

## Setting up the Dell DR Series System with IBM Tivoli Storage Manager

Dell Engineering May 2016

## Revisions

Date	Description
January 2014	Initial release
August 2014	Added screenshots where new functionality is introduced in 2014
April 2015	Updated for v3.2 release
June 2015	Updated the cleaner recommendations
May 2016	Updated with ISCSI VTL support and instructions

THIS WHITE PAPER IS FOR INFORMATIONAL PURPOSES ONLY, AND MAY CONTAIN TYPOGRAPHICAL ERRORS AND TECHNICAL INACCURACIES. THE CONTENT IS PROVIDED AS IS, WITHOUT EXPRESS OR IMPLIED WARRANTIES OF ANY KIND.

© 2016 Dell Inc. All rights reserved. Reproduction of this material in any manner whatsoever without the express written permission of Dell Inc. is strictly forbidden. For more information, contact Dell.

PRODUCT WARRANTIES APPLICABLE TO THE DELL PRODUCTS DESCRIBED IN THIS DOCUMENT MAY BE FOUND AT: <u>http://www.dell.com/learn/us/en/19/terms-of-sale-commercial-and-public-sector</u> Performance of network reference architectures discussed in this document may vary with differing deployment conditions, network loads, and the like. Third party products may be included in reference architectures for the convenience of the reader. Inclusion of such third party products does not necessarily constitute Dell's recommendation of those products. Please consult your Dell representative for additional information.

#### Trademarks used in this text:

Dell<sup>TM</sup>, the Dell logo, and PowerVault<sup>TM</sup> are trademarks of Dell Inc. Other Dell trademarks may be used in this document. Microsoft<sup>®</sup>, Windows<sup>®</sup>, Windows Server<sup>®</sup>, Internet Explorer<sup>®</sup>, MS-DOS<sup>®</sup>, Windows Vista<sup>®</sup> and Active Directory<sup>®</sup> are either trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. IBM<sup>®</sup>, Tivoli, and Storage Manager are trademarks or registered trademarks of International Business Machines Corporation. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and/or names or their products and are the property of their respective owners. Dell disclaims proprietary interest in the marks and names of others.

## Table of contents

1	Insta	Illing and configuring the DR Series system	5
	1.1	Creating a container (NFS/CIFS)	8
	1.2	Creating a VTL container with an iSCSI connection	10
2	Conf	figuring IBM Tivoli Storage Manager for CIFS & NFS target containers	13
	2.1	Configuring the device class for CIFS & NFS protocols	13
	2.2	Configuring the storage pool for CIFS & NFS protocols	16
	2.3	Creating a policy domain for the backup job	
	2.4	Creating client node and backup sets	23
3	Crea	ting and configuring iSCSI target container(s) for TSM	25
	3.1	Configuring the iSCSI initiator	25
	3.1.1	Configuring ISCSI initiator for Windows	25
	3.1.2	Configuring the iSCSI initiator – Linux	29
	3.2	Configuring DR Series system VTL for Windows and Linux TSM servers	
	3.2.1	Configuring the DR Series system VTL for Windows	30
	3.2.2	2 Configuring the DR Series system VTL for Linux	
	3.3	Configuring the device class for iSCSI VTL	
	3.4	Configuring the storage pool for iSCSI VTL	
	3.4.1	Adding volumes to a library	35
	3.4.2	2 Adding volumes to a storage pool	
	3.5	Creating the policy domain for iSCSI VTL	
	3.6	Creating the client node for iSCSI VTL	
4	Using	g the Backup & Archive GUI	42
5	Setti	ng up the DR Series system cleaner	43
6	Mon	itoring deduplication, compression, and performance	44
А	Conf	figuring CIFS authentication	45
В	Best	practices/considerations	47
	B.1	Deduplication	47
	B.2	Compression	47
	B.3	Encryption	47
	B.4	Space reclamation	47
С	Conf	figuring the tape library devices on Linux	48



## **Executive summary**

This document provides information about how to set up the Dell DR Series system as a backup to disk target for IBM Tivoli Storage Manager (TSM).

For additional information, see the DR Series system documentation and other data management application best practices whitepapers for your specific DR Series system at:

http://www.dell.com/support/home

**NOTE**: The DR Series system/Tivoli Storage Manager screen shots used for this document may vary slightly, depending on the versions of the DR Series system/Tivoli Storage Manager Software you are using.



## 1 Installing and configuring the DR Series system

- Rack and cable the DR Series system, and power it on. In the *Dell DR Series System Administrator Guide*, refer to the sections "iDRAC Connection", "Logging in and Initializing the DR Series System", and "Accessing IDRAC6/Idrac7 Using RACADM" for information about using the iDRAC connection and initializing the appliance.
- 2. Log on to iDRAC using the default address **192.168.0.120** or the IP address that is assigned to the iDRAC interface with the user name and password: **root/calvin.** Launch the virtual console.

	EGRATED DELL REMOTE ESS CONTROLLER 6 - ENTERPRISE				Support   About   Logo	at:	
System Dell DR4000 root , Admin	Properties Sea System Summary	Contraction of the second statement of the second stat					
System IDRAC Settings Batteries Fans Intrusion	System Sum Server Healt				• • • ?		
Power Supplies Removable Flash Media	Status Comp			Virtual	I Console Preview		
Temperatures	Datteri	**		Options : Settings			
Voltages Power Monitoring	Cans Fans				A DATA DATA DATA DATA DATA DATA DATA DA		
	Power Supplies						
	the state of the second second	Removable Flash Media					
		Temperatures			Retresh		
	Voitage:			Retrosh			
	Server Informat	ion		Quick	Launch Tasks		
	Power State		ON	Power	r ON / OFF		
	System Model		Dell DR4000	Power	r Cycle System (cold boot)		
	System Revisio	n.		Laund	ch Virtual Console		
	System Host N	ame	DR4000-DKCV6S1.asglab.roundrock	View S	System Event Log		
	Operating Syst	m	CentOS	View IDRAC Log			
	Operating Syst	Im Version	release 5.4 (Final) Kernel 2.6 18-164 e	Updah	te Firmware		
	Service Top		DKCV6S1	Reset	NDRAC		
	Express Service	Code	29529104401				
	BIOS Version		1.9.0				
	Firmware Versi	00	1.80 (Build 17)				

3. After the virtual console is open, log on to the system as the user **administrator** with the password **St0r@ge!** (The "0" in the password is the numeral zero).



4. Set the user-defined networking preferences.

Would you like to use DHCP (yes∕no)?
Please enter an IP address:
Please enter a subnet mask:
Please enter a default gateway address:
Please enter a DNS Suffix (example: abc.com):
Please enter primary DNS server IP address: .
Mould you like to define a secondary DNS server (yes/no) ?
Please enter secondary DNS server IP address:



5. View the summary of preferences and confirm that it is correct.

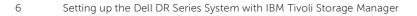


6. Log on to the DR Series system administrator console using the IP address you just provided for the DR Series system with the username: **administrator** and password: **St0r@ge!** (The "0" in the password is the numeral zero.).

DELL DR4000 DR4000-D	KCV651	Help
ogin		Reset Password
	Please enter your password:	
	Username: administrator Password: Silor@gel Log in	

**Note:** if you do not want to add the DR Series system to Active Directory, see the *DR Series System Owner's Manual* for guest logon instructions.

- 7. Join the DR Series system into the Active Directory domain.
- a. Select **System Configuration** > **Active Directory** from the left navigation area of the DR Series system GUI.





b. Enter your Active Directory credentials.

SW	sys-241 testad.ocarina.ic 🔻			
	Global View	Active Directory		Join
	Dashboard			
	Alerts	Settings		
	Events Health	The Active Directory settings have not been configured. Click on the	'Join' link to configure them.	
	Usage			
	Container Statistics	CIFS Share		
	Replication Statistics	Active Directory Configuration		
	Storage Schedules System Configuration	Note: By joining the Active Directory, you will lose the current URL system. The browser will re-direct to a new URL and you will need		
	Networking	Dural New CODIN	* = fields are require	ed.
	Active Directory	Domain Name (FQDN)*:		
	Local Workgroup Users Email Alerts	Username*:		
	Admin Contact Info	Password*:		
	Password	Org Unit:		
	Email Relay Host			
	Date and Time		Cancel Join Doma	ain
8	Support			



## 1.1 Creating a container (NFS/CIFS)

1. Create and mount the container by selecting **Containers** in the left navigation area and then clicking **Create** at the top of the page.

sys-241.testad.ocarina.lc  Global View	Containers			Create	Edit   Delete   Displ	ay Statisti
Dashboard Storage	Number of Containers: 3				Container Path	: /containe
Containers	Containers	Files	Marker Type	Access Protocol Enabled	Replication	Select
Replication	backup	19	Auto	NFS, CIFS	Not Configured	0
- Encryption - Clients	test1	0	None	CIFS	Not Configured	0
Schedules	tsmsmall	31	Auto	VTL iSCSI	Not Configured	0
System Configuration	·				-	

2. Enter a Container Name, and click Next.

ontainer Name			* = required field
Container Name*:	Max 32 characters, including only letters, numbers, hyphen, and underscore. Name must start with a letter. My_Container_Backup		
rtual Tape Library (VTL) :			
		Cancel	Next >

3. Select the storage access protocol as **NAS**, and then click **Next**.

Select Access Protocols		* = required fields
Storage Access Protocol <sup>*</sup> : Dell Rapid Data Storage (RDS) Symantec OpenStorage (OST)	?	Container Name and Type My_container_backup
	< Bac	k Cancel Next >



4. Select to Enable Access Protocols (**NFS** or **CIFS**) as appropriate and select the Marker type as **Auto**. Click **Next**.

