IMS 10 Dynamic Resource Definition

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Good-Bye IMS SYSGEN for Databases, Programs, Routing Codes, and Transactions – Hello IMS Dynamic Resource Definition

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Dynamic Resource Definition (DRD) Objectives

- **Increase Availability**
  - Allow users to dynamically create, update and delete IMS resources without having to perform an IMS cold start or go through the Online Change process
  - Allows granular change with minimum impact to availability
  - System is quiesced for only those resources to be changed

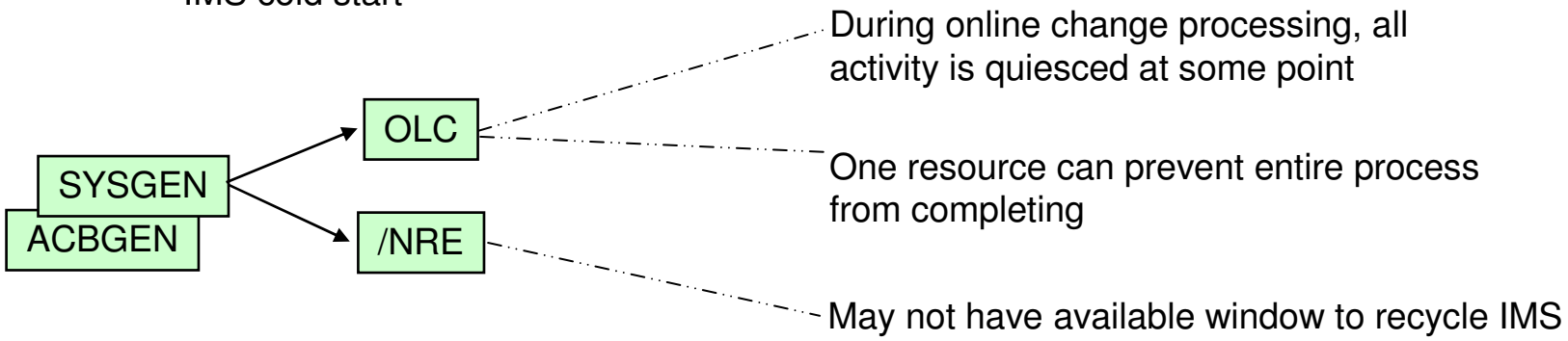
- **Increase Productivity**
  - New User Interfaces
  - Simplifies the IMS definition process for IMS systems and resources
  - Reduces IMS and z/OS skill set required to define and customize IMS
  - Simplifies environment setup for application development

Defining Resources to IMS without DRD

- **To define resources to IMS without DRD**
  - Assembler macro statements must be coded to define the MODBLKSs resources (programs, databases, transactions and routing codes) to IMS:
    - APPLCTN, DATABASE, TRANSACT, RTCODE
  - A SYSGEN must then be done to generate the control blocks used to manage those resources
    - PDIR, DDIR, SMB, RCTE
    - The control blocks are saved in the IMS.MODBLKS data set
  - A DBDGEN, PSBGEN and ACBGEN must be done to generate the PSBs and DMBs for the programs and databases
    - The PSB and DMB control blocks are saved in the IMS.ACBLIB data set
  - The MODBLKS control blocks are loaded from the IMS.MODBLKS data set during cold start and used by the online IMS to manage the MODBLKS resources

Modifying Resource Definitions without DRD

- **To add, change, or delete MODBLKS resources in a running IMS system requires**
  - MODBLKS SYSGEN
  - ACBGEN - if database (DDIR) or program (PDIR) change
  - Way to bring the new MODBLKS resources online
    - Online change
    - IMS cold start



- **Process is more complex with multiple IMSs running in an IMSplex**
  - Coordinated online change -or- multiple coordinated system restarts

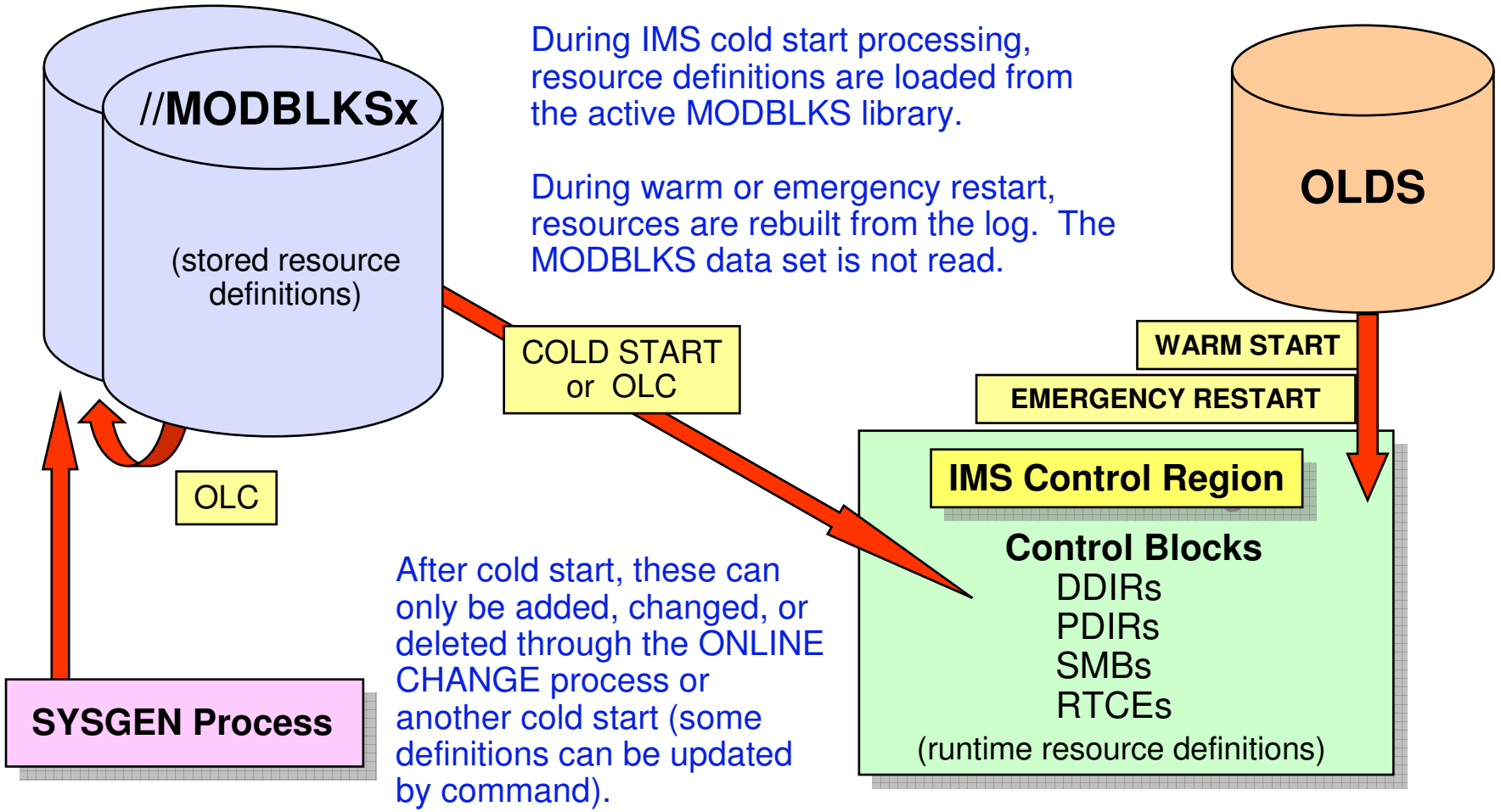
Dynamic Resource Definition (DRD)

- **Simplifies resource definition**
- **Allows you to *dynamically* create, update and delete *MODBLKS resource definitions* without a cold start or online change**
  - *Databases*
  - *Programs*
  - *Transactions*
  - *Routing Codes*
- **Provides increased resource availability**

DRD Components

- **Type-2 commands added to dynamically create, update or delete MODBLKS resource definitions**
  - Databases, programs, routing codes and transactions
- **Set of resource definition data sets (RDDS)**
  - To contain resource and descriptor definitions
- **Export and import functions and commands provided**
  - To save/restore resource definitions to/from an RDDS
- **Enhanced Type-2 QUERY commands**
  - To display attributes of defined IMS resources and descriptors
- **Enhanced DFSINSX0 (Destination Creation) user exit**
  - Ability to dynamically create transaction and program resources
- **UPDATE and QUERY support for MSC resources**
  - Supports resource modification without requiring system definition changes or an IMS restart

Modifying MODBLKS Resources without DRD

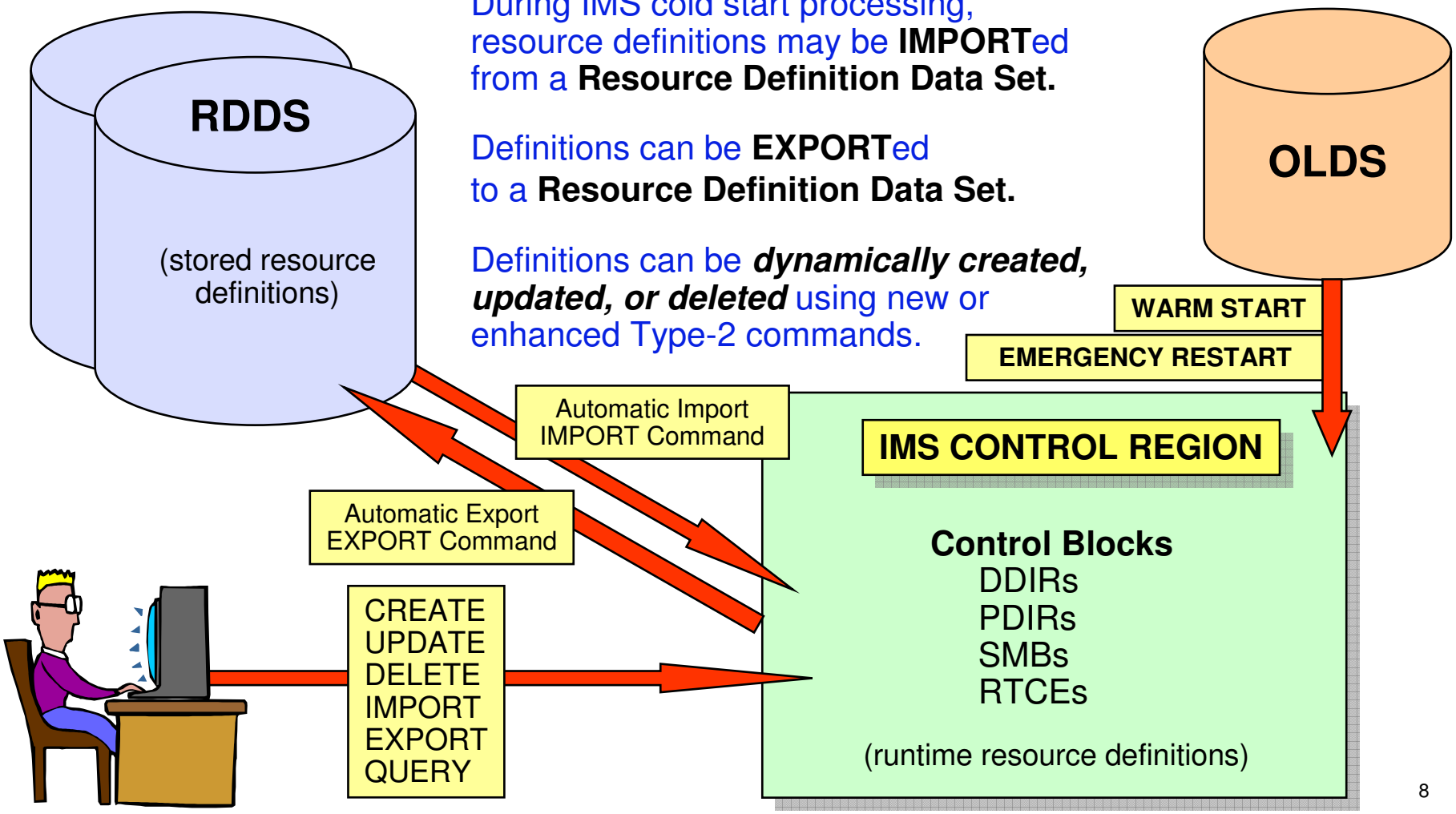


Modifying MODBLKS Resources with DRD

During IMS cold start processing, resource definitions may be **IMPORT**ed from a **Resource Definition Data Set.**

Definitions can be **EXPORT**ed to a **Resource Definition Data Set.**

Definitions can be ***dynamically created, updated, or deleted*** using new or enhanced Type-2 commands.



