Configuring Server-Related Policies

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Configuring BIOS Settings

Server BIOS Settings

Cisco UCS provides two methods for making global modifications to the BIOS settings on servers in an instance. You can create one or more BIOS policies that include a specific grouping of BIOS settings that match the needs of a server or set of servers, or you can use the default BIOS settings for a specific server platform.

Both the BIOS policy and the default BIOS settings for a server platform enable you to fine tune the BIOS settings for a server managed by Cisco UCS Manager.

Depending upon the needs of the data center, you can configure BIOS policies for some service profiles and use the BIOS defaults in other service profiles in the same Cisco UCS instance, or you can use only one of

them. You can also use Cisco UCS Manager to view the actual BIOS settings on a server and determine whether they are meeting current needs.

Note Cisco UCS Manager pushes BIOS configuration changes through a BIOS policy or default BIOS settings to the CIMC buffer. These changes remain in the buffer and do not take effect until the server is rebooted.

We recommend that you verify the support for BIOS settings in the server that you want to configure. Some settings, such as Mirroring Mode and Sparing Mode for RAS Memory, are not supported by all Cisco UCS servers

Main BIOS Settings

The following table lists the main server BIOS settings that you can configure through a BIOS policy or the default BIOS settings:

Name	Description
Reboot on BIOS Settings Change **set reboot-on-update**	When the server is rebooted after you change one or more BIOS settings. **yes** —If you enable this setting, the server is rebooted according to the maintenance policy in the server's service profile. For example, if the maintenance policy requires user acknowledgment, the server is not rebooted and the BIOS changes are not applied until a user acknowledges the pending activity. **no** —If you do not enable this setting, the BIOS changes are not applied until the next time the server is rebooted, whether as a result of another server configuration change or a manual reboot.
Quiet Boot **set quiet-boot-config**	What the BIOS displays during Power On Self-Test (POST). This can be one of the following: • **disabled**—The BIOS displays all messages and Option ROM information during boot. • **enabled**—The BIOS displays the logo screen, but does not display any messages or Option ROM information during boot. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

Name	Description
Post Error Pause **set post-error-pause-config post-error-pause**	What happens when the server encounters a critical error during POST. This can be one of the following: • **disabled**—The BIOS continues to attempt to boot the server. • **enabled**—The BIOS pauses the attempt to boot the server and opens the Error Manager when a critical error occurs during POST. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Resume Ac On Power Loss **set resume-ac-on-power-loss-config resume-action**	How the server behaves when power is restored after an unexpected power loss. This can be one of the following: • **stay-off**—The server remains off until manually powered on. • **last-state**—The server is powered on and the system attempts to restore its last state. • **reset**—The server is powered on and automatically reset. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Front Panel Lockout **set front-panel-lockout-config front-panel-lockout**	Whether the power and reset buttons on the front panel are ignored by the server. This can be one of the following: • **disabled**—The power and reset buttons on the front panel are active and can be used to affect the server. • **enabled**—The power and reset buttons are locked out. The server can only be reset or powered on or off from the CIMC GUI. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

Name	Description
ACPI10 Support **set acpi10-support-config acpi10-support**	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. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

Processor BIOS Settings

The following table lists the processor BIOS settings that you can configure through a BIOS policy or the default BIOS settings:

Name	Description
Turbo Boost **set intel-turbo-boost-config turbo-boost**	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. • **enabled**—The processor utilizes Turbo Boost Technology if required. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

Name	Description
Enhanced Intel Speedstep **set enhanced-intel-speedstep-config speed-step**	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. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Hyper Threading **set hyper-threading-config hyper-threading**	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. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.

Name	Description
Core Multi Processing **set core-multi-processing-config multi-processing**	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 **10**—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. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Execute Disabled Bit **set execute-disable bit**	Classifies memory areas on the server to specify where 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 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. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Virtualization Technology (VT) **set intel-vt-config vt**	Whether the processor uses Intel Virtualization Technology, 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. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor. **Note** If you change this option, you must power cycle the server before the setting takes effect.

Name	Description
Direct Cache Access **set direct-cache-access-config access**	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. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Processor C State **set processor-c-state-config c-state**	Significantly reduces the power of the processor during idle periods. This can be one of the following: • **disabled** • **enabled** • **platform-default** We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Processor C1E **set processor-c1e-config c1e**	Allows the processor to transition to its minimum frequency upon entering C1. This setting does not take effect until after you have rebooted the server. This can be one of the following: • **disabled** • **enabled** • **platform-default**
Processor C3 Report **set processor-c3-report-config processor-c3-report**	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. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor. On the B440 server, the BIOS Setup menu uses enabled and disabled for these options. If you specify acpi-c2 or acpi-c2, the server sets the BIOS value for that option to enabled.

Name	Description
Processor C6 Report **set processor-c6-report-config processor-report**	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. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
CPU Performance **set cpu-performance-config cpu-config**	Sets the CPU performance profile for the server. This can be one of the following: • **enterprise**—All prefetchers and data reuse are disabled. • **high-throughput**—All prefetchers are enabled, and data reuse is disabled. • **hpc**—All prefetchers and data reuse are enabled. This setting is also known as high performance computing. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Max Variable MTRR Setting **set max-variable-mtrr-setting-config processor-mtrr**	Allows you to select the number of MTRR variables. This can be one of the following: • **auto-max**—The BIOS uses the default value for the processor. • **8**—The BIOS uses the number specified for the variable MTRR. • **platform-default**—The BIOS uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

Intel Directed I/O BIOS Settings

The following table lists the Intel Directed I/O BIOS settings that you can configure through a BIOS policy or the default BIOS settings:

Name	Description
VT for Directed IO **set intel-vt-directed-io-config vtd**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Interrupt Remap **set intel-vt-directed-io-config interrupt-remapping**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Coherency Support **set intel-vt-directed-io-config coherency-support**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
ATS Support **set intel-vt-directed-io-config ats-support**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

Name	Description
Pass Through DMA Support **set intel-vt-directed-io-config passthrough-dma**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

RAS Memory BIOS Settings

The following table lists the RAS memory BIOS settings that you can configure through a BIOS policy or the default BIOS settings:

Name	Description
Memory RAS Config **set memory-ras-config ras-config**	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. • **lockstep**—If the DIMM pairs in the server have an identical type, size, and organization and are populated across the SMI channels, you can enable lockstep mode to minimize memory access latency and provide better performance. Lockstep is enabled by default for B440 servers. • **sparing**—System reliability is enhanced with a degree of memory redundancy while making more memory available to the operating system than mirroring. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

Name	Description
NUMA **set numa-config numa-optimization**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Mirroring Mode **set memory-mirroring-mode mirroring-mode**	Memory mirroring enhances system reliability by keeping two identical data images in memory. This option is only available if you choose the **mirroring** option for Memory RAS Config. It can be one of the following: • **inter-socket**—Memory is mirrored between two Integrated Memory Controllers (IMCs) across CPU sockets. • **intra-socket**—One IMC is mirrored with another IMC in the same socket. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Sparing Mode **set memory-sparing-mode sparing-mode**	Sparing optimizes reliability by holding memory in reserve so that it can be used in case other DIMMs fail. This option provides some memory redundancy, but does not provide as much redundancy as mirroring. The available sparing modes depend on the current memory population. This option is only available if you choose **sparing** option for Memory RAS Config. It can be one of the following: • **dimm-sparing**—One DIMM is held in reserve. If a DIMM fails, the contents of a failing DIMM are transferred to the spare DIMM. • **rank-sparing**—A spare rank of DIMMs is held in reserve. If a rank of DIMMs fails, the contents of the failing rank are transferred to the spare rank. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

Name	Description
LV DDR Mode **set lv-dimm-support-config lv-ddr-mode**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

Serial Port BIOS Settings

The following table lists the serial port BIOS settings that you can configure through a BIOS policy or the default BIOS settings:

Name	Description
Serial Port A **set serial-port-a-config serial-port-a**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

USB BIOS Settings

The following table lists the USB BIOS settings that you can configure through a BIOS policy or the default BIOS settings:

Name	Description
Make Device Non Bootable **usb-boot-config make-device-non-bootable**	Whether the server can boot from a USB device. This can be one of the following: • **disabled**—The server cannot boot from a USB device. • **enabled**—The server can boot from a USB device. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

PCI Configuration BIOS Settings

The following table lists the PCI configuration BIOS settings that you can configure through a BIOS policy or the default BIOS settings:

Name	Description
Max Memory Below 4G **max-memory-below-4gb-config max-memory**	Whether the BIOS maximizes memory usage below 4GB for an operating without PAE support, depending on the system configuration. This can be one of the following: • **disabled**—Does not maximize memory usage. Choose this option for all operating systems with PAE support. • **enabled**—Maximizes memory usage below 4GB for an operating system without PAE support. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Memory Mapped IO Above 4Gb Config **memory-mapped-io-above-4gb-config**	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 function correctly with this setting enabled. This can be one of the following: • **disabled**—Does not map I/O of 64-bit PCI devices to 4GB or greater address space. • **enabled**—Maps I/O of 64-bit PCI devices to 4GB or greater address space. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

Boot Options BIOS Settings

The following table lists the boot options BIOS settings that you can configure through a BIOS policy or the default BIOS settings:

Name	Description
Boot Option Retry **boot-option-retry-config retry**	Whether the BIOS retries NON-EFI based boot options without waiting for user input. This can be one of the following: • **disabled**—Waits for user input before retrying NON-EFI based boot options. • **enabled**—Continually retries NON-EFI based boot options without waiting for user input. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Intel Entry SAS RAID **intel-entry-sas-raid-config sas-raid**	Whether the Intel SAS Entry RAID Module is enabled. This can be one of the following: • **disabled**—The Intel SAS Entry RAID Module is disabled. • **enabled**—The Intel SAS Entry RAID Module is enabled. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Intel Entry SAS RAID Module **intel-entry-sas-raid-config sas-raid-module**	How the Intel SAS Entry RAID Module is configured. This can be one of the following: • **it-ir-raid**—Configures the RAID module to use Intel IT/IR RAID. • **intel-esrtii**—Configures the RAID module to use Intel Embedded Server RAID Technology II. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

Server Management BIOS Settings

The following tables list the server management BIOS settings that you can configure through a BIOS policy or the default BIOS settings:

General Settings

Name	Description
Assert Nmi on Serr **set assert-nmi-on-serr-config assertion**	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. • **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**. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
Assert Nmi on Perr **set assert-nmi-on-perr-config assertion**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.
OS Boot Watchdog Timer **set os-boot-watchdog-timer-config os-boot-watchdog-timer**	Whether the BIOS programs the watchdog timer with a predefined 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 predefined length of time, the CIMC resets the system and logs an error. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor. This feature requires either operating system support or Intel Management software.

