CICS

Session - I

Objectives

- Computer Application Systems
- Why is CICS Sub-system needed?
- History of CICS
- What is CICS?
- What does CICS do?
- CICS System Components
- Concepts of CICS
- Terminologies in CICS
- CICS Nucleus
- CICS Commands
- Execution of an application program
- Lab Session

Computer Application Systems

- Batch Systems
- Online Systems

Batch & Online : Differences

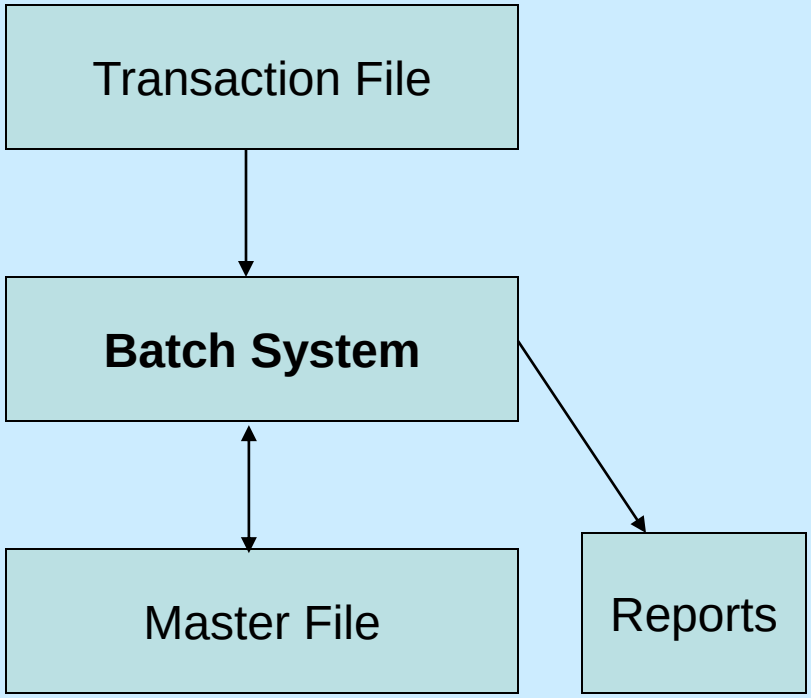
- **BATCH SYSTEM**

1. Input data is prepared and given in sequence (file)
2. Processing sequence is predictable and hence restarting the process in case of failure is easy.
3. Programs and files can't be shared
4. Programs are scheduled through jobs

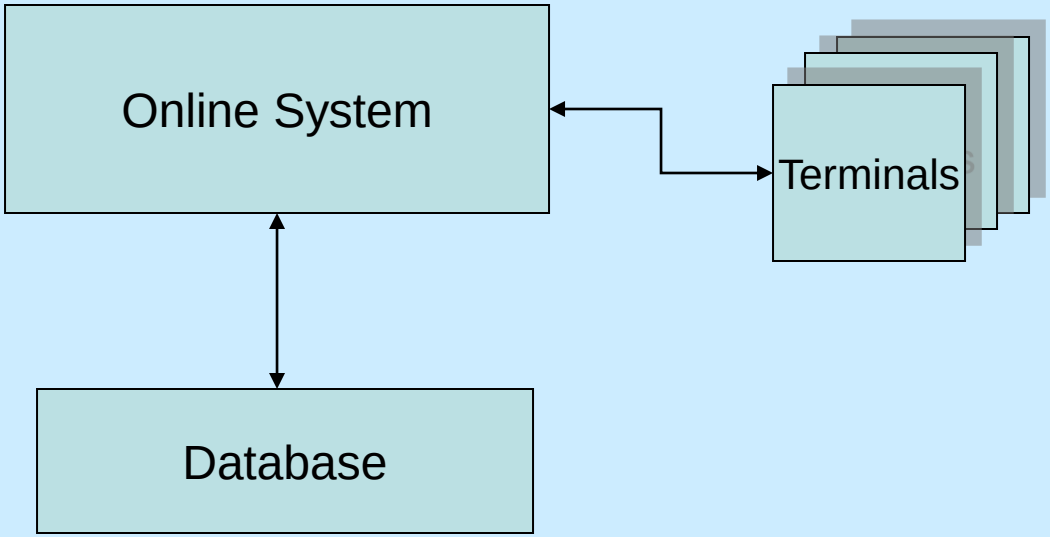
- **ONLINE SYSTEM**

1. Data is entered as needed not in sequence (terminal)
2. Since processing seq. is unpredictable, special recovery/restart proc. is reqd. in case of failure.
3. Programs and files can be shared
4. Transaction can be run at any time

Batch System



Online System



Why is CICS sub system needed?

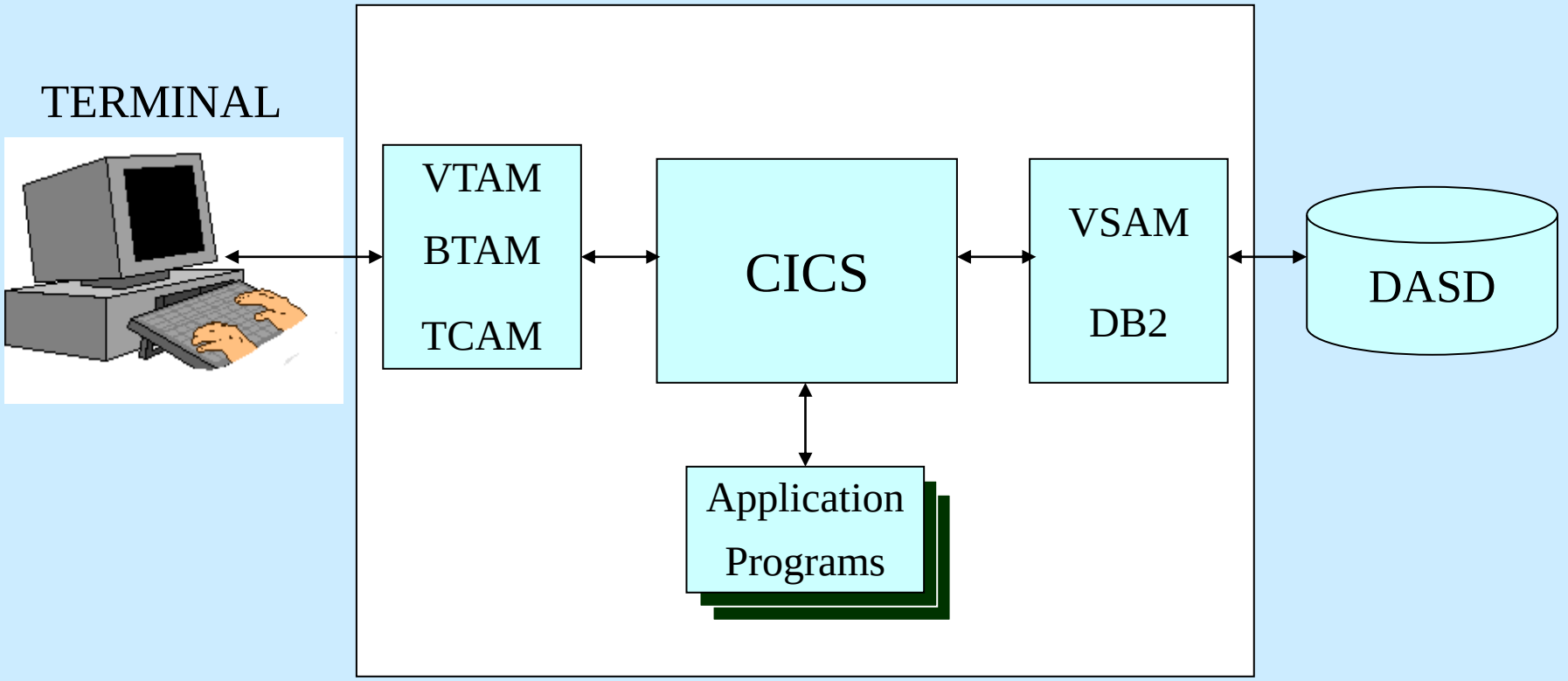
History of CICS

- Introduced by IBM in 1968
- CICS on many platforms
- Introduction of Transaction Server

WHAT IS CICS?

- CUSTOMER INFORMATION CONTROL SYSYTEM

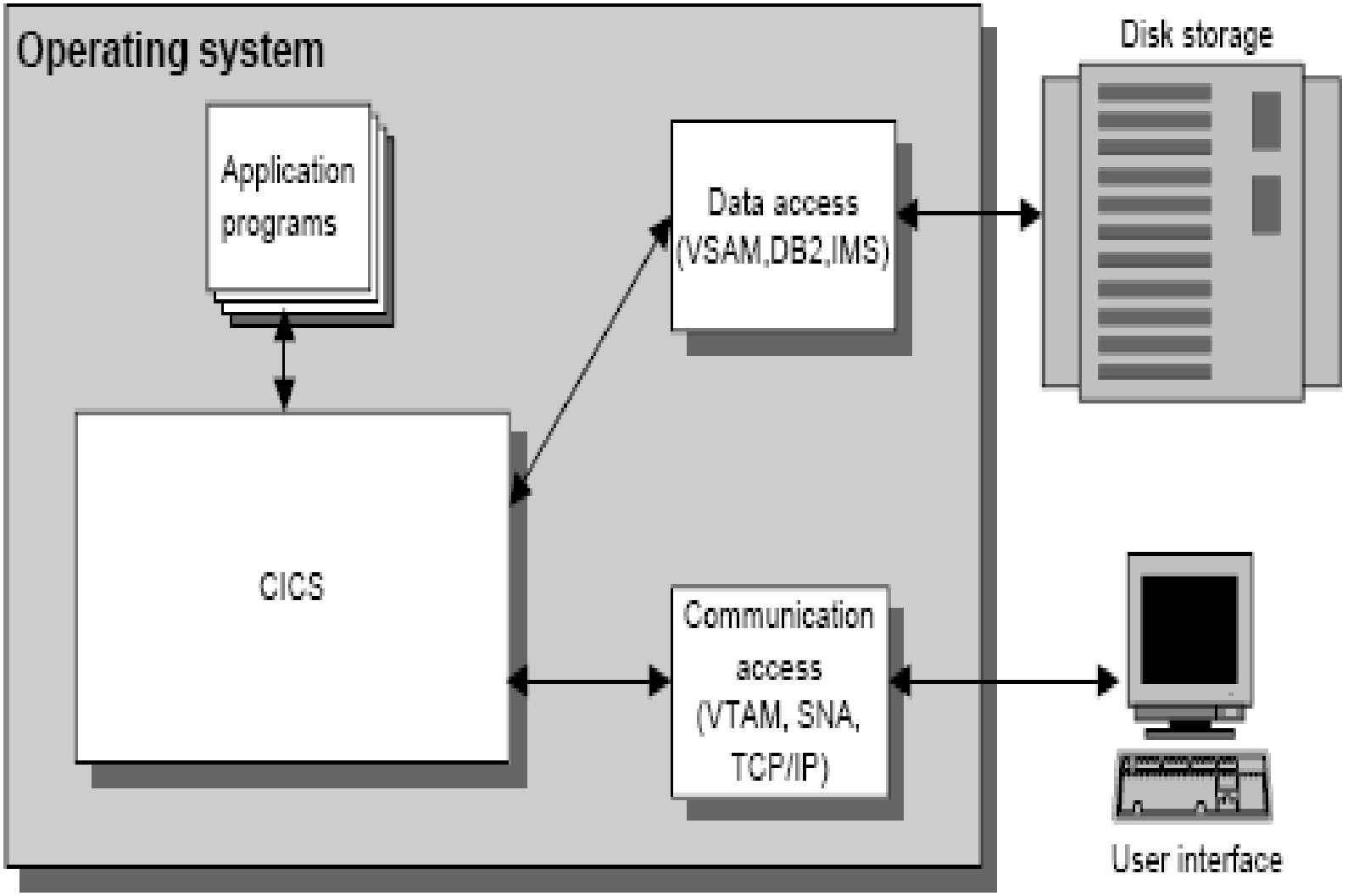
WHAT IS CICS ?


