

Setting Up the Dell™ DR Series System as an NFS or CIFS Backup Target on Oracle Recovery Manager®

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Executive summary

This paper provides guideline about how to set up the Dell DR Series System as a backup to disk target for RMAN® over CIFS/Rapid CIFS and NFS/Rapid NFS.

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/powervaultmanuals

Note: The DR Series System/RMAN build version and screenshots used for this paper may vary slightly, depending on the version of the DR Series System/ RMAN software version used.

About RMAN

RMAN (Recovery Manager) is a backup and recovery manager supplied for Oracle databases by the Oracle Corporation. Oracle Corporation recommends RMAN as its preferred method for backup and recovery and has written command-line and graphical (via Oracle Enterprise Manager) interfaces for the product. The following illustration shows a typical implementation of the backup infrastructure with the Dell DR Series system. The DR Seriees system offers optimized replication of data from one system to another over the WAN for disaster recovery.



Dell DR Series System: RMAN: Baseline Scenarios

1 Installing and configuring the DR Series system

1. Rack and cable the DR Series system, and power it on. Initialize the DR Series system.

In the *Dell DR Series System Administrator Guide*, refer to the following topics: "iDRAC Connection", "Logging in and Initializing the DR Series System and "Accessing IDRAC6/Idrac7 Using RACADM" for more information.

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**".

	TED DELL REMOTE CONTROLLER 6 - ENTERPF	IISE	Support About Logou	t
System Dell DR4000 root , Admin	Properties Setup Po System Summary System	ower Logs Alerts Console/Media em Details System Inventory	vFlash Remote File Share	
System iDRAC Settings Batteries	System Summary		• • • •	-
Fans Intrusion	Server Health			
Power Supplies	Status Component		Virtual Console Preview	Cogout
Removable Flash Media Temperatures	Batteries		Options : Settings	
Voltages Devus Manitarina	Fans			
Power Monitoring	Intrusion		n 1990 - Brancis Californi, a Science Service a na Arrige California (Arrive) 1990 - Brancis California (Arrive) 1990 - Brancis California (Arrive) 1990 - Brancis California (Arrive) 1990 - Arrive California (A	=
	Power Supplie	S		
	Removable Fl	ash Media		
	Temperatures			
	Voltages		Refresh	
IDRAC Settings Batteries Fans Intrusion Power Supplies Removable Flash Media Temperatures Voltages Power Monitoring Voltages Power Monitoring Intrusion Intrusion Power Monitoring Voltages Power Monitoring Server Information Immoratures Voltages Server Information Power State ON System Model Dell DR4000 System Host Name DR4000-DKCV6S1.asglab.roundrock Operating System CentOS View IDRAC Log Update Firmware Reset IDRAC Reset IDRAC	Quick Launch Tasks			
	Power State	ON	Power ON / OFF	
	System Model	Dell DR4000	Power Cycle System (cold boot)	
	System Revision	11	Launch Virtual Console	
	System Host Name	DR4000-DKCV6S1.asglab.roundrock	View System Event Log	
	Operating System	CentOS	View iDRAC Log	
	Operating System Vers	on release 5.4 (Final) Kernel 2.6.18-164.e	Update Firmware	
	Service Tag	DKCV6S1	Reset IDRAC	
	Express Service Code	29529104401		
	BIOS Version	1.9.0		
	Firmware Version	1.80 (Build 17)		-

