

Setting up the DR Series System as a CIFS or
NFS target on Oracle Recovery Manager®

Technical White Paper

Quest Engineering
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Legend



WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death.



CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.



IMPORTANT, NOTE, TIP, MOBILE, or VIDEO: An information icon indicates supporting information.

Setting up the DR Series System as a CIFS or NFS Target on Oracle RMAN

Updated – December 20, 2017

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Revisions

Date	Description
January 2014	Initial release
November 2016	Updated the guide with new DR-4.0 GUI screens
October 2017	Updated with new Quest-branded DR Series system GUI screenshots (v4.0.3)

Executive Summary

This document provides information about how to set up the DR Series system as a backup target for Oracle Recovery Manager (RMAN). For additional information, see the DR Series system documentation and other data management application best practices whitepapers for your specific DR Series system at:

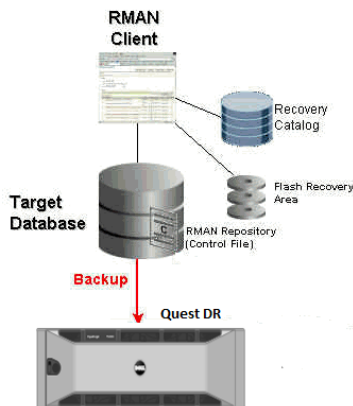
<http://support.quest.com/DR-Series>

For more information about RMAN, refer to the Oracle documentation at:

https://docs.oracle.com/cd/E11882_01/backup.112/e10642/toc.htm

i | **NOTE:** The DR Series system/ Oracle RMAN build version and screenshots used in this document might vary slightly, depending on the version of the DR Series system/ Oracle RMAN Software version you are using.

RMAN (Recovery Manager) is a backup and recovery manager supplied for Oracle databases created by the Oracle Corporation. It provides database backup, restore, and recovery capabilities addressing high availability and disaster recovery concerns. 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 a backup infrastructure with the DR Series system.



i | **NOTE:** The DR Series system/ Oracle RMAN build version and screenshots used in this document might vary slightly, depending on the version of the DR Series system/ Oracle RMAN Software version you are using.

Installing and configuring the DR Series system

- 1 Rack and cable the DR Series system, and power it on. Initialize the DR Series system. Refer to the following topics in the *DR Series System Administrator Guide* for more information: “iDRAC Connection”, “Logging in and Initializing the DR Series System” and “Accessing iDRAC6/iDRAC7 Using RACADM.”
- 2 Log on to iDRAC using the default credentials (username: **root** and password: **calvin**) and either:
 - the default address **192.168.0.120**,
 - or the IP address that is assigned to the iDRAC interface

INTEGRATED REMOTE ACCESS CONTROLLER Enterprise

Login

IDRAC | Quest DR6300

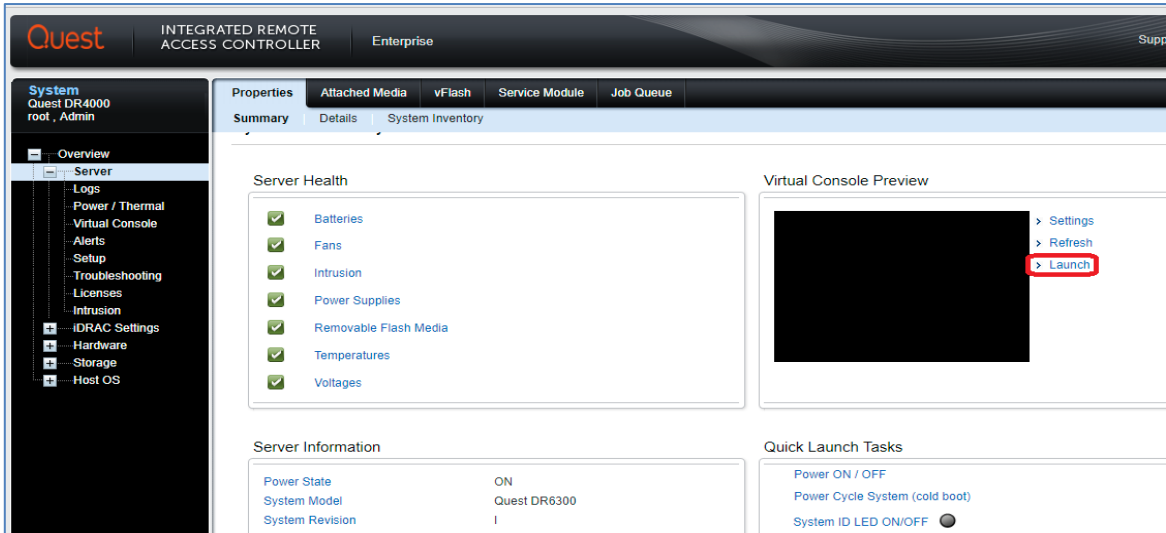
Type the Username and Password and click Submit.