TERMINAL
VTAM
BTAM
TCAM
CICS
VSAM
DB2
DASD
Application
Programs

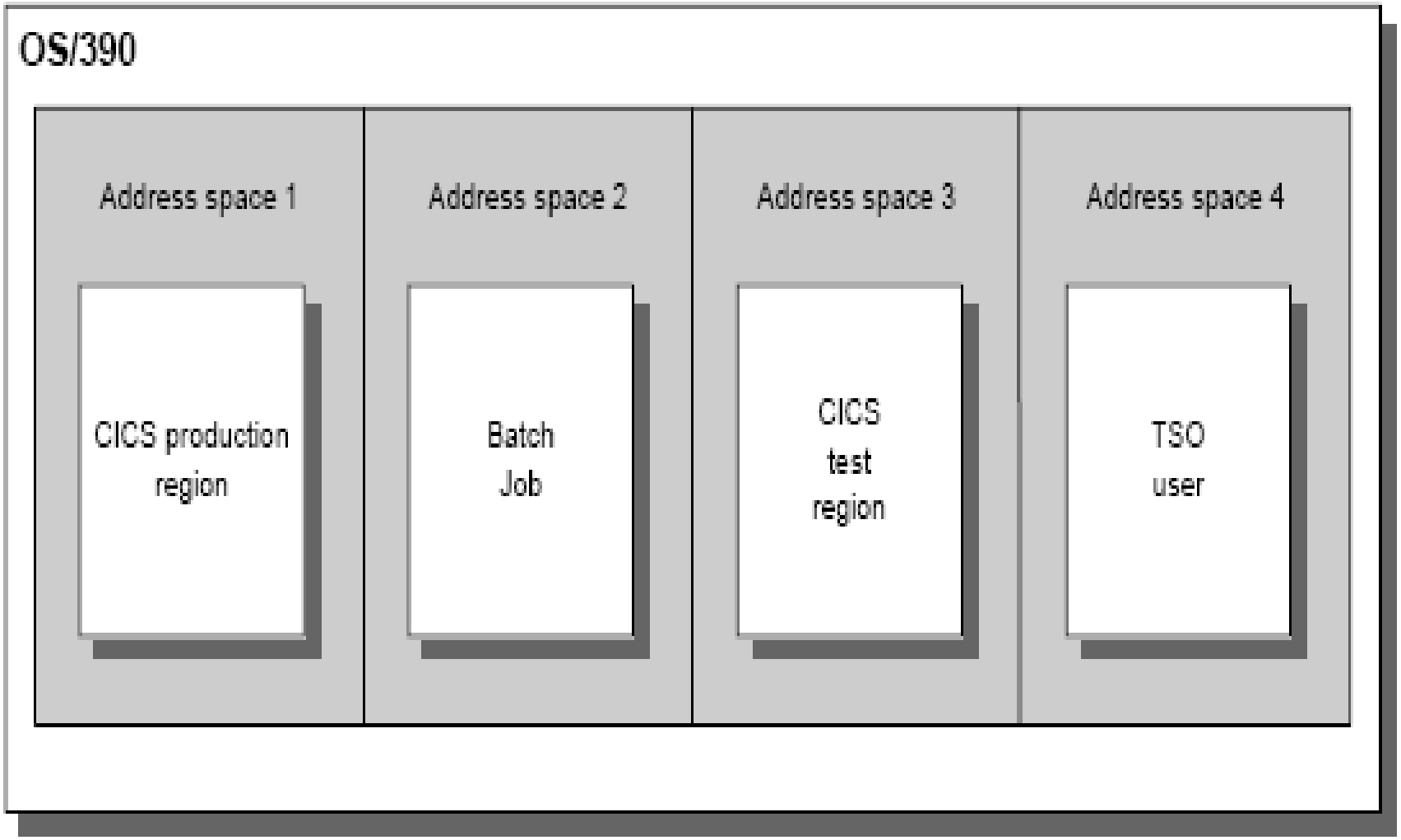
What does CICS do?

- Telecommunication
- Multitasking
- Data Access and Transaction Control
- Inter System Communication

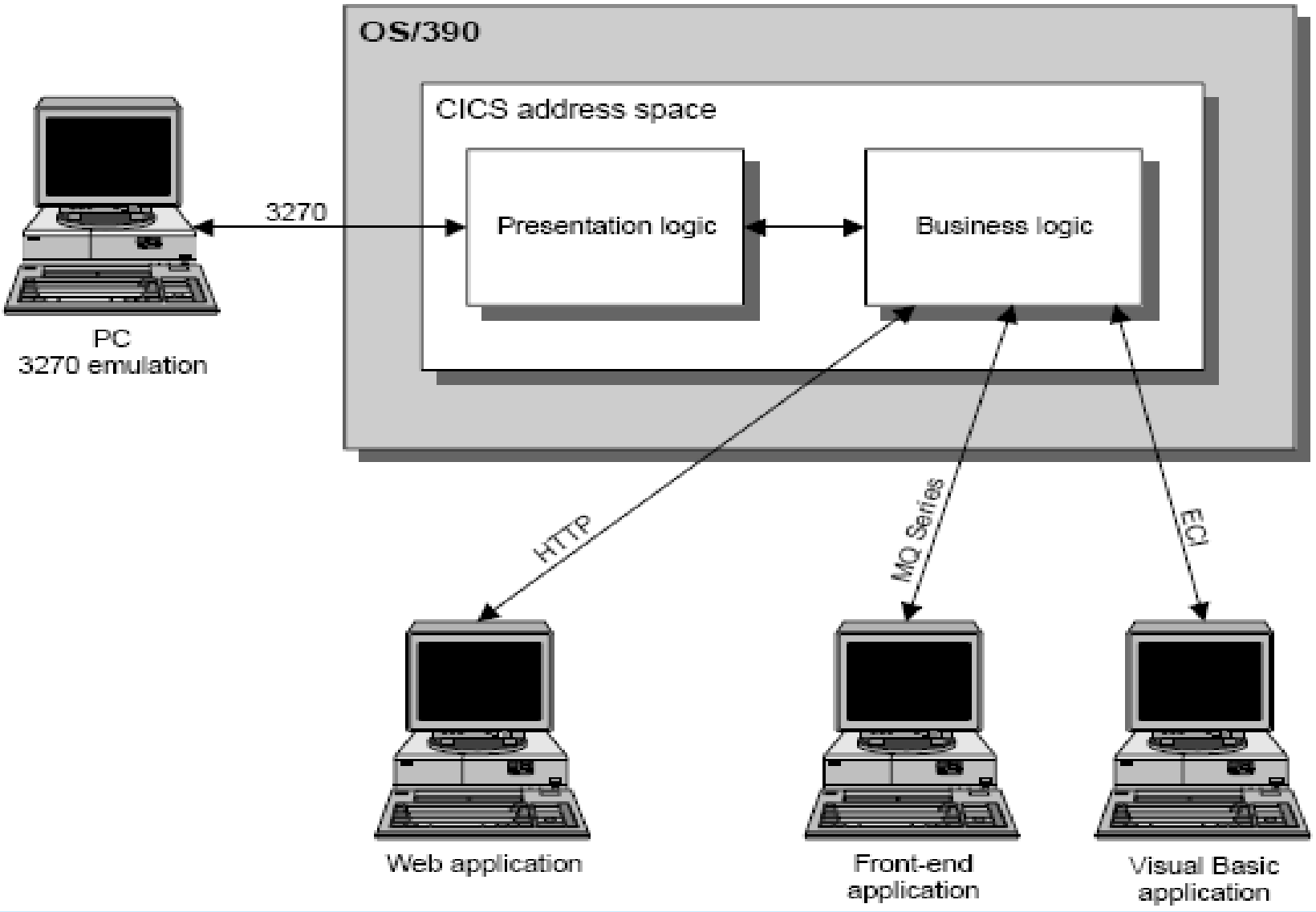
A CICS interface



CICS in an OS/390 address space



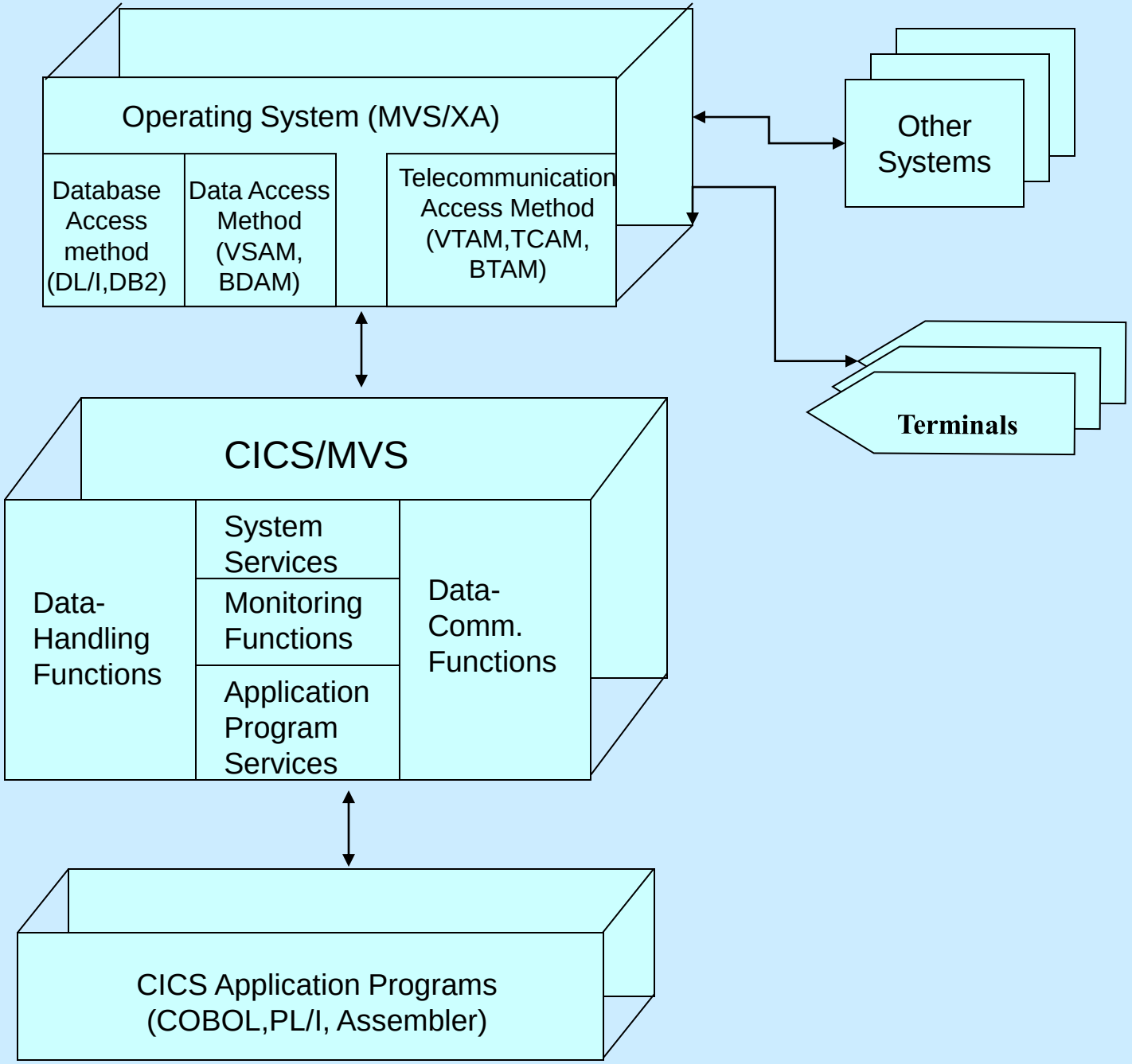
Alternate user interfaces



CICS SYSTEM COMPONENTS

- Data-Communication Functions
- Data Handling Functions
- Application Program Services
- System Services
- Monitoring Functions

CICS SYSTEM CONCEPT



SYSTEM SERVICES

- Program Control
- Storage Control
- Task Control

DATA COMMUNICATION FUNCTIONS

- Interface to telecommunication access methods
- Free application programs from terminal hardware
- Provide MRO
- Provide Inter System Communication

