# **Quantum Smart NVR**

Software Initial Configuration Guide Part Number: 6-69043-01 Rev A



# Quantum Smart NVR Software Initial Configuration Guide

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### **Requirements and Prerequisites**

This section describes the requirements and prerequisites required before starting the Smart Network Video Recorder (NVR) server installation.

If you have sized the server using the Quantum sizing tools, or as a pre-sales activity, the following physical configuration requirements are not necessary to review. If, however, the system is to be installed using a software-only method (that is, purchased the Smart-NVR .iso from Quantum directly), you should review the <u>Physical Server Requirements</u>.

### **Physical Server Requirements**

The following minimums must be met before installation. Performance can vary depending on the selected hardware components. You should consult your Sales Associate, or Pre-Sales Engineer, for proper sizing.

Component	Quantity
CPU	Minimum of six cores.
RAM	Minimum of 32GB.
Boot Disks	2x mixed use (3DWPD) SSDs or M.2s (minimum of 480GB each) in RAID 1. You can use 2x SAS HDDs, but is not recommended for best performance.
Capacity Disks	Count of 4 or more disks, to meet the retention or other storage requirements.
RAID on Data Disks <i>Note:</i> After 12 HDDs, counts must be even (that is. 12, 14, 16, 18, and so on)	<ul> <li>3 to 5 HDDs, RAID-5 (n+1)</li> <li>6 to 16 HDDs, RAID-6 (n+2)</li> <li>18+ HDDs, 2 volumes @ 9+ HDDs, RAID-6 (n+2)</li> <li>36 HDDs, 3 volumes @ 12 HDDs, RAID-6 (n+2) To Provide additional ingest levels.</li> <li>60 HDDs, 5 volumes @ 12 HDDs, RAID-6 (n+2) To Provide additional ingest levels.</li> </ul>
NICs	2x or 4x 1Gb; OR 2x or 4x 10Gb

### **BIOS Settings**

Upon first boot, you must confirm that the following items are set in the BIOS. The exact setting name can vary from vendor to vendor, and in some cases from version to version with the same vendor.

- Adjust the BIOS (if not default) to use **Maximum Performance** for CPU. This ensures that the BIOS does not throttle the C States of the processor(s), based on the power saving.
- Validate that **Virtualization Technology** is **Enabled**. This setting, usually under Processor settings guarantees that the virtualization can run.

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### **Network Requirements**

- The Smart-NVR software allows for either an open/flat network for flexible configuration, or a network where VLANs already exist. VLAN configurations require up-front knowledge of the switch setup and tags and could require additional switch modification as necessary.
- You must know the Gateway IP, any DNS IPs, and netmasks that will be used during deployment.
- A network range of 5+ IPs are required, and you should consider the following minimums. Obviously, many more IPs for associated cameras and other network-attached devices should be considered but are outside the scope of this guide.

IP Count Need	Usage
1	Server IP. This IP is used as the dedicated IP for the server and allows for navigation to the Louvre Dashboard for user configuration and monitoring tools.
3	OpenStack internal monitoring instances. These are not dedicated and float within the range based on a customer's specified needs.
1+	An IP for every virtual instance that a customer might want (that is separate instances of the following: A recording server, + a management server + a Mobile server would equal 3 IPs).

### Other Requirements

The following requirements are necessary to continue to the next steps of the system installation. The term Intelligent Platform Management Interface (IPMI) is meant generically, referencing any vendor's implementation (that is iDRAC (Dell), IMM (Lenovo), IPMI (Supermicro), or iLo (HPE), and so on).

- IPMI mountable media with the Smart NVR ISO:
  - This could be a USB (direct connection to the server), or a remote system connected using IPMI that has the appropriate license to allow for virtual media to be connected to the server.
- Keyboard, monitor and mouse to connect and access the server, during BIOS, installation, and powering activities.



### Installing the Smart NVR Software

The Smart NVR software is either pre-installed using a factory process or supplied as licensed .iso software, which has the base OS, as well as the software packages necessary for setting up the Smart NVR.

The following steps describe the Smart NVR software installation.

- <u>Step 1: Booting the server (initial steps)</u>
- <u>Step 2: Configuring, installing, and monitoring the ISO deployment</u>
- <u>Step 3: Configuring the network information</u>
- <u>Step 4: Installing the ISO</u>
- <u>Step 5: Monitoring the ISO deployment</u>
- <u>Step 5b: Adding a . raw image for faster customer deployment</u>
- <u>Step 6: Configuring the Smart NVR</u>
- <u>Step 7: Deploying the Smart NVR</u>



### Step 1: Booting the Server (Initial Steps)

Using pre-provided .iso software, prepare to boot the server.

- 1. Attach the mountable media to the server, and connect using remote IPMI, or KVM (keyboard, video, mouse). You can mount the media using USB, or the .iso via a virtual mount over the IPMI connection.
- 2. Boot the server by pressing the power button on the server or using an IPMI command. If you have not already done so, enter and validate the BIOS settings and then update any RAID configurations not present (see table in <u>Physical Server Requirements</u>), and then reboot.
- 3. During the server boot load, go to the vendor's **BOOT Manager** by pressing the shortcut key given in the options (in below Dell example, F11 is used).





4. Using the boot selector (**One-shot UEFI Boot Menu**, in following screenshot), boot to the appropriate media .iso. This Boot Manager / One-Shot option can vary depending on the server vendor.