3. Launch the virtual console.

	ATED DELL RE S CONTROLLEF	MOTE R 6 - ENTERPRISE			Support About Logout
System Dell DR4000 root , Admin	Properties System Sun	Setup Power	Logs Alerts Console/Media	vFlash Remote File Share	
System iDRAC Settings Batteries Fans	System	Summary			• C ?
System Properties Dell DR4000 system Si root, Admin System System System Si Batteries System Fans Intrusion Power Supplies Serve Power Monitoring Image: Serve Statures Image: Serve Power Monitoring Image: Serve Serve Serve System Image: Serve Power Monitoring Image: Serve System Image: Serve Serve Image: Serve Image: Serve Image: Serve Power Monitoring Image: Serve System System System System Image: Serve System System System	Status	Component		Virtual Concolo Proviow	
Removable Flash Media	TEGRATED DELL REMOTE CCESS CONTROLLER 6 - ENTERPRISE Support 1 About 1 Lo Properties Setup Power Logs Alerts Console/Media vFlash Remote File Share System Summary System Details System Inventory Image: Console/Media vFlash Remote File Share System Summary System Details System Inventory Image: Console/Media Virtual Console Preview Image: Console/Media Image: Console				
Temperatures Voltages		Fans		options. Settings	
Power Monitoring		Intrusion		concernence and a second se	1. 1993
		Power Supplies			E
		Removable Flash	Media		
		Temperatures			
		Voltages			Refresh Launch
	Server	Information		Quick Launch Tasks	
	Power	State	ON	Power ON / OFF	
	System	Model	Dell DR4000	Power Cycle System (cold boo	ot)
	System	Revision	1	Launch Virtual Console	
	System	Host Name	DR4000-DKCV6S1.asglab.roundrock	View System Event Log	
	Operati	ng System	CentOS	View iDRAC Log	
	Operati	ng System Version	release 5.4 (Final) Kernel 2.6.18-164 e	Update Firmware	
	Service	Tao	DKCV6S1	Reset iDRAC	
	Express	s Service Code	29529104401		
	BIOS V	ersion	1.9.0		
	Firmwa	re Version	1.80 (Build 17)		-

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

Ocarina release 1 (EAR-1.00.00) Kernel 2.6.18-164.el5 on an x86	Build: 32850 _64
localhost login: administrator Password: StOr@ge!	▶

5. 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:
Would	you like to define a secondary DNS server (yes/no) ?
Please	enter secondary DNS server IP address:

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

6

Set Static IP A	ddress k
IP Address	: 10.10.86.108
Network Mask	: 255.255.255.128
Default Gateway	: 10.10.86.126
DNS Suffix	: idmdemo.local
Primary DNS Server	: 10.10.86.101
Secondary DNS Server	: 143.166.216.237
Host Name	: DR4000-5
Are the above settings correct	(yes/no) ? _

7. Log on to 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.).

https://192.168.22.50/	Enter User Defined IP Address	
DELL DR4000 DR4000-DKCV6S	Help	
Login	ResetPassword	
	Please enter your password:	
	Username: administrator Password: St0r@ge!	
	Log in	

8. Join the DR Series system to Active Directory.

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

a. Under System Configuration in the left navigation area, click Active Directory.

DR4100-VM - sush-hv2t2: ×	The Delivery Loss Age		The second s	
← → C 🕼 bttps://10.250.208.240/dashboard.cgi?a	action=upgrade			ร่
	M		administrator (Log out) Help	
sush-hv2t2.testad.ocarina.k ▼ — Global View	Dashboard			
☐ ☐ Dashboard Alerts Events	System State: optimal	HW State: optimal 🛛 🔞 Number of A	Alerts: <u>1</u> Number of Events: <u>1147</u>	
- Health - Usage	Capacity	Storage Savings	Throughput	
Container Statistics Replication Statistics Selection Statistics System Configuration Active Directory Excel Manageory Users Email Alerts Admin Contact Info Password Email Relay Host Date and Time Support	Physical 99% 99% Used & Unencrypted 400.00 MiB / 432.00 MB) • Free (1.99 TiB / 2.14 TB) • Used & Encrypted (0.00 MiB / 0.00 MB)	Zoom: 10 id id in ix (C) Savings (%) 15 0 0 0 0 0 0 0 0 0 0 0 0 0	Zom: IN 14 54 10 1x MB/9 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	
	System Information			
	Product Name: DR4100-V System Name: sush-hv2t Software Version: 3.2.0185.0 Current Date/Time: Mon Apr 6	M Total Number of Files Number of Containers Number of Containers 01:16:42 2015 Active Rvtes:	in All Containers: 0 ⑦ s: 1 s: Replicated: 1 0 bytes ⑦	

b. Enter your Active Directory credentials.

