# C07

# Using IMS Online Recovery Service at Royal Bank of Canada

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**St. Louis, MO** **Sept. 30 – Oct. 3, 2002**

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# Disclaimers

- I'm not a DBA nor a Database Specialist
- RBC uses primarily DEDBs with some VSAM Full Function
  - no HALDBs
- only run Change Accumulation (CA) at time of recovery

# Recovery Types

- Full Forward Recovery
  - recover from most recent image copy using all logs
- Timestamp Recovery
  - recover from image copy to allocation boundary (DBDS not ALLOC to any SUBSYS - new USID)
- Point In Time Recovery (PITR)
  - any time; includes committed updates, excludes inflights
  - sets Image Copy Needed flag for DBDS

  ***WARNING: be aware of impact to "business related" databases

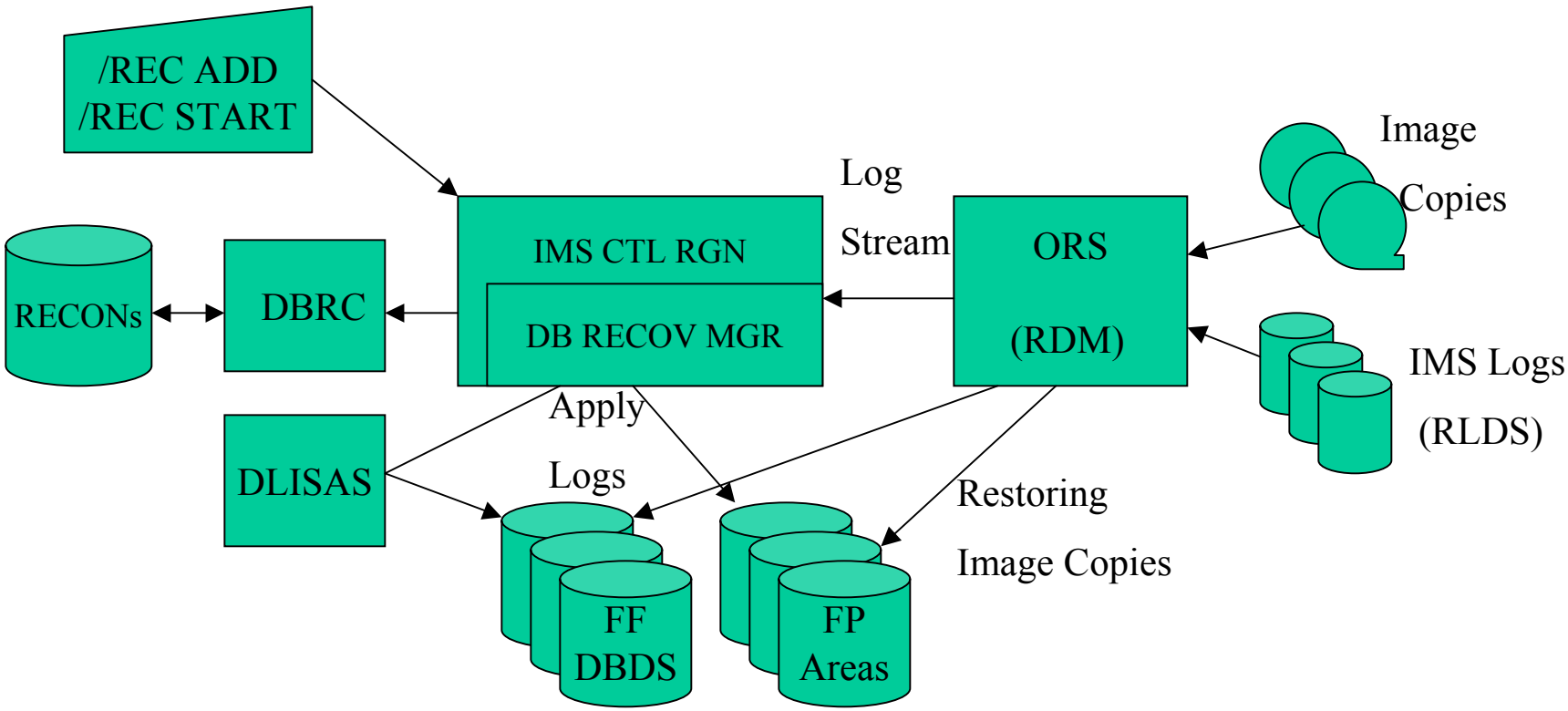
# Recovery Types (cont'd)