DRD Highlights

- **DRD for MODBLKS resources is optional**
- **Either DRD or online change can be enabled for MODBLKS resource management, but not both**
  - Cold start required to switch
- **If DRD is enabled**
  - Online Change for MODBLKS is disabled
  - ACBLIB and FMTLIB Online Change is allowed
  - MODBLKS data sets are optional
  - MODBLKS SYSGEN no longer required

Required Environment for DRD

- **DRD requires IMS 10 with ...**
  - Common Service Layer with SCI and Operations Manager
    - Resource Manager is not required
  - Entry point for DRD commands
    - SPOC, IMS Control Center, Manage Resources Application, other OM interface
  - Data sets to hold resource definitions
    - Resource Definition Data Sets (RDDSs)

- **All IMS online environments supported, including data sharing and shared queues**
  - For applicable resources

- **No longer required**
  - MODBLKS Sysgen process
  - MODBLKS staging, active, and inactive data sets
  - MODBLKS online change process

Commands Used in Dynamic Resource Definition

- **Type-2 commands entered through OM interface**

Command	Short Form	Purpose
CREATE	CRE	Create resource or descriptor
DELETE	DEL	Delete resource or descriptor
UPDATE	UPD	Update attributes of resource or descriptor Update status of resource
IMPORT	IMP	Import resource or descriptor definitions
EXPORT	EXP	Export resource or descriptor definitions
QUERY	QRY	Query attributes of resource or descriptor Query status of resource

Descriptors

- **A descriptor is a model for defining (creating) a resource or another descriptor**
  - Establishes *defaults* for attributes not set in the CREATE command
- **IMS-defined descriptors provided with the IMS product:**
  - DFSDSDB1 (database)
  - DFSDSPG1 (program)
  - DFSDSTR1 (transaction)
  - DBFDSRT1 (routing code)
- **User-defined descriptors**
  - Created or updated by the user
- **Current default descriptor**
  - Each resource type will have one *default descriptor* (IMS-defined or user-defined with DEFAULT(Y))

Recoverability

- **Resource and descriptor definitions**
  - Exist for the life of IMS or until deleted
  - Are recovered from logs across warm and emergency restart
    - Definitions are logged when created, updated, or deleted, and at system checkpoint time
  - Are recovered across cold start if both:
    - Previously exported to RDDS
    - Imported during next cold start

Resource Definition Data Sets

- **BSAM data set used to save resource and descriptor definitions**
- **System RDDS**
  - Provides a single system view of an IMS's resources and descriptors
  - Contains all resource and descriptor definitions for an IMS
  - Each IMS must define its own set of system RDDS data sets
  - A set of system RDDS data sets must be defined for Automatic Import and Automatic Export
- **Non-System RDDS**
  - Can be shared between IMSs
  - May contain a subset of an IMS’s resource and descriptor definitions

Automatic Export

- **Allows all resource and descriptor definitions for an IMS to be exported to a System RDDS data set automatically at checkpoint time (simple or shutdown)**
- **Enabling Automatic Export is optional**
- **If enabled:**
  - Automatic Export is always done following the restart checkpoint
  - Subsequent exports are only done if one or more definitions have been added, changed or deleted since the last checkpoint
- **A set of system RDDSs must be defined**

Automatic Import

- **Allows all resource and descriptor definitions to be read in automatically during IMS cold start**
- **Definitions are used to create the internal control blocks needed to manage resources**
- **During cold start, definitions can be imported from**
  - System RDDS
  - MODBLKS data set
  - Or not imported at all

DFSINSX0 - Destination Creation Exit

- **Enhanced to support the dynamic creation of transactions that can be scheduled**
- **Also enhanced to support the creation of the associated program**
- **Attributes of resources to be created can be**
  - specified by the exit
  - obtained from a model (descriptor or other resource)
  - obtained from the default descriptor
- **Supports creation of transaction on other IMSs, in shared queues environment**

Manage Resources Application

- **ISPF panel driven application**
  - Support for Dynamic Resource Definition
  - Invoked from IMS Application Menu

- **Panels for managing resources without a knowledge of DRD commands**
  - Actions
    - Create, delete, update, query
  - Resource types supported are those supported by DRD
    - Databases, programs, transactions, routing codes
  - Primary technique is “fill in the blanks”
    - Choices for each parameter are provided
  - Help available for all fields

- **See Reference Section for more information on the Manage Resources Application**

DRD Commands

Reference Table for Resources & Keywords

Resource Type	SYSGEN Macro	IMS Control Block	Resource Keyword	Descriptor Keyword
Database	DATABASE	DDIR	DB	DBDESC
Program	APPLCTN	PDIR	PGM	PGMDESC
Transaction	TRANSACT	SMB	TRAN	TRANDESC
Routing Code	RTCODE	RTCE	RTC	RTCDESC

- **Examples**
  - CREATE PGM…
  - DELETE TRANDESC…
  - UPDATE TRAN…

DRD Command Entry and Response

- **Operations Manager (OM)**
  - Commands must be entered through an OM interface
  - OM will consolidate responses from all IMSs in IMSplex
- **If any IMS returns a non-zero return/reason code to OM**
  - OM will return a non-zero return/reason code to SPOC, plus a completion code for each resource
    - If CC not 0, CCText explains reason
  - SPOC displays completion code and text for each IMS and resource
- **Sample command input and response**
  - PGM2 created even though command failed for PGM1

```
CREATE PGM NAME(PGM1,PGM2) SET(SCHDTYPE(SERIAL))

PgmName  MbrName  CC  CCText
PGM1     IMS1     11  RESOURCE ALREADY EXISTS
PGM2     IMS1      0
```

DRD Command Entry and Response

- **In some cases, an "Error Text" will also be returned**
- **Sample command input and response**

```
DELETE DB NAME(ACCTMSTR,CUSTMSTR)

DBName    MbrName  CC  CCText                        ErrorText
ACCTMSTR  IMS1     6F  REFERENCED BY PROGRAM   ACCTUPDT
CUSTMSTR  IMS1      0
```

- ***IMS 10 Command Reference* documents, for each command**
  - Return and reason codes
  - CC (Completion Codes)
  - CCText (meaning of completion code – if non-zero)
  - ErrorText (further explanation – if applicable)

CREATE Command - Syntax

```
CREATE rsc-type | desc-type
NAME(name1,name2,...)
LIKE(RSC(rsc-name)) | LIKE(DESC(desc-name))
SET(attr1(val1),attr2(val2),...)
DEFAULT(Y)   <<< valid for descriptors only
```

- **rsc-type** | **desc-type** = resource or descriptor type
  - DB, DBDESC, PGM, PGMDESC, RTC, RTCDESC, TRAN, TRANDESC
- **NAME()** = resource or descriptor names; they will all have the same attributes; wild cards not supported
- **LIKE()** = resource or descriptor name to use as model
- **SET()** = attribute names and values
- **DEFAULT(Y)** – valid for descriptors only
  - Y causes this descriptor to become current default descriptor

CREATE Command - Setting Attributes

- **All attribute values are set either explicitly by SET command keyword or by default**
- **Hierarchy of attribute setting:**
  - SET command keyword – takes precedence over all others
  - LIKE command keyword
    - Attributes not SET are obtained from the specified model
    - Can be LIKE DESC or LIKE RSC
    - Takes precedence over current default descriptor
  - If LIKE command keyword not specified
    - Attributes not SET will be obtained from current default descriptor, which can be either:
      - DFSDSxx1 (IMS-provided)
      - User descriptor created with DEFAULT(Y)
- **See Reference Section for examples**

DELETE Command - Syntax

```
DELETE rsc-type | desc-type
    NAME(* | name1,name2,NAME*,...) OPTION(ALLRSP)
```

- **rsc-type | desc-type** = resource or descriptor type
  - DB, DBDESC, PGM, PGMDESC, RTC, RTCDESC, TRAN, TRANDESC
- **NAME()** = names of resources or descriptors
  - Can specify multiple names
  - Can use wildcard character
    - NAME(*) – all resources or descriptors (be careful)
    - NAME(PART*) – resource or descriptors starting with PART
    - NAME(ADDPART,BILL*)
- **OPTION(ALLRSP)**
  - Ignored except when NAME(*)
  - Indicates responses to be returned for all resources
    - Default is to return response only for error conditions

DELETE Command

- **To delete a resource**
  - Resource cannot be “in use”
  - Recommendation: stop resource before attempting to delete
- **QUERY command enhanced to display resource work status**
  - Show work that might cause delete command (or OLC) to fail
- **See Reference Section for examples**

UPDATE Command - Syntax

```
UPDATE rsc-type | desc-type
NAME(name1,name2,...)
SET(attr1(val1),attr2(val2),...) |
START(attr1,attr2,...) STOP(attr1,attr2,…)
DEFAULT(Y)   <<< valid for descriptors only
```

- **rsc-type | desc-type** = resource or descriptor type
  - DB, DBDESC, PGM, PGMDESC, RTC, RTCDESC, TRAN, TRANDESC
- **NAME()** = resource or descriptor names; they will all have the same attributes; wild cards are supported
- **SET()** = attribute names and values
- **START()** = function to be started
- **STOP()** = function to be stopped
- **DEFAULT(Y)** – valid for descriptors only
  - Y causes this descriptor to become current default descriptor

UPDATE Command

- **Enhanced in IMS 10 to support updating:**
  - Resource/descriptor status and attributes
    - MODBLKS: DB, PGM, TRAN, RTC
    - MSC: MSPLINK, MSLINK, MSNAME
      - MSC definitions have no CREATE | DELETE support
- **Cannot update resource attribute if resource "in use"**
- **Recommendation: QUERY and /STOP resource before attempting to update**
- **Cannot update resource attributes and status in same command**
- **Updating (or creating) descriptor with DEFAULT(Y) sets this descriptor to current system default descriptor for that resource type**
- **See Reference Section for examples**

QUERY Command

- **Enhanced in IMS 10 to support:**
  - QUERY PGM (queries information about program resources)
  - QUERY RTC (queries information about Fast Path routing codes)
  - New parameter SHOW(WORK) displays work status of runtime resource

- **SHOW(WORK) indicates reasons that would prevent online change or some DRD commands from completing successfully**
  - Online Change MODBLKS / ACBLIB
  - DELETE resource
  - UPDATE resource

- **See Reference Section for examples**

QUERY Command for MSC Resources

- **Enhanced in IMS 10 to display MSC attributes and status**
  - QUERY MSPLINK
    - Displays definitions and status for one or more physical links
  - QUERY MSLINK
    - Displays definitions and status for one or more logical links
  - QUERY MSNAME
    - Displays definitions and status for one or more logical link paths
- **See Reference Section for examples**

EXPORT Command (IMS 10 SPE – PK66704, Oct 08)

- **Used to export resource and descriptor definitions to an RDDS**
- **EXPORT Command Syntax**

```
EXPORT DEFN TARGET(RDDS) TYPE() NAME() RDDSDSN() OPTION()
```

- **Where**
  - **TYPE()** defines the resource type
    - ALL, ALLDESC, ALLRSC ,DB, DBDESC, PGM, PGMDESC, RTC, RTCDESC, TRAN, TRANDESC
  - **NAME()** defines the names of the resources to export
    - NAME(*) is the default
  - **RDDSDSN()** defines a non-system RDDS
    - Cannot be a system RDDS defined in DFSDFxxx member
    - If omitted, exports to a system RDDS

EXPORT Command (IMS 10 SPE – PK66704, Oct 08)

- **EXPORT Command Syntax**

```
EXPORT DEFN TARGET(RDDS) TYPE() NAME() RDDSDSN() OPTION()
```

  - **OPTION()**
    - **OVERWRITE (default)** indicates that resource/descriptor definitions are to overwrite all existing definitions in the RDDS
      - Valid when exporting to system and non-system RDDS
    - **APPEND** indicates that resource/descriptor definitions are to be appended to the end of the specified RDDS data set
      - Valid when exporting to non-system RDDS
    - **ALLRSP** returns a response for each exported resource, valid with NAME(*) only

EXPORT Command (IMS 10 SPE – PK66704, Oct 08)

- **EXPORT Command Syntax**

```
EXPORT DEFN TARGET(RDDS) TYPE() NAME() RDDSDSN() OPTION()
```

  - **OPTION()**
    - **NOCHECK** valid with the APPEND option and allows the IMS performing the export to be a different IMS than the one that performed the previous export
      - Only valid when exporting to a non-system RDDS

EXPORT Command Restrictions

- **When exporting to a system RDDS**
  - All resource and descriptor definitions must be exported
  - Existing definitions are overwritten
- **When exporting to a non-system RDDS**
  - A subset of resource and descriptor definitions may be exported
  - Existing definitions can be overwritten or appended to
- **IMS defined resources cannot be exported**
  - DBF#FPU0,
  - DBFDSRT1, DFSDSDB1, DFSDSPG1, DFSDSTR1
- **The EXPORT DEFN command can be issued in both a DRD and non-DRD environment**
  - In a non-DRD environment the export must be to a non-system RDDS
- **See Reference Section for examples**

IMPORT Command (IMS 10 SPE – PK66682, Oct 08)

- **Used to import resource and descriptor definitions from an RDDS**
- **IMPORT Command Syntax**

```
IMPORT DEFN SOURCE(RDDS) TYPE() NAME() RDDSDSN() OPTION()
```

- **Where**
  - **TYPE()** defines the resource type
    - ALL, ALLDESC, ALLRSC, DB, DBDESC, PGM, PGMDESC, RTC, RTCDESC, TRAN, TRANDESC
  - **NAME()** defines the names of the resources to import
    - NAME(*) is the default
  - **RDDSDSN()** defines a system RDDS or a non-system RDDS
    - If omitted, imports from the current system RDDS.
    - If RDDSDSN() specifies system RDDS, TYPE(ALL) and NAME(*) must be specified, or defaulted to.

