# **Unified Surveillance Platform (USP) 5.0**

### **OS Installation and Cluster Setup Guide**

6-069080-01, Rev B



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### **Overview**

This guide explains how to install USP 5.0 (Unified Surveillance Platform) software on a cluster of enterprise servers.

### Hardware Requirements & Recommendations

### Hardware Requirements

Component	Requirements
Server	<ul> <li>X86_64 Enterprise class server, updated with recent BIOS &amp; firmware</li> <li>Servers must be capable of having CentOS 8 stream installed, i.e., support by CentOS 8 Stream.         <ul> <li><u>RHEL 8 (CentOS 8 &amp; x86_64) Ecosystem Catalog</u></li> </ul> </li> <li>UEFI capable</li> <li>VT/d enabled</li> <li>Chassis Serial number is required</li> </ul>
CPU	<ul> <li>X86_64 compatible</li> <li>AMD or Intel</li> <li>14 cores minimum</li> </ul>
Memory	<ul> <li>Total CPU count needs to be taken into consideration for minimum memory requirements.</li> <li>Total CPU = (Threads per core * Cores per socket) * Physical Socket <ul> <li>24 or less total CPU: 96 GB</li> <li>28 - 40 total CPU: 128 GB</li> <li>48 - 64 total CPU: 196 GB</li> <li>68 and above total CPU: 256 GB</li> </ul> </li> </ul>
Network	<ul> <li>1 NIC port for iDRAC/KVM/IPMI</li> <li>4 10 GbE         <ul> <li>Management Network</li> <li>SAN 0 Network</li> <li>SAN 1 Network</li> <li>Application Network (Camera Network)</li> </ul> </li> </ul>
OS Boot Disk(s)	<ul> <li>Minimum size 120 GB</li> <li>M.2, SSD, or HDD</li> <li>For SSD or HDD recommend 2 disks per node for software RAID</li> </ul>

Component	Requirements
Storage Disks	<ul> <li>Enterprise class SSDs and/or HDDs (512e)</li> <li>Each node should have the same number of disks.</li> <li>Disks across nodes should be the same size.</li> <li>Sizes Requirements: <ul> <li>SSD – 960 GB minimum, 8 TB maximum</li> <li>HDD – 1 TB minimum, 16 TB maximum</li> </ul> </li> </ul>
Cache Disks	<ul> <li>Required when using 16 or more HDDs for storage.</li> <li>If used, then requires exactly 2. One cache disk is not supported.</li> <li>480 GB minimum, 2 TB maximum</li> </ul>
Cluster	Required 3 nodes of same hardware

### Suggested Drive Configurations

This section describes three suggested drive configurations.

Drive Count	Configuration (per server)
Small (minimum)	<ul> <li>4 SSDs (Storage Tier) <b>OR</b></li> <li>4 HDDs (Storage Tier)</li> </ul>
Medium	<ul> <li>8 HDDs (Storage Tier) + 2 SSDs (Cache Tier) OR</li> <li>8 SSDs (Storage Tier)</li> </ul>
Large (maximum)	<ul> <li>12 HDDs (Storage Tier) + 2 SSDs (Cache Tier) OR</li> <li>16 HDDs (Storage Tier) + 2 SSDs (Cache Tier)</li> </ul>

### Hardware Limitations

- Lenovo SR655 with AMD 7452 Processor is not supported.
- Secure boot is not supported and must be disabled prior to installation.
- NVMe tiers are not supported.
- 16 HDDs per server is the maximum for this release.

### Required Infrastructure Resources

This section outlines the resources used by the USP software.

Component	vCPU	RAM	Storage	Configuration (per server)
Acuity VM	10 vCPU	24 GB	14 GiB	1 per Host, manages storage.
Monitoring VM (historical)	8	12 GB	90.038 GiB	1 per Cluster
Monitoring VM (backend)	2	4 GB	36.035 GiB	1 per Cluster
Monitoring VM (zookeeper)	4	8 GB	36.035 GiB	1 per Cluster
Monitoring VM (broker)	4	8GB	36.035 GiB	1 per Cluster
Image Store	n/a	n/a	900.038 GiB	1 per Cluster
Nova	n/a	n/a	180.038 GiB	1 per Cluster

### **Example Configurations**

The following table shows example configurations for large, medium, and small deployments.

Configuration	Server	RAM	CPU	OS Drive	Cache Tier	Storage Tier
Large	Dell R740 XD2	192 GB	2 x 24 cores	1 x 1TB M.2	2 x 2TB SSD	16 x 8TB HDD
Medium	Lenovo SR650	128 GB	2 x 12 cores	2 x 2TB SSD	N/A	8 x 4TB SSD
Small	Dell	96 GB	2 x 10 cores	2 x 1TB HDD	2 x 1TB SSD	4 x 4TB HDD

### **Network Overview**

### Network Types

- **MGMT** This network is used for accessing the USP operating system that gets installed on each host. It is also used to connect to the instances running on the cluster.
- VM Network / Application Network This network is used to host the application traffic inside each VM. For example, this is the network in which your cameras are connected.
- SAN 0 / SAN 1 These networks are used for SAN iSCSI traffic between the storage backend and the hosts in the cluster.
- **IPMI** Out-of-band management network

*NOTE*: Jumbo frame support is required for the MGMT and VM Network. Performance may be impacted if jumbo frame support is not enabled.

Configuration	# Ports	Network	# Switches	Switch Redundancy	Port Redundancy
1	4	Flat	4	SAN Only	
2	4	4 VLAN	2	2 All Networks	
3	4	2 Flat (SAN 0/1) 2 VLAN (Management / VM Traffic)	4	All Networks	
4	6	Flat 4 S		SAN Only	All Networks
5	6	2 Flat (SAN 0/1) 2 VLAN (Management / VM Traffic)	4	All Networks	
6	6	Flat	6	All Networks	

### **Recommended Network Configurations**

#### Configuration 1 – 4 Ports, Flat Network, 4 Switches

*NOTE*: The IPs illustrated in the diagrams are examples and will vary based on the customer's network environment.





