iWay

iWay Emulation Adapter (3270/5250) User's Guide
Version 5 Release 5

Updated for J2EE CA 1.5

DN3501487.0305

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Preface

This documentation describes how to install, configure, and use the iWay Emulation Adapter (3270/5250). It is intended for system administrators who are responsible for planning an enterprise software environment.

How This Manual Is Organized

The following table lists the numbers and titles of the chapters and appendix for this manual with a brief description of the contents of each chapter and the appendix.

Chapter		Contents
1	Introducing the iWay Emulation Adapter (3270/5250)	Provides an overview of the iWay Emulation Adapter (3270/5250) and describes how to install it.
2	Remote Procedure Call Mode	Describes how to use the iWay Emulation Adapter (3270/5250) in RPC mode.
3	Developing Applications Using Emulation and Recorder Modes	Describes how to use the iWay Emulation Adapter (3270/5250) in Emulation and Recorder modes when developing a Telnet application.
4	Using Web Mode (Optional)	Describes how to use the iWay Emulation Adapter (3270/5250) in Web mode.
A	Emulator Keyboard Mapping	Describes how your keyboard maps to 3270/5250 keys when you use the emulator.

Documentation Conventions

The following table lists and describes the conventions that apply in this manual.

Convention	Description
`THIS TYPEFACE` or `this typeface`	Denotes syntax that you must enter exactly as shown.
`this typeface`	Represents a placeholder (or variable) in syntax for a value that you or the system must supply.
`underscore`	Indicates a default setting.
this typeface	Represents a placeholder (or variable) in a text paragraph, a cross-reference, or an important term.
this typeface	Highlights a file name or command in a text paragraph that must be lowercase.
this typeface	Indicates a button, menu item, or dialog box option you can click or select.
Key + Key	Indicates keys that you must press simultaneously.
`{ }`	Indicates two or three choices; type one of them, not the braces.
`|`	Separates mutually exclusive choices in syntax. Type one of them, not the symbol.
`...`	Indicates that you can enter a parameter multiple times. Type only the parameter, not the ellipsis points (…).
`.` `.` `.`	Indicates that there are (or could be) intervening or additional commands.

Related Publications

Visit our World Wide Web site, http://www.iwaysoftware.com, to view a current listing of our publications and to place an order. You can also contact the Publications Order Department at (800) 969-4636.

Customer Support

Do you have questions about iWay Emulation Adapter (3270/5250)?

If you bought the product from a vendor other than iWay Software, contact your distributor.

If you bought the product directly from iWay Software, call Information Builders Customer Support Service (CSS) at (800) 736-6130 or (212) 736-6130. Customer Support Consultants are available Monday through Friday between 8:00 a.m. and 8:00 p.m. EST to address all your iWay Emulation Adapter (3270/5250) questions. Information Builders consultants can also give you general guidance regarding product capabilities and documentation. Please be ready to provide your six-digit site code (*xxxx.xx*) when you call.

You can also access support services electronically, 24 hours a day, with InfoResponse Online. InfoResponse Online is accessible through our World Wide Web site, http://www.informationbuilders.com. It connects you to the tracking system and known-problem database at the Information Builders support center. Registered users can open, update, and view the status of cases in the tracking system and read descriptions of reported software issues. New users can register immediately for this service. The technical support section of www.informationbuilders.com also provides usage techniques, diagnostic tips, and answers to frequently asked questions.

To learn about the full range of available support services, ask your Information Builders representative about InfoResponse Online, or call (800) 969-INFO.

Help Us to Serve You Better

To help our consultants answer your questions effectively, please be prepared to provide specifications and sample files and to answer questions about errors and problems.

The following tables list the specifications our consultants require.

Platform	
Operating System	
OS Version	
Product List	
Adapters	

Platform	
Adapter Deployment	For example, JCA or Business Services Engine.
Container Version	

The following table lists components. Specify the version in the column provided.

Component	**Version**
iWay Adapter	
EIS (DBMS/APP)	
HOTFIX / Service Pack	

The following table lists the types of Application Explorer. Specify the version (and platform, if different than listed previously) in the columns provided.

Application Explorer Type	**Version**	**Platform**
Swing		
Servlet		
ASP		

In the following table, specify the JVM version and vendor in the columns provided.

Version	**Vendor**

The following table lists additional questions to help us serve you better.

Request/Question	**Error/Problem Details or Information**
Provide usage scenarios or summarize the application that produces the problem.	
Did this happen previously?	

Request/Question	**Error/Problem Details or Information**
Can you reproduce this problem consistently?	
Any **change in the application environment**: software configuration, EIS/ database configuration, application, and so forth?	
Under what circumstance does the problem *not* occur?	
Describe the **steps** to reproduce the problem.	
Describe the **problem**.	
Specify the **error** message(s).	

The following table lists error/problem files that might be applicable.

XML schema
XML instances
Other input documents (transformation)
Error screen shots
Error output files
Trace and log files
Log transaction

User Feedback

In an effort to produce effective documentation, the Documentation Services staff welcomes your opinions regarding this manual. Please use the Reader Comments form at the end of this manual to communicate suggestions for improving this publication or to alert us to corrections. You also can go to our Web site, http://www.iwaysoftware.com and use the Documentation Feedback form.

Thank you, in advance, for your comments.

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Interested in technical assistance for your implementation? Our Professional Services department provides expert design, systems architecture, implementation, and project management services for all your business integration projects. For information, visit our World Wide Web site, http://www.iwaysoftware.com.

Contents

CHAPTER 1

Introducing the iWay Emulation Adapter (3270/5250)

Topics:

- Integrating Mainframe Logic
- Installing the iWay Emulation Adapter Client Components

The iWay Emulation Adapter (3270/5250) enables you to invoke mainframe applications from non-mainframe environments, such as UNIX and Windows, without modifying anything on the mainframe. It enables you to make logic and data associated with legacy mainframe programs available to a new generation of applications.You also can replace green-screen displays with sophisticated user interfaces.

The adapter emulates IBM 3270/5250 terminals and enables you to integrate legacy mainframe applications, including those hosted by IBM z/OS and OS/400 systems.

Note: In the past, the iWay Emulation Adapter (3270/5250) also was referred to as the iWay Adapter for Telnet, iWay Adapter for Terminal Emulation, and the iWay Adapter for 3270/5250.

Integrating Mainframe Logic

Telnet is a standard protocol for remote login over the Internet. The name is an abbreviation of Telecommunications Network. When a user establishes a Telnet connection to a remote mainframe computer, the user's local system emulates a terminal connected directly to the mainframe.

The iWay Emulation Adapter (3270/5250) emulates IBM 3270/5250 terminals and adds "screen scraper" functionality. A screen scraper intercepts character-based data from a mainframe application to a terminal and passes the data to either a:

- User through a more sophisticated graphical user interface (GUI), such as a Web page.
- Client application, in order to automate interaction between the mainframe application and the client application.

Define the type of emulation you want using the Telnet Designer.

You can use the adapter in several ways when developing and running applications that access a mainframe:

- **RPC mode.** In a production environment, your application can communicate with a mainframe session using files. The application sends keystrokes to the mainframe in an XML request document, and the mainframe returns screen data in an XML response document. You can use these documents to integrate a mainframe session into your application. This is called RPC (remote procedure call) mode.

  RPC mode is described in Chapter 2, *Remote Procedure Call Mode*.
- **Emulation mode.** During development, you can access a mainframe session directly from your workstation using the Telnet Designer, which displays standard 3270/5250 screens. This is called Emulation mode and is described in Chapter 3, *Developing Applications Using Emulation and Recorder Modes*.
- **Recorder mode.** During development, you can record interaction with a mainframe and later play it back to simulate a live mainframe session. Simulating a session enables you to develop an application offline. You can simulate a Web mode connection or an RPC mode connection. This simulation is called Recorder mode and is described in Chapter 3, *Developing Applications Using Emulation and Recorder Modes*.
- **Web mode (Optional).** In a production environment, you can provide an application user at a Web browser with live access to the mainframe. You can modify the appearance of the mainframe screens in the browser to create a common look-and-feel and to expand the functionality of your online application. This is called Web mode and is described in Chapter 4, *Using Web Mode (Optional)*. For more information on the Web mode option, consult your iWay Software representative.

You can choose to convert terminal display characteristics to the Web using a default mapping, using your own customized template, or using JavaServer Pages™ (JSP). JSP also enables you to modify the flow and logic of the mainframe screens.

Installing the iWay Emulation Adapter Client Components

The iWay Emulation Adapter (3270/5250) links new business applications to mainframe-based business logic through IBM 3270/5250 terminal screens and data streams. It enables you to transform your 3270/5250 mainframe screens into HTML pages or to create a remote procedure request (RPC) to transform the output of screens into an answer set. The adapter provides a simple, lightweight, and scalable way to reuse the business logic and data of terminal applications.

The iWay Emulation Adapter (3270/5250) requires client components that you must configure after installing iWay 5.5. The two client components are:

- The **run-time component**, which is supported on:
  - Microsoft Windows 2000 with SP2 and Windows 2003.
  - UNIX.
  - OS/390 and z/OS (under UNIX System Services (USS)).
- The **Telnet Designer**, which is supported on:
  - Microsoft Windows 2000 with SP2.
  - Windows 2003.
  - Windows XP SP1.

UNIX note: if you plan to run the Emulation Adapter on a UNIX system, you must install iWay 5.5 and the Emulation Adapter client components on the UNIX system and *also* install the adapter client components on a Windows system. This enables you to use the Telnet Designer, which is supported on Windows only.

The iWay Emulation Adapter requires client components, including the Telnet Designer, that must be configured after installing iWay 5.5.

Procedure: How to Install the iWay Emulation Adapter Client Components on Windows

To configure the client components on Windows:

1. Run the following utility installed with iWay 5.5:

   ```
   C:\Program Files\iway55\etc\setup\iwtnwin32
   ```

2. Follow the installation windows to install the adapter client components.

Procedure: How to Install the iWay Emulation Adapter Client Components on UNIX

To configure the client components on Linux:

1. Navigate to the following directory:

   ```
   $IWAY55/etc/setup
   ```

2. Use chmod to ensure the installation utility is executable. The name of the utility varies depending on your platform, for example:

   ```
   chmod 555iwtnlinux.bin
   ```

   Note: If this file does not appear for your platform, download the current version from:

   ```
   http://iwse.ibi.com/iway55/support/adapters/telnet/
   ```

3. Execute the installation utility, for example:

   ```
   $IWAY55/etc/setup/iwtnlinux.bin -console
   ```

4. Respond to the prompts.

CHAPTER 2

Remote Procedure Call Mode

Topics:

- Using Remote Procedure Call Mode
- Creating a Transaction Module

The adapter Remote Procedure Call (RPC) mode enables your application to communicate with a mainframe session using files. The application sends keystrokes to the mainframe in an XML request document, and the mainframe returns screen data in an XML response document.

Using Remote Procedure Call Mode

In a production environment, the adapter Remote Procedure Call (RPC) mode enables your client application to communicate with a mainframe application using XML files.

At design time, you can create a transaction module for your mainframe application after you deploy and test the adapter.

At run time, your client application can:

- **Send information to a mainframe session.** The client application sends information required for navigating through the mainframe application to the application in an XML request document.
- **Receive information from a mainframe session.** The mainframe application returns screen data to the client in an XML response document.

Creating a Transaction Module

A transaction module is an XML request document that defines a transaction. It contains all of the information required to execute an online mainframe application: screen references, entered data, menu selections, and other keystrokes.

Procedure: How to Create and Deploy a Transaction Module: Overview

To create a transaction module at design time:

1. Connect to the mainframe application via the emulator.
2. Navigate through the application screens, as described in *How to Create a Transaction for a Mainframe Application* on page 2-3. For each screen:

   a. Identify the screen so that the adapter recognizes it at run time, as described in *How to Identify a Screen to the Transaction Module* on page 2-6.

   b. Define each input field that requires a value at run time as an input parameter and specify the value.

      At run time, the request document provides the value to the field on the screen.

   c. Define each output field required by the client application as an output parameter.

      At run time, output parameter values are returned to the client application by the response document. Defining input and output parameters is described in *How to Define an Input or an Output Screen Parameter on page 2-8*.

3. Save your work.

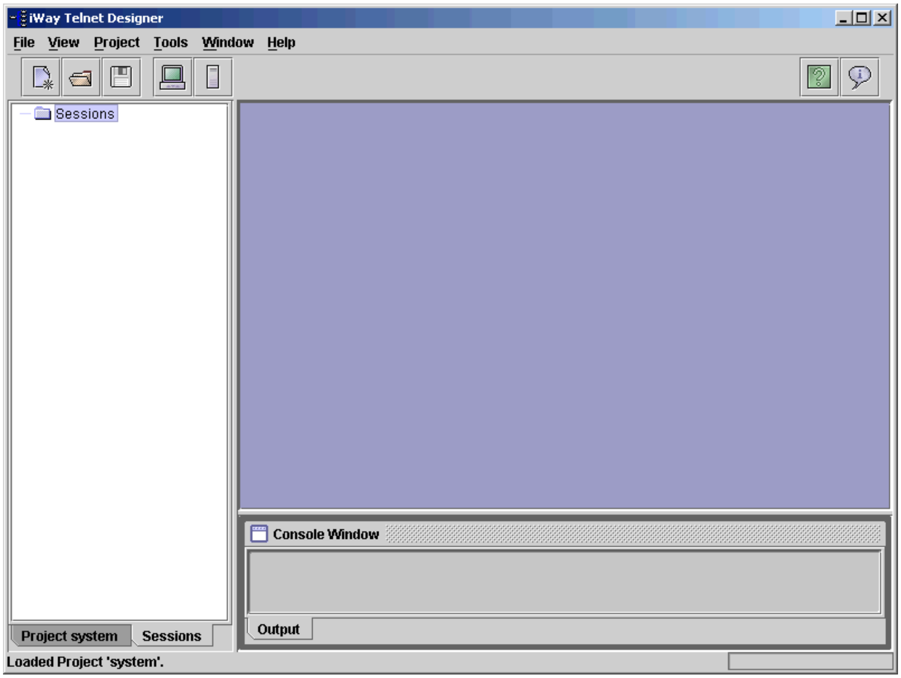
   This automatically generates the transaction module in the form of a request document.

Procedure: How to Create a Transaction for a Mainframe Application

To create a transaction for a mainframe application:

1. Open the Telnet Designer.

   The Telnet Designer window opens as shown in the following image and displays a Sessions folder.

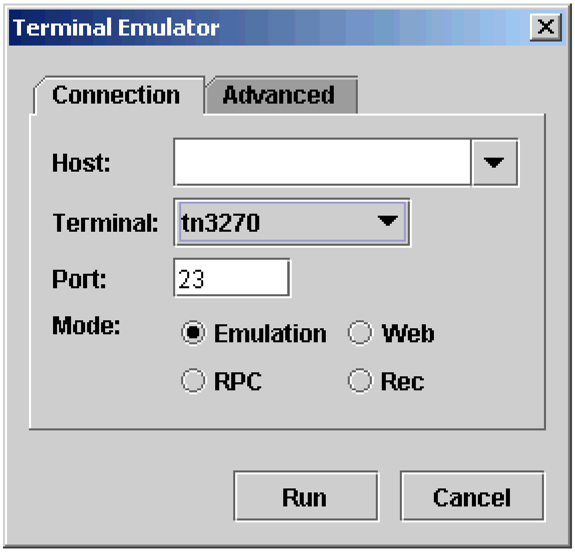


Loaded Project 'system'.

2. Right-click the *Sessions* folder and select *New Transaction*.

   An emulator session starts.

The Terminal Emulator dialog box opens as shown in the following image. The Connection tab where you provide information about the host and port is active.



Host:

Terminal: tn3270

Port: 23

Mode: ● Emulation ○ Web ○ RPC ○ Rec

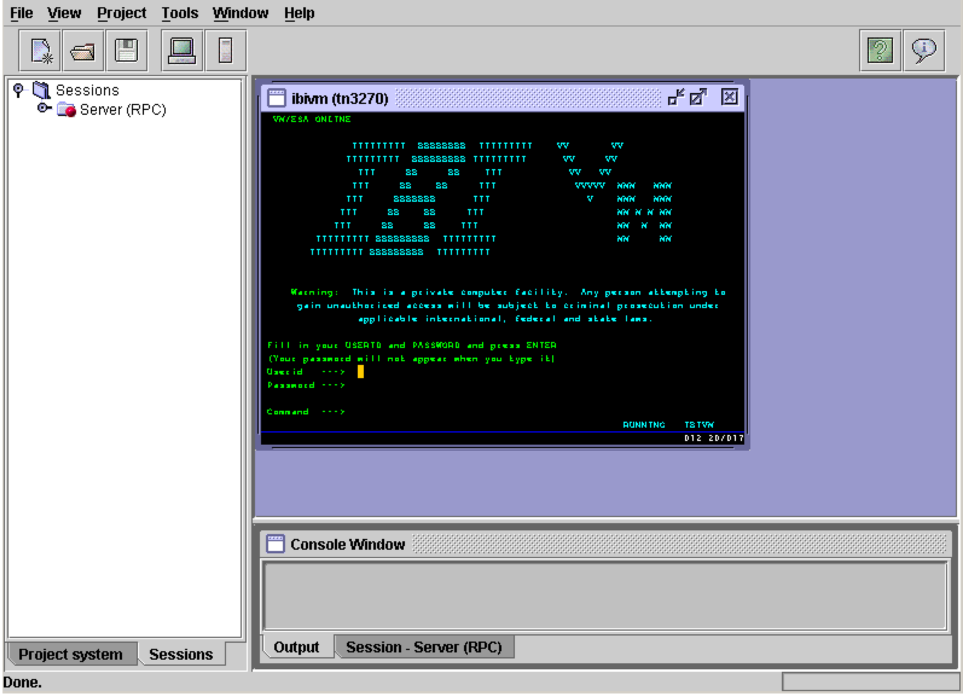
a. From the drop-down list, select a host and type a port number in the Port field.

b. Click the *Advanced* tab and select the *Extended Attributes* check box.

This enables you to change the national language character set.

3. To connect to the mainframe application and start the emulation session, click *Run*.

A window opens that represents the initial VTAM session. A sample window is shown in the following image.



```
VM/ESA ONLINE

            TTTTTTTTT  88888888  TTTTTTTTT    VV       VV
           TTTTTTTTT  888888888 TTTTTTTTT      VV     VV
             TTT     88      88    TTT          VV   VV
            TTT     88    88      TTT            VVVVV  NNN   NNN
           TTT     8888888      TTT               V    NNN   NNN
          TTT     88    88      TTT                    NN N N NN
         TTT     88      88    TTT                     NN  N  NN
       TTTTTTTTT 888888888  TTTTTTTTT                  NN     NN
      TTTTTTTTT 888888888  TTTTTTTTT


   Warning:  This is a private computer facility.  Any person attempting to
    gain unauthorized access will be subject to criminal prosecution under
             applicable international, federal and state laws.

Fill in your USERID and PASSWORD and press ENTER
(Your password will not appear when you type it)
Userid   --->
Password --->

Command  --->
                                                              RUNNING   TSTVM
                                                                   D12 20/017
```

a. Identify each screen so that the adapter recognizes it when the adapter encounters the screen at run time when executing the request.

b. Record all keystrokes to be played back at run time.

For more information, see *How to Identify a Screen to the Transaction Module* on page 2-6.

4. For each screen, define any input fields that require values as input parameters at run time.

These are to be provided by the request document.

5. Define any output fields as output parameters that are returned by the response document.

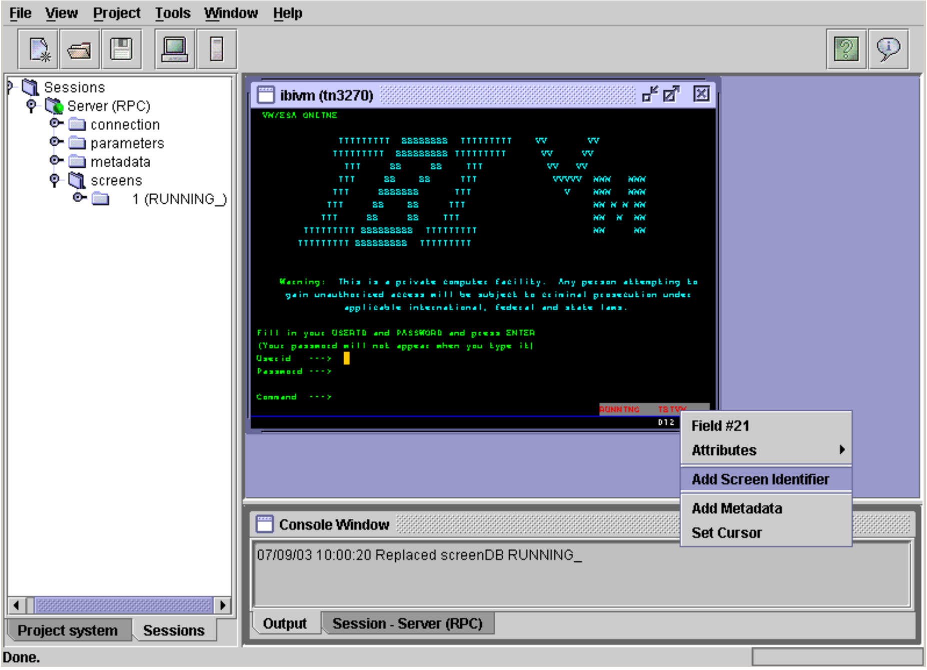
For more information, see *How to Define an Input or an Output Screen Parameter on page 2-8.*

Procedure: How to Identify a Screen to the Transaction Module

To identify a screen to the transaction module (that is, to the XML request document):

1. Determine which field(s) on the 3270/5250 screen uniquely identify this screen from among all the application screens.

2. If there are several fields, choose one to identify the screen using the context menu as shown in the following image.

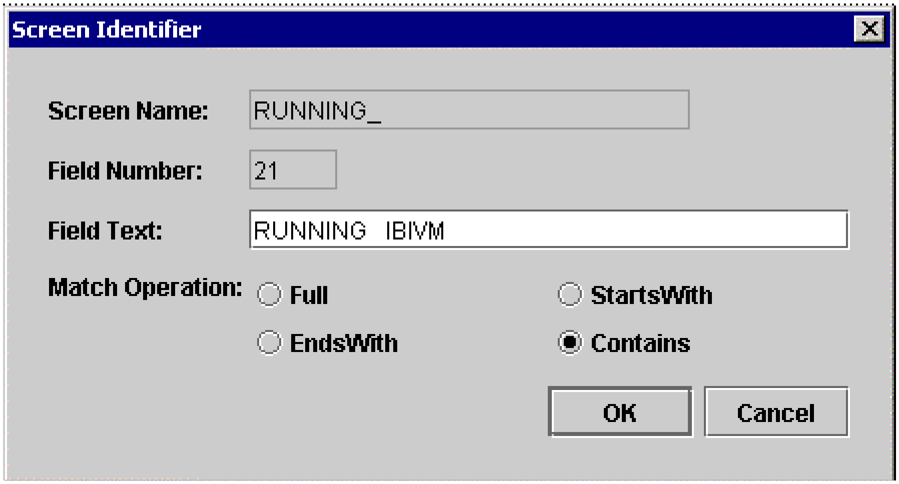


```
VM/ESA ONLINE

          TTTTTTTTT  SSSSSSSS  TTTTTTTTT    VV       VV
         TTTTTTTTT  SSSSSSSSS TTTTTTTTT      VV     VV
           TTT     SS     SS    TTT           VV   VV
          TTT     SS    SS     TTT             VVVVV  MMM   MMM
         TTT     SSSSSSS      TTT                V    MMM   MMM
        TTT     SS    SS     TTT                      MM M M MM
       TTT     SS     SS    TTT                       MM  M  MM
    TTTTTTTTT SSSSSSSSS  TTTTTTTTT                    MM     MM
   TTTTTTTTT SSSSSSSSS  TTTTTTTTT


   Warning:  This is a private computer facility.  Any person attempting to
    gain unauthorized access will be subject to criminal prosecution under
             applicable international, federal and state laws.

Fill in your USERID and PASSWORD and press ENTER
(Your password will not appear when you type it)
Userid   --->
Password --->

Command  --->
                                                        RUNNING    TSTVM
                                                                     D12
```

```
07/09/03 10:00:20 Replaced screenDB RUNNING_
```

3. Right-click the identifying field and select *Add Screen Identifier*.

The Screen Identifier dialog box opens as shown in the following image with prompts for identifying the field.



