UNIT 8

Data Set Reorganization, Backup and Recovery

OBJECTIVES

- Understanding the different ways to take Backup
- Backup/recovery techniques:
  - REPRO
  - EXPORT/IMPORT
  - DFDSS dump/RESTORE
  - DFHSM HBACKDS/HRECOVER

REORGANIZATION,BACKUP AND RECOVERY

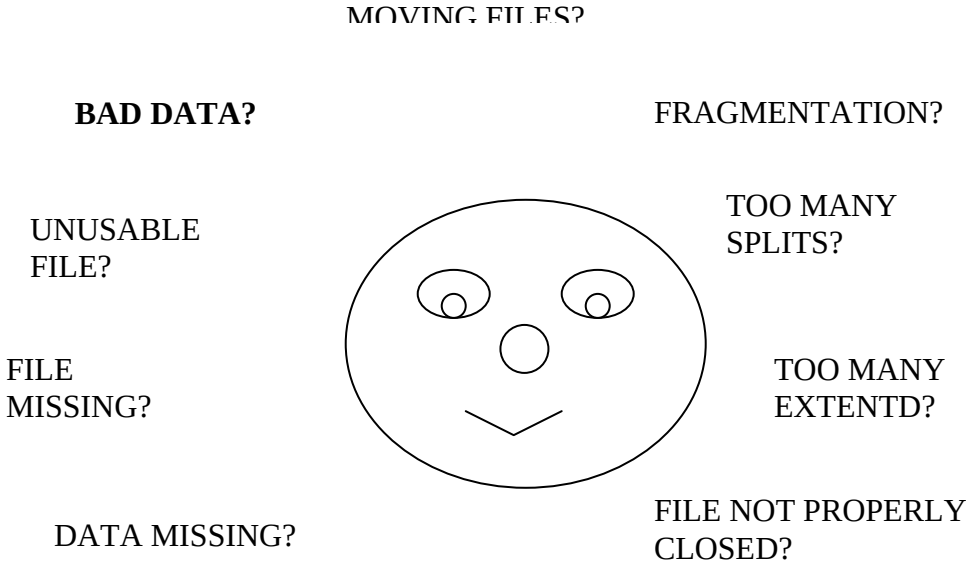


Figure 8-1.

BACKUP AND RECOVERY TASKS

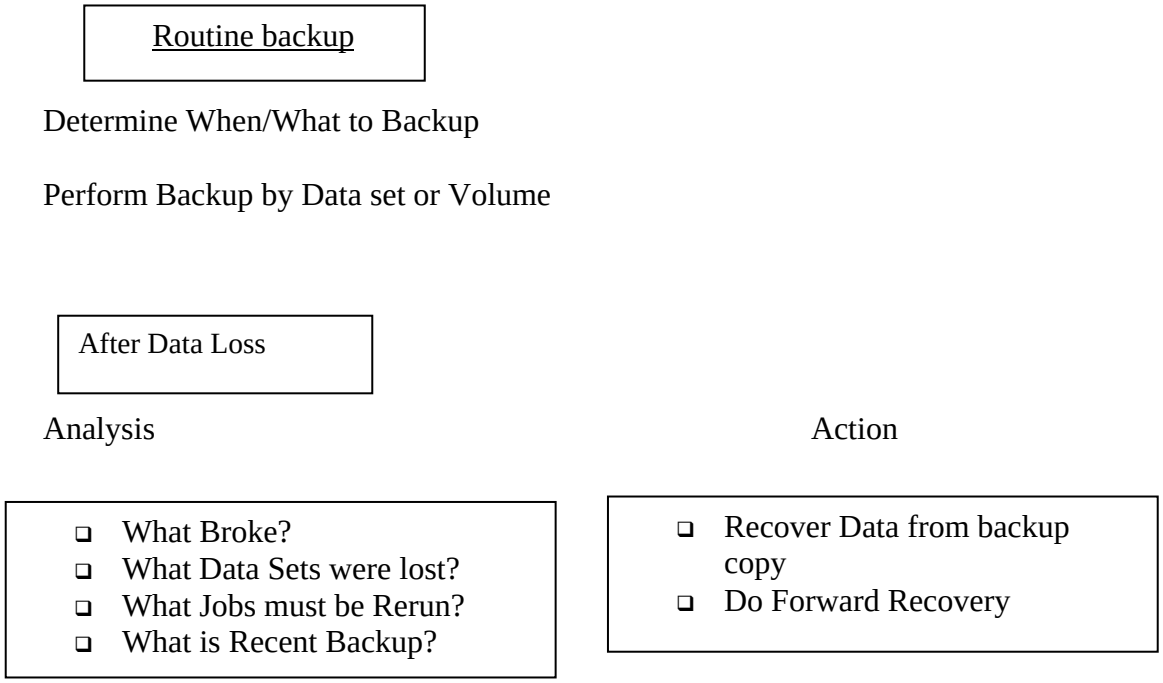


Figure 8-2.

