CA Enterprise Tester

Test Drive

r3.1

CA Product References

This document references the following CA products:

- CA Enterprise Tester® (formerly know as ProTerm)

Contact Technical Support

For online technical assistance and a complete list of locations, primary service hours, and telephone numbers, contact Technical Support at http://ca.com/support.

Contents

Chapter 7: Analyzing Traced Sessions

Chapter 8: Using a Session Analyzer with Masking

Chapter 9: Using the Browse Facility

Chapter 1: Introduction

This chapter introduces you to CA Enterprise Tester, formerly known as ProTerm, and gets you started on the tutorial.

- Introduction to CA Enterprise Tester
- Using this Tutorial
- Selecting CA Enterprise Tester
- The ProTerm Control Panel
- PF Key Operation and Control
- CA Enterprise Tester Options

CA Enterprise Tester was previously known as ProTerm. Some of the application screens and functions still use the previous product name.

Introduction to CA Enterprise Tester

Much of the mainframe software developed in the last few decades has been designed for use by people who access the system using terminals. While online system software has been written to accomplish almost any conceivable task, much of the power of the software is lost because the software was designed for interactive use by people only.

CA Enterprise Tester boosts the power of all online system software by allowing the software to be used not only by people, but also by systems. Using CA Enterprise Tester, you can automate many of the non-productive, repetitive, and error prone terminal tasks that you and others must now do manually. Using any combination of online software available to you as subroutines, you can create many new and powerful functions.

To deliver this capability, CA Enterprise Tester provides a platform of general purpose integrated functions that operate in both the z/OS batch and TSO/ISPF environments.

The exercises in this publication present five of the basic functions provided by the CA Enterprise Tester Interactive System.

- SESSION—You can start a one or more sessions with one or more online systems while retaining your session with TSO and ISPF.
- RECORD—You can capture terminal sessions in the form of executable CA Enterprise Tester Scripts or REXX execs.

- PLAY—You can execute CA Enterprise Tester Scripts that drive sessions to automatically perform any task that can be accomplished by a person using a terminal.
- TRACE—You can capture sessions in the form of screen images that can be used as documentation or can be used as the basis for automatic regression testing of online system software.
- BROWSE—You can repeat a previously traced session "movie" without creating a new session to demonstrate an application without affecting system operation or the data accessed.
- ANALYZE—You can repeat a previously traced session using a new session and upgraded online system software to automatically find differences in online system responses.

Using this Tutorial

The CA Enterprise Tester Test Drive is a hands-on, self-study tutorial that introduces some of the panels and functions provided by the CA Enterprise Tester Interactive System. By performing the exercises presented here, you will become familiar with basic CA Enterprise Tester concepts, with the general organization of CA Enterprise Tester panels and features, and with the operation of specific CA Enterprise Tester functions and commands.

You should allow one half to one full day to complete the course.

The tutorial should be read from front to back. As you read through the explanations and illustrations of the features being demonstrated by the exercises described in this tutorial, you will encounter instructions that describe actions that you should perform as you read them.

For best results, do NOT begin by reading through this guide. Begin by logging on to TSO and ISPF as you normally do, and then proceed with the exercises that follow.

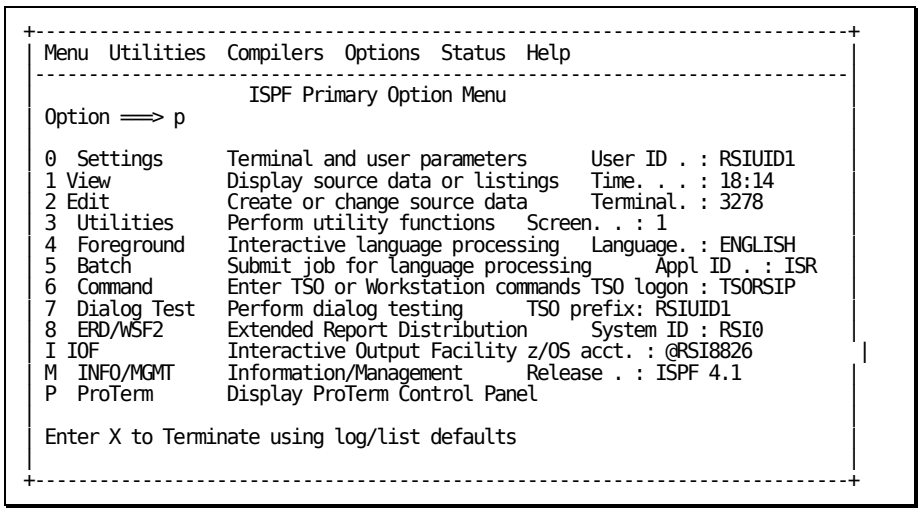
Selecting CA Enterprise Tester

When CA Enterprise Tester was installed at your installation, your system programmer chose one or more methods that you can use to access CA Enterprise Tester.

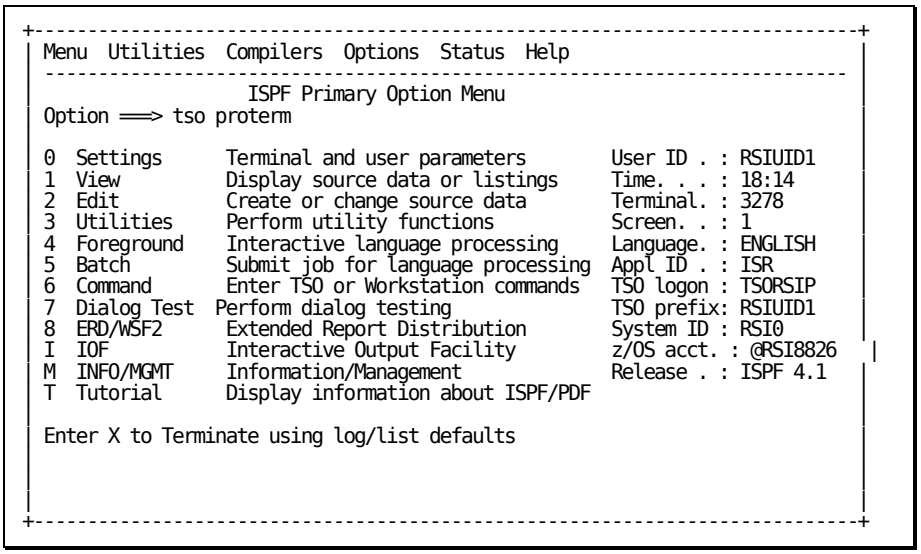
- "ProTerm" may have been added as an option on your ISPF/PDF PRIMARY OPTION MENU or another ISPF option selection menu available at your installation.
- CA Enterprise Tester may have been installed as an ISPF command, allowing you to access CA Enterprise Tester by entering the command, PROTERM, in the OPTION ===>or COMMAND ===> data entry area of any ISPF/PDF panel.
- A CLIST or REXX EXEC, named PROTERM, may have been installed, allowing you to access CA Enterprise Tester by entering PROTERM at ISPF/PDF option 6, or to enter TSO PROTERM in the command entry area of other ISPF/PDF panels.

To select CA Enterprise Tester

- If ProTerm appears as an option on your ISPF/PDF PRIMARY MENU, then enter the ProTerm option number and press Enter.



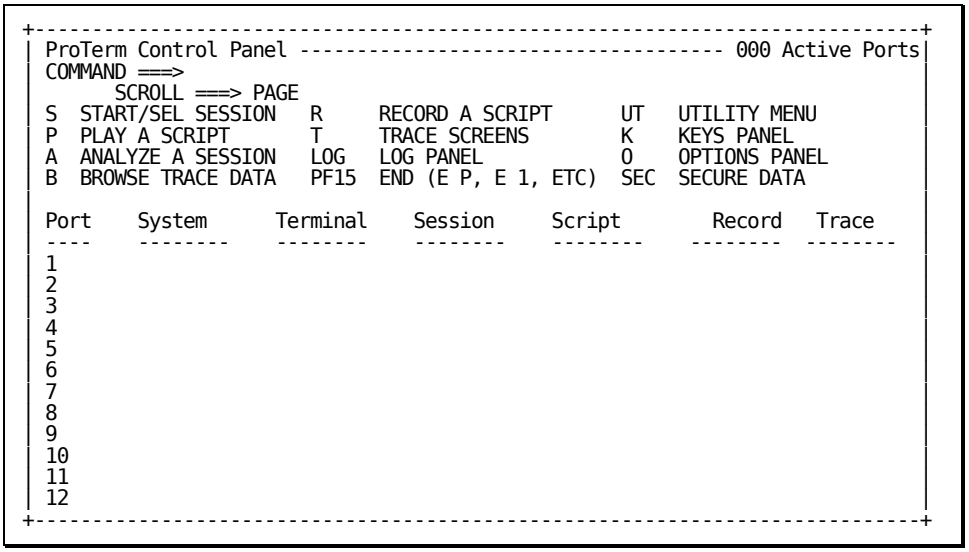
- If ProTerm is not displayed as a primary menu option, then try entering the command, PROTERM or TSO PROTERM, in the primary menu OPTION ===> data entry area and press Enter.



- If none of the methods described above result in the display of the ProTerm Control Panel, then ask the system programmer who installed CA Enterprise Tester how to access the application.

The ProTerm Control Panel

The following is an example of the Control Panel:



The CA Enterprise Tester Interactive System is an ISPF dialog. The Control Panel and most other CA Enterprise Tester panels conform to the ISPF standards and conventions with which you are already familiar.

- You can see that the Control Panel begins with a title line and provides standard ISPF COMMAND ===> and SCROLL ===> data entry areas.
- Like other ISPF dialogs, short messages are displayed at the right of the title line, and while short messages are displayed, long messages can be displayed on the third panel line by invoking HELP.
- A list of active commands follows standard panel fields. Each command is preceded by an abbreviation or PF key that can be used to enter the command. If an abbreviation or PF key does not preceded an option, the Enter key can be used to select the option. For example, the S that precedes the START/SEL SESSION command can be entered in the command field rather than the full command name. The highlighted command begins a phrase that describes the function of the command.
- The PF15 key has been assigned the END command. The list of characters that follow the END command are abbreviations of functions that can be entered following the END command to end a specific function.
- For example, E Tor e t can be entered to end all active session traces; E 2or e 2 can be entered to end all activity on port 2. CA Enterprise Tester considers lowercase and uppercase alpha characters to be equal when interpreting Interactive System commands.
- Another thing to know about the commands listed on the Control Panel and other CA Enterprise Tester panels, is that CA Enterprise Tester command lists are dynamic. Any command displayed is available at that moment in time. After starting CA Enterprise Tester functions, additional commands are displayed while they are appropriate.

The body of the ProTerm Control Panel is a scrollable list of "ports".

A port is a place to anchor a virtual terminal and keep track of CA Enterprise Tester functions such as sessions with online systems.

The Control Panel port list shows the status of CA Enterprise Tester functions that are active on each port.

A port can be used to start a session with an online system. The session can be recorded or traced. A CA Enterprise Tester script can be played on a port to automatically start a session or to automatically drive session activity on the port.

These functions can be started on each port in any combination and in any order that you want.

In addition to the functions which are related to an active session with an online system, you can also browse a trace data set or trace list on a port. The browse function will create a movie of a previously traced session, but will not actually create a live session.

CA Enterprise Tester session, play, analyze, record, trace, and browse functions are demonstrated in the exercises that follow.

PF Key Operation and Control

While using CA Enterprise Tester, PF keys are used to enter commands. CA Enterprise Tester PF key command assignments are maintained separately from your normal ISPF keys, allowing you to assign PF keys to CA Enterprise Tester commands without affecting the operation of the PF keys while using other ISPF dialogs.

As you can see on the Control Panel, the KEYS command, abbreviated K, can be entered to display the Keys Panel. (The KEYS command can be entered on most CA Enterprise Tester panels.)

