Session E62:
Expanding CICS - REXX and 3270 Bridge

Colin Boulain
colin_boulain@uk.ibm.com

VM/ESA and VSE/ESA
TECHNICAL CONFERENCE

Trademarks

- The following terms are trademarks of International Business Machines Corporation in the United States and/or other countries:

AIX   DB2   OS/390   VisualAge

CICS   MVS/ESA   VSE/ESA

CICS/VSE   OS/2   VTAM

- Java and Solaris are trademarks of Sun Microsystems, Inc

- Windows, Windows 95, Windows 98, and Windows NT are trademarks of Microsoft Corporation, Inc

- Other company, product, and service names may be trademarks or service marks of others

© Copyright 2000 IBM Corporation   IBM SOFTWARE

What will be covered

- **REXX**

  - Overview

  - Limitations

  - Installation

  - Examples

- **3270 Bridge**

  - What the Bridge provides
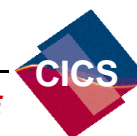
  - How to use the Bridge
    - ▶ *Examples*

  - DFHBMSUP utility to reconstruct MAP source files

© Copyright 2000 IBM Corporation

IBM   SOFTWARE

CICS

REXX/CICS

© Copyright 2000 IBM Corporation

IBM SOFTWARE

CICS

- Interpretive execution of REXX EXECs within a CICS environment

- Supports most of the CICS API

- VSAM based file system for saving EXECs and Data files (RFS)

- Built in Editor for writing REXX EXECs and Data files

- VSE Librarian Sublibraries can be used to store EXECs

  – member type must be .PROC

- IMPORT/EXPORT between RFS and VSE Librarian sublibraries

IBM SOFTWARE

Overview of REXX/CICS *(continued)*

- New Commands can be written in REXX

- User and System commands can be defined from within REXX/CICS

- Support for System and user Profiles

- Shared Execs in Virtual Storage

- Interface to CEDA and CEMT transaction programs

  – results returned in REXX variables

- Support for TS and TD Queues

- Panel Support

- Support for BMS

- HELP - Online manual

© Copyright 2000 IBM Corporation

IBM   SOFTWARE

REXX/CICS - Limitations

- Does NOT provides an environment for REXX/VSE execs

  - No Address Power

  - No Address JCL

  - No EXECIO to SAM and VSAM libraries

- No Compiled REXX

- No SPI

© Copyright 2000 IBM Corporation

IBM SOFTWARE

e-business

- Consists of FILEPOOLS

- Minimum of 2 required

- Unique 1 to 7 character name

- A FILEPOOL is two VSAM KSDS Clusters consisting of

  - DIR

  - DATA
    - *Control Intreval size must be at least 16K*

- Fillepools needs to be formatted before being used

- Uses a directory structure similar to the VM Shared File System or PC

- User or Non-User FILEPOOL

- REXX File System commands are preceded with RFS

  - RFS COPY file_id1 file_id2

- Each pool has a root directory

  – filepool_name:\
    ► *POOL1:*

  – can contain files as well as subdirectories

- A USERS directory should exist in all USER FILEPOOLS

  – contains subdirectories for users on the system

- Subdirectories are created by the RFS MKDIR command

  – name is 1 to 8 characters with an optional extension following a dot
    ► *USER1*
    ► *USER1.INFO*

- Files are referenced by a fully qualified file id

  – consists of root, subdirectories, filename and membertype
    ► *POOL1:\USERS\USER1\DEMO1.EXEC*

REXX File System *(continued)*

- Owner can allow other users to access a directory

  - RFS AUTH command
    - ► *publicr*
    - ► *publicw*
    - ► *secured*

- Current Directory

  - use CD command to change
    - ► *'CD POOL1:\USERS\CICSUSER\COLINS\'*

- Path

  - defines search path for execs

  - current directory searched first

  - can contain multiple directories
    - ► *PATH POOL1:\ POOL1:\USERS\ POOL1:\USERS\USER1*

© Copyright 2000 IBM Corporation   *IBM   SOFTWARE*

Installing REXX/CICS

- REXX/CICS is only available on CICS Transaction Server for VSE/ESA

- Delivery

  - PTF
    - ► *APAR PQ37115*

  - Included in future release

- Resource Definitions
  - ► *provided in DFHCUREX*
  - ► *LSRPOOL Definitions*
  - ► *Skeleton JCL for FILEPOOL definition*

