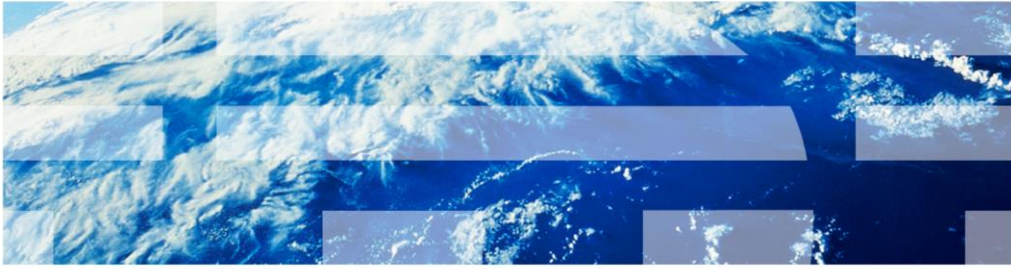


IBM Tivoli Storage Manager 6.2

Disaster Recovery Manager basics



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In this module, you learn how to implement Tivoli Storage Manager Disaster Recovery Manager (DRM) basics.

Assumptions

You are familiar with Tivoli Storage Manager version 5.5 or higher

An assumption is that you are familiar with Tivoli Storage Manager version 5.5 or higher.

Objectives

After completing this module, you can perform these tasks:

- Configure DRM settings
- Describe the daily process and the DRM media movement commands
- Describe the PREPARE command and the recovery process

After completing this module, you can configure DRM settings and describe the daily process and the DRM media movement commands. You can also describe the PREPARE command and the recovery process.

Configuring DRM settings

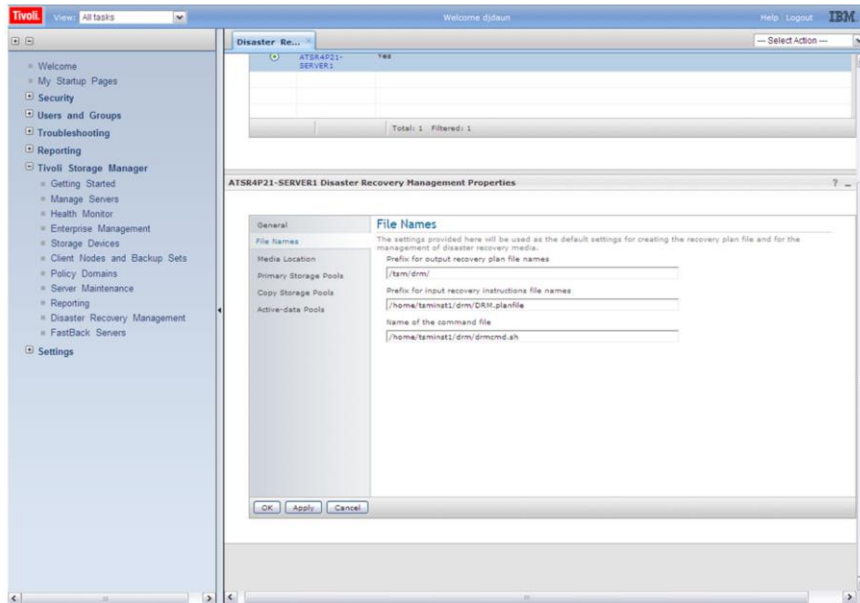
```
QUERY DRMSTATUS
SET DRMDBBACKUPEXPIREDDAYS days

tsm: SERVER1>q drmstatus

    Recovery Plan Prefix: /tsm/drm/
    Plan Instructions Prefix: /home/tsminst1/drm/DRM.planfile
Replacement Volume Postfix: @
    Primary Storage Pools:
    Copy Storage Pools: DRPOOL
    Active-Data Storage Pools:
Not Mountable Location Name: Room M156 Kevin Shelf
    Courier Name: Gburg Currier Service
    Vault Site Name: Gburg Vault
    DB Backup Series Expiration Days: 2 Day(s)
Recovery Plan File Expiration Days: 2 Day(s)
    Check Label?: Yes
    Process FILE Device Type?: No
    Command File Name: /home/tsminst1/drm/drmcmd.sh
```

Use the QUERY DRMSTATUS command to see the DRM settings for your Tivoli Storage Manager server. You can change the settings with a SET command. The parameter names for the DRM settings start with DRM as in the example SET DRMDBBACKUPEXPIREDDAYS. Several of the more important settings are highlighted in blue. At a minimum, set the DB Backup Series Expiration Days to control the number of days to keep Tivoli Storage Manager database backups. You also use this setting to set the copy storage pools and control which copy storage pools participate in the DRM processing. See the *Tivoli Storage Manager Administrators Reference* for details about setting these values.

