

Proxmox Setup Guide

Application Note

May 2024

ANNOUNCEMENT

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PREFACE

Technical Support

Do you have any questions or need help trouble-shooting a problem? Please contact QSAN Support, we will reply to you as soon as possible.

- Via the Web: <u>https://www.qsan.com/technical_support</u>
- Via Telephone: +886-2-77206355
- (Service hours: 09:30 18:00, Monday Friday, UTC+8)
- Via Skype Chat, Skype ID: qsan.support
- (Service hours: 09:30 02:00, Monday Friday, UTC+8, Summer time: 09:30 01:00)
- Via Email: <u>support@qsan.com</u>

Information, Tip, and Caution

This document uses the following symbols to draw attention to important safety and operational information.



INFORMATION

INFORMATION provides useful knowledge, definition, or terminology for reference.



TIP

TIP provides helpful suggestions for performing tasks more effectively.







CAUTION

CAUTION indicates that failure to take a specified action could result in damage to the system.



1.1. What is Proxmox

Proxmox VE (Virtual Environment) is a complete, open-source server management platform for enterprise virtualization. It tightly integrates the KVM (Kernel-based Virtual Machine) hypervisor and LXC (Linux Containers), software-defined storage and networking functionality, on a single platform. With the integrated web-based user interface you can manage VMs (Virtual Machines) and containers, high availability for clusters, or the integrated disaster recovery tools with ease.

Proxmox fits the SMB (Small and Medium-sized Business) the best, which requires the IT infrastructure for virtualization solutions that have been dedicated. Also, its intuitive GUI (Graphical User Interface) gives the way for the centralized management of VMs, how the network is set, and how high the features are available. Proxmox allows SMBs to design the tool according to its open-source nature and what fits them while avoiding vendor lock-in.

or View	0										
Determine (demonstrates)	Datacenter										Θ
batacenter (democluster)	Q Search		Health			Guests					
102 (debianbuster) deb In.	Summary					00000					
📄 103 (centosstream) centos	Inux D Notes		Status	Nodes	Ceph	Virtua	l Machines		LXC	Container	
104 (centos)	Cluster					O Rupping		2	O Dunning		0
105 (Rocky9)	Ceph			✓ Online 5		 Stopped 		2	 Stopped 		6
107 (AlmaLinux)	Options			× Offline 0							
🕞 100 (Ubuntu-23.04) 🚹 🛄	Storage		Charles democratication Councilia Vice		UPATTL OF						
101 (Win10) windows	B Backup		cluster, democluster, quorate, res		HEALTH_OK						
108 (F37) 109 (Debian-Bullseve)	Replication										
Iccalnetwork (pve-demo1)	Permissions	~	Resources			Nodes					
backupstore1 (pve-demo1)	LUSers					Name ID Online	Support	Server Address	CPU usage	Memory usage	Upti
cephfs1 (pve-demo1)	API Tokens		CPU	Memory	Storage	pwe 1 🗸	Community	192.168.6.80	31%	53%	03
🛢 🖟 iso-templages (pve-demo1)	4 Two Factor					pve 2 🗸		192.168.6.81	496	30%	04:
local (pve-demo1)	😸 Groups					pve 3 🗸	-	192.168.6.82	4%	30%	04
I local-hm (pve-demo1)	Pools		00/	250/	200/	pve 4 🗸		192.168.6.83	396	2496	04
pve-demo3	Roles		9%	35%	39%	pve 5 🗸	-	192.168.6.84	496	25%	04:
pve-demo4	Realms		of 10 CPU(s)	18.78 GiB of 54.26 GiB	7.18 TIB of 18.45 TIB						
pve-demo5	97 HA										
	ACME		Subscriptions								
	C Firewall	Þ		No Subscription							
	Lal Metric Server										
	C Resource Map	pings		S							
	Q Support			V							
			You he	ave at least one node without subscri	ption.						
	_				-						
Cluster log											
End Time	Node	User name	Description							Status	
	a second descent of the second s	rootmpam	Shell							OK	
11:06:52 Jun 21 11:07:3	a bye-gemot	root the own	184.100 Elect							OF	
1 11:06:52 Jun 21 11:07:3 1 11:02:25 Jun 21 11:02:20 1 11:02:27 Jun 21 11:02:40	5 pve-demo1	root@pam	VM 100 - Start							ок	

Figure 1-1 Proxmox GUI



2. CONFIGURATION SETTINGS

In this chapter, we will demonstrate how to use XEVO and QSM to create storage in a Proxmox VE environment to deposit VMs. We will also introduce how to create storage using iSCSI / SMB / NFS protocols in the following chapters.

2.1. Recommended Storage

- 1. Use <u>XCalc.</u> tool on the QSAN website to obtain recommended storages.
- 2. Enter the Total Usable Capacity Required and the desired RAID Level.

XCa	alc.		
Input you	r parameters to estimate the necessary quantity of disks and find the most suitable products to support your unique environment.		
1	Total Usable Capacity Required		
	10	ТВ	
2	Single Drive Size		
	1	ТВ	
3	RAID Level		
	RAID 5		

Figure 2-1 Use XCalc. Tool to Obtain Recommended Storages

3. Select the Virtualization option.



Proxmox Setup Guide Application Note

Find Out Your Suitable Storage			
Total Usable Capacity 🕕	XCubeFAS XF3126		Proposal Details 🗸
Disk Required: 13	Configuration ()	Performance (i)	Highlights
Usable Space: 11 TB		Throughput(MBps) 11000	- µs-level latency - Virtualization ready
		IOPS	- 99.9999% high availability - Dual active controller
Select Your Plan	HEAD : XF3126 x1	660000	
 Best Price-Performance 			
O Best Cost-Efficiency			
Virtualization	XCubeSAN XS5324		Proposal Details 🗸 🗸
○ Surveillance			
⊖ Backup	Configuration (1)	Performance ()	Highlights
○ File Sharing		Throughput(MBps)	- Auto tiering
○ Video Editing		8938	- Support MPIO - Support SED
○ AI ML		IOPS	
O Education Industry	HEAD : XS5324 x1	804375	

Figure 2-2 Select Virtualization Option

4. Select the model and click the **Proposal Details** button to view more.



Figure 2-3 Click Proposal Details Button to View More

5. If necessary, click the **Export the Result** button to export the report.



Proxmox Setup Guide Application Note

Find Out Your Suitable Storag	le	Export the Result
The Configuration for the Total Capacity: Total Usable Capacity Required: 10 TB Single Drive Size: 1 TB RAID Level: RAID 5	XCubeNXT XN8124 Configuration	Performance
Total Usable Capacity Disk Required: : 12 Usable Space: : 11 TB	HEAD : XN8124 x1	Throughput(MBps) 7597 IOPS 683719
Select Your Plan: Virtualization	1 Units of XN8124	
Key Features of this Configuration		
CPU RAM	Active-Active Architecture	ully Redundant Modular
Figure 2-4 Clie	ck Export Button to Export Re	esult

2.2. Configuration Steps in XEVO

In this section we will provide an example of setting up iSCSI in XEVO.

2.2.1. Environment and Topology

Demonstration Environment

Proxmox Server

Data Port IP: 192.168.252.81

Storage

4

Model: XCubeSAN 5326D
 Memory: 16 GB per controller
 Firmware: XEVO 2.3.3
 Data Port IP 1: 192.168.175.31
 Data Port IP 2: 192.168.175.32



Demonstration Topology



Figure 2-5 Demonstration Topology in XEVO

2.2.2. Configure iSCSI Settings in XEVO

1. Connect the data port IPs 192.168.175.31 and 192.168.175.32 in XEVO and the installed Proxmox server to the same switch, and confirm that they can ping each other.

OSAN X	EVO XSS	3326-D60030									÷ 📰 🤅
Dashboard	Storag	je Hosts F	Protection	Analysis Syste	m Messages						
						Arrays	Settings Data	Ports Maintenance	Data Encryption		
Data Por	t Overview	v									
					Slot 1		Slot 2 Onhoa	4	Slot 1	int 2 Onboard	
				CTRL 1			alor 2 Children	5 CTRL 2	3001 3	۵۲۲2 Onboard	
\$ i	SCSI Po	rts									
	CTRL	Interface	Location	Port	Status	LAG	IP Address	Gateway	VLAN ID	Jumbo Frame	MAC Address
8	1	iSCSI (10Gb) 🎄	Onboard	LAN1	1 Gb/s	N/A	192.168.175.31		N/A	Disabled	00:13:78:d6:00:32
6	1	iSCSI (10Gb) 🌣	Onboard	LAN2	Down	N/A	192.168.2.1	192.168.2.254	N/A	Disabled	00:13:78:d6:00:33
6	2	iSCSI (10Gb) 🌣	Onboard	LAN1	Down	N/A	192.168.11.1	192.168.11.254	N/A	Disabled	00:13:78:d6:00:3c
-	2	iSCSI (10Gb) 🔅	Onboard	LAN2	1 Gb/s	N/A	192.168.175.32		N/A	Disabled	00:13:78:d6:00:3d

Figure 2-6 Connect Data Ports in XEVO



2. Create a pool, a volume, and a host group; then connect the volume to the host group.

CSAN XEVO XS3326-D60030														
Dashboard Storage Hosts Protection	ishboard Storage Hosts Protection Analysis System Messages													
Pools	Pool	Pool_01 🌣												
 Pool_01 	Capacity				0.05 TB / 0.09 T	В		64% Used						
		Health Status Controller Disk Group	Good Online Controller 1		Actual Space Arvilable Space Provisioning Type	92.08 92.08 Thick Provisioning								
									1					
		! Vo	lume Name	Status	Snapshot Space	Capacity	LUN	Cache Mode	Volume Type					
		• Vo	lume_01 🌣	Online	0 MB / 0 MB	60.00 GB	0	Write-through Cache	RAID Volume					
		L												

Figure 2-7 Create a Pool and a Volume

3. Login to the Proxmox VE Web UI, enter the editing node "pve" network, and configure the IP address 192.168.175.11/24 and 192.168.175.12/24.

	al Environment 7.2-3 S	earch											
Server View ~	Node 'pve'												
Datacenter	^	Create \lor	Revert Edit	Remove	Apply Configura	ation							
1	Q Search	Name \uparrow	З Туре	Active	Autostart	VLAN a	Ports/Slaves	Bond Mode	CIDR	Gateway	Comment		
	Summary	ens33	Network Device	Yes	No	No							
	C. Notes	ens35	Network Device	Yes	Yes	No			192.168.175.11/24				
	>_ Shell	ens36	Network Device	Yes	Yes	No			192.168.175.12/24				
	¢g System ▼	vmbr0	Linux Bridge	Yes	Yes	No	ens33		192.168.252.81/17	4 192.168.128.254			
	Certificates												
	O DNS												
	Hosts												
	 Time 												
	🔳 Syslog												
	2 Updates -												
	Pa Repositories												
	♥ Firewall >												
	🖨 Disks 👻												
	LVM												
	LVM-Thin												
	Directory												
	II ZFS												
	Ceph												
	ta Replication												
	\sim												

Figure 2-8 Login to Proxmox and Configure

4. Apply Configuration tab enables the above settings.



	al Environment 7.2-3 Se	arch									
Server View 🗸	Node 'pve'										
✓ ■ Datacenter > ₽ pve	Q Search	Create v	Revert Edit	Remove	Apply Configura	ation					
	Summary	Name ↑	Type	Active	Autostart	VLAN a	Ports/Slaves	Bond Mode	CIDR	Gateway	Comment
	D Notes	ens35	Network Device	Yes	Yes	No			192.168.175.11/24		
	>_ Shell	ens36	Network Device	Yes	Yes	No			192.168.175.12/24		
	¢ç System →	vmbr0	Linux Bridge	Yes	Yes	No	ens33		192.168.252.81/17	192.168.128.254	
	Cartificatas										
	DNS										
	Hosts										
	O Time										
	I Syslog										
	2 Updates 🗸										
	P Repositories										
	♥ Firewall										

- Figure 2-9 Enables Settings
- 5. Login to the Proxmox via SSH, and verify that they can ping the XEVO IPs set previously.

root@pve:~# ping 192.168.175.31
PING 192.168.175.31 (192.168.175.31) 56(84) bytes of data.
64 bytes from 192.168.175.31: icmp_seq=1 ttl=64 time=0.328 ms
64 bytes from 192.168.175.31: icmp_seq=2 ttl=64 time=0.390 ms
64 bytes from 192.168.175.31: icmp_seq=3 ttl=64 time=0.384 ms
64 bytes from 192.168.175.31: icmp_seq=4 ttl=64 time=0.385 ms
64 bytes from 192.168.175.31: icmp_seq=5 ttl=64 time=0.392 ms
^c
192.168.175.31 ping statistics
5 packets transmitted, 5 received, 0% packet loss, time 4050ms
rtt min/avg/max/mdev = 0.328/0.375/0.392/0.024 ms
root@pve:~#
root@pve:~#
root@pve:~# ping 192.168.175.32
PING 192.168.175.32 (192.168.175.32) 56(84) bytes of data.
64 bytes from 192.168.175.32: icmp_seq=1 ttl=64 time=0.299 ms
64 bytes from 192.168.175.32: icmp seq=2 ttl=64 time=0.386 ms
64 bytes from 192.168.175.32: icmp_seq=3 ttl=64 time=0.522 ms
64 bytes from 192.168.175.32: icmp seq=4 ttl=64 time=0.431 ms
^c
192.168.175.32 ping statistics
4 packets transmitted, 4 received, 0% packet loss, time 3033ms
rtt min/avg/max/mdev = $0.299/0.409/0.522/0.080$ ms

Figure 2-10 Login to Proxmox and Ping

6. Go to the Datacenter of the Storage, then click the **Add** tab and select the **iSCSI** option.



Proxmox Setup Guide

Application Note

XPROXMOX Virtual Environment 7.2-3	Search		
Server View Vatacenter			
Datacenter Q Search	Add V Remove Edit		
pve 1 Q Search Q Search Q Search Summary Notes Ceph Options Storage Backup 2 Replication Permissions G API Tokens Q, Two Factor G Groups Pools f Roles B Realms マ HA P	Add & Remove Edit Directory LVM LVM-Thin BTRFS SMB/CIFS GlusterFS GlusterFS CepFS 4 RBD ZFS over ISCSI ZFS Proxmox Backup Server	Type Content NFS Disk image, Container SMB/CIFS Disk image SCSI Disk image Directory VZDump backup file, ISO image, Container VM Disk image, Container	Path/Target /mnl/pve/Proxmox_NFS /mnl/pve/Proxmox_SMB iqn 2004-08.com.storage.storage-000d6a0a6 iscsi proxmox r template /var/lib/vz
● ACME ① Firewall ↓ <u>Att</u> Metric Server ♀ Support			

Figure 2-11 Select iSCSI Option to Configure

7. Enter the **ID**, **Portal IP**, and select the **Target** which you just created. Note that **Use LUNs** needs to be unchecked.

Add: iSCS	I		\otimes
General	Backup Retention		
ID:	SANiSCSI1	Nodes:	All (No restrictions) \checkmark
Portal:	192.168.175.31	Enable:	
Target:	iqn.2004-08.com.qsan:x \vee	Use LUNs	
	iqn.2004-08.com.qsan:xf202	6-000d60030:dev	/1.ctr1
😧 Help			Add
Add: iSCS			\otimes
General	Backup Retention		
ID:	SANISCSI2	Nodes:	All (No restrictions) \checkmark
Portal:	192.168.175.32	Enable:	
Target:	iqn.2004-08.com.qsan:x 🖂	Use LUNs	
	iqn.2004-08.com.qsan:xf2020	6-000d60030:dev	1.ctr2
Help			Add

Figure 2-12 Configure iSCSI Settings



8. After clicking the **Add** button, you can go to the storage page to confirm the storage settings.

ver View	Datacenter									
Datacenter	O Search	Add	lomairo I	Edit						
📂 pve	C Council	Aug v	centove a	LUIL						
	Sommary	ID ↑			Туре	Content	Path/Target	Shared	Enabled	Bandwidth Lim
	LJ Notes	Proxmox_NF	s		NFS	Disk image, Container	/mnt/pve/Proxmox_NFS	Yes	Yes	
	Cluster	Proxmox_SM	В		SMB/CIFS	Disk image	/mnt/pve/Proxmox_SMB	Yes	Yes	
	M Ceph	Proxmox_iSC	SI		ISCSI	Disk image	iqn.2004-08.com.storage:storage-000d6a0a6:iscsi.proxmox	Yes	Yes	
	Options	SANISCSI1			iscsi	none	iqn.2004-08.com.qsan:xf2026-000d60030:dev1.ctr1	Yes	Yes	
	Storage	SANISCSI2			ISCSI	none	ign.2004-08.com.gsan:xt2026-000d60030:dev1.ctr2	Yes	Yes	
	🖺 Backup	local			Directory	V2Dump backup file, ISO image, Container template	/varnib/vz	No	Tes	
	13 Replication	local-ivm			LVM	Disk image, Container		NO	res	
	Permissions									
	_ ≜ Users									
	O ADI Teleses									
	C AFTIONERS									
	ck Iwo ⊨actor									
	Groups									
	Pools									
	🛉 Roles									
	Realms									
	😻 HA 🛛 🕨									
	ACME									
	♥ Firewall									
	Ltd. Metric Server									
	C Suggest									
	Support									



- 9. Connect to Proxmox via SSH and enter the commands to download the multipath-tools.
 - # apt updat
 # apt install multipath-tools
- 10. Enter the command "fdisk -I" to confirm the mounted iSCSI drive location.

Disk /dev/sdc: 60 GiB, 64424509440 bytes, 125829120 sectors
Disk model: XF2026
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 131072 bytes / 131072 bytes
Disk /dev/sde: 60 GiB, 64424509440 bytes, 125829120 sectors
Disk model: XF2026
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 131072 bytes / 131072 bytes

Figure 2-14 Confirm Mounted iSCSI Drive Location

11. Enter the command "iscsiadm -m session" to confirm that there are two sessions.





Figure 2-15 Confirm iSCSI Sessions

- 12. Enter the command "service multipathd start " to enable multipath function. And use the command "cd /etc/" to enter the etc directory.
- 13. Enter the command "multipath -II" to record the wwid as shown in the picture below, and when MPIO has not been enabled, the status is active and enable.

root@pve:/etc#_multipath_ll								
proxmox1 (3200b0013780e8c40) dm-7 QSAN,XF2026								
size=6	DG feat	ures	='0'	hwhandl	ler='1 al	lua' wp=rw		
-+- po	olicy='	servi	ice-t	ime O'	prio=50	status=active		
`- 3	:0:0:5	sdc 8	3:32	active	ready ru	nning		
`-+- po	olicy='	servi	ice-t	ime O'	prio=50	status=enabled		
`- 4	:0:0:5	sde 8	3:64	active	ready ru	nning		

Figure 2-16 Check MPIO Status

14. Enter the command "vi multipath.conf" to edit the MPIO policy.

defaults	; {			
	user_fr	iendly_names yes		
}				
devices	{ device	<pre>{ vendor //cat /sys/block/sdx/der product //cat /sys/block/sdx/der path_grouping_policy path_selector failback rr_weight</pre>	"QSAN" vice/vender "XF2026" vice/model multibus "round-robin immediate priorities	0"
}	}	no_path_retry rr_min_io	5 1	
multipat	:hs { multipa }	th { wwid 3200b0013780e8c40 alias proxmox1		
}				

Figure 2-17 Edit the MPIO policy



- 15. Enter the command "service multipathd restart" to apply multipath.conf setting.
- 16. Enter the command "multipath -II" to check MPIO enable successfully. It can be found that the status of both paths has become active.

root@pve:/etc# multipath -ll		
proxmox1 (3200b0013780e8c40) dm-7 QSAN,XF2026		
<pre>size=60G features='1 queue_if_no_path' hwhandler='1</pre>	alua'	wp=rw
`-+- policy='round-robin 0' prio=5) status=active		
- 3:0:0:5 sdc 8:32 active ready running		
`- 4:0:0:5 sde 8:64 active ready running		
root@pve:/etc#		

Figure 2-18 Check MPIO Status

17. Back to the Proxmox web UI, and then go to the Datacenter of the Storage, click the **Add** tab and select the **LVM** option.

						E Docani
Server View ~	Datacenter	3				
✓ Datacenter ✓ Datacenter ↓ pve 1	Q Search	Add V Remove Edit				
100 (Test1)	Summary	Directory	Туре	Content	Path/Target	Shared
101 (test2)	Notes		NFS	Disk image, Container	/mnt/pve/Proxmox_NFS	Yes
222 (test)	E Cluster		SMB/CIFS	Disk image	/mnt/pve/Proxmox_SMB	Yes
255 (sam)	Ceph	NES	iSCSI	Disk image	iqn.2004-08.com.storage:storage-000d6a0a6:iscsi.proxmox	Yes
Proxmox_NFS (pve)	Options	SMB/CIFS	LVM	Disk image, Container		Yes
Proxmox_SMB (pve)	Storane	GlusterFS	iSCSI	none	iqn.2004-08.com.qsan:xf2026-000d60030:dev1.ctr1	Yes
Proxmox_iSCSI (pve)	E Pasture 2	iSCSI	ISCSI	none	iqn.2004-08.com.qsan:xf2026-000d60030:dev1.ctr2	Yes
SANMPIO (pve)	🖺 Васкир 🗕	E CephFS	Directory	VZDump backup file, ISO image, Container template	/var/lib/vz	No
SANISCSI1 (pve)	13 Replication	RBD	LVM	Disk image, Container		No
■ SANSCSIZ (pre) ■ I local-lym (pre) ■ II local-lym (pre)	Permissions Users API Tokens API Tokens API Tokens Groups Pools Reles Reles Reles ACME Frevail Metric Server Support	ZFS over ISCSI ZFS Proxmox Backup Server				

Figure 2-19 Select LVM Option to Configure

18. Enter the **ID**, select the **Base storage**, **Base volume**, and enter the **Volume group** name. Finally, check the Shared option.



Proxmox Setup Guide
Application Note

Add: LVM				8
General Bac	ckup Retention			
ID:	SANMPIO		Nodes:	All (No restrictions) \vee
Base storage:	SANiSCSI1 (iSCSI)	\sim	Enable:	
Base volume:	CH 00 ID 0 LUN 5	\sim	Shared:	
Volume group:	SANISCSI_MPIO			
Content:	Disk image, Container	\sim		
Help				Add

Figure 2-20 Configure LVM Settings

19. After clicking the **Add** button, you can go to the storage page to confirm the storage settings.

Sarvar Viaw			Car orcone this	Concease of	rocogpan v
Node 'pve'	"D Reboot	O Shutdown) _ Shell -	Bulk Actions	V 🛛 Help
Balacenter Q Search C Reload Create Volume Group			No vol	me group selected	\equiv More $\scriptstyle{\vee}$
100 (Test1) 2 Summary Name	Number	of LVs Ass	igned to LVs	Size	Free
101 (test2) Distance SANISCSL_MPIO		0	0%	64.42 GB	64.42 GB
2 122 (vindowsserver, > Shell Given/mapper/proxmox1			0%	64.42 GB	64.42 GB
255 (sam) OS System VE pve		4	88%	42.41 GB	5.23 GB
Proxmox_NFS (pve) = Network			88%	42.41 GB	5.23 GB
Proxmox_SMB (rve) Certificates					
Prozmoz jesus (pre) SanAmPli(row) ONS					
SANISCSI (pre) Q Hosts					
SANISCSI2 (pve) O Time					
Elipical (pre) ■ Brute / c = E System					
C Undates					
(t) Panoskrvise					
- Dieday					
uu iaskristory					
C Subscription					

Figure 2-21 Check LVM Settings

20. Click the **Create VM** button at the upper right corner. Now you can select the storage setting in the **Disk** tab to create a VM.

Proxmox Setup Guide

Application Note

	ual Environment 7.2-3	Search				8	Documentation	reate VM 🕞 Create CT 🔺 root	i@pam ∨
Server View ~	Datacenter								Help
Datacenter Detector	Q Search	Add V Remove Edit							
	Summary	ID ↑	Туре	Content	Path/Target	Shared	Enabled	Bandwidth Limit	
	D Notes	Proxmox_NFS	NFS	Disk image, Container	/mnt/pve/Proxmox_NFS	Yes	Yes		
	E Cluster	local	Directory	VZDump backup file, ISO image, Container template	/var/lib/vz	No	Yes		
	n Ceph	local-lvm	LVM	Disk image, Container		No	Yes		
	Options								
	Storage								
	🖺 Backup								
	to Replication								
	Permissions								
	LUSers								
	API Tokens								
	Re Two Factor								
	Groups								
	Pools								
	Roles								
	Realms								
	😻 HA 🛛 🕨								
	 ACME 								
	♥ Firewall >								
	Lat Metric Server								
	Q Support								

Figure 2-22 Click Create VM button

30310	Disk Bandw	ldth			
	Bus/Device:	SCSI V 0 0	Cache:	Default (No	o cache) 🛛 🗸
	SCSI Controller:	VirtIO SCSI)iscard:		
	Storage:	SANMPIO ~			
	Disk size (GiB):	Name 1	Туре	Avail	Capacity
	Format:	Proxmox_NFS	nfs	0 B	0 B
		Proxmox_SMB	cifs	0 B	0 B
	SSD emulation:	Proxmox_iSCSI	iscsi	0 B	0 B
	IO thread:	SANMPIO	lvm	64.42 GB	64.42 GB
	Read-only:	local-lvm	lvm	5.23 GB	42.41 GB

Figure 2-23 Create a VM via an iSCSI Drive

2.3. Configuration Steps in QSM

In this section we will provide an example of setting up iSCSI in QSM.

Proxmox Setup Guide Application Note

2.3.1. Environment and Topology

Demonstration Environment

Proxmox Server

Data Port IP: 192.168.252.81

- Storage
 - Model: XCubeNXT 8126D
 Memory: 16 GB per controller
 Firmware: QSM 4.0.1
 Cluster IP: 192.168.138.109
 Private IP 1: 192.168.175.41
 Private IP 2: 192.168.175.42

Demonstration Topology



XCubeNXT

Figure 2-24 Demonstration Topology in QSM





2.3.2. Configure SMB / CIFS Settings in QSM

1. Create a share folder named "Proxmox_SMB".

OSAN XI	N5116-D48E	38				
Dashboard			🕞 Shares	~	Name	Proxmox SMB
Storage			+	3 items	Usage	103.6 MB / 10.0 GB
C Shares			Normal			
ి. Hosts			Second St.		Location	Pool_01 > Proxmox2
Protection			Proxmox SMB		Description	Enter the description of this share
Monitor	~		1000		Campuon	
o Accounts	~				Permis	ssion
System	~					
P. Notification	~				Group	User Domain: Local
					Name	
					Administra	ator_Group
		Figure	2-25 Creater	n Shared E	older	
		riguic	2 25 010000	JIGICUI	UNUCI	

- 2. Create a Share Host.
- 3. Login to the Proxmox VE Web UI, and go to the Datacenter of the Storage, then click the **Add** tab and select the **SMB/CIFS** option.

Proxmox Setup Guide

Application Note

	I Environment 7.2-3 S	earch			
Server View 🗸	Datacenter				
Datacenter Detacenter pye 1	Q Search	Add V Remove Edit			
100 (Test1)	Summary	Directory	Туре	Content	Path/Target
101 (test2)	Notes		NFS	Disk image, Container	/mnt/pve/Proxmox_NFS
222 (test)	Cluster	BTDES	SMB/CIFS	Disk image	/mnt/pve/Proxmox_SMB
255 (sam)	n Ceph	NES.	ISCSI	Disk image	iqn.2004-08.com.storage:storage-000d6a0a6:iscsi.proxmox
Proxmox_NFS (pve)	Options	SMB/CIFS	LVM	Disk image, Container	
Proxmox_SMB (pve)	Storage	GlusterFS 4	ISCSI	none	iqn.2004-08.com.qsan:xf2026-000d60030:dev1.ctr1
Proxmox_iSCSI (pve)	E Backup 2	iscsi	ISCSI	none	iqn.2004-08.com.qsan:xf2026-000d60030:dev1.ctr2
SANMPIO (pve)		CephFS	Directory	VZDump backup file, ISO image, Container template	/var/lib/vz
SANISCSIT (pve)	C Replication	RBD	LVM	Disk image, Container	
local (pve)	Permissions	ZFS over iSCSI			
S local-lvm (pve)	Users	E ZFS			
	API Tokens	Proxmox Backup Server			
	🔩 Two Factor				
	嶜 Groups				
	Pools				
	Roles				
	Realms				
	* 1015				
	ACIVIE				
	♥ Firewall ▶				
	Lill Metric Server				
	Q Support				
< F					

Figure 2-26 Select SMB/CIFS Option to Configure

4. Enter the **ID**, **Server IP** (i.e. cluster IP), **Username**, **Password**, and select the **Share** folder you just created.

Add: SMB/C	IFS		\otimes
General	Backup Retention		
ID:	Proxmox_SMB	Nodes:	All (No restrictions) \checkmark
Server:	192.168.138.109	Enable:	
Username:	admin	Content:	Disk image V
Password:	••••	Domain:	
Share:	1	~	
	Proxmox_NFS		
Help	Proxmox_SMB		nced 🗌 🛛 Add
	UserHome		
	UserHomes		
	ft1		
	ft2		

Figure 2-27 Configure SMB / CIFS Settings

5. After clicking the **Add** button, you can go to the storage page to confirm the storage settings.



Proxmox Setup Guide

Application Note

	al Environment 7.2-3	Search				8	Documentation	Create VM 😨 Create CT	💄 root@pam 🗸
Server View ~	Datacenter								@ Help
Datacenter	Q Search	Add ~ Remove Edit							
, BD Pro	Summary	ID ↑	Туре	Content	Path/Target	Shared	Enabled	Bandwidth Limit	
	Notes	Proxmox_NFS	NFS	Disk image, Container	/mnt/pve/Proxmox_NFS	Yes	Yes		
	E Cluster	Proxmox_SMB	SMB/CIFS	Disk image	/mnt/pve/Proxmox_SMB	Yes	Yes		
	n Ceph	local	Directory	VZDump backup file, ISO image, Container template	/var/lib/vz	No	Yes		
	Options	local-lvm	LVM	Disk image, Container		No	Yes		
	Storage								
	Backup								
	ta Replication								
	Permissions								
	Lusers								
	API Tokens								
	a, Two Factor								
	Groups								
	Pools								
	Roles								
	Realms								
	♥ HA →								
	ACME								
	♥ Firewall ▶								
	Jal Metric Server								
	C Support								

Figure 2-28 Check SMB / CIFS Settings

6. Click the **Create VM** button at the upper right corner. Now you can select the storage setting in the **Disk** tab to create a VM.

scsi0 💼	Disk Bandwi	dth			
	Bus/Device:	SCSI V 0	Cache:	Default (No	cache) 🗸
	SCSI Controller:	VirtIO SCSI	Discard:		
	Storage:	Proxmox_SMB ~			
	Disk size (GiB):	Name 个	Туре	Avail	Capacity
	Format:	Proxmox_NFS	nfs	107.37 GB	107.37 GE
		Proxmox_SMB	cifs	107.37 GB	107.37 GE
		local-lvm	lvm	5.23 GB	42.41 GB
Add					

Figure 2-29 Create a VM via an SMB Shared Folder



2.3.3. Configure NFS Settings in QSM

- 1. Connect the cluster IP 192.169.138.109 in QSM and the installed Proxmox server to the same switch, and confirm that the IP addresses of QSM can be pinged.
- 2. Create a share folder named "Proxmox_NFS".

CSAN XN5116-D48	B38				
 Dashboard 		🕞 Shares	~	Name	Proxmox NFS 🌼
Storage		+	2 items	Usage	103.6 MB / 10.0 GB
C Shares		Normal		-	
ದಿ. Hosts		Proxmox NFS		Location	Pool_01 > Proxmox
Protection		-		Description	Enter the description of this share
Monitor 🗸					
o Accounts ✓				Permis:	sion
🖈 System 🔺					
ప్రొ General				Group	User Domain: Local
Wetwork				Name	
				Administrat	tor Group
	Figure	2-30 Created	a Shared F	older	

- 3. Add the IP address of Proxmox server to the NFS host.
- 4. Login to the Proxmox VE Web UI, and go to the Datacenter of the Storage, then click the **Add** tab and select the **NFS** option.



Proxmox Setup Guide

Application Note

XPROXMOX Virtu	al Environment 7.2-3	Search			
Server View ~	Datacenter				
Datacenter	Q Search	Add \checkmark Remove Edit			
100 (Test1)	Summary	Directory	Туре	Content	Path/Target
101 (test2) 102 (WindowsServer2	Notes	LVM LVM-Thin	NFS	Disk image, Container	/mnt/pve/Proxmox_NFS
222 (test)	Cluster	BTRFS	SMB/CIFS	Disk image	/mnt/pve/Proxmox_SMB
255 (sam)	W Ceph	NFS	IVM	Disk image Container	iqi.2004-00.com.storage.storage-00000a0a0.iscsi.pioxinox
Proxmox_SMB (pve)	Options	GlusterES 4	ISCSI	none	iqn.2004-08.com.qsan:xf2026-000d60030:dev1.ctr1
Proxmox_iSCSI (pve)	Storage	iscsi	iSCSI	none	iqn.2004-08.com.qsan:xf2026-000d60030:dev1.ctr2
SANMPIO (pve)	🖺 Backup 🖌	CephFS	Directory	VZDump backup file, ISO image, Container template	/var/lib/vz
SANISCSI1 (pve)	✿ Replication	RBD	LVM	Disk image, Container	
SANISCSI2 (pve)	Permissions v	ZFS over iSCSI			
local-lvm (pve)	Users	E ZFS			
	API Tokens	Proxmox Backup Server			
	a, Two Factor				
	🖀 Groups				
	Pools				
	Roles				
	Realms				
	👽 HA 🔹 🕨				
	ACME				
	♥ Firewall >				
	Jul Metric Server				
	Q Support				
<					

Figure 2-31 Select NFS Option to Configure

5. Enter the **ID**, **Server IP** (i.e. cluster IP) and then select the **Export** folder you just created. Finally, select the default **Content** as "Disk image".

Add. NI S			
General	Backup Retention		
ID:	Proxmox_NFS	Nodes:	All (No restrictions)
Server:	192.168.138.109	Enable:	
Export:		~	
Content:	Disk image	\sim	
Help			Advanced 🗌 🛛 🗛
Add: NFS			
Add: NFS General	3ackup Retention		
Add: NFS General E	3ackup Retention Proxmox_NFS	Nodes:	All (No restrictions)
Add: NFS General E ID: Server:	3ackup Retention Proxmox_NFS 192.168.138.109	Nodes: Enable:	All (No restrictions)
Add: NFS General E ID: Server: Export:	Backup Retention Proxmox_NFS 192.168.138.109	Nodes: Enable:	All (No restrictions)
Add: NFS General E ID: Server: Export: Content:	Backup Retention Proxmox_NFS 192.168.138.109 I /nfs-share/Proxmox_NFS	Nodes: Enable:	All (No restrictions)
Add: NFS General E ID: Server: Export: Content:	Backup Retention Proxmox_NFS 192.168.138.109 I /nfs-share/Proxmox_NFS	Nodes: Enable:	All (No restrictions)

Figure 2-32 Configure NFS Settings



©2024 QSAN Technology, Inc. All rights reserved. www.qsan.com 6. After clicking the **Add** button, you can go to the storage page to confirm the storage settings.

	al Environment 7.2-3	Search				2	Documentation 📮 Cr	sate VM 闵 Create CT 💄 root@pam 🗸
Server View 🗸	Datacenter							@ Help
Datacenter Dyte Ditacenter Dive 100 (Test1) 101 (test2)	Q Search	Add V Remove Edit						
	Summary	ID ↑	Type	Content	Path/Target	Shared	Enabled	Bandwidth Limit
	D Notes	Proxmox_NFS	NFS	Disk image, Container	/mnt/pve/Proxmox_NFS	Yes	Yes	
222 (test)	E Cluster	local	Directory	VZDump backup file, ISO image, Container template	/var/lib/vz	No	Yes	
255 (sam)	Ceph Ceph	local-lvm	LVM	Disk image, Container		No	Yes	
Proxmox_NFS (pve)	Options							
local (pve)	Storage							
S (i local-iviti (bve)	Backup							
	ta Replication							
	Permissions							
	LUSers							
	API Tokens							
	A Two Factor							
	🔮 Groups							
	Pools							
	🛊 Roles							
	Realms							
	🏶 HA 🔋							
	ACME							
	♥ Firewall							
	Lat Metric Server							
	Q Support							
<								

Figure 2-33 Check NFS Settings

7. Click the **Create VM** button at the upper right corner. Now you can select the storage setting in the **Disk** tab to create a VM.

Create: Virtual Machine							
General OS Sys	tem Disks C	CPU Memory Network	Confirm				
scsi0 🛍	Disk Bandwid	dth					
	Bus/Device:	SCSI 🗸 0 🗘	Cache:	Default (No	cache) 🗸		
	SCSI Controller:	VirtIO SCSI	Discard:				
	Storage:	Proxmox_NFS ~					
	Disk size (GiB):	Name ↑	Туре	Avail	Capacity		
	Format:	Proxmox_NFS	nfs	107.37 GB	107.37 GB		
		local-lvm	lvm	5.23 GB	42.41 GB		
↔ Add							
Help			Adv	anced 🗌 🛛 🖪 🗛	ck Next		

Figure 2-34 Create a VM via an NFS Shared Folder



2.3.4. Configure iSCSI Settings in QSM

1. Connect the private IPs 192.168.175.41 and 192.168.175.42 in QSM and the installed Proxmox server to the same switch, and confirm that they can ping each other.

OSAN	XN5116-D48	B38					
 Dashl Stora 	poard	E Blo	ck Host V	Name Pro	oxmox_iSCSI 🌣		
다. Share	s	+ ISCSI	2 items	Host	ed Volume (Lun)		
Monii	tor 🗸						
🔹 Syste	m 🗸			0	Proxmox_iSCSi	Lapacity 10.0 GB	
Eq Notifi	cation 🗸						
			2.25 0 1	-			

Figure 2-35 Create a Target and Connect to a Volume

2. Create a target and connect to a volume, and note the IQNs of the controller 1 and controller 2.

🛱 Block Host 🛛 🗸	Name Pr	oxmox_iSCSI 🌣		
+ 2 items	모 Host			
iSCSI Proxmox_iSCSI	ø ^Ø Target			🗶 Edit Interfa
	Controller	Target Host	Interface	
	1	iqn.2004-08.com.qsan:xn5116- 000d48b38:dev2.ctr1	LAN1, LAN2, LAN3, LAN4, LAN5	
	2	iqn.2004-08.com.qsan:xn5116- 000d48b38:dev2.ctr2	LAN1, LAN2, LAN3, LAN4, LAN5	
	Connec	ted Volume (Lun)		

Figure 2-36 Note IQNs of Controller 1 and Controller 2



 Since the following configuration will be the same as iSCSI setting in XEVO. Please refer to the Step 3 to Step 20 in the Section <u>2.2 Configuration Steps for XEVO</u> to create a VM through QSM iSCSI.

2.4. Configuration Steps for Cluster with NFS

In this section, we will demonstrate setting up a demo using three Proxmox hosts and an unified storage to establish an NFS share. This NFS share can then be mounted to a Proxmox cluster environment for deploying Linux or Windows VMs. The setup is designed to showcase the application of VMs with redundancy features, providing insights into achieving HA (High Availability) and efficient data management in a virtualized infrastructure.

2.4.1. Environment and Topology

Demonstration Environment

- Proxmox Server
 - Model: 3 x ASUS Server
 OS: Proxmox VE 8.1.4
 Server 1 IP: 192.168.203.220
 Server 2 IP: 192.168.203.222
 Server 3 IP: 192.168.203.223
- Storage
 - Model: XN5116S Memory: 16 GB per controller Firmware: QSM 4.0.2 Data Port IP: 192.168.195.1



Demonstration Topology



Figure 2-37 Demonstration Topology for HA

2.4.2. Configuration Storage

1. Create a pool and a file volume, then create and add an NFS share to the shared host.

CSAN XN51165-D48838			
Ø Dashboard	🔄 Shares 🗸 🗸	Name proxmox 💠	
📑 Storage	+ 4 items	1/sage 745 9 MP / 100 0 GP	1 %
C Shares	Normal	145.3 mb / 100.0 Gb	1.7
సి. Hosts	RSYNCW	Location Pool_03 > Volume_08	
Protection	RsyncM	Enter the description of this share	
🖂 Monitor 👻	RsyncO		
🚑 Accounts 👻	proxmox		
◙ System ↔		L Permission	, v
E Notification Y		Group User Domain: Local V	Edit
		Name	Permission
		Administrator_Group	Read/Write 🗸 🗎
		User_Group	Read/Write 🗸 🕯
		the Connected Hosts	

Figure 2-38 Create a Pool and a NFS shared



2.4.3. Configuration Proxmox

1. Visit one of the Proxmox servers and navigate to the **Cluster** menu to create a cluster.



2. Enter a cluster name and select a cluster network.

Create Cluster	8
Cluster Name:	testcluster
Cluster Network:	Link: 0 🗘 192.168.203.223 🗸 🗎
	Add Multiple links are used as failover, lower numbers have higher priority.
Help	Create

Figure 2-40 Create Cluster Step 2

3. After creating the cluster, click the Join Information tab.



Proxmox Setup Guide

Application No	ote
----------------	-----

	nt 8.1.4 Search				🖉 Documentation	Create VM 🕞 Create CT 🛔 root@pam 🗸
Server View	Datacenter					@ Help
Datacenter (test)	Q Search	Cluster Information Create Cluster Join Information Join Cluster				
S NFS (pve)	Cluster	Cluster Name: test	Config Version: 4		Number of Nodes: 2	
	@ Ceph	Nodename	✓ ID ↑	Votes	Link 0	
localnetwork (pve3)	Options	pve	1	1	192.168.203.220	
NFS (pve3)	Storage	pve3	2	1	192.168.203.222	
Iccal-lvm (pve3)	B Backup Replication					
	Permissions					
	Users					
	& API lokens					
	a, Two Factor					
	Groups					
	Pools					
	Roles					
	Realms					
	😻 HA 🔋 🕨					
	SDN -					
	III Zones					
	🖧 VNets					
	Options					
	≠ IPAM					
	Δ0ME					
	\sim					

Figure 2-41 Join Information Tab

4. Click the **Copy Information** button to copy the join information.

Cluster Join Information					
Copy the Join Info	rmation here and use it on the node you want to add.				
IP Address:	192.168.203.220				
Fingerprint:	20:3F:BE:6A:EC:4D:D2:AD:A5:1E:0F:4F:2D:41:C2:D8:80:59:8A:AC:68:F2:7B:46:0C:CA:F9:91:BA:B9:36:4B				
Join Information:	eyJpcEFkZHJlc3MiOilxOTluMTY4LjlwMy4yMjAiLCJmaW5nZXJwcmludCl6ljlwOjNGOkJFOjZBOkVDOjREOkQ OkFEOkE10jFFOjBGOjRGOjJEOjQxOkMyOkQ4OjgwOjU5OjhBOkFDOjY4OkYyOjdCOjQ2OjBDOkNBOkY5Oj xOkJBOkl5OjM2OjRCliwicGVlckxpbmtzljp7ljAiOilxOTluMTY4LjlwMy4yMjAifSwicmluZ19hZGRyljpbljE5Mi4xNjg MiAzLilvMCJdLCJ0h3RIhSI6ev.lihHVzdGVxX25hbWLliOiJ0ZXN0liwic2ViYXV0aCl6Im9uliwidmVvc2lvbil6liliLCJ	y k ju li			
Copy Information					

Figure 2-42 Copy Join Information

5. Navigate to the other Proxmox server you want to join the cluster and click the **Join Cluster** tab.

Proxmox Setup Guide Application Note

	3.1.4 Search	
Server View V	Datacenter	
Cerver view view view view view view view view	Datacenter Q Search Summary Notes Cluster O Ceph Options Storage Backup Replication Permissions Users API Tokens A, Two Factor Groups Pools Roles	Cluster Information Create Cluster Join Information Join Cluster Standalone node - no cluster defined Cluster Nodes Nodename
	Realms	

- Figure 2-43 Join Cluster Step 1
- 6. Paste the **Joining Information** and enter the password of the cluster node to successfully join the cluster.

Cluster Join				\otimes
Assisted join:	Paste encoded cluster join informatio	n and enter password.		
Information:	OjkxOkJBOkI5OjM2OjRCliwicGVk NjguMjAzLjlyMCJdLCJ0b3RlbSl6e bmZpZ192ZXJzaW9uljoiNClsInNN VyZmFjZSl6eylwIjp7ImxpbmtudW	xxpbmtzljp7ljAiOibxOTluMTY yJsaW5rX21vZGUiOiJwYXN /2F1dGgiOiJvbilsInZlcnNpb2 liZXliOilwIn19fX0=	4LjlwMy4yMjAifSwic zaXZIIiwiY2x1c3Rld5 4iOilyIiwiaXBfdmVyc	mluZ19hZGRyljpb1jE5Mi4x 9uYW1lljoidGVzdClsImNv 2lvbil6lmtwdjQtNilsImludG
Peer Address:	192.168.203.220	Password		ଚ
Fingerprint:	20.3F BE 6A EC 4D D2 AD A5 1E	0F:4F:2D:41:C2:D8:80:59:8A	AC 68 F2 7B 4 ①	This field is required 3
Cluster Network:	Link: 0 IP resolved by node's hos	stname 🤟 peer's link addr	ess 192.168.203.220	D
O Help				Join Test



7. Repeat steps 5 and 6 on the Proxmox server that is not yet in the cluster. Once added, the settings will look like the image below.

Proxmox Setup Guide

Application Note

	nt 8.1.4 Search						Documental	tion
Server View 🗸	Datacenter							
 Datacenter (test) pve pve3 pve4 	Q Search	Cluster Information Create Cluster Join Information Join Cluster	er					
	Notes	Cluster Name: test	Config Version: 5				Number of Nodes: 3	3
	E Cluster	Cluster Nodes						
		Nodename		ID ↑	Votes	Link 0		
	Options	pve		1	1	192.168.203.220		
	Storage	pve3	2	1	192.168.203.222			
	🖺 Backup	pve4	3	1	192.168.203.223			
	Replication							
	Permissions							
	LUsers							
	API Tokens							
	a Two Factor							
	🖀 Groups							
	Pools							
	Roles							
	Realms							

Figure 2-45 Proxmox Cluster Configuration

8. Go to the **Storage** menu of the datacenter and create an NFS share.

	t8.1.4 Search					@ Do	cumentation 📮 Cre	ate VM 💽 Create CT 🔺 rool@pam 🗸
Server View	Datacenter							O Help
Pre Pre Pre Pre Pre Pre Pre3 Pre3 Pre4	Q. Search @ Summary D Notes E Cluster @ Ceph Options E Storage D Backup D Replication Permissions Users A FI Tokens Q. Two Factor E Groups Pools Prols Reles A Realms	Add Renche Edt Im Directory Im UNM Im UVM Im UVM Im UVM Im UVM Im BTRFS Im Stress Im Stress Im Stress Im Stress <t< th=""><th>Tjpe Directory LVM-Thin</th><th>Content VZDump backup file. ISO image. Container template Disk image. Container</th><th>Path/Target Arafitbixz</th><th>Shared No No</th><th>Enabled Yes Yes</th><th>Bandsidth Limit</th></t<>	Tjpe Directory LVM-Thin	Content VZDump backup file. ISO image. Container template Disk image. Container	Path/Target Arafitbixz	Shared No No	Enabled Yes Yes	Bandsidth Limit

Figure 2-46 Create an NFS Share Step 1

9. Enter the ID and storage IP in the server fields, then select the NFS share you created in the export options.



Add: NFS			\otimes
General	Backup Retention		
ID:	NFS	Nodes:	All (No restrictions)
Server:	192.168.195.1	Enable:	
Export:	/share/proxmox	~	
Content	Disk image	~	

Figure 2-47 Create an NFS Share Step 2

10. After the setup is complete, make sure that all nodes have NFS storage.

	t8.1.4 Search					@ Doc	umentation 🖵 Cre	ale VIII 🕜 Creale CT	👗 rool@pam
erver View 🗠 🗘	Datacenter							Ū.	Ø Hel
ever View C Datacenter (test)	Datacenter Q. Search Summary Notes Cluster Geph Options Storage Bedup Cakup	Add Remove Ec ID † NFS local koal-km	t Type Directory LVM-Thin	Content Disk image VZDump backup file. ISO image, Container template Disk image, Container	Path/Target ImmlpreNFS Ivarilibiz	Shared Yes No No	Enabled Yes Yes	Bandwidth Limit	Q He
ୁ [local (pve4) g [local-hm (pve4)	Lusers API Tokens API Tokens API Tokens API Tokens Groups Pools Pools Roles API Tokens API								

Figure 2-48 Create an NFS Share Step 3

11. Create a VM using NFS storage.

Proxmox Setup Guide Application Note

Proxmox Setup Guide Application Note

Bus/Device: SCSI ✓ 0 Cache: Default (No cache) ✓ SCSI Controller: VirtUO SCSI single Discard: □ □ Storage: NFS ✓ IO thread: ☑ Disk size (GiB): 200 ○ ○ Format: 0 EMU image format ✓ ○	icsi0	Disk Bandw	idth		
SCSI Controller: VirtIO SCSI single Discard: □ Storage: NFS ✓ IO thread: ☑ Disk size (GiB): 2001 ↔ Format: 0EMU image format ✓		Bus/Device:	SCSI 🗸 0 🗘	Cache:	Default (No cache)
Storage: NFS ✓ IO thread: ☑ Disk size (GiB): 200 ○ Format: OEMU image format ✓		SCSI Controller:	VirtIO SCSI single	Discard	
Disk size (GiB): 200 C Format: OEMU image format <		Storage:	NFS ~	IO thread:	
Format: OEMU image format v		Disk size (GiB):	200		
		Format	QEMU image format 🖂		

Figure 2-49 Create a VM

12. After the VM is created, the HA status is displayed as **None**, indicating that the HA function has not been enabled on the VM.



Figure 2-50 Check HA State



13. Navigate to the **Groups** submenu and create a group.

O Search	Cicale 111					
Summary						
Notes						
E Chuster						
Canh						
A Options		Create: HA Gr	oup		8	
Storage		ID:	test	restricted.		
🖺 Backup				nofailback:		
🗈 Replication		Comment				
Permissions		Node ↑	Memory usa	age % CPU usage	Priority	
🛔 Users		D pve	4.5 %	0.3% of 8 CPUs	0	
8 API Tokens		pve3	4.0 %	0.2% of 12 CPUs	0	
A. Two Factor		🗹 pve4	4.3 %	0.2% of 12 CPUs	0	
oroups Groups						
S Pools						
🛉 Roles						
(A) Realms						
👽 HA						
🖾 Groups						
A. Constant					63	
7 rencing						
Fencing sDN		Help			Create	

Figure 2-51 Create an HA group

14. Then, go to the **HA** menu, add a VM, and select the group you just created.

Options		ve, Fri Mar 29 20.0	1 25 2024)					
Storage								
🖺 Backup	Resources							
🔁 Replication	Add Edd							
Permissions	10	Add: Resource	Container/Vi	rtual Machine			\otimes	
🛓 Users		101	100	×	Craws	Incl	×	
API Tokens		VM.	100	A *	Group.	test		
A. Two Factor		Max. Restart.	1	Ų.	Request State:	started	~	
쯑 Groups		Max. Relocate:	1	0				
Pools		Comment						
🛊 Roles		O Hole					A44	
(a) Realms		6 Help						
😻 HA								
国 Groups ²								

Figure 2-52 Add a VM



15. Finally, you can see that the HA status has changed to **Started**.



2.4.4. Test Result

In this section, we will demonstrate the process of VM migration and failover. This phase is critical to verify the seamless transition of VM in the environment, ensuring they remain functional under a variety of conditions.

1. Before testing, you need to unmount the ISO mounted on the VM in the **Hardware** menu.



Proxmox Setup Guide Application Note

Summary	Add - Remove Edit				
>_ Console	Memory	2.00 GiB			
Hardware	Processors	1 (1 sockets, 1 cor	es) [x86-64-v2-AES]		
Cloud-Init	BIOS	Default (SeaBIOS)			
Options	🖵 Display	Default			
Task History	Op Machine	pc-i440fx-8.1			
Monitor	SCSI Controller	VirtIO SCSI single			
Rackup	Hard Disk (ide0)	NFS:101/vm-101-0	lisk-0.qcow2,size=100G		
Dackup	 CD/DVD Drive (ide2) 	none,media=cdror	n		
13 Replication	➡ Network Device (net0)	e1000=BC:24:11:A	x0:C6:27,bridge=vmbr0,firewall=1		
Snapshots		Ec	lit: CD/DVD Drive		\otimes
Firewall					
Permissions		C	Use CD/DVD disc image file (iso)		
		C	Use physical CD/DVD Drive		
		۲	Do not use any media		
				OK Reset	

Figure 2-54 Unmount ISO

2. Go to the VM console, click the **Migrate** button, and select the node to move to.



Figure 2-55 VM Migration Step 1



3. After the migration is complete, verify that the ownership of the VM has been transferred to the designated node.



Figure 2-56 VM Migration Step 2

4. You can try to simulate a disaster scenario by shutting down the node that holds the VM.

U Notes	🔘 CPU usage		0.0 etc.
o _e System	El Load average		O to delay
🚍 Network	📼 RAM usage	4 67% (1.46 GiB of 31 21 GiB)	KSM sharing
Certificates	🕀 (HD space	11 96% (11:23 G/B of 93 93 G/B)	C SWAP usage
Q DNS			
Q Hosts			8 × Intell
Ø Options	Boot Mode		
() Time	Manager Version		
/≣ Syslog		Confirm	
C Updates		Shutdown node 'pve'?	
Firewall		Yes No	
LVM			
Directory			
II ZFS			
@ Ceph	4-		
ta Replication	2 -		

Figure 2-57 Shut Down Node



5. You may notice that the VM does not fail over automatically when the owner node goes down. At this time, you can adjust the priorities in the HA group, setting the priority of the failed node to the lowest and the node to be transferred to the highest. The VM then fails over to the node assigned the highest priority.

	Remove					
Q Search						
E Summary	No	No				
Notes						
E Cluster						
Ceph	Edit: HA Grou	n			\otimes	
O Options	Call. Tor orou	P			0	
Storage	ID:	test	r	estricted.		
🖺 Backup			r	nofailback:		
B Replication	Comment					
P Permissions	Node 1		Memory usage %	CPU usage	Priority	
🛔 Users	D pve		0.0 %		1 0	
	pve3		4.0 %	0.3% of 12 CPUs	3 0	
9e Two Factor	pve4		4.3 %	0.2% of 12 CPUs	5 0	
쯑 Groups						
S Pools						
🛊 Roles						
Realms						
👽 HA						
E Groups						
5 Fencing						
SDN .	O Help				GK Reset	
III Zones						
-						

Figure 2-58 Set Priority

6. Verify that the VM has successfully failed over to the highest priority node and is functioning properly.



Proxmox Setup Guide

Application Note

Server View 🗸 🖁	Virtual Machine 100 ((testnfs) on node 'pve4' No Tags		▶ Start	() Shutdown	🕢 Migrate	>_ Console v	More -	0 H
Datacenter (test)	Summary						Ho	ur (average)	
▶ pre III localinetwork (pre) □ NFS (pre) □ local (pre) □ local hetwork (pre3) □ local hetwork (pre4) □ local hetwork (pre4) □ local hetwork (pre4) □ local (pre4)	 Console Hardware Cloud-Init Options Task History Monitor Backup Replication Snapshots Firewall Permissions 	testnfs (Uptime: 00 00 06) i Status ♥ HA State Node @ CPU usage Bootdisk size ⇒ IPs	L tunning started. Group: test pv4 45.11% of 1 CPU(s) 1.79% (36.66 MB ef 2 00 GB) 200 00 GB No Guest Agent configured	Notes					
30		CPU usage						CPU usa	ge
		30 25 20 ²⁶ 15 10 5 0 2024-03-29 2024-03-29 2024-03-29 2024 185500 190300 19	403-29 2024-03-29	5-29 2024-05-29 2024-03-29 2024-03-29 20 1931:00 1935:	24-03-29 2024-03	-29 2024-03-29 0 19.51.00) 2024-03-29 21 19 55 00	024-03-29 : 19:59:00	2024-03

Figure 2-59 VM Failover



3. CONCLUSION

QSAN storage is an ideal solution for virtualization. Deploying iSCSI / SMB / NFS virtualization infrastructure using QSAN storage does not require complex configuration. Enjoy stability and performance, and access QSAN's solutions to optimize your organization's existing IT resources.

Additionally, this document effectively demonstrates the process of setting up a Proxmox high availability cluster using NFS shares, including configuration and implementation of VM migration and failover testing. Comprehensive tutorials on setting up a robust and resilient virtualized environment in QSM are also provided to ensure service continuity and data redundancy. We also explored various storage solutions and their capabilities to support VMs under different operating conditions.

Storage Options to Enhance VM Performance

The table below summarizes our findings and provides a clear overview of the maximum number of VMs that each storage type can support, regardless of latency. This comprehensive analysis is designed to assist in selecting the most appropriate storage solution based on specific performance needs and workload requirements, ensuring optimal deployment and scalability of virtual environments.

STORAGE TYPE	LATENCY THRESHOLD	ADDITIONAL VMS SUPPORTED UNDER LATENCY	NUMBER OF VMS SUPPORTED
NVMe Storage	< 100 µs	50+ VMs	Up to 1,000 VMs (high- end configurations)
SAS SSD Storage	< 500 μs	20 ~ 30 VMs	Up to 300 VMs
Hybrid Drive Storage	< 1 ms	10 ~ 20 VMs	Up to 150 VMs
SAS HDD Storage	< 50 ms	3 ~ 4 VMs	Up to 15 VMs

Table 3-1Storage Options to Enhance VM Performance



4. **APPENDIX**

4.1. Apply To

- XEVO firmware 2.3.3 and later
- QSN firmware 4.0.1 and later

4.2. Reference

Document

- XEVO Software Manual
- <u>QSM 4 Software Manual</u>