Name	Description
OS Boot Watchdog Timer Timeout Policy **set os-boot-watchdog-timer-policy-config os-boot-watchdog-timer policy**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor. This option is only available if you enable the OS Boot Watchdog Timer.
OS Boot Watchdog Timer Timeout **set os-boot-watchdog-timer-timeout-config os-boot-watchdog-timeout**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor. This option is only available if you enable the OS Boot Watchdog Timer.

Console Redirection Settings

Name	Description
Console Redirection **set console-redir-config console-redir**	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. • **serial-port-a**—Enables serial port A for console redirection during POST. This option is valid for blade servers and rack-mount servers. • **serial-port-b**—Enables serial port B for console redirection and allows it to perform server management tasks. This option is only valid for rack-mount servers. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor. **Note** If you enable this option, you also disable the display of the Quiet Boot logo screen during POST.
Flow Control **set console-redir-config flow-control**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor. **Note** This setting must match the setting on the remote terminal application.

Name	Description
BAUD Rate **set console-redir-config baud-rate**	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: • **9600**—A 9600 BAUD rate is used. • **19200**—A 19200 BAUD rate is used. • **38400**—A 38400 BAUD rate is used. • **57600**—A 57600 BAUD rate is used. • **115200**—A 115200 BAUD rate is used. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor. **Note** This setting must match the setting on the remote terminal application.
Terminal Type **set console-redir-config terminal-type**	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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor. **Note** This setting must match the setting on the remote terminal application.
Legacy OS Redirect **set uefi-os-legacy-video-config legacy-video**	Whether redirection from a legacy operating system, such as DOS, is enabled on the serial port. This can be one of the following: • **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. • **platform-default**—The processor uses the value for this attribute contained in the BIOS defaults for the server type and vendor.

BIOS Policy

The BIOS policy is a policy that automates the configuration of BIOS settings for a server or group of servers. You can create global BIOS policies available to all servers in the root organization, or you can create BIOS policies in sub-organizations that are only available to that hierarchy.

To use a BIOS policy, do the following:

1. Create the BIOS policy in Cisco UCS Manager.
2. Assign the BIOS policy to one or more service profiles.
3. Associate the service profile with a server.

During service profile association, Cisco UCS Manager modifies the BIOS settings on the server to match the configuration in the BIOS policy. If you do not create and assign a BIOS policy to a service profile, the server uses the default BIOS settings for that server platform.

Default BIOS Settings

Cisco UCS Manager includes a set of default BIOS settings for each type of server supported by Cisco UCS. The default BIOS settings are available only in the root organization and are global. Only one set of default BIOS settings can exist for each server platform supported by Cisco UCS. You can modify the default BIOS settings, but you cannot create an additional set of default BIOS settings.

Each set of default BIOS settings are designed for a particular type of supported server and are applied to all servers of that specific type which do not have a BIOS policy included in their service profiles.

Unless a Cisco UCS implementation has specific needs that are not met by the server-specific settings, we recommend that you use the default BIOS settings that are designed for each type of server in the instance.

Cisco UCS Manager applies these server platform-specific BIOS settings as follows:

- The service profile associated with a server does not include a BIOS policy.
- The BIOS policy is configured with the platform-default option for a specific setting.

You can modify the default BIOS settings provided by Cisco UCS Manager. However, any changes to the default BIOS settings apply to all servers of that particular type or platform. If you want to modify the BIOS settings for only certain servers, we recommend that you use a BIOS policy.

Creating a BIOS Policy

Note Cisco UCS Manager pushes BIOS configuration changes through a BIOS policy or default BIOS settings to the CIMC buffer. These changes remain in the buffer and do not take effect until the server is rebooted.

We recommend that you verify the support for BIOS settings in the server that you want to configure. Some settings, such as Mirroring Mode and Sparing Mode for RAS Memory, are not supported by all Cisco UCS servers

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters org mode for the specified organization. To enter the default org mode, type / as the *org-name* .
Step 2	UCS-A /org # **create bios-policy** *policy-name*	Creates a BIOS policy with the specified policy name, and enters org BIOS policy 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: • **Main** page: Main BIOS Settings, on page 2 • **Processor** page: Processor BIOS Settings, on page 4 • **Intel Directed IO** page: Intel Directed I/O BIOS Settings, on page 8 • **RAS Memory** page: RAS Memory BIOS Settings, on page 10 • **Serial Port** page: Serial Port BIOS Settings, on page 12 • **USB** page: USB BIOS Settings, on page 12 • **PCI Configuration** page: PCI Configuration BIOS Settings, on page 13 • **Boot Options** page: Boot Options BIOS Settings, on page 14 • **Server Management** page: Server Management BIOS Settings, on page 14
Step 4	UCS-A /org/bios-policy # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates a BIOS policy under the root organization and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # create bios-policy biosPolicy3
UCS-A /org/bios-policy* # set numa-config numa-optimization enabled
```

```
UCS-A /org/bios-policy* # commit-buffer
UCS-A /org/bios-policy #
```

Modifying BIOS Defaults

We recommend that you verify the support for BIOS settings in the server that you want to configure. Some settings, such as Mirroring Mode and Sparing Mode for RAS Memory, are not supported by all Cisco UCS servers

Unless a Cisco UCS implementation has specific needs that are not met by the server-specific settings, we recommend that you use the default BIOS settings that are designed for each type of server in the instance.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope system**	Enters system mode.
Step 2	UCS-A /system # **scope server-defaults**	Enters server defaults mode.
Step 3	UCS-A /system/server-defaults # **show platform**	(Optional) Displays platform descriptions for all servers.
Step 4	UCS-A /system/server-defaults # **scope platform** *platform-description*	Enters server defaults mode for the server specified. For the *platform-description* argument, enter the entire server description as displayed by the **show platform** command.
Step 5	UCS-A /system/server-defaults/platform # **scope bios-settings**	Enters server defaults BIOS settings mode for the server.
Step 6	Reconfigure the BIOS settings.	For the CLI commands, descriptions and information about the options for each BIOS setting, see the following topics: • **Main** page: Main BIOS Settings, on page 2 • **Processor** page: Processor BIOS Settings, on page 4 • **Intel Directed IO** page: Intel Directed I/O BIOS Settings, on page 8 • **RAS Memory** page: RAS Memory BIOS Settings, on page 10 • **Serial Port** page: Serial Port BIOS Settings, on page 12 • **USB** page: USB BIOS Settings, on page 12 • **PCI Configuration** page: PCI Configuration BIOS Settings, on page 13 • **Boot Options** page: Boot Options BIOS Settings, on page 14

	Command or Action	Purpose
		• **Server Management** page: Server Management BIOS Settings, on page 14
Step 7	UCS-A /system/server-defaults/platform/bios-settings # **commit-buffer**	Commits the transaction to the system configuration.

The following example shows how to change the NUMA default BIOS setting for a platform and commits the transaction:

```
UCS-A# scope system
UCS-A /system # scope server-defaults
UCS-A /system/server-defaults # show platform

Platform:
    Product Name Vendor     Model      Revision
    ------------ ---------- ---------- --------
    Cisco B200-M1
                 Cisco Systems, Inc.
                            N20-B6620-1
                                       0

UCS-A /system/server-defaults # scope platform 'Cisco Systems Inc' N20-B6620-1 0
UCS-A /system/server-defaults/platform # scope bios-settings
UCS-A /system/server-defaults/platform/bios-settings # set numa-config numa-optimization
disabled
UCS-A /system/server-defaults/platform/bios-settings* # commit-buffer
UCS-A /system/server-defaults/platform/bios-settings #
```

Viewing the Actual BIOS Settings for a Server

Follow this procedure to see the actual BIOS settings on a server.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope server** *chassis-id* / *server-id*	Enters chassis server mode for the specified server.
Step 2	UCS-A /chassis/server # **scope bios**	Enters BIOS mode for the specified server.
Step 3	UCS-A /chassis/server/bios # **scope bios-settings**	Enters BIOS settings mode for the specified server.
Step 4	UCS-A /chassis/server/bios/bios-settings # **show** *setting*	Displays the BIOS setting. Enter **show ?** to display a list of allowed values for *setting* .

The following example displays a BIOS setting for blade 3 in chassis 1:

```
UCS-A# scope server 1/3
UCS-A /chassis/server # scope bios
```

```
UCS-A /chassis/server/bios # scope  bios-settings
UCS-A /chassis/server/bios/bios-settings # show intel-vt-config

