Session – 8

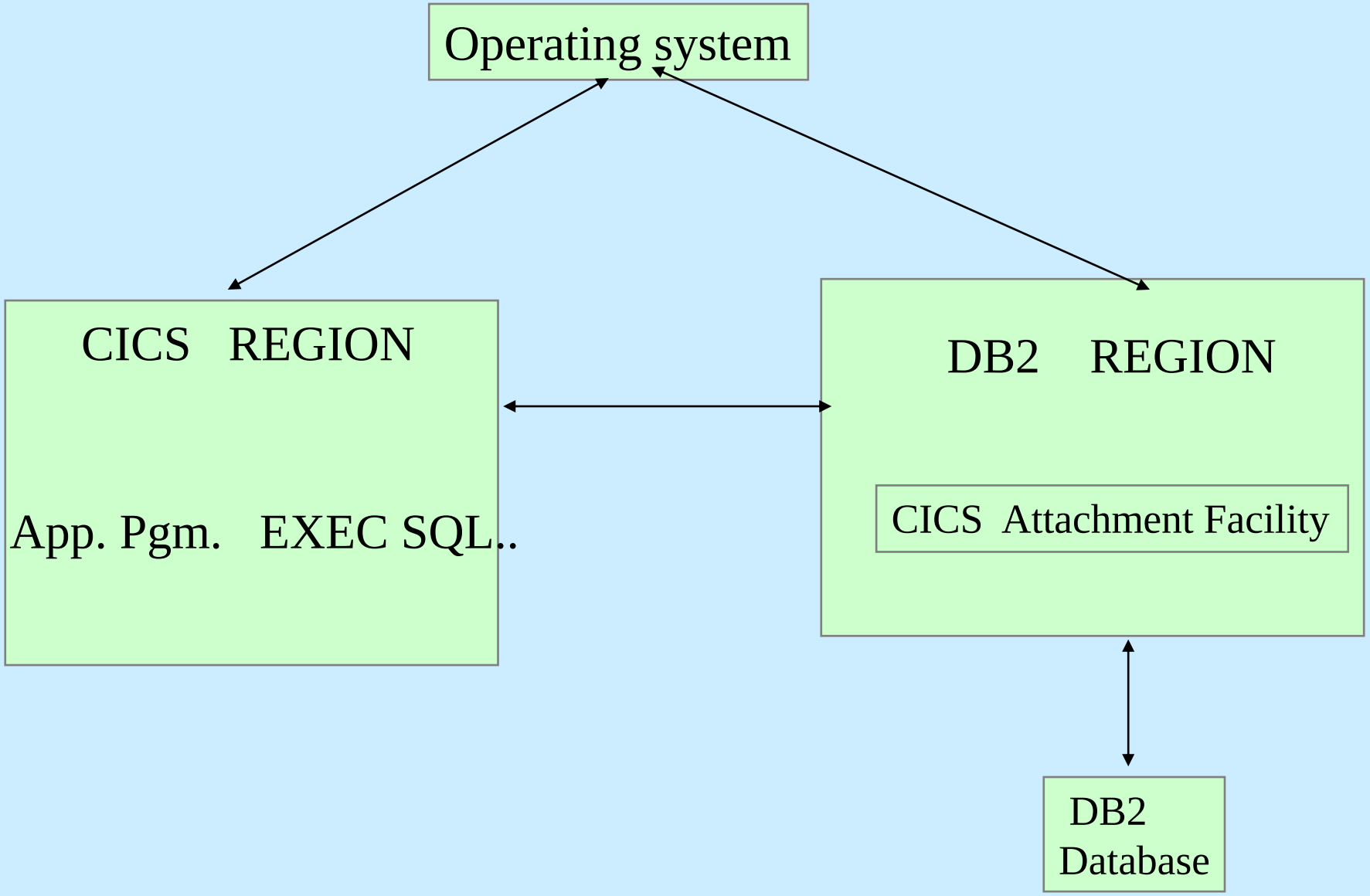
Communication with Database

CICS – DB2

- CICS provides interface to DB2.
- DB2 requires “CICS Attachment Facility” to connect itself to CICS
- CICS programs can issue commands for SQL services in order to access the DB2 database.

```
EXEC SQL function
    [options]
END-EXEC
```

DB2 Database access by CICS



RCT Entry

- The CICS-to-DB2 connection is defined by creating and assembling the resource control table (RCT)
- The information in RCT is used to control the interactions between CICS & DB2 resources
- DB2 attachment facility provides a macro (DSNCRCT) to generate the RCT.
- The RCT must be link-edited into a library that is accessible to MVS

DB2 – Precompiler

Source Program (EXEC SQL...
| EXEC CICS...)
DB2 Precompiler
|
CICS command translator
|
Compile By COBOL
|
Linkedit by Linkage editor
|
Load Module

Recap

- How is DB2 Sql statements included in CICS program?
- What are host variables?
- What is RCT?
- How is compilation done for CICS with DB2 program?