- You will need a library into which to copy the source file

- Minimum of two Filepools for the REXX File System (RFS)

- 35 Cylinders 3390 for help files

  - Default is POOL2

© Copyright 2000 IBM Corporation   *IBM   SOFTWARE*

Installing REXX/CICS (PTF)

- Minimum EDSALIM of 20m

  – make it at least 10M more than your current setting

- Upgrade CSD using DFHCUREX

- Use RDO to modify CICREXX group to meet your system requirements

  – Install using CEDA once modified

  – Add to a GRPLIST in your SIT so that it is automatically installed following a COLD START

- Copy and rename modules

  – Copy them to a library listed in your LIBDEF for CICS

  – Library must be in CICS LIBDEF PROC search chain

  – List supplied in PTF instructions
    - *Names begin CIC and need a member type of PROC*

© Copyright 2000 IBM Corporation

IBM SOFTWARE

Installing REXX/CICS

- **Update CICSTART.PROC**

  - This is the System Profile Exec

  - Filepool formatting will fail with Return Code 4 if you do not do this

  - Change AUTHUSER RCUSER or add addtional lines to add userid that will logon to format the pools.

  - Use SYSA if no security is active

  - Change FILEPOOL definitions to meet your system requirements

- **Update CICS Initialisation JCL if needed**

  - Add LIBDEF for PROC if not already included
    - ▶ *// LIBDEF PROC,SEARCH=userlibrary*

  - If REXX is unable to find PROC library CICS REXX transactions will fail with
    - ▶ *CICREX490E Error 48 running CICSTART EXEC: Failure in system service*

© Copyright 2000 IBM Corporation   *IBM SOFTWARE*

- Update LRSPOOL definitions

  - use data buffers large enough to contain the control interval size

  - If the LSRPOOL is unable to support a key length of 252 and the control interval size you will get message
    - ► *4228I FILE RFSxxxx OPEN ERROR X'DC' (220)*

- Add DLBLs for RFS definitions if required.

- Create the FILEPOOLS

  - Implemens as VSAM clusters

  - Sample JCL - CICVSAM.J is provided in PRD1.BASE

IBM SOFTWARE

e-business

- Format the FILEPOOLS

  - Use a REXX authorised user

  - Start REXX transaction

  - Enter 'FILEPOOL FORMAT POOL1'

  - When complete enter SAY RC to check return code.

  - Repeat for the second Filepool

  - Reformatting a FILEPOOL will result in message
    - ► *Subcommand return code = 1836*

- If MORE appears in the bottom left of the screen whilst excuting REXX press the enter Key to clear the screen.

IBM   SOFTWARE

CICS

Installing REXX/CICS *(continued)*

- FILEPOOL FORMAT command

```
Enter a REXX command or EXIT to quit
FILEPOOL FORMAT POOL1
SAY RC
0
FILEPOOL FORMAT POOL2
SAY RC
0




_                                                              READ
```

© Copyright 2000 IBM Corporation   **IBM   SOFTWARE**

- Create the Help Files

  - Copy and rename the files to your sublibrary
    - ► *Originals will be in PRD1.BASE*
    - ► *See installation instructions for details*

  - Start CICS with an EDSALIM of at least 20M

  - Enter REXX

  - Enter EXEC CICHREP

  - Respond to the messages with your sublibrary

  - The help files are created in the FILEPOOL defined in the CICSTART HELPPATH option.

- Verify the installation was successful

  - Enter CALL CICIVP1 from within CICS REXX.

Installing REXX/CICS *(continued)*

- Creating the Help file
  - ▶ *Note that the entered data is not reflected back in the display*

```
EXEC CICHPREP
Please enter the Librarian sublibrary containing the REXX/CICS LIST3270.
(example: LIB.SUBLIB )
Please enter the Librarian sublibrary containing the HELP panels.
(example: LIB.SUBLIB )
17:47:32 Building INDEX and CHAPTER files.  Please be patient.
17:47:38 INDEX file built.
17:47:38 Building Chapter files
17:47:47 Chapter files are built
17:47:47 Building Appendix files.
17:47:48 Appendix files are built
17:47:48 34 Files built, all done !!



_                                                           READ
```