Username: Password:

Domain:

Support | About

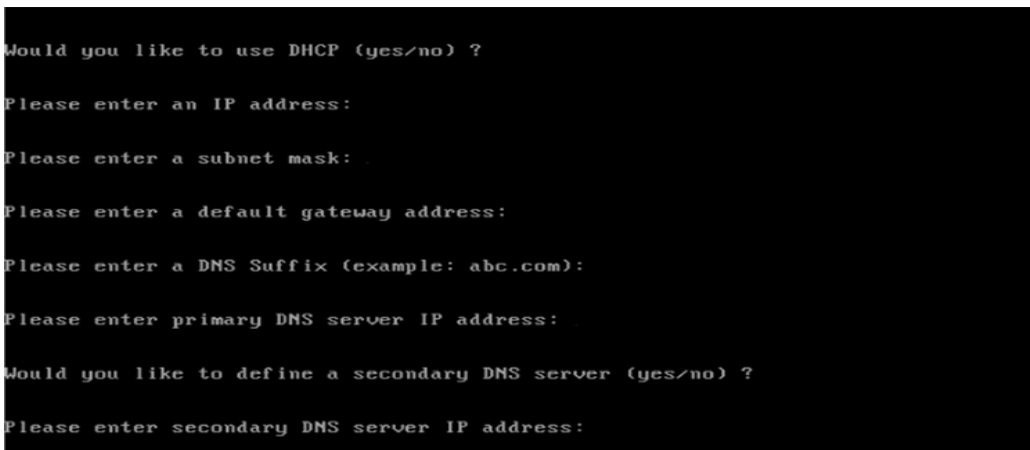
- 3 Launch the virtual console by clicking **Launch**.



- 4 After the virtual console opens, log on to the system (with the username: **administrator** and password: **St0r@ge!** where the “0” in the password is the numeral zero).



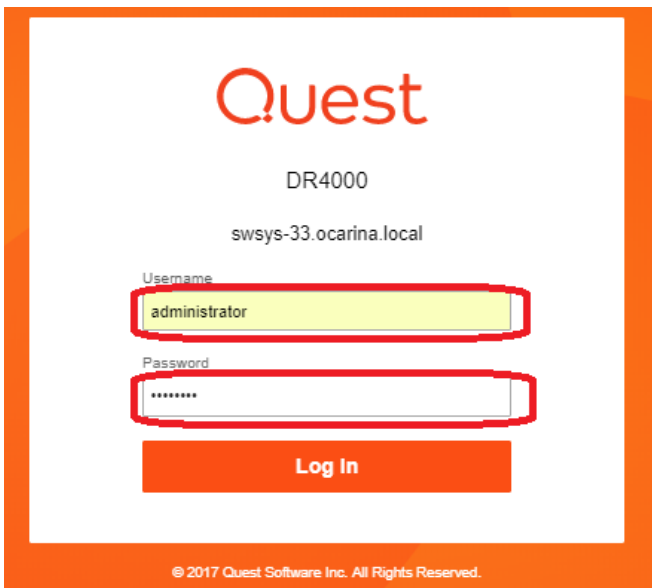
- 5 Set the user-defined networking preferences as needed.



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

```
-----  
Set Static IP Address  
  
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 : 143.166.216.237  
Host Name     : swsys-33  
  
Are the above settings correct (yes/no) ? █
```

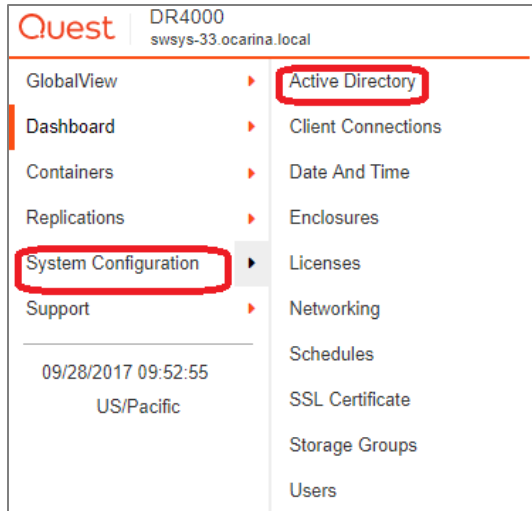
- 7 Log on to the DR Series system console with the IP address you just provided for the DR Series system (with the username **administrator** and password **St0r@ge!** where the “0” in the password is the numeral zero).



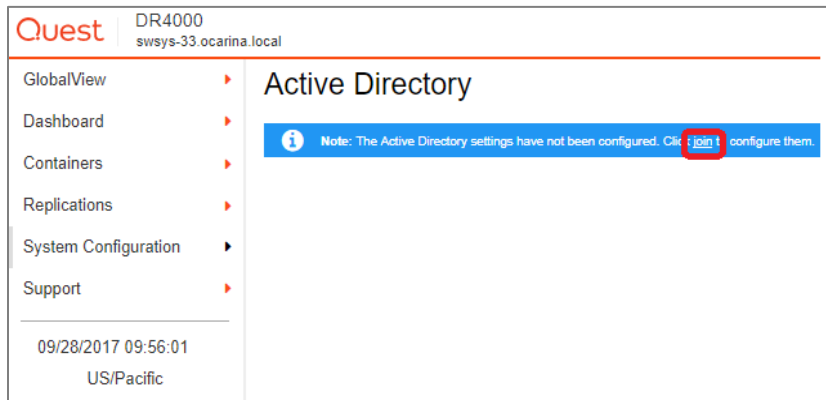
- 8 Join the DR Series system to Active Directory.

i **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.

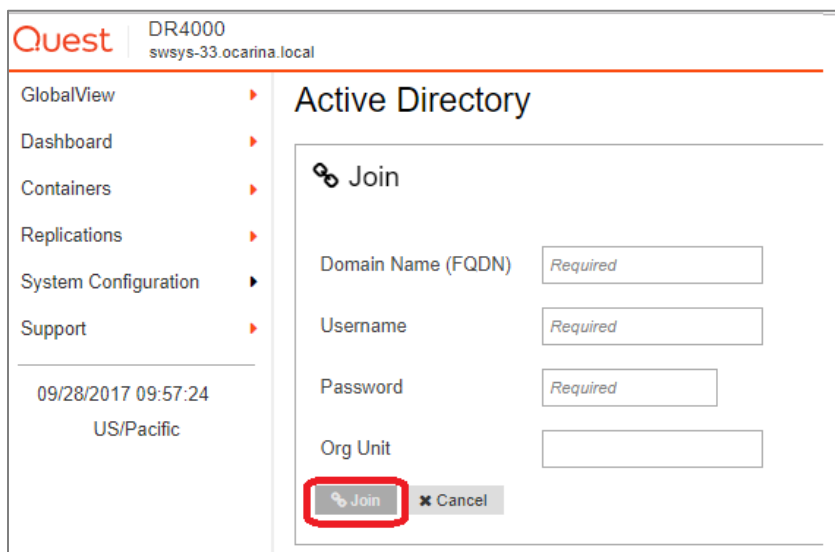
- a In the left navigation menu, click **System Configuration > Active Directory**.