Configure NAS Access—			* = required field
nable Access Protocols	NFS (Use NFS to backup UNIX or LINUX clients)		Container Name and Type My_container_backup
	CIFS (Use CIFS to backup MS Windows clients)		Access Protocols NAS (NFS, CIFS)
Marker Type*	None None	?	
	O Auto		
	Networker		
	Unix Dump		
	BridgeHead		
	Time Navigator		
		< Back	Cancel Next >

- 5. Configure access by doing one of the following:
  - For NFS, select the preferred client access credentials, and click Next.

Container Wizard - Create New	Container		
Configure NFS Access			* = required fields
NFS Options *:	<ul> <li>Read Write Access</li> <li>Read Only Access</li> </ul>	Insecure	Container Name and Type My_container_backup Access Protocols
Map root to :	-select-		NAS (NFS, CIFS) Auto
Client Access :	Open (allow all clients) Create Client Access List		
Client FQDN or IP :		Add	
allow access client(s)		Remove	
		< Bac	k Cancel Next >

• For CIFS, select the preferred client access credentials, and click **Next**.

nfigure CIFS Client Access –		* = required field
Client Access :	<ul> <li>Open (allow all clients)</li> <li>Create Client Access List</li> </ul>	Container Name and Type My_container_backup
Client FQDN or IP : allow access client(s)	Add	Access Protocols NAS (NFS, CIFS) Auto NFS Access Read Write Access secure Open (allow all clients)
		< Back Cancel Next >



6. Check the configuration summary, and click **Create a New Container**.

Sontainer wizaru - Create New Container	
Configuration Summary	* = required fields
Container Name and Type Container Name: My_container_backup Access Protocols Access Protocol: NAS (NFS, CIFS)	NFS Access Access Option: Read Write Access Insecure: No Open (allow all clients):
Marker Type: Auto	CIFS Access Open (allow all clients):
	< Back Cancel Create a New Container

## 1.2 Creating a VTL container with an iSCSI connection

1. Create and mount the container by selecting **Containers** in the left navigation area and then clicking **Create** at the top of the page.

vsys-241.testad.ocarina.lc ▼ Global View	Containers			Create	Edit   Delete   Displ	lay Statisti
Dashboard Storage	Number of Containers: 3				Container Path	: /containe
Containers	Containers	Files	Marker Type	Access Protocol Enabled	Replication	Select
Replication	backup	19	Auto	NFS, CIFS	Not Configured	0
Encryption	test1	0	None	CIFS	Not Configured	0
	tsmsmall	31	Auto	VTL iSCSI	Not Configured	0
Schedules System Configuration	tsmsmall	31	Auto	VTL iSCSI	Not Configured	(

2. Enter a container name, select the VTL option, and then click Next. Container Wizard - Create New Container

Container Name		* = required fields
	Max 32 characters, including only letters, numbers, hyphen, and underscore. Name must start with a letter.	
Container Name*:	TSM-iscsi	
Virtual Tape Library (VTL) :		
		Cancel Next >

3. Select the required tape size, the access protocol as **iSCSI**, and the marker type. Also, enter the initiator details as appropriate. Click **Next**.

Edit Container: TSM-iscsi					
- Configure Virtual Tape Libra	irv				* = required fields
Is OEM:	-			1	Container Name and Type TSM-iscsi
Tape Size:	800GB	400GB	200GB		VTL
	0 100GB	50GB	0 10GB		
Access Protocol:	NDMP	iscsi	No Access		
Access Control (initiator): Add Tapes (no. of tapes):	IQN, FQDN or If 10.250.209.35	5		?	
Marker Type:	<ul><li>Unix Dump</li><li>None</li></ul>	<ul><li>Network</li><li>Auto</li></ul>			
					Cancel Next >

4. Click Create a New Container.

figuration Summary	* = required fiel
Container Name and Type	Virtual Tape Library
Container Name: TSM-iscsi	OEM: no
Connection Type: VTL	Tape Size: 800gb
	Access Protocol: iSCSI
	Access Control: 10.250.209.35
	Marker Type: Auto
	< Back Cancel Create a New Container
	Cleate a New Container



5. Confirm that the container is successfully added on the Containers page.

ocarina.local  Containers bal View			Create	Edit   Delete   Displ	ay Statist
hboard					
Message					
	Successfully added container "TSM-iscsi".				
de Succe	essfully enabled container "TS	M-iscsi" with the followi	ng marker(s) "Auto".		
tainer Statistics Number of Contai	ners: 15			Container Path	/contain
lication Statistics					
rage Containers	Files	Marker Type	Access Protocol Enabled	Replication	Selec
tainers back_cifs	0	Auto	CIFS	Not Configured	0
backis	31	Auto	VTL ISCSI	Not Configured	
ryption backup	19	Auto	NFS, CIFS	Not Configured	0
nts Backup1	0	None	CIFS	Not Configured	0
tem Configuration data	2258	None	CIFS	Not Configured	0
port esh-bkup	8	None	CIFS	Not Configured	0
hpdata	14	None	CIFS	Not Configured	0
largedata	31	Auto	VTL ISCSI	Not Configured	0
sav2	2	HP DataProtector	NFS	Not Configured	
savings	0	None	CIFS	Not Configured	0
source	0	None	CIFS	Not Configured	0
source1	0	None	CIFS	Not Configured	0
target	0	None	CIFS	Online	0
target1	1	None	CIFS	Not Configured	0
TSM-iscsi	0	Auto	VTL	Not Configured	0



# 2 Configuring IBM Tivoli Storage Manager for CIFS & NFS target containers

## 2.1 Configuring the device class for CIFS & NFS protocols

The following instructions describe a basic configuration for connecting a DR Series system to the Windows version of IBM Tivoli Storage Manager (TSM) version 7.1.4.

- 1. Open the IBM Tivoli Storage Manger Administration Center.
- 2. Click Storage Devices > View Storage Classes.

Tivoli. View: All tasks				
+ =	Storage Devices × +			
<ul> <li>Welcome</li> <li>My Startup Pages</li> <li>Users and Groups</li> <li>Settings</li> </ul>	Servers Select a server and pick an option f servers that were added to the con	rom the Select Action menu to work with its sole.		
<ul> <li>Tivoli Storage Manager</li> <li>Getting Started</li> </ul>		View Storage Pools View Device Classes		
<ul> <li>Manage Servers</li> <li>Health Monitor</li> <li>Enterprise Management</li> <li>Storage Devices</li> </ul>	Select ^ Server Name ^	View NAS File Servers		
Client Nodes and Backup Sets     Policy Domains     Server Maintenance     Reporting		Expire Inventory Shred Data Identify Duplicates		
<ul> <li>Disaster Recovery Management</li> <li>FastBack Servers</li> </ul>	Librarias for All Sonrors	View Volume History View Operator Requests Back Un Device Configuration		

#### 3. Click Create a Device Class.





4. Select the **FILE** device type, and click **Next**. (This device type is optimized for writing to disk-based storage.)

