

LAB 07 – BACKUP & RECOVER

A. PRE-REQUISITE

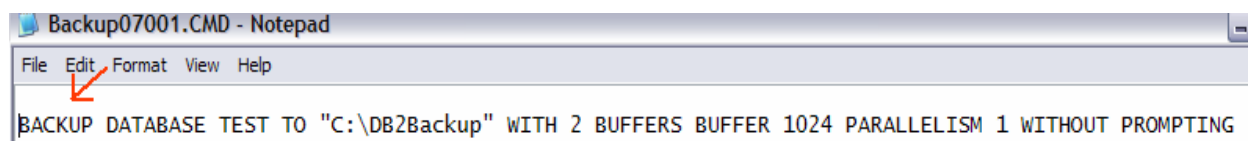
1. Get in a DB2 Command Window
2. Go to the directory `C:\POT\07 Backup`
3. We will work with a TEST database to demonstrate backup / restore.

B. OFFLINE BACKUP

Execute command `Backup07001.CMD` to create a database, add some tables to it and take an offline backup of the database. Before running this command, review the contents of the command file.

The output of all commands is stored in `Backup07001_OUTPUT.TXT` file. Please review this file after executing the command.

```
C:\POT\07 Backup>Backup07001
```

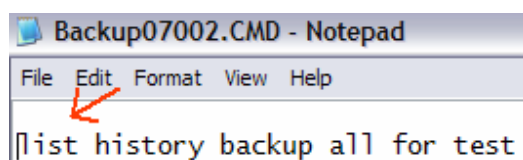


C. OFFLINE RESTORE

We need the **TIMESTAMP** of the database backup to restore it from a backup image. There are two methods to locate the **TIMESTAMP** of the last backup: one is to write down the **TIMESTAMP** of the backup from the last **BACKUP** command, the other is to see the output of the "**LIST HISTORY BACKUP ALL FOR <dbname>**" command.

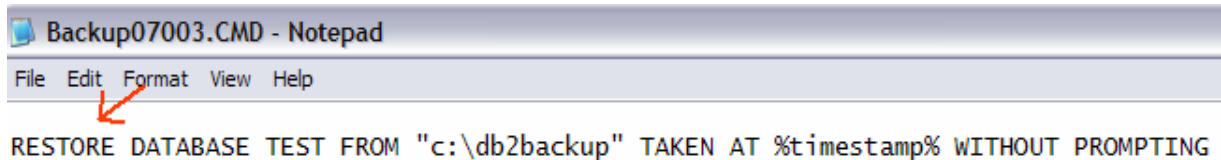
This command lists all the timestamps of all the previous backups taken on TEST database.

```
C:\POT\07 Backup>Backup07002
```



Restore the TEST database backup image using following command.

```
C:\POT\07 Backup>Backup07003
```

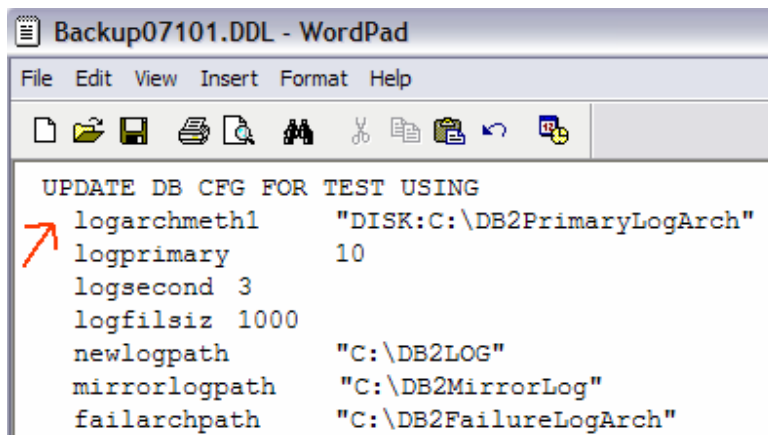


```
Backup07003.CMD - Notepad
File Edit Format View Help
RESTORE DATABASE TEST FROM "c:\db2backup" TAKEN AT %timestamp% WITHOUT PROMPTING
```