- Full Forward Recovery & Timestamp Recovery available with traditional batch recovery (GENJCL.RECOV)
- BLS creates problems for Change Accumulation when using Timestamp Recovery
  - ORS can use CA &/or Logs

# ORS Introduction

- online recovery of multiple DBDS in single pass of logs
  - full function DBDS, FP area, HALDB partitions
  - must be registered in DBRC
- runs in IMS Control Region & new ORS STC
  - requires DLISAS for full function databases
  - uses online DBRC Region to access RECONs
  - executes in parallel with online activity
    - be careful since uses DLI buffer pools (gets own DBBF pool)
- uses IMS commands to create Recovery List(s)
  - covered later

# ORS Components



# ORS Components (cont'd)

- Database Recovery Manager (DRM)
  - runs in IMS Control Region
  - coordinates the recovery process
  - starts ORS STC at first /RECover command
    - ORS STC stops at IMS shutdown or /REC TERMINATE command
  - passes log stream to FP tracker (CTL RGN) and FF tracker (DLISAS) to update databases

- Recovery Data Manager (RDM)
  - ORS address space
  - restores database clusters from image copies
  - applies any Change Accum datasets to databases
  - reads Logs and passes log stream to DRM

# ORS Implementation

- SMP/E installation – PID 5655E50, FMID HMTR110
  - same or different zones as IMS
  - modules & messages FRD* prefix
- add ORS loadlib (SFRDRESL) to Control Region STEPLIB
  - if not, get:

```
DFS4217I DATABASE RECOVERY SERVICE DISABLED:
             FACILITY NOT INSTALLED, RETURN CODE= 0
```

- add ORS FRDRVS00 to MVS program properties table (PPT)
  - use MVS SET SCH= command or IPL
- ORS Started Task
  - procedure name from DFSORSxx RDMNM parameter
  - RACF user profile & STARTED Class entry

# DFSORSxx

- add ORSMBR=xx to IMS PROCLIB DFSPBxxx member
- new DFSORSxx PROCLIB member (pointed to by ORSMBR)

```
    /*NUMBER OF PARALLEL INPUT STREAMS ALLOWED */
READNUM(99)
    /*ONLINE RECOVERY SERVICE ADDRESS SPACE NAME */
RDMNM(P9FCORS)
    /*MAX DS USAGE =XXXXM,AVG REDO REC =YYYYK */
DLIDSIZE(DSSIZE(1600) REDO(256))
    /*FP DATASPACE THRESHOLD =ZZZZM */
FPDSSIZE(1024)
    /*SPILL DATASPACE SIZE =YYYYM */
SPSIZE(2047)
    /*PQ47811 CACHE FOR LOGS IN VTS */
CACHE(PRIM|RLDS SEC|SLDS)
```

# DFSORSxx (cont'd)

- READNUM
  - maximum number of input devices used in parallel (more later)
  - 1 – 99, default is 3
- RDMNM
  - ORS STC procedure name started by IMS when /REC command
- DLIDSIZE
  - DSSIZE specifies the maximum megabytes for FF dataspace
    - 15 – 1600, default 15 or number of PSTs (whichever is greater)
  - REDO specifies the average x'50' log record size in bytes
    - power of two, 128 – 4096, default 256

# DFSORSxx (cont'd)

- FPDSSIZE
  - specifies the maximum megabytes for FP dataspace
  - 1 – 1024, default 1024
- SPSIZE
  - specifies the ORS dataspace size in megabytes
  - 1 – 2047, default 1024
- CACHE (new with PQ47811/UQ62828 F203)
  - specifies which (if any) logs are managed by up to two VTS
  - allocated & opened at start of recovery to stage datasets from tape to DASD