I	CEL DR4100	administrator (Log out) He	elp
SW	sys-241.testad.ocarina.ic Global View Dashboard Alerts Events Health	Active Directory Jo Settings The Active Directory settings have not been configured. Click on the 'Join' link to configure them.	in
	Usage -Container Statistics -Replication Statistics -Storage -Schedules -System Configuration	CIFS Share Active Directory Configuration Note: By joining the Active Directory, you will lose the current URL and session connectivity to the system. The browser will re-direct to a new URL and you will need to log back into the system again.	
	Networking Active Directory Local Workgroup Users Email Alerts Admin Contact Info Password Email Relay Host	The same required. Second Se	
E.	Date and Time Support right © 2011 - 2015 Dell Inc. All rig	Cancel Join Domain	

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

Dél

DELL DR4100					administrator (Log	out) Help
swsys-241.testad.ocarina.lc 🔻	Containers			Create	Edit Delete Disp	lay Statistics
Dashboard Storage	Number of Containers: 3				Container Path	: /containers
Containers	Containers	Files	Marker Type	Access Protocol Enabled	Replication	Select
Replication	backup	19	Auto	NFS, CIFS	Not Configured	0
	test1	0	None	CIFS	Not Configured	0
+ Schedules	tsmsmall	31	Auto	VTL iSCSI	Not Configured	0
System Configuration Support						

10. Enter a Container Name, click **Next**.

ontainer Name			* = required fiel
Container Name [*] :	Max 32 characters, including only letters, numbers, hyphen, and underscore. Name must start with a letter. sample		
rtual Tape Library (VTL) :	0		
		Cancel	Next >

11. Select the NAS (NFS, CIFS) option and click Next.

Select Access Protocols					* = required field
Storage Access Protocol [*] :	 Dell Rapid Data Storage (RDS) Symantec OpenStorage (OST) NAS (NFS, CIFS) 	(?)	Cont sa	tainer Name an mple	d Туре

12. Enable the access protocols as needed, and then click **Next**.

9

		* = required f	
Configure NAS Access		- required i	
Enable Access Protocols : VFS (Use NFS to backup UNIX	indows clients) Conta Sam Acces	Container Name and Type sample Access Protocols NAS (NES CIES)	
Marker Type*: 🔍 None	۲		
Auto			
Networker			
Unix Dump			
BridgeHead			
Time Navigator			
	< Back	Cancel Next >	

13. For NFS, provide the client access information and click Next.

NFS Options *:	 Read Write Access Read Only Access 	Insecure	Container Name and Type sample
Map root to :	-select-		Access Protocols NAS (NFS, CIFS) Auto
Client Access :	Open (allow all clients)		
Client FQDN or IP : allow access client(s)		Add Remove	
		Ŧ	

14. For CIFS, provide the client access control information and click **Next**. Container Wizard - Create New Container

Configure CIFS Client Access		* = required fields
Client Access :	 Open (allow all clients) Create Client Access List 	Container Name and Type sample
Client FQDN or IP : allow access client(s)	Add	NAS (NFS, CIFS) Auto NFS Access Read Write Access
	v	secure Open (allow all clients)
	< Ba	ack Cancel Next >

Xel

Note: For improved security, Dell recommends adding IP addresses for the Backup console (RMAN). Not all environments will have all components.