Screen Identifier

Screen Name: RUNNING_

Field Number: 21

Field Text: RUNNING IBIVM

Match Operation: ○ Full ○ StartsWith ○ EndsWith ● Contains

a. In the Screen Name field, type a descriptive name for the screen you are identifying.

b. In the Field Number field, type a value.

c. In the Field Text field, type the text that uniquely identifies this screen.

d. Select an option for Match Operation, the relationship of the text you entered to the complete text of the field.

For example, if the field value is "OPERATOR INSTRUCTIONS," and you enter "OPERATOR INSTRUCTIONS," then the field text you entered is the full text of the field on the screen. Therefore, you would select the Match Operation option, Full.

Alternatively, if you entered "Instructions" for that same field, you would select the Match Operation option, EndsWith or Contains.

When a match is made, the adapter proceeds with the keystroke pressed, such as Enter or a PF key. At run time, the screen is processed accordingly.

4. Click *OK*.

You have identified the screen to the transaction module. You must identify each screen in this way. You identify each screen only once.

After you identify a screen, identify its values that may change each time the transaction in invoked.

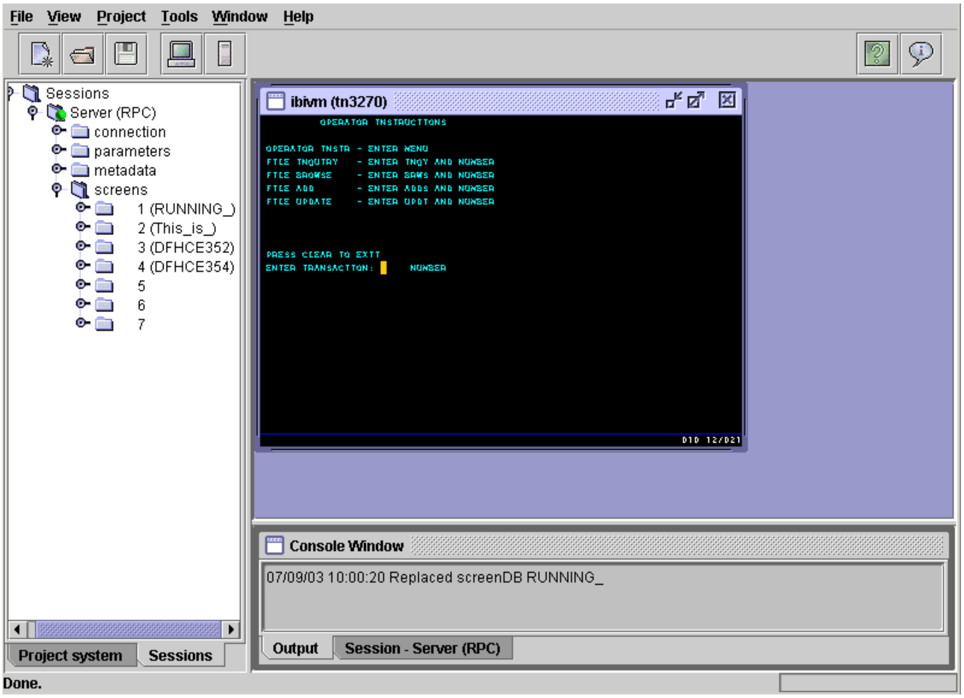
For more information, see *How to Define an Input or an Output Screen Parameter on page 2-8*.

5. Continue navigating through the application and ensure you identify all screens in the process.

   You need not identify a blank screen, such as the one you encounter after you navigate to CICS.

6. Enter the CICS transaction MENU and press *Enter*.

   A menu screen opens as shown in the following image.



```
          OPERATOR INSTRUCTIONS

OPERATOR INSTR - ENTER MENU
FILE INQUIRY   - ENTER INQY AND NUMBER
FILE BROWSE    - ENTER BRWS AND NUMBER
FILE ADD       - ENTER ADDS AND NUMBER
FILE UPDATE    - ENTER UPDT AND NUMBER



PRESS CLEAR TO EXIT
ENTER TRANSACTION:      NUMBER
```

```
07/09/03 10:00:20 Replaced screenDB RUNNING_
```

7. Add a screen identifier to identify the screen.

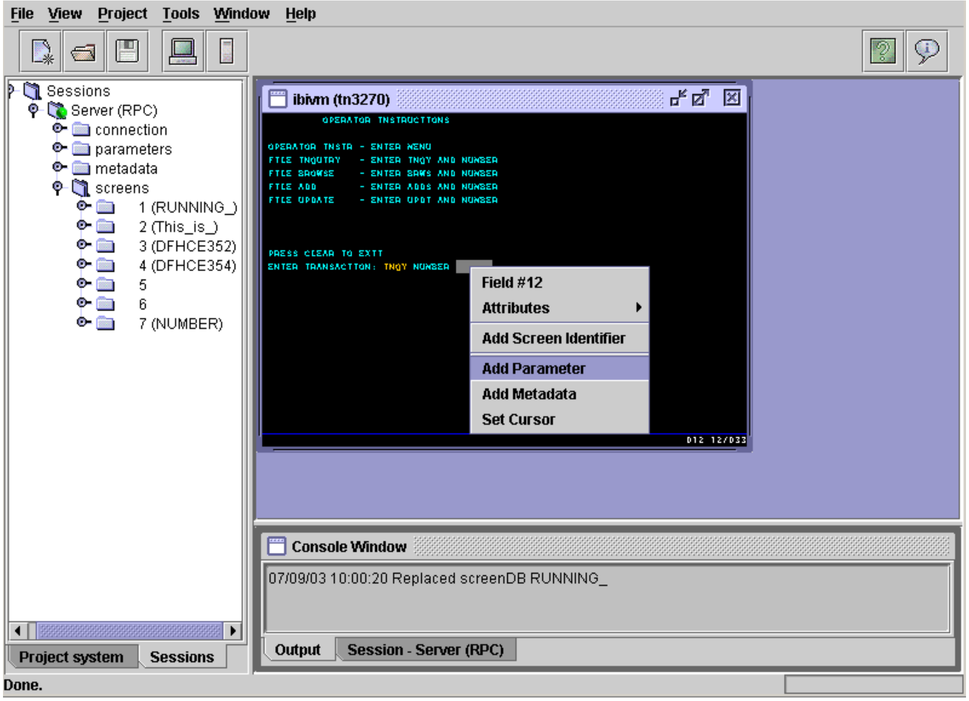
Procedure: How to Define an Input or an Output Screen Parameter

In the following procedure, INQY is used as a sample transaction and NUMBER as a sample input parameter.

To define screen input and output parameters:

1. In the ENTER TRANSACTION field, enter the *INQY* transaction.

The following image shows the options after you enter INQY.

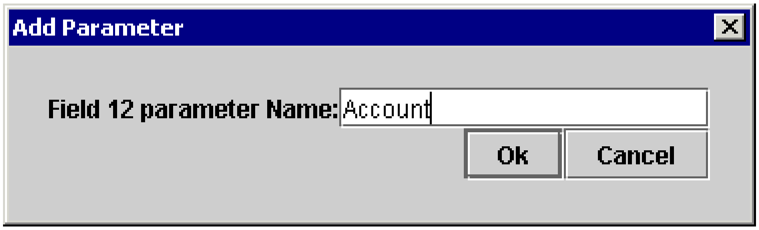


```
        OPERATOR INSTRUCTIONS

OPERATOR INSTR - ENTER MENU
FILE INQUIRY   - ENTER INQY AND NUMBER
FILE BROWSE    - ENTER BRWS AND NUMBER
FILE ADD       - ENTER ADDS AND NUMBER
FILE UPDATE    - ENTER UPDT AND NUMBER



PRESS CLEAR TO EXIT
ENTER TRANSACTION: INQY NUMBER
```

```
07/09/03 10:00:20 Replaced screenDB RUNNING_
```

2. Move the cursor to the NUMBER field, right-click, and select *Add Parameter.*

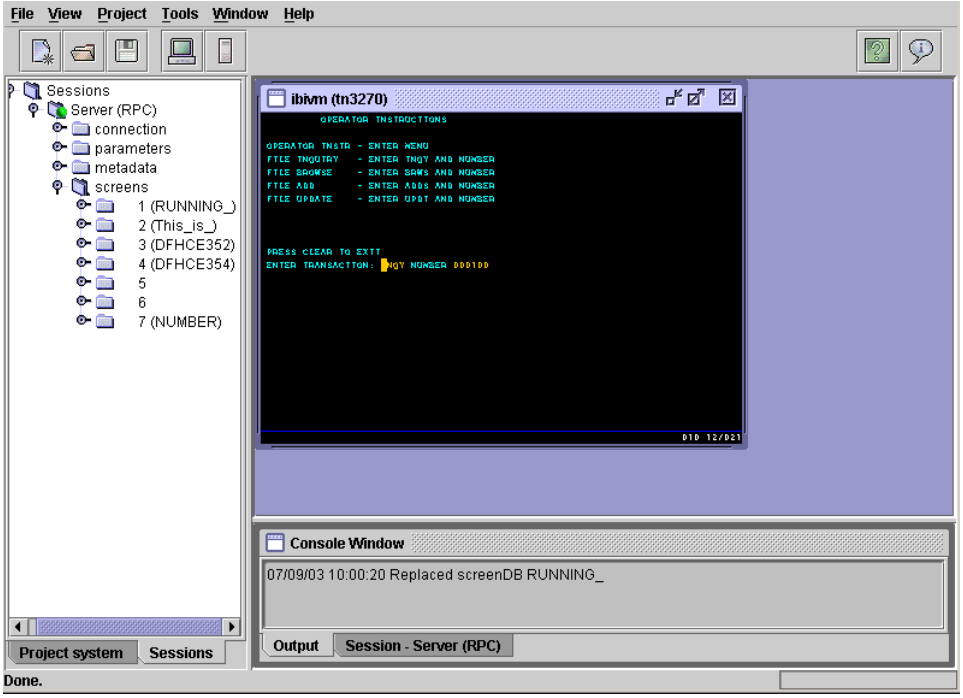
   The Add Parameter dialog box appears as shown in the following image and prompts you for a parameter name.



Field 12 parameter Name: Account

3. Type a name, for example, Account and click *OK*.

The following image shows the screen after the dialog box disappears.

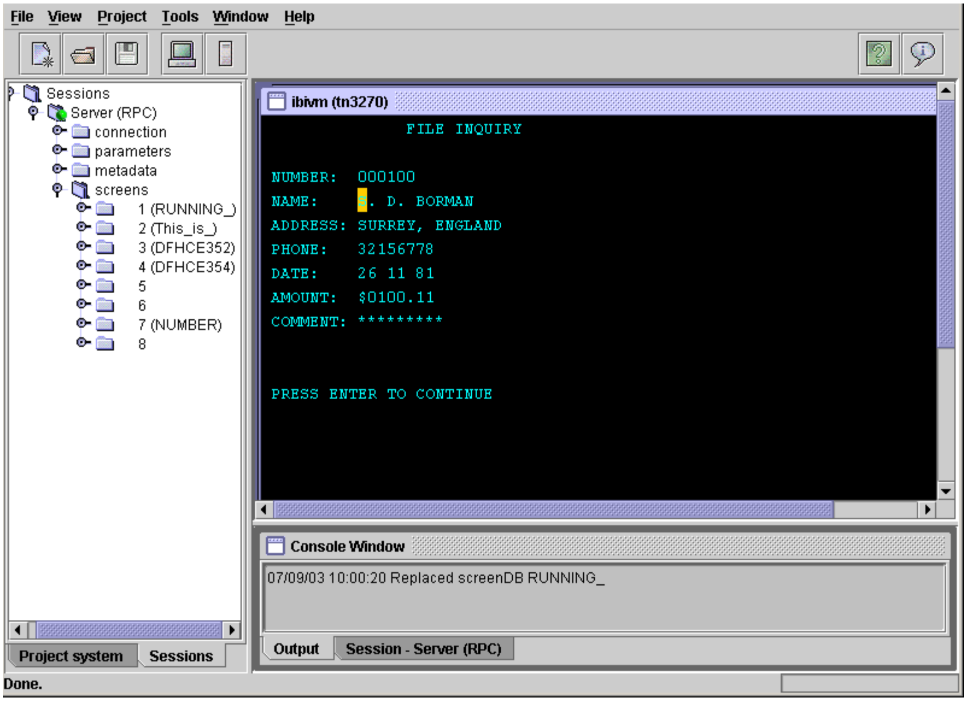


```
        OPERATOR INSTRUCTIONS

OPERATOR INSTR - ENTER MENU
FILE INQUIRY   - ENTER INQY AND NUMBER
FILE BROWSE    - ENTER BRWS AND NUMBER
FILE ADD       - ENTER ADDS AND NUMBER
FILE UPDATE    - ENTER UPDT AND NUMBER



PRESS CLEAR TO EXIT
ENTER TRANSACTION: INQY NUMBER 000100

                                                010 12/021
```

```
07/09/03 10:00:20 Replaced screenDB RUNNING_
```

4. Enter an existing account number in the available field, for example, 000100.
5. To view the detail screen, press the *Enter* key.

The detail screen opens as shown in the following image and displays the information that you must describe as output.



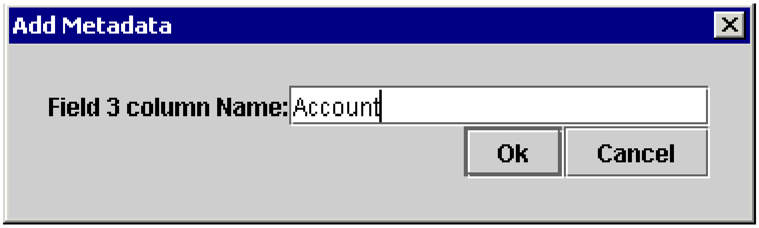
```
               FILE INQUIRY

NUMBER:  000100
NAME:    S. D. BORMAN
ADDRESS: SURREY, ENGLAND
PHONE:   32156778
DATE:    26 11 81
AMOUNT:  $0100.11
COMMENT: *********


PRESS ENTER TO CONTINUE
```

```
07/09/03 10:00:20 Replaced screenDB RUNNING_
```

The output fields are returned as part of the answer set by the transaction module you create.

6. Right-click one of the output fields, for example, the NUMBER field and select *Add Metadata*.

   The Add Metadata dialog box appears as shown in the following image and prompts you to enter a name.



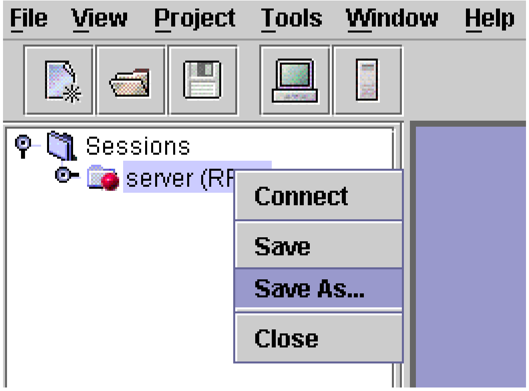
Field 3 column Name: Account

7. Type a name, for example, Account, and click *OK*.

8. Repeat these steps for the remaining fields (two, in this example) that you want the module to return as output.
9. When you are finished assigning output fields, navigate through the screens.
10. Log off the CICS region.

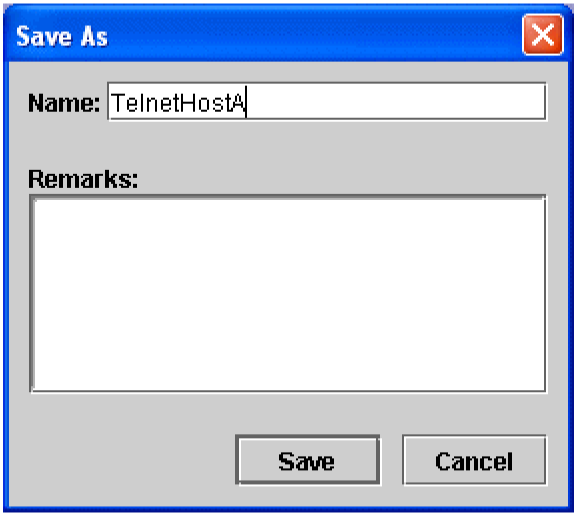
    The transaction module signs off CICS in the same manner.

    The following image shows the option menu.



11. Right-click the *Server (RPC)* icon and select *Save As*.

    The Save As dialog box opens as shown in the following image and prompts you to type a name for the saved document.



Name: TelnetHostA

12. Type a name, for example, TelnetHostA, and click *Save*.

The request document is saved to

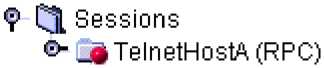
`TelnetInstalDir\projects\system\rpcs`

where:

`TelnetInstalDir`

Is the directory into which Telnet was installed.

The Telnet Designer opens as shown in the following image and displays the new document under the Sessions folder.



This XML file contains all the information required to execute the transaction within the iWay Emulation Adapter (3270/5250). This includes screen matches, keystrokes, and parameters.

You can vary the request by modifying the input parameters in the XML request document. Input parameters are enclosed in parameter tags, for example:

```
<parameters>
   <parameter NAME="Account" LENGTH='6'>000100</parameter>
</parameters>
```

To alter the request, you change parameter values. For example, you might change the value of Account from 000100 to another account number.

CHAPTER 3

Developing Applications Using Emulation and Recorder Modes

Topics:

- Emulation Mode
- Recorder Mode

The iWay Emulation Adapter (3270/5250) provides the following two modes to help you develop Telnet applications:

- **Emulation mode**, in which you can access a mainframe session directly from your workstation using the adapter Integrated Development Environment (IDE). The IDE displays standard 3270/5250 screens.
- **Recorder mode**, in which you can record interaction with a mainframe and later play back the recording to simulate a live mainframe session. Simulating a session enables you to develop an application offline. You can simulate a Web mode connection or an RPC mode connection.

Emulation Mode

The adapter Emulation mode enables you to access a mainframe session directly from the adapter Integrated Development Environment (IDE). This is simple emulation that displays standard 3270/5250 screens and does not create any work files on your system.

Using Emulation Mode

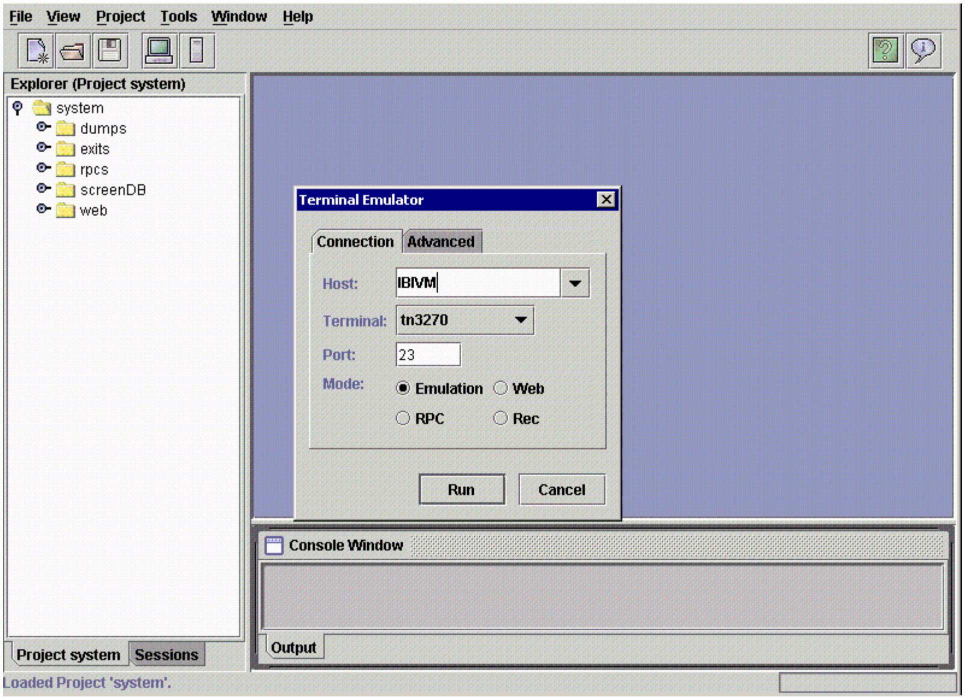
Emulation mode enables you to access the mainframe as you develop Telnet applications.

Procedure: How to Run the IDE in Emulation Mode

To run the adapter IDE in Emulation mode:

1. Invoke the Terminal Emulator from the IDE.

   The Connection tab of the Terminal Emulator opens as shown in the following image.



Host: IBIVM

Terminal: tn3270

Port: 23

Mode: ● Emulation ○ Web ○ RPC ○ Rec

Loaded Project 'system'.

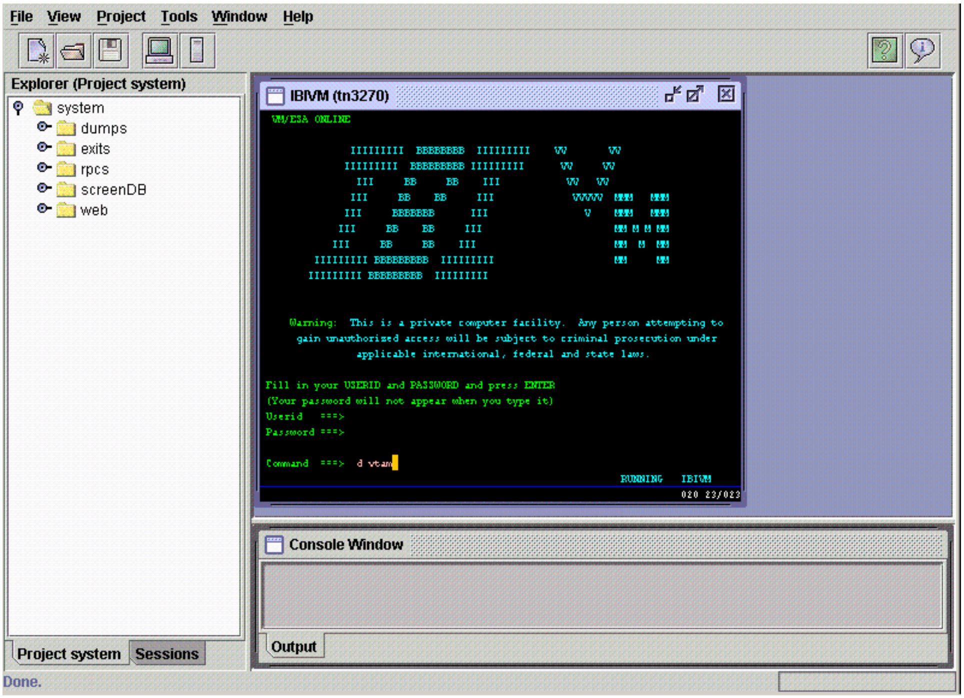
   a. On the Connection tab, set the connection parameters.

   b. Ensure the Mode option is set to *Emulation*.