REORGANIZING A KSDS

Why Reorganization?

- Freespace Saturated
- Data Set Fragmented
  - CI/Ca Splits
  - Secondary Extents

After reorganization

- Physical Sequence same as Logical Sequence.
- Freespace Redistributed
- Index Component reconstructed

TOOLS

AMS Commands

MVS/DFP

Storage Management Products

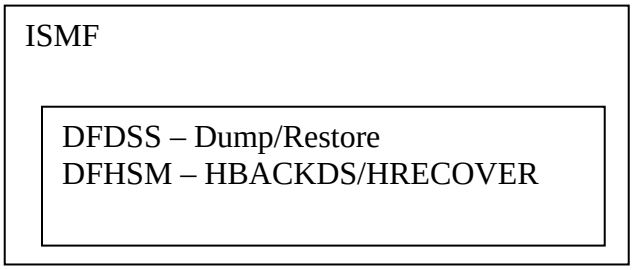


Figure 8-3.

- DFDSS = Data facility Data set Service
- DFHSM = Data Facility Hierarchical Space Manager
- ISMF = Interactive Storage Management Facility

REPRO TECHNIQUE 1

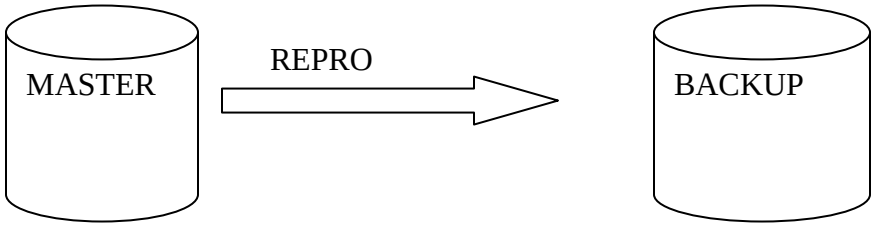


Figure 8-4.

- Backup is Immediately Usable
- Backup is reorganized
- Uses DASD Space

- The backup data set must be defined with REUSE.
- Code the REPRO command with REUSE.
- To reorganize the master data set, you must REPRO back to the master.

