

StarWind Virtual SAN: Set Up Challenge-Handshake Authentication Protocol (CHAP)

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TECHNICAL PAPERS





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StarWind is a pioneer in virtualization and a company that participated in the development of this technology from its earliest days. Now the company is among the leading vendors of software and hardware hyper-converged solutions. The company's core product is the years-proven StarWind Virtual SAN, which allows SMB and ROBO to benefit from cost-efficient hyperconverged IT infrastructure. Having earned a reputation of reliability, StarWind created a hardware product line and is actively tapping into hyperconverged and storage appliances market. In 2016, Gartner named StarWind "Cool Vendor for Compute Platforms" following the success and popularity of StarWind HyperConverged Appliance. StarWind partners with world-known companies: Microsoft, VMware, Veeam, Intel, Dell, Mellanox, Citrix, Western Digital, etc.

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Annotation

Relevant Products

StarWind Virtual SAN (VSAN)

Purpose

This document outlines the implementation and configuration of the Challenge-Handshake Authentication Protocol (CHAP) authentication within StarWind Virtual SAN targets.

Audience

This document is intended for IT professionals, system administrators, and network administrators who are responsible for configuring and managing storage solutions within StarWind Virtual SAN.

Expected Result

The expected result is the successful configuration of CHAP settings in StarWind Virtual SAN. Users should be able to implement CHAP for initiator authentication, ensuring secure access to their storage targets. The document also provides guidance on setting global and individual permissions.

Configuring Chap Settings In Starwind Management Console

StarWind enables global and individual access CHAP restrictions to targets. Challenge-Handshake Authentication Protocol (CHAP) authenticates a user or network host to an authenticating entity. CHAP provides protection against replay attacks by the peer through the use of an incrementally changing identifier and a variable challenge value. CHAP requires that both client and server know the plain text of the secret, although it is never sent over the network.

NOTE: More information about CHAP can be found here.

Setting global permissions



1. Select one of the hosts in the StarWind Management Console tree.

2. Click the CHAP Permissions tab. Right-click the main tab area and select Add Permission from the shortcut menu.

Starwing Management Console									D /
FILE HOST TARGET TOOLS OPTIONS HELP									
Refresh Connect Disconnect Add Server Remove Server Add Device	e Add Device (advanced) Add	VTL Device Remove Tar	aet Help						
Servers	General Configuration	CHAP Permissions	Access Rights	Server Log	Events	Performance			
4 SW-HCA-1.STARWIND.LOCAL (192.168.12.203): 3	Target CHAP Name	Target Secret Init	iator CHAP Name	Initiator	Secret				
▲ ♦ Storage1									
HAImage1									
4 SW-HCA-2 (192.168.12.222): 3261									
▲ 🔶 Storage1									
HAImage1									
				- Ad	d Permission				
				C Edit	t Permission				
				× Del	ete Permissio	in .			
C. 107 10 (c) 14110 111									

- 3. In New Permission Item, specify the required settings:
 - Target CHAP name: is a name used by CHAP for initiator authentication.
 - Target secret: is a secret that is used by CHAP for initiator authentication.
 - Initiator CHAP name: is a name for the CHAP mutual authentication.
 - Initiator secret: is a secret for the CHAP mutual authentication.



lew Permission Item		×
CHAP Authentication	Options	
Target CHAP Name	Target1	
Target Secret	•••••	
Confirm Secret	•••••	
Mutual CHAP Aut	hentication	
Initiator CHAP Name		
Initiator Secret		
Confirm Secret		
	OK Cancel	

4. Check the new CHAP Permission tab.

General	Configuration	CHAP Permission	ns	Access Rights	Serve	er Log	Events
Target CHA	P Name	Target Secret	Initi	iator CHAP Name		Initiato	Secret

NOTE: Repeat this step to add as many permissions as needed. Now all clients need to provide CHAP settings to access any target on this server.

NOTE: If the partner authentication settings are not changed, StarWind will not be able to synchronize HA devices to the partner node after the service restart.

Setting individual target permissions

- 1. Select the required target in the StarWind Management Console tree.
- 2. Click Add Permission in the CHAP Permissions area.