Boot Manager Boot Manager Main Menu
Boot Manager Main Menu
Continue Normal Boot
One-shot UEFI Boot Menu
Launch System Setup
Launch Lifecycle Controller
System Utilities
I his selection will take you to the UEH Boot Menu and select an one-shot boot option to boot from.
PowerEdge R740xd Finish

If the one-time boot option using Boot Manager, is not available, you can manually select or change the boot order using the **System Setup > BIOS Settings**.



5. Booting the server from the mounted media (USB or virtual) displays the list of options, as seen in the following screenshot. Using the arrow keys on the keyboard, select the **Install Quantum Smart NVR** option and press **Enter**.





### Step 2: Configuring, Installing, and Monitoring the ISO Deployment.

To configure the ISO installation destination and partitions, complete the following steps:

1. On the **Installation Summary** screen, select **Installation Destination** to specify the partitioning structure of the boot media.





 In the Device Selection section, select the disk(s) where you want the OS installed (hint: RAID 1/Software RAID of 2x M.2 or SSDs for OS install, should be selected not RAID 5 or RAID 6 HDDs, HDDs used with a software RAID, or any other connected devices).

Done	ATION		CENTOS STREAM 8-STREAM INSTALLATION
Device Selection			
Select the device(s) you'd	l like to install to. They	ill be left untouched until you click on t	the main menu's "Begin Installation" button.
ocal Standard Disks			
	7.28 TiB	111.73 GiB	28.9 GiB
DELL PERC H330 Adp	64cd98f0c42c300029a	312b03ea17b8 ATA DELLBOSS V	D Patriot Memory
sda	/ 7.28 TiB fr	sdb / 1.4 MiB fre	e sdc / 28.9 GiB free
Specialized & Network Disk	5		Disks left unselected here will not be toucher
			Disks left unselected here will not be touche
Automatic     Automatic     I would like to make addit     incryption     Encrypt my data. You'll set	Custom ional space available. : a passphrase next.		

**NOTE**: All disks are selected by default, deselect any disks where the OS will not be installed.

If hardware RAID is configured, select only one disk. If you require software RAID, select the 2x M.2/SSD disks for a software RAID 1 to install the OS.

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3. Once the correct disk is selected, Click **Custom** under **Storage Configuration**. Then click **Done**.

INSTALLATION DESTINATION Done		CENTOS STREAM 8-STREAM INSTALLATION
Device Selection		
Select the device(s) you'd like to install to. They will be left untouch	ed until you click on the r	main menu's "Begin Installation" button.
Local Standard Disks		
7.28 TIB	111.73 GiB	28.9 GiB
	<b></b>	
DELL PERC H330 Adp 64cd98f0c42c300029aa812b03ea17b8	ATA DELLBOSS VD	Patriot Memory
sda / 7.28 TiB free	sdb / 1.4 MiB free	sdc / 28.9 GiB free
Specialized & Network Disks		Disks left unselected here will not be touched.
Add a disk		
Storage Configuration Automatic  Custom		Disks left unselected here will not be touched.
		k
Full disk summary and boot loader	1	L disk selected; 111.73 GiB capacity; 1.4 MiB free <u>Refresh</u>



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4. In the **MANUAL PARTITIONING** window, remove any partitions **if present** by clicking on the partition and then click the minus (-) sign.

NUAL PARTITIONING			CENTOS	STREAM 8-STREAM INSTALLATION
New CentOS Stream 8-stream Insta	allation	sdb4		
installation yet. You can:	ur CentOS Stream 8-stream	Mount Point:		Device(s):
<u>Click here to create them automatically</u>				ATA DELLBOSS VD (sdb)
Create new mount points by clicking the *	+' button.	Desired Capacity:		Modify
<ul> <li>Or, assign new mount points to existing p below.</li> </ul>	artitions after selecting them	98.97 GiB		
New mount points will use the following par	titioning scheme:	D		
LVM	•	Device Type:		
Encrypt automatically created mount points Encrypt my data. • CentOS Stream Linux 8 for x86_64 SYSTEM	by default:	File System:	Reformat	
/ sdb4	98.97 GiB >			
/boot sdb2	1024 MiB	Label:		Name:
/boot/efi sdb1	600 MiB			sdb4
swap sdb3	11.17 GiB			Update Settings
+ - C			Note: The s be applied o	ettings you make on this screen will not until you click on the main menu's 'Begin Installation' button.
AVAILABLE SPACE 1.4 MiB 111.73 GiB				
1 storage device selected				Reset All

5. Select **Delete all file systems which are only used by CentOS stream Linux 8 for x86\_64** and then confirm by clicking **Delete It**.





- 6. Change the **New mount points will use the following partition scheme** to **Standard Partition** and then select **Click here to create them automatically**. Five partitions are created:
  - /boot
  - /boot
  - /efi
  - /
  - swap
  - /home.

MANUAL PARTITIONING	CENTOS STREAM 8-STREAM INSTALLATION
Done	🖽 us Helpi
New CentOS Stream 8-stream Installation     You haven't created any mount points for your CentOS Stream 8-stream     installation yet. You can:         Click here to create them automatically.         Create new mount points by clicking the '+' button.         New power points will use the following partitioning scheme:         Standard Partition         Encrypt automatically created mount points by default:         Encrypt my data.	
	When you create mount points for your CentOS Stream 8-stream installation, you'll be able to view their details here.
+     -     C       AVAILABLE SPACE     TOTAL SPACE       111.73 GIB     111.73 GIB       1 storage device selected	Reset All

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7. Remove the **/home** partition by clicking minus (–) sign.

