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Shutting down attached regions from the TOR

My problem was to devise a method that prevented operators from accidentally shutting down the wrong region – this has happened periodically, causing unscheduled downtime. Because we are a local government facility, and a great number of our users are law enforcement officers, this can create hazardous situations.

The operators had been using the CRTE transaction to route to the desired region and occasionally ended up in the wrong region and issued the shutdown command. This method was supposed to allow them to verify they were where they were supposed to be.

The solution involved a set of programs that allow for a normal or, if need be, an immediate shutdown.

There are four programs and a table involved in our solution. One program runs in the terminal region, and the others run in the application regions as needed. The table contains a list of the various regions with their names, APPLIDs, SYSIDs, and a brief description of the region. The programs are used by entering the transaction-id (we named them CSHU for normal and CSHI for immediate shutdown), followed by the name of the region to be shut down. The CSHUTOR program makes various checks, including:

- Is the region name valid?
- Is the TOR being shut down?
- Is the region named actually connected to this TOR?
- Is the region alive?
- Is the region a Version 2 region? (We have a couple that we cannot get rid of yet and they will not shut down with this method.)

The INQUIRE CONNECTION command is used to determine whether the named region is actually connected to this terminal region. Then a short program (CCON – Check Connection) is started in the named AOR to determine whether it is actually running. (It just executes a RETURN. I had to include an IGNORE NOTAUTH condition
statement when I ran into authorization errors on some regions.) If these checks are true, then one of the following messages is displayed on the terminal screen:

- **SHUTTING DOWN NORMALLY**: region name — region description DO YOU WANT TO CONTINUE? (Y/N).
- **SHUTTING DOWN IMMEDIATELY**: region name — region description DO YOU WANT TO CONTINUE? (Y/N).

If the operator responds with a ‘Y’, the shutdown program is executed in the application region and that region terminates. If the operator enters ‘N’, or clears the screen, the program terminates and the shutdown is cancelled. This method has reduced the number of accidental region shutdowns in our shop.

The necessary entries have to be made in the CSD in the appropriate regions. The CSHUTOR/CSHU program/transaction is defined and runs in the terminal region, while the others (TSHN/CSHUAOR, TSHF/CSHIAOR, and CCON/CCON) are defined and run in the application regions.

The table is included in the CSHUTOR program. We use Panvalet so we use ‘++include’ as coded here; a regular ‘copy’ statement would do the job in a regular source library. The format of the table is:

<table>
<thead>
<tr>
<th>FIELD</th>
<th>OFFSET</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSID</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>APPLID</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>REGION NAME</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>20</td>
<td>32</td>
</tr>
</tbody>
</table>

(Ex. SYSID = STXA
APPLID = CTXAAPPL
REGION NAME = CICSTXA
DESCRIPTION = TEST APPLICATION REGION

DC C'STXACTXAAPPLCICSTXA TEST APPLICATION REGION
DC C'.... etc)

Note that the programs have to be assembled with the ‘SP’ translator option. These programs work in CICS Version 3.3 and Version 4.1. We have not tested them in any other versions of CICS.
CSHU

** TITLE ' CHSU - CICS SHUTDOWN TRANSACTION ' **
** THIS PROGRAM IS USED TO SHUTDOWN VERSION 3 OR 4 CICS APPLICATION **
** REGIONS FROM THE TERMINAL REGION. **
** IT WILL VERIFY THAT: **
** THE TARGET REGION IS A VALID NAME, **
** THE TARGET REGION IS CONNECTED TO THE TERMINAL REGION, **
** THE TARGET REGION IS A VERSION 3/4 REGION, **
** THAT THE TARGET REGION IS OPERATIONAL, **
** AND ISSUE APPROPRIATE MESSAGES. **
** IT CAN BE USED FOR NORMAL OR IMMEDIATE SHUTDOWNS (TRANSACTION **
** CSHU IS USED FOR NORMAL AND TRANSACTION CSHI IS USED FOR **
** IMMEDIATE SHUTDOWNS). **
** THIS PROGRAM USES REGNTAB. **
** THE FORMAT IS CSHU/CSHI CICSREGION **

DFHEISTG DSECT
SYSID DS CL4
APPLID DS CL8
SAVAPPL DS CL8
REGNAPPL DS CL8
REGDISC DS CL32
INCMD DS CL15
SCREEN DS CL160
LEN DS 0H
RESP DS F
TRANID DS CL4
PROGID DS CL8
*

CSHU CSECT
EXEC CICS HANDLE CONDITION ERROR(ERROR) LENGERR(LENERR)
* FIND THIS REGION'S APPLID
EXEC CICS ASSIGN APPLID(APPLID)
MVC SAVAPPL(8),APPLID
* GET THE INPUT
MVC LEN,=H'15'
EXEC CICS RECEIVE INTO(INCMD) LENGTH(LEN)
*
MVI THISRSW,C'0'
MVI IMMEDSW,C'0'
MVI REGNAPPL(8),=CL8' '
MVC APPLID(8),=CL8' '
MVC TRANID(4),=CL4' '
MVC PROGID(8),=CL8' '
*
CLC INCMD+1(3),=C'SHU' IMMEDIATE OR NORMAL?
BE CLRNAME (CSHU OR CSHI)
MVI IMMEDSW,C'1' SET IMMEDIATE SWITCH.
CLRNAME  MVC  CICSNAME(8),=CL8' '  
LA  R4,INCMD+5  POINT TO BEGINNING OF CICSNAME  
CLI  Ø(R4),X'ØØ'  CICS NAME ENTERED?  
BE  ERRIN  ... NO, SEND MSG WITH REG NAME  
LA  R7,9  CHECK 9 CHARS.  
LA  R6,CICSNAME  
CKNULLS CLI  Ø(R4),X'ØØ'  CHECK FOR NULLS AFTER CICSNAME  
BE  CKNAME  
MVC  Ø(1,R6),Ø(R4)  MOVE CICS NAME ENTERED  
LA  R6,1(R6)  TO CICSNAME  
LA  R4,1(R4)  BUMP THRU NAME TO FIND  
BCT  R7,CKNULLS  END.  
B  ERRIN  
*  
CKNAME EQU  *  CHECK FOR VALIDITY OF  
LA  R5,REGTAB  REGION NAME ENTERED.  
LOOPNM  CLC  CICSNAME,12(R5)  
BE  FOUND  MAY GET TO END  
LA  R5,52(R5)  OF TABLE.  
CLC  Ø(4,R5),=C'LAST'  
BE  NMERR  
B  LOOPNM  
*  
FOUND EQU  *  SAVE: SYSID  
MVC  SYSID(4),Ø(R5)  APPLID  
MVC  REGNAPPL(8),4(R5)  REGION NAME  
MVC  CICSNM(8),12(R5)  REGION DESCRIPTION  
*  
CLC  REGNAPPL(8),SAVAPPL  IS IT THIS REGION?  
BNE  INQCONN  NO... MOVE ON  
MVI  THISRSW,C'1'  YES ... SET SWITCH  
B  MVMSG  AND SKIP CONNECTION INQUIRY  
*  
* IS TARGET REGION CONNECTED TO THIS REGION?  
*  
INQCONN EQU  *  EXEC CICS INQUIRE CONNECTION(SYSID) RESP(RESP)  
CLC  RESP(4),DFHRESP(SYSIDERR)  
BE  NOTCONN  
*  
* IS TARGET REGION OPERATIONAL?  
*  
EXEC CICS START TRANSID(CKTRANS) SYSID(SYSID) RESP(RESP)  
CLC  RESP(4),DFHRESP(SYSIDERR)  
BE  NOTUP  
*  
MVMSG EQU  *  IS THE REGION A  
LA  R8,VER2TAB  VERSION 2  
LOOPV2  CLC  CICSNAME(8),Ø(R8)
BE VER2REGN REGION?
LA R8,8(R8) YES - SEND MESSAGE
CLC Ø(8,R8),=C'VER2TAB' NO - CONTINUE
BE SAVEDATA
B LOOPV2

* SAVEDATA EQU *
MVC SCREEN(160),=C160' ' MOVE SHUT
CLI IMMEDSW,C'1' IMMEDIATE SHUTDOWN?
BE IMMEDMSG
MVC SCREEN+5(26),SHUMSG1N NO...SEND NORMAL MESSAGE
B BLDMSG
IMMEDMSG MVC SCREEN+5(26),SHUMSGII YES..SEND IMMEDIATE MESSAGE
BLDMSG MVC SCREEN+32(8),CICSNAME REGION NAME
MVC SCREEN+41(3),=C'->'
MVC SCREEN+45(32),REGDISC REGION DESCRIPTION
MVC SCREEN+85(3Ø),SHUMSG2
MVC LEN,=H'147'
EXEC CICS SEND FROM(SCREEN) LENGTH(LEN) WAIT ERASE
EXEC CICS RECEIVE INTO(SCREEN) LENGTH(LEN)
CLC SCREEN(1),=C'Y' CONTINUE SHUTDOWN?
BE SHUTD
MVC SCREEN(17),CANSHUT ... NO..SEND MESSAGE
MVC LEN,=H'17' ANY RESPONSE EXCEPT 'Y'
B WRTMSG CANCELS OPERATION.

* SHUTD EQU *
CLI IMMEDSW,C'1' IMMEDIATE SHUTDOWN?
BE SETIMMED
MVC TRANID(4),=C'TSHN' NORMAL SHUTDOWN
B EXECSTRT
SETIMMED EQU *
MVC TRANID(4),=C'TSHF' IMMEDIATE SHUTDOWN
EXECSTRT EQU *
CLI THISRSW,C'1' THIS REGION SWITCH SET?
BE SHUTTHIS YES .. SHUT THIS REGION
EXEC CICS START TRANSID(TRANID) SYSID(SYSID) RESP(RESP)
CLC RESP(4),DFHRESP(SYSIDERR)
BE NOTUP
CLC RESP(4),DFHRESP(TRANSIDERR)
BE VER3ERR
B RETURN

* SHUTTHIS EQU *
CLI IMMEDSW,C'1' IMMEDIATE?
BE IMMEDTHS YES .. GO TO ISSUE IMMED
EXEC CICS PERFORM SHUTDOWN
B RETURN

* IMMEDTHS EQU *
EXEC CICS PERFORM SHUTDOWN IMMEDIATE
B RETURN

* ERROR MESSAGES

ERRIN EQU * FORMAT ERROR ON
MVC SCREEN(38),ERRINMSG INPUT
CLI IMMEDSW,C'1'
BNE ERRINNOR
MVC SCREEN+19(4),=C'CSHI'
ERRINNOR MVC LEN,=H'38'
B WRTMSG

* NOTCONN EQU * CONNECTION ERROR:
MVC SCREEN(47),CONNERR TARGET REGION IS
MVC SCREEN+7(8),CICSNM NOT CONNECTED TO
MVC LEN,=H'47' THIS REGION.
B WRTMSG

* VER3ERR EQU * TARGET REGION IS
MVC SCREEN(43),VER3MSG NOT A VERSION 3
MVC SCREEN+7(8),CICSNM REGION (_TRANSACTION
MVC LEN,=H'41' DID NOT START)
B WRTMSG