15. Click **Create a New Container**, and then confirm that the container is added. Container Wizard - Create New Container

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

CAL DR4100)				administrator (Log	out) Hel
ys-241.testad.ocarina.lc Global View	Containers			Create	Edit Delete Displ	ay Statistic
Storage	Message • Successfully	added container "samp	le".			
Replication Encryption Clients Schedules System Configuration	Successfully Successfully Successfully Successfully Number of Containers: 4	added NFS connection added CIFS connection enabled container "san	for container "sample for container "sampl iple" with the followin	s". e". Ig marker(s) "Auto".	Container Path:	: /container
Replication Encryption Clients Schedules System Configuration Support	Successfully Successfully Successfully Number of Containers: 4 Containers	added NFS connection added CIFS connection enabled container "san Files	for container "sample for container "sampl pple" with the followin Marker Type	s". e". g marker(s) "Auto". Access Protocol Enabled	Container Path: Replication	: /container Select
Replication Encryption Clients Schedules System Configuration Support	Successfully Successfully Successfully Number of Containers: 4 Containers backup	added NFS connection added CIFS connection enabled container "san Files 19	for container "sample for container "sampl pple" with the followin Marker Type Auto	s". e". g marker(s) "Auto". Access Protocol Enabled NFS, CIFS	Container Path: Replication Not Configured	/container
Replication Encryption Clients Schedules System Configuration Support	Successfully Successfully Successfully Number of Containers: 4 Containers backup sample	added NFS connection added CIFS connection enabled container "san Files 19 0	for container "sample for container "sampl ple" with the followin Marker Type Auto Auto	s". e". g marker(s) "Auto". Access Protocol Enabled NFS, CIFS NFS, CIFS	Container Path: Replication Not Configured Not Configured	/container Select
Replication Encryption Clients Schedules System Configuration Support	Successfully Successfully Successfully Number of Containers: 4 Containers backup sample test1	added NFS connection added CIFS connection enabled container "san Files 19 0 0	for container "sample for container "sampl ple" with the followin Marker Type Auto Auto None	s". e". g marker(s) "Auto". Access Protocol Enabled NFS, CIFS NFS, CIFS CIFS	Container Path: Replication Not Configured Not Configured Not Configured	/container Select

- Copyright © 2011 2015 Dell Inc. All rights reserved.
- 16. Select the Container that was just created and click **Edit.** Note the container share/export path, which you will use later to target the DR Series system.

2 Configuring a backup job on RMAN over a CIFS target

2.1 Oracle settings for Windows RMAN Online Backup

There are two options for RMAN to authenticate to the DR Series system through CIFS.

- <u>DR is joined into an Active Directory Domain</u>: Integrate RMAN Node and DR Series System with Active Directory
 - Ensure the AD user has appropriate ACLs to the DR Series System Container share
- <u>DR is standalone CIFS server</u>: Make sure this CIFS user has appropriate access permission to the DR Series system container share. Oracle RMAN Backup Node will use this user to authenticate to DR Series system share in Workgroup mode.
 - To set the password for local CIFS administrator on the DR Series system, log on to the DR using SSH.
 - i. Log on with the username Administrator, and password St0r@ge!
 - ii. Run the following command:

authenticate --set --user administrator

Note: The CIFS administrator account is a separate account from the administrator account used to administer the appliance. After an authentication method is chosen, set the RMAN Oracle service account to use the CIFS administrator account.

2.2 Default RMAN backup configuration

The Default settings for RMAN are listed below with command show all.

🚾 Administrator: C:\Windows\system32\cmd.exe - rman	
RMAN> show all;	
using target database control file instead of recovery catalog RMAN configuration parameters for database with db_unique_name DEMO are: CONFIGURE RETENTION POLICY TO REDUNDANCY 1; # default CONFIGURE DECKUP OPTIMIZATION OFF; # default CONFIGURE DEFOULT DEULTE TVPET TO DISK: # default	
CONFIGURE CONTROLFILE AUTOBACKUP OFF; # default CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO '%F'; # default	
CONFIGURE DEVICE TYPE DISK PARALLELISM 1 BACKUP TYPE TO BACKUPSET; # default CONFIGURE DATAFILE BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default CONFIGURE ARCHIVELOG BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default	
CONFIGURE MAXSETSIZE TO UNLIMITED; # default CONFIGURE ENCRYFIION FOR DATABASE OFF; # default	
CONFIGURE COMPRESSION ALGORITHM 'HESIZO'; # default CONFIGURE COMPRESSION ALGORITHM 'BASIC' AS OF RELEASE 'DEFAULT' OPTIMIZE FOR LOAD TRUE ; # default CONFIGURE ARCHIVELOG DELETION POLICY TO NONE; # default	
CONFIGURE SNAPSHOT CONTROLFILE NAME TO 'C:\APP\ADMINISTRATOR\PRODUCT\11.2.0\DBHOME_3\DATABASE\SNCFDEMO.ORA'; # de	fault

2.3 RMAN backup settings to DR Series system backup

The RMAN backup settings changed for taking backup to Dell DR Server systems over CIFS.