IMPORT Command (IMS 10 SPE – PK66682, Oct 08)

- **IMPORT Command Syntax**

```
IMPORT DEFN SOURCE(RDDS) TYPE() NAME() RDDSDSN() OPTION()
```

  - **OPTION()**

    - **ABORT** imports only if all resources are successful. Otherwise, no resources are to be imported.
    - **ALLRSP** returns a response for each imported resource, valid with NAME(*) only

IMPORT Command Considerations

- **IMPORT supports CREATE of new MODBLKS resources only**
- **IMPORT does not support UPDATE existing MODBLKS resources**
- **HALDB databases: can import HALDB Master only, no partitions**
  - Successful import of HALDB Master will result in ‘ D’ completion code with accompanying text returned:

```
RSC NEEDS STA DB ON HALDB MASTER
```

    - Serves as a reminder that HALDB partitions must be built with either /STA DB command or UPDATE DB START(ACCESS)
- **See Reference Section for examples**

EXPORT/IMPORT with IMS Application Migration

- **Use EXPORT/IMPORT to migrate an application defined on one IMS system to another IMS system**
  - Issue EXPORT command on IMSA to export an application's database, program, routing code and transaction definitions to a non-system RDDS
  - Issue IMPORT command on IMSB to import the definitions

EXPORT/IMPORT with IMS Cloning

- **Use EXPORT/IMPORT to port IMS system resources from one IMS system to another IMS system**
- **Example steps**
  1. EXPORT definitions from IMSA to non-system RDDS
  2. Coldstart new IMSB with no resources defined
  3. IMPORT definitions to IMSB from non-system RDDS to port IMSA system resources to IMSB without doing an IMS SYSGEN for databases, programs, routing codes and transactions.

DRD Utilities

New DRD Utilities

- **Projected availability: 1st Quarter 2009**
- **Set of offline utilities to perform the following DRD-related functions:**
  - Generate RDDS from
    - Checkpoint and X'22' (type-2 command) log records
    - MODBLKS data set
    - SYSGEN macros
  - Generate CREATE commands from
    - MODBLKS data set
    - SYSGEN macros
  - Display RDDS content
  - Copy source RDDS to a target RDDS

New DRD Utilities

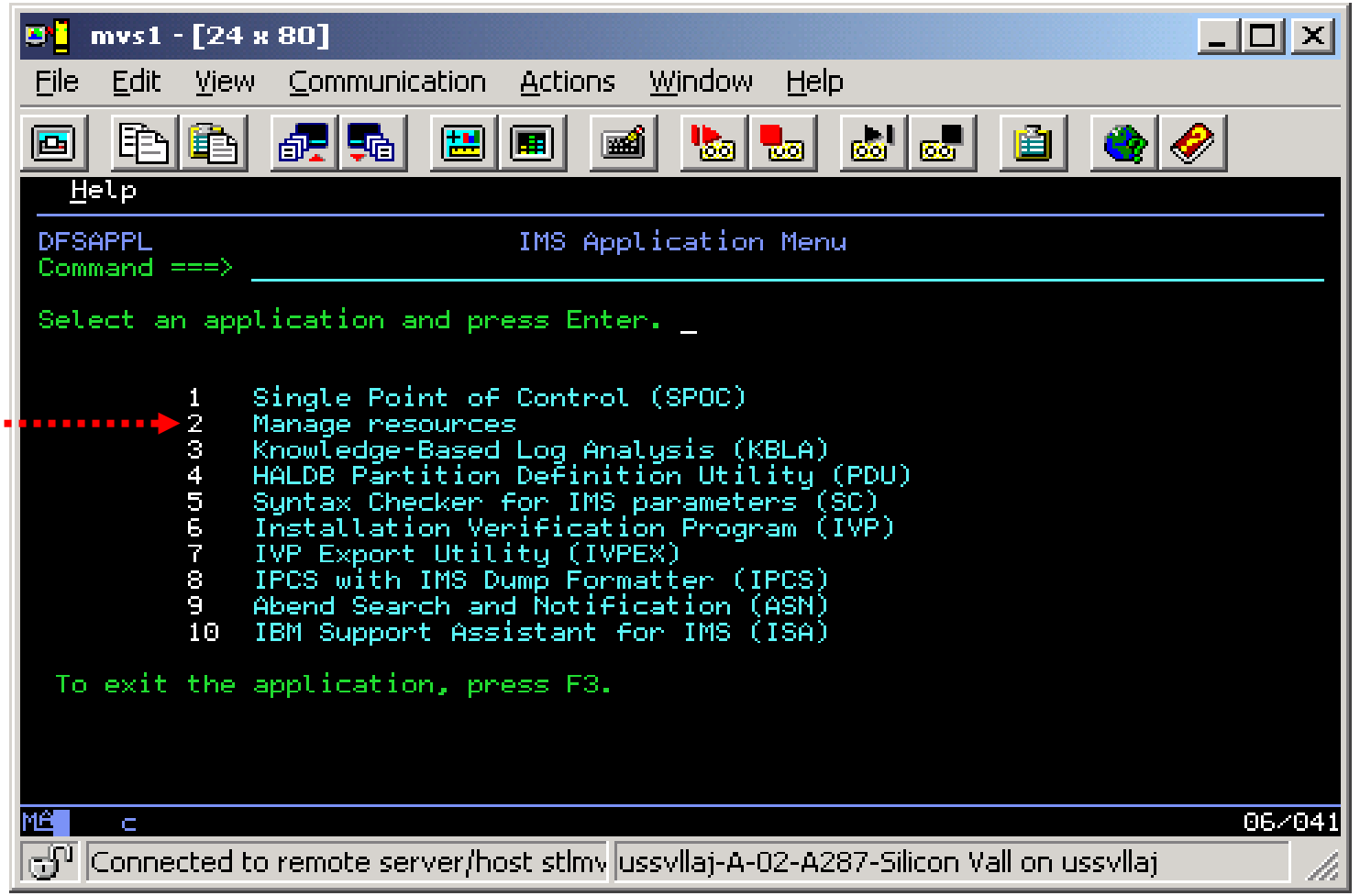
- **Utilities run offline and are invoked via JCL streams**
- **JCL can be generated by either:**
  - ISPF Panels accessible from the Manage Resources application off the IMS Application Menu
  - Utilities will all be documented in the *IMS System Utilities Reference* manual (use of the ISPF panels are not required in order to invoke utilities)

Benefits

- **DRD Utilities**
  - Facilitate implementation of DRD by reducing manual effort required to create an RDDS
  - Make DRD more usable by providing capability to re-create an “up-to-date” RDDS in the event of accidental loss
    - Allow creation of an RDDS from IMS system definitions, MODBLKS data set, checkpoint log records and X’22’ log records
    - Allow contents of an RDDS to be queried/displayed/copied