# ORS Maintenance

- nasty habit of requiring both ORS & IMS fixes

```
++ IF FMID(HMK7700) THEN REQ (UQ62314).
++ HOLD(UQ62829) SYS FMID(HMTR110) REASON(DEP) DATE(02049)
   COMMENT
    (+-------------------------------------------------------------+
     + HOLD FOR PQ52105 / AQ52105                                ---+
     + SERVICE FOR IMS PQ52076 / DQ52076 IS REQUIRED               +
     + UNPREDICTABLE RESULTS WILL OCCUR IF ALL PIECES OF SERVICE   +
     + NOT INSTALLED.                                              +
     +-------------------------------------------------------------+).
```

- *eg*

| ORS | | IMS V7 |
|---|---|---|
| PQ52798 | -> | PQ52103 |
| PQ52105 | -> | PQ52076 |
| PQ55887 | -> | PQ55888 |

# ORS Maintenance (cont'd)

- DBRC CATDS (calatloged dataset) support requires:
  PQ52305/UQ66681 - IMS V7 ORS CATDS (F206)
  PQ53758/UQ66886 - ORS CATDS (F206)
  PQ61855/UQ67661 - IMS V7 ORS CATDS for IC GDG (F207)

- IMS V8 support via PQ55887/UQ63821 (F203)

- ORS fix IMS CTL RGN S067 (PQ60942/closed)
  - BPE0041I UNABLE TO ALLOCATE REQUESTED STORAGE
  - can reduce READNUM & increase ORS REGION size
  - also externalizes recovery options on FRD1001I message

- recommendation - stay VERY current with both IMS & ORS

# Recovery Lists - Creating

- recovery list is group of DBDS and areas to be recovered together (identified by RCVTOKEN)
- use /RECover {ADD | REMOVE } to build list
  - AREA, CAGROUP, DATAGROUP, DB, DBDS, DBDSGRP, RECOVGRP
  - USEDBDS | USEAREA when using User Image Copy (UIC)
- lists maintained by online system
  - deleted if IMS terminates or successful recovery

# Recovery Lists – Example

- /DIS RECOVERY shows all or specific recovery list

```
/DIS RECOVERY RCVTOKEN SNAPPY

**** RECOVERY LIST INFORMATION **********************
TOKEN    STATUS       ERROR OPTION RECOVERY TYPE
SNAPPY   BEING BUILT N/A           N/A
**** RECOVERY LIST ENTRY INFORMATION ***************
DATABASE DATA SET  START OPTION  STATUS   AUTH SSID
D5EAL800           OFFLINE       NORMAL   NONE
D5EAT800           OFFLINE       NORMAL   NONE
B5EBL100 D5EBL100  OFFLINE       NORMAL   NONE
B5EBL200 D5EBL200  OFFLINE       NORMAL   NONE
*02360/125959*
```

# /REC START

- /REC START initiates recovery of recovery list (RCVTOKEN)
  - only one recovery active per IMS
- ERRORABORT | ERRORCONT
  - ERRORABORT halts recovery of all entries for any problems
- READNUM nn
  - number of input devices used in parallel for ICs & CADSs in restore phase and Logs during log read phase
- OFFLINE | STAGLOBAL | STALOCAL
  - entries to stay offline or be started after successful recovery
- RCVTIME timestamp { PITR }
  - indicates full, timestamp, or point-in-time recovery

# /REC START (cont'd)

- DBDSs must be /DBR'd before /REC START
- clusters must be DELETE/DEFINE
  - not necessary if VSAM REUSE specified or restoring from IC2
  - if recovery fails but image copy restores started, the clusters must be DELETE/DEFINE again
- can use data sharing partners for multiple recoveries
  - recovery lists not shared
  - contention for RLDS, tape drives, etc
    - even more so for stacked IC & Logs

# /REC START – Example

```
/REC START RCVTOKEN BOBO ERRORCONT READNUM 20 STAGLOBAL

DFS058I 14:19:50 RECOVER COMMAND IN PROGRESS
DFS4264I RECOVERY STARTED FOR (BOBO,ERRORCONT):
DFS4265I BD1MA800 DD1MA800
DFS4265I BD1RL800 DD1RL800
DFS4265I BD1RS800 DD1RS800
. . .
DFS4277I RECOVERY COMPLETE FOR:  BD1MA800 DD1MA800
DFS4277I RECOVERY COMPLETE FOR:  BD1RL800 DD1RL800
DFS4277I RECOVERY COMPLETE FOR:  BD1RS800 DD1RS800
DFS4285I END OF RECOVERY FOR:  BOBO
```