Using the Administration Center to configure DRM



Disaster Recovery Manager basics

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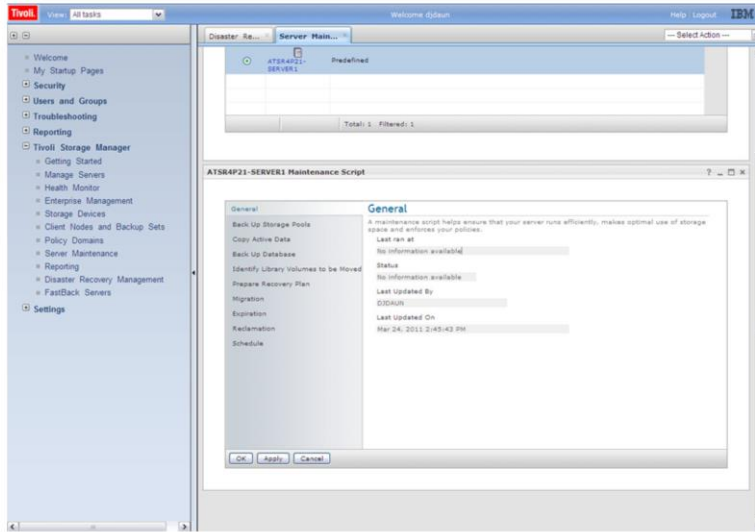
As an alternative to using the command line, you can initialize or change the DRM settings from the Administration Center user interface.

Daily process steps

1. Tivoli Storage Manager: Back up the storage pool
2. Tivoli Storage Manager: Copy to an active data pool
3. Tivoli Storage Manager: Back up the database
4. Tivoli Storage Manager: Identify the offsite cartridges
5. Library: Eject the cartridges
6. Operator: Remove the cartridges and send them to a courier
7. Courier: Carry them to a vault
8. Tivoli Storage Manager: Identify the empty cartridges in the vault
9. Courier: Carry the empty cartridges to onsite
10. Operator: Insert the empty (scratch) cartridges into the library

These steps are the typical daily process to create backups for disaster recovery. You can use copy storage pools, active data storage pools, or both for offsite processing. You must have a database backup to perform disaster recovery. The Tivoli Storage Manager database holds all the metadata for the backups.

