

Setting up Rapid Air Gap for the DR Series System

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.

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Revisions

Date	Description
October 2017	Initial Release

Executive Summary

The Air gap solution is a replication solution in which a secondary target DR in a three-way replication is in an isolated private network. The Secondary target will be up for replication for only a particular period of time (Air gap closes); and, only during this period will the replication between Primary and Secondary target DRs happen. Only a set of services will be running on the secondary target so that it is secured from the external environment. The primary target will act as the target for the Primary DR Series system and as the source for the Secondary target. The primary target will be in two different networks to cater to both the Primary DR and the Secondary target networks.

This document describes how to set up the Air Gap solution for your DR Series system environment.



NOTE: In this document, the Primary Source/Primary DR Series system, the Primary Target/Secondary Source, and Secondary Target are represented as DR1, DR2, and DR3 respectively.

Preparing the DR Series systems

Assumptions

Refer to the following assumptions, which are used to illustrate the basic setup for the air gap solution described in this document.

- The air gap setup described in this document requires three DR Series systems (DR1, DR2, and DR3). DR1 and DR2 have RDS containers with Op-dup enabled. DR3 is in an isolated network. The RDS container on DR2 will be replicated (Hybrid Replication) to a connection-less container on DR3.
- There are two NetVault Backup servers in the environment. One NetVault backup server is on the regular network to establish backups, restores, and Op-dups from DR1 and DR2. The second NetVault Backup server is in the isolated network, which can be used to restore data from DR3 in disaster recovery conditions.
- The data on DR3 is retained as per user requirements after it has been removed from DR1 and DR2.
- DR3 will have Air Gap enabled in which certain protocols (such as, CIFS/NFS) will not work.
- There will be an Air Gap between DR2 and DR3, which when open will have only a few required ports available. Replication will not be performed during this period. When the air gap is closed, additional ports will be available during which replication can continue.
- The isolation of DR3 can be obtained by using Switch or Wan Emulator software.

Upgrading the DR Series system to the required image

You first need to ensure the required latest version (version 4.0.3 and later) of the DR Series software is downloaded and installed on your DR Series systems.

Using the DR Series system CLI

- 1 Download the DR Series system image to any client and copy it to the DR Series system by using the following commands:

```
scp oca-0.latest.tar.gz administrator@<DR_IP>:/root
system -upgrade
```

- 2 Reboot the DR Series system if needed.

Using the DR Series system GUI

- 1 Log on to the DR Series system via your browser.
- 2 Navigate to Support > Software Upgrade >
- 3 Click Select DR binary package, upload the image, and click Upgrade.
- 4 Reboot the system if required after the upgrade process has finished.

DR2 and DR3 prerequisites

Ensure that the following settings are configured on DR2 and DR3 for Air Gap setup.

Enabling hybrid replication on DR2

Hybrid replication is needed on DR2 so that replication can be set up from an RDA container that does not support legacy replications.

- 1 To enable hybrid replication, execute the following command on DR2:

```
system --hybrid_replication --enable

administrator@swsys-49 > system --hybrid_replication --enable
Password required to proceed.
Please enter the administrator password:

Hybrid replication enabled successfully.
Stopping filesystem...Done.
Starting filesystem...Done.

administrator@swsys-49 >
```

- 2 Confirm that hybrid replication is enabled on DR2 by using the command: `system --show`

```

administrator@swsys-49 > system --show
System Name           : swsys-49
Current Time          : Mon Aug 21 03:18:59 2017 PDT
Service Tag           : JMW78Q1
Product Name          : Dell DR4000
BIOS Version          : 1.11.0
Version               : 4.0.0631.4
Build                 : 64586
Build Date            : Fri Aug 18 03:06:49 PDT 2017
IP Addr               : 10.250.241.44
Mac Addr              : 78:2B:CB:0D:BB:C2
Telnet State          : Disabled
Time Zone             : US/Pacific
Data Check            : Enabled - namespace,blockmap,throttle:50%
Verify on Read        : Disabled
Marker Detection      : Enabled
Storage Usage Alert   : 98%
Hybrid replication    : Enabled
NTPD Service is      : UP
System State          : Operational Mode
Reason                : Filesystem is fully operational for I/O.
Diagnostics Collector : RUNNING Aug 21 01:40:28
Configuration Server   : RUNNING Aug 21 03:14:17
Filesystem Server      : RUNNING Aug 21 03:14:19
NDMP Daemon            : RUNNING Aug 21 03:15:56
Windows Access Server  : RUNNING Aug 21 03:14:17
HTTP Server            : RUNNING Aug 21 01:40:06
Hardware Health Monitor : RUNNING Aug 21 01:40:35
Windows Active Directory Client : RUNNING Aug 21 01:44:47
Filesystem Checker     : STOPPED
VTL Daemon             : RUNNING Aug 21 03:15:59
ISCSI Server           : RUNNING Aug 21 03:15:59
Global View Process    : RUNNING Aug 21 01:40:06
Support Portal Agent Process : STOPPED
administrator@swsys-49 >

```

Enabling Air Gap on DR3

You must enable the Air Gap feature for DR3 to work in air gap mode (close/open).

- 1 Using the DR Series system CLI, enter the following command to enable Air Gap:

```
system --rdairgap --enable
```



NOTE: By default, Air Gap is set to the **open** state, and the retention period is set to 180 days.

```

administrator@dr6300-35 > system --rdairgap --enable
Password required to proceed.
Please enter the administrator password:

Airgap mode enabled successfully.
Stopping filesystem...Done.
Starting filesystem...Done.
administrator@dr6300-35 >

```

- 2 Confirm that DR3 is in air gap mode by using the command: `system --show`


```

administrator@dr6300-35 > system --show
System Name           : dr6300-35
Current Time          : Mon Aug 21 03:35:46 2017 PDT
Service Tag           : 3H3MFB2
Product Name          : Dell DR6300
BIOS Version          : 1.3.6
Version               : 4.0.0631.4
Build                 : 64586
Build Date            : Fri Aug 18 03:04:59 PDT 2017
IP Addr               : 10.250.240.195
Mac Addr              : 14:18:77:60:A6:FC
Telnet State          : Disabled
Time Zone             : US/Pacific-New
Data Check            : Enabled - namespace,blockmap,throttle:50
Verify on Read        : Disabled
Marker Detection      : Enabled
Storage Usage Alert   : 90%
Airgap state          : Enabled and Open
Airgap retention period : 180 days
NTPD Service is       : DOWN
System State          : Operational Mode
Reason                : Filesystem is fully operational for I/O.
Diagnostics Collector : RUNNING Aug 21 02:23:35
Configuration Server  : RUNNING Aug 21 03:21:35
Filesystem Server     : RUNNING Aug 21 03:21:37
NDMP Daemon           : STOPPED
Windows Access Server : STOPPED
HTTP Server           : RUNNING Aug 21 02:23:18
Hardware Health Monitor : RUNNING Aug 21 02:37:58
Windows Active Directory Client : RUNNING Aug 21 02:41:37
Filesystem Checker    : STOPPED
VTL Daemon            : STOPPED
ISCSI Server          : STOPPED
FC Server             : STOPPED
Global View Process   : RUNNING Aug 21 02:23:18
Support Portal Agent Process : STOPPED
administrator@dr6300-35 >

```

3 You can change the Air Gap mode by using the command: `system --rdairgap --close/open`

4 You can change the retention period by using the command:
`system --rdairgap --set_retention_period <value in days>`

5 You can view the retention period by using the command:

`system --airgap --get_retention_period`

```

administrator@dr6300-35 > system --rdairgap --close
Password required to proceed.
Please enter the administrator password:
Airgap close successfully.

administrator@dr6300-35 >
administrator@dr6300-35 > system --rdairgap --set_retention_period 20
Password required to proceed.
Please enter the administrator password:

Airgap retention period set successfully.
administrator@dr6300-35 > system --rdairgap --get_retention_period

Airgap retention period is : 20 days.