D. CONFIGURE DATABASE LOGGING

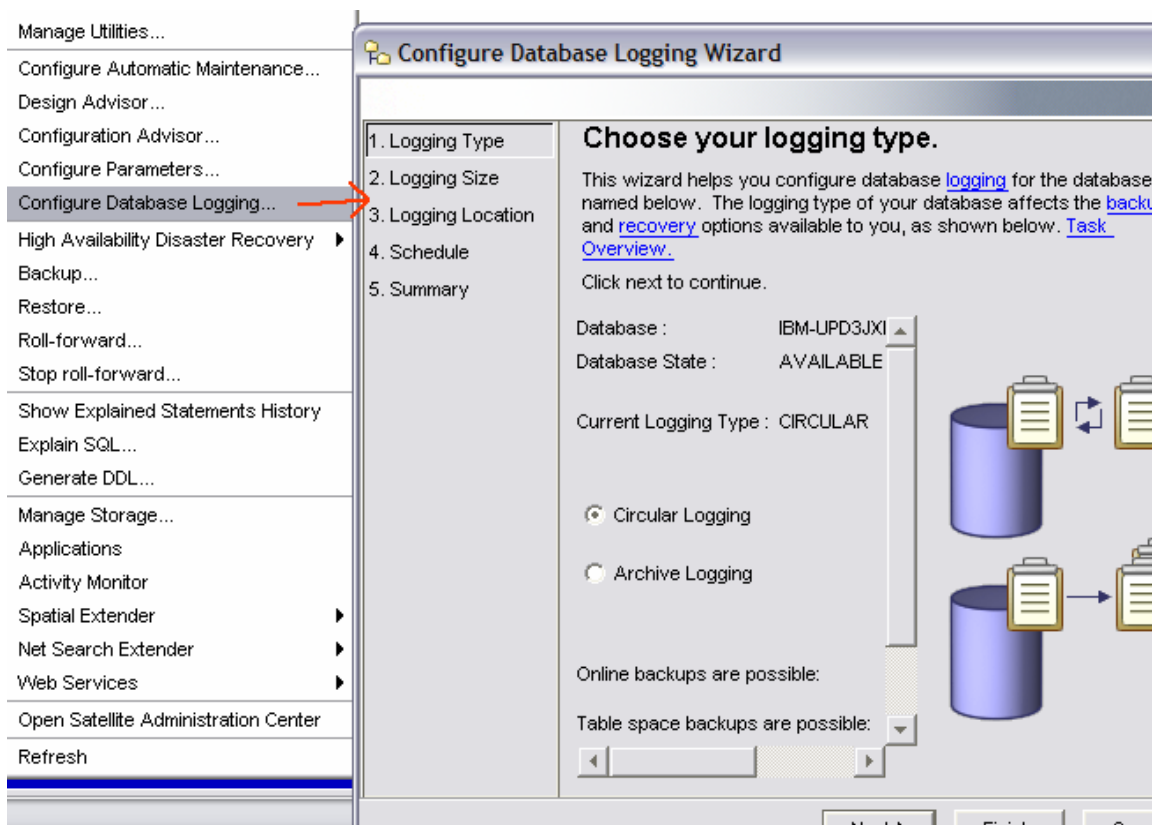
We need to set logretain database parameter to enable RECOVERY in the database. After this parameter is set to RECOVERY, we need to take an offline backup as the database is kept in backup pending mode immediately following the parameter change. This command also sets other important logging parameters, which are logprimary, logsecond, logfilsiz, newlogpath, mirrorlogpath, failarchpath, and logarchmeth1. Please review the contents of this command, and then after executing it, review the output of this command output from file Backup07004_OUTPUT.TXT.

```
C:\POT\07 Backup\>Backup07004
```



```
Backup07101.DDL - WordPad
File Edit View Insert Format Help
UPDATE DB CFG FOR TEST USING
logarchmeth1 "DISK:C:\DB2PrimaryLogArch"
logprimary 10
logsecond 3
logfilsiz 1000
newlogpath "C:\DB2LOG"
mirrorlogpath "C:\DB2MirrorLog"
failarchpath "C:\DB2FailureLogArch"
```

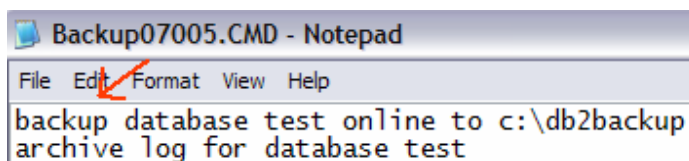
Note: We built our logging script that updates the db config parameters using the Configuration Database Logging wizard as shown below. We will not be using this wizard in the lab, but you should know it is available and simplifies first time logging setup



E. ONLINE DATABASE BACKUP

After turning RECOVERY on, we can take an online backup of the database (all table spaces) and of individual table spaces. This next command takes an online backup of the TEST database that will include all table spaces. This differs from offline database backup in the sense that the online database backup includes all table spaces and does not include all other information that normally would be backed up in the offline backup.