MANUAL PARTITIONING Done		C	ENTOS STREAM 8-STREAM INSTALLATION Bus Helpi
• New CentOS Stream 8-stream Installation DATA /home sdb5           SYSTEM           /boot/efi           sdb1           /boot           sdb2           /           sdb4           swap           sdb3	32.47 GIB > 600 MiB 1024 MiB 66.5 GiB 11.17 GiB	sdb5 Mount Point: /home Desired Capacity: 32.47 GiB Device Type: Standard Partition    □ Enc File System: xfs    ✔ Refor	Device(s): ATA DELLBOSS VD (sdb) Modify
+ - C AVAILABLE SPACE 2.4 MiB TOTAL SPACE 111.73 GiB 1 storage device selected		Label:	Name: sdb5 Update Settings te: The settings you make on this screen will not e applied until you click on the main menu's 'Begin Installation' button. Reset All

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- 8. Modify the partition configurations as follows:
  - a. If you require software RAID, select RAID for device type. Otherwise, select Standard Configuration, except for */boot*, */efi*, and *swap*, which should default to efi, and swap types for each.
  - b. If hardware RAID is configured, specify Device Type: **Standard Partition**. Do the same for the **/boot** and **/** partitions. Change the File System to **ext4**.

MANUAL PARTITIONING		C	ENTOS STREAM 8-STREAM INSTALLATION
<ul> <li>New CentOS Stream 8-stream Installation</li> <li>SYSTEM</li> <li>/boot/efi</li> <li>sdb1</li> <li>/boot</li> <li>sdb2</li> <li>/</li> <li>sdb4</li> </ul>	600 MiB 1024 MiB > 66.5 GiB	sdb2 Mount Point: /boot Desired Capacity: 1024 MiB	Device(s): ATA DELLBOSS VD (sdb) Modify
swap sdb3	11.17 GiB	Device Type: Standard Partition   Enc File System: ext4  Refor	<b>rypt</b> mat
+ – C AVAILABLE SPACE 32,47 GIB TOTAL SPACE 111.73 GIB		Label: Not be	Name: sdb2 Update Settings e: The settings you make on this screen will not applied until you click on the main menu's 'Begin installation' button.
1 storage device selected			Reset All



c. Change the **Mount Point** value to / to use up all available space. Under **Desired Capacity**, select a size larger than what is available, for example, 550 GiB. Click **Update Settings**. The maximum allowed **Desired Capacity** will auto adjust.

MANUAL PARTITIONING		CEN E	TOS STREAM 8-STREAM INSTALLATION s
• New CentOS Stream 8-stream Install SYSTEM /boot/efi sdb1 /boot sdb2 / sdb4 swap sdb3	ation 600 MiB 1024 MiB 98.97 GiB > 11.17 GiB	sdb4 Mount Point: / Desired Capacity: 98.97 GIB Device Type: Standard Partition   Encryp File System: ext4   Reforma	Device(s): ATA DELLBOSS VD (sdb) Modify
+ - C AVAILABLE SPACE 1.4 MIB 1 storage device selected		Label: Note: be app	Name: sdb4 Update Settings The settings you make on this screen will not olied until you click on the main menu's 'Begin Installation' button. Reset All

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d. Select **Done** in the top-left corner and then **Accept Changes** in the pop-up dialog.

SYSTEM					Manak Dainta				
/boot/efi sdb1			6	600 MiB	Mount Point:				
/boot sdb2	SUMMA	RY OF CHANGE	s				_	Modify	
1	Your cu	stomizations will	result in the followin	g changes ta	aking effect after y	ou return to the mai	n menu a	and begin installation:	
sdb4	Order	Action	Туре	Device		Mount point			
swap	1	destroy format	ext4	sdb4 on A	TA DELLBOSS VD				
sdb3	2	destroy device	partition	sdb4 on A	TA DELLBOSS VD				
	3	destroy format	ext4	sdb2 on A	TA DELLBOSS VD				
	4	destroy format	EFI System Partition	sdb1 on A	TA DELLBOSS VD				
	5	destroy format	swap	sdb3 on A	TA DELLBOSS VD				
	6	destroy device	partition	sdb3 on A	TA DELLBOSS VD				
	7	destroy device	partition	sdb2 on A	TA DELLBOSS VD				
	8	destroy device	partition	sdb1 on A	TA DELLBOSS VD				
	9	create device	partition	sdb1 on A	TA DELLBOSS VD				
	10	create device	partition	sdb2 on A	TA DELLBOSS VD				
	11	create device	partition	sdb3 on A	TA DELLBOSS VD				
	12	create device	partition	sdb4 on A	TA DELLBOSS VD				
					Cancel & Return	to Custom Partitionii	ng	Accept Changes	
									Jpdate Setting
+ - 0	y							settings you make on Funtil you click on the	
								N5-	

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### Step 3: Configuring the Network Information

This step is skipped at the factory, because Dynamic Host Configuration Protocol (DHCP) is needed to do a secure copy (scp) of the VM . raw images before the Smart NVR deployment, and a static Automatic Private IP Addressing (APIPA) IP is set in that step.