Intel Vt Config:
    Vt
    --
    Enabled

UCS-A /chassis/server/bios/bios-settings #
```

Configuring Boot Policies

Boot Policy

The boot policy determines the following:

- Configuration of the boot device
- Location from which the server boots
- Order in which boot devices are invoked

For example, you can choose to have associated servers boot from a local device, such as a local disk or CD-ROM (VMedia), or you can select a SAN boot or a LAN (PXE) boot.

You must include this policy in a service profile, and that service profile must be associated with a server for it to take effect. If you do not include a boot policy in a service profile, the server uses the default settings in the BIOS to determine the boot order.

Important Changes to a boot policy may be propagated to all servers created with an updating service profile template that includes that boot policy. Reassociation of the service profile with the server to rewrite the boot order information in the BIOS is auto-triggered.

Guidelines

When you create a boot policy, you can add one or more of the following to the boot policy and specify their boot order:

Boot type	Description
SAN boot	Boots from an operating system image on the SAN. You can specify a primary and a secondary SAN boot. If the primary boot fails, the server attempts to boot from the secondary. We recommend that you use a SAN boot, because it offers the most service profile mobility within the system. If you boot from the SAN when you move a service profile from one server to another, the new server boots from the exact same operating system image. Therefore, the new server appears to be the exact same server to the network.
LAN boot	Boots from a centralized provisioning server. It is frequently used to install operating systems on a server from that server.

Boot type	Description
Local disk boot	If the server has a local drive, boots from that drive. **Note** Cisco UCS Manager does not differentiate between the types of local drives. If an operating system has been installed on more than one local drive or on an internal USB drive (eUSB), you cannot specify which of these local drives the server should use as the boot drive.
Virtual media boot	Mimics the insertion of a physical CD-ROM disk (read-only) or floppy disk (read-write) into a server. It is typically used to manually install operating systems on a server.

Note The default boot order is as follows:

1. Local disk boot
2. LAN boot
3. Virtual media read-only boot
4. Virtual media read-write boot

Configuring a Boot Policy

You can also create a local boot policy that is restricted to a service profile or service profile template. However, except for iSCSI boot, we recommend that you create a global boot policy that can be included in multiple service profiles or service profile templates.

Before You Begin

If you are creating a boot policy that boots the server from a SAN LUN and you require reliable SAN boot operations, you must first remove all local disks from servers associated with a service profile that includes the boot policy.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **create boot-policy** *policy-name* [**purpose** {**operational** | **utility**}]	Creates a boot policy with the specified policy name, and enters organization boot policy mode. When you create the boot policy, specify the **operational** option. This ensures that the server boots from the operating system installed on the server. The **utility** options is reserved

	Command or Action	Purpose
		and should only be used if instructed to do so by a Cisco representative.
Step 3	UCS-A /org/boot-policy # **set descr** *description*	(Optional) Provides a description for the boot policy. **Note** If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks do not appear in the description field of any **show** command output.
Step 4	UCS-A /org/boot-policy # **set reboot-on-update** {**no** | **yes**}	Specifies whether the servers using this boot policy are automatically rebooted after you make changes to the boot order.
Step 5	UCS-A /org/boot-policy # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates a boot policy named boot-policy-LAN, provides a description for the boot policy, specifies that servers using this policy will not be automatically rebooted when the boot order is changed, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # create boot-policy boot-policy-LAN purpose operational
UCS-A /org/boot-policy* # set descr "Boot policy that boots from the LAN."
UCS-A /org/boot-policy* # set reboot-on-update no
UCS-A /org/boot-policy* # commit-buffer
UCS-A /org/boot-policy #
```

What to Do Next

Configure one or more of the following boot options for the boot policy and set their boot order:

- **LAN Boot** —Boots from a centralized provisioning server. It is frequently used to install operating systems on a server from that server.

  If you choose the LAN Boot option, continue to Configuring a LAN Boot for a Boot Policy, on page 26.

- **Storage Boot** — Boots from an operating system image on the SAN. You can specify a primary and a secondary SAN boot. If the primary boot fails, the server attempts to boot from the secondary.

  We recommend that you use a SAN boot, because it offers the most service profile mobility within the system. If you boot from the SAN, when you move a service profile from one server to another, the new server boots from exactly the same operating system image. Therefore, the new server appears to be exactly the same server to the network.

  If you choose the Storage Boot option, continue to Configuring a Storage Boot for a Boot Policy, on page 27.

- **Virtual Media Boot** —Mimics the insertion of a physical CD into a server. It is typically used to manually install operating systems on a server.

  If you choose the Virtual Media boot option, continue to Configuring a Virtual Media Boot for a Boot Policy, on page 28.

Tip We recommend that the boot order in a boot policy include either a local disk or a SAN LUN, but not both, to avoid the possibility of the server booting from the wrong storage type. If you configure a local disk and a SAN LUN for the boot order storage type and the operating system or logical volume manager (LVM) is configured incorrectly, the server might boot from the local disk rather than the SAN LUN.

For example, on a server with Red Hat Linux installed, where the LVM is configured with default LV names and the boot order is configured with a SAN LUN and a local disk, Linux reports that there are two LVs with the same name and boots from the LV with the lowest SCSI ID, which could be the local disk.

Include the boot policy in a service profile and/or template.

Configuring a LAN Boot for a Boot Policy

Before You Begin

Create a boot policy to contain the LAN boot configuration.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope boot-policy** *policy-name*	Enters organization boot policy mode for the specified boot policy.
Step 3	UCS-A /org/boot-policy # **create lan**	Creates a LAN boot for the boot policy and enters organization boot policy LAN mode.
Step 4	UCS-A /org/boot-policy/lan # **set order** {**1** | **2** | **3** | **4**}	Specifies the boot order for the LAN boot.
Step 5	UCS-A /org/boot-policy/lan # **create path** {**primary** | **secondary**}	Creates a primary or secondary LAN boot path and enters organization boot policy LAN path mode.
Step 6	UCS-A /org/boot-policy/lan/path # **set vnic** *vnic-name*	Specifies the vNIC to use for the LAN path to the boot image.
Step 7	UCS-A /org/boot-policy/lan/path # **commit-buffer**	Commits the transaction to the system configuration.

The following example enters the boot policy named lab2-boot-policy, creates a LAN boot for the policy, sets the boot order to 2, creates primary and secondary paths using the vNICs named vNIC1 and vNIC2 , and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # scope boot-policy lab2-boot-policy
UCS-A /org/boot-policy* # create lan
UCS-A /org/boot-policy/lan* # set order 2
```

```
UCS-A /org/boot-policy/lan* # create path primary
UCS-A /org/boot-policy/lan/path* # set vnic vNIC1
UCS-A /org/boot-policy/lan/path* # exit
UCS-A /org/boot-policy/lan* # create path secondary
UCS-A /org/boot-policy/lan/path* # set vnic vNIC2
UCS-A /org/boot-policy/lan/path* # commit-buffer
UCS-A /org/boot-policy/lan/path #
```

What to Do Next

Include the boot policy in a service profile and/or template.

Configuring a Storage Boot for a Boot Policy

Before You Begin

Create a boot policy to contain the storage boot configuration.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope boot-policy** *policy-name*	Enters organization boot policy mode for the specified boot policy.
Step 3	UCS-A /org/boot-policy # **create storage**	Creates a storage boot for the boot policy and enters organization boot policy storage mode.
Step 4	UCS-A /org/boot-policy/storage # **set order** {**1** | **2** | **3** | **4**}	Sets the boot order for the storage boot.
Step 5	UCS-A /org/boot-policy/storage # **create** {**local** | **san-image** {**primary** | **secondary**}	Creates a local or SAN image storage location, and if the san-image option is specified, enters organization boot policy storage SAN image mode. The use of the terms primary or secondary boot devices does not imply a boot order. The effective order of boot devices within the same device class is determined by PCIe bus scan order.
Step 6	UCS-A /org/boot-policy/storage/san-image # **set vhba** *vhba-name*	Specifies the vHBA to be used for the storage boot.
Step 7	UCS-A /org/boot-policy/storage/san-image # **create path** {**primary** | **secondary**}	Creates a primary or secondary storage boot path and enters organization boot policy SAN path mode. The use of the terms primary or secondary boot devices does not imply a boot order. The effective order of boot devices within the same device class is determined by PCIe bus scan order.

	Command or Action	Purpose
Step 8	UCS-A /org/boot-policy/storage/san-image/path # **set** {**lun** *lun-id* | **wwn** *wwn-num*}	Specifies the LUN or WWN to be used for the storage path to the boot image.
Step 9	UCS-A /org/boot-policy/storage/san-image/path # **commit-buffer**	Commits the transaction to the system configuration.

The following example enters the boot policy named lab1-boot-policy, creates a storage boot for the policy, sets the boot order to 1, creates a primary SAN image, uses a vHBA named vHBA2, creates primary path using LUN 967295200, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # scope boot-policy lab1-boot-policy
UCS-A /org/boot-policy* # create storage
UCS-A /org/boot-policy/storage* # set order 1
UCS-A /org/boot-policy/storage* # create san-image primary
UCS-A /org/boot-policy/storage* # set vhba vHBA2
UCS-A /org/boot-policy/storage/san-image* # create path primary
UCS-A /org/boot-policy/storage/san-image/path* # set lun 967295200
UCS-A /org/boot-policy/storage/san-image/path* # commit-buffer
UCS-A /org/boot-policy/storage/san-image/path #
```

What to Do Next

Include the boot policy in a service profile and/or template.

Configuring a Virtual Media Boot for a Boot Policy

Before You Begin

Create a boot policy to contain the virtual media boot configuration.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope boot-policy** *policy-name*	Enters organization boot policy mode for the specified boot policy.
Step 3	UCS-A /org/boot-policy # **create virtual-media** {**read-only** | **read-write**}	Creates a virtual media boot for the boot policy, specifies whether the virtual media is has read-only or read-write privileges, and enters organization boot policy virtual media mode.
Step 4	UCS-A /org/boot-policy/virtual-media # **set order** {**1** | **2** | **3** | **4**}	Sets the boot order for the virtual-media boot.

	Command or Action	Purpose
Step 5	UCS-A /org/boot-policy/virtual-media # **commit-buffer**	Commits the transaction to the system configuration.

The following example enters the boot policy named lab3-boot-policy, creates a virtual media boot with read-only privileges for the policy, sets the boot order to 3, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # scope boot-policy lab3-boot-policy
UCS-A /org/boot-policy* # create virtual-media read-only
UCS-A /org/boot-policy/virtual-media* # set order 3
UCS-A /org/boot-policy/virtual-media* # commit-buffer
```

What to Do Next

Include the boot policy in a service profile and/or template.

Viewing a Boot Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **show boot-policy** *policy-name*	Displays the boot definition (set by the create boot-definition command). If the boot-definition is not set, and if a policy is set (using the set boot-policy command), then the policy will be displayed.

The following example shows how to display boot policy information for a boot policy called boot-policy-LAN:

```
UCS-A# scope org /
UCS-A /org # show boot-policy boot-policy-LAN

Boot Policy:
Full Name: org-root/boot-policy-LAN
Name: boot-policy-LAN
Purpose: Operational
Reboot on Update: Yes
Description:
Enforce vNIC Name: No
```

Deleting a Boot Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name*.
Step 2	UCS-A /org # **delete boot-policy** *policy-name*	Deletes the specified boot policy.
Step 3	UCS-A /org # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the boot policy named boot-policy-LAN and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # delete boot-policy boot-policy-LAN
UCS-A /org* # commit-buffer
UCS-A /org #
```

Configuring IPMI Access Profiles

IPMI Access Profile

This policy allows you to determine whether IPMI commands can be sent directly to the server, using the IP address. For example, you can send commands to retrieve sensor data from the CIMC. This policy defines the IPMI access, including a username and password that can be authenticated locally on the server, and whether the access is read-only or read-write.

