Database Backup and Restore Mechanism

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Database Server Connection Error

Suppose error is handled gracefully. The error message may be :-
The Database server is down. Please wait till its up and running.

Person responsible for handling such kind of errors :-

• **Database Administrator (DBA)**
By definition is a person responsible for the design, implementation, maintenance and repair of an organization's database.
Source : http://en.wikipedia.org/wiki/Database_administrator
Roles and Responsibilities of DBA [1]

• Installing and upgrading tools on database server.
• Using storage properly.
• Transferring Data
• Scheduling Events
• Performing backups and recovery duties
  (this point to be covered in detail)
Plus many more .......
Recovery Models

Before beginning to take backups the business needs to define the database recovery model.

3 Recovery models are:
• Simple
• Full
• Bulk Logged
Methods for backing up databases

• Full backup
  
  BACKUP DATABASE TestDB
  TO DISK = 'C:\DB2\Backups\TestDB_Apr25_2010.bak',

• Transactional log
  
  BACKUP LOG TestDB
  TO DISK = 'C:\DB2\Backups\TestDB_Apr_25_2010_1819.trn'

• Differential backup
  
  BACKUP DATABASE TestDB
  TO DISK = 'C:\DB2\Backups\TestDB.diff'
  WITH DIFFERENTIAL
Striping Backups

BACKUP DATABASE TestDB
TO DISK = 'C:\DB2\Backups\TestDB_Strip1.bak',
DISK = 'D:\DB2\Backups\TestDB_Strip2.bak',
DISK = 'E:\DB2\Backups\TestDB_Strip3.bak'

Mirroring Backups

BACKUP DATABASE TestDB
TO DISK = 'C:\DB2\Backups\TestDB_Original.bak'
MIRROR TO DISK = 'D:\DB2\Backups\TestDB_Mirror_1.bak'
MIRROR TO DISK = 'E:\DB2\Backups\TestDB_Mirror_2.bak'
MIRROR TO DISK = 'F:\DB2\Backups\TestDB_Mirror_3.bak'
WITH FORMAT
Restoring Databases

• RESTORE is not always an online operation.
• For full database restore user connections must be disconnected from the database prior to restoring over the database.
  
  Can be done as follows:
  ALTER DATABASE TestDB
  SET SINGLE_USER
  WITH ROLLBACK IMMEDIATE

• Full Database restore
  
  RESTORE DATABASE TestDB
  FROM DISK = 'C:\DB2\Backups\TestDB_Apr25_2010.bak'
  WITH NORECOVERY, REPLACE
  
  Note: REPLACE argument is used to tell SQL server to overlay the existing TestDB database.

  Transaction log restore
  
  RESTORE LOG TestDB
  FROM DISK = 'C:\Apress\Recipes\TestDB_Apr25_2010_log.trn'
  WITH RECOVERY
Scheduling Backups

• Daily backups can be done by SQL Server Agent using the Management studio tool in sql server 2005
• A schedule is to be created and automatically the backups will be created based on the specified time.
• Another option is to use sqlcmd utility for automating Transact-SQL scripting tasks. [3] & later use Windows scheduled tasks.
• pgAgent is a scheduling agent that comes packages with PgAdmin.
• pgAgent has many advantages compared to other scheduling backup tools.
• Use crontab to schedule backups repeatedly.
  add a line in crontab file which reads as :-
  15 2 * * * root mysqldump -u root –p PASSWORD --all-databases | gzip >
  /mnt/disk2/database_`data ' %m-%d-%Y'`.sql.gz

Automated Scripts

• Can write sql stored procedures with input parameter as database name and type of backup.
• Execute the scripts with required parameters as required.
Tools used: Mysqldump, pg_dump

Mysqldump

- backup a local database and restore it on remote database at the same time in Mysql.[4]

For Backup

Shell> mysqldump -u root -p[root_password] [database_name] > dumpfilename.sql
- For faster dump use –opt option

Copying on remote host:

shell> mysqldump --opt db_name | mysql --host=remote_host -C db_name

To dump all databases:

shell> mysqldump --all-databases > all_databases.sql

To restore:

Shell> mysqldump -u root -p[root_password] [database_name] < dumpfilename.sql

In the same way pg_dump is the utility for backing up PostgreSQL database. [5]
High Availability Solutions

• Failover clustering
• Database Mirroring
• Log Shipping
• Replication
Questions ?
References