### Logical

### Configuration 2 – 4 Ports, 4 VLANs, 2 Switches

All VLANs should be trunk+tagged to switch ports.













Configuration 3 – 4 Ports, 2 Flat, 2 VLANs, 4 Switches



|--|





Configuration 5 – 6 Ports, 2 Flat, 2 VLAN, 4 Switches

VLANs should be trunk+tagged to switch ports.







### Configuration 6 – 6 Ports, All Flat Network, 6 Switches



USP 5.0 Beta supports the following port configuration:

- 1 x 10 Gbe Management (OpenStack, Management UI/API, Guest VM)
- 1 x 10 Gbe VM Traffic (Application / camera network)
- 1 x 10 Gbe SAN 0 (Acuity storage traffic)

1 x 10 Gbe – SAN 1 (Acuity storage traffic)

*NOTE*: For failure redundancy it is highly recommended that the SAN 0 and SAN 1 networks be on separate switches.

### **IP Address Requirements**

The USP software will require a number of IP addresses in each of the different ranges.

Network	IP Address Requirements
Management	<ul> <li>Host IP (1 per server)</li> <li>Acuity Management IP (1 per server)</li> <li>Cluster IP (1)</li> </ul>
SAN 0	<ul> <li>Host bridge IP (1 per server)</li> <li>Acuity Storage VM (1 per server)</li> </ul>
SAN 1	<ul> <li>Host bridge IP (1 per server) Acuity Storage VM (1 per server)</li> </ul>
VM Network (Application)	<ul> <li>DHCP Agents (2)</li> <li>Neutron Gateway (2)</li> <li>Monitoring VMs (4)</li> <li>Default department (1)</li> <li>Guest VMs (1 * number NICs * number of VMs)</li> </ul>
Out-of-band Management	1 IP per server

### Ports Used

For ports used by the software, see the <u>Appendix C – Ports Used</u> section.

### Install the USP OS

The following section describes how to install the USP Operating System (OS) on your servers. This process must be performed on every server that will become part of the USP cluster. The USP OS can be installed serially or in parallel on each node.

*NOTE*: If you purchased an appliance from Quantum that already has the USP OS installed, you can skip this step and go directly to the <u>Configure the Management Network</u> section below.

### **Boot from ISO**

Each server must boot from the provided Quantum USP ISO file. This can be done by creating a bootable USB stick or by loading the ISO from a network share to the server's virtual media device.

To install the USP OS, you must boot each node member from the provided ISO file. See the following appendix sections to use either of the following methods:

- For instructions on creating a bootable USB, refer to <u>Appendix A Creating a Bootable USB Key</u>
- For instructions on booting to the ISO using virtual media in the out-of-band management interface, refer to <u>Appendix B Booting from an ISO Through Out-Of-Band Management</u>.

### Install USP

Once the server is booted to the ISO, select Install QMCO USP 5.0.



### Selecting the OS Disk Configuration

The next step is to choose your OS partition configuration. The installation screen will display the detected disks and prompt you to choose *Hardware Raid, Software Raid,* or *Standard Partitioning.* 

BIOU OF POTION OR AUTOMATIC DARTITIONING	
DISK SELECTION FOR HUJORNILL FRATITIONING	
NAME SIZE MODEL REV TYPE TRAN	
sda 14.36 Ultra Fit 1.00 disk usb	
sdb 111.06 SSDSCK.JB12867R DL43 disk sata	
sdd 9.1T ST100080NMB196-2A TA23 disk sas	
sde 9.1T STIBUBURNB196-2A TR23 disk sas	
sdf 9.11 Stildudunnu136-2A TR23 disk sas	
sdg 9.11 Stildbiddhild 24 Th23 disk sas	
sah 9.11 Siluudunnulyo-za Iraza disk sas	
Sd1 9.11 5118000HM0150-24 1H23 disk SdS	
Sd. 9.11 SII SII SII SII SII SI SI SI SI SI SI S	
Sak 7.11 SILBUBONNBIJD-ZH IHGJ ALSK SAS	
Sol 2.11 31190909010120-261 1023 disk Sol edw 9 17 ST180001M906-20 T023 disk eas	
sam 5.11 51100000010120-261 IA23 disk sas edn 9 17 STIBABBANG196-20 To23 disk sas	
sun J.H. STROBORNOLD-En Inc.J. UISK sus	
Suu J.II JIIDODOMIDIJU-LAI IALJ UISA SAS edn. 447. 16. Mirsen, 5180. MTTR 1027. diek eae	
snp filling internal for galage new use	
sha 427 16 Mirenn 5199 MTFh 1927 di ek sas	
sdr 9 11 STI BARANA 196-20 TA23 dick sas	
sds 9.1T ST199991M9196-2A TA23 disk sas	
sdt 9.1T ST10000NM0196-2A TAZ3 disk sas	
sdu 9.1T ST19989M9196-2A TA23 disk sas	
Enter 'hw' for Hardware Raid, 'sw' for Software Raid, 'sp' for Standard Partitioning without Raid or 'g' for exiting to pr	oceed
with manual partitioning : sp	
Enter the disk name for Standard Partitioning (Eq. sda) : sdb	
The disk selected is 'sdb'	
Do you want to Proceed? (y/n) :	

### Hardware Raid (hw)

Select the **Hardware Raid** option to install the USP Operating System on disks that are connected to a hardware RAID controller and have been previously configured using the server's out-of-band management interface or BIOS.