To access the Keys Panel

Enter K in the Control Panel command data entry area and press the Enter key. The Keys Panel will be displayed.

```
+-------------------------------------------------------------------------------+
| ProTerm Keys Panel ----------------------------------------------------------|
| COMMAND ===>                                                                  |
|         ISPF     Window   Zoom              ISPF     Window     Zoom         |
| Key     Command  Command  Command    Key     Command  Command    Command      |
| ---     ------   ------ 1  ------ 2  ----    -------- ------ 1   ------ 2     |
| PF1  => HELP     PF1      PF1        PF13 => HELP     HELP      KEYS         |
| PF2  => SPLIT    PF2      PF2        PF14 => SPLIT              OPTIONS      |
| PF3  => END      PF3      PF3        PF15 => END      END       END          |
| PF4  => RETURN   PF4      PF4        PF16 => RETURN   CLEAR     CLEAR        |
| PF5  => RFIND    PF5      PF5        PF17 => RFIND    ZOOM      ZOOM         |
| PF6  => RCHANGE  PF6      PF6        PF18 => RCHANGE  ROLL      ROLL         |
| PF7  => UP       PF7      PF7        PF19 => UP       UP        UP           |
| PF8  => DOWN     PF8      PF8        PF20 => DOWN     DOWN      DOWN         |
| PF9  => SWAP     PF9      PF9        PF21 => SWAP               PA2          |
| PF10 => LEFT     PF10     PF10       PF22 => LEFT     REVIEW    REVIEW       |
| PF11 => RIGHT    PF11     PF11       PF23 => RIGHT    STEP      STEP         |
| PF12 => RETRIEVE PF12     PF12       PF24 => RETRIEVE VIEW      VIEW         |
| Assign ProTerm Commands to Window or Zoom PF keys or enter in COMMAND fields: |
| Analyze DOWN    Invite  Monitor  PF1-PF24  RESume   ROll   STEp   UP         |
| ATtn    End     Keys    Options  Play      RETURN   SECure STOp   UTility    |
| Browse  ERase   LEFT    PA1-PA3  Record    REView   Session TErminal View    |
| Clear   EXecute LOG     PEN      REPly     RIGHT    SPot   Trace    Zoom     |
|1 Window Commands override ISPF Commands if active at the panel displayed      |
|2 Zoom Commands are active while using fullscreen Zoom Mode session displays  |
+-------------------------------------------------------------------------------+
```

Notice the following things about the Keys Panel:

- The two columns labeled "Key" identify PF keys. The first Key column identifies the PF1 through PF12 keys. The second Key column identifies the PF13 through PF24 keys.
- Following each key column are three columns labeled "ISPF Command", "Window Command" and "Zoom Command". The values listed in these columns are the commands that are currently assigned to the indicated PF keys.

The terms "Zoom" and "Window" refer to the two ways CA Enterprise Tester presents screen images of session panels. "Zoom Mode" refers to a full-screen display of a session panel which will look just as though you were using online sessions the way you usually do.

The other way CA Enterprise Tester presents screen images is called "Window Mode". A CA Enterprise Tester Window Mode screen display provides three additional lines of data at the top of your screen: a panel title line, a standard TSO ISPF/ PDF command entry area, and a rule line separating the area from the "window" of your application.

- PF keys enter Window Commands when CA Enterprise Tester is displaying any CA Enterprise Tester ISPF panel, including an online system session screen display in Window Mode.
- PF keys enter Zoom Commands only while using a full-screen Zoom Mode session with an online system.
- PF keys enter ISPF Commands when a Window Command is not specified for a PF key, or when a specified Window Command is not active while using the panel currently displayed.

Notice that some PF keys are assigned to commands whose names are PF n where n is some number. PF key commands instruct CA Enterprise Tester to send the named PF key signal on to an online system being accessed via a CA Enterprise Tester session.

For example, maybe you have a "main menu" transaction in an online system which can always be invoked by pressing the PF6 key on your keyboard. We can assign the PF6 command to the PF6 PF key on your Keys Panel. Then when you are using CA Enterprise Tester to access that system, and you press the PF6 key on your keyboard, CA Enterprise Tester will see from your PF key assignment, that you want the PF6 key passed on to the online system. CA Enterprise Tester will pass on the PF6 to your system, and your system will process it, displaying the "main menu" transaction screen.

However, sometimes you want CA Enterprise Tester to execute other CA Enterprise Tester functions when you press a PF key, such as "REVIEW" so that you can view a previous screen image from the current session. If you assign the command, REVIEW to your PF22 key under your Keys Panel Window Command column, then when you are in a Window Mode display, and you press the PF22 key on your keyboard, CA Enterprise Tester will not send the PF22 to your online system. Instead, CA Enterprise Tester will execute the REVIEW command, and display the previous screen image.

Sometimes you can want CA Enterprise Tester to execute an ISPF/PDF function when you press a PF key, such as "SPLIT" to invoke an ISPF/PDF split-screen display. If you assign the command, SPLIT to your PF14 key under your Keys Panel ISPF Command column, then when you are in a Window Mode display, and you press the PF14 key on your keyboard, CA Enterprise Tester will not send the PF14 to your online system. Instead, CA Enterprise Tester will execute the SPLIT command, invoking the ISPF/PDF split-screen function. This will be demonstrated in subsequent exercises.

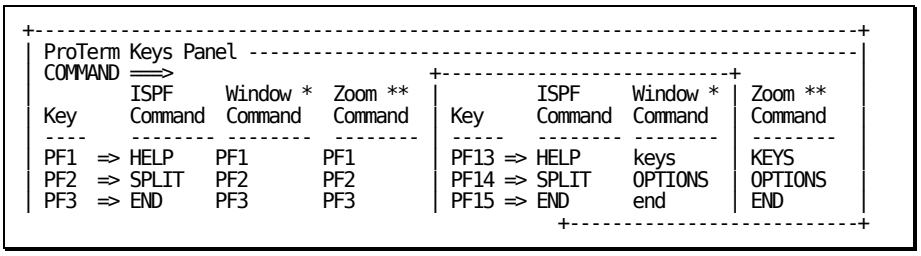
The commands listed at the bottom of the screen are CA Enterprise Tester commands, and can be assigned to any CA Enterprise Tester PF key for the display mode in which they are valid.

Note that the listed commands are displayed using dual case letters. The leading capital letters are an acceptable abbreviation of the command when the command is keyed manually into the COMMAND ===> data entry area of any CA Enterprise Tester panel.

The following exercise shows how to change PF keys and how the changed PF key works.

To change PF keys

1. In the previous Keys Panel example, note that the HELP command has been assigned to PF13 in the Window Command column.
2. Change the HELP command to the KEYS command.
3. Verify that the Window Command PF15 key is assigned the END command as illustrated in the outlined section of the Keys Panel in the next example.
4. Press the Enter key.
5. Press the PF15 key to enter the END command and to return to the Control Panel.



In the Control Panel command list, that the KEYS command is now preceded by "PF13", indicating that the PF13 key can be used to display the Keys Panel.

7. Press the PF13 key to enter the KEYS command and to display the Keys Panel.
8. In subsequent exercises, you will be instructed to press PF keys to accomplish certain tasks. Those exercises assume that your PF keys have been assigned to commands, as shown in the previous full-screen illustration of the Keys Panel.
9. Change your Keys Panel to match the full-screen Keys Panel illustration, so that subsequent exercises work as described.
10. Press the PF15 key to enter the END command and to return to the Control Panel.
11. After you have completed the tutorial, you can re-assign your CA Enterprise Tester PF keys if you wish.

CA Enterprise Tester Options

CA Enterprise Tester provides options that allow you to specify how CA Enterprise Tester is to perform certain tasks. The control of CA Enterprise Tester options works much like the control of CA Enterprise Tester PF keys. The OPTIONS command can be entered at most CA Enterprise Tester panels to display the first page of the Options Panel.

The Options Panel displays current option settings, which can be changed by keying desired values into panel fields. The END key can be used to return to the panel at which the OPTIONS command was entered. The DOWN command, (or the PF key to which you have assigned the DOWN command, probably PF20 if you are using standard keys), can be used to scroll to the second page of the display.

As you can see on the ProTerm Control Panel, the OPTIONS command, abbreviated O, can be entered to display the Options Panel.

To specify options

1. Enter O in the Control Panel command area and press the Enter key. The first page of the Options Panel will be displayed.

   The following is an example of each page of the Options Panel:

```
+-------------------------------------------------------------------------------+
| ProTerm Options Panel ------------------------------------------------------- |
| COMMAND ===>                                                 SCROLL ===> PAGE |
|                                                                               |
|  ENTER TO UPDATE      PF20 DOWN TO PAGE 2                                     |
|   PF15 END PANEL DISPLAY                                                      |
|                                                                               |
| Specify option values:                                                        |
|                                                                               |
|  Should SESSION command start sessions in Zoom Mode?  ===> YES  ( Yes or No ) |
|                                                                               |
|  Should active functions END on jump (=) or RETURN?   ===> NO   ( Yes or No ) |
|                                                                               |
|  Data set name prefix: N None, U ZUSER, P ZPREFIX     ===> U    ( N U or P ) |
|                                                                               |
|  Maximum number of session screens to save for REVIEW ===> 25   ( a number ) |
|                                                                               |
|  Maximum number of Monitor Panel Message Log lines    ===> 500  ( a number ) |
|                                                                               |
|  Delayed outbound message automatic INVITE interval   ===> 0030 ( ssth )     |
|                                                                               |
|  Step display time for session movies                 ===> 0200 ( ssth )      |
|                                                                               |
|  Should PLAY, ANALYZE and BROWSE start in Zoom Mode?  ===> NO   ( Yes or No ) |
+-------------------------------------------------------------------------------+
+-------------------------------------------------------------------------------+
| ProTerm Options Panel ------------------------------------------------------- |
| COMMAND ===>                                                 SCROLL ===> PAGE |
|                                                                               |
|       ENTER TO UPDATE      PF19 UP TO PAGE 1                                 |
|   PF15 END PANEL DISPLAY                                                      |
|                                                                               |
| Specify option values:                                                        |
|                                                                               |
|   TRACE, RECORD, LOG directory stats: I ISPF, N No    ===> I    ( I or N )    |
|                                                                               |
|  Should TRACE, RECORD, LOG protect existing data?     ===> YES  ( Yes or No ) |
|                                                                               |
|  Should THINK and WAIT times delay session movies?    ===> NO   ( Yes or No ) |
|                                                                               |
|  Should RESHOW (PA2) switch to Window Mode display?   ===> YES  ( Yes or No ) |
|                                                                               |
|  Should installation Select Exits be called?          ===> NO   ( Yes or No ) |
|                                                                               |
|  Should movies and reviews show free KB screens only? ===> YES  ( Yes or No ) |
|                                                                               |
+-------------------------------------------------------------------------------+
```

   At a later time, you should read the description of CA Enterprise Tester options contained in the CA Enterprise Tester Application Guide or in CA Enterprise Tester tutorials that are available by pressing the HELP key, (PF13).

The initial option settings shown on your Options Panel are assigned during CA Enterprise Tester installation. The exercises that follow assume that options have been set to certain values that can or can not be the same as the ones specified during your specific installation. The first and last option of the first Options Panel, which describe how CA Enterprise Tester should present screen image displays to you, are particularly important.

Remember, Zoom Mode refers to a full-screen display of a session panel which will look just as though you were using online sessions the way you usually do; CA Enterprise Tester Window Mode screen displays provide three additional lines of data at the top of your screen: a panel title line, a standard TSO ISPF/PDF command entry area, and a rule line separating the area from the "window" of your application.

Also, the option, "Step display time for session movies" will affect how long screen images are displayed when you are using CA Enterprise Tester functions which drive "movies" or automatically display session screen images without keyboard interaction from you.

This number should be at least 0200, (which represents 2 seconds), for your exercises. You can want to make it even larger, such as 0500, (five seconds), or even 1000, (ten seconds). You can change this option any time you wish to "speed up" or "slow down" the "movies".

2. If your Options Panels do not match the illustrations, change the option values to match the illustrated settings, so that subsequent exercises will work as described.
3. If or when your Options Panel settings match the illustration, press the PF15 key to enter the END command and to return to the Control Panel.

After you have completed the tutorial, you can set your options to meet your own specifications.

Chapter 2: CA Enterprise Tester Sessions

This chapter shows how to start and use CA Enterprise Tester sessions.

Starting and Using Sessions

This exercise shows how to start and use CA Enterprise Tester sessions. CA Enterprise Tester sessions can be started with CICS, IMS, TSO or any other VTAM based systems available at your installation. (Of course, you must have a valid user ID and password to access the system.)

Starting a Session

To start a session

1. If the Control Panel is not displayed, select ProTerm or enter the ProTerm command. Proceed when the Control Panel is displayed.

   A session can be started by entering the SESSION command, abbreviated S, in the Control Panel COMMAND ===> data entry area, followed by the name of an online system.

   For example, a session may be started with an online system named "CICS1" by

   entering the following command:

   ```
   COMMAND ===> s cics1 (and press the Enter key)
   ```

   If you enter a SESSION command that does not specify an online system name, then the System Menu is displayed. The System Menu is tailored at each installation to provide instructions and a list of available systems. Using the System Menu, a session is started by entering a system name or short system ID as instructed, and by pressing the Enter key.