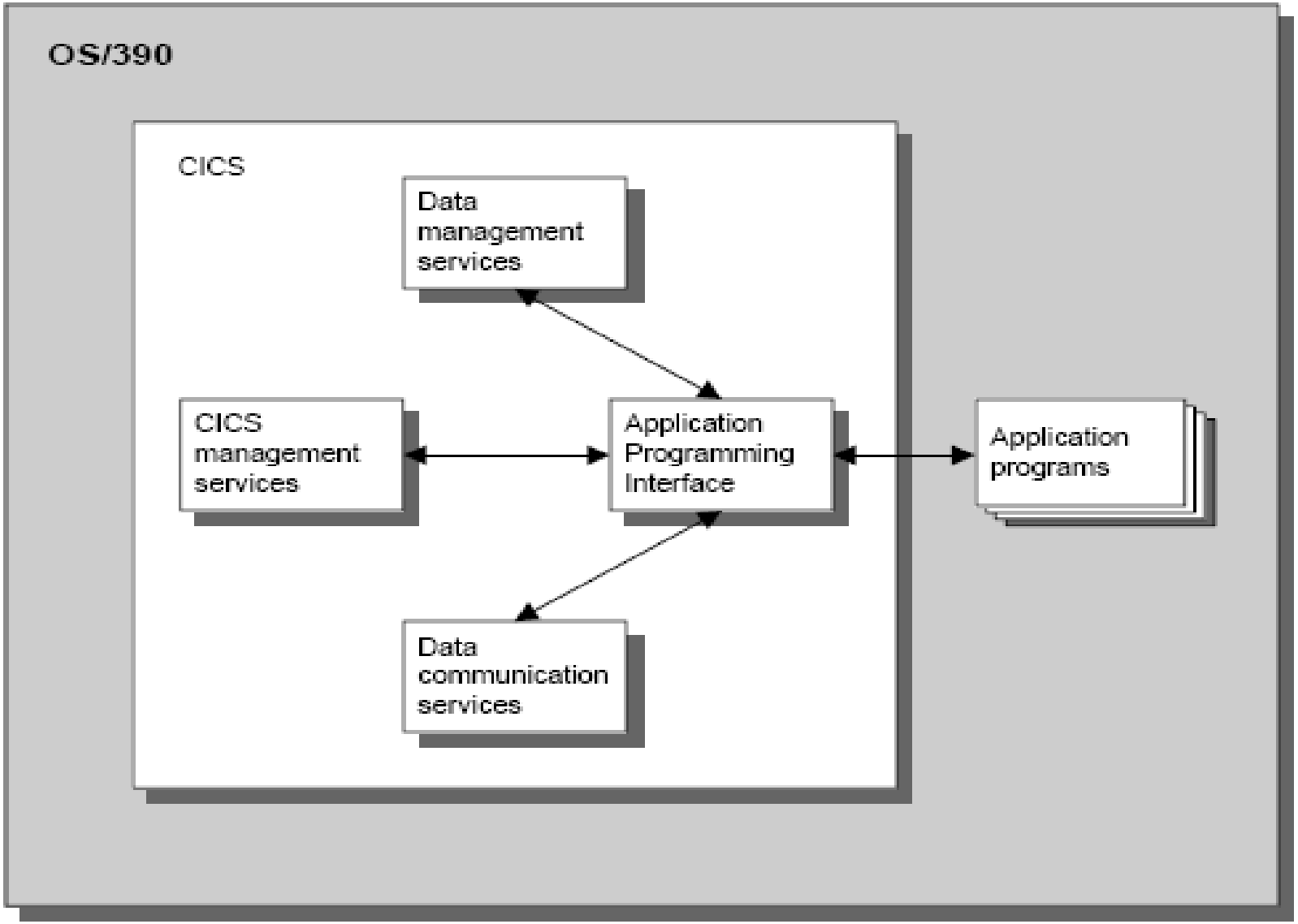
DATA HANDLING FUNCTIONS

- Interface with data access methods
- Interface with database access methods
- Maintain data integrity

APPLICATION PROGRAM SERVICES

- Interface with COBOL, PL/I, Assembler Programs
- Command level translator
- Execution Diagnostic facility
- Command Interpreter
- Screen Definition Facility
- Trace and Dump Facility

How an application program accesses CICS services



Monitoring Functions

- Monitor events within CICS
- Provides Statistics for system tuning

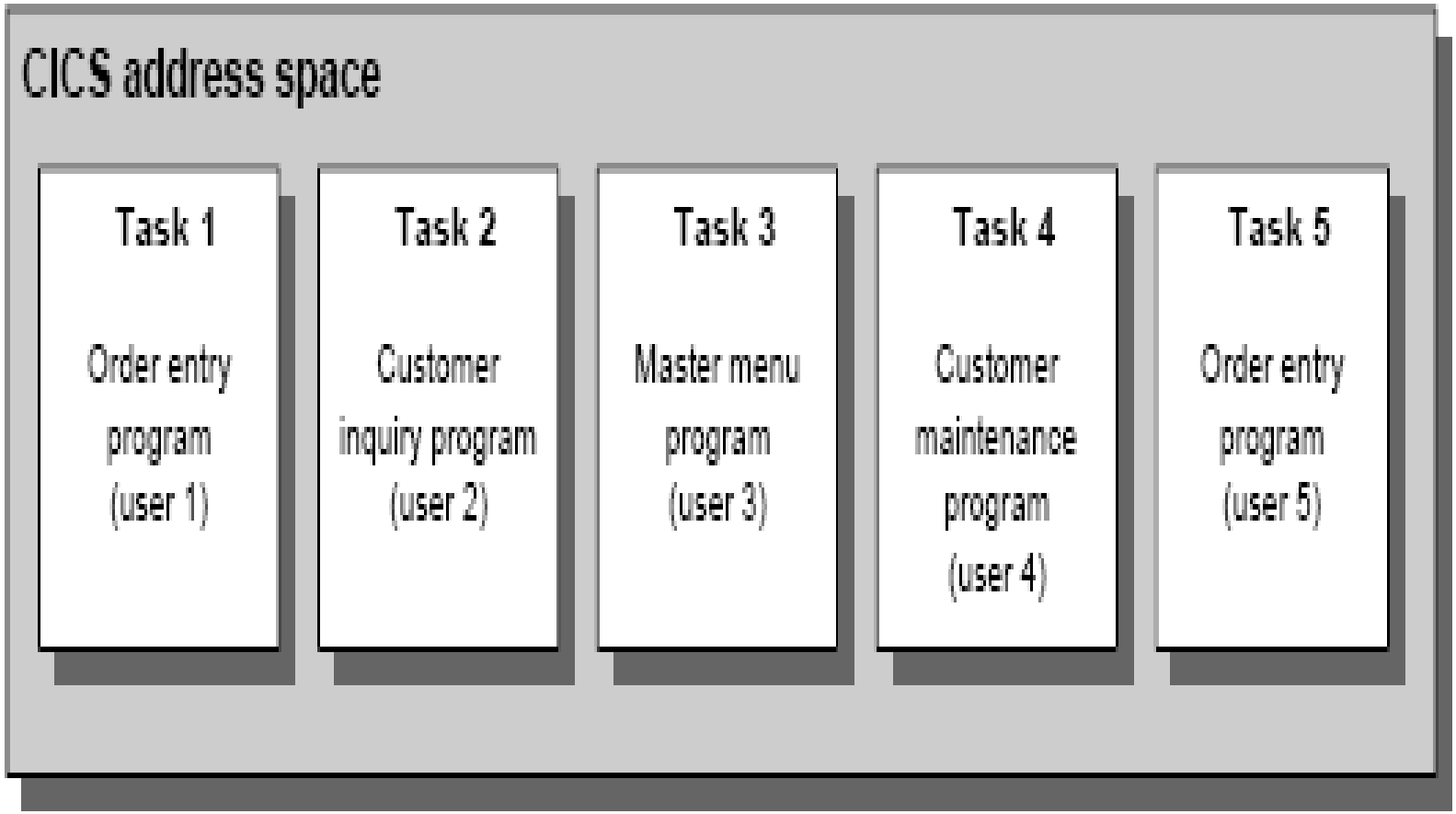
Concepts of CICS

- Multitasking
- Multithreading
- Quasi-Reentrancy

MULTITASKING

- Concurrent execution of more than one task

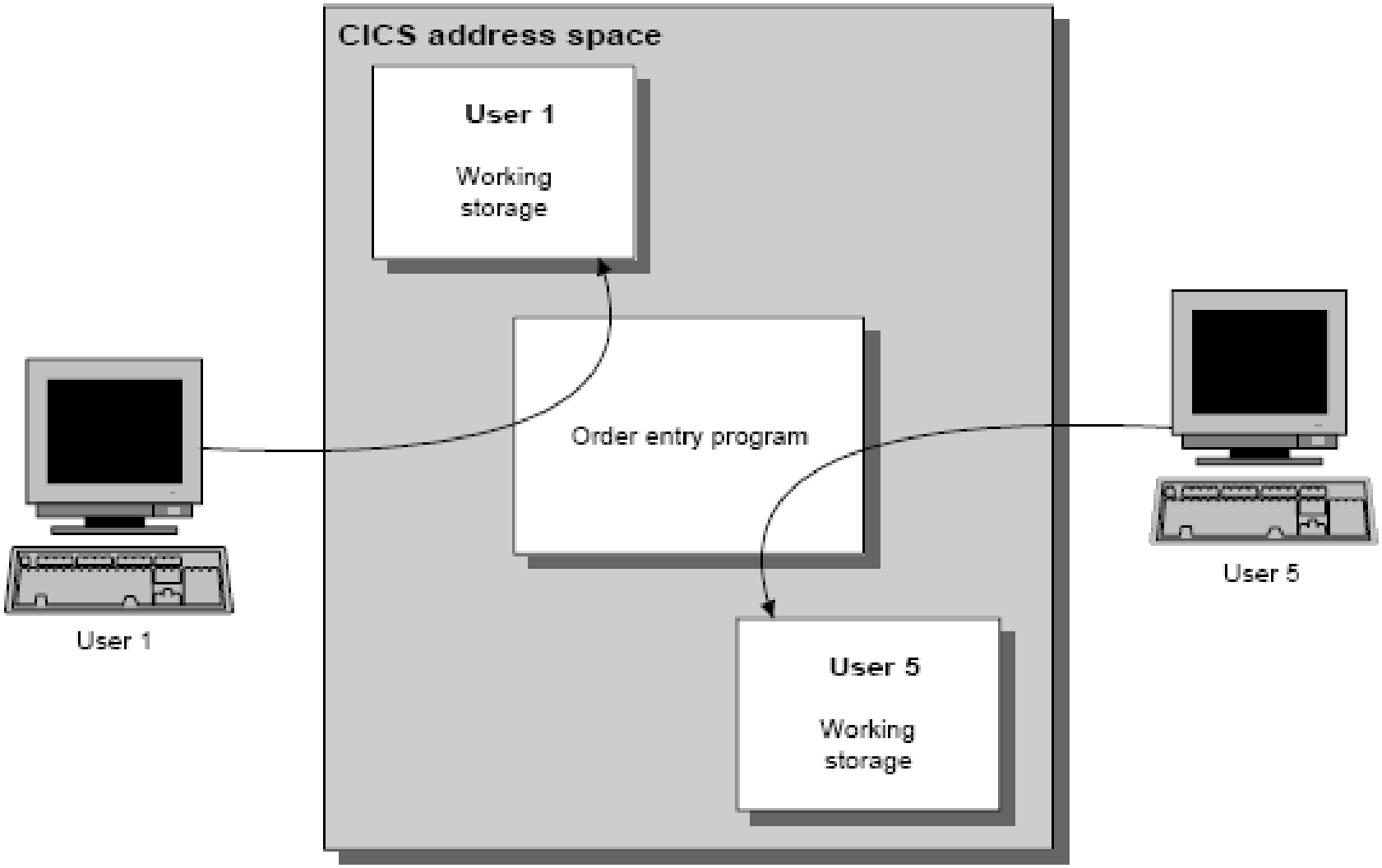
CICS uses its address space to support multitasking



MULTI THREADING

- A Program is shared by several tasks concurrently

Multithreading provides a separate copy of working storage for each user



QUASI-REENTRANCY

- Re-entrant program under CICS environment

Terminologies in CICS

- Application
- Transaction
- Task

What is an Application?

