iWay

iWay Adapter for Telnet for BEA WebLogic User's Guide
Version 5.5

DN3501196.0104

Preface

This document describes how to use the iWay Adapter for Telnet to invoke mainframe applications from non-mainframe environments, such as UNIX and Windows.

How This Manual Is Organized

This manual includes the following chapters:

Chapter		**Contents**
1	Introducing the iWay Adapter for Telnet	Provides an overview of the iWay Adapter for Telnet and describes how to install it.
2	Using Remote Procedure Call Mode	Describes how to use the iWay Adapter for Telnet in RPC mode.
3	Using Web Mode	Describes how to use the iWay Adapter for Telnet in Web mode.
4	Developing Applications: Using Emulation and Recorder Modes	Describes how to use the iWay Adapter for Telnet in Emulation and Recorder modes when developing a Telnet application.
A	Sample Code	Provides sample code referenced throughout the manual.
B	Emulator Keyboard Mapping	Describes how your keyboard maps to 3270 or 5250 keys when you use the emulator.

Documentation Conventions

The following conventions apply throughout 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.
`[  ]`	Indicates a group of optional parameters. None are required, but you may select one of them. Type only the parameter in the brackets, not the brackets.
`|`	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.

Customer Support

Do you have questions about iWay Adapter for Telnet?

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 Adapter for Telnet 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.

Information You Should Have

To help our consultants answer your questions most effectively, be ready to provide the following information when you call:

- Your six-digit site code (*xxxx.xx*).
- Your iWay Software configuration:
  - The iWay Software version and release.
  - The communications protocol (for example, TCP/IP or LU6.2), including vendor and release.
- The stored procedure (preferably with line numbers) or SQL statements being used in server access.
- The database server release level.
- The database name and release level.
- The Master File and Access File.

- The exact nature of the problem:
  - Are the results or the format incorrect? Are the text or calculations missing or misplaced?
  - The error message and return code, if applicable.
  - Is this related to any other problem?
- Has the procedure or query ever worked in its present form? Has it been changed recently? How often does the problem occur?
- What release of the operating system are you using? Has it, your security system, communications protocol, or front-end software changed?
- Is this problem reproducible? If so, how?
- Have you tried to reproduce your problem in the simplest form possible? For example, if you are having problems joining two data sources, have you tried executing a query containing just the code to access the data source?
- Do you have a trace file?
- How is the problem affecting your business? Is it halting development or production? Do you just have questions about functionality or documentation?

User Feedback

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

Thank you, in advance, for your comments.

iWay Software Consulting and Training

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For information on course descriptions, locations, and dates, or to register for classes, visit our World Wide Web site (http://www.iwaysoftware.com) or call (800) 969-INFO to speak to an Education Representative.

Contents

CHAPTER 1

Introducing the iWay Adapter for Telnet

Topics:

- Integrating Mainframe Logic Using the iWay Adapter for Telnet
- Deployment Information Roadmap

The iWay Adapter for Telnet 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 and 5250 terminals and enables you to integrate legacy mainframe applications, including those hosted by IBM z/OS and OS/400 systems.

Integrating Mainframe Logic Using the iWay Adapter for Telnet

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 Adapter for Telnet emulates IBM 3270 and 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 via a more sophisticated graphical user interface (GUI), such as a Web page.
- a client application, in order to automate interaction between the mainframe application and the client application.

For information about deploying the adapter and about the iWay Connector for JCA and the iBSE servlet, see the *iWay 5.5 Installation and Configuration Guide*.

You define the type of emulation you want using the adapter’s 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 and is supported when you deploy the adapter through the iWay Connector for JCA or the iWay Business Services Engine servlet. RPC mode is described in Chapter 2, *Using Remote Procedure Call Mode*.
- **Web mode** 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 3, *Using Web Mode*.

  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.
- **Emulation mode** During development, you can access a mainframe session directly from your workstation using the Telnet Designer, which displays standard 3270 and 5250 screens. This is called Emulation mode and is described in *Emulation Mode* in Chapter 4, *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 *Recorder Mode* in Chapter 4, *Developing Applications: Using Emulation and Recorder Modes*.

Deployment Information Roadmap

The following table lists the location of information about deploying the iWay Adapter for Telnet. A description of the iWay Business Services Engine and the iWay Enterprise Connector for J2EE Connector Architecture (JCA) follow the table.

Deployed Component	For more information, see
iWay Application Explorer	• Chapter 2, *Using Remote Procedure Call Mode*, of this guide. • *iWay Installation and Configuration for BEA WebLogic Version 5 Release 5*. • *iWay Application Explorer (Java Servlet Version) User's Guide Version 5 Release 5*.
iWay Business Services Engine (iBSE)	• *iWay Business Services Engine User Guide*. • *iWay Installation and Configuration for BEA WebLogic Version 5 Release 5*.
iWay Enterprise Connector for J2EE Connector Architecture (JCA)	• *iWay Connector for JCA for BEA WebLogic Server User's Guide*. • *iWay Installation and Configuration for BEA WebLogic Version 5 Release 5*.

The iWay Business Services Engine (iBSE)

The iWay Business Services Engine (iBSE) exposes—as Web services—enterprise assets that are accessible from adapters regardless of the programming language or the particular operating system. iBSE simplifies the creation and execution of Web services when running:

- Terminal emulation and screen-based systems
- Custom and legacy applications
- Database queries and stored procedures

- Packaged applications
- Transactional systems

Web services is a distributed programming architecture that promises to solve Enterprise Application Integration (EAI) hurdles that other programming models cannot. It enables programs to communicate with one another using a text-based, but platform- and language-independent, markup format called XML (eXtensible Markup Language).

Coupled with a platform and language independent messaging protocol called SOAP (Simple Object Access Protocol), XML enables application development and integration by enabling you to assemble previously built components from multiple Web services.

The iWay Enterprise Connector for J2EE Connector Architecture (JCA)

The iWay Enterprise Connector for J2EE Connector Architecture (JCA) enables developers of JCA-compliant applications to deploy iWay adapters as JCA resources. The connector is supported on BEA WebLogic Enterprise.

The iWay Connector for JCA is distributed as a standard Resource Adapter Archive (RAR) for deployment to the application server. Thus, the connector can be employed in systems that are non-compliant, although services such as pooled connections will not be available.

Because the connector currently conforms to the JCA 1.0 specification, deployed adapters do not support event listeners. It is anticipated that the JCA 1.5 specification will enable deployment of adapters for event listening.

CHAPTER 2

Using Remote Procedure Call Mode

Topics:

The iWay Adapter for Telnet's 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 iWay Adapter for Telnet's Remote Procedure Call (RPC) mode enables your client application to communicate with a mainframe application using XML files.

You can access the adapter in RPC mode by means of:

- **J2EE™ Connector Architecture (JCA)**. This requires deploying the adapter to a JCA-compliant application server to which you have also deployed the iWay Connector for JCA.
- A **Web service.** This requires deploying the adapter to an application server to which you have also deployed the iWay Business Services Engine (iBSE) servlet.

  You can combine JCA and Web service environments, deploying the iBSE servlet to a JCA-compliant application server.

For more information about deployment, see *iWay 5.5. Installation and Configuration for BEA WebLogic Version 5 Release 5*.

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 Telnet Designer.
2. Navigate through the application's screens, as described in *How to Create a Transaction for a Mainframe Application* on page 2-4. 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 2-7.

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 via the response document.

Defining input and output parameters is described in *How to Define an Input or an Output Screen Parameter* on page 2-9.

3. Save your work.

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

4. To deploy the transaction module as a business service (also known as a Web service):

a. Open the iWay Application Explorer and connect to a Telnet target.

b. Import the transaction module.

c. Generate the Web service.

For more information about deploying the transaction module as a Web service, see *How to Deploy a Transaction Module as a Business Service* on page 2-14.

Reference Submitting a Telnet Request at Run Time: Overview

At run time, if you submit a Telnet request to:

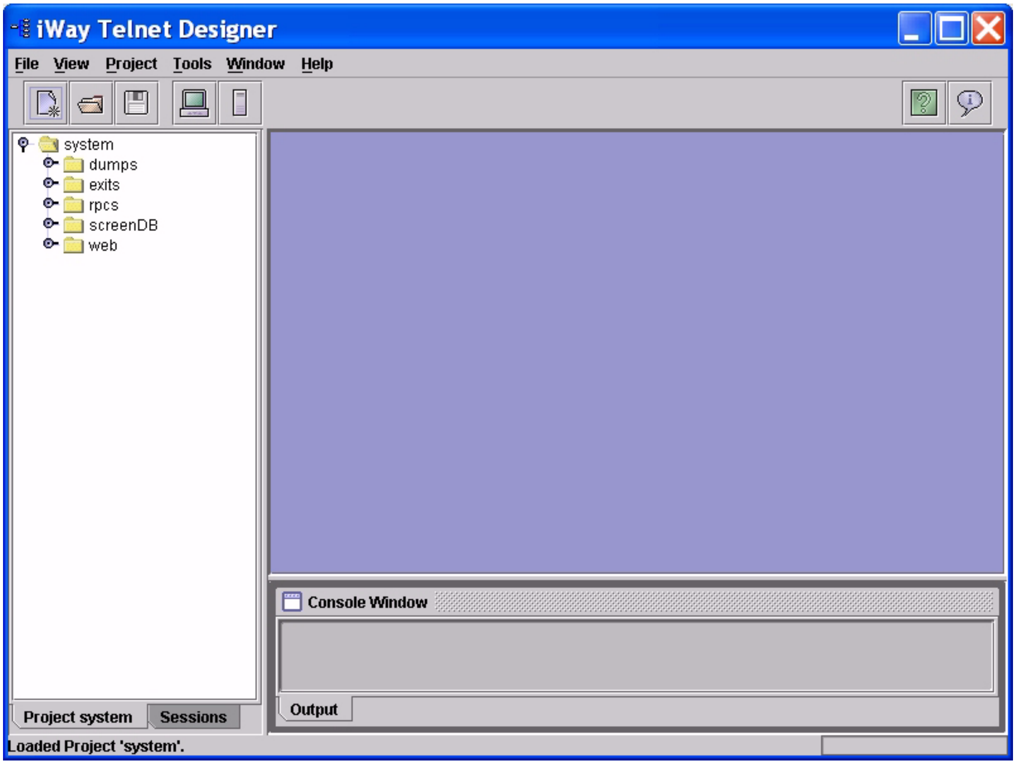
- **The iWay Connector for JCA**, the client application sends the request document (including the transaction information) to the connector, which forwards it to the iWay Adapter for Telnet. The adapter then executes the transaction.
- **iWay Business Services Engine** (iBSE) **servlet**, the client application sends the request document (including the transaction information) to the iBSE servlet, which forwards it to the iWay Adapter for Telnet. The adapter then executes the transaction.

Procedure How to Create a Transaction for a Mainframe Application

To create a transaction for a mainframe application:

1. Open the Telnet Designer by clicking from the Start menu *Programs*, *iWay 5.5*, and *iWay Telnet Designer.*

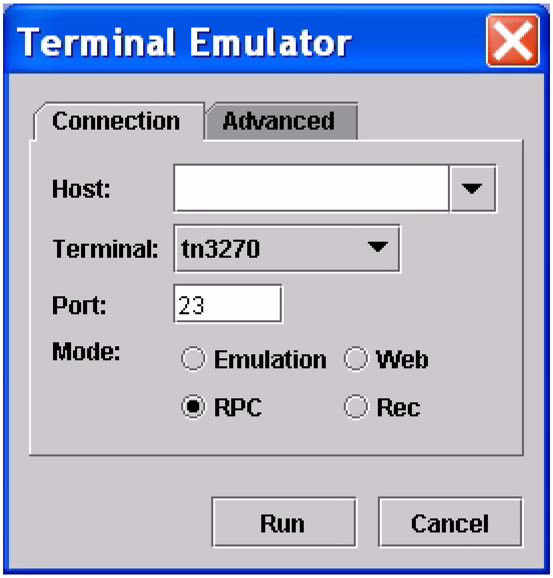
   The Telnet Designer opens.

   Loaded Project 'system'.

2. Select *Emulator* from the Tools menu.

The emulation properties dialog box opens.



Host:

Terminal: tn3270

Port: 23

Mode: ○ Emulation ○ Web ● RPC ○ Rec

3. Specify the emulation properties:

   a. Enter a new host name, or select an existing host name, of the computer on which the mainframe application resides.

   b. Select the type of emulation from the Terminal drop-down list.

   c. Enter the number of the terminal port.

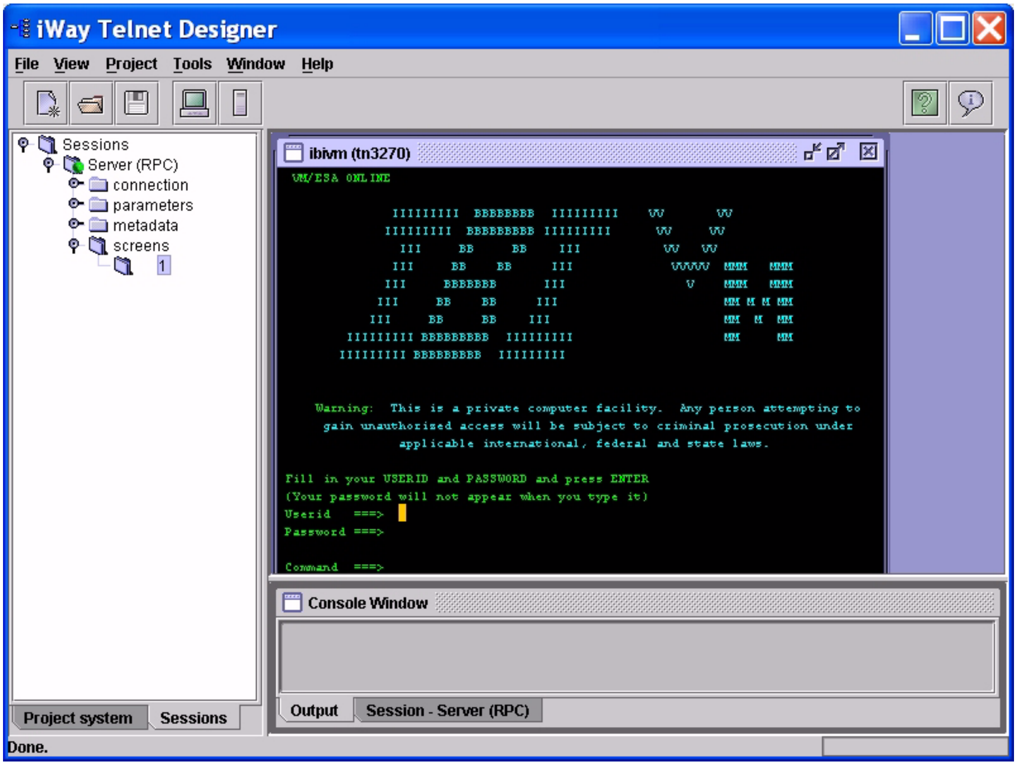
   d. Select *RPC* in the Mode panel.

   e. Click the *Advanced* tab

   f. Select *Extended Attributes* and, if desired, select a different national language character set.

4. Click *Run* to connect to the mainframe application and start the emulation session.

The following window opens, which represents the initial VTAM session:



```
 VM/ESA ONLINE

              IIIIIIIII  BBBBBBBB  IIIIIIIII    WW       WW
             IIIIIIIII  BBBBBBBBB IIIIIIIII      WW     WW
               III     BB     BB    III          WW   WW
              III     BB    BB    III               WWWWW  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  ===>
```

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

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

   For more information, see *How to Identify a Screen to the Transaction Module*.

7. 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,

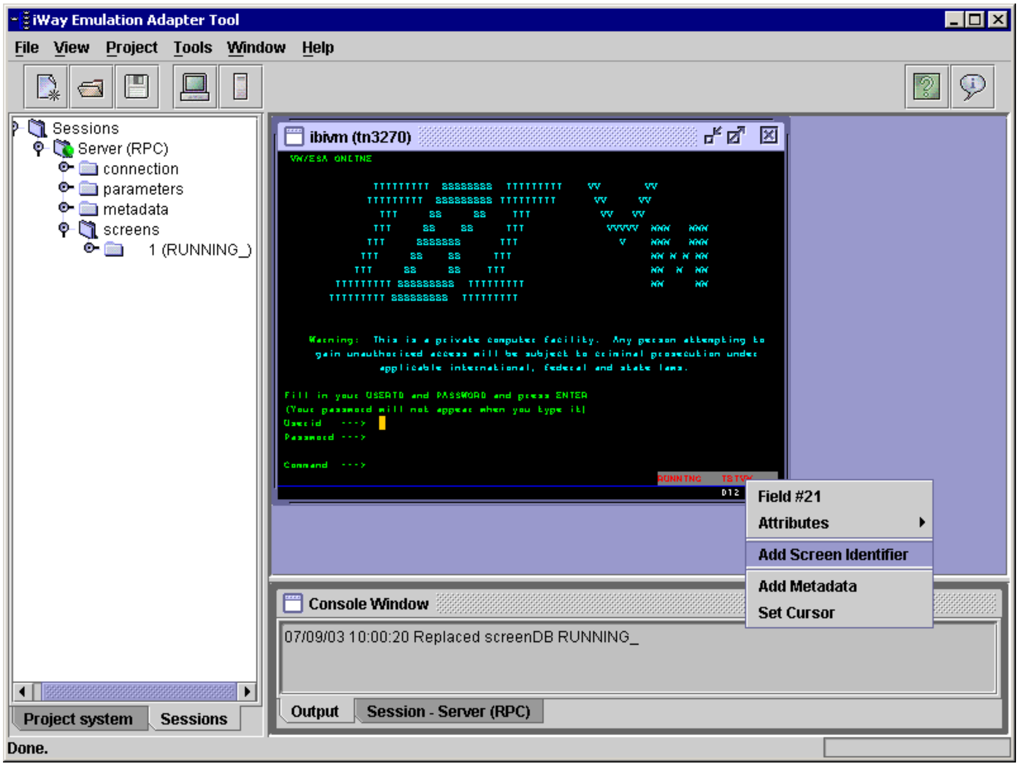
8. Define any output fields as output parameters that are returned via the response document.

   For more information, see *How to Define an Input or an Output Screen Parameter* on page 2-9.

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 screen uniquely identify this screen from among all the application's screens.
2. If there are several fields, choose one to identify the screen.

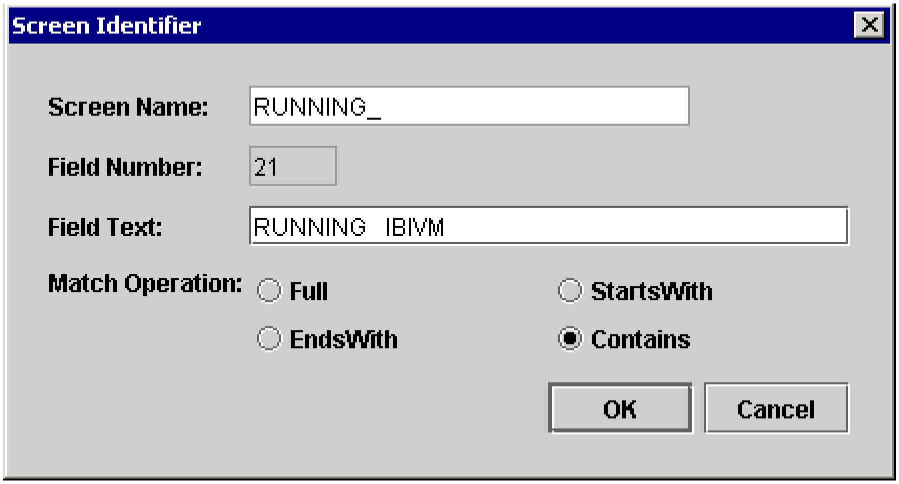


```
 VM/ESA ONLINE

              TTTTTTTTT  88888888  TTTTTTTTT    VV       VV
             TTTTTTTTT  888888888 TTTTTTTTT      VV     VV
               TTT     88     88    TTT           VV   VV
              TTT     88    88     TTT             VVVVV  MMM   MMM
             TTT     8888888      TTT                V    MMM   MMM
            TTT     88    88     TTT                      MM M M MM
           TTT     88     88    TTT                       MM  M  MM
        TTTTTTTTT 888888888  TTTTTTTTT                    MM     MM
       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    TSTVY
                                                                          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.



Screen Identifier

Screen Name: RUNNING_

Field Number: 21

Field Text: RUNNING IBIVM

Match Operation: ○ Full ○ StartsWith ○ EndsWith ● Contains

4. To identify the field:

   a. Type a Screen Name, a descriptive name for the screen you want to identify.

   b. Type a value for Field Number.

   c. Type the text in the identifying field that uniquely identifies this screen in Field Text.

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

      For example, if the field’s 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 had 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.

5. 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.

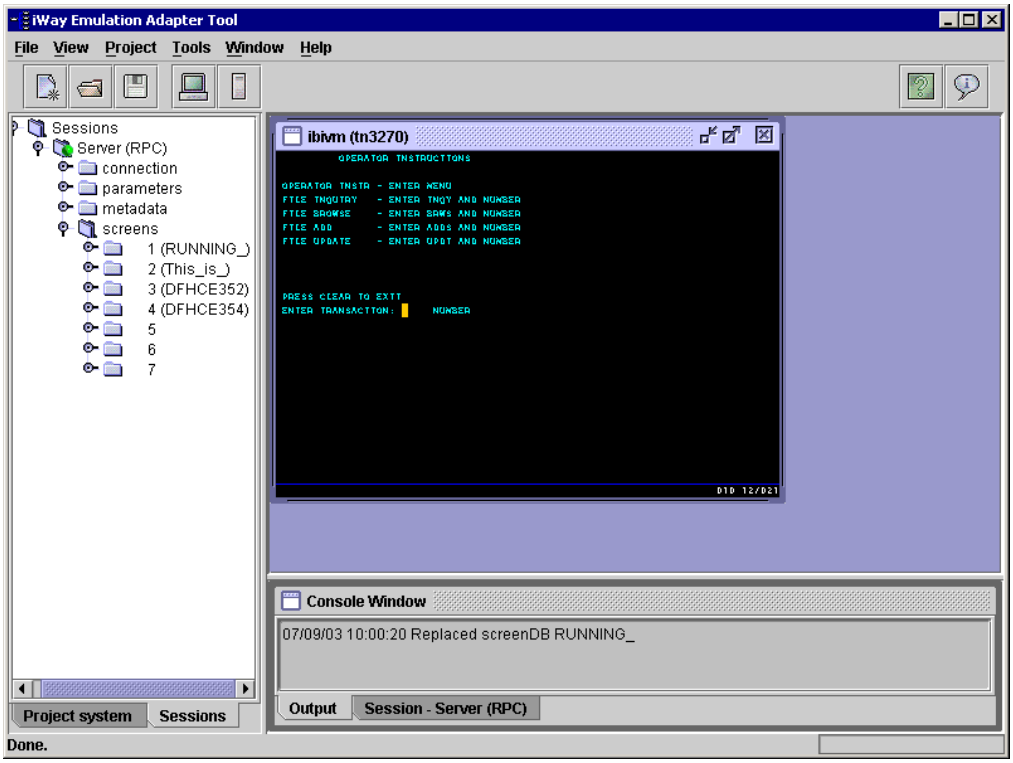
   For more information, see *How to Define an Input or an Output Screen Parameter*.

6. 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.

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

8. When the following menu screen opens, add a screen identifier to identify the screen.