REPRO TECHNIQUE 2

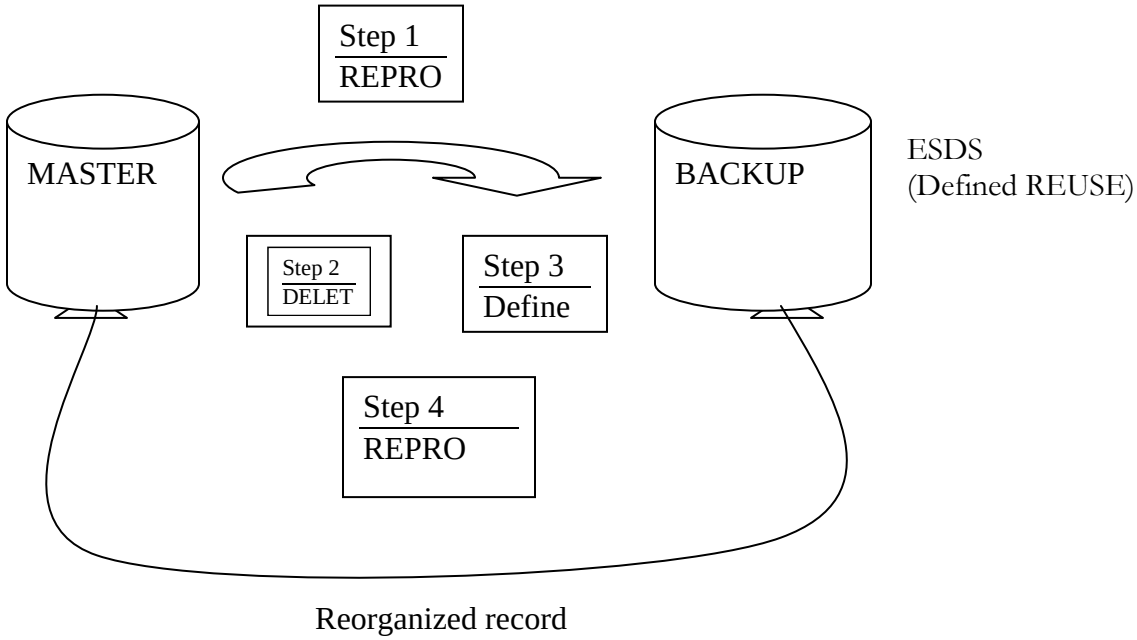


Figure 8-5.

This creates a sequential backup.
All four AMS commands can be stacked in one job step

REPRO EXAMPLE

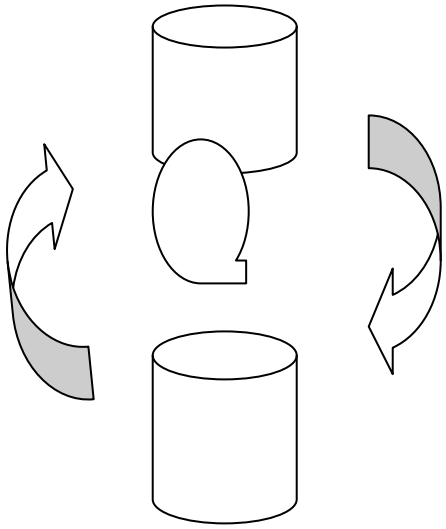
```
//BACKUP1   JOB……..
          //BACKUP EXEC PGM = IDCAMS
          //SYSPRINT DD SYSOUT=A
          //SYSIN DD  *
                     REPRO IDS(USER.MASTER) –
                     ODS(USER.BACKUP) REUSE
               IF LASTCC = 0 THEN –
                     DO
                     DELETE (USER.MASTER0
                     DEFINE CLUSTER(NAME (USER.MASTER) –
                                .
                                .
                     REPRO IDS(USER.BACKUP) –
                              ODS(USER.MASTER0

               END
/*
//
```

Record larger than 32860 on either input or output causes REPRO to terminate with error.

EXPORT/IMPORT

EXPORT

.



IMPORT

Figure 8-6.

- Data is reorganized
- Redefinition is Easy
- Attributes can be changed or added

EXPORT

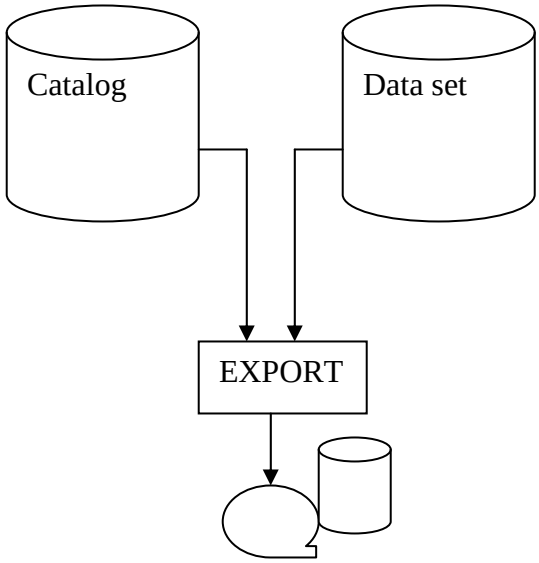


Figure 8-7.

```
EXPORT entryname –
Outfile(ddname) | outdataset(entryname)

Cimode   | Recordmode  -
Temporary    | permanent
```

- Export extracts catalog information and creates a copy of the data records.
- When a base cluster and its alternate index are permanently exported, the alternate index must be exported before the base cluster.
- When exporting a data set for backup purpose specify TEMPORARY to preserve the original data set.