*NOTE*: If you select the **Hardware Raid** option and select a disk that is not configured for hardware raid, the installation will still proceed, and the disk will be partitioned using the **Standard Partitioning** method.

### Software Raid (sw)

Select the Software Raid option to configure software raid on 2 disks that are not connected to a hardware RAID controller. It is recommended to select two disks of the same type (HDD or SSD) and size.

### Standard Partitioning (sp)

Select the Standard Partitioning option to install the USP Operating System on a single drive without hardware or software RAID. It is recommended to install the OS on an SSD drive, however either an SSD or HDD can be selected.

### Manual Partitioning

*CRITICAL:* Manual partitioning is not supported for this release. Only use the above options to install the USP OS.

#### Running the Installation

 After choosing the installation disks and selecting Y to proceed, the CentOS Installation Summary screen is displayed. The screen will automatically advance to the Installation Progress screen.

*NOTE:* If any buttons are selected on the CentOS installation screen, the install may not proceed automatically. If this happens, press the "Begin Installation" button to start the process.

😤 CentOS	INSTALLATION SUMMARY		CENTOS STREAM 8-STREAM INSTALLATION
	LOCALIZATION   Image: Constraint of Constraints   Image: Cons	SOFTWARE  (a) Installation Source Local media  (b) Software Selection Minimal Install	SYSTEM   Since Installation Destination   Cutore partitioning selected   Counce Contended Contended Contended

🏘 CentOS	INSTALLATION PROGRESS	CENTOS STREAM 8-STREAM INSTALLATION
	Creating xfs on /dev/sda4	

2. Once the installation is complete, click on **Reboot System** to reboot the system.

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

3. After rebooting the servers, they will boot to an intermediate state.



You can log in and watch the processing, but do not execute any keystrokes. The system will automatically boot to the console that is seen below.

### Configure the Management Network

After installing the USP OS, you must log on to the console of each server and manually configure the management network.

- 1. Log on to the CentOS operating system using the default credentials.
  - Username: root
  - **Password:** *server1011q2w*
- 2. Select the Network dropdown in the upper-right corner.
- 3. Select the Configure icon in the bottom-left corner of the dropdown dialog



4. Select **Network** on the left side of the configuration dialog and press the **Configure** button for the correct network

🚸 Activities 🛛 🛠 Settings 🗸	Mar 3 16:57	ල <del>-</del>
	Natural	
X Settings	Network	×
Background	Ethernet (eno1)	+
Notifications	10000 Mb/s OFF 🗱	
Q Search	Ethernet (eno2)	÷
🕅 Region & Language	10000 Mb/s OFF 🌣	
Universal Access	Ethernet (eno3)	÷
∋: Online Accounts	10000 Mb/s OFF 🗱	
Ши Privacy	Ethernet (eno4) -	+
Sharing	10000 Mb/s OFF 🌣	
<ul> <li>€) Sound</li> </ul>	VDN	
🕞 Power		
교 Network	Not set up	
≂j Devices >	Network Proxy Off 🗱	
Details >		

*CRITICAL:* Physical ports are not always enumerated in the same order on each server. Ensure that you choose the correct Ethernet port on each host. Use the ping utility to confirm that all hosts can ping each other once the IP addresses are configured.

Details Identity	IPv4 IPv6 Sect	irity	
IPv4 Method	O Automatic (DHCP)	C Link-Local Only	
	<ul> <li>Manual</li> </ul>	<ul> <li>Disable</li> </ul>	
Addresses			
Address	Netmask	Gateway	0
DNS		Automatic ON	
Separate IP addresses wit	h commas		
Routes		Automatic ON	
		C	

5. Select **IPv4** and change it to **Manual**.

- 6. Enter the values for **IP Address**, **Netmask**, **Gateway**, and **DNS**. If you have multiple DNS addresses, enter them as comma-separated values.
- 7. Click on Apply.
- 8. To load the new configuration, restart the network by toggling the **Off/On** button.

% Q Settings	Network	×
Background	Ethernet (eno1) +	
Notifications	10000 Mb/s OFF 🇱	
Q Search	Ethernet (eno2) +	
📾 Region & Language	10000 Mb/s OFF 🗱	
O Universal Access	Ethernet (eno3) +	
€ Online Accounts	Connected - 10000 Mb/s	
le Privacy	Ethernet (eno4) +	
< Sharing		
ال Sound		
Ce Power	VPN +	
🗗 Network	Not set up	
To Devices >		
Details >	Network Proxy Off	

### **Configure VLAN**

If you configured the management networks using VLAN in the installation template, then you need to follow these steps on each node to finish configuring your network.

- 1. Navigate to the out-of-band management web page and log in to the server console.
- 2. Open the **Terminal** application from the **Application** menu in the top-left corner.
- 3. Execute the following command to change directories: cd /etc/sysconfig/network-scripts
- 4. Edit the management network configuration file. The file will be named after the interface name. For example, if your management port is **eno1**, the network file will be called **ifcfg-eno1**.
- Edit the network configuration file by typing the following command in the terminal: vim ifcfg-eno1
- 6. Type the following to enter Insert mode: i
- 7. Add/modify the content to look like this:

TYPE=Ethernet BOOTPROTO=none DEVICE=eno1 ONBOOT=yes

- 8. To save the file, press the Escape key and type :wq
- 9. Press Enter to save.
- 10. Create a new file using the VLAN tag you specified for this network during installation. For this example, we will use '3' as our VLAN tag.
  - a. Type the following to open a new file: vim ifcfg-eno1.3
  - b. Type the following to change to Insert mode: i

c. Add the following content to the file.

```
DEVICE=eno1.3
BOOTPROTO=none
ONBOOT=yes
IPADDR=10.20.3.231
PREFIX=24
GATEWAY=10.20.3.1
VLAN=yes
```

- d. Save the file by pressing the Escape key and typing :wq
- e. Press Enter to save the new file.
- 11. Restart service by typing this command: systemctl restart NetworkManager

#### NOTE:

eno1 is example interface, it can change based on the hardware.