```
        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
```

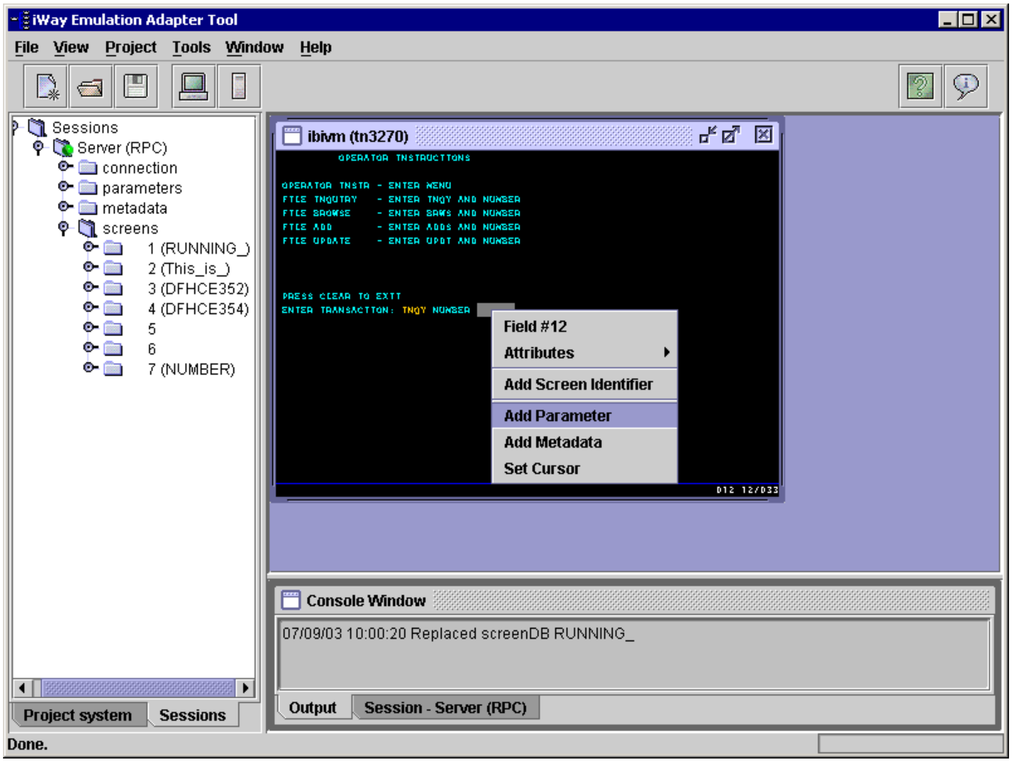
```
07/09/03 10:00:20 Replaced screenDB RUNNING_
```

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 a screen's input and output parameters:

1. Enter the INQY transaction in the ENTER TRANSACTION field.

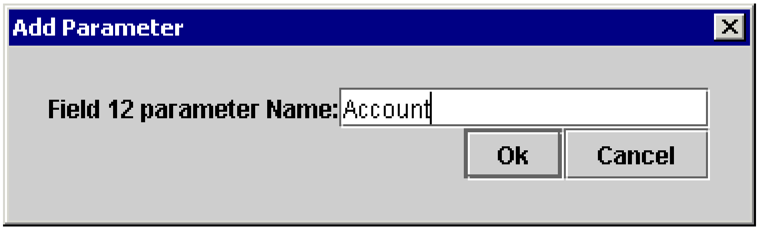


```
        OPERATOR INSTRUCTIONS

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
                                                              D12 12/033
```

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

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

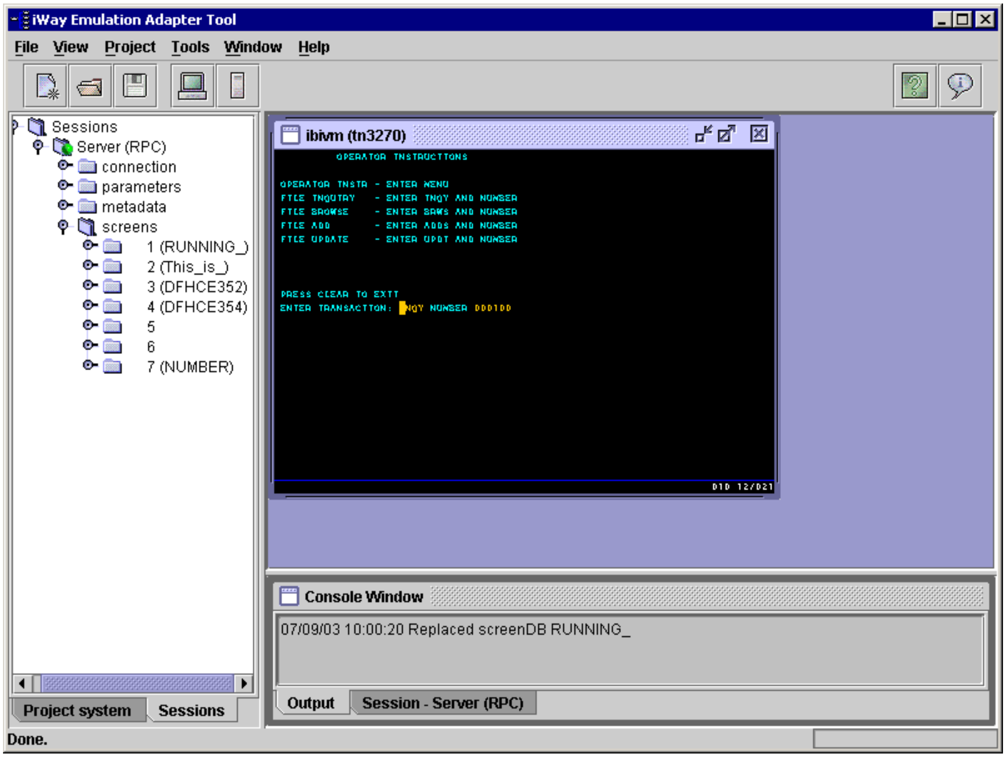
   The Add Parameter dialog box appears.



Field 12 parameter Name: Account

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

4. Enter an existing account number, for example, 000100.

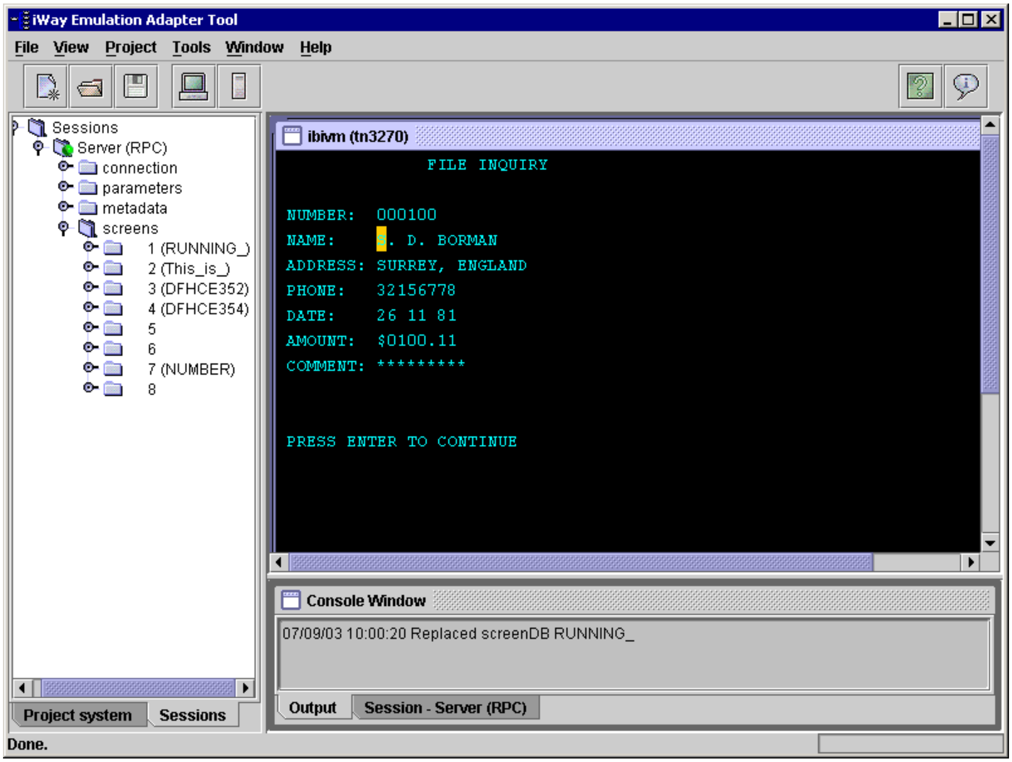


```
        OPERATOR INSTRUCTIONS

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_
```

5. To view the detail screen, press the *Enter* key.

The detail screen opens.



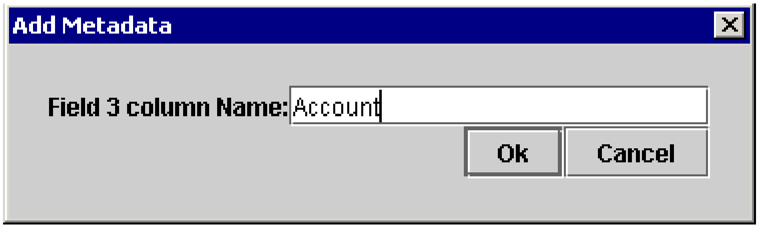
```
              FILE INQUIRY

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 detail screen contains information that you must describe as output. 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 opens.



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. End the emulation session:

   a. Navigate through the screens.

   b. Log off the CICS region.

   c. Close the emulator by clicking the *X* in its upper-right corner.

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

The Save As dialog box opens.

11. Enter a name, enter an optional comment that will be stored in the module's remarks element , and click *Save*.

The transaction module (also known as the request document) is saved as an XML document to

`DesignerDir\tools\projects\system\rpcs`

where:

`DesignerDir`

Is the directory into which Telnet Designer is installed.

A folder representing the new transaction module is displayed in the left pane under the Sessions folder.

Caution: if the Telnet Designer and the iWay Adapter for Telnet run-time component reside on different computers (for example, if the Designer is on a Windows system and the run-time component is on a UNIX system), you must copy the transaction module to the run-time system before importing it using the iWay Application Explorer.

12. To close the Telnet Designer, click the *X* in the upper-right corner.

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.

For an example of a complete request document, see Appendix A, *Sample Code*.

Procedure How to Deploy a Transaction Module as a Business Service

Before you can use the iWay Application Explorer, you must start the BEA WebLogic Server. For complete information about the using the Application Explorer, see the *iWay Application Explorer User's Guide*.

To deploy a transaction module as a business service (also known as a Web service):

1. Enter the following URL in your Web browser window to open the Application Explorer (iAE) and connect to the iWay Business Services Engine

   `http://hostname:port/iwae/index.html`

   where:

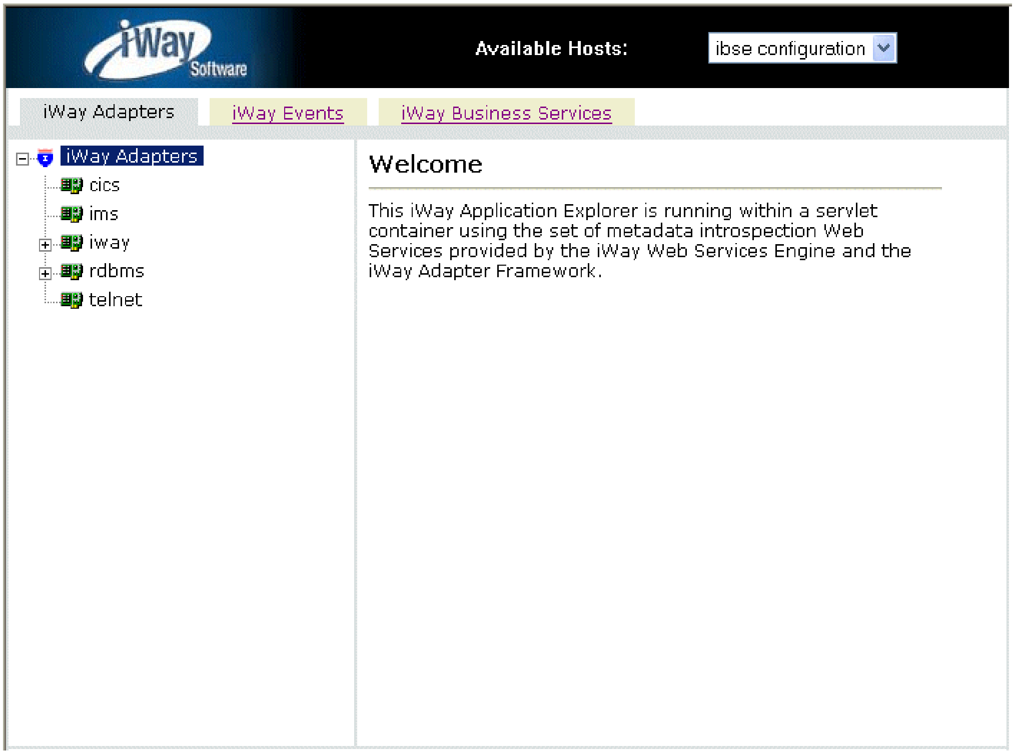
   `hostname`

   Is the machine where the BEA WebLogic Server and iWay Version 5.5 are installed.

   `port`

   Is the port number where BEA WebLogic Server is listening.

   When you start iAE, the following window opens.



Welcome

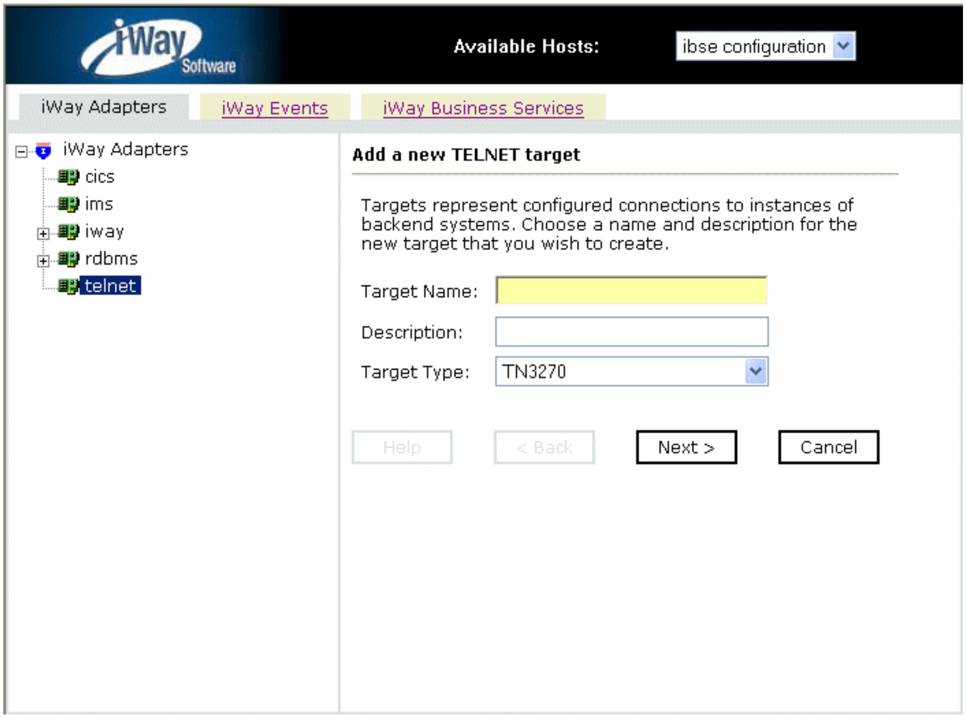
This iWay Application Explorer is running within a servlet container using the set of metadata introspection Web Services provided by the iWay Web Services Engine and the iWay Adapter Framework.

The Available Hosts drop-down list on the top frame specifies to which environment you connect; ibse configuration is required for deploying a transaction module as a business service.

2. Select *ibse configuration* from the Available Hosts drop-down list.
3. If the target to which you want to connect is not already defined, define it:

   a. Click *Operations* in the right pane and select *Define a new target*.

   The Add a new Telnet target window opens in the right pane.



Available Hosts: ibse configuration

Add a new TELNET target

Targets represent configured connections to instances of backend systems. Choose a name and description for the new target that you wish to create.

Target Name:

Description:

Target Type: TN3270

   b. Specify the following target information:

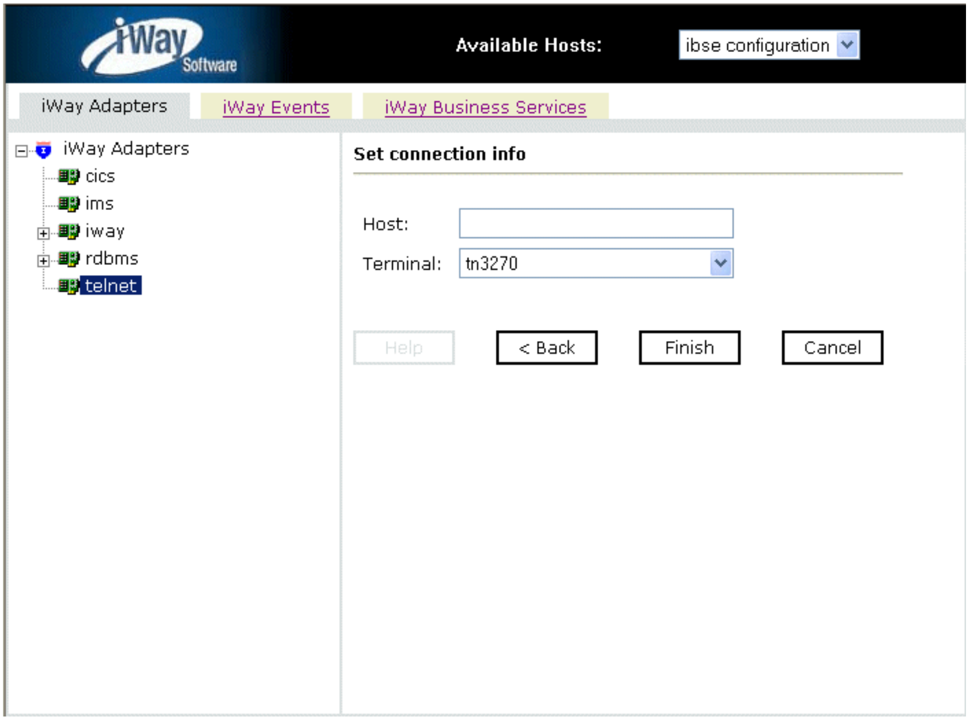
   Target Name. Enter a descriptive name for the target.

   Target Description. Enter a brief description of the connection.

   Target Type. Select the type of terminal emulation from the drop-down list.

   c. Click *Next*.

The Set connection info window opens in the right pane.



Available Hosts: ibse configuration

Set connection info

Host:

Terminal: tn3270

d. Specify the connection information:

Host. Enter the name of the host system to which you want to connect.

Terminal. Select the connection's terminal type.

e. Click *Finish*.

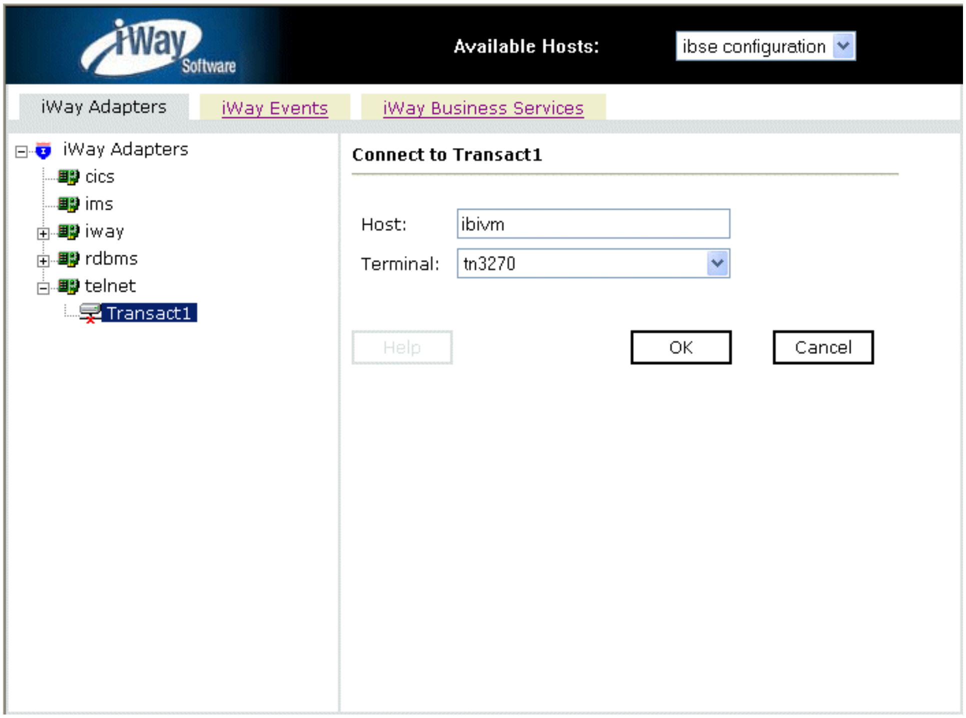
The target is now listed beneath the Telnet node in the left pane.