EXPORT COMMAND SYNTAX

```
EXPORT  entryname[/password]     -
        {outfile(ddname) | outdataset(entryname)}     -
        [CIMODE  |   RECORDMODE]      -
      [TEMPORARY  | PERMANENT]  -
      [INHIBITSOURCE  |  NOINHIBITSOURCE]  -
      [INHIBITTARGET  |  NOINHIBITTARGET]   -
      [ERASE  | NOERASE]   -
      [PURGE   | NOPURGE]
```

- RECORD MODE – RECORDS ARE EXPORTED ONE LOGICAL RECORD AT A TIME.
- RECORDMODE is the default for ESDS, KSDS, and RRDS.
- CIMODE – CI rather than logical record exports data. CIMOD is default for LDS.
- TEMPORARY – The data set is not deleted after export.
- PERMANENT- The data set is deleted after export
- INHIBITSOURCE – The original data set becomes read-only.
- NOINHIBITSOURCE - The original data can be updated.
- INHIBITTARGET - The copy data set becomes read-only
- NOINHIBITTARGET - The target data set can be updated

EXPORT BY CI

```
EXPORT EXAMPLE.ESDS –
      OUTFILE(EXPTAPE) –
      CIMODE –
      TEMPORARY
```

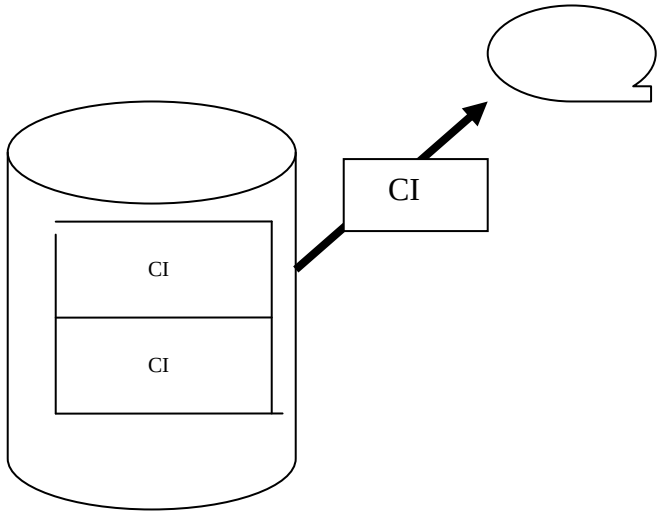


Figure 8-7.

- Control interval access allows quicker backup/recovery however CI free space is not restored on IMPORT
- IMPORT determine the processing used by EXPORT, then imports the data set accordingly
- CIMODE must be used when exporting a LDS.

IMPORT

```
IMPORT –
{infile (ddname) | indataset (entryname)}-
outfile(ddname)  | outdataset(entryname)}-
                 .
                 .

OBJECTS(objectname) -
      Newname(newname) -
      Volumes(voluer…) –
               .
               .
               .

                    )
```

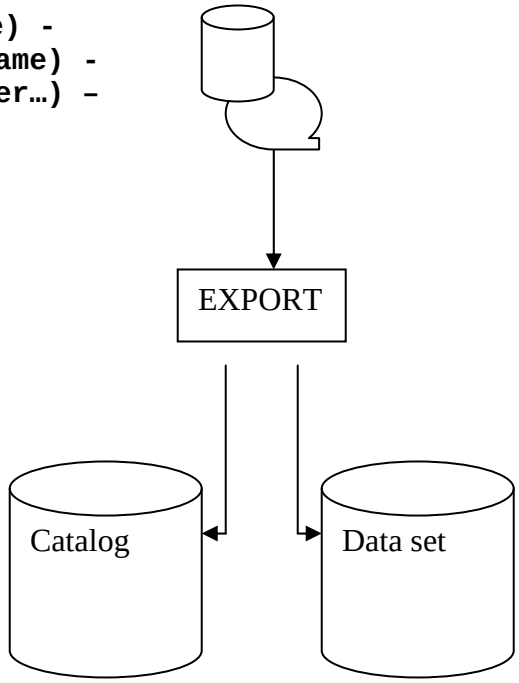


Figure 8-8.

- On import the existing catalog entry is deleted unless the object is empty (HI-USED-RBA is zero).
- When a base cluster and its alternate index are imported the base cluster must be imported before the alternate index.

IMPORT COMMAND SYNTAX

```
IMPORT
          {INFILE(DDNAME)  | INDATASET(ENTERYNAME)} –

          {OUTFILE(DDNAME) | UTDATASET(ENTERYNAME)} -
          [OBJECTS((ENTERYNAME  - [NEWNAME(NAME)] -

          VOLUMES(VOLSER])[ENTRYNAME….)])] –

          [INTOEMPTY]
```

- NEWNAME – Objects beginning imported can be renamed.
- VOLUMES – Specifies the volume on which the cluster is to reside if omitted the original volume is the receiving volume
- INTOEMPTY – Indicates that the receiving dataset is empty.
- On IMPORT the existing catalog entry is deleted unless the receiving data set is empty.