StarWind Management Console		– ø ×
FILE HOST TARGET TOOLS OPTIONS HELP	e Add Decise (advanced) Add VIL Device Remove Target	
	STORAGE1 Target (N) isp.2006-08.com.stanwindschwaresav-hca.1.stanvind.local-storage1 Clustering Ye Group General Image: Constraint Devices (1) Doice Name UN Device Type Malage1 0 HA Active 1 GB Malage1 0 HA Active 1 GB Malage1 Market Name Right 2008-08.com.stanwindschwaresav-hca.2-storage1 Right 2008-08.com.stanwindschware	<i>⊙</i>
	CHAP Permissions (0) <u>+ Add Permission</u> <u>Instruct CHAP Name</u> No CHAP Permissions configured No CHAP Permissions configured	

- 3. In the New Permission Item window, specify the required settings:
 - Target CHAP name: is a name used by CHAP for initiator authentication.
 - Target secret: is a secret that is used by CHAP for initiator authentication.
 - Initiator CHAP name: is a name for the CHAP mutual authentication.
 - Initiator secret: is a secret for the CHAP mutual authentication.

New Permission Item		×
CHAP Authentication (Options	
Target CHAP Name	Target1	
Target Secret	•••••	
Confirm Secret	•••••	
Mutual CHAP Aut	nentication	
Initiator CHAP Name		
Initiator Secret		
Confirm Secret		
	OK Cancel	

Click OK.



NOTE: Repeat this step to add as many permissions as needed. Now all clients need to provide CHAP settings to access target on this server.

©	CHAP Permissions (1)	+ Add Permission	\bigcirc
	Target CHAP Name	Initiator CHAP Name	Ŭ
	🖳 target1	Not specified	

NOTE: If the partner authentication settings are not changed, StarWind will not be able to synchronize HA devices to the partner node after the service restart.

Setting permissions for HA target

1. Open StarWind Management Console.

2. Choose partner device. Click Change Partner Authentication Settings or right-click the device and select Change Partner Authentication Settings from the shortcut menu.



3. Select CHAP in Authentication Type.



	? ×
\leftarrow	Partner Authentication Settings
	Authentication Parameters
	Partner iqn.2008-08.com.starwindsoftware:sw-sup-fs-01-ha-ds-main
	Authentication Type CHAP ~
	Local Name
	Local Secret
	Peer Name
	Peer Secret
	OK Cancel

dicate Local Name and Local Secret. Click OK.



		?	×
\leftarrow	Partner Authentication Settings		
	uthentication Parameters		
	Partner iqn.2008-08.com.starwindsoftware:sw-sup-fs-01-ha-ds-main	า	
	Authentication Type CHAP ~		
	Local Name Target1		
	Local Secret		_
	Peer Name		
	Peer Secret		
	ОК	Canc	el

Selecting The Hypervisor

Please select the required option:

Configuring Chap Settings On Hyper-V

Setting target permissions

- 1. Open iSCSI Initiator.
- 2. Select Target in the Discovered targets area. Click Connect.



	iator Prope	rties				×	
argets	Discovery	Favorite Targets	Volumes and Devices	RADIUS	Configuration		
Quick (To disc DNS na	Connect cover and log ame of the ta	g on to a target usin arget and then click	g a basic connection, t Quick Connect.	ype the IP	address or		
Target	:			Qu	uick Connect		
Discove	ered targets				Refresh	1	
Name	:			Status			
iqn.2	008-08.com.	starwindsoftware:s	w-hca-1.starwind.l	Inactive			
To con	nect using a	dvanced options, se	elect a target and then		Connect		
To con click Co To con then cl	nect using a onnect. Ipletely disco ick Disconne	dvanced options, se onnect a target, sele ct.	elect a target and then		Connect Disconnect]	
To con dick Co To con then d For tar select	nect using a onnect. npletely disco ick Disconne get properti the target a	dvanced options, se onnect a target, sele ct. es, including configu nd click Properties.	elect a target and then ect the target and uration of sessions,		Connect Disconnect Properties]]]	
To con click Co To con then cl For tar select For con the tar	nect using a onnect. Inpletely disco lick Disconne get properti the target an nfiguration o get and the	dvanced options, se onnect a target, sele ct. es, including configu nd click Properties. of devices associated n click Devices.	elect a target and then ect the target and uration of sessions, d with a target, select		Connect Disconnect Properties Devices]]]]	
To con click Co To con then d For tar select For co the tar	nect using a onnect. npletely disco ick Disconne rget properti the target an nfiguration o rget and the	dvanced options, se onnect a target, sele ct. ies, including configu nd click Properties. of devices associated n click Devices.	elect a target and then act the target and uration of sessions, d with a target, select		Connect Disconnect Properties Devices		
To con click Co To con then cl For tar select For col the tar	nect using a onnect. Ipletely disco ick Disconne get properti the target an nfiguration o get and the	dvanced options, se onnect a target, sele ct. es, including configu nd click Properties. of devices associated n click Devices.	elect a target and then ect the target and uration of sessions, d with a target, select		Connect Disconnect Properties Devices		