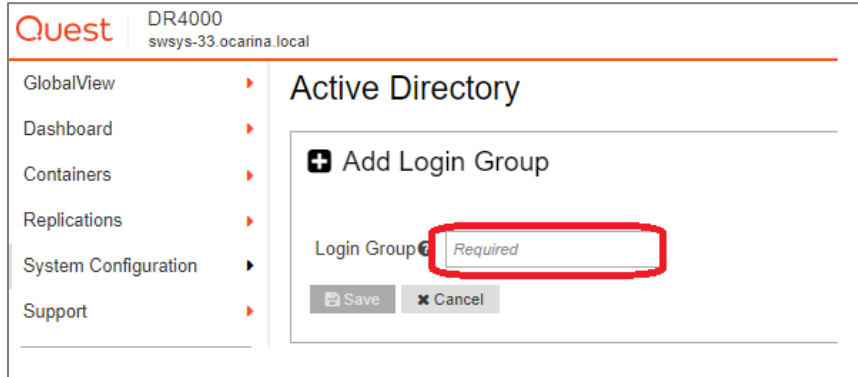
b Click the **Join** link.



c Enter valid credentials and click the **Join** button.



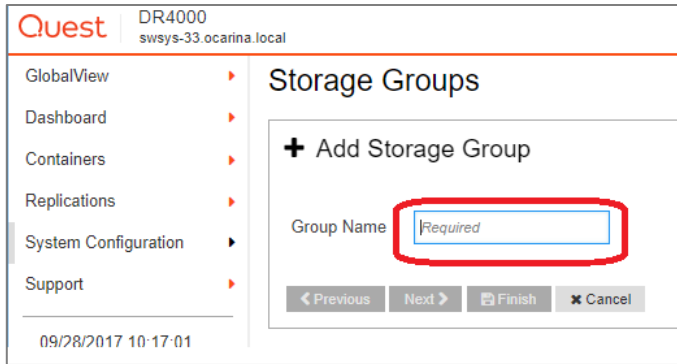
- d On the Action menu in the upper right corner, click **Add Login Group**.
- e Enter a valid login group and click **Save**.



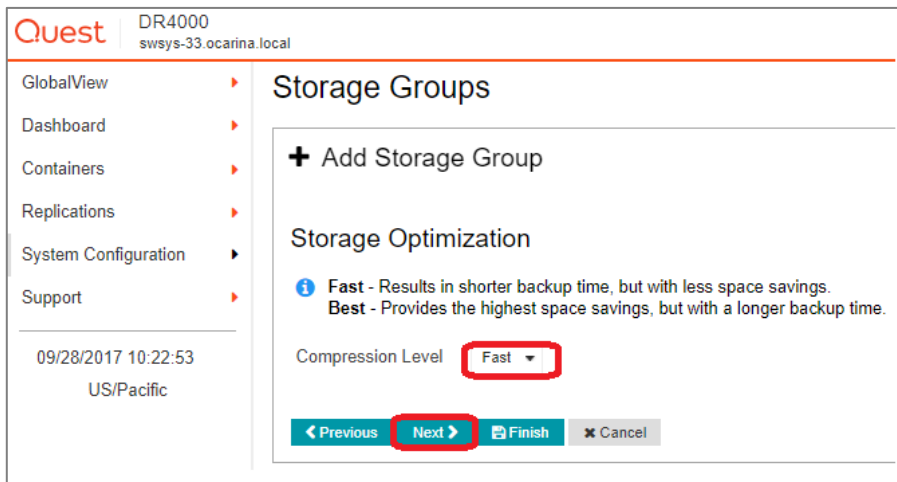
- 9 In the left navigation menu, click **System Configuration > Storage Groups** to create a storage group.



- 10 On the Action menu, click **Add Storage Group**, enter a storage group name, and click **Next**.



- 11 For storage optimization, select a compression level (By default, compression level is set to **Fast**) and click **Next**.



- 12 For encryption, enter a passphrase, select the encryption mode and key rotation interval as needed, and click **Finish**.

Quest | DR4000
swsys-33.ocarina.local

GlobalView | Dashboard | Containers | Replications | System Configuration | Support

09/28/2017 10:27:32
US/Pacific

Storage Groups

+ Add Storage Group

Encryption

Passphrase Not Set

Passphrase ✓

Confirm Passphrase ✓

Encryption On Off

Encryption Mode None Static Internal

Key Rotation Interval Day(s) 12 ✓

< Previous Next **Finish** x Cancel

13 Verify the details on the Storage Group creation confirmation page, and click **Save**.

Quest DR4000
swsys-33.ocarina.local

GlobalView
Dashboard
Containers
Replications
System Configuration
Support

09/28/2017 10:29:11
US/Pacific

Storage Groups

+ Add Storage Group

Summary

Storage Group Name
Name: **SG1**

Compression
Level: **Fast**

Encryption
Passphrase: *****
Encryption: **Enabled**
Encryption Mode: **Internal**
Key Rotation Interval Day(s): **12**

[< Previous](#) [Next >](#) **Save** [x Cancel](#)

14 Verify that the newly created Storage Group is displayed on the Storage Groups page.

15 Select the Dashboard icon next to the newly created Storage Group to view storage group level statistics and throughput graphs.