- Collection of Programs

What is a Transaction?

- Collection of logically related programs

What is a Task?

- Single execution of some type of transaction

CICS NUCLEUS

- Control Tables
- Control Programs

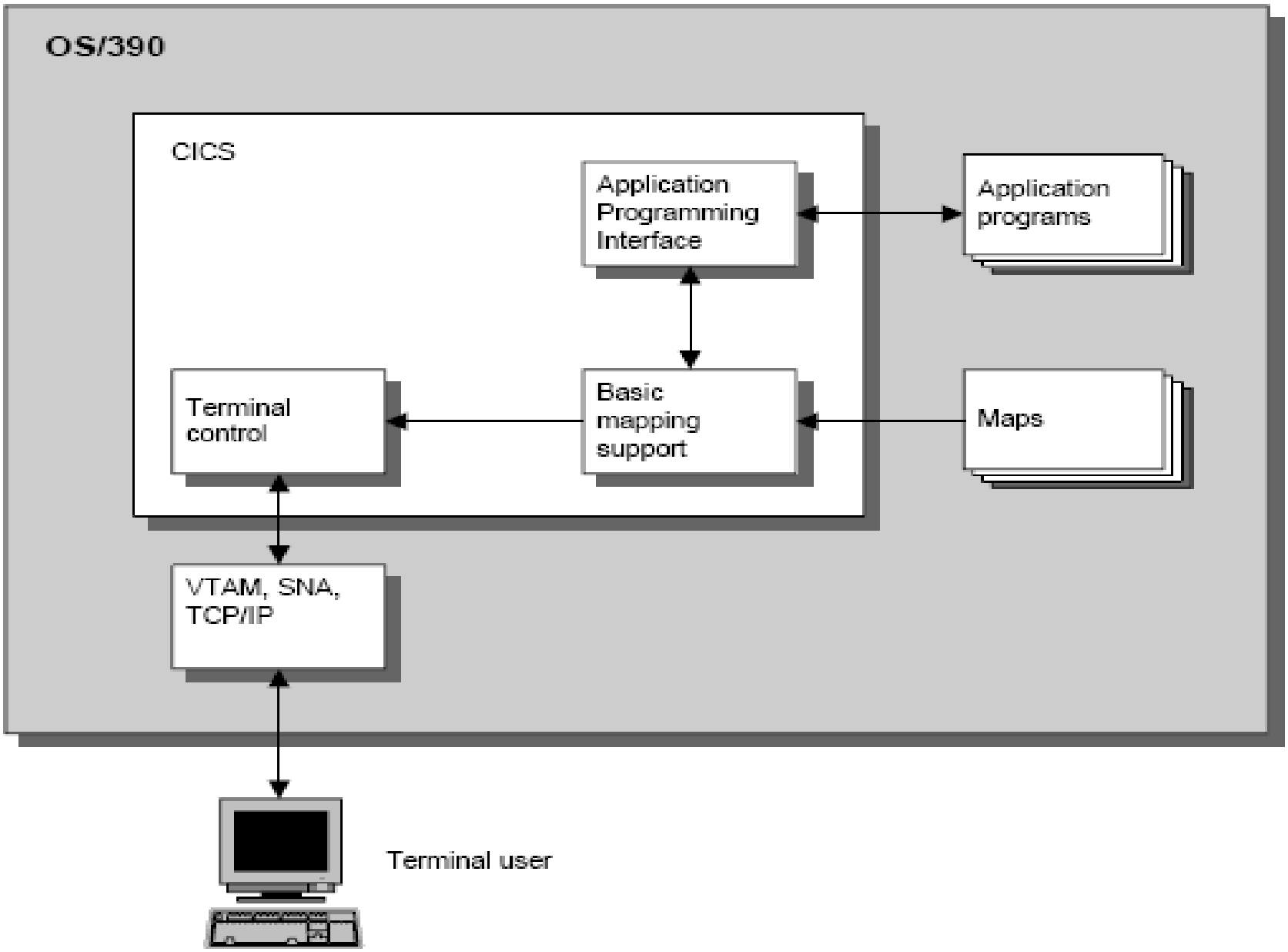
CICS CONTROL PROGRAMS AND TABLES

- TERMINAL MANAGEMENT
- PROGRAM MANAGEMENT
- STORAGE MANAGEMENT
- TASK MANAGEMENT
- FILE MANAGEMENT

Terminal Management

- Terminal control program (TCP)
- Terminal control table (TCT)
- Terminal I/O area (TIOA)

How an application program communicates with terminal devices



PROGRAM MANAGEMENT

- Program Control program (PCT)
- Processing Program Table (PPT)

STORAGE MANAGEMENT

- Storage Control program (SCP)

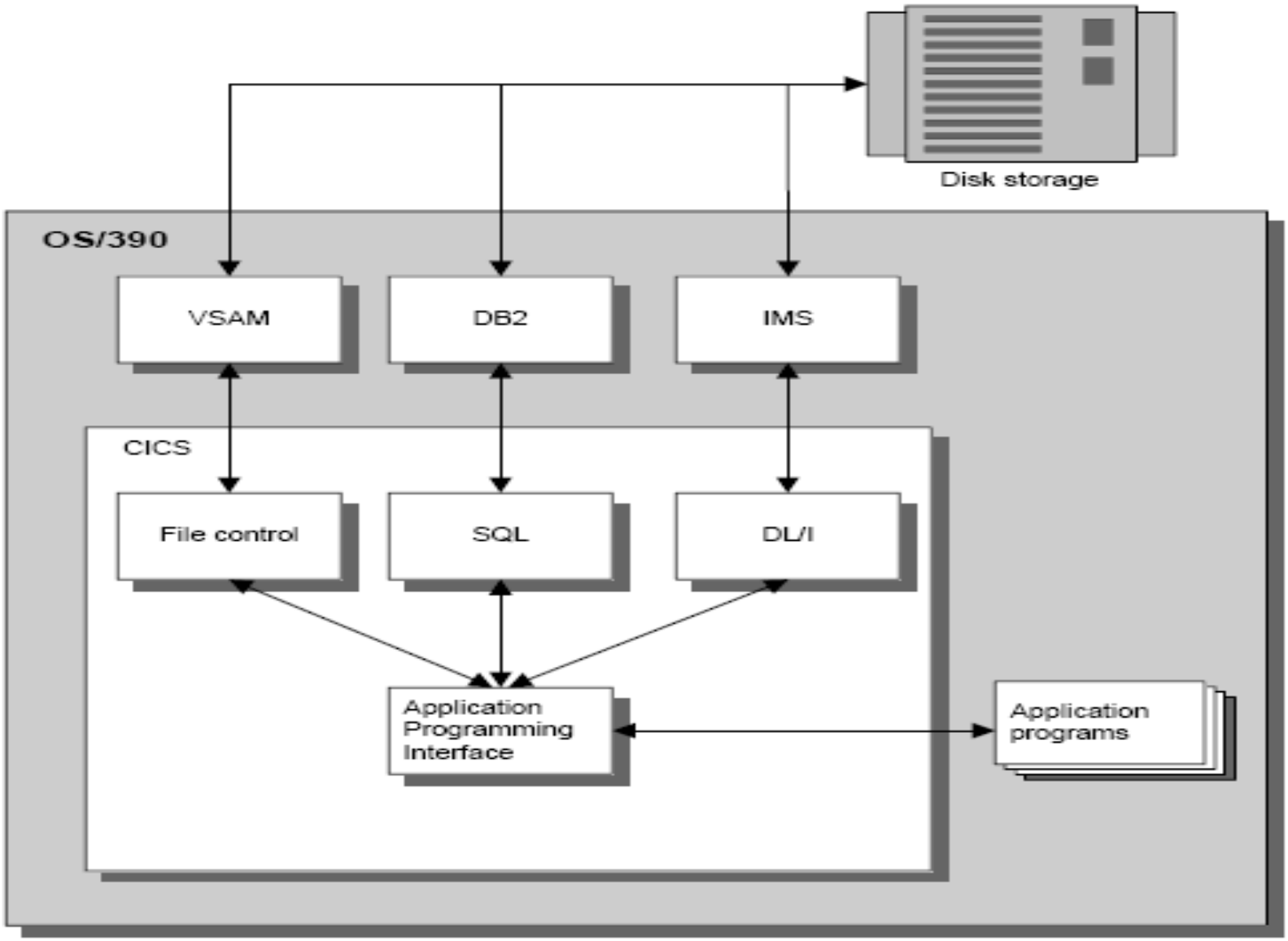
TASK MANAGEMENT

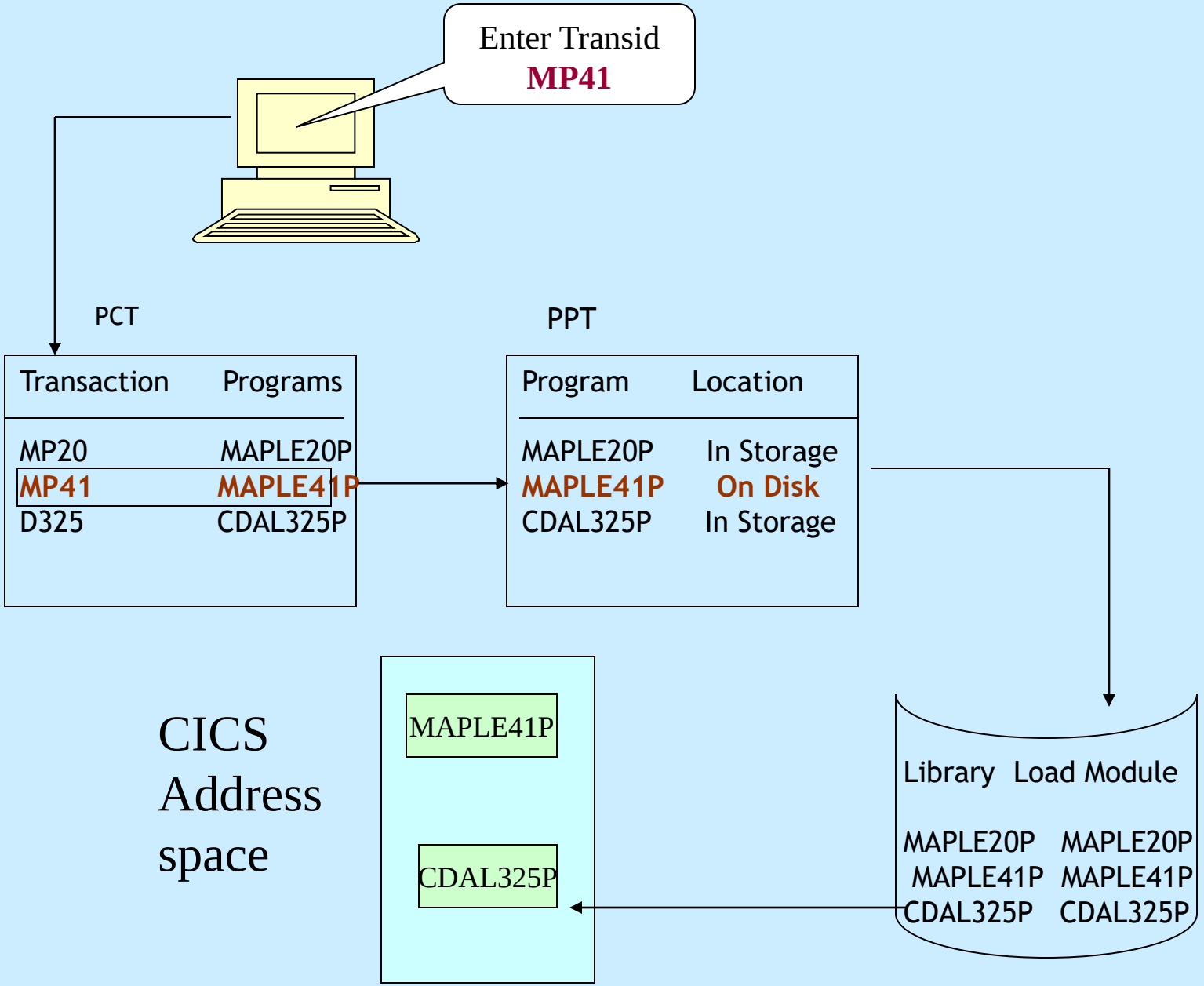
- Task Control Program (KCP)
- Program Control Table (PCT)
- Task Control Area (TCA)
- Execute Interface Block (EIB)

FILE MANAGEMENT

- File Control Program (FCP)
- File Control table (FCT)
- File I/O Area (FIOA)

Three ways an application program can access data from disk storage




Enter Transid
MP41
PCT
PPT
Transaction
Programs
MP20
MAPLE20P
MP41
MAPLE41P
D325
CDAL325P
Program
Location
MAPLE20P
In Storage
MAPLE41P
On Disk
CDAL325P
In Storage
CICS
Address
space
MAPLE41P
CDAL325P
Library
Load Module
MAPLE20P
MAPLE20P
MAPLE41P
MAPLE41P
CDAL325P
CDAL325P

Native CICS Commands

- CESN: CICS Execute Sign ON
- CEDA: CICS Execute Definition and Administration
- CEMT: CICS Execute Master Terminal
- CECI: CICS Execute Command Interpreter
- CEDF: CICS Execute Debug Facility
- CMAC: CICS Messages for Abend Codes
- CESF: CICS Execute Sign OFF
- CEBR – CICS Execute temporary storage BRowse

COMMANDS IN CICS

- The general format of command is:

```
EXEC CICS command function
        option (argument)
        option (argument)
END-EXEC.
```

RECEIVE COMMAND

- Syntax :

  EXEC CICS RECEIVE

  INTO (dataname)

  LENGTH (length of dataname)

  END-EXEC.