4. Connect to the target:

a. Expand the Telnet node in the left pane and select the target to which you want to connect.

b. Click *Operations* in the right pane and select *Connect*.

The Connect to *transactionname* window opens in the right pane.



Connect to Transact1

Host: ibivm

Terminal: tn3270

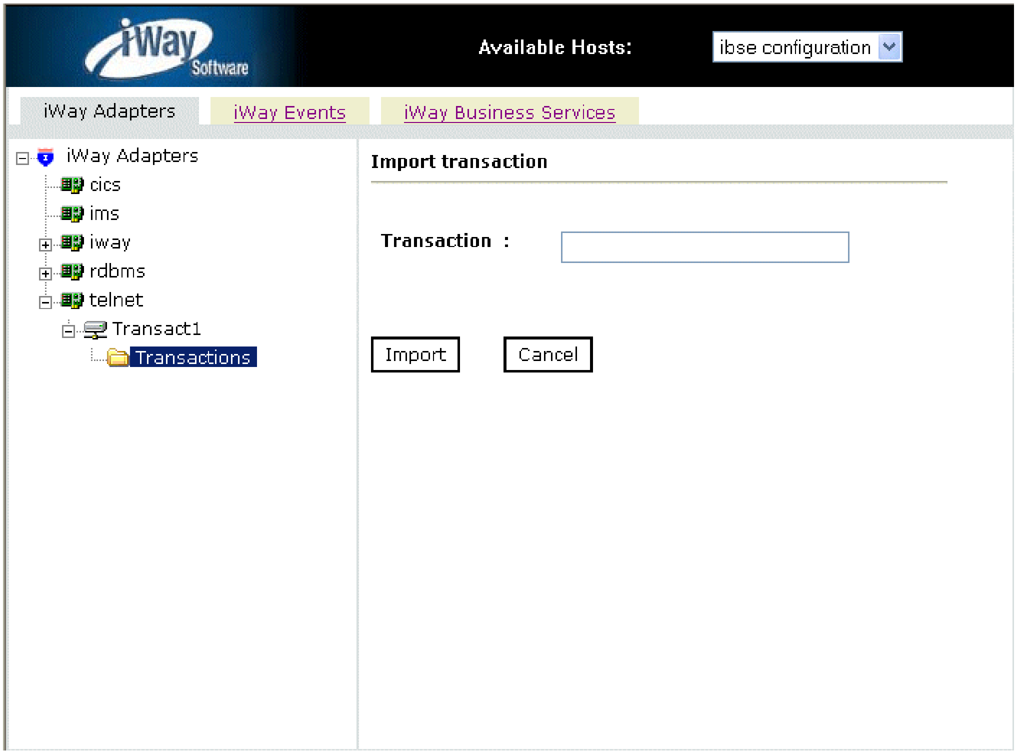
c. Click *OK*.

The target node in the left pane changes to reflect that a connection was made.

5. Expand the target node and select the *Transactions* folder.

6. Click *Operations* in the right pane and select *Import transaction*.

The Import transaction window opens in the right pane.



7. Identify the transaction module:

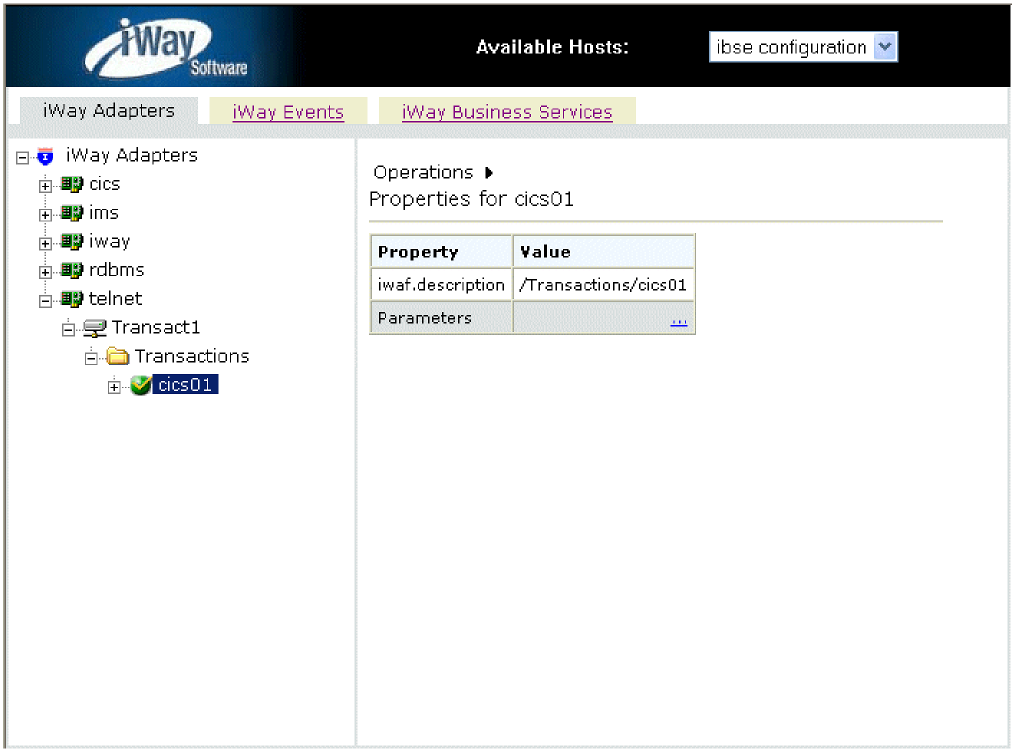
   a. Enter the full path and file name (including the extension) of the transaction module you wish to deploy as a business service.

      For example:

      ```
      c:\temp\cics01.xml
      ```

   b. Click *Import*.

The Application Explorer imports the module into the Transactions folder.

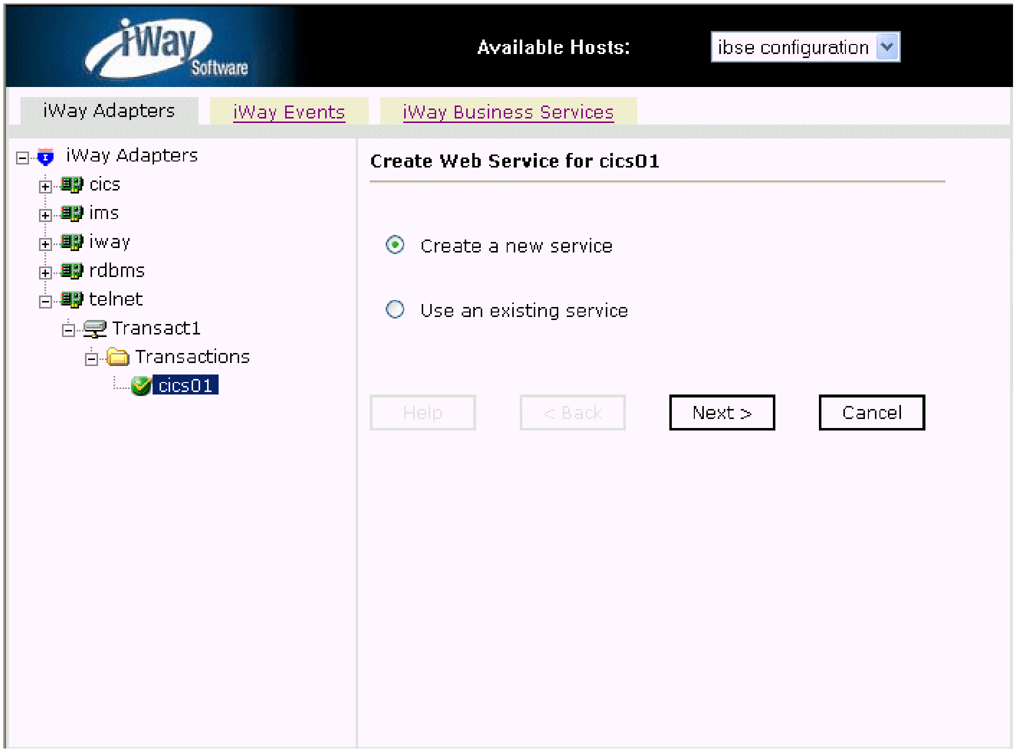


Properties for cics01

Property	Value
iwaf.description	/Transactions/cics01
Parameters	...

8. Select the transaction, click *Operations* in the right pane, and select *Create iWay Web Service.*

The Create Web Service for *transactionname* window opens in the right pane.



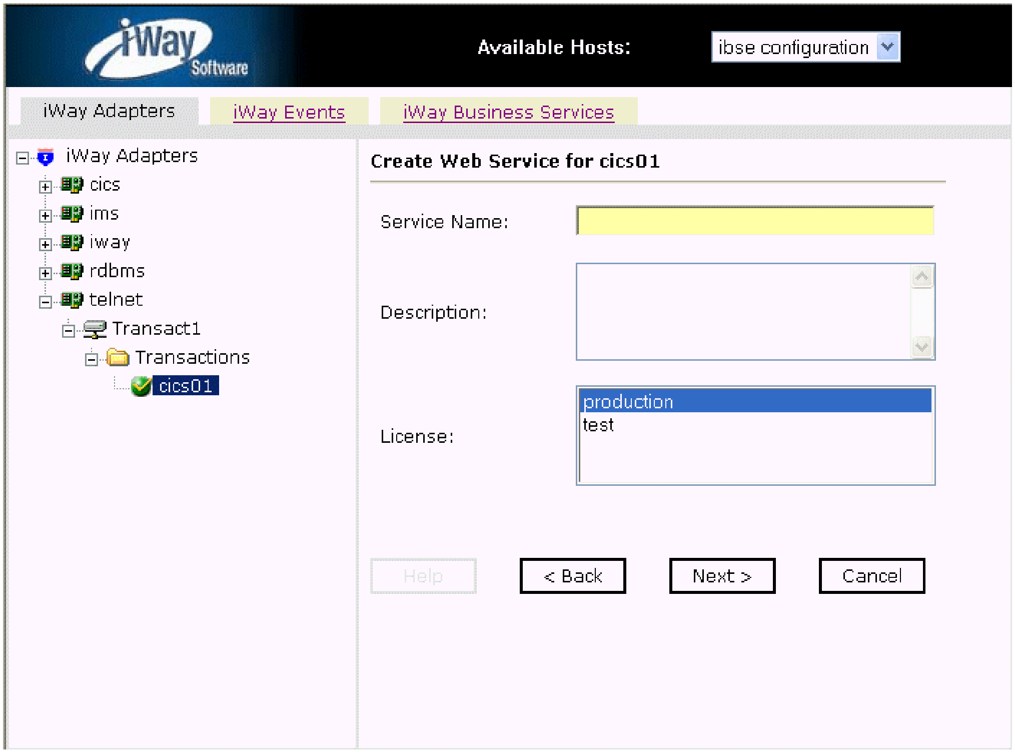
Create Web Service for cics01

● Create a new service

○ Use an existing service

9. Make sure that *Create a new service* is selected and click *Next*.

You are prompted for several Web service properties.



Create Web Service for cics01

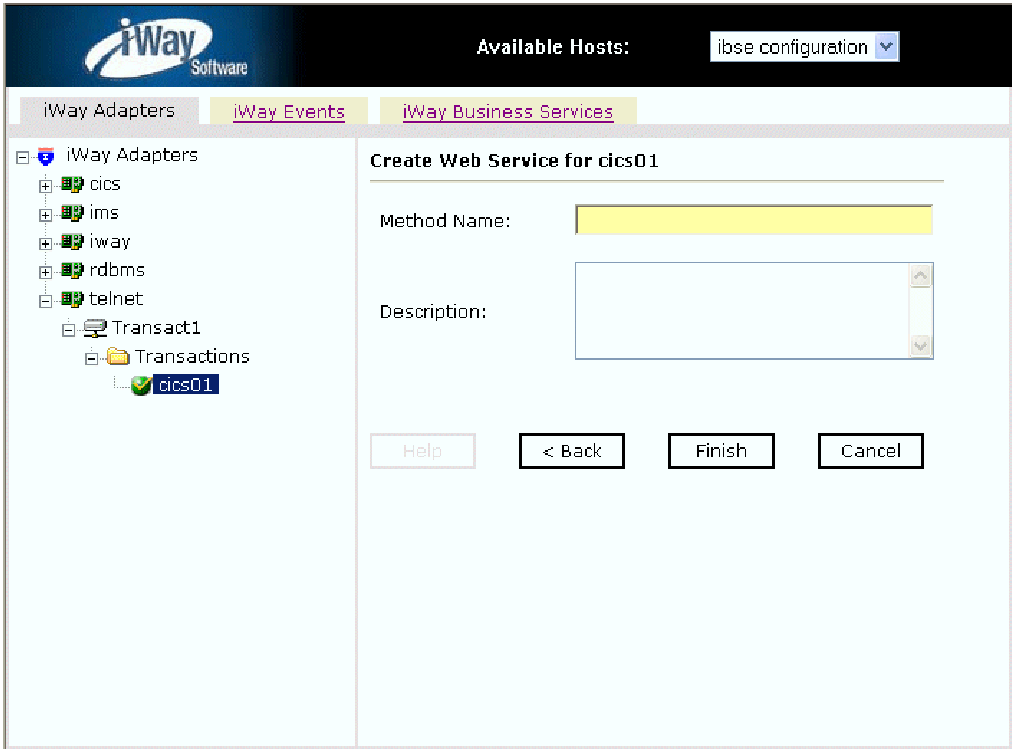
Service Name:

Description:

License: production, test

10. Specify the following properties:
    - **Service Name.** Enter a name for the Web service.
    - **Description.** Enter a description of the service.
    - **License.** Select an appropriate license.
11. Click Next.

You're prompted for additional properties:



Create Web Service for cics01

Method Name:

Description:

12. Specify the following properties:

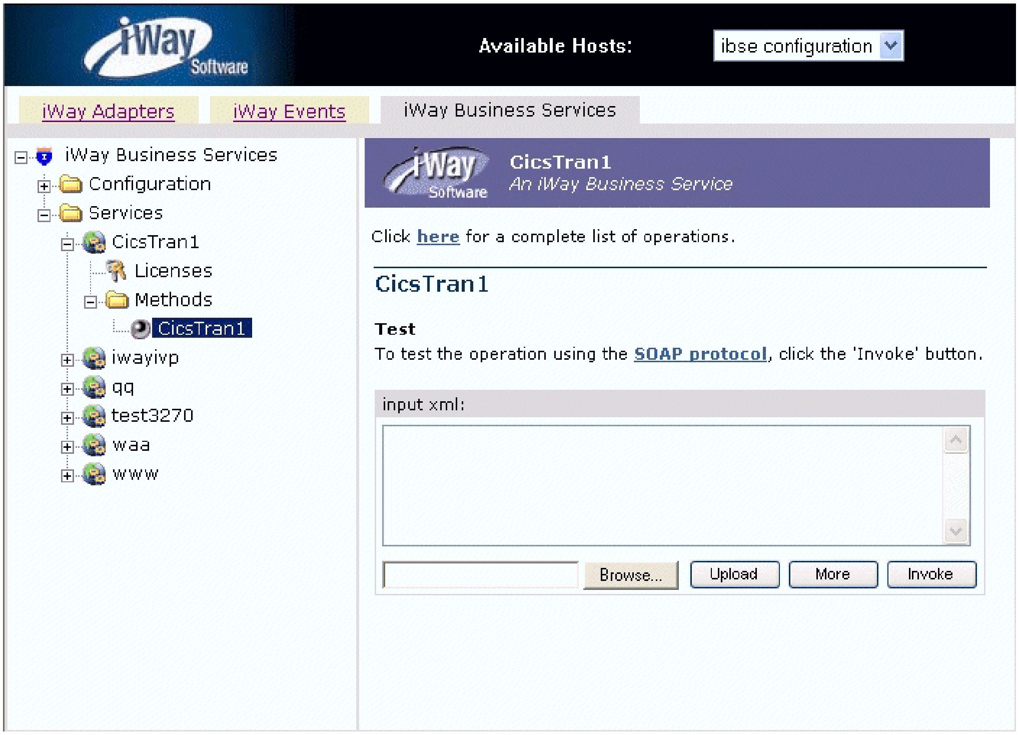
    - **Method Name.** Enter a name for this Web service method.
    - **Description.** Enter a description of the method.

13. Click *Finish*.

    The iWay Business Services tab opens.

    The left pane lists all the available services that have been created. The current transaction method is automatically selected.

The test window for the method opens in the right pane.



Click here for a complete list of operations.

CicsTran1

Test

To test the operation using the SOAP protocol, click the 'Invoke' button.

14. Enter a sample XML document in the input xml field to invoke the business service.
15. Click *Invoke.*

    The result displays in the right pane.

    You have finished deploying the transaction module as a business service.

CHAPTER 3

Using Web Mode

Topics:

- The Telnet Designer
- Default HTML Translation
- Using the Telnet Designer to Create JavaServer Pages
- Using HTML Translation Services
- Creating an HTML Page to Start a Telnet Session

For the iWay Adapter for Telnet, Web deployment refers to the process by which you use the adapter's Telnet Designer to create an adapter Web application. 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.

The Telnet Designer

In Web mode, the iWay Adapter for Telnet's Designer enables you to create a Telnet application using the following techniques:

- **Default HTML translation.** You can run your 3270 or 5250 application instantly via the Web using default emulation. A screen that is "not recognized" 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 to 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 3-43 for information about HTML Translation Services.

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

Default HTML Translation

Default HTML translation automatically translates your terminal screens into HTML pages. The HTML translation mode is responsible for managing 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 which 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 also uses the cmd parameter and may use other parameters depending on the requested command.
- **TelnetHtmlServlet** is responsible for processing screens for an active session.

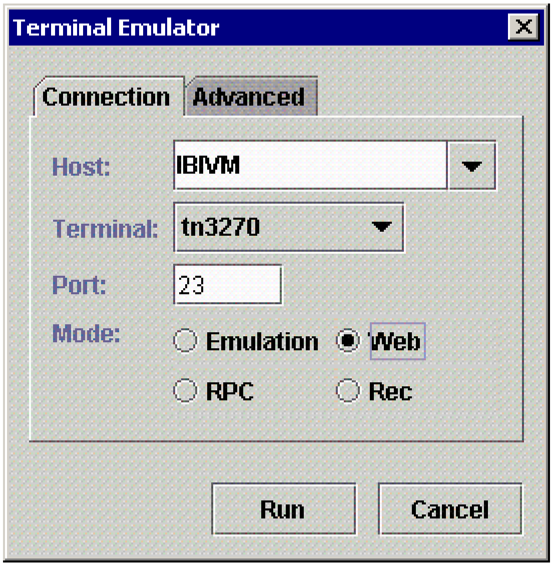
Example Using Default Translation to Create a Web Application

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.

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 Telnet Designer opens.



Host: IBIVM

Terminal: tn3270

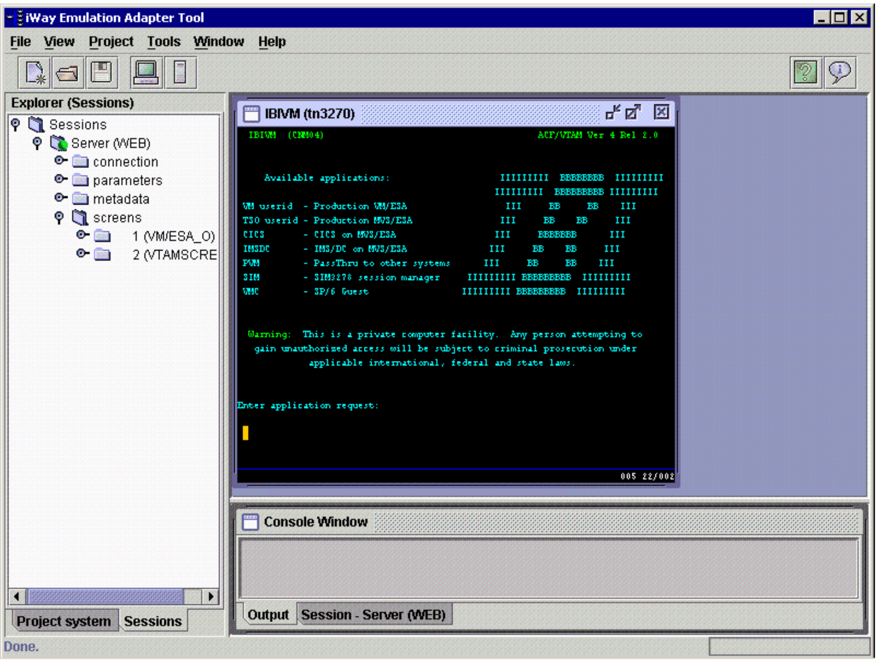
Port: 23

Mode: ○ Emulation ● Web ○ RPC ○ Rec

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

   A connection is made to the mainframe online system.