-	
Storage Devices × +	3592 (uses IBM 3592 tape cartridges) 4MM (uses 4-mm tape cartridges)
	8MM (uses 8-mm tape cartridges)
Create a Device Class	CENTERA (uses EMC Centera)
	DLT (uses Digital linear tape cartridges)
	DTF (uses Digital tape format cartridges)
Select Device Type	ECARTRIDGE (uses StorageTek tane cartridges)
General Information	FILE (uses sequential-access volumes on disk)
General Information	GENERICIAPE (tape drive is not supported by the Tivoli Storage Manager server)
Summary	LTO (uses Linear Tape-Open Ultrium cartridges)
	NAS (uses tape cartridges in drives attached to a NAS file server)
	OPTICAL (uses rewritable optical cartridges)
	QIC (uses quarter-inch tape cartridges)
	REMOVABLEFILE (uses removable media, such as CD-RW)
	SERVER (uses virtual volumes to store data on another server)
	VOLSAFE (uses StorageTek write-once-read-many tape cartridges)
	WORM (uses write-once-read-many optical cartridges)
	Select a Device Type
< Back Next > Finish	Cancel
C BOCK NOXE > FINISH	

- 5. Under General Information, enter the following information, and click **Next**.
  - Name Enter a descriptive name for the device class.
  - **Path** Add the UNC path to the DR container for CIFS and the mount point of DR Series system export for NFS.
  - **Mount Limit** Set the mount limit. The DR Series system supports up to 32 concurrent CIFS connections. The optimal number of connections is five.
  - **Maximum File Size** Set the maximum file size. The DR Series system supports very large files, such as 1TB.

**Note:** The service account for TSM needs to have the correct permission to connect to the DR Series system CIFS share for this step to complete successfully. Before providing the information, see Appendix A for information about setting up the TSM service account correctly.

Create a Device Class	•
<ul> <li>Select Device Type</li> </ul>	General Information
🗘 General Information	A file device represents a series of files in a directory, which are treated as sequential access volumes. Enter name for the device class and the directory location where this device class will store client node data.
Summary	*Name DR4X00
	*Path to store files (separate multiple directory names with commas, and no intervening spaces) \\swsys-70\My_container_backup
	$\Box$ Allow other servers and storage agents to share access to volumes in the specified directories
	Consider adding a minimum of two mount points for every storage pool, server, or storage agent that will use this devic class.
	Mount limit 5 -
	Maximum file size <sup>*</sup> 50 GB
< Back Next > Finish	1 Cancel

An example for the CIFS Container Path follows.

An example for the NFS container path follows.

Create a Device Clas	S vi
<ul> <li>Select Device Type</li> <li>General Information Summary</li> </ul>	General Information
	A file device represents a series of files in a directory, which are treated as sequential access volumes. Enter a name for the device class and the directory location where this device class will store client node data.
	*Name TSM-iscsi
	*Path to store files (separate multiple directory names with commas, and no intervening spaces) //mnt/TSM-iscsi x
	Allow other servers and storage agents to share access to volumes in the specified directories
	Consider adding a minimum of two mount points for every storage pool, server, or storage agent that will use this device class.
	Mount limit
	Maximum file size
< Back Next > Fin	ish Cancel

#### 6. Click Finish.

Create a Device Class	
✓ Select Device Type	Summary
<ul> <li>General Information</li> </ul>	These storage objects have been successfully defined.
🗘 Summary	Bevice class DR4X00-Device has been created.
< Back Next > Finish	Cancel



## 2.2 Configuring the storage pool for CIFS & NFS protocols

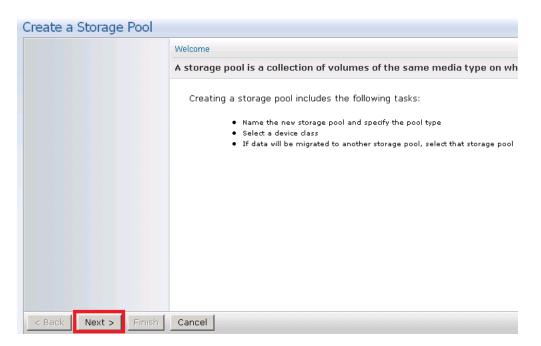
#### 1. Click Storage Devices > View Storage Pools.

Tivoli. View: All tasks		
• =	Storage Devices × Manage Servers	× +
<ul> <li>Welcome</li> <li>My Startup Pages</li> <li>Users and Groups</li> <li>Settings</li> </ul>	Select a server and pick an option from to the console.	n the Select Action menu to work with i
<ul> <li>Tivoli Storage Manager</li> <li>Getting Started</li> </ul>	🔢 🖤 🥙 🖉 🔳 🏽	View Storage Pools
<ul> <li>Manage Servers</li> </ul>	Select ^ Server Name ^	View Device Classes
<ul> <li>Health Monitor</li> <li>Enterprise Management</li> </ul>		View Collocation Groups
<ul> <li>Enterprise Management</li> <li>Storage Devices</li> </ul>	R310-SYS-121_TSMSRV	View NAS File Servers
Client Nodes and Backup		Refresh Table
<ul> <li>Policy Domains</li> </ul>		Expire Inventory
<ul> <li>Server Maintenance</li> </ul>		Shred Data
<ul> <li>Reporting</li> <li>Disaster Recovery Manage</li> </ul>		Identify Duplicates
<ul> <li>FastBack Servers</li> </ul>		View Volume History
		View Operator Requests
	Libraries for All Servers	Back Up Device Configuration
		Add a Storage Device
	A server uses storage devices to stor	Create a Library

#### 2. Click Create Storage Pools.

Tivoli. View: All tasks	Welcome tsmadmin
+ -	Storage Devices × Manage Servers × +
<ul> <li>Welcome</li> <li>My Startup Pages</li> <li>Users and Groups</li> <li>Settings</li> <li>Tivoli Storage Manager</li> <li>Getting Started</li> <li>Manage Servers</li> <li>Health Monitor</li> <li>Enterprise Management</li> <li>Storage Devices</li> <li>Client Nodes and Backup</li> <li>Policy Domains</li> <li>Server Maintenance</li> <li>Reporting</li> <li>Disaster Recovery Manager</li> <li>FastBack Servers</li> </ul>	Storage Pools for R310-SYS-       Refresh Table         Servers > Storage Pools       Modify Storage Pool         A storage pool represents a collection cannot backup a copy storage pool or       Modify Storage Pool         Image:

3. Click Next.



- 4. Enter the following information for General Storage Pool Settings and then click Next.
  - Storage Pool Name: Enter a descriptive name for the DR Series system pool.
  - Storage Pool Description: Enter a description for the DR Series system pool.
  - **Storage Pool Type**: Select **Sequential Access** as the DR Series system is integrated as a FILE type device.

Create a Storage Pool	*  ?
➡ General Specify storage pool settings Summary	General Storage Pool Settings
	A storage pool represents a collection of storage volumes of the same media type. A storage volume represents the basic unit of storage, such as a tape cartridge or allocated disk space. Storage pools are used to designate where all managed data will be stored. After you define a storage pool, you cannot change its type.
	*Storage pool name DR4X00-POOL
	Storage pool description DR4X00 Pool
	Storage pool type © Random access – primary pool that uses random-access disk (DISK device class)
	🖲 Sequential access - uses tape, optical media, sequential-access disk (FILE device class), or the SERVER device class
	* Primary 💌 📟
	C NAS - stores NAS file server data using NDMP
	Primary 🗹 🖂
< Back Next > Finish	Cancel

- 5. Enter the required information for the device class, and click **Next**.
  - Device Class Name: Select the name of the DR Series system device class (created previously).
  - **Maximum Number of Scratch Volumes:** Set the number of scratch volumes in the system. (Setting the value between 100 to 200 scratch volumes is recommended.)

Create a Storage Pool	*
✓ General Specify storage pool settings	Select a Device Class
	A device class represents a set of similar storage devices. A device class is used to associate storage pool volumes with a compatible storage device.
Summary	*Device class name DR4X00-DEVICE
	Scratch volumes are used to dynamically satisfy mount requests. Consider entering the number of physical volumes available for this storage pool.
	*Maximum number of scratch volumes 150
	You can select another primary storage pool to use as a Next pool. The Next pool is used to store data migrated from th storage pool being created. During client node operations, the Next pool can also be used to store data if this storage pool runs out of space, or to store files that exceed its maximum size.
	Next storage pool None 💌
< Back Next > Finish	Cancel

For Identifying Duplicates, accept the defaults selections, and click Next.
 (Ensure that the Identify the duplicate data in the storage pool check box is not selected as the DR Series system uses inline deduplication and already identifies and removes duplicate data.)