3 is example VLAN for management, it will depend on your network environment.

DEVICE=interface-name.vlanid

PREFIX is CIDR for subnet

IPADDR and GATEWAY as per subnet

### Configure the USP Cluster

Once the USP OS been installed on all nodes, the next step is to configure the cluster.

*NOTE*: The USP Cluster setup process only needs to be executed on one of the nodes. You can choose any of the nodes to run this workflow.

*CRITICAL:* IPMI over LAN must be enabled on each server in the cluster. If this setting is disabled, the configuration process will fail.

1. The template upload UI can be accessed from a web browser by pointing to the management address of the first host.



*NOTE*: You must accept terms and conditions of EULA to move forward with installation.



2. Click the "Choose file" button and browse to the pre-configured template file you want to upload. Click the "Next" button to continue.

Quantum. Unified Surveillance Platform	
1 Load Template > 2 Configure Nics > 3 Summary > 4 Deploy	
Chause File No file chasen	
	NEXT.

*NOTE:* If there is a validation issue with the template, you will get an error message on the UI. You can update the template as needed and upload again.

Quantu Unified Surveillance P	1 Load Template > 2 Configure Nics > 3 Summary > 4 Deploy		
	Choose File USP_Template 267 xlsx Unexpected error while verifying Node1 ip with URL ip		
		NEXT	

3. For each network, select the correct physical NIC on each host. You can use the "Identify NIC" button to blink the light on the physical NIC to ensure the correct ones are chosen. Click the "Next" button after completing the NIC details of all tabs.

	Management	VM Network			
	hcictrl01		Select NIC(Optional)	10.134.82.241	
	hcictrl02			10.134.83.1	$\triangleright$
	hcictrl03		Select NIC(Optional) 🔹	10.134.83.11	
BACK				IDENTIFY NO	

4. View the summary and confirm all the information is correct.

Quantun Unified Surveiliance Plat	form	1 Load Tes	nplate > 2 Configure	NICs > 3 Summary	> 4 Deploy		
			Cloud IP: 10.20.149.223	VM Network lp: 10.20 10.20 10.20	.149.224 - 10.20.149.229 .149.233 - 10.20.149.239 .149.243 - 10.20.149.249		
		Management	VM Network	San 0	San 1	Fence	
	vg775hci1 10.20.149.221	Bridge IP. 10.20.149.221 Acuity MIP: 10.20.149.222 Interface 1: eno3	Interface 1: eno4	Bridge IP: 192.168.149.220 Acaily SOIP: 192.168.149.221 Interface 1: eno1	Bridge IP. 192.169.149.220 Acuity S1IP. 192.169.149.221 Interface 1. eno2	Type: Ipmilan Username: root Fence IP: 10.20.149.220	
	vg775hci2 10.20.149.231	Bridge IP. 10 20 149 231 Acuity MIP: 10 20 149 232 Interface 1: cno3	Interface 1: eno4	Bridge IP: 192 168 149 230 Acuity S0IP: 192 168 149 231 Interface 1: eno1	Bridge IP. 192 169 149 230 Acuity S1IP. 192 169 149 231 Interface 1: eno2	Type: ipmilan Usemane: rool Fonce IP: 10.20.149.230	
	vg775hci3 10 20 149 241	Bridge IP: 10.20.149.241 Acuity MIP: 10.20.149.242 Interface 1: eno3	Interface 1: eno4	Bridge IP: 192.168.149.240 Acuity SOIP: 192.168.149.241 Interface 1: eno1	Bridge IP: 192.169.149.240 Acuity S1IP: 192.169.149.241 Interface 1: eno2	Type: Ipmilan Usemanne: root Fence IP: 10.20.149.240	
	DOWNLOAD					ACK CONFIRM	

	Go ahead	with the deployment?	
		Acuity 501P: None Interface 1: enp2x0f0	

5. A log of the steps and a progress bar will be displayed.

Opency       Image: Completed Successfully         MSTALL:       database instal completed Successfully         COMPORTS:       database instal completed Successfully         STAUS:       in progress         @ San-Storage       in progress         @ Ountum Storage       29 %	1 Los	d Template > 2 Contigure Nics > 3 Summary > 4 Deploy	
Database     SINO_DOWN dubbes bring down completed Successfully     ONFOLF: database instal completed Successfully     ONFOLF: database completed Successfully     STATUS: database completed Successfully     CONFINUE: database completed Successfully     STATUS: database completed Successfully     STATUS: database completed Successfully     STATUS: database completed Successfully     CONFINUE: In progress     San-Storage     Countum Storage     Z0 %			
BING DOWN :       database bring down completed Successfully         NISTUL :       database instail completed Successfully         CONFRURE:       database compare completed Successfully         STATUS:       database completed Successfully         Status:       Biscossfully         Status:       In progress         Status:       Gountum Storage         23 %       23 %	🥑 Database		
Communication Broker RESTART: In progress San-Storage	BRING_DOWN : INSTALL : CONFIGURE : STATUS :	database bring_down completed Successfully database install completed Successfully database configure completed Successfully database status completed Successfully	
RESTART In progress	Communication Broker		
Ouantum Storage	RESTART :	In progress	
Quantum Storage 29 %	san-Storage		
29 %	Quantum Storage		
		29 %	
CommBroker setup is in progress.		CommBroker setup is in progress.	

*NOTE*: If the deployment fails, you will get a high-level detail of the failure as shown below.