To configure the network information, complete the following steps:

1. Select Network & Host Name to set the server IP.

CentOS	INSTALLATION SUMMARY		CENTOS STREAM INSTALLATION
	LOCALIZATION	SOFTWARE	SYSTEM
	Reyboard Depter 202	Installation Seurce     In d make     Software Selection	Consequentiation Destination
	Time & Date Australian Stream	Mand land	Network & Hout Starse
	USER SETTINGS		Security Policy Reconnectment
	Car Root Parameter d Anti-parameter at		
	User Creation     Reconcret Incoment		

2. Select **the first interface** to assign an IP to the server. Click **Configure**.

NETWORK & HOST NAME		CENTOS 7 INSTALLATION
Ethernet (eno1, unplugged) Intel Corporation 12570V Could Violation Convertion Ethernet (enp2s0, unplugged) Intel Corporation 82540EM Gigabit Ethernet Controller (PRO/1000 MT Desktop	Ethernet (eno1) Unavailable Hardware Address E0:69:95:EB:28:72 Speed 1 Mb/s Subnet Mask 127:0.0.1	OFF
+ -		Configure



- a. From the popup window, select **IPv4 Settings > Method > Manual**.
- b. Click Add and enter the IP Address, Netmask, and Gateway IP.
- c. Click Save.

			Ed	iting enp0	s3		1
connection r	name:	enp0s3					
General	Ethe	rnet 8	02.1X Security	DCB	Proxy	IPv4 Settings	IPv6 Settings
Method:	Manual					1	•
Addresse	s	2					3
Addres	5		Netmask		Gate	way	Add
4 DNS serv	/ers:						belete
Search d	omains:						
DHCP cli	ent ID:						
🗌 Requi	ire IPv4 a	ddressing f	or this connection	to complet	e		
							Routes

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d. Click on the **slider** to connect the interface. The information is displayed once the interface is connected. Click **Done**.

NETWORK & HOST NAME		CENTOS STREAM 8-STRE	AM INSTALLATION
	Ethernet (eno3) Connected Hardware Address 24:6E:96:54:09:8E Speed 10000 Mb/s IP Address 10.134:83.11/20 Default Route 10.134:95:254 DNS	) Current host name:	Configure
	_		



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### Step 4: Installing the ISO

To install the ISO, complete the following steps:

1. On the Installation Summary page, click Begin Installation to start the installation process.



The installation progress will start and take some time to complete landing the necessary files.



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### Step 5: Monitoring the ISO Deployment

1. Once the installation has completed successfully, click **Reboot System**, and monitor the system reboot.

CentOS	INSTALLATION PROGRESS	CENTOS STREAM 8-STREAM INSTALLATION
1	Complete!	
	CentC	DS Stream is now successfully installed and ready for you to use! Go ahead and reboot your system to start using it!
		Reboot System

2. Once the system boots, log in with the username **root** and password **server1011q2w**.





3. The remaining scripts are executed automatically on reboot. Once logged in, the terminal displays the status of the first boot scripts and installation activities. This progresses until the output shown on the following image is displayed indicating that the scripts and other activities are complete. After the execution is completed, **the server will reboot automatically** which is a second reboot (First one is the manual reboot done at the end of <u>Step 1</u>, the second one is this automatic reboot.)

Downloading Packages: Running transaction check Transaction check succeeded. Running transaction test Transaction test succeeded.	
Preparing :	1/1
Reinstalling : python3-setuptools-50.3.2-1.el8.noarch	1/2
Cleanup : python3-setuptools-50.3.2-1.el8.noarch	2/2
Running scriptlet: python3-setuptools-50.3.2-1.el8.noarch	2/2
Verifying : python3-setuptools-50.3.2-1.et8.noarch	1/2
	2, 2
Reinstalled:	
python3-setuptools-50.3.2-1.el8.noarch	
Complete!	
FirstBoot Setup Script Finished Execution. Please wait for the server	to reboot Automatically

### Step 5b: Adding a .raw Image for Faster Customer Deployment

**NOTE**: This step is only performed at the factory, to provide for faster customer deployments.

A special updated .iso is converted to a .raw image, and is made available for customers using a Windows Server 2019, that has many of our Video Surveillance best practice settings already configured. This acts as an available template that the customer can license (if used), for a quick deployment.

Using an scp tool (for example, WinSCP), with the aforementioned credentials (*root* and *server1011q2w*) connect to the server IP (a terminal session with command [#ip a ] may be needed to get this) and then copy the image (provided) under the ~/enclouden/images subdirectory.

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### Step 6: Configuring the Smart NVR

To configure the Smart NVR, complete the following steps:

- 1. When the host returns from the automatic reboot, a GUI login with X running is presented. Log in again with the username **root** and password **server1011q2w**. The Smart NVR UI is displayed.
  - a. For factory Smart NVR appliance setup, update the Server IP to **169.254.0.1**, Public Gateway to **169.254.0.254** and Prefix to **16**.
  - b. For a Smart NVR software only install, select the desired IP for deployment.
- 2. Click Next.

	Po	wered By Quantum		×
System Configurati	on			
	Welcome	to Quantum	Smart NVR	
	Please input your network	details to begin th	he deployment process	
	Server IP		169.254.0.1	
	Public Gateway IP		169.254.0.254	
	Prefix		16	
				Next



### Step 7: Deploying the Smart NVR

To deploy the Smart NVR, complete the following steps:

- 1. For factory setup, remove all network cables from the host.
- 2. Click Deploy.