   For details on setting emulation mode parameters, see *Creating a Transaction Module* in Chapter 2, *Remote Procedure Call Mode*.

2. Click *Run*.

   A connection is made to the mainframe online system. For example, at iWay Software, the initial VTAM screen opens, as shown in the following image.



```
 VM/ESA ONLINE

            IIIIIIIII  BBBBBBBB  IIIIIIIII    VV       VV
           IIIIIIIII  BBBBBBBBB IIIIIIIII      VV     VV
             III     BB     BB    III          VV   VV
            III     BB    BB     III            VVVVV  MMM   MMM
           III     BBBBBBB      III               V    MMM   MMM
          III     BB    BB     III                     MM M M MM
         III     BB     BB    III                      MM  M  MM
      IIIIIIIII BBBBBBBBB  IIIIIIIII                   MM     MM
     IIIIIIIII BBBBBBBBB  IIIIIIIII


    Warning:  This is a private computer facility.  Any person attempting to
     gain unauthorized access will be subject to criminal prosecution under
               applicable international, federal and state laws.

Fill in your USERID and PASSWORD and press ENTER
(Your password will not appear when you type it)
Userid   ===>
Password ===>

Command  ===>  d vtam
                                                           RUNNING   IBIVM
                                                                 020 23/023
```

   You can move through each mainframe screen.

3. Enter the appropriate information to navigate through the mainframe online system of your site.

4. To terminate emulation at any time, click the *X* in the upper right of the emulation window.

Recorder Mode

The adapter Recorder mode enables you to capture all of your mainframe application screens and end-user keystrokes using the adapter Integrated Development Environment (IDE) terminal emulation and then store the screens and keystrokes in a file. The 3270/5250 communication information is transferred into a binary file that you can refer to when you start a Player Server.

Creating a Pre-recorded File

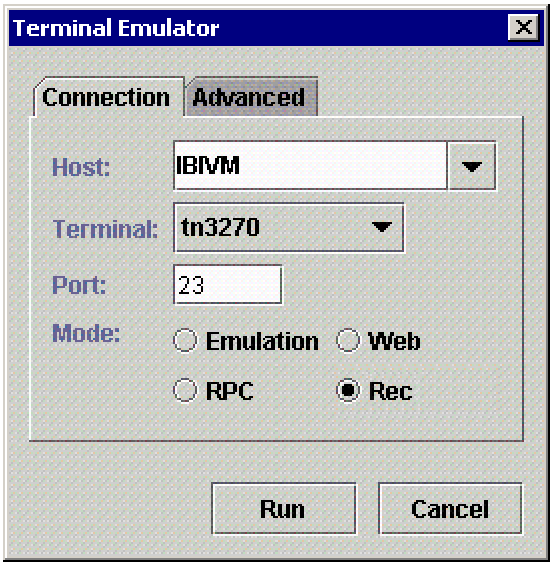
The Player Server uses the pre-recorded file to act as a live connection to the mainframe. With this pre-recorded file, you can continue your development off-line without being connected to the mainframe host. This is a useful feature for off-line development, testing, benchmarking, prototyping, debugging, and demonstration purposes.

Procedure: How to Run the IDE in Recorder (REC) Mode

To run the adapter IDE in REC mode:

1. In the IDE, click *Tools* and select *Emulator.*

   The Terminal Emulator appears with the Connection tab active as shown in the following image.



Host: IBIVM

Terminal: tn3270

Port: 23

Mode: ○ Emulation ○ Web ○ RPC ● Rec

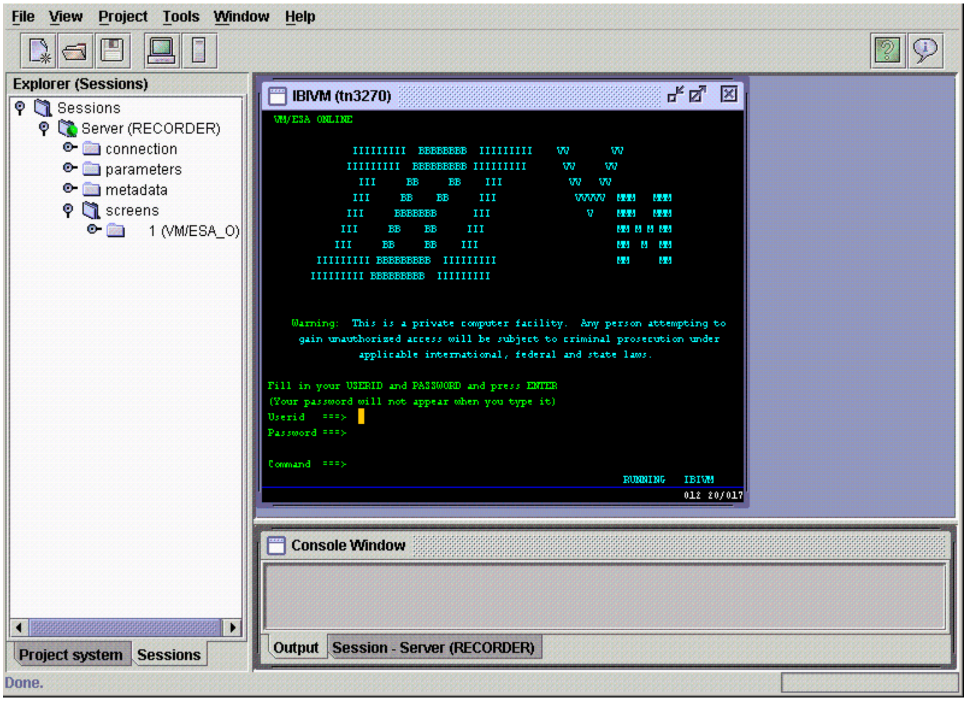
   a. Enter the parameters described in *Creating a Transaction Module* in Chapter 2, *Remote Procedure Call Mode*.

   b. For the deployment mode, select *Rec.*

2. Click *Run.*

   A connection is made to the mainframe online system.

The mainframe session window opens as shown in the following image.



```
 VM/ESA ONLINE

          IIIIIIIII  BBBBBBBB  IIIIIIIII    VV       VV
         IIIIIIIII  BBBBBBBBB IIIIIIIII      VV     VV
           III     BB     BB    III           VV   VV
          III     BB    BB     III             VVVVV  MMM   MMM
         III     BBBBBBB      III                V    MMM   MMM
        III     BB    BB     III                      MM M M MM
       III     BB     BB    III                       MM  M  MM
     IIIIIIIII BBBBBBBBB  IIIIIIIII                   MM     MM
    IIIIIIIII BBBBBBBBB  IIIIIIIII


   Warning:  This is a private computer facility.  Any person attempting to
    gain unauthorized access will be subject to criminal prosecution under
              applicable international, federal and state laws.

Fill in your USERID and PASSWORD and press ENTER
(Your password will not appear when you type it)
Userid   ===>
Password ===>

Command  ===>
                                                            RUNNING   IBIVM
                                                                012 20/017
```

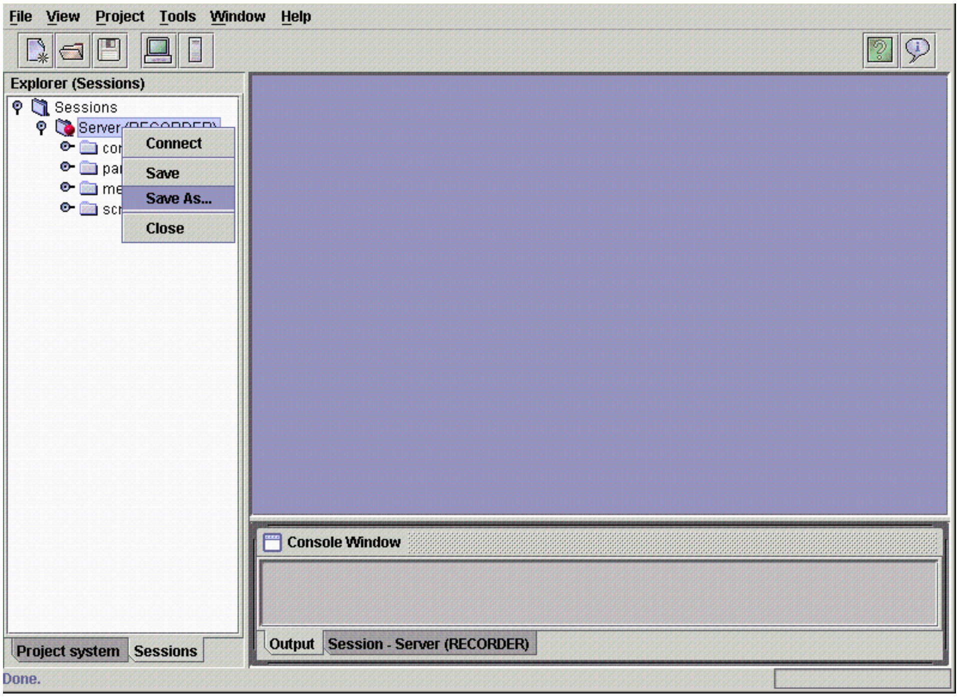
You can move through each mainframe screen.

a. To record each screen, enter the appropriate information to navigate through the mainframe online system of your site.

b. When you are finished, log off from the mainframe session. For example, for CICS, issue the command *CESF LOGOFF*.

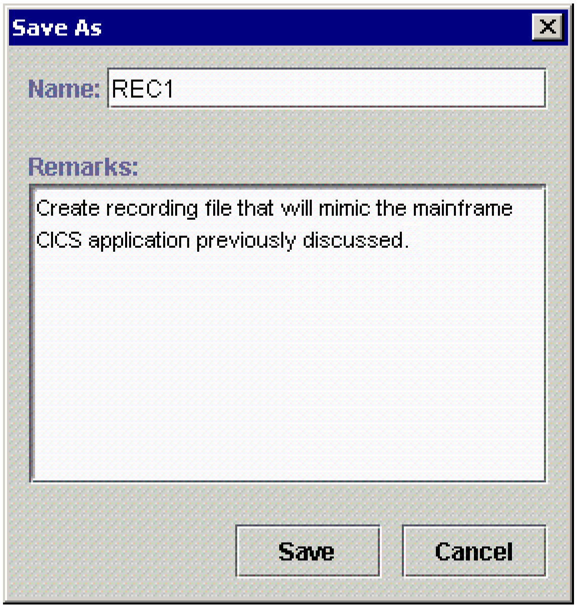
3. Click the *X* in the upper right of the mainframe session window.

You can now save the pre-recorded file as shown in the following image.



4. Right-click the *Server (RECORDER)* icon and select *Save As*.

The Save As dialog box appears as shown in the following image.



Name: REC1

Remarks:

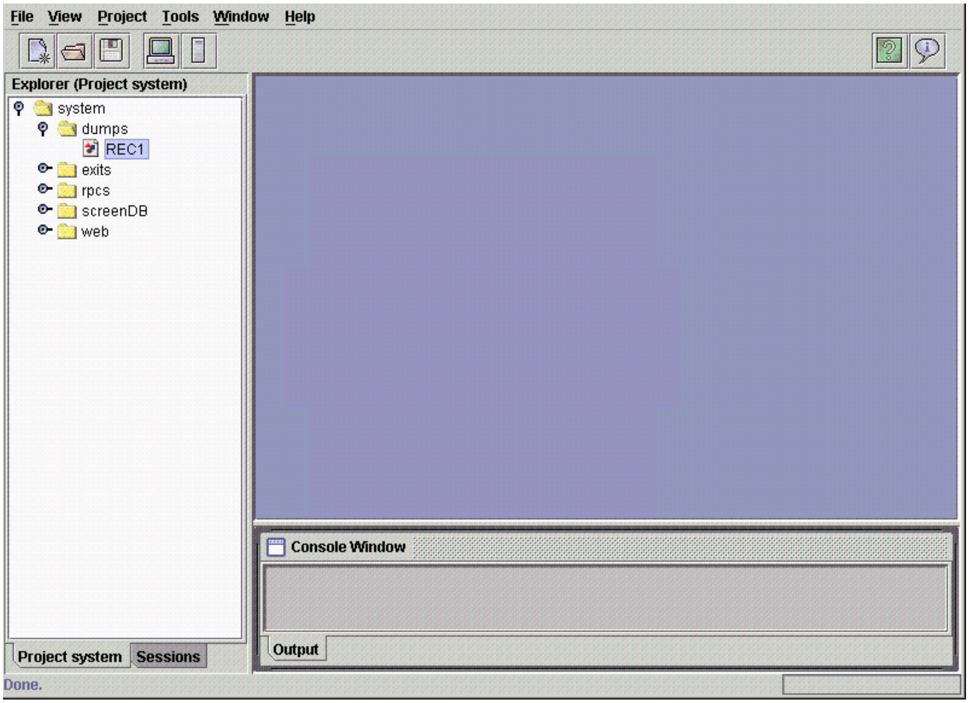
Create recording file that will mimic the mainframe CICS application previously discussed.

a. In the Name field, type a name, for example, REC1.

The Remarks field is optional.

b. To save the pre-recorded file called REC1, click *Save*.

You return to the IDE window as shown in the following image.



5. Click the *Project* system tab on the lower left hand corner.

   In the left pane, the REC1 file appears under the dumps folder. You are ready to develop against the pre-recorded file called REC1.

Developing Against a Pre-Recorded File

The IDE enables a developer to create the Telnet components offline, disconnected from the mainframe by using the adapter Recorder (REC) mode.

The Player Server executes against a pre-recorded file. You can create several files where each one can simulate a specific online application, such as a browse transaction or an update transaction. You can also create one large file that encompasses many mainframe transactions. This is useful. For example, two or more developers can work on separate transactions on a laptop that is disconnected from the actual mainframe.

You have all options available to create an iWay Emulation Adapter (3270/5250) application against a pre-recorded file. As explained in the previous chapters, you can run the IDE to create a Web-based solution or an RPC solution. The difference when running against a pre-recorded file is that development is not running against the mainframe; there is no mainframe connection.

The following procedures describe how to:

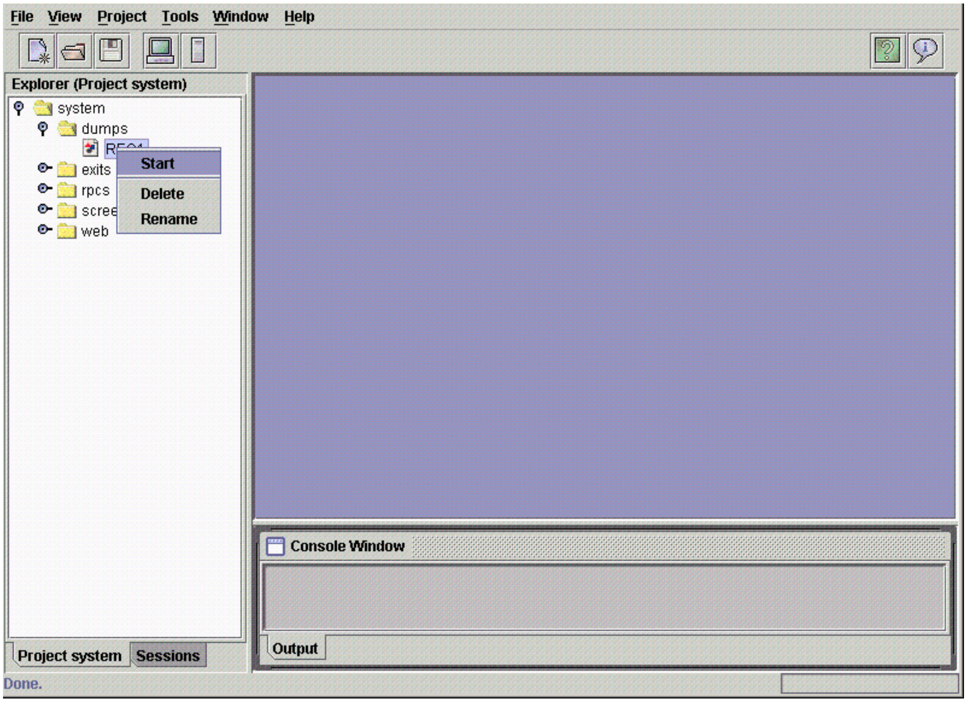
- Start a player session against a pre-recorded file.
- View or change the Player Server connection information.
- Run the GUI developer against a pre-recorded file.

Procedure: How to Start a Player Session Against a Pre-recorded File

To start a player session against a pre-recorded file:

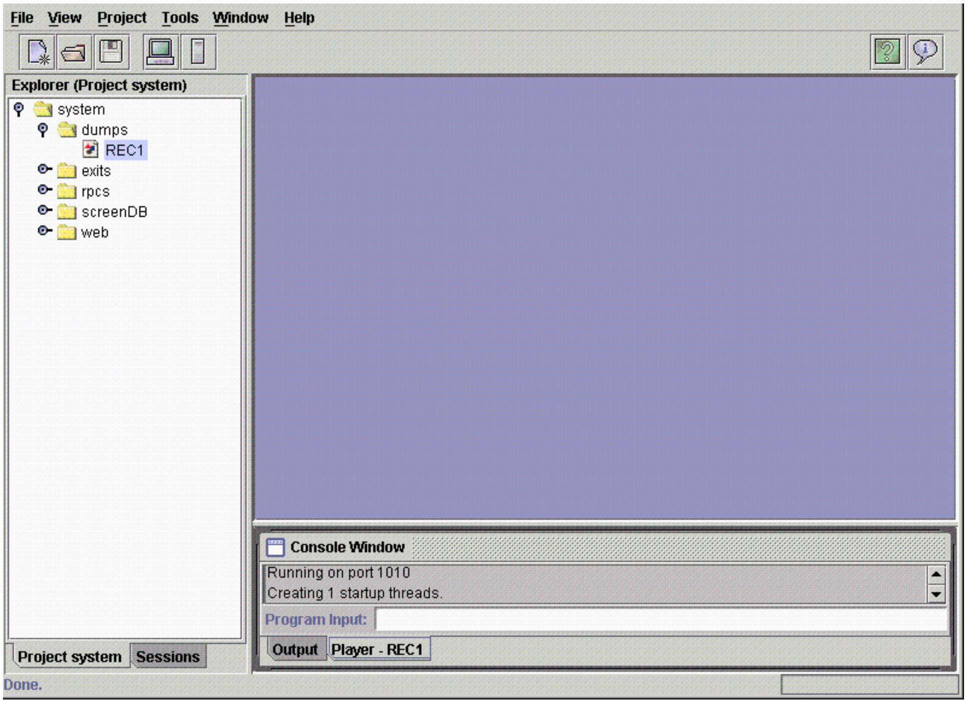
1. In the left pane of the IDE, expand the dumps node to view all the pre-recorded files.

   The following image shows the expanded node with the options menu open.



2. Right-click *REC1*and click *Start*.

The Player - REC1 tab becomes available in the right pane as shown in the following image.



```
Running on port 1010
Creating 1 startup threads.
```

3. Click the *Player - REC1* tab.

   A console window opens and displays the port number on which the player is running.

   Port 1010 is the default port.

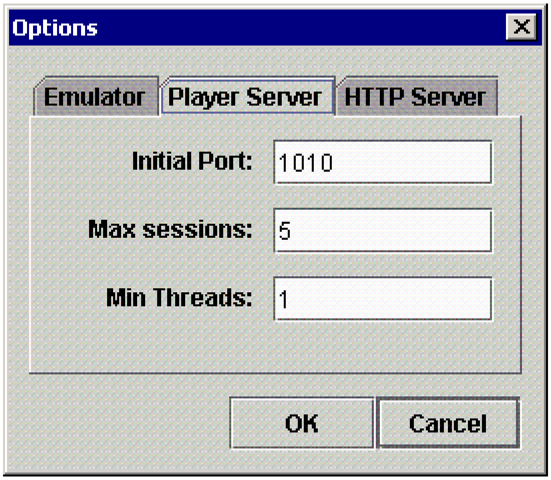
Procedure: How to View or Change the Player Server Connection Information

The GUI Developer enables you to control the port on which the player server is running. The default is 1010. The port number can change to any desired port number. The port number is used to connect to the Telnet session to create an adapter application.

To view or change the player server connection information:

1. Click *Tools* in the GUI developer and select *Options*.

The Options dialog box appears as shown in the following image. If the Player Server tab is active, you see fields for the initial port, the maximum number of sessions, and the minimum number of threads.



Initial Port: 1010

Max sessions: 5

Min Threads: 1

2. If the Player Server tab is not active, click it.

   The player session is running on port 1010 on the local machine. This port number is required for other developers on a machine other than the one where the player server is running. Any developer with a network connection to the player machine, in this case, localhost, can develop a Telnet application using the GUI Developer against the local pre-recorded file, REC1.

Procedure: How to Run the IDE Against a Pre-recorded File

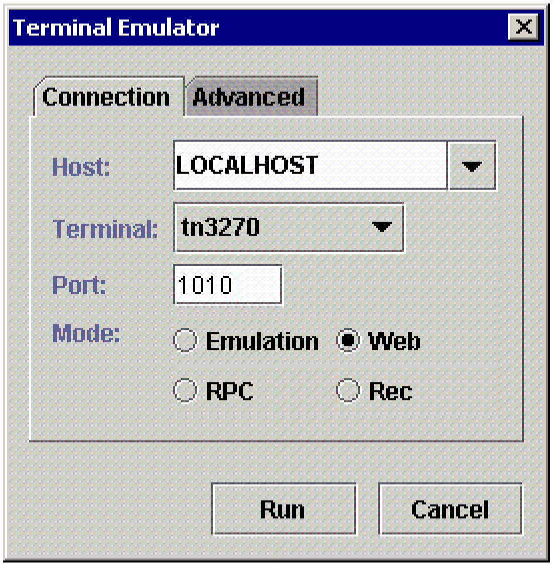
While the Player session is running, you are able to run the IDE against it to create a Web-based or RPC application. You can use the IDE as if you were connected to the mainframe.

To develop against the pre-recorded file:

1. Develop a Web-based adapter application as described in Chapter 4, *Using Web Mode (Optional)*.

2. Invoke the Terminal Emulator.

The Terminal Emulator dialog box opens as shown in the following image. When the Connection tab is active, you see fields for Host, Terminal, and Port.