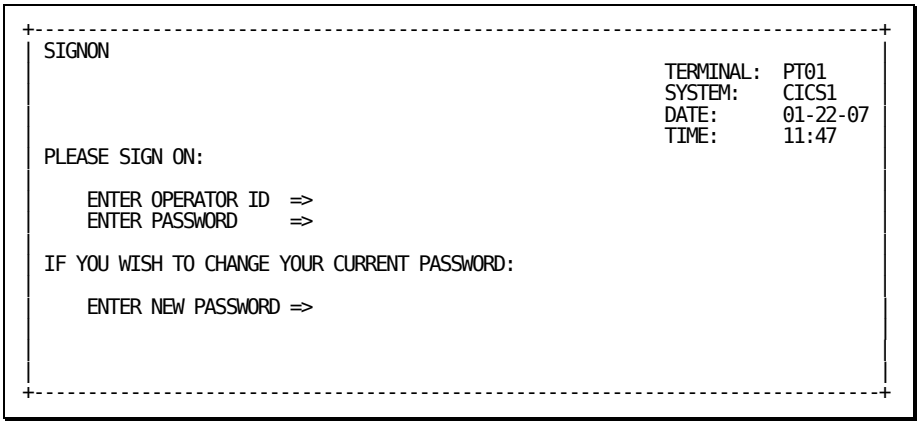
2. Enter a SESSION command to start a session with an online system with which you are familiar.

   When you start a session using CA Enterprise Tester, the session should

   begin with an initial online system display that is familiar to you.

   When a session is started, most online systems display a logo or a "sign on" panel that solicits the user to sign on.

As an example, when a session is started with our "CICS1" system, the following sign-on screen is displayed.



Your online system probably sends a panel with a similar purpose. Whatever initial display you receive, if you have set the option that controls the initial presentation of sessions that are started using the SESSION command to YES, as instructed in the options exercise, then the initial session display should be familiar to you.

3. At this time, perform whatever actions are normally performed at the beginning of a session with your online system. To sign on, enter your user ID and password as you normally do.

Using a Session

To use a session

1. Next, enter a few transactions of your choosing to see that the session behaves in a manner familiar to you.

   Remember that in the previous PF keys exercise, that PF1 through PF12 keys were assigned PF1 through PF12 commands, and that PF13 through PF24 commands were assigned to PF13 through PF24 keys.

   If you need to press a PF key to access a function of your online system, then use the low numbered PF keys. (If you need to use PF13 through PF24, then your Keys Panel may be tailored to pass needed keys through to your online system. If possible, try to avoid this during this exercise.)

   While using the full-screen session, the Clear key and the PA1 key should operate normally.

   While the session may appear to be an ordinary terminal session, there is one big difference. When you started the session with your online system, your TSO/ISPF session remained active.

2. To illustrate this, press the PF17 key to enter the ZOOM command.

   When the ZOOM key is pressed while viewing the initial CICS1 sign on screen, the screen will be displayed again and should look like the following example:

```
+-------------------------------------------------------------------------------+
| ProTerm Session(PT01/CICS1) ------------------------------------- Port 001 |
| COMMAND ===>                                                  SCROLL --=> PAGE |
|----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+---|
| SIGNON                                                                        |
|                                                          TERMINAL:  PT01      |
|                                                          SYSTEM:    CICS1     |
|                                                          DATE:      01-22-07  |
|                                                          TIME:      11:47     |
| PLEASE SIGN ON:                                                               |
|                                                                               |
|     ENTER OPERATOR ID  =>                                                     |
|     ENTER PASSWORD     =>                                                     |
|                                                                               |
| IF YOU WISH TO CHANGE YOUR CURRENT PASSWORD:                                  |
|                                                                               |
|     ENTER NEW PASSWORD =>                                                     |
|                                                                               |
+-------------------------------------------------------------------------------+
```

   When the ZOOM key is pressed, the full-screen session is re-displayed using the “ProTerm Session Panel” in Window Mode. Notice the following changes to the session display.

   - The online system display has been moved down three lines to make room for standard ISPF panel title, COMMAND ===> area and message lines.
   - In the panel title, the expression, “Session(PT01/CICS1)”, identifies the partners in a session. The session is between a terminal named "PT01" and an online system named "CICS1".
   - The terminal, "PT01" in the example, is the name of a "virtual terminal" and not the name of the real terminal being used to perform this exercise.
   - The body of the Session Panel is a window through which a portion of the virtual terminal screen being used for the session may be viewed.

   Because the Session Panel uses up three display lines, an entire online system display can not be viewed at once. Scroll commands may be entered in the COMMAND ===> area, or by using PF keys to view portions of the session screen.

3. Press the PF20 key or enter the DOWN command to display the bottom of the session screen.

4. Press the PF19 key or enter the UP command to display the top of the session screen.

   The ZOOM key may be used as a toggle switch to "zoom in" on a session, (Zoom Mode), and to re-display the session via the Session Panel, (Window Mode).

5. Press the PF17 key to enter the ZOOM command and to switch to the full-screen session display.
6. Press the PF17 key again to return to the Session Panel, or Window Mode display. (If a Zoom Mode PF key is not assigned to the ZOOM command, the PA2 key may be used to re-display a session in Window Mode.)

   While a session screen is not entirely visible when a session is being viewed in Window Mode, the session remains fully operational.

   When a command is NOT ENTERED in the COMMAND ===>area, the Enter key is used to send terminal input to the connected online system.
7. While the session is displayed in Window Mode, key in an online system request and press the Enter key to see that your online system responds normally.

   While the Session Panel is displayed, the PF keys are used to enter the "Window Commands" specified via the Keys Panel. When the PF keys were set up for this tutorial, PF1 through PF12commands for both Window and Zoom Mode session displays were assigned to PF1 through PF12 keys. As a result, the PF1 through PF12 keys may be used as ordinary PF keys to access online system PF key functions.
8. While viewing your session in Window Mode, press one of the low-numbered PF keys, or enter one of the commands, PF1 through PF12, into the Session Panel COMMAND ===> area to see that all online system PF key functions may be accessed while in Window Mode.
9. Remember while using Window Mode to view a session, that the high numbered PF keys, as set up for this tutorial, are used to enter CA Enterprise Tester and ISPF commands. For example, the UP, DOWN and ZOOM keys have already been used to scroll the session display and to "zoom in" on a session.

   The terminal keyboard Clear key is not supported by ISPF and therefore should not be used while using the CA Enterprise Tester Session Panel in Window Mode.

   If you press the Clear key while using an ISPF panel, you may be surprised by how the system responds. The screen will probably be cleared, and an error message might be displayed, along with "tso stars", *** . This is a harmless error. Simply press the PA2 key to refresh the display.

   Because the Clear key is meaningful to many online systems, CA Enterprise Tester provides a CLEAR command. For this tutorial, the CLEAR command was assigned to the PF16 key.

10. If the Clear key is meaningful to your online system, press the PF16 key or enter the CLEAR command into the Session panel COMMAND ===>area to see that a Clear key signal may be sent to an online system while using the Session panel.

    CA Enterprise Tester operates as an ISPF dialog while any CA Enterprise Tester ISPF panel is displayed, including the Session Panel. If you press the PA1 key while using an ISPF dialog, the dialog may be terminated. CA Enterprise Tester provides a PA1 command to allow you to send a PA1 key signal to an online system while using the Session Panel in Window Mode.

11. If your online system provides a PA1 key function, enter the PA1 command into the Window Mode Session Panel COMMAND ===> area and press the Enter key, to see that the online system responds normally. (The PA1 command may be assigned to a PF key via the Keys Panel.)

    Following TSO and ISPF convention, your PA2 key provides a "reshow" function. CA Enterprise Tester may respond to the PA2 key by re-displaying a session in Window Mode, depending on how the PA2 option was specified on the second page of the Options Panel.

    CA Enterprise Tester provides a PA2 command to allow you to send a PA2 key signal to an online system. The PA2 command may be entered via the Session Panel COMMAND ===> area in Window Mode, or may be assigned to a Window or Zoom Mode PF key.

12. If your online system provides a PA2 key function, enter the PA2 command into the Session Panel COMMAND ===> area in Window Mode, and press the Enter key to see that the online system responds normally.

Accessing Other Functions

While using an online system session in Window Mode, you not only have access to all functions provided by the online system, but you also have direct access to other CA Enterprise Tester functions and to all standard ISPF and ISPF/PDF functions. To demonstrate this, try the following procedure:

1. Press the PF13 key or enter the HELP command to display the ProTerm Tutorial. (The Tutorial provides documentation for all CA Enterprise Tester functions, commands and panels and provides a comprehensive index to give you a fast path to information. You will probably want to spend some time reviewing the contents after you have completed these exercises.)
2. Press the PF15 key to return to the Session Panel.
3. Enter the KEYS command, abbreviated k, to see that you may access the Keys Panel at any time.
4. Press the PF15 key to return to the Session Panel.
5. Enter the ISPF PFSHOW command to overlay the bottom portion of the session display with a PF key function display.

6. Enter the "PFSHOW OFF" command to restore the overlaid lines of the session display.
7. With the cursor positioned near the middle of the screen, press the PF14 key or enter the SPLIT command to obtain an ISPF split-screen. You may invoke any ISPF dialog on the bottom half of the split-screen, including CA Enterprise Tester.
8. With the cursor positioned on the CA Enterprise Tester half of the split-screen, press the PF17 key, (to which we assigned the ZOOM command), to "zoom in" on the online system session. Both halves of the ISPF split-screen are eliminated.
9. Press the PF17 key again to return to the ISPF Session Panel. Both halves of the ISPF split-screen are re-displayed.
10. With the cursor positioned on the ISPF part of the screen, (the part of the display that is not CA Enterprise Tester), enter the "=x" command to eliminate the split-screen.

    While using the Zoom Mode session presentation, you also have direct access to CA Enterprise Tester functions that have been assigned to Zoom Mode PF keys.

    For example, the previous Keys Panel exercise suggested that you assign the Zoom Mode PF13 key to the KEYS command, and that you assign the Zoom Mode PF15 key to the END command.
11. Press the PF17 key to enter the ZOOM command to display the session in Zoom Mode. This also activates the Zoom Commands.
12. Press the PF13 key to enter the KEYS command to display the Keys Panel.
13. Press the PF15 key to enter the END command to return to the Zoom Mode session presentation.
14. Press the PF15 key again to enter the END command again, to return to the Control Panel.

    The CA Enterprise Tester Control Panel shows the status of the session that remains active on port 1. Under the "Session" column, a statistic is displayed showing the total of session inputs and outputs that have occurred on the session.

    While viewing the Control Panel, you may start another session with the same or with another online system. The SESSION command, abbreviated S, may specify the name of the online system, or may specify only a port number, and when the Enter key is pressed, the System Menu will be displayed.

    The System Menu may be used to start a session on the specified port.

    The port number is also optional. If you do not specify a port number, CA Enterprise Tester will default to the next port number on which there is no active function.

When you are using one session, and multiple sessions are active, you may switch directly from one session to the next by entering the ROLL command. For this tutorial, the ROLL command was assigned to the PF18 key.

A SESSION command that specifies a port on which a session is already active, may be entered at the Control Panel to select the session for interactive use.

15. While viewing the Control Panel, select the active session on port 1 by entering the SESSION command:

    ```
    COMMAND ===> s 1  (and press the Enter key)
    ```

16. Using either a Zoom Mode or Window Mode display, terminate the session by entering any transactions that you normally use to end a session with your online system.

    When the session has ended, the Control Panel is re-displayed an shows that the

    session has ended.

    You may also end a session by entering the END SESSION command, abbreviated E S, in the Control Panel COMMAND ===> data entry area.

    Usually, this is a safe method to use to terminate session activity. We recommend, however, that you terminate active sessions using normal system termination procedures. Some systems may have software installed that depends on normal termination procedures to ensure that all terminal-related storage is properly released.

Chapter 3: Record Sessions

This chapter describes the CA Enterprise Tester session recording facility, which allows you to capture a CA Enterprise Tester session with an online system in the form of an executable CA Enterprise Tester script.

- Recording a Session
- Script Language Statements in a Recorded Script

Recording a Session

The CA Enterprise Tester session recording facility allows you to capture a CA Enterprise Tester session with an online system in the form of an executable CA Enterprise Tester script. When the script is executed, the recorded session events are automatically re-created. This exercise demonstrates how to record a session.