Oppose       Oppose            • Network           MSTALL:	United Surveillance Platform	1 Load Templato > 2 Configuro Nics > 3 Summary > 4 Doploy	
Network NSTALL: network install completed Successfully CONFIGURE: network install completed Successfully RESTART: network restart completed Successfully RESTART: network restart completed Successfully CONFIGURE: cluster network restart completed Successfully STATUS: cluster network restart completed Successfully STATUS: cluster status completed Successfully CONFIGURE: cluster status completed Successfully CONFIGURE: loadbalancer install completed Successfully CONFIGURE: loadbalancer configure co			
NSTALL:       network configure consided Successfully         CONFIGURE:       network rentant completed Successfully         RESTART:       network rentant completed Successfully         Cluster       NSTALL:         CONFIGURE:       cluster network rentant completed Successfully         CONFIGURE:       cluster network rentant completed Successfully         CONFIGURE:       cluster network rentant completed Successfully         CONFIGURE:       cluster network status completed Successfully         © Load Balancer       NSTALL:         NSTALL:       loadbalancer rentant completed Successfully         CONFIGURE:       loadbalancer configure completed Successfully	Network		
Cluster      NSTAL1:     CONFIGURE:     cluster metal completed Successfully     STATUS:     Configure completed Successfully     STATUS:     Configure completed Successfully     CONFIGURE:     leadbalancer      NSTAL1:     CoNFIGURE:     leadbalancer onfigure completed Successfully     CONFIGURE:     leadbalancer configure completed Successfully     CONFIGURE:     leadbalancer Age %	INSTALL : CONFIGURE : RESTART :	network install completed Successfully network configure completed Successfully network restart completed Successfully	
INSTALL:       cluster install completed Successfully         CONFIGURE:       cluster install completed Successfully         STATUS:       cluster status completed Successfully         INSTALL:       loadbalancer install completed Successfully         CONFIGURE:       loadbalancer install completed Successfully         CONFIGURE:       loadbalancer completed Successfully         29 %       29 %	Cluster		
Load Balancer      NoSTALL:     Kostbalancer Install completed Successfully     CONFIGURE:     Kostbalancer configure completed Successfully     29 %	INSTALL : CONFIGURE : STATUS :	ckuster install completed Successfully ckuster configure completed Successfully ckuster stalura completed Successfully	
INSTALL: Inadbalancer install completed Successfully CONFIGURE: Inadbalancer configure completed Successfully 29 %	Load Balancer		
29 %	INSTALL : CONFIGURE :	leadbalancer install completed Successfully leadbalancer configure completed Successfully	
		29 %	

6. A confirmation page will display that the deployment was successful. There will be a link attached to visit the USP Management Application.



 Once the installation is complete, launch the USP Management Application in the browser. <u>https://<cluster\_ip>/quantum/usp/dashboard</u>



8. Log on to the Advanced Storage Configuration Utility using the same credentials you used to access the Quantum USP Management Application.

ſ		
	Quantum	
	administrator	
	······ &	
	LOGIN	

Ouantum. VS Management Application 22.12.13.6860	967e							Filter by vPG /	Node name	Events and Logs	0.0	0	⊳
Bashboard	STORAGE UTILIZATION	LOGICAL DOMAIN			PHYSICAL DOMAIN				DEVICE HEALTH STATE				
Virtual Performance Group	94% MULABE 15PACE								Node / vPG Name	Q Device Status	<u>с</u> в	evice C	
E Configure			$\odot$	Normal		0	Normal						
ToolBox	🔲 Used - 5.015 TiB 📄 Available - 78.527 TiB	Systems			Assigned								
Settings	Total Storage - 83.543 TiB	Volumes			Unassigned								
	SSD												
	Used:5 TiB Available:78.5 TiB												
		SYSTEM UTILIZATION					VOLUME HOST CON	NECTION - ISCSI	Connection (Active  Inactiv	e)			
		Name		Total	Available		Volume Name	Q. Hos	t IP/Initiator Na. Q	vPG Name	Q iscsi	Connec	
		📄 VPG101348923		83.543 TiB	78.527 TiB		_						
									👔 Click the refresh ison	to fetch the data			

### Viewing the Acuity VM Console

- 1. Log on to the USP CentOS console.
- 2. Click the **Activities** button at top-left.
- 3. Search for Virtual Machine Manager and click on the icon to launch.



4. Select the **Acuity-VM** instance and click on **Open** to launch the console.

< Activities	💵 Virtual N	1achine Manager 👻	Mar 29 19:23	
			Virtual Machine Man	nager ×
		File Edit	View Help	
			Ppen 🕞 🔟 🔳 🗸	
		Show the virtual r	machine console and details	✓ CPU usage
			Acuity-VM Running	
		پ 🛃	instance-00000007 Running	
			instance-0000000d Running	

👙 Activities 🛛 📾	Virtual Machine	e Manager 👻		Mar 29 19:2	24		
				Acuity-VM on QEM	IU/KVM		
File Virtual Machin	e View Sen	d Key					
		-					
	**	∗× Quantum V	S-HCI 203	36/02/06 07:26:	21.527 UP	TIME 1.03:19:39 >	<del>(***</del>
	Linux Host	tname: 00176c168535	cdd1a729f	VH-65HQQP2 Sha611h78ea	Serial Nu Model Num	mber: Not ber: UHu6-Of	Specified BO2-01W25
	NIC	STATIC		IPv6	nouer num		
	SANO	10.134.101.	141/20 f	fe80::5054:ff:f	ed7:f574/	64	
	SAN1 MGMTO	10.134.117.	141/20 f	1080::5054:ff:f 080::5054:ff:f	ed1:f983/	64 64	
	VIRTUALO	172.16.16.2	1/24 f	fe80::5054:ff:f	e5b:6f46/	64	
	License:	Pivot3	120-Day I	Evaluation Lice	nse 10.x		
	Active OS	: pvt00.1	0.9.1.B0	50	0.0		
		13. potoo.1	0.3.0.100	9002171520.1000	UZ		
	NodeName	VH-65H	QQP2 Nod	leState	NORMAL	NodeNum	2
	vPGName	VPG101348	5133 vPG	aState	NORMAL	Members	3
	Wuorum MFState	FUI	3 CII ICMD Hol	ientSessions	38 15	StorageSessions	4
	Support	Ena	bled HW	rumes	10	wo_nerouu_otute	221
	Mig Vol:	MIG_	DONE Mig	g Progress(%):	100	Est Time(sec):	Θ
	Cache	600d : 1	Failed	a Rebuildin	n:0 0	ther:0	
	SATA	Good : 6	Failed:(	9 Rebuildin	g:0 0	ther:0	