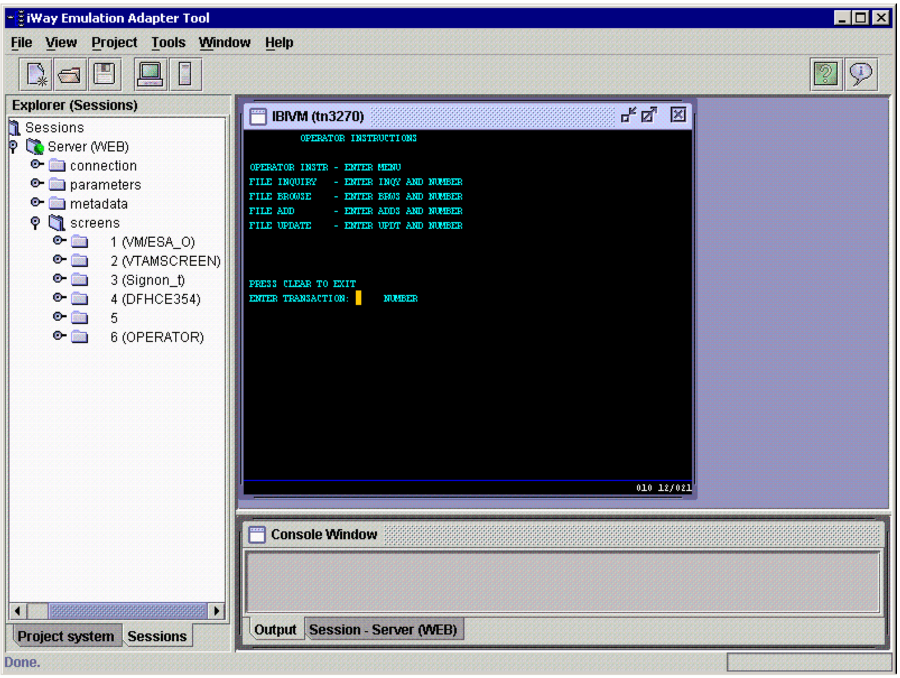
The main VTAM screen appears for MVS host IBIVM.



```
 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. If the CICS region is running unsecured, press the clear key to navigate to a blank CICS screen.
   b. In the blank screen, enter *MENU* to invoke the IBM CICS MENU APPLICATION.

This application, specifically the BROWSE transaction, is transformed into a Web application using default translation.



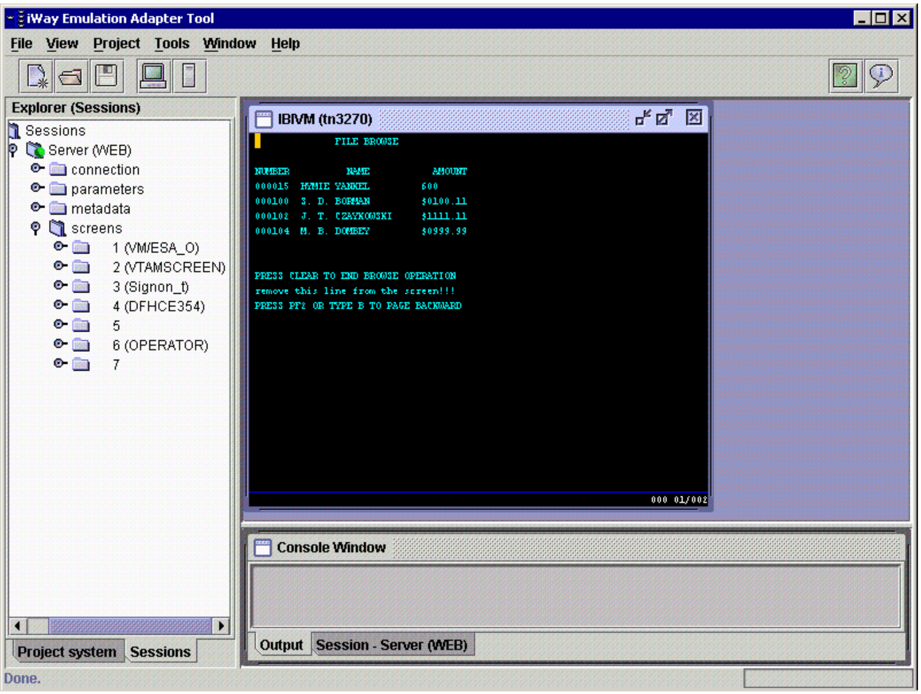
```
        OPERATOR INSTRUCTIONS

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 opens.



```
           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
```

Four records appear, more than enough to describe the process of running this application on the Web. The mainframe screen shots were included to show the actual mainframe application that is converted to HTML and appears on the Web.

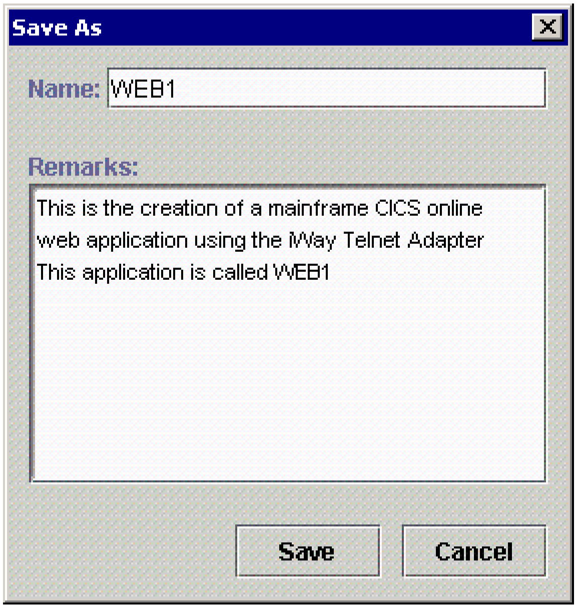
You can now create the iWay Adapter for Telnet application.

Procedure How to Create the iWay Adapter for Telnet Application

To create the iWay Adapter for Telnet application:

1. To log off CICS, enter the command *CESF LOGOFF*.
2. Click the *X* on the upper-right corner of the Telnet Designer's emulator screen.
3. Right-click the *Server (WEB)* folder under Sessions and select *Save As*.

The Save As dialog box opens.



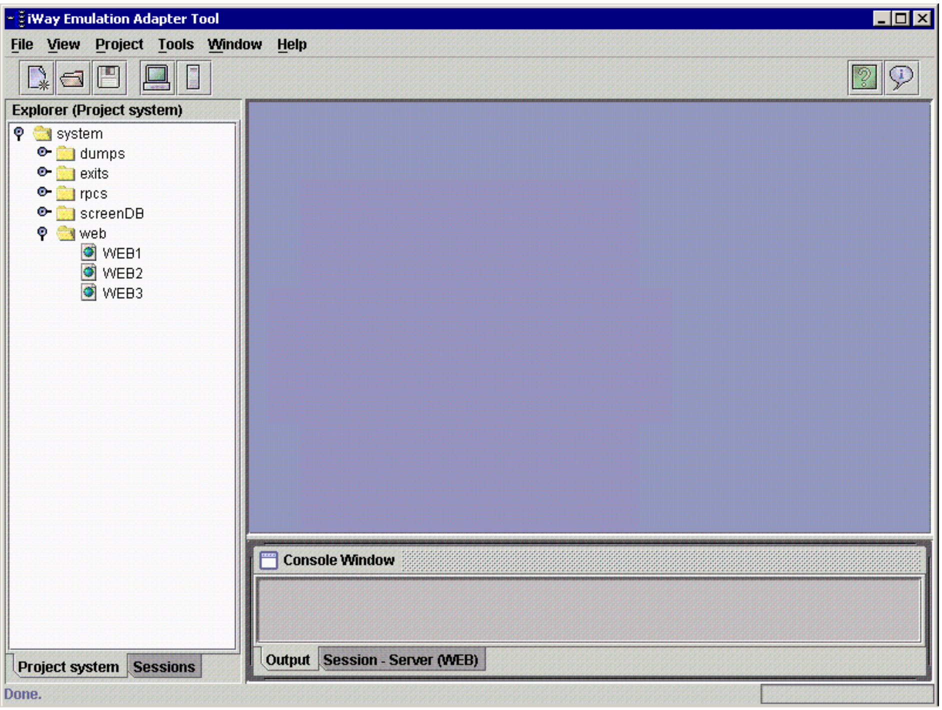
Name: WEB1

Remarks:

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

4. Type a name, for example, WEB1.
5. To save the adapter application called WEB1, click *Save*.

You return to the Telnet Designer.



6. Click the *Project system* tab on the lower left corner of the left pane.

   The Web application called WEB1 appears in the left pane.

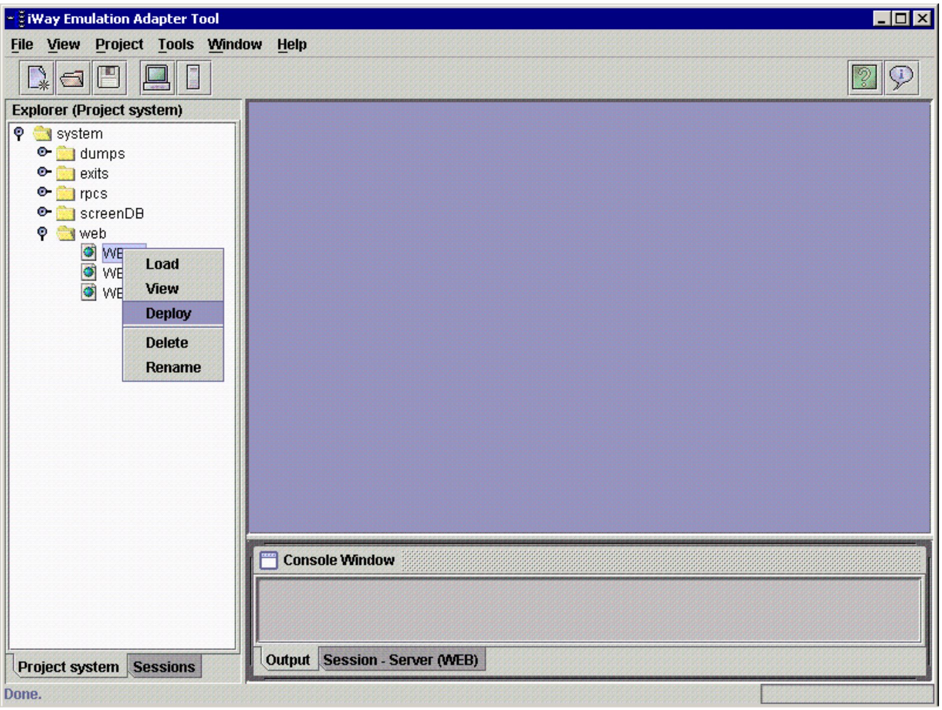
   You can test the adapter application by deploying WEB1 to the supplied Web server.

Procedure How to Test the iWay Adapter for Telnet Web Application

To test the Web application:

1. Right-click *WEB1*.

2. Select *Deploy*.



Selecting Deploy automatically transfers the Web components created by the Telnet Designer to the supplied Web application server. The following events occur:

- An XML rules file called WEB1.XML is created and placed into the following directory:

  iWay55InstallDir`/tools/Telnet/projects/system/web`

  This is an internal file used by the Designer when you select Deploy.

- A directory called ibitelnet/WEB1 is created within the webapps directory of the Web server.

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

  If you created JSP (described in the next chapter), 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 Adapter for Telnet Web Application

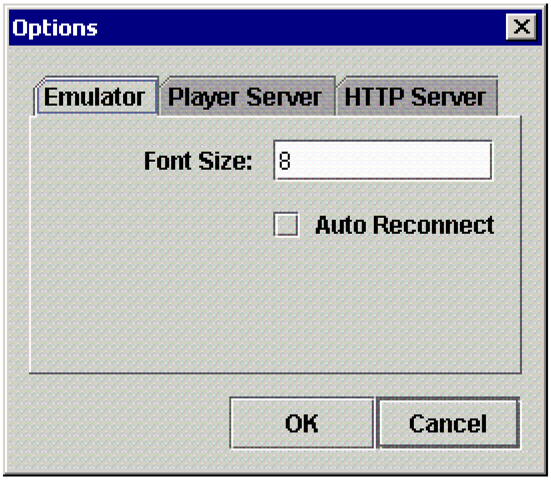
Note: The iWay Adapter for Telnet must locate the JDK or JRE file. Otherwise, a NoJavaLangCLAss error appears in the browser. If this error occurs, set the java_home variable in the iwaytelnet.bat file to the location of your JDK or JRE file. For example,

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

To start the Web server:

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

   The Options dialog box opens.

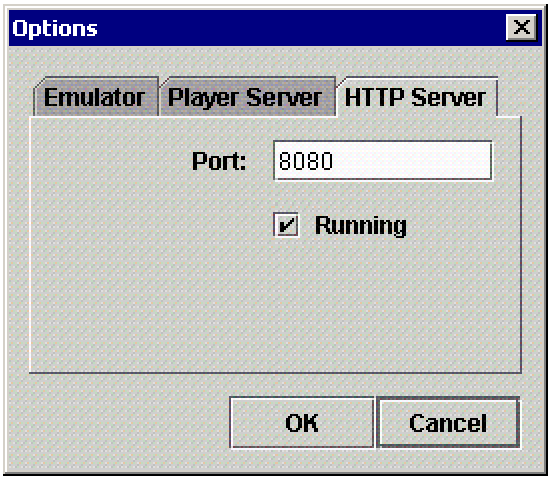
   

   Font Size: 8

   □ Auto Reconnect

2. Click the *HTTP Server* tab.

The HTTP Server tab appears.



Port: 8080

☑ Running

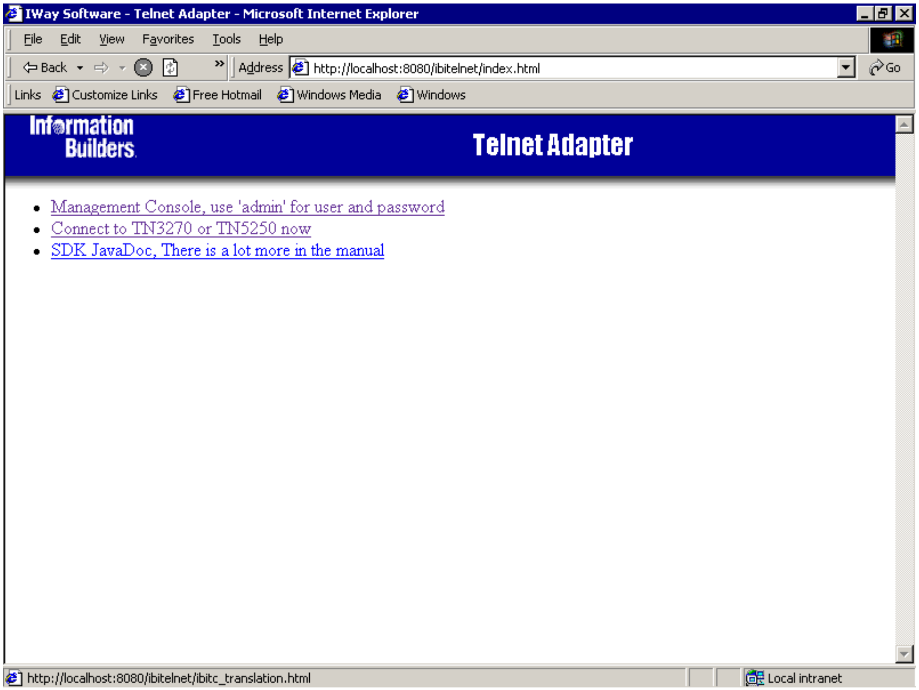
3. Enter the port number on which the Web server is listening.
4. Select the *Running* check box.
5. Click *OK* to start the Web server.

Procedure How to View the iWay Adapter for Telnet Web Application

1. Enter the following URL in a Web browser that has access to the machine where the iWay Adapter for Telnet is running:

   `http://`*`domain`*`:8080/ibitelnet/index.html`

The iWay Adapter for Telnet default HTML window opens.


IWay Software - Telnet Adapter - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address http://localhost:8080/ibitelnet/index.html
Go
Links Customize Links Free Hotmail Windows Media Windows
Information Builders
Telnet Adapter

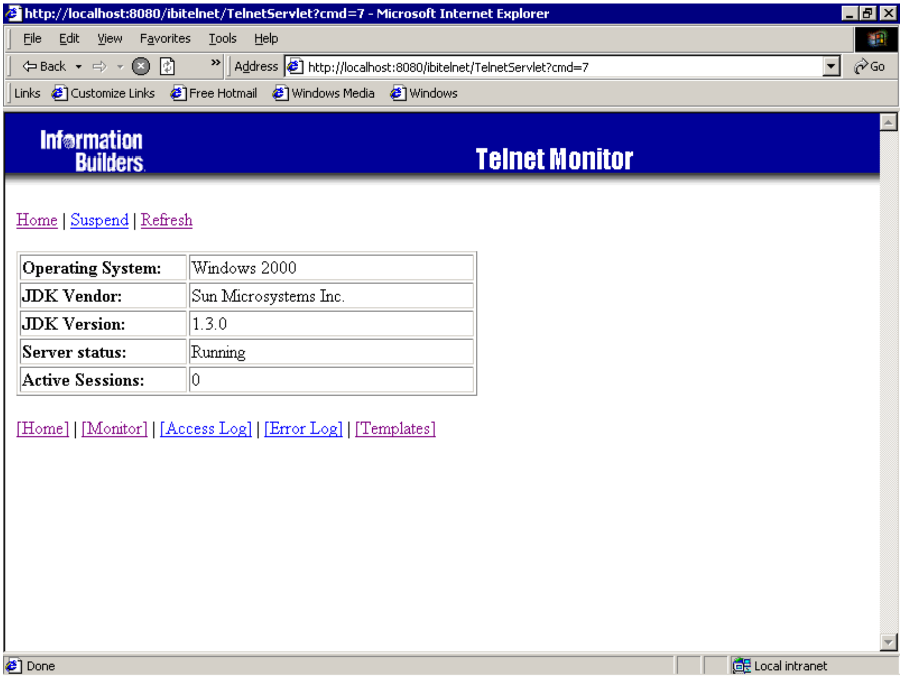
- Management Console, use 'admin' for user and password
- Connect to TN3270 or TN5250 now
- SDK JavaDoc, There is a lot more in the manual

http://localhost:8080/ibitelnet/ibitc_translation.html
Local intranet

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

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

The iWay Adapter for Telnet console opens.

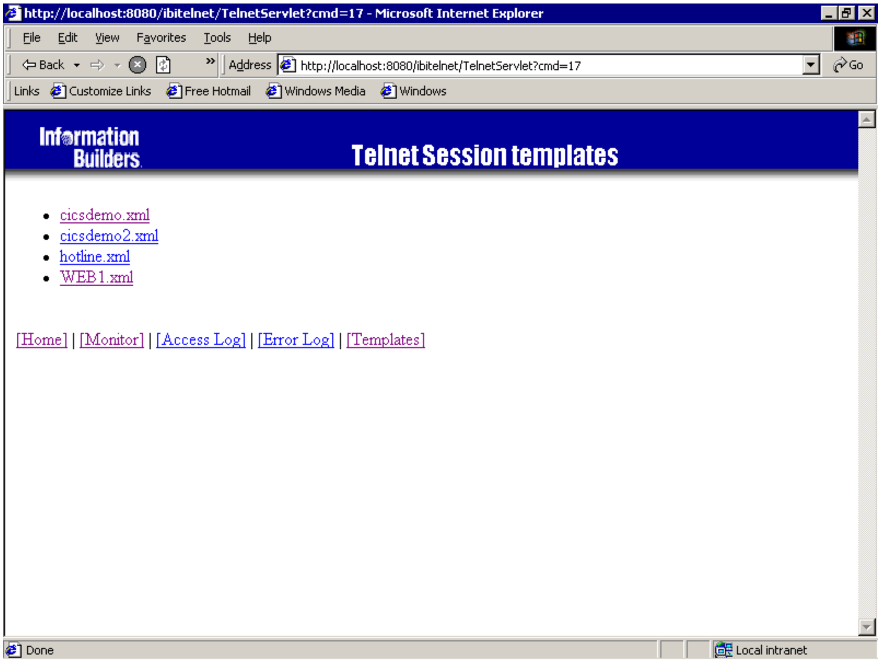

http://localhost:8080/ibitelnet/TelnetServlet?cmd=7 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address http://localhost:8080/ibitelnet/TelnetServlet?cmd=7
Go
Links Customize Links Free Hotmail Windows Media Windows
Information Builders
Telnet Monitor
Home | Suspend | Refresh

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

[Home] | [Monitor] | [Access Log] | [Error Log] | [Templates]
Done
Local intranet

3. To view the iWay Adapter for Telnet applications that you created recently, including WEB1, click *Templates*.

The list of templates appears in the Telnet Session templates window.



http://localhost:8080/ibitelnet/TelnetServlet?cmd=17 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address http://localhost:8080/ibitelnet/TelnetServlet?cmd=17
Go
Links Customize Links Free Hotmail Windows Media Windows
Information Builders
Done
Local intranet

Telnet Session templates

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

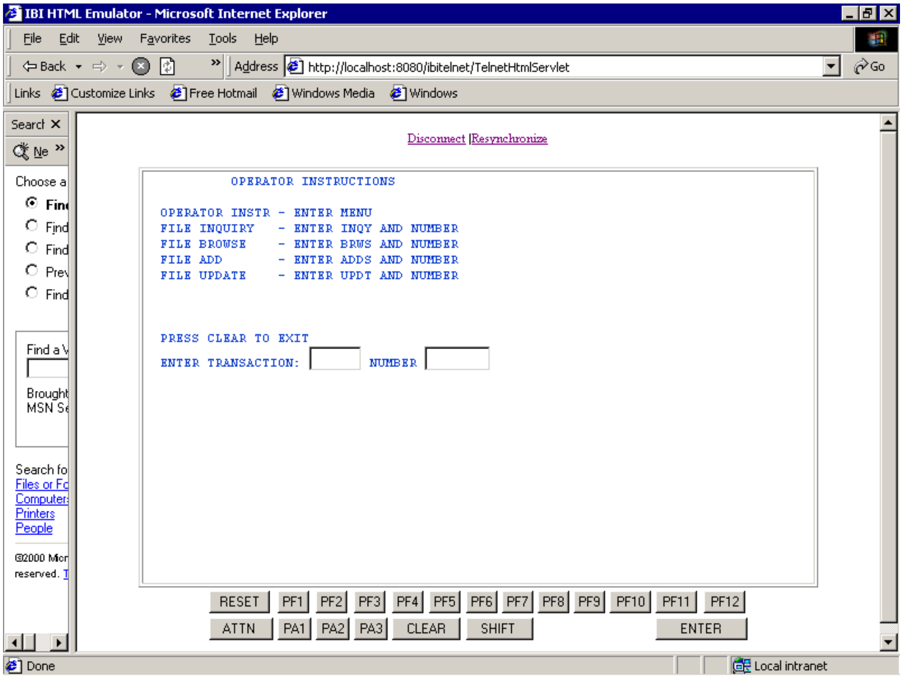
[Home] | [Monitor] | [Access Log] | [Error Log] | [Templates]

4. Click *WEB1.xml* to navigate through the screens in default emulation mode.

Reference 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 development, Web deployment, and execution.


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
Searcl
Ne
Choose a
Fin
Find
Find
Prev
Find
Find a V
Brought
MSN Se
Search fo
Files or Fc
Computer
Printers
People
©2000 Micr
reserved. T
Disconnect |Resynchronize
RESET
PF1
PF2
PF3
PF4
PF5
PF6
PF7
PF8
PF9
PF10
PF11
PF12
ATTN
PA1
PA2
PA3
CLEAR
SHIFT
ENTER
Done
Local intranet

```
          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 Telnet Designer in Web Mode: Default Translation

In the following topic you create a second iWay Adapter for Telnet 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 may seem 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 Adapter for Telnet 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 Adapter for Telnet identifies the screen when you identify the screen using a field or literal on the screen.

Using the Add Screen Identifier Feature

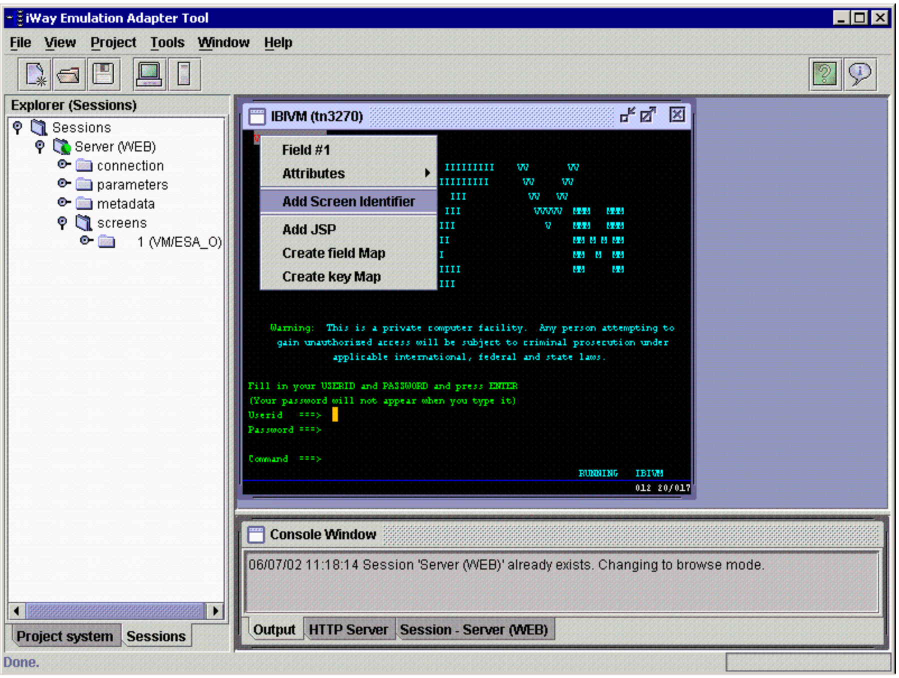
The Add Screen Identifier feature enables the user to add patterns (filters) based on screen fields. You can click the region of the screen that uniquely identifies the current screen. The Telnet Designer highlights the field, and a dialog box appears with additional string matching capabilities. You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

By adding a screen identifier, the iWay Adapter for Telnet records the screen and the key data entered in a local database. After the screen is identified, it is recognized by the iWay Adapter for Telnet.

Procedure How to Add a Screen Identifier

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.

To add a screen identifier:

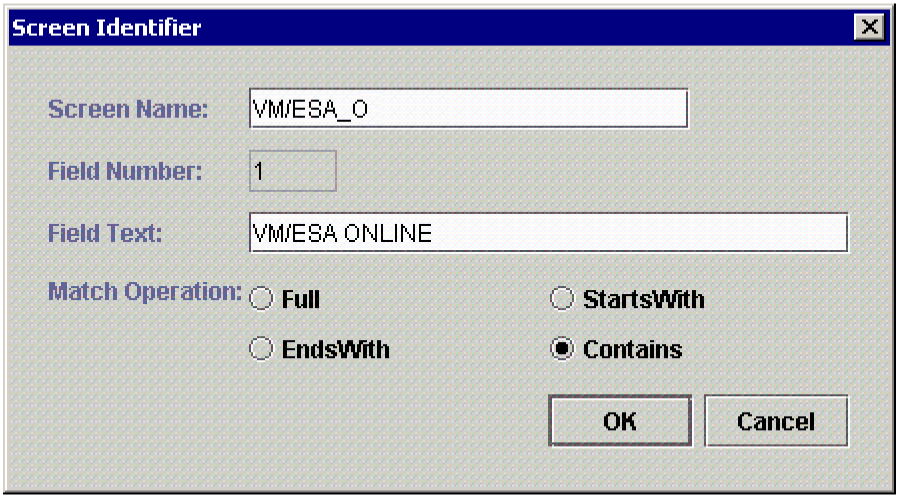


```
     Warning:  This is a private computer facility.  Any person attempting to
      gain unauthorized access will be subject to criminal prosecution under
               applicable international, federal and state laws.

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.
```

1. When the VTAM screen appears in the Telnet Designer, right-click the top literal field and select *Add Screen Identifier.*

   The Screen Identifier menu appears with the following options.



Screen Name: VM/ESA_O

Field Number: 1

Field Text: VM/ESA ONLINE

Match Operation: ○ Full ○ StartsWith ○ EndsWith ● Contains

   a. Provide a screen name.

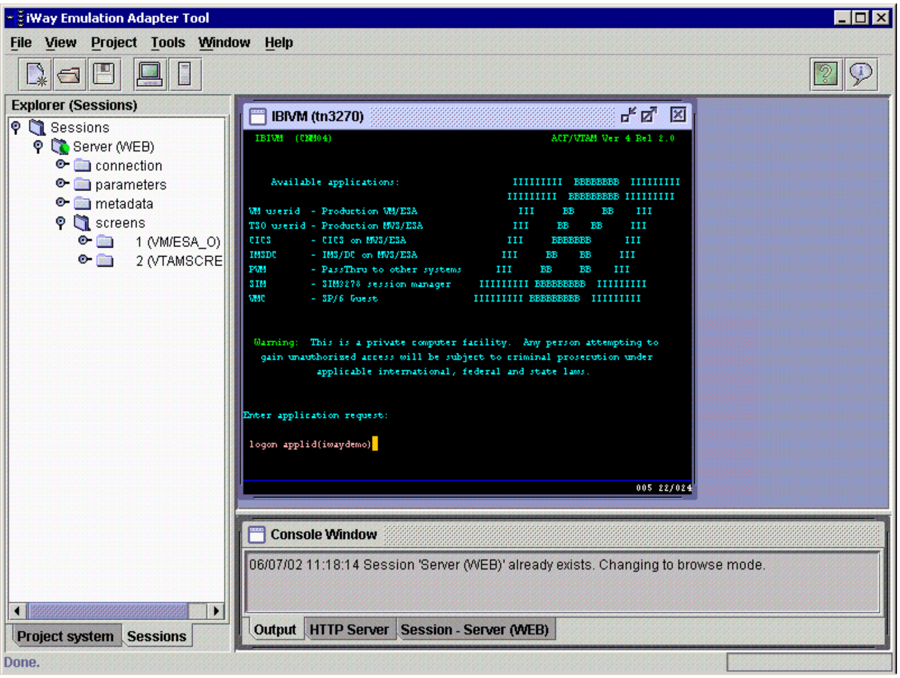
   b. Choose match operations.

      When a match is made, the iWay Adapter for Telnet 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 Adapter for Telnet.

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



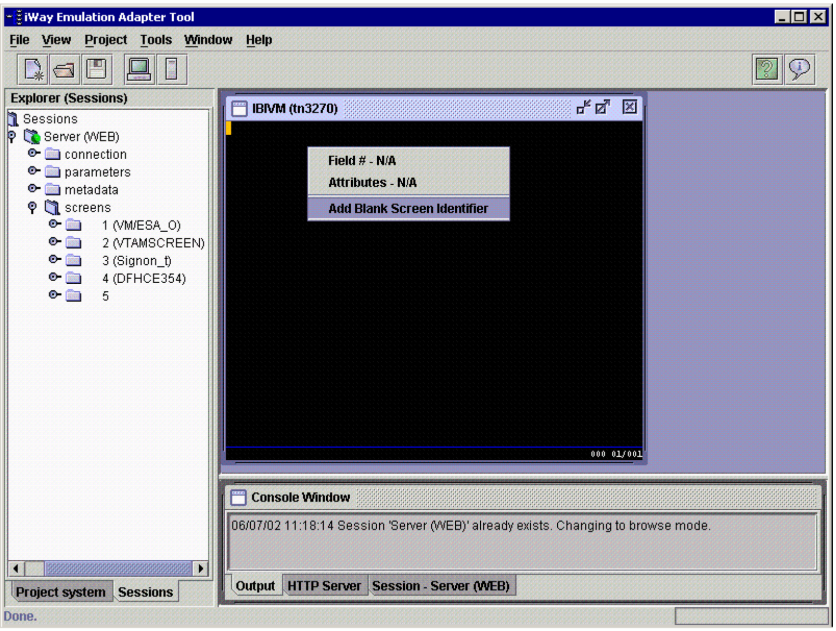
```
 IBIVM  (CNM04)                                      ACF/VTAM Ver 4 Rel 2.0


    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.
```

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

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

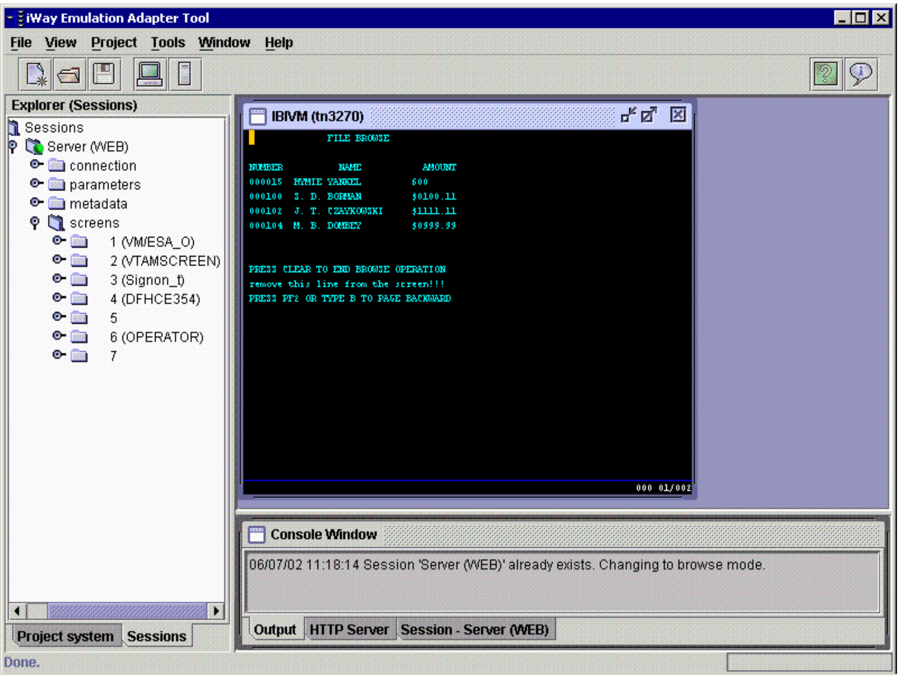
   Important: Make sure not to identify the Browse screen since you want it to appear in the browser in default translated HTML.



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

6. For a blank screen, you must select *Add Blank Screen Identifier*.

The following 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
```

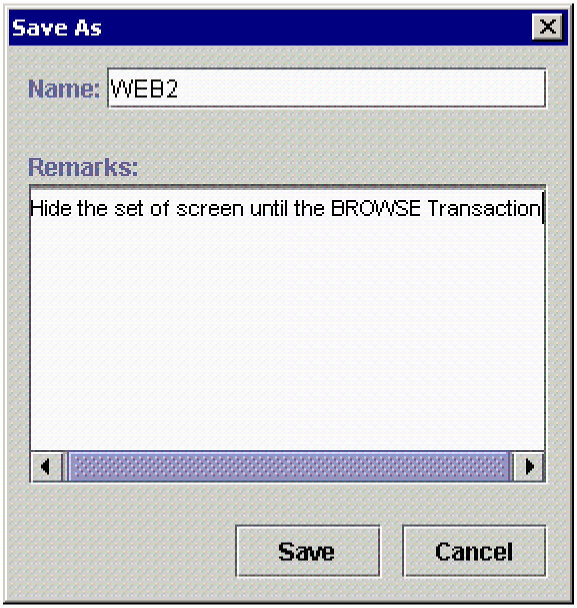
06/07/02 11:18:14 Session 'Server (WEB)' already exists. Changing to browse mode.

7. To log off CICS, enter the command, *CESF LOGOFF*.

8. Click the *X* in the upper-right corner of the Telnet Designer emulator screen.

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

The Save As dialog box opens.



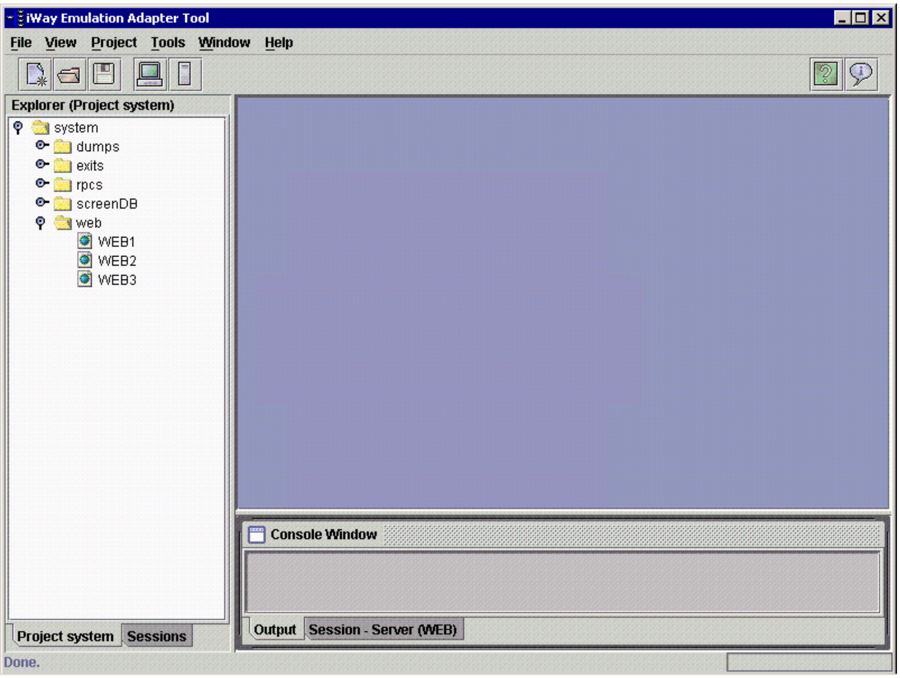
Name: WEB2

Remarks:

Hide the set of screen until the BROWSE Transaction

10. Enter a name, for example, WEB2.

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



12. 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.

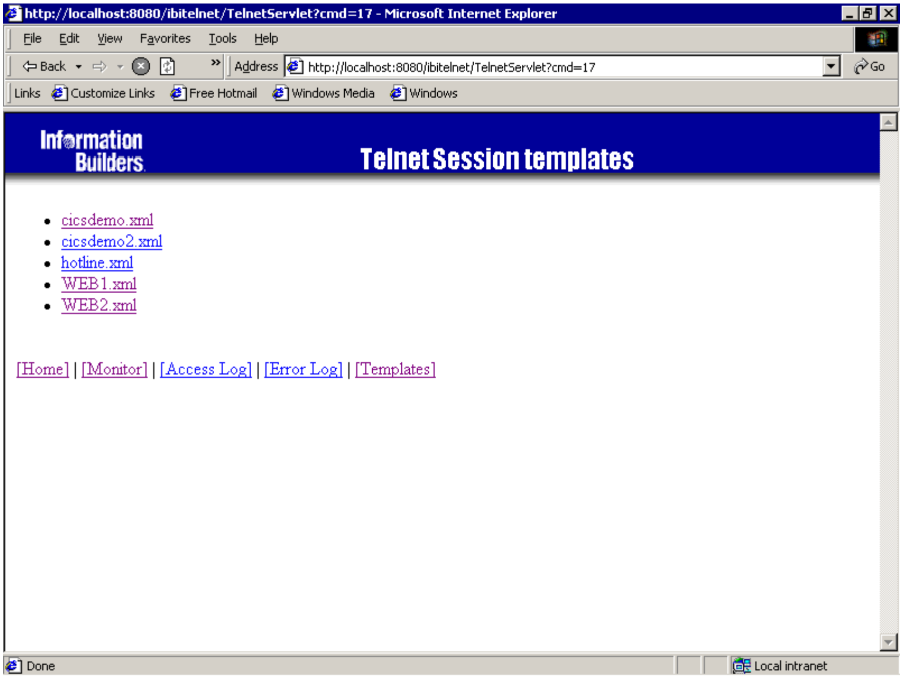
For more information on how to deploy the WEB2 Telnet application, see *How to Test the iWay Adapter for Telnet Web Application on page 3-8*.

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 Adapter for Telnet Web Application on page 3-10*.

13. In a Web browser that has access to the machine where the iWay Adapter for Telnet is running, enter the following URL:

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

The default HTML window for the iWay Adapter for Telnet opens.


http://localhost:8080/ibitelnet/TelnetServlet?cmd=17 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address http://localhost:8080/ibitelnet/TelnetServlet?cmd=17
Go
Links Customize Links Free Hotmail Windows Media Windows
Information Builders
Telnet Session templates

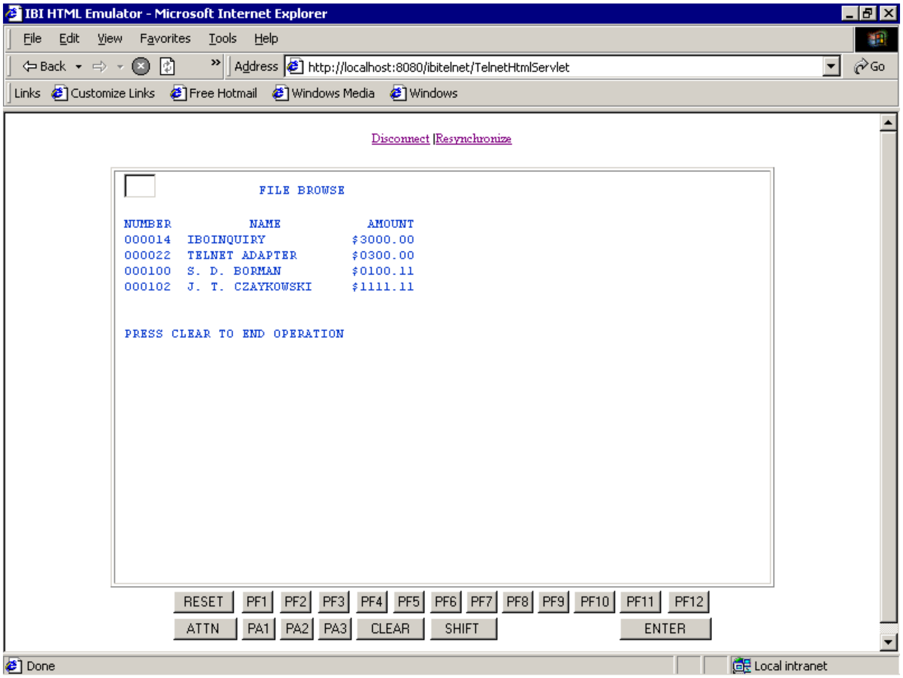
- cicsdemo.xml
- cicsdemo2.xml
- hotline.xml
- WEB1.xml
- WEB2.xml

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

The window contains sample Web applications that connect to CICS and VM systems.

14. Click *WEB2.xml*.

The following window opens.


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
ATTN PA1 PA2 PA3 CLEAR SHIFT ENTER
Done
Local intranet

```
              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*.
- JSP for the page to totally change its appearance and add functionality. This method is achieved through the Telnet Designer. For more information, see *Using the Telnet Designer to Create JavaServer Pages* on page 3-28.

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 via 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.

Procedure How to Use a Generic template

For this 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.

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) %>
```

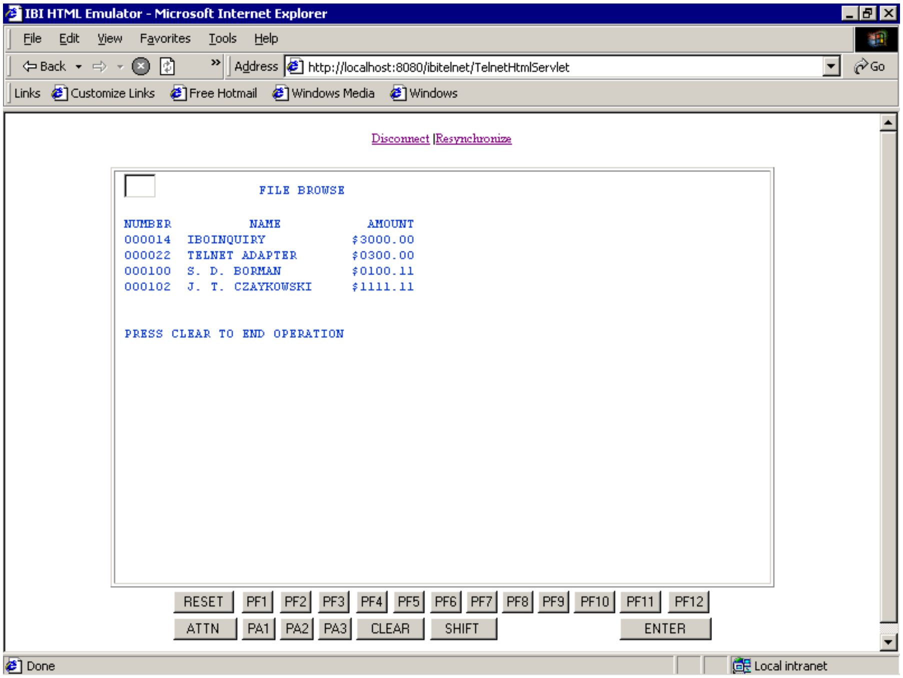
4. Edit the WEB2.XML rules file located in the ibitelnet/sessions directory within the webapps directory of the Web server.

   The WEB2.XML file was created when you deployed the application using the Telnet Designer.

5. Make the following change that identifies the web2template.jsp:

```
<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' />
```

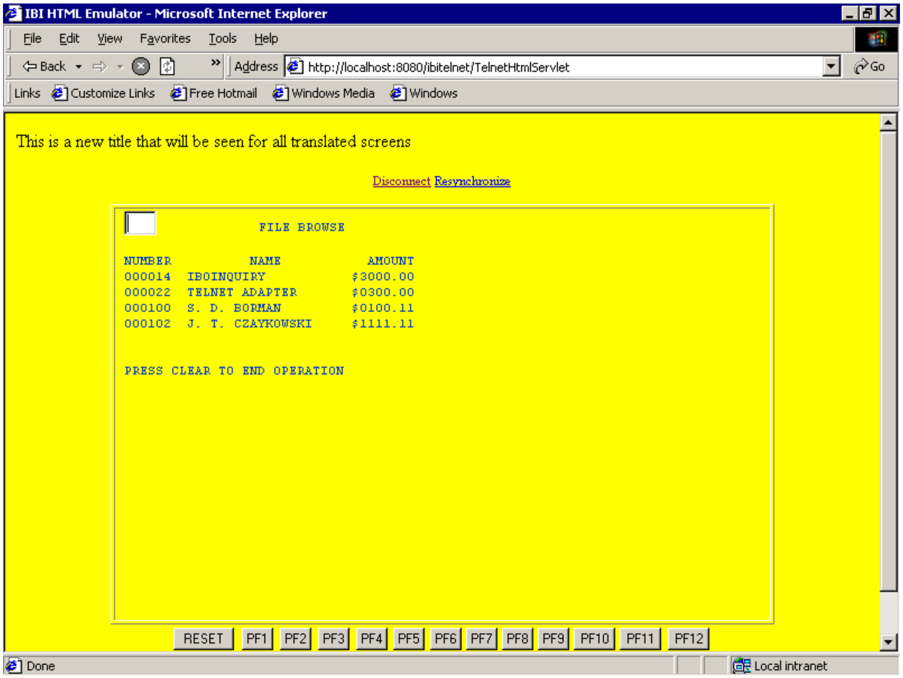
The following screen illustrates the translated CICS Browse screen *before* adding a template.



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

```
                 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 following screen 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
Go
Links Customize Links Free Hotmail Windows Media Windows
RESET PF1 PF2 PF3 PF4 PF5 PF6 PF7 PF8 PF9 PF10 PF11 PF12
Done
Local intranet

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

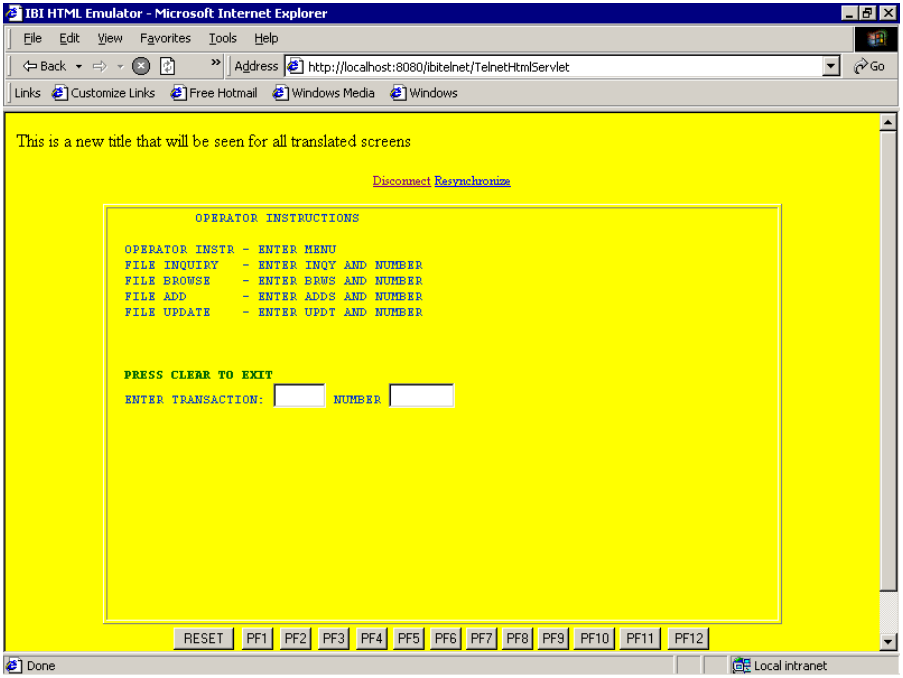
This is a new title that will be seen for all translated screens

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
```

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.


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 Telnet Designer to Create JavaServer Pages

To change the appearance of the mainframe application more significantly than using templates, the Telnet Designer 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 Adapter for Telnet 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.

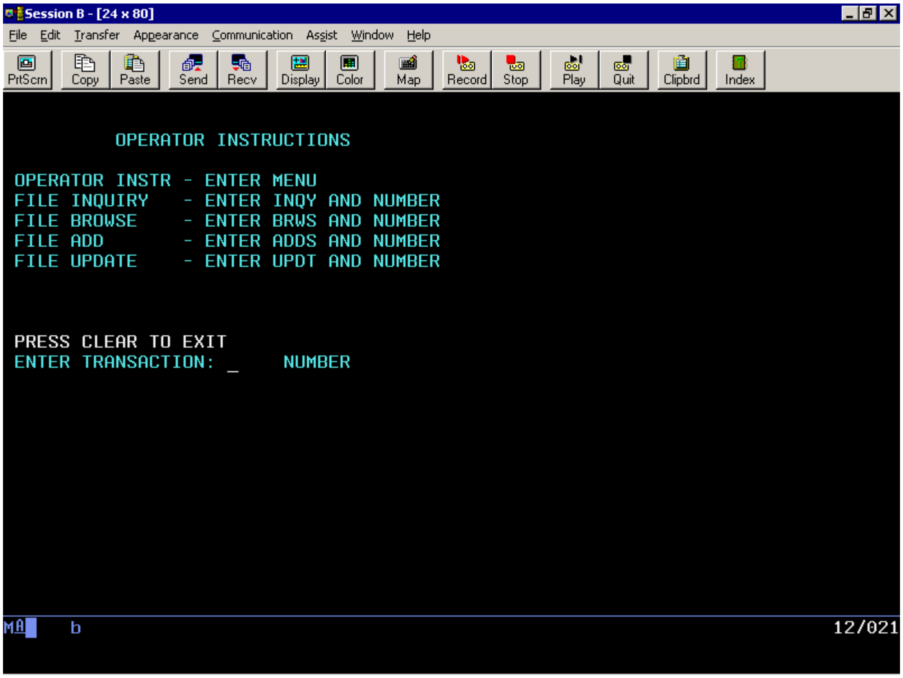
The iWay Adapter for Telnet enables you to control the mainframe Telnet session by associating one JavaServer Page to many mainframe screens.

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

The following topic describes the steps required to create a Telnet application called WEB3. The topic 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 Telnet Designer, the browser user can click WEB3 to view the CICS menu screen JSP. All previous mainframe screens are hidden.

The following is 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

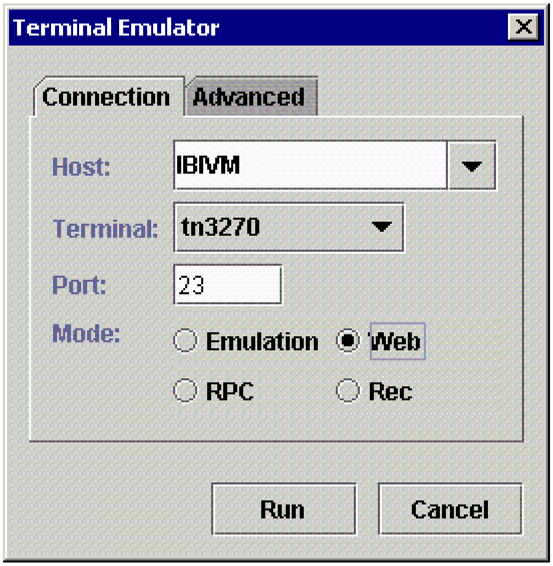
```
         OPERATOR INSTRUCTIONS

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 Telnet Designer in Web mode: JavaServer Pages

To run the Telnet Designer in Web mode:

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

An emulator session is started.



Host: IBIVM

Terminal: tn3270

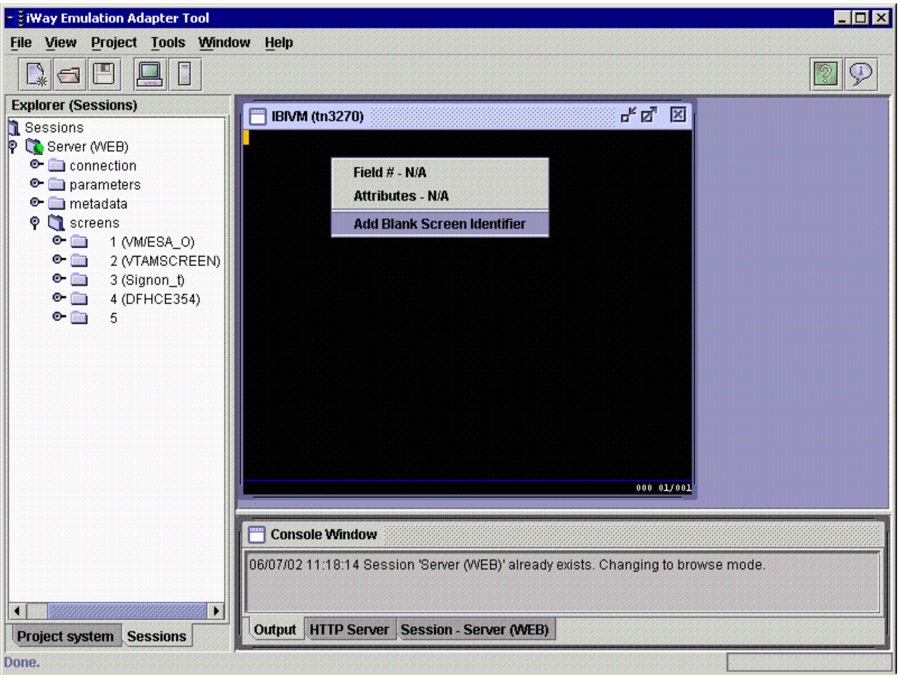
Port: 23

Mode: ○ Emulation ● Web ○ RPC ○ Rec

3. Enter the connection parameters illustrated on the previous screen.
4. Click *Web*.
5. Click *Ru*n.

   This enables you to navigate through each mainframe screen.

The following screen is an example of a screen that appears.



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

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

7. 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

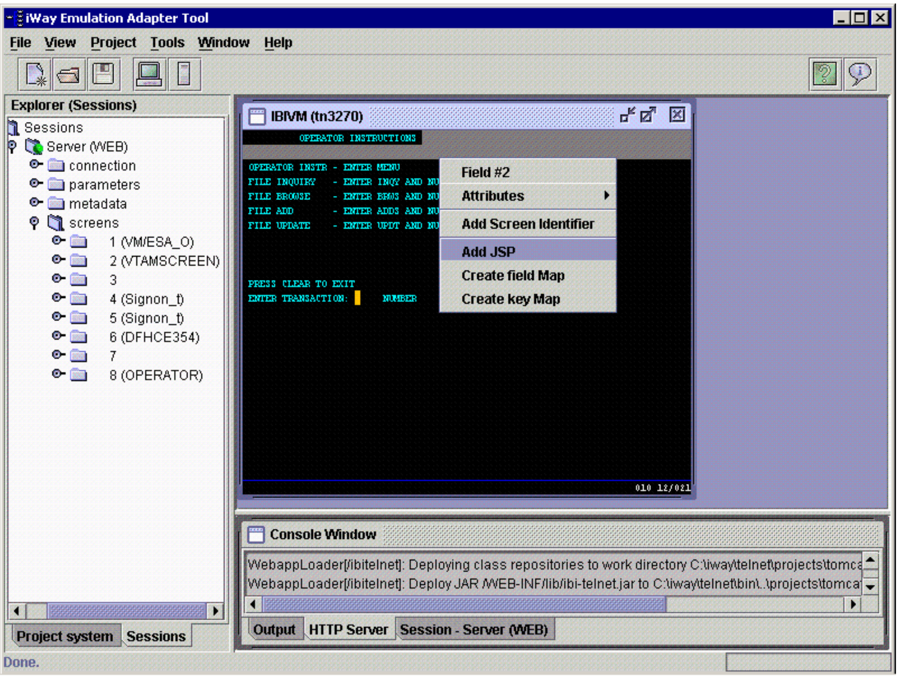
You must add a JSP for each screen that is revamped and displayed during a browser session. The Add JSP option is used to associate a JSP with a mainframe screen or set of mainframe screens.

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 Telnet Designer, 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 Adapter for Telnet commands that must not be removed or modified.

Procedure How to Add a JavaServer Page for a Screen

In this example, you want to Add JSP only for the CICS menu screen.



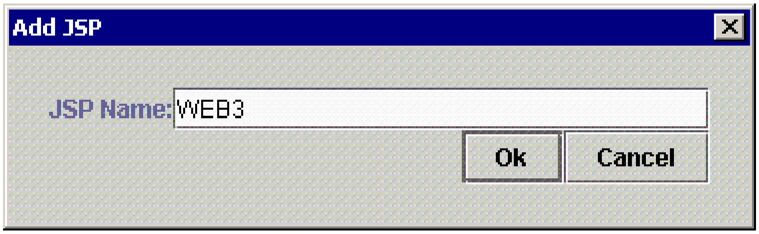
```
           OPERATOR INSTRUCTIONS

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 Telnet Designer (screen 7 (OPERATOR)). This indicates that the adapter database was updated.

   The Add JSP dialog box appears.



JSP Name: WEB3

2. 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 a JSP is added. The Telnet Designer enumerates the fields on a screen.

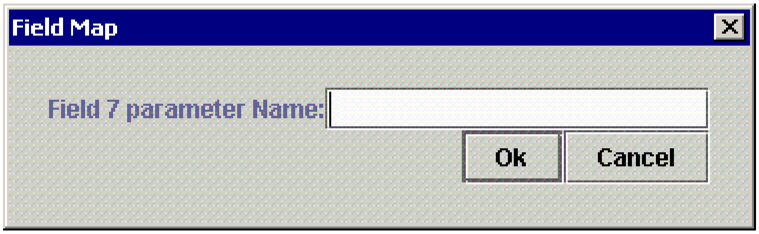
The generated JavaServer Page has the default keyboard. After a JSP is added, the Create Key Map option also is available. You can redefine any key on the keyboard. The default keyboard is suppressed after you create the first key map.

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.



   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. Type the field number and click *Ok*.

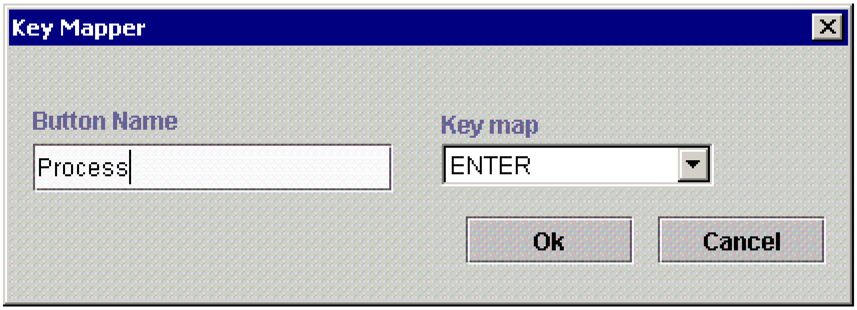
   This information is placed in the generated JavaServer Pages for further reference.

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.

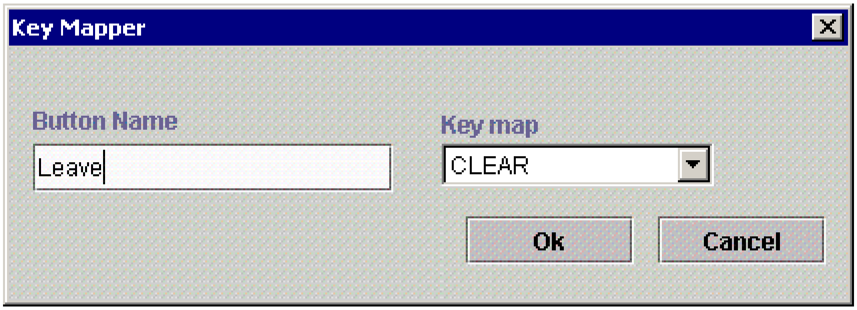
   

   Button Name: Process

   Key map: ENTER

2. Type a Button name (for example, Process) and associate a key with it by selecting from the drop-down list (for example, ENTER).

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

   Button Name: Leave

   Key map: CLEAR

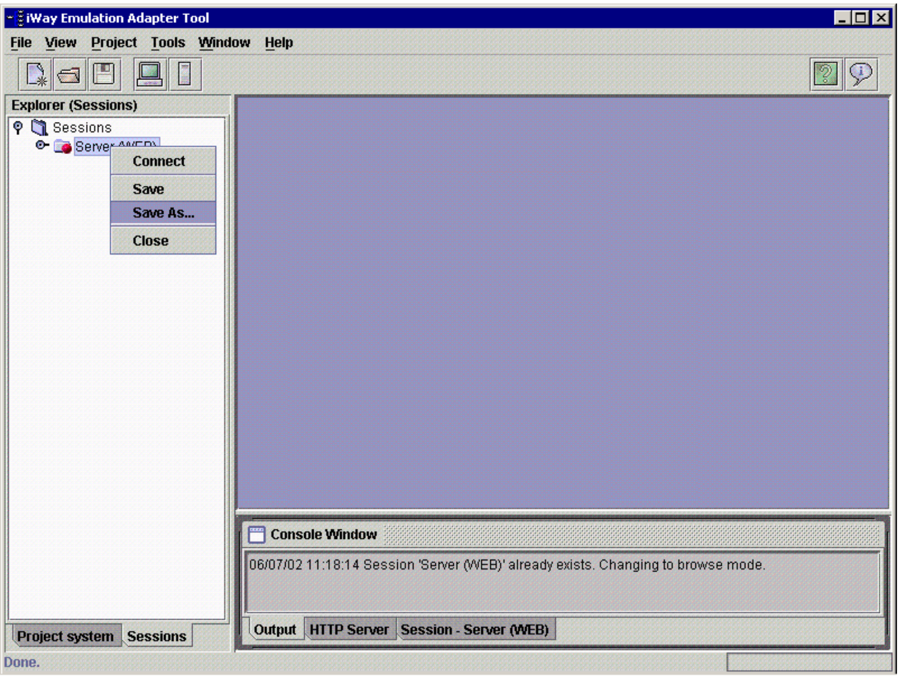
   Similarly, a box with the title, Leave, executes the CLEAR key when the Web user clicks the box.

3. Continue with the development of the WEB3 application.

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

5. Click the *X* in the upper-right corner of the Telnet Designer emulator screen.

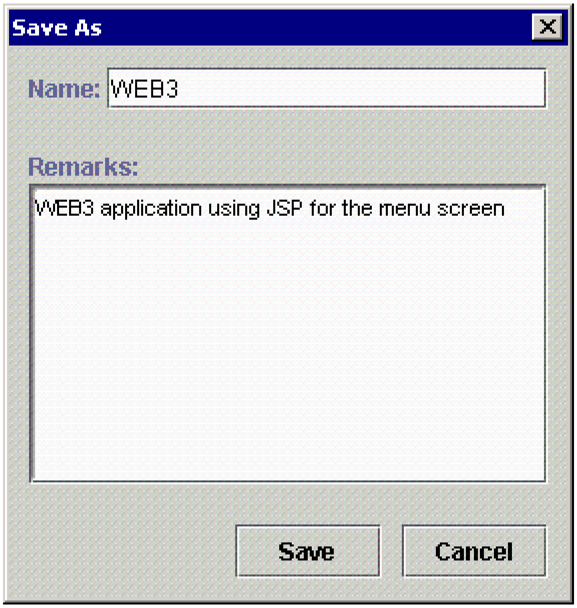
You return to the Telnet Designer.



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

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

The Save As dialog box appears.



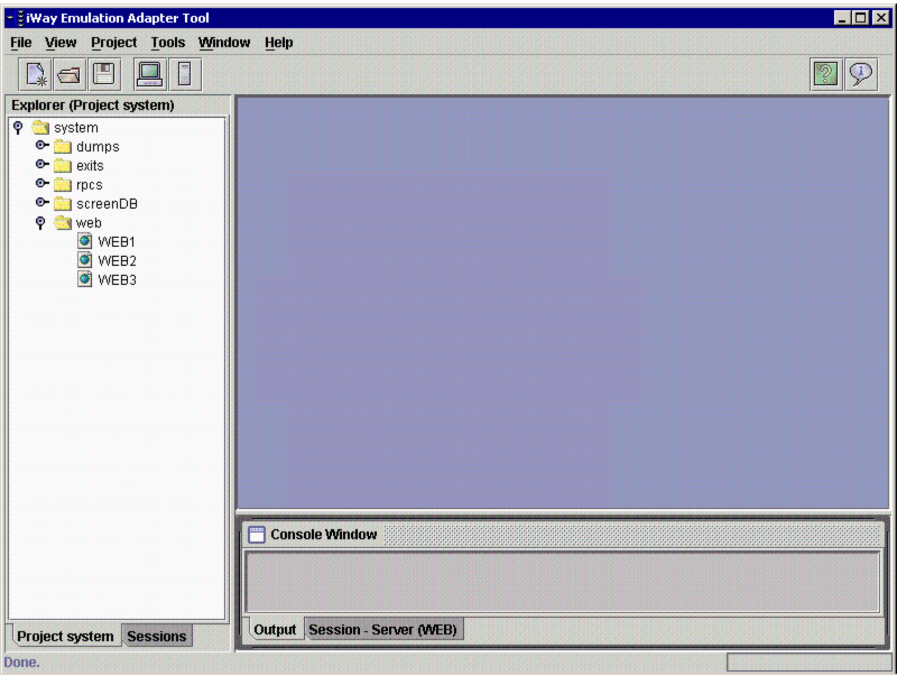
Name: WEB3

Remarks:

WEB3 application using JSP for the menu screen

7. Type a name, for example, WEB3.
8. To save the Telnet application called WEB3, click *Save*.

You return to the Telnet Designer.



9. Click the *Project* system tab in the lower.

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

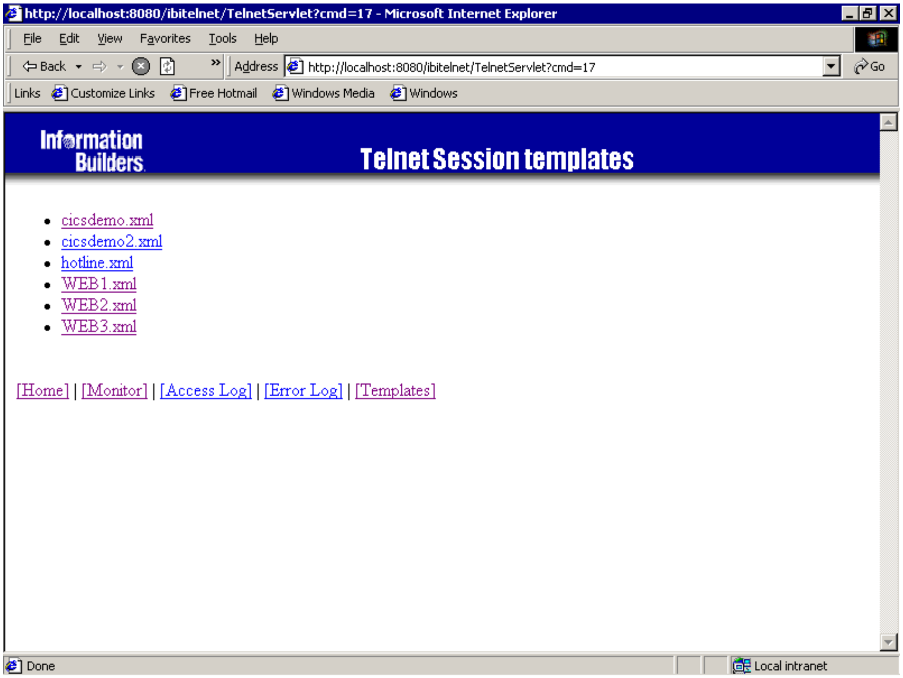
   For more information on how to deploy the WEB3 Telnet application, see *How to Test the iWay Adapter for Telnet Web Application on page 3-8*.

   For more information on how to view the WEB3 Telnet application, see *How to Start the Supplied Web Server to Run the iWay Adapter for Telnet Web Application on page 3-10*.

10. In a Web browser that has access to the iWay Adapter for Telnet, enter the following URL:

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

The iWay Adapter for Telnet default HTML page opens.


http://localhost:8080/ibitelnet/TelnetServlet?cmd=17 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address http://localhost:8080/ibitelnet/TelnetServlet?cmd=17
Go
Links Customize Links Free Hotmail Windows Media Windows
Information Builders
Done
Local intranet

Telnet Session templates

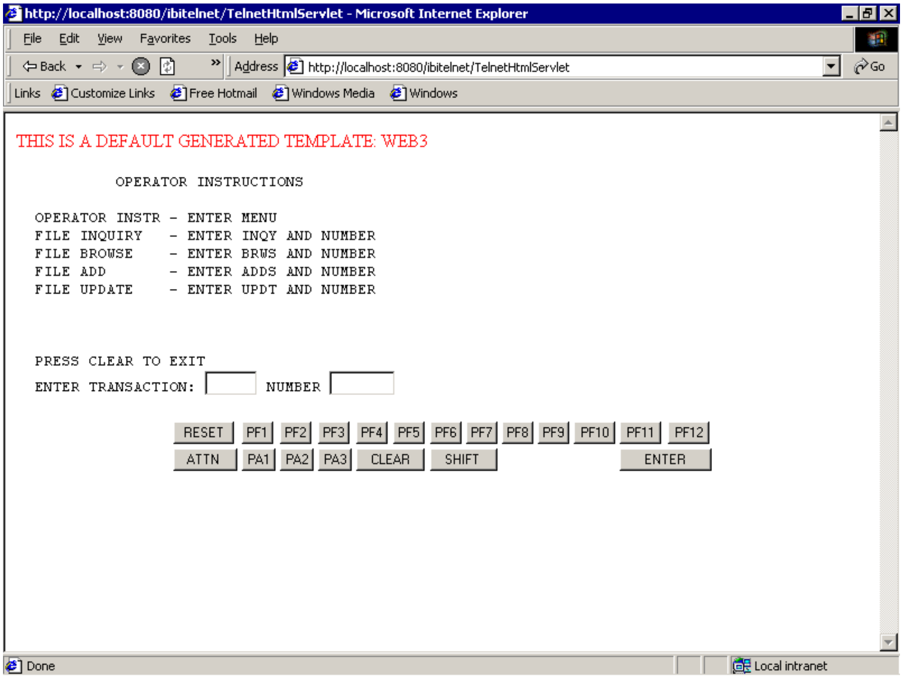
- cicsdemo.xml
- cicsdemo2.xml
- hotline.xml
- WEB1.xml
- WEB2.xml
- WEB3.xml

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

The page contains sample Web applications that connect to CICS and VM systems.

11. Click *WEB3.xml*.

The following screen opens.


http://localhost:8080/ibitelnet/TelnetHtmlServlet - 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
RESET PF1 PF2 PF3 PF4 PF5 PF6 PF7 PF8 PF9 PF10 PF11 PF12
ATTN PA1 PA2 PA3 CLEAR SHIFT ENTER
Done
Local intranet

```
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 screen uses the JSP called WEB3.JSP.

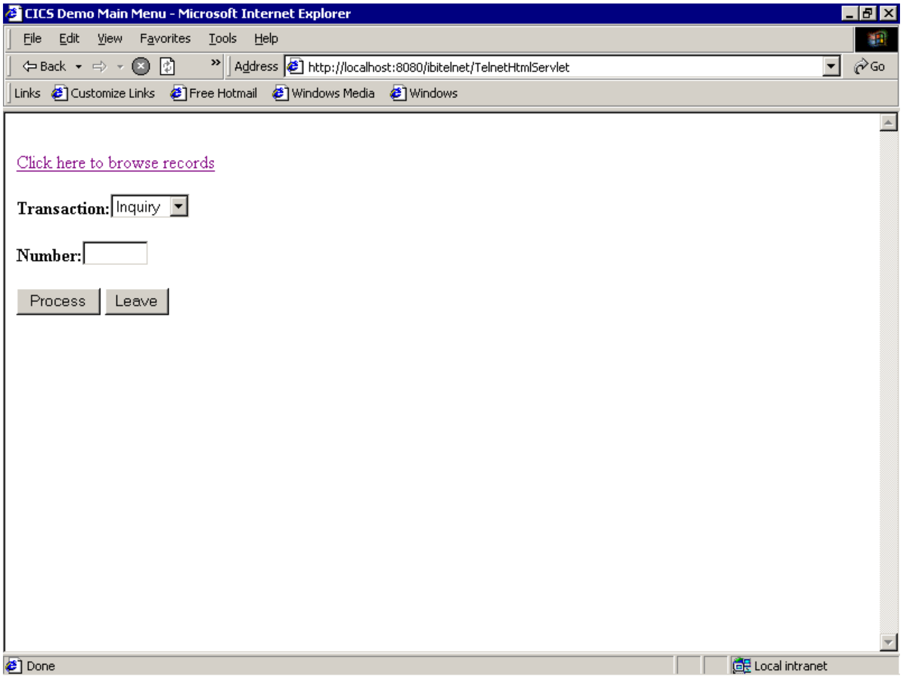
Now you can edit the WEB3.JSP to completely redesign the look and feel of this CICS menu screen.

Reference 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 illustrated by the following example:


CICS Demo Main Menu - 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
Click here to browse records
Transaction: Inquiry
Number:
Process
Leave
Done
Local intranet

- The screen uses the JSP called WEB3.JSP.
- It includes a link to execute the BROWSE transaction.
- It includes a drop-down list with options to Inquire, Add, and 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).

Reference The Enriched WEB3.JSP File

The following sample code is for the enriched WEB3.JSP file that illustrates the previous enhancements. This supplied JSP is 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 are automatically deployed on the Web server when you select to deploy in the Telnet Designer. In addition, the adapter software is already installed within the supplied web application server.

To run an iWay Adapter for Telnet Web application on a Web application server other than the supplied one, which is the case in a production environment, configuration steps must be performed.

Deploy the following on your particular Web application server:

- The iWay Adapter for Telnet 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 class path.

- 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 Telnet Designer in Web deployment mode.

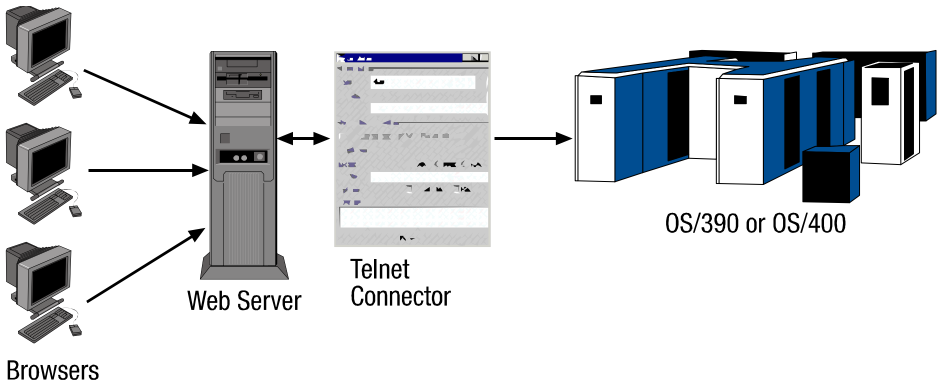
  These folders/files must be made available to your Web application server.

Using HTML Translation Services

In Web mode, the iWay Adapter for Telnet's Designer 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.

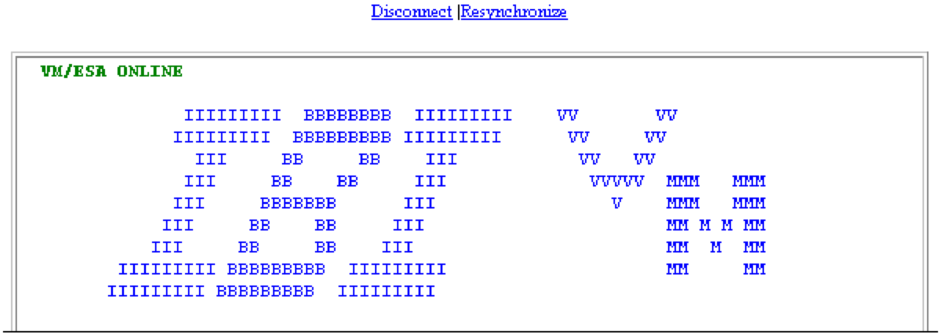
It is important to understand the effects of running a mainframe online application over the Web. These effects can occur when using default translation with or without a generic template or when using the Telnet Designer's template facility.

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 commands are available:

- **Unlock Keyboard Command.** A field in the TN3270 and the TN5250 protocol determines the state of the terminal's 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.



```
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
```

- **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, 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 parameters 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 parameters 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 parameter affects the HTML Web session:

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

The following parameter 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>
```

Reference 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.

Example Using a Combo Box for a Specific Field

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 following parameters.

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 target listens. The default port is 23.
emulation	The terminal (term) type: Tn3270 or Tn5250. The default is Tn3270.

Example Establishing a Telnet Connection With a Hyperlink

You can establish a Telnet connection by adding the following code to an HTML page:

```
<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:

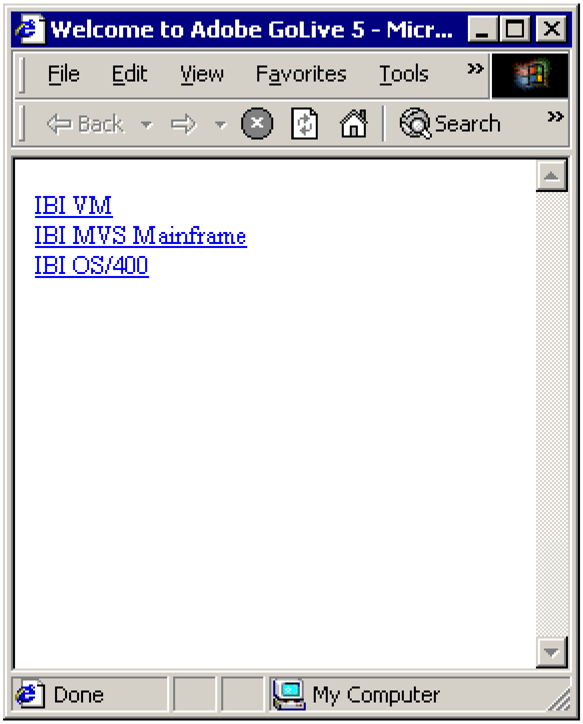
1. Enter the following in a text editor and save as sample1.html in your Telnet\wwwtelnet directory:

```
<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=tn5250>
MY As/400 Machine
</a>
</body>
</html>
```

2. Start your Web server.
3. Run your sample1.html file from the browser.

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

The following window opens.



IBI VM
IBI MVS Mainframe
IBI OS/400

CHAPTER 4

Developing Applications: Using Emulation and Recorder Modes

Topics:

- Emulation Mode
- Recorder Mode

The iWay Adapter for Telnet 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's Telnet Designer. The Designer displays standard 3270 and 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 iWay Adapter for Telnet's Emulation mode enables you to access a mainframe session directly from the adapter's Telnet Designer. This is simple emulation that displays standard 3270 or 5250 screens and does not create any work files on your system.

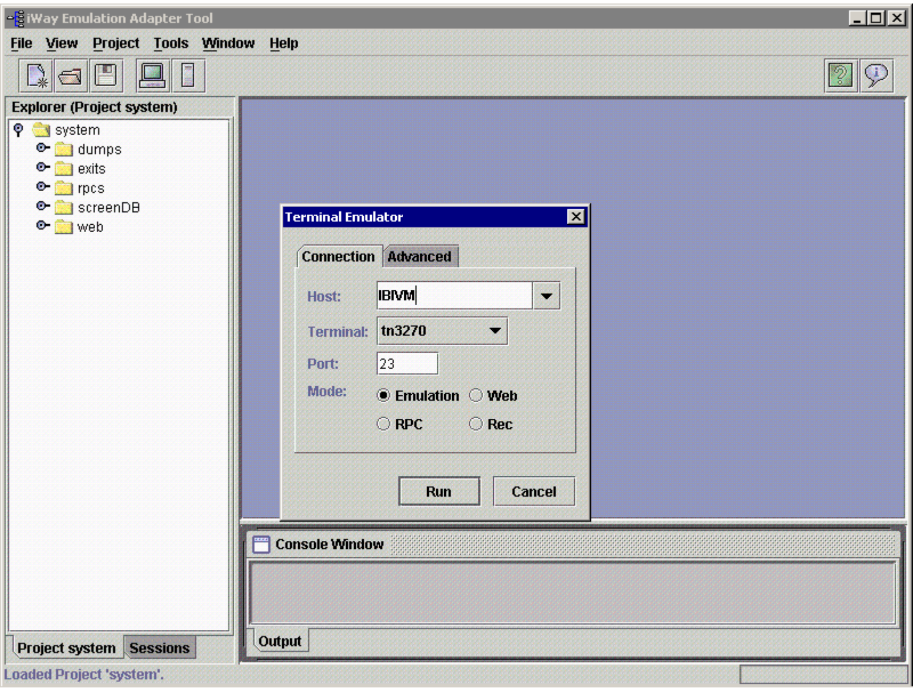
Using Emulation Mode

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

Procedure How to Run the Telnet Designer in Emulation Mode

To run the Telnet Designer in Emulation mode:

1. Invoke the Terminal Emulator from the Telnet Designer.



Host: IBIVM

Terminal: tn3270

Port: 23

Mode: ● Emulation ○ Web ○ RPC ○ Rec

Loaded Project 'system'.

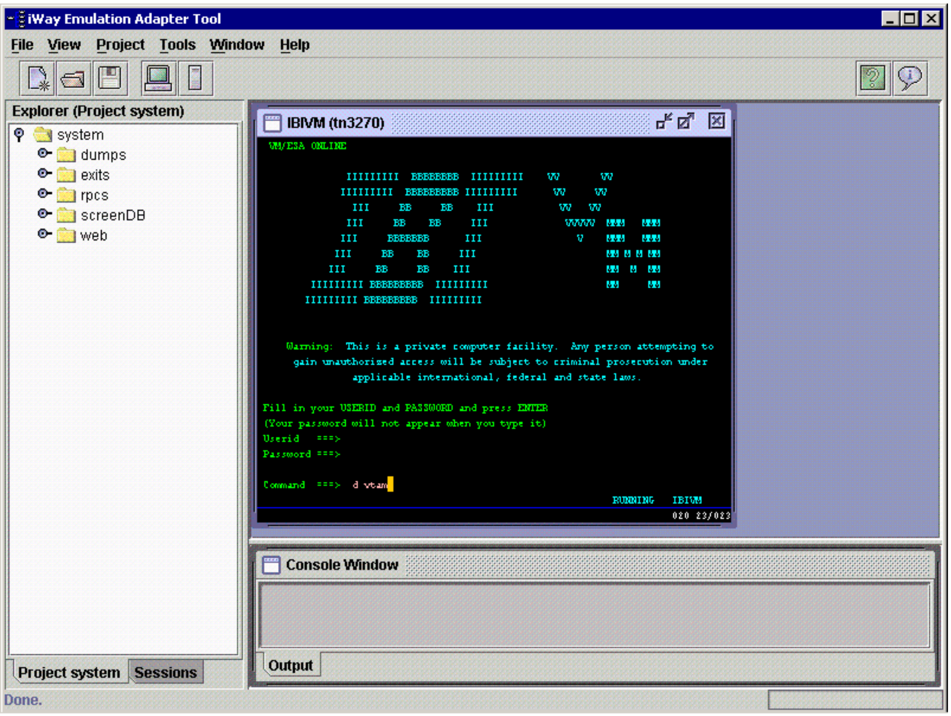
   a. On the Connection tab, set the connection parameters.

   b. Ensure the mode is set to *Emulation*.

   For details on setting emulation mode parameters, see *Creating a Transaction Module* in Chapter 2, *Using 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.



```
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 your site’s mainframe online system.

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

Recorder Mode

The iWay Adapter for Telnet's Recorder mode enables you to capture all of your mainframe application screens and end-user keystrokes using the adapter's Designer terminal emulation, and then store the screens and keystrokes in a file. The 3270 or 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

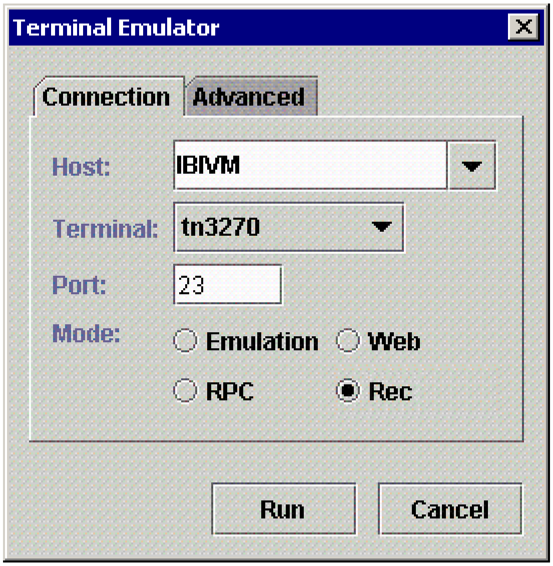
The Player Server uses the pre-recorded file to act as a live connection to the mainframe. With this pre-recorded file, you can continue your development off-line without being connected to the mainframe host. This is a useful feature for off-line development, testing, benchmarking, prototyping, debugging,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

Procedure How to Run the Telnet Designer in Recorder (REC) Mode

To run the Telnet Designer in REC mode:

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

   The Terminal Emulator dialog box opens.



Host: IBMVM

Terminal: tn3270

Port: 23

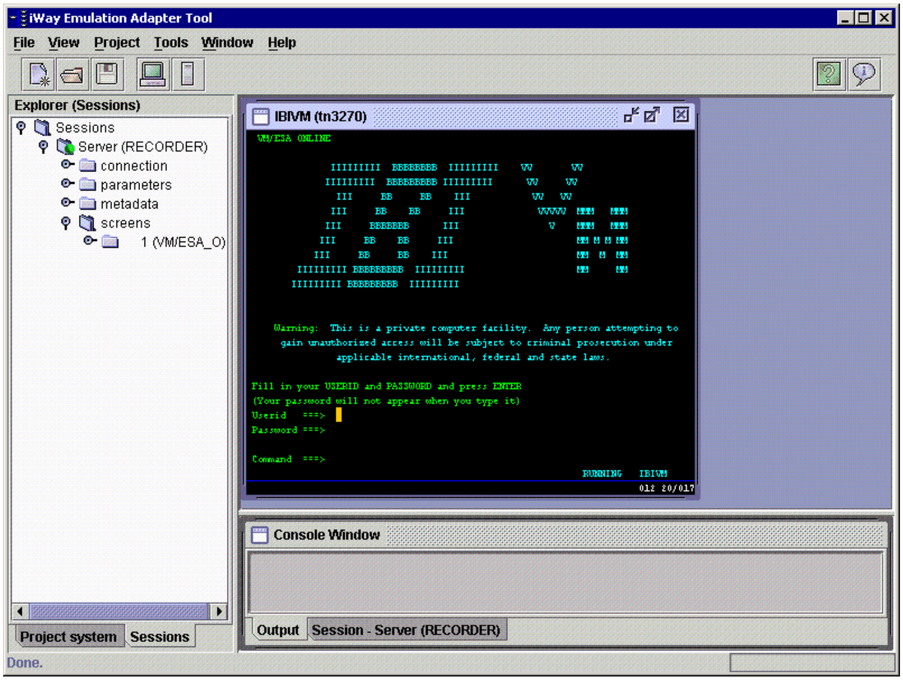
Mode: ○ Emulation ○ Web ○ RPC ● Rec

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

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

2. Click *Run.*

A connection is made to the mainframe online system.



```
VM/ESA ONLINE

          IIIIIIIII  BBBBBBBB  IIIIIIIII    VV       VV
         IIIIIIIII  BBBBBBBBB IIIIIIIII      VV     VV
           III     BB     BB    III           VV   VV
          III     BB    BB     III             VVVV  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
```

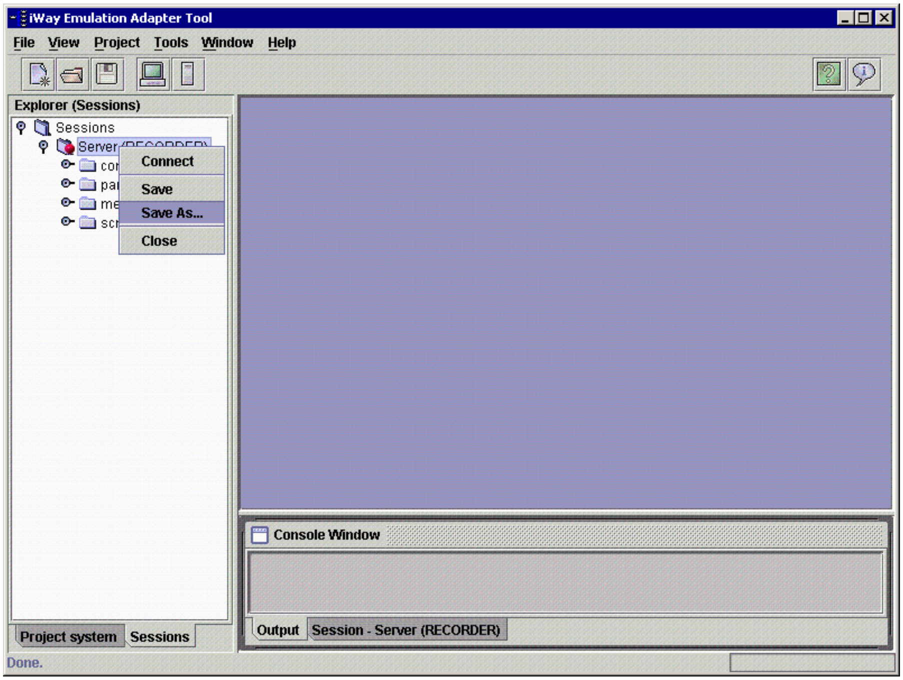
You can move through each mainframe screen.

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

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

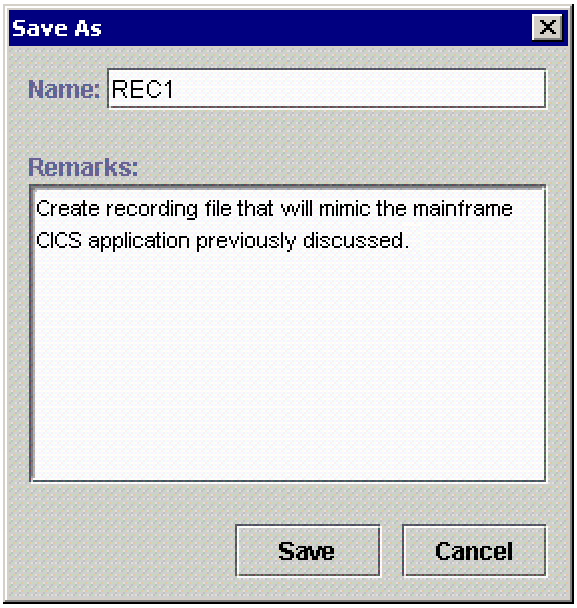
3. Click the *X* in the upper right of the mainframe session window.

You can now save the pre-recorded file.



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

The Save As dialog box appears.



Name: REC1

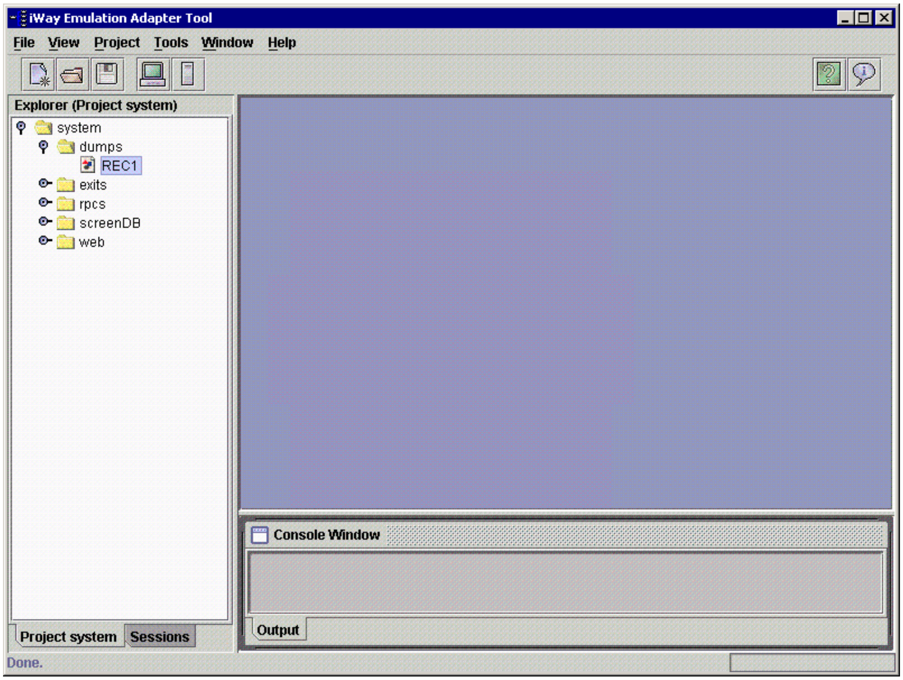
Remarks:

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

a. Type a name, for example, REC1.

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

You return to the Telnet Designer.


iWay Emulation Adapter Tool
File View Project Tools Window Help
Explorer (Project system)
system
dumps
REC1
exits
rpcs
screenDB
web
Console Window
Output
Project system
Sessions
Done.

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 Telnet Designer enables a developer to create the Telnet components offline, disconnected from the mainframe by using the adapter's 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 Adapter for Telnet application against a pre-recorded file. As explained in the previous chapters, you can run the Telnet Designer 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.

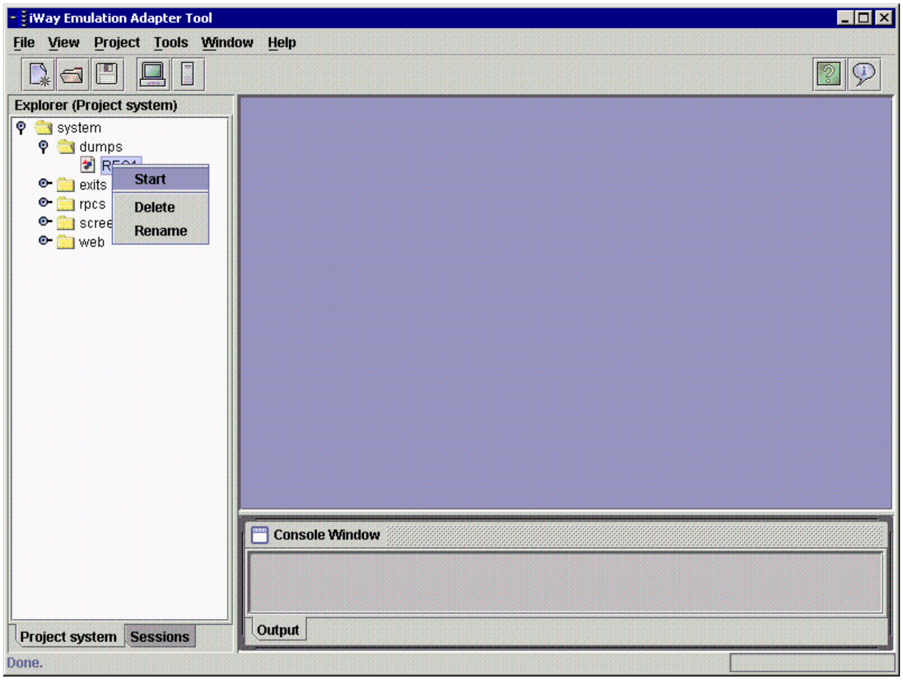
The following procedures describe how to:

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

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

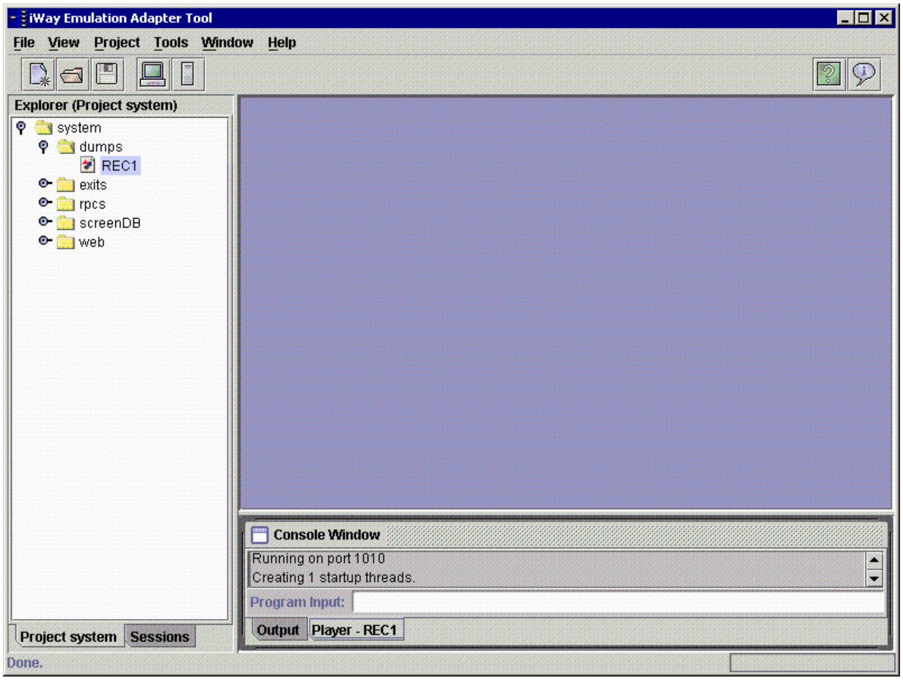
To start a player session against a pre-recorded file:

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



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

The Player - REC1 tab becomes available in the right pane.



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

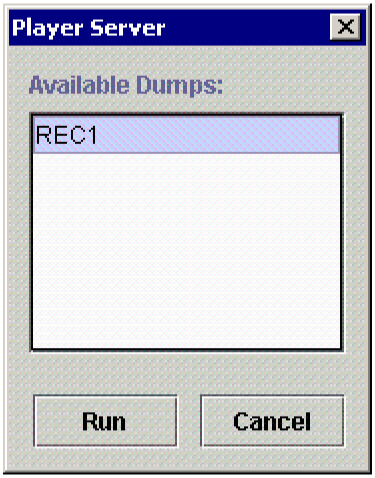
3. Click the *Player - REC1* tab.

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

Port 1010 is the default port.

An alternative way to start a player session is to click *Tools* and select *Player Server* or click the Player Server icon on the menu bar.

The following Server player dialog box opens that lists all of the available pre-recorded files.



1. Select *REC1* and click *Run* to start a player session.

   Before you connect, using the Emulator function, you must know on which port the player server is running.

   Port 1010 is the default port.

2. Specify the value for the port when you use the Telnet Designer to create a Telnet application.

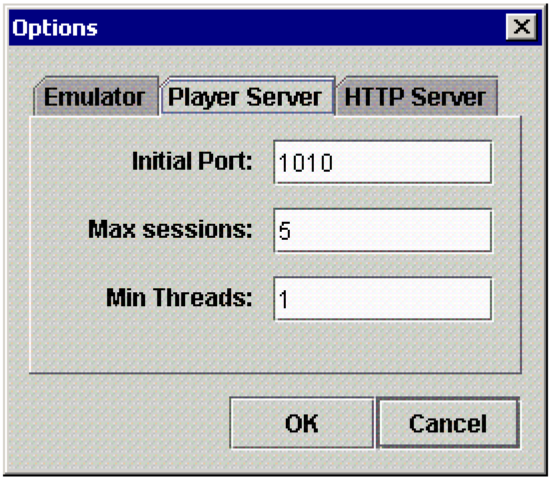
Procedure How to View or Change the Player Server Connection Information

The Telnet Designer 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 Telnet Designer and select *Options*.
2. Click the *Player Server* tab.

The Options dialog box appears.



Initial Port: 1010

Max sessions: 5

Min Threads: 1

The player session is running on port 1011 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 Telnet Designer against the local pre-recorded file, REC1.

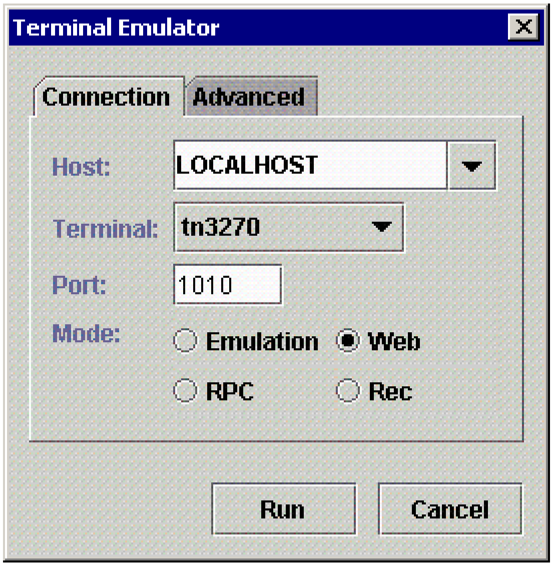
Procedure How to Run the Telnet Designer Against a Pre-recorded File

While the Player session is running, you are able to run the Telnet Designer against it to create a Web-based or RPC application. You can use the Telnet Designer 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 3, *Using Web Mode*.

2. Invoke the Terminal Emulator.



Host: LOCALHOST

Terminal: tn3270

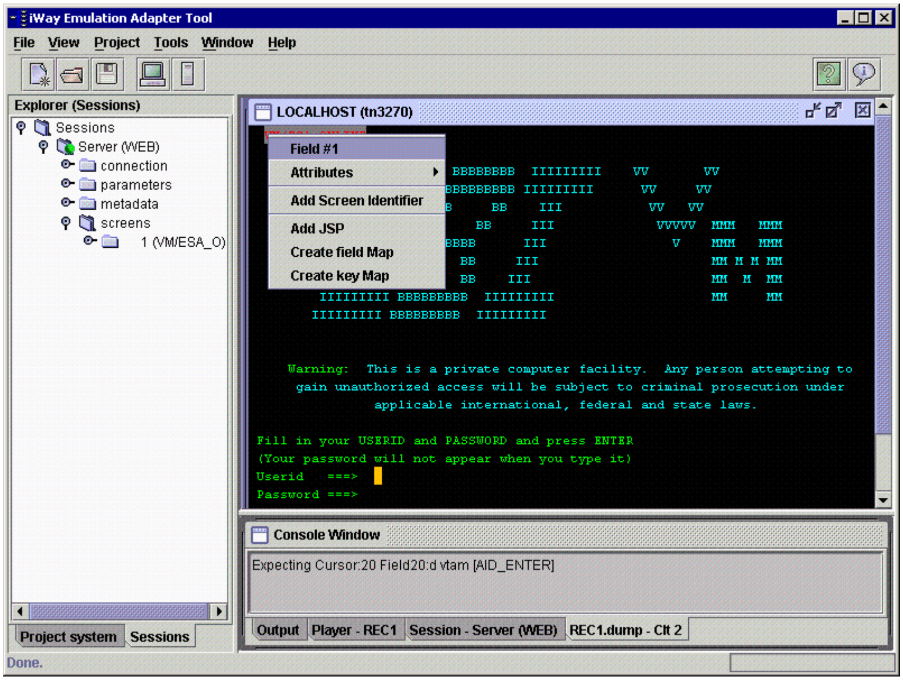
Port: 1010

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.



```
                        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 Telnet Designer 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.

APPENDIX A

Sample Code

Topic:

- Request Document INQY.XML

This appendix provides sample code.

Request Document INQY.XML

This sample XML request document, INQY.XML, defines a Remote Procedure Call (RPC) mode module named INQY.

```
<sequence NAME='INQY' MODE='RPC' VERSION='2.0' >
  <parameters>
    <parameter NAME="Account" LENGTH='6'>000100</parameter>
  </parameters>
  <metadata>
<segment NAME="Screen7" >
  <column NAME="Account" LENGTH='8' POSITION='2' />
  <column NAME="Name" LENGTH='8' POSITION='5' />
  <column NAME="Address" LENGTH='8' POSITION='8' />
  <column NAME="Balance" LENGTH='8' POSITION='17' />
</segment>
  </metadata>
  <connection HOST='ibivm' PORT='23' EMULATION='tn3270' EXTENDED='OFF'
LANGUAGE='Cp037' TIMERTIMEOUT='15' />
  <screen ID='1' NAME='RUNNING_' METHOD='execute' >
    <filter FIELD='5' TYPE='MATCHOP_CONTAINS' VALUE='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.'/>
    <filter FIELD='21' TYPE='MATCHOP_CONTAINS' VALUE='RUNNING   IBIVM'/>
    <action NAME='setFieldContent' FIELD='20' VALUE='d vtam'/>
    <attention NAME='Session.AID_ENTER' VALUE='0' />
  </screen>
  <screen ID='2' NAME='IBIVM__(' >
    <filter FIELD='1' TYPE='MATCHOP_CONTAINS' VALUE='IBIVM  (CNM04)'/>
    <filter FIELD='4' TYPE='MATCHOP_CONTAINS' VALUE='equest:'/>
    <action NAME='setFieldContent' FIELD='5' VALUE='logon
applid(edbgm010)'/>
    <attention NAME='Session.AID_ENTER' VALUE='0' />
  </screen>
  <screen ID='3' NAME='DFHCE352' >
    <filter FIELD='26' TYPE='MATCHOP_CONTAINS' VALUE='DFHCE3520 Please
type your userid.'/>
    <attention NAME='Session.AID_F3' VALUE='4' />
  </screen>
  <screen ID='4' NAME='DFHCE354' >
    <filter FIELD='1' TYPE='MATCHOP_CONTAINS' VALUE='DFHCE3543 You have
cancelled your sign-on request. Sign-on is terminated.'/>
    <attention NAME='Session.AID_CLEAR' VALUE='1' />
  </screen>
  <screen ID='5' TYPE='unformatted' >
    <action NAME='setContent' FIELD='-1' VALUE='menu'/>
    <attention NAME='Session.AID_ENTER' VALUE='0' />
  </screen>
  <screen ID='6' NAME='NUMBER' >
    <filter FIELD='11' TYPE='MATCHOP_CONTAINS' VALUE='NUMBER'/>
    <action NAME='setFieldContent' FIELD='10' VALUE='inqy'/>
    <action NAME='setFieldContent' FIELD='12' LABEL='Account'
VALUE='$LABEL$'/>
    <attention NAME='Session.AID_ENTER' VALUE='0' />
  </screen>
  <screen ID='7' NAME='PRESS_EN' >
    <filter FIELD='24' TYPE='MATCHOP_CONTAINS' VALUE='PRESS ENTER TO
CONTINUE'/>
    <action NAME='getFieldContent' FIELD='2' LABEL='Account'
VALUE='Screen7'/>
    <action NAME='getFieldContent' FIELD='5' LABEL='Name'
VALUE='Screen7'/>
    <action NAME='getFieldContent' FIELD='8' LABEL='Address'
VALUE='Screen7'/>
    <action NAME='getFieldContent' FIELD='17' LABEL='Balance'
VALUE='Screen7'/>
    <attention NAME='Session.AID_ENTER' VALUE='0' />
  </screen>
  <screen ID='8' NAME='NUMBER' >
    <filter FIELD='11' TYPE='MATCHOP_CONTAINS' VALUE='NUMBER'/>
    <attention NAME='Session.AID_F3' VALUE='4' />
  </screen>
  <screen ID='9' NAME='NUMBER' >
    <filter FIELD='11' TYPE='MATCHOP_CONTAINS' VALUE='NUMBER'/>
    <attention NAME='Session.AID_CLEAR' VALUE='1' />
  </screen>
  <screen ID='10' TYPE='unformatted' >
    <action NAME='setContent' FIELD='-1' VALUE='cesf logoff'/>
    <attention NAME='Session.AID_ENTER' VALUE='0' />
  </screen>
  <screen ID='11' NAME='IBIVM__(' >
    <filter FIELD='1' TYPE='MATCHOP_CONTAINS' VALUE='IBIVM  (CNM04)'/>
    <filter FIELD='4' TYPE='MATCHOP_CONTAINS' VALUE='equest:'/>
  </screen>
</sequence>
```

APPENDIX B

Emulator Keyboard Mapping

Topic:

- 3270/5250 Emulator Keyboard Mapping

This appendix describes how your keyboard maps to 3270 or 5250 keys when you are using the iWay Adapter for Telnet terminal emulator.

Reference **3270/5250 Emulator Keyboard Mapping**

The iWay Adapter for Telnet's emulator keyboard mapping is:

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	Ctr -N

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