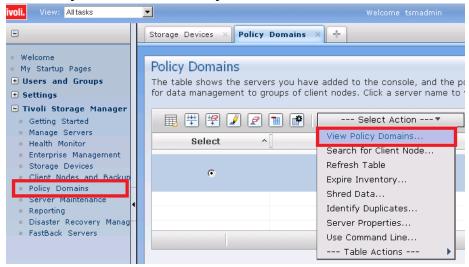
Create a Storage Pool	*  ?
<ul> <li>✓ General</li> <li>⇒ Specify storage pool settings</li> </ul>	Identify Duplicates
	The server can identify duplicate data within a FILE storage pool. This data is then removed during reclamation processing. Eliminating duplicate data increases the amount of available disk space. However, identifying duplicate data increases the server workload, and data that has been deduplicated can take longer to restore.
Summary	□ Identify the duplicate data in this storage pool.
	The number of processes to identify duplicates. When calculating this number, consider the workload on the server and the amount of data requiring deduplication.
< Back Next > Finish	cancel

7. Review the settings and click Finish.

Create a Storage Pool		
✓ General	Summary	
	You have successfully created the following storage pool:	
<ul> <li>Specify storage pool settings</li> </ul>		
🗘 Summary	Storage Pool Name: DR4X00-POOL	
	Storage Pool Type: Primary, sequential access	
	Device Class Name: DR4X00-DEVICE	
	Maximum Number of Scratch Volumes: 150	
	Data will be deduplicated: No	
	Associated Policy Domains:	
	× •	
<pre>&lt; Back Next &gt; Finish</pre>	Cancel	

## 2.3 Creating a policy domain for the backup job

#### 1. Click Policy Domains > View Policy Domains.





#### 2. Click Create a Policy Domain.

R310-SYS-121_TSMSRV Policy Domains Policy domains help you to apply consistent rules for data management sets, client node schedules, and management classes.			
<b></b>	1 😰 📝 😰 🕇		Select Action 🔻
Select ^	Domain Name	^ Descr	Create a Policy Domain
o	R310-SYS- 121	Data sto	Modify Policy Domain Delete Policy Domain Manage Pending Changes
0	STANDARI	Installed	Export Policy Domain Import Policy Domain
0		Data sto	Create a Client Node Refresh Table Table Actions

3. Click Next.

Create Policy Doma	in vi 1	t i
	Welcome	
	A policy domain applies consistent data management rules to a specified group of client nodes.	Į.
	Creating a policy domain includes the following tasks: • Name the new policy domain. • Careta a default management data for the domain. Belect one or more storage pools for client node data in the domain, and set backup and arithme settings for that data. • Optionally select the client nodes that will use the policy domain.	
CBack Next >	Cancel	

- 4. Enter the following required information, and then click **Next**.
  - Name: Enter a descriptive name for the DR Series system policy domain.
  - **Description:** Enter a description for the DR Series policy domain.

Create Policy Domain	v  ?
🗢 General	General Specify the name of the policy domain. You can optionally enter a brief description of the domain.
Data and storage pool settings Assign client nodes Summary	*Name DR4X00-PolicyDomain Description
	DESCRIDION DR4X00 Policy Domain
< Back Next > Finish C	ancel



- 5. Enter the required information for data and storage pool settings, and then click **Next**.
  - **Specify default management class:** Select the DR Series system pool that was set up previously.
  - Number of file versions to Keep: Specify how many versions of a file to keep.
  - **Number of days to keep inactive versions**: Specify how many days to retain data after it falls out of policy.

Note: File versions and inactive versions are set based on company policies.

	Data and storage pool settings
<ul> <li>✓ General</li> <li>⇒ Data and storage pool settings Assign client nodes</li> </ul>	The default management class is used for all client node data that are not bound to a different management class. Select the default management class storage pools, specify backup and archive settings, and specify if active-data pools can be used.
Summary	Select a storage pool for at least one of these data types. If you do not select storage pools for both data types, backup o archive operations can fail.
	Specify default management class settings for backup data:     Storage pool for backup data     DR4X00-POOL
	Number of file versions to keep
	Number of days to keep inactive versions
	Specify default management class settings for archive data: <u>Storage pool for archive data</u>

6. Select Yes to assign this policy domain to clients, and click Next.

Create Policy Domain	v  ?
<ul> <li>✓ General</li> <li>✓ Data and storage pool settings</li> <li>◇ Assign client nodes</li> <li>Summary</li> </ul>	Assign Client Nodes Now?
	The server manages the data and operations for a client node by using the rules of the policy domain. You can select the client nodes to assign to the new policy domain now or at another time. A client node can be assigned to only one policy domain.
	Do you want to assign client nodes to this policy domain now? Yes No
< Back Next > Finish C	ancel



7. Select **View all client nodes** to display the set of clients to move to the DR Series system, and click **Next**.

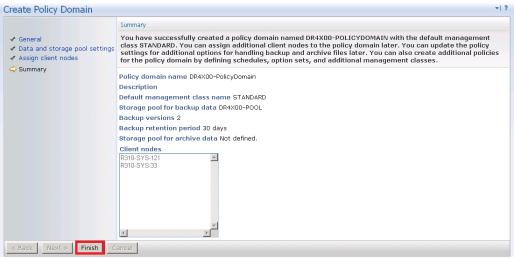
Create Policy Domain		
	Assign Client Nodes	
🗸 General	Create the list of client nodes to select from.	
<ul> <li>Data and storage pool settings</li> <li>Assign client nodes</li> <li>Summary</li> </ul>	© View all client nodes. © View client nodes that match your conditions: Name	
<pre>&lt; Back Next &gt; Finish C</pre>	ancel	

Note: You can choose to limit if you have a lot of client computers.

8. Select the check boxes next to the clients you want to back up to the DR Series system, and click **Next**.

Create Policy Domain		<b>.</b>
	Assign Client Nodes	
🗸 General	Select client nodes to assign to the policy domain. A client node belongs to only one policy domain.	
✓ Data and storage pool settings	5	
Assign client nodes Summary	C C II II C III C IIII C III C IIII C III C IIII C IIII C IIII C IIII C IIII C III C IIII C III C IIII	
	Select ^         Name         ^         Current Policy Domain         Type         Platform         ^         Description	^[
	R310-SYS-121 STANDARD Client	
	R310-SYS-33 STANDARD Client	
	Page 1 of 1 1 Go Rows 2 😓 Total: 2 Filtered: 2	
<pre>&lt; Back Next &gt; Finish C</pre>	Cancel	

#### 9. Click Finish.



### 2.4 Creating client node and backup sets

1. Open the client nodes and backup sets from TSM to register the client machine.

Tivoli. View: All tasks		Velcome tipadmin			Help Logout
• •	Client Nodes and Backup Sets	+			Select Action
<ul> <li>Welcome</li> <li>My Startup Pages</li> <li>Users and Groups</li> <li>Settings</li> </ul>	Client Nodes All Client Nodes By Server Se	arch			
Reporting     Tivoli Storage Manager     Getting Started     Manage Servers	The table lists all of the client refresh action to update the				8/24/14 at 8:23 PM. Select the
Health Monitor     Enterprise Management     Storage Devices	Creste a Client Node	Platform	Version	Policy Domain	ilter Contact
Client Nodes and Backup Sets     Policy Domains     Server Maintenance     Reporting     Disaster Recovery Management	There Create Like Change Password Modify Client Node	your servers	VERSION	Policy Jonnain	Contact
= FastBack Servers	Schedule an Auto Deployment Launch Backup-Archive Client Move to Another Policy Export Client Node Move Data				Total: 0 Filtered: C



2. Provide the client name, policy name, and password to connect.

10.250.242.10 - Remote Desktop Connection		
Tivoli. View: Altaska	Wekome tipadmin	Help Logout
	Client Nodes and Backup Sets × +	Select Action
<ul> <li>Welcome</li> <li>Wy Startup Pages</li> <li>Users and Groups</li> <li>Settings</li> <li>Reporting</li> <li>Citiol Storage Manager</li> <li>Getting Started</li> <li>Manage Servers</li> <li>Health Monitor</li> <li>Enterprise Management</li> <li>Storage Devices</li> <li>Client Moles and Backup Sets</li> <li>Policy Domaina</li> <li>Server Maintenance</li> <li>Reporting</li> <li>Disaster Recovery Management</li> <li>FastBack Servers</li> </ul>	Create a client node by accepting the default settings or by entering new information. Click OK to create a node and return to Client Nodes and Backup sets or click Add Ano form. To edit the default settings, click the pencil icon in the upper right-hand corner of Server: Policy domain: WZX882-02 Policy domain: ** Atame: WZX872-02 ** STANDARD ** ** Atame: ** Confirm password: ** Confarm password: ** Confarm password: ** Confarm password: ** Confart: Web address: ** Policy Settings * Security Settings * Security Settings ** Memberships Add the following parameters to the generated command: ** Confart contact: ** Confart contact command: ** Confart contact contact command: ** Confart contact contact command: ** Confart contact contact command: ** Confart contact contact contact contact command: ** Confart contact co	other to create a node and save all entries to a new

3. Confirm that the client node is successfully registered.

🕒 🔍 💌 🍙 Inter://10.250.242.10.16311/bm/cor 🔎	Tivol	I Integrated Portal X					
Tivoli. View: Altasis.		Welcome tipada					a IB
• •	Client Nodes and Bac	kup Sets 👒 🕂				Select Action	
Welcome     My Startup Pages     Users and Groups     Settings     Reporting     Tiveli Storage Nanager     Getting Started     Manage Servers	The table lists all	of the client nodes for th update the table. Use the			14 at 1:28 AM and 8/26/14	at 1:28 AM. Select th	*  7
Health Monitor     Enterprise Management	- Select Action -	<b>V</b>			Filter		2
Storage Devices     Client Nodes and Backup Sets     Policy Domains     Server Maintenance	Name Walding-og	Server Without Co	Platform	Version	Policy Domain	Contact	-
Reporting     Disaster Recovery Management     FastBack Servers	•						



## 3 Creating and configuring iSCSI target container(s) for TSM

- 3.1 Configuring the iSCSI initiator
- 3.1.1 Configuring ISCSI initiator for Windows
  - 1. In the Windows TSM Server, open iSCSI initiator software, and then enter the DR IP/Hostname as target. Click **Quick Connect**.