**NOTE**: There will be a network reset during the first step. Until 1/10 is completed, do not touch the GUI after clicking Deploy. If the GUI is moved before the network is setup, it will lose connection and you must restart the Smart NVR utility and click **Deploy** again to continue from where it left off.

	Powered By Quantum	×
	Quantum Smart NVR	
Please click deploy a	and get yourself a cup of coffee while we set everything up in 20-30 mins	;
	Deploy	
	0/10	



	Powered By Quantum	×				
Q	Quantum Smart NVR	2				
Please click deploy	Please click deploy and get yourself a cup of coffee while we set everything up in 20-30 mins					
	In Progress					
	0/10					
	Network Setup is in progress					
	Powered By Quantum	×				
Q	Powered By Quantum Quantum Smart NVF	×				
O Please click deploy a	Powered By Quantum Quantum Smart NVF and get yourself a cup of coffee while we set	× R t everything up in 20-30 mins				
O Please click deploy a	Powered By Quantum Quantum Smart NVF and get yourself a cup of coffee while we set	× R t everything up in 20-30 mins				
O Please click deploy	Powered By Quantum Quantum Smart NVF and get yourself a cup of coffee while we set In Progress 6/10	× R t everything up in 20-30 mins				
O Please click deploy	Powered By Quantum  CRUANT Smart NVF  and get yourself a cup of coffee while we set  In Progress  f/10  Storage Setup is in progress Storage is Setup LoadBalancer Setup is in progress loadbalancer is Setup Database Setup is in progress Database is Setup CommBroker Setup is in progress CommBroker is Setup CommBroker is Setup CommBroker is Setup	× R t everything up in 20-30 mins □ ↓				

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3. When the following screen is displayed, click **Done.** 

	Powered By Qu	antum	×
	Quantum S	Smart NVR	
Software Installation cor Louvre URL is n	npleted, please proceed with ow available at - https://169.	network configuration 254.0.1/quantum/sm	from louvre dashboard. artnvr/louvre/
	Done		
	10/10		
	CommBroker is Setup OpenStack Setup is in progress OpenStack is Setup opstackcloud setup is in progress infra is Setup Sessionbroker Setup is in progress SessionBroker is Setup Louvre Setup is in progress Louvre is Setup	I	



### Factory Setup Complete

The setup is now complete. The link to the Louvre Dashboard is displayed on the final screen of the Smart NVR, which can be opened in any browser





### Additional Steps Post-Factory Installation

- 1. When the setup is complete, using the power option in the top-right corner, power down the server, and place the server back into the original manufacturing shipping materials.
  - a. Insert a card that shows the URL for the Louvre Dashboard for the customer: https://169.254.0.1/quantum/smartnvr/louvre



### Appendix A: Software RAID Manual Installation

This appendix describes the manual installation procedure for software RAID based installation media in Section 2, <u>Step 2, Configuring, Installing, and Monitoring the ISO Deployment</u>.

- 1. Complete the following:
  - a. Select /boot
  - b. Desired Capacity: 1024 MB
  - c. Device Type: RAID
  - d. RAID Level: RAID1 (Redundancy)
  - e. File System: ext4
- 2. Click Update Settings.



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- 3. Complete the following:
  - a. Select /boot/efi
  - b. Device Type: RAID
  - c. RAID Level: RAID1 (Redundancy)
- 4. Click Update Settings.

If there is hardware RAID configured, you do not need to specify Device Type: RAID. Instead, it should be Device Type: Standard Partition. Follow this for all partitions.

MANUAL PARTITIONING			CENTOS 7 INSTALLATION I us Help!
- New CentOS 7 Installation		sdb1	
SYSTEM /boot boot	1024 MiB	Mount Point: /boot/efi	Device(s):
/boot/efi	200 MiB >	Desired Capacity:	ATA ST1000DM003-1ER1 (sdb) and 1
/ centos-root	50 GiB	200 MiB	other
swap centos-swap	15.69 GiB		Modify
		Device Type:	RAID Level:
		RAID • Encrypt	RAID1 (Redundancy)
		File System:	
		Reformat.	
		Label:	Name:
			boot_efi
+ - C		Note: be ap	Update Settings The settings you make on this screen will not slied until you click on the main menu's 'Begin Installation' button.
AVAILABLE SPACE 1795.13 GIB 1863.03 GIB			
2 storage devices selected			Reset All



- 5. Complete the following:
  - a. Select swap
  - b. Desired Capacity: 32 GiB
  - c. Device Type: RAID
  - d. RAID Level: RAID1 (Redundancy)
  - e. File System: swap
- 6. Click Update Settings.

If there is hardware RAID configured, you do not need to specify Device Type: RAID. Instead, it should be Device Type: Standard Partition. Follow this for all partitions.

MANUAL PARTITIONING			CENTOS 7 INSTALLATION
DOTO			🕮 us Helpi
		centos-swap	
SYSTEM /boot boot	1024 MiB	Mount Point:	Device(s):
/boot/efi boot_efi	200 MiB	Desired Capacity:	ATA ST1000DM003-1ER1 (sdb) and 1 other
/ centos-root	50 GiB	32.00	
swap contos-swap	15.69 GiB 🗲		Modify
		Device Type: RAID	RAID Level: RAID1 (Redundancy) +
		swap • Re	format
		Label:	Name: swap
			Update Settings
+ - C			Note: The settings you nake on this screen will not be applied until you click on the main menu's 'Begin Installation' button.
AVAILABLE SPACE TOTAL SPACE 1794.93 GIB			
2 storage devices selected			Reset All



- 7. Complete the following:
  - a. Select /
  - b. Desired Capacity: Copy the TOTAL SPACE value (ISO automatically adjusts the value)
  - c. Device Type: **RAID**
  - d. RAID Level: RAID1
  - e. File System: ext4
- 8. Click Update Settings.