Quest DR4000
swsys-33.ocarina.local

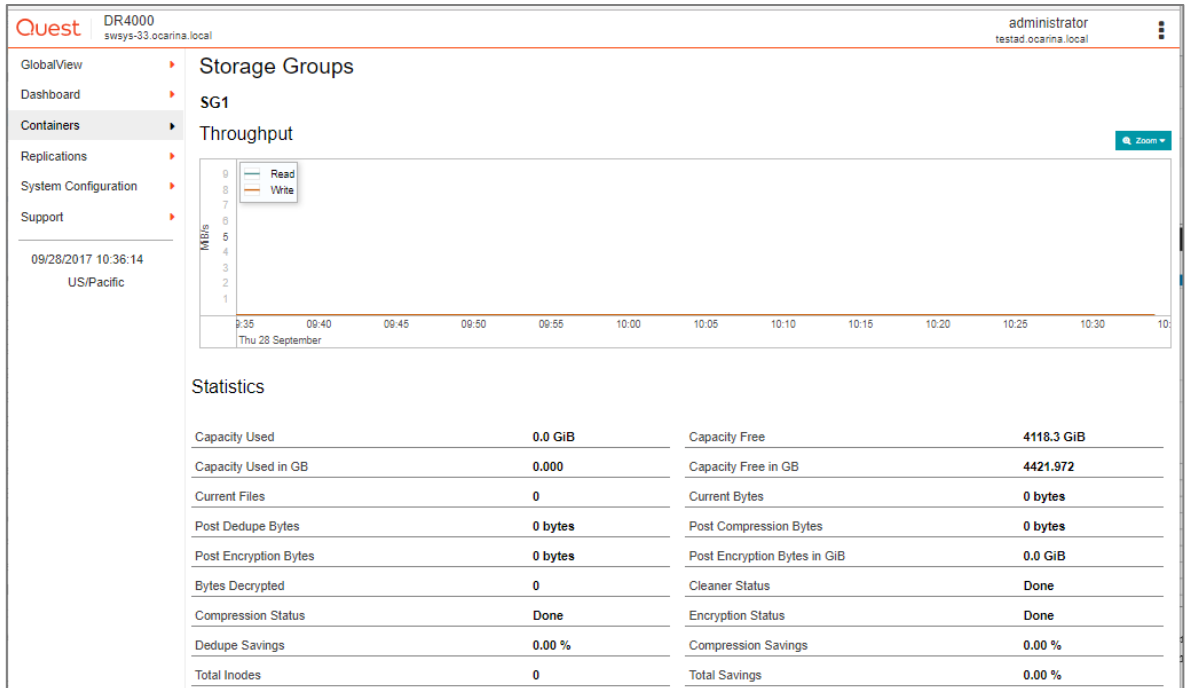
administrator
testad.ocarina.local

GlobalView
Dashboard
Containers
Replications
System Configuration
Support

09/28/2017 10:34:38
US/Pacific

Storage Groups

Name ^	Compression ⇅	Encryption ⇅	Containers ⇅	Source Replicated Containers ⇅	Actions
+ DefaultGroup	Fast	On	4	1	Dashboard Info
+ SG1	Fast	On	0	0	Dashboard Info Delete
+ test1	Fast	On	1	0	Dashboard Info Delete



16 To create a container, click **Containers** in the left navigation menu, and then, on the Action menu in the upper right corner of the page, click **Add Container**. (This starts the process of creating a container in Storage Group- DefaultGroup).

The screenshot shows the Quest DR4000 interface with the 'All Containers' page. The 'Add Container' button in the top right corner is highlighted with a red box. The 'Add Container' form is open, showing the following fields:

- Storage Group: DefaultGroup
- Access Protocol: Quest Rapid Data Storage (RDS)
- Container Name: Required

At the bottom of the form, there are buttons for 'Previous', 'Next', 'Finish', and 'Cancel'.

17 For the Access Protocol, select **NAS (NFS, CIFS)**, enter a Container Name, and click **Next**.

Quest DR4000
swsys-33.ocarina.local

GlobalView
Dashboard
Containers
Replications
System Configuration
Support

SG1/Containers

+ Add Container

Access Protocol

Container Name ✓

< Previous Next > Finish x Cancel

09/28/2017 10:40:19
US/Pacific

18 Select the specific Access Protocol(s) as needed, select the Marker Type as **Auto**, and then click **Next**.

Quest DR4000
swsys-33.ocarina.local

GlobalView
Dashboard
Containers
Replications
System Configuration
Support

SG1/Containers

+ Add Container

Access Protocols NFS CIFS

Marker Type

< Previous Next > Finish x Cancel

09/28/2017 10:42:16
US/Pacific

19 (For NFS) Enter the client Access Control information for the NFS protocol and click **Next**.

20 (For CIFS) Enter the client Access Control information for the CIFS protocol and click **Next**.



NOTE: For improved security, you should add IP addresses for the Backup console (RMAN). Not all environments will have all components.