Maintenance script to automate DRM processes

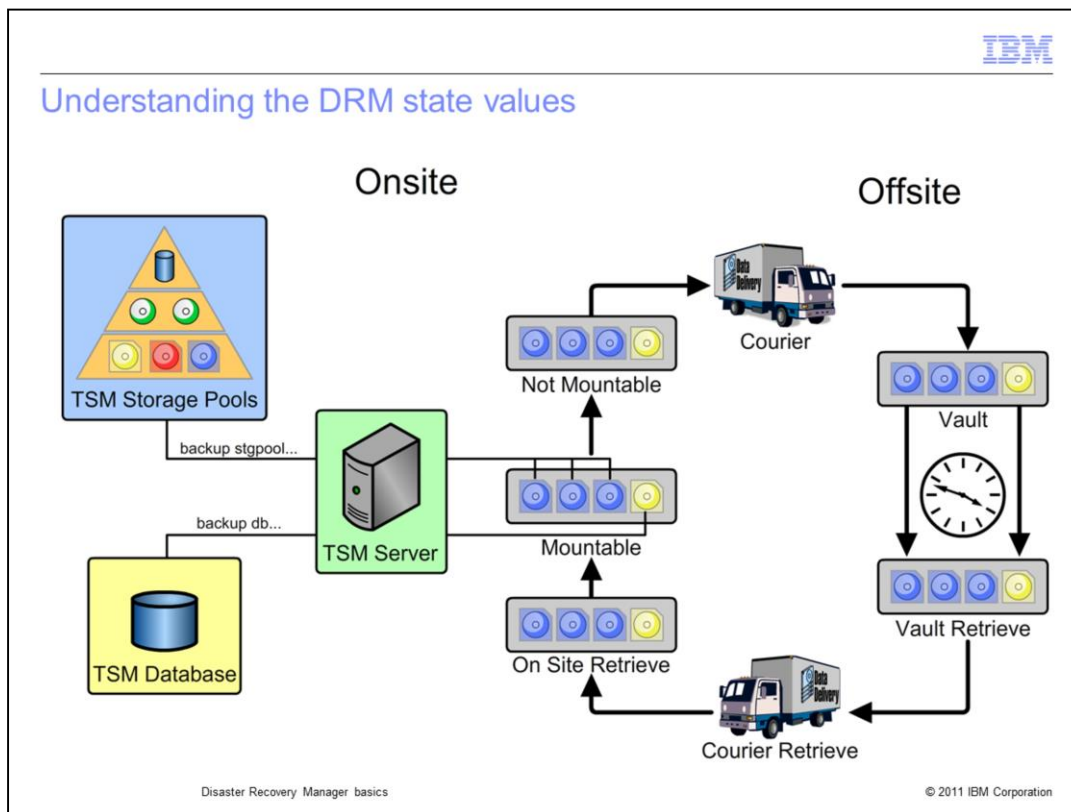


Disaster Recovery Manager basics

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Using the built-in Tivoli Storage Manager maintenance script or a custom maintenance script is a way to automate the daily DRM process. Other options include using an operating system script or batch file.

Understanding the DRM state values



On this slide, you see the DRM media management commands to complete the daily processing. DRM assigns state values to the tape cartridges to keep track of them as they move offsite and then back onsite again. Tapes in the MOUNTABLE state are those tapes that contain disaster recovery data and are in the tape library. Tapes in the NOTMOUNTABLE state have been removed from the tape library but are still at the primary facility. Tapes in the COURIER state have been turned over to the courier and are on their way to the offsite storage. Tapes in the VAULT state are non-empty and at the offsite storage. As tapes become empty and satisfy their reuse delay setting, they are automatically transitioned to the VAULTRETRIEVE state. Tapes that are with the courier and on their way back to the primary facility are in the COURIERRETRIEVE state. After tapes return to the primary facility, they have the ONSITERETRIEVE state. Tapes that were automatically added to the storage pool from scratch are returned to scratch when they reach the ONSITERETRIEVE state.

Identify the cartridges that are ready for offsite

```
QUERY DRMEDIA * WHERESTATE=MOUNTABLE
```

- Generate a list of tapes that are ready for offsite
- Provide the list to the operations staff
 - Email the list to tape operations
 - Indicate that it is time to remove tapes from the library
- Tape operations can check off the tapes as they remove them from the tape library

```
tsm: SERVER1>q drmedia * wherestate=mountable
```

Volume Name	State	Last Update Date/Time	Automated LibName
ATS300L3	Mountable	10/28/2010 18:53:16	TS3584
ATS308L3	Mountable	03/24/2011 16:09:39	TS3584
ATS305L3	Mountable	03/24/2011 16:09:39	TS3584

You use the QUERY DRMEDIA command to create lists of disaster recovery tapes and their associated state values. The QUERY DRMEDIA command in this example shows how to create a list of disaster recovery tapes that are ready to be ejected from the tape library and sent offsite. It is important to create lists like this one for cross-checking. The list can be sent to the operations staff, and they can use it to check off the tapes as they come out of the tape library.

Eject the tapes from the library

```
MOVE DRMEDIA * WHERESTATE=MOUNTABLE TOSTATE=VAULT SOURCE=DBBACKUP
```

- Use this command to eject tapes from most libraries
Has the same effect as CHECKOUT LIBVOL REM=YES
- Tape operations staff must be trained to interact with the library to ensure that all cartridges have been removed
Having an eject list (created in the previous step) is important here

You use the MOVE DRMEDIA command to change the states of the disaster recovery tapes. The only exception is the change from VAULT state to VAULTRETRIEVE state. This change happens automatically. Issue the MOVE DRMEDIA command at appropriate times as the tapes move through the onsite and offsite cycle. This command shows the move from MOUNTABLE state directly to VAULT state. You do not have to use all of the state values. When the state is changed from MOUNTABLE to any other valid state, Tivoli Storage Manager automatically ejects the tapes from the tape library. It is important to have good operations procedures to ensure that all tapes have been properly removed from the library and packaged for shipment to the offsite storage.