If there is hardware RAID configured, you do not need to specify Device Type: RAID. Instead, it should be Device Type: Standard Partition. Follow this for all partitions.

Done			CENTOS STREAM 8-STREAM INSTALLATIO
New CentOS Stream 8-stream Installation		sdo4	
SYSTEM /boot boot	1024 MiB	Mount Point:	Device(s): ATA SSDSC2KG480G7R 55cd2e414de7abc2 (sdo) and 1 other
/boot/efi boot_efi	600 MiB	Desired Capacity:	Modify
/ sdo4	70 GiB >	895 GiB	
swap swap	4 GiB	Device Type: RAID    □ En File System: ext4    ▼ Refe	RAID Level: RAID1
		Label:	Name: root
+ - C AVAILABLE SPACE 813.08 GiB 2 storage devices selected			Update Settings Note: The settings you make on this screen will not be applied until you click on the main menu's 'Begin Installation' button. Reset All

### Quantum.

9. Click **Done** in the top left corner and click **Accept Changes** in the popup.

		R.			awah			
/boot bont			1024	MiB	Noort Print.	Device(s):		
( toot	SUMMA	RY OF CHANGE	5	_			IOMI (ada) a	nid 3
SWIED	Your cus	stomizations will r	esult in the following cha	nges ta	king effect after you return to the main m	enu and begin installation:		
Manager C.	Order	Action	Туре	Devk	e Name Mount point			
	1	<b>Destroy Format</b>	ntfs	\$682				
	2	Destroy Dovice	partition	sda2				
	4	Destroy Format	otts	seta1				
	4	Destroy Device	partition	sdal				
	5	Destroy Format	partition table (MSDOS)	sda				
	6	Destroy Format	partition table (MSDOS)	sdb				
	7	Create Format	partition table (MSDOS)	sda				
	н	Create Device	partition	sdal				
	9	Greate Format	software RAID	sdal				
	10	Create Device	partition	sda2				
	ш	Create Device	partition	5083	Verify and confirm the chinages and	click on below button		
	12	Create Format	software RAID	sda3				
					Cancel & Return to Custom Partitioning	Accept Changes		
	-			÷.		/	Updata Setti	
					alex alexander	The settings was make a	IN THIS SCHOOL IN	
+ - 0					De a	speed until you shok on th	e/nun menus	8
							Installation b	98

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### Appendix B: BIOS and RAID Controller Configuration for USP

This appendix describes how to use the vendor's tool for replicating BIOS and RAID controller settings from a reference host. This appendix focuses on the settings that are appropriate to Quantum USP software. Consult the vendor's tool documentation for other supported BIOS settings.

There are two distributions of Quantum USP software:

- USP Standalone for single node
- USP HCI for multi-nodes

There are three offerings:

- Smart NVR Appliance with USP Standalone
- USP Standalone as Software-only
- USP HCI as Software-only

This appendix focuses on the following vendors:

- Dell
- Lenovo
- Supermicro

#### USP Offerings

#### Smart NVR Appliance with USP Standalone

This is an appliance NVR preloaded with USP Standalone for single node deployment. The Smart NVR is available from MBX.

BIOS and RAID controller settings:

- Factory default BIOS settings with the following adjustments:
  - CPU Maximum Performance
- USP is installed on 2x M.2 setup as RAID-1
- RAID Controller shall support RAID-5 (n+1) and RAID-6 (n+2) for data storage
  - 3 to 5 HDDs, RAID-5 (n+1)
  - 6 to 17 HDDs, RAID-6 (n+2)
  - 18 HDDs, 2 volumes @ 9 HDDs, RAID-6 (n+2)
  - Beyond 18 HDDs, options are either 36 HDDs or 60 HDDs
    - 36 HDDs, 3 volumes @ 12 HDDs, RAID-6 (n+2)
    - 60 HDDs, 5 volumes @ 12 HDDs, RAID-6 (n+2)

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### USP Standalone as Software-Only

USP Standalone is offered as software-only for single node deployment. Deployment is hardware agnostic.

Quantum recommends the following BIOS and RAID Controller settings:

- Factory default BIOS settings with the following adjustments:
  - CPU Maximum Performance
- USP installation:
  - Independent hardware-RAID volume, e.g. 2x M.2 setup as RAID-1
  - Separate hardware-RAID volume from data storage disks set
  - Software-RAID option is available but not optimal
- Software-RAID option for data storage is available but not optimal
  - 3 to 5 HDDs, RAID-5 (n+1)
  - 6 to 12 HDDs, RAID-6 (n+2)
  - 12+ HDDs shall be evenly distributed between 2+ volumes
    - RAID setup of each volume shall be as above
- RAID Controller shall support RAID-5 (n+1) and RAID-6 (n+2) for data storage
  - 3 to 5 HDDs, RAID-5 (n+1)
  - 6 to 17 HDDs, RAID-6 (n+2)
  - 18 HDDs, 2 volumes @ 9 HDDs, RAID-6 (n+2)
  - Beyond 18 HDDs, options are either 36 HDDs or 60 HDDs
    - 36 HDDs, 3 volumes @ 12 HDDs, RAID-6 (n+2)
    - 60 HDDs, 5 volumes @ 12 HDDs, RAID-6 (n+2)

#### USP HCI as Software-Only

USP HCl is offered as software-only for multi-nodes deployment. Deployment is hardware agnostic.