# READNUM Problem

- one READNUM value sets parallel input processing for:
  - Image Copies, IMS Logs (RLDS), Change Accum Datasets
- may be on different media types
  - eg. IC on tape, RLDS on DASD
- if READNUM > tape drives, IC restores will fail
- open requirement to have separate specifications
- can use higher READNUM if few tapes
  - eg. three image copies on tape & sixty RLDS on DASD
    - /REC START . . . READNUM 20

# STAGLOBAL & FP Areas

- STAGLOBAL uses IRLM to issue /STA . . . GLOBAL after recovery completes
  - ignored if PITR was used
- starts DB for full function & AREA for Fast Path
- easier to /DBR AREA before STAGLOBAL
  - if /DBR DB for Fast Path, the STAGLOBAL only starts the areas, a separate /STA DB must be issued after the recovery completes

# /REC STOP & TERMINATE

- /REC STOP
  - aborts one, some or all entries of active recovery
  - DBDS marked "RECOV NEEDED" in RECONs
  - use SAVE option to retain recovery list
    - only when stops last DBDS in recovery list
  - use ALLENT to stop all entries immediately

- /REC TERMINATE
  - deletes all recovery lists & terminates ORS address space
  - any recovery in progress continues to execute

    ```
    DFS4288I DATABASE RECOVERY SERVICE IS UNABLE TO TERMINATE
    ```

    - can use /REC STOP ALLENT command first

# Odds & Ends

- messages are split between IMS Control Region & ORS STC
  - IMS V8 will "echo" ORS msgs using DFS4299I
    - sent to MTO & LTERM that issued /REC START command
    - PQ61875/UQ68692 for IMS V8
    - PQ61866/UQ68699 for ORS
- if IMS or ORS fails when a recovery is active,
  the recovery terminates & DBDS still marked RECOV NEEDED

# ORS at RBC

- online recovery of production DBDS's
  - haven't had a database problem requiring ORS recovery yet (touch wood)
- DRP using Remote Logs & RECONs
  - IMS Logs & RECONs sent remotely in real time
  - database image copies use ABARS
- DRP using Disk Mirroring
  - IMS & database DASD fully mirrored to remote site
  - all IMS Subsystems are /ERE'd
  - must recover SVSO since CF not mirrored

# RBC DRP With ORS

- use batch jobs for recovering groups of databases
  - each creates one recovery list (unique RCVTOKEN)

Step 1 - BMP command processor to issue /DBR for FF DBs & FP areas

Step 2 - IDCAMS delete/define clusters*

Step 3 - DBRC CHANGE.DBDS RECOV

Step 4 - JCL Commands:

/REC ADD RCVTOKEN xxxxxxxx DB yyyyyyyy

*note: even with VSAM REUSE, clusters not available for DRP

# RBC DRP With ORS (cont'd)

- can run multiple batch jobs to create many recovery lists
- only one recovery active per IMS
  - we have three IMS Control Regions in each Sysplex
- start recovery using:

```
/REC START RCVTOKEN PD1DB ERRORCONT READNUM 20 STAGLOBAL
```

# Recovery Example

```
IMS CTL  DFS4445I CMD FROM MCS/E-MCS CONSOLE USERID=QM47VGD: DIS REC HPTO
IMS CTL  DFS4444I DISPLAY FROM ID=HPTO
IMS CTL       **** RECOVERY LIST INFORMATION **********************
IMS CTL       TOKEN    STATUS      ERROR OPTION RECOVERY TYPE
IMS CTL       NO LISTS
IMS CTL       *02185/141843*
IMS CTL  DFS4445I CMD FROM MCS/E-MCS CONSOLE USERID=PD1: REC ADD RCVTOKEN PD1DB DB BD1RL800
IMS CTL  DFS058I 14:18:55 RECOVER COMMAND IN PROGRESS HPTO
IMS CTL  DFS4445I CMD FROM MCS/E-MCS CONSOLE USERID=PD1: REC ADD RCVTOKEN PD1DB DB BD1RS800
IMS CTL  DFS058I 14:18:55 RECOVER COMMAND IN PROGRESS HPTO
IMS CTL  DFS4445I CMD FROM MCS/E-MCS CONSOLE USERID=PD1: REC ADD RCVTOKEN PD1DB DB BD1MA800
IMS CTL  DFS058I 14:18:55 RECOVER COMMAND IN PROGRESS HPTO
IMS CTL  DFS0578I - READ SUCCESSFUL FOR DDNAME PROCLIB  MEMBER = DFSORSHP  HPTO
  ORS STC  IEF403I P9FHORS - STARTED - TIME=14.18.56
IMS CTL  DFS551I BATCH   REGION PD1VSORS STARTED ID=00002 TIME=1418  HPTO
  ORS STC  FRD1000I - ORS TCB INITIALIZATION COMPLETE
```

