetch options can be configured in the fields below.
Hardware Prefetcher **set HardwarePrefetch**	Whether the processor allows the Intel hardware prefetcher to fetch streams of data and instruction from memory into the unified second-level cache when necessary. This can be one of the following: • **Disabled**—The hardware prefetcher is not used. • **Enabled**—The processor uses the hardware prefetcher when cache issues are detected. **Note** You must select **Custom** in the **CPU Performance** setting in order to specify this value. For any value other than **Custom**, this option is overridden by the setting in the selected CPU performance profile.
Adjacent Cache-Line Prefetch **set AdjacentCacheLinePrefetch**	Whether the processor uses the Intel Adjacent Cache-Line Prefetch mechanism to fetch data when necessary. This can be one of the following: • **Disabled**—The Adjacent Cache-Line Prefetch mechanism is not used. • **Enabled**— The Adjacent Cache-Line Prefetch mechanism is used when cache issues are detected. **Note** You must select **Custom** in the **CPU Performance** setting in order to specify this value. For any value other than **Custom**, this option is overridden by the setting in the selected CPU performance profile.
CPU C State **set ProcessorCcxEnable**	Whether the system can enter a power savings mode during idle periods. This can be one of the following:

Name	Description
	• **Disabled**—The system remains in high performance state even when idle. • **Enabled**—The system can reduce power to system components such as the DIMMs and CPUs. The amount of power reduction is specified by the **set PackageCStateLimit** command.
Package C State Limit **set PackageCStateLimit**	The amount of power available to the server components when they are idle. This can be one of the following: • **C0_state**—The server provides all server components with full power at all times. This option maintains the highest level of performance and requires the greatest amount of power. • **C1_state**—When the CPU is idle, the system slightly reduces the power consumption. This option requires less power than C0 and allows the server to return quickly to high performance mode. • **C3_state**—When the CPU is idle, the system reduces the power consumption further than with the C1 option. This requires less power than C1 or C0, but it takes the server slightly longer to return to high performance mode. • **C6_state**—When the CPU is idle, the system reduces the power consumption further than with the C3 option. This option saves more power than C0, C1, or C3, but there may be performance issues until the server returns to full power. • **C7_state**—When the CPU is idle, the server makes a minimal amount of power available to the components. This option saves the maximum amount of power but it also requires the longest time for the server to return to high performance mode. • **No_Limit**—The server may enter any available C state. **Note** This option is used only if **CPU C State** is enabled.
C1E **set ProcessorC1eEnable**	Whether the CPU transitions to its minimum frequency when entering the C1 state. This can be one of the following: • **Disabled**—The CPU continues to run at its maximum frequency in C1 state. • **Enabled**—The CPU transitions to its minimum frequency. This option saves the maximum amount of power in C1 state.

Name	Description
	Note This option is used only if **CPU C State** is enabled.

Advanced: Memory BIOS Settings

Name	Description
Select Memory RAS **set SelectMemoryRAS**	How the memory reliability, availability, and serviceability (RAS) is configured for the server. This can be one of the following: • **Maximum_Performance**—System performance is optimized. • **Mirroring**—System reliability is optimized by using half the system memory as backup. • **Sparing**—System reliability is enhanced with a degree of memory redundancy while making more memory available to the operating system than mirroring.
NUMA Optimized **set NUMAOptimize**	Whether the BIOS supports NUMA. This can be one of the following: • **Disabled**—The BIOS does not support NUMA. • **Enabled**—The BIOS includes the ACPI tables that are required for NUMA-aware operating systems. If you enable this option, the system must disable Inter-Socket Memory interleaving on some platforms.
Low Voltage DDR Mode **set LvDDRMode**	Whether the system prioritizes low voltage or high frequency memory operations. This can be one of the following: • **Power_Saving_Mode**—The system prioritizes low voltage memory operations over high frequency memory operations. This mode may lower memory frequency in order to keep the voltage low. • **Performance_Mode**—The system prioritizes high frequency operations over low voltage operations.
Sparing Mode **set SparingMode**	The sparing mode used by the CIMC. This can be one of the following: • **Rank_Sparing**—The spared memory is allocated at the rank level. • **DIMM Sparing**—The spared memory is allocated at the DIMM level.