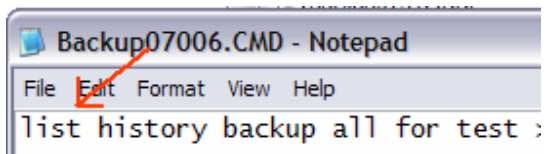
```
C:\POT\07 Backup>Backup07005
```



F. DATABASE RESTORE (RECOVERY MODE)

The first step in recovery/restore is to find the **TIMESTAMP** of the last offline backup. Run the following command to pick up the last offline backup **TIMESTAMP**:

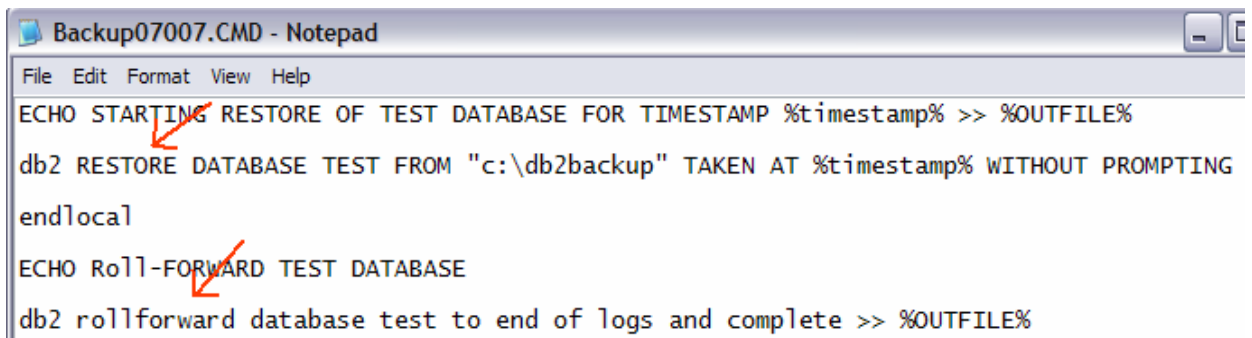
```
C:\POT\07 Backup>Backup07006
```



```
Backup07006.CMD - Notepad
File Edit Format View Help
list history backup all for test :
```

Run the following command to restore database and roll forward transactions.

```
C:\POT\07 Backup>Backup07007
```



```
Backup07007.CMD - Notepad
File Edit Format View Help
ECHO STARTING RESTORE OF TEST DATABASE FOR TIMESTAMP %timestamp% >> %OUTFILE%
db2 RESTORE DATABASE TEST FROM "c:\db2backup" TAKEN AT %timestamp% WITHOUT PROMPTING
endlocal
ECHO Roll-FORWARD TEST DATABASE
db2 rollforward database test to end of logs and complete >> %OUTFILE%
```

G. RECOVER DROPPED TABLE

To recover a dropped table, it is necessary that we have an offline backup taken previously and that the database is in RECOVER mode. These are the steps required to simulate a recover of a dropped table:

- a. Take an offline back up of the database
- b. Create a table after full database backup
- c. Drop the table (to simulate accidentally losing it)
- d. Pick up the dropped table id from the history of the dropped table
- e. Restore the table space (containing the table) from the previous backup image
- f. Unload dropped table data
- g. Recreate the table using the DDL from history command
- h. Load data in table

Run the following command to execute all above steps

```
C:\POT\07 Backup>Backup07008
```

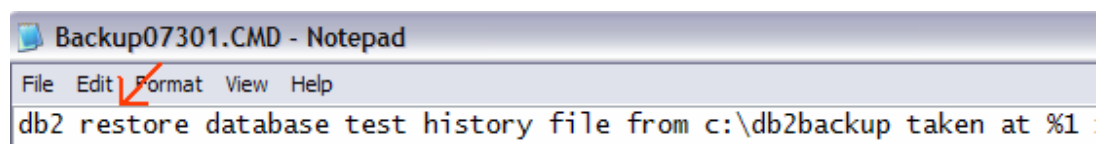
EXTRA EXERCISES

The following extra exercises can be run if you have extra time.

H. RESTORE HISTORY FILE

Sometimes we may need to restore a history file from a backup; we can use the time stamp argument to do so. (You can see the timestamp of the backup from the “LIST HISTORY BACKUP ALL FOR TEST” command.)