1. Configure channel to use UNC path of the DR Series system container.

CONFIGURE CHANNEL DEVICE TYPE DISK MAXOPENFILES 1 FORMAT '\\<UNCPath to the container noted above >/ora df%t s%s s%p';

2. Configure RMAN to back up the control file after each backup.



2.4 RMAN backup of full database

Backup Oracle Database using RMAN with BACKUP INCRMENTAL LEVEL 0 DATABASE FILESPERSET 1;



2.5 RMAN incremental backup of database

Incremental Backup Oracle Database using RMAN with BACKUP INCRMENTAL LEVEL 1 DATABASE FILESPERSET 1;



2.6 Backup with different options

BACKUP ARCHIVELOG ALL;

BACKUP DATABASE PLUS ARCHIVELOG;

2.7 RMAN restore of Oracle database from DR Series system

The following screen shot shows the restore process of Oracle Database through RMAN from DR Series system images.

📾 Administrator: C:\Windows\system32\cmd.exe - rman 📃 🗖	×
RMAN> restore database;	-
Starting restore at 11-JUN-14 using target database control file instead of recovery catalog allocated channel: ORA_DISK_1 channel ORA_DISK_1: SID=129 device type=DISK	
channel ORA_DISK_1: starting datafile backup set restore channel ORA_DISK_1: specifying datafile(s) to restore from backup set channel ORA_DISK_1: restoring datafile(s) to restore from backup set channel ORA_DISK_1: reading from backup piece \SUSYS-58.OCARINA.LOCAL\BACKUP\ORA_DF849935901_S5_S1 channel ORA_DISK_1: restored backup piece \SUSYS-58.OCARINA.LOCAL\BACKUP\ORA_DF849935901_S5_S1 tag=TAG20140611T051821 channel ORA_DISK_1: restored backup piece 1 channel ORA_DISK_1: restored backup piece 1 channel ORA_DISK_1: restored backup piece 1 channel ORA_DISK_1: starting datafile backup set restore channel ORA_DISK_1: restore complete, elapsed time: 00:00:14 channel ORA_DISK_1: restore complete, elapsed time: 00:00:14 channel ORA_DISK_1: restore datafile 00002 to E:\APP\ADMINISTRATOR\ORADATA\DEMO\SYSAUX01.DBF channel ORA_DISK_1: restore datafile 00002 to E:\APP\ADMINISTRATOR\ORADATA\DEMO\UNDOTES01.DBF channel ORA_DISK_1: restore datafile 00000 to E:\APP\ADMINISTRATOR\ORADATA\DEMO\UNDOTES01.DBF channel ORA_DISK_1: restoring datafile backup set restore channel ORA_DISK_1: restore datafile 000000 to E:\APP\ADMINISTRATOR\ORADATA\DEMO\UNDOTES01.DBF channel ORA_DISK_1: restore datafile 000000 to E:\APP\ADMINISTRATOR\ORADATA\DEMO\UNDOTES01.DBF channel ORA_DISK_1: restore datafile 000000 to E:\APP\ADMINISTRATOR\ORADATA\DEMO\UNDOTES01.DBF channel ORA_DISK_1: restore datafile backup set restore channel ORA_DISK_1: restore datafile backup set restore channel ORA_DISK_1: restore datafile backup set restore channel ORA_DISK_1: restore datafile 000000 to E:\APP\ADMINISTRAT	
RMAN>	- //