Name	Description
	Note This option is used only if **set SelectMemoryRAS** is set to **Sparing**.
Mirroring Mode **set MirroringMode**	Mirroring is supported across Integrated Memory Controllers (IMCs) where one memory riser is mirrored with another. This can be one of the following: • **Intersocket**—Each IMC is mirrored across two sockets. • **Intrasocket**—One IMC is mirrored with another IMC in the same socket. **Note** This option is used only if **set SelectMemoryRAS** is set to **Mirroring**.
Patrol Scrub **set PatrolScrub**	Whether the system actively searches for, and corrects, single bit memory errors even in unused portions of the memory on the server. This can be one of the following: • **Disabled**—The system checks for memory ECC errors only when the CPU reads or writes a memory address. • **Enabled**—The system periodically reads and writes memory searching for ECC errors. If any errors are found, the system attempts to fix them. This option may correct single bit errors before they become multi-bit errors, but it may adversely affect performance when the patrol scrub is running.
Patrol Scrub Interval **set PatrolScrubDuration**	Controls the time interval between each patrol scrub memory access. A lower interval scrubs the memory more often but requires more memory bandwidth. Select a value between 5 and 23. The default value is 8. **Note** This option is used only if **Patrol Scrub** is set to **Enabled**.
CKE Low Policy **set CKELowPolicy**	Controls the DIMM power savings mode policy. This can be one of the following: • **Disabled**—DIMMs do not enter power saving mode. • **Slow**—DIMMs can enter power saving mode, but the requirements are higher. Therefore, DIMMs enter power saving mode less frequently. • **Fast**—DIMMs enter power saving mode as often as possible. • **Auto**—The BIOS controls when a DIMM enters power saving mode based on the DIMM configuration.

Advanced: Mass Storage Controller BIOS Settings

Name	Description
Onboard SATA Controller **set OnboardSATA**	Whether the processor uses its built-in SATA controller. This can be one of the following: • **Disabled**—The server does not use the onboard SATA controller. • **Enabled**—The processor uses the built-in SATA controller.
SATA Mode **set ConfigSATAMode**	The mode in which the SATA controller runs. This can be one of the following: • **AHCI**—The controller enables the Advanced Host Controller Interface (AHCI) and disables RAID. • **Compatibility**—The controller disables both AHCI and RAID and runs in IDE emulation mode. • **Enhanced**—The controller enables both AHCI and RAID. • **S/W RAID**—The controller enables RAID and disables the AHCI.

Advanced: Serial Port BIOS Settings

Name	Description
Serial A Enable **set Serial-PortA**	Whether serial port A is enabled or disabled. This can be one of the following: • **Disabled**—The serial port is disabled. • **Enabled**—The serial port is enabled.
Serial A Address **set SerialPortAAddress**	If serial port A is enabled, select the hex address that it should use. This can be one of the following: • **3F8** • **2F8** • **3E8** • **2E8**
Serial B Enable **set Serial-PortB**	Whether serial port B is enabled or disabled. This can be one of the following: • **Disabled**—The serial port is disabled. • **Enabled**—The serial port is enabled.

Name	Description
Serial B Address **set SerialPortBAddress**	If serial port B is enabled, select the hex address that it should use. This can be one of the following: • **3F8** • **2F8** • **3E8** • **2E8**

Advanced: USB BIOS Settings

Name	Description
USB Controller **set USBController**	Whether the processor uses its built-in USB controller. This can be one of the following: • **Disabled**—The server does not use the built-in USB controller. • **Enabled**—The processor uses the built-in USB controller.
Make Device Non-Bootable **set MakeUSBDeviceNonBootable**	Whether the server can boot from a USB device. This can be one of the following: • **Disabled**—The server can boot from a USB device. • **Enabled**—The server cannot boot from a USB device.
USB Performance Mode **set USBPerformanceMode**	Whether the server uses USB 2.0 or USB 1.1 mode. This can be one of the following: • **High_Performance**—The server enables the EHCI (USB 2.0) controllers so that all USB devices function in USB 2.0 mode. This option maximizes USB device performance but requires additional power. • **Lower_Idle_Power**—The server disables the EHCI (USB 2.0) controllers so that all USB devices function in USB 1.1 mode. This option requires less power but decreases USB device performance.