* NOTUP EQU * TARGET REGION
MVC SCREEN(38),NOTUPER NOT OPERATIONAL
MVC SCREEN+7(8),CICSNM
MVC LEN,=H'38'
B WRTMSG

* VER2REGN EQU * TARGET REGION
MVC SCREEN(63),VER2MSG IS NOT A VERSION
MVC SCREEN(8),CICSNAME 3/4 REGION (TARGET
MVC LEN,=H'63' IS IN VERSION 2
B WRTMSG TABLE)

* LENERR EQU * LENGTH ERROR ON
MVC SCREEN(14),WRNGLEN INPUT
MVC LEN,=H'14'
B WRTMSG

* ERROR EQU * GENERAL ERROR ON
MVC SCREEN(18),GENERR INPUT
MVC LEN,=H'18'
B WRTMSG

* NMERR EQU * NOT A VALID
MVC SCREEN(35),NMERMSG CICS NAME
MVC SCREEN(8),CICSNAMc
MVC LEN,=H'43'
B WRTMSG
CICSERR EQU * TERMINAL NOT CONNECTED
MVC SCREEN(42),CICSERRM TO CICS BEING
MVC SCREEN+34(8),CICSNM SHUT DOWN
MVCNAME MVC CICSERR1+15(8),CICSNM INCLUDE THIS REGION
MVC SCREEN+50(24),CICSERR1 NAME
MVC LEN,=H'74'
*
WRTMSG EXEC CICS SEND TEXT FROM(SCREEN) LENGTH(LEN) FREEKB ERASE
B RETURN1
*
RETURN EQU *
MVC SCREEN(27),ENDMESS
MVC SCREEN+7(8),CICSNM
MVC LEN,=H'27'
EXEC CICS SEND TEXT FROM(SCREEN) LENGTH(LEN) FREEKB ERASE
RETURN1 EQU *
EXEC CICS RETURN
*
R4 EQU 4
R5 EQU 5
R6 EQU 6
R7 EQU 7
R8 EQU 8
*
IMMEDSW DC CL1'Ø' SWITCH TO INDICATE IMMEDIATE SHUTDOWN
THISRSW DC CL1'Ø' SWITCH TO INDICATE THIS REGION
*
CICSNAME DC CL8' ' CICSNM DC CL8' '
WRNGLEN DC C'INPUT TOO LONG' GENERR DC C'NON-SPECIFIC ERROR'
VER3MSG DC C'REGION IS NOT A VERSION 3/4 REGION'
CONNERR DC C'REGION IS NOT CONNECTED TO THIS REGION'
NOTUPER DC C'REGION IS NOT UP AT THIS TIME'
ERRINMSG DC C'CORRECT FORMAT IS: CSHU CICSNAME'
NMERMSG DC C'IS NOT A KNOWN REGION NAME'
CICSERRM DC C'THIS TERMINAL IS NOT CONNECTED TO CICSNM DC C'(YOU ARE ON =)
SHUMSG1N DC C'SHUTTING DOWN NORMALY: '
SHUMSG1I DC C'SHUTTING DOWN IMMEDIATELY: '
SHUMSG2 DC C'DO YOU WANT TO CONTINUE? (Y/N)'
CANSHT DC C'SHUTDOWN CANCELED'
ENDMESS DC C'REGION TERMINATING'
VER2MSG DC C'IS A VERSION 2 REGION AND CANNOT BE SHUTDOWN - FROM HERE.'
CKTRANS DC C'CCON' DUMMY TRANS IN VERSION 3/4 APP REGIONS
*** TABLE OF VERSION 2 REGIONS ***
VER2TAB EQU * VERSION 2 REGIONS
* ** TEST REGIONS **
DC CL8'CICSTV2' ** WILL REMAIN VERSION 2
* ** PRODUCTION REGIONS **
CHSUAOR

TITLE 'CHSUAOR - APPLICATION NORMAL SHUTDOWN'

EXEC CICS PERFORM SHUTDOWN
EXEC CICS RETURN

LTORG
END

CHSIAOR

TITLE 'CHSIAOR - APPLICATION IMMEDIATE SHUTDOWN'

EXEC CICS PERFORM SHUTDOWN IMMEDIATE
EXEC CICS RETURN

LTORG
END

CCON

TITLE 'CCON - ISSUE RETURN - CHECK CONNECTION'

EXEC CICS IGNORE CONDITION NOTAUTH ISCINVREQ
EXEC CICS RETURN

LTORG
END

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Using EXCI to control CICS resources

The following code allows sites to control the status of CICS files (eg open, enabled, etc) and other resources (such as terminals, transactions, etc), and to execute application programs in a CICS environment.

Using the code, it is possible to start a CICS program from a job or jobstep, and also to pass data to the application as well as control of a file or group of files.

With some additional code, it is possible to control transactions and other resources.

For example (SYSIN):

```
CICSNAME,SET CLO FI(AAA*)    CLOSE/DISABLE FILES AAA*
CICSNAME,SET CLO FI(AAA*  X* ABCDEF) CLOSE/DISABLE FILES AAA* X* ABCDEF
CICSNAME,%PROGCICS,INPUT DATA CALL PROGCICS with data
```

COMPONENTS
The components are:

- **PGMBATCH** – the batch program.
- **PGMCICS** – the CICS program.
- **JCL**.

The result is sent to JES (OUTPUT SDSF).

**PGMBATCH**

```
IDENTIFICATION DIVISION.
  PROGRAM-ID. PGMBATCH.
  ************************************************************************
  * PROGRAM NAME: PGMBATCH *
  *                             *
  * TITLE: Batch Client Program. *
  *                             *
  ************************************************************************
ENVIRONMENT DIVISION.
```
*==============================================================================*

INPUT-OUTPUT SECTION.

FILE-CONTROL.

SELECT PRINTER ASSIGN TO SYSPRINT.

*==============================================================================*

DATA DIVISION.

*==============================================================================*

FILE SECTION.

FD PRINTER BLOCK CONTAINS 128 CHARACTERS
    RECORDING MODE S
    LABEL RECORDS OMITTED.

Ø1 OUTPUT-RECORD    PIC X(128).

*==============================================================================*

WORKING-STORAGE SECTION.

* Declare Call level, DPL, and EXEC level Return Code areas. *

COPY DFHXCPLO.

* Initialize Target information variables. *

Ø1 TARGET-PROGRAM    PIC X(8)       VALUE 'PGMCICS'.
Ø1 TARGET-TRANSID    PIC X(4)       VALUE 'EXCI'.
Ø1 TARGET-SYSTEM.
    Ø5 TARGET-SYS-ELEM   PIC X OCCURS 8 TIMES.

* Define COMMAREA struct. *

Ø1 COMMAREA.
    Ø5 W-COMMA.
        1Ø W-INFFI.
            15 FILLER OCCURS 6.
            2Ø W-NLFI    PIC X(Ø1)     VALUE 'Ø'.
            2Ø W-CODFI   PIC X(Ø2)     VALUE 'ØØ'.
        1Ø W-INFFILE REDEFINES W-INFFI.
            15 FILLER    PIC X(18).
        1Ø WFITAB.
            15 FILLER    PIC X(48) VALUE SPACES.
        1Ø WFITABR REDEFINES WFITAB.
            15 WFITBF OCCURS 6 TIMES.
                20 WFIT PIC X(Ø8).
        1Ø FILLER    PIC X(Ø5).
    Ø5 W-COMMA-APLIC REDEFINES W-COMMA.
        1Ø W-COD-APLIC   PIC X(Ø2).
        1Ø W-MSG-APLIC   PIC X(69).
    Ø1 W-SYSIN.
        Ø5 W-SETFILE.
            1Ø CICS-SYSTEM    PIC X(Ø8) VALUE SPACES.
            1Ø FILLER    PIC X(Ø1) VALUE SPACES.
10 PARM-INPUT PIC X(71) VALUE SPACES.
05 W-SYSIN-APLIC REDEFINES W-SETFILE.
  10 FILLER PIC X(09).
  10 W-PERCENT PIC X(01).
  10 PARM-PROG PIC X(08).
  10 FILLER PIC X(01).
  10 PARM-DADOS PIC X(61).

01 W-WORKVAR.
  05 IND PIC 9(1) VALUE ZERO.
  05 SAVED-RESPONSE PIC 9(8) COMP VALUE ZERO.
  05 W-RETCOD PIC X(08) VALUE ZEROS.
  05 WR-RETCOD REDEFINES W-RETCOD.
    10 FILLER PIC 9(05).
    10 CODRET PIC 9(03).
  05 W-RETCOD2 PIC X(08) VALUE ZEROS.
  05 WR-RETCOD2 REDEFINES W-RETCOD2.
    10 FILLER PIC 9(05).
    10 CODRET2 PIC 9(03).

01 PROGRAM-MESSAGES.
  05 W-MSG-18.
    10 FILLER PIC X(11) VALUE 'FILES: '.
    10 W-FICH-18 PIC X(08) VALUE SPACES.
    10 FILLER PIC X(37) VALUE ' NOT DEFINED/FOUND - EIBRESP=18'.
    10 FILLER PIC X(72) VALUE SPACES.
  05 W-MSG-99.
    10 FILLER PIC X(11) VALUE 'FILES: '.
    10 W-FICH-99 PIC X(08) VALUE SPACES.
    10 FILLER PIC X(37) VALUE ' RETURN CODE = '.
    10 W-CODFILE PIC X(02) VALUE SPACES.
    10 FILLER PIC X(72) VALUE SPACES.
  05 MSG01 PIC X(128) VALUE '==============================================================*
    ' S Batch Client Program =====================*
  05 MSG02 PIC X(128) VALUE '* EXEC Level Processor.
  05 MSG03 PIC X(128) VALUE '* Setting up the EXEC level cal
  05 MSG04 PIC X(128) VALUE '*  EXEC Level Processor.
  05 MSG05 PIC X(128) VALUE '*  EXEC Level Processor.
  05 MSG06 PIC X(128) VALUE '*  EXEC Level Processor.
  05 MSG07 PIC X(128) VALUE SPACES.
  05 MSG08 PIC X(128) VALUE '==============================================================*
  05 MSG09 PIC X(128) VALUE '* Sample PGMBATCH Batch Client Program ==========
    '==============================================================*

PROCEDURE DIVISION.
*=============================================================================*
OPEN OUTPUT PRINTER.
ACCEPT W-SYSIN.
*===============================================================================*
* Get applid of CICS system from PARM statement if specified *
*===============================================================================*
WRITE OUTPUT-RECORD FROM MSGØ1.
WRITE OUTPUT-RECORD FROM MSGØ2.
WRITE OUTPUT-RECORD FROM MSGØ3.
*
MOVE CICS-SYSTEM TO TARGET-SYSTEM.
IF W-PERCENT = '%'
    MOVE PARM-PROG TO TARGET-PROGRAM
    MOVE PARM-DADOS TO COMMAREA
ELSE
    MOVE PARM-INPUT TO COMMAREA.
WRITE OUTPUT-RECORD FROM MSGØ4
WRITE OUTPUT-RECORD FROM COMMAREA
*===============================================================================*
* Perform the Link Request; *
*===============================================================================*
EXEC CICS LINK PROGRAM (TARGET-PROGRAM)
    TRANSID (TARGET-TRANSID)
    APPLID (TARGET-SYSTEM)
    COMMAREA (COMMAREA)
    LENGTH (LENGTH OF COMMAREA)
    DATALENGTH (LENGTH OF COMMAREA)
    RETCODE (EXCI-EXEC-RETURN-CODE)
    SYNONRETURN
END-EXEC.
*
MOVE EXEC-RESP TO W-RETCOD.
MOVE EXEC-RESP2 TO W-RETCOD2.
MOVE COMMAREA TO MSGØ7.
WRITE OUTPUT-RECORD FROM MSGØ7.
IF EXEC-RESP IS EQUAL TO ZERO THEN
    MOVE 'EXEC-RESP = Ø' TO MSGØ2
    WRITE OUTPUT-RECORD FROM MSGØ2
    WRITE OUTPUT-RECORD FROM EXEC-RESP
    WRITE OUTPUT-RECORD FROM EXEC-RESP2
ELSE
    MOVE 'EXEC-RESP <> Ø' TO MSGØ2
    WRITE OUTPUT-RECORD FROM MSGØ2
    MOVE CODRET TO SAVED-RESPONSE
    IF CODRET = 88
        AND CODRET2 = 203
            MOVE 'SPECIFIED CICS NOT ACTIV' TO MSGØ2
            WRITE OUTPUT-RECORD FROM MSGØ2
    ELSE
        IF CODRET = 27 AND CODRET2 = ZEROS
            MOVE 'SPECIFIED PROG NOT DEFINED' TO MSGØ2