### Network Adapter Physical-to-Logical Mapping

While installing the USP software, you will be prompted to select the adapter within the Linux operating system to use for each network. It is important to ensure that the physical-to-logical port mapping for each host is correct, especially if there are isolated switches for the different networks. The logical adapter you choose on each host should be cabled to the same switch as the logical adapters for the others hosts for the same network.

During installation, the USP Configuration Utility will attempt to blink the physical ports on the server so that you can ensure that the ports are cabled correctly (the same as the other servers).

If for some reason the blinking functionality does not work, or it is impossible to physically see the back of the server, it may be necessary to log in to each server using SSH and confirm that you can ping between all the adapters in the cluster for the given network.

### Cluster Status Failed Popup During Cluster Setup

This popup message can be displayed for several different reasons. See the below sections to help debug the issue further.

#### iDRAC Password Reset Issue

**Identify Error:** On the system running the USP Cluster Setup utility, look at the contents of the <todo> /var/log/enclouden/orchestrator\_run\_history.log file and check for the existence of this message:

If you run the following command using ipmitool you will see the error message "RAKP 2 HMAC is invalidError: Unable to establish IPMI v2 / RMCP+ session".

#### ipmitool -I lanplus -H [iDRAC\_IP\_ADRESS] -U [USERNAME] -P [PASSWORD] -v chassis power status

**Cause:** If there were hardware replacements in this server, for example a motherboard replacement, the iDRAC password will not work for the IPMI interface even though you can still log in to the Web Interface.

**Solution:** To fix this issue you will need to reset the iDRAC password and then restart the USP cluster setup.

**Validation:** Once the iDRAC password has been reset, you can verify by running the following ipmitool command and observing a success message.

ipmitool -I lanplus -H [iDRAC\_IP\_ADRESS] -U [USERNAME] -P [PASSWORD] -v chassis power status

### Troubleshooting

### Launching the Acuity Advanced Storage Configuration Utility

To launch the Acuity Advanced Storage Configuration Utility, navigate to the USP Menu and select Advances Storage Configuration.

### Associating USP Cluster with Your Cloud-Based Analytics Account

If you would like to automatically associate your USP cluster with your Cloud-Based Analytics account, you must retrieve your association token. This token can be entered into the installation template in the next section.

- 1. If you do not have an account with the <u>Quantum CBA Portal UI</u>, you can request access by clicking the **Request Site Access** link.
- 2. To find your Association token, log in to the <u>Quantum CBA Portal UI</u> and click the *user* icon, as highlighted in the following image.

<	SOLUTIONS	NODES	ALERTS	cba-ui customer 2 2	•
	Nodes 😗			Profile/Logout	ç

1. When you click the *user* icon, the following menu displays with the appropriate options. Click **Association Token** for the Association token for your account.



Your unique Association token displays in a pop-up dialog box. Click **Copy to Clipboard** to copy the Association token to your clipboard.



### Appendix A – Creating a Bootable USB Key

Creating a Bootable USB Key from a Linux Operating System

- 1. Use PXE to install any Linux ext4 filesystem on the target OS disk.
- 2. Copy the ISO file and the md5 checksum file to any location on a Linux server with an ext4 filesystem. Make sure both the md5 checksum and the ISO file are in the same directory.
- 3. Run the md5sum command to verify the ISO has been properly copied: # md5sum -c USP-5.0.0.iso.md5
- 4. Detect the USB from the command: # lsblk -d -o name,size,tran | grep usb Example Output: sdt 14.3G usb

*NOTE*: For the remaining examples we will use "sdt" as the location returned from the lsblk command.

For the remaining examples, we will use "sdt" as the USB location.

- 5. Use fdisk or any other tool to remove partitions/re-format from the USB:
  - # fdisk /dev/sdt
  - Use "p" option to print the existing partitions.
  - Use "d" option to delete a partition and specify the partition numbers, if any.
- 6. After deleting, use "w" option to save the config.
- 7. Use the "dd" command to wipe the first few Bytes of the USB:
  - # dd if=/dev/zero of=/dev/sdt bs=1M count=1 status=progress

*NOTE*: This is done to guarantee that there is nothing left on the USB. You can increase the bs size to 10M or any other size you require.

- 8. Now that the USB drive is formatted, use any of the following commands to copy the ISO to the USB:
  - using dd: (recommended method)
     # dd bs=4M if=path/to/USP-5.0.0.iso of=/dev/sdt conv=fsync oflag=direct status=progress
  - using <u>cat</u>:
     # cat path/to/USP-5.0.0.iso > /dev/sdt
  - using cp: # cp path/to/USP-5.0.0.iso /dev/sdt
  - using tee: # tee < path/to/USP-5.0.0.iso > /dev/sdt
- 9. Use fdisk to verify that the USB has been copied with the right content: # fdisk /dev/sdt
- 10. Use the "p" option to print the partitions.You will see 2 partitions. Part 1 will be the size of the ISO file. Part 2 will be an EFI partition.