Advanced: PCI BIOS Settings

Name	Description
Memory Mapped I/O Above 4GB **set MemoryMappedIOAbove4GB**	Whether to enable or disable memory mapped I/O of 64-bit PCI devices to 4GB or greater address space. Legacy option ROMs are not able to access addresses above 4GB. PCI devices that are 64-bit compliant but use a legacy option ROM may not

Name	Description
	function correctly with this setting enabled. This can be one of the following: • **Disabled**—The server does not map I/O of 64-bit PCI devices to 4GB or greater address space. • **Enabled**—The server maps I/O of 64-bit PCI devices to 4GB or greater address space.
Onboard Gbit NIC 1 **set OnboardNic1**	Whether the first onboard Network Interface Card (NIC) is enabled or disabled on the server. This can be one of the following: • **Disabled**—NIC 1 is not available. • **Enabled**—NIC 1 is available.
Onboard Gbit NIC 2 **set OnboardNic2**	Whether the second onboard NIC is enabled or disabled on the server. This can be one of the following: • **Disabled**—NIC 2 is not available. • **Enabled**—NIC 2 is available.
Onboard Gbit NIC 1 ROM **set OnboardNic1ROM**	Whether the system loads the embedded PXE option ROM for the first onboard NIC. This can be one of the following: • **Disabled**—PXE option ROM is not available for NIC 1. • **Enabled**—PXE option ROM is available for NIC 1.
Onboard Gbit NIC 2 ROM **set OnboardNic2ROM**	Whether the system loads the embedded PXE option ROM for the second onboard NIC. This can be one of the following: • **Disabled**—PXE option ROM is not available for NIC 2. • **Enabled**—PXE option ROM is available for NIC 2.
Onboard Gbit NIC 3 ROM **set OnboardNic3ROM**	Whether the system loads the embedded PXE option ROM for the third onboard NIC. This can be one of the following: • **Disabled**—PXE option ROM is not available for NIC 3. • **Enabled**—PXE option ROM is available for NIC 3.
Onboard Gbit NIC 4 ROM **set OnboardNic4ROM**	Whether the system loads the embedded PXE option ROM for the fourth onboard NIC. This can be one of the following: • **Disabled**—PXE option ROM is not available for NIC 4. • **Enabled**—PXE option ROM is available for NIC 4.

Name	Description
PCIe Option ROMs **set Pci-Opt-Roms**	Whether the server can use the PCIe Option ROM expansion slots. This can be one of the following: • **Disabled**—PCIe Option ROMs are not available. • **Enabled**—PCIe Option ROMs are available.
PCIe Slot *n* ROM **set Slot*n*Disable**	Whether the PCIe expansion slot designated by ***n*** is available to the server. This can be one of the following: • **Disabled**—The expansion slot ***n*** is not available. • **Enabled**—The expansion slot ***n*** is available.
PCIe Mezzanine Slot ROM **set SlotMezzDisable**	Whether the PCIe mezzanine slot expansion ROM is available to the server. This can be one of the following: • **Disabled**—The mezzanine slot is not available. • **Enabled**—The mezzanine slot is available.
Active Video **set ActiveVideo**	How the server displays video. This can be one of the following: • **Auto**—The server uses an external graphics adapter for display if one is available. • **Onboard_Device**—The server always uses its internal graphics adapter even if an external graphics adapter is available.

Server Management BIOS Settings

Name	Description
set BootOptionRetry	Whether the BIOS retries NON-EFI based boot options without waiting for user input. This can be one of the following: • **Enabled**—Continually retries NON-EFI based boot options without waiting for user input. • **Disabled**—Waits for user input before retrying NON-EFI based boot options.
Assert NMI on SERR **set AssertNMIOnSERR**	Whether the BIOS generates a non-maskable interrupt (NMI) and logs an error when a system error (SERR) occurs. This can be one of the following: • **Disabled**—The BIOS does not generate an NMI or log an error when a SERR occurs.

