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CICS Update

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Editor

Trevor Eddolls

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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

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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:

```
   FIELD           OFFSET   LENGTH

   SYSID             Ø        4
   APPLID            4        8
   REGION NAME      12        8
   DESCRIPTION      2Ø       32

(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.

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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    CL16Ø
LEN      DS    ØH
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'Ø'             SET SWITCHES
         MVI   IMMEDSW,C'Ø'              TO OFF.
         MVC   REGNAPPL(8),=CL8' '
         MVC   APPLID(8),=CL8' '         CLEAR
         MVC   TRANID(4),=CL4' '           AREAS.
         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.
*
```

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```
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   *
         MVC   SYSID(4),Ø(R5)         SAVE: SYSID
         MVC   REGNAPPL(8),4(R5)             APPLID
         MVC   CICSNM(8),12(R5)              REGION NAME
         MVC   REGDISC(32),2Ø(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    *
         LA    R8,VER2TAB               IS THE REGION A
LOOPV2   CLC   CICSNAME(8),Ø(R8)          VERSION 2
```


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```
         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(16Ø),=CL16Ø' '              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),SHUMSG1I     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
```

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```
         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),CICSNAME
         MVC   LEN,=H'43'
         B     WRTMSG
*
```


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```
CICSERR  EQU    *                              TERMINAL NOT CONNECTED
         MVC    SCREEN(42),CICSERRM              TO CICS BEING
         MVC    SCREEN+34(8),CICSNAME            SHUT DOWN
MVCNAME  MVC    CICSERR1+15(8),CICSNM           INCLUDE THIS REGION
         MVC    SCREEN+5Ø(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),CICSNAME
         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         '
CICSERR1 DC     C'(YOU ARE ON =>         )'
SHUMSG1N DC     C'SHUTTING DOWN NORMALLY:   '
SHUMSG1I DC     C'SHUTTING DOWN IMMEDIATELY:'
SHUMSG2  DC     C'DO YOU WANT TO CONTINUE? (Y/N)'
CANSHUT  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 **
```

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```
         DC    CL8'CICSPV2'             ** WILL REMAIN VERSION 2
*
         DC    CL8'VER2TAB'     ** END OF TABLE **
        ++INCLUDE REGNTAB       INCLUDE REGION DESCRIPTION TABLE
         LTORG
         END
```

CHSUAOR

```
         TITLE ' CHSUAOR - APPLICATION NORMAL SHUTDOWN'
DFHEISTG DSECT
*
CSHUAOR  CSECT
         EXEC  CICS PERFORM SHUTDOWN
         EXEC  CICS RETURN
*
         LTORG
         END
```

CHSIAOR

```
         TITLE ' CHSIAOR - APPLICATION IMMEDIATE SHUTDOWN'
DFHEISTG DSECT
*
CSHIAOR  CSECT
         EXEC  CICS PERFORM SHUTDOWN IMMEDIATE
         EXEC  CICS RETURN
*
         LTORG
         END
```

CCON

```
         TITLE ' CCON - ISSUE RETURN - CHECK CONNECTION'
DFHEISTG DSECT
*
CCON     CSECT
         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.
```

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```
*================================================================*
 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.
               2Ø  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.
```


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```
          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 '*===================== EXCI PGMCIC
-         'S  Batch Client Program =====================*'.
      05  MSG02  PIC X(128) VALUE '*
-         '                                              *'.
      05  MSG03  PIC X(128) VALUE '*  EXEC Level Processor.
-         '                                              *'.
      05  MSG04  PIC X(128) VALUE '*    Setting up the EXEC level cal
-         'l.                                            *'.
      05  MSG07  PIC X(128) VALUE SPACES.
      05  MSG09  PIC X(128) VALUE '*==================== End of EXCI S
-         'ample PGMBATCH  Batch Client Program ==========*'.
    *================================================================*
     PROCEDURE DIVISION.
    *================================================================*
         OPEN OUTPUT PRINTER.
```

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```
     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)
                    SYNCONRETURN
     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 = 2Ø3
             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.
```