- 11. Once verified, complete these steps to USB drive as a bootable option:
  - a. Attach the USB to the server for installation.
  - b. Reboot the server.
  - c. Navigate to the One-Time-Boot Option of the server to see the USB drive as a bootable option.

It will usually be named with the USB drive's manufacturer. For example: SanDisk, Samsung, etc.

The rest of the process is similar to other OS installations.

### Creating a Bootable USB Key from a Windows Operating System

- 1. Copy the ISO file and the md5 checksum file to the server at any location. Make sure both the md5 checksum and the ISO file are in the same directory.
- 2. Use a program to verify that the ISO's md5 checksum has been properly copied.
  - Using <u>md5summer</u>:
    - a. Click on Verify Sums.

Please select the root folder: Haggis Bug Info Key Cut Tool PasswordIssue Training Screenshots USB Windows md5v12011 Rufus md5v12011.zip	MD5Summer	_		$\times$					
Haggis Bug Info       Key Cut Tool       PasswordIssue       Training Screenshots       USB Windows       md5v12011       Rufus       MD5       Checksum type:       MD5       Create sums	Please select the root folder:								
Checksum type: MD5 Create sums Verify sums About		Haggis Bug Key Cut Too Passwordls: Training Sci USB Windo 	Info ol sue reenshots 2011 2011.zip	*					
Checksum type: MD5  Create sums Verify sums About	<			>					

🥞 Open md5sun	n file				×
Look in:	USB Windows	3 ~	G 🤌 📂 🖽	Ŧ	
Quick access Desktop Libraries	Name md5v12011	^ •NVR-5.0.0-230314.iso.md5	Date modified 3/14/2023 6:18 f 3/13/2023 2:10 f 3/14/2023 12:38	PM PM PM	Type File fc File fc MD5
Network	File name: Files of type:	QMCO-USP-NVR-5.0.0-230314.iso All MD5 files (*.md5;*.txt)	.md5 ~	Ope	> cel

b. From the **Open** dialog, select the .md5 file.

**Opening the file** may take a few minutes to complete.

	MD5sums: Generating						
File QMCO-USP-NVR-5.0.0-2303	14.iso	MD5 Hash 69c9304127c2d78c77fa	582da46667ab				
Кеу	Patala (1 a( 1))	File Information					
<ul> <li>Unprocessed</li> <li>OK / Done</li> </ul>	100%	Path: C:\Users\Admin	istrator\Downloads\				
Processing	File:	QMCO-USP-NV	R-5.0.0-230314.iso				
<ul> <li>Error (0 so far)</li> <li>6 Mins, 29 Sec</li> </ul>	Save	Size: Close 13,991,618.00 k	КЬ				

- c. Plug in the USB drive to use for creating the installation file.
- d. Using <u>balenaEtcher</u> select the ISO file from your local system.



e. Select the Target device (USB drive).

📚 balenaEtcher			- 🗆 X
	😚 balena Elcher		<b>\$ 0</b>
<b>↔</b>		- 4	
CentOS-Stdvd1.iso	Select target		
Cancel			
12 GB			

f. Note that current data on the device will be destroyed. It will start writing the ISO to USB key, which will take a few minutes.





g. Once the "Flash!" button displays, click on it to start the USB drive flashing. A Command Prompt pop-up will ask to confirm. Click on Yes. It will flash the USB drive.



- h. Confirming that the flash has completed, exit the program, safely eject the USB key, and then insert it in the server to install USP 5.0.
- i. Boot the server and go to the One-Time-Boot Option of the server to select the USB drive as a bootable option. The drive will usually be named with the manufacturer of the USB drive. For example: SanDisk, Samsung, etc.

### Appendix B - Booting from an ISO Through Out-Of-Band Management

*NOTE*: The example below is for a Dell server. Your server out-of-band management interface may differ from the example below. See the vendor specific instructions for booting from virtual media.

- 1. Place the Quantum .ISO file on a network share that is accessible to all of your nodes.
- 2. Connect to the out-of-band interface and log in.

3. Click on the Virtual Console.



4. Select the "Connect "Virtual Media" button.

Boot Power	Chat	Keyboard	Screen Capture	Refresh	Full Screen	Connect Virtual Media	Disconnect Viewer	Console C
n the "Map	o CD/D۱	/D" secti	ion, select <b>B</b>	rowse.				
Virtual Media								
Virtual Media is co	nnected					Disc	onnect Virtual Media	
Map CD/DVD								
Image File	Bro	wse No file	selected.			Map Device		
	R	ead Only						
Map Removabl	e Disk							
Image File	Bro	wse) No file	selected.			Map Device		
	R R	ead Only						
Resets the USB Sta	ate for redete	ection.					Reset USB	
							Close	

6. Browse to the Quantum ISO file and press Open.

### 7. Select "Map Device"

Virtual Media		
Virtual Media is con	nected	Disconnect Virtual Media
Map CD/DVD Image File	Browse) QMCO-USP-NVR-5.0.0-220929.iso	Map Device
Map Removable Image File	P Disk Browse No file selected.	Map Device
	Read Only	

### 8. The ISO will appear as mapped. Press "Close"

Virtual Media		
Virtual Media is cor	nected	Disconnect Virtual Media
Map CD/DVD Image File	QMCO-USP-NVR-5.0.0-220929 iso is mapped to CD/DVD drive.(Read Only) Un-Map Device	
Map Removable	Browse No file selected.	Map Device
Resets the USB Sta	te for redetection.	Reset USB
		Close

9. Configure the server to boot from the virtual ISO by pressing the "Boot" button and selecting "Virtual CD/DVD/ISO."

Boot Power Chat Keyboard Screen Capture Re	Refresh Full Screen	Virtual Media	Disconnect Viewer	Console Controls
--	---------------------	---------------	-------------------	------------------

#### 10. Select Virtual CD/DVD/ISO.

pot Controls
✓ Normal Boot
PXE
BIOS Setup
Local Floppy/Primary Removable Media
Local CD/DVD
Hard Disk Drive
Virtual Floppy
Virtual CD/DVD/ISO
Local SD Card
Lifecycle Controller
BIOS Boot Manager
UEFI Device Path
UEFI HTTP

#### 11. Click on Yes.

Confirm Boot Action	
This will set a new boot device do you wish to continue? Virtual CD/DVD/ISO	
	No Yes

- 12. Select Power.
- 13. Select Reset System (Warm boot).