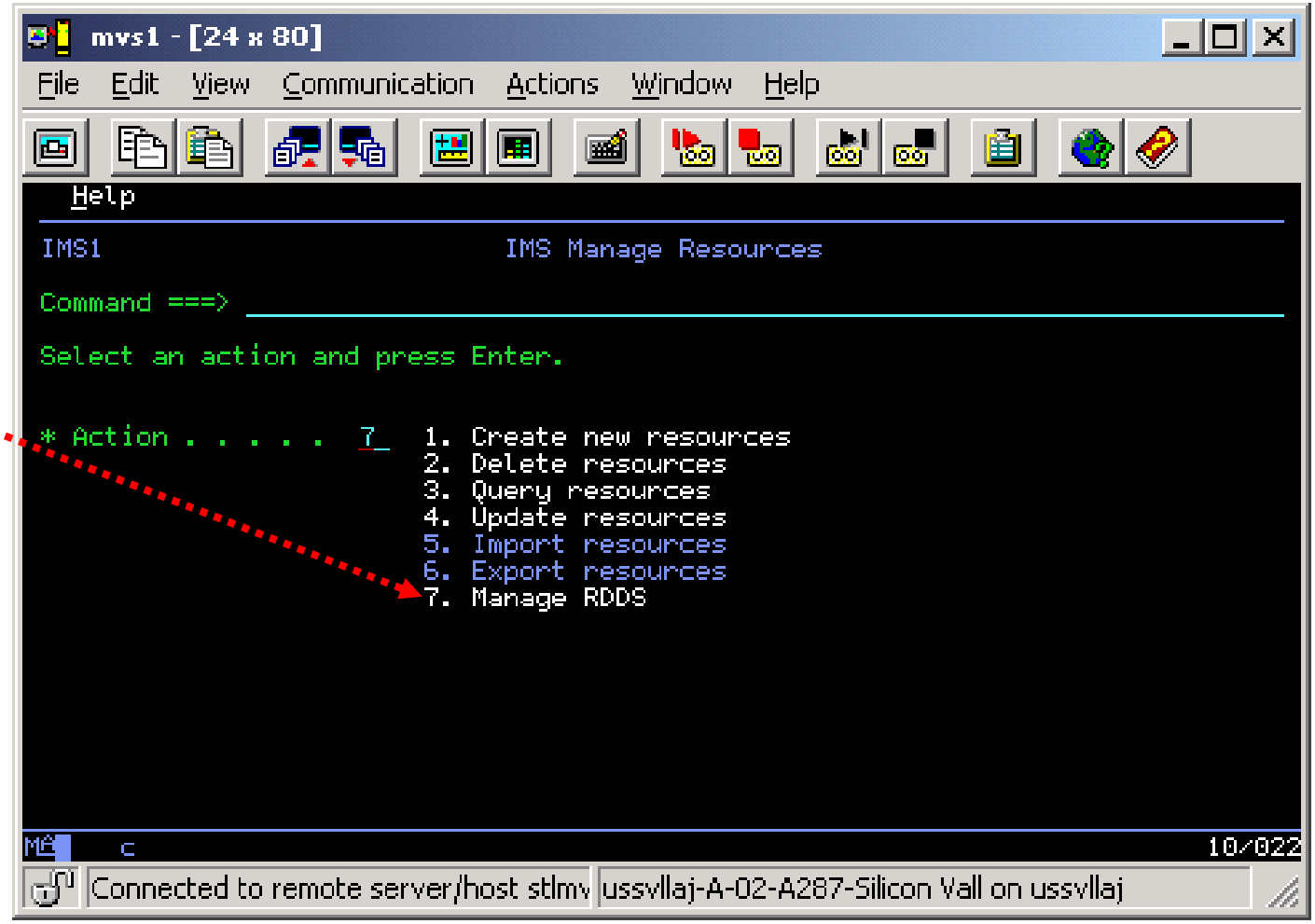
New DRD Utilities - Example Screenshots

Invoke DRD Utilities via Manage Resource application



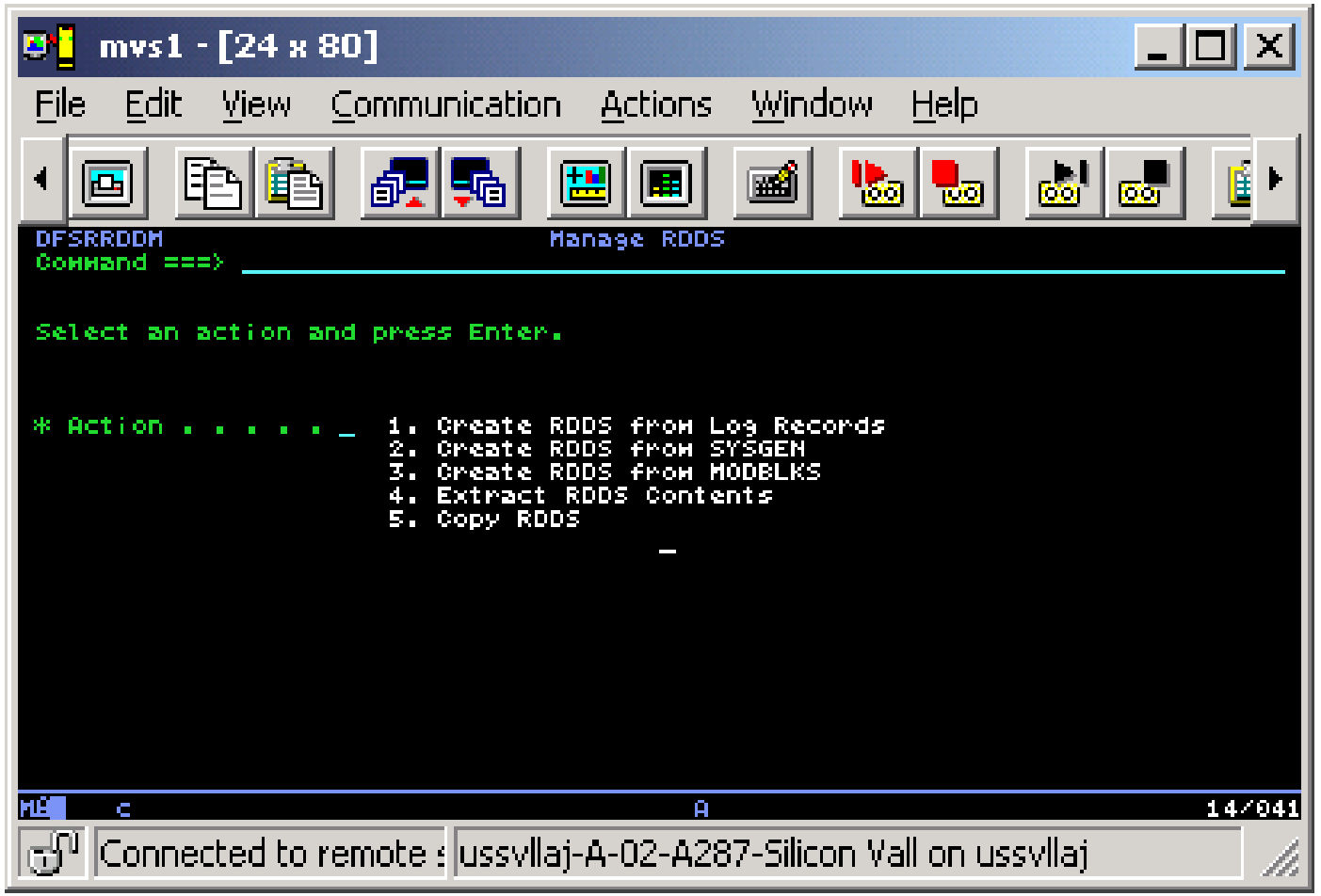
New DRD Utilities - Example Screenshots

Select Manage RDDS

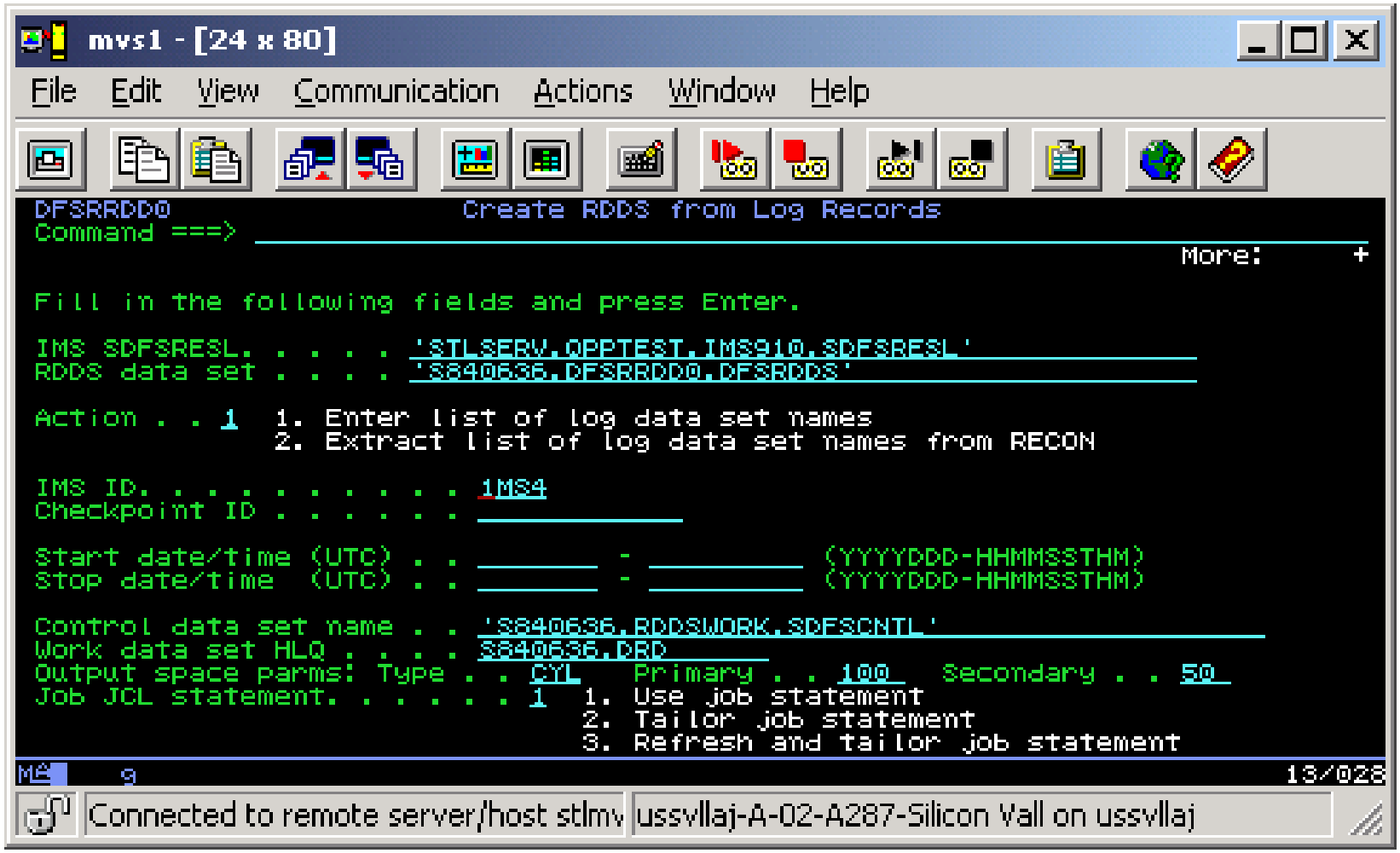


New DRD Utilities - Example Screenshots

Select action to perform

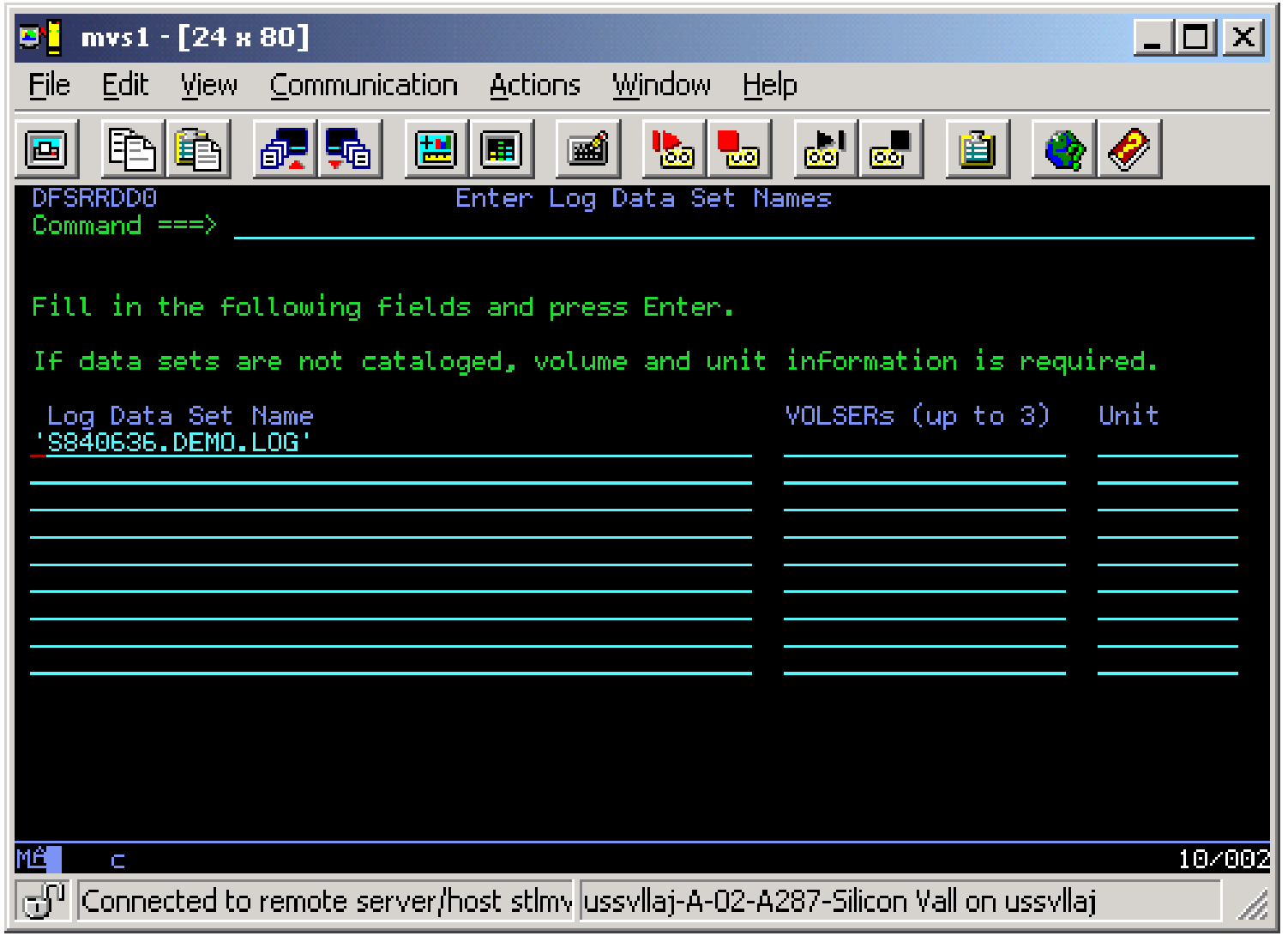


Generating an RDDS from log records



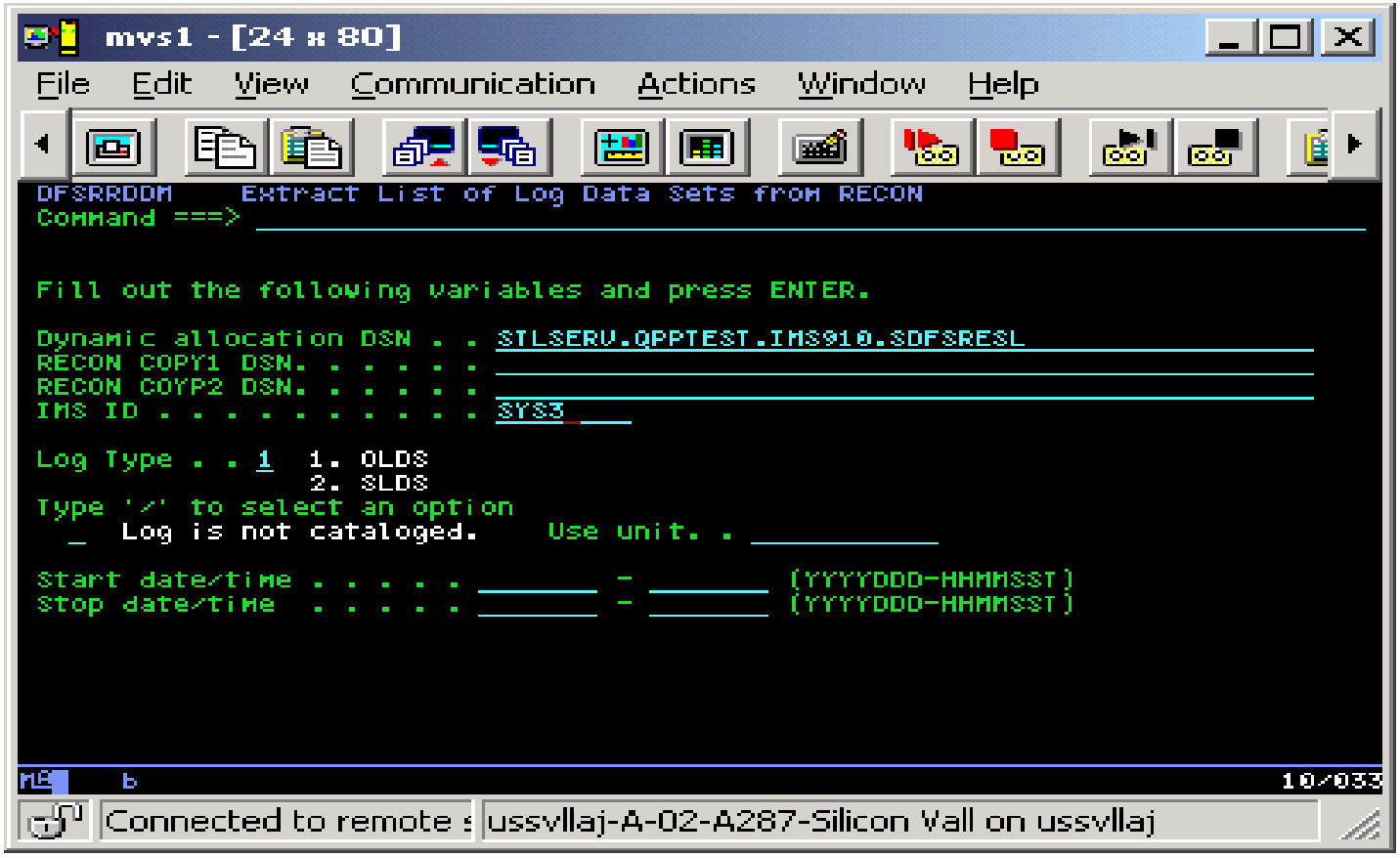
Generating an RDDS from log records

Option 1: enter log data set names



Generating an RDDS from log records

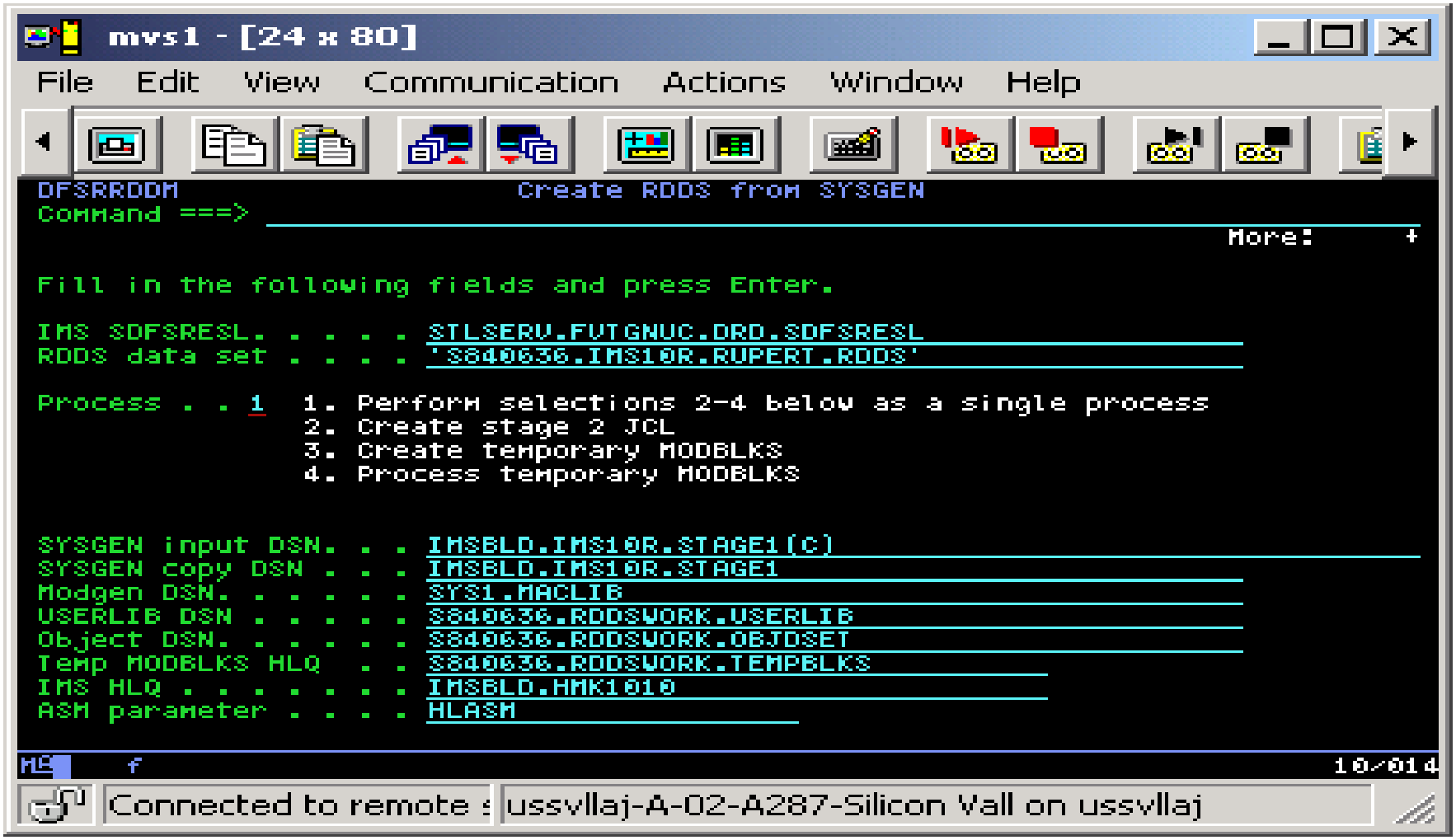
Option 2: enter RECON data set name



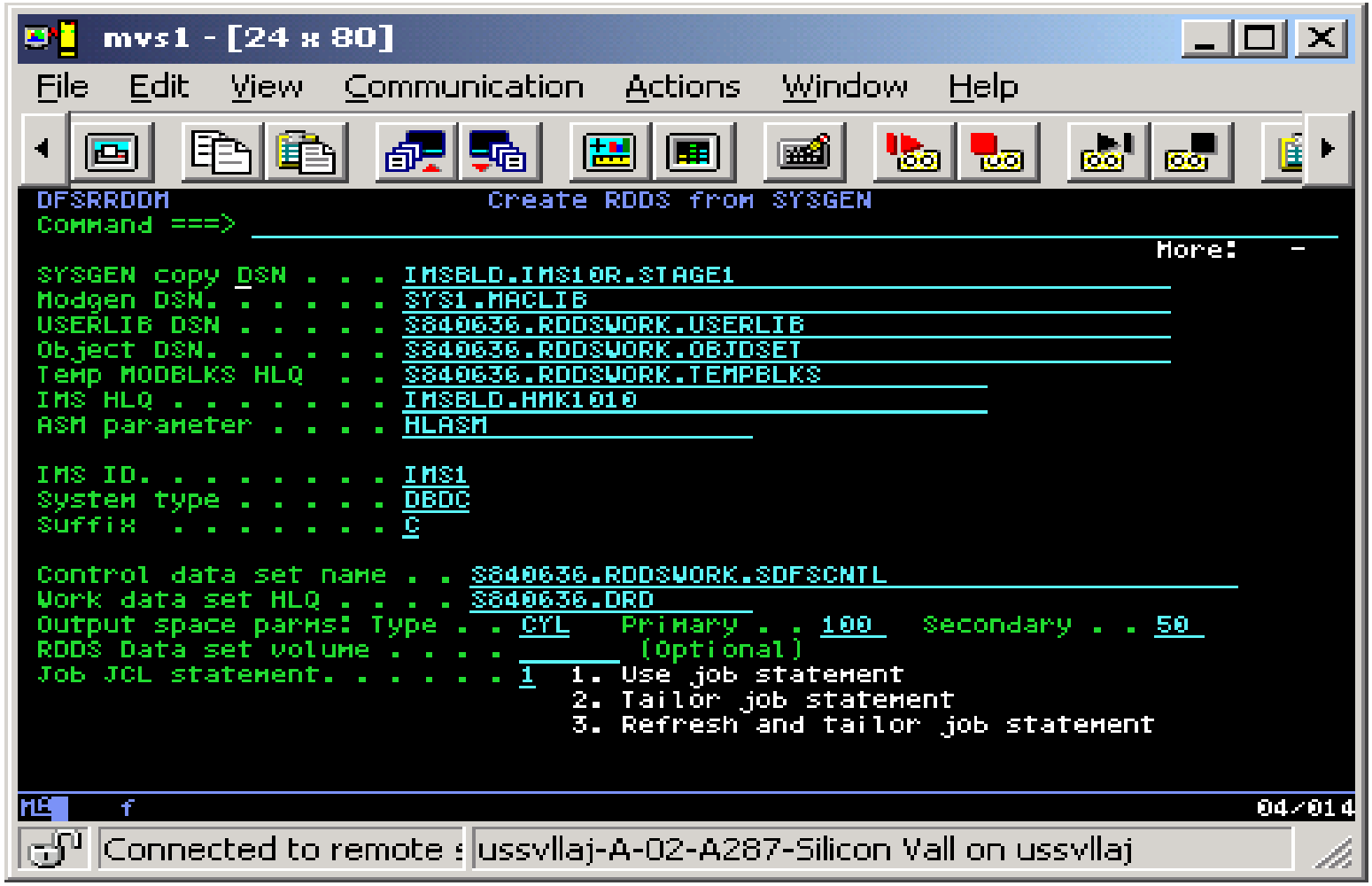
Generating an RDDS from log records – JCL generated from panels

```
//job name JOB  CLASS=J,MSGCLASS=A,MSGLEVEL=(1,1)