Example:

EXEC CICS RECEIVE

INTO (ws-input)

LENGTH (length of ws-input)

END-EXEC.

SEND COMMAND

- EXEC CICS SEND
  FROM (dataname)
  LENGTH (length of dataname)
  END-EXEC.

Example:

```
EXEC CICS SEND
    FROM (ws-output)
    LENGTH (length of ws-output)
END-EXEC.
```

SEND PAGE COMMAND

- EXEC CICS SEND TEXT
  FROM (dataname)
  ACCUM
  END-EXEC.
  :
  :
  EXEC CICS SEND
  PAGE
  END-EXEC.

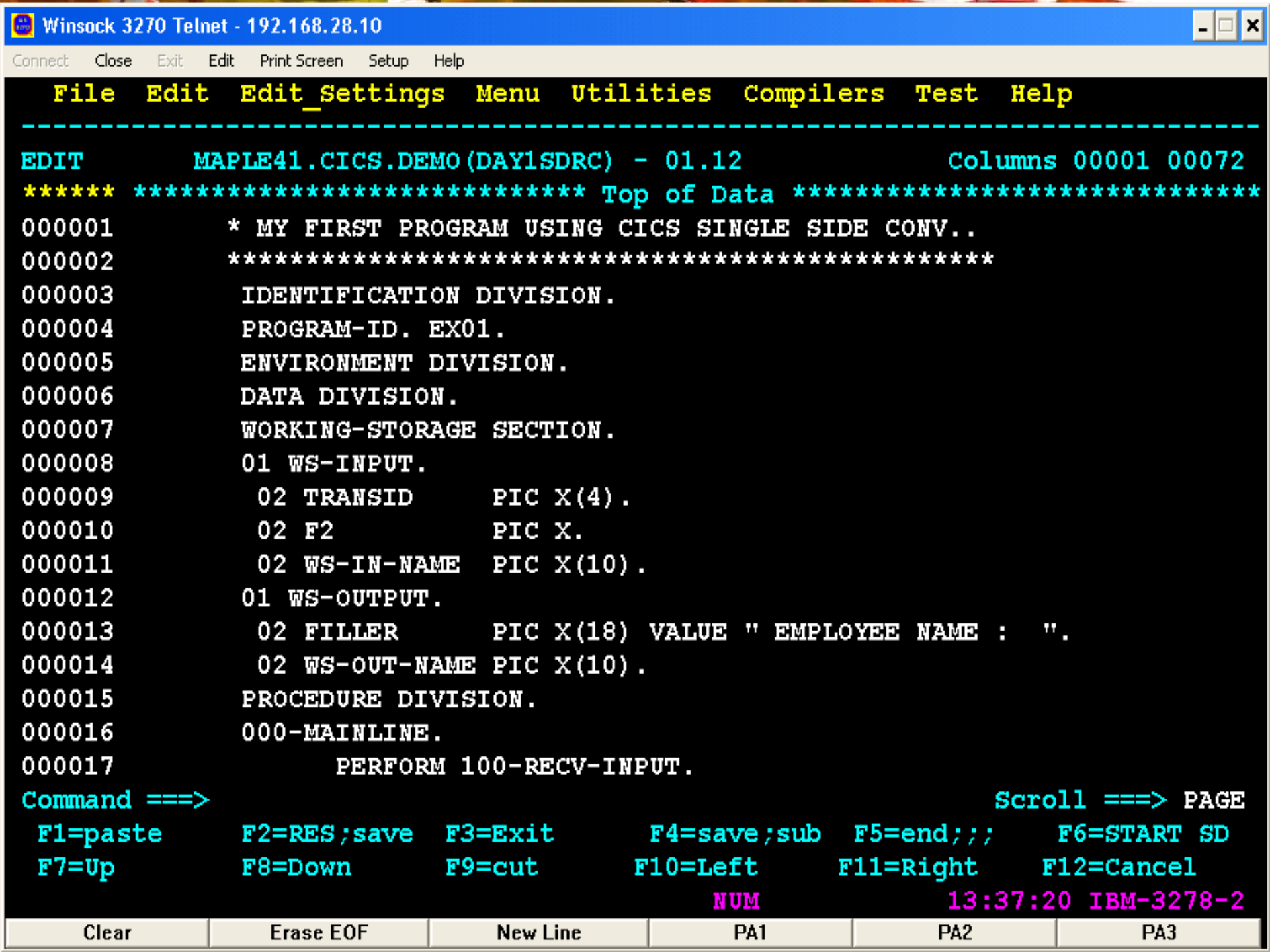
Execution of a CICS application program

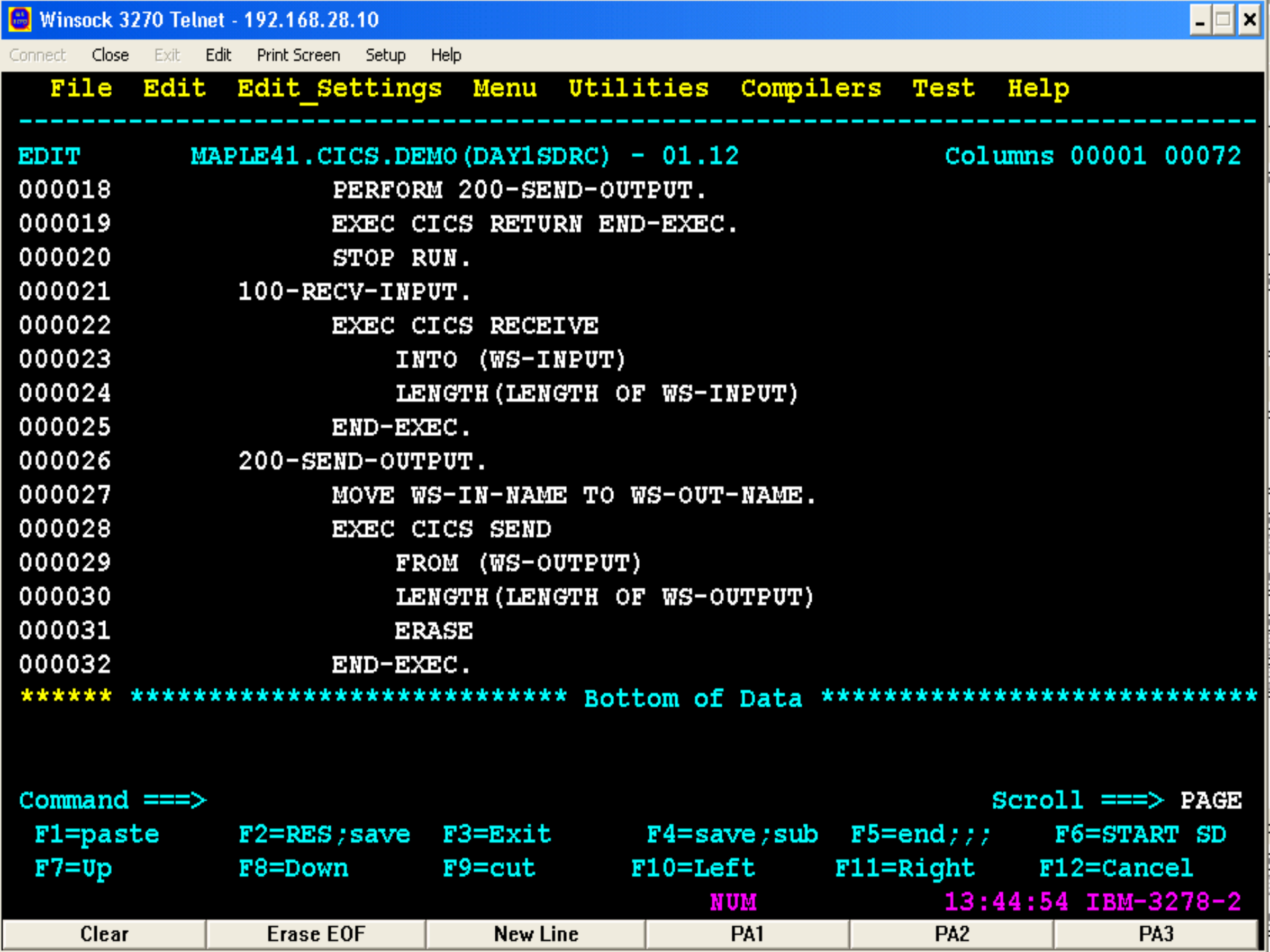
- Basic Procedure
- CICS Program considerations
- CICS Program Restrictions