- 14. Confirm Power action, select "Yes."
- 15. On the next boot, your server will boot from the Quantum USP ISO. The server will boot-up from the ISO.



The Install Menu screen will appear.



16. Select Install QMCO USP 5.0 and click on **Enter.** The next screen will allow you to select disks for the OS partition.

### Appendix C – Ports Used

The following ports are used by the USP software.

Service	Port	Protocol	Description
haproxy_stats	1984	ТСР	haproxy statistics port
galera_dbclient_haprox	3305	ТСР	Galera Cluster database client connections
У			
galera_dbclient	3306	TCP	Galera Cluster database client connections
galera_replication	4567	ТСР	Galera Cluster database replication traffic
galera_inc_state_transf	4568	ТСР	Galera Cluster database Incremental State
er			Transfers
galera_state_snapshot_	4444	ТСР	Galera Cluster other database State Snapshot
transfer			Transfer methods
nova_metadata	8785	ТСР	nova metadata service bind port
nova_osapi_compute	8784	TCP	nova compute osapi service bind port
nova_novncproxy	8881	ТСР	nova novncproxy service bind port
nova_metadata_hapro	8775	ТСР	nova metadata service loadbalancer virtual port
ху			
nova_osapi_compute_ haproxy	8774	ТСР	nova compute osapi service loadbalancer virtual port
nova_novncproxy_hapr oxy	8880	ТСР	nova novncproxy service loadbalancer virtual port
nlacomont	0770	тср	nlacement ani convice hind nort
placement	0//0	ICF	
placement_haproxy	8788	ТСР	placement api service loadbalancer virtual port
squid	8883	ТСР	squid proxy bind port
squid_icp	8884	ТСР	squid proxy ICP (cache synchronization) bind port

Service	Port	Protocol	Description
squid_haproxy	8882	ТСР	loadbalancer virtual port
heat_api	8005	ТСР	heat api service bind port
heat_api_haproxy	8004	ТСР	heat api service loadbalancer virtual port
heat_api_cfn	8001	ТСР	heat cloudformation api service bind port
heat_api_cfn_haproxy	8000	ТСР	heat cloudformation api service loadbalancer virtual port
glance_api	9293	ТСР	glance api serivice bind port
glance_api_haproxy	9292	ТСР	glance api serivice loadbalancer virtual port
barbican_api	9312	ТСР	barbican api service bind port
barbican_api_haproxy	9311	ТСР	barbican api service loadbalancer virtual port
iscsi	3260	ТСР	iscsi initiator port
cinder_api	8777	ТСР	cinder api service bind port
cinder_api_haproxy	8776	ТСР	cinder api service loadbalancer virtual port
keystone_public	5001	ТСР	keystone public api service bind port
keystone_public_hapro xy	5000	ТСР	keystone public api service loadbalancer virtual port
keystone_admin	35358	ТСР	keystone admin api service bind port
keystone_admin_hapro xy	35357	ТСР	keystone admin api service loadbalancer virtual port
neutron_api	9596	ТСР	neutron api service bind port
neutron_api_haproxy	9696	ТСР	neutron api service loadbalancer virtual port
vxlan	4789,8472	UDP	IANA and Linux VXLAN connection ports
neutron_dhcp_in	67	UDP	Neutron dhcp input
neutron_dhcp_out	68	UDP	Neutron dhcp output
libvirtd	16514	ТСР	libvirtd tls remote connection port
kvm	49152- 49261	ТСР	kvm livemigration ephemeral connection ports
vncspice	5900-6700	ТСР	virtual machine VNC and SPICE connectin ports
memcached	11211	ТСР	memcached connection port
rabbitmq	5672	ТСР	rabbitmq connection port
epmd	4369	ТСР	erlang epmd connection port

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Service	Port	Protocol	Description
rabbitmq_dist	44001- 44010	ТСР	rabbitmq distrubution connection ports
rabbitmq_haproxy	5671	ТСР	rabbitmq service loadbalancer virtual port
ntp	123	UDP	ntp connection port
http	80	ТСР	apache http unsecure bind port
https_haproxy	443	ТСР	apache httpd SSL haproxy loadbalancer virtual port
pcsd	2224,3121, 21064	ТСР	pcsd and pacemaker ports
corosync	5404,5405	UDP	corosync ports
ceph_mon	3300,6789	ТСР	ceph monitor ports
ceph	6800-7300	ТСР	ceph OSD and MSD ports
ceph_rgw	7480	ТСР	Ceph RADOS Gateway port
ceph_dashboard	8443	ТСР	ceph dashboard port
ceph_container_registr y	5009	ТСР	ceph container local registry port
acuity_mgmt_api	8080	ТСР	port for acuity management api
acuity_mgmt_ui	8443	ТСР	port for acuity management UI
acuity_mgmt_ui_webs ocket	8887	ТСР	port for acuity management websocket
acuity_mgmt_ui_hapro xy	8442	ТСР	mngmnt SSL haproxy loadbalancer virtual port
cba	5050	ТСР	server port for cba

# Quantum

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