# Recovery Example (cont'd)

```
IMS CTL  DFS4263I THE FOLLOWING ENTRIES ARE ADDED TO THE PD1DB RECOVERY LIST: HPTO
IMS CTL  DFS4265I BD1RL800 DD1RL800                HPTO
IMS CTL  DFS4263I THE FOLLOWING ENTRIES ARE ADDED TO THE PD1DB RECOVERY LIST: HPTO
IMS CTL  DFS4265I BD1RS800 DD1RS800                HPTO
IMS CTL  DFS4263I THE FOLLOWING ENTRIES ARE ADDED TO THE PD1DB RECOVERY LIST: HPTO
IMS CTL  DFS4265I BD1MA800 DD1MA800                HPTO
IMS CTL  DFS4445I CMD FROM MCS/E-MCS CONSOLE USERID=PD1: DIS RECOVERY RCVTOKEN PD1DB
IMS CTL  DFS4444I DISPLAY FROM ID=HPTO
IMS CTL       **** RECOVERY LIST INFORMATION *********************
IMS CTL       TOKEN    STATUS      ERROR OPTION RECOVERY TYPE
IMS CTL       PD1DB    BEING BUILT N/A          N/A
IMS CTL       **** RECOVERY LIST ENTRY INFORMATION ***************
IMS CTL       DATABASE DATA SET  START OPTION  STATUS   AUTH SSID
IMS CTL       DD1MA800           OFFLINE       NORMAL   NONE
IMS CTL       DD1RL800           OFFLINE       NORMAL   NONE
IMS CTL       DD1RS800           OFFLINE       NORMAL   NONE
IMS CTL       *02185/141858*
IMS CTL  DFS2500I DATASET  DD1RL800 SUCCESSFULLY DEALLOCATED HPTO
IMS CTL  DFS0488I DBR COMMAND COMPLETED. AREA= DD1RL800 RC= 0 HPTO
IMS CTL  DFS2500I DATASET  DD1RS800 SUCCESSFULLY DEALLOCATED HPTO
IMS CTL  DFS0488I DBR COMMAND COMPLETED. AREA= DD1RS800 RC= 0 HPTO
IMS CTL  DFS0488I DBR COMMAND COMPLETED. AREA= DD1MA800 RC= 0 HPTO
IMS CTL  DFS552I BATCH   REGION PD1VSORS STOPPED ID=00002 TIME=1419  HPTO
```