A session recording may be started prior to starting the session to be recorded to capture session start-up events, and may be ended after the recorded session has ended to capture session termination events.

A recording may also be started or ended at any time while a session is active to capture a segment of a session.

In this exercise, a script will be created that may be used to automatically start a session with a desired online system, sign on by entering a user ID and password required by the online system, then enter any transactions required to get to a desired online system "application menu". At that point, the script will end, leaving the session available for interactive use.

To record a script

1. While viewing the Control Panel, start a recording on port 1 by entering the RECORD command, abbreviated R or r:

   ```
   COMMAND ===> r 1 (and press the Enter key)
   ```

   When the RECORD command is entered, the Record Panel is displayed. The panel should look like the following example:

   ```
   +-------------------------------------------------------------------------------+
   | ProTerm Record Panel ------------------------------------------- Port 001 |
   | COMMAND ===>                                                                  |
   |                                                                               |
   |        ENTER TO START                                                         |
   |   PF15 END RECORD REQUEST                                                     |
   |                                                                               |
   | Specify target data set or data set and member:                               |
   |                                                                               |
   |   Data Set Name ===> 'UIDRS2.PROTERM.SCRIPT'                                  |
   |   Member Name   ===> VNDRADD ( Blank or pattern for member selection list )   |
   |                              ( Select codes: S Select, B Browse, E Edit )     |
   | Pack data?      ===> NO      ( Yes or No )                                    |
   |                                                                               |
   | Screen comments ===> 02      ( Record 0 - 43 screen rows before each TYPE )   |
   |                                                                               |
   | Protect target? ===> NO      ( Yes or No to replace data )                    |
   |                                                                               |
   | Share PDS?      ===> YES     ( Yes or No )                                    |
   |                                                                               |
   | Language        ===> PSL     ( PSL or REXX )                                  |
   |                                                                               |
   | Record data options:         ( Yes or No )                                    |
   |                                                                               |
   |   Delays?       ===> YES    MDT fields?  ===> NO                              |
   +-------------------------------------------------------------------------------+
   ```

   The Record Panel is used to specify the data set name and a member name, (if the data set is a PDS), to which the session recording is to be written.

   You may start a recording by following this procedure:

2. A default name of a PDS to use for your script library will be displayed in the data set name data entry area. Enter a meaningful name for your session start-up script into the "Member Name" data entry area:

   ```
   Data Set Name ===> 'userid.PROTERM.SCRIPT'Member Name ===> startses
   ```

   Note that the data set name is a fully qualified data set name surrounded by single quotes. But when we entered the member name, we did not surround it with quotes. This is a convention you should follow. Other ways to enter data set names using standard prefixes are described in the CA Enterprise Tester Application Guide section on Options and Controls.

3. The Pack data? option tells CA Enterprise Tester whether or not to store the script using ISPF packed data format. (This is really more important when you are creating large trace data sets which will be kept over a long period of time. The packed data format can save 80 per cent of the space required for unpacked data.)

4. The Screen comments option tells CA Enterprise Tester to include lines from the online screen image as comments in the script, providing automatic documentation. You may enter a number from 0to 43, depending on the size of your screens.
5. You may set the Protect target? option to YES. This means CA Enterprise Tester will warn you if you are using the same data set member name you have used before. If you set this option to NO, CA Enterprise Tester will write over existing data without warning you.
6. You may set the Share PDS? option to YES, indicating that others may write to the same PDS you are using at the "same" time you are using it. You may set it to NO, indicating no one else may write to the PDS while CA Enterprise Tester is recording the script.
7. Set the Language option to PSL. This means CA Enterprise Tester will capture a script using the CA Enterprise Tester Script Language. If you set this option to REXX, CA Enterprise Tester will capture a REXX exec, which may be executed using the CA Enterprise Tester Host Command Environment. (You should refer to the CA Enterprise Tester Application Guide for information on CA Enterprise Tester and REXX).
8. The Record data options tell CA Enterprise Tester whether or not to record certain types of data.
9. The Delays? option tells CA Enterprise Tester to capture the amount of time between the last response from the online system and the next time you press and Attention Identifier key, such as the Enter key or a PF key. This is sometimes called "user think time" and can be used to affect the speed at which the script is played later.
10. The MDT fields? option tells CA Enterprise Tester whether or not to capture all fields which have the Modified Data Tag (MDT) turned on or to only capture data which you have actually changed on the screen.
11. Press the Enter key to start the recording.

    After the recording has been started, the Control Panel is re-displayed.

    In the "Record" column of the Control Panel, a statistic or status message will be displayed for each port on which a recording is active. The data, "I/O 0", means the number of inputs and/or outputs, (I/O) or Script Language statements that have been written to the recording data set.
12. Start a session on port 1 by entering the SESSION command as described in the previous session exercise.
13. Sign on by entering user ID and password as required by your online system.

14. After signing on, enter whatever transactions are necessary to reach a desired online system menu, information display or any other display that it would be handy to reach automatically.

    The objective in this exercise is to create a script that will automatically do all of the repetitious, non-productive things that you must do at the start of a session before arriving at a display from which productive work may be done.

    The things to do at this point are the things that you wish the script to do automatically when a session is needed at a later time. When you have arrived at a desired initial point for a session, end the recording using the following procedure:

15. To end the recording, first get into Window Mode so that a command entry area is available. Either press the ZOOM PF key, (which should be PF17), or press the PA2 key.

16. Enter the END RECORD command:

    ```
    COMMAND ===> e r (and press the Enter key)
    ```

17. When the recording has ended, end the session. Use either the Window Mode session panel or Zoom Mode session display to enter whatever transactions are required to end the session.

    When the session has ended, the Control Panel is displayed. The Control Panel will show that the session has ended and that no CA Enterprise Tester functions are active.

Script Language Statements in a Recorded Script

A CA Enterprise Tester session recording is an executable script written in the CA Enterprise Tester Script Language. To see how easy it is to understand and to write CA Enterprise Tester scripts, you should use ISPF BROWSE to examine the session recording created in the previous exercise.

To examine a session recording

1. You may exit CA Enterprise Tester by pressing the END key, PF15, by entering the END command or by entering the ISPF jump command, "=1".
2. Alternatively, you may press the PF14 key to enter the SPLIT command and select the ISPF BROWSE option from the "ISPF/PDF PRIMARY OPTION MENU".
3. Browse the data set and member that was specified as the target for your session recording.

As an example, the session recording listed below was captured during the start of a session with a CICS system.

```
LOGON CICS1
      MODEL D4A32XX3 24X80 24X80 EXTDS
INVITE 1000                   /* WAIT FOR MESSAGE (BRACKET) */
INVITE 1000                   /* WAIT FOR MESSAGE (BRACKET) */
TYPE <11,29>  'rs2'
     <12,29>  TOKEN 'RS2A'
     <12,35>  ENTER
TYPE          CLEAR
TYPE <1,1>    'mail'
     <1,5>    ENTER
```

While the recording was active, the user started a session, signed on, pressed the Clear key, and entered the name of an electronic mail transaction. The recording was ended while the session was still active.

If the script is executed using the CA Enterprise Tester Interactive System Play Facility, the following things happen:

- The LOGON statement starts a session with an online system called "CICS1", using a "virtual terminal" with a 24 by 80 character screen and that supports 3270 extended color and highlighting, like the terminal used when the recording was created.
- Your script may have one or more INVITE statements. In our case, the first INVITE was recorded when CICS sent a query to determine virtual terminal device capabilities. The second INVITE was recorded when CICS sent the sign on screen. When the INVITE statements are executed, the script receives the equivalent messages on the session started when the LOGON statement is executed. The "1000" parameter gives CICS1 up to 10 seconds to send each message.
- The first TYPE statement enters the operator ID and password into the sign on screen and presses the Enter key. In the CA Enterprise Tester statements, expressions of the form, <rr,cc>represent the screen row and column where the data which follows was keyed, or the position of the cursor when the Enter key, (or other AID key), was pressed.

- The TOKEN keyword in the TYPE statement indicates that the following data is a “CA Enterprise Tester Token”. The token was created when CA Enterprise Tester recognized the entry of a password into a non-display screen field. The user ID of the person who entered the password was used to create the token. When the TYPE statement is executed, the token is interpreted using the user ID of the person executing the script. If someone else executes your script, your password will be incorrectly reconstructed. As a result, your password is secured and no one can use your script to sign on with your authorization.

  Note: CA Enterprise Tester provides more than one type of Security interface, so your script may include the keyword, CODE followed by an encoded password data item instead of a token. You may refer to the Application Guide sections on security to fully understand how CA Enterprise Tester works with your security system to protect your system resources.

  After receiving the online system response to the sign on transaction, the second TYPE statement presses the Clear key.

- The third TYPE statement enters the "mail" transaction and waits for the transaction to display the mail directory for the person currently signed on.
- The script ends after the last statement is executed, leaving the session readied for normal interactive use.

Recorded scripts employ only four, (or optionally, five if the Delays? Option was set to YES), of the many verbs supported by the CA Enterprise Tester Script Language. Recorded scripts may be modified to add intelligence or may be generalized so that they can be used by anyone or so that they use variable data rather than just the specific data entered during a recorded session. You may also use the Script Language to write complete scripts that create and drive planned online system sessions.

The *Application Guide* provides complete documentation of the CA Enterprise Tester Script Language, and provides many examples that show how CA Enterprise Tester scripts may be used to control production systems, automate manual tasks, perform online system stress tests, and to solve many other data processing problems.

Chapter 4: Playing CA Enterprise Tester Scripts

This chapter describes how to use the CA Enterprise Tester Interactive System Play Facility to execute recorded or user-written CA Enterprise Tester scripts.

- Playing a CA Enterprise Tester Script
- Quick Path Command Stack to Play a Scrip

Playing a CA Enterprise Tester Script

The CA Enterprise Tester Interactive System Play Facility may be used to execute recorded or user-written CA Enterprise Tester scripts. In this exercise, the Play Facility will be demonstrated by executing the "session start-up" script that was recorded during the previous exercise.

To play a CA Enterprise script

1. If you have exited CA Enterprise Tester, enter the "ProTerm" command or select ProTerm from an ISPF selection menu. Proceed when the Control Panel is displayed.
2. Play your session start-up script on port 1 by entering the PLAY command, abbreviated "p", into the Control Panel command field:

   ```
   COMMAND ===> p 1 (and press the Enter key)
   ```

When the PLAY command is entered, the Play Panel is displayed. The panel should look like the following example:

```
+-------------------------------------------------------------------------------+
| ProTerm Play Panel ------------------------------------------------ Port 001 |
| COMMAND ===>                                                                  |
|                                                                               |
|  ENTER TO VIEW I/O M   MONITOR EXECUTION  S    START SESSION                  |
|   PF23 STEP TO SCREEN 1 P   PLAY IN BACKGROUND  PF15 END PLAY REQUEST         |
|                                                                               |
| Specify data set containing the script to be played:                          |
|                                                                               |
|   Data Set Name ===> 'UIDRS2.PROTERM.SCRIPT'                                  |
|   Member Name   ===> VNDRMSTR ( Blank or pattern for member selection list )  |
|                              ( Select codes: S Select, B Browse, E Edit )     |
| Specify optional play options and script parms:                               |
|                                                                               |
|   EXEC PARM     ===> SYSID=CICST3                                             |
|                              ( ie., LIST,FLOW,variable=value,.. )             |
| Specify other script libraries containing linked to scripts:                  |
|                                                                               |
|   Library 1     ===> 'UIDRS2.PROTERM.SCRIPT'                                  |
|   Library 2     ===> 'APMSTR.PROTERM.SCRIPT'                                  |
|   Library 3     ===>                                                          |
|                                                                               |
| Delay Percent    ===> 100  ( Delay 0 - 999 percent of DELAY statement times ) |
| Think Time       ===> 0000 ( Add think time ssth before all TYPE statements ) |
| Number of Ports  ===> 1    ( 1 - 999 Use ports > 1 for system stress testing)  |
+-------------------------------------------------------------------------------+
```

In general, to play a script, enter the data set name and member name of the script to be played, and other optional parameters and script libraries into appropriate panel fields and press the Enter key. You may optionally enter one of the listed commands to specify how script execution is to proceed.

When you recorded the session start-up script in the previous exercise, the target data set and member name were remembered. Your Play Panel "Data Set Name" and "Member Name" fields should already be primed with the last script that you have recorded or played.

The commands listed on the Play Panel provide several ways to begin script execution. The various options support different uses of the Play Facility.