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PGMCICS

```
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.
      *-------------------------------------------------------------*
       Ø1  W-RECEIVE.
           Ø5 FILLER                     PIC X(Ø4)  VALUE SPACES.
           Ø5 W-TYPE-OPER                PIC X(Ø3)  VALUE SPACES.
           Ø5 FILLER                     PIC X(Ø1)  VALUE SPACES.
           Ø5 W-RESOURCE                 PIC X(Ø2)  VALUE SPACES.
           Ø5 W-APAR                     PIC X(Ø1)  VALUE SPACES.
           Ø5 W-NOME                     PIC X(53)  VALUE SPACES.
           Ø5 W-NOMEXX REDEFINES W-NOME  PIC X(Ø1)  OCCURS 53.
           Ø5 FILLER                     PIC X(Ø6)  VALUE SPACES.
       Ø1 FILLER               PIC X(8) VALUE '-TABELA-'.
       Ø1 WFITAB.
          Ø2 WFI1.
             Ø3 FILLER         PIC X(8) VALUE SPACES.
          Ø2 WFI2.
             Ø3 FILLER         PIC X(8) VALUE SPACES.
          Ø2 WFI3.
             Ø3 FILLER         PIC X(8) VALUE SPACES.
          Ø2 WFI4.
             Ø3 FILLER         PIC X(8) VALUE SPACES.
          Ø2 WFI5.
             Ø3 FILLER         PIC X(8) VALUE SPACES.
          Ø2 WFI6.
             Ø3 FILLER         PIC X(8) VALUE SPACES.
       Ø1 WFITABR REDEFINES WFITAB.
          Ø2 WFITBF  OCCURS 6 TIMES.
             1Ø  WFIT       PIC X(Ø1) OCCURS 8.
       Ø1  W-INFFI.
           Ø5  FILLER  OCCURS 6.
               1Ø  W-NLFI       PIC X(Ø1)     VALUE 'Ø'.
               1Ø  W-CODFI      PIC X(Ø2)     VALUE 'ØØ'.
       Ø1  W-INFFILE REDEFINES W-INFFI.
           Ø5  FILLER           PIC X(18).
```


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```
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('.
```

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```
          10 W-FILE-REM                PIC X(Ø8)  VALUE SPACES.
          10 FILLER                    PIC X(52)  VALUE SPACES.
       Ø5 WCOMMR REDEFINES WCOMMREM.
          10 FILLER                    PIC X(Ø1).
          10 W-CODREM                  PIC X(Ø2).
          10 W-CODREM-N REDEFINES W-CODREM  PIC 9(Ø2).
          10 FILLER                    PIC X(68).
    Ø1  W-SPOOL.
       Ø5 W-NODE                    PIC X(Ø8) VALUE 'NODENAME'.
       Ø5 W-USERID                  PIC X(Ø8) VALUE 'LOCAL'.
       Ø5 W-CLASS                   PIC X(Ø1) VALUE 'A'.
       Ø5 W-TOKEN                   PIC X(Ø8) VALUE LOW-VALUE.
       Ø5 W-FROM.
          10 W-FROMØ1                PIC X(Ø9) VALUE SPACE.
          10 FILLER                  PIC X(14) VALUE
         '   EIBRESP2 = '.
          10 W-FROMØ2                PIC X(Ø2) VALUE SPACE.
          10 FILLER                  PIC X(49) VALUE SPACES.
          10 W-REMOTE                PIC X(Ø6) VALUE SPACES.
    Ø1  W-WORKVAR.
       Ø5 NFIL                      PIC  9(1)  VALUE ZERO.
       Ø5 IND                       PIC  9(2)  VALUE ZERO.
       Ø5 IND1                      PIC  9(1)  VALUE ZERO.
       Ø5 W-SYSID                   PIC X(Ø4)  VALUE SPACES.
       Ø5 W-WTO-OPE.
          1Ø  FILLER                PIC X(41)  VALUE
       'EXCI BATCH/CICS - PROBLEM  TO OPEN FICH: '.
          1Ø  W-OPE-FILE            PIC X(Ø8)  VALUE SPACES.
          1Ø  FILLER                PIC X(14)  VALUE
       '     EIBRESP2='.
          1Ø  W-OPE-RESP            PIC 9(Ø2)  VALUE ZEROS.
       Ø5 W-WTO-CLO.
          1Ø  FILLER                PIC X(42)  VALUE
       'EXCI BATCH/CICS - PROBLEM  TO CLOSE FICH: '.
          1Ø  W-CLO-FILE            PIC X(Ø8)  VALUE SPACES.
          1Ø  FILLER                PIC X(14)  VALUE
       '     EIBRESP2='.
          1Ø  W-CLO-RESP            PIC 9(Ø2)  VALUE ZEROS.
       Ø5 W-NOMEY                   PIC X(Ø8)  VALUE SPACES.
       Ø5 W-NOMEYY REDEFINES W-NOMEY PIC X(Ø1)  OCCURS 8.
       Ø5 W-MSGFIM                  PIC X(36)  VALUE
       '=>> TRANSACTION END WITH RETCOD '.
       Ø5 W-MSGRC                   PIC X(25)  VALUE SPACE.
       Ø5 W-COUNTER                 PIC 9(Ø4)  VALUE ZEROS.
       Ø5 W-RETCOD                  PIC X(Ø8)  VALUE ZEROS.
       Ø5 WR-RETCOD REDEFINES W-RETCOD.
          1Ø  FILLER                PIC 9(Ø6).
          1Ø  CODRET                PIC 9(Ø2).
       Ø5 W-GENERIC                   PIC X(Ø1) VALUE 'N'.
          88 W-ASTERISK           VALUE 'S'.
```