Target: Discovered	10.250.241.229		Quick Connect
JISCOVERED	targets		Refresh
Name			Status
	05.com.dell:dr4000.1986 05.com.dell:dr4000.3273		Connected Inactive
To connect	using advanced options	, select a target and th	en Connect
	ely disconnect a target, Disconnect.	select the target and	Disconnect
	properties, including con target and click Propertie		Properties
	ration of devices associa and then click Devices.	ated with a target, sele	ct Devices



#### Quick connect will discovers the targets.

Quick Connect	x
Targets that are available for connection at the IP address or DNS name that you provided are listed below. If multiple targets are available, you need to connect to each target individually. Connections made here will be added to the list of Favorite Targets and an attemp to restore them will be made every time this computer restarts.	t
Discovered targets	
Name Status	]
iqn.1984-05.com.dell:dr4000.1986543.tsm-iscsi.50 Inactive	
Progress report	
Unable to Login to the target.	
Connect	

- 2. Click **Done**.
- 3. Then, select the required targets and click **Connect**.

		15651	initiator FIO	perues	,		-
argets Dis	coverv	Favorite Target	s Volumes and	Devices	RADIUS	Configuration	1
Quick Conn	ect		1				-
		) on to a target u arget and then cli			ype the IP	address or	
Target:					Qu	uick Connect	
Discovered	targets						
						Refresh	
Name					Status		
		dell:dr4000.1986 dell:dr4000.3273			Inactive Inactive		
To connect	using a	dvanced options,	coloct a taxaat	and then	_		
To connect click Conne		dvanced options,	select a target .	and then		Connect	
To complet then click D		nnect a target, s :t.	elect the target	and		Disconnect	
For target select the I	properti arget ar	es, including conf nd click Properties	iguration of sess ;.	ions,		Properties	
		f devices associa n click Devices.	ted with a targe	t, select		Devices	



#### 4. Click Advanced.



- 5. Select the option, Enable CHAP log on, enter the following credentials, and click OK:
  - Name: iscsi\_user
  - Password: St0r@ge!iscsi

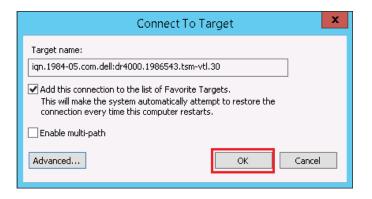
**Note:** The iSCSI user name can be found by entering the following command on the DR Series system:

# iscsi --show --user

	Advanced Settings	?	x					
General IPsec								
Connect using			- I					
Local adapter:	Default	~						
Initiator IP:	Default	~						
Target portal IP:	Default	۷						
CRC / Checksum			ΞΙ					
Data digest	Header digest							
Enable CHAP log on CHAP Log on informatic								
CHAP helps ensure conne an initiator.	ection security by providing authentication between a target an	d						
	name and CHAP secret that was configured on the target for t fault to the Initiator Name of the system unless another name							
Name:	iscsi_user		1					
Target secret:	••••••							
Perform mutual authentication     To use mutual CHAP, either specify an initiator secret on the Configuration page or use     RADIUS.     Use RADIUS to generate user authentication credentials     Use RADIUS to authenticate target credentials								
	OK Cancel	Ap	ply					



#### 6. Click OK.



7. Verify that the Status shows as "Connected," and click **OK**.

		iSCSI In	itiator Properties		
Targets	Discovery	Favorite Targets	Volumes and Devices	RADIUS	Configuration
-Quick C	onnect				
		) on to a target usin arget and then click	ιg a basic connection, tγ Quick Connect.	/pe the IP	address or
Target				Qu	uick Connect
Discove	red targets				
					Refresh
Name				Shahur	-
		dell:dr4000.198654 dell:dr6000.188568		Connecter Connecter	
To coni click Co		dvanced options, se	elect a target and then		Connect
click Co To com	nnect.	nnect a target, sel	-		Connect Disconnect
click Co To com then cli For tar	nnect. pletely disco ck Disconne get properti	nnect a target, sel :t.	-		
click Co To com then cli For tar select t	nnect. pletely disco ck Disconne get properti the target an ifiguration o	nnect a target, sel ct. es, including configu nd click Properties.	ect the target and		Disconnect



#### 3.1.2 Configuring the iSCSI initiator – Linux

Before you begin this procedure, ensure that the iSCSI initiator is installed (iscsi-initiator-utils). For example, enter the following command:

#### yum install iscsi-initiator-utils ; /etc/init.d/iscsi start

To configure the iSCSI target for Linux, follow these steps.

Add the CHAP Authentication details for the DR Series system on the Linux Initiator as follows:
 a. Edit /etc/iscsi/iscsid.conf and un-comment the following line:

node.session.auth.authmethod = CHAP

b. Modify the following lines:

# To set a CHAP username and password for initiator

# authentication by the target(s), uncomment the following lines:

node.session.auth.username = iscsi\_user

node.session.auth.password = St0r@ge!iscsi

2. Set the Discovery Target Node(s) by using this command:

iscsiadm -m discovery -t st -p <IP or IQN of DR>

For example:

iscsiadm -m discovery -t st -p 10.8.230.108

3. Enable logon to the DR Series system iSCSI VTL target(s) by using the following command:

iscsiadm -m node --portal <IP or IQN of DR:PORT> --login

For example:

```
iscsiadm -m node --portal "10.8.230.108:3260" -- login
```

4. Display the open session(s) with DR VTL(s) by using the following command:

iscsiadm -m session

For example:

iscsiadm -m session = tcp: [8] 10.8.230.108:3260,1 iqn.1984-05.com.dell:dr4000.3071067.interoprhel52n1.30

- 5. Review dmesg or /var/log/messages for details about the tape devices created upon adding the DR Series system iSCSI VTL.
- 6. Run the "cat /proc/scsi/scsi" command to see the LUN and HOST details

## 3.2 Configuring DR Series system VTL for Windows and Linux TSM servers

**Note:** Refer to the following instructions for viewing the tape devices and IDs, which you will need to configure the DR Series system VTL.

For Windows: To see the Tape Library device IDs, use the command "tsmdlst." For example: cd C:\program files\Tivoli\TSM\Server\Tsmdiag .\tsmdlst.exe For Linux: For discovering the tape devices and their IDs, refer to Appendix C later in this document.

#### 3.2.1 Configuring the DR Series system VTL for Windows

#### 3.2.1.1 Define library

# define library TSM-iscsi libtype=scsi shared=yes autolabel=yes

(TSM-iscsi is user defined name for the library)

#### 3.2.1.2 Define library path

# define path WIN-8B1A4SA50SR TSM-iscsi srct=server autodetect=yes destt=library
device=lb0.1.0.3

Where:

- WIN-8B1A4SA50SR = TSM server hostname
- Device = Device ID for medium changer listed by "tsmdlst" command.

#### 3.2.1.3 Define drive

# define drive TSM-iscsi drive01 online=yes

Where:

- TSM-iscsi = Library name defined in earlier command
- Drive01 = User defined drive name

#### 3.2.1.4 Define drive path

# define path WIN-8B1A4SA50SR drive01 srct=server destt=drive library=TSM-iscsi
device=mt0.2.0.3 online=yes

#### 3.2.1.5 Audit the library

# audit library TSM-iscsi checklabel=barcode

#### 3.2.1.6 Check in the library volumes

# checkin libvolume TSM-iscsi search=yes checklabel=barcode status=scratch

#### 3.2.2 Configuring the DR Series system VTL for Linux

#### 3.2.2.1 Define library

# define library TSM-iscsi libtype=scsi shared=yes autolabel=yes

#### 3.2.2.2 Define library path

# define path RHEL-TSM-SERVER TSM-iscsi srct=server autodetect=yes destt=library device=/dev/tsmscsi/lb0

#### 3.2.2.3 Define drive

# define drive TSM-iscsi drive01 online=yes (define all drives 0-9, drive01 is defined by user)

#### 3.2.2.4 Define drive path

# define path RHEL-TSM-SERVER drive01 srct=server destt=drive library=TSM-iscsi
device=/dev/IBMtape0 online=yes

#### 3.2.2.5 Audit the library

# Audit library TSM-iscsi checklabel=barcode

#### 3.2.2.6 Checkin the library volumes

# checkin libvolume TSM-iscsi search=yes checklabel=barcode status=scratch

## 3.3 Configuring the device class for iSCSI VTL

Follow Steps 1, 2, and 3 earlier in the Device Class creation section 2.1.