2.8 RMAN restore of archive logs from DR Series system images

RMAN> RESTORE ARCHIVELOG ALL;

```
Starting restore at 18-JUN-14 using channel ORA DISK 1
```

```
channel ORA DISK 1: starting archived log restore to default destination
channel ORA DISK 1: restoring archived log
archived log thread=1 sequence=23
channel ORA DISK 1: restoring archived log
archived log thread=1 sequence=24
channel ORA DISK 1: restoring archived log
archived log thread=1 sequence=25
channel ORA DISK 1: restoring archived log
archived log thread=1 sequence=26
channel ORA DISK 1: restoring archived log
archived log thread=1 sequence=27
channel ORA DISK 1: restoring archived log
archived log thread=1 sequence=28
channel ORA DISK 1: restoring archived log
archived log thread=1 sequence=29
channel ORA DISK 1: reading from backup piece
\\10.250.242.108\ORARDCIFS\LARGE DF850522883 S6 S1
channel ORA DISK 1: piece
handle=\\10.250.242.108\ORARDCIFS\LARGE DF850522883 S6 S1 tag=TAG20140618T002123
channel ORA DISK 1: restored backup piece 1
channel ORA DISK 1: restore complete, elapsed time: 00:00:10
channel ORA DISK 1: starting archived log restore to default destination
channel ORA_DISK_1: restoring archived log
archived log thread=1 sequence=30
```

```
channel ORA_DISK_1: reading from backup piece
\\10.250.242.108\ORARDCIFS\LARGE_DF850522946_S9_S1
channel ORA_DISK_1: piece
handle=\\10.250.242.108\ORARDCIFS\LARGE_DF850522946_S9_S1 tag=TAG20140618T002226
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
Finished restore at 18-JUN-14
```

RMAN>

To restore archive logs to a different location, use the following RMAN command. The default location of the archive log restore will be where they are created.

```
RUN
{
   SET ARCHIVELOG DESTINATION TO '/oracle/temp_restore';
   RESTORE ARCHIVELOG ALL;
}
```

3 Replicating Oracle RMAN database images

First, you need to create containers on the source and target DR Series systems and then configure replication between those source and target DR containers. Both of the DR Series systems should be on the same version. Refer to the *Dell DR Series System Administrator's Guide* for information about configuring cascaded replication.



Replication of Oracle Database to target DR Series system

3.1 RMAN restore from replication DR Series system container

To restore the Oracle Database from replication container, first detach the replication on the target container, and run the following commands to import the backup images into the RMAN Catalog.

RMAN> catalog start with '<UNC Path of the DR replication container>';

Searching for all files that match the pattern <UNC Path of the DR replication container>

List of Files Unknown to the Database

File Name<UNC Path of the DR replication container>\ORA_DF848183546_S112_S1 File Name: <UNC Path of the DR replication container>\ORA_DF848183663_S114_S1 File Name: <UNC Path of the DR replication container>\ORA_DF848183662_S113_S1 Do you really want to catalog the above files (enter YES or NO)? yes Cataloging files... Cataloging done

List of Cataloged Files

File Name: <UNC Path of the DR replication container>\ORA_DF848183546_S112_S1 File Name: <UNC Path of the DR replication container>\ORA_DF848183663_S114_S1 File Name: <UNC Path of the DR replication container>\ORA_DF848183662_S113_S1

4 Configuring a backup job on RMAN over an NFS target

4.1 Create a storage device for NFS

For NFS backup using RMAN, a target folder needs to be created as an NFS share directory. This is the location to which backup objects will be written. (This is not required while adding CIFS share.)

- 1. Mount the DR Series System NFS share onto the NFS share directory which backup objects will be written in the RMAN environment.
- 2. For example:

mount -t nfs <ip address of DRXXXX>:/containers/sample
/mnt/RMANtargetContainer

3. Verify the NFS share. One way is to try using the Linux command "cat /proc/mounts". The rsize and wsize of the connects in the command output should be 512K.

In the RMAN settings use the below command to add the NFS mount path as device.