Connect To Target		×
Target name:		1
2008-08.com.starw	indsoftware:sw-hca-1.starwind.local-storage1	
Add this connection This will make the connection every	on to the list of Favorite Targets. system automatically attempt to restore the time this computer restarts.	
🗹 Enable multi-path		
Advanced	ОК	Cancel
d		

select the Enable CHAP log on checkbox.

5. Indicate Name and Target secret. Click OK.



dvanced Settings			?	×
General IPsec				
Connect using				_
Local adapter:	Microsoft iSCSI Initiator		~	
Initiator IP:	Default		~	
Target portal IP:	127.0.0.1 / 3260		~	
CRC / Checksum				
Data digest	Header diges	t		
Name:	name and CHAP secret that t fault to the Initiator Name of Target1	was configured on the target f f the system unless another na	or this ime is]
Target secret:	•••••]
Perform mutual auther To use mutual CHAP, eith RADIUS. Use RADIUS to genera Use RADIUS to auther	ntication er specify an initiator secret o ate user authentication crede nticate target credentials	on the Configuration page or u ntials	se	
	[OK Cancel	Apj	ply

roperties... in the iSCSI Initiator and check Authentication of the connected session.



perties			×	
ssions Portal Groups				
		Refresh		
Identifier				
ffffe709d6397010-40000137000	00010			
To add a session, dick Add session.		Add session		
To disconnect one or more sessions, s	elect each	Disconnect	11	
To view devices associated with a ses	sion select			
a session and then click Devices.	sion, select	Devices		
Session Information				
Target portal group tag:	1			
Status:	Connected			
Connection count:	1			
Maximum Allowed Connections:	1			
Authentication:	CHAP			
Header Digest:	None Spec	ified		
Data Digest:	None Spec	ified		
- Configure Multiple Connected Sessio	n (MCS)			
To add additional connections to a s configure the MCS policy for a select click MCS.	ession or ted session,	MCS		
	(OK Cance	9	



	Favorite Target Details	×
	Target name:	iqn.2008-08.com.starwindsoftware:storage:
		< >
	IP address or DNS name:	127.0.0.1
	Port:	3260
	Local adapter:	Microsoft iSCSI Initiator
	Source IP:	Default
	Header digest:	Not used
	Data digest:	Not used
	Authentication:	CHAP
)etails.		ОК

NOTE: Target will not be reconnected after the service restart in case it does not have CHAP Authentication.

Changing CHAP initiator configuration

1. Open iSCSI initiator and click Configuration.



CSI Initi	ator Prope	rties				\times
argets	Discovery	Favorite Targets	Volumes and Devices	RADIUS	Configuration	
Configur the initia Any exis	ation setting ator.	gs here are global a tions may continue	nd will affect any futur to work, but can fail if t	e connectio he system	ons made with restarts or	
the initia When co particula	ator otherwis onnecting to ar connection	se tries to reconnec a target, advancec n.	t to a target. I connection features a	llow specifi	c control of a	
Initiator iqn. 199	Name: 91-05.com.n	nicrosoft:sw-hca-1.s	tarwind.local			
To modif	fy the initiat	or name, dick Chang	ge.		Change	
To set t dick CH/	ne initiator C AP.	CHAP secret for use	with mutual CHAP,		CHAP	
To set u click IPse	p the IPsec ec.	tunnel mode addres	ses for the initiator,		IPsec	
To gene the syst	rate a repor em, dick Re	t of all connected ta port.	argets and devices on		Report	
			ОК	Cancel	Apply	/

nge... to modify the initiator name. Click CHAP... to set the initiator CHAP secret.