IMPORT INTO EMPTY

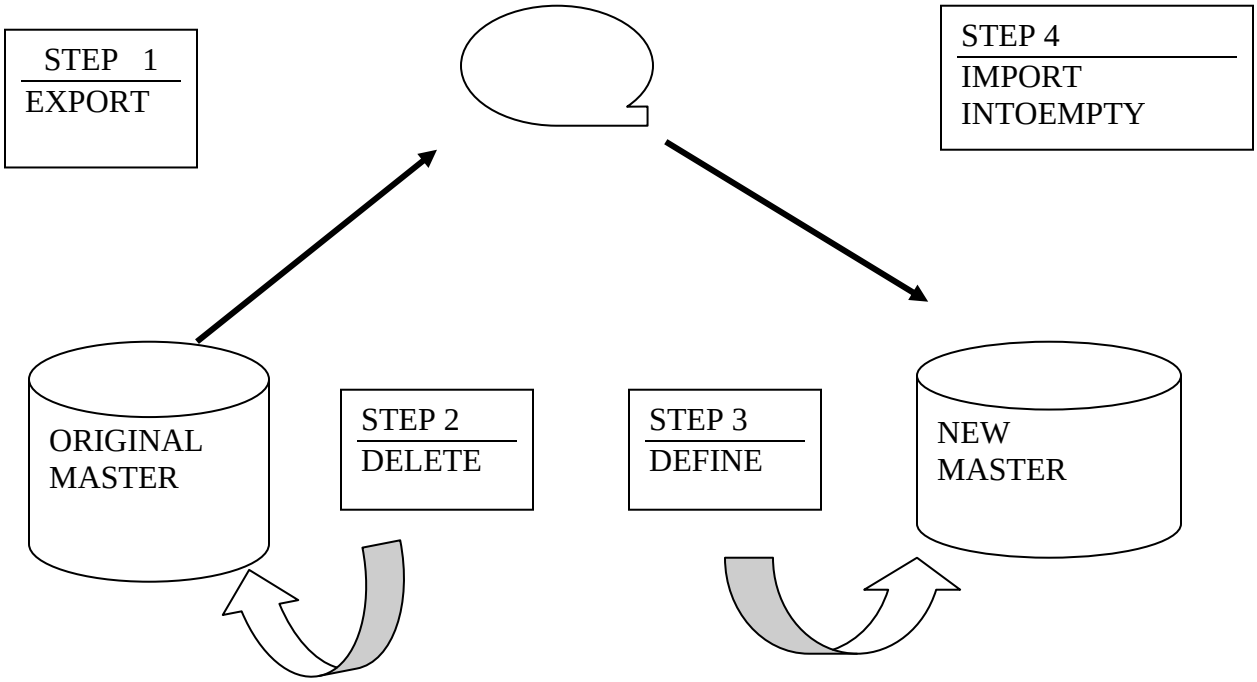


Figure 8-9.

- This procedure provides backup and recovery capabilities and also permits the modification of data set attributes when the data set is imported during recovery or reorganization.

WHAT IS DFDSS

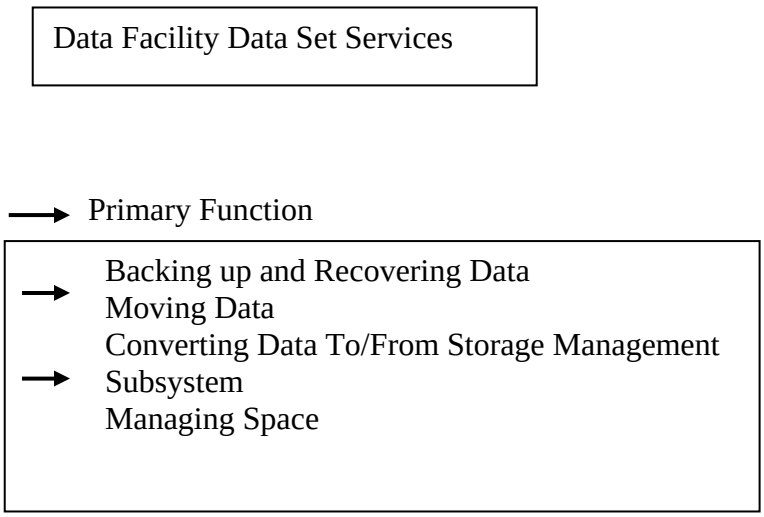


Figure 8-10.