21 Click **Save**.

Quest DR4000
swwsys-33.ocarina.local

GlobalView > SG1/Containers

Dashboard >

Containers > **+ Add Container**

Replications >

System Configuration >

Support >

09/28/2017 10:44:55
US/Pacific

Storage Access Protocol

Access Protocol **NAS (NFS, CIFS)**

Container Name **sample**

Configure NAS Access & Marker

NAS Access Protocol **NFS, CIFS**

Marker Type **Auto**

Configure NFS Client Access

NFS Options **Read Write Access**

Map Root To **Root**

Client Access **Open (allow all clients)**

Configure CIFS Client Access

Client Access **Open (allow all clients)**

< Previous Next > **Save** * Cancel

22 Verify that the container was created.

< Quest DR4000
swwsys-33.ocarina.local

GlobalView > **Success: Successfully added container "sample1". Container is being established. Information updates may be briefly delayed until the process is fully completed**

Dashboard >




Containers > **SG1/Containers**

Replications >

System Configuration >

Support >

09/28/2017 10:49:57
US/Pacific

Container	Marker Type	Access Protocol	Connection Status	Replication	Actions
sample	Auto	NFS,CIFS	Available, Available	Not Configured	  

1 Item(s) found.

Configuring a backup job on RMAN over a CIFS target

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

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

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

Backing up with RMAN (default configuration)

The Default settings for RMAN are shown below with the command **show all**.

```

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 BACKUP OPTIMIZATION OFF; # default
CONFIGURE DEFAULT DEVICE TYPE 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 ENCRYPTION FOR DATABASE OFF; # default
CONFIGURE ENCRYPTION ALGORITHM 'AES128'; # default
CONFIGURE COMPRESSION ALGORITHM 'BASIC' AS OF RELEASE 'DEFAULT' OPTIMIZE FOR LOAD TRUE ; # default
CONFIGURE RMAN OUTPUT TO KEEP FOR 7 DAYS; # default
CONFIGURE ARCHIVELOG DELETION POLICY TO NONE; # default
CONFIGURE SNAPSHOT CONTROLFILE NAME TO 'C:\APP\ORACLE\PRODUCT\12.1.0\DBHOME_1\DATABASE\SNCFDEMO.ORA'; # default

```

The RMAN backup settings are changed for backups to DR Series systems over CIFS.

Configure the channel to use the UNC path of the DR Series system container as shown in the following example:

```

CONFIGURE CHANNEL DEVICE TYPE DISK MAXOPENFILES 1 FORMAT '\\<UNCPath
to the container noted above >/ora_df%t_s%s_s%p';

```

For example:

```

RMAN> CONFIGURE CHANNEL DEVICE TYPE DISK MAXOPENFILES 1 FORMAT '\\swsys-33.ocarina.local\sample/ora_df%t_s%s_s%p';
new RMAN configuration parameters:
CONFIGURE CHANNEL DEVICE TYPE DISK MAXOPENFILES 1 FORMAT '\\swsys-33.ocarina.local\sample/ora_df%t_s%s_s%p';
new RMAN configuration parameters are successfully stored

```

Configure RMAN to back up the control file after each backup:

```

RMAN> show all;

RMAN configuration parameters for database with db_unique_name DEMO are:
CONFIGURE RETENTION POLICY TO REDUNDANCY 1; # default
CONFIGURE BACKUP OPTIMIZATION OFF; # default
CONFIGURE DEFAULT DEVICE TYPE 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 CHANNEL DEVICE TYPE DISK MAXOPENFILES 1 FORMAT '\\swsys-33.ocarina.local\sample/ora_df%t_s%s_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 RMAN OUTPUT TO KEEP FOR 7 DAYS; # default
CONFIGURE ARCHIVELOG DELETION POLICY TO NONE; # default
CONFIGURE SNAPSHOT CONTROLFILE NAME TO 'C:\APP\ORACLE\PRODUCT\12.1.0\DBHOME_1\DATABASE\SNCFDEMO.ORA'; # default

```

Backing up the FULL Oracle database with RMAN

To back up the Oracle database with RMAN use the command:

```

BACKUP INCRMENTAL LEVEL 0 DATABASE FILESPERSET 1;

```

```

RMAN> BACKUP INCREMENTAL LEVEL 0 DATABASE FILESPERSET 1;

Starting backup at 29-SEP-16
using target database control file instead of recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=127 device type=DISK
channel ORA_DISK_1: starting incremental level 0 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00001 name=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_SYSTEM_CYSBML0B_.DBF
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795480_S23_S1 tag=TAG20160929T015120 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:15
channel ORA_DISK_1: starting incremental level 0 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00005 name=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_UNDOTB51_CYSBPMG0_.DBF
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795495_S24_S1 tag=TAG20160929T015120 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:07
channel ORA_DISK_1: starting incremental level 0 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00003 name=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_SYSAUX_CYSBJM7N_.DBF
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795502_S25_S1 tag=TAG20160929T015120 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:07
channel ORA_DISK_1: starting incremental level 0 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current control file in backup set
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795509_S26_S1 tag=TAG20160929T015120 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental level 0 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00006 name=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_USERS_CYSBPL7N_.DBF
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795512_S27_S1 tag=TAG20160929T015120 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental level 0 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current SPFILE in backup set
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795513_S28_S1 tag=TAG20160929T015120 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 29-SEP-16

```

To list backup files, run the command:

list backup;

```

RMAN> list backup;

List of Backup Sets
=====

BS Key   Type LV Size       Device Type Elapsed Time Completion Time
-----
1        Full  9.64M   DISK          00:00:12   29-SEP-16
        BP Key: 1   Status: AVAILABLE Compressed: NO Tag: TAG20160929T010820
        Piece Name: \\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923792901_S3_S1
        SPFILE Included: Modification time: 29-SEP-16
        SPFILE db_unique_name: DEMO
        Control File Included: Ckp SCN: 2268718      Ckp time: 29-SEP-16

BS Key   Size       Device Type Elapsed Time Completion Time
-----
2        28.80M    DISK          00:00:07   29-SEP-16
        BP Key: 2   Status: AVAILABLE Compressed: NO Tag: TAG20160929T013426
        Piece Name: \\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923794466_S4_S1