© Copyright 2000 IBM Corporation   *IBM   SOFTWARE*

CICS

Executing REXX/CICS EXECS

- **From a Terminal**

  - Use the REXX transaction and enter EXEC execname
    - ► *Interactive environment CICRXTRY*
    - ► *you can enter REXX commands directly*
    - ► *Enter EXIT to end*

  - Define as a TRANSACTION
    - ► *EDIT is a CICS transaction that brings up the REXX Editor*

- **Using CICS START**

  - If there is no associated terminal, then any terminal output is discard unless directed to a CICS TS queue
    - ► *If terminal input is requested an error is generated*

- **Using CICS LINK or XCTL**

  - Invoke the CICREXD interface.
    - ► *COMMAREA must be passed to the interface.*
    - ► *COMMAREA must contain the name of the exec and arguments*

© Copyright 2000 IBM Corporation

IBM   SOFTWARE

CICS

The Editor

© Copyright 2000 IBM Corporation

IBM SOFTWARE

Using REXX/CICS - Editor

Basic Editor Screen

```
EDIT ---- POOL1:\USERS\CICSUSER\NONAME -------------- File not found (RC=203)
COMMAND ===>
00000 **************************** TOP OF DATA *******************************
00001 **************************** BOTTOM OF DATA ****************************




F1=HELP F2=LADD F3=FIL F4=SPLT F5=F F6=JN F7=BA F8=FWD F10=LFT F11=RGT F12=QUI
```

■ can be invoked from a CLEAR CICS session by entering the EDIT transaction

  – similar to DITTO editor but can be customised

■ can be used to edit REXX and data files

  – edited files are stored in the REXX Filepool System (RFS)

■ does not support binary files

■ supports prefix commands
    ► *C, CC, M, MM, R, RR, ", "", B, A, I, F and P*

■ can use macros

■ CICEPROF.PROC

  – profile for the editor

  – Its a REXX exec so can be used to customise the editor

Using REXX/CICS - Editor

- Example of an edit session

```
EDIT ---- POOL1:\USERS\CICSUSER\PANSAMP.PROC --------------- REXX/CICS Editor
COMMAND ===>
00000 **************************** TOP OF DATA ******************************
00001 /* PROGRAM TO QUERY APPLICANT'S NAME AND ADDRESS */
00002 LNAME = '';  /* NULL OUT ALL NAME PARTS */
00003 FNAME = '';
00004 MI = '';
00005 MAIL_STREET = '';
00006 MAIL_CITY = 'DALLAS';  /* PREFILL THE MOST LIKELY RESPONSE FOR CITY/STATE
00007 MAIL_STATE = 'TX';
00008 MAIL_COUNTRY = 'USA' ;
00009 MAIL_ZIP = '';
00010 DO FOREVER;
00011   'PANEL SEND APPLICAN CURSOR(LNAME)';
00012   IF RC > 0 THEN
00013     CALL ERROR_ROUTINE;
00014
00015   'PANEL RECEIVE APPLICAN'; /* PSEUDO-CONVERSATIONAL THIS WOULD BE SEPARA
00016   IF PAN.AID = 'PF3' | PAN.AID = 'PF12' THEN
00017     LEAVE;
00018   IF PAN.AID = 'ENTER' & PAN.REA = 124 THEN
00019     ITERATE;
00020   IF PAN.AID = 'CLEAR' | SUBSTR(PAN.AID,1,2) = 'PA' THEN
F1=HELP F2=LADD F3=FIL F4=SPLT F5=F F6=JN F7=BA F8=FWD F10=LFT F11=RGT F12=QUI
```

IBM SOFTWARE

CICS

- There are 6 command environments suuplied with REXX\CICS

  - REXXCICS

  - CICS

  - EDITSVR

  - FLSTSVR

  - RFS

  - RLS

- Use ADDRESS to switch environment

  - Single Command
    - *ADDRESS CICS "READQ TSQ QUEUE('QUEUE1') INTO(VAR1)"*

  - All Commands
    - *ADDRESS CICS*

e-business

- Use CICS not EXEC CICS

- cannot handle

  – Handle Condition, Handle Aid, Handle Abend, Ignore Condition, Push and POP

- Syntax is the same as EXEC CICS

  – See Application Programmers Guide

- Data value fields can be literals or REXX variables

- Data area fields can be REXX variables

  – use different variables for source and target

- Length will be determined from REXX variable if not specified

- Always specify length on CICS ENQ command

REXX/CICS - FLST Environment

- File List Utility (FLST) provides fullscreen interface to the REXX File System (RFS)