```

6 You can view Air Gap mode status by using the command: `system --status`

```

administrator@dr6300-35 > system --rdairgap --status

Airgap mode is enabled and in Close State on the system.

administrator@dr6300-35 >

```

Configuring backup and op-dup

Creating containers and setting up the backup job

- Create RDA containers on DR1 and DR2, and create a container without any connection on DR3. The steps in this document will use the following example containers: rda_s on DR1, rda_m on DR2, and rda_t on DR3.

Example CLI for adding container rda_s on DR1:

```
administrator@swsys-73 > container --add --name rda_s
Container "rda_s" created successfully.
administrator@swsys-73 > connection --add --name rda_s --type RDS
Successfully added connection entry.
RDS connection Quota           : Unlimited
RDS connection Enabled        : Yes
administrator@swsys-73 >
```

Example CLI for adding container rda_m on DR2:

```
administrator@swsys-49 > container --add --name rda_m
Container "rda_m" created successfully.
administrator@swsys-49 > connection --add --name rda_m --type RDS
Successfully added connection entry.
RDS connection Quota           : Unlimited
RDS connection Enabled        : Yes
administrator@swsys-49 >
```

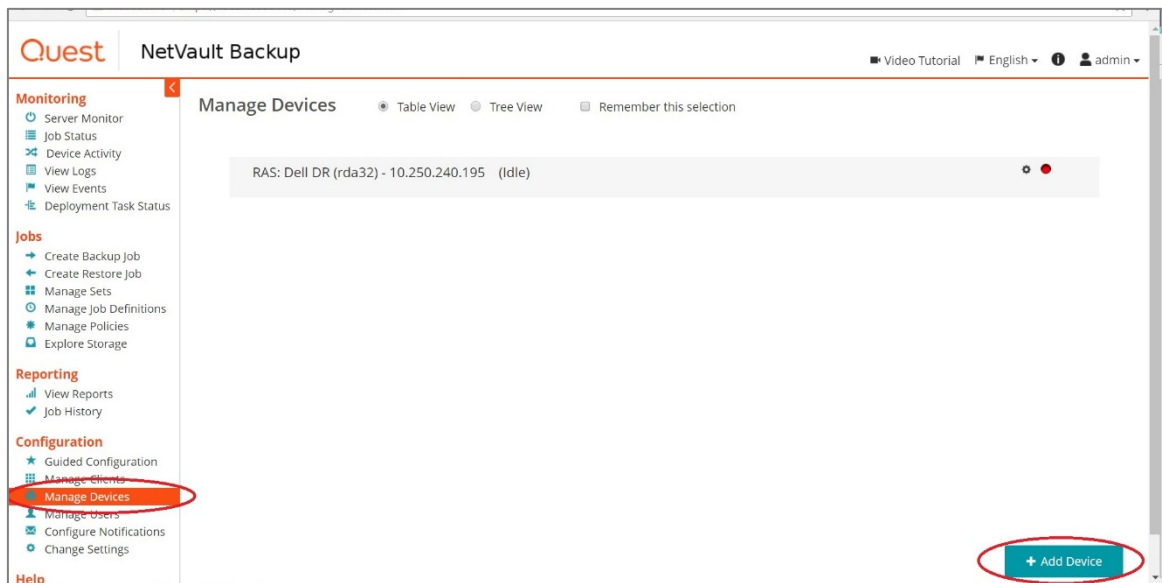
Example CLI for adding container rda_t on DR3:

```
administrator@dr6300-35 > container --add --name rda_t
Container "rda_t" created successfully.
administrator@dr6300-35 >
```

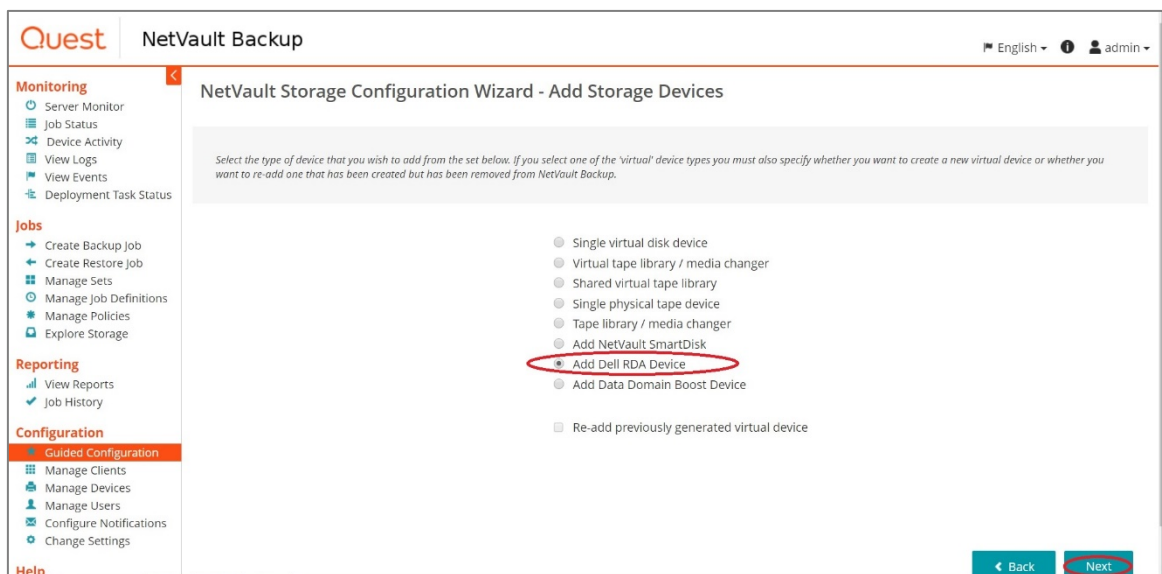
Adding DR1 and DR2 containers to NetVault Backup

In the following steps, you will add containers DR1 and DR2 to NetVault Backup by using the web interface.

- 1 From the NetVault Backup web interface, go to **Manage Devices** and click **Add Device**.



- 2 Then, click **Add Dell RDA Device**.



- 3 Enter the required information for the DR1 container `rda_s` and click **Next**.

NetVault Backup Configuration Wizard - Add Dell RDA Storage (1/2)

You now need to specify the details below to allow the Dell RDA storage device to be added to the NetVault Backup Server.

If the target device is already added to another NetVault Backup Server with the same name, select the 'Force Add' option to force the device to be added to the currently selected server. This can be useful in situations where the NetVault Backup Server has been lost and rebuilt.

Network name / IP address: 10.250.241.58

Username: backup_user

Password:

LSU: rda_s

Block Size (in KiB): 512

Stream Limit: 256

☐ Force Add

Back Next

- 4 Repeat the preceding steps for DR2 container rda_m.
- 5 Confirm that both containers are added to NetVault Backup.

NetVault Backup Manage Devices

Table View Tree View Remember this selection

RAS: Dell DR (rda_s) - 10.250.241.58 (Idle)

RAS: Dell DR (rda_m) - 10.250.241.44 (Idle)

Add Device

Configuring backup and op-dup

The instructions in this section describe how to set up backup and op-dup from NetVault Backup to DR1 and DR2 Containers

- 1 In the NetVault Backup UI, click **Create Backup Job**.
- 2 For Selections, click **Create New**.

Quest NetVault Backup

Video Tutorial English admin

Monitoring

- Server Monitor
- Job Status
- Device Activity
- View Logs
- View Events
- Deployment Task Status

Jobs

- Create Backup Job**
- Create Restore Job
- Manage Sets
- Manage Job Definitions
- Manage Policies
- Explore Storage

Reporting

- View Reports
- Job History

Configuration

- Guided Configuration
- Manage Clients
- Manage Devices
- Manage Users
- Configure Notifications
- Change Settings

Help

Create Backup Job

Create a new backup job by selecting or creating options sets below.

Job Name:

Selections: **Create New**

Plugin Options: **Create New**

Schedule: **Create New**

Target Storage: **Create New**

Advanced Options: **Create New**

Back Save Save & Submit

- 3 Select data for the backup, and click **Save**.