//JOBLIB   DD   DSN=[library data set name],DISP=SHR
//S1       EXEC PGM=DFSURCL0
//SYSUT1   DD   DSN=[Log data set name(s)],DISP=SHR
//RDDSDSN  DD   DSN=[RDDS data set name],DISP=(,CATLG,DELETE),
//              UNIT=SYSDA,VOL=SER=[Volume name],
//              SPACE=(CYL,(1,1),RLSE),
//              DCB=(LRECL=32756,BLKSIZE=32760,RECFM=VB)
//WORKFILE DD   DSN=[Workfile data set name),DISP=(,CATLG,DELETE),
//              UNIT=SYSDA,VOL=SER=[Volume name],
//              SPACE=(CYL,(1,1),RLSE),
//              DCB=(LRECL=133,BLKSIZE=6118,RECFM=FBA)
//REPORT   DD   SYSOUT=*,
//              DCB=(LRECL=133,BLKSIZE=6118,RECFM=FBA)
//CONTROL  DD   *
IMSID=SYS3
CHKPTID=200809002144935
/*
//
```

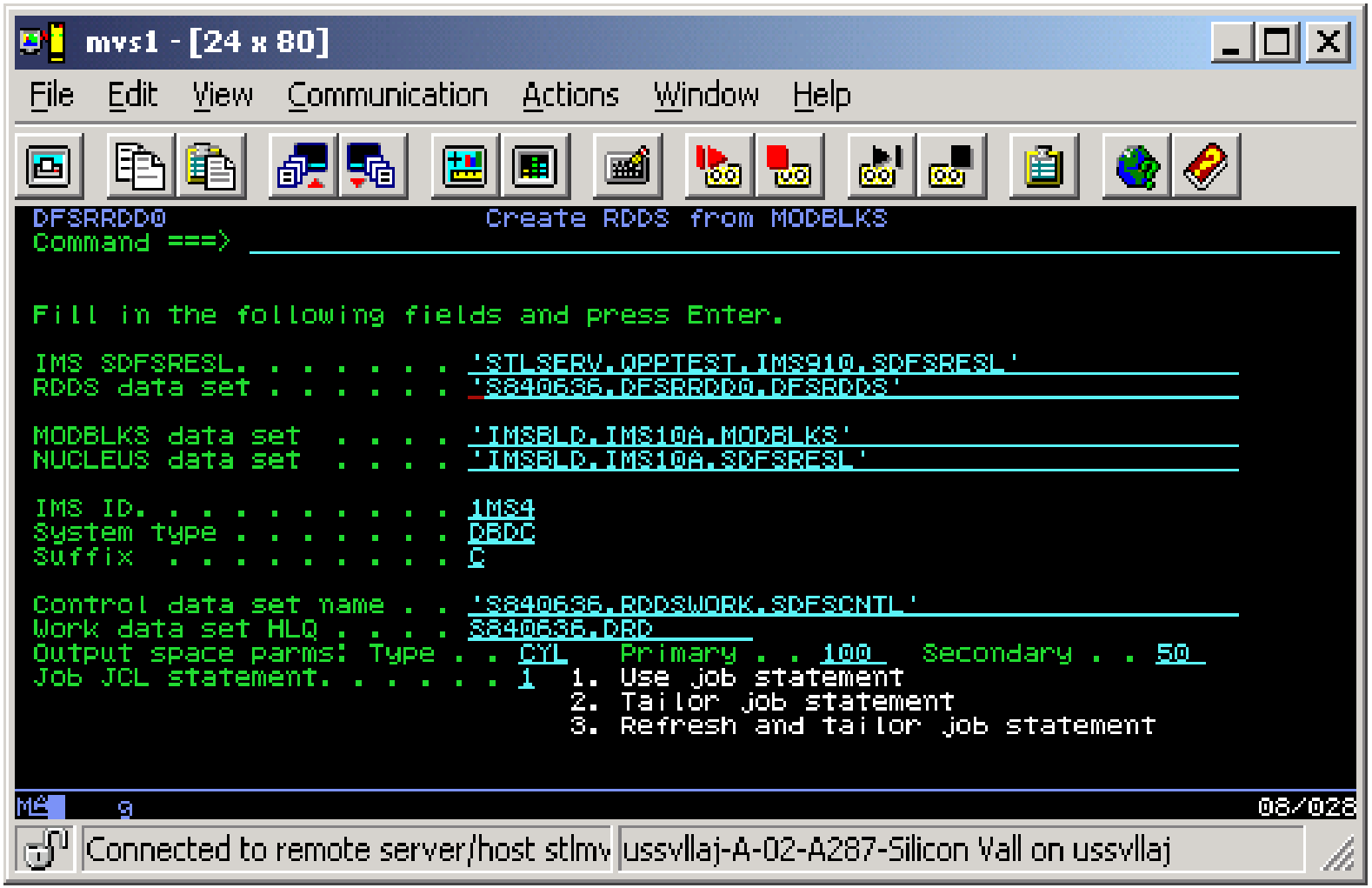
Generating an RDDS from Sysgen – Top of Panel