Host: LOCALHOST

Terminal: tn3270

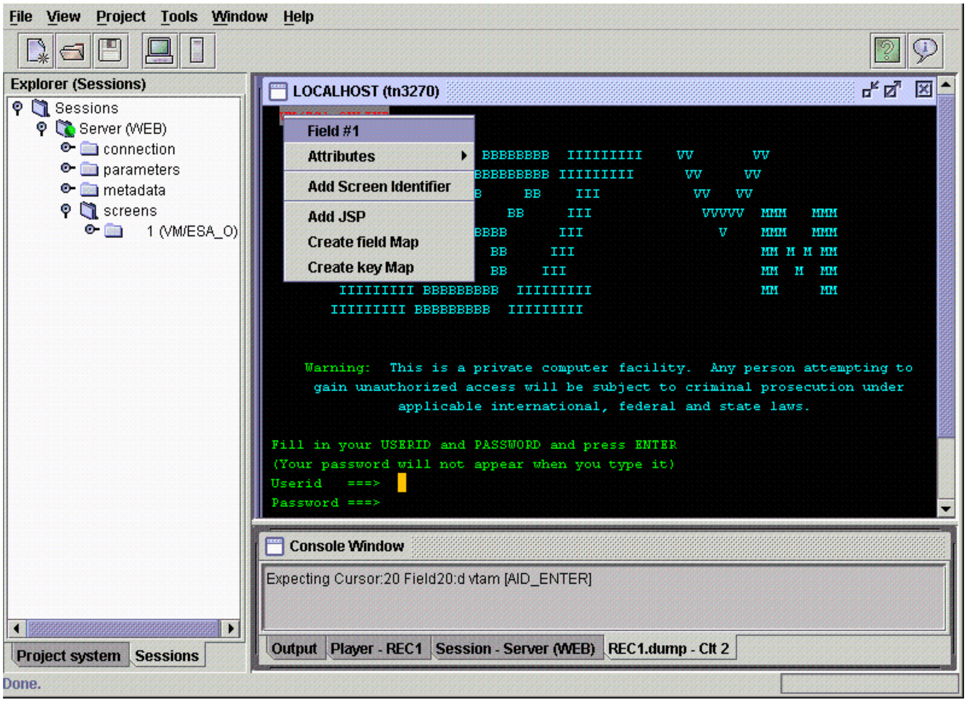
Port: 1010

Mode: ○ Emulation ● Web ○ RPC ○ Rec

3. Select *Web* as the mode.

4. Click *Run*.

The following screen opens that matched the first screen in the pre-recorded dump file as shown in the following image.



```
                     BBBBBBBB  IIIIIIIII    VV       VV
                    BBBBBBBBB IIIIIIIII      VV     VV
                    B     BB    III           VV   VV
                        BB     III             VVVVV  MMM   MMM
                    BBBB      III                V    MMM   MMM
                      BB     III                      MM M M MM
                      BB    III                       MM  M  MM
      IIIIIIIII BBBBBBBBB  IIIIIIIII                  MM     MM
     IIIIIIIII BBBBBBBBB  IIIIIIIII


   Warning:  This is a private computer facility.  Any person attempting to
    gain unauthorized access will be subject to criminal prosecution under
              applicable international, federal and state laws.

Fill in your USERID and PASSWORD and press ENTER
(Your password will not appear when you type it)
Userid   ===>
Password ===>
```

```
Expecting Cursor:20 Field20:d vtam [AID_ENTER]
```

You can navigate through the screens as if you were connected to the mainframe.

Note: When you are using the IDE against the pre-recorded file, you must enter the same commands and input data used when the pre-recorded file was created. If you input an incorrect field or keystroke (for example, an unmatched enter or PF2 key) the player session terminates. You must press Enter to clear the waiting session. To verify what must be entered you can play the dump file as explained in the previous topic.

CHAPTER 4

Using Web Mode (Optional)

Topics:

- Overview
- Default HTML Translation
- Using the GUI Developer to Create JavaServer Pages
- Using HTML Translation Services
- Creating an HTML Page to Start a Telnet Session

For the iWay Emulation Adapter (3270/5250), Web deployment refers to the process by which you use the Telnet Designer to create an adapter Web application. Using Web mode is optional. For more information on the Web mode option, consult with your iWay Software representative.

You can create Web applications using one of the following techniques:

- Default HTML translation
- Default HTML translation using a generic template
- Redesign using JavaServer Pages (JSP)

The following topics describe how to create a Web-based application to run a mainframe CICS application on the Web.

Overview

Using Telnet Designer in Web development mode enables you to create an iWay Emulation Adapter (3270/5250) application using the following techniques:

- **Default HTML translation.** You can run your 3270 or 5250 application instantly on the Web using default emulation. A screen that is "unrecognized" appears using default HTML translation.
- **Default HTML translation templates.** You can create a generic template that provides a customized look for all default translated screens (unrecognized screens). You can create a common template that can surround your HTML translated mainframe screen.
- **JavaServer Pages (JSP) for redesign and added functionality.** You can redesign the look and feel of a mainframe screen and expand the functionality of your online application by combining multiple screens or extracting screen data to one or more newly designed JSP pages.

A thorough understanding of each topic is recommended before advancing to the next topic. Before continuing to the following topic, see *Using HTML Translation Services* on page 4-41 for information about HTML Translation Services.

Tip: When you create your Web application using the Telnet Designer, you can deploy your application immediately using the supplied Web application server.

Default HTML Translation

Default HTML translation automatically translates your terminal screens into HTML pages. The HTML translation mode manages the various Telnet sessions (connections) to the mainframe.

You have the option of creating a generic template that can surround the translated mainframe screens. The generic template is used for default HTML translation only. It provides a customized look for default translation and is restricted to cosmetic changes only. To move fields or completely redesign the screen, you must use JavaServer Pages that are described in the following topics.

The TelnetServlet and the TelnetHtmlServlet are the two main servlets that drive the default HTML translation feature.

- **TelnetServlet** is the starting point for all of the features in the HTML translation. The servlet is responsible for creating and managing Telnet sessions. It uses the cmd parameter and may use other parameters depending on the requested command.
- **TelnetHtmlServlet** is responsible for processing screens for an active session.

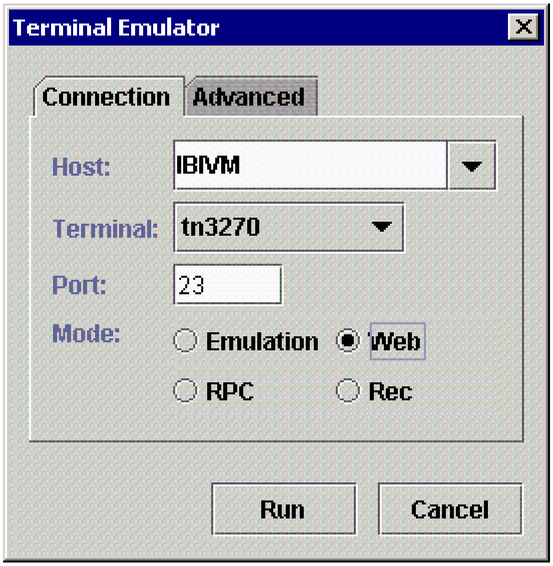
The following example describes how to create a Web application using default translation and how to execute this application from a Web browser. The steps required for your site may differ, but the concept is the same.

Example: Using Default Translation to Create a Web Application

The screens that illustrate the example represent a portion of a mainframe CICS system. These screens and other screens that are not “seen” by the Telnet Designer are automatically translated when you run the application on the Web.

1. In the Telnet Designer, click *Tools* and then, select *Emulator.*

   The Terminal Emulator opens and includes fields for the host name, terminal, port number, and the deployment mode as shown in the following image.



Host: IBIVM

Terminal: tn3270

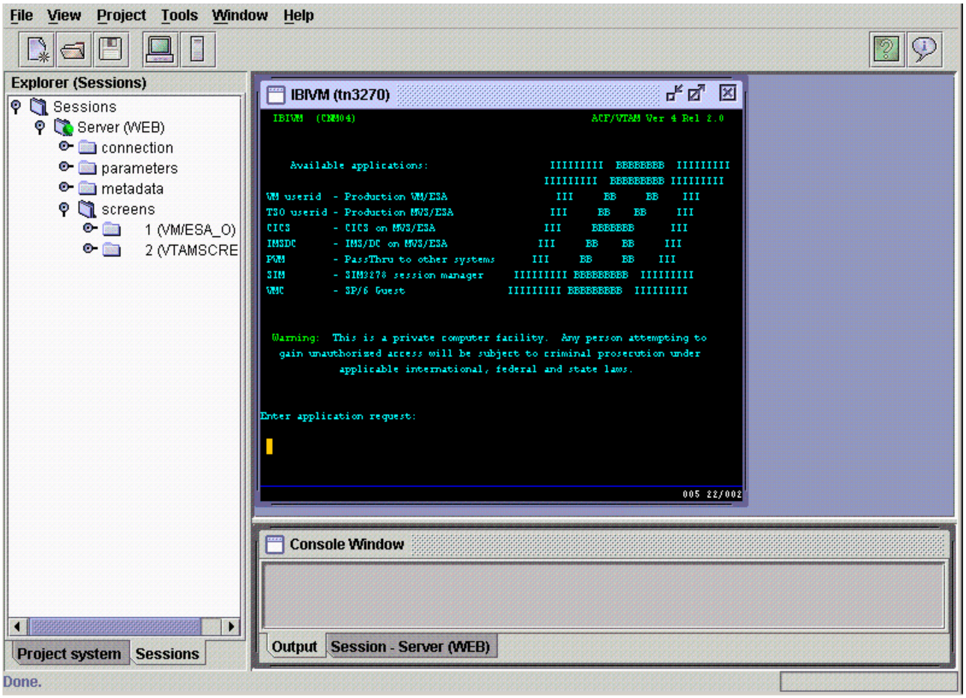
Port: 23

Mode: ○ Emulation ● Web ○ RPC ○ Rec

2. On the Connection tab, enter the parameters (described in *Creating a Transaction Module* in Chapter 2, *Remote Procedure Call Mode*.
3. For the deployment mode, select *Web.*
4. Click *Run*.

   A connection is made to the mainframe online system.

The main VTAM screen appears for MVS host IBIVM as shown in the following image. The Sessions tab is active, and the left pane lists the Explorer sessions. The bottom right pane is a console window.



```
 IBIVM   (CNM04)                                  ACF/VTAM Ver 4 Rel 2.0



    Available applications:                     IIIIIIIII  BBBBBBBB  IIIIIIIII
                                               IIIIIIIII  BBBBBBBBB IIIIIIIII
VM userid  - Production VM/ESA                   III     BB     BB    III
TSO userid - Production MVS/ESA                 III     BB    BB     III
CICS       - CICS on MVS/ESA                   III     BBBBBBB      III
IMSDC      - IMS/DC on MVS/ESA                III     BB    BB     III
PVM        - PassThru to other systems       III     BB     BB    III
SIM        - SIM3278 session manager      IIIIIIIII BBBBBBBBB  IIIIIIIII
VMC        - SP/6 Guest                  IIIIIIIII BBBBBBBBB  IIIIIIIII


 Warning:  This is a private computer facility.  Any person attempting to
  gain unauthorized access will be subject to criminal prosecution under
           applicable international, federal and state laws.


Enter application request:


                                                                005 22/002
```

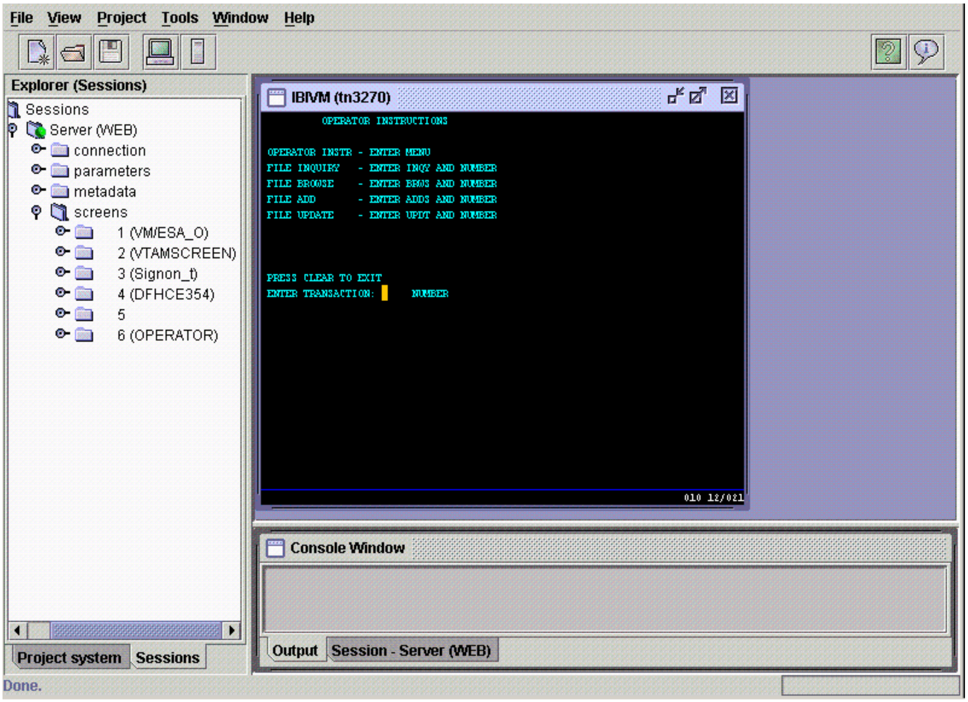
5. Enter *LOGON APPLID(IWAYDEMO)* to return to a currently running CICS region.

6. Enter a valid user ID and password for the mainframe.

   a. To navigate to a blank CICS screen when the CICS region is running unsecured, press the *Clear* key.

   b. To invoke the IBM CICS MENU APPLICATION, in the blank screen, enter *MENU*.

This application, specifically the BROWSE transaction, is transformed into a Web application using default translation as shown in the following image.



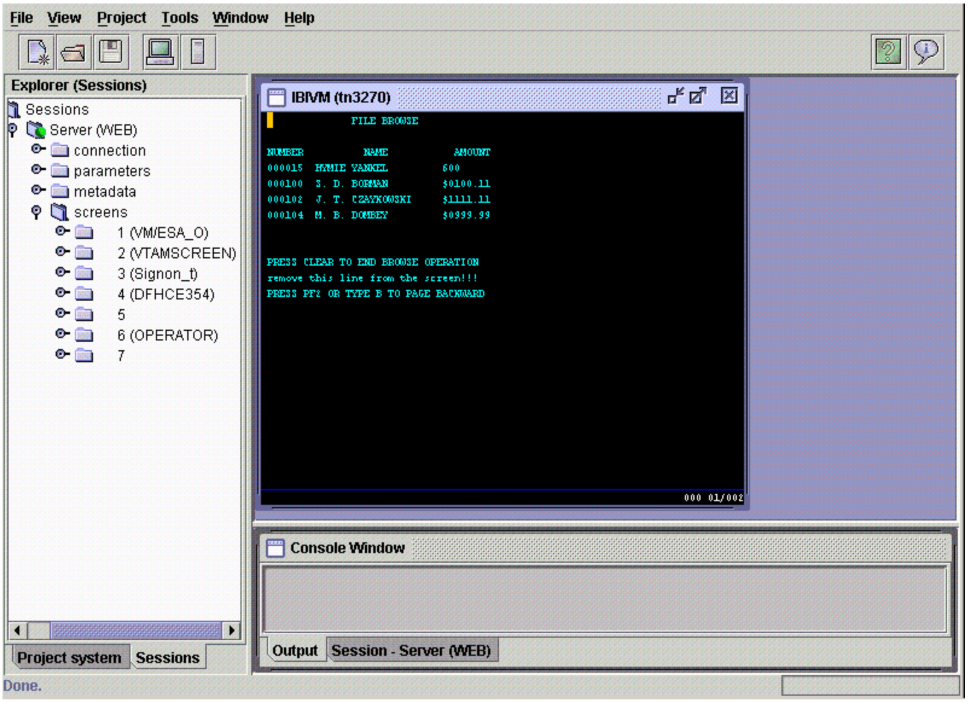
```
         OPERATOR INSTRUCTIONS

OPERATOR INSTR - ENTER MENU
FILE INQUIRY   - ENTER INQY AND NUMBER
FILE BROWSE    - ENTER BRWS AND NUMBER
FILE ADD       - ENTER ADDS AND NUMBER
FILE UPDATE    - ENTER UPDT AND NUMBER



PRESS CLEAR TO EXIT
ENTER TRANSACTION: █    NUMBER

                                                    010 12/021
```

You can select from several options, for example:

- **INQY** queries a particular VSAM record.
- **BRWS** browses the file.

7. Enter *BRWS*.

The the following screen appears with four records (more than sufficient to describe the process of running the application on the Web). The mainframe image is included to show the actual mainframe application that is converted to HTML and appears on the Web as shown in the following image.



```
              FILE BROWSE

NUMBER          NAME          AMOUNT
000015  HYMIE YANKEL        600
000100  S. D. BORMAN        $0100.11
000102  J. T. CZAYKOWSKI    $1111.11
000104  M. B. DOMBEY        $0999.99


PRESS CLEAR TO END BROWSE OPERATION
remove this line from the screen!!!
PRESS PF2 OR TYPE B TO PAGE BACKWARD

                                                    000 01/002
```

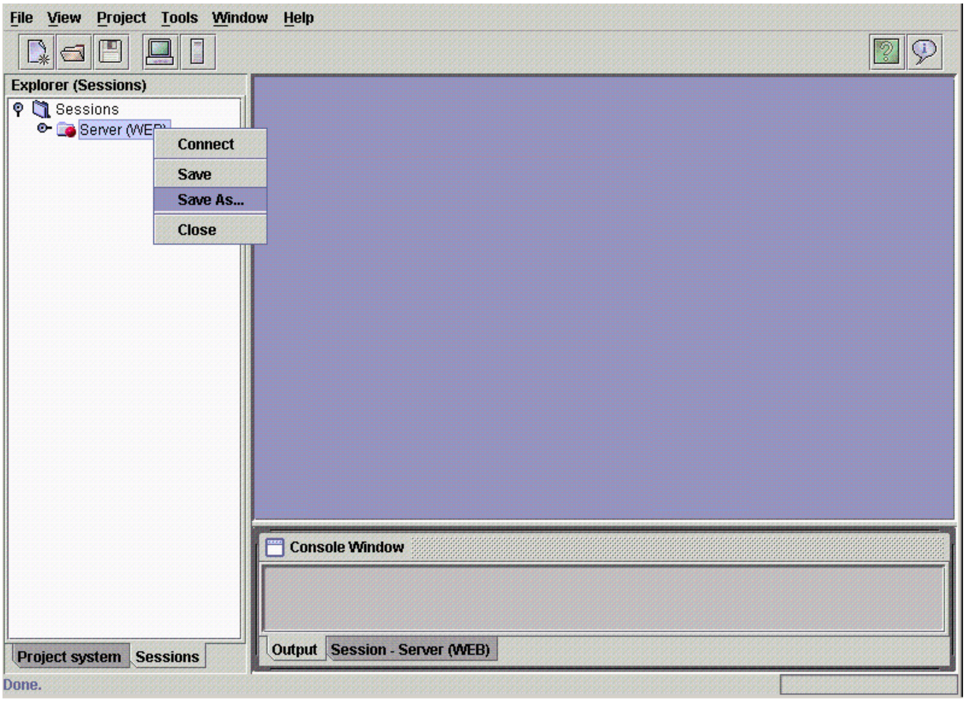
You can now create the iWay Emulation Adapter (3270/5250) application.

Procedure: How to Create the iWay Emulation Adapter (3270/5250) Application

To create the iWay Emulation Adapter (3270/5250) application:

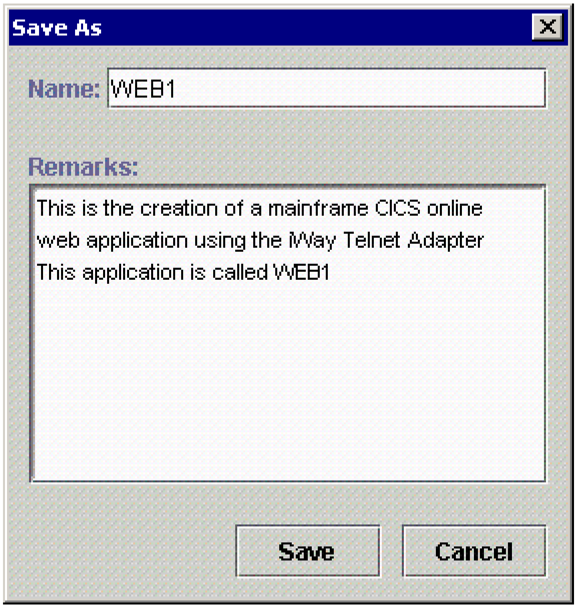
1. To log off CICS, enter the command *CESF LOGOFF*.
2. Click the *X* in the upper right of the GUI Developer emulator screen.

The Telnet Designer displays the Sessions folder and the Server beneath it as shown in the following image.



3. Right-click the *Server (WEB)* folder under Sessions and select *Save As*.

The Save As dialog box opens as shown in the following image.



Name: WEB1

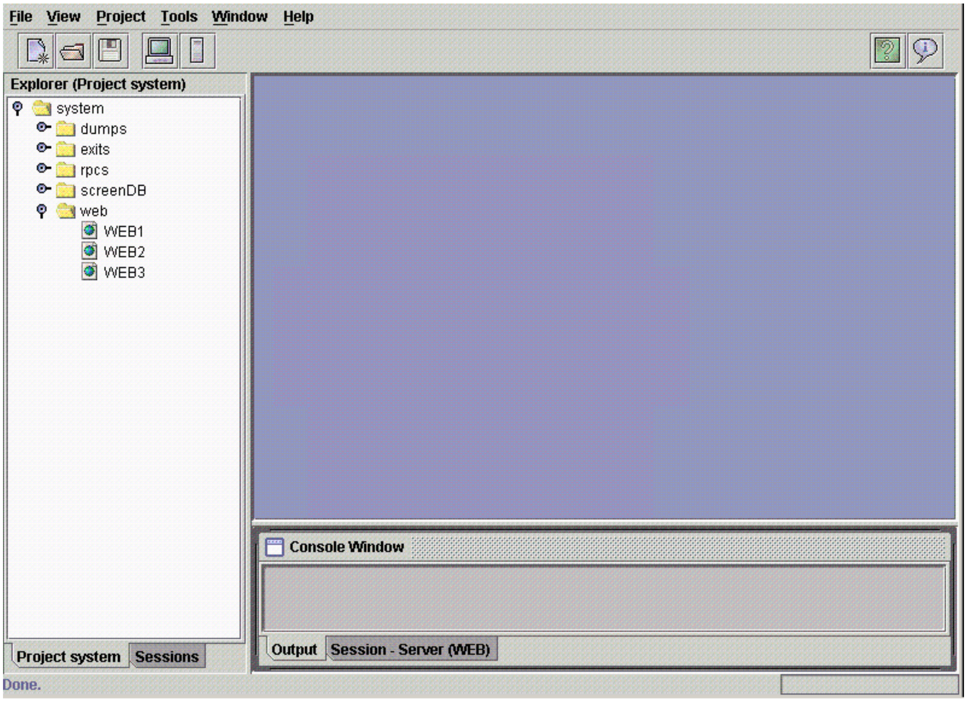
Remarks: This is the creation of a mainframe CICS online web application using the iWay Telnet Adapter This application is called WEB1

a. In the Name field, type a name, for example, WEB1.

b. In the Remarks field, type a brief description.