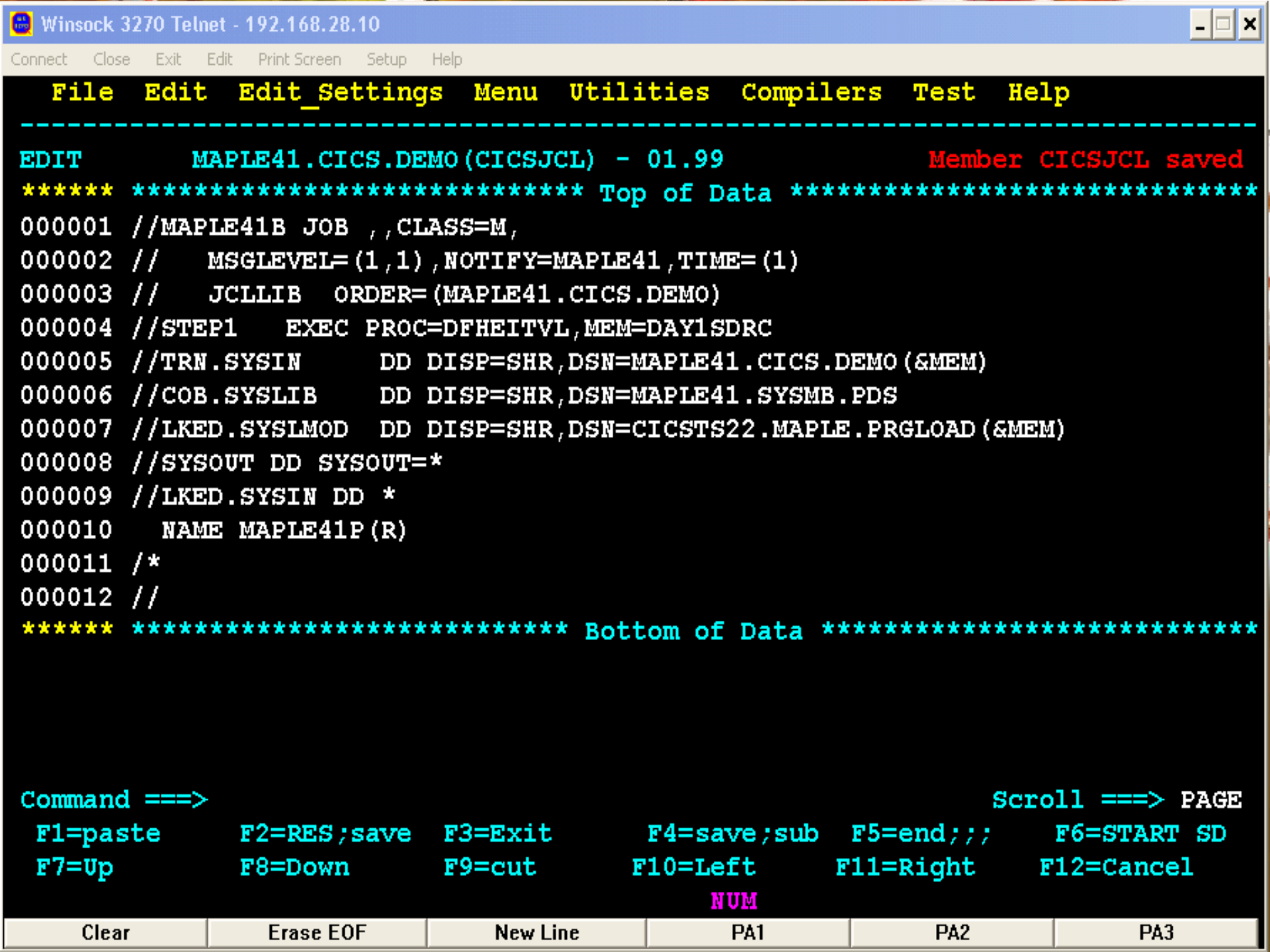
Summary

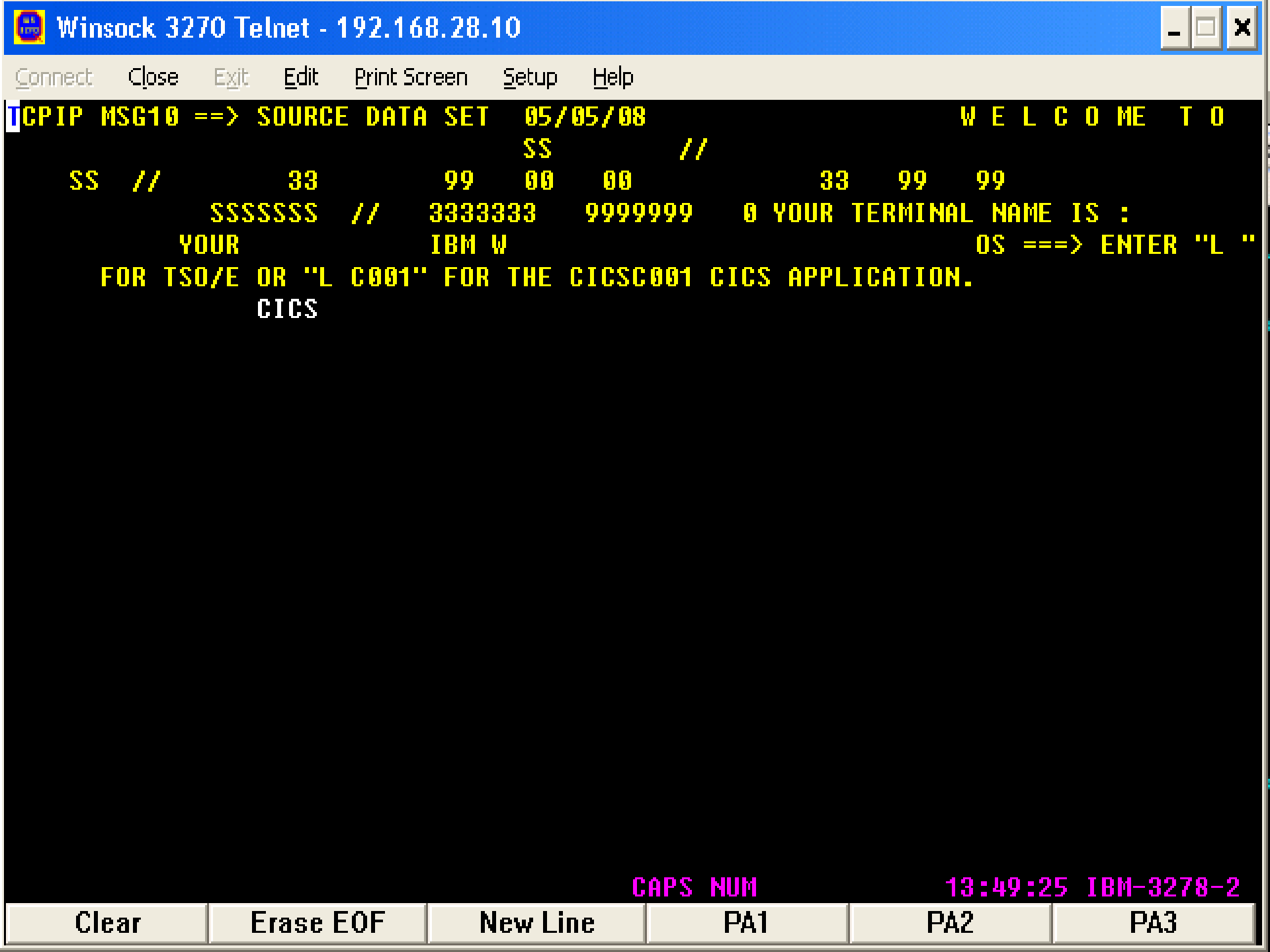
- What is CICS?
- Why CICS in MVS?
- How is CICS similar to OS?
- What are AID, PF, PA keys?
- What are transactions and tasks?
- What is Multitasking, Multithreading, Quasi-reentrancy?
- What are the ways of starting a transaction?
- What are the CICS tables?
- What is conversational and pseudo-conversational programming?
- What are the native CICS Commands