You must include this policy in a service profile and that service profile must be associated with a server for it to take effect.

Configuring an IPMI Access Profile

Before You Begin

Obtain the following:

- Username with appropriate permissions that can be authenticated by the operating system of the server
- Password for the username
- Permissions associated with the username

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **create ipmi-access-profile** *profile-name*	Creates the specified IPMI access profile and enters organization IPMI access profile mode.
Step 3	UCS-A /org/ipmi-access-profile # **create ipmi-user** *ipmi-user-name*	Creates the specified endpoint user and enters organization IPMI access profile endpoint user mode. **Note** More than one endpoint user can be created within an IPMI access profile, with each endpoint user having its own password and privileges.
Step 4	UCS-A /org/ipmi-access-profile/ipmi-user # **set password**	Sets the password for the endpoint user. After entering the **set password** command, you are prompted to enter and confirm the password. For security purposes, the password that you type does not appear in the CLI.
Step 5	UCS-A /org/ipmi-access-profile/ipmi-user # **set privilege** {**admin** | **readonly**}	Specifies whether the endpoint user has administrative or read-only privileges.
Step 6	UCS-A /org/ipmi-access-profile/ipmi-user # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates an IPMI access profile named ReadOnly, creates an endpoint user named bob, sets the password and the privileges for bob, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # create ipmi-access-profile ReadOnly
UCS-A /org/ipmi-access-profile* # create ipmi-user bob
UCS-A /org/ipmi-access-profile/ipmi-user* # set password
Enter a password:
Confirm the password:
UCS-A /org/ipmi-access-profile/ipmi-user* # set privilege readonly
UCS-A /org/ipmi-access-profile/ipmi-user* # commit-buffer
UCS-A /org/ipmi-access-profile/ipmi-user #
```

What to Do Next

Include the IPMI profile in a service profile and/or template.

Deleting an IPMI Access Profile

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name*.
Step 2	UCS-A /org # **delete ipmi-access-profile** *profile-name*	Deletes the specified IPMI access profile.
Step 3	UCS-A /org # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the IPMI access profile named ReadOnly and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # delete ipmi-access-profile ReadOnly
UCS-A /org* # commit-buffer
UCS-A /org #
```

Adding an Endpoint User to an IPMI Access Profile

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope ipmi-access-profile** *profile-name*	Enters organization IPMI access profile mode for the specified IPMI access profile.
Step 3	UCS-A /org/ipmi-access-profile # **create ipmi-user** *ipmi-user-name*	Creates the specified endpoint user and enters organization IPMI access profile endpoint user mode. **Note** More than one endpoint user can be created within an IPMI access profile, with each endpoint user having its own password and privileges.
Step 4	UCS-A /org/ipmi-access-profile/ipmi-user # **set password**	Sets the password for the endpoint user. After entering the **set password** command, you are prompted to enter and confirm the password. For security purposes, the password that you type does not appear in the CLI.

	Command or Action	Purpose
Step 5	UCS-A /org/ipmi-access-profile/ipmi-user # **set privilege** {**admin** | **readonly**}	Specifies whether the endpoint user has administrative or read-only privileges.
Step 6	UCS-A /org/ipmi-access-profile/ipmi-user # **commit-buffer**	Commits the transaction to the system configuration.

The following example adds an endpoint user named alice to the IPMI access profile named ReadOnly and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # scope ipmi-access-profile ReadOnly
UCS-A /org/ipmi-access-profile* # create ipmi-user alice
UCS-A /org/ipmi-access-profile/ipmi-user* # set password
Enter a password:
Confirm the password:
UCS-A /org/ipmi-access-profile/ipmi-user* # set privilege readonly
UCS-A /org/ipmi-access-profile/ipmi-user* # commit-buffer
UCS-A /org/ipmi-access-profile/ipmi-user #
```

Deleting an Endpoint User from an IPMI Access Profile

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name*.
Step 2	UCS-A /org # **scope ipmi-access-profile** *profile-name*	Enters organization IPMI access profile mode for the specified IPMI access profile.
Step 3	UCS-A /org/ipmi-access-profile # **delete ipmi-user** *epuser-name*	Deletes the specified endpoint user from the IPMI access profile.
Step 4	UCS-A /org/ipmi-access-profile # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the endpoint user named alice from the IPMI access profile named ReadOnly and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope ipmi-access-profile ReadOnly
UCS-A /org/ipmi-access-profile # delete ipmi-user alice
UCS-A /org/ipmi-access-profile* # commit-buffer
UCS-A /org/ipmi-access-profile #
```

Configuring Local Disk Configuration Policies

Local Disk Configuration Policy

This policy configures any optional SAS local drives that have been installed on a server through the onboard RAID controller of the local drive. This policy enables you to set a local disk mode for all servers that are associated with a service profile that includes the local disk configuration policy.

The local disk modes include the following:

- **No Local Storage**—For a diskless server or a SAN only configuration. If you select this option, you cannot associate any service profile which uses this policy with a server that has a local disk.
- **RAID 0 Stripes**—Data is striped across all disks in the array, providing fast throughput. There is no data redundancy, and all data is lost if any disk fails.
- **RAID 1 Mirrored**—Data is written to two disks, providing complete data redundancy if one disk fails. The maximum array size is equal to the available space on the smaller of the two drives.
- **Any Configuration**—For a server configuration that carries forward the local disk configuration without any changes.
- **No RAID**—For a server configuration that removes the RAID and leaves the disk MBR and payload unaltered.
- **RAID 6 Stripes Dual Parity**—Data is striped across all disks in the array and two parity disks are used to provide protection against the failure of up to two physical disks. In each row of data blocks, two sets of parity data are stored.
- **RAID 5 Striped Parity**—Data is striped across all disks in the array. Part of the capacity of each disk stores parity information that can be used to reconstruct data if a disk fails. RAID 5 provides good data throughput for applications with high read request rates.
- **RAID10 Mirrored and Striped**— RAID 10 uses mirrored pairs of disks to provide complete data redundancy and high throughput rates.

You must include this policy in a service profile, and that service profile must be associated with a server for the policy to take effect.

Guidelines for all Local Disk Configuration Policies

Before you create a local disk configuration policy, consider the following guidelines:

No Mixed HDDs and SSDs

Do not include HDDs and SSDs in a single server or RAID configuration.

Impact of Upgrade to Release 1.3(1i) or Higher

An upgrade from an earlier Cisco UCS firmware release to release 1.3(1i) or higher has the following impact on the Protect Configuration property of the local disk configuration policy the first time servers are associated with service profiles after the upgrade:

Unassociated Servers

After you upgrade the Cisco UCS instance, the initial server association proceeds without configuration errors whether or not the local disk configuration policy matches the server hardware. Even if you enable the Protect Configuration property, Cisco UCS does not protect the user data on the server if there are configuration mismatches between the local disk configuration policy on the previous service profile and the policy in the new service profile.

Note If you enable the Protect Configuration property and the local disk configuration policy encounters mismatches between the previous service profile and the new service profile, all subsequent service profile associations with the server are blocked.

Associated Servers

Any servers that are already associated with service profiles do not reboot after the upgrade. Cisco UCS Manager does not report any configuration errors if there is a mismatch between the local disk configuration policy and the server hardware.

When a service profile is disassociated from a server and a new service profile associated, the setting for the Protect Configuration property in the new service profile takes precedence and overwrites the setting in the previous service profile.

Guidelines for Local Disk Configuration Policies Configured for RAID

No Mixed HDDs and SSDs

Do not include HDDs and SSDs in a single RAID configuration.

Do Not Use the Any Configuration Mode on Servers with MegaRAID Storage Controllers

If a blade server or rack-mount server in a Cisco UCS instance includes a MegaRAID storage controller, do not configure the local disk configuration policy in the service profile for that server with the **Any Configuration** mode. If you use this mode for servers with a MegaRAID storage controller, the installer for the operating system cannot detect any local storage on the server.

If you want to install an operating system on local storage on a server with a MegaRAID storage controller, you must configure the local disk configuration policy with a mode that creates a RAID LUN (RAID volume) on the server.

Server May Not Boot After RAID1 Cluster Migration if Any Configuration Mode Specified in Service Profile

After RAID1 clusters are migrated, you need to associate a service profile with the server. If the local disk configuration policy in the service profile is configured with **Any Configuration** mode rather than **RAID1**, the RAID LUN remains in "inactive" state during and after association. As a result, the server cannot boot.

To avoid this issue, ensure that the service profile you associate with the server contains the identical local disk configuration policy as the original service profile before the migration and does not include the **Any Configuration**mode.

Configure RAID Settings in Local Disk Configuration Policy for Servers with MegaRAID Storage Controllers

If a blade server or integrated rack-mount server has a MegaRAID controller, you must configure RAID settings for the drives in the Local Disk Configuration policy included in the service profile for that server.

If you do not configure your RAID LUNs before installing the OS, disk discovery failures might occur during the installation and you might see error messages such as “No Device Found.”

Do Not Use JBOD Mode on Servers with MegaRAID Storage Controllers

Do not configure or use JBOD mode or JBOD operations on any blade server or integrated rack-mount server with a MegaRAID storage controllers. JBOD mode and operations are not intended for nor are they fully functional on these servers.

Maximum of One RAID Volume and One RAID Controller in Integrated Rack-Mount Servers

A rack-mount server that has been integrated with Cisco UCS Manager can have a maximum of one RAID volume irrespective of how many hard drives are present on the server.

All the local hard drives in an integrated rack-mount server must be connected to only one RAID Controller. Integration with Cisco UCS Manager does not support the connection of local hard drives to multiple RAID Controllers in a single rack-mount server. We therefore recommend that you request a single RAID Controller configuration when you order rack-mount servers to be integrated with Cisco UCS Manager.