The START SESSION command, abbreviated s, is designed to start scripts like the session start-up script to be played here. When entered at the Play Panel, the START SESSION command instructs CA Enterprise Tester to play the specified script and to wait for the script to end. When the script has ended, any session started by the script is presented for interactive use.

3. Enter the START SESSION command into the Play Panel command area:

   ```
   COMMAND ===> s
   ```

4. If the data set and member name of the script that you want to play are not displayed, enter them.

5. Press the Enter key to execute the script.

   You should now be in session with the online system that was accessed when the script was recorded. Sign on and other recorded transaction activity should have been repeated and the terminal display should appear as it did when the recorded script was ended.

6. You may execute some transaction to see that a normal session has been started and readied automatically.

7. End the session by entering any transactions that are required to terminate a session with your online system.

Quick Path Command Stack to Play a Script

It is possible to invoke CA Enterprise Tester, and play a script without ever viewing a CA Enterprise Tester panel.

Assuming that CA Enterprise Tester has been installed as an ISPF command, and that your ISPF command delimiter is a semicolon, (see ISPF option 0.1), the following command may be entered into the command area of any ISPF/PDF panel to repeat all of the activity described in the previous exercise:

```
COMMAND ===> proterm;p 1;s cicsmail
```

By assigning one of your ISPF PF keys to this stack of commands, (see ISPF option 0.3), you may transfer directly from any ISPF/PDF panel, to a fully signed-on and readied online system session, using only a single keystroke.

Chapter 5: Tracing Session Screens

This chapter describes how to use the CA Enterprise Tester Session Trace Facility to capture screen images that document activity on a traced terminal session.

- Using the Trace Facility
- Images in a Session Trace

Using the Trace Facility

The CA Enterprise Tester Session Trace Facility allows you to capture screen images that document activity on a traced terminal session. When a session is traced, a screen image is written to a trace data set whenever terminal input is sent to an online system. A second screen image is written to the trace data set that shows the online system response. Optional trace formats support different uses of session traces.

- An image trace is quality documentation and may be printed. Using ISPF EDIT, traced screen images may be "cut and pasted" into other system documentation. All of the screen images contained in this document were produced using an image trace.
- A format trace may be used as input to a CA Enterprise Tester session analyzer. A session analyzer may be used to automate regression testing of online system software. session analyzer. An analyzer creates a new session, re-keys traced terminal inputs, and compares live online system responses to traced responses to identify session differences.

You may also use CA Enterprise Tester's Browse facility to view a session trace without actually re-creating a live system session. (You may have used the Browse facility earlier to view our CA Enterprise Tester demo.)

This exercise shows how to use the Trace Facility to capture session screen images.

A session trace may be started or ended before during or after a session is started or ended. In this exercise, a session trace will be started before starting the session to be traced and will be ended after ending the traced session. This will allow capture of an entire session including session initiation and termination events.

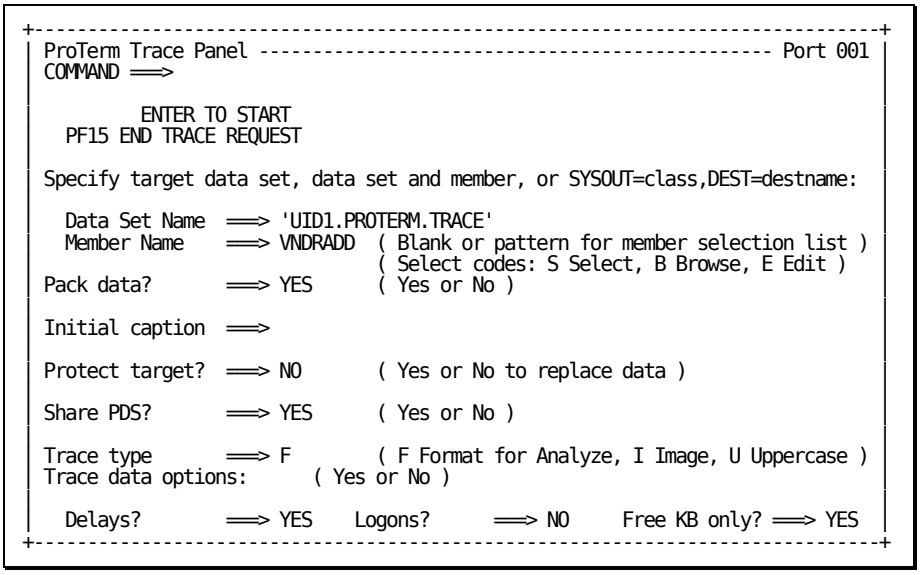
To start a session trace

You can start a session trace by following this procedure:

1. If the Control Panel is not displayed, select ProTerm or enter the "ProTerm" command. Proceed when the Control Panel is displayed.
2. Start a trace on port 1, by entering the TRACE command, abbreviated T, into the Control Panel command data entry area:

   ```
   COMMAND ===> t 1  (and press the Enter key)
   ```

   When the TRACE command is entered, the Trace Panel is displayed. The panel should look like the following example:



3. A default name of a PDS to use for your trace library will be displayed in the data set name data entry area. Enter a meaningful name for your trace into the Member Name data entry area:

   ```
   Data Set Name ===> 'userid.PROTERM.TRACE'Member Name ===> trace1
   ```

   Note that the data set name is a fully qualified data set name surrounded by single quotes. But when we entered the member name, we did not surround it with quotes.
4. The Pack data? option tells CA Enterprise Tester whether or not to store the script using ISPF packed data format. A packed trace typically requires less than 20% of the disk space required by a trace that is not packed. Packed traces appear to be normal data when accessed using ISPF/PDF BROWSE or EDIT or when processed by CA Enterprise Tester. An IMAGE trace that is to be printed should not be packed because most print utilities do not understand the ISPF packed data format.
5. You can optionally specify an initial caption to be included on the bottom border of traced screens.

6. You can set the Protect target? option to YES. This means CA Enterprise Tester will warn you if you are using the same data set member name you have used before. If you set this option to NO, CA Enterprise Tester will write over existing data without warning you.
7. You can set the Share PDS? option to YES, indicating that others may write to the same PDS you are using at the "same" time you are using it. You may set it to NO, indicating no one else may write to the PDS while CA Enterprise Tester is capturing the trace.
8. The Trace type option tells CA Enterprise Tester what type of trace to capture. A FORMAT trace contains attributes and other data needed to re-create a traced session automatically. The IMAGE and UPPER, (uppercase), options remove attributes and other data and the resulting trace can not be repeated automatically.
9. You should enter an F, indicating you want a format trace for this exercise.
   - The Trace data options tell CA Enterprise Tester whether or not to capture certain types of data.
   - The Delays? option tells CA Enterprise Tester to capture the amount of time between the last response from the online system and the next time you press and Attention Identifier key, such as the Enter key or a PF key.
   - The Logons? option tells CA Enterprise Tester whether or not to capture session logon data.
   - The Free KB only? option tells CA Enterprise Tester whether or not to capture only outbound screen images which free the keyboard.
10. Press the Enter key to start the trace.

    When the trace is started, the Control Panel is re-displayed.

    In the "Trace" column of the Control Panel, a statistic or status message will be displayed for each port on which a trace is active. The value "I/O 0" is a statistic indicating the number of screens that have been written to the trace data set.

    While a trace is active on a port, the port is monitored and screen images are written to the trace data set whenever session activity occurs on the port.
11. Start a session on port 1 by entering the START SESSION command in the same way that you did in previous exercises.
12. Sign on by entering user ID and password as required by your online system.

13. Now conduct a session by entering some transactions.

    So that the trace may be used later as input to a session analyzer try to limit your transactions to "list", "browse", or "inquiry" transactions that do not create or change data in any way. Then the session may be repeated, using the trace as input, and the system should respond in the same way as it did when you created the trace. This will allow "regression testing", without the need to set up or restore data.

    If you choose to do online system "add" or "update" transactions, you could undo what was done, using online system "delete" transactions. This would allow "add" transactions to work correctly when the session is repeated.

    During the session, invoke at least one transaction that displays time-of-day, so that you will be assured of at least one mismatch between the first and second session, when the session is repeated in the analyzer exercise which follows.

14. After doing several transactions, end the session by logging off using your normal procedure.

    When the session has ended, the Control Panel is re-displayed.

    The Control Panel shows that the session has ended and that the trace is still active.

15. End the trace on port 1 by entering the END TRACE command into the Control Panel command data entry area:

    ```
    COMMAND ===> e t 1  (and press the Enter key)
    ```

Images in a Session Trace

You should use ISPF BROWSE to examine the trace data set and note the following:

- A title line documents the trace type, "format". Information on the right half of the title line includes the online system name, "PLU", the virtual terminal name, "SLU", and characteristics of the virtual terminal that was used for the session.
- Screen images are enclosed in a border. The top border of each screen image identifies session partners, the direction in which a message was transmitted when the screen was traced, PF key or AID key used, and cursor position.
- A FORMAT trace contains all screen data including field attributes and non-display data. Field attributes and non-display data are not seen when a screen is viewed during a live session. Field attribute values are documented in the CA Enterprise Tester Application Guide.

- If the 3270 extended data stream was used for a session, an "extended attribute buffer" is traced following the screen buffer. An extended attribute buffer contains extended color, highlighting and other attributes that apply to corresponding positions in the screen buffer.
- While browsing a trace, you may use the TSO FIND command, "f step(", and the REPEAT FIND PF key, (usually PF5 or PF17), to find subsequent screen images.
- When you get to the screen where you entered your password, note that the actual password does not appear in the trace, but instead has been replaced according to the active security options selected when CA Enterprise Tester was installed in your system. CA Enterprise Tester's security features permit CA Enterprise Tester applications to use procedures which may include passwords, but ensure that actual passwords are protected.

Chapter 6: Starting a Script Log

This chapter describes how to start a log to capture CA Enterprise Tester messages and information logged by a script in a dataset.

Starting a Script Log

When CA Enterprise Tester scripts are executed in batch, CA Enterprise Tester messages and information logged by a script are written to a log data set for subsequent review. By default, when CA Enterprise Tester scripts are played using the CA Enterprise Tester Interactive System, CA Enterprise Tester messages and information logged by a script are not written to a data set. Instead messages are kept in a temporary log in memory and may be viewed interactively when problems occur or a script pauses to display messages.

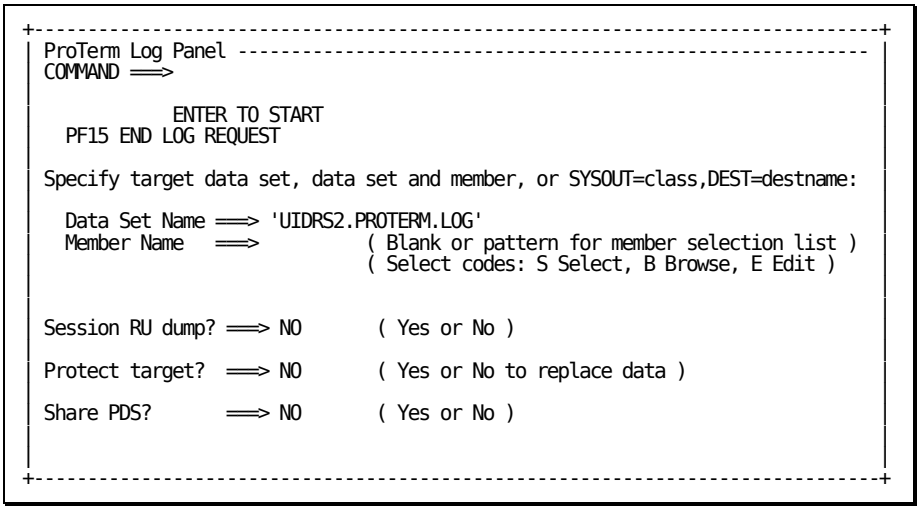
When CA Enterprise Tester scripts are played interactively a log must be started to capture CA Enterprise Tester messages and information logged by a script, in a data set. In this exercise, a log will be started to capture test results reported by the session analyzer used in the following exercise to perform regression testing interactively.

To start a script log

1. Select ProTerm from an option menu or by entering the "ProTerm" command. Continue when the Control Panel is displayed.
2. Enter the LOG command at the Control Panel to display the Log Panel.

```
COMMAND ===> log  (and press the Enter key)
```

The Log Panel will display.