Generating an RDDS from Sysgen – Scrolled down



Generating an RDDS from MODBLKS



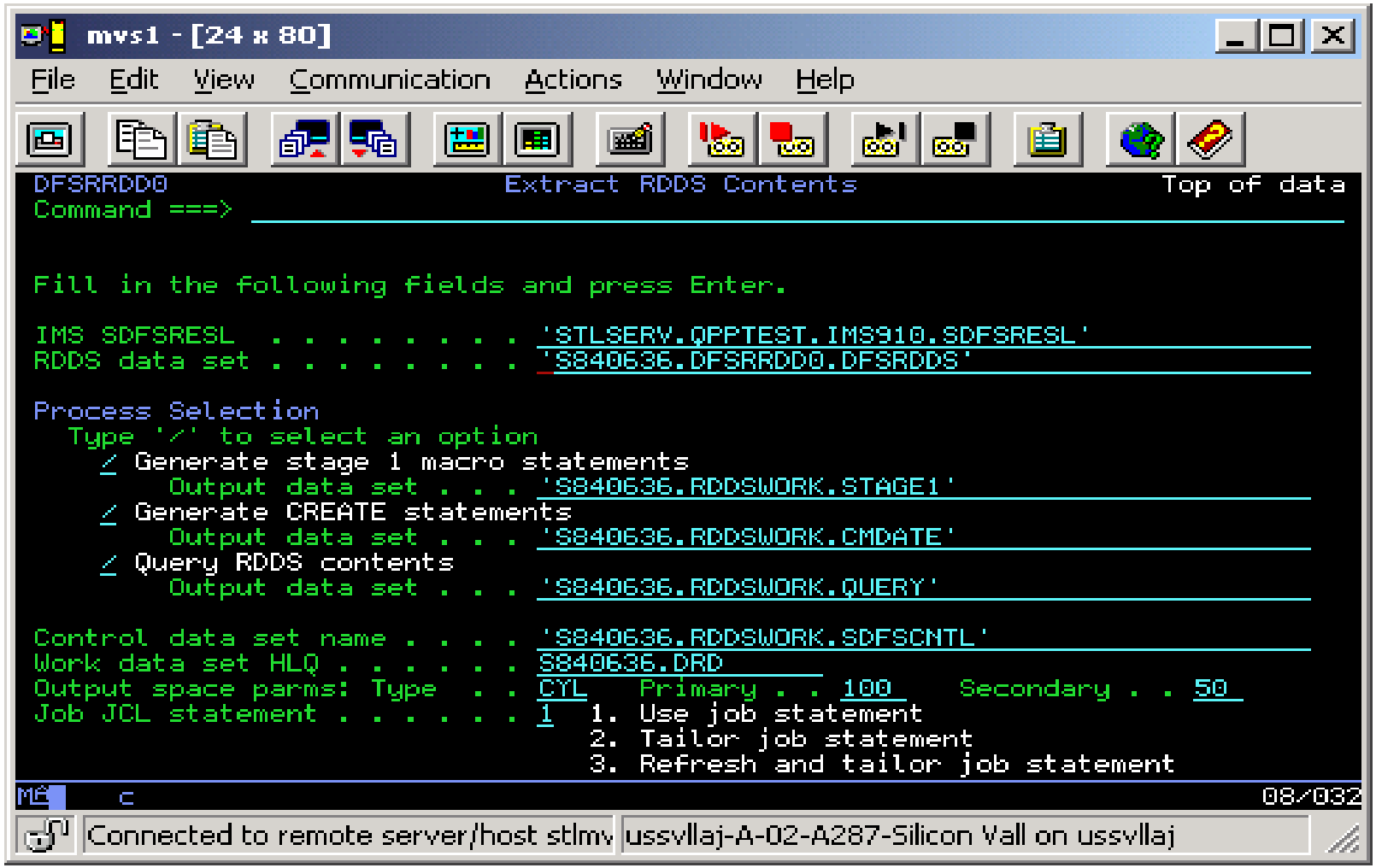
Generating an RDDS from MODBLKS – JCL generated from panels

```
job name JOB  CLASS=J,MSGCLASS=A,MSGLEVEL=(1,1)
//JOBLIB   DD   DSN=[library data set name],DISP=SHR
//S1       EXEC PGM=DFSURCM0
//MODBLKS  DD   DSN=[MODBLKS data set name],DISP=SHR
//RDDSDSN  DD   DSN=[RDDS data set name],DISP=(,CATLG,DELETE),
//              UNIT=SYSDA,VOL=SER=[Volume name],
//              SPACE=(CYL,(1,1),RLSE),
//              DCB=(LRECL=32756,BLKSIZE=32760,RECFM=VB)
//SYSPRINT DD   SYSOUT=*,
//              DCB=(LRECL=133,BLKSIZE=6118,RECFM=FBA)
//REPORT   DD   SYSOUT=*,
//              DCB=(LRECL=133,BLKSIZE=6118,RECFM=FBA)
//CONTROL  DD   *
IMSID=SYS3
SUF=V
/*
```

RDDS Extraction Utility (DFSURDD0)

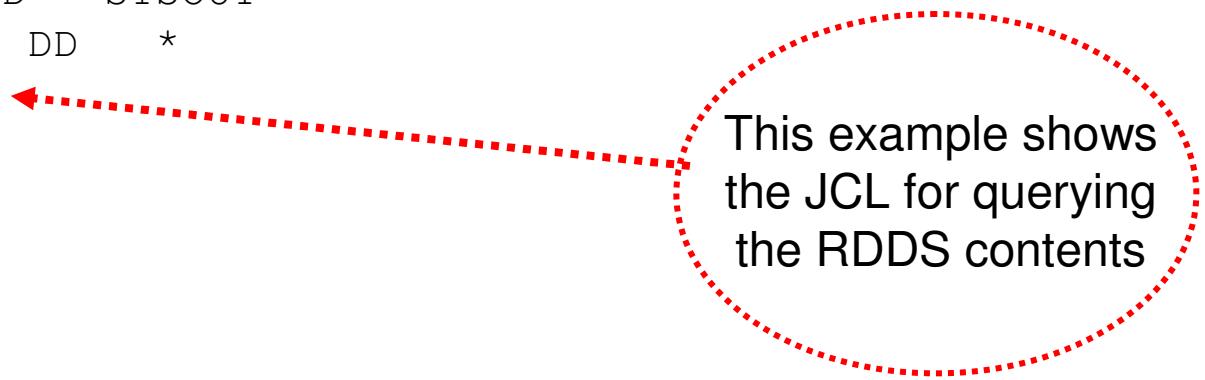
- **Offline batch utility**
- **Converts stored resource definitions in a system or non-system RDDS to:**
  - IMS Stage-1 macro statements (APPLCTN, TRANSACT, DATABASE, RTCODE)
  - IMS Type-2 CREATE commands for DRD (could be submitted to IMS via batch SPOC)
    - CREATE DB
    - CREATE TRAN
    - CREATE PGM
    - CREATE RTC
  - RDDS Content query and statistics report
- **Queries the RDDS and displays the resources/descriptors with all attribute values, also reports duplicates (available 1st quarter 2009)**
- **Output written to SYSPRINT data set**

RDDS Extraction Utility- Example Screenshot

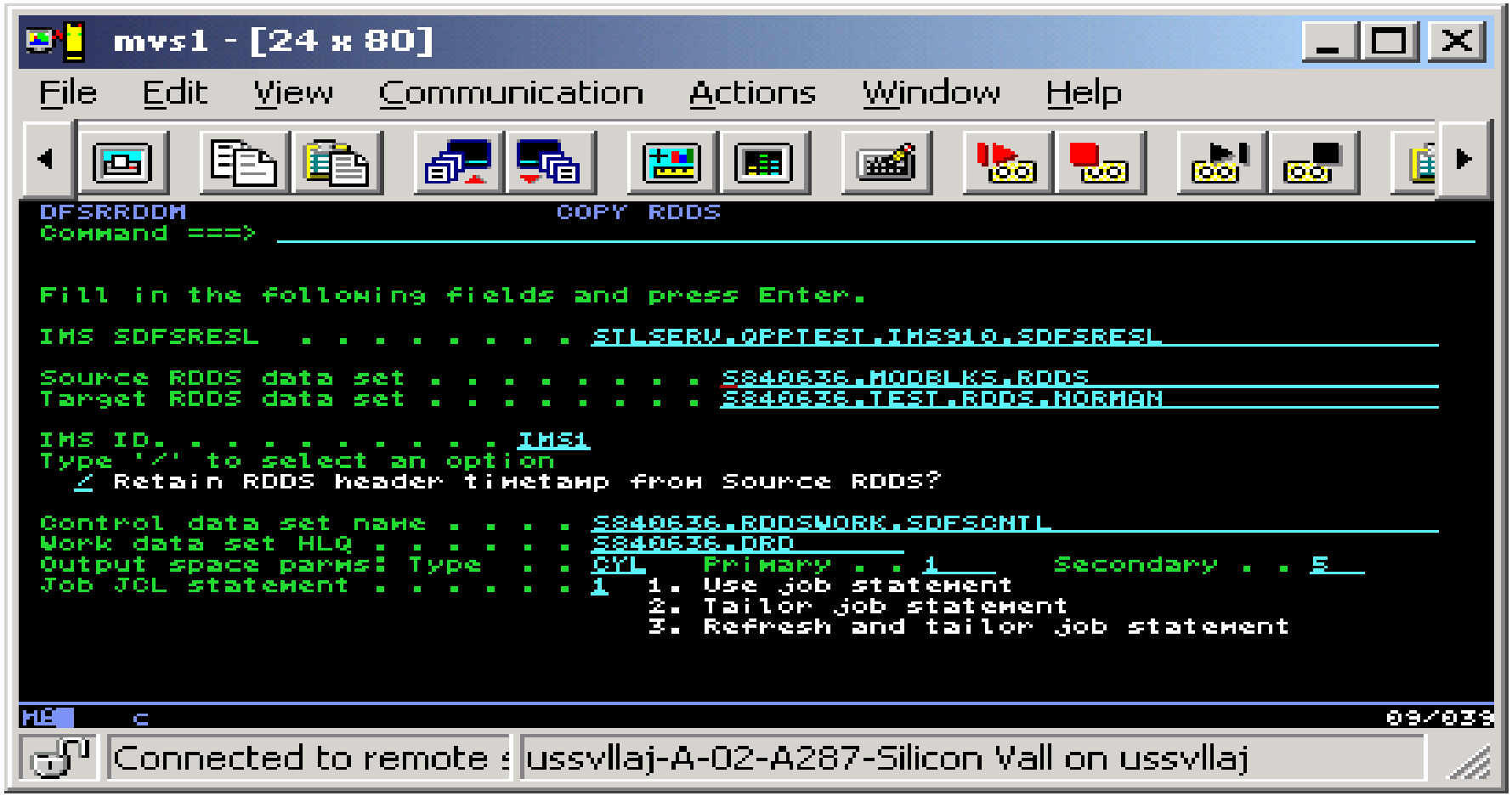


RDDS Extraction Utility – JCL Generated

```
//job name JOB  CLASS=J,MSGCLASS=A,MSGLEVEL=(1,1)
//JOBLIB   DD   DSN=[library data set name],DISP=SHR
//S1       EXEC PGM=DFSURDD0,MEMLIMIT=4G
//RDDSDSN  DD   DSN=[RDDS data set name],DISP=SHR
//SYSOUT   DD   DSN=[output data set name],DISP=(,CATLG,DELETE),
//              UNIT=SYSDA,VOL=SER=[Volume name],
//              SPACE=(CYL,(1,1),RLSE),
//              DCB=(LRECL=80,RECFM=FB,BLKSIZE=800)
//SYSPRINT DD   SYSOUT=*
//CONTROL    DD   *
OUTPUT=QUERY
/*
//
```