Quest NetVault Backup

English admin

Monitoring

- Server Monitor
- Job Status
- Device Activity
- View Logs
- View Events
- Deployment Task Status

Jobs

- Create Backup Job**
- Create Restore Job
- Manage Sets
- Manage Job Definitions
- Manage Policies
- Explore Storage

Reporting

- View Reports
- Job History

Configuration

- Guided Configuration
- Manage Clients
- Manage Devices
- Manage Users
- Configure Notifications
- Change Settings

Help

NetVault Backup Selections

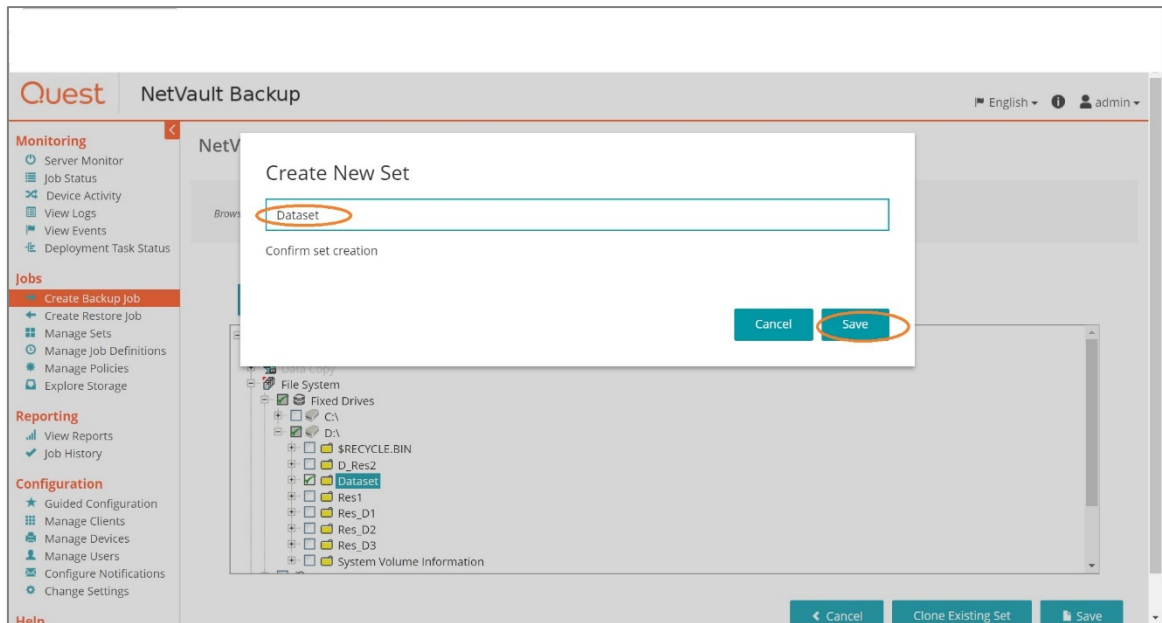
Browse to create/edit a backup selection set. Save the selection set by clicking the Save button.

Actions

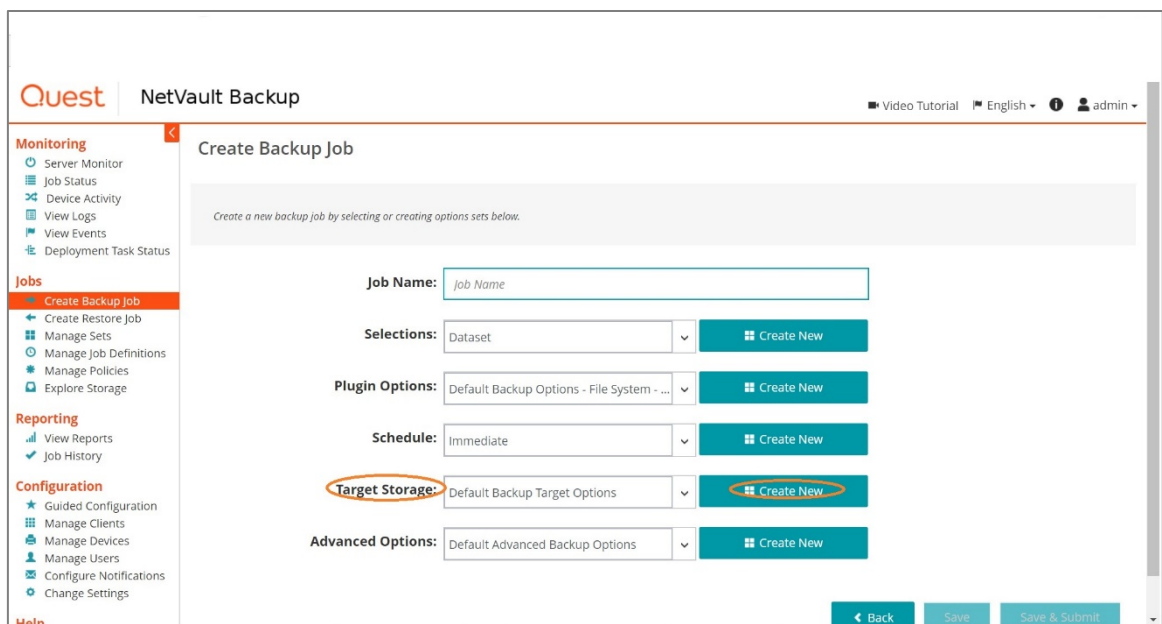
- AIRGAP1
 - Consolidate Incremental backups
 - Data Copy
 - File System
 - Fixed Drives
 - C:\
 - D:\
 - \$RECYCLE.BIN
 - D_Res2**
 - Dataset**
 - Res1
 - Res_D1
 - Res_D2
 - Res_D3
 - System Volume Information

Cancel Clone Existing Set Save

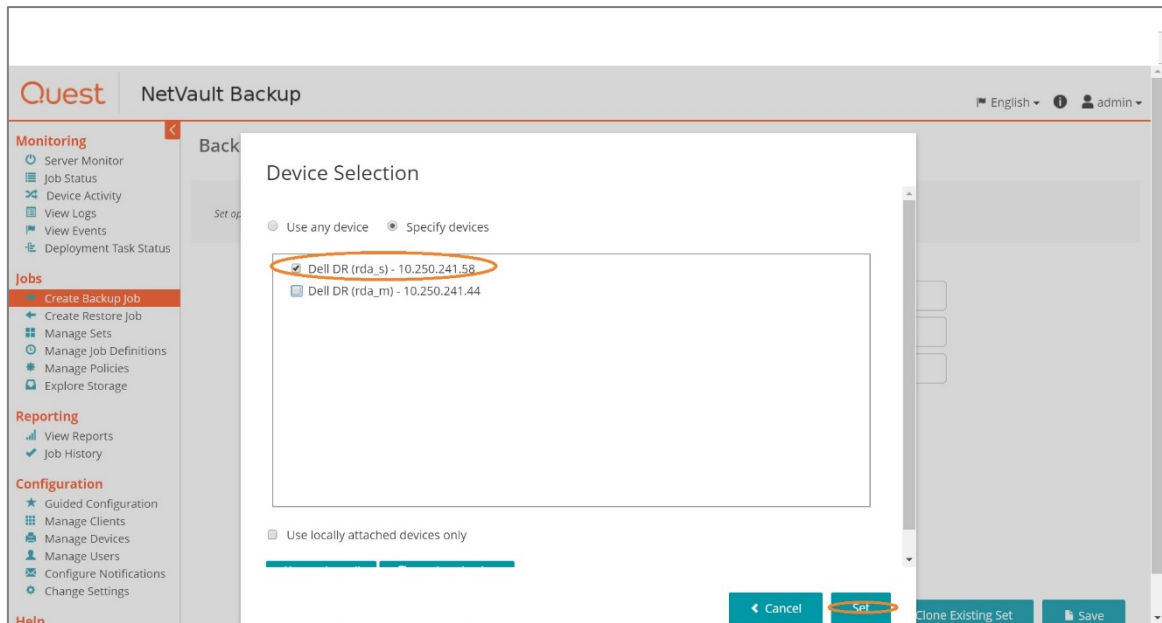
- 4 Provide a name for the dataset and click **Save**.