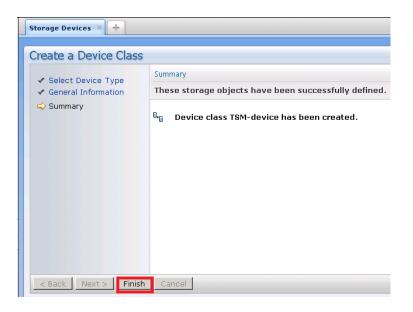
1. Select the Device Type as LTO for iSCSI VTL.

Storage Devices × +		Select Action
Device Classes for WIN	I-8B1A4SA50SR	<b>~</b>   ?
	Select Device Type	
Select Device Type	To use a storage device, you must define several objects that are used to manage operation	s for the device.
Summary		
	Select the type of device this device class will use. A device class is used to associate media volume with a compatible storage device. A device class can be used by multiple storage pools, but each sto only one device class.	
	Device type	
	Select a Device Type	
	Select a Device Type 3570 (uses IBM 3570 tape cartridges)	
	3590 (uses IBM 3590 tape cartridges)	
	3592 (uses IBM 3592 tape cartridges)	
	4MM (uses 4-mm tape cartridges) 8MM (uses 8-mm tape cartridges)	
	CENTERA (uses EMC Centera)	
	DLT (uses Digital linear tape cartridges)	
	DTF (uses Digital tape format cartridges)	
	ECARTRIDGE (uses StorageTek tape cartridges)	
< Back Next > Finish	FILE (uses sequential-access volumes on disk) GENERICTAPE (tape drive is not supported by the Tivoli Storage Manager server)	
	LTO (uses Linear Tape-Open Ultrium cartridges)	)
Libraries for All Servers	INAS (uses tape cartridges in drives attached to a INAS file server)	00:08:48 🍋 🚽 ?
	OPTICAL (uses rewritable optical cartinuges)	shows libraries for all
servers that have been added		shows libraries for all eate the library and
its drives, create a storage po	SERVER (uses virtual volumes to store data on another server)	internet and and a second
	VOLSAFE (uses StorageTek write-once-read-many tape cartridges)	
	WORM (uses write-once-read-many optical cartridges)	

2. Under General Information, provide the name and select the library configured. Under Drive-level data encryption, select the **Do not allow drives to encrypt data** option, and under Logical block protection, click **None**.

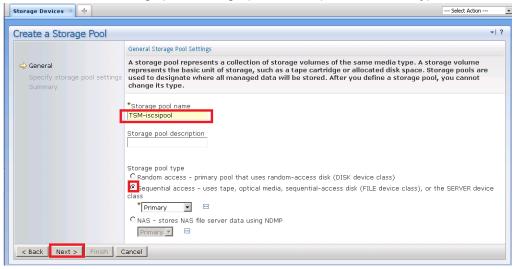
Storage Devices × +	Select Action
Create a Device Class	۳) کار
<ul> <li>Select Device Type</li> <li>General Information</li> <li>Summary</li> </ul>	General Information Enter a name for the device class, and select a library that contains the type of drive you selected. You can use the Storage Devices work item to define a library.
Gunnery	*Name TSM-device Library
	TSM-ISCSI
	C Allow drives to encryption C Allow drives to encrypt data if they are configured to use an external key manager (for example, the library). Tivoli Storage Manager will not manage the encryption keys. C Encrypt data at the drive level, using Tivoli Storage Manager to generate and manage the encryption keys. Only storage pool volumes will be encrypted.
	C Use an encryption methodology that is provided by another vendor and that is used with Application Method Encryption (AME) enabled on the drive. O not allow drives to encrypt data.
	Logical block protection <sup>C</sup> Read and write operations <u>C</u> Write prevations only <u>© None</u>
<pre>&lt; Back Next &gt; Finish</pre>	Cancel

3. Click **Next** and then click **Finish**.



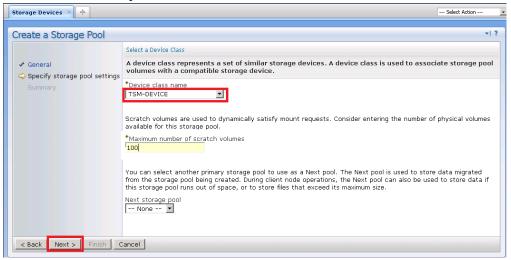
## 3.4 Configuring the storage pool for iSCSI VTL

- 1. Follow Steps 8,9 and 10 from the previous Storage Pool creation section 2.2
- 2. Under General storage pool settings, provide the pool name and type, and then click Next.





4. Provide the necessary Device name and maximum number of Scratch volumes and click Next.



#### 5. Click Finish.

Storage Devices × +		Select Action
Create a Storage Pool		*  ?
<ul> <li>✓ General</li> <li>✓ Specify storage pool settings</li> <li>⇒ Summary</li> </ul>	Summary         You have successfully created the following storage pool:         Storage Pool Name: TSM-ISCSIPOOL         Storage Pool Type: Primary, sequential access         Device Class Name: TSM-DEVICE         Maximum Number of Scratch Volumes: 100         Associated Policy Domains:	
<pre>&lt; Back Next &gt; Finish C</pre>	Cancel	



### 3.4.1 Adding volumes to a library

1. After creating a storage pool, click Storage Devices in the Left Pane, and then select the library that was configured earlier.

Libraries for All Servers A server uses storage devices to store data for client nodes. Libraries and drives represent storage devices to the server. The table shows libraries for all servers that have been added to the console. There are two ways to add a library. Use the Add a Storage Device table action to create the library and its drives, create a storage pool, and add media. Use Create a Library to create only the library and its drives.							
Select ·		😰   🔤 Status 🔺 Library		ratc	h Volu	imes	^] Private Volumes _^] Device Classes _]
0	ISILIB	Good	⊂ WIN-8B1A4SA50SR	-	-	-	ISICLASS, LTO-CLASS
c	MINE	Good	WIN-8B1A4SA50SR	-	10	-	MINE_DEVICE
o	ONE	Good	WIN-8B1A4SA50SR	-	-	10	NAS_CLASS_1, ONE
C	TSM-ISCSI	Good Good	WIN-8B1A4SA50SR	-	-	-	TSM-DEVICE
		Total: 4 F	Filtered: 4				

2. Select the column (which was default earlier) and disable the target reset option when the server is restarted.

Libraries for All Servers			⊗ ≁  5	
General				
Drives	General A library represents a storage device that contains drives. You cannot change a library name or type after it ha			
Library Paths	been defined.			
Drive Paths	Name TSM-ISCSI	Library type		
Volumes	15M-15C51	SCSI		
Cleaning Cartridges		Change library type to VTL		
	World wide name       Serial number         C Automatically detect the serial number when the library's path is defined.         Image: C Yes         Image: Root Reserved			
	O Yes, and overwrite existing volu			
	Last Updated By TIPADMIN	Last Updated On Feb 9, 2016 12:13:28 AM		
	🗹 Share this library			
	Perform a target reset when the server is restarted or when a library client or storage agent reconnects to the server			
OK Apply Cancel				

#### 3. In the Volumes section, click Add Volumes.

Libraries for All Servers	82 <b>~</b>   \$
General Drives Library Paths Drive Paths Volumes	Volumes         The table shows the volumes that have been checked into the library's volume inventory. A volume represents a single unit of storage media, such as a tape cartridge.         Image: Im
Cleaning Cartridges	None Modify Volume C C C C C C C C C C C C C C C C C C C
	Page 1 of 1 Go Rows O 🗢 Total: O Filtered: O
OK Apply Cancel	

#### 4. Select the option, All of the volumes are labeled. Just check them in. Click Next.

TSM-ISCSI Propertie	s (WIN-8B1A4SA50SR)	₹2 <del>+</del>   ?
Check in volumes Advanced Options Summary	Add Volume	
	A volume represents a single unit of storage media. All volumes must be internally label Manager, including those with external bar code labels. Volumes must then be checked i they can be used.	
	Insert the volumes you want to use into the library or its entry-exit ports. Not all of the volumes are labeled. Label them now.	
< Back Next > Fini	ish Cancel	



6. Select the option, Search for all eligible volumes in the library's regular slots. Click Next.

TSM-ISCSI Properties	(WIN-8B1A4SA50SR)	<u></u> ≰5 ≁  5
	Volume Search Options	
Check in volumes Advanced Options Summary	Select whether to search for volumes that are not currently checked in. For a single volume, the server issue a mount request. Use the View Operator Requests table action in the Libraries table to reply to the mount request.	
	C Search for all eligible volumes in the library's entry-exit ports Search for all eligible volumes in the library's regular slots Request only this volume Volume name	
< Back Next > Finit	sh Cancel	

- 7. On the Check in Volumes page, do the following:
  - a. Select the option, Read bar codes and check in all eligible volumes.
  - b. Select **Scratch** as the pool to check in volumes to the scratch pool.
  - c. Click Next.