Quantum recommends the following BIOS and RAID Controller settings:

- Factory default BIOS settings with the following adjustments:
  - CPU Maximum Performance
- USP installation:
  - Independent Hardware-RAID volume, e.g. 2x M.2 setup as RAID-1
  - Independent disks using Software-RAID
  - 2 or more disks from the data storage disks set using Software-RAID
- Data storage disks set using Software-RAID

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- HBA disk controller
- RAID controller setup with HBA mode (if available)
- RAID controller setup with disks pass-through
- Recommended RAID setup
  - 3 to 5 HDDs, RAID-5 (n+1)
  - 6 to 12 HDDs, RAID-6 (n+2)
  - 12+ HDDs shall be evenly distributed between 2+ volumes:
    - RAID setup of each volume shall be as above

### **BIOS and RAID Controller Configuration**

### Dell PowerEdge Windows Powershell cmdlets for Redfish

Dell provides several tools for managing BIOS and firmware configuration. Current platforms support the Redfish API, providing an industry standard protocol for server management. The "Dell PowerEdge Windows PowerShell cmdlets for Redfish" provides an agnostic tool for managing Dell servers.

To get started, first install the MS Windows PowerShell cmdlets following the procedures documented in "<u>Automating Dell EMC PowerEdge Server Management by using iDRAC REST API with DMTF Redfish</u> and <u>Microsoft PowerShell</u>".

Additional information about Dell's Redfish API with Dell iDRAC is available at <u>https://www.dell.com/support/kbdoc/en-us/000178045/redfish-api-with-dell-integrated-remote-access-controller</u>.

The steps are:

- 1. Selects a reference host
- 2. Reset BIOS to factory default for all hosts
- 3. Adjust BIOS to "CPU Maximum Performance"
- 4. Configure the disk controller
- 5. Export the System Configuration Profile (SCP) using "Clone Export"
- 6. Import the SCP to other hosts, replicating the settings from the reference host

#### Reset BIOS to Factory Default

Use the following PowerShell cmdlets for Redfish:

```
PS C:\>Set-BiosDefaultSettingsREDFISH -idrac_ip <ip> -idrac_username
<usr> -idrac password <passwd> -reboot server y
```

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#### Set CPU Performance

Use the following PowerShell cmdlets for Redfish to check the "CPU Maximum Performance":

```
PS C:\>Set-OneBIOSAttributeREDFISH -idrac_ip <ip> -idrac_username
<usr> -idrac_password <passwd> -get_one_attribute ProcPwrPerf -
reboot server n
```

Use the following PowerShell cmdlets for Redfish to change the "CPU Maximum Performance":

```
PS C:\>Set-OneBIOSAttributeREDFISH -idrac_ip <ip> -idrac_username
<usr> -idrac_password <passwd> -attribute_name SysProfile -
attribute_value Custom -reboot_server n
PS C:\>Set-OneBIOSAttributeREDFISH -idrac_ip <ip> -idrac_username
<usr> -drac_password <passwd> -attribute_name ProcPwrPerf -
attribute_value MaxPerf -reboot_server y
```

#### Configure the Disk Controller

The "PowerShell cmdlets for Redfish" facility does not support configuring the BOSS-S1 or RAID Controller. Manually configures the reference host from the BIOS Setup. The "System Configuration Profile" does support replicating the BOSS-S1 and RAID Controller settings under the RAID target.

Export the System Configuration Profile Using Clone Export

File is exported to %HOMEPATH%

Use the following PowerShell cmdlets for Redfish:

```
PS C:\>Set-ExportServerConfigurationProfileLocalREDFISH -idrac_ip
<ip> -idrac_username <usr> -idrac_password <passwd> -Target ALL -
ExportFormat XML -ExportUse Clone
```

Import the System Configuration Profile

Leave the host powered off with iDRAC connected. Only replicate the BIOS and RAID configurations.

Use the following PowerShell cmdlets for Redfish:

```
PS C:\>Set-ImportServerConfigurationProfileLocalFilenameREDFISH -
idrac_ip <ip> -idrac_username <usr> -idrac_password <passwd> -Target
"BIOS,RAID" -filename <SCP-dot-XML-file> -ShutdownType Forced -
HostPowerState Off
```



#### Lenovo XClarity Essentials OneCLI

Lenovo servers can be managed using the "Lenovo XClarity Essentials OneCLI" utility. This is a feature rich facility providing remote management using a command-line interface for managing and configuring the BIOS and firmware.

To get started, download the OneCLI tool from <u>https://datacentersupport.lenovo.com/us/en/documents/Invo-tcli</u>.

Additional information about OneCLI is available in Lenovo XClarity Essentials OneCLI User Guide.