```

Performing an incremental backup of the Oracle database with RMAN

To perform an incremental backup of the Oracle database with RMAN use the command:

```
BACKUP INCRMENTAL LEVEL 1 DATABASE FILESPERSET 1;
```

```
RMAN> BACKUP INCREMENTAL LEVEL 1 DATABASE FILESPERSET 1;

Starting backup at 29-SEP-16
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=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_SYSTEM_CYSBML0B_.DBF
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795550_S29_S1 tag=TAG20160929T015230 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:07
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=00005 name=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_UNDOTB51_CYSBPMG0_.DBF
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795557_S30_S1 tag=TAG20160929T015230 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
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=00003 name=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_SYSAUX_CYSBJM7N_.DBF
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795558_S31_S1 tag=TAG20160929T015230 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental level 1 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current control file in backup set
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795559_S32_S1 tag=TAG20160929T015230 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
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=00006 name=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_USERS_CYSBPL7N_.DBF
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795561_S33_S1 tag=TAG20160929T015230 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental level 1 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current SPFILE in backup set
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795563_S34_S1 tag=TAG20160929T015230 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 29-SEP-16
```

Backing up with different options

```
BACKUP ARCHIVELOG ALL;
```

```
RMAN> BACKUP ARCHIVELOG ALL;

Starting backup at 29-SEP-16
current log archived
using channel ORA_DISK_1
channel ORA_DISK_1: starting archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=3 RECID=1 STAMP=923794465
input archived log thread=1 sequence=4 RECID=2 STAMP=923794553
input archived log thread=1 sequence=5 RECID=3 STAMP=923794598
input archived log thread=1 sequence=6 RECID=4 STAMP=923795599
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795599_S35_S1 tag=TAG20160929T015319 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:07
Finished backup at 29-SEP-16
```

```
BACKUP DATABASE PLUS ARCHIVELOG;
```

```

RMAN> BACKUP DATABASE PLUS ARCHIVELOG;

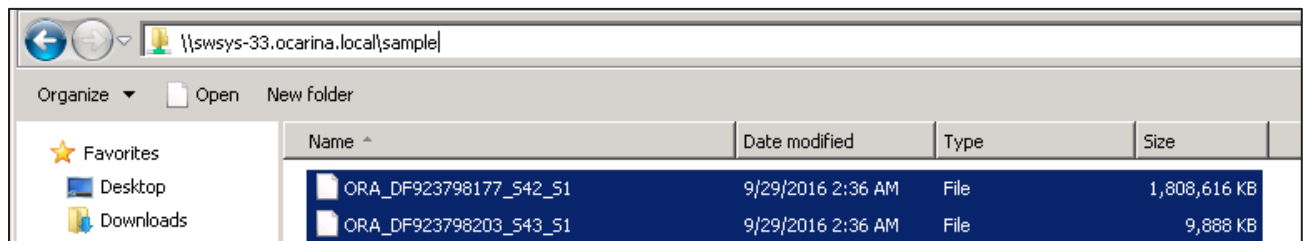
Starting backup at 29-SEP-16
current log archived
using channel ORA_DISK_1
channel ORA_DISK_1: starting archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=3 RECID=1 STAMP=923794465
input archived log thread=1 sequence=4 RECID=2 STAMP=923794553
input archived log thread=1 sequence=5 RECID=3 STAMP=923794598
input archived log thread=1 sequence=6 RECID=4 STAMP=923795599
input archived log thread=1 sequence=7 RECID=5 STAMP=923795626
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795626_S36_S1 tag=TAG20160929T015346 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:07
Finished backup at 29-SEP-16

Starting backup at 29-SEP-16
using channel ORA_DISK_1
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00001 name=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_SYSTEM_CYSBML0B_.DBF
input datafile file number=00005 name=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_UNDOTBS1_CYSBPMG0_.DBF
input datafile file number=00003 name=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_SYSAUX_CYSB3M7N_.DBF
input datafile file number=00006 name=C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_USERS_CYSBPL7N_.DBF
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\BACKUP\ORA_DF923795634_S37_S1 tag=TAG20160929T015354 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:15
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current control file in backup set
including current SPFILE in backup set
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795649_S38_S1 tag=TAG20160929T015354 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 29-SEP-16

Starting backup at 29-SEP-16
current log archived
using channel ORA_DISK_1
channel ORA_DISK_1: starting archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=8 RECID=6 STAMP=923795651
channel ORA_DISK_1: starting piece 1 at 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923795651_S39_S1 tag=TAG20160929T015411 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 29-SEP-16

```

To browse the container location to check data:



Performing an RMAN restore of an Oracle database from the DR Series system

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

```

RMAN> restore database;

Starting restore at 29-SEP-16
using channel ORA_DISK_1

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 00001 to C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_SYSTEM_CYSBML0B_.DBF
channel ORA_DISK_1: restoring datafile 00003 to C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_SYSAUX_CYSB3M7N_.DBF
channel ORA_DISK_1: restoring datafile 00005 to C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_UNDOTBS1_CYSBPMG0_.DBF
channel ORA_DISK_1: restoring datafile 00006 to C:\APP\ADMINISTRATOR\ORADATA\DEMO\DATAFILE\01_MF_USERS_CYSBPL7N_.DBF
channel ORA_DISK_1: reading from backup piece \\SWSYS-33.OCARINA.LOCAL\BACKUP\ORA_DF923798177_542_S1
channel ORA_DISK_1: piece handle=\\SWSYS-33.OCARINA.LOCAL\sample\ORA_DF923798177_542_S1 tag=TAG20160929T023617
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:26
Finished restore at 29-SEP-16

```

Performing an RMAN restore of archive logs from DR Series system images

```

RMAN> RESTORE ARCHIVELOG ALL;

Starting restore at 29-SEP-16
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 29-SEP-16

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.