INVOKING DFDSS

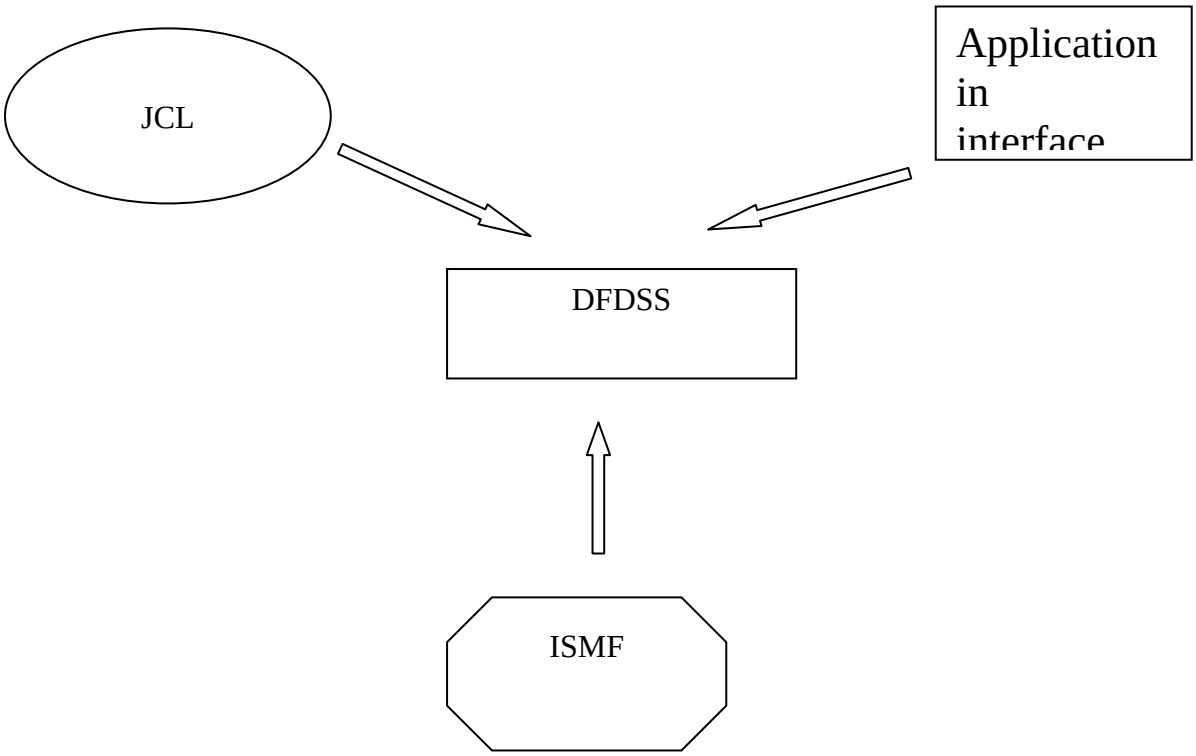


Figure 8-11.

- DFDSS runs as a batch job, it is a utility similar in input style to IDCAMS.
- ISMF is an interactive panel-driven facility, which generates and submits a DFDSS batch job.
- DFDSS can be invoked by batch application Programmes.

DFDSS JCL

```
//DFDSS    JOB  ……..
//STEP1    EXEC PGM=ADRDSSU
//INDASD   DD   UNIT=3380,VOL=SER=11111,DISP=OLD
//OUTTAPE  DD   UNIT=3480,VOL=SER=TAPE01,LABEL=(1,SL),
//              DISP=(NEW,KEEP),DSNAME=USER1.DUMP
//FILTER   DD   data set containing filtering criteria
//SYSIN    DD   command data set
```

