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Configuring the BIOS

We now need to configure the BIOS of the server motherboard.

You can do this via a keyboard and monitor attached to the server or through IPMI as outlined in a previous section.

The settings and screen shots are all taken from a Supermicro X10SRH-CLN4F, but most are applicable to most server motherboards (I would imagine).

Getting Into Your BIOS

In order to gain access to the motherboard's BIOS the user is required to press a certain key at a certain point in time (usually as the POST messages are displayed).

Consult your motherboard documentation to find out how to gain access to your motherboard's BIOS.

On Fester's motherboard it is done by pressing the "DEL" key at a specific point.

Incidentally, motherboards usually display a screen at some point during the POST process that tells you what key to press, something like this.





When you have access to the BIOS it's time to configure it.

Most BIOS settings are navigated using the " $\leftarrow \rightarrow \uparrow \downarrow$ " keys.

BIOS Settings

Quiet Boot

This setting is entirely optional.

It determines if POST messages are displayed on screen or a graphic logo (so the POST messages are hidden from view) when you first turn on the server. Fester likes to see the POST messages so I disabled this function.

Navigate to the "Advanced" page.

🛓 Java iKVM Viewer v1.69.25 [192.168.0.2] TestServer - Resolution 800 X 600 - FPS 29		
Virtual Media Record Macro	Options User List Capture Power Control Exit	
Aptio Setu Main Advanced Event L	up Utility – Copyright (C) 2015 American Me Logs IPMI Security Boot Save & Exit	egatrends, Inc.
System Date System Time		Set the Date. Use Tab to switch between Date elements.
Supermicro X10SRH-CLN4F BIOS Version Build Date	1.0c 09/14/2015	
Memory Information Total Memory	16384 MB	++: Select Screen †↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values
Memory Speed	1867 MT/s	F3: Optimized Defaults F4: Save & Exit ESC: Exit
version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.		

Select the submenu "Boot Feature".

🍰 Java iKVM Viewer v1.69.25 [192.168.0.2] TestServer - Resolution 800 X 600 - FPS 30			
Virtual Media Record Macro Options User List Capture Power Control Exit			
Aptio Setup Utility – Copyright (C) 2015 American Megatrends, Inc. Main <mark>Advanced</mark> Event Logs IPMI Security Boot Save & Exit			
 Boot Feature UPU configuration Chipset Configuration SATA Configuration SSATA Configuration Server ME Configuration PCIE/PCI/PNP Configuration Super ID Configuration Serial Port Console Redirection ACPI Settings 	Boot Feature Configuration Page ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help E2: Previous Values		
	F3: Optimized Defaults F4: Save & Exit ESC: Exit		
Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.			

Now go to "Quiet Boot" and select "Disabled".



Watch Dog Function

Remain in the "Advanced \rightarrow Boot Feature" page and select "Watch Dog Function".

The watch dog function serves to reboot the server if it experiences an error it cannot recover from (and so hangs) for more than 5 minutes. It works by starting a 5 minute count-down timer when the server hangs. When this timer reaches zero the system is forced to reboot.

When I first tried this in FreeNAS it caused my system to spontaneously reboot every 5 minutes even though the system was not hanging, so I disabled it.



AES-NI Encryption

If you intend to encrypt the information on your storage drives then you need to enable this in the BIOS.

This can be useful as it allows a failing HDD in a vdev to be discarded without worrying about wiping the information before disposal.

Go to the "Advanced" page.



Now navigate to "CPU Configurtion".

🛓 Java iKVM Viewer v1.69.25 [192.168.0.2] TestServer - Resolution 800 X 600 - FPS 30		
Virtual Media Record Macro Options User List Capture Power Control Exit		
Aptio Setup Utility – Copyright (C) 2015 American M Main Advanced Event Logs IPMI Security Boot Save & Exit	egatrends, Inc.	
 Boot Epsture CPU Configuration Chipset configuration SATA Configuration SSATA Configuration Server ME Configuration PCIe/PCI/PnP Configuration Super IO Configuration Serial Port Console Redirection ACPI Settings 	Boot Feature Configuration Page	
	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>	
Version 2.17.1245. Copyright (C) 2015 American Meg	atrends, Inc.	

Then scroll down (it is towards the bottom) to "AES-NI" and select "Enable".

🛓 Java iKVM Viewer v1.69.25 [192.168.0	.2] TestServer - Resolution 800 X 600 - FP	S 28
Virtual Media Record Macro Options	User List Capture Power Control Exit	
Aptio Setup Util Advanced	ity – Copyright (C) 2015 American	Megatrends, Inc.
Processor Frequency Processor Max Ratio Processor Min Ratio Microcode Revision L1 Cache RAM L2 Cache RAM L3 Cache RAM CPU1 Version	2.400GHz 18H 0CH 00000036 384KB 1536KB 15360KB Intel(R) Xeon(R) CPU H 5-2620 v3 @ 2.40GHz	Enable/Disable Processor Advanced Encryption Standard (AES) feature
Clock Spread Spectrum Hyper-Threading (ALL) Cores Enabled Execute Disable Bit PPIN Control Hardware Prefetcher Adjacent Cache Prefetch DCU Streamer Prefetcher DCU IP Prefetcher Direct Cache Access (DCA) X2APIC AES-NI Intel Virtualization Technolog Advanced Power Management Conf	[Disabled] [Enable] O [Enable] [Unlock/Enable] [Enable] [Enable] [Enable] [Auto] [Disable] [Enable] [Enable] [Enable] [Enable] [Enable] [Enable]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults ▼ F4: Save & Exit ESC: Exit</pre>
Version 2.17.12	45. Copyright (C) 2015 American M	egatrends, Inc.