The steps are:

- 1. Selects a reference host
- 2. Reset BIOS to factory default for all hosts
- 3. Adjust "Operating Mode" in BIOS to "Maximum Performance"
- 4. Configure the disk controller
- 5. Save the System Configuration settings
- 6. Replicate the System Configuration settings to other hosts

#### Reset BIOS to Factory Default

Use the following OneCLI command to load the BIOS defaults

```
OneCli.exe config loaddefault UEFI -bmc <username>:<password>@<bmc
ip address> --post
```

OneCLI.exe ospower reboot --bmc <username>:<password>@<bmc ip
address>

#### Set Operating Mode

Use the following OneCLI command to check the Operating Mode:

```
OneCli.exe config show OperatingModes.ChooseOperatingMode --bmc
<username>:<password>@<bmc ip address>
```

Use the following OneCLI command to set Operating Mode to Maximum Performance:

```
OneCli.exe config set "OperatingModes.ChooseOperatingMode" "Maximum
Performance" --bmc <username>:<password>@<bmc ip address>
```

OneCLI.exe ospower reboot --bmc <username>:<password>@<bmc ip
address>

#### Configure the Disk Controller

The OneCLI.exe provides the "raid" command to create, clear and save the RAID configuration. Manually configures the reference host from the BIOS Setup. Export the reference host "raid configuration" to replicate other hosts.



Export the Raid Configuration

Use the following OneCLI command to save the raid configuration:

```
OneCli.exe raid save --bmc <username>:<password>@<bmc ip address> --
file <raid-config>
```

Import the Raid Configuration:

Use the following OneCLI commands to add the raid configuration:

```
OneCli.exe raid clear --bmc <username>:<password>@<bmc ip address> -
-force
OneCli.exe raid add --bmc <username>:<password>@<bmc ip address> --
file <raid-config> --force
```

Save the System Configuration Settings

Use the following OneCLI command to save the System Configuration settings:

OneCli.exe config save --file <filename> --bmc
<username>:<password>@<bmc ip address> --excbackupctl

Replicate the System Configuration Settings

Use the following OneCLI command to replicate the System Configuration settings to other hosts:

```
OneCli.exe config replicate --file <filename> --bmc
<username>:<password>@<bmc ip address>
OneCLI.exe ospower reboot --bmc <username>:<password>@<bmc ip
address>
```

Supermicro Update Manager (SUM)

Supermicro provides the "Supermicro Update Manager (SUM)" for managing and configuring the BIOS and firmware on X9 generation motherboards and later.

To get started, download the SUM.exe tool from <a href="https://www.supermicro.com/en/solutions/management-software/supermicro-update-manager">https://www.supermicro.com/en/solutions/management-software/supermicro-update-manager</a>.

See the SUM User Guide for more information.

The steps are:

- 1. Selects a reference host
- 2. Reset BIOS to factory default for **all** hosts
- Adjust "Advanced Power Management Configuration" ENERGY\_PERF\_BIAS\_CFG in BIOS to "Maximum Performance"
- 4. Configure the disk controller
- 5. Save the System Configuration settings
- 6. Replicate the System Configuration settings to other hosts

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#### Reset BIOS to Factory Default

Use the following SUM command to load the Factory BIOS settings:

The uploaded configuration will take affect only after a reboot or power up

sum -i <bmc ip address> -u <username> -p <password> -c LoadDefaultBiosCfg --reboot

#### Set Operating Mode

SUM does not provide a facility to manipulate a single BIOS attribute. Manually configure the reference host from the BIOS Setup. The BIOS configuration from the reference host can be exported and replicated to other hosts.

In the BIOS setup Go to Advanced  $\rightarrow$  Advanced Power management configuration  $\rightarrow$  Change Power Technology to Custom, ENERGY PERF BIAS CFG mode to Maximum Performance

#### Configure the Disk Controller

SUM does not provide a facility for configuring the RAID Controller. Manually configure the reference host from the BIOS Setup. The RAID configuration from the reference host can be exported and replicated to other hosts.

#### Save the System Configuration Settings

The commands GetCurrentBiosCfg and GetRaidCfg for SUM allow capturing the BIOS and RAID configurations from the reference host. See the SUM User Guide for more information.

Save the Current BIOS settings:

sum -i <bmc ip address> -u <username> -p <password> -c
GetCurrentBiosCfg --file <USER SETUP.file> --overwrite

Save the RAID settings:

sum -i <bmc ip address> -u <username> -p <password> -c GetRaidCfg file <RAIDCfg.xml> --overwrite

#### Replicate the System Configuration Settings

The commands ChangeBiosCfg and ChangeRaidCfg for SUM allow replicating the BIOS and RAID configurations from the reference host. See the SUM User Guide for more information.

Considers updating the RAID settings before the BIOS since the host needs to be rebooted after BIOS settings change



#### Updating the RAID Settings

```
sum -i <bmc ip address> -u <username> -p <password> -c ChangeRaidCfg
-file <RAIDCfg.xml>
```

#### Updating the BIOS Settings

sum -i <bmc ip address> -u <username> -p <password> -c ChangeBiosCfg
-file <USER SETUP.file> --reboot





# Quantum

Quantum technology, software, and services provide the solutions that today's organizations need to make video and other unstructured data smarter – so their data works for them and not the other way around. With over 40 years of innovation, Quantum's end-to-end platform is uniquely equipped to orchestrate, protect, and enrich data across its lifecycle, providing enhanced intelligence and actionable insights. Leading organizations in cloud services, entertainment, government, research, education, transportation, and enterprise IT trust Quantum to bring their data to life, because data makes life better, safer, and smarter. Quantum is listed on Nasdaq (QMCO) and the Russell 2000<sup>®</sup> Index. For more information visit www.quantum.com.

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