# Recovery Example (cont'd)

```
IMS CTL  DFS4445I CMD FROM MCS/E-MCS CONSOLE USERID=QM47VGD:
             REC START RCVTOKEN PD1DB ERRORCONT READNUM 20 STAGLOBAL HPTO
IMS CTL  DFS058I 14:19:50 RECOVER COMMAND IN PROGRESS HPTO
  ORS STC *IEF233D M 2A43,VO5522,,P9FHORS,P9FHORS,AC.DD1ICDY.AR00D1MA.G1595V00
IMS CTL  DFS4264I RECOVERY STARTED FOR (PD1DB,ERRORCONT): HPTO
IMS CTL  DFS4265I BD1MA800 DD1MA800                HPTO
IMS CTL  DFS4265I BD1RL800 DD1RL800                HPTO
IMS CTL  DFS4265I BD1RS800 DD1RS800                HPTO
  ORS STC *IEF233D M 2A45,VO5519,,P9FHORS,P9FHORS,AC.DD1ICDY.AR00D1RL.G9161V00
  ORS STC *IEF233D M 2A46,VO5520,,P9FHORS,P9FHORS,AC.DD1ICDY.AR00D1RS.G9158V00
  ORS STC  FRD4237I RESTORING DBD=BD1MA800, DDN/AREA=DD1MA800
  ORS STC  FRD4237I WITH IC DSNAME=AC.DD1ICDY.AR00D1MA.G1595V00
  ORS STC  FRD4237I RESTORING DBD=BD1RL800, DDN/AREA=DD1RL800
  ORS STC  FRD4237I WITH IC DSNAME=AC.DD1ICDY.AR00D1RL.G9161V00
  ORS STC  FRD4237I RESTORING DBD=BD1RS800, DDN/AREA=DD1RS800
  ORS STC  FRD4237I WITH IC DSNAME=AC.DD1ICDY.AR00D1RS.G9158V00
  ORS STC  IEF234E K 2A43,VO5522,PVT,P9FHORS,P9FHORS
  ORS STC  FRD4222I IMAGE COPY RESTORE COMPLETE: BD1MA800 DD1MA800
  ORS STC  IEF234E K 2A46,VO5520,PVT,P9FHORS,P9FHORS
  ORS STC  FRD4222I IMAGE COPY RESTORE COMPLETE: BD1RS800 DD1RS800
  ORS STC  IEF234E K 2A45,VO5519,PVT,P9FHORS,P9FHORS
  ORS STC  FRD4222I IMAGE COPY RESTORE COMPLETE: BD1RL800 DD1RL800
```

# Recovery Example (cont'd)

```
ORS STC  FRD4222I IMAGE COPY RESTORE COMPLETE: BD1RL800 DD1RL800
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00004
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00005
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00006
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00007
ORS STC  FRD4204I READER INITIALIZATION COMPLETE
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00008
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00009
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00010
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00011
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00012
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00013
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00014
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00015
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00016
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00017
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00018
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00019
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00020
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00021
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00022
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00023
```

# Recovery Example (cont'd)

```
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.CSTO.D02172.T0636297
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.CSTO.D02171.T2006515
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0823061
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.CSTO.D02172.T0029216
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02171.T2232379
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0358492
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0118118
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.CSTO.D02172.T0250308
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.CSTO.D02172.T0406318
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02171.T2159536
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.CSTO.D02172.T0740328
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0000239
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02171.T2057445
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.CSTO.D02171.T2205446
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02171.T2310531
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02171.T2128529
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0705532
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0801226
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0616279
ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0737121
ORS STC  FRD4211I DATA SET UNALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0000239
ORS STC  FRD4207I 00140442 RECORDS READ, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0000239
ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00024
```

# Recovery Example (cont'd)

```
  ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.CSTO.D02172.T0825102
  ORS STC  FRD4211I DATA SET UNALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0823061
  ORS STC  FRD4207I 00086845 RECORDS READ, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0823061
  ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00025
  ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T0842429
  ORS STC  FRD4211I DATA SET UNALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02171.T2310531
  ORS STC  FRD4207I 00138674 RECORDS READ, DSN=O1.D9F.RMTLOG.HPTO.D02171.T2310531
  ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00026
  ORS STC  ... more of the same
  ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T1247135
  ORS STC  FRD4211I DATA SET UNALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T1028176
  ORS STC  FRD4207I 00094457 RECORDS READ, DSN=O1.D9F.RMTLOG.HPTO.D02172.T1028176
  ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00054
  ORS STC  FRD4209I DATA SET ALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T1303058
IMS CTL  DFS2500I DATASET  DD1RL800 SUCCESSFULLY ALLOCATED   HPTO
  ORS STC  FRD4211I DATA SET UNALLOCATED, DSN=O1.D9F.RMTLOG.CSTO.D02172.T1117145
  ORS STC  FRD4207I 00095377 RECORDS READ, DSN=O1.D9F.RMTLOG.CSTO.D02172.T1117145
IMS CTL  DFS2500I DATASET  DD1MA800 SUCCESSFULLY ALLOCATED   HPTO
  ORS STC  FRD4211I DATA SET UNALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T1043242
  ORS STC  FRD4207I 00093891 RECORDS READ, DSN=O1.D9F.RMTLOG.HPTO.D02172.T1043242
  ORS STC  IGD103I SMS ALLOCATED TO DDNAME SYS00055
  ORS STC  ... more of the same
```