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WRITE OUTPUT-RECORD FROM MSGØ2
END-IF
END-IF
WRITE OUTPUT-RECORD FROM EXEC-RESP
WRITE OUTPUT-RECORD FROM EXEC-RESP2
GO TO PROGRAM-EXIT.
*
IF W-PERCENT = '％'
MOVE W-COD-APLIC TO SAVED-RESPONSE
WRITE OUTPUT-RECORD FROM W-MSG-APLIC
ELSE
PERFORM GET-RET-COD VARYING IND FROM 1 BY 1
UNTIL IND > 6
OR W-NLFI(IND) = 'Ø'.
GO TO PROGRAM-EXIT.
***************
GET-RET-COD.
***************
IF W-NLFI(IND) = '9'
MOVE 'ERROR IN THE EXECUTION OF REQUEST' TO MSGØ2
WRITE OUTPUT-RECORD FROM MSGØ2
MOVE +99 TO SAVED-RESPONSE
MOVE 7 TO IND
ELSE
IF W-CODFI(IND) NOT = 'ØØ'
MOVE +Ø4 TO SAVED-RESPONSE
IF W-CODFI(IND) = '18'
MOVE WFITBF(IND) TO W-FICH-18
WRITE OUTPUT-RECORD FROM W-MSG-18
ELSE
MOVE W-CODFI(IND) TO W-CODFILE
MOVE WFITBF(IND) TO W-FICH-99
WRITE OUTPUT-RECORD FROM W-MSG-99
END-IF
ELSE
MOVE W-CODFI(IND) TO W-CODFILE
MOVE WFITBF(IND) TO W-FICH-99
WRITE OUTPUT-RECORD FROM W-MSG-99
END-IF
END-IF.
*
* Exit to MVS.
*
PROGRAM-EXIT.
WRITE OUTPUT-RECORD FROM MSGØ9.
CLOSE PRINTER.
MOVE SAVED-RESPONSE TO RETURN-CODE.
STOP RUN.
IDENTIFICATION DIVISION.
    PROGRAM-ID. PGMCICS.
    *
    * FOR CLOSE (CLO DIS) OR OPEN (CLO ENA)
    * FILES OR GROUP FILES (WITH ASTERISK)
    * NOMENCLATURE 'SET CLO|OPE FI(XXXXXXXX|XXX*)'
    * EX: SET CLO FI(XXX*)
    * SET OPE FI(XXX* ZZZZZZ WWWW*)
    *
    * WORK WITH REMOTE FILES
    *
ENVIRONMENT DIVISION.
    *
DATA DIVISION.
    *
WORKING-STORAGE SECTION.
    *
    01 W-RECEIVE.
       05 FILLER                  PIC X(04) VALUE SPACES.
       05 W-TYPE-OPER             PIC X(03) VALUE SPACES.
       05 FILLER                  PIC X(01) VALUE SPACES.
       05 W-RESOURCE              PIC X(02) VALUE SPACES.
       05 W-APAR                  PIC X(01) VALUE SPACES.
       05 W-NOME                   PIC X(53) VALUE SPACES.
       05 W-NOMEXX REDEFINES W-NOME PIC X(01) OCCURS 53.
       05 FILLER                  PIC X(06) VALUE SPACES.
    01 FILLER                  PIC X(8) VALUE '-TABELA-'.
    01 WFITAB.
       02 WFI1.
          03 FILLER                  PIC X(8) VALUE SPACES.
       02 WFI2.
          03 FILLER                  PIC X(8) VALUE SPACES.
       02 WFI3.
          03 FILLER                  PIC X(8) VALUE SPACES.
       02 WFI4.
          03 FILLER                  PIC X(8) VALUE SPACES.
       02 WFI5.
          03 FILLER                  PIC X(8) VALUE SPACES.
       02 WFI6.
          03 FILLER                  PIC X(8) VALUE SPACES.
    01 WFITABR REDEFINES WFITAB.
       02 WFITBF OCCURS 6 TIMES.
          10 WFIT     PIC X(01) OCCURS 8.
    01 W-INFFI.
       05 FILLER OCCURS 6.
          10 W-NLFI       PIC X(01) VALUE 'Ø'.
          10 W-CODFI      PIC X(02) VALUE 'ØØ'.
    01 W-INFILE REDEFINES W-INFFI.
       05 FILLER                  PIC X(18).
Ø1 FILLER PIC X(8) VALUE '-TABLE-'.

Ø1 W-NOMEX8.
  Ø5 W-NOME1.
    1Ø W-NOMEX1 PIC X(Ø1) VALUE SPACES.
    1Ø FILLER PIC X(Ø7) VALUE SPACES.
  Ø5 W-NOME2 REDEFINES W-NOME1.
    1Ø W-NOMEX2 PIC X(Ø2).
    1Ø FILLER PIC X(Ø6).
  Ø5 W-NOME3 REDEFINES W-NOME1.
    1Ø W-NOMEX3 PIC X(Ø3).
    1Ø FILLER PIC X(Ø5).
  Ø5 W-NOME4 REDEFINES W-NOME1.
    1Ø W-NOMEX4 PIC X(Ø4).
    1Ø FILLER PIC X(Ø4).
  Ø5 W-NOME5 REDEFINES W-NOME1.
    1Ø W-NOMEX5 PIC X(Ø5).
    1Ø FILLER PIC X(Ø3).
  Ø5 W-NOME6 REDEFINES W-NOME1.
    1Ø W-NOMEX6 PIC X(Ø6).
    1Ø FILLER PIC X(Ø2).
  Ø5 W-NOME7 REDEFINES W-NOME1.
    1Ø W-NOMEX7 PIC X(Ø7).
    1Ø FILLER PIC X(Ø1).

Ø1 NAMEFILE.
  Ø5 W-NAME1.
    1Ø W-NAMEX1 PIC X(Ø1).
    1Ø FILLER PIC X(Ø7).
  Ø5 W-NAME2 REDEFINES W-NAME1.
    1Ø W-NAMEX2 PIC X(Ø2).
    1Ø FILLER PIC X(Ø6).
  Ø5 W-NAME3 REDEFINES W-NAME1.
    1Ø W-NAMEX3 PIC X(Ø3).
    1Ø FILLER PIC X(Ø5).
  Ø5 W-NAME4 REDEFINES W-NAME1.
    1Ø W-NAMEX4 PIC X(Ø4).
    1Ø FILLER PIC X(Ø4).
  Ø5 W-NAME5 REDEFINES W-NAME1.
    1Ø W-NAMEX5 PIC X(Ø5).
    1Ø FILLER PIC X(Ø3).
  Ø5 W-NAME6 REDEFINES W-NAME1.
    1Ø W-NAMEX6 PIC X(Ø6).
    1Ø FILLER PIC X(Ø2).
  Ø5 W-NAME7 REDEFINES W-NAME1.
    1Ø W-NAMEX7 PIC X(Ø7).
    1Ø FILLER PIC X(Ø1).

Ø1 W-COMM-REM.
  Ø5 WCOMMREM.
    1Ø FILLER PIC X(Ø4) VALUE 'SET '.
    1Ø W-OPER-REM PIC X(Ø3) VALUE SPACES.
    1Ø FILLER PIC X(Ø4) VALUE ' FI('.
10 W-FILE-REM PIC X(08) VALUE SPACES.
10 FILLER PIC X(52) VALUE SPACES.
05 WCOMMRE REDEFINES WCOMMREM.
  10 FILLER PIC X(01).
  10 W-CODREM PIC X(02).
  10 W-CODREM-N REDEFINES W-CODREM PIC 9(02).
  10 FILLER PIC X(68).
01 W-SPool.
  05 W-NODE PIC X(08) VALUE 'NODENAME'.
  05 W-USERID PIC X(08) VALUE 'LOCAL'.
  05 W-CLASS PIC X(01) VALUE 'A'.
  05 W-TOKEN PIC X(08) VALUE LOW-VALUE.
  05 W-FROM.
    10 W-FROM01 PIC X(09) VALUE SPACE.
    10 FILLER PIC X(14) VALUE ' EIBRESP2 = '.
    10 W-FROM02 PIC X(02) VALUE SPACE.
    10 FILLER PIC X(49) VALUE SPACES.
    10 W-REMOTE PIC X(06) VALUE SPACES.
01 W-WORKVAR.
  05 NFIL PIC 9(1) VALUE ZERO.
  05 IND PIC 9(2) VALUE ZERO.
  05 IND1 PIC 9(1) VALUE ZERO.
  05 W-SYSID PIC X(04) VALUE SPACES.
  05 W-WTO-OPE.
    10 FILLER PIC X(41) VALUE 'EXCI BATCH/CICS - PROBLEM TO OPEN FICH: '.
    10 W-OPE-FILE PIC X(08) VALUE SPACES.
    10 FILLER PIC X(14) VALUE ' EIBRESP2='.
  05 W-WTO-RESP PIC 9(02) VALUE ZEROS.
  05 W-WTO-CLO.
    10 FILLER PIC X(42) VALUE 'EXCI BATCH/CICS - PROBLEM TO CLOSE FICH: '.
    10 W-CLO-FILE PIC X(08) VALUE SPACES.
    10 FILLER PIC X(14) VALUE ' EIBRESP2='. 
  05 W-CLO-RESP PIC 9(02) VALUE ZEROS.
  05 W-NOMEY PIC X(08) VALUE SPACES.
  05 W-NOMEYY REDEFINES W-NOMEY PIC X(01) OCCURS 8.
  05 W-MSGFIM PIC X(36) VALUE '=> TRANSACTION END WITH RETCOD '.
  05 W-MSGRC PIC X(25) VALUE SPACE.
  05 W-COUNTER PIC 9(04) VALUE ZEROS.
  05 W-RETCOD PIC X(08) VALUE ZEROS.
  05 WR-RETCOD REDEFINES W-RETCOD.
    10 FILLER PIC X(06).
    10 CODRET PIC X(02).
    05 W-GENERIC PIC X(01) VALUE 'N'.
88 W-ASTERISK VALUE 'S'.