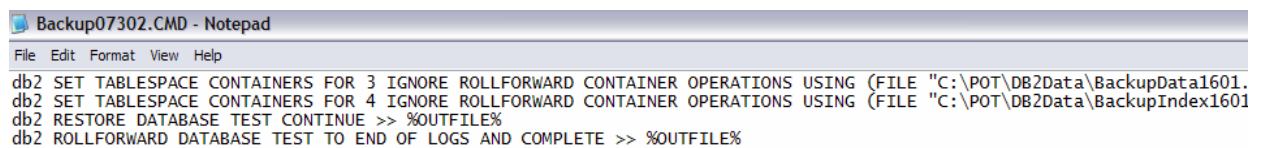
```
C:\POT\07 Backup>Backup07301 TIMESTAMP
```



I. MOVING TABLE SPACE LOCATIONS

The table space container's locations can be moved during a restore. This is called a redirected restore. This is helpful when we need to change the location of containers. The command "Backup07302" creates two table spaces in C:\POT\DB2Data directory. It takes an offline backup and does a redirected restore to move the table space containers locations to a new location at C:\DB2NEWLOC

```
C:\POT\07 Backup>Backup07302
```



```
Backup07302.CMD - Notepad
File Edit Format View Help
db2 SET TABLESPACE CONTAINERS FOR 3 IGNORE ROLLFORWARD CONTAINER OPERATIONS USING (FILE "C:\POT\DB2Data\BackupData1601.
db2 SET TABLESPACE CONTAINERS FOR 4 IGNORE ROLLFORWARD CONTAINER OPERATIONS USING (FILE "C:\POT\DB2Data\BackupIndex1601
db2 RESTORE DATABASE TEST CONTINUE >> %OUTFILE%
db2 ROLLFORWARD DATABASE TEST TO END OF LOGS AND COMPLETE >> %OUTFILE%
```

After running the above command, check the new locations of the DATA16 and IDX16 table spaces in C:\DB2NEWOC directory. All other database files remain in their old locations and DB2 does not attempt to remove them.

J. ONLINE TABLE SPACE BACKUP / RESTORE / RECOVERY

To demonstrate online backup/restore and recovery of table spaces, we will follow these steps.

- Create two DATA16 and IDX16 DMS table spaces and create STRAWMAN table.
- Insert 1000 rows in STRAWMAN table.
- Take online backup of these two table spaces.
- Insert another 1000 rows in the STRAWMAN table.
- Assume that we need to recover these two table spaces due to disk failure. Do Online Restore of these two table spaces. After online restore, you will get a SQL0290N error if you try to access the table space.
- Roll forward the transactions to apply changes from logs.
- Check the count of rows and it should be 2000.

Run the following command to perform the online backup and restore of the above two table spaces.

```
C:\POT\07 Backup>Backup07303
```

K. INCREMENTAL BACKUP / RESTORE / RECOVERY

We will use the following steps to demonstrate incremental backup and restore:

- a. Update TRACKMOD database parameter to enable incremental backup
- b. Create DATA16 and IDX16 table spaces with STRAWMAN table
- c. Insert 1000 rows in the table.
- d. Perform offline backup of TEST database.
- e. Insert another 1000 rows in the table
- f. Perform 1st incremental backup on TEST database.
- g. Insert another 1000 rows in the table
- h. Perform 2nd incremental backup on TEST database
- i. Insert another 1000 rows in the table
- j. Assume that the disk containing DATA16 and IDX16 has failed. Restore offline backup of TEST database
- k. Apply incremental backups
- l. Roll forward the transactions
- m. We should see 4000 rows in the table after recovery

Run the following command to demonstrate online incremental backup and restore:

```
C:\POT\07 Backup>Backup07304
```

L. DELTA BACKUP / RESTORE / RECOVERY

We will use the following steps to demonstrate delta backup and restore:

- a. Update TRACKMOD database parameter to enable incremental backup
- b. Create DATA16 and IDX16 table spaces with STRAWMAN table
- c. Insert 1000 rows in the table.
- d. Perform offline backup of TEST database.
- e. Insert another 1000 rows in the table
- f. Perform 1st delta backup on TEST database.
- g. Insert another 1000 rows in the table
- h. Perform 2nd delta backup on TEST database
- i. Insert another 1000 rows in the table
- j. Assume that the disk containing DATA16 and IDX16 has failed. Restore offline backup of TEST database
- k. Apply delta backups
- l. Roll forward the transactions.
- m. We should see 4000 rows in the table after recovery.

Run the following command to demonstrate online incremental backup/restore and recovery.

```
C:\POT\07 Backup>Backup07305
```

M. CLEANUP

After you are done with the above exercises, you can run the following command to clean up resources.

```
C:\POT\07 Backup>Backup07306
```