# Recovery Example (cont'd)

```
  ORS STC  FRD4211I DATA SET UNALLOCATED, DSN=O1.D9F.RMTLOG.HPTO.D02172.T1800000
  ORS STC  FRD4207I 00088242 RECORDS READ, DSN=O1.D9F.RMTLOG.HPTO.D02172.T1800000
  ORS STC  FRD4211I DATA SET UNALLOCATED, DSN=O1.D9F.RMTLOG.CSTO.D02172.T0250308
  ORS STC  FRD4207I 00062987 RECORDS READ, DSN=O1.D9F.RMTLOG.CSTO.D02172.T0250308
  ORS STC  FRD4219I 07680113 RECORDS PROCESSED
IMS CTL  DFS3705I AREA=DD1MA800 DD=DD1MA800 CLOSED HPTO
IMS CTL  DFS2500I DATASET  DD1MA800 SUCCESSFULLY DEALLOCATED HPTO
IMS CTL  DFS2574I AREA=DD1MA800 STOPPED                          HPTO
IMS CTL  DFS3705I AREA=DD1RL800 DD=DD1RL800 CLOSED HPTO
IMS CTL  DFS2500I DATASET  DD1RL800 SUCCESSFULLY DEALLOCATED HPTO
IMS CTL  DFS2574I AREA=DD1RL800 STOPPED                          HPTO
IMS CTL  DFS2500I DATASET  DD1MA800 SUCCESSFULLY ALLOCATED   HPTO
IMS CTL  DFS0488I STA COMMAND COMPLETED. AREA= DD1MA800 RC= 0 HPTO
IMS CTL  DFS2500I DATASET  DD1RL800 SUCCESSFULLY ALLOCATED   HPTO
IMS CTL  DFS0488I STA COMMAND COMPLETED. AREA= DD1RL800 RC= 0 HPTO
IMS CTL  DFS2500I DATASET  DD1RS800 SUCCESSFULLY ALLOCATED   HPTO
IMS CTL  DFS0488I STA COMMAND COMPLETED. AREA= DD1RS800 RC= 0 HPTO
IMS CTL  DFS4277I RECOVERY COMPLETE FOR:  BD1MA800 DD1MA800 HPTO
IMS CTL  DFS4277I RECOVERY COMPLETE FOR:  BD1RL800 DD1RL800 HPTO
IMS CTL  DFS4277I RECOVERY COMPLETE FOR:  BD1RS800 DD1RS800 HPTO
IMS CTL  DFS4285I END OF RECOVERY FOR:  PD1DB HPTO
```

# Recovery Example (cont'd)

```
IMS CTL  DFS4445I CMD FROM MCS/E-MCS CONSOLE USERID=QM47VGD: DIS REC HPTO
IMS CTL  DFS4444I DISPLAY FROM ID=HPTO
IMS CTL       **** RECOVERY LIST INFORMATION *********************
IMS CTL       TOKEN    STATUS      ERROR OPTION RECOVERY TYPE
IMS CTL       NO LISTS
IMS CTL       *02185/143420*
IMS CTL  DFS4445I CMD FROM MCS/E-MCS CONSOLE USERID=QM47VGD: DIS DB BD1MA800 HPTO
IMS CTL  DFS4444I DISPLAY FROM ID=HPTO
IMS CTL       DATABASE  TYPE  TOTAL UNUSED  TOTAL UNUSED ACC  CONDITIONS
IMS CTL       BD1MA800  DEDB    SEQ DEPEND DIRECT ADDRES UP   NOTOPEN
IMS CTL       DD1MA800  AREA    N/A    N/A    N/A    N/A      NOTOPEN
IMS CTL       *02185/143430*
```

# References

IMS V7 Command Reference SC26-9436
IMS V7 Install Volume 2: System Definition and Tailoring GC26-9430

IMS Online Recovery Service for z/OS User's Guide SC27-0944

A DBA's View of IMS Online Recovery Service SG24-6112

IMS Tech Conference & SHARE Presentations