	Check In Volumes
Check in volumes Advanced Options Summary	The server will search the library to discover volumes that are not currently checked in. Volumes currently defined to the server cannot be checked in as scratch volumes. The check-in process will fail if a drive is not available.
	Use the following procedure to discover eligible volumes Read bar codes and check in all eligible volumes. Read bar codes, but search only these volumes (separate volume names with commas)
	C Read bar codes, but search only the volumes found in the following file
	C Read bar codes, but search only volumes within this range of names Starting volume name
	Ending volume name
	Give volumes the following status when checking them in Gratch - can be used to satisfy any request to mount a scratch volume
	C Private - can only be used to satisfy a request to mount the volume by name



8. For Advanced Options, select the option, **Do not prompt me to insert the tape volumes into the library**. Click **Next**.

TSM-ISCSI Properties	s (WIN-8B1A4SA50SR) 00:09:25 🗞 📲
Check in volumes	Advanced Options
Advanced Options	If this library is shared, select the server that will own the volumes being checked in.
Summary	
	C Prompt me to insert the tape volumes. Cancel the request if a reply is not issued within the following amount of time 60 Minutes
	O not prompt me to insert the tape volumes into the library. They have already been inserted.
< Back Next > Fini	sh Cancel

9. Click **Finish**.

TSM-ISCSI Properties (	WIN-8B1A4SA50SR) 00:09:46 🗞 🚽 ?
✓ Check in volumes	Summary
<ul> <li>✓ Advanced Options</li> <li>⇒ Summary</li> </ul>	The volume discovery process has started. To update volume information, open the library's properties notebook and select the Volumes tab.
	Volume discovery process started as process 16. To view the status of the process open the server's properties notebook and select the Process tab.
<pre>&lt; Back Next &gt; Finish</pre>	Cancel



10. Check that all the volumes are created.

General						
Drives	Volumes					
ibrary Paths			s that have been checked into the such as a tape cartridge.	library's volume	inventory. A volume re	presents a
rive Paths			📝 🖉 🛅 🅐 🔤 Select A	ction •	▼ Filter	
olumes			eqory ^ Owner ^ Last Use ^	Home Elemen	t A Device Type A	Media Tyne 🔿
leaning Cartridges		c c				incuta rype
		6WV8AP001	Scratch	1,024	ECARTRIDGE	
		6WV8AP002	Scratch	1,025	ECARTRIDGE	
		6WV8AP003	Scratch	1,026	ECARTRIDGE	
		6WV8AP004	Scratch	1,027	ECARTRIDGE	
		6WV8AP005	Scratch	1,028	ECARTRIDGE	
		6WV8AP006	Scratch	1,029	ECARTRIDGE	
		6WV8AP007	Scratch	1,030	ECARTRIDGE	
		6WV8AP008	Scratch	1,031	ECARTRIDGE	
		6WV8AP009	Scratch	1,032	ECARTRIDGE	
		6WV8AP00A	Scratch	1,033	ECARTRIDGE	
	Pag	elofi 1	Go Rows 10	Total: 10 Fil	tered: 10	

### 3.4.2 Adding volumes to a storage pool

1. Go to the Storage Pool section (which was created earlier for the iSCSI target), and click Volumes.

Storage Pools for WIN-8	3B1A4SA50SR	<b>≁</b>   ?
Storage Pools for WIN-8 General Migration Media management Volumes Statistics Advanced Options Simultaneous Write	General         A storage pool represents a collection of storage volumes of the same media type. A storage volume represents the basic unit of storage, such as a tape cartridge or allocated disk space. Storage pools are used to designate where all managed data will be stored.         Storage pool name         TSM-ISCSIPOOL         Storage pool description         Storage pool         Primary, sequential access         Next storage pool         TSM-ISCS IPOOL         Storage pool         TSM-BERGE POOL         Storage pool         Storage pool         Primary, sequential access         Next storage pool         TSM-DEVICE	~  ?
OK Apply Cancel		



2. In the Volumes section, click Add Volumes.

Storage Pools for WIN-	8B1A4SA50SR	<b>≁</b>   ?
General Migration Media management Volumes	Storage Pool Volumes         The table shows volumes that have been added to this storage pool.         Image: Imag	
Statistics Advanced Options Simultaneous Write	Select ^ Volume Name ^ Est       Add Volume       Status ^ Access ^         None       Modify Volume       Delete Volume         Page 1 of 1       1       Go       Restore Volume From Copy Pool	
Simulations Wille	Page 1 of 1       Go       Restore Volume From Copy Pool         Restore Volume From Active-data Pool         Audit Volume         Move Data         View Contents         Refresh Table         Table Actions	
OK Apply Cancel		

3. Provide the details of the volumes one by one in the volumes name column.

**Note**: Provide exactly the same volume name as present in the LIBRARY for volume name for the storage pool.

Add Storage Pool	Volume		*
Add Storage Pool Volume			
*Volume name			
6WV8AP001			
You can enter a descri	ption of the volume's location		
1			
□ Make this volume re	ad-only		
OK Cancel Add	Another		
Libraries for All Sei	vers		00:06:56 🍋 🤘
General			
Drives	Volumes The table shows the volumes that have bee	an checked into the library's volume is	nventory A volume represents a
Library Paths	single unit of storage media, such as a tape		Wentery. A volume represente d
Drive Paths		🕐 🛛 Select Action 🗸 💽	Filter
Volumes	Select ^ Name ^ Category ^ C	wner ^ Last Use ^ Home Elem	nent ^ Device Type ^ Media Type ^
Cleaning Cartridges		E E	
	6WV8AP001 Scratch	1,024	ECARTRIDGE
	6WV8AP002 Scratch	1,025	ECARTRIDGE
	6WV8AP003 Scratch	1,026	ECARTRIDGE
	6WV8AP004 Scratch	1,027	ECARTRIDGE
	6WV8AP006 Scratch	1,028	ECARTRIDGE
	6WV8AP000 Scratch	1,029	ECARTRIDGE
	6WV8AP007 Scratch	1,031	ECARTRIDGE
	6WV8AP009 Scratch	1,031	ECARTRIDGE
	6WV8AP009 Scratch	1,032	ECARTRIDGE

General							
Migration	Storage Po						
Media management	The table :	shows volumes that	have been added to this s	torage p	bool.		
Volumes		🛱 🛃 🖉 🔳	🛛 🅐 🛛 Select Actio	on•	Filter		
Statistics	Select	^ Volume Name	^ Estimated Capacity	/ ^[ P	ercentage	Utilized 🔺 🛛 Status 🔺 🗍 Acces	s ^[
		0			c .	C	
Advanced Options	0	6WV8AP001	0 KB	0	Empty	Read/Write	
Simultaneous Write	0	6WV8AP002	0 KB	0	Empty	Read/Write	
	0	6WV8AP003	0 KB	0	Empty	Read/Write	
	0	6WV8AP004	0 KB	0	Empty	Read/Write	
	0	6WV8AP005	0 KB	0	Empty	Read/Write	
	0	6WV8AP006	0 KB	0	Empty	Read/Write	
	0	6WV8AP007	0 КВ	0	Empty	Read/Write	
	0	6WV8AP008	о кв	0	Empty	Read/Write	
	0	6WV8AP009	0 KB	0	Empty	Read/Write	
	0	6WV8AP00A	0 КВ	0	Empty	Read/Write	
	Page	1 of 1 1	Go Rows 10		Total: 10 F	Filtered: 10	

4. Check that all the storage pool volumes are configured

### 3.5 Creating the policy domain for iSCSI VTL

Follow the steps described in the earlier section related to Policy Domain creation, Section 2.3.

### 3.6 Creating the client node for iSCSI VTL

Follow the steps described earlier in the section for creating a client node, Section 2.4.