4. To save the Telnet Adapter application called WEB1, click *Save*.

You are returned to the Telnet Designer as shown in the following image.



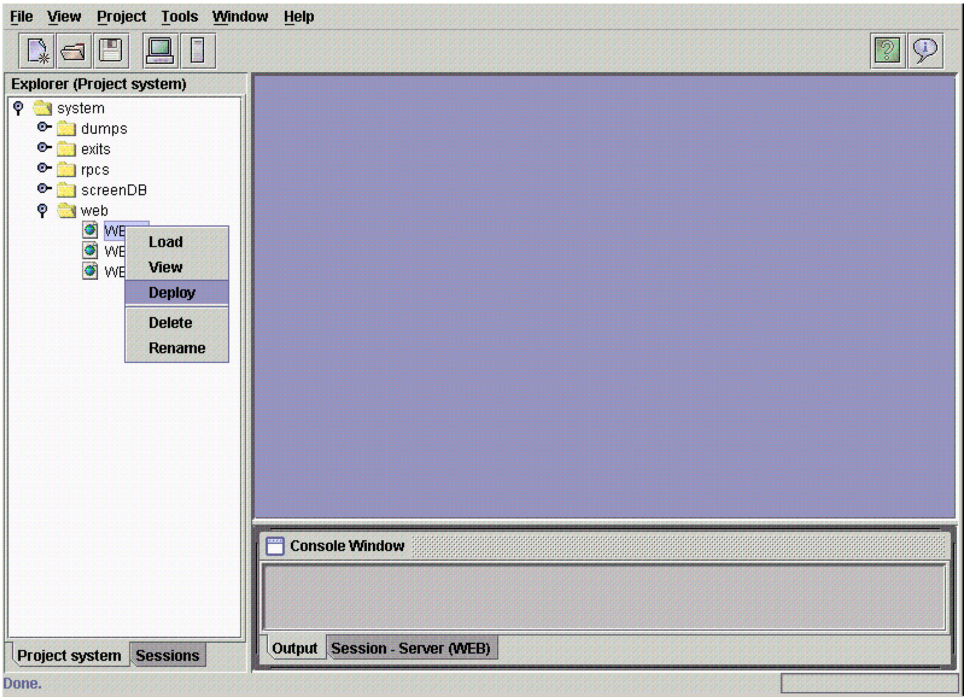
5. Click the *Project* system tab in the lower left corner.

The Web application called WEB1 appears in the left pane.

You can test the adapter application by deploying WEB1 to the supplied Web server.

Procedure: How to Test the iWay Emulation Adapter (3270/5250) Web Application

The following image shows the Telnet Designer with the WEB1 Web application highlighted and the menu of options expanded.



To test the iWay Emulation Adapter (3270/5250) Web application:

1. In the left pane, right-click *WEB1*.
2. Select *Deploy*.

   Selecting the Deploy option automatically transfers the Web components created by the GUI Developer to the supplied Web application server. The following events occur:

   - An XML rules file called WEB1.XML is created and placed into the ibitelnet/sessions directory within the webapps directory of the Web server. The rules file is an internal file and is used by the GUI Developer when you select the Deploy option.
   - A directory called ibitelnet/WEB1 is created within the webapps directory of the Web server.

     The WEB1 folder is empty because you are using default HTML translation.

If you created JSP (described in *Using the GUI Developer to Create JavaServer Pages* on page 4-28), all JSP are placed in the WEB1 folder when you deploy the application.

Procedure: How to Start the Supplied Web Server to Run the iWay Emulation Adapter (3270/5250) Web Application

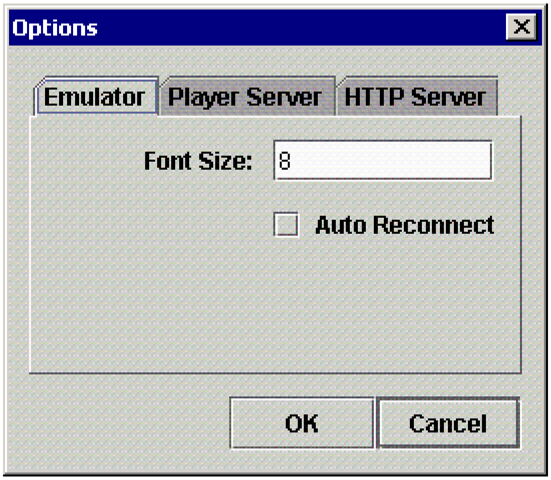
The iWay Emulation Adapter (3270/5250) must locate the JDK or JRE file. Otherwise, a NoJavaLangCLAss error appears in the browser. If this error occurs, set the java_home variable in the iwaytelnet.bat file to the location of your JDK or JRE file, for example:

```
SET JAVA_HOME= drive:\jdk1.3
```

To start the Web server:

1. In the GUI Developer screen, click *Tools* and then, select *Options*.

   The Options dialog box opens and includes the Emulator, Player Server, and HTTP Server tabs as shown in the following image.

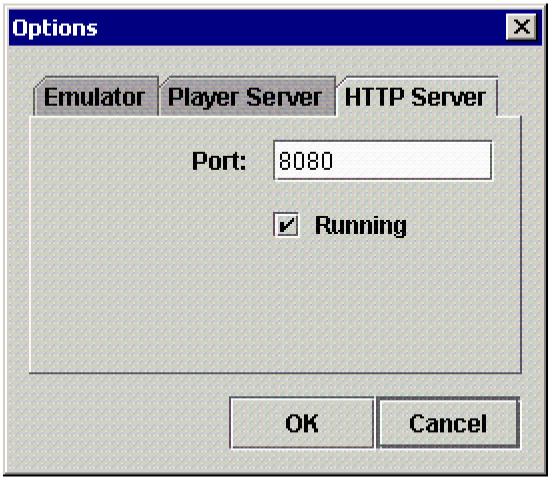


Font Size: 8

□ Auto Reconnect

2. Click the *HTTP Server* tab.

The HTTP Server tab appears as shown in the following image.



Port: 8080

☑ Running

a. In the Port field, type the port number on which the Web server is listening.

b. Select the *Running* check box.

3. To start the Web server, click *OK*.

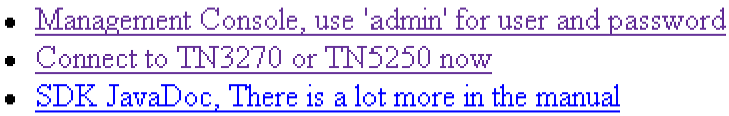
Procedure: How to View the iWay Emulation Adapter (3270/5250) Web Application

To view the iWay Emulation Adapter (3270/5250) Web application:

1. Enter the following URL in a Web browser that has access to the machine where the iWay Emulation Adapter (3270/5250) is running:

   `http://localhost:8080/ibitelnet/index.html`

   The iWay Emulation Adapter (3270/5250) default HTML window opens and includes a list of hyperlinks as shown in the following image.

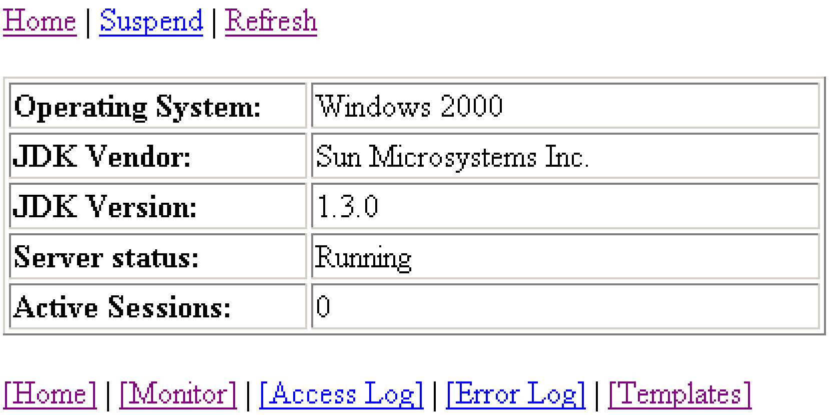
   

   - Management Console, use 'admin' for user and password
   - Connect to TN3270 or TN5250 now
   - SDK JavaDoc, There is a lot more in the manual

   This window contains sample Web applications that connect to CICS and VM systems in New York.

2. Click *Management Console; use admin for user and password.*

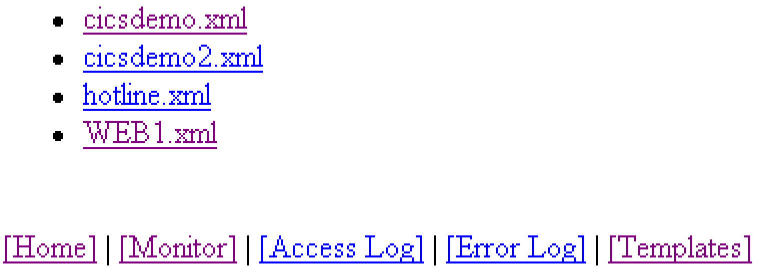
The iWay Emulation Adapter (3270/5250) console opens and displays information about your Telnet session and includes six options as shown in the following image.


Home | Suspend | Refresh
[Home] | [Monitor] | [Access Log] | [Error Log] | [Templates]

Operating System:	Windows 2000
JDK Vendor:	Sun Microsystems Inc.
JDK Version:	1.3.0
Server status:	Running
Active Sessions:	0

3. To view the iWay Emulation Adapter (3270/5250) applications that you created recently, including WEB1, click *Templates*.

   The list of templates appears in the Telnet Session templates window as shown in the following image.


[Home] | [Monitor] | [Access Log] | [Error Log] | [Templates]

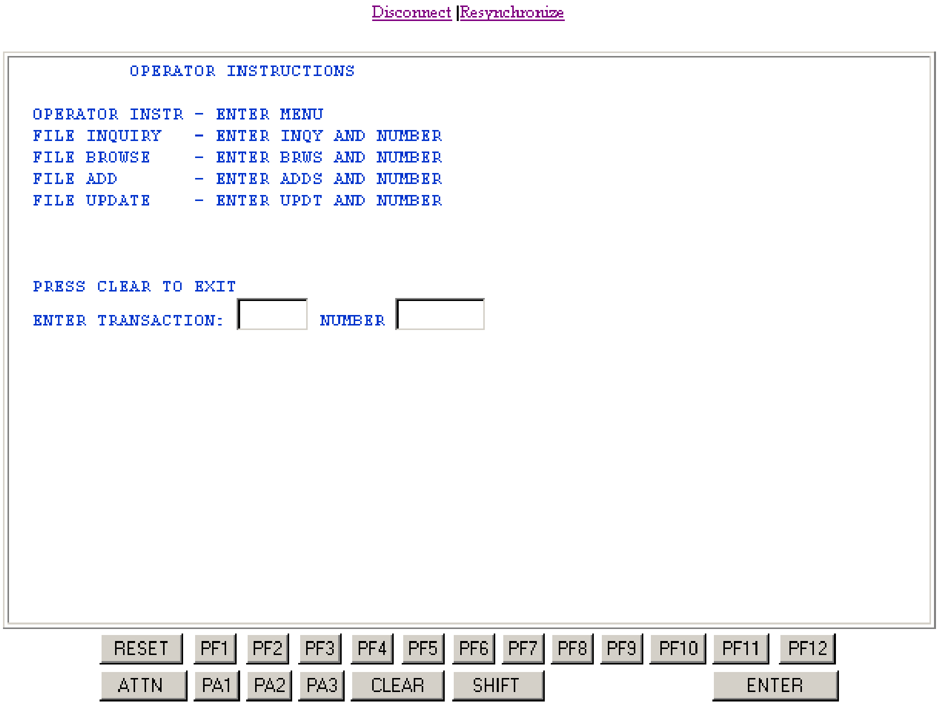
- cicsdemo.xml
- cicsdemo2.xml
- hotline.xml
- WEB1.xml

4. To navigate through the screens in default emulation mode, click *WEB1.xml*.

Example: HTML Translated Mainframe Screens

The following screen illustrates a default HTML translation of the mainframe application. The online application is running in the back end. Function keys and other buttons appear at the bottom of the screen.

Note that templates and Java Server Pages were not used. This screen illustrates default translation and the ease of GUI development, Web deployment, and execution.



Disconnect |Resynchronize

```
          OPERATOR INSTRUCTIONS

  OPERATOR INSTR - ENTER MENU
  FILE INQUIRY   - ENTER INQY AND NUMBER
  FILE BROWSE    - ENTER BRWS AND NUMBER
  FILE ADD       - ENTER ADDS AND NUMBER
  FILE UPDATE    - ENTER UPDT AND NUMBER


  PRESS CLEAR TO EXIT
  ENTER TRANSACTION: [      ] NUMBER [       ]
```

Running the GUI Developer in Web Mode: Default Translation

In this topic, you create a second iWay Emulation Adapter (3270/5250) Web application (WEB2). In this example, all the screens are hidden except for the last Browse screen. This technique is called *scripting* or *autologon*. The Web application seems to skip screens, but in reality, the screens and application programs behind the screens are running on the mainframe but are invisible to the Web browser user.

When a user clicks the application, the adapter runs through all of the screens except for the last Browse screen. As a result, an application that runs through all the previous screens, streamlining the mainframe online session, is created. The same procedure as just described is used for each screen that is to be hidden. However, you must identify each screen so that the application "records" your keystrokes and data.

To accomplish this, you must choose a portion of the screen that is unique to each mainframe screen. The unique portion enables the iWay Emulation Adapter (3270/5250) to determine what action to take when the screen becomes active as part of a 3270 or 5250 data stream. You can select options for how the iWay Emulation Adapter (3270/5250) identifies the screen when you identify the screen using a field or literal on the screen.

Using the Add Screen Identifier Feature

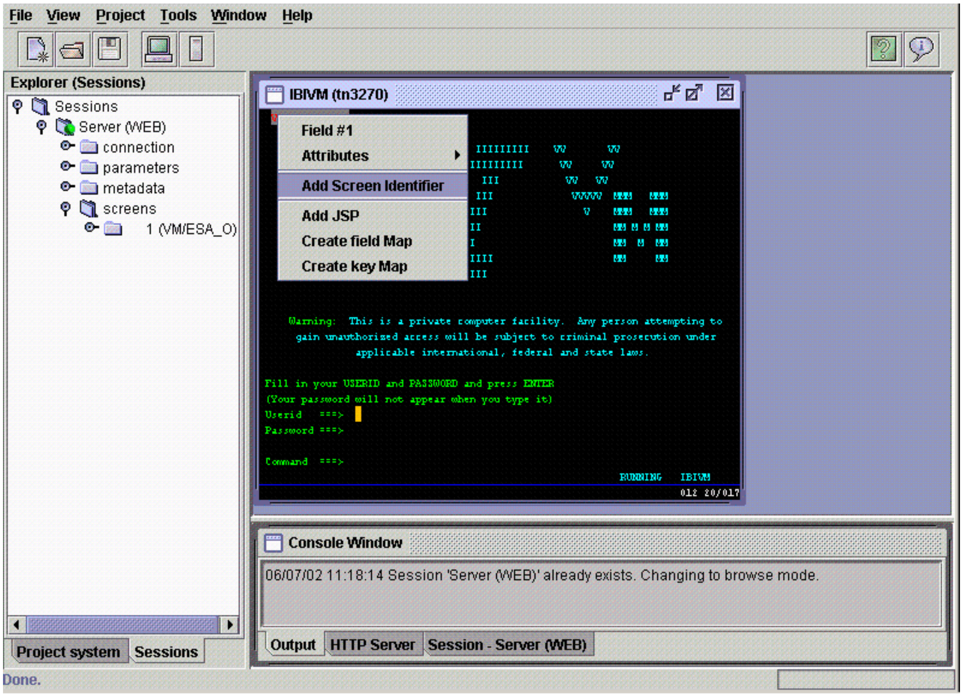
The Add Screen Identifier feature enables the user to add patterns (filters) based on screen fields. You can click the region of the screen that uniquely identifies the current screen. The GUI Developer highlights the field, and a dialog box appears with additional string matching capabilities. You can enter a screen name and after you click OK, the screen database updates.

By adding a screen identifier, the iWay Emulation Adapter (3270/5250) records the screen and the key data entered in a local database. After the screen is identified, it is recognized by the iWay Emulation Adapter (3270/5250).

The first screen that appears when connecting to the mainframe is the VTAM screen. This screen always appears, and the first literal line on top of the screen is (CM04) ACF VTAM VER 4. This is an example of a screen identifier.

Procedure: How to Add a Screen Identifier

The following image shows the GUI Developer in the VTAM screen on the right. The Sessions tab is active, and the left pane lists the Explorer sessions. The bottom right pane is a console window.



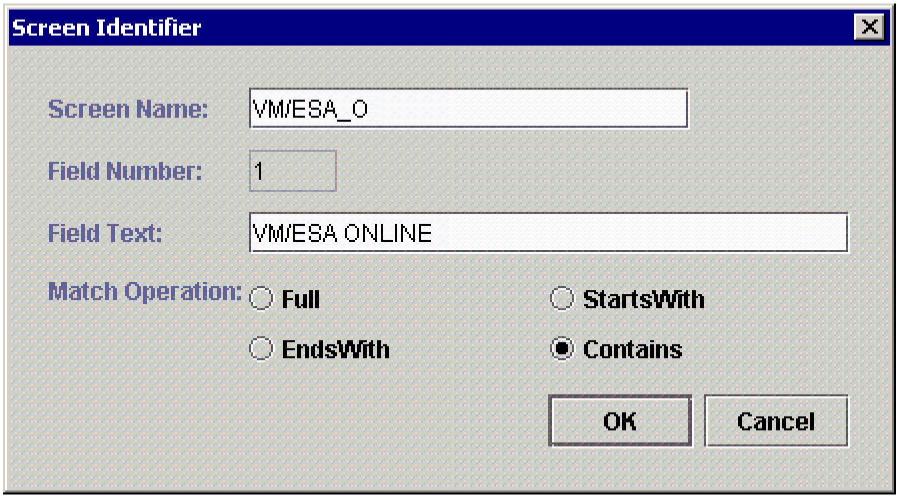
```
    Warning:  This is a private computer facility.  Any person attempting to
     gain unauthorized access will be subject to criminal prosecution under
             applicable international, federal and state laws.

Fill in your USERID and PASSWORD and press ENTER
(Your password will not appear when you type it)
Userid   ===>
Password ===>

Command  ===>
                                                       RUNNING   IBIVM
                                                                 012 20/017
```

06/07/02 11:18:14 Session 'Server (WEB)' already exists. Changing to browse mode.

To add a screen identifier:

1. In the GUI Developer on the VTAM screen, right-click the top literal field and select *Add Screen Identifier.*

The Screen Identifier dialog box appears as shown in the following image. The field number appears and the Field Text field is populated.



Screen Name: VM/ESA_O

Field Number: 1

Field Text: VM/ESA ONLINE

Match Operation: ○ Full ○ StartsWith ○ EndsWith ● Contains

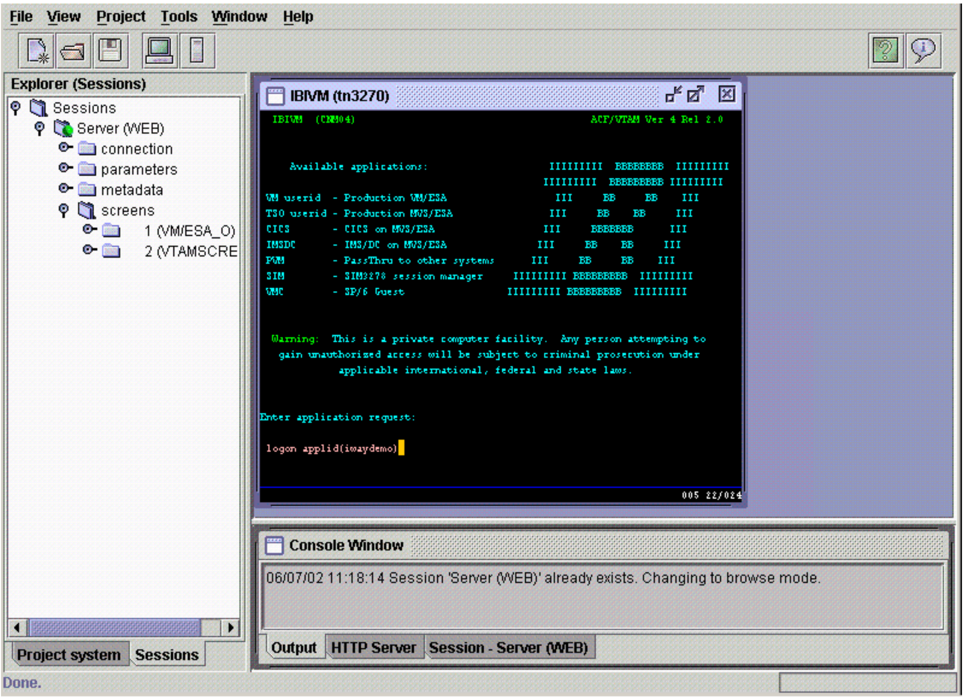
a. In the Screen Name field, provide a name.

b. Select a match operation.

When a match is made, the iWay Emulation Adapter (3270/5250) proceeds with whatever keystroke is pressed (for example, the enter key or PFKEY). As a result, the screen is not revealed to the user during run time.

2. Click *OK*.

The screen is now recognized by the iWay Emulation Adapter (3270/5250) as shown in the following image.



```
 IBIVM  (CNM04)                                          ACF/VTAM Ver 4 Rel 2.0


   Available applications:                    IIIIIIIII  BBBBBBBB  IIIIIIIII
                                             IIIIIIIII  BBBBBBBBB IIIIIIIII
VM userid  - Production VM/ESA                 III     BB     BB    III
TSO userid - Production MVS/ESA               III     BB    BB     III
CICS       - CICS on MVS/ESA                 III     BBBBBBB      III
IMSDC      - IMS/DC on MVS/ESA              III     BB    BB     III
PVM        - PassThru to other systems     III     BB     BB    III
SIM        - SIM3278 session manager     IIIIIIIII BBBBBBBBB  IIIIIIIII
VMC        - SP/6 Guest                 IIIIIIIII BBBBBBBBB  IIIIIIIII


 Warning:  This is a private computer facility.  Any person attempting to
  gain unauthorized access will be subject to criminal prosecution under
            applicable international, federal and state laws.


Enter application request:

 logon applid(iwaydemo)


                                                                     005 22/024
```

```
06/07/02 11:18:14 Session 'Server (WEB)' already exists. Changing to browse mode.
```

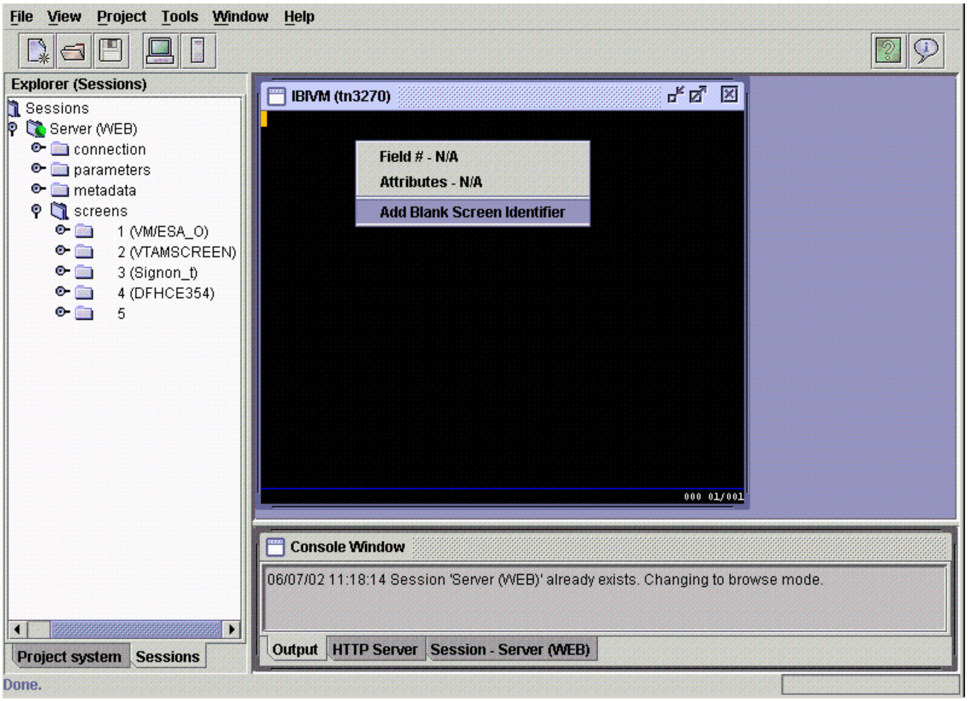
a. Continue as you did during default emulation and enter the *LOGON APPLID(IWAYDEMO)* command.

b. Add screen identifiers to the screens that you want to hide.

c. Continue the Add Screen Identifier option for other screens.