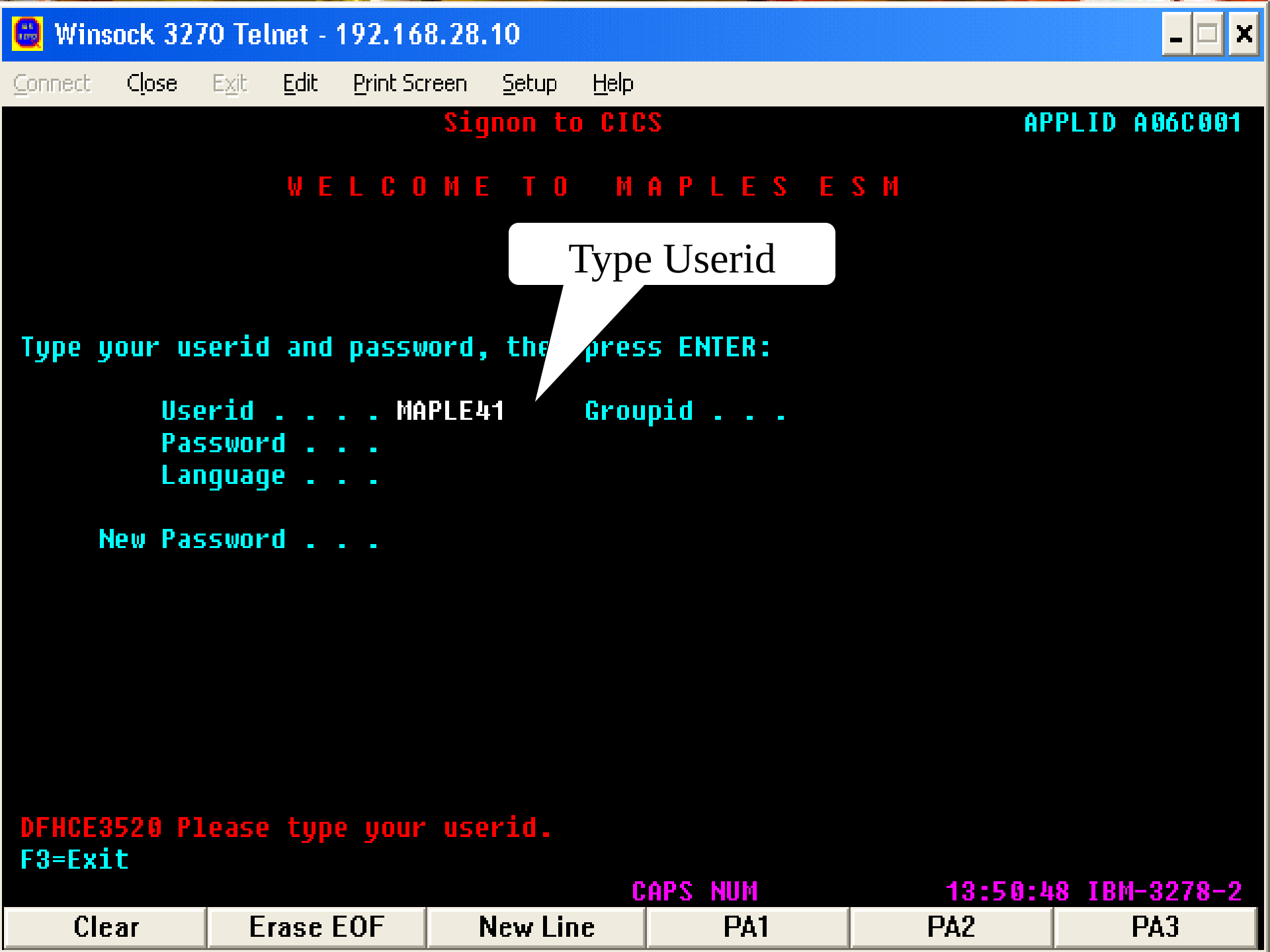
Lab Session

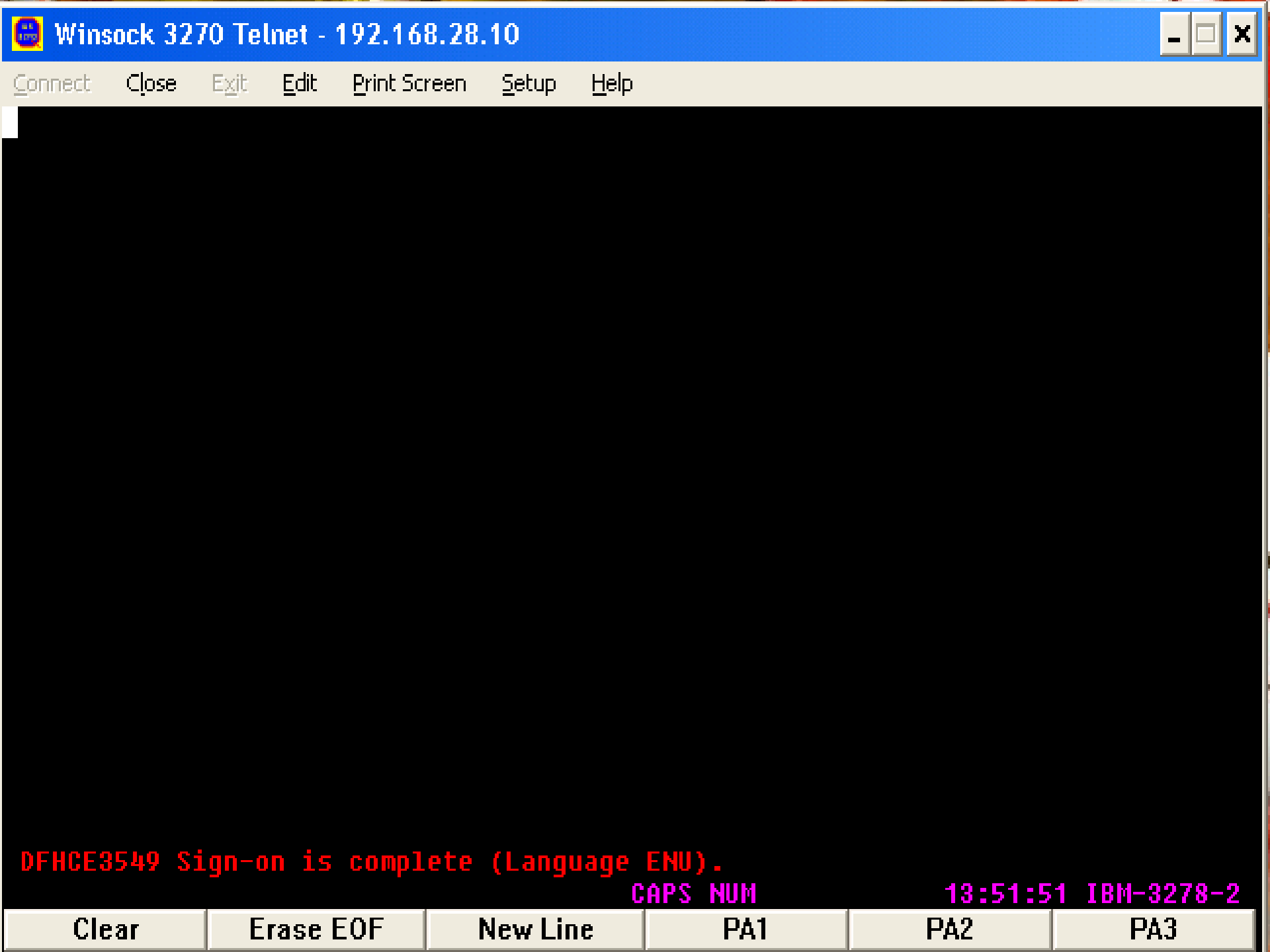

Winsock 3270 Telnet - 192.168.28.10
Connect Close Exit Edit Print Screen Setup Help
File Edit Edit_Settings Menu Utilities Compilers Test Help
EDIT MAPLE41.CICS.DEMO(DAY1SDRC) - 01.12 Columns 00001 00072
****** ******************************** Top of Data ********************************
000001 * MY FIRST PROGRAM USING CICS SINGLE SIDE CONV..
000002 **
000003 IDENTIFICATION DIVISION.
000004 PROGRAM-ID. EX01.
000005 ENVIRONMENT DIVISION.
000006 DATA DIVISION.
000007 WORKING-STORAGE SECTION.
000008 01 WS-INPUT.
000009 02 TRANSID PIC X(4).
000010 02 F2 PIC X.
000011 02 WS-IN-NAME PIC X(10).
000012 01 WS-OUTPUT.
000013 02 FILLER PIC X(18) VALUE " EMPLOYEE NAME : ".
000014 02 WS-OUT-NAME PIC X(10).
000015 PROCEDURE DIVISION.
000016 000-MAINLINE.
000017 PERFORM 100-RECV-INPUT.
Command ===> Scroll ===> PAGE
F1=paste F2=RES;save F3=Exit F4=save;sub F5=end;;; F6=START SD
F7=Up F8=Down F9=cut F10=Left F11=Right F12=Cancel
NUM 13:37:20 IBM-3278-2
Clear Erase EOF New Line PA1 PA2 PA3

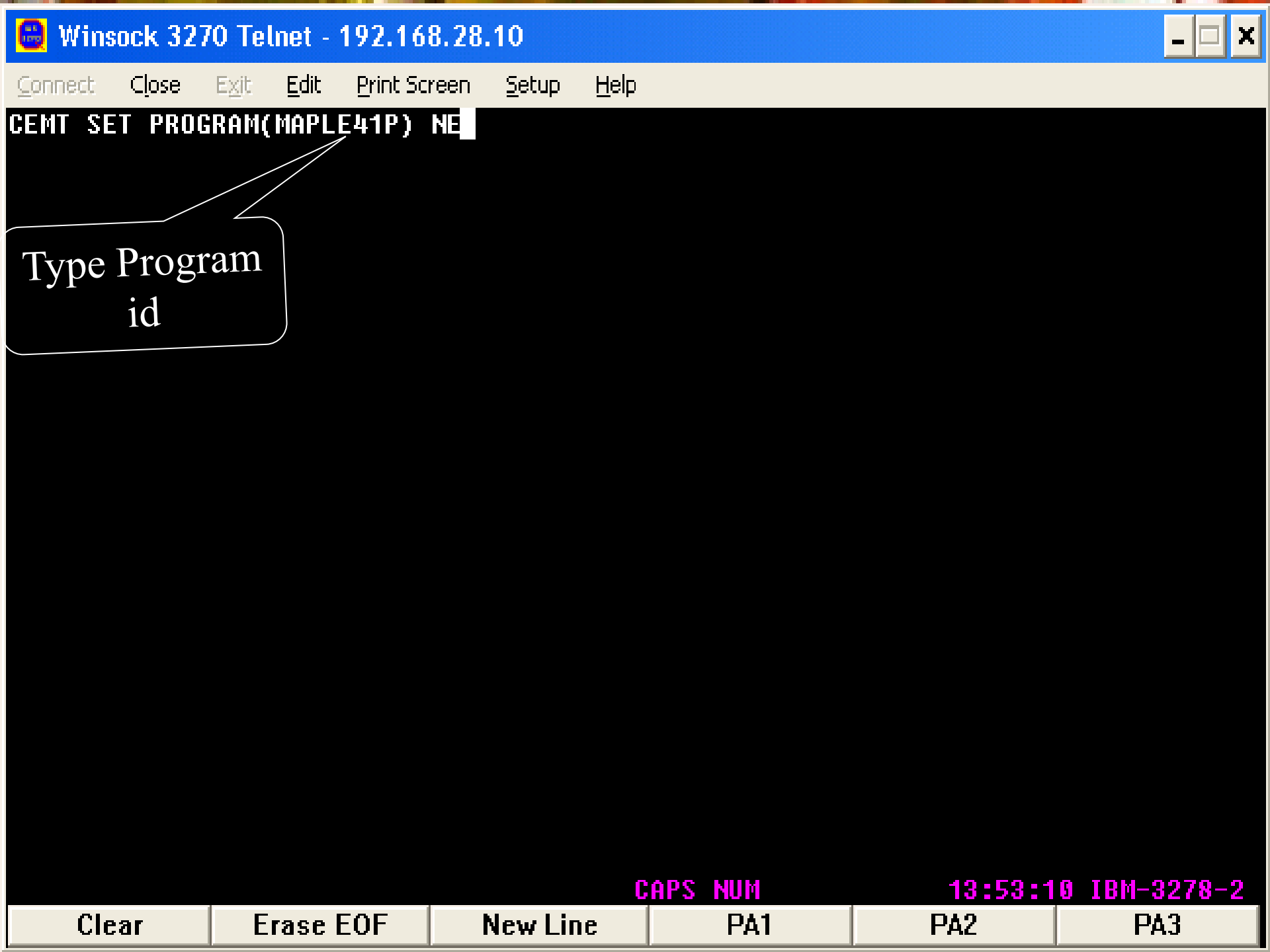

Winsock 3270 Telnet - 192.168.28.10
Connect Close Exit Edit Print Screen Setup Help
File Edit Edit_Settings Menu Utilities Compilers Test Help
EDIT MAPLE41.CICS.DEMO(DAY1SDRC) - 01.12 Columns 00001 00072
000018 PERFORM 200-SEND-OUTPUT.
000019 EXEC CICS RETURN END-EXEC.
000020 STOP RUN.
000021 100-RECV-INPUT.
000022 EXEC CICS RECEIVE
000023 INTO (WS-INPUT)
000024 LENGTH(LENGTH OF WS-INPUT)
000025 END-EXEC.
000026 200-SEND-OUTPUT.
000027 MOVE WS-IN-NAME TO WS-OUT-NAME.
000028 EXEC CICS SEND
000029 FROM (WS-OUTPUT)
000030 LENGTH(LENGTH OF WS-OUTPUT)
000031 ERASE
000032 END-EXEC.
****** ********** Bottom of Data **********
Command ===>
Scroll ===> PAGE
F1=paste F2=RES;save F3=Exit F4=save;sub F5=end;;; F6=START SD
F7=Up F8=Down F9=cut F10=Left F11=Right F12=Cancel
NUM 13:44:54 IBM-3278-2
Clear Erase EOF New Line PA1 PA2 PA3

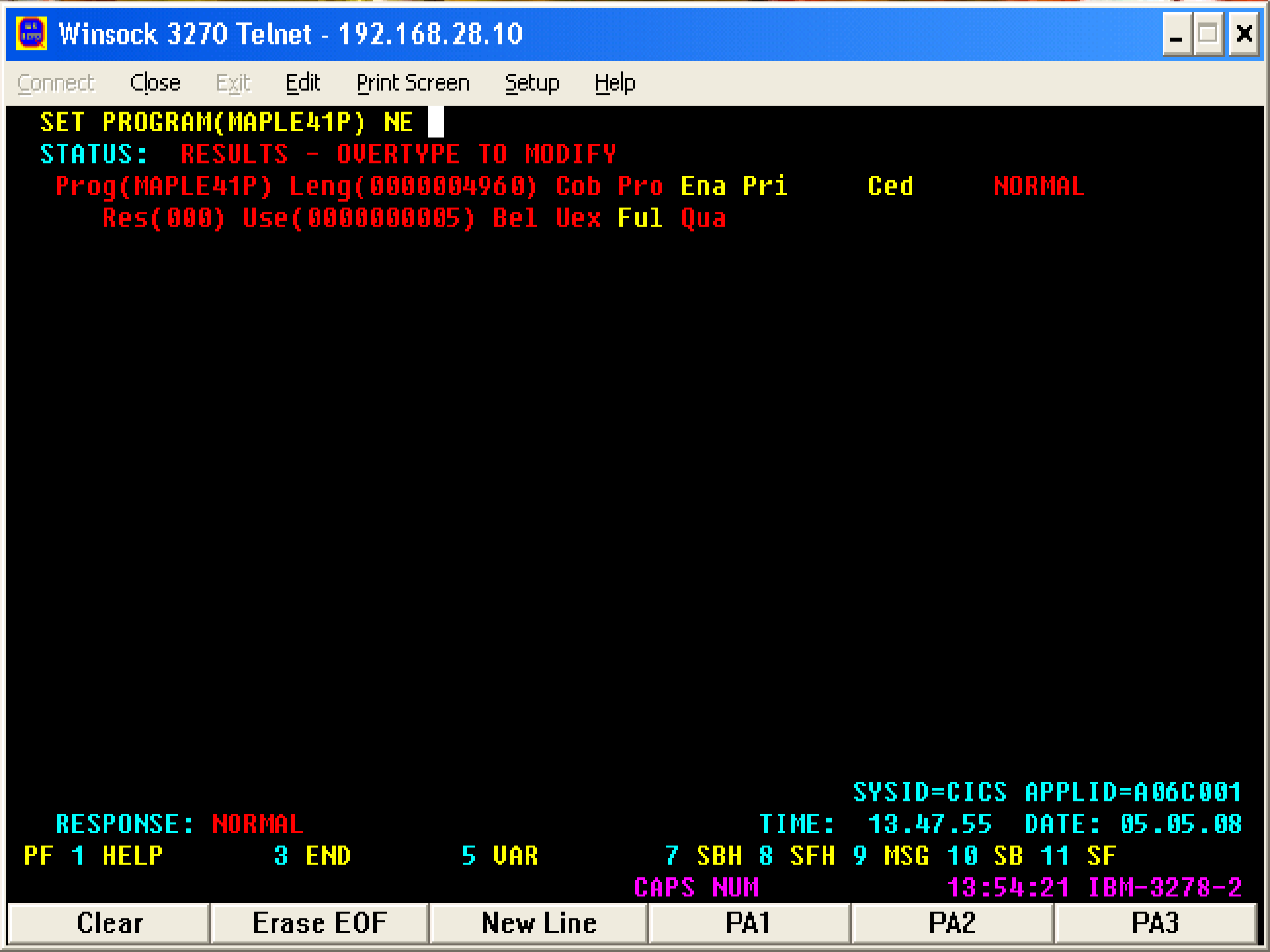

Winsock 3270 Telnet - 192.168.28.10
Connect Close Exit Edit Print Screen Setup Help
File Edit Edit_Settings Menu Utilities Compilers Test Help
EDIT MAPLE41.CICS.DEMO(CICSJCL) - 01.99 Member CICSJCL saved
****** ******************************** Top of Data ********************************
000001 //MAPLE41B JOB ,,CLASS=M,
000002 // MSGLEVEL=(1,1),NOTIFY=MAPLE41,TIME=(1)
000003 // JCLLIB ORDER=(MAPLE41.CICS.DEMO)
000004 //STEP1 EXEC PROC=DFHEITVL,MEM=DAY1SDRC
000005 //TRN.SYSIN DD DISP=SHR,DSN=MAPLE41.CICS.DEMO(&MEM)
000006 //COB.SYSLIB DD DISP=SHR,DSN=MAPLE41.SYSMB.PDS
000007 //LKED.SYSLMOD DD DISP=SHR,DSN=CICSTS22.MAPLE.PRGLOAD(&MEM)
000008 //SYSOUT DD SYSOUT=*
000009 //LKED.SYSIN DD *
000010 NAME MAPLE41P(R)
000011 /*
000012 //
****** ***************************** Bottom of Data ******************************
Command ===>
Scroll ===> PAGE
F1=paste F2=RES;save F3=Exit F4=save;sub F5=end;;; F6=START SD
F7=Up F8=Down F9=cut F10=Left F11=Right F12=Cancel
NUM
Clear Erase EOF New Line PA1 PA2 PA3