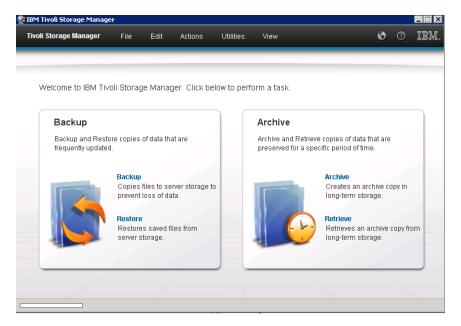
## 4 Using the Backup & Archive GUI

On a client machine, open the Backup-Archive GUI. Provide the user ID and password details that were described previously.

TSM Login		
	Login into a TSM server	
	Userid: W2K8R2-02	
	Password:	
[	Login Cancel Help	

When you have logged on, the Backup button will be enabled.

The Backup and Restore Manager is ready to perform.



When you have successfully completed the steps above, you have configured the DR Series system for TSM. The next time the client is scheduled to back up it will back up to the DR Series system(s).

See Appendix B for additional best practices.

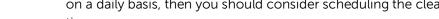
### Setting up the DR Series system cleaner

Performing scheduled disk space reclamation operations are recommended as a method for recovering disk space from system containers in which files were deleted as a result of deduplication.

The system cleaner runs during idle time. If your workflow does not have a sufficient amount of idle time on a daily basis, then you should consider scheduling the cleaner to force it to run during a scheduled time.

If necessary, you can perform the procedure shown in the following example screenshot to force the cleaner to run. After all of the backup jobs are set up, the DR Series system cleaner can be scheduled. The DR Series system cleaner should run at least 40 hours per week when backups are not taking place, and generally after a backup job has completed.

Dashboard Alerts Events	Cleaner Sched	ule	Schedule Cleaner	Schedule
Events Health Usage Statistics: Container	-	acific, Fri Jul 5 05:00:41 2013 is set, the cleaner will run as neede	d.	
Statistics: Replication	Day	Start Time	Stop Time	
Storage	Sun			
Containers Replication	Mon	-		
Compression Level	Tue	-	-	
Clients	Wed		-	
Schedules	Thu			
Replication Schedule	Fri			
Cleaner Schedule	Sat			
System Configuration Networking Active Directory Local Workgroup Users Email Alerts Admin Contact Info Password Email Relay Host Date and Time Support Diagnostics Software Upgrade License				



5

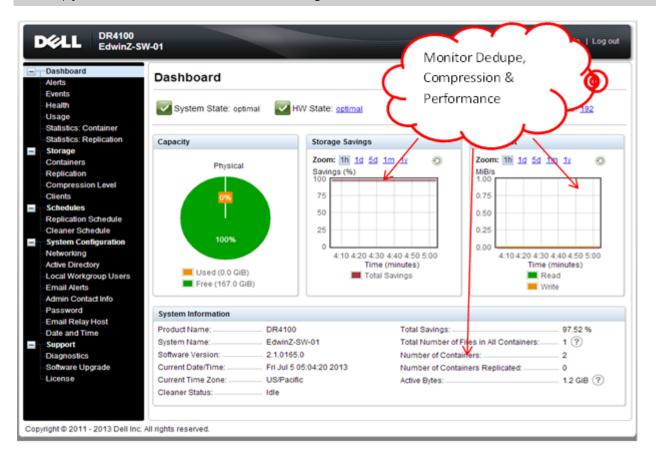


## Monitoring deduplication, compression, and performance

6

After backup jobs have run, the DR Series system tracks capacity, storage savings, and throughput on the DR Series system dashboard. This information is valuable in understanding the benefits of the DR Series system.

**Note:** Deduplication ratios increase over time. It is not uncommon to see a 2-4x reduction (25-50% total savings) on the initial backup. As additional full backup jobs are completed, the ratios will increase. Backup jobs with a 12-week retention will average a 15x ratio, in most cases.





# A Configuring CIFS authentication

This appendix describes the steps for sync-ing CIFS authentication between the TSM service account and the DR Series system.

There are two methods for allowing the TSM service account to authenticate to a DR Series system.

- Integrate the Tivoli Storage Manager Media Server and DR Series system with Active Directory (AD).
  - o Ensure the AD user has appropriate ACLs to the DR4X00 Container.
  - o Set the TSM Server service to run with <Domain\User>.
- Sync local usernames and passwords between the DR Series system and the TSM media server. To set the password for the local CIFS administrator on the DR Series system, log on to the DR Series system using SSH.
  - o Logon with the credentials: administrator/St0r@ge!
  - o Run the following command: authenticate --set --user administrator

```
administrator@SWSY5-70 > authenticate --set --user administrator
Enter new password for CIFS user administrator:
Re-enter new password for CIFS user administrator:
Changed administrator's password.
```

**Note:** The CIFS administrator is a different account than the administrator used to administer the DR Series system.

When an authentication method has been selected, set the TSM service account to use that account.

- 1. Launch the Microsoft Services Snap-in. (Start > Run > Services.msc > Enter).
- 2. Locate the TSM Server Service (Right-click > Properties > Logon tab.)



Note: If you are using local sync'ed accounts instead of an Active Directory account, make sure that there is a ".\"in front of the user name.

- 3. Click OK.
- 4. Right-click the TSM Service process, and click **Stop/Start** to restart the process.



### B Best practices/considerations

#### B.1 Deduplication

The DR Series system has inline deduplication built-in and does not require any additional deduplication to be done ahead of data being written to the DR Series system. The system will remove any redundancies in the data before the data is stored on disk.

Enabling deduplication before the data stream is sent to the DR Series system will cause the data to be obfuscated, not allowing the system to achieve optimal dedupe savings. It is highly recommended that deduplication is not done before the data stream is sent to the DR Series system.

#### B.2 Compression

The DR Series system has compression built-in and does not require any additional compression to be done ahead of data being written to the DR Series system. The system will remove any redundancies in the data before being stored on disk.

Enabling compression before the data stream is sent to the DR Series system will cause the data to be obfuscated, not allowing the system to achieve optimal savings. It is highly recommended that compression is not done before the data stream is sent to the DR Series system.

#### B.3 Encryption

The DR Series system supports encryption-at-rest; hence there is no need to enable encryption for the data management application.

Enabling encryption before the data stream is sent to the DR Series system will cause the data to be obfuscated, not allowing the DR series devices to achieve optimal savings. It is highly recommended that encryption is not done before the data stream is sent to the DR Series system. It supports encryption on the wire for transferring data to remote sites using replication.

#### B.4 Space reclamation

For optimal performance, DR Series system and TSM backup and space reclamations jobs should be scheduled to happen at different times.

# C Configuring the tape library devices on Linux

After installing the required device drivers for medium changer and drive, we need to configure tape Library with TSM Server. There is need to figure out the device IDs for respective devices so that Library can be defind in TSM.

In Windows server, there is a command utility "tsmdlst," which lists all the devices with their IDs.

The same can be done in Linux TSM server with "Autoconf" utility located at '/opt/tivoli/tsm/devices/bin'.

If "Autoconf" utility is not working, you need to define library manually in the TSM server as described below.

Note: Please see following link for more details -

http://publib.boulder.ibm.com/tividd/td/ITSML/GC23-4692-02/en\_US/HTML/anrlqs52254.htm

To configure the TSM device drivers for selected tape drives and libraries, do the following:

- 1. Verify that the device is connected to your system, and is powered on and active.
- 2. Ensure that the TSM device driver package (TIVsm-tsmscsi-x.x.x-x) is installed for your corresponding architecture.
- Copy the two sample configuration files that are located in the installation directory from mt.conf.smp and lb.conf.smp to mt.conf and lb.conf, respectively: For drives:
- > cp /opt/tivoli/tsm/devices/bin/mt.conf.smp /opt/tivoli/tsm/devices/bin/mt.conf

For libraries:

- > cp /opt/tivoli/tsm/devices/bin/lb.conf.smp /opt/tivoli/tsm/devices/bin/lb.conf
  - 4. Edit the mt.conf and lb.conf. Add one stanza (as shown in the example at the top of the file) for each SCSI target ID and LUN combination for which you want the device driver to probe for supported tape drives, and for each autochanger device in the system that you want the server to use.
  - 5. To load the device driver, run the tsmscsi script from the device driver installation directory.
- > cd /opt/tivoli/tsm/devices/bin ./tsmscsi

Then all the devices will be listed in following locations:

TSM drives	/dev/tsmscsi/mt#
IBM drives	/dev/IBMtape#
TSM Library	/dev/tsmscsi/lb#



6. Change the permissions of the devices to avoid IO error during Library configuration -

chmod 777 /dev/tsmscsi/\*
chown tsminstl:tsmsrvrs /dev/tsmscsi/\*
chmod 777 /dev/IBM\*
chown tsminstl:tsmsrvrs /dev/IBM\*

**Note**: tsminst1 and tsmsrvrs are the user and group created for TSM installation.