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88 WOUT-ASTERISK VALUE 'N'.
05 W-RESP PIC S9(08) COMP VALUE ZERO.
05 W-RESP2 PIC S9(08) COMP VALUE ZERO.
05 W-OPENSTATUS PIC S9(08) COMP VALUE ZERO.
05 W-ENABLESTATUS PIC S9(08) COMP VALUE ZERO.

COPY DFHAID.

LINKAGE SECTION.
01 DFHCOMMAREA.
   05 COD-RETURN PIC X(18).
   05 FILE-TAB PIC X(48).
   05 FILLER PIC X(05).

PROCEDURE DIVISION.

EXEC CICS IGNORE CONDITION END
PGMIDERR SYSIDERR END-EXEC.
EXEC CICS HANDLE CONDITION ERROR (RETURN-ERROR) END-EXEC.
MOVE DFHCOMMAREA TO W-RECEIVE.

*****************************************************************
PROCESSING
*****************************************************************
PERFORM OPEN-SPOOL.
PERFORM ØØØ-INPUT.
PERFORM 999-RETCOD.
PERFORM CLOSE-SPOOL.
GO TO RETURN-EXIT.
GOBACK.

ØØØ-INPUT.

IF W-RESOURCE = 'FI'
   MOVE 1 TO IND
   MOVE 1 TO NFIL
   PERFORM
      BUILD-TABLE-FILES
   TEST AFTER
   VARYING IND FROM 1 BY 1
   UNTIL IND > 53
   OR W-NOMEXX(IND) = ')
ELSE
   GO TO RETURN-ERROR.
*
PERFORM WORK-FILES THRU WORK-FILES-EXIT TEST BEFORE
   VARYING IND FROM 1 BY 1 UNTIL IND > NFIL.
*
BUILD-TABLE-FILES.
*
IF W-NOMEXX(IND) = SPACE
   IF W-ASTERISK
MOVE INDI TO W-NLFI(NFIL)
MOVE 'N' TO W-GENERIC
ELSE
    MOVE 8 TO W-NLFI(NFIL)
END-IF
ADD 1 TO NFIL
MOVE ZERO TO INDI
ELSE
    IF W-NOMEXX(IND) = '*' 
        MOVE INDI TO W-NLFI(NFIL)
        MOVE 'S' TO W-GENERIC
    ELSE
        IF W-NOMEXX(IND) = ')' 
            IF W-ASTERISK 
                MOVE INDI TO W-NLFI(NFIL)
                MOVE 'N' TO W-GENERIC
            ELSE
                MOVE 8 TO W-NLFI(NFIL)
            END-IF
        ELSE
            ADD 1 TO INDI
        END-IF
        MOVE W-NOMEXX(IND) TO WFIT(NFIL, INDI)
END-IF
END-IF.
*==================================================================*
*              END OF PROGRAM                                       *
*==================================================================*

WORK-FILES.
*———*
IF W-NLFI(IND) < 8
    MOVE 'S' TO W-GENERIC
ELSE
    MOVE 'N' TO W-GENERIC.
IF W-TYPE-OPER = 'CLO'
    IF W-ASTERISK
        PERFORM CLOSE-GROUP
    ELSE
        EXEC CICS SET FILE( WFITBF (IND))
        CLOSED DISABLED
        FORCE RESP(W-RESP) RESP2(W-RESP2)
    END-EXEC
    MOVE W-RESP2 TO W-RETCOD
    IF CODRET = 1
        MOVE SPACES TO W-COMM-REM
        MOVE 'SET CLO FI(' TO W-COMM-REM
        MOVE WFITBF (IND) TO W-FILE-REM
        MOVE 'REMOTE' TO W-REMOTE
        PERFORM WORK-FICH-REMOTE
    END-IF
MOVE CODRET TO W-CODFI(IND)
IF CODRET NOT = ZERO
  MOVE WFITBF (IND) TO W-CLO-FILE
  MOVE CODRET TO W-CLO-RESP
  PERFORM WTO-CLO
END-IF
MOVE WFITBF (IND) TO W-FROMØ1
MOVE CODRET TO W-FROMØ2
PERFORM WRITE-SPOOL
END-IF
ELSE
  IF W-TYPE-OPER = 'OPE'
    IF W-ASTERISK
      PERFORM OPEN-GROUP
    ELSE
      EXEC CICS SET FILE( WFITBF (IND))
      CLOSED ENABLED
      FORCE RESP(W-RESP) RESP2(W-RESP2)
    END-EXEC
    MOVE W-RESP2 TO W-RETCOD
    IF CODRET = 1
      MOVE SPACES TO W-COMM-REM
      MOVE 'SET OPE FI(' TO W-COMM-REM
      MOVE WFITBF (IND) TO W-FILE-REM
      MOVE 'REMOTE' TO W-REMOTE
      PERFORM WORK-FICH-REMOTE
    END-IF
    MOVE CODRET TO W-CODFI(IND)
    IF CODRET NOT = ZERO
      MOVE WFITBF (IND) TO W-OPE-FILE
      MOVE CODRET TO W-OPE-RESP
      PERFORM WTO-OPE
    END-IF
    MOVE WFITBF (IND) TO W-FROMØ1
    MOVE CODRET TO W-FROMØ2
    PERFORM WRITE-SPOOL
  END-IF
ELSE
  GO TO RETURN-ERROR.
*---------------------*
WORK-FILES-EXIT. EXIT.
*---------------------*
*---------------------*
CLOSE-GROUP.
*---------------------*
EXEC CICS INQUIRE FILE START  END-EXEC.
MOVE ZERO TO W-COUNTER.
MOVE WFITBF (IND) TO W-NOMEX8.
PERFORM CLOSE-FILES THRU CLOSE-FILES-EXIT UNTIL EIBRESP2 = 2.
EXEC CICS INQUIRE FILE END END-EXEC.
IF W-COUNTER = ZERO
  MOVE 18 TO CODRET W-CODFI(IND).
******************************************************************************
CLOSE-FILES.
******************************************************************************
EXEC CICS INQUIRE FILE(NAMEFILE) NEXT
  ENABLESTATUS (W-ENABLESTATUS)
END-EXEC.
EVALUATE W-NLFI(IND)
WHEN '1'
  IF W-NOMEX1 = W-NAMEX1
    PERFORM SET-CLOSE-FILE
  ELSE
    IF W-NAMEX1 > W-NOMEX1
      MOVE 2 TO EIBRESP2
    END-IF
  END-IF
WHEN '2'
  IF W-NOMEX2 = W-NAMEX2
    PERFORM SET-CLOSE-FILE
  ELSE
    IF W-NAMEX2 > W-NOMEX2
      MOVE 2 TO EIBRESP2
    END-IF
  END-IF
WHEN '3'
  IF W-NOMEX3 = W-NAMEX3
    PERFORM SET-CLOSE-FILE
  ELSE
    IF W-NAMEX3 > W-NOMEX3
      MOVE 2 TO EIBRESP2
    END-IF
  END-IF
WHEN '4'
  IF W-NOMEX4 = W-NAMEX4
    PERFORM SET-CLOSE-FILE
  ELSE
    IF W-NAMEX4 > W-NOMEX4
      MOVE 2 TO EIBRESP2
    END-IF
  END-IF
WHEN '5'
  IF W-NOMEX5 = W-NAMEX5
    PERFORM SET-CLOSE-FILE
  ELSE
    IF W-NAMEX5 > W-NOMEX5
      MOVE 2 TO EIBRESP2
    END-IF
  END-IF
WHEN '6'
  IF W-NOMEX6 = W-NAMEX6
      PERFORM SET-CLOSE-FILE
  ELSE
      IF W-NAMEX6 > W-NOMEX6
          MOVE 2 TO EIBRESP2
      END-IF
  END-IF
WHEN '7'
  IF W-NOMEX7 = W-NAMEX7
      PERFORM SET-CLOSE-FILE
  ELSE
      IF W-NAMEX7 > W-NOMEX7
          MOVE 2 TO EIBRESP2
      END-IF
  END-IF
WHEN OTHER
  CONTINUE
END-EVALUATE.

CLOSE-FILES-EXIT. EXIT.
*****************************************************************
SET-CLOSE-FILE.
EXEC CICS SET FILE(NAMEFILE)
  CLOSED DISABLED
  FORCE RESP(W-RESP) RESP2(W-RESP2)
END-EXEC
ADD 1 TO W-COUNTER
MOVE W-RESP2 TO W-RETCOD.
  IF CODRET = 1
      MOVE SPACES TO W-COMM-REM
      MOVE 'SET CLO FI(' TO W-COMM-REM
      MOVE NAMEFILE TO W-FILE-REM
      MOVE 'REMOTE' TO W-REMOTE
      PERFORM WORK-FICH-REMOTE
  END-IF.
  IF CODRET NOT = ZEROS
      MOVE CODRET TO W-CODFI(IND) W-CLO-RESP
      MOVE NAMEFILE TO W-CLO-FILE
      PERFORM WTO-CLO
  END-IF.
MOVE NAMEFILE TO W-FROMØ1
MOVE CODRET TO W-FROMØ2
PERFORM WRITE-SPOOL.

OPEN-GROUP.
EXEC CICS INQUIRE FILE START END-EXEC.
MOVE ZERO TO W-COUNTER.
MOVE WFITBF (IND) TO W-NOMEX8.
PERFORM OPEN-FILES THRU OPEN-FILES-EXIT UNTIL EIBRESP2 = 2.
EXEC CICS INQUIRE FILE END END-EXEC.
IF W-COUNTER = ZERO
  MOVE 18 TO CODRET W-CODFI(IND).
*****************************************************************
OPEN-FILES.
*****************************************************************
EXEC CICS INQUIRE FILE(NAMEFILE) NEXT END-EXEC.
EVALUATE W-NLFI(IND)
  WHEN '1'
    IF W-NOMEX1 = W-NAMEX1
      PERFORM SET-OPEN-FILE
    ELSE
      IF W-NAMEX1 > W-NOMEX1
        MOVE 2 TO EIBRESP2
      END-IF
    END-IF
  WHEN '2'
    IF W-NOMEX2 = W-NAMEX2
      PERFORM SET-OPEN-FILE
    ELSE
      IF W-NAMEX2 > W-NOMEX2
        MOVE 2 TO EIBRESP2
      END-IF
    END-IF
  WHEN '3'
    IF W-NOMEX3 = W-NAMEX3
      PERFORM SET-OPEN-FILE
    ELSE
      IF W-NAMEX3 > W-NOMEX3
        MOVE 2 TO EIBRESP2
      END-IF
    END-IF
  WHEN '4'
    IF W-NOMEX4 = W-NAMEX4
      PERFORM SET-OPEN-FILE
    ELSE
      IF W-NAMEX4 > W-NOMEX4
        MOVE 2 TO EIBRESP2
      END-IF
    END-IF
  WHEN '5'
    IF W-NOMEX5 = W-NAMEX5
      PERFORM SET-OPEN-FILE
    ELSE
IF W-NAMEX5 > W-NOMEX5
    MOVE 2 TO EIBRESP2
END-IF
END-IF
WHEN '6'
    IF W-NOMEX6 = W-NAMEX6
        PERFORM SET-OPEN-FILE
    ELSE
        IF W-NAMEX6 > W-NOMEX6
            MOVE 2 TO EIBRESP2
        END-IF
    END-IF
WHEN '7'
    IF W-NOMEX7 = W-NAMEX7
        PERFORM SET-OPEN-FILE
    ELSE
        IF W-NAMEX7 > W-NOMEX7
            MOVE 2 TO EIBRESP2
        END-IF
    END-IF
WHEN OTHER
    CONTINUE
END-EVALUATE.