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```
        88 WOUT-ASTERISK        VALUE 'N'.
     Ø5 W-RESP                     PIC S9(Ø8) COMP VALUE ZERO.
     Ø5 W-RESP2                    PIC S9(Ø8) COMP VALUE ZERO.
     Ø5 W-OPENSTATUS               PIC S9(Ø8) COMP VALUE ZERO.
     Ø5 W-ENABLESTATUS             PIC S9(Ø8) COMP VALUE ZERO.
*-------------------------------------------------------------------*
 COPY DFHAID.
*-------------------------------------------------------------------*
 LINKAGE SECTION.
 Ø1  DFHCOMMAREA.
     Ø5  COD-RETURN                PIC X(18).
     Ø5  FILE-TAB                  PIC X(48).
     Ø5  FILLER                    PIC X(Ø5).
 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
```

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```
            MOVE IND1 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 IND1
      ELSE
          IF W-NOMEXX(IND) = '*'
              MOVE IND1 TO W-NLFI(NFIL)
              MOVE 'S' TO W-GENERIC
          ELSE
              IF W-NOMEXX(IND) = ')'
                 IF W-ASTERISK
                     MOVE IND1 TO W-NLFI(NFIL)
                     MOVE 'N' TO W-GENERIC
                  ELSE
                     MOVE 8 TO W-NLFI(NFIL)
                  END-IF
              ELSE
                  ADD 1 TO IND1
                  MOVE W-NOMEXX(IND) TO WFIT(NFIL, IND1)
              END-IF
          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
```


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```
            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.
```

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```
     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
```


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```
      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.
*-----------------*
```

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```
     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
```


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```
            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.
*****************************************************************
*-----------------*
 SET-OPEN-FILE.
*-----------------*
      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.
```

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```
*****************************************************************
 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.
```


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```
           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.
      *-------------*
           MOVE '99ENTROU E SAIU COM ERRO' TO DFHCOMMAREA.
           EXEC CICS RETURN END-EXEC.
      *-------------*
       RETURN-EXIT.
      *-------------*
           EXEC CICS RETURN END-EXEC.
```

JCL

```
//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.V1R5M0.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=*
//SYSMDUMP  DD  SYSOUT=*
//CEEDUMP   DD  SYSOUT=*
//SYSUDUMP  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 PGAIEXIT. 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 partitionsets. 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!

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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)
```

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```
GROUP(PGAIØ1)          PROGRAM(EPGAI2)
DESCRIPTION(READ PDS DIRECTORY ENTRY)
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/Ø4/21 11:45:32 INSTALL RESOURCE(SCSPØ7 ) TYPE(PROGRAM)
       TEMPLATE(DFHPGAPG) CONCATENATION(     5) DATALOCATION(ANY   )
       LIBRARY(CICS.SUP4LE.ACSCS.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

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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/OS390                 *
*                                                                    *
* 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   0CL240
*
```

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```
MLINE1    DS   ØCL8Ø
          DS   CL12
ML1DATE   DS   CL1Ø
          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'
```


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```
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   ØF
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_LENGH EQU  *-EPGAI2API
* END API
*********************************************************************
EPGAI1   CSECT
EPGAI1   AMODE 31
EPGAI1   RMODE ANY
         DFHREGS
         OC    EIBCALEN,EIBCALEN       /* IF THERE IS NO COMMAREA,  */
         BZ    RETURNØ                 /* 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       */
CPSM     CLC   =C'EYU',PGAC_PROGRAM    /* CPSM PROGRAMS?            */
         BNE   OMEG                    /* NO. TEST OMEGAMON.        */
         B     CICSKEY                 /* YES. SET EXECKEX 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.         */
```