3. A Data Set Name is displayed that will be created for you automatically the first time you start a log. Enter Member Name to which logged data is to be written.
4. Set the Session RU dump? option to NO. The Request Unit dump feature is a diagnostic aid that documents session data streams at the lowest level.
5. Set the Protect Target? option to NO. This means CA Enterprise Tester will not warn you if you are using the same data set name you have used before. If you set this option to YES, CA Enterprise Tester will warn you before writing over existing data. (Usually, system logs are written to the same data set, over and over. You may, however, choose whatever method of maintaining log data sets that you wish.)
6. When the Share PDS? is set to yes, multiple users may log data to the same PDS. Enter either yes or no.
7. Press the Enter key to start the log.

   When the log is started, the Control Panel is re-displayed. If a script or session analyzer is executed while a log is active, CA Enterprise Tester messages and information logged by the script is written to both the log data set and to the Monitor Panel message log.

Chapter 7: Analyzing Traced Sessions

This chapter shows how to use a CA Enterprise Tester session analyzer to perform automatic regression testing of online system software.

Analyzing a Traced Session

This exercise shows how to use a CA Enterprise Tester session analyzer to perform automatic regression testing of online system software.

- A regression test is a test of online system software that is performed after changing an online system or application to verify that the software continues to operate correctly or to identify differences in online system responses to similar terminal requests.
- A session analyzer is a CA Enterprise Tester script that reads traced screens, re-keys input data on a new live session, and compares live online system responses to traced online system responses to detect differences.

In this exercise, a session analyzer will be used to re-create the session that was traced in the previous exercise.

To analyze a Trace session

1. Begin by selecting ProTerm from an option menu or by entering the "ProTerm" command. Continue when the Control Panel is displayed.
2. Enter the ANALYZE command, abbreviated A, to display the Analyze Panel on port 1:

```
COMMAND ===> a 1  (and press the Enter key)
```

The Analyze Panel should look like the following example:

```
+-------------------------------------------------------------------------------+
| ProTerm Analyze Panel ------------------------------------------- Port 001 |
| COMMAND ===>                                                                  |
|                                                                               |
|        ENTER TO VIEW I/O    PF15 END ANALYZE REQUEST  K    KEYS PANEL        |
|   PF23 STEP TO SCREEN 1 LOG  LOG PANEL O    OPTIONS PANEL                     |
|                                                                               |
| Specify trace data set or trace list data set to be analyzed:                 |
|                                                                               |
|   Data Set Name   ===> 'UID1.PROTERM.TRACE'                                   |
|   Member Name     ===> VENDRADD ( Blank or pattern for member selection list ) |
|                                 ( Select codes: S Select, B Browse, E Edit )  |
| Specify Script Library to access private session analyzer scripts: **         |
|                                                                               |
|   Script Library  ===> 'UID1.PROTERM.SCRIPT'                                  |
|   Mask Script     ===> MASKAP   ( * or pattern for member selection list )    |
|                                                                               |
|                                                                               |
|                                                                               |
|   Analyzer Script ===> PTESAFE  ( PTESAFE  Fast Fixed Event Session Analyzer ) |
|                                 ( PTESAVE  Timed Variable Event Analyzer )    |
|                                 ( PTESAVED Delayed Variable Event Analyzer )  |
|                                 ( Blank or pattern for member selection list ) |
|                                                                               |
| ** Script Library is searched before PTE.R310.SCRIPT                          |
+-------------------------------------------------------------------------------+
```

The Analyze Panel is used to start the analysis of a previously traced session.

The request panel contains a field that is used to specify the input to the session analyzer. The input may be a trace data set that contains a complete traced session, like the trace that was created in the previous exercise.

Another type of input, a "trace list", may also be specified. Trace lists allow you to structure traced sessions for easy maintenance and improved flexibility, allow you to use scripts to start sessions and manage user ID's and passwords, and support other options that allow you to tailor and control session analyzer processing.

Additional information about trace lists may be accessed by pressing the PF13 key to invoke HELP, and by selecting the "Analyzing Sessions" topic, or may be found in the CA Enterprise Tester Application Guide. In this exercise, the input to the session analyzer will be the trace data set created in the previous exercise.

The request panel provides optional fields that are used to identify a script library and a "mask" script. A mask script is a user-written script that has knowledge of the online applications being tested and that identifies dates, times and other selected data that is to be ignored when particular traced screen images are compared to corresponding live session screens.

Because we do not yet know what to mask, a mask script will not be used during this exercise. However, this exercise will show how to obtain the information needed to use masking and how to write a mask script that will be used in a subsequent exercise to automatically skip insignificant session mismatches.

The request panel contains a field that may be used to specify the session analyzer to be used. The session analyzers listed on the Analyze Panel use different analyzer synchronization options. PTESAFE may be used to analyze sessions that respond predictably at maximum speed. PTESAVE and PTESAVED use synchronization options that allow session that may respond unpredictably to be analyzed reliably by allowing time for an unpredictable system to respond.

After keying in required and optional information, you could press the Enter key to instruct the session analyzer to analyze an entire traced session automatically, stopping only when unresolved mismatches are detected. However, if the session were analyzed automatically, many screens would flash by, and you would not have an opportunity to read the descriptions, provided below, of the events as they occur.

Optionally, you may use the STEP key, (the PF key to which you have assigned the STEP command, which is PF23 by default), to instruct the session analyzer to re-key one traced input screen or to compare one online system response each time the STEP key is pressed. This exercise uses the STEP key to start the session analyzer and to continue following mismatches, so that you have an unlimited amount of time to examine the resulting displays and to try out the controls available while analyzing sessions interactively.

Press the PF23 key to enter the STEP command.

Assuming that your online system sends a sign-on message, (and barring errors, such as your online system is not available, etc.), pressing the STEP key displayed the initial screen sent by your online system. The session screen is presented using the Session Step Panel in Window Mode, which appears much like the Session Panel.

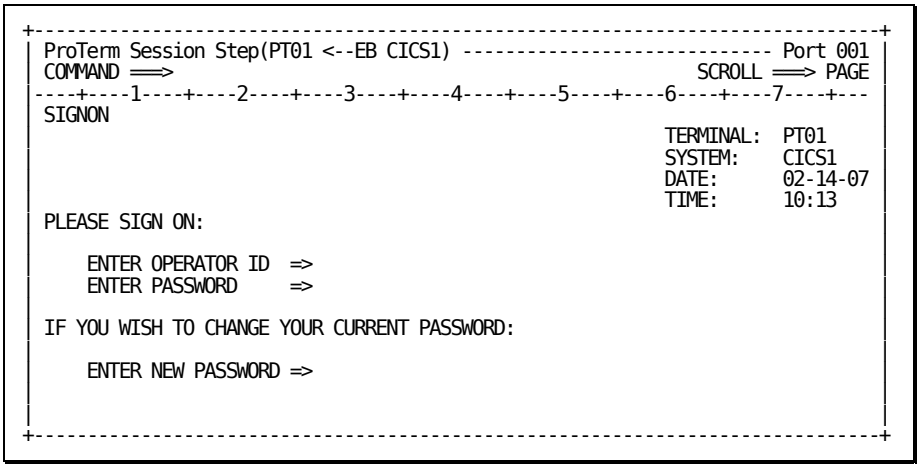
The Session Step Panel is explained later. First, here is what happened when the STEP key was pressed at the Analyze Panel:

- The STEP key started the session analyzer.
- The session analyzer read the first screen image contained in the trace data set specified on the Analyze Panel.

- Using information obtained from the trace data set, the session analyzer started a new session with the system that was being used when the trace data set was created.
- If your online system begins a session by sending a sign-on screen, then the first screen image read from the trace data set was an image of the sign-on screen, showing that the screen was sent from the online system to the terminal. Seeing this, the session analyzer anticipated and received the sign-on screen on the newly created session.

Upon receiving the initial sign-on screen from the online system, which represents the first session step, the `STEP` command completed and the session analyzer stopped, after displaying the session step using the Session Step Panel.

For example, our CICS1 system sent a sign-on prompt that was displayed via the Session Step Panel:



The Session Step Panel title contains information that distinguishes a session step display from a session screen that has been presented for interactive use via the Session Panel.

- The panel title identifies the display as a "ProTerm Session Step".
- In the panel title, the expression, (PT01 <--EB CICS1), means that the display represents the session screen image as it appears just after receiving the message from CICS1 at virtual terminal PT01.
- The arrow indicates the direction of the message. (The "EB" means that the message included an "End Bracket" indicator. End Bracket unlocks the terminal keyboard and allows subsequent session messages to flow in either direction.)

A Session Step display is not for interactive use. Rather, a Session Step display allows you to view a session event that was created by the session analyzer. Each Session Step display shows the session screen as it appears just after receiving a message from an online system or just before sending a re-keyed terminal input to an online system.

The display mode initially used when a session step is presented by a session analyzer, is an option on the Options Panel. If you specify that sessions started by scripts are to be initially presented in Zoom Mode, then the full terminal screen is used to present a session step, rather than the Session Step Panel displayed in Window Mode.

While viewing a session step display, you may re-display the session step using the full terminal screen and then return to the Window Mode display using the same commands that are used to switch display modes when a session is being used interactively.

- Press the PF17 key to enter the ZOOM command.
- Press the PF17 key again to return to Window Mode, displaying the Session Step Panel.
- You may also use UP and DOWN scroll keys, (PF19 and PF20 unless you have changed the system defaults), to display portions of the virtual terminal screen within the Session Step Panel window.
- While viewing the session step via the Session Step Panel, press the PF23 key to enter the STEP command.

When the session analyzer is resumed by pressing the STEP key, following the display of a session step that represents a message that was sent by an online system to a virtual terminal, the live screen image is compared to the corresponding screen image that is read from the trace data set.

The next display depends on whether the compared screens match or mismatch.

If the screens match, the session analyzer reads the next screen image from the trace data set. The screen image that follows an outbound session step will most likely be a terminal input screen. When a screen image is read that represents a terminal input, the session analyzer re-keys input field data from the traced screen image into corresponding fields of the live session screen.

After re-keying input data, and before sending the terminal input to the online system, the `STEP` command completes, and the inbound session step is displayed using the Session Step Panel.

An inbound session step display looks much like an outbound session step display. The first three lines of an inbound session step display might look like the following example:

```
+-------------------------------------------------------------------------------+
| ProTerm Session Step(PT01 ENTER--> CICS1) ----------------------- Port 001 |
| COMMAND ===>                                                  SCROLL ===> PAGE |
|----+----1----+----2----+----3----+----4----+---5----+----6----+----7----+---|
```

The following information is provided in the panel title:

- The panel title identifies the display as a ProTerm Session Step.
- In the panel title, the expression, (PT01 ENTER--> CICS1), means that displayed terminal input is about to be sent from virtual terminal PT01 to an online system named CICS1.
- The arrow indicates the direction of the message.
- The input will be sent using the Enter Key, which was used when the traced input screen was captured.

Each time the STEP key is pressed, the next screen image read from trace data set will be re-keyed or will be compared to an online system response, until a response is received that does not match the corresponding trace data set response screen.

When a mismatch is found, the analyzer logs messages that identify the location of mismatching screen data and that show the live session and trace screen data that does not match. After logging messages that describe all differences for a pair of compared screens, and after displaying the Monitor Panel, the session analyzer stops. The Monitor Panel Message Log contains all mismatch messages logged by the session analyzer.

The CICS1 sign-on screen used in this example, contains current date and time fields. Because the trace data set contains time stamps that were current when the session was traced, and because the online system displays the current time when the session is re-created, a mismatch occurred in our example, when the STEP key was pressed following the display of the CICS1 sign-on screen.

The Monitor Panel and Message Log should look similar to the following example:

```
+------------------------------------------------------------------------------+
| ProTerm Monitor - Session(PT01/CICS1) ---------------------------- Port 001|
| COMMAND ===>                                                                 |
|                                                          SCROLL ===> CSR     |
|   PF24 VIEW UNTIL STOP/END  RES  RESUME /P/A/R/T      PF15 END /P/A/R/T/L    |
|   PF23 STEP TO I/O OR STOP  S    SELECT SESSION       LOG  LOG PANEL         |
|   PF22 REVIEW /S/T EX   EXECUTE 'STATEMENT'  K        KEYS PANEL             |
|                                                                              |
| Script Status --------------------- 243 Statements executed; Session I/O 0/1|
|   SCRIPT IS STOPPED                                                          |
| Next Script Line ------------------------------------------- Line number 455|
|      exit /* continue session analysis when script is resumed */             |
| Message Log ------------------------------------------------ Log line 23 of 30|
|   Screen 1 mismatch 1 found at row 5, column 62 (trace=10:27:24.61):         |
|      TRACE data   "10:27 "                                                   |
|      SESSION data "12:13 "                                                   |
|                                                                              |
|                                                                              |
|   REVIEW, then ROLL to visually compare full SESSION and TRACE screens.      |
|   STEP, VIEW or RESUME to analyze next TRACE screen.                         |
|   PTE10150 - SCRIPT PAUSE, AWAITING INTERACTIVE SYSTEM COMMAND               |
| Stop Conditions ------------------------------------ ( Enter stops or all ) |
|   Script Verbs      ===>                                                     |
|   Statement Labels  ===>                                                     |
|   Statement Numbers ===>                                                     |
+------------------------------------------------------------------------------+
```

If a mismatch has not yet been encountered on the session that you are analyzing, continue to press the STEP key until the Monitor Panel is displayed. (When your trace data set was being created in the previous exercise, it was suggested that at least one application be accessed that displays current time, so that a session mismatch is assured. This exercise assumes that a session mismatch will be found.)