Run the PREPARE command

```
PREPARE SOURCE=DBBACKUP WAIT=YES
```

- Use this command to generate the Tivoli Storage Manager plan file based on the setup commands
- Put the plan file where it can be retrieved at the disaster site
 - Send it to another site by way of NFS or CIFS mount
 - Email it
 - Put it on media, for example, a flash drive or CD

The next step is to run the PREPARE command. The PREPARE output is a plan for recovery of the Tivoli Storage Manager server. The output is a flat file, which must be transported to the disaster recovery site when necessary. Store the file in a safe location. It is too small to put on a high-capacity tape cartridge. Send the file to another site by way of an NFS or CIFS connection or email it to a safe and secure location. An alternative is to place it on media, like a flash drive or a CD, and then send that media to a safe location.

Generate a list of empty tapes to retrieve from the vault

```
QUERY DRMEDIA * WHERESTATE=VAULTRETRIEVE
```

Use this command to generate a list of tapes that are empty, that satisfy their reuse delay setting, and are ready to return from the vault.

- Package this list with the set of tapes going to the offsite
- Email this list to the offsite provider
- Use an electronic interface to the offsite provider
- Save the output and use it as an audit trail

```
tsm: SERVER1>q drmedia * wherestate=vaultretrieve
```

Volume Name	State	Last Update Date/Time	Automated LibName
-----	-----	-----	-----
ATS307L3	Vault Retrieve	11/24/2010 18:53:16	TS3584
ATS309L3	Vault Retrieve	02/19/2011 16:09:39	TS3584

When tapes in the offsite storage are empty and satisfy their reuse delay, they automatically change to the VAULTRETRIEVE state. The QUERY DRMEDIA command generates a list of these tapes so that they can be returned from the offsite storage. The list can be printed and sent with the outgoing tapes. In some cases, it can be electronically transmitted to the offsite storage provider.

Perform the state change for tapes that have returned

```
MOVE DRMEDIA * WHERESTATE=VAULTRETRIEVE TOSTATE=ONSITERETRIEVE
```

- Use this command to change the state for all VAULTRETRIEVE tapes
Tapes can then be reinserted to the library
- Issue this command for individual tapes as they are received at the primary location:

```
MOVE DRMEDIA ATS300L3 TOSTATE=ONSITERETRIEVE
```

Use this command to indicate that tapes have returned from the offsite location and are ready to be inserted into the tape library for reuse. The MOVE DRMEDIA command updates all tapes in the VAULTRETRIEVE state. You can use a similar command to make the change one tape at a time, if required.

Check in empty tapes to be reused as scratch

```
CHECKIN LIBVOL TS3584 CHECKLABEL=BARCODE SEARCH=BULK STATUS=SCRATCH  
- WAITT=0
```

- Issue this command after the tapes have been placed into the Import/Export port of the tape library
- Use a value greater than zero for 'WAITT='
The library waits for a prompt (a Tivoli Storage Manager REPLY command) before importing the cartridges
- The tape operators use the checklist from the previous step to avoid missed cartridges

The tapes must be inserted into the tape library to make them available for reuse. The CHECKIN LIBVOL command is used for this purpose. This example uses the SEARCH option to find all newly inserted tapes for check-in. If the Tivoli Storage Manager server shares the tape library with other applications, problems can occur because Tivoli Storage Manager can check in tapes that belong to another application. Use a volume serial number range on the check-in command or check in the tapes one by one to avoid this problem. Use a WAITT value greater than zero. Be sure to reference the vault retrieve checklist created earlier to ensure that all tapes have returned from the offsite storage.

PREPARE output: Planfile stanzas

- Informational stanzas
 - Custom instruction stanzas
 - Recovery scripts
 - Tivoli Storage Manager macros
 - Tivoli Storage Manager configuration files
- Explode the Planfile
- SERVER.REQUIREMENTS
 - RECOVERY.INSTRUCTIONS.GENERAL
 - RECOVERY.INSTRUCTIONS.OFFSITE
 - RECOVERY.INSTRUCTIONS.INSTALL
 - RECOVERY.INSTRUCTIONS.DATABASE
 - RECOVERY.INSTRUCTIONS.STGPOOL
 - RECOVERY.VOLUMES.REQUIRED
 - RECOVERY.DEVICES.REQUIRED
 - RECOVERY.SCRIPT.DISASTER.RECOVERY.MODE script
 - RECOVERY.SCRIPT.NORMAL.MODE script
 - DB.STORAGEPATHS
 - LICENSE.REGISTRATION macro
 - ACTIVEDATASTGPOOL.VOLUMES.AVAILABLE macro
 - ACTIVEDATASTGPOOL.VOLUMES.DESTROYED macro
 - COPYSTGPOOL.VOLUMES.AVAILABLE macro
 - COPYSTGPOOL.VOLUMES.DESTROYED macro
 - PRIMARY.VOLUMES.DESTROYED macro
 - PRIMARY.VOLUMES.REPLACEMENT macro
 - STGPOOLS.RESTORE macro
 - VOLUME.HISTORY.FILE
 - DEVICE.CONFIGURATION.FILE
 - DSMSERV.OPT.FILE
 - LICENSE.INFORMATION