OPEN-FILES-EXIT. EXIT.
******
EXEC CICS SET FILE(NAMEFILE)
    CLOSED ENABLED
    FORCE RESP(W-RESP) RESP2(W-RESP2)
END-EXEC
ADD 1 TO W-COUNTER
MOVE W-RESP2 TO W-RETCOD.
IF CODRET = 1
    MOVE SPACES TO W-COMM-REM
    MOVE 'SET OPE FI(' TO W-COMM-REM
    MOVE NAMEFILE TO W-FILE-REM
    MOVE 'REMOTE' TO W-REMOTE
    PERFORM WORK-FICH-REMOTE
END-IF.
IF CODRET NOT = ZEROS
    MOVE CODRET TO W-CODFI(IND) W-OPE-RESP
    MOVE NAMEFILE TO W-OPE-FILE
    PERFORM WTO-OPE
END-IF.
MOVE NAMEFILE TO W-FROMØ1
MOVE CODRET TO W-FROMØ2
PERFORM WRITE-SPOOL.
**WORK-FICH-REMOTE.**

EXEC CICS INQUIRE FILE(W-FILE-REM)
    REMOTESYSTEM (W-SYSID)
END-EXEC.

INSPECT W-FILE-REM REPLACING FIRST ' ' BY ' '.
EXEC CICS LINK PROGRAM ('PGMCICS')
    SYSID (W-SYSID)
    COMMAREA(W-COMM-REM)
    LENGTH (LENGTH OF W-COMM-REM)
END-EXEC.

IF EIBRESP NOT = ZERO
    MOVE EIBRESP TO CODRET
ELSE
    MOVE W-CODREM-N TO CODRET.

**OPEN-SPOOL.**

EXEC CICS SPOOLOPEN TOKEN(W-TOKEN)
    OUTPUT
    NODE(W-NODE)
    USERID(W-USERID)
    CLASS(W-CLASS)
    NOHANDLE
END-EXEC.

EXEC CICS SPOOLWRITE TOKEN(W-TOKEN)
    FROM(W-RECEIVE)
    NOHANDLE
END-EXEC.

**WRITE-SPOOL.**

EXEC CICS SPOOLWRITE TOKEN(W-TOKEN)
    FROM(W-FROM)
    NOHANDLE
END-EXEC.

MOVE SPACES TO W-REMOTE.

**CLOSE-SPOOL.**

EXEC CICS SPOOLCLOSE TOKEN(W-TOKEN)
    KEEP
    NOHANDLE
END-EXEC.

**999-RETCOD.**

MOVE SPACES TO DFHCOMMAREA.
MOVE W-INFFILE TO COD-RETURN.
MOVE WFITAB TO FILE-TAB.

**—— WTO-CLO.**

EXEC CICS WRITE OPERATOR
   TEXT(W-WTO-CLO)
   TEXTLENGTH (LENGTH OF W-WTO-CLO)
END-EXEC.

**—— WTO-OPE.**

EXEC CICS WRITE OPERATOR
   TEXT(W-WTO-OPE)
   TEXTLENGTH (LENGTH OF W-WTO-OPE)
END-EXEC.

**—— RETURN-ERROR.**

RETURN-EXIT.

EXEC CICS RETURN END-EXEC.

---

**JCL**

```plaintext
//JOBNAME1 JOB (EXCI),CLASS=S,MSGCLASS=X,NOTIFY=&SYSUID
//*===============================================================*
//*    JCL TO EXECUTE AN EXTERNAL CICS INTERFACE CLIENT PROGRAM   *
//*===============================================================*
//STEP1     EXEC  PGM=PGMBATCH
//STEPLIB   DD  DSN=your.lib.LOAD,DISP=SHR
  // DD DSN=SYSP.CEE.VIR5MØ.SCEERUN,DISP=SHR
  // DD DSN=SYSP.CICS.SDFHEXCI,DISP=SHR
//SYSIN    DD  DSN=your.lib.SYSIN(SYSINXX),DISP=SHR
//SYSIN    DD  *
CICSNAME,SET CLO FI(A*)
/*
//SYSOUT   DD  SYSOUT=*  
//SYSPRINT  DD  SYSOUT=*  
//SYSDUMP   DD  SYSOUT=*  
//CEEDUMP   DD  SYSOUT=*  
//SYSDUMP   DD  SYSOUT=*  
//```

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Selecting the appropriate data location

INTRODUCTION
IBM introduced program auto-install in CICS Version 4. The benefits of program auto-install include the reduction of system administration and virtual storage usage.

The use of the program auto-install feature is optional. If program auto-install is turned on (SIT: PGAIPGM=ACTIVE) you can hook an exit program (the default is DFHPGADX) into the IBM-provided exit point to change the process of auto-installing programs to suit your needs.

For this purpose, CICS uses the program name specified in the SIT parameter PGAEXIT. An additional RDO-defined program model is mandatory. The IBM-supplied default model name for programs is DFHPGAPG.

In the COMMAREA provided for the auto-install control program you can change the name of the model and/or any particular parameters of the model.

The program auto-install exit point is also driven by installing mapsets and partition sets. For this type of program, a parameter of data location is not applicable and therefore outside the scope of the problem described here.

THE PROBLEM
In the PGAI exit program (user-replaceable-module), you can specify the data location above or below the 16MB line for the life of the task. Move the constant PGAC_LOCATION_ANY to the variable PGAC_DATA_LOCATION, if the program needs data location ANY. Otherwise, move the constant PGAC_LOCATION_BELOW to the variable.

The problem is how to select the appropriate data location!
THE SOLUTION

To set the appropriate data location, it is necessary to exploit the program’s AMODE link attribute. To do this, I have written a little subroutine (EPGAI2) used by my auto-install control program (EPGAI1). The subprogram expects the name of the program to be installed as input and the DDNAME where the program is to be found (DFHRPL). Using these parameters, it reads the program’s directory entry using the BLDL macro.

The directory record returned will be mapped by the IHAPDS macro. The AMODE information is stored at offset X'21' in the fieldname PDS2FTB2 (see macro expansion). This byte is returned via the COMMAREA field AMODEX to the PGAI exit program.

Using this information, the PGAI exit program can determine the appropriate data location of the program auto-installed.

Programs with a link attribute of AMODE 24 get a data location of BELOW, AMODE 31 members get a data location of ANY. Additional information is returned, including the dataset name in which the program/member resides, and the concatenation number within DFHRPL.

RESTRICTION

It is possible, but unlikely, that programs linked with AMODE 31 need a data location of BELOW. These ‘special’ programs should be defined by RDO and not by program auto-install.

IMPLEMENTATION

Note that the PGAI exit program (EPGAI1) cannot itself be auto-installed, nor can any program it references (EPGAI2). You must define a program resource definition in the CSD for both programs. I have used the following definitions:

```
GROUP(PGAIØ1)          PROGRAM(EPGAI1)
DESCRIPTION(AUTOINSTALL CONTROL PROGRAM)
LANGUAGE(ASSEMBLER)    EXECKEY(CICS)    EXECUTIONSET(FULLAPI)
RELOAD(NO)             RESIDENT(NO)     USAGE(NORMAL)
STATUS(ENABLED)        CEDF(NO)         DATALOCATION(ANY)
```
HINTS AND TIPS

EPGAI2 issues a return code of four if the program to be auto-installed is not found in any of the concatenated libraries under the DD name DFHRPL.

In this case, I recommend you not to auto-install the program into the PPT chains (move GAC_RETURN_DONT_DEFINE_PROGRAM to PGAC_RETURN_CODE). If you do, the program gets the copystatus ‘REQUIRED’. This means a ‘SET PROGRAM NEWCOPY’ is necessary after the load module is available. A message indicating that the load module is not available is the better way.

MESSAGES

If everything works smoothly, CICS issues the message DFHPG0209, including just the program name and the model name used.

I propose to issue an additional message with more information, as shown in the following example:

EPGAI1-Ø1 I 1999/04/21 11:45:32 INSTALL RESOURCE(SCSPØ7 ) TYPE(PROGRAM) TEMPLATE(DFHPGAPG) CONCATENATION( 5) DATALOCATION(ANY ) LIBRARY(CICS.SUP4LE.ACSCLS.LOADLIB )

The concatenation number and the library’s dataset name is determined by program EPGAI2. Note that the concatenation number is zero for the first library.

CONCLUSION

I have separated the function of reading the PDS(E) directory entry in program EPGAI2, assuming you have your own PGAI exit program. At most sites, this program is not written in Assembler, and therefore
Assembler macros cannot be used. In this case, you can call EPGAI2 from your PGAI exit program with a normal EXEC CICS LINK command, using a COMMAREA described in program EPGAI1.

If you have no PGAI exit program to date, you can use my program EPGAI1 as an example and/or starting point.

Note that the usage of the BLDL macro requires an open DCB. A method to locate the DCB for DFHRPL, which was already opened by CICS, is to scan the DEB chain for the associated DCBs. This technique is described by Chorng Hwang in his article Determining the library using PINQPGM, published in CICS Update, Issue 152, July 1998.

EPGAI1

**********************************************************************
*                         EPGAI1                                     *
* —————————————————————————————————————————————————————————————————— *
* FUNCTION    : PROGRAM AUTO-INSTALL CONTROL PROGRAM                 *
*                                                                    *
* VERSION     : CICS VERSION 4 AND 5 UNDER MVS/OS39Ø                  *
*                                                                    *
* DESCRIPTION : THIS PROGRAM IS INVOKED WHEN A PROGRAM IS BEING AUTO-* *
*               INSTALLED AND THE AUTO-INSTALL EXIT NAME (PGAIEXIT)  *
*               IS SET TO EPGAI1.                                    *
*                                                                    *
*               A PARAMETER LIST IS PROVIDED AS INPUT TO THE PROGRAM.* *
*               THE PARAMETER LIST IS PASSED AND ADDRESSED VIA THE    *
*               NORMAL CONVENTIONS FOR A COMMAREA. THE PARAMETER LIST* *
*               IS DEFINED IN DFHPGACD. THE 'COPY DFHPGACD' STATEMENT* *
*               IS COMMENTED OUT IN THIS PROGRAM. YOU SHOULD CHANGE    *
*               THIS. FOR DOCUMENTATION PURPOSES, THE COMMAREA AND     *
*               PARTS OF THE CONSTANTS ARE HARDCODED.                  *
*                                                                    *
* BINDER PARM : THE PROGRAM CAN BE LINKED WITH THE REENTRANT ATTRIB. *
**********************************************************************

DFHEISTG  DSECT
DABSTIME  DS   15P
DWORD     DS   D
            ORG  *-4
NUMBER    DS   F
X_RESP    DS   F
            MESSAGE LINES
MESSAGES DS  ØCL24Ø
            *
MLINE1    DS  ØCL8Ø
          DS  CL12
ML1DATE   DS  CL10
          DS  CL1
ML1TIME   DS  CL8
          DS  CL18
ML1PROG   DS  CL8
          DS  CL7
ML1TYPE   DS  CL8
          DS  CL8
*
MLINE2    DS  ØCL8Ø
          DS  CL17
ML2TEMPL  DS  CL8
          DS  CL16
ML2CONCAT DS  CL8
          DS  CL15
ML2LOC    DS  CL8
          DS  CL8
*
MLINE3    DS  ØCL8Ø
          DS  CL16
ML3DSN    DS  CL44
          DS  CL2Ø
***      COPY DFHPGACD                AUTO-INSTALL COMMAREA
PGAC__DSECT
PGAC__DUMMY     DS  ØCL41
PGAC_PROGRAM    DS  CL8
PGAC_MODULE_TYPE DS  CL1
PGAC_RETURN_INFORMATION DS  ØCL32
PGAC_MODEL_NAME  DS  CL8
PGAC_LANGUAGE    DS  CL1
PGAC_CEDF_STATUS DS  CL1
PGAC_DATA_LOCATION DS  CL1
PGAC_EXECUTION_KEY DS  CL1
PGAC_LOAD_ATTRIBUTE DS  CL1
PGAC_USE_LPA_COPY DS  CL1
PGAC_EXECUTION_SET DS  CL1
PGAC_REMOTE_SYSID DS  CL4
PGAC_REMOTE_PROGID DS  CL8
PGAC_REMOTE_TRANSID DS  CL4
PGAC_RETURN_CODE  DS  CL1
PGAC__LEN EQU  L'PGAC__DUMMY           STRUCTURE LENGTH
*
********************************************************************
*  USED CONSTANTS FROM DFHPGACD
********************************************************************
PGAC_TYPE_PROGRAM               EQU C'1'
PGAC_LOCATION_BELOW             EQU C'1'
PGAC_LOCATION_ANY EQU C'2'
PGAC_CICS_KEY EQU C'1'
PGAC_USER_KEY EQU C'2'
PGAC_RETURN_OK EQU C'1'
PGAC_RETURN_DONT_DEFINE_PROGRAM EQU C'2'

********************************************************************
*/ API FOR EPGAI2
********************************************************************

EPGAI2API DS $F
COMMA_ID DS CL8
RET_CODE DS F
REA_CODE DS F
DDD_NAME DS CL8
MEM_NAME DS CL8
LIB_NAME DS CL44
CONCAT_N DS H
AMODEX DS B
ELAPS_TI DS PL8
RESERVED DS CL9
RET_MESS DS CL80
EYE_CATCH DS CL80
API_LENGTH EQU *-EPGAI2API
/* END API

***********************************************************************
EPGAI1 CSECT
EPGAI1 AMODE 31
EPGAI1 RMODE ANY
DFHREGS
OC EIBCALEN,EIBCALEN /* IF THERE IS NO COMMAREA, */
BZ RETURN0 /* RETURN. */
L R2,DFHEICAP /* ADDRESS THE COMMAREA */
USING PGAC,R2 /* */
CLI PGAC_MODULE_TYPE,PGAC_TYPE_PROGRAM IF MODULE TYPE */
BNE RETURNOK /* NOT PROGRAM, RETURN OK. */
TAIS CLC =C'SYAI',PGAC_PROGRAM /* PROGRAM NAMES STARTING */
/* WITH SYAI NEED EXECKEY */
/* CICS. */
BNE CPSM /* TEST OF EYU PROGRAMS. */
B CICSKEY /* SET EXECKEY TO CICS FOR */
/* SYAI* PROGRAM NAMES */
CPSTM CLC =C'EYU',PGAC_PROGRAM /* CPSM PROGRAMS? */
BNE OMEG /* NO. TEST OMEGAMON. */
B CICSKEY /* YES. SET EXECKEY TO CICS */
OMEG CLC =C'KOC',PGAC_PROGRAM /* OMEGAMON PROGRAMS? */
BNE USERKEY /* NO. THE REQUESTED PROGRAM */
/* IS NOT A CPSM, OMEGAMON OR*/
/* SYAI* (OUR TERMINAL AUTO- */
/* INSTALL) PROGRAM: SET */
/* EXEC KEY TO USER. */
CICSKEY MVI PGAC_EXECUTION_KEY,PGAC_CICS_KEY SET EXECKEY CICS */
B INIT01 /* SKIP EXECKEY USER */
USERKEY MVI PGAC_EXECUTION_KEY,PGAC_USER_KEY SET EXECKEY USER */
INIT01 MVI EPGAI2API,X'00' /* INITIALIZE ... */
MVC EPGAI2API+1(API_LENGTH-1),EPGAI2API THE ... */
MVC DDD_NAME,=CL8'DFHRPL' /* INTERFACE ... */
MVC COMMA_ID,=CL8'*PGMAIS*' /* TO ... */
MVC MEM_NAME,PGAC_PROGRAM /* SUBROUTINE ... */
MVC PGAC_MODEL_NAME,=CL8'DFHPGAPG' EPGAI2 */
MVC MESSAGES,MSGCONST /* MOVE CONST. TO DYN.STOR. */
EXEC CICS LINK PROGRAM('EPGAI2'). INVOKE */ +
COMMAREA(EPGAI2API). SUB */ +
LENGTH(=Y(API_LENGTH)). ROU */ +
RESP(X_RESP). TINE */
CLC X_RESP,DFHRESP(NORMAL) /* SUCCESSFUL ? */
BE LINK_OK /* YES. */
EXEC CICS WRITE OPERATOR. /* NO. ISSUE ERROR MESSAGE */ +
TEXT('EXE* ERROR IN LINK TO PROGRAM EPGAI2 '). */ +
NOHANDLE. /* AND RETURN WITHOUT INSTAL-*/
B RETURNDD /* LINKING A PROGRAM DEFINITION */
LINK_OK EQU * /* LINK TO EPGAI2 OK. */
CLC RET_CODE,DFHRESP(NORMAL) /* RETURN-CODE ZERO? */
BE RET_CODE_OK /* YES. */
EXEC CICS WRITE OPERATOR. /* NO. ISSUE ERROR MESSAGE */ +
TEXT(RET_MESS). /* AND RETURN WITHOUT */ +
NOHANDLE. /* INSTALLING A PROGRAM */
B RETURNDD /* DEFINITION. */
RET_CODE_OK EQU * /* RETURN-CODE FROM EPGAI2 0K*/ +
/* CREATE MESSAGE */ +
/* —————————————— */
MVC ML3DSN,LIB_NAME /* DATA SET NAME */
MVC ML1PROG,MEM_NAME /* PROGRAM NAME */
MVC ML1TYPE,=CL8'PROGRAM' /* PROGRAM TYPE (ALWAYS PGM) */
MVC ML2TEMPL,PGAC_MODEL_NAME MODEL NAME */
LH R5,CONCAT_N /* CONCAT */
CVD R5,DWORD /* ENATION */
MVC ML2CONCAT,=X'4020202020202021200' NUM */
ED ML2CONCAT,NUMBER /* BER */
TM AMODEX.B'000000010' /* IS AMODE 31 OR ANY? */
BO AMODE31 /* YES. */
MVI PGAC_DATA_LOCATION,PGAC_LOCATION_BELOW NO. SET BELOW.*
MVC ML2LOC,=CL8'BELOW' /* MOVE BELOW TO MESSAGE AND */
B RETURNOK /* RETURN TO CICS. */
AMODE31 EQU * /* AMODE IS 31 OR ANY! */
MVI PGAC_DATA_LOCATION,PGAC_LOCATION_ANY SET TO ANY. */
MVC ML2LOC,=CL8'ANY' /* MOVE ANY TO MESSAGE AND */
/* RETURN TO CICS. */
RETURNOK DS ØH /* —————————————— */
MVI PGAC_RETURN_CODE,PGAC_RETURN_OK /*
EXEC CICS ASKTIME. /*                           */
ABSTIME(DABSTIME). /* GET CURRENT TIME */
NOHANDLE. /*                           */
EXEC CICS FORMATTIME. /*                           */
ABSTIME(DABSTIME). /* AND FORMAT IT FOR */
YYYYMMDD(MLIDATE). /*                          */
DATESEP('.'). /*                               */
TIME(MLTIME). /* MESSAGE. */
TIMESEP(':'). /*                          */
NOHANDLE. /*                           */
EXEC CICS WRITEQ TD. /* ISSUE MESSAGE LINE 1 */
QUEUE('CSMT'). /*                           */
FROM(MLINE1). /*                           */
NOHANDLE. /*                           */
EXEC CICS WRITEQ TD. /* ISSUE MESSAGE LINE 2 */
QUEUE('CSMT'). /*                           */
FROM(MLINE2). /*                           */
NOHANDLE. /*                           */
EXEC CICS WRITEQ TD. /* ISSUE MESSAGE LINE 3 */
QUEUE('CSMT'). /*                           */
FROM(MLINE3). /*                           */
NOHANDLE. /*                           */
B     RETURNØ                 /*                           */
RETURNDD DS ØH                      /* DO NOT DEFINE THE PROGRAM */
MVI   PGAC_RETURN_CODE,PGAC_RETURN_DONT_DEFINE_PROGRAM /*
RETURNØ DS ØH                      /* DEFINE THE PROGRAM AND */
EXEC CICS RETURN. /* RETURN TO CICS */
**********************************************************************
*        CONSTANTS                                                   *