In addition, do not use third party tools to create multiple RAID LUNs on rack-mount servers. Cisco UCS Manager does not support that configuration.

Creating a Local Disk Configuration Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **create local-disk-config-policy** *policy-name*	Creates a local disk configuration policy and enters local disk configuration policy mode.
Step 3	UCS-A /org/local-disk-config-policy # **set descr** *description*	(Optional) Provides a description for the local disk configuration policy.
Step 4	UCS-A /org/local-disk-config-policy # **set mode** {**any-configuration** | **no-local-storage** | **no-raid** | **raid-0-striped** | **raid-1-mirrored** | **raid-5-striped-parity** | **raid-6-striped-dual-parity** | **raid-10-mirrored-and-striped**}	Specifies the mode for the local disk configuration policy.
Step 5	UCS-A /org/local-disk-config-policy # **set protect** {**yes** | **no**}	Specifies whether the local disk will be protected or not.

	Command or Action	Purpose
Step 6	UCS-A /org/local-disk-config-policy # **commit-buffer**	Commits the transaction to the system configuration.

The following example configures a local disk configuration policy and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # create local-disk-config-policy DiskPolicy7
UCS-A /org/local-disk-config-policy* # set mode raid-1-mirrored
UCS-A /org/local-disk-config-policy* # set protect yes
UCS-A /org/local-disk-config-policy* # commit-buffer
UCS-A /org/local-disk-config-policy #
```

Viewing a Local Disk Configuration Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **show local-disk-config-policy** *policy-name*	Displays the local disk policy. If you have not configured a local disk policy, the local disk configuration (created by the create local-disk-config command) displays. Displays the local disk definition (set by the create local-disk-config command). If the serial over LAN definition is not set, and if a policy is set (using the set local-disk-config-policy command), then the policy will be displayed.

The following example shows how to display local disk policy information for a local disk configuration policy called DiskPolicy7:

```
UCS-A# scope org /
UCS-A /org # show local-disk-config-policy DiskPolicy7

Local Disk Config Policy:
Name: DiskPolicy7
Mode: Raid 1 Mirrored
Description:
Protect Configuration: Yes
```

Deleting a Local Disk Configuration Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name*.
Step 2	UCS-A /org # **delete local-disk-config-policy** *policy-name*	Deletes the specified local disk configuration policy.
Step 3	UCS-A /org # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the local disk configuration policy named DiskPolicy7 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # delete local-disk-config-policy DiskPolicy7
UCS-A /org* # commit-buffer
UCS-A /org #
```

Configuring Scrub Policies

Scrub Policy

This policy determines what happens to local data and to the BIOS settings on a server during the discovery process and when the server is disassociated from a service profile. Depending upon how you configure a scrub policy, the following can occur at those times:

Disk Scrub

One of the following occurs to the data on any local drives on disassociation:

- If enabled, destroys all data on any local drives
- If disabled, preserves all data on any local drives, including local storage configuration

BIOS Settings Scrub

One of the following occurs to the BIOS settings when a service profile containing the scrub policy is disassociated from a server:

- If enabled, erases all BIOS settings for the server and and resets them to the BIOS defaults for that server type and vendor
- If disabled, preserves the existing BIOS settings on the server

Creating a Scrub Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **create scrub-policy** *policy-name*	Creates a scrub policy with the specified policy name, and enters organization scrub policy mode.
Step 3	UCS-A /org/scrub-policy # **set descr** *description*	(Optional) Provides a description for the scrub policy. **Note** If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any **show** command output.
Step 4	UCS-A /org/scrub-policy # **set disk-scrub** {**no** | **yes**}	Disables or enables disk scrubbing on servers using this scrub policy as follows: • If enabled, destroys all data on any local drives • If disabled, preserves all data on any local drives, including local storage configuration
Step 5	UCS-A /org/scrub-policy # **set bios-settings-scrub** {**no** | **yes**}	Disables or enables BIOS settings scrubbing on servers using this scrub policy as follows: • If enabled, erases all BIOS settings for the server and and resets them to the BIOS defaults for that server type and vendor • If disabled, preserves the existing BIOS settings on the server
Step 6	UCS-A /org/scrub-policy # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates a scrub policy named ScrubPolicy2, enables disk scrubbing on servers using the scrub policy, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # create scrub-policy ScrubPolicy2
UCS-A /org/scrub-policy* # set descr "Scrub disk but not BIOS."
UCS-A /org/scrub-policy* # set disk-scrub yes
UCS-A /org/scrub-policy* # set bios-settings-scrub no
UCS-A /org/scrub-policy* # commit-buffer
UCS-A /org/scrub-policy #
```

Deleting a Scrub Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name*.
Step 2	UCS-A /org # **delete scrub-policy** *policy-name*	Deletes the specified scrub policy.
Step 3	UCS-A /org # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the scrub policy named ScrubPolicy2 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # delete scrub-policy ScrubPolicy2
UCS-A /org* # commit-buffer
UCS-A /org #
```

Configuring Serial over LAN Policies

Serial over LAN Policy

This policy sets the configuration for the serial over LAN connection for all servers associated with service profiles that use the policy. By default, the serial over LAN connection is disabled.

If you implement a serial over LAN policy, we recommend that you also create an IPMI profile.

You must include this policy in a service profile and that service profile must be associated with a server for it to take effect.

Configuring a Serial over LAN Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **create sol-policy** *policy-name*	Creates a serial over LAN policy and enters organization serial over LAN policy mode.

	Command or Action	Purpose
Step 3	UCS-A /org/sol-policy # **set descr** *description*	(Optional) Provides a description for the policy. **Note** If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any **show** command output.
Step 4	UCS-A /org/sol-policy # **set speed** {**115200** | **19200** | **38400** | **57600** | **9600**}	Specifies the serial baud rate.
Step 5	UCS-A /org/sol-policy # {**disable** | **enable**}	Disables or enables the serial over LAN policy. By default, the serial over LAN policy is disabled; you must enable it before it can be applied.
Step 6	UCS-A /org/sol-policy # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates a serial over LAN policy named Sol9600, provides a description for the policy, sets the speed to 9,600 baud, enables the policy, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # create sol-policy Sol9600
UCS-A /org/sol-policy* # set descr "Sets serial over LAN policy to 9600 baud."
UCS-A /org/sol-policy* # set speed 9600
UCS-A /org/sol-policy* # enable
UCS-A /org/sol-policy* # commit-buffer
UCS-A /org/sol-policy #
```

Viewing a Serial over LAN Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **show sol-policy** *policy-name*	Displays the serial over LAN definition (set by the create sol-config command). If the serial over LAN definition is not set, and if a policy is set (using the set sol-policy command), then the policy will be displayed.

The following example shows how to display serial over LAN information for a serial over LAN policy called Sol9600:

```
UCS-A# scope org /
UCS-A /org # show sol-policy Sol9600
```

```
SOL Policy:
Full Name: Sol9600
SOL State: Enable
Speed: 9600
Description:
```

Deleting a Serial over LAN Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **delete sol-policy** *policy-name*	Deletes the specified serial over LAN policy.
Step 3	UCS-A /org # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the serial over LAN policy named Sol9600 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # delete sol-policy Sol9600
UCS-A /org* # commit-buffer
UCS-A /org #
```

Configuring Server Autoconfiguration Policies

Server Autoconfiguration Policy

Cisco UCS Manager uses this policy to determine how to configure a new server. If you create a server autoconfiguration policy, the following occurs when a new server starts:

1. The qualification in the server autoconfiguration policy is executed against the server.
2. If the server meets the required qualifications, the server is associated with a service profile created from the service profile template configured in the server autoconfiguration policy. The name of that service profile is based on the name given to the server by Cisco UCS Manager.
3. The service profile is assigned to the organization configured in the server autoconfiguration policy.

Configuring a Server Autoconfiguration Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **create server-autoconfig-policy** *policy-name*	Creates a server autoconfiguration policy with the specified policy name, and enters organization server autoconfiguration policy mode.
Step 3	UCS-A /org/server-autoconfig-policy # **set descr** *description*	(Optional) Provides a description for the policy. **Note** If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any **show** command output.
Step 4	UCS-A /org/server-autoconfig-policy # **set destination org** *org-name*	(Optional) Specifies the organization for which the server is to be used.
Step 5	UCS-A /org/server-autoconfig-policy # **set qualifier** *server-qual-name*	(Optional) Specifies server pool policy qualification to use for qualifying the server.
Step 6	UCS-A /org/server-autoconfig-policy # **set template** *profile-name*	(Optional) Specifies a service profile template to use for creating a service profile instance for the server.
Step 7	UCS-A /org/server-autoconfig-policy # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates a server autoconfiguration policy named AutoConfigFinance, provides a description for the policy, specifies finance as the destination organization, ServPoolQual22 as the server pool policy qualification, and ServTemp2 as the service profile template, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # create server-autoconfig-policy AutoConfigFinance
UCS-A /org/server-autoconfig-policy* # set descr "Server Autoconfiguration Policy for
Finance"
UCS-A /org/server-autoconfig-policy* # set destination org finance
UCS-A /org/server-autoconfig-policy* # set qualifier ServPoolQual22
UCS-A /org/server-autoconfig-policy* # set template ServTemp2
UCS-A /org/server-autoconfig-policy* # commit-buffer
UCS-A /org/server-autoconfig-policy #
```

Deleting a Server Autoconfiguration Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **delete server-autoconfig-policy** *policy-name*	Deletes the specified server autoconfiguration policy.
Step 3	UCS-A /org # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the server autoconfiguration policy named AutoConfigFinance and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # delete server-autoconfig-policy AutoConfigFinance
UCS-A /org* # commit-buffer
UCS-A /org #
```

Configuring Server Discovery Policies

Server Discovery Policy

This discovery policy determines how the system reacts when you add a new server. If you create a server discovery policy, you can control whether the system conducts a deep discovery when a server is added to a chassis, or whether a user must first acknowledge the new server. By default, the system conducts a full discovery.