The PREPARE output is called a Planfile. The Planfile is a plain text file that is a series of stanzas. There are several different types of stanzas. Some contain information about the Tivoli Storage Manager server, which are useful in a server restore event. Some of the stanzas contain scripts and Tivoli Storage Manager macros that can be used to automate the recovery. Five stanzas can contain user custom instructions. Three stanzas contain the volume history file, device configuration file, and the server options file. At the disaster recovery site, the planfile must be exploded (broken into many files) one for each stanza. The Tivoli Storage Manager server includes an awk, REXX, or VisualBasic script to automatically explode the stanzas.

Custom instruction stanzas: RECOVERY.INSTRUCTIONS.XXXX

You can include some of these items:

- **General information about the server:** hardware type, operating system level
- **Support staff contact names and numbers:** Tivoli Storage Manager administrator, system administrators, management
- **Information about client systems:** Restore priority, unique restore requirements
- **Information about travel:** Airlines, hotels, and others
- **Security information:** Access to the disaster recovery site, access to passwords
- **Hardware replacement procedures:** Vendor contacts, account numbers
- **Location of all vendor contracts:** Verification in case of problems
- **Disaster declaration procedures:** Documentation procedures, responsibilities
- **Courier information:** Contacts, service level expectations
- **Telecommunications requirements:** WAN provider contacts and procedures to institute alternate connections, Internet Service Provider contacts, TelCo contacts and alternate service plan
- **Plan for alternate office space and appropriate contacts**
- **Modified Device Configuration file (preconfigured)**

In this list are some ideas to include in the custom instruction stanzas. These stanza names start with the prefix, RECOVERY.INSTRUCTIONS. Often, you must create a modified device configuration file to support the tape hardware configuration at the disaster recovery site. This altered device configuration file can be preconfigured and stored in one of the custom instruction stanzas.

RECOVERY.SCRIPT.DISASTER.RECOVERY.MODE RECOVERY.SCRIPT.NORMAL.MODE script

- You use these two scripts to perform the recovery actions by issuing operating system commands and by running a series of Tivoli Storage Manager administrative macros. The macros are all stanzas in the recovery plan
- You can run these scripts directly or use them as templates to run commands manually

The Planfile contains two scripts, which contain operating system commands. These commands call Tivoli Storage Manager macros to perform all the steps that are necessary to recover the Tivoli Storage Manager server at the disaster recovery site. In some cases, you can run these scripts as-is. However, differing hardware at the disaster recovery site might make it impossible to do so. In these cases, you can use the scripts and macros as templates for the recovery. You can cut and paste the commands for execution.

The RECOVERY.SCRIPT.DISASTER.RECOVERY.MODE script recovers the server and makes the copy storage pool volumes or active data pool volumes available for client restores. The RECOVERY.SCRIPT.NORMAL.MODE script recovers the primary storage pools, if necessary.

The DRM commands

- SET DRM....
- QUERY DRMEDIA
- MOVE DRMEDIA
- PREPARE

For complete syntax, visit this website and consult the *Tivoli Storage Manager Administrator's Reference*:

http://www-01.ibm.com/support/knowledgecenter/SSGSG7_6.2.0/com.ibm.itsm.nav.doc/r_pdf_srv.html

You can use these DRM commands to implement disaster recovery backups. See the *Tivoli Storage Manager Administrators Reference* for more information about these commands.

Summary

Now that you have completed this module, you can perform these tasks:

- Configure DRM settings
- Describe the daily process and the DRM media movement commands
- Describe the PREPARE command and the recovery process

Now that you have completed this module, you can configure DRM settings and describe the daily process and the DRM media movement commands. You can also describe the PREPARE command and the recovery process.



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