Configuring Chap Settings On Esxi

1. Click Add dynamic target in Dynamic Targets. Click Edit Settings.



Configure iSCSI - vmhba64							
iSCSI enabled	O Disabled						
 Name & alias 	iqn.1998-01.com.vmware:5af25724-ae2e-029c-de89-b8	998-01.com.vmware:5af25724-ae2e-029c-de89-b8ca3a6cd174-6605b3f3					
▼ CHAP authentication	Use CHAP 🔻	T					
Name	Storage1						
Secret							
 Mutual CHAP authentication 	Do not use CHAP	T					
► Advanced settings	Click to expand						
Network port bindings	🚘 Add port binding 🛛 🗮 Remove port binding						
	VMkernel NIC ~ Port group	up v IPv4 address	~				
		No port bindings					
Static targets	🙋 Add static target 🛛 🧖 Remove static target 🥒 E	Edit settings Q Search	\supset				
	Target	 Address Port 	~				
		No static targets					
Dynamic targets	Add dynamic target 🛛 🕺 Remove dynamic target	et 🥒 Edit settings	\supset				
	Address	~ Port	~				
		No dynamic targets					
		Save configuration Canc	el				
	· ·						
2. Uncheck Inherit fro	m parent.		_				
Configure iSCSI target - Click	to add address						
	Use CHAP	T					
Name	Storage1						
Secret	•••••						
Inherit from parent							
Mutual CHAP authentication			_				
	Use CHAP	 Innerit from parent 					
Advanced settings	Click to expand						
		Save					
			11.				

3. Write Name and Secret in the corresponding fields. Click Save.

4. Click the Save configuration button.

NOTE: Target will not be reconnected after the service restart if it does not have CHAP



Authentication.

Configuring Chap Settings On Xen

1. Open XenCenter and click on the Server tab. Then select Storage tab and click New SR... .

Gener	al Memory	Storage	Networking	NICs	Console P	erformance	Users	Search				
Sto	Storage Repositories											
Stor	age											
Nar	ne		Descriptio	n	Туре	Share	d Usa	ge	Size	Virtual allocation		
	Local storage	on sw-sed.	Local stora	age on s	LVM	No	83%	(32.1 GB used)	38.5 GB	32 GB		
	SR1		iSCSI SR [1	172.16.10	LVM over	iS Yes	0%	(4 MB used)	1012 MB	0 B		
	DVD drives or	n sw-sed-b.	Physical D	VD drive	. udev	No	1009	% (652 MB used)	652 MB	652 MB		
	SR2				LVM over	iS Yes	0%	(4 MB used)	1012 MB	0 B		
	Removable st	torage on s.	Physical re	emovabl	udev	No	0%	(0 B used)	0 B	0 B		
	New SR	Reclaim	n freed space	I P	roperties							

2. Select iSCSI as Virtual disk storage and click Next.



😣 New Storage Repository - StarW	/ind			_		×
Choose the type of new	v storage					?
Type Name Location	Virtual disk storage NFS isCSI Hardware HBA Software FCoE ISO library Windows File Sharing (SMB/CIFS) NFS ISO	iSCSI iSCSI or Fibre Channel acce using LVM. Using an LVM for a shared benefits as a unshared LVM VM agility.	ess to a shared SR provides th 1 for local disk	LUN can be o	configure rmance Ilso enabl	d es
			< Previous	Next >	Cano	el
3. Indicate Name in N	ew Storage Repository. C	lick Next to proc	eed.			
😣 New Storage Repository - StarW	/ind			_		×
What do you want to o	all this Storage Repository?					?
Type Name	Provide a name and a description (optio	nal) for your SR.				
Location	Name: iSCSI virtual disk storage					
	Autogenerate description based on S	R settings (e.g., IP address, L	UN etc.)			
	Description:					
CITRIX.						
			< Previous	Next >	Cano	el

4. Indicate Target host name/IP address and check Use CHAP. Type username and password. Click Finish.



😣 New Storage Repository - StarV	/ind		_	
Enter a path for your i	SCSI storage			0
Type Name	Provide a target host for your i before proceeding.	SCSI storage, indicating your target IQN and	d your target LUN	
Location		192.100.10.103	: 5200	
	CHAP username: CHAP password:	Target1]	
	Scan Target Host			
	Target IQN:			~
				~
CİTRIX				
		< Pre	vious Finish	Cancel

Conclusion

By implementing CHAP, users can enhance the security of their storage solution by authenticating users or network hosts and protecting against replay attacks. The document covers both global and individual access CHAP restrictions, ensuring that users have the flexibility to configure authentication settings as needed.



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