If you create a server discovery policy, the following occurs when a new server starts:

1. The qualification in the server discovery policy is executed against the server.
2. If the server meets the required qualifications, Cisco UCS Manager applies the following to the server:
   - Depending upon the option selected for the action, either discovers the new server immediately or waits for a user to acknowledge the new server
   - Applies the scrub policy to the server

Configuring a Server Discovery Policy

Before You Begin

If you plan to associate this policy with a server pool, create server pool policy qualifications.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org /**	Enters the root organization mode. **Note** Chassis discovery policies can only be accessed from the root organization.
Step 2	UCS-A /org # **create server-disc-policy** *policy-name*	Creates a server discovery policy with the specified policy name, and enters org server discovery policy mode.
Step 3	UCS-A /org/server-disc-policy # **set action** {**diag** | **immediate** | **user-acknowledged**}	Specifies when the system will attempt to discover new servers.
Step 4	UCS-A /org/chassis-disc-policy # **set descr** *description*	(Optional) Provides a description for the server discovery policy. **Note** If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any **show** command output.
Step 5	UCS-A /org/server-disc-policy # **set qualifier** *qualifier*	(Optional) Uses the specified server pool policy qualifications to associates this policy with a server pool.
Step 6	UCS-A /org/server-disc-policy # **set scrub-policy**	Specifies the scrub policy to be used by this policy. The scrub policy defines whether the disk drive on a server should be scrubbed clean upon discovery.
Step 7	UCS-A /org/server-disc-policy # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates a server discovery policy named ServDiscPolExample, sets it to immediately discover new servers, provides a description for the policy, specifies the server pool policy qualifications and scrub policy, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # create server-disc-policy ServDiscPolExample
UCS-A /org/server-disc-policy* # set action immediate
UCS-A /org/server-disc-policy* # set descr "This is an example server discovery policy."
UCS-A /org/server-disc-policy* # set qualifier ExampleQual
UCS-A /org/server-disc-policy* # set scrub-policy NoScrub
UCS-A /org/server-disc-policy # commit-buffer
```

What to Do Next

Include the server discovery policy in a service profile and/or template.

Deleting a Server Discovery Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name*.
Step 2	UCS-A /org # **Delete server-disc-policy** *policy-name*	Deletes the specified server discovery policy.
Step 3	UCS-A /org/server-disc-policy # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the server discovery policy named ServDiscPolExample and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # delete server-disc-policy ServDiscPolExample
UCS-A /org* # commit-buffer
UCS-A /org #
```

Configuring Server Inheritance Policies

Server Inheritance Policy

This policy is invoked during the server discovery process to create a service profile for the server. All service profiles created from this policy use the values burned into the blade at manufacture. The policy performs the following:

- Analyzes the inventory of the server
- If configured, assigns the server to the selected organization
- Creates a service profile for the server with the identity burned into the server at manufacture

You cannot migrate a service profile created with this policy to another server.

Configuring a Server Inheritance Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **create server-inherit-policy** *policy-name*	Creates a server inheritance policy with the specified policy name, and enters organization server inheritance policy mode.
Step 3	UCS-A /org/server-inherit-policy # **set descr** *description*	(Optional) Provides a description for the policy. **Note** If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any **show** command output.
Step 4	UCS-A /org/server-inherit-policy # **set destination org** *org-name*	(Optional) Specifies the organization for which the server is to be used.
Step 5	UCS-A /org/server-inherit-policy # **set qualifier** *server-qual-name*	(Optional) Specifies server pool policy qualification to use for qualifying the server.
Step 6	UCS-A /org/server-inherit-policy # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates a server inheritance policy named InheritEngineering, provides a description for the policy, specifies engineering as the destination organization and ServPoolQual22 as the server pool policy qualification, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # create server-inherit-policy InheritEngineering
UCS-A /org/server-inherit-policy* # set descr "Server Inheritance Policy for Engineering"
UCS-A /org/server-inherit-policy* # set destination org engineering
UCS-A /org/server-inherit-policy* # set qualifier ServPoolQual22
UCS-A /org/server-inherit-policy* # commit-buffer
UCS-A /org/server-inherit-policy #
```

Deleting a Server Inheritance Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **delete server-inherit-policy** *policy-name*	Deletes the specified server inheritance policy.
Step 3	UCS-A /org # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the server inheritance policy named InheritEngineering and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # delete server-inherit-policy InheritEngineering
UCS-A /org* # commit-buffer
UCS-A /org #
```

Configuring Server Pool Policies

Server Pool Policy

This policy is invoked during the server discovery process. It determines what happens if server pool policy qualifications match a server to the target pool specified in the policy.

If a server qualifies for more than one pool and those pools have server pool policies, the server is added to all those pools.

Configuring a Server Pool Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **create pooling-policy** *policy-name*	Creates a server pool policy with the specified name, and enters organization pooling policy mode.

	Command or Action	Purpose
Step 3	UCS-A /org/pooling-policy # **set descr** *description*	(Optional) Provides a description for the server pool policy. **Note** If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any **show** command output.
Step 4	UCS-A /org/pooling-policy # **set pool** *pool-distinguished-name*	Specifies the server pool to use with the server pool policy. You must specify the full distinguished name for the pool.
Step 5	UCS-A /org/pooling-policy # **set qualifier** *qualifier-name*	Specifies the server pool qualifier to use with the server pool policy.
Step 6	UCS-A /org/pooling-policy # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates a server pool policy named ServerPoolPolicy4 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # create pooling-policy ServerPoolPolicy4
UCS-A /org/pooling-policy* # set pool org-root/compute-pool-pool3
UCS-A /org/pooling-policy* # set qualifier ServPoolQual8
UCS-A /org/pooling-policy* # commit-buffer
UCS-A /org/pooling-policy #
```

Deleting a Server Pool Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name*.
Step 2	UCS-A /org # **delete pooling-policy** *policy-name*	Deletes the specified server pool policy.
Step 3	UCS-A /org # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the server pool policy named ServerPoolPolicy4 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # delete pooling-policy ServerPoolPolicy4
UCS-A /org/pooling-policy* # commit-buffer
UCS-A /org/pooling-policy #
```

Configuring Server Pool Policy Qualifications

Server Pool Policy Qualifications

This policy qualifies servers based on the inventory of a server conducted during the discovery process. The qualifications are individual rules that you configure in the policy to determine whether a server meets the selection criteria. For example, you can create a rule that specifies the minimum memory capacity for servers in a data center pool.

Qualifications are used in other policies to place servers, not just by the server pool policies. For example, if a server meets the criteria in a qualification policy, it can be added to one or more server pools or have a service profile automatically associated with it.

You can use the server pool policy qualifications to qualify servers according to the following criteria:

- Adapter type
- Chassis location
- Memory type and configuration
- Power group
- CPU cores, type, and configuration
- Storage configuration and capacity
- Server model

Depending upon the implementation, you may configure several policies with server pool policy qualifications including the following:

- Autoconfiguration policy
- Chassis discovery policy
- Server discovery policy
- Server inheritance policy
- Server pool policy

Creating a Server Pool Policy Qualification

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .

	Command or Action	Purpose
Step 2	UCS-A /org # **create server-qual** *server-qual-name*	Creates a server pool qualification with the specified name, and enters organization server qualification mode.
Step 3	UCS-A /org/server-qual # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates a server pool qualification named ServPoolQual22 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # create server-qual ServPoolQual22
UCS-A /org/server-qual* # commit-buffer
UCS-A /org/server-qual #
```

What to Do Next

Configure one or more of the following server component qualifications:

- Adapter qualification
- Chassis qualification
- Memory qualification
- Power group qualification
- Processor qualification
- Storage qualification

Deleting a Server Pool Policy Qualification

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **delete server-qual** *server-qual-name*	Deletes the specified server pool qualification.
Step 3	UCS-A /org/server-qual # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the server pool qualification named ServPoolQual22 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # delete server-qual ServPoolQual22
```

```
UCS-A /org* # commit-buffer
UCS-A /org #
```

Creating an Adapter Qualification

Before You Begin

Create a server pool policy qualification.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **create adapter**	Creates an adapter qualification and enters organization server qualification adapter mode.
Step 4	UCS-A /org/server-qual/adapter # **create cap-qual** *adapter-type*	Creates an adapter capacity qualification for the specified adapter type and enters organization server qualification adapter capacity qualification mode. The *adapter-type* argument can be any of the following values: • **fcoe** —Fibre Channel over Ethernet • **non-virtualized-eth-if** —Non-virtualized Ethernet interface • **non-virtualized-fc-if** —Non-virtualized Fibre Channel interface • **path-encap-consolidated** —Path encapsulation consolidated • **path-encap-virtual** —Path encapsulation virtual • **protected-eth-if** —Protected Ethernet interface • **protected-fc-if** —Protected Fibre Channel interface • **protected-fcoe** —Protected Fibre Channel over Ethernet • **virtualized-eth-if** —Virtualized Ethernet interface • **virtualized-fc-if** —Virtualized Fibre Channel interface • **virtualized-scsi-if** —Virtualized SCSI interface
Step 5	UCS-A /org/server-qual/adapter/cap-qual # **set maximum** {*max-cap* | **unspecified**}	Specifies the maximum capacity for the selected adapter type.

	Command or Action	Purpose
Step 6	UCS-A /org/server-qual/adapter/cap-qual # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates and configures an adapter qualification for a non-virtualized Ethernet interface and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # create adapter
UCS-A /org/server-qual/adapter* # create cap-qual non-virtualized-eth-if
UCS-A /org/server-qual/adapter/cap-qual* # set maximum 2500000000
UCS-A /org/server-qual/adapter/cap-qual* # commit-buffer
UCS-A /org/server-qual/adapter/cap-qual #
```

Deleting an Adapter Qualification

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **delete adapter**	Deletes the adapter qualification from the server pool policy qualification.
Step 4	UCS-A /org/server-qual # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the adapter qualification from the server pool policy qualification named ServPoolQual22 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # delete adapter
UCS-A /org/server-qual* # commit-buffer
UCS-A /org/server-qual #
```

Configuring a Chassis Qualification

Before You Begin

Create a server pool policy qualification.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **create chassis** *min-chassis-num max-chassis-num*	Creates a chassis qualification for the specified chassis range and enters organization server qualification chassis mode.
Step 4	UCS-A /org/server-qual/chassis # **create slot** *min-slot-num max-slot-num*	Creates a chassis slot qualification for the specified slot range and enters organization server qualification chassis slot mode.
Step 5	UCS-A /org/server-qual/chassis/slot # **commit-buffer**	Commits the transaction to the system configuration.