Important: Ensure you do not identify the Browse screen as you want it to appear in the browser in default translated HTML.

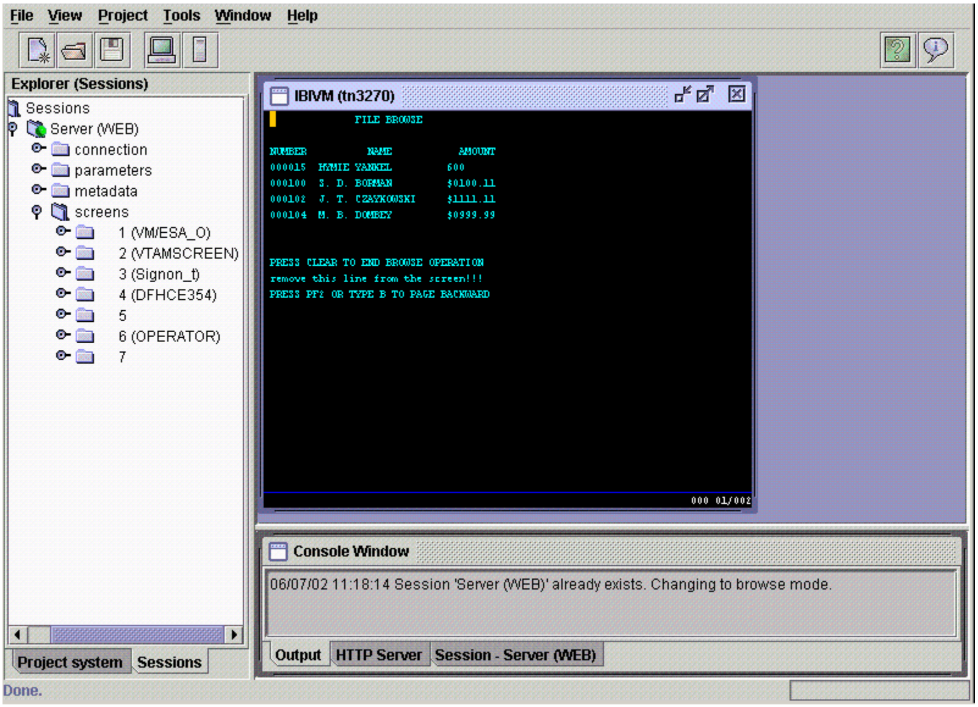
The following image represents the screen with the menu for your selection.



```
06/07/02 11:18:14 Session 'Server (WEB)' already exists. Changing to browse mode.
```

3. For a blank screen, you must select *Add Blank Screen Identifier* from the menu.

The following image shows that the screens that were recognized are added to the database.

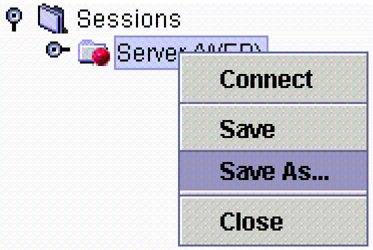


```
             FILE BROWSE

NUMBER          NAME           AMOUNT
000015  HYMIE YANKEL          600
000100  S. D. BORMAN          $0100.11
000102  J. T. CZAYKOWSKI      $1111.11
000104  M. B. DOMBEY          $0999.99


PRESS CLEAR TO END BROWSE OPERATION
remove this line from the screen!!!
PRESS PF2 OR TYPE B TO PAGE BACKWARD

                                          000 01/002
```

```
06/07/02 11:18:14 Session 'Server (WEB)' already exists. Changing to browse mode.
```

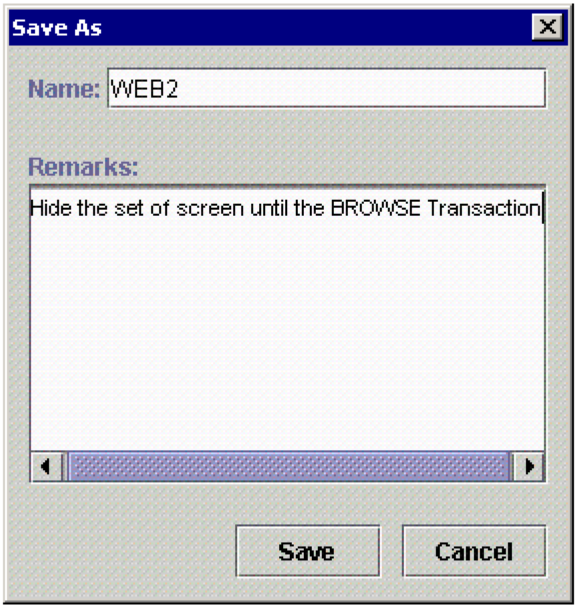
4. To log off CICS, enter the command, *CESF LOGOFF*.
5. Click the *X* in the upper right of the GUI Developer emulator screen.

   The following image shows an options menu in the left pane.



6. Right-click the *Server (WEB)* folder under Sessions and select *Save As*.

The Save As dialog box opens as shown in the following image.



Name: WEB2

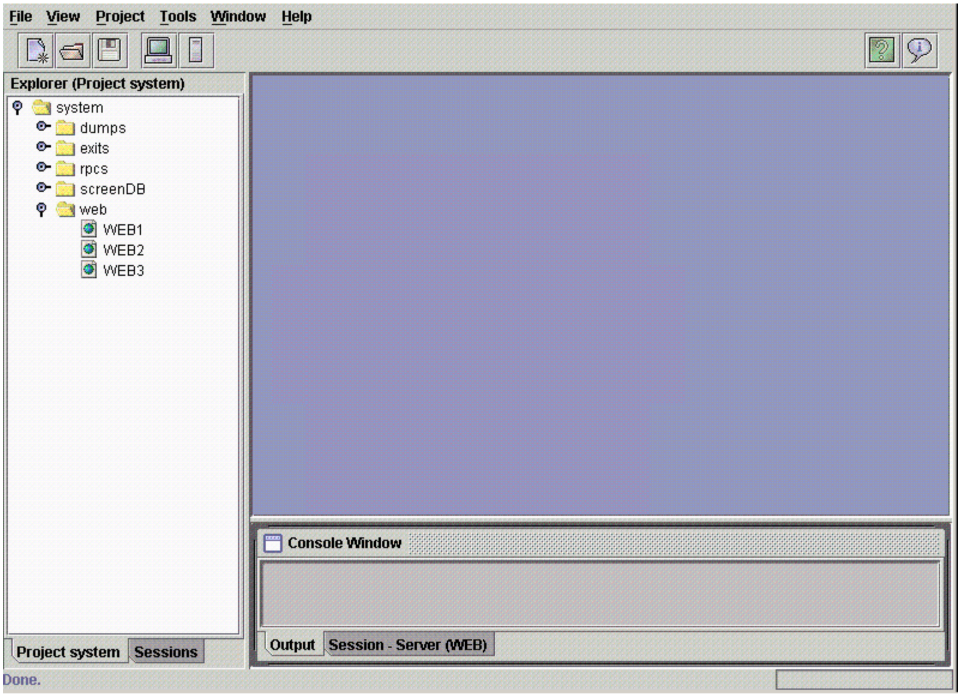
Remarks: Hide the set of screen until the BROWSE Transaction

a. In the Name field, type a name, for example, WEB2.

b. In the Remarks field, type instructions or comments.

7. To save the Telnet application called WEB2, click *Save*.

You are returned to the Telnet Designer as shown in the following image.



8. To view the Web application called WEB2, click the *Project* system tab in the lower left.

   The application WEB2 can now be accessed on the Web.

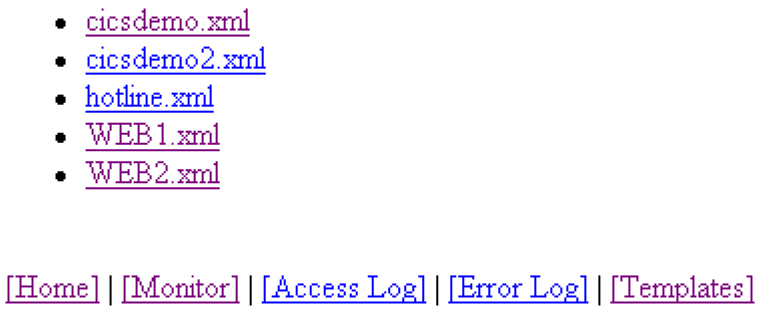
   For more information on how to deploy the WEB2 Telnet application, see *How to Test the iWay Emulation Adapter (3270/5250) Web Application on page 4-10*.

   For more information on how to start the supplied Web application server to view the WEB2 Telnet application, see *How to Start the Supplied Web Server to Run the iWay Emulation Adapter (3270/5250) Web Application on page 4-11*.

9. In a Web browser that has access to the machine where the iWay Emulation Adapter (3270/5250) is running, enter the following URL:

```
http://localhost:8080/ibitelnet/index.html
```

The default HTML window for the iWay Emulation Adapter (3270/5250) opens and displays a list of available templates as shown in the following image.



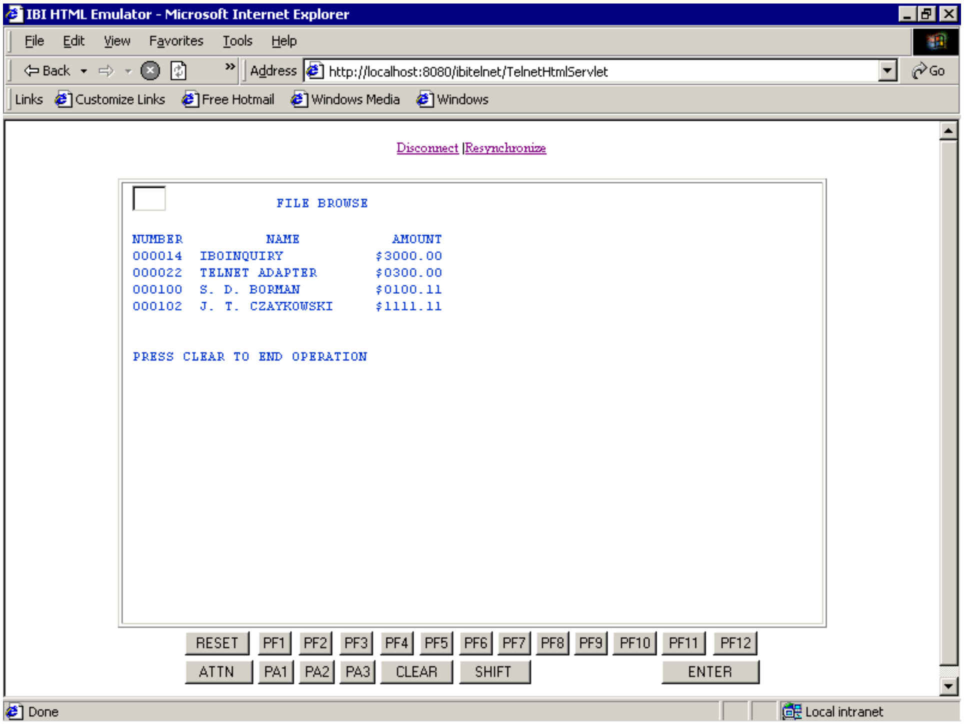
- cicsdemo.xml
- cicsdemo2.xml
- hotline.xml
- WEB1.xml
- WEB2.xml

[Home] | [Monitor] | [Access Log] | [Error Log] | [Templates]

The window contains sample Web applications that connect to the CICS and VM systems in New York.

10. Click *WEB2.xml*.

The following window opens and displays the default HTML translation, as shown in the following image.



Address: http://localhost:8080/ibitelnet/TelnetHtmlServlet

Disconnect |Resynchronize

```
                   FILE BROWSE

NUMBER          NAME          AMOUNT
000014  IBOINQUIRY            $3000.00
000022  TELNET ADAPTER        $0300.00
000100  S. D. BORMAN          $0100.11
000102  J. T. CZAYKOWSKI      $1111.11


PRESS CLEAR TO END OPERATION
```

The VTAM screen, the CICS logon screen, and other screens were eliminated from view.

The screen that appears is default HTML translation. To change its look and feel you have two options. You can create a:

Generic template that surrounds this mainframe screen and the other default translated screens. This method requires a manual edit to a file. For more information, see *Using Default HTML Translation With a Generic Template on page 4-24*.

JSP for the page to totally change its appearance and add functionality. This method is achieved through the GUI Developer. For more information, see *Using the GUI Developer to Create JavaServer Pages* on page 4-28.

Using Default HTML Translation With a Generic Template

With default HTML translation, you can create a generic template that surrounds the translated screen to provide a more customized look and feel. You can make only cosmetic changes with HTML. You cannot completely redesign the screen or combine multiple mainframe screens into one HTML screen.

With a generic template using default translation, you can:

- Change the background color.
- Move the Resynchronize and Disconnect links to the top or bottom of the Web page.
- Change the fonts, intensities, and other characteristics of fields.
- Move the translated keyboard to the top or bottom of the Web page.
- Add images.
- Make cosmetic HTML modifications.

In the following procedure, you create a template for the WEB2 application. The Browse screen appears but surrounded by an HTML template. You change the background color and also add a new title to the screen. The background color and new title appear for all screens that appear, not only for the browse screen.

Procedure: How to Use a Generic Template

To use a generic template:

1. Create a JSP file in the directory, webapps\ibitelnet.

   You can use the JSP file distributed with the adapter (ibitc_default.jsp) located in the iway\telnet\projects\tomcat\webapps\ibitelnet directory as a sample.

2. Copy and save the JSP file as *web2template.jsp*.

3. Edit the web2template.jsp file manually to change the background color and to add a title.

```
<!-- The fieldTab javascript takes care of cursor positioning -->

<!-- 1) Here you can change the background color -->

<BODY onLoad='fieldTab()' bgcolor='#FFFF00'>
```

where:

#FFFF00

Is the hexadecimal code for the color yellow.

You can make other HTML modifications to the JSP file, which are reflected in the translated mainframe screen, in this case, the CICS BROWSE screen.

This is a new title that is seen for all translated screens:

```
<!-- ------------------------ -->

<!-- THIS MUST ALWAYS BE HERE -->

<!-- ------------------------ -->
```

Snippets from the file reveal notes that can help you make other changes, such as:

```
<!-- 2) Here you can change the translation commands properties -->

<!--    or move it to the bottom of your page                   -->

<font style='font-size:8pt' color='#0033CC'>

<!-- 3) Here you can change the font properties -->

<% telnetConnection.setIntensifiedColor("#006600"); %>

<font style='font-size:8pt' color='#0033CC'>

<!-- 4) Here you can move the keyboard to the top of the page -->

<%= TelnetHtmlHelper.buildKeyboard(emulation) %>
```

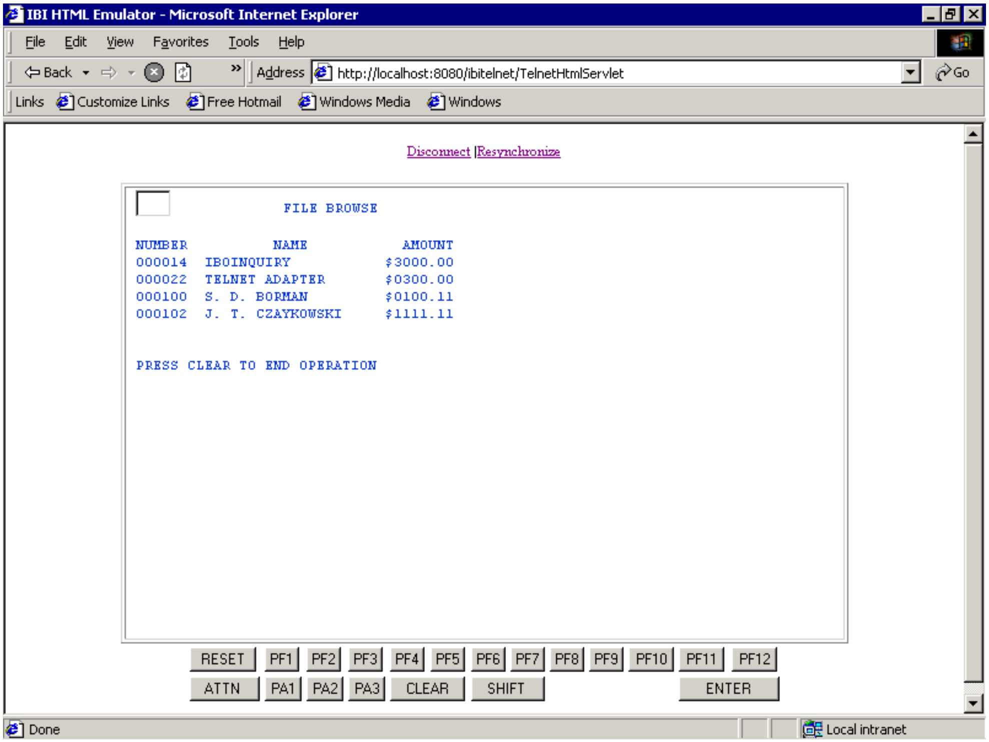
4. Edit the WEB2.XML rules file located in the ibitelnet/sessions directory within the webapps directory of the Web server.

The WEB2.XML file was created when you deployed the application using the GUI Developer.

5. Make the following change that identifies the web2template.jsp (3270 is used for this procedure):

```
<sequence NAME='WEB2' MODE='WEB' VERSION='2.0' >

  <remarks>

  5.Hide the set of screens until the BROWSE Transaction.
  </remarks>
 <connection HOST='IBIVM' PORT='23' EMULATION='tn3270' EXTENDED='OFF'
LANGUAGE='Cp037' TIMERTIMEOUT='15' URL='web2template.jsp' />
```

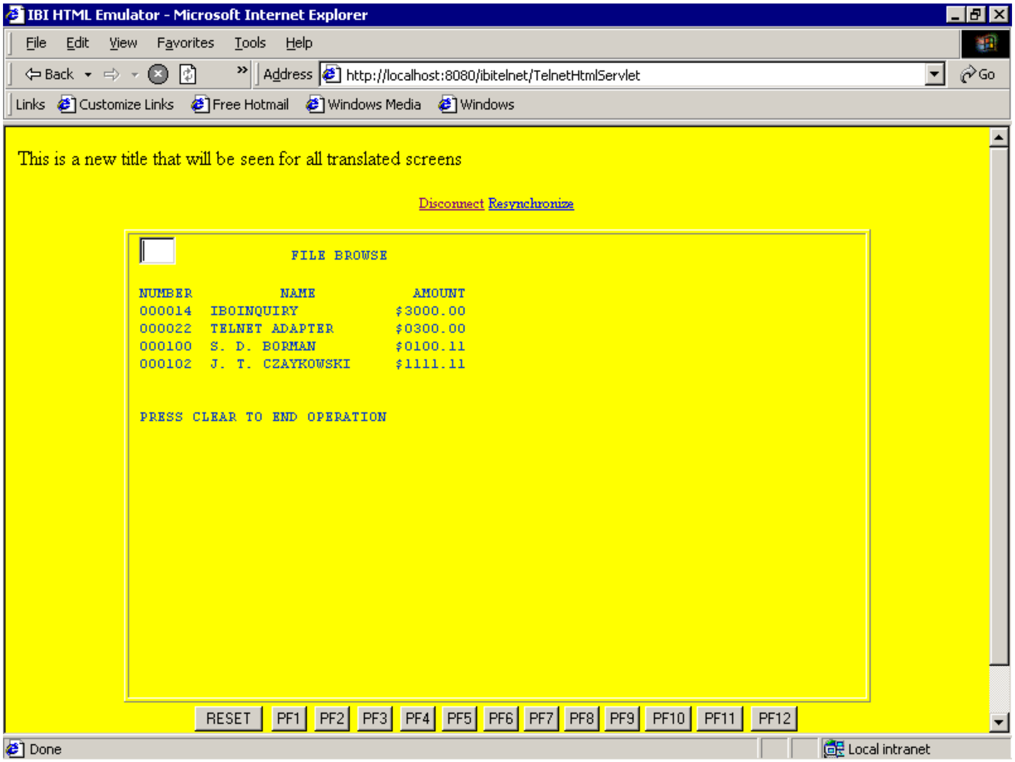
The following image illustrates the translated CICS Browse screen *before* adding a template.


IBI HTML Emulator - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address
http://localhost:8080/ibitelnet/TelnetHtmlServlet
Go
Links
Customize Links
Free Hotmail
Windows Media
Windows
Disconnect |Resynchronize

```
                 FILE BROWSE

NUMBER          NAME           AMOUNT
000014  IBOINQUIRY            $3000.00
000022  TELNET ADAPTER        $0300.00
000100  S. D. BORMAN          $0100.11
000102  J. T. CZAYKOWSKI      $1111.11


PRESS CLEAR TO END OPERATION
```

RESET PF1 PF2 PF3 PF4 PF5 PF6 PF7 PF8 PF9 PF10 PF11 PF12
ATTN PA1 PA2 PA3 CLEAR SHIFT ENTER
Done
Local intranet

The following image illustrates the CICS Browse screen *after* adding the template called web2template.jsp to the WEB2.XML rules file.