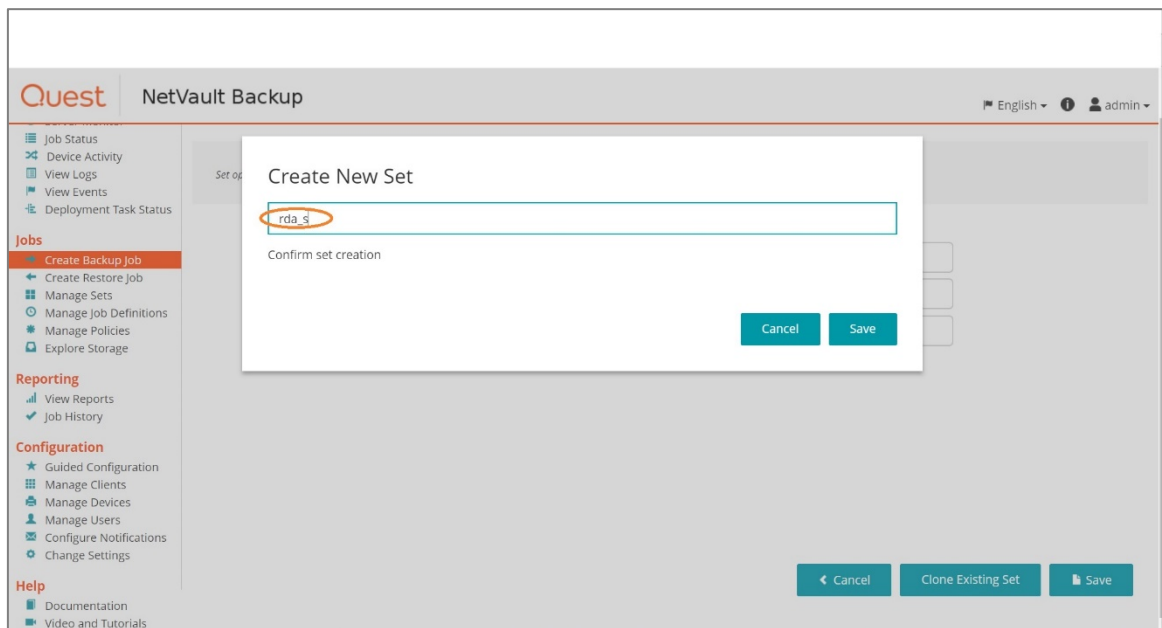
- 5 Select the required plugin options and job scheduling.
- 6 Select the Target device for backup, that is, 'rda_s' as follows: For Target Storage, click **Create New**.



- 7 Select the device as rda_s, and click **Set**.



- 8 Enter a name for the new set and click **Save**.



- 9 In Advanced Options, select the source 'rda_s' and target 'rda_m' for op-dup as follows. For Advanced Options, click **Create New**.

Quest NetVault Backup Video Tutorial English admin

Monitoring

- Server Monitor
- Job Status
- Device Activity
- View Logs
- View Events
- Deployment Task Status

Jobs

- Create Backup Job**
- Create Restore Job
- Manage Sets
- Manage Job Definitions
- Manage Policies
- Explore Storage

Reporting

- View Reports
- Job History

Configuration

- Guided Configuration
- Manage Clients
- Manage Devices
- Manage Users
- Configure Notifications
- Change Settings

Help

Create Backup Job

Create a new backup job by selecting or creating options sets below.

Job Name:

Selections: [Create New](#)

Plugin Options: [Create New](#)

Schedule: [Create New](#)

Target Storage: [Create New](#)

Advanced Options: [Create New](#)

[Back](#) [Save](#) [Save & Submit](#)

10 Select **Secondary Copy**.

Quest NetVault Backup English admin

Monitoring

- Server Monitor
- Job Status
- Device Activity
- View Logs
- View Events
- Deployment Task Status

Jobs

- Create Backup Job**
- Create Restore Job
- Manage Sets
- Manage Job Definitions
- Manage Policies
- Explore Storage

Reporting

- View Reports
- Job History

Configuration

- Guided Configuration
- Manage Clients
- Manage Devices
- Manage Users
- Configure Notifications
- Change Settings

Help

Advanced Backup Options

Select Advanced Options for Backup Job. Scripts must be placed in the 'scripts' directory below where NetVault is installed.

Backup Life	<input type="text" value="Backup Job(Never discard)"/>
Additional Options	<input type="text" value="Enable : Deduplication"/>
Secondary Copy	<input type="text" value="None"/>
Pre & Post Scripts	<input type="text" value="None"/>
Events	<input type="text" value="None"/>

[Cancel](#) [Clone Existing Set](#) [Save](#)

11 In the Secondary Copy dialog box, do the following:

- a Select **Create Secondary Copy**.
- b Select **Data Copy**.
- c For Use Target Set, create a new saveset using 'rda_m'.
- d For Use Source Set, create a new saveset using 'rda_s'.
- e After selecting other required options, click **Set**.

Quest NetVault Backup

Secondary Copy

☒ Create Secondary Copy

Copy With ☐ Duplicate ☒ Data Copy

Run Copy Job On: Server

Use Schedule Set: Immediate [Create New](#)

Use Target Set [Create New](#)

Use Source Set [Create New](#)

Maximum Streams for Data Copy: 1 Media Request Timeout: 10 Minutes

☐ Encrypt Secondary Copy Only

☐ Migrate (Discard Original)

☐ Allow Streams to Share Media

☒ Use Optimised Replication Between Devices That Support This Feature

[Cancel](#) [Set](#) [Clone Existing Set](#) [Save](#)

Quest NetVault Backup

Secondary Copy

☒ Create Secondary Copy

Copy With ☐ Duplicate ☒ Data Copy

Run Copy Job On: Server

Use Schedule Set: Immediate [Create New](#)

Use Target Set: rda_m_t [Create New](#)

Use Source Set: rda_s_s [Create New](#)

Maximum Streams for Data Copy: 8 Media Request Timeout: 10 Minutes

☐ Encrypt Secondary Copy Only

☐ Migrate (Discard Original)

☐ Allow Streams to Share Media

☒ Use Optimised Replication Between Devices That Support This Feature

[Cancel](#) [Set](#) [Clone Existing Set](#) [Save](#)

12 Enter a name for the new set and click **Save**.

The screenshot shows the Quest NetVault Backup interface. A modal dialog titled "Create New Set" is open, prompting the user to "Confirm set creation". The input field for the set name contains "rda_s-rda_m", which is circled in orange. Below the input field are "Cancel" and "Save" buttons, with the "Save" button also circled in orange. The background interface shows a sidebar with navigation options like "Jobs", "Reporting", and "Configuration", and a main area with a "Select" dropdown and a "Events" button.

The screenshot shows the Quest NetVault Backup interface with the "Create a new backup job" form. The form includes several fields and buttons: "Job Name" (containing "opdup_rda-s-to_rda-m_1", circled in orange), "Selections" (set to "Dataset", circled in orange), "Plugin Options" (set to "Default Backup Options - File System - ..."), "Schedule" (set to "Immediate"), "Target Storage" (set to "rda_s", circled in orange), and "Advanced Options" (set to "rda_s-rda_m", circled in orange). Each field has a "Create New" button next to it. At the bottom right, there are "Back", "Save", and "Save & Submit" buttons.

13 To run the saved job manually any time: Go to Manage job definitions > select saved job > Run Now.

Configuring Replication

Hybrid Replication from DR2 RDA container to DR3 container

For replication from the DR2 RDS container, you need to enable hybrid replication on DR2. You also need to ensure that Air Gap is enabled on DR3. Replication progresses only when the Air Gap is in “closed” mode. When in open mode, replication pauses and only resumes when the Air Gap is closed again.

By default, the data on DR3 is retained for 180 days after it is deleted from DR2, you can change this retention period though. Retention period when set to zero will not retain data on DR3 after it is deleted on DR2.