The Monitor Panel provides information and controls that support session analyzers and a variety of other CA Enterprise Tester applications.

- The Monitor Panel command list shows only commands that are active given the current status of CA Enterprise Tester functions that are active on the port being used. Some of the commands listed were designed for other applications of the Monitor Panel and will not be used during this demonstration of the session analyzer.
- As previously mentioned, a session analyzer is a CA Enterprise Tester script. The Monitor Panel shows the status of the script, the script statement that will be executed next when the session analyzer is resumed, and other information. This information is of greater significance when the Monitor is used to debug user-written scripts, and may be
- The Monitor Panel "Message Log" is used by the session analyzer to present mismatch messages and messages that describe other problems. After all trace data has been processed, completion messages and statistics are also displayed using the Monitor Panel Message Log.

Recently logged messages are added to the bottom of the log, pushing older messages up and off of the screen. The log display is automatically positioned at the bottom of the log each time the Monitor Panel is displayed, to describe a mismatch or other problem. The log is scrollable. The UP and DOWN keys, (probably PF19 and PF20), may be used to view older or more recent messages or to view all mismatch messages that have been logged for a pair of compared screens.

All messages logged by the session analyzer are numbered by screen within session, and mismatch message within screen.

- The "Stop Conditions" section of the Monitor Panel is applicable to debugging user-written scripts, and may be ignored while using the session analyzer.

When the Monitor Panel is displayed while analyzing a session, pay particular attention to the messages displayed in the Message Log. In the Monitor Panel illustration above, the logged messages identify a single mismatch that was found while comparing the first pair of online system responses. The messages identify the row and column of the mismatching data and show the trace and live session data that was found at the indicated screen location.

- Press the PF19 key to enter the UP command, to see that the Message Log is scrollable, and to view any other mismatch messages that may precede the last logged message.
- Press the PF20 key to enter the DOWN command and to scroll back to the bottom of the Message Log.
- In addition to mismatch messages, other messages are logged that suggest actions that may be taken to further analyze a session mismatch. While stopped at a mismatch, the REVIEW and ROLL keys, (probably PF22 and PF18, unless you changed the defaults), may be used to view and visually compare the full session and trace screen images.
- While viewing session mismatch messages at the Monitor Panel, press the PF22 key to enter the REVIEW command.

When the REVIEW command is entered, the most recent session screen is presented using the Session Review Panel:

```
+------------------------------------------------------------------------------+
| ProTerm Session Review(-1, PT01 <--EB CICS1) ---------------------- Port 001|
| COMMAND ===>                                                 SCROLL ===> PAGE |
|----+----1----+----2----+----3----+----4----+----5----+----6----+----7---+---|
| SIGNON                                                                       |
|                                                        TERMINAL:  PT01       |
|                                                        SYSTEM:    CICS1      |
|                                                        DATE:      02-14-07   |
|                                                        TIME:      10:13      |
| PLEASE SIGN ON:                                                              |
|                                                                              |
|     ENTER OPERATOR ID  =>                                                    |
|     ENTER PASSWORD     =>                                                    |
|                                                                              |
| IF YOU WISH TO CHANGE YOUR CURRENT PASSWORD:                                 |
|                                                                              |
|     ENTER NEW PASSWORD =>                                                    |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+
```

The Session Review Panel title contains information that distinguishes a review screen from an interactive session display and from a session step display.

- The panel title identifies the display as a "ProTerm Session Review".
- In the panel title, the expression, (-1, PT01 <--EB CICS1) describes the session step being reviewed. "-1" indicates that the display is the most recent session step. The reviewed session step shows the screen image as it appeared following the receipt of a message from CICS1.

While reviewing a session screen, the ROLL command may be used to display the corresponding trace review screen.

Press the PF18 key to enter the ROLL command, and to display the traced screen image that corresponds to the session review screen currently displayed.

The traced screen image is presented using the Trace Review Panel.

For example, the Trace Review Panel showing the CICS1 sign-on screen, would look like the following example:

```
+------------------------------------------------------------------------------+
| ProTerm Trace Review(-1, PT01 <--EB CICS1) ---------------------- Port 001 |
| COMMAND ===>                                                  SCROLL ===> PAGE |
|---+----1----+----2----+----3----+----4----+----5----+----6----+----7----+---|
| SIGNON                                                                       |
|                                                        TERMINAL:  PT01       |
|                                                        SYSTEM:    CICS1      |
|                                                        DATE:      02-14-07   |
|                                                        TIME:       9:27      |
| PLEASE SIGN ON:                                                              |
|                                                                              |
|     ENTER OPERATOR ID  =>                                                    |
|     ENTER PASSWORD     =>                                                    |
|                                                                              |
| IF YOU WISH TO CHANGE YOUR CURRENT PASSWORD:                                 |
|                                                                              |
|     ENTER NEW PASSWORD =>                                                    |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+
```

The Trace Review Panel looks much like other panels that are used to display screen images. The panel title distinguishes the display from other types of session displays.

- The panel title identifies the display as a "ProTerm Trace Review".
- In the panel title, the expression, (-1, PT01 <--EB CICS1), describes the traced session step being reviewed. "-1" indicates that the display is the most recent screen image read from the trace data set.
- The remaining information identifies session partners and shows the direction of the last message transmitted prior to capturing the traced screen image.

While the session analyzer is stopped at a session mismatch, the "–1" Session Review screen and the "–1" Trace Review screen, are the screen images that were being compared when the most recent session mismatch was detected.

While viewing either the Trace Review screen or a Session Review screen, the ROLL command may be used to switch to the corresponding review screen.

- Press the PF18 key several times to enter the ROLL command several times. All mismatching screen fields will change at the same place on the screen, making it easy to see the differences.
- Press the PF17 key to enter the ZOOM command, to re-display the review screen that you are viewing using the full terminal screen.

- Press the PF18 key several times to enter the ROLL command several times. REVIEW, ROLL, STEP, and ZOOM functions work using either session display mode, provided that both Window and Zoom PF keys have been assigned to the commands.
- Press the PF17 key to toggle back to Window Mode.

While reviewing session or trace screen images, the REVIEW key may be pressed to view older session or trace screen images.

The number of most recent session and trace review screens that are saved for review may be specified using the Option Panel.

Older review screens are numbered relative to the current session screen, (for example, the -3 screen is older than the -2 screen, and so on).

While viewing any session or trace review screen, the ROLL key may be used to toggle to the corresponding trace or session review screen.

Writing Scripts that Mask Mismatches

Masking may be used to automatically skip insignificant mismatches like current time displays. When you encounter a time mismatch, use the following procedure to create a mask script that will be used in a subsequent exercise.

To create a mask script

1. While viewing a time mismatch at the Monitor Panel, enter the REVIEW command or key to get to a Session or Trace Review Panel.
2. If the panel is displayed using the full-screen Zoom Mode display, press the ZOOM key, PF17, to toggle to a Window Mode display. mode.
3. In the command field, key in the SPOT command, then move the cursor to the first position of the time-of-day field, as shown in the following example:

```
+-------------------------------------------------------------------------------+
| ProTerm Session Review(-1, PT01 <--EB CICS1) ---------------------- Port 001 |
| COMMAND ===> spot                                          SCROLL ===> PAGE |
|----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----|
| SIGNON                                                                        |
|                                                      TERMINAL:  PT01          |
|                                                      SYSTEM:    CICS1         |
|                                                      DATE:      02-14-07      |
|                                                      TIME:      10:13         |
|                                                                 A             |
|                                                                 |             |
|                                                               cursor          |
```

4. Press the Enter key.

   When the Enter key is pressed, the cursor location, relative to the virtual terminal screen is displayed in the short message area at the right of the panel title line.

For example, the SPOT command response shown in the following example states that the cursor is positioned at row 5, column 62 of the virtual terminal screen:

```
+-------------------------------------------------------------------------------+
| ProTerm Session Review(-1, PT01 <--EB CICS1) --------------- Cursor at <5,62> |
| COMMAND ===> spot                                             SCROLL ===> PAGE |
|----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----|
| SIGNON                                                                        |
|                                                                               |
|                                                        TERMINAL:  PT01        |
|                                                        SYSTEM:    CICS1       |
|                                                        DATE:      02-14-07    |
|                                                        TIME:      10:13       |
|                                                                   A           |
|                                                                   |           |
|                                                                 cursor        |
```

5. Examine the application display, and choose a displayed constant value, like a title or transaction ID, that may be used to identify the displayed application screen. In our example, the word "SIGNON" appears at row 1, column 2 of the sign-on panel, and may be used to distinguish the sign-on panel from other application displays. You may use the SPOT command to find the location of any displayed data.
6. Enter the SPLIT command by pressing the PF14 key.
7. Use ISPF EDIT to create a member in your script data set, (userid.PROTERM.SCRIPT), called "MASK1".
8. Write a mask script that is similar to the script illustrated below, however, use the display identifier, time field location, and a time field format that fits your application display.

```
|                                                                               |
| . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  |
| EDIT ---- userid.PROTERM.SCRIPT(MASK1) ---------------------- COLUMNS 001 072 |
| COMMAND ===>                                                  SCROLL ===> CSR |
|****** ***************************** TOP OF DATA ******************************|
| 000001          if <1 1 80> contains 'signon'                                 |
| 000002          then                                                          |
| 000003             mask <5 62> 'zn:nn'                                        |
| 000004          endif                                                         |
|****** **************************** BOTTOM OF DATA ****************************|
|                                                                               |
```

Script statements must be coded in columns 2 through 72.

The script statement in the example can be interpreted:

". . . if the data, 'signon' is displayed anywhere on line 1 of the screen display, then the data at row 5, column 62, is to be masked if the data displayed at that location conforms to the picture 'zn:nn', where 'z' may be a blank or a number (leading zeros may be suppressed in a time display), and each 'n' must be a number."

Special symbols in a picture must match the corresponding display data. Complete documentation of the Script Language IF and MASK statements may be found in the *CA Enterprise Tester Application Guide*.

You may optionally leave your "MASK1" script displayed on the bottom half of the split-screen, and add additional script statements that mask other fields that cause insignificant mismatches to occur. The mask script created here will be used in a subsequent exercise to automatically skip selected mismatches.

Resuming and Ending Session Analyzers

While stopped at a mismatch and while using the live session, a review panel, or the Monitor Panel, a session mismatch may be ignored and the session analysis may be resumed by pressing the STEP key.

Eventually, when all screen images contained in the trace data set have been processed, a message stating the fact, and session statistics are displayed via the Monitor Panel.

```
+-------------------------------------------------------------------------------+
| ProTerm Monitor - Session(N/A) ---------------------------------- Port 001 |
| COMMAND ===>                                                                  |
|                                                          SCROLL ===> PAGE     |
|   PF24 VIEW UNTIL STOP/END  RES  RESUME /P/A/R/T      LOG  LOG PANEL         |
|   PF23 STEP SCREEN/SCRIPT  EX   EXECUTE 'STATEMENT'   K    KEYS PANEL        |
|   PF22 REVIEW /S/T    PF15 END /P/A/R/T/L             O    OPTIONS PANEL     |
|                                                                               |
| Script Status ---------------------------------- 12659 Statements executed |
|   SCRIPT IS STOPPED                                                           |
| Next Script Line ------------------------------------------- Line number 215 |
|      end  /* end session analysis when script is resumed */                   |
| Message Log ------------------------------------------------ Log line 132 of 139 |
|   --> All trace data processed.  Session analysis ended.                      |
|       12 screens rekeyed.                                                     |
|       13 screens compared.                                                    |
|       2 session screens contained mismatching data.                           |
|       0 rekeying errors encountered.                                          |
|                                                                               |
|   STEP again to end test.  You may REVIEW session screens before ending.      |
|   PTE10150 - SCRIPT PAUSE, AWAITING INTERACTIVE SYSTEM COMMAND                |
| Stop Conditions ------------------------------------- ( Enter stops or all ) |
|   Script Verbs       ===>                                                     |
|   Statement Labels   ===>                                                     |
|   Statement Numbers  ===>                                                     |
+-------------------------------------------------------------------------------+
```

To review and end a session analyzer

1. Press the PF23 key to enter the STEP command, until the Monitor Panel is displayed, showing that all trace data has been processed.
2. If additional mismatches are encountered, use the REVIEW, ROLL and ZOOM keys to compare mismatching screens, as desired, and use the STEP key to advance to the end of the session being analyzed.