AHCI SATA Configuration

There are certain advantages to putting the SATA controller in AHCI mode. By enabling this option any SATA devices connected to the SATA ports on the motherboard will operate in AHCI mode.

Go to the "Advanced" page.



Now select "SATA Configuration" from the submenu.

Java iKVM Viewer v1.69.25 [192.168.0.2] TestServer - Resolution 800 X 600 - FPS	30 🗖 🗖 🗙	
Virtual Media Record Macro Options User List Capture Power Control Exit		
Aptio Setup Utility – Copyright (C) 2015 American M Main Advanced Event Logs IPMI Security Boot Save & Exit	Megatrends, Inc.	
 Boot Feature CPU Configuration Chipset Configuration SATA Configuration SSATA configuration Server ME Configuration PCIe/PCI/PnP Configuration Super IO Configuration Serial Port Console Redirection ACPI Settings 	Boot Feature Configuration Page	
	<pre>++: Select Screen f4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>	
Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.		

Now navigate to "Configure SATA as" and select "AHCI" from the options.

Virtual Media Record Macro Options User List Capture Power Control Exit Aptio Setup Utility Copyright (C) 2015 American Megatrends, Inc. Advanced Advanced This will configure SATA as This will configure SATA as SATA Controller [Enabled] This will configure SATA as Support Aggressive Link Power Mgmt Imabled] Imabled] SATA Port 0 Samsung SSD 85 - 256.0 Port 0 Hot Plug Imabled] Port 0 Hot Plug Imabled] Imabled] Port 0 SATA Device Imabled] Port 1 Spin Up Device Imabled] Imabled] Port 1 SATA Device Type Imabled] Port 1 SATA Device Type Imabled] Imabled] Imabled] Imabled] Port 1 Spin Up Device Imabled] Imabled] Imabled] Imabled] Imabled] Port 1 SATA Device Type Imabled] Imabled] Imabled] Imabled] Imabled] Port 1 SATA Device Type Imabled] Imabled] Imabled] Imabled] Imabled] SATA Port 2 Imabled	🏄 Java iKVM Viewer v1.69.25 [192.168.0.2] TestServer - Resolution 800 X 600 - FPS 30				
Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc. Advanced SATA Configuration SATA Controller SATA Controller Configure SATA as Support Aggressive Link Power Mgmt IEnabled] SATA Port 0 Samsung SSD 85 - 256.0 Port 0 Hot Plug Port 0 Spin Up Device [Disabled] Port 0 SATA Device Type [Solid State Drive] SATA Port 1 Port 1 Hot Plug Port 1 Spin Up Device [Disabled] Port 1 Spin Up Device [Disabled] Port 1 SATA Device Type [Hard Disk Drive] SATA Port 2 [Not Installed] [Sata Port 2 [Sata	Virtual Media	Record Macro	Options User L	ist Capture Power Control Exit	
SATA Configuration	A	Aptio Se advanced	tup Utility –	Copyright (C) 2015 American	Megatrends, Inc.
SATA Controller [Enabled] Configure SATA as [AHCI] Support Aggressive Link Power Mgmt [Enabled] SATA Port 0 Samsung SSD 85 - 256.0 Port 0 Hot Plug [Enabled] Port 0 Hot Plug [Enabled] Port 0 Spin Up Device [Disabled] Port 0 SATA Device Type [Solid State Drive] SATA Port 1 [Not Installed] Port 1 SaTA Device Type [Hard Disk Drive] SATA Port 2 [Not Installed]	SATA Con	figuration			▲ This will configure SATA as
SATA Port 0Samsung SSD 85 - 256.0Port 0 Hot Plug[Enabled]Port 0 Spin Up Device[Disabled]Port 0 SATA Device Type[Solid State Drive]SATA Port 1[Not Installed]Port 1 Hot Plug[Enabled]Port 1 Spin Up Device[Disabled]Port 1 SATA Device Type[Hard Disk Drive]SATA Port 2[Not Installed]	SATA Con Configur Support	ntroller ne SATA as Aggressive Lin	k Power Mgmt	[Enabled] [AHCI] [Enabled]	IDE, RAID OF AHCI.
	SATA Port Port 0 Port 0 Port 0 SATA Port Port 1 Port 1 SATA Port SATA Port	et 0 9 Hot Plug 9 Spin Up Devic 9 SATA Device T et 1 1 Hot Plug 1 Spin Up Devic 1 SATA Device T et 2	e ype	Samsung SSD 85 - 256.0 [Enabled] [Disabled] [Solid State Drive] [Not Installed] [Enabled] [Disabled] [Hard Disk Drive] [Not Installed]	
Port 2 Hot Plug[Enabled]Port 2 Spin Up Device[Disabled]Port 2 SATA Device Type[Hard Disk Drive]SATA Port 3[Not Installed]Port 3 Hot Plug[Enabled]Port 3 Spin Up Device[Disabled]Port 3 SATA Device Type[Hard Disk Drive]Port 3 SATA Device Type[Hard Disk Drive]SATA Port 4[Not Installed]Port 4 Hot Plug[Enabled]Port 4 Spin Up Device[Disabled]Port 4 Spin Up Device[Disabled]	Port 2 Port 2 Port 2 SATA Por Port 3 Port 3 Port 3 SATA Por Port 4 Port 4	2 Hot Plug 2 Spin Up Devic 2 SATA Device T 3 Hot Plug 3 Spin Up Devic 3 SATA Device T 4 Hot Plug 4 Hot Plug 4 Spin Up Devic	e ype ype	[Enabled] [Disabled] [Hard Disk Drive] [Not Installed] [Enabled] [Hard Disk Drive] [Not Installed] [Enabled] [Disabled]	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults </pre> <pre> • F4: Save & Exit</pre>

IPMI Configuration

Boot Order Configuration

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