Name	Description
	• **Enabled**—The BIOS generates an NMI and logs an error when a SERR occurs. You must enable this setting if you want to enable **Assert NMI on PERR**.
Assert NMI on PERR **set AssertNMIOnPERR**	Whether the BIOS generates a non-maskable interrupt (NMI) and logs an error when a processor bus parity error (PERR) occurs. This can be one of the following: • **Disabled**—The BIOS does not generate an NMI or log an error when a PERR occurs. • **Enabled**—The BIOS generates an NMI and logs an error when a PERR occurs. You must enable **Assert NMI on SERR** to use this setting.
FRB2 Enable **set FRB-2**	Whether the FRB2 timer is used by CIMC to recover the system if it hangs during POST. This can be one of the following: • **Disabled**—The FRB2 timer is not used. • **Enabled**—The FRB2 timer is started during POST and used to recover the system if necessary.
PlugNPlay BMC Detection **set BMCPnP**	Whether the system automatically detects the BMC in ACPI-compliant operating systems. This can be one of the following: • **Disabled**—The system never automatically detects the BMC. • **Enabled**—The system automatically detects the BMC whenever possible.
ACPI1.0 Support **set ACPI10Support**	Whether the BIOS publishes the ACPI 1.0 version of FADT in the Root System Description table. This version may be required for compatibility with OS versions that only support ACPI 1.0. This can be one of the following: • **Disabled**—ACPI 1.0 version is not published. • **Enabled**—ACPI 1.0 version is published.
Console Redirection **set ConsoleRedir**	Allows a serial port to be used for console redirection during POST and BIOS booting. After the BIOS has booted and the operating system is responsible for the server, console redirection is irrelevant and has no effect. This can be one of the following: • **Disabled**—No console redirection occurs during POST.

Name	Description
	• **Serial_Port_A**—Enables serial port A for console redirection during POST. This option is valid for blade servers and rack-mount servers. **Note** If you enable this option, you also disable the display of the Quiet Boot logo screen during POST.
Flow Control **set FlowCtrl**	Whether a handshake protocol is used for flow control. Request to Send / Clear to Send (RTS/CTS) helps to reduce frame collisions that can be introduced by a hidden terminal problem. This can be one of the following: • **None**—No flow control is used. • **RTS-CTS**—RTS/CTS is used for flow control. **Note** This setting must match the setting on the remote terminal application.
Baud Rate **set BaudRate**	What BAUD rate is used for the serial port transmission speed. If you disable Console Redirection, this option is not available. This can be one of the following: • **9.6k**—A 9600 BAUD rate is used. • **19.2k**—A 19200 BAUD rate is used. • **38.4k**—A 38400 BAUD rate is used. • **57.6k**—A 57600 BAUD rate is used. • **115.2k**—A 115200 BAUD rate is used. **Note** This setting must match the setting on the remote terminal application.
Terminal Type **set TerminalType**	What type of character formatting is used for console redirection. This can be one of the following: • **PC-ANSI**—The PC-ANSI terminal font is used. • **VT100**—A supported vt100 video terminal and its character set are used. • **VT100-PLUS**—A supported vt100-plus video terminal and its character set are used. • **VT-UTF8**—A video terminal with the UTF-8 character set is used. **Note** This setting must match the setting on the remote terminal application.
Legacy OS Redirection **set LegacyOSRedir**	Whether redirection from a legacy operating system, such as DOS, is enabled on the serial port. This can be one of the following:

Name	Description
	• **Disabled**—The serial port enabled for console redirection is hidden from the legacy operating system. • **Enabled**—The serial port enabled for console redirection is visible to the legacy operating system.
OS Boot Watchdog Timer **set OSBootWatchdogTimer**	Whether the BIOS programs the watchdog timer with a specified timeout value. If the operating system does not complete booting before the timer expires, the CIMC resets the system and an error is logged. This can be one of the following: • **Disabled**—The watchdog timer is not used to track how long the server takes to boot. • **Enabled**—The watchdog timer tracks how long the server takes to boot. If the server does not boot within the length of time specified by the **set OSBootWatchdogTimerTimeout** command, the CIMC logs an error and takes the action specified by the **set OSBootWatchdogTimerPolicy** command.
OS Boot Watchdog Timer Timeout **set OSBootWatchdogTimerTimeOut**	What timeout value the BIOS uses to configure the watchdog timer. This can be one of the following: • **5_Minutes**—The watchdog timer expires 5 minutes after the OS begins to boot. • **10_Minutes**—The watchdog timer expires 10 minutes after the OS begins to boot. • **15_Minutes**—The watchdog timer expires 15 minutes after the OS begins to boot. • **20_Minutes**—The watchdog timer expires 20 minutes after the OS begins to boot. **Note** This option is only applicable if you enable the OS Boot Watchdog Timer.
OS Boot Watchdog Policy **set OSBootWatchdogTimerPolicy**	What action the system takes if the watchdog timer expires. This can be one of the following: • **Power_Off**—The server is powered off if the watchdog timer expires during OS boot. • **Reset**—The server is reset if the watchdog timer expires during OS boot. **Note** This option is only applicable if you enable the OS Boot Watchdog Timer.