   In the statistics displayed after processing all trace data, you may notice that more screens were compared than were re-keyed. This occurs because the online system sent a message at the beginning of the session, however, nothing was entered on the session to cause that display. In addition, some online systems send more than one display in response to a single terminal input. This would explain a difference greater than one.

3. Press the PF23 key to enter the STEP command.

   When the STEP key is pressed after all trace data has been processed, the session

   analyzer is terminated and the Control Panel is displayed.

   If you encounter an irresolvable problem while analyzing a session, you may terminate the session analyzer at any time by entering the END ANALYZE command, abbreviated E A (or e a).

   The command may be entered at any point in the session and at any session display panel or at the Monitor Panel. If you end an analysis prematurely, it may be necessary to manually terminate the active session, either by selecting the session and entering transactions that are normally used to end a session, or by entering the END SESSION command, abbreviated E S, (or e s).

   The Control Panel is displayed when the session analyzer and any session used by the session analyzer has ended.

4. At the Control Panel, enter the END LOG command, abbreviated E L, (or e l), to close the log data set.
5. Use ISPF BROWSE to browse the member created in your "userid.PROTERM.LOG" data set.

Session analyzers may also be executed using batch jobs to perform regression testing automatically in an unattended mode. Traced session data is processed in exactly the same way whether a session analyzer is used interactively or executed in batch, except that in batch, a session analyzer can not interact with a terminal user and continues or ends processing following response mismatches or other problems depending on specified event handling options. The regression test results reported in the CA Enterprise Tester log data set by a session analyzer executed in batch provides exactly the same information about mismatches and problems that is reported by a session analyzer when it is used interactively.

Regression Testing in the CA Enterprise Tester Application Guide, provides complete information about CA Enterprise Tester regression testing capabilities and session analyzers.

Chapter 8: Using a Session Analyzer with Masking

This chapter describes how to use a mask script to skip masked mismatches, and how to use the VIEW command to analyze the entire session automatically, stopping only when unmasked mismatches are found.

Using a Session Analyzer with Masking

In the previous exercise, a CA Enterprise Tester session analyzer, PTESAFE, was used to analyze a session. The STEP key was used to manually step through the session, so that time was available to describe the panels and commands that are used to analyze sessions.

In this exercise the trace that was used as input to the session analyzer in the previous exercise, will be analyzed again. However, this time, the mask script created in the previous exercise will be used to skip masked mismatches and the VIEW command will be used to analyze the entire session automatically, stopping only when unmasked mismatches are found.

To use a Session Analyzer with masking

1. At the Control Panel, enter the command, "a 1", to display the Analyze Panel for port 1.
2. At the Analyze Panel, verify the trace data set and member name, key in the name of your "userid.PROTERM.SCRIPT" library and "MASK1" script, (created in the previous exercise), and verify that the session analyzer to be used is PTESAFE, as shown in the following example:

```
+-------------------------------------------------------------------------------+
| ProTerm Analyze Panel ------------------------------------------- Port 001 |
| COMMAND ===>                                                                  |
|                                                                               |
|  ENTER TO VIEW I/O    PF15 END ANALYZE REQUEST  K    KEYS PANEL               |
|   PF23 STEP TO SCREEN 1 LOG  LOG PANEL 0    OPTIONS PANEL                    |
|                                                                               |
| Specify trace data set or trace list data set to be analyzed:                 |
|                                                                               |
|   Data Set Name   ===> 'userid.PROTERM.TRACE'                                 |
|   Member Name     ===> trace1  ( Blank or pattern for member selection list )  |
|                                ( Select codes: S Select, B Browse, E Edit )   |
| Specify Script Library to access private session analyzer scripts: **         |
|                                                                               |
|   Script Library  ===> 'userid.PROTERM.SCRIPT'                                |
|   Mask Script     ===> mask1    ( * or pattern for member selection list )     |
|                                                                               |
|                                                                               |
|                                                                               |
|  Analyzer Script ===> PTESAFE  ( PTESAFE  Fast Fixed Event Session Analyzer ) |
|                                ( PTESAVE  Timed Variable Event Analyzer )     |
|                                ( PTESAVED Delayed Variable Event Analyzer )   |
|                                ( Blank or pattern for member selection list )  |
|                                                                               |
| ** Script Library is searched before PTE.R310.SCRIPT                          |
+-------------------------------------------------------------------------------+
```

3. Press the Enter key to start the session analyzer.

   When the Enter key is used to start a session analyzer, and a command is not specified, the VIEW command is assumed.

   The VIEW command instructs a session analyzer to start a session, re-key traced terminal input and to compare live online system responses automatically, stopping only when an unresolved mismatch is found.

   The effect is a session "movie". (To learn about creating a "movie" without using a live online system session, you should refer to Chapter 10, Using the Browse Facility.)

   Two options on the Options Panel control the movie. The "session 'movie' step display time" option may be used to control the speed of the movie by specifying the amount of time that inbound or outbound screens are to be displayed before automatically comparing responses or before re-keying the next terminal input. Another option controls the session display mode that is initially used to present sessions that are started by CA Enterprise Tester scripts, and may be used to specify that session steps are to be displayed using the Session Panel in Window Mode or are to be displayed using the full-screen Zoom Mode display.

If your "MASK1" script contained statements that mask all response mismatches, then the session will proceed automatically and stop at the Monitor Panel when all traced screens have been processed.

4. If all mismatches were not masked, then the session analyzer will stop and display the Monitor Panel when an unmasked mismatch is found. If unmasked mismatches are encountered, you may use the Monitor Panel and REVIEW and ROLL commands to view mismatch messages and mismatching screens.
5. If a mismatch occurs that you think should have been masked by your "MASK1" script, then you may use the SPOT command to verify the location of the mismatch data and the screen data that was used in your script to identify a screen.
6. You may use the ISPF SPLIT command and EDIT to verify or correct your "MASK1" script.
7. After stopping at a mismatch, you may resume the session movie by pressing the PF24 key to enter the VIEW command.
8. When you have arrived at the Monitor Panel, after processing all trace data, you may press the PF24 key to enter the VIEW command, and to end the session analyzer.

Chapter 9: Using the Browse Facility

This chapter explains how to use the trace browse function to demonstrate an application without affecting the performance of the online system or changing any of the data accessed by the system.

Using the Browse Facility

In previous exercises, a CA Enterprise Tester session analyzer, PTESAFE, was used to analyze a session re-created from a trace data set. In executing a session analyzer, another live online session was created, and the results from the current session were compared with screen images in the trace data set. Any mismatches were reported. The Browse Facility will create a "movie" of a previously captured session trace without creating another live online system session. You may use the trace browse function to demonstrate an application without affecting the performance of the online system or changing any of the data accessed by the system. In this exercise the trace that was used as input to the session analyzer in the previous exercise, will be used again. However, this time, no analysis will be performed, and no online session will be re-created.

To use the Browse Facility

1. At the Control Panel, enter the command, b 1, to display the Browse Panel for port 1. If you do not enter a port number, CA Enterprise Tester will default to the next available port.
2. At the Browse Panel, enter the trace data set and member name.
3. Key in T for the Responses Option.

4. You should key E in the Attribute Option if your terminal supports extended 3270 attributes such as color, otherwise you should key in B.

```
+-------------------------------------------------------------------------------+
| ProTerm Browse Panel ------------------------------------------- Port 001 |
| COMMAND ===>                                                                  |
|                                                                               |
|  ENTER TO VIEW I/O L   LOCATE SCREEN # K    KEYS PANEL                        |
|   PF23 STEP TO SCREEN 1     PF15 END BROWSE REQUEST  0    OPTIONS PANEL       |
|                                                                               |
| Specify trace data set or trace list data set to be browsed:                  |
|                                                                               |
|   Data Set Name ===>                                                          |
|   Member Name   ===>          ( Blank or pattern for member selection list )  |
|                               ( Select codes: S Select, B Browse, E Edit )    |
| Specify response screens to be displayed (input is always displayed):         |
|                                                                               |
|   Responses     ===> A        ( A All responses )                             |
|                               ( F all responses that Free keyboard )          |
|                               ( T final Transaction responses only )          |
|                                                                               |
| If your device and data support color, specify Zoom Mode attributes:          |
|                                                                               |
|   Attributes    ===> E        ( E Extended attributes, B Basic )              |
|                                                                               |
+-------------------------------------------------------------------------------+
```

5. Press the STEP key, (probably PF23), to start the trace browse. (When the Enter key is pressed, the VIEW command is used to initiate the browse and will produce a continuous "movie".) The first screen image will be displayed and the browse is stopped, freeing the keyboard for further input or commands.

If the browse is initiated in Window Mode, or Window Mode is invoked with the ZOOM command or key, the Session Browse Panel will be displayed, as illustrated in the following example:

```
+-------------------------------------------------------------------------------+
| ProTerm Session Browse(7, PT01 <--CD CICS) ---------------------- Port 001 |
| COMMAND ===>                                                 SCROLL ===> CSR  |
|---+----1----+----2----+----3----+----4--- RS1.TRACE.PDS(CICSTRC3)11:34:09:17|
| S DA(HFTRFILE) ENABLED                                                        |
| STATUS:  RESULTS - OVERTYPE TO MODIFY                                         |
|  Dat(HFTRFILE) Vsa Clo Ena Rea Upd Add Bro Del   Sha NORMAL                   |
|     Obj( CICS.HFTR.FILE )                                                     |
+-------------------------------------------------------------------------------+
```

In the previous example, the Session Browse Panel displays the following information:

- The title of the panel, followed by an open parenthesis, (.
- The number of the browse panel relative to this simulated session, 7.
- The virtual terminal id used when the session was traced, PT01.
- The direction of transmission, <--CD, indicating it is an outbound screen image, and that the message contained a change direction indicator.
- An inbound screen image displays the AID key which initiated the transaction preceding the directional arrow, for example, ENTER -->.

- The name of the online system used by the session, CICS, followed by a close parenthesis.
- The current port on which the browse is displayed, Port 001.
- The name of the trace or trace list data set and the time stamp of the original session displayed on the scale line:

```
. . . 3----+----4--- RS1.TRACE.PDS(CICSTRC3) 11:34:09:17
```

CA Enterprise Tester commands available at the Session Browse Panel include those listed below. You will find PF key command assignments particularly useful when moving through browse screen image displays. You should enter each one of the commands to become familiar with how each one executes from a Session Browse Panel.

To use commands in the Browse Facility

1. The STEP command, abbreviated STE, by default assigned to PF23, may be used to advance the browse a single session step display. An optional number of session steps may be entered.
2. The REVIEW command, abbreviated REV, by default assigned to PF22, may be used to display a prior session step. An optional number of session steps may be entered.
3. The virtual terminal screen image scroll commands, UP, DOWN, RIGHT, and LEFT, by default assigned to PF19, PF20, PF21, and PF22, may be used to view areas of the trace data set screen images which may not be displayed in the window you are viewing.
4. The END command, abbreviated E, by default assigned to PF15, may be entered to return to the Control Panel. The END command, entered at the Session Browse Panel, will not end the browse. You may select the browse again by entering the BROWSE command, abbreviated B port, from the Control Panel.
5. The OPTIONS command, abbreviated O, may be used to display the Options Panel.
6. The KEYS command, abbreviated K, may be used to display the Keys Panel.
7. Enter the LOCATE command, abbreviated L, and a screen number. CA Enterprise Tester will display the specified screen image.
8. Enter the VIEW command, abbreviated V, by default assigned to PF24. The browse “movie” is displayed without freeing the terminal keyboard.
9. A “step display time interval” may be specified on the Options Panel to determine how long each screen image will be displayed on the terminal. When the browse has completed, the last browse screen image will be displayed.

10. Enter the END command. This will take you back to the Control Panel.
11. From the Control Panel, you may select the browse again, or you may end the browse by entering an END BROWSE port command.