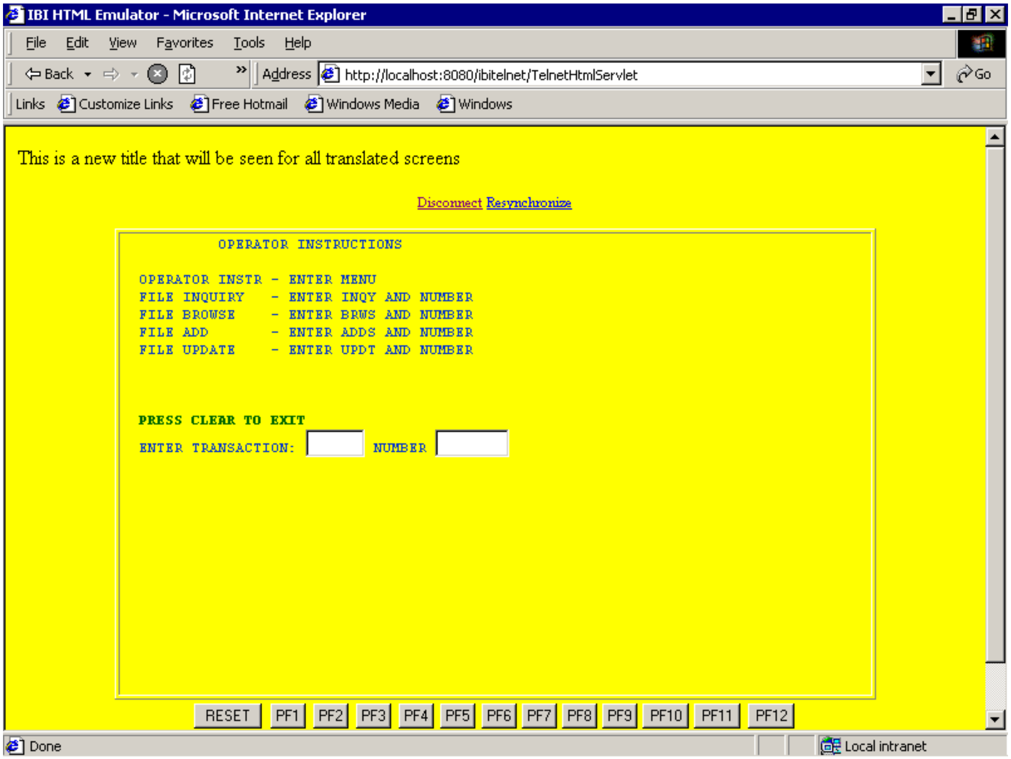

IBI HTML Emulator - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address http://localhost:8080/ibitelnet/TelnetHtmlServlet
Go
Links Customize Links Free Hotmail Windows Media Windows
Disconnect Resynchronize
RESET PF1 PF2 PF3 PF4 PF5 PF6 PF7 PF8 PF9 PF10 PF11 PF12
Done
Local intranet

This is a new title that will be seen for all translated screens

```
                 FILE BROWSE

NUMBER          NAME              AMOUNT
000014  IBOINQUIRY              $3000.00
000022  TELNET ADAPTER          $0300.00
000100  S. D. BORMAN            $0100.11
000102  J. T. CZAYKOWSKI        $1111.11


PRESS CLEAR TO END OPERATION
```

Notice the new title and the yellow background color.

Another action such as clicking the Clear key displays the menu screen with the yellow background and the title as shown in the following image.


IBI HTML Emulator - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address http://localhost:8080/ibitelnet/TelnetHtmlServlet
Go
Links Customize Links Free Hotmail Windows Media Windows
Disconnect Resynchronize
RESET PF1 PF2 PF3 PF4 PF5 PF6 PF7 PF8 PF9 PF10 PF11 PF12
Done
Local intranet

This is a new title that will be seen for all translated screens

```
          OPERATOR INSTRUCTIONS

OPERATOR INSTR - ENTER MENU
FILE INQUIRY   - ENTER INQY AND NUMBER
FILE BROWSE    - ENTER BRWS AND NUMBER
FILE ADD       - ENTER ADDS AND NUMBER
FILE UPDATE    - ENTER UPDT AND NUMBER


PRESS CLEAR TO EXIT
ENTER TRANSACTION: [      ] NUMBER [      ]
```

Using the GUI Developer to Create JavaServer Pages

To change the appearance of the mainframe application more significantly than using templates, the GUI Developer in Web mode enables you to change the look and feel of the application, as well as enhance the functionality of your mainframe online application. You can move fields, extract screen data, and combine one or more screens into one HTML screen.

The purpose of using JavaServer Pages is to convert mainframe legacy screens using Web elements. The result is an XML rules file as discussed previously as well a JSP file for each screen to which you want to apply a custom HTML page. The XML file contains all the identification rules and the name of the JSP file associated with the Telnet screen.

Creating JavaServer Pages

The iWay Emulation Adapter (3270/5250) and its capability to employ user-defined JSP is an extension of the HTML translation capability previously described. With default HTML translation, you cannot control the appearance of the HTML page. However, with JSP, you can customize an HTML page so the screens on your mainframe system appear as a Web application. For example, you can add images, combo boxes, and check boxes to customize your application.

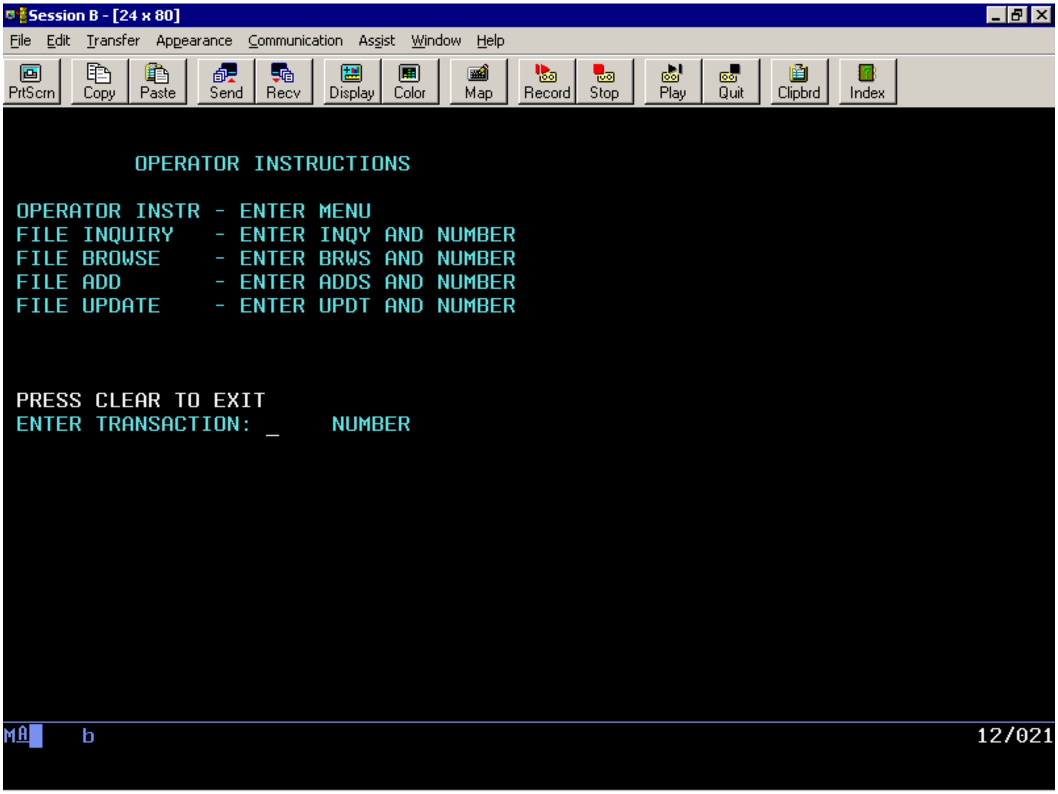
The iWay Emulation Adapter (3270/5250) enables you to control the mainframe Telnet session by associating one JavaServer Page to many mainframe screens.

Note: You can also integrate other applications and data sources with your existing mainframe system to add limitless functionality.

The following procedure describes the steps required to create a Telnet application called WEB3. The procedure describes a system identical to the CICS system that was described for creating the WEB1 and WEB2 applications. In this case, a new application called WEB3 displays the CICS MENU screen in a new way.

When the application finishes using the GUI Developer, the browser user can click WEB3 to view the CICS menu screen JSP. All previous mainframe screens are hidden.

The following image shows the original CICS menu screen that is to be converted by a JSP called WEB3.JSP.



Session B - [24 x 80]
File Edit Transfer Appearance Communication Assist Window Help
PrtScrn Copy Paste Send Recv Display Color Map Record Stop Play Quit Clipbrd Index

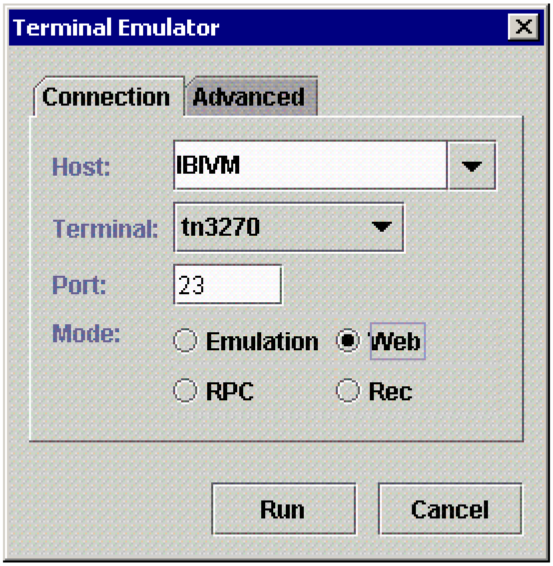
```
          OPERATOR INSTRUCTIONS

OPERATOR INSTR - ENTER MENU
FILE INQUIRY   - ENTER INQY AND NUMBER
FILE BROWSE    - ENTER BRWS AND NUMBER
FILE ADD       - ENTER ADDS AND NUMBER
FILE UPDATE    - ENTER UPDT AND NUMBER



PRESS CLEAR TO EXIT
ENTER TRANSACTION: _    NUMBER
```

Procedure: How to Run the GUI Developer in Web Mode: JavaServer Pages

To run the GUI Developer in Web mode:

1. Open the iWay Emulation Adapter.
2. Right-click the *Sessions* folder and select *New Transaction*.

An emulator session starts, and the Terminal Emulator appears with the Connection tab active where you enter the connection parameters as shown in the following image.



Host: IBIVM

Terminal: tn3270

Port: 23

Mode: ○ Emulation ● Web ○ RPC ○ Rec

a. In the Host field, type a name for the host.

b. From the Terminal drop-down list, select the terminal

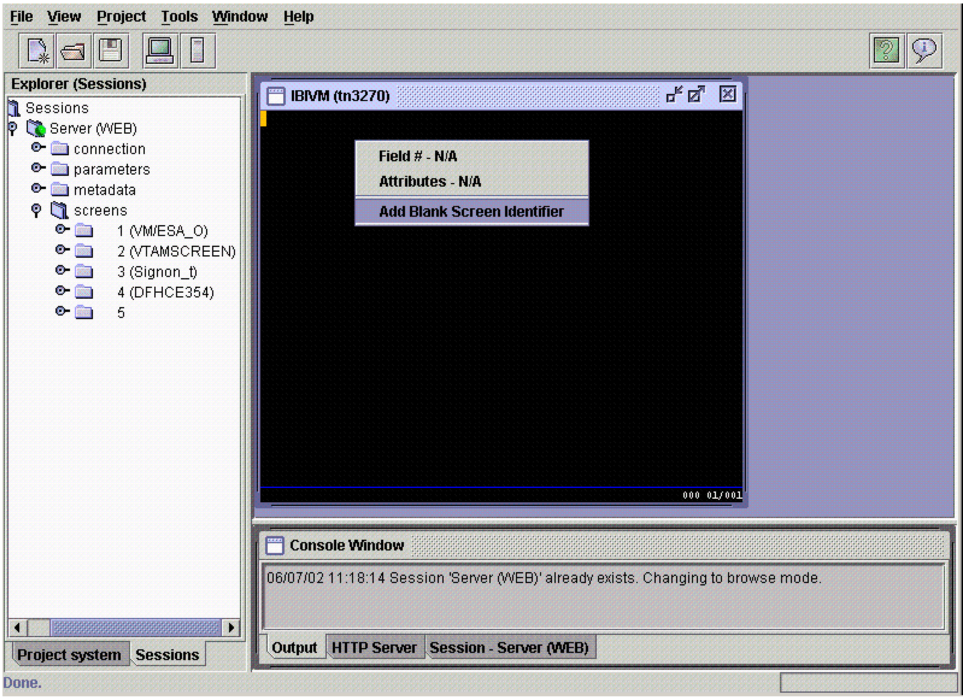
c. In the Port field, type the port number.

d. Click the *Web* option.

3. Click *Run*.

   This enables you to navigate through each mainframe screen.

The following image shows an example of a screen that appears with a menu with the option, Add Blank Screen Identifier.



06/07/02 11:18:14 Session 'Server (WEB)' already exists. Changing to browse mode.

4. Identify all the screens as previously described, remembering that for every blank screen, you must select *Add Blank Screen Identifier*.

5. When you come to a screen for which you want to create a JSP (for example, the MENU screen), you must right-click anywhere in the screen and select *Add JSP*.

Adding a JavaServer Page for a Screen

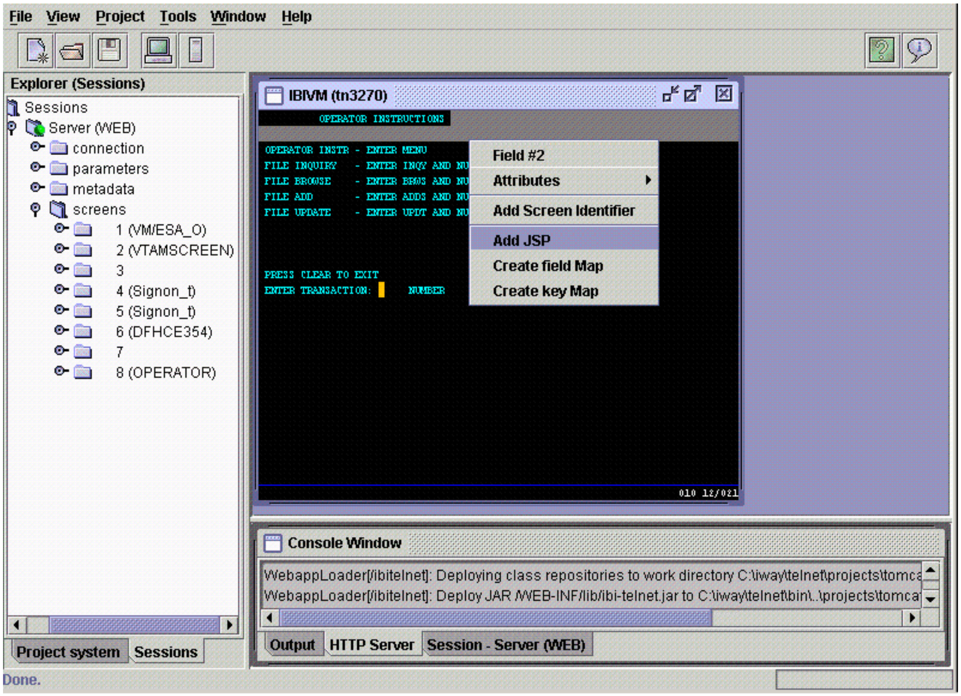
You must add a JSP for each screen that is revamped and displayed during a browser session. The Add JSP option is used to associate a JSP with a mainframe screen or set of mainframe screens.

As described previously, all screens for which you add a screen identifier will be hidden until the application displays a screen with an associated JSP. After you add the JSP using the GUI Developer, the JSP can be manually edited or used as input to any HTML editor.

Note: You must use caution as the JSP is not a pure HTML file. It contains JSP-specific properties as well as iWay Emulation Adapter (3270/5250) commands that must not be removed or modified.

Procedure: How to Add a JavaServer Page for a Screen

In this procedure, you add JSP only for the CICS menu screen as shown in the following image that shows the Explorer session in the left pane and a screen in the right pane.



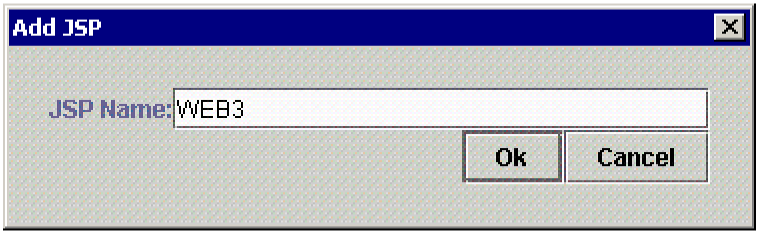
```
          OPERATOR INSTRUCTIONS

OPERATOR INSTR - ENTER MENU
FILE INQUIRY   - ENTER INQY AND NU
FILE BROWSE    - ENTER BRWS AND NU
FILE ADD       - ENTER ADDS AND NU
FILE UPDATE    - ENTER UPDT AND NU


PRESS CLEAR TO EXIT
ENTER TRANSACTION:      NUMBER

                                        010 12/021
```

```
WebappLoader[/ibitelnet]: Deploying class repositories to work directory C:\iway\telnet\projects\tomca
WebappLoader[/ibitelnet]: Deploy JAR /WEB-INF/lib/ibi-telnet.jar to C:\iway\telnet\bin\..\projects\tomca
```

1. Right-click anywhere in the screen and select *Add JSP.*

   The Add JSP option is only available if you have identified the screen or if it has been previously identified as indicated in the left pane of the GUI Developer screen 7 (OPERATOR). This indicates that the adapter database was updated.

   The Add JSP dialog box appears as shown in the following image.



JSP Name: WEB3

2. In the JSP Name field, type a name, for example, WEB3.
3. Click *OK.*

The WEB3.JSP file is created.

Upon deployment of the application (also called WEB3), the JSP is placed into a directory called ibitelnet/WEB3 within the webapps directory of the Web server. All JSP that you create for the WEB3 application are placed in the WEB3 folder when you deploy.

To ease development, other options are available to identify the fields on a screen, including the option to rename the PF/PA and AID keys associated with the mainframe screen.

Creating a Field Map and a Key Map

The Create Field Map option is available only after you add a JSP. The GUI Developer enumerates the fields on a screen.

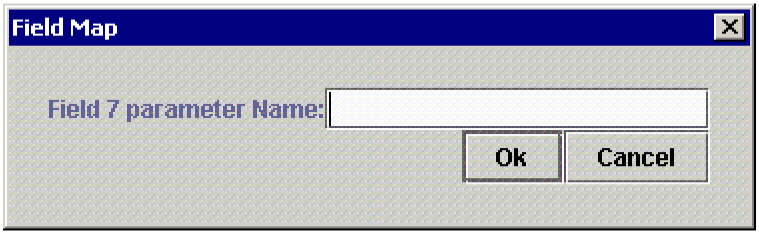
The generated JavaServer Page has the default keyboard. After you add a JSP, the Create Key Map option also is available. You can redefine any key on the keyboard. The default keyboard is suppressed after you create the first key map.

Procedure: How to Create a Field Map

To create a field map:

1. Right-click anywhere on the screen and select *Create field Map*.

   The Field Map dialog box appears as shown in the following image.

   To work with a particular field in a mainframe screen, you must know the field number. This information can be viewed in the pop-up menu in any development mode.

   To facilitate the development of custom HTML pages (as JavaServer Pages), this option enables you to associate a name to the field number.

2. In the Field parameter Name field, type the field number and click *Ok*.

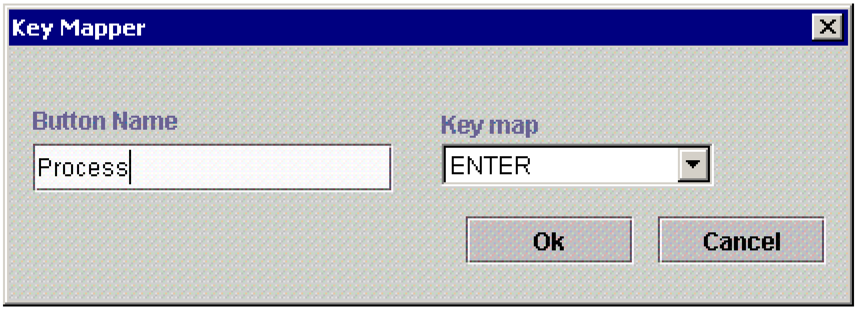
   This information is placed in the generated JavaServer Pages for further reference.

Procedure: How to Create a Key Map

To create a key map:

1. Right-click anywhere on the screen and select *Create key Map*.

   The Key Mapper dialog box appears as shown in the following image.

   Button Name: Process

   Key map: ENTER

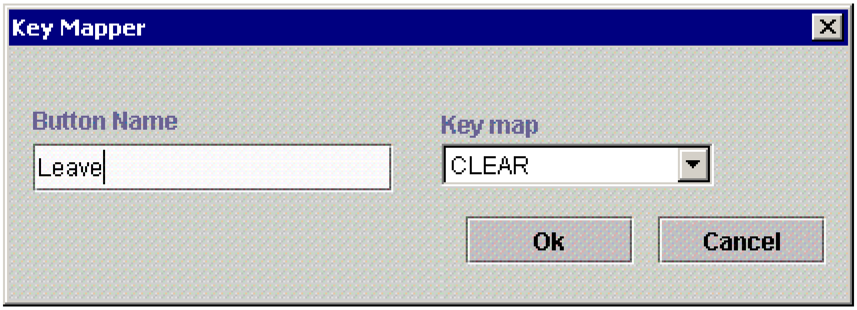
   a. In the Button Name field, type a button name, for example, Process.

   b. From the Key map drop-down list, select a key, for example, ENTER, to associate with the button.

2. Click *Ok*.

   A box with the title, Process, executes the ENTER key when the Web user clicks Process.

   The following image shows the Key Mapper dialog box where the Button Name is Leave and the Key map is CLEAR.

   Button Name: Leave

   Key map: CLEAR

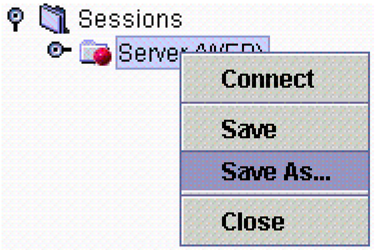
   Similarly, a box with the title, Leave, executes the CLEAR key when the Web user clicks the box.

3. Continue with the development of the WEB3 application.

4. After you add the JSP for the Menu Screen, to log off of CICS, enter the command *CESF LOGOFF*.

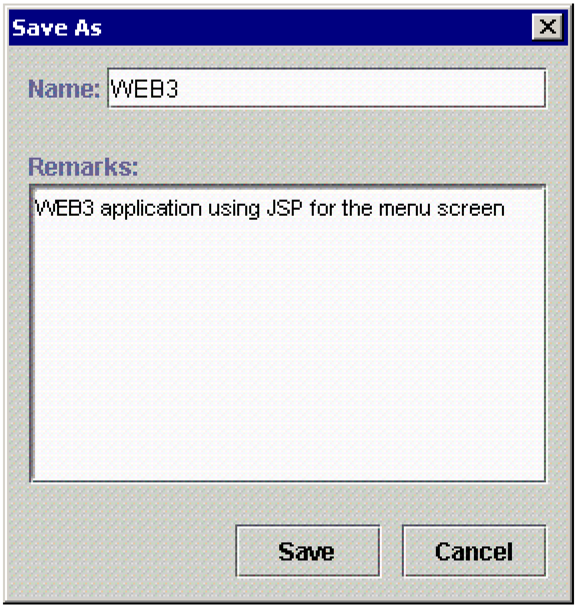
5. Click the *X* in the upper right of the GUI Developer emulator screen.