```

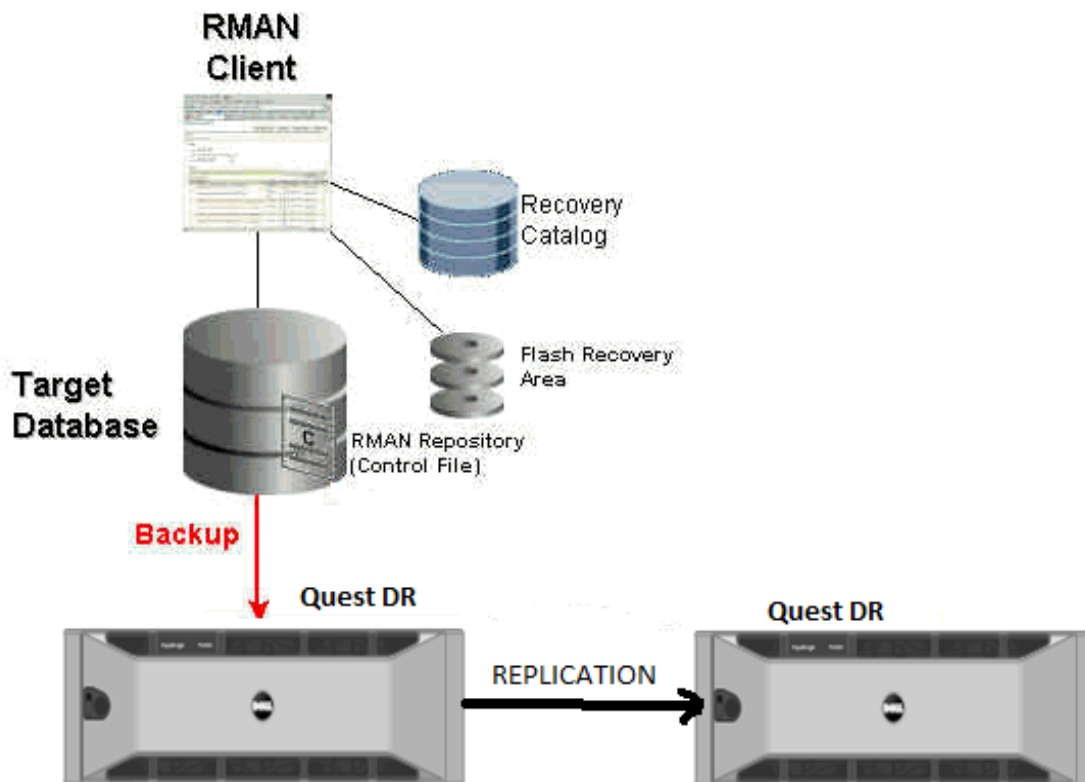
RUN
{
    SET ARCHIVELOG DESTINATION TO '/oracle/temp_restore';
    RESTORE ARCHIVELOG ALL;
}

```


Replicating Oracle RMAN database images

- 1 First, you need to create containers on the source and target DR Series systems.
- 2 Configure replication between the source and target DR Series system containers.

i **NOTE:** Both the DR Series systems should be on the same software versions. See the *DR Series System Administrator's Guide* for information about configuring the replication and cascaded replication features of the DR Series system.



Performing an RMAN restore from a replication DR Series container

To restore an Oracle database from a replication container, follow these steps:

- 1 First, detach the replication on the target container.
- 2 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

Configuring a backup job on RMAN over an NFS target

Creating 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 if you are adding a CIFS share.)

- 1 Mount the DR Series system NFS share onto the NFS share directory to which backup objects will be written in the RMAN environment. For example:
`mount -t nfs <ip address of DRXXXX>:/containers/sample /mnt/RMANtargetContainer`
- 2 Verify the NFS share. One way to do this is to try using the Linux command, `cat /proc/mounts` (The rsize and wsize of the connects in the command output should be 512K.)
- 3 In the RMAN settings use the following command to add the NFS mount path as a device.

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



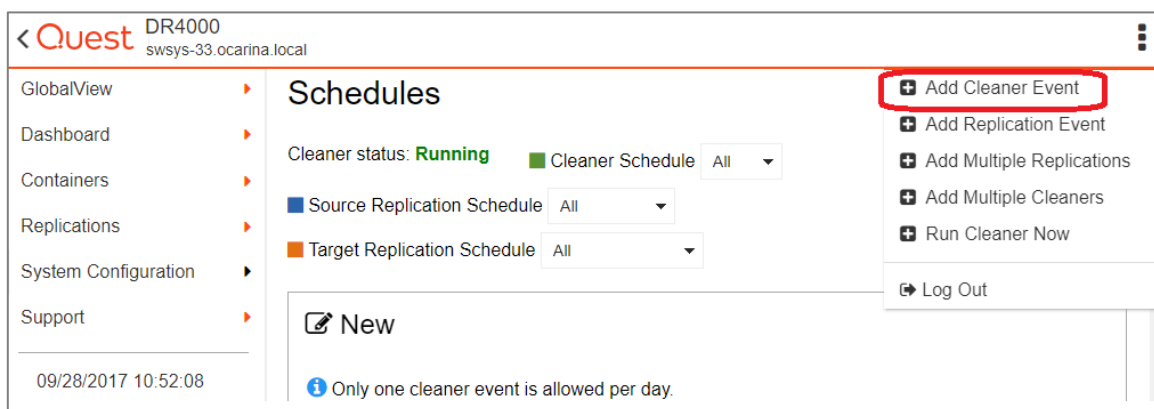
NOTE: Please follow the steps in section 3; the backup and other settings are the same as that of CIFS.

Setting up the DR Series system cleaner


Performing scheduled disk space reclamation operations is 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. Refer to the *DR Series Cleaner Best Practices* white paper for guidance on setting up the cleaner.

- 1 In the left navigation area of the DR Series system GUI, click **System Configuration > Schedules**.
- 2 On the **Action Menu** in the upper right corner of the page, click **Add Cleaner Event**.



- 3 Define the schedule, and click **Save**.

 **New**

i Only one cleaner event is allowed per day.

Set event from start day: at: : to end day: at: :

The new cleaner event is displayed on the Schedules page.

Quest DR4000
swwsys-33.ocarina.local

GlobalView ▶
Dashboard ▶
Containers ▶
Replications ▶
System Configuration ▶
Support ▶

09/28/2017 10:54:42
US/Pacific

Schedules

Cleaner status: **Done** Cleaner Schedule

Source Replication Schedule

Target Replication Schedule

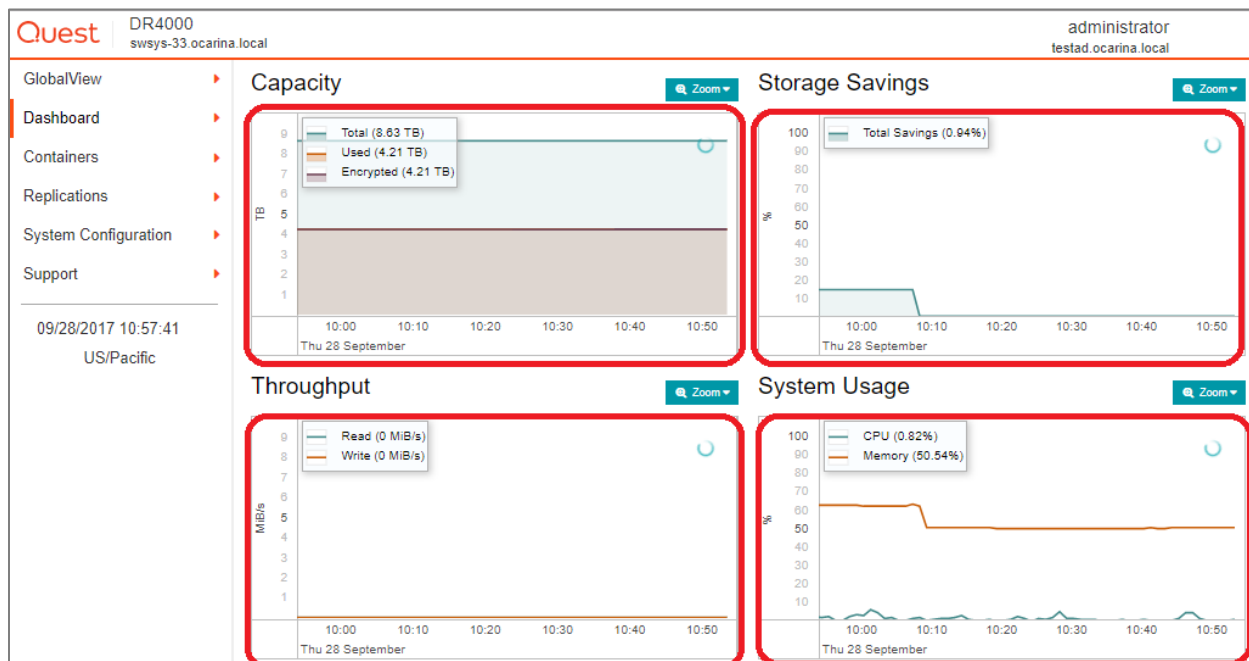
	Sun	Mon	Tue	Wed
0:00		1:00 - 2:00 Cleaner		
1:00	1:00 - 2:00 Cleaner			
2:00				

Monitoring deduplication, compression, and performance

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 - Creating a storage device for Rapid CIFS

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 the current list of supported DMAs, see the *DR Series System Interoperability Guide*.

Rapid CIFS is a Windows-certified filter driver that also ensures that only unique data is written to the DR Series system. All chunking and hash computations are done at the client level.

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

Below is the output for a Rapid CIFS configured backup.