The following example configures a chassis qualification for slots 1 to 4 on chassis 1 and 2 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # scope server-qual ServPoolQual22
UCS-A /org/server-qual* # create chassis 1 2
UCS-A /org/server-qual/chassis* # create slot 1 4
UCS-A /org/server-qual/chassis/slot* # commit-buffer
UCS-A /org/server-qual/chassis/slot #
```

Deleting a Chassis Qualification

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **delete chassis** *min-chassis-num max-chassis-num*	Deletes the chassis qualification for the specified chassis range.
Step 4	UCS-A /org/server-qual # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the chassis qualification for chassis 1 and 2 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # delete chassis 1 2
UCS-A /org/server-qual* # commit-buffer
UCS-A /org/server-qual #
```

Creating a CPU Qualification

Before You Begin

Create a server pool policy qualification.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **create cpu**	Creates a CPU qualification and enters organization server qualification processor mode.
Step 4	UCS-A /org/server-qual/cpu # **set arch** {**any** | **dual-core-opteron** | **intel-p4-c** | **opteron** | **pentium-4** | **turion-64** | **xeon** | **xeon-mp**}	Specifies the processor architecture type.
Step 5	UCS-A /org/server-qual/cpu # **set maxcores** {*max-core-num* | **unspecified**}	Specifies the maximum number of processor cores.
Step 6	UCS-A /org/server-qual/cpu # **set mincores** {*min-core-num* | **unspecified**}	Specifies the minimum number of processor cores.
Step 7	UCS-A /org/server-qual/cpu # **set maxprocs** {*max-proc-num* | **unspecified**}	Specifies the maximum number of processors.
Step 8	UCS-A /org/server-qual/cpu # **set minprocs** {*min-proc-num* | **unspecified**}	Specifies the minimum number of processors.
Step 9	UCS-A /org/server-qual/cpu # **set maxthreads** {*max-thread-num* | **unspecified**}	Specifies the maximum number of threads.
Step 10	UCS-A /org/server-qual/cpu # **set minthreads** {*min-thread-num* | **unspecified**}	Specifies the minimum number of threads.
Step 11	UCS-A /org/server-qual/cpu # **set stepping** {*step-num* | **unspecified**}	Specifies the processor stepping number.

	Command or Action	Purpose
Step 12	UCS-A /org/server-qual/cpu # **set model-regex** *regex*	Specifies a regular expression that the processor name must match.
Step 13	UCS-A /org/server-qual/cpu # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates and configures a CPU qualification and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # create processor
UCS-A /org/server-qual/cpu* # set arch xeon
UCS-A /org/server-qual/cpu* # set maxcores 8
UCS-A /org/server-qual/cpu* # set mincores 4
UCS-A /org/server-qual/cpu* # set maxprocs 2
UCS-A /org/server-qual/cpu* # set minprocs 1
UCS-A /org/server-qual/cpu* # set maxthreads 16
UCS-A /org/server-qual/cpu* # set minthreads 8
UCS-A /org/server-qual/cpu* # set stepping 5
UCS-A /org/server-qual/cpu* # commit-buffer
UCS-A /org/server-qual/cpu #
```

Deleting a CPU Qualification

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **delete cpu**	Deletes the processor qualification.
Step 4	UCS-A /org/server-qual # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the processor qualification and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # delete cpu
UCS-A /org/server-qual* # commit-buffer
UCS-A /org/server-qual #
```

Creating a Power Group Qualification

Before You Begin

Create a server pool policy qualification.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **create power-group** *power-group-name*	Creates a power group qualification for the specified power group name.
Step 4	UCS-A /org/server-qual # **commit-buffer**	Commits the transaction to the system configuration.

The following example configures a power group qualification for a power group called powergroup1 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # create power-group powergroup1
UCS-A /org/server-qual* # commit-buffer
UCS-A /org/server-qual #
```

Deleting a Power Group Qualification

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **delete power-group** *power-group-name*	Deletes the specified power group qualification.
Step 4	UCS-A /org/server-qual # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes a power group qualification for a power group called powergroup1 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # delete power-group powergroup1
UCS-A /org/server-qual* # commit-buffer
UCS-A /org/server-qual #
```

Creating a Memory Qualification

Before You Begin

Create a server pool policy qualification.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **create memory**	Creates a memory qualification and enters organization server qualification memory mode.
Step 4	UCS-A /org/server-qual/memory # **set clock** {*clock-num* | **unspec**}	Specifies the memory clock speed.
Step 5	UCS-A /org/server-qual/memory # **set maxcap** {*max-cap-num* | **unspec**}	Specifies the maximum capacity of the memory array.
Step 6	UCS-A /org/server-qual/memory # **set mincap** {*min-cap-num* | **unspec**}	Specifies the minimum capacity of the memory array.
Step 7	UCS-A /org/server-qual/memory # **set speed** {*speed-num* | **unspec**}	Specifies the memory data rate.
Step 8	UCS-A /org/server-qual/memory # **set units** {*unit-num* | **unspec**}	Specifies the number of memory units (DRAM chips mounted to the memory board).
Step 9	UCS-A /org/server-qual/memory # **set width** {*width-num* | **unspec**}	Specifies the bit width of the data bus.
Step 10	UCS-A /org/server-qual/memory # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates and configures a memory qualification and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # create memory
UCS-A /org/server-qual/memory* # set clock 1067
UCS-A /org/server-qual/memory* # set maxcap 4096
UCS-A /org/server-qual/memory* # set mincap 2048
UCS-A /org/server-qual/memory* # set speed unspec
UCS-A /org/server-qual/memory* # set units 16
UCS-A /org/server-qual/memory* # set width 64
UCS-A /org/server-qual/memory* # commit-buffer
UCS-A /org/server-qual/memory #
```

Deleting a Memory Qualification

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **delete memory**	Deletes the memory qualification.
Step 4	UCS-A /org/server-qual # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the memory qualification and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # delete memory
UCS-A /org/server-qual* # commit-buffer
UCS-A /org/server-qual #
```

Creating a Physical Qualification

Before You Begin

Create a server pool policy qualification.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **create physical-qual**	Creates a physical qualification and enters organization server qualification physical mode.
Step 4	UCS-A /org/server-qual/physical-qual # **set model-regex** *regex*	Specifies a regular expression that the model name must match.
Step 5	UCS-A /org/server-qual/physical-qual # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates and configures a physical qualification and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # create physical-qual
UCS-A /org/server-qual/physical-qual* # set model-regex
UCS-A /org/server-qual/physical-qual* # commit-buffer
UCS-A /org/server-qual/physical-qual #
```

Deleting a Physical Qualification

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **delete physical-qual**	Deletes the physical qualification.
Step 4	UCS-A /org/server-qual # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes a physical qualification and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
```

```
UCS-A /org/server-qual # delete physical-qual
UCS-A /org/server-qual* # commit-buffer
UCS-A /org/server-qual #
```

Creating a Storage Qualification

Before You Begin

Create a server pool policy qualification.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **create storage**	Creates a storage qualification and enters organization server qualification storage mode.
Step 4	UCS-A /org/server-qual/storage # **set blocksize** {*block-size-num* | **unspecified**}	Specifies the storage block size.
Step 5	UCS-A /org/server-qual/storage # **set maxcap** {*max-cap-num* | **unspecified**}	Specifies the maximum capacity of the storage array.
Step 6	UCS-A /org/server-qual/storage # **set mincap** {*min-cap-num* | **unspecified**}	Specifies the minimum capacity of the storage array.
Step 7	UCS-A /org/server-qual/storage # **set numberofblocks** {*block-num* | **unspecified**}	Specifies the number of blocks.
Step 8	UCS-A /org/server-qual/storage # **set perdiskcap** {*disk-cap-num* | **unspecified**}	Specifies the per-disk capacity.
Step 9	UCS-A /org/server-qual/storage # **set units** {*unit-num* | **unspecified**}	Specifies the number of storage units.
Step 10	UCS-A /org/server-qual/storage # **commit-buffer**	Commits the transaction to the system configuration.

The following example creates and configures a storage qualification and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # create storage
UCS-A /org/server-qual/storage* # set blocksize 512
UCS-A /org/server-qual/storage* # set maxcap 420000
UCS-A /org/server-qual/storage* # set mincap 140000
UCS-A /org/server-qual/storage* # set numberofblocks 287277984
```

```
UCS-A /org/server-qual/storage* # set perdiskcap 140000
UCS-A /org/server-qual/storage* # set units 1
UCS-A /org/server-qual/storage* # commit-buffer
UCS-A /org/server-qual/storage #
```

Deleting a Storage Qualification

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope server-qual** *server-qual-name*	Enters organization server qualification mode for the specified server pool policy qualification.
Step 3	UCS-A /org/server-qual # **delete storage**	Deletes the storage qualification.
Step 4	UCS-A /org/server-qual/ # **commit-buffer**	Commits the transaction to the system configuration.

The following example deletes the storage qualification and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope server-qual ServPoolQual22
UCS-A /org/server-qual # delete storage
UCS-A /org/server-qual* # commit-buffer
UCS-A /org/server-qual #
```

Configuring vNIC/vHBA Placement Policies

vNIC/vHBA Placement Policies

vNIC/vHBA placement policies are used to determine what types of vNICs or vHBAs can be assigned to the physical adapters on a server. Each vNIC/vHBA placement policy contains four virtual network interface connections (vCons) that are virtual representations of the physical adapters. When a vNIC/vHBA placement policy is assigned to a service profile, and the service profile is associated with a server, the vCons in the vNIC/vHBA placement policy are assigned to the physical adapters.

If you do not include a vNIC/vHBA placement policy in the service profile or you use the default configuration for a server with two adapters, Cisco UCS Manager defaults to the **All** configuration and equally distributes the vNICs and vHBAs between the adapters.

You can use this policy to assign vNICs or vHBAs to either of the two vCons. Cisco UCS Manager uses the vCon assignment to determine how to assign the vNICs and vHBAs to the physical adapter during service profile association.