- Invoke with FLST or FLST dirid

```
USER=CICSUSER - DIRECTORY=POOL1:\USERS\CICSUSER\
CMD    FILENAME FILETYPE ATTRIBUTES RECORDS      SIZE     DATE        TIME
       APPLICAN PANOBJ   FILE              1      1364     2000/04/07 12:31:01
       APPLICAN PANSRC   FILE             29       824     2000/04/07 12:30:42
       COLIN             DIR, PRIV                         2000/04/07 13:40:36
       DEMO     EXEC     FILE             33       802     2000/04/07 14:02:06
       MIKE              DIR, PRIV                         2000/04/07 14:01:29
       NEVILLE           DIR, PRIV                         2000/04/07 14:01:16
       PANSAMP  EXEC     FILE             33       802     2000/04/07 12:29:42
       SAMPLE   PANSRC   FILE             27       803     2000/04/07 12:01:43




       COMMAND ===>

       F1=HELP F2=REFRESH F3=END F7=UP 18 F8=DOWN 18 F11=EDIT F12=CANCEL
```

- Enter commands against the file

  – rename / test.exec

- Enter Refresh on command line or use the REFRESH PF Key to update display

- To sort list use the SORT command on the command line

  – SORT option
    ► *DT sorts by date and time*
    ► *FN sorts by name*
    ► *FT sorts by type*
    ► *AT sorts by attribute*
    ► *RC sorts by number of records*
    ► *SZ sorts by size*

- Subdirectories are included in the list

- Default key to execute an exec is X

- Default to edit a file is EDIT

© Copyright 2000 IBM Corporation

IBM SOFTWARE

- CICFPROF.PROC is system profile

- FLSTPROF.PROC can be used to override system profile.

- To execute commands in the FLST environment use ADDRESS FLSTSVR

- When defining synonyms there is no minimum length option

    - To define a synonym for LOCATE that accepts 3 or more characters you need 4 synonym definitions
        - ► *DEFINE SYNONYM LOCATE*
        - ► *DEFINE SYNONYM LOCAT*
        - ► *DEFINE SYNONYM LOCA*
        - ► *DEFINE SYNONYM LOC*

IBM   SOFTWARE

REXX/CICS - RLS

- REXX List System provides capability for data in list or table to be loaded into virtual storage

- RLS and CLD are used instead of RFS and CD

- First invocation creates a TS queue called *CICREX* which contains the anchor address

- Route directory is \ and it always has a USERS subdirectory.

- Commands are authorised

- Move data between a REXX stem variable and an RLS file by using

  - RLS READ and RLS WRITE

- Move data between a REXX Variable and a RLS file using

  - RLS VARGET and RLS VARPUT

- Special commands for accessing RLS queues

  - RSL LPULL, RLS LPUSH and RLS LQUEUE

© Copyright 2000 IBM Corporation

IBM SOFTWARE

CICS

REXX/CICS - Panels

- Simple Panel support

- Panels are defined in RFS

    - membertype is PANSRC

- When first used or after editing, REXX generates a file with a membertype of PANOBJ

- Use PANEL command in EXEC to display panel and to read results.

IBM   SOFTWARE

CICS

- 'CICS GETMAIN SET(varname) LENGTH(xx) INITMSG(ZEROES)'

- COPYR2S var1 varname datalength

IBM SOFTWARE

e-business

- Assembled Mapset must be in the CICS LIBDEF chain

- The BMS map must be assembled to produce a map DSECT

- The Map Dsect can be converted using CONVTMAP

- Maps must be defined to CICS using Resource Definition Online

- To read or send data to the screen, GETMAIN CICS storage for the Map input/ouput area

  – Storage must be initialised to nulls

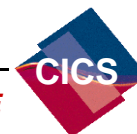- If a field is referenced by multiple labels, use the last one