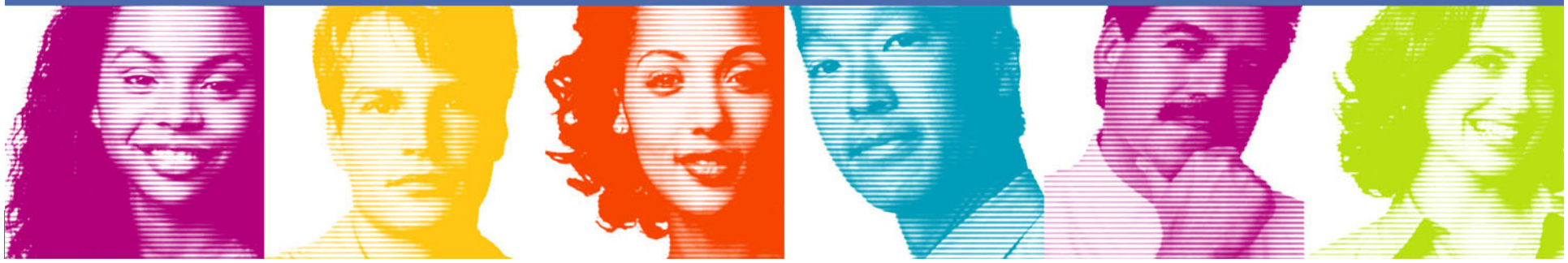
RDDS Copy RDDS Utility- Example Screenshot



RDDS Copy Utility – JCL Generated

```
//job name JOB  CLASS=J,MSGCLASS=A,MSGLEVEL=(1,1)
//JOBLIB   DD   DSN=[library data set name],DISP=SHR
//S1       EXEC PGM=DFSURCP0
//RDDSIN   DD   DSN=[Source RDDS data set name],DISP=SHR
//RDDSDSN  DD   DSN=[Target RDDS data set name],
//              DISP=(,CATLG,DELETE),
//              UNIT=SYSDA,VOL=SER=[Volume name],
//              SPACE=(CYL,(15,1),RLSE),
//              DCB=(LRECL=32756,BLKSIZE=32760,RECFM=FB)
//REPORT   DD   SYSOUT=*,DCB=(LRECL=133,BLKSIZE=6118,RECFM=(FBA)
//CONTROL    DD   *
IMSID=IMS1
RETAINTIME
/*
//
```

Summary



Summary

- **IMS 10 Dynamic Resource Definition**
  - Improves IMS availability by allowing dynamic creation, deletion, and updating of MODBLKS runtime resource definitions
    - Reduces the requirements for planned outages
    - Eliminates unavailability associated with MODBLKS OLC and IMS restart
  - MSC DRD allows dynamic updating of MSC definitions
- **DRD Utilities**
  - Allow user to generate DRD-related components using existing resources
    - RDDS
    - IMS SYSGEN macro statements
    - Type-2 CREATE commands
  - Allow user to query/display/copy RDDS contents
- **See following Reference Section**
  - Examples of DRD command input/output
  - Manage Resources application (optional interface for using DRD)

Reference Section

DRD Command Examples

CREATE Command - Examples

- Creating a transaction with the IMS default descriptor

```
CRE TRAN NAME(BALCHECK) SET(PGM(ACCTPGM))
```

  - Default descriptor is used since LIKE not specified
    - Could be IMS defined descriptor, DFSDSTR1
    - Or user defined descriptor
  - All attribute values besides PGM are obtained from default descriptor

- Creating a transaction with a user-defined descriptor

```
CRE TRANDESC NAME(ACCTMODL)
       SET(PARLIM(5),PLCT(20),PLCTTIME(2),MAXRGN(5))

CRE TRAN NAME(ACCTUPDT) LIKE(DESC(ACCTMODL)
       SET(MAXRGN(8),PGM(ACCTPGM))

CRE TRAN NAME(ACCTDLET) LIKE(RSC(ACCTUPDT))
```

DELETE Command - Examples

- Examples of deleting MODBLKS runtime resource definitions

```
QRY PGM NAME(ACCTPGM) SHOW(WORK)
UPD PGM NAME(ACCTPGM) STOP(SCHD)
DEL PGM NAME(ACCTPGM)

QRY TRAN NAME(ACCTDLET,ACCTADD,ACCTU*) SHOW(WORK)
UPD TRAN NAME(*) STOP(SCHD)
DEL TRAN NAME(ACCTDLET,ACCTADD,ACCTU*)
```

UPDATE Command - Examples

- Examples of updating MODBLKS runtime resource definitions

```
UPD DB NAME(ACCTMSTR) START(ACCESS) SET(ACCTYPE(EXCL))

UPD PGM NAME(ACCT*) SET(RESIDENT(Y))

UPD TRAN NAME(ACCTUPDT) SET(PARLIM(5),RESP(Y))

UPD TRANDESC NAME(COMPMODL) SET(MAXRGN(10),DEFAULT(Y))
```

UPDATE Command for MSC - Examples

- Activating previously defined “dummy” definitions between IMSA and IMSB
- On IMSA

```
UPD MSPLINK NAME(DMYMSP1)
       SET(MSPLINK(IMSAB),NODE(IMSB))

UPD MSLINK NAME(DMYMSL1)
       SET(MSLINK(IMSAB1),MSPLINK(IMSAB))

UPD MSNAME NAME(DMYMSN1)
       SET(MSNAME(LINKA1),(SIDR(30),SIDL(20))
```

- Repeat for IMSB

QUERY Command - Examples

- Examples of how to determine if there is work in progress for a resource or if the resource is referenced by another resource

```
QRY DB NAME(ACCTMSTR) SHOW(WORK|PGM)

QRY PGM NAME(ACCTPGM) SHOW(WORK|TRAN|RTC)

QRY TRAN NAME(ACCT*) SHOW(WORK)

QRY RTC NAME(ACCT*) SHOW(WORK|REGION)
```

QUERY Command for MSC Resources - Examples

- Examples of querying MSC resource definitions

```
QUERY MSPLINK NAME(IMSAB)
              SHOW(MSLINK,MSNAME)

QUERY MSLINK NAME(IMSAB1)
              SHOW(PARTNER,MSPLINK)

QUERY MSNAME NAME(LINKA1)
              SHOW(MSLINK,MSPLINK,SYSID)
```

EXPORT Command - Example 1

TSO SPOC Input

```
EXPORT DEFN TARGET(RDDS)
```

TSO SPOC Output Response

```
IMSplex . . . . . : PLEX1
 Routing . . . . . :
 Start time. . . . : 2008.294 15:55:10.77
 Stop time . . . . : 2008.294 15:55:10.82
 Return code . . . : 00000000
 Reason code . . . : 00000000
 Reason text . . . :
 Command master. . : IMS1

MbrName  Messages
  IMS1     DFS3404I EXPORT COMMAND COMPLETE FOR ALL ,
DSN=IMS.SYSTEM.RDDS1
```

EXPORT Command - Example 2

TSO SPOC Input

```
EXPORT DEFN TARGET(RDDS) RDDSDSN(NON.SYS.RDDS1)
 NAME(D*, E*, F*,HIMALM01,TPDYNCUR) TYPE(ALL)
 OPTION(OVERWRITE)
```

TSO SPOC Output Response

```
Name      Type      MbrName     CC
DBFSAMD2  DB        IMS1         0
EMHTX2    TRAN      IMS1         0
EMHTX3    TRAN      IMS1         0
FESTXA    TRAN      IMS1         0
FESTXB    TRAN      IMS1         0
HIMALM01  PGM       IMS1         0
TPDYNCUR  PGM       IMS1         0
```

EXPORT Command - Example 2

If you hit PF4 you see the following response:

```
IMSplex . . . . . : PLEX1
 Routing . . . . . :
 Start time. . . . : 2008.294 16:05:10.77
 Stop time . . . . : 2008.294 16:05:10.82
 Return code . . . : 00000000
 Reason code . . . : 00000000
 Reason text . . . :
 Command master. . : IMS1

MbrName  Messages
  IMS1     DFS3404I EXPORT COMMAND COMPLETE FOR ALL ,
DSN=NON.SYS.RDDS1
```

EXPORT Command - Example 3

TSO SPOC Input

```
EXPORT DEFN TARGET(RDDS) RDDSDSN(NON.SYS.RDDS1)
 TYPE(ALLRSC) NAME(TEST)
```

TSO SPOC Output Response

```
Name      Type      MbrName     CC
TEST      PGM       IMS1         0
```

EXPORT Command - Example 4

TSO SPOC Input

```
EXPORT DEFN TARGET(RDDS) RDDSDSN(NON.SYS.RDDS2)
 NAME(TEST,PGMTES*)
```

TSO SPOC Output Response

```
Name      Type      MbrName     CC
TEST      PGM       IMS1         0
PGMTEST   PGMDESC   IMS1         0
TEST      TRANDESC  IMS1         0
```

IMPORT Command - Example 1

TSO SPOC Input

```
IMPORT DEFN SOURCE(RDDS) OPTION(ABORT,ALLRSP)
```

TSO SPOC Output Response

```
IMSplex . . . . . : PLEX1
 Routing . . . . . :
 Start time. . . . : 2008.294 15:55:04.40
 Stop time . . . . : 2008.294 15:55:04.41
 Return code . . . : 0200000C
 Reason code . . . : 00003004
 Reason text . . . : No requests were successful.
 Command master. . : IMS1
              Return     Reason
 MbrName      Code       Code       Description
 --------     ------     ------     -----------
 IMS1         00000008   0000211F   No system RDDSs
defined, rddsdsn() required
```

IMPORT Command - Example 2

TSO SPOC Input

```
IMPORT DEFN SOURCE(RDDS) RDDSDSN(NON.SYS.RDDS1)
```

TSO SPOC Output Response

```
IMSplex . . . . . : PLEX1
 Routing . . . . . :
 Start time. . . . : 2008.294 15:55:05.36
 Stop time . . . . : 2008.294 15:55:07.45
 Return code . . . : 00000000
 Reason code . . . : 00000000
 Reason text . . . :
 Command master. . : IMS1
 MbrName  Messages
 -------- ----------------------
 IMS1     DFS3405I IMPORT COMMAND COMPLETE FOR ALL ,
DSN=NON.SYS.RDDS1
```

IMPORT Command - Example 3

TSO SPOC Input

```
IMPORT DEFN SOURCE(RDDS) RDDSDSN(IMSPLEX1.RDDS.DEFN)
 OPTION(ALLRSP)
```

TSO SPOC Output Response

```
Name      Type      MbrName   CC ImpType
DEDBJN01  DB        IMS2       0 CREATE
DBDFLT    DBDESC    IMS2       0 CREATE
CDEBS     PGM       IMS2       0 CREATE
PGMDFLT   PGMDESC   IMS2       0 CREATE
SMQFP5A   RTC       IMS2       0 CREATE
RTCDFLT   RTCDESC   IMS2       0 CREATE
CDEBTRN1  TRAN      IMS2       0 CREATE
TRANDFLT  TRANDESC  IMS2       0 CREATE
```

IMPORT Command - Example 4

TSO SPOC Input

```
IMPORT DEFN SOURCE(RDDS) RDDSDSN(MYDSN.DEFN)
 OPTION(ABORT)
```

TSO SPOC Output Response

```
Name      Type      MbrName   CC CCText
PART      DB        IMS1       9 NO IMPORT - OPTION ABORT
PARTMAST  DB        IMS1       9 NO IMPORT - OPTION ABORT
TESTDB    DB        IMS1       9 NO IMPORT - OPTION ABORT
TRND01    TRAN      IMS1      6D INVALID PROGRAM NAME
TRND11    TRAN      IMS1       9 NO IMPORT - OPTION ABORT
TRND123   TRAN      IMS1       9 NO IMPORT - OPTION ABORT
TRND01    TRANDESC  IMS1       9 NO IMPORT - OPTION ABORT
```

Manage Resources Application

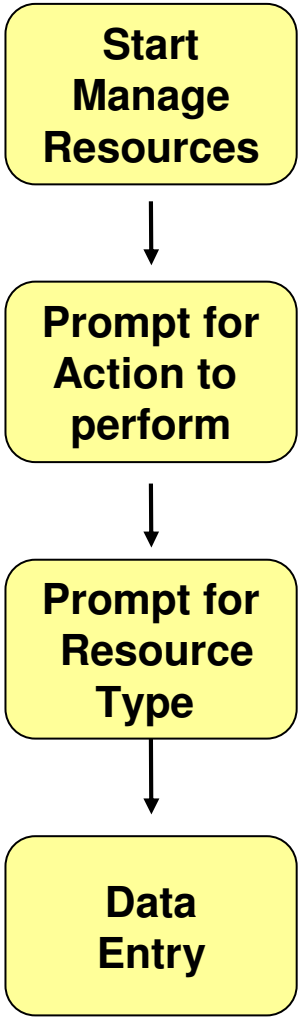
Manage Resources (MR) - Overview

- What is “Manage Resources”?
  - IMS application which guides the user through the DRD process
  - Invoked from IMS Application Menu
  - Includes a series of panels to let the user perform DRD functions against IMS MODBLKS resources and descriptors
- What kind of actions can you perform with MR?
  - Create, delete, update, query, manage RDDS
- Resource types supported are those supported by DRD
  - Databases, programs, transactions, routing codes