**********************************************************************
MSGCONST DS ØCL24Ø
DC CLØ'EPGAI1-Ø1 I YYYY/MM/DD HH:MM:SS INSTALL '
DC CLØ'RESOURCE(........) TYPE(........) '
DC CLØ' TEMPLATE(........) CONCATENATION'
DC CLØ' (........) DATALOCATION(........) '
DC CLØ' LIBRARY(..................)' 
DC CLØ'..................'
END   EPGAI1

EPGAI2
**********************************************************************
*       EPGAI2                                                         *
**********************************************************************
* FUNCTION : READ PDS DIRECTORY ENTRIES - SUBROUTINE FOR THE         *
*             PROGRAM AUTO-INSTALL CONTROL PROGRAM                    *
*                                                                *
* VERSION : CICS VERSION 4 AND 5 UNDER MVS/OS39Ø                    *
*                                                                *
* DESCRIPTION: THIS PROGRAM IS INVOKED FROM THE PROGRAM AUTO-INSTALL*
  * CONTROL PROGRAM TO READ A PARTICULAR PARTITIONED  *
  * DATASET DIRECTORY ENTRY.                         *
  *                                                     *
  * BINDER PARM: THE PROGRAM CAN BE LINKED WITH THE REENTRANT ATTRIB. *
  ******************************************************

PRINT ON, NOGEN, NODATA
DFHEISTG

TCB_ADDR DS A                       /* SAVE ADDRESS OF TCB */
TIOTADDR DS A                       /* SAVE ADDRESS OF TIOT */
RPLFLAG DS X                        /* FLAG */
XABSTIME DS PL8                      /* WORKFIELD FOR TIME */
DS 0F                               /* ALIGN FULLWORD */
CL8                                 /* BLDL PREFIX */

BLDLIST DS CL(LBLDLLEN)             /* BLDL PARAMETER LIST */

EPGAI2 DFHEIENT CODEREG=10,EIBREG=11,DATAREG=12
EPGAI2 AMODE 31                     /* */
EPGAI2 RMODE ANY                    /* */

B BEGIN                            /* SKIP ACROSS EYECATCHER */
EYECATCH DC C'*** PGMID=EPGAI2 ***' /* */
DC C'/&SYSDATE.ADATE'              /* */
DC C'/&SYSTIME.ATIME'              /* */
DC C'LEVEL=01 ***'                 /* */
EYEC_LEN EQU *-EYECATCH            /* */

BEGIN EXEC CICS ASKTIME.            /* GET THE ... */
NOHANDLE.                          /* TIME. */

* VERIFY COMMAREA

OC EIBCALEN,EIBCALEN                /* NO COMMAREA ? */
BNZ CO_LENGH                        /* GO TO CHECK LENGTH */
EXEC CICS WRITE OPERATOR.           /* */
TEXT(NO_COMMAREA).                  /* */
NOHANDLE.                           /* */

B RETURN                            /* */

CO_LENGH DS 0H                       /* */
LH WORKREG,Y(API_LENGTH)             /* */
CH WORKREG,EIBCALEN                  /* INVALID COMMAREA LENGTH */
BE COMM_ID                           /* GO TO CHECK IDENTIFICATION */
EXEC CICS WRITE OPERATOR.           /* */
TEXT(INVALID_CO_LEN).                /* */
NOHANDLE.                           /* */

B RETURN                            /* */

COMM_ID DS 0H                        /* IDENTIFY RIGHT COMMAREA */
L COMPTR,DFHEICAP                    /* */
USING API,COMPTR                     /* ADDRESSABILITY ... */
CLC COMM_ID,COMMAREA_ID              /* */
BE COMM_OK                           /* COMMAREA IS NOW OK. */

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EXEC  CICS WRITE OPERATOR. /* */ +
   TEXT(INVALID_CO_ID). /* */ +
   NOHANDLE. /* */ +
LA WORKREG,16 /* RETURN-CODE 16 IF INV.LD */
ST WORKREG,RET_CODE /* STORE RC IN COMMAREA FIELD */
B  RETURN /* */ +
COMMA_OK DS ØH /* COMMAREA OK. */ +
**********************************************************************
*        INITIALIZE API                                              *
**********************************************************************
LA WORKREG,Ø /* CLEAR WORKREGISTER (R7) */
ST WORKREG,RET_CODE /* CLEAR RETURN-CODE */
ST WORKREG,REA_CODE /* CLEAR REASON-CODE */
STH WORKREG,CONCAT_N /* CLEAR CONCATENATION NUMBER */
STCM WORKREG,B'0001',AMODEX /* CLEAR AMODEX */
MVC LIB_NAME,SPACES /* CLEAR_LIBRARY DSN */
MVC RET_MESS,=CL08'ALL WORK''S FINE!' /* */
MVC RESERVED,SPACES /* */
MVC EYE_CATCH,SPACES /* */
MVC EYE_CATCH(EYEC_LEN),EYECATCH /* */
**********************************************************************
*        FIND DCB OF REQUESTED DDNAME USING THE DEB CHAIN.           *
**********************************************************************
USING PSA,Ø /* */
L 1,PSATOLD /* GET TCB ADDRESS */
USING TCB,1 /* */
TCBLOOP ST 1,TCB_ADDR /* SAVE IT */
SR 2,2 /* */
ICM 2,15,TCBDEB /* GET FIRST DEB ADDRESS */
BZ NORPL /* */
L 5,TCBTIO /* GET TIOT ADDRESS */
ST 5, TIOTADDR /* SAVE IT */
DROP 1 /* */
USING DEBBASIC,2 /* */
DEBLOOP DS ØH /* */
SR 1,1 /* */
ICM 1,7,DEBDCBB /* GET DCB ADDRESS */
BZ NEXTDEB /* ZERO, GO TO NEXT DEB */
USING IHADCB,1 /* */
LR DCBREG,1 /* SAVE DCB ADDRESS */
LH 6, DCBTIOT /* OFFSET */
AR 6,5 /* OFFSET + TIOT START ADDR. */
USING TIOENTRY,6 /* */
CLC TIOEDDNNM,DDD_NAME /* DDNAME FOUND ? */
BE READ_PDS /* YES. */
NEXTDEB DS ØH /* NO. */
XR 1,1 /* */
ICM 1,7,DEBDEBB /* GET NEXT DEB ADDRESS */
BZ NORPL /* */
LR  2,1                       /*                           */
B   DEBLOOP                    /*                           */
DROP 1,2                       /*                           */
NORPL DS ØH                    /*                           */
L  2,TCB_ADDR                 /*                           */
USING TCB,2                    /*                           */
SR  1,1                       /*                           */
ICM 1,15,TCBBACK               /* GET NEXT TCB                 */
DROP 2                         /*                           */
BZ  TCBLOOPD                   /* NO, CONTINUE WITH ERR.MES.*/
C  1,PSATOLD                  /* SEE IF WE’VE HIT END       */
BNE TCBLOOP                    /*                           */
TCBLOOPD DS ØH                 /*                           */
MVC RET_MESS,MSGNORPL          /*                           */
MVC RET_CODE,RCNORPL           /*                           */
B GOBACK                       /*                           */
**********************************************************************
*        READ PDS DIRECTORY ENTRY FOR REQUESTED PROGRAM NAME         *
**********************************************************************
READ_PDS DS ØH                 /*                           */
MVC BLDLLIST,LBLDLST           /* MOVE BLDL PARAMETER LIST   */
LA  BLDLLREG,BLDLLIST          /* TO DYNAMIC STORAGE.        */
MVC BLDLLIST+4(8),MEM_NAME     /* MOVE PROGRAM NAME TO BLDL  */
BLDL (DCBREG),(BLDLREG),NOCONNECT READ DIRECTORY ENTRY   */
XR  WORKREG,WORKREG            /*                           */
CLR 15,WORKREG                 /* IS BLDL RETURN-CODE ZERO?  */
BZ  BLDL_OK                    /* YES.                       */
ST  15,RET_CODE                /* NO. STORE RETURN & REASON  */
ST Ø,REA_CODE                  /* CODES IN COMMAREA.         */
MVC RET_MESS(4Ø),=CL4Ø'*EXE* BLDL ERROR-CHECK RET/REA CODE'
MVC RET_MESS+4Ø(4Ø),=CL4Ø'RC=4 : PGM NOT FOUND ON LIBRARIES'
B FIND_DS                      /*                           */
BLDL_OK LA BLDLLREG,4(BLDLREG)  /* POINT TO THE FIRST ENTRY  */
USING PDS2,BLDLREG             /* PDS2 IS LABEL FROM IHAPS   */
MVC AMODEX,PDS2FTB2            /* MOVE AMODE/RMODE INFORMA. */
MVC CONCAT_N+1(1),PDS2CNT      /* MOVE CONCATENATION NUMBER  */
**********************************************************************
*        FIND DATA SET NAME                                          *
**********************************************************************
FIND_DS DS ØH                  /*                           */
XR  WORKREG,WORKREG            /* IF RETURN_CODE IS NOT ...  */
C  WORKREG,RET_CODE            /* EQUAL TO ZERO, THEN ...    */
BNE TIOTEND                    /* SKIP 'FIND DATSET NAME'!   */
   MVI RPLFLAG,X'ØØ'            /* SET DCBL-FOUND TO FALSE    */
   LH 5,CONCAT_N                /*                           */
   L 4, TIOTADDR                /* RESTORE TIOT ADDRESS       */
   USING TIOT1,4                 /*                           */
TIOTLOOP DS ØH                  /*                           */
   CLI RPLFLAG,X'FF'            /*                           */

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BE TIOTCONC /* */
CLC TIODEDDNM,DDD_NAME /* */
BNE TIOTNEXT /* */
MVI RPLFLAG,X'FF' /* SET DCBL-FOUND TO TRUE */
TIOTCONC DS ØH /* */
CH 5,=H'0' /* */
BH CONTINUE /* */
TIOTDSN DS ØH /* */
XR 3,3 /* */
ICM 3,7,TIOEJFCB /* GET 24 BIT ADDRESS FOR JFCB/ */
LA 3,16(Ø,R3) /* KLUGE FACTOR */
USING JFCB,3 /* */
MVC LIB_NAME,JFCBDSNM /* MOVE DATA SET NAME */
B TIOTEND /* */
CONTINUE DS ØH /* */
SH 5,=H'1' /* */
TIOTNEXT DS ØH /* */
XR 15,15 /* */
IC 15,TIOELNGH /* */
AR 4,15 /* NEXT ENTRY IN TIOT */
CLC =XL4'00000000',TIODEDDNM /* */
BE TIOTEND /* NO MORE ENTRIES */
CLI TIOELNGH,X'00' /* */
BE TIOTEND /* */
B TIOTLOOP /* */
TIOTEND DS ØH /* */
**********************************************************************
*        EXIT PROGRAM                                                *
**********************************************************************
GOBACK EXEC CICS ASKTIME ABSTIME(ELAPS_TI) NOHANDLE
SP ELAPS_TI,XABSTIME /* COMPUTE ELAPSED TIME */
RETURN EXEC CICS RETURN
**********************************************************************
* CONSTATNTS, DSECTS ETC.                                          *
**********************************************************************
COMMAREA_ID DC CL8'*PGMAIS*'
NO_COMMAREA DC CL8Ø'EPGA2-Ø1 E NO COMMAREA SPECIFIED FOR PROGRAM AUTO+
OINSTALL SUBEXIT.'
INVALID_CO_LEN DC CL8Ø'EPGA2-Ø2 E INVALID COMMARA LENGTH SPECIFIED FOR+
PROGRAM AUTOINSTALL SUBEXIT.'
INVALID_CO_ID DC CL9Ø'EPGA2-Ø3 E INVALID COMMARA IDENTIFICATION SPECIF+
IED FOR PROGRAM AUTOINSTALL SUBEXIT.'
MSGNORPL DC CL8Ø'EPGA2-Ø4 E NO DFHRPL DD NAME FOUND.'
RCNORPL DC F'16'
DS ØD
SPACES DC Øocl1' '
* BLDDLST