Lab Session

CICS With DB2 – Compilation JCL

```
000001 //MAPLE41A JOB ,,NOTIFY=&SYSUID,TIME=(,2)
000002 // JCLLIB  ORDER=(MAPLE41.CICSDB2.PDS)
000003 //STEP01     EXEC CICSDB,MEM=ADDSQL,WSPC=500
000004 //TRN.SYSIN DD DISP=SHR,DSN=MAPLE41.CICSDB2.PDS(&MEM)
000005 //PC.DBRMLIB DD DISP=SHR,DSN=MAPLE41.DB2.DBRM(&MEM)
000006 //PC.SYSLIB DD DISP=SHR,DSN=MAPLE41.CICS.DB2(EDCLGEN)
000007 //COB.SYSLIB DD DSN=MAPLE41.SYSMB.PDS(EMPMAP),DISP=SHR
000008 //LKED.SYSLMOD DD DISP=SHR,DSN=CICSTS22.MAPLE.PRGLOAD1(&M
000009 //LKED.SYSIN DD   *
000010   INCLUDE SYSLIB(DSNCLI)
000011   NAME MAPLE41P(R)
000012 /*
```

JCL contd…

```
000014 //BIND    EXEC PGM=IKJEFT01,DYNAMNBR=20,COND=(4,LT)
000015 //STEPLIB DD DISP=SHR,DSN=SYS1.DSN710.SDSNEXIT
000016 //SYSTSPRT DD  SYSOUT=(*)
000017 //SYSTSIN DD  *
000018         DSN SYSTEM(DSN2)
000019         BIND PLAN(MAPLE41P)-
000020         MEMBER(ADDSQL)-
000021         VALIDATE(BIND) -
000022         ISOLATION(CS) -
000023         RELEASE(C) -
000024         EXPLAIN(NO)-
000025         OWNER(MAPLE41)-
000026         LIB('MAPLE41.DB2.DBRM')
000027 /*
000028 //
```

```
000001 MAPLE41 DFHMSD TYPE=MAP,MODE=INOUT,LANG=COBOL,
      X
000002                       STORAGE=AUTO,TIOAPFX=YES
000003 EMAP    DFHMDI SIZE=(24,80),CTRL=(FREEKB,FRSET),
      X
000004                       MAPATTS=(COLOR,HILIGHT),DSATTS=(COLOR,HILIGHT)
000005             DFHMDF POS=(4,25),ATTRB=(ASKIP,PROT,NORM),LENGTH=20,
                X
000006                       INITIAL='EMPLOYEE DETAILS'
000007             DFHMDF POS=(8,10),ATTRB=(ASKIP,NORM),LENGTH=15,
      X
000008                       INITIAL='CODE         :'
000009 CODE    DFHMDF POS=(8,30),ATTRB=(UNPROT,FSET,IC),LENGTH=4,
      X
000010                       INITIAL='----'
000011             DFHMDF POS=(8,35),ATTRB=(PROT,NORM),LENGTH=1,INITIAL=' '
000012             DFHMDF POS=(10,10),ATTRB=(ASKIP,NORM),LENGTH=15,
      X
000013                       INITIAL='NAME         :'
000014 NAME    DFHMDF POS=(10,30),ATTRB=(UNPROT,FSET),LENGTH=20,
      X
000015                       INITIAL='--------------------'
000016             DFHMDF POS=(10,51),ATTRB=(PROT,NORM),LENGTH=1,
      X
000017                       INITIAL=' '
000018             DFHMDF POS=(22,10),ATTRB=(ASKIP,NORM),LENGTH=15,
      X
000019                       INITIAL='MESSAGE     :'
000020 MESS    DFHMDF POS=(22,30),ATTRB=(UNPROT,FSET),LENGTH=30,
```

DCLGEN for the Table

```
000001 ************************************************************
000002 * DCLGEN TABLE(EMP)
000003 *        LIBRARY(MAPLE41.CICS.DB2(EDCLGEN))
000004 *        ACTION(REPLACE)
000005 *        LANGUAGE(COBOL)
000006 *        QUOTE
000007 * ... IS THE DCLGEN COMMAND THAT MADE THE FOLLOWING STAT
       *
000008 ************************************************************
000009     EXEC SQL DECLARE EMP TABLE
000010     ( ECODE                CHAR(4),
000011       ENAME                CHAR(20)
000012     ) END-EXEC.
000013 ************************************************************
000014 * COBOL DECLARATION FOR TABLE EMP
000015 ************************************************************
000016  01  DCLEMP.
000017     10 ECODE            PIC X(4).
000018     10 ENAME            PIC X(20).
000019 ************************************************************
000020 * THE NUMBER OF COLUMNS DESCRIBED BY THIS DECLARATION I
000021 ************************************************************
```

Read data from Map and Insert into Table in Database.

```
000001       IDENTIFICATION DIVISION.
000002       PROGRAM-ID. ADDS.
000003       ENVIRONMENT DIVISION.
000004       DATA DIVISION.
000005       WORKING-STORAGE SECTION.
000006           EXEC SQL INCLUDE SQLCA
000007           END-EXEC.
000008           EXEC SQL
000009               INCLUDE EDCLGEN
000010           END-EXEC.
000011       COPY EMPMAP.
000012       PROCEDURE DIVISION.
000013           MOVE LOW-VALUES TO EMAPI, EMAPO.
000014           EXEC CICS
000015               SEND MAP('EMAP') MAPSET('MAPLE41')
000016           END-EXEC.
000017           EXEC CICS
000018                RECEIVE MAP('EMAP')
MAPSET('MAPLE41')
000019           END-EXEC.
```

```
000020          MOVE CODEI TO ECODE.
000021          MOVE NAMEI TO ENAME.
000022          EXEC SQL
000023              INSERT INTO EMP VALUES(:ECODE, :ENAME)
000024          END-EXEC.
000025          DISPLAY SQLCODE.
000026          IF SQLCODE = 0
000027             MOVE "RECORD ADDED SUCCESSFULLY" TO
MESSO
000028          ELSE
000029             MOVE "RECORD NOT ADDED " TO MESSO
000030             MOVE SQLCODE TO MESSO
000031          END-IF.
000032          EXEC CICS SEND FROM (MESSO)
000033             LENGTH(LENGTH OF MESSO)
000034             ERASE
000035       END-EXEC.
```

Try Yourself!

- Create a table for student details in DB2.
- Write program to receive student details from the user and insert in the table.
- Write programs to update, select and delete particular student referred by student number.
- Write program to list the student details in the table to the user.

Thank You