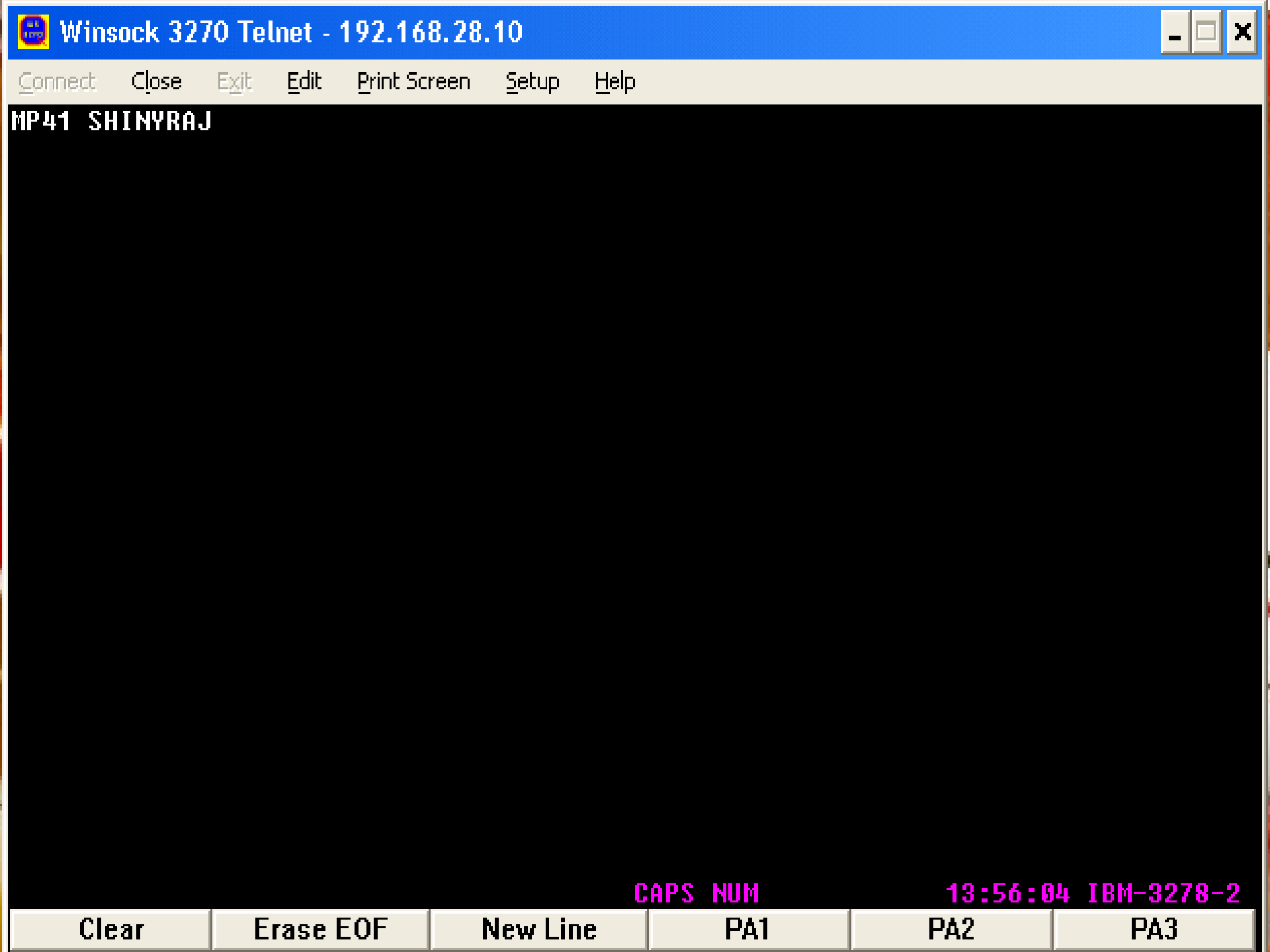

Winsock 3270 Telnet - 192.168.28.10
Connect Close Exit Edit Print Screen Setup Help
TCPIP MSG10 ==> SOURCE DATA SET 05/05/08 W E L C O ME T O
SS //
SS // 33 99 00 00 33 99 99
SSSSSSS // 3333333 9999999 0 YOUR TERMINAL NAME IS :
YOUR IBM W OS ===> ENTER "L "
FOR TSO/E OR "L C001" FOR THE CICSC001 CICS APPLICATION.
CICS
CAPS NUM 13:49:25 IBM-3278-2
Clear Erase EOF New Line PA1 PA2 PA3

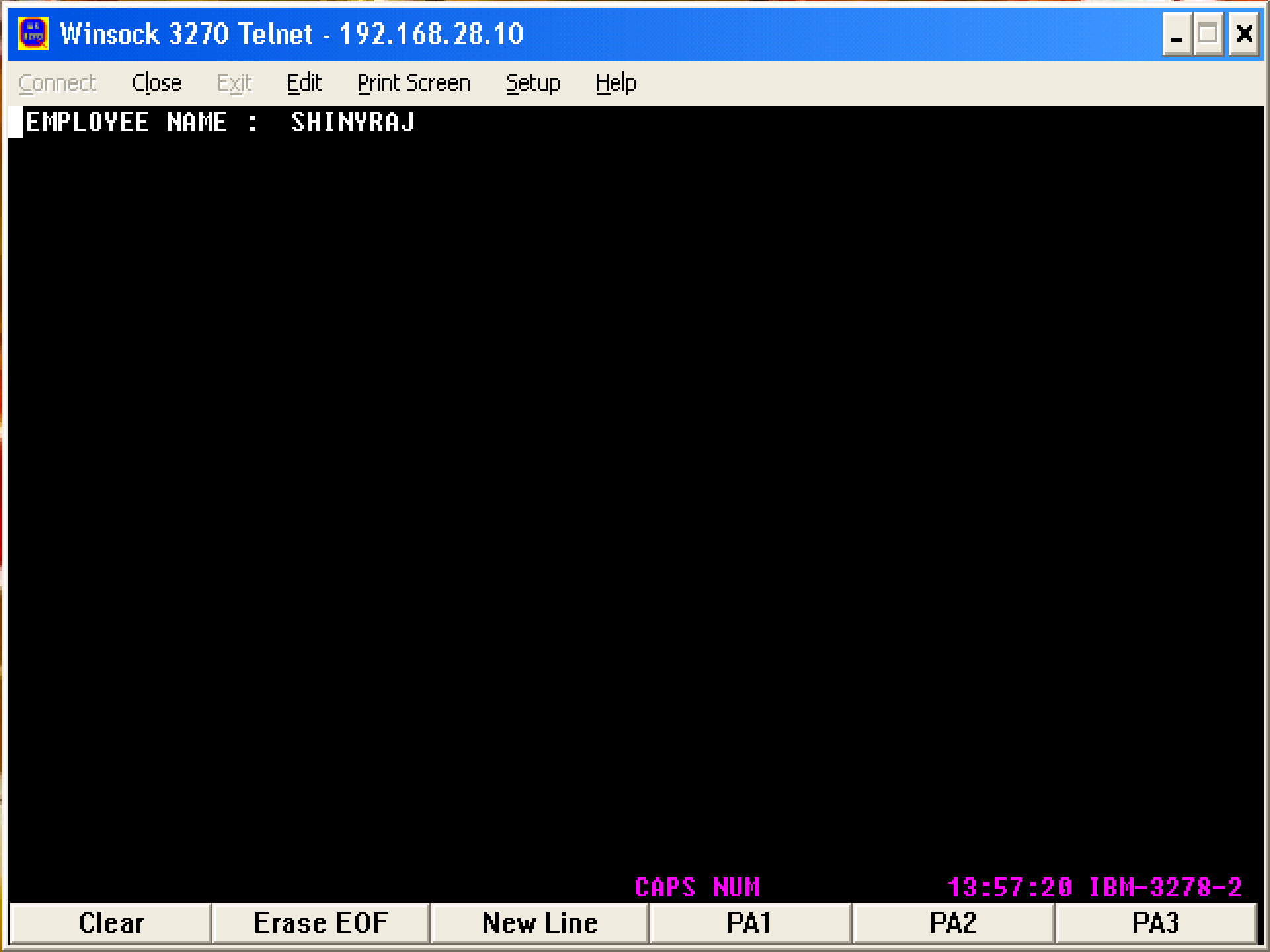

Winsock 3270 Telnet - 192.168.28.10
Connect
Close
Exit
Edit
Print Screen
Setup
Help
Signon to CICS
APPLID A06C001
W E L C O M E T O M A P L E S E S M
Type Userid
Type your userid and password, the press ENTER:
Userid MAPLE41
Groupid . . .
Password . . .
Language . . .
New Password . . .
DFHCE3520 Please type your userid.
F3=Exit
CAPS NUM
13:50:48 IBM-3278-2
Clear
Erase EOF
New Line
PA1
PA2
PA3


Winsock 3270 Telnet - 192.168.28.10
Connect
Close
Exit
Edit
Print Screen
Setup
Help
DFHCE3549 Sign-on is complete (Language ENU).
CAPS NUM
13:51:51 IBM-3278-2
Clear
Erase EOF
New Line
PA1
PA2
PA3


Winsock 3270 Telnet - 192.168.28.10
Connect
Close
Exit
Edit
Print Screen
Setup
Help
CEMT SET PROGRAM(MAPLE41P) NE
Type Program id
CAPS NUM
13:53:10 IBM-3278-2
Clear
Erase EOF
New Line
PA1
PA2
PA3


Winsock 3270 Telnet - 192.168.28.10
Connect
Close
Exit
Edit
Print Screen
Setup
Help
SET PROGRAM(MAPLE41P) NE
STATUS: RESULTS - OVERTYPE TO MODIFY
Prog(MAPLE41P) Leng(0000004960) Cob Pro Ena Pri Ced NORMAL
Res(000) Use(0000000005) Bel Uex Ful Qua
SYSID=CICS APPLID=A06C001
RESPONSE: NORMAL TIME: 13.47.55 DATE: 05.05.08
PF 1 HELP 3 END 5 VAR 7 SBH 8 SFH 9 MSG 10 SB 11 SF
CAPS NUM 13:54:21 IBM-3278-2
Clear
Erase EOF
New Line
PA1
PA2
PA3


Winsock 3270 Telnet - 192.168.28.10
Connect
Close
Exit
Edit
Print Screen
Setup
Help
MP41 SHINYRAJ
CAPS NUM
13:56:04 IBM-3278-2
Clear
Erase EOF
New Line
PA1
PA2
PA3


Winsock 3270 Telnet - 192.168.28.10
Connect
Close
Exit
Edit
Print Screen
Setup
Help
EMPLOYEE NAME : SHINYRAJ
CAPS NUM
13:57:20 IBM-3278-2
Clear
Erase EOF
New Line
PA1
PA2
PA3

Try Yourself !

- Write a program in CICS to receive two numbers from the user and find the sum and send the result to the user with suitable message.