Manage Resources (MR) - Overview

- How do you use MR?
  - Primary technique is “fill in the blanks”
  - Panels and navigation similar to TSO SPOC panels
- Supports various skill levels
  - Graduated levels of help available
  - Fewer screens required for higher skill levels

Hierarchical Panel Structure



From IMS Application Menu

Create
Delete
Query
Update

Database
Program
Transaction
Routing Code

Varies Depending On Action

General Flow through Manage Resources

Using MR to Create Resources

- Multiple resources of the same type can be created with a single command
- Separate resource names by commas
- Two “views” available
  - List view: each parameter on a separate line with a short description
  - Command Syntax view: fewer screens and requires higher skill level

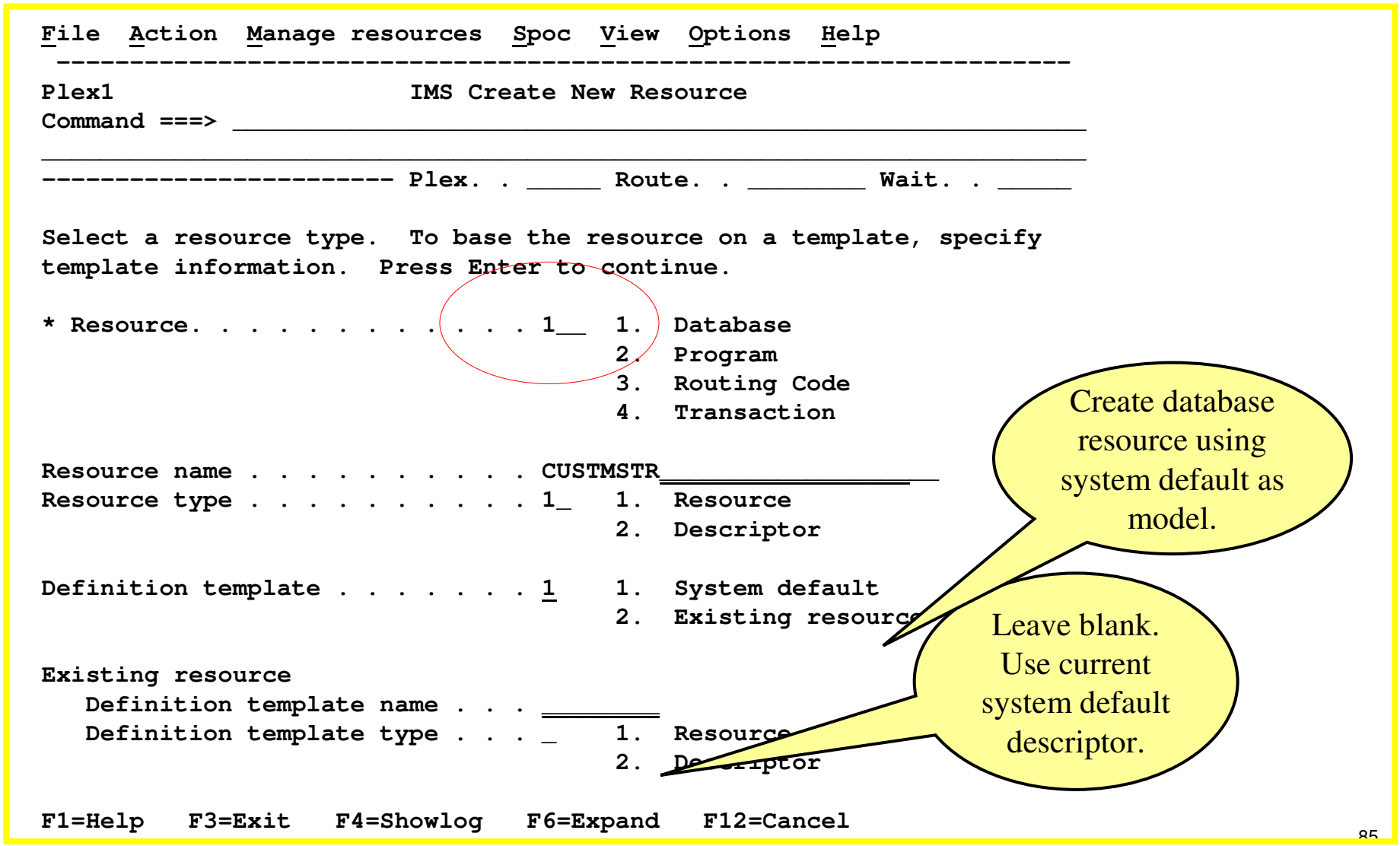
Using MR to Create Resources

- Scroll through the screens using ISPF function key assignments
  - 

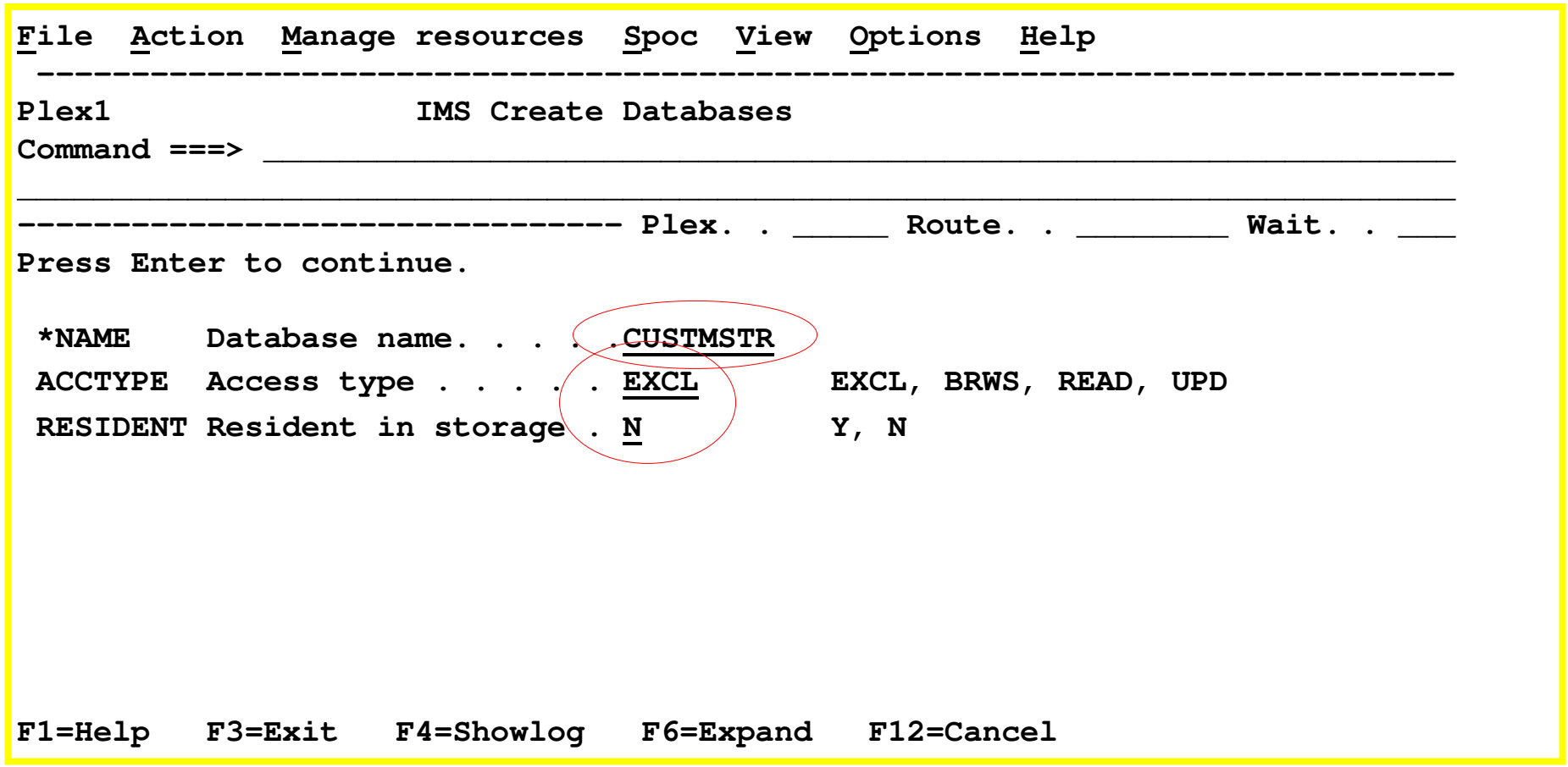
(scroll forward)
  - 

(scroll back)
- Make changes to defaults on the screen and press Enter to submit
- A confirmation screen will be presented if elected in Preferences
- Press enter again and MR will submit command to IMS(s)
  - MR will edit input for valid field values
    - Does not cross check multiple fields
  - IMS edits input and returns success or failure
  - Now for an example of creating a database…

MR's Initial "Create New Resource" Panel



MR's List View of Creating a Database



MR's Command Syntax View of Creating a Database

```
File  Action  Manage resources  Spoc  View  Options  Help
 ------------------------------------------------------------------------
Plex1                  IMS Create Databases
Command ===> ____________________________________________________________
_______________________________________________________________________
------------------------------ Plex. . _____ Route. . _________ Wait. . ___

Press Enter to continue.

CREATE DB NAME( CUSTMSTR                                              )
  SET( ACCTYPE( EXCL ) RESIDENT( N ) )



F1=Help   F3=Exit   F4=Showlog   F6=Expand   F12=Cancel
```

Deleting Resources

- Same navigation as “create”
  - Select Action
  - Select Resource Type
  - Name resource(s) to be deleted
- Wild cards supported for delete processing
  - TEMP* - all resources beginning with TEMP
  - T%MP* - can also use single character substitution
  - * - all resources (be careful)
- Same panel format for deleting all resource and descriptor types
- Follow same rules for deleting as native DRD
  - Resource cannot be “in use”

Updating Resources

- Update command
  - Supports changing resource or descriptor attributes
  - Does NOT support changing resource status (use SPOC)
- Same List or Command Syntax views available

Querying Resources

- Support for the QUERY command has been enhanced
  - Shortcut to displaying ALL attributes of a resource
    - QRY xxxx SHOW(ALL)
  - Shortcut to displaying resources with “exceptional” status
    - QRY xxxx <user-default filters>
  - Build customized queries
    - QRY xxxx <customized filters>
  - Field level help on all displayed fields
    - Put cursor on column heading and press F1

MR Example of Querying a Transaction

```
File   Action   Manage resources   Spoc   View   Options   Help
 ------------------------------------------------------------
Plex1                        IMS Query Resources
Command ===> ____________________________________________________
_____________________________________________________________________
---------------------- Plex. . _____ Route. . _________ Wait. . _____

Select a resource type. Press Enter to continue.

* Resource. . . . . 4__  1.  Database
                         2.  Program
                         3.  Routing Code
                         4.  Transaction

Resource name . . . . . A*_____________________________________
Resource type . . . . . 1__  1.  Resource
                         2.  Descriptor


* Query type. . . . . 1_   1.  Show all
                         2.  Exceptions
                         3.  Custom

F1=Help   F3=Exit   F4=Showlog   F6=Expand   F12=Cancel
```

Show ALL attributes of all transactions beginning with "A"

MR Example of Command Response for Query

```
File  Action  Manage resources  Spoc  View  Options  Help
 ------------------------------------------------------------
Plex1                    IMS Single Point of Control
Command ===> ____________________________________________________
============================================================================
---------------------- Plex. . ______ Route. . _________ Wait. . ______

  Response for:  QRY TRAN NAME(A*) SHOW ALL                        More:   >
Trancode MbrName     CC PSBname  LCls    LQCnt  LLCT LPLCT LPLCTTime  LCPRI
ADDPART  SYS3         0 DFSSAM04    4        0     2 65535      65535      7
AOBMP    SYS3         0 TS2IAOB0   23        0 65535 65535      65535      7
AOP      SYS3         0 TS1IAOP0    4        0     4     4          5      0
APOL11   SYS3         0 APOL1       1        0 65535 65535      65535     10
APOL13   SYS3         0 APOL1       1        0 65535 65535      65535      1
APOL14   SYS3         0 APOL1       1        0 65535 65535      65535      9
APOL15   SYS3         0 APOL1       1        0 65535 65535      65535      1
APOL16   SYS3         0 APOL1       1        0 65535 65535      65535      1
APOL17   SYS3         0 APOL1       1        0 65535 65535      65535      1
APOL18   SYS3         0 APOL1       1        0 65535 65535      65535      1


F1=Help   F3=Exit   F4=Showlog   F6=Expand   F12=Cancel
```

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