3270 Bridge

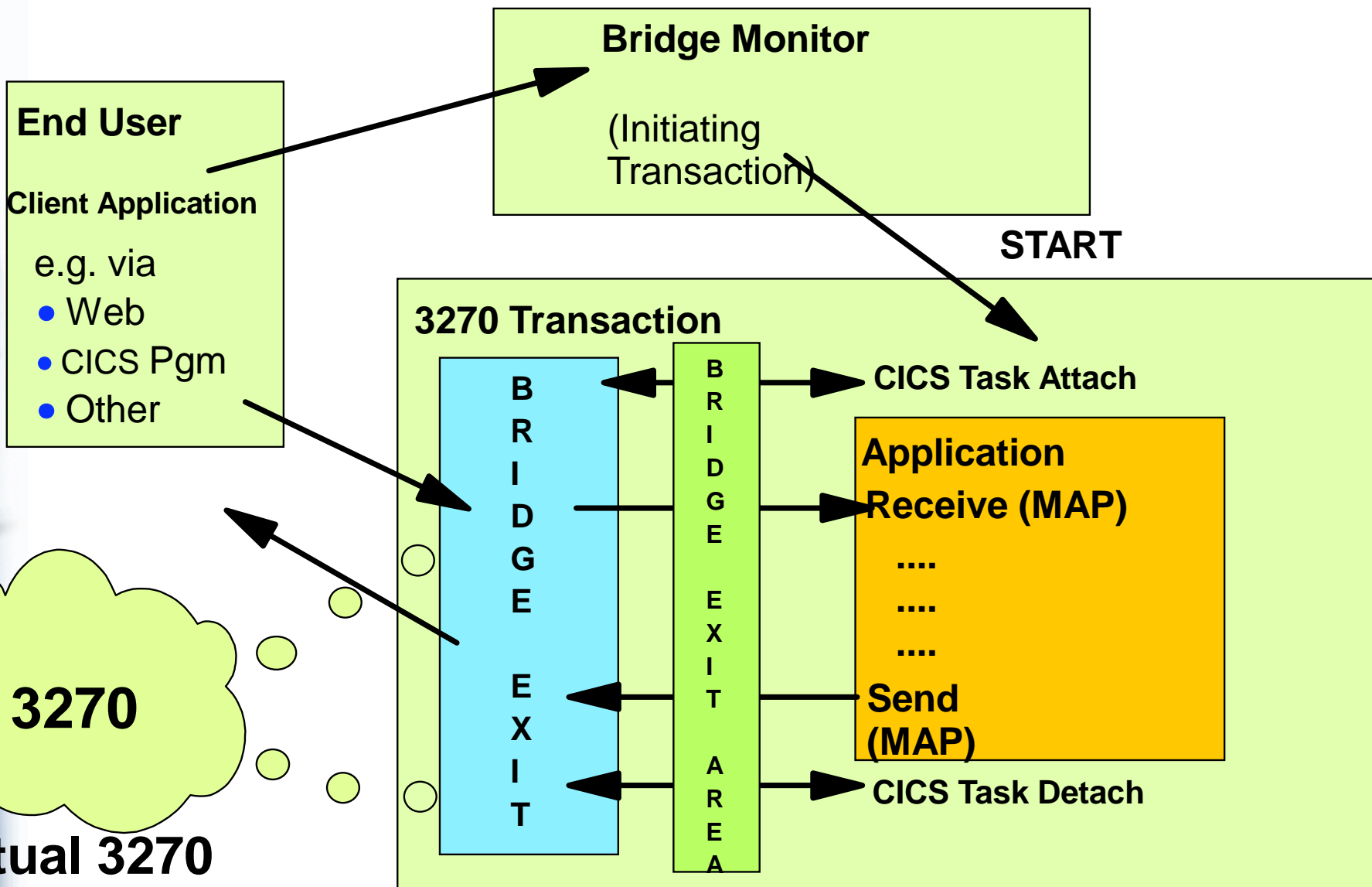© Copyright 2000 IBM Corporation

IBM   SOFTWARE

Overview

- provides the ability to run existing 3270 based transactions

  – Without a 3270 Terminal

  – Without changing application

- 3270 terminal I/O requests handled by a bridge exit program

- CICS supplied 3270 bridge exit programs

  – General purpose sample which uses TS or TD queues for I/O

  – Specific program for use with the CICS Web Interface

© Copyright 2000 IBM Corporation

IBM SOFTWARE

e-business

End User

Client Application

e.g. via
- Web
- CICS Pgm
- Other

Bridge Monitor

(Initiating Transaction)

START

3270 Transaction

BRIDGE EXIT

BRIDGE EXIT AREA

CICS Task Attach

Application Receive (MAP)

....

