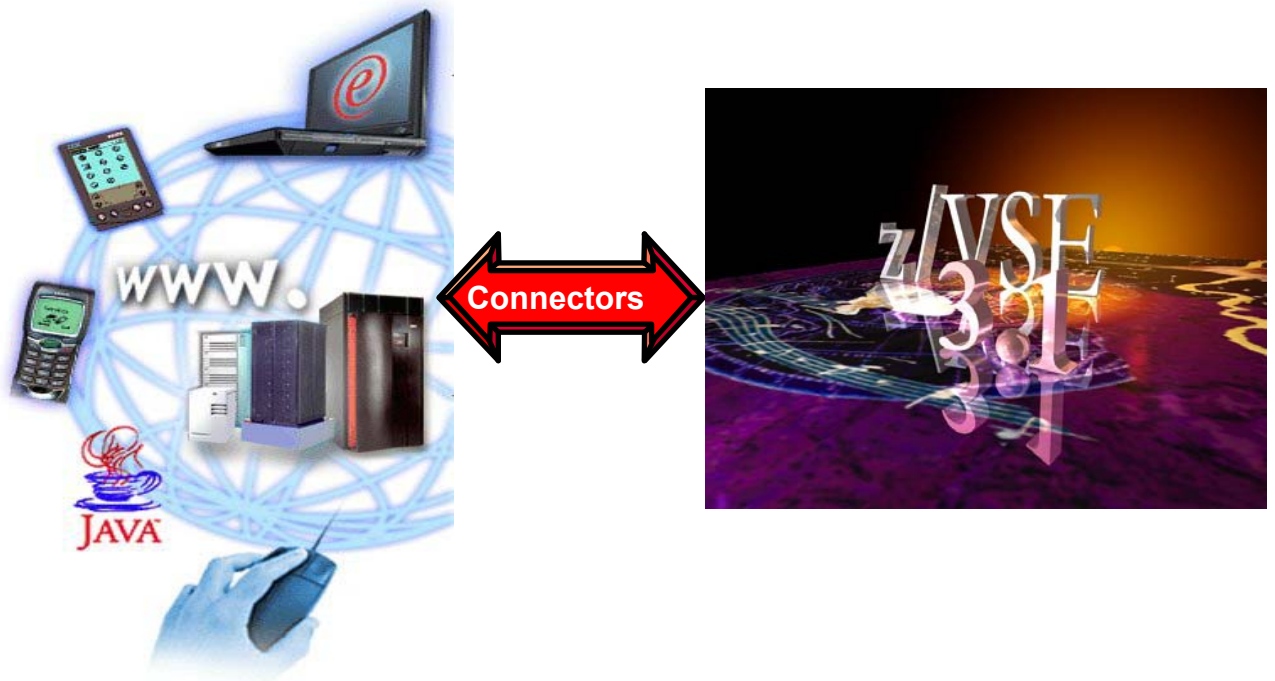


VSE Connectors Workshop

Setup of Connections to VSE CICS TS from Windows



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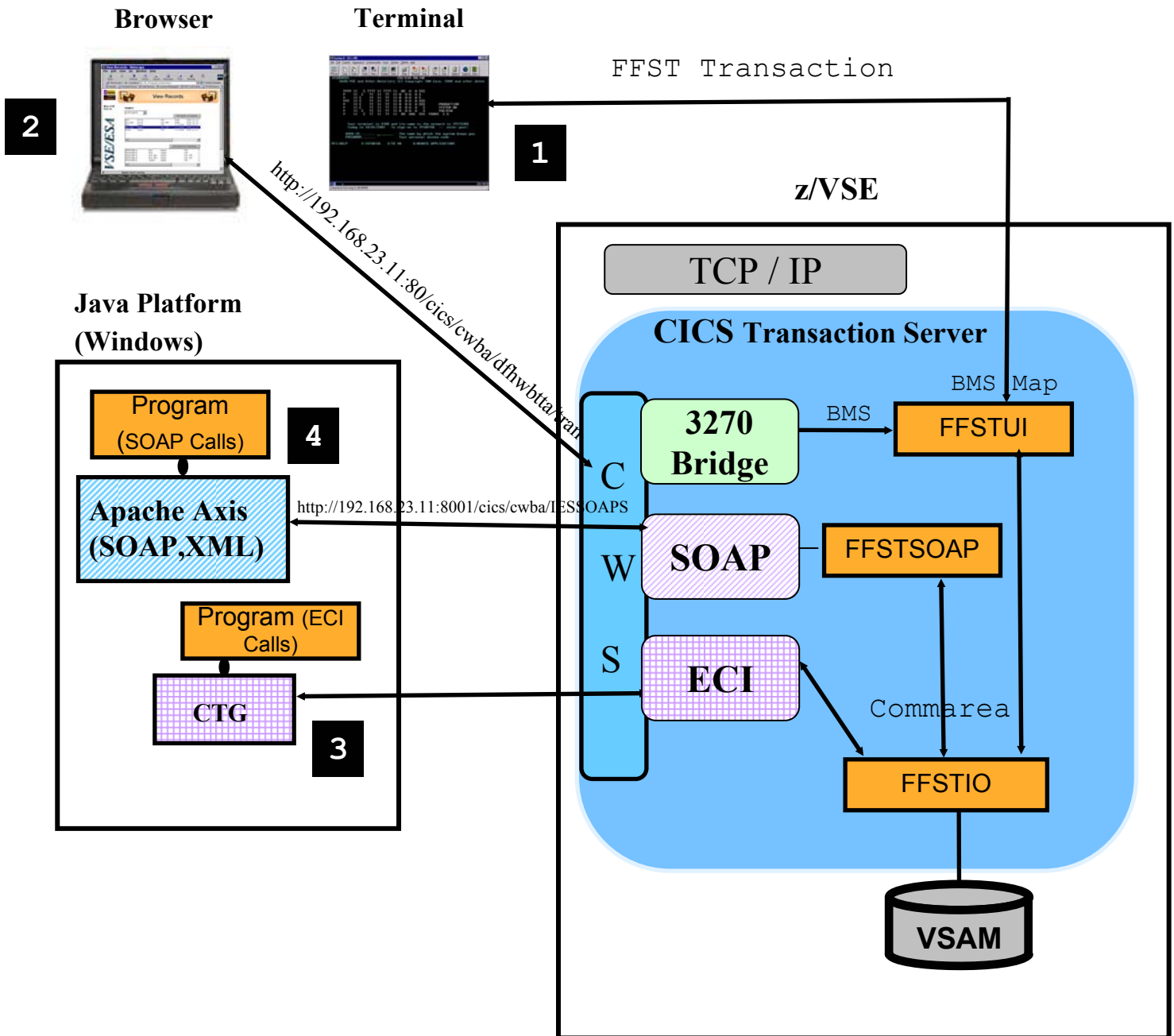
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Workshop Objective

Implementation of different ways For CICS access

- 1. Access the sample CICS transaction FFST via 3270 terminal (Chapter 2):** Original access to a CICS transaction that will be modernized in different ways in the following chapters.
- 2. Access to CICS transactions via Web Browser (Chapter 2):** Implementation of CICS Web Support and 3270 Bridge.
- 3. Integration of CICS Transactions in distributed processes (Chapter 3) :** Implementation of a solution with CICS Transaction Gateway
- 4. Access a CICS transaction as Web service (Chapter 4):** Implementation of VSE Web services using SOAP and XML

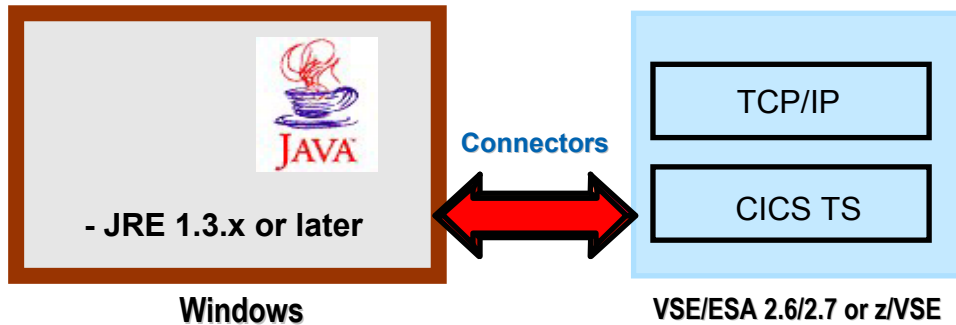
Structure of the Lab sample Application FFST



Integration of CICS business logic in heterogeneous transaction Processes.

The Lab, will guide you to implