

# Connecting to PetaSAN from Windows Server 2019 using MPIO

Version 1.0



# **Revision History**

Date	Version	Description
15-7-2019	1.0	Initial version



## Contents

1. Purpose	3
2. Pre-requisites	3
3. Creating our disk in PetaSAN	3
4. MPIO Installation	5
5. ISCSI Initiator	7
5.1 Target discovery	8
5.2 Session connections	.1
5.2.1 Path 1 session1	.1
5.2.2 Path 2 session1	.4
5.2.3 Path 3 session1	.5
5.2.4 Path 4 session1	.6
5.3 Reviewing Connections1	.7
6. Formatting our disk1	.8



## 1. Purpose

The purpose of this guide is to show how to connect to a PetaSAN disk from Windows 2019 using MPIO and CHAP based authentication.

#### 2. Pre-requisites

This guide assumes the reader has followed the Quick Start guide and has deployed a working PetaSAN cluster. We will be using the same subnet assignments as given in the Quick Start example.

Our Windows Server 2019 needs to have interfaces on both iSCSI 1 and iSCSI 2 networks. For this demonstration, the IP addresses will be:

ISCSI 1IP: 10.0.2.51 ISCSI 2 IP: 10.0.3.51

## 3. Creating our disk in PetaSAN

In "Add Disk" create a 100 TB named "VM Data Storage" with 4 paths on both subnets.

We will secure the disk by enabling "Password Authentication" and specifying a username and password. This uses the iSCSI CHAP authentication protocol.

Add Disk					📑 Manage Disk 🚿 🖨 Add Disk
Disk Name *:				Password Authentication	
VM Data Storage				Yes No	
1 GB	100 TB	Size		User Name *:	
	Û.	100	ТВ	admin	
				Password *:	
Active Paths					
4				Confirm Password *:	
ISCSI Subnet *:					
Both 🔻					
Auto assign IP address					
Yes No				<ul> <li>All</li> <li>IQN(s)</li> </ul>	
Cancel					Submit



We can also further protect the disk by a entering a comma separated list of Client IQNs that are allowed to connect. However in our example, using CHAP authentication will suffice.

Note: Windows will give an error if the password length specified is less than 12 or more than 16 characters.

Once done, our disk will be added to the "Disk List" page

Disk List									<b>≣</b> N	∕lanage Disk > 🔳 List
Show 10 •	entries								Search:	
Disk Id 🛛 🕌	Size	↓†	Name	$\downarrow \uparrow$	Created	1	IQN	Active Paths	Status	Action
00001	100 TB		VM Data Storage		2016-10-06		iqn.2016-05.com.petasan:00001	<u>4</u>	Started	
Showing 1 to 1 of	1 entries								Previo	us 1 Next

Notice that under the "Active Paths" column, the number of paths available is listed as 4. Click on it to view the virtual IP addresses.

	Active Paths		Х
	Disk 00001		
	IP	Assigned Node	
ame	10.0.2.100	ps-node-03	
M Dat	10.0.2.101	ps-node-02	
	10.0.3.100	ps-node-04	
	10.0.3.101	ps-node-01	
	Close		

We need to take note of the IP addresses, we will be specifying them when connecting to our disk.

Note: the Assigned Node column lists the nodes currently serving the active paths. Since we are using virtual IPs, this assignment is dynamic. If a node fails, its path will be transparently assigned to another node.

Since our Windows server has addresses 10.0.2.51 & 10.0.3.51 our path connections will be as follows:

Path	Initiator IP	Target disk IP	Subnet
1	10.0.2.51	10.0.2.100	ISCSI 1
2	10.0.3.51	10.0.3.100	ISCSI 2
3	10.0.2.51	10.0.2.101	ISCSI 1
4	10.0.3.51	10.0.3.101	ISCSI 2



## 4. MPIO Installation

To use MPIO from Windows Server, we need to first add the MPIO feature using Server Manager

<u> </u>		Server Manager		_ 0 ×
€∋∙	Server Manager •	Dashboard	🔹 🕄   🚩 Manage Tools	View Help
Dashboard Local Servers     All Servers     File and St	Select features Before You Begin Installation Type Server Selection Server Roles Features Confirmation Results	Add Roles and Features Wizard         Select one or more features to install on the selected server.         Features <ul> <li>Enhanced Storage</li> <li>Failover Clustering</li> <li>Group Policy Management</li> <li>IIS Hostable Web Core</li> <li>Ink and Handwriting Services</li> <li>Internet Printing Client</li> <li>IP Address Management (IPAM) Server</li> <li>iSNS Server service</li> <li>LPR Port Monitor</li> <li>Management OData IIS Extension</li> <li>Media Foundation</li> <li>Message Queuing</li> <li>Multipath I/O</li> <li>Network Load Balancing</li> <li>Network Load Balancing</li> <li>Network Load Balancing</li> </ul>	DESTINATION SERVER WIN-PB4FQGKL4FI Description Microsoft Device Specific Module (DSM) or a third-party DSM, provides support for using multiple data paths to a storage device on Windows.	Hide
	BP/	A results BPA results	> Install Cancel	₩ 4:53 AM

#### At the end of the Wizard, click "Yes" to reboot





#### After rebooting go to "Server Manager" -> "Tools" click "MPIO"

<u> </u>	Serve	er Manager	_ 0 ×
Server M	lanager • Dashboard	- ©	Manage Tools View Help
Dashboard	WELCOME TO SERVER MANAGER		Component Services Computer Management
<ul> <li>Local Server</li> <li>All Servers</li> <li>File and Storage Services</li> </ul>	1 Config	gure this local server	Defragment and Optimize Drives Event Viewer Failover Cluster Manager iSCSL Initiator
	QUICK START	roles and features	Local Security Policy MPIO
	3 Add what's new 4 Crea	other servers to manage ate a server group	ODBC Data Sources (32-bit) ODBC Data Sources (64-bit) Performance Monitor Resource Monitor
	LEARN MORE		Security Configuration Wizard Services System Configuration System Information
	ROLES AND SERVER GROUPS Roles: 1   Server groups: 1   Servers total: 4		Task Scheduler Windows Firewall with Advanced Security Windows Memory Diagnostic
	File and Storage 4 Services 4	Local Server 1	Windows PowerShell Windows PowerShell (x86)
	Manageability     Events	Manageability     Events	Windows PowerShell ISE Windows PowerShell ISE (x86) Windows Server Backup
	Services Performance BPA results	Performance BPA results	Activate Windows Go to System in Control Panel to activate Windows.
	10/2/2016 2:16 DM	10/2/2016 2:16 DM	→ 🕞 🖓 🔥 3:17 PM 10/2/2016

In the MPIO Properties, select the second tab labeled "Discover Multi-Paths". Check the "Add support to ISCSI devices" and click the Add button. Then reboot the system again.

MPIO Properties	
MPIO Devices Discover Multi-Paths DSM Install Configuration Snapshot	
SPC-3 compliant	
Device Hardware Id	
Add support for ISCSI devices	
Add	
Others	
Device Hardware Id	
Add	
OK Cancel	]



## **5. ISCSI Initiator**

Once MPIO is setup, we are ready to connect to our ISCSI disk.

From Server Manager -> Tools Click iSCSI Initiator



If this is the first time accessing the iSCSI Initiator, confirm we would like to run the iSCSI service by clicking Yes. This service is responsible for automatically connecting to our iSCSI disks on computer startups as well as re-connecting automatically after any connection failures.

Microso	ft iSCSI X
The Microsoft iSCSI service is not running. T iSCSI to function correctly. To start the servi automatically each time the computer restar	he service is required to be started for ce now and have the service start rts, click the Yes button.
	Yes No



## 5.1 Target discovery

In the iSCSI Initiator Properties window select the "Discovery" tab.

	iSCSI	Initiator Properties	5
argets Discover	Y Favorite Targe	ts Volumes and Devices	RADIUS Configuration
Target portals			
The system will	look for Targets or	n following portals:	Refresh
Address	Port	Adapter	IP address
To add a targe To remove a ta	t portal, click Discov	ver Portal. the address above and	Discover Portal
CMC convers			
iSNS servers The system is r	egistered on the fo	llowing iSNS servers:	Refresh
iSNS servers The system is r Name	egistered on the fa	llowing iSNS servers:	Refresh
iSNS servers The system is r Name To add an iSNS	egistered on the fo	llowing iSNS servers:	Refresh Add Server
ISNS servers The system is r Name To add an ISNS To remove an i then click Remo	egistered on the fo server, click Add S SNS server, select we.	llowing iSNS servers: erver. the server above and	Refresh Add Server Remove
ISNS servers The system is r Name To add an ISNS To remove an i then dick Remo	egistered on the fo	llowing iSNS servers:	Refresh Add Server Remove

Click on "Discover Portal" button and enter the first ip address of the iSCSI disk we created in PetaSAN, in our case this would be 10.0.2.100:

Discover Target Portal						
Enter the IP address or DNS name and port number of the portal you want to add.						
To change the default settings of the discovery of the target portal, click the Advanced button.						
IP address or DNS name:	Port: (Default is 3260.)					
Advanced	OK Cancel					



If all goes well, our Windows client has now discovered our target disk, but has not connected to it yet.

Next select the first tab labeled "Target", we should see our PetaSAN disk listed with its iqn name. The iqn name is composed of our base prefix (which by default is "iqn-2016-05.com.petasan:" and is configurable In the PetaSAN Cluster Management application) followed by the disk id.

Select the disk and click on the "Properties.." button

Note: Do not click the "Connect" button, as this will setup a single path connection.

	es		x
Targets Discovery Favorite Targets Volumes and Device	es RADIU	JS Configuration	
To discover and log on to a target using a basic connection DNS name of the target and then dick Quick Connect.	, type the	IP address or	
Target:		Quick Connect	
Discovered targets	Γ	Refresh	
Name	Status		
iqn.2016-05.com.petasan:00001	Inactiv	e	
To connect using advanced options, select a target and the click Connect.	en 🗌	Connect	
L To connect using advanced options, select a target and the click Connect. To completely disconnect a target, select the target and then dick Disconnect.	en	Connect Disconnect	
To connect using advanced options, select a target and the dick Connect. To completely disconnect a target, select the target and then dick Disconnect. For target properties, including configuration of sessions, select the target and dick Properties.	en	Connect Disconnect Properties	
To connect using advanced options, select a target and the dick Connect. To completely disconnect a target, select the target and then dick Disconnect. For target properties, including configuration of sessions, select the target and dick Properties. For configuration of devices associated with a target, select the target and then dick Devices.	en [	Connect Disconnect Properties Devices	
To connect using advanced options, select a target and the click Connect. To completely disconnect a target, select the target and then click Disconnect. For target properties, including configuration of sessions, select the target and click Properties. For configuration of devices associated with a target, select the target and then click Devices.	en [	Connect Disconnect Properties Devices	

This will open the "Properties" window for our discovered but yet to be connected iSCSI disk.



To view the available paths for our disk, select the "Portal Groups" tab

		Proper	ties	×
Sessions	Portal Groups			
Porta conne for th Porta Assoc	l groups are a way actions across multi is target are listed I group count: ciated network port	for a target to ple network por below. als:	manage sessions with tals. The network por 4	tals
Ind	ex Address	Port	Symbolic Name	
3	10.0.3.10	1 3260		
2	10.0.2.10	1 3260		
1	10.0.3.10	0 3260		
0	10.0.2.10	0 3260		
			ОК	Cancel



#### **5.2 Session connections**

To connect to our different paths, we need to add connection sessions. Each session is a separate login from our client initiator to our iSCSI target disk over a specific path. In PetaSAN, the different paths for our disk are actually virtual ips clustered across different physical machines.

Select the "Sessions" tab

Properties		x
Sessions Portal Groups		
	Refresh	
Identifier		
To add a session, click Add session.	Add session	
To disconnect one or more sessions, select each session and then click Disconnect.	Disconnect	
To view devices associated with a session, select a session and then dick Devices.	Devices	
Session Information		
Target portal group tag:		
Status:		
Connection count:		
Maximum Allowed Connections:		
Authentication:		
Header Digest:		
Data Digest:		
Configure Multiple Connected Session (MCS)		Ξ.
To add additional connections to a session or configure the MCS policy for a selected session, click MCS.	MCS	
	OK Cancel	

#### 5.2.1 Path 1 session

Click on "Add session"





In the "Connect To Target" dialog, check "Enable multi-path" box and click on the "Advanced.." button.

In "Local adapter:" select "Microsoft iSCSI Initiator"

In "Initiator IP:" this is the client ip we will connect from, for our first path this is 10.0.2.51

In "Target portal IP:" this is the ip of the first path 10.0.2.100

Since we have created a secure disk in PetaSAN, check the "Enable CHAP log-in" and type the username and password we specified when we created our disk.

The settings for our first session should be as follows:

	Advanced Settings	?	x
General IPsec			
Connect using			
Local adapter:	Microsoft iSCSI Initiator	¥	
Initiator IP:	10.0.2.51	~	
Target portal IP:	10.0.2.100 / 3260	~	
CRC / Checksum			21
Data digest	Header digest		
✓ Enable CHAP log on			
CHAP Log on information	n		
CHAP helps ensure conne an initiator.	ection security by providing authentication between a target and	1	
To use, specify the same initiator. The name will d specified.	name and CHAP secret that was configured on the target for the efault to the Initiator Name of the system unless another name in	nis is	
Name:	admin		
Target secret:	•••••		
Perform mutual authe To use mutual CHAP, eith RADIUS.	ntication her specify an initiator secret on the Configuration page or use		
Use RADIUS to gener	ate user authentication credentials nticate target credentials		
	OK Cancel	App	oly

Click "OK"

Connect To Target	x
Target name: iqn.2016-05.com.petasan:00001	
Add this connection to the list of Favorite Targets. This will make the system automatically attempt to restore the connection every time this computer restarts.	
☑ Enable multi-path	
Advanced OK Cancel	



Click "Ok" again

If all goes well, we are now connected with our first session

Proper	ties ×
Sessions Portal Groups	
<u>.</u>	Refresh
Identifier  ffffe00000b04430-4000013700000	00a
To add a session, dick Add session.	Add session
To disconnect one or more sessions, sele session and then click Disconnect.	ect each Disconnect
To view devices associated with a sessio a session and then click Devices.	n, select Devices
Session Information	
Target portal group tag:	1
Status:	Connected
Connection count:	1
Maximum Allowed Connections:	1
Authentication:	CHAP
Header Digest:	None Specified
Data Digest:	None Specified
Configure Multiple Connected Session To add additional connections to a sess configure the MCS policy for a selected click MCS.	(MCS) sion or d session, MCS
	OK Cancel

We need to repeat the same steps for our remaining paths as will be shown in the next sections.

Note: when repeating the steps for paths 2 to 4, take special note of the different initiator and target ips for each path.



#### 5.2.2 Path 2 session

"Initiator IP:" 10.0.3.51

"Target portal IP:" 10.0.3.100

Remaining settings are the same as path 1.

		Advan	ced Settings		?	X
General	IPsec					
Conne	ect using					
Local a	adapter:	Microsoft iSCSI Ini	tiator		¥	
Initiat	or IP:	10.0.3.51			¥	
Targe	t portal II	10.0.3.100 / 3260			~	
	Checksu					
Da	ta digest	Hea	der digest			
To use initiato specifi	e, specify or. The n ied.	e same name and CHAP se ne will default to the Initiato	rret that was configured r Name of the system un	on the target for t less another name	his is	
Name:		dumin				
Targe	t secret:	•••••				
Per To use RADIU	rform mui e mutual ( JS. e RADIUS e RADIUS	al authentication IAP, either specify an initiate o generate user authentical o authenticate target crede	or secret on the Configur ion credentials ntials	ation page or use		
			ОК	Cancel	Арр	ly



#### 5.2.3 Path 3 session

"Initiator IP:" 10.0.2.51

"Target portal IP:" 10.0.2.101

Remaining settings are the same as path 1.

neral	IPsec	
Conn	ect using	
Local	adapter:	Microsoft iSCSI Initiator 🗸
Initiat	or IP:	10.0.2.51 🗸
Targe	t portal IP:	10.0.2.101/3260 🗸
CRC	/ Checksum	
Da	ta digest	Header dioest
CHA CHAP In init To use nitiate	able CHAP log P Log on inform helps ensure of iator. e, specify the st or. The name iad	on mation connection security by providing authentication between a target and same name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is
CHA CHAP an init To us initiat specif	able CHAP log P Log on inform helps ensure of iator. e, specify the s or. The name ied.	on mation connection security by providing authentication between a target and same name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is admin
CHA CHAP an init To use nitiate specif Name	able CHAP log P Log on inforn helps ensure of iator. e, specify the : or. The name ied. : t secret:	on mation connection security by providing authentication between a target and same name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is admin
CHAP CHAP an init To use initiab specif Name Targe To use RADIU Us	able CHAP log P Log on inforn helps ensure of iator. a, specify the : or. The name ied. : t secret: rform mutual a e mutual CHAP JS. e RADIUS to g e RADIUS to a	on mation connection security by providing authentication between a target and same name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is admin 



#### 5.2.4 Path 4 session

"Initiator IP:" 10.0.3.51

"Target portal IP:" 10.0.3.101

Remaining settings are the same as path 1.

neral IPsec	
Connect using	
Local adapter:	Microsoft iSCSI Initiator 🗸
Initiator IP:	10.0.3.51 🗸
Target portal IP:	10.0.3.101/3260 🗸
CRC / Checksum	
Data digest	Header digest
CHAP Log on inform CHAP helps ensure of an initiator. To use, specify the s	nation onnection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this
CHAP Log on inform CHAP helps ensure of an initiator. To use, specify the s initiator. The name v specified.	nation onnection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this vill default to the Initiator Name of the system unless another name is
CHAP Log on inform CHAP helps ensure of an initiator. To use, specify the s initiator. The name v specified. Name:	nation onnection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this vill default to the Initiator Name of the system unless another name is admin
CHAP Log on inform CHAP helps ensure of an initiator. To use, specify the s initiator. The name v specified. Name: Target secret:	nation onnection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is admin
CHAP Log on inform CHAP helps ensure of an initiator. To use, specify the s initiator. The name v specified. Name: Target secret: Perform mutual at To use mutual CHAP, RADIUS. Use RADIUS to ge	nation onnection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is admin admin attentication either specify an initiator secret on the Configuration page or use senerate user authentication credentials uthenticate target credentials



## **5.3 Reviewing Connections**

Review the 4 different sessions; make sure each session is associated with the correct path number

Propert	ties 🗙
Sessions Portal Groups	
	Refresh
Identifier	00a 00b 100 00d
To add a session, click Add session.	Add session
To disconnect one or more sessions, sele session and then click Disconnect.	ect each Disconnect
To view devices associated with a sessio a session and then click Devices.	n, select Devices
Session Information	
Target portal group tag:	3
Status:	Connected
Connection count:	1
Maximum Allowed Connections:	1
Authentication:	CHAP
Header Digest:	None Specified
Data Digest:	None Specified
Configure Multiple Connected Session ( To add additional connections to a sess configure the MCS policy for a selected click MCS.	(MCS) sion or d session, MCS
	OK Cancel

Click on "Devices..." then "MPIO..." double check that Windows set each path as "Active" and set a "Load balance policy" to "Round Robin".

		Device	es		x
Name	Address				_
Disk 1	Port 4: Bus	0: Target 2: LUN 0			
					- 1
Volume pat	th names:				
Legacy dev	vice name:	\\. \PhysicalDrive:	L		
		1121mpio #dick@uc	n notacan®or	od rbd®rov 4.0 #	10.
Device inte	rface name:	(If thiplo#diskeve	in_perasanapi	00_1000020_4.0_#	10
		< 111			>
Configure I	Multipath IO (N	IPIO)			_
To configu	ire the MPIO p	olicy for a			
selected d	evice, click MP	IO.		MPIO	
				ОК	

Round Robi	n			~
Description	1			
The round	d robin policy	attempts	to evenly dis	tribute incoming
requests	to all proces	sing paths.		-
'his device h	nas the follo	wing paths	:	
'his device h Path Id	nas the follo Status	wing paths	: Weight	Session ID
'his device h Path Id 0x7704	Status Conne	wing paths Type Active	: Weight n/a	Session ID ffffe000024e5430-400
his device h Path Id 0x7704 0x7704	Status Conne	Type Active Active	: Weight n/a n/a	Session ID ffffe000024e5430-400 ffffe000024e5430-400
his device h Path Id 0x7704 0x7704 0x7704	Status Conne Conne Conne	Wing paths Type Active Active Active	: Weight n/a n/a n/a	Session ID ffffe000024e5430-400 ffffe000024e5430-400 ffffe000024e5430-400
his device h Path Id 0x7704 0x7704 0x7704 0x7704	Status Conne Conne Conne Conne	wing paths Type Active Active Active Active Active	: N/a n/a n/a n/a n/a	Session ID ffffe000024e5430-400 ffffe000024e5430-400 ffffe000024e5430-400 ffffe000024e5430-400
his device h Path Id 0x7704 0x7704 0x7704 0x7704	Status Conne Conne Conne Conne	Type Active Active Active Active Active	: N/a n/a n/a n/a n/a	Session ID ffffe000024e5430-400 ffffe000024e5430-400 ffffe000024e5430-400 ffffe000024e5430-400
his device h Path Id 0x7704 0x7704 0x7704 0x7704	Status Conne Conne Conne Conne	Type Active Active Active Active Active	: n/a n/a n/a n/a n/a	Session ID ffffe000024e5430-400 ffffe000024e5430-400 ffffe000024e5430-400 ffffe000024e5430-400
his device h Path Id 0x7704 0x7704 0x7704 0x7704	Status Conne Conne Conne Conne	Ving paths Type Active Active Active Active	: N/a n/a n/a n/a	Session ID ffffe000024e5430-400 ffffe000024e5430-400 ffffe000024e5430-400 ffffe000024e5430-400
his device H Path Id 0x7704 0x7704 0x7704 0x7704	Status Conne Conne Conne Conne	Wing paths Type Active Active Active Active	: Weight n/a n/a n/a	Session ID ffffe000024e5430-400 ffffe000024e5430-400 ffffe000024e5430-400 ffffe000024e5430-400
his device h Path Id 0x7704 0x7704 0x7704 0x7704	Status Conne Conne Conne Conne	Ving paths Type Active Active Active Active III	: N/a n/a n/a n/a	Session ID ffffe00024e5430-40 ffffe00024e5430-40 ffffe00024e5430-40 ffffe00024e5430-40



## 6. Formatting our disk

To format the disk, go to "Server Manager" -> "File and Storage Services" -> "Disks"

Note: When preparing the disk for use in a clustered scenario where multiple Windows machines access the disk concurrently (example: when using Clustered Shared Volumes with Hyper-V or with Scale Out File Server), this step is done from the first machine only.

First bring the disk online:

<b>b</b>		Se	erver Manager					-	D	x
$\mathbf{E}$	. ✓ File and	Storage Services • Volu	mes • Disk	S	• 🕲	• ۲	Manage Too	ls View	ŀ	lelp
	Servers Volumes Disks Storage Pools Shares iSCSI Work Folders	DISKS All disks   2 total	<ul> <li>(ii) ▼ (ii) ヽ</li> <li>acity Unallocated</li> <li>GB 0.00 B</li> <li>TB 100 TB</li> </ul>	Partition MBR Unknown	Read Only (	Clustered Re Bri Tal Re	Su Bus Type SAS iSCSI w Volume ing Online ke Offline set Disk	TASKS Name VMware PETASA	VMw	
		<ul> <li>▲</li> <li>Last refreshed on 10/1/2016 5:40:59 AM</li> </ul>		1					>	
		VOLUMES Related Volumes   0 total Disk is Offline	TASKS	STO PETA	RAGE POOL SAN RBD Multi <i>N</i>	-Path Disk D	Device on WIN-PI	3 TASKS	•	
		$\odot$					• R	5 🖬 🈡	5:44 10/1	4 AM /2016



Then initialize the disk to create the partition table and boot record

<b>b</b>		Server Manager	-	٥	x	
E	. ✓ File and	Storage Services • Volumes • Disks • 🕄   🏲 Manage Tools	View	He	elp	
	Servers Volumes	All disks   2 total	TASKS	•	^	
ii:	Disks	Filter $\rho$ (III) $\checkmark$ (III) $\checkmark$		•		
₽	Storage Pools Shares	Number Virtual Disk Status Capacity Unallocated Partition Read Only Clustered Su Bus Type WIN-PB4FOGKL4FI (2)	Name			
	iSCSI	0 Online 200 GB 0.00 B MBR SAS	VMware,	VMw		
	Work Folders	1     Online     100 TB     100 TB     Unknow     iSCSI       Bring Online     Take Offline       Initialize     Reset Disk	PETASAN	N RBD	=	
		Last refreshed on 10/1/2016 5:40:59 AM				
		VOLUMES     STORAGE POOL       Related Volumes   0 total     TASKS ▼       No volumes exist.     PETASAN RBD Multi-Path Disk Device on WIN-PB	TASKS	•		
		To create a volume, start the New Volume Wizard.			~	
$\square$		- No	<b>a</b> 😡	5:46 10/1/2	AM 2016	



Now click "New Volume..." to format the disk as NTFS.

è		Server Manager	_	۰	x
E	●	d Storage Services 🔸 Volumes 🔸 Disks 🛛 🗸 🕄 🖌 Manage Tools	View	Help	p
⊞ i: i:	Servers Volumes Disks Storage Pools Shares iSCSI Work Folders	DISKS All disks   2 total         Filter       P       Image: Capacity       Unallocated       Partition       Read Only       Clustered       Sum       Bus Type       Number         MUN-PB4FQGKL4FI (2)       0       Online       200 GB       0.00 B       MBR       SAS       V         0       Online       100 TB       100 TB       GPT       SCC       P         Bring Online       Take Offline       Reset Disk       Sas       V	TASKS lame /Mware, V /ETASAN	✓ /Mw RBD	~
			TASKS	>	
		No volumes exist.  No related storage pool exists.  To create a volume, start the New Volume Wizard.			~
		- Re (i	1 🕼	5:47 Al 10/1/20	M 016

This will open the "New Volume Wizard", go through all steps accepting the default values. This will format the disk as NTFS and assign a drive letter to it.



Congratulations! We have successfully prepared our 100 TB 4 Active paths disk.

New Volume (E:) Properties							
Shadow Copie	es Pre	vious Versions	Quota	Customize			
General	General Tools		Sharing	Security			
Ŷ	New Volume						
Туре:	Type: Local Disk						
File system:	NTFS						
Used spa	Used space:         608,075,776 bytes         579 MB           Free space:         working         99.9 TB						
Free space							
Capacity:		working 99.9 TB					
Drive E:							
Allow files on this drive to have contents indexed in addition to file properties OK Cancel Apply							

Note: Don't forget that PetaSAN uses cloud technology which allows us to over-commit storage. We need to regularly check the PetaSAN Dashboard and find out how much physical storage has actually been used and add physical disks as necessary. As far as Windows is concerned, the 100 TB disk is fully available from day one and will not warn us if its usage is approaching the physical storage available, it is actually oblivious to this.