LBLDLST DS ØF LIST OF MEMBER NAMES FOR BLDDL
DC H'1' NUMBER OF ENTRIES
DC  H'34'       NUMBER OF BYTES PER ENTRY
DC  CL8'MEMBERA' NAME OF MEMBER
DS  CL3        TTR OF FIRST RECORD (CREATED BY BLDL)
DS  X          K BYTE, CONCATENATION NUMBER
DS  X          Z BYTE, LOCATION CODE
DS  X          C BYTE, FLAG AND USER DATA LENGTH
DS  CL100      BUFFER AREA
LBLDLLLEN EQU   *-LBLDLST
* REASON CODES
REA_OPEN DC    F'1'
REA_CLOS DC    F'2'
* REGISTERS
BLDLREG EQU   6
WORKREG EQU   7
DCBREG EQU   8
COMPTR EQU   9
*                      LTORG
                      YREGS
* API FOR CALLING PROGRAMS
API    DSECT
COMMA_ID DS CL8
RET_CODE DS F
REA_CODE DS F
DDD_NAME DS CL8
MEM_NAME DS CL8
LIB_NAME DS CL44
CONCAT_N DS H
AMODEX DS B
ELAPS_TI DS PL8
RESERVED DS CL9
RET_MESS DS CL8Ø
EYE_CATCH DS CL8Ø
API_LENCH EQU *-API
* END API
RPLFOUND EQU   X'FF'
                      PRINT ON,GEN
DCBD  DEVD=DA,DSORG=PO
IKJTCB LIST=YES
IEFTIOT1
IHAPSA
IEZDEB LIST=YES
JFCB     DSECT
IEFJFCBN LIST=YES
IHAPDS IHAPDS DSECT=YES
END EPGAI2

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Using the CEMT interface

In *CICS Update*, June 1999, there was an article entitled *A pattern matching algorithm*. This gave an algorithm for replacing the CEMT interface by the SP command SET to allow new copies out of batch, using the EXCI interface. The reason for this was because the CEMT interface was apparently revoked by IBM with the introduction of EXCI. However, the CEMT interface that I know, DFHEMTA, still works under CICS Version 4 Release 1.

In circumstances when you want to use EXCI, rather than modifiers like `'/f ctapct01,cemt i ta'` against CICS, you can avoid the use of this algorithm if you work with DFHEMTA. An advantage of this is that you have the flexibility of CEMT without any of the effort of programming. A disadvantage is that the interface is only fully documented in Version 2 Release 1 manuals. However, because most of us work with soft copies this isn’t such a disadvantage.

Another possible disadvantage is that in all the manuals (including Version 2 Release 1), where the interface is mentioned, they suggest no longer using DFHEMTA and replacing this interface with programs that use SP commands for all the inquire/set business. But it still works…

This article gives an example program. It’s really simple – no checks are done, and you should add functionality as you want. It does nothing more than receive the parameters, which have to be the same as the corresponding CEMT command, GETMAINs communication areas for the interface, and stores those addresses in a COMMAREA that is passed to the interface DFHEMTA.

The program can also be invoked directly under CICS. You can use the PCT definition of CEMT as a model for your own user transaction, which points to your program using the DFHEMTA interface. The only difference is that the example program (and DFHEMTA) supports full 31-bit addressing, so you can change ‘Taskdataloc’ to ‘ANY’ instead of ‘BELOW’. You will find more information in the listing.
IDENTIFICATION DIVISION.
PROGRAM-ID. CEMTINTF.
DATE-WRITTEN. JUNE 1999.
DATE-Compiled.

* SAMPLE PROGRAM, WHICH SHOWS THE USAGE OF THE CEMT INTERFACE *
* PROGRAM DFHEMTA. A DETAILED DESCRIPTION OF THIS INTERFACE    *
* IS AVAILABLE IN THE 'CICS CUSTOMIZATION' MANUAL OF V2R1.     *
* THIS INTERFACE IS STILL SUPPORTED IN V4R1, BUT NOTE THAT.     *
* IN V4R1 MANUALS, THEY RECOMMEND USING EXEC CICS INQUIRE/SET *
* INSTEAD OF THE CEMT INTERFACE.                              *
* IT'S A SIMPLE EXAMPLE. NO CHECKS ARE DONE. THE PROGRAM       *
* CAN BE INVOKED FROM EITHER A TERMINAL OR VIA CONSOLE. IF IT  *
* IS INVOKED FROM A CONSOLE, THE OUTPUT IS DISPLAYED INTO THE *
* JOBLOG OF THE CICS. ENTERED FROM A TERMINAL, YOU GET THE      *
* NORMAL CEMT DISPLAY, DEPENDING ON THE COMMAND ENTERED. IT IS *
* ALSO POSSIBLE TO SUPPRESS THIS DISPLAY, BE AWARE THAT THE   *
* FIELD WITH THE MESSAGES OF THE EXECUTED CEMT COMMAND IS      *
* LARGE ENOUGH SO THAT THE MESSAGE DOESN'T GET TRUNCATED.      *

ENVIRONMENT DIVISION.
DATA DIVISION.

WORKING-STORAGE SECTION.

* WORK FIELDS

Ø1 FILLER.

* INPUT FIELD, FILLED BY THE RECEIVE OF THE PARAMETERS

Ø5 CONS-INPUT.
  1Ø TRAN-NAME PIC X(4).
  1Ø FILLER PIC X(96).

* LENGTH OF THE RECEIVED PARMS

Ø5 CONS-INPUT-FLENGTH PIC S9(5) COMP.

* POINTERS TO THE PARMS, WHICH ARE PASSED TO THE INTERFACE

Ø5 CEMT-PARM.
  1Ø COMMAND-AREA-PTR USAGE IS POINTER.
  1Ø COMMAND-LENGTH-PTR USAGE IS POINTER.
  1Ø OUTPUT-DISPLAY-PTR USAGE IS POINTER.
  1Ø OUTPUT-ADDR-PTR USAGE IS POINTER.
  1Ø OUTPUT-MAXLENGTH-PTR USAGE IS POINTER.

LINKAGE SECTION.
* * FIELDS WITH THE PARAMETERS FOR THE INTERFACE, GETMAINED BY
* THIS PROGRAM
*
Ø1 L-COMMAND-AREA   PIC X(100).
Ø1 L-COMMAND-LENGTH  PIC S9(4) COMP.
Ø1 L-OUTPUT-DISPLAY  PIC X.
Ø1 L-OUTPUT-ADDR     PIC X(133).
Ø1 L-OUTPUT-MAXLENGTH PIC S9(4) COMP.
*
PROCEDURE DIVISION.
*
* SET THE LENGTH FIELD TO THE MAXIMUM ALLOWED LENGTH, CODE
* WHATEVER YOU WANT TO AVOID AN ABEND IF MORE IS PASSED
*
MOVE +100 TO CONS-INPUT-FLENGTH
*
* RECEIVE THE COMMAND, WHICH IS PASSED TO THIS PROGRAM
*
EXEC CICS RECEIVE INTO(CONS-INPUT)
   FLENGTH(CONS-INPUT-FLENGTH)
END-EXEC
*
* IF NOTHING OTHER THAN THE INVOKED TRANSACTION NAME IS RECEIVED,
* JUST RETURN TO CICS
*
IF CONS-INPUT-FLENGTH < +6 THEN
   EXEC CICS RETURN END-EXEC
END-IF
*
* GETMAIN ALL REQUIRED FIELDS FOR THE CEMT INTERFACE, STORE
* THE POINTERS OF THIS FIELD IN THE STRUCTURE, WHICH IS
* PASSED TO THE INTERFACE
*
EXEC CICS GETMAIN
   SET(COMMAND-AREA-PTR)
   FLENGTH(CONS-INPUT-FLENGTH)
END-EXEC
EXEC CICS GETMAIN
   SET(COMMAND-LENGTH-PTR)
   FLENGTH(2)
END-EXEC
EXEC CICS GETMAIN
   SET(OUTPUT-DISPLAY-PTR)
   FLENGTH(1)
END-EXEC
EXEC CICS GETMAIN
   SET(OUTPUT-ADDR-PTR)
   FLENGTH(133)
END-EXEC
EXEC CICS GETMAIN
   SET(OUTPUT-MAXLENGTH-PTR)
   FLENGTH(2)
END-EXEC

* * NOW ADDRESS THOSE FIELDS THAT ARE USED FOR THE CEMT INTERFACE *
*
SET ADDRESS OF L-COMMAND-AREA      TO COMMAND-AREA-PTR
SET ADDRESS OF L-COMMAND-LENGTH    TO COMMAND-LENGTH-PTR
SET ADDRESS OF L-OUTPUT-DISPLAY    TO OUTPUT-DISPLAY-PTR
SET ADDRESS OF L-OUTPUT-ADDR       TO OUTPUT-ADDR-PTR
SET ADDRESS OF L-OUTPUT-MAXLENGTH  TO OUTPUT-MAXLENGTH-PTR
*
* NOW FILL THOSE FIELDS. THE NAME OF THE INVOKING TRANSACTION *
* IS CHANGED TO 'CEMT'.
*
MOVE 'CEMT'            TO TRAN-NAME
*
* MOVE THE RECEIVED COMMAND TO THE PARM FIELD AND SET THE LENGTH *
* FIELD.
*
MOVE CONS-INPUT(1:CONS-INPUT-FLENGTH) TO
   L-COMMAND-AREA(1:CONS-INPUT-FLENGTH)
MOVE CONS-INPUT-FLENGTH TO L-COMMAND-LENGTH
*
* TELL THE INTERFACE TO SHOW OUTPUT FROM THE COMMAND ON TERMINAL/
* CONSOLE. IF X'ØØ' IS USED INSTEAD OF X'8Ø', THE CEMT DISPLAY IS
* SUPPRESSED. IF YOU WANT TO SUPPRESS THE DISPLAY AND TO USE THE
* OUTPUT FIELD, CUSTOMIZE THE MAXLENGTH TO YOUR REQUIREMENTS (AND
* DON'T FORGET TO CHANGE THE GETMAIN !!!)
*
MOVE X'8Ø'             TO L-OUTPUT-DISPLAY
MOVE +133              TO L-OUTPUT-MAXLENGTH
*
* NOW INVOKE THE INTERFACE
*
EXEC CICS LINK PROGRAM('DFHEMTA')
   COMMAREA(CEMT-PARM)
END-EXEC
*
* PASS CONTROL BACK TO CICS, CLEAN-UP OF THE GETMAINED STORAGE *
* IS DONE BY CICS...
*
EXEC CICS RETURN END-EXEC.

Guido Rechsteiner
System Programmer
SIS SegaInterSettle AG (Switzerland) © Xephon 1999
# January 1995 – November 1999 index

Items below are references to articles that have appeared in *CICS Update* since Issue 110, January 1995. References show the issue number followed by the page number(s). Back-issues of *CICS Update* are available back to issue 110 (January 1995). See page 2 for details.

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OptiSystems has announced Version 4.1 of its Energizer for CICS performance management tool for managing CICS environments in real-time. New features include full support of CICS Transaction Server 1.3, support for a single Report File that will be utilized by all CICS regions within an MVS image, and enhanced MAXTASKS and program compression management functions.

The new reporting address space feature, with a single report file, lowers file maintenance requirements and provides increased CPU savings.

For further information contact:
OptiSystems, Suite 404, 1100 Fifth Avenue South, Naples, FL 34102, USA.
Tel: (941) 263 3885.

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Software AG has announced its EntireX CICS 3270 Bridge, which integrates mainframe-based CICS applications with Windows applications.

Part of the EntireX middleware suite for distributed applications and software components, the new Version uses the existing 3270 Bridge within CICS Transaction Server to integrate CICS applications that aren’t client/server-capable, without the need for modified program code.

The available interfaces enable other applications to use the functions in these applications in the form of components. The DCOM interface component, included with the product, simplifies the integration of CICS applications with Windows.

For further information contact:
Software AG (UK), Charter Court, 74/78 Victoria Street, St Albans, Herts, AL1 3XH, UK.
Tel: (01727) 844 455.
Software AG of North America, 11190 Sunrise Valley Drive, Reston, VA 22091, USA.
Tel: (703) 860 5050.

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Cisco has announced Version 2.0 of its Transaction Connection (CTRC), providing TCP/IP end-users and servers with access to CICS transaction applications using SNA and/or TCP/IP. Part of Cisco IOS software that resides on Cisco 7500 and 7200 class routers, CTRC makes use of network services including security, load-balancing, redundancy, and quality of service. Because it runs on routers, it’s designed to be faster and more scalable than stand-alone gateways or proprietary host software. Version 2.0 routes the Inter-System Communications (ISC) data access protocol used for CICS transaction applications.

For further information contact:
Cisco, 5305 Gulf Drive, Suite 1, New Port Richey, FL 34652, USA.
Tel: (813) 817 0131.