- **all**—All configured vNICs and vHBAs can be assigned to the vCon, whether they are explicitly assigned to it, unassigned, or dynamic.
- **assigned-only**—vNICs and vHBAs must be explicitly assigned to the vCon. You can assign them explicitly through the service profile or the properties of the vNIC or vHBA.
- **exclude-dynamic**—Dynamic vNICs and vHBAs cannot be assigned to the vCon. The vCon can be used for all static vNICs and vHBAs, whether they are unassigned or explicitly assigned to it.
- **exclude-unassigned**—Unassigned vNICs and vHBAs cannot be assigned to the vCon. The vCon can be used for dynamic vNICs and vHBAs and for static vNICs and vHBAs that are explicitly assigned to it.

vCon to Adapter Placement

Cisco UCS Manager maps every vCon in a service profile to a physical adapter on the server. How that mapping occurs and how the vCons are assigned to a specific adapter in a server with two adapters depends upon the type of server. You must consider this placement when you configure the vNIC/vHBA placement policy to assign vNICs and vHBAs to vCons.

Note vCon to adapter placement is not dependent upon the PCIE slot number of the adapter. The adapter numbers used for the purpose of vCon placement are not the PCIE slot numbers of the adapters, but the ID assigned to them during server discovery.

vCon to Adapter Placement for N20-B6620-2 and N20-B6625-2 Blade Servers

In these blade servers, the adapters are numbered left to right, but vCons are numbered right to left. If the server has a single adapter, all vCons are assigned to that adapter. However, if the server has two adapters, the vCons are assigned to the adapters in reverse order, as follows:

- Adapter1 is assigned vCon2 and vCon4
- Adapter2 is assigned vCon1 and vCon3

vCon to Adapter Placement for All Other Supported Servers

For all other servers supported by Cisco UCS, the vCon assignment depends upon the number of adapters in the server, as follows:

Table 1: vCon to Adapter Placement by Number of Adapters in Server

Number of Adapters	vCon1 Assignment	vCon2 Assignment	vCon3 Assignment	vCon4 Assignment
1	Adapter1	Adapter1	Adapter1	Adapter1
2	Adapter1	Adapter2	Adapter1	Adapter2
3	Adapter1	Adapter2	Adapter3	Adapter2
4	Adapter1	Adapter2	Adapter3	Adapter4

vNIC/vHBA to vCon Assignment

Cisco UCS Manager provides two options for assigning vNICs and vHBAs to vCons through the vNIC/vHBA placement policy: explicit assignment and implicit assignment.

Explicit Assignment of vNICs and vHBAs

With explicit assignment, you specify the vCon and, therefore, the adapter to which a vNIC or vHBA is assigned. Use this assignment option when you need to determine how the vNICs and vHBAs are distributed between the adapters on a server.

To configure a vCon and the associated vNICs and vHBAs for explicit assignment, do the following:

- Set the vCon configuration to **Assigned Only**, **Exclude Dynamic**, or **Exclude Unassigned**. You can configure the vCons through a vNIC/vHBA placement policy or in the service profile associated with the server. If a vCon is configured for **All**, you can still explicitly assign a vNIC or vHBA to that vCon.
- Assign the vNICs and vHBAs to a vCon. You can make this assignment through the Virtual Host Interface Placement properties of the vNIC or vHBA or in the service profile associated with the server.

If you attempt to assign a vNIC or vHBA to a vCon that is not configured for that type of vNIC or vHBA, Cisco UCS Manager displays a message box to advise you of the configuration error.

During service profile association, Cisco UCS Manager validates the configured placement of the vNICs and vHBAs against the number and capabilities of the physical adapters in the server before assigning the vNICs and vHBAs according to the configuration in the policy. Load distribution is based upon the explicit assignments to the vCons and adapters configured in this policy.

If the adapters do not support the assignment of one or more vNICs or vHBAs, Cisco UCS Manager raises a fault against the service profile.

Note vCon to adapter assignment occurs in a round-robin order. This order means that vNICs are placed on the adapters in the following order: vnic-1, vnic-3, vnic-2, vnic-4. As a result, under the following circumstances, the PCIE order of vNICs can be different than the explicit assignment configured in Cisco UCS Manager:

- In a server with two adapters, vNICs are explicitly assigned to all four vCons.
- A service profile that includes explicit assignment is migrated from a server with a higher number of adapters to one with a lower number of adapters.

Implicit Assignment of vNICs and vHBAs

With implicit assignment, Cisco UCS Manager determines the vCon and, therefore, the adapter to which a vNIC or vHBA is assigned according to the capability of the adapter. Use this assignment option if the adaptor to which a vNIC or vHBA is assigned is not important to your system configuration.

To configure a vCon for implicit assignment, do the following:

- Set the vCon configuration to **All**. You can configure the vCons through a vNIC/vHBA placement policy or in the service profile associated with the server.
- Do not assign any vNICs or vHBAs to a vCon.

During service profile association, Cisco UCS Manager verifies the number and capabilities of the physical adapters in the server and assigns the vNICs and vHBAs accordingly. Load distribution is based upon the capabilities of the adapters, and placement of the vNICs and vHBAs is performed according to the actual order determined by the system. For example, if one adapter can accommodate more vNICs than another, that adapter is assigned more vNICs.

If the adapters cannot support the number of vNICs and vHBAs configured for that server, Cisco UCS Manager raises a fault against the service profile.

Configuring a vNIC/vHBA Placement Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **create vcon-policy** *policy-name*	Creates the specified vNIC/vHBA placement profile and enters organization vcon policy mode.
Step 3	UCS-A /org/vcon-policy # **set descr** *description*	(Optional) Provides a description for the vNIC/vHBA Placement Profile. **Note** If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any **show** command output.
Step 4	UCS-A /org/vcon-policy # **set vcon** {**1** | **2**} **selection** {**all** | **assigned-only** | **exclude-dynamic** | **exclude-unassigned**}	Specifies the selection preference for the specified vCon.
Step 5	UCS-A /org/vcon-policy # **commit-buffer**	Commits the transaction.

The following example creates a vNIC/vHBA placement policy named Adapter1All, places all vNICs and vHBAs on adapter 1, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # create vcon-policy Adapter1
UCS-A /org/vcon-policy* # set descr "This profile places all vNICs and vHBAs on adapter 1."
UCS-A /org/vcon-policy* # set vcon 1 selection all
```

```
UCS-A /org/vcon-policy* # commit-buffer
UCS-A /org/vcon-policy* #
UCS-A /org #
```

Deleting a vNIC/vHBA Placement Policy

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the specified organization. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **delete vcon-policy** *policy-name*	Deletes the specified vNIC/vHBA placement profile.
Step 3	UCS-A /org # **commit-buffer**	Commits the transaction.

The following example deletes the vNIC/vHBA placement profile named Adapter1All and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # delete vcon-policy Adapter1All
UCS-A /org* # commit-buffer
UCS-A /org #
```

Explicitly Assigning a vNIC to a vCon

Before You Begin

Configure the vCons through a vNIC/vHBA placement policy or in the service profile with one of the following values:

- **Assigned Only**
- **Exclude Dynamic**
- **Exclude Unassigned**

If a vCon is configured for **All**, you can still explicitly assign a vNIC or vHBA to that vCon. However, you have less control with this configuration.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the organization which contains the service profile whose vNICs you want to explicitly assign to a vCon. To enter the root organization mode, type / as the *org-name* .

	Command or Action	Purpose
Step 2	UCS-A /org # **scope service-profile** *profile-name*	Enters organization service profile mode for the specified service.
Step 3	UCS-A /org/service-profile # **scope vnic** *vnic-name*	Enters organization service profile mode for the specified vnic.
Step 4	UCS-A /org/service-profile/vnic # **set vcon** {**1** | **2** | **3** | **4** | **any**}	Sets the virtual network interface connection (vCon) placement for the specified vNIC. Entering a value of any allows Cisco UCS Manager to determine the vCon to which the vNIC is assigned.
Step 5	UCS-A /org/service-profile/vnic # **set order** {*order-num* | **unspecified**}	Specifies the desired PCI order for the vNIC. Valid values include 0-128 and unspecified.
Step 6	UCS-A /org/service-profile/vnic # **commit-buffer**	Commits the transaction to the system configuration.

The following example sets the vCon placement for a vNIC called vnic3 to 2, sets the desired order to 10, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope service-profile accounting
UCS-A /org/service-profile # scope vnic vnic3
UCS-A /org/service-profile/vnic # set vcon 2
UCS-A /org/service-profile/vnic* # set order 10
UCS-A /org/service-profile/vnic* # commit-buffer
UCS-A /org/service-profile/vnic #
```

Explicitly Assigning a vHBA to a vCon

Before You Begin

Configure the vCons through a vNIC/vHBA placement policy or in the service profile with one of the following values:

- **Assigned Only**
- **Exclude Dynamic**
- **Exclude Unassigned**

If a vCon is configured for **All**, you can still explicitly assign a vNIC or vHBA to that vCon. However, you have less control with this configuration.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# **scope org** *org-name*	Enters organization mode for the organization which contains the service profile whose vHBAs you want to

	Command or Action	Purpose
		explicitly assign to a vCon. To enter the root organization mode, type / as the *org-name* .
Step 2	UCS-A /org # **scope service-profile** *profile-name*	Enters organization service profile mode for the specified service.
Step 3	UCS-A /org/service-profile # **scope vhba** *vhba-name*	Enters organization service profile mode for the specified vHBA.
Step 4	UCS-A /org/service-profile/vhba # **set vcon** {**1** | **2** | **3** | **4** | **any**}	Sets the virtual network interface connection (vCon) placement for the specified vHBA. Entering a value of any allows Cisco UCS Manager to determine the vCon to which the vHBA is assigned.
Step 5	UCS-A /org/service-profile/vhba # **set order** {*order-num* | **unspecified**}	Specifies the desired PCI order for the vHBA. Valid desired order number values include 0-128 and unspecified.
Step 6	UCS-A /org/service-profile/vhba # **commit-buffer**	Commits the transaction to the system configuration.

The following example sets the vCon placement for a vHBA called vhba3 to 2, sets the desired order to 10, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope service-profile accounting
UCS-A /org/service-profile # scope vhba vhba3
UCS-A /org/service-profile/vhba # set vcon 2
UCS-A /org/service-profile/vhba* # set order 10
UCS-A /org/service-profile/vhba* # commit-buffer
UCS-A /org/service-profile/vhba #
```