....

....

Send (MAP)

CICS Task Detach

3270

Virtual 3270

© Copyright 2000 IBM Corporation

IBM SOFTWARE

CICS

Elements of the 3270 Bridge

e-business

- End User Client application

  - The initiating application that can reside on any platform

  - Issues a message to start the CICS Transaction via the TRANSPORT MECHANISM.

- Transport Mechanism

  - The means by which the messages containing the information is passed between the 3270 Bridge and the Client Application

  - TS or TD Queues

  - CICS Web

- Bridge Monitor

  - Optional module that monitors a TRANSPORT MECHANISM for a message to start the 3270 Bridge

  - May be a long running task

© Copyright 2000 IBM Corporation

IBM SOFTWARE

CICS

Elements of the 3270 Bridge *(continued)*

- Bridge Exit

  – The module that handles the sending and receiving of messages between the End User Client Application and the CICS Transaction

  – It can handle the formatting of messages for the End User Client and the interpretation of returned messages into 3270 format for CICS or it can call a FORMATTER to do this

  – It is is user replaceable module

- FORMATTER

  – Formats the messages to be sent to the End User Client and interprets received messages to create the 3270 data required by CICS

  – It is called by the Bridge Exit if defined

  – It is a user replaceable module

- Bridge Exit Area

  – A COMMAREA used between the Bridge Exit and CICS to process and retain information between calls

© Copyright 2000 IBM Corporation   IBM   SOFTWARE

■ **Bridge Facility**

– the Virtual Terminal that is invisible to the rest of CICS but is visible to the User Transaction

– Does not appear in the results of a CEMT INQUIRE TERM or CEMT INQUIRE TASK

– A Real Terminal Definition can be used as a template by naming it in the FACILITYLIKE definition option

■ **Bridge Environment**

– Term used to describe the components used by the 3270 Bridge when used with an User Transaction
  ► *Includes Bridge Exit, Bridge Exit Area, Formatter and Bridge Facility*

■ **User Transaction**

– A CICS Transaction or series of Transactions that perform 3270 operations

– executed by the 3270 Bridge

© Copyright 2000 IBM Corporation

IBM SOFTWARE

3270 Bridge - Considerations for writing a Bridge Exit

- Supported Languages

  – Assembler, C, Cobol, PL/I
    - ► *Copybooks supplied for these*

- Uses the same Transaction Work Area (TWA) as the User Transaction

- User replaceable module

  – GETMAIN any storage for state data etc

- Commit and Backout are done at the same time as the User Transactions

- Should not attempt to share resources such as VSAM records or ENQ names with the User Transaction

- Do not use EXEC CICS ABEND

  – If abend required set the BRXA_USER_ABEND field

© Copyright 2000 IBM Corporation   *IBM   SOFTWARE*

CICS

3270 Bridge - Considerations for writing a Bridge Exit *(continued)*

- Bridge Exit Area

  – Interface between Bridge Exit and CICS

  – It is a CICS COMMAREA

  – Subdivided into sub-areas
    - ► *Header*
    - ► *Transaction Area*
    - ► *Command Area*
    - ► *User Area*
    - ► *ADS Descriptor*

© Copyright 2000 IBM Corporation

IBM SOFTWARE

- Default message exchanged between the 3270 Bridge Exit and the End User Application are based on MQ format

  - Copybooks are provided for supported languages
    - ► *Assembler - DFHBRMQD*
    - ► *C   - DFHBRMQH*
    - ► *PL/I   - DFHBRMQL*
    - ► *Cobol   - DFHBRMQO*

- For provided samples, ALL messages must start with a standard message header

  - Copybooks for both definition and constants are provided
    - ► *Assembler Definition - DFHBRMHD   Constants - DFHBRMCD*
    - ► *C   Definition - DFHBRMHH   Constants - DFHBRMCH*
    - ► *PL/I   Definition - DFHBRMHL   Constants - DFHBRMCL*
    - ► *Cobol   Definition - DFHBRMHO   Constants - DFHBRMCO*