CONFIGURE CHANNEL DEVICE TYPE DISK MAXOPENFILES 1 FORMAT '/<Mount point path on RMAN server>/ora_df%t_s%s_s%p';

Note: Please follow the instructions in Section 3 as the backup and other settings are the same as that of CIFS.

5 Creating a storage device for Rapid CIFS

5.1 About the Rapid CIFS plugin

Rapid CIFS enables write operation acceleration on clients that use CIFS file system protocols. These accelerators allow for better coordination and integration between DR Series systems backup, restore, and optimized duplication operations with Data Management Applications (DMAs) such as CommVault, EMC Networker, and Tivoli Storage Manager. For a current list of supported DMAs, see the *Dell DR Series System Interoperability Guide*. Rapid CIFS is a Windows-certified filter driver that ensures that only unique data is written to the DR Series system. All chunking and hash computations are done at the client level.

5.2 Configure Rapid CIFS

To configure Rapid CIFS on windows operating systems download and install the plugin DellRapidCIFS-xxxxx.msi on the Oracle server.

Refer to the *Dell DR Series System Administrator's Guide* for the download location and for more information.

Below is the output for Rapid CIFS configured backup.

```
RMAN> BACKUP INCREMENTAL LEVEL 1 DATABASE filesperset 1;
Starting backup at 02-JUN-14
using channel ORA DISK 1
channel ORA DISK 1: starting incremental level 1 datafile backup set
channel ORA DISK 1: specifying datafile(s) in backup set
input datafile file number=00001
name=E:\APP\ADMINISTRATOR\ORADATA\BLOCK\SYSTEM01.DBF
channel ORA DISK 1: starting piece 1 at 02-JUN-14
channel ORA DISK 1: finished piece 1 at 02-JUN-14
piece handle=\\SWSYS-33.OCARINA.LOCAL\BACKUP\ORA DF849163738 S17 S1
tag=TAG20140602T064858 comment=NONE
-----Screen O/P truncated-----
Starting Control File and SPFILE Autobackup at 02-JUN-14
piece handle=C:\APP\ADMINISTRATOR\PRODUCT\11.2.0\DBHOME 3\DATABASE\C-1689233326-
20140602-03 comment=NONE
Finished Control File and SPFILE Autobackup at 02-JUN-14
```

To check the Client Side optimization:

```
C:\Program Files\Dell\Rapid CIFS>rdcifsctl.exe stats -s
Aggregate Statistics:
   Total Bytes Written: 2,411,298,816
    Total Bytes Sent: 1,378,067,343
Total Network Savings: 42.8496
C:\Program Files\Dell\Rapid CIFS>rdcifsctl.exe stats -s
Aggregate Statistics:
Total Bytes Written: 2,412,691,456
Total Bytes Sent: 1,379,461,495
Total Network Savings: 42.8248
```

6 Creating a storage device for Rapid NFS

6.1 About the Rapid NFS plugin

Rapid NFS enables write operation acceleration on clients that use NFS file system protocols. These accelerators allow for better coordination and integration between DR Series systems backup, restore, and optimized duplication operations with Data Management Applications (DMAs) such as CommVault, EMC Networker, and Tivoli Storage Manager. For the current list of supported DMAs, see the *Dell DR Series System Interoperability Guide*.

Rapid NFS is a client file system type that ensures that only unique data is written to the DR Series system. It uses user space components and file system in user space (FUSE) to accomplish this. Metadata operations such as file creates and permission changes go through the standard NFS protocol, whereas write operations go through Rapid NFS.

6.2 Configuring Rapid NFS

For Rapid NFS to configure on Linux system we need to install plugin bin file, DellRapidNFS-xxxxx-xxxx-x86_64.bin.The rpm after install looks like DellRapidNFS-310093.0-52425.x86_64.

1. To mount as Rapid NFS:

mount -t rdnfs <ip address of DRXXXX>:/containers/sample
/mnt/RMANtargetContainer

2. Verify the NFS share. One way is to try using the Linux command "cat /proc/mounts". The rsize and wsize of the connects in the command output should be 512K.