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```
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_LENGH-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_LENGH)).   /*             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                 /* LING 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 OK*/ +
                                        /*      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'4020202020202120'          NUM          */
         ED    ML2CONCAT,NUMBER         /*                 BER       */
         TM    AMODEX,B'00000010'       /* 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    0H                      /*      ──────────────       */
         MVI   PGAC_RETURN_CODE,PGAC_RETURN_OK                      */
```


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```
         EXEC  CICS ASKTIME.           /*                          */ +
               ABSTIME(DABSTIME).      /*     GET CURRENT TIME     */ +
               NOHANDLE.               /*                          */
         EXEC  CICS FORMATTIME.        /*                          */ +
               ABSTIME(DABSTIME).      /*     AND FORMAT IT FOR    */ +
               YYYYMMDD(ML1DATE).      /*                          */ +
               DATESEP('/').           /*                          */ +
               TIME(ML1TIME).          /*     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    CL4Ø'EPGAI1-Ø1 I YYYY/MM/DD HH:MM:SS INSTALL '
         DC    CL4Ø'RESOURCE(........) TYPE(........)       '
         DC    CL4Ø'        TEMPLATE(........) CONCATENATION'
         DC    CL4Ø'(........) DATALOCATION(........)       '
         DC    CL4Ø'        LIBRARY(........................'
         DC    CL4Ø'.....................)                  '
         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           *
*                                                               *
```

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```
* 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    ØF                     /* ALIGN FULLWORD            */
         DS    CL8                    /* BLDL PREFIX               */
BLDLLIST DS    CL(LBLDLLEN)           /* BLDL PARAMETER LIST       */
EPGAI2   DFHEIENT CODEREG=1Ø,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=Ø1 ***'        /*                           */
EYEC_LEN EQU   *-EYECATCH             /*                           */
BEGIN    EXEC  CICS ASKTIME.          /* GET THE ...               */ +
               ABSTIME(XABSTIME).     /* START ...                 */ +
               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    ØH                     /*                           */
         LH    WORKREG,=Y(API_LENGH)  /*                           */
         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    ØH                     /* IDENTIFY RIGHT COMMAREA   */
         L     COMPTR,DFHEICAP        /*                           */
         USING API,COMPTR             /* ADDRESSABILITY ...        */
         CLC   COMMA_ID,COMMAREA_ID   /*                           */
         BE    COMMA_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 INVL.ID */
         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'ØØØ1',AMODEX  /* CLEAR AMODEX              */
         MVC   LIB_NAME,SPACES         /* CLEAR LIBRARY DSN         */
         MVC   RET_MESS,=CL8Ø'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   TIOEDDNM,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                   /*                          */
```

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```
         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    BLDLREG,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    BLDLREG,4(BLDLREG)     /* POINT TO THE FIRST ENTRY  */
         USING PDS2,BLDLREG           /* PDS2 IS LABEL FROM IHAPDS */
         MVC   AMODEX,PDS2FTB2        /* MOVE AMODE/RMODE INFORMA. */
         MVC   CONCAT_N+1(1),PDS2CNCT  /* 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   TIOEDDNM,DDD_NAME       /*                            */
         BNE   TIOTNEXT                /*                            */
         MVI   RPLFLAG,X'FF'           /* SET DCBL-FOUND TO TRUE     */
TIOTCONC DS    ØH                      /*                            */
         CH    5,=H'Ø'                 /*                            */
         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'ØØØØØØØØ',TIOEDDNM /*                            */
         BE    TIOTEND                 /* NO MORE ENTRIES            */
         CLI   TIOELNGH,X'ØØ'          /*                            */
         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
*********************************************************************
*        CONSATNTS, DSECTS ETC.                                     *
*********************************************************************
COMMAREA_ID    DC CL8'*PGMAIS*'
NO_COMMAREA    DC CL8Ø'EPGA2-Ø1 E NO COMMAREA SPECIFIED FOR PROGRAM AUT+
               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    8ØCL1' '
* BLDLLIST
LBLDLST  DS    ØF           LIST OF MEMBER NAMES FOR BLDL
         DC    H'1'         NUMBER OF ENTRIES
```

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```
         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
LBLDLLEN 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 CL80
EYE_CATCH DS CL80
API_LENGH 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.

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CEMTINTF

```
 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 PARMETERS
*
      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.
```


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```
*
* FIELDS WITH THE PARAMETERS FOR THE INTERFACE, GETMAINED BY
* THIS PROGRAM
*
 Ø1  L-COMMAND-AREA         PIC X(1ØØ).
 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 +1ØØ 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)
```

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```
      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.
```

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January 1995 – November 1999 index

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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.
URL: http://www.optisystems.com.

* * *

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:
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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:
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