3270 Bridge - Samples

- CICS Temporary Storage and Transient Data queues

  - Provided in Cobol
    - ► *Bridge Exit*   *- DFH0CBRE*
    - ► *Formatter*   *- DFH0CBRF*
    - ► *Bridge Exit Copybook - DFH0CBRD*
    - ► *Formatter Copybook   - DFH0CBRU*

  - Uses TS or TD Queues for Transport Mechanism
    - ► *Messages must be in the MQ format*

- CICS Web

  - Object code
    - ► *DFHWBLT*

  - Allows access via TCP/IP and the Web using a browser

© Copyright 2000 IBM Corporation   *IBM SOFTWARE*

- Bridge supports BMS MAPS

  – with Application Data Structures (ADS) which is preferred

  – or without ADS

- To build BMS MAPS with ADS requires the Maps to be reassembled at CICS Transaction Server for VSE/ESA Release 1.1.1 or above level.

- If you do not have the BMS source, there is a provided utility, DFHBMSUP, which will take an assembled Mapset and create a BMS MAP

  – Execute in a batch job giving the Mapset name as the input parameter

  – Result is written to Sequential Disk file addressed by BMSOUT DLBL

- Example:

  – DLBL Statement
    - *// DLBL BMSOUT,'VSE9.BMSMAP.OUTPUT',0,SD*

  – Execute Statement
    - *// EXEC PGM=DFHBMSUP,SIZE=DFHBMSUP,PARM='BRQMAPS'*

■ **Example Output**

```
* This is an unaligned mapset
*
         TITLE 'BRQMAPS Mapset MACRO Definition Listing'
@000001  DFHMSD TYPE=DSECT,LANG=ASM,TIOAPFX=YES,MODE=INOUT
*
BRQMAP   DFHMDI SIZE=(24,80),CTRL=(FREEKB)
FLD00001 DFHMDF POS=0,LENGTH=4
FLD00002 DFHMDF POS=13,LENGTH=8,ATTRB=(ASKIP,BRT),INITIAL='        '
         DFHMDF POS=22,LENGTH=45,ATTRB=(ASKIP,BRT),                    *
             INITIAL='- CICS 3270 Bridge, Passthrough Transaction '
         DFHMDF POS=160,LENGTH=33,                                     *
             INITIAL='Overtype to modify then press PF2'
         DFHMDF POS=320,LENGTH=12,INITIAL='MQCIH values'
         DFHMDF POS=361,LENGTH=37,                                     *
             INITIAL='Application Data Structure Descriptor'
FLD00003 DFHMDF POS=402,LENGTH=21,INITIAL='Transaction id    ==>'
FLD00004 DFHMDF POS=424,LENGTH=4,ATTRB=(UNPROT)
         DFHMDF POS=429,LENGTH=0
         DFHMDF POS=443,LENGTH=19,INITIAL='On SEND        ==>'
FLD00005 DFHMDF POS=463,LENGTH=1,ATTRB=(UNPROT)
         DFHMDF POS=465,LENGTH=0
         DFHMDF POS=482,LENGTH=21,INITIAL='Startcode        ==>'
FLD00006 DFHMDF POS=504,LENGTH=2,ATTRB=(UNPROT)
         DFHMDF POS=507,LENGTH=0
         DFHMDF POS=523,LENGTH=19,INITIAL='On RECEIVE       ==>'
FLD00007 DFHMDF POS=543,LENGTH=1,ATTRB=(UNPROT)
         DFHMDF POS=545,LENGTH=0
```

IBM SOFTWARE

CICS

- Example *(continued)*

  - New name assigned to MAPSET so that it can be assembled without overwritting original

  - Name and labels can be edited to more reasonable names

  - POS is the offset from the start of the Map.

© Copyright 2000 IBM Corporation   *IBM   SOFTWARE*

- **Passthrough Utility Support Pack**

  - Provides a means of evaluating a 3270 Application to see if it is suitable for use with the 3270 Bridge

  - Allows examination of the 3270 Data streams created by the bridge exit

  - Works with the supplied Temporary Storage and Transient Data sample Bridge Exit
    - *DFH0CRBE*

  - Can be used with other Bridge Exit
    - *must conform to the same Interfaces as the supplied Samples*

  - Support Pack number is CA21

© Copyright 2000 IBM Corporation

IBM SOFTWARE