Refer to the *Dell DR Series System Administrator's Guide* for the download location and for more information.

7 General best practices for RMAN backups to the DR Series system

The Dell DR Series system supports RMAN backups over both CIFS and NFS protocols. With client side optimization drivers like Rapid CIFS and Rapid NFS backups become faster and more efficient. Several options exist with RMAN that every DBA should be aware of. These effect how RMAN behaves when performing its backup duties. Some of the most important are outlined here because they affect how RMAN will interact with a Dell DR Series deduplication appliance. Refer to Oracle's documentation for more details.

Multiplexing of data is not recommended as it adversely affects the deduplication savings. Every time data gets multiplexed, the patterns may change, and the deduplication algorithm can fail to decipher the duplicates. Specify **FILESPERSET = 1** when backing up to a DR Series system. FILESPERSET controls how many data files are written to a particular file within the backup set.

• Backup database FILESPERSET=1

Specify **MAXOPENFILES = 1** for each channel defined. This will ensure that each RMAN channel only reads from a single file at any one time. It is recommended to keep the value at minimum.

- CONFIGURE CHANNEL DEVICE TYPE DISK MAXOPENFILES 1 FORMAT '<UNCPath of the DR container>/ora_df%t_s%s_s%p';
- Turn on change block tracking by using below command.

SQL> ALTER DATABASE ENABLE BLOCK CHANGE TRACKING USING FILE '<Path on the RMAN server Oracle Home>/oradata/rman_change_track.f';

• Configure RMAN settings to backup control file and SPFILE.

Auto backup on CONFIGURE CONTROLFILE AUTOBACKUP ON; Keep CONFIGURE BACKUP OPTIMIZATION OFF every time for better savings.

RMAN encryption should NOT be used as the deduplication savings get affected.

A listing of the global parameters can be generated by the "show all" RMAN command:

```
RMAN> show all;
```

```
RMAN configuration parameters for database with db_unique_name APPLE are:

CONFIGURE RETENTION POLICY TO REDUNDANCY 1; # default

CONFIGURE BACKUP OPTIMIZATION OFF; # default

CONFIGURE DEFAULT DEVICE TYPE TO DISK; # default

CONFIGURE CONTROLFILE AUTOBACKUP ON;

CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO '%F'; # default

CONFIGURE DEVICE TYPE DISK PARALLELISM 1 BACKUP TYPE TO BACKUPSET; # default

CONFIGURE DATAFILE BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default

CONFIGURE ARCHIVELOG BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default

CONFIGURE CHANNEL DEVICE TYPE DISK FORMAT '/mnt/apple_nfs/apple_%u_%s_%p';

CONFIGURE MAXSETSIZE TO UNLIMITED; # default

CONFIGURE ENCRYPTION FOR DATABASE OFF; # default

CONFIGURE ENCRYPTION ALGORITHM 'AES128'; # default
```

CONFIGURE COMPRESSION ALGORITHM 'BASIC' AS OF RELEASE 'DEFAULT' OPTIMIZE FOR LOAD TRUE ; # default CONFIGURE ARCHIVELOG DELETION POLICY TO NONE; # default CONFIGURE SNAPSHOT CONTROLFILE NAME TO '/home/orabase/product/11.2.0/db_1/dbs/snapcf_apple.f'; # default



8 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 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 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 three hours per day when backups are not taking place, and generally after a backup job has completed.

DEVELL DR4000 Help Log out						
Dashboard -Alerts -Events -Health	Cleaner Sched	iule Central, Mon Jan 23 15:18:49 2012	Schedule Cleaner	Schedule		
Statistics: Container Statistics: Replication Storage Containers Replication Compression Schedule Replication	Day Sun Mon Tue Wed Thu Fri	Start Time 	Stop Time	3		
Cleaner System Configuration Networking Active Directory Email Alerts Date & Time Support Diagnostics Software Upgrade	Sat Note: When no schedu	 e is set, the cleaner will run as needed.	-			

Dell recommends scheduling the cleaner at a separate time from backup and replication jobs.

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.