INDASD DD Statement

- DDname is chosen by user
- DDname specifies the input DASD Volume

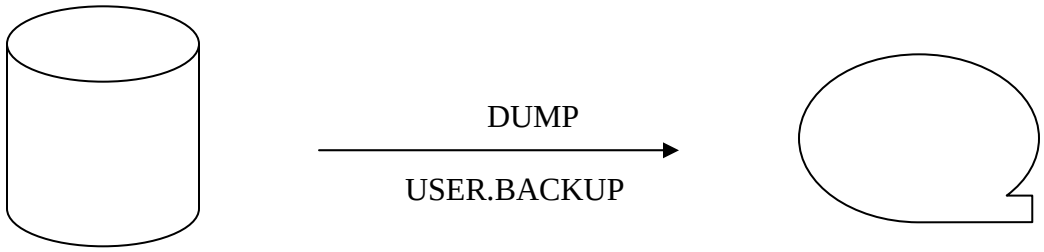
OUTTAPE DD Statement

- DDname is chosen by user
- DDname specifies the input DASD Volume
- Standard labels are recommended to help prevent identification errors.

FILTER DD Statement

- DDname is chosen by user

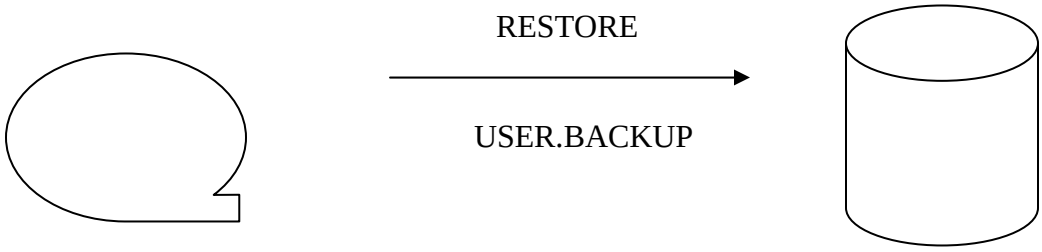
DUMPING A DATA SET




```
//MYJOB    JOB   ……..
//STEP1    EXEC  PGM=ADRDSSU
//SYSPRINT DD    SYSOUT=A
//DASD     DD    UNIT=3380,VOL=SER=11111,DISP=OLD
//TAPE     DD    UNIT=3480,VOL=SER=TAPE01,

     LABEL=(1,SL),DISP=(NEW,KEEP),DSNAME=USER.BACKUP
//SYSIN    DD    *
DUMP DATASET(INCLUDE(USER.BACKUP))-
INDDNAME(DASD) OUTDDNAME(TAPE)
/*
```

Figure 8-12.

RESTORING A DATA SET




```
//MYJOB    JOB   ……..
//STEP1    EXEC  PGM=ADRDSSU
//SYSPRINT DD    SYSOUT=A
//TAPE     DD    UNIT=3480,VOL=SER=TAPE01,

     LABEL=(1,SL),DISP=(NEW,KEEP),DSNAME=USER.BACKUP
//DASD     DD    UNIT=3380,VOL=SER=11111,DISP=OLD
//SYSIN    DD    *
DUMP DATASET(INCLUDE(USER.BACKUP))-
INDDNAME(TAPE) OUTDDNAME(DASD) REPLACE
/*
```

Figure 8-13.

HBACKDS

HBACKDS DSNAME[/PASSWORD]

[NOWAIT | WAIT [EXTENDRC]]

EXAMPLES:

```
HBACKDS    'USER1.KSDS'
HBACKDS    'USER2.KSDS'        NOWAIT
HBACKDS    'USER3.KSDS'        WAIT  EXTENDRC
```

Figure 8-14.

- HBACKDS can be abbreviated HBACK.
- Ddname is positional and must appear after HBACKDS
- NOWAIT is DEFAULT.

HRECOVER

```
HRCOVER    DSNAME[/PASSWORD]

           GENERATION(GENNUM) | DATE(date)]

           NEWNAME(newname)]

           [REPLACE]

           [TOVOLUME(VOLID)UNIT9UNITTYPE)]

           [NOWAIT   | WAIT[EXTENDRC]]
```

Examples
HRECOVER 'USER1.ESDS' REPLACE NOWAIT
HRECOVER 'USER2.ESDS' TOVOLUME(VOL007)
UNIT(3380) WAIT

- HRECOVER can be abbreviated to HRECOV
- NEWNAME is used to rename a data set
- REPLACE specifies the existing dataset to be replaced
- TO VOLUME and UNIT indicate the placement of the recovered data set the default is the original volume.
- GENERATION | DATE specifies a particular backup version for recovery

Unit 8 Exercises

Unit 8 Lab Exercises

Notes