   You are returned to the Telnet Designer window where you can invoke the Save dialog box from the left pane as shown in the following image.

6. Right-click the *Server (WEB)* folder under Sessions and select *Save As*.

   The Save As dialog box appears as shown in the following image.

   Name: WEB3

   Remarks:

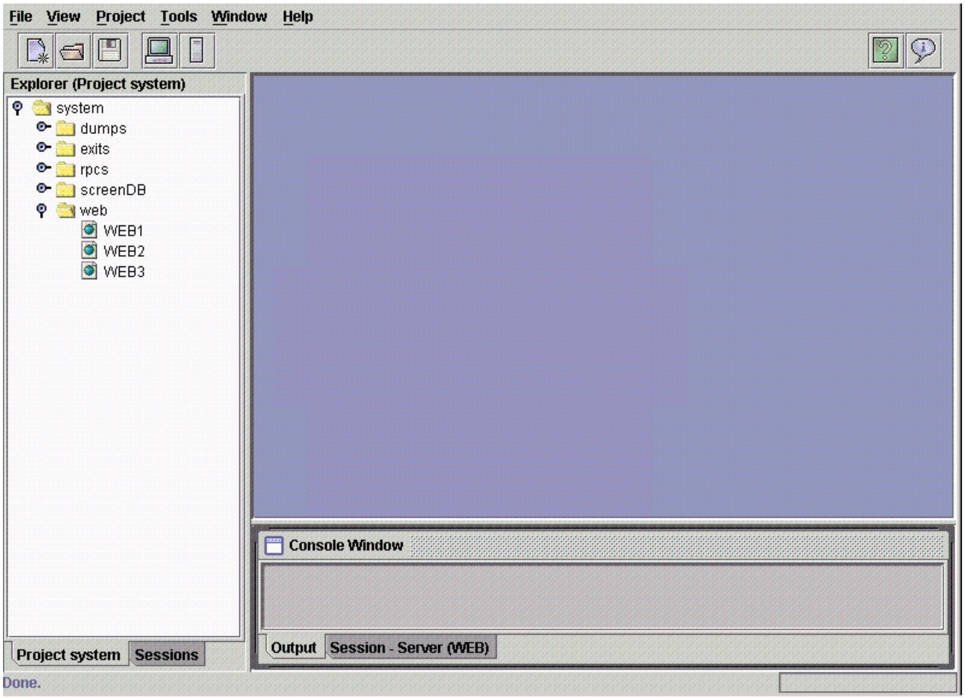
   WEB3 application using JSP for the menu screen

   a. In the Name field, type a name, for example, WEB3.

   b. In the Remarks field, type a description.

7. To save the Telnet application called WEB3, click *Save*.

You are returned to the Telnet Designer window as shown in the following image.



8. In the lower left, click the *Project* system tab.

   The Web application called WEB3 appears in the left pane. The application, WEB3, can now be accessed on the Web.

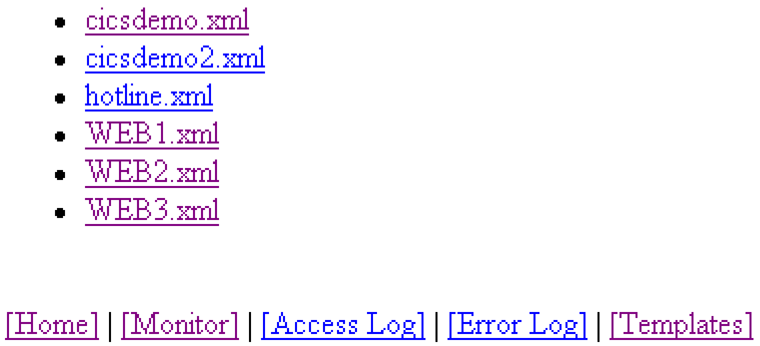
   For more information on how to deploy the WEB3 Telnet application, see *How to Test the iWay Emulation Adapter (3270/5250) Web Application on page 4-10.*

   For more information on how to view the WEB3 Telnet application, see *How to Start the Supplied Web Server to Run the iWay Emulation Adapter (3270/5250) Web Application on page 4-11*.

9. In a Web browser that has access to the iWay Emulation Adapter (3270/5250), enter the following URL:

   ```
   http://localhost:8080/ibitelnet/index.html
   ```

The iWay Emulation Adapter (3270/5250) default HTML page opens as shown in the following image.



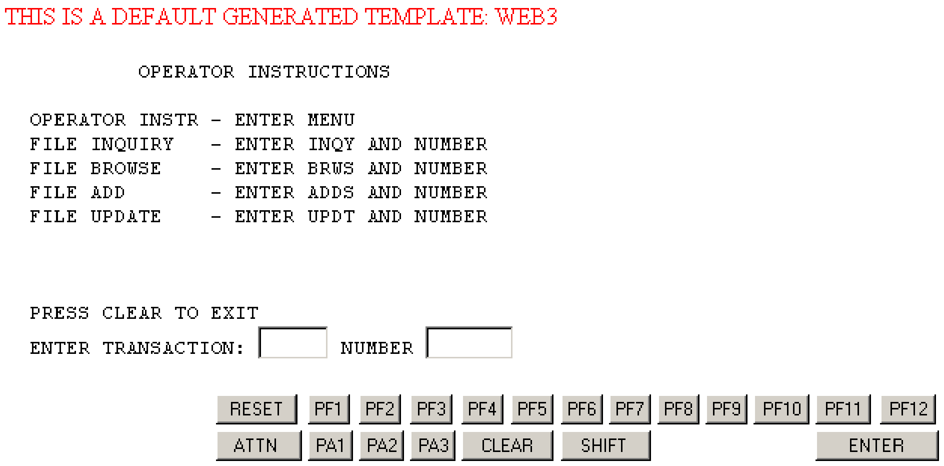
- cicsdemo.xml
- cicsdemo2.xml
- hotline.xml
- WEB1.xml
- WEB2.xml
- WEB3.xml

[Home] | [Monitor] | [Access Log] | [Error Log] | [Templates]

The page contains sample Web applications that connect to the CICS and VM systems in New York.

10. Click *WEB3.xml*.

The following screen opens as shown in the following image, which allows you to edit the WEG3 JSP or redesign the CICS menu entirely.



THIS IS A DEFAULT GENERATED TEMPLATE: WEB3

```
           OPERATOR INSTRUCTIONS

 OPERATOR INSTR - ENTER MENU
 FILE INQUIRY   - ENTER INQY AND NUMBER
 FILE BROWSE    - ENTER BRWS AND NUMBER
 FILE ADD       - ENTER ADDS AND NUMBER
 FILE UPDATE    - ENTER UPDT AND NUMBER


 PRESS CLEAR TO EXIT
 ENTER TRANSACTION:        NUMBER
```

The VTAM screen, CICS logon screen, and other screens were eliminated from view.

The following default message appears on the screen:

`THIS IS A DEFAULT GENERATED TEMPLATE: WEB3`

This means that the screen uses the JSP called WEB3.JSP.

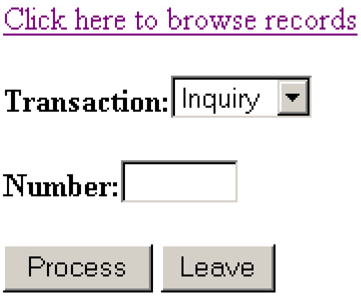
Now you can edit the WEB3.JSP to completely redesign the look and feel of this CICS menu screen.

Example: The Default WEB3.JSP File

The following is the default WEB3.JSP file. Upon deployment using the Telnet Designer, the file is located in the directory called ibitelnet/WEB3 within the webapps directory of the Web server.

```
<HTML>
<BODY>
<font color="#FF0000">THIS IS A DEFAULT GENERATED TEMPLATE: WEB3</font>
<!-- THIS MUST ALWAYS BE HERE -->
<%@ include file="../templates/beginTemplate.jsp" %>
<!-- Default Translation -->
<pre>
<%= screen.paintHtml() %>
</pre>
<!-- Default keyboard -->

<%= screen.paintKeyboard(emulation) %>
<!-- THIS MUST ALWAYS BE HERE -->
<%@ include file="../templates/endTemplate.jsp" %>
</BODY>
</HTML>
```

Making modifications to the JSP can change the look and functionality of the original CICS menu screen as shown in the following image and as illustrated by the following example.



Transaction: Inquiry

Number:

- The screen uses the JSP called WEB3.JSP.
- It includes an option to execute the BROWSE transaction.
- It includes a drop-down list with options to Inquire, Add, or Update.
- The Process button denotes the ENTER key (created a key map in the Telnet Designer).
- The Leave button denotes the CLEAR key (created a key map in the Telnet Designer).

Example: The Enriched WEB3.JSP File

The following sample code is for the enriched WEB3.JSP file that illustrates the enhancements in the previous example. This supplied JSP is called cicsMenu.jsp and is located in the directory called ibitelnet/cicsdemo within the webapps directory of the Web server.

```
<HTML>
<HEAD>
<TITLE>CICS Demo Main Menu</TITLE>
</HEAD>
<BODY>
<!-- ------------------------ -->
<!-- THIS MUST ALWAYS BE HERE -->
<!-- ------------------------ -->
<%@ include file="../templates/beginTemplate.jsp" %>
<!-- BROWSE TRANSACTION
     creating hyperlink that will be equivalent to
     - Entering "brws" in the field 10
     - Issuing the attention key "ENTER"
-->
<br><%= screen.paintHyperlink("Click here to browse records", "ENTER",
10, "brws") %>
<!-- OTHER TRANSACTIONS
     Using the combo box to enter the transaction name to field 10
-->
<p><b>Transaction:</b><select name="10">
                     <option value="inqy">Inquiry
                     <option value="adds">Add
                     <option value="updt">Update
                     </select>

<!-- Painting field 12, which is an unprotected field for entering number
-->
<p><b>Number:</b><%= screen.paintField(12) %>
<!-- SCREEN MESSAGE -->
<%
    String message = screen.getField(8).getValue().trim();
    if (message.startsWith("PRESS CLEAR TO EXIT"))
     message = "";
%>
<p>
<center>
<font color="#FF0000">
<b><%= message %></b>
</font>
</center>
<p>
<!-- CREATING BUTTONS FOR KEYBOARD STROKES -->
```

```
<%= screen.paintButton("Process", "ENTER") %>
<%= screen.paintButton("Leave", "CLEAR") %>
<!-- ------------------------ -->
<!-- THIS MUST ALWAYS BE HERE -->
<!-- ------------------------ -->
<%@ include file="../templates/endTemplate.jsp" %>
</BODY>
</HTML>
```

Deploying your Application on a Web Application Server

The previous examples illustrated the deployment of your Telnet application on the supplied Web application server. All of the files required to run the application on the Web automatically are deployed on the Web server when you select to deploy in the GUI Developer. In addition, the adapter software is already installed within the supplied Web application server.

To run an iWay Emulation Adapter (3270/5250) Web application on a Web application server other than the supplied one (the case in a production environment), configuration steps must be performed.

Deploy the following on your particular Web application server:

- The iWay Emulation Adapter (3270/5250) software is required for deployment.

  Most Web application servers support WAR files. The ibitelnet.war file must be deployed on the particular Web application server.

  In some cases, the files contained within the ibitelnet.war must be appended to the CLASSPATH.

- ibitelnet directory is required.

  The directory contains the created XML rules file and JavaServer Pages (JSP) that were created as a result of running the GUI Developer in Web deployment mode.

  These folders/files must be made available to your Web application server.

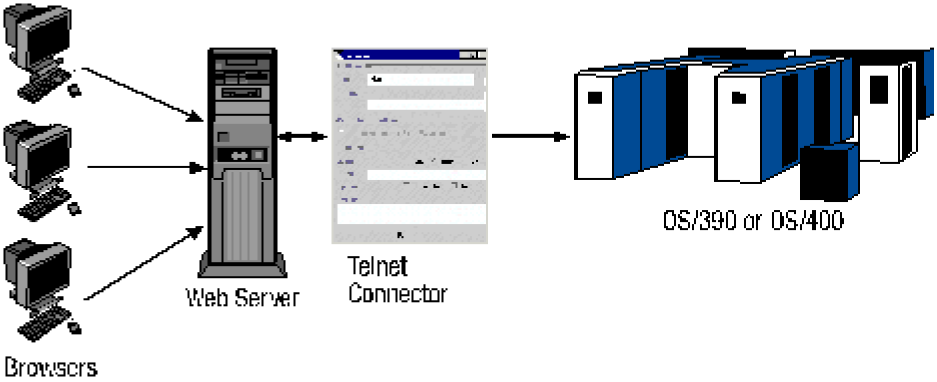
Using HTML Translation Services

The Telnet Designer in Web deployment mode creates an XML rules file that controls your online session with appropriate JavaServer Pages (JSP) for each screen you want to run with a template. These templates change the look and feel of the screen or add functionality to the screen.

It is important to understand the effects of running a mainframe online application over the Web. These effects can occur when using default translation with or without a generic template or when using the Telnet Designer template facility.

HTTP communication occurs in half-duplex mode, which means the communication occurs in both directions, but with only one entity communicating at a time. To bring Terminal Emulator capabilities to the Web, the HTML translation services determine when the communication from the back end completes.

The following figure shows the process of running a mainframe online application over the Web.



The following commands are available:

- **Unlock Keyboard Command.** A field in the TN3270 or TN5250 protocol determines the state of the terminal keyboard. The TelnetHtmlServlet stops reading screens from the back end when the keyboard is unlocked by this command.
- **Disconnect.** The Disconnect command terminates the connection to the back end (OS/390 or OS/400). It is recommended that you log off the back end before using the Disconnect feature. For example, failing to log off the mainframe session could leave your TSO ID or your CICS connection in an active state.
- **Resynchronize.** You can use the Resynchronize option to synchronize the HTML page with the current Telnet screen when an application releases the keyboard before it finishes transmitting.

  It is recommended that you resynchronize each screen for either deployment method, default translation or template modes.
- **Minimal Buffer Size.** Occasionally, an application sends small messages while keeping the keyboard unlocked. You can avoid displaying incomplete screens by using the TelnetServlet property, minBufferSize. It enables you to configure the minimal screen size you want to display. The TelnetHtmlServlet attempts to read more screens if the current screen is smaller than the minBufferSize. The TelnetServlet property, TelnetTimeout, defines the maximum time, in seconds, that it waits for an answer.

Reference: The HTML Configuration File

The Telnet Designer enables you to control parameters that affect the Emulator console, screen navigation, and the Web session. The parameters have an effect on default translation and the template facility. The configuration file called web.xml is located in the telnet/wwwtelnet/web-inf directory.

The following table lists and describes the parameters that affect the Terminal Emulator console facility.

Parameter	Description
`AccessLogOn`	Logs an entry for each established session.
`User`	Authenticates the management commands for HTTP.
`Password`	The password associated with the user.

The following table lists and describes parameters that affect screen navigation.

Parameter	Description
`TelnetTimeout (seconds)`	The number of seconds to retry a connection if the initial connection attempt fails.
`MaxTimeoutLimit`	The number of retries when a timeout occurs.
`MinBufferSize`	The minimum size acceptable for a Telnet screen. A smaller screen requires another read.

The following table lists and describes the parameter that affects the HTML Web session.

Parameter	Description
`HTTP Timeout (hours)`	The time, in hours, an inactive session is retained.

The following table lists and describes a parameter that affects the location of created XML rules files when using the Telnet Designer in template mode (template facility).

Parameter	Description
`Repository`	The location of the files that contain the template rules. Used only in template mode.

TelnetHtmlServlet Parameters

Understanding the HTML service request helps you to create screen templates. The TelnetHtmlServlet controls Telnet sessions. Each HTML screen sends parameters for the TelnetHtmlServlet to handle the Telnet screen. The types of parameters are:

- Field Handling

  In HTML, unprotected fields are represented as text fields, and protected fields are regular text. The unprotected fields are sent back to the TelnetHtmlServlet for handling. In Default Translation, unprotected fields look similar to the following:

  ```
  <input onFocus='setCursor(this.name)' type='text' value='' size='8'
  maxlength='8' name='12'>
  ```

  Note: The names of the field must match the numbers represented in the Telnet screen.

- Keyboard Handling

  The keyboard is created using HTML buttons, as in the following example:

  ```
  <input type='button' value='PA1' style='font-size: 8pt'
  onclick='setAttention("PA1")'>
  ```

  The onClick event uses a Java Script function to set the current keyboard value in the keyboard hidden field. The Shift key is used to switch from PF1-PF12 to PF13-PF24.

  These two fields track which attention key is pressed:

  ```
  <input type='hidden' name='shift' value='0' size='2'>
  <input type='hidden' name='keyboard' value='ENTER' size='15'>
  ```

- Cursor Positioning

  Cursor positioning reflects the field position of the cursor for the current Telnet screen. Each field is called to a Java Script function, setCursor(), on the onClick event.

  ```
  <input type='hidden' name='cursor' size='3'>
  ```

Screen Objects

Screen templates enable you to redesign Telnet screens. The template screen is a JavaServer Page (JSP) on which Telnet HTML Services expose a screen object. The screen object obtains the dynamic value of the Telnet Session.

Example: Using a Hyperlink Equivalent to a Keystroke

You can use the hyperlink equivalent to a keystroke as follows:

```
<!-- Issuing the attention key "CLEAR" -->
<a href='TelnetHtmlServlet?keyboard=CLEAR&10=brws'>Click here to browse
records</a>
```

Example: Using a Hyperlink Equivalent to a Field and a Keystroke

You can use the hyperlink equivalent to a field and a keystroke as follows:

```
<!-- Entering "brws" in the field 10  and Issuing the attention key
"ENTER" -->
```

```
<br><a href='TelnetHtmlServlet?keyboard=ENTER&10=brws'>Click here to
broBSE records</a>
```

Example: Using a Hyperlink Equivalent to a Cursor and a Keystroke

You can use a hyperlink equivalent to a cursor and a keystroke as follows:

```
<!-- Positioning the cursor at field 16 and Issuing the attention key
"F4"
-->
<a href='TelnetHtmlServlet?keyboard=F4&cursor=16'>Names </a>
```

Example: Form Fields and Form Buttons

Form fields include combo boxes for specific fields and protected and unprotected screen fields. Form buttons are used to create keyboard strokes.

You can use the combo box for a specific field as follows:

```
<!-- Using the combo box to enter the transaction name to field 10 -->
<b>Transaction:</b><select name="10">
                     <option value="inqy">Inquiry
                     <option value="adds">Add
                     <option value="updt">Update
                   </select>
```

Example: Using an Unprotected Screen Field

You can use unprotected screen fields as follows:

```
<!-- Painting field 12, which is an unprotected field for entering number
-->
<b>Number:</b><input type='text' value='' size='6' maxlength='6'
name='12'>
```

Example: Using a Protected Screen Field

You can use protected screen fields as follows:

```
<!-- Painting field 3, which is protected field  -->
<b>Number..:</b><%= screen.paintField(3) %>
```

Example: Using a Form Button

You can use form buttons as follows:

```
<!-- CREATING BUTTONS FOR KEYBOARD STROKES -->
<input type='button' value='Process' onclick='setAttention("ENTER")'>
<input type='button' value='Leave' onclick='setAttention("CLEAR")'>
```

Creating an HTML Page to Start a Telnet Session

You can create your own HTML page to start a mainframe session over the Web. To establish a Telnet connection, you must use the Connect command, which requires the parameters listed and described in the following table.

Parameter	Description
host	The host to which you want to connect. **Note:** Must be in lower case.
port	The port number on which the Telnet Server listens. The default port is 23.
emulation	The terminal (term) type: Tn3270 or Tn5250.

The following two examples show how to establish a Telnet connection.

Example: Establishing a Telnet Connection With a Hyperlink

You can establish a Telnet connection by adding the following code to an HTML page (3270 is used in this example):

```
<a href=TelnetServlet?cmd=connect&host=ibivm&emulation=tn3270>IBI VM</a>
```

Example: Establishing a Telnet Connection With an HTML Form

To establish a Telnet connection with an HTML form:

1. Enter the following in a text editor and save as sample1.html in your Telnet\wwwtelnet directory (3270 is used in this example):

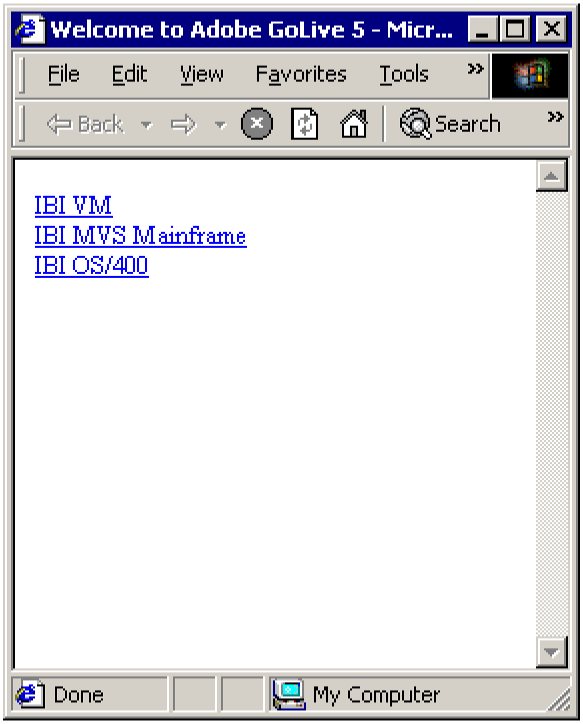
```
<html>
<body>
<a href=TelnetServlet?cmd=connect&host=vmhost&emulation=tn3270>MY VM
Machine</a>
<br>
<a href=TelnetServlet?cmd=connect&host=mvshost&emulation=tn3270>
MY MVS Machine
</a>
<br>
<a href=TelnetServlet?cmd=connect&host=as400host&emulation=tn3270>
MY As/400 Machine
</a>
</body>
</html>
```

2. Start your Web server.

3. Run the *sample1.html* file from the browser by entering the following URL:

```
http://localhost:8081/telnet/TelnetHtmlServlet
```

The Welcome window opens with options for various mainframe applications as shown in the following image.



Welcome to Adobe GoLive 5 - Micr...
File Edit View Favorites Tools
Back Search
Done
My Computer

IBI VM
IBI MVS Mainframe
IBI OS/400

Appendix A

Emulator Keyboard Mapping

Topic:

- Emulator Keyboard Mapping

This appendix describes how your keyboard maps to 3270/5250 keys when you are using the iWay Emulation Adapter (3270/5250).

Emulator Keyboard Mapping

The following table lists 3270/5250 keys in the left column and corresponding keyboard equivalents in the right column.

3270/5250 Key	**Keyboard**
PF1 - PF12	F1 - F12
PF13 - PF24	Shift F1 - Shift F12
Clear	Ctrl-C
PA0	Alt F1
PA1	Alt F2
PA3	Alt F3
Page Up	Page Up
Page Down	Page Down
Forward Tab	Tab or Ctrl - F
Backward Tab	Shift Tab or Ctrl- B
Rubout	Backspace
Delete	Delete or Ctrl-E
Home	Home
New Line	Ctrl-N

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