```


RMAN> BACKUP INCREMENTAL LEVEL 1 DATABASE filesperset 1;
Starting backup at 29-SEP-16
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 29-SEP-16
channel ORA_DISK_1: finished piece 1 at 29-SEP-16
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 29-SEP-16
piece handle=C:\APP\ADMINISTRATOR\PRODUCT\12.1.0\DBHOME_3\DATABASE\C-1689233326-20140602-03 comment=NONE
Finished Control File and SPFILE Autobackup at 29-SEP-16
To check the Client Side optimization:-
C:\Program Files\Quest\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\Quest\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
```


B - Creating a storage device for Rapid NFS

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 *DR Series System Interoperability Guide*.

Rapid NFS is a new 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.

To configure Rapid NFS on a Linux system you need to install plugin bin file: QuestRapidNFS-xxxxx-xxxxx-x86_64.bin


 **NOTE:** The rpm after install looks like QuestRapidNFS-310093.0-52425.x86_64.

To mount as Rapid NFS:

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

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

For more information, see the *DR Series System Administrator’s Guide*.

 **NOTE:** Rapid CIFS and Rapid NFS are available only in the DR6000, DR6300 and DR4300 models.

C - Best Practices for doing RMAN backups to the DR Series system

The DR Series systems support 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 Quest 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 **FILESERSET = 1** when backing up to a DR Series appliance. 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 the following 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/12.1/db_1/dbs/snapcf_apple.f'; # default
```