Starting replication from DR2 to DR3

You can start replication by using the following command from DR2:

```
replication --add --name rda_s --role source --peer <DR3 IP/Hostname> --peer_name rda_m
```

If you do not specify `--peer_name`, a container with the same name as the source container will be created on the target DR Series system. After replication is in sync (INSYNC), the container-used spaces of DR2 and DR3 should be the same. You can verify this by using the `stats --container` command.

```

administrator@swsys-49 > replication --add --name rda_m --role source --peer 10.250.240.195 --p
eer name rda_t
Enter password for administrator@10.250.240.195:
Replication entry created successfully.
Replication Container      : rda_m
Replication Role          : Source
Replication Target        : 10.250.240.195
Replication Target IP     : 10.250.240.195
Replication Target Mgmt Name : 10.250.240.195
Replication Target Mgmt IP  : 10.250.240.195
Replication Local Data Name : swsys-49.ocarina.local
Replication Local Data IP   : 10.250.243.119
Replication Target Container : rda_t
Replication Enabled        : Yes
Replication Compression Enabled : Yes
Replication Encryption     : Not Enabled

administrator@swsys-49 >
administrator@swsys-49 >
administrator@swsys-49 > replication --show
Container Name      Replication Role      Status
backup             None                 None
rda_m              Source                Enabled
administrator@swsys-49 > stats --replication

Replication Source Container : rda_m
Replication Source System    : 10.250.243.119
Replication Target Container : rda_t
Replication Target System    : 10.250.240.195
Peer Status                 : Online
Replication State           : REPLICATING
Schedule Status             : In window
Replication Average Throughput : 46234 KiB/s
Replication Maximum Throughput : 146228 KiB/s
Network Average Throughput   : 35056 KiB/s
Network Maximum Throughput   : 114725 KiB/s
Network Bytes Sent           : 1.37 GiB
Pending Bytes                : 12.87 GiB
Dedupe Network Savings      : 56.24%
Compression Network Savings  : 10.42%
Last INSYNC Time            : Unavailable
Estimated Time to Sync      : 0 days 0 hours 4 minutes 51 seconds

administrator@swsys-49 >

```

Use the replication --show command on DR2 and DR3 to confirm that replication is set. For example:

```

administrator@dr6300-35 > replication --show
Container Name      Replication Role      Status
backup             None                 None
rda_t              Target                Enabled
administrator@dr6300-35 > stats --replication

Replication Source Container : rda_m
Replication Source System    : 10.250.243.119
Replication Target Container : rda_t
Replication Target System    : 10.250.240.195
Peer Status                 : Online
Replication State           : REPLICATING
Schedule Status             : In window
Replication Average Throughput : 0 KiB/s
Replication Maximum Throughput : 0 KiB/s
Network Average Throughput   : 0 KiB/s
Network Maximum Throughput   : 0 KiB/s
Network Bytes Sent           : 280.00 B
Pending Bytes                : Unavailable
Dedupe Network Savings      : 0.00%
Compression Network Savings  : 0.00%
Last INSYNC Time            : Unavailable
Estimated Time to Sync      : Calculating...

```

You can use the `stats --replication` command to view the the replication statistics on the DR. By using this command, you can see that replication progresses on DR3 with container-used space increasing.

```
administrator@dr6300-35 > stats --container --name rda_t
Container Name      : rda_t
Container ID        : 3
Total Inodes        : 14
Read Throughput     : 0.00 MiB/s
Write Throughput    : 536.66 MiB/s
Current Files       : 6
Current Bytes       : 6469386449
Cleaner Status      : Done
administrator@dr6300-35 > stats --container --name rda_t
Container Name      : rda_t
Container ID        : 3
Total Inodes        : 14
Read Throughput     : 0.00 MiB/s
Write Throughput    : 215.03 MiB/s
Current Files       : 6
Current Bytes       : 6766985425
Cleaner Status      : Done
administrator@dr6300-35 > stats --container --name rda_t
Container Name      : rda_t
Container ID        : 3
Total Inodes        : 14
Read Throughput     : 0.00 MiB/s
Write Throughput    : 242.76 MiB/s
Current Files       : 6
Current Bytes       : 7891058897
Cleaner Status      : Done
```

When Air Gap is open you can see that replication will not progress. You can confirm this by seeing that used space remains space on DR3.

```
administrator@dr6300-35 > system --rdairgap --open
Password required to proceed.
Please enter the administrator password:
Airgap open successfully.

administrator@dr6300-35 >
administrator@dr6300-35 > stats --container --name rda_t
Container Name      : rda_t
Container ID        : 3
Total Inodes        : 14
Read Throughput     : 0.00 MiB/s
Write Throughput    : 0.00 MiB/s
Current Files       : 6
Current Bytes       : 10021765329
Cleaner Status      : Done
administrator@dr6300-35 > stats --container --name rda_t
Container Name      : rda_t
Container ID        : 3
Total Inodes        : 14
Read Throughput     : 0.00 MiB/s
Write Throughput    : 0.00 MiB/s
Current Files       : 6
Current Bytes       : 10021765329
Cleaner Status      : Done
administrator@dr6300-35 > stats --container --name rda_t
Container Name      : rda_t
Container ID        : 3
Total Inodes        : 14
Read Throughput     : 0.00 MiB/s
Write Throughput    : 0.00 MiB/s
Current Files       : 6
Current Bytes       : 10021765329
Cleaner Status      : Done
```

If DR3 is in an open state, replication will go to a disconnected state.

```
administrator@swsys-49 > stats --replication

Replication Source Container      : rda_m
Replication Source System        : 10.250.243.119
Replication Target Container     : rda_t
Replication Target System        : 10.250.240.195
Peer Status                      : Disconnected
Replication State                 : REPLICATING
Schedule Status                  : In window
Replication Average Throughput    : 0 KiB/s
Replication Maximum Throughput    : 375194 KiB/s
Network Average Throughput        : 0 KiB/s
Network Maximum Throughput        : 115445 KiB/s
Network Bytes Sent                : 5.25 GiB
Pending Bytes                    : 12.87 GiB
Dedupe Network Savings           : 56.24%
Compression Network Savings       : 10.42%
Last INSYNC Time                 : Unavailable
Estimated Time to Sync           : 0 days 0 hours 0 minutes 1 seconds

administrator@swsys-49 >
```

When the Air Gap is closed, replication should progress. After replication is INSYNC, the container spaces on DR2 and DR3 should be the same. You can confirm this by using the `stats --container` command.

```
administrator@swsys-49 > stats --replication

Replication Source Container      : rda_m
Replication Source System        : 10.250.243.119
Replication Target Container     : rda_t
Replication Target System        : 10.250.240.195
Peer Status                      : Online
Replication State                 : INSYNC
Schedule Status                  : In window
Replication Average Throughput    : 186770 KiB/s
Replication Maximum Throughput    : 734823 KiB/s
Network Average Throughput        : 64561 KiB/s
Network Maximum Throughput        : 115445 KiB/s
Network Bytes Sent                : 8.56 GiB
Pending Bytes                    : 0.00 B
Dedupe Network Savings           : 72.78%
Compression Network Savings       : 6.28%
Last INSYNC Time                 : 2017-08-21 23:18:56
Estimated Time to Sync           : 0 days 0 hours 0 minutes 0 seconds

administrator@swsys-49 >
```



```

administrator@dr6300-35 > system --rdairgap --close
Password required to proceed.
Please enter the administrator password:
Airgap close successfully.

administrator@dr6300-35 >
administrator@dr6300-35 > stats --container --name rda_t
Container Name      : rda_t
Container ID        : 3
Total Inodes        : 14
Read Throughput     : 0.00 MiB/s
Write Throughput    : 123.06 MiB/s
Current Files       : 6
Current Bytes       : 11493966033
Cleaner Status      : Done
administrator@dr6300-35 > stats --container --name rda_t
Container Name      : rda_t
Container ID        : 3
Total Inodes        : 14
Read Throughput     : 0.00 MiB/s
Write Throughput    : 112.96 MiB/s
Current Files       : 6
Current Bytes       : 11766595793
Cleaner Status      : Done
administrator@dr6300-35 > stats --container --name rda_t
Container Name      : rda_t
Container ID        : 3
Total Inodes        : 15
Read Throughput     : 0.00 MiB/s
Write Throughput    : 0.00 MiB/s
Current Files       : 7
Current Bytes       : 13823901905
Cleaner Status      : Done

```

```

administrator@dr6300-35 > stats --container --name rda_t
Container Name      : rda_t
Container ID        : 3
Total Inodes        : 15
Read Throughput     : 0.00 MiB/s
Write Throughput    : 0.00 MiB/s
Current Files       : 7
Current Bytes       : 13823901905
Cleaner Status      : Done
administrator@dr6300-35 >

```

```

administrator@swsys-49 > stats --container --name rda_m
Container Name      : rda_m
Container ID       : 17
Total Inodes       : 15
Read Throughput    : 0.00 MiB/s
Write Throughput   : 0.00 MiB/s
Current Files      : 7
Current Bytes      : 13823901905
Cleaner Status     : Done
RDS connection Used Capacity : 12.0 GiB
RDS Inbound Images Duplicated : 2
RDS Inbound Bytes Processed   : 13822853120 (12.87 GiB)
RDS Inbound Bytes Duplicated  : 13822853120 (12.87 GiB)
RDS Inbound Bytes Transferred : 8879268832 (8.27 GiB)
RDS Inbound Bytes Decrypted   : 0 (0.00 GiB)
RDS Inbound Bytes Synthesized : 0 (0.00 GiB)
RDS Inbound Network Savings   : 35.76 %
RDS Inbound Extent Errors     : 0
RDS Inbound Duplication Errors : 0
RDS Outbound Images Duplicated : 0
RDS Outbound Bytes Processed   : 0 (0.00 GiB)
RDS Outbound Bytes Duplicated  : 0 (0.00 GiB)
RDS Outbound Bytes Transferred : 0 (0.00 GiB)
RDS Outbound Bytes Encrypted   : 0 (0.00 GiB)
RDS Outbound Network Savings   : 0.00 %
RDS Outbound Extent Errors     : 0
RDS Outbound Duplication Errors : 0
RDS Outbound Timeout Errors    : 0
RDS Outbound Network Errors    : 0
RDS Bytes Synthesized         : 0
RDS Images Synthesized        : 0
RDS Images Included From      : 0
RDS Synthesized Errors        : 0
RDS Images Ingested           : 7
RDS Images Aborted            : 0
RDS Used Capacity             : 13823901905 (12.87 GiB)
RDS Image Ingest Errors       : 0
RDS Bytes Ingested            : 1049033 (0.00 GiB)
RDS Images Read               : 7926
RDS Image Read Errors         : 0
RDS Bytes Restored            : 582515 (0.00 GiB)
RDS Bytes Transferred         : 1049033 (0.00 GiB)
RDS Network Savings           : 0.00 %
administrator@swsys-49 >

```



NOTE: Do not disable hybrid replication while active replications are in progress between DR2 and DR3.

Restoring data

Restoring from DR1 and DR2 containers using NetVault Backup

There are two ways to restore data from a saveset:

- One way is to navigate as follows in NetVault Backup:
Explore Storage > Select disk or tape device > Select your device > Explore savesets > Select your saveset > Restore
- You can also do the following:
Create Restore Job > Select the saveset for restore > Next > Select what to restore > Rename/relocate if needed > Select other options like scheduling > Save

You select from which device (container) to restore by checking the Media list option in the saveset selection page.

Quest NetVault Backup

Video Tutorial English admin

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Create Restore Job - Choose Saveset

Client All Plugin All Date All Job All search filter

Saveset Name	Created	Size	Status
opdup_rda-s_to_rda-m_1 (Saveset 2)	8/22/2017, 9:55:05 AM	12.87 GiB	
opdup_rda-s_to_rda-m_1 (Saveset 1)	8/22/2017, 9:55:05 AM	12.87 GiB	

Load more... Manage Indexes...

1 - 2 of 2 items

Saveset Information

Job 60 (Instance 1)
 Title opdup_rda-s_to_rda-m_1 (Saveset 1)
 Tag None
 Server AIRGAP1
 Client AIRGAP1
 Plugin File System
 Date 8/22/2017, 9:55:05 AM
 Expires Never
 Incremental No
 Archive No
 Size 12.87 GiB

Media List

Next

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Create Selection Set

Selection Set Name AIRGAP1_Saveset_1_Selections_1503383933470

Job 60
 Title opdup_rda-s_to_rda-m_1 (Saveset 1)
 Client AIRGAP1
 Plugin File System

Action

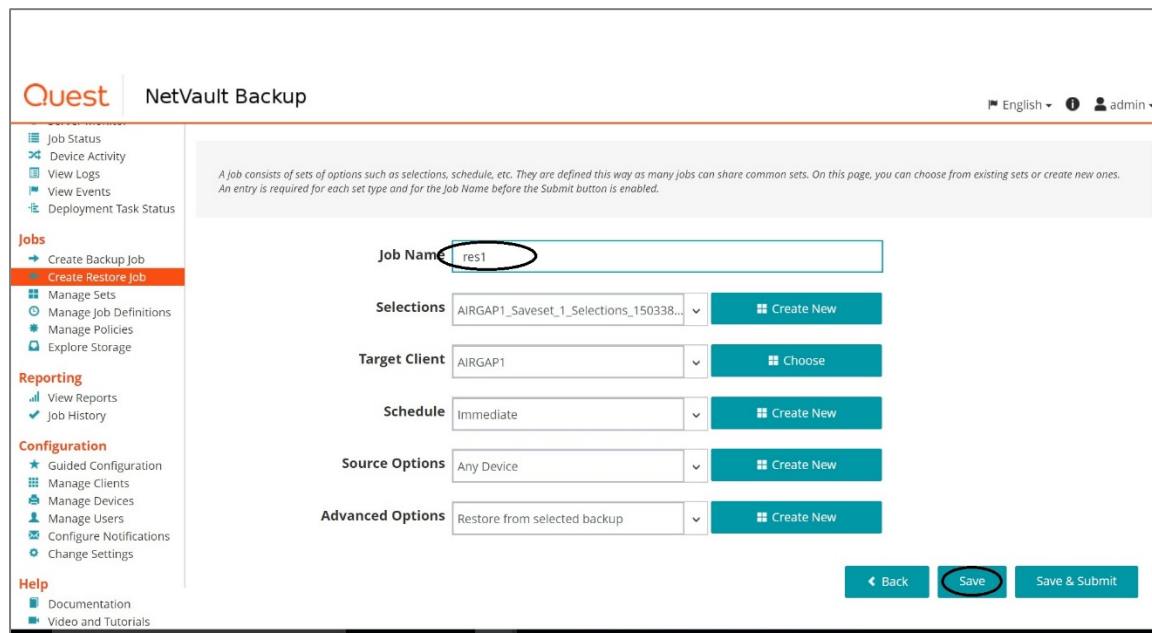
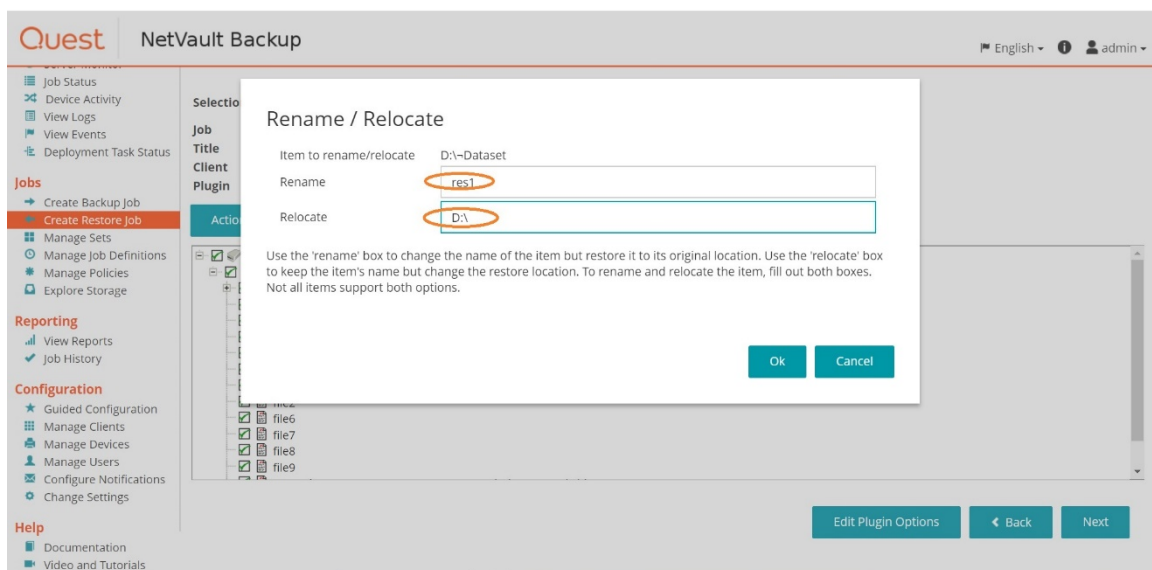
Rename...

Dataset

- netv_11.3
- 101
- 107
- 108
- WinSCP-5.9.5-Setup.exe
- Windows-KB841290-x86-ENU.exe
- file1
- file2
- file6
- file7
- file8
- file9

https://10.250.212.152:8443/configuration/jobs/restore/createselectionset.html

Edit Plugin Options Back Next



Restoring from DR3 using Primary NetVault Backup

Before restoring from DR3, ensure the following prerequisites have been met.

- Replication between DR2 and DR3 containers should be stopped and deleted. The DR3 should be in closed mode as there should be communication between DR2 and DR3 for propagating replication stop/deletion to each other.
- After replication deletion is confirmed on DR3, the container on DR3 should be given an RDS connection as follows:
`connection --add --name rda_t --type RDS`
- DR2 device should be deleted on NetVault Backup. This is needed as during backup, NetVault Backup transfers the meta-data. After replication, NetVault Backup will see the container on DR3 as the container on DR2.
- The Restore procedure is the same as described previously in the topic, Restoring from DR1 and DR2 containers using NetVault Backup; however, you would need to select the saveset from the DR3.

Example on DR2:

```
administrator@swsys-49 > replication --show
Container Name      Replication Role    Status
backup              None                 None
rda_m               Source              Enabled
administrator@swsys-49 >
administrator@swsys-49 >
administrator@swsys-49 > replication --stop --name rda_m --rolw source
--rolw is not a valid argument.
source is not a valid argument.
--role missing: Role of container.
administrator@swsys-49 > replication --show
Container Name      Replication Role    Status
backup              None                 None
rda_m               Source              Enabled
administrator@swsys-49 >
administrator@swsys-49 >
administrator@swsys-49 >
administrator@swsys-49 > replication --stop --name rda_m --role source
Replication configuration updated successfully.
Replication Container      : rda_m
Replication Role           : Source
Replication Target         : 10.250.240.195
Replication Target IP      : 10.250.240.195
Replication Target Mgmt Name : 10.250.240.195
Replication Target Mgmt IP  : 10.250.240.195
Replication Local Data Name : swsys-49.ocarina.local
Replication Local Data IP   : 10.250.243.119
Replication Target Container : rda_t
Replication Enabled        : No
Replication Compression Enabled : Yes
Replication Encryption     : Not Enabled
administrator@swsys-49 > replication --show
Container Name      Replication Role    Status
backup              None                 None
rda_m               Source              Disabled
administrator@swsys-49 > replication --delete --name rda_m --role source
Successfully marked replication for deletion. Please run "container --show --verbose" to check
the status of replication.
administrator@swsys-49 > replication --show
Container Name      Replication Role    Status
backup              None                 None
rda_m               None                 None
administrator@swsys-49 >
```

Example on DR3 :

```

administrator@dr6300-35 > replication --show
Container Name      Replication Role    Status
backup              None                 None
rda_t               Target              Enabled
administrator@dr6300-35 > replication --show
Container Name      Replication Role    Status
backup              None                 None
rda_t               Target              Disabled
administrator@dr6300-35 >
administrator@dr6300-35 > replication --show
Container Name      Replication Role    Status
backup              None                 None
rda_t               None                 None
administrator@dr6300-35 >
administrator@dr6300-35 > connection --add --name rda_t --type RDS
Successfully added connection entry.
RDS connection Quota      : Unlimited
RDS connection Enabled    : Yes
administrator@dr6300-35 >
administrator@dr6300-35 > container --show --name rda_t
Container's Group ID      : 0
Container's Group Name    : DefaultGroup
Container Name            : rda_t
Container Path            : /containers/rda_t
Container Marker          : None
RDS connection Quota      : Unlimited
RDS connection Used Capacity : 0.0 GiB
RDS connection Enabled    : Yes
RDS connection status     : Available
administrator@dr6300-35 >

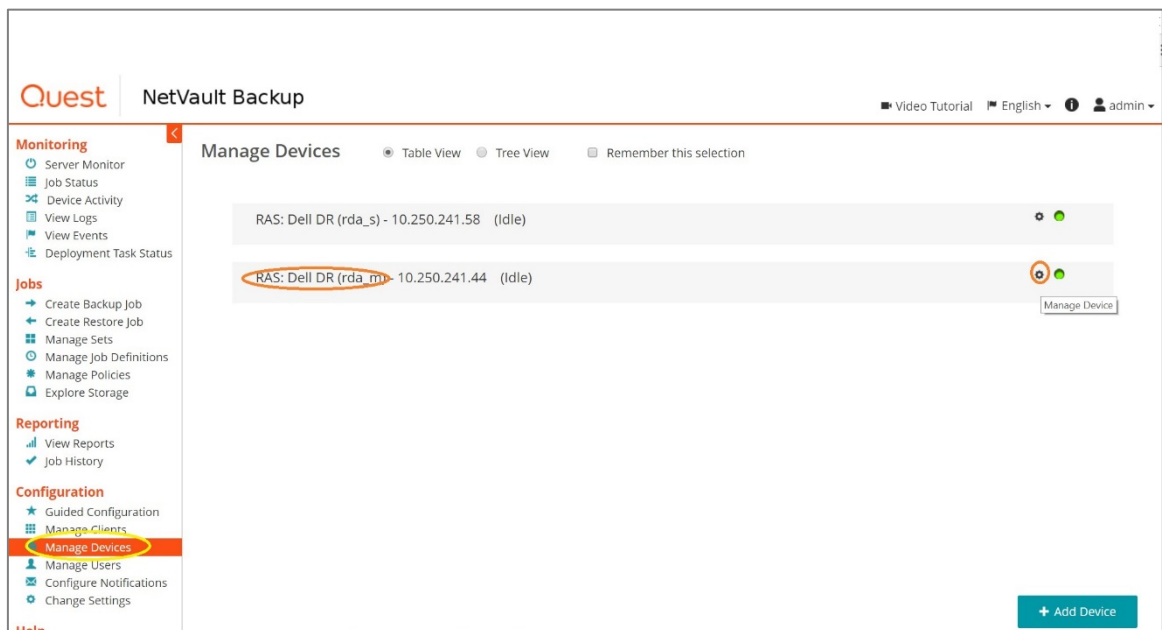
```

Annotations in the terminal output:

- Before replication stop (points to the first `replication --show` command)
- After Replication stop (points to the second `replication --show` command)
- After Replication delete (points to the third `replication --show` command)
- Connection add (points to the `connection --add` command)

You need to delete the DR2 device on NetVault Backup as described below.

- 1 Click **Manage Devices** and select the device.



2 Click **Remove**.

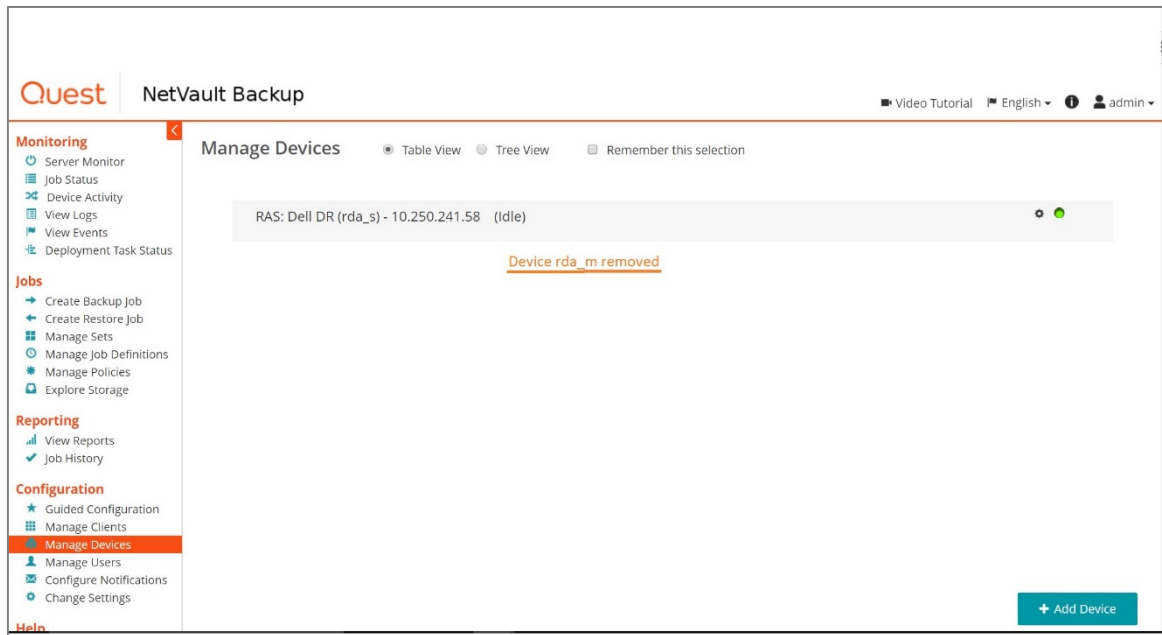
The screenshot shows the Quest NetVault Backup web interface. The left sidebar contains navigation menus for 'Configuration', 'Reporting', and 'Help'. The 'Manage Devices' option is highlighted. The main content area displays details for a device named 'Dell DR (rda_m) - 10.250.241.44'. The status is 'Available'. A message states 'There are no transfers currently in progress'. At the bottom, a row of buttons includes 'Back', 'Expire All', 'Update', 'Check', 'Offline', 'Remove' (circled in orange), and 'Scan'.

Property	Value
Name	Dell DR (rda_m) - 10.250.241.44
DR OS Version	4.0.631.0
Client RDA API Version	3.2.621.2
Status	Available
Activity	Idle
Data Stored	12.87 GiB
Space Used	9.61 GiB
Space Available	15.92 TiB
Block Size (in KiB)	512
Stream Limit	256
Deduplication ratio	Not available
Group	NONE

3 Click **Remove** to confirm deletion.

The screenshot shows the same Quest NetVault Backup web interface, but with a 'Remove Device' confirmation dialog box open. The dialog asks 'Are you sure you want to remove this device?' and provides instructions on what happens to backups and the device's status. It includes a 'Force Removal' checkbox. At the bottom of the dialog, the 'Remove' button is circled in orange. The background interface is dimmed.

- 4 Verify the device has been removed.



- 5 Add the container rda_t to NetVault Backup.



- 6 Then restore the saveset from rda_t as described in the topic, Restoring from DR1 and DR2 containers using NetVault Backup.

Restoring from DR3 using a secondary NetVault Backup in isolated network

Ensure the following prerequisite has been met before creating a NetVault Backup server in the isolated network:

- The NetVault Backup server in the isolated network should have the same 'NetVault Backup Server name' as the Primary NetVault Backup Server. This is the NetVault Backup Server name and not the hostname/FQDN of the NetVault Backup Server. The NetVault Backup Server name will be, by default, the hostname during installation, but it is recommended to provide a name other than Hostname.

Ensure the following prerequisites have been met before adding the DR3 container to the NetVault Backup server in the isolated network:

- The NetVault Backup services on the Primary NetVault Backup Services should be stopped or the Device from DR2 on the Primary NetVault Backup server needs to be deleted. If you are not deleting or stopping the NetVault Backup services while adding the device to the isolated NetVault Backup Server, the device on the Primary NetVault Backup server can go offline. (This is because the NetVault Backup names are the same and the devices are considered as the same by both NetVault Backups).
- Replication between DR2 and DR3 containers should be stopped and then deleted. DR3 should in closed mode as there should be communication between DR2 and DR3 for propagating replication stop/deletion to each other.
- After replication deletion is confirmed on DR3, the container on DR3 should be given an RDS connection as follows:

```
connection --add --name rda_t --type RDS
```
- Then, follow the restore procedure as described in the topic, Restoring from DR1 and DR2 containers using NetVault Backup.

Verifying the retention period on DR3

Depending on the retention period set, the DR3 container should retain data until the retention period ends from the time of deletion on the DR2 container.

To confirm that the data is retained even after it is deleted on DR2 container, you can manually delete the saveset on the DR2 container from NetVault Backup by using the following procedure.

- Explore storage > Select device > Explore saveset > Select saveset > Remove saveset.

Quest

NetVault Backup

Video TutorialEnglishadmin

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Savesets:

2

Backup Savesets

Disk Storage:

25.75 GiB

22.48 GiB

1.1:1

Total data stored

Physical space used

Deduplication ratio

Tape & VTL Storage:

0.00 KiB

0

0

Total data stored

Individual media items

Blank media items available

Tape vs Disk Storage

Tape & Disk Storage Sizes

Explore Disk Storage

Explore Tape Storage ...

Quest

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Explore Disk Storage

Choose a disk storage repository from the list below:

search

	Repository Name	Type	Record Count	Saveset Count	Space Free	Space Used	Deduplication ratio
<input checked="" type="checkbox"/>	Dell DR (rda_m) - 1	Dell DR (rda_m)	2	1	15.92 TiB	9.61 GiB	Not available
<input checked="" type="checkbox"/>	Dell DR (rda_s) - 1...	Dell DR (rda_s)	2	1	14.85 TiB	12.87 GiB	Not available

1 - 2 of 2 items

Back

Scan

Explore Repository

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Repository Name

Dell DR (rda_m) - 10.250.243.119

Data Stored

12.87 GiB

Physical space used

9.61 GiB

Space Available

15.92 TiB

Storage Data Type

Filter Options

search

	Saveset Date	Saveset Name	Size	Job/Instance/Phase
	8/22/2017, 9:55:	opdup_rda-s to f...	12.87 GiB	60 / 1 / 2

Load more ...

Back

Restore

View Job

Expire All

Remove Savesets

Examine Saveset

Quest

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Remove Saveset

Are you sure you wish to remove selected saveset(s)?

☐ Remove all duplicates associated with selected saveset(s).

Select removal timing option. Note: If the Media Manager configuration option "Retirement Timing Control" is set to "Force Always", "Force immediate removal" will be used regardless of the choice made here.

☒ Mark for removal. If there are no dependent incremental or differential backups, saveset removal will be immediate, otherwise saveset removal will be deferred until all dependent backups are ready for retirement.

☐ Force immediate removal, with the possible consequence of early retirement of dependent incremental or differential backups. See the NetVault Administrator's Guide "Backup retirement" section for information on retirement.

Cancel

Ok

Back

Restore

View Job

Expire All

Remove Savesets

Examine Saveset

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Explore Disk Storage Repository

Repository Name

Dell DR (rda_m) - 10.250.243.119

Data Stored

12.87 GiB

Physical space used

9.61 GiB

Space Available

15.92 TiB

Storage Data Type

Filter Options

search

Saveset Date	Saveset Name	Size	Job/Instance/Phase
Saveset Missing			

No items to display

Load more

Back

Restore

View Job

Expire All

Remove Savesets

Examine Saveset

After removing the saveset on DR2 container, either from the isolated NetVault Backup or the primary NetVault Backup, add the DR3 container and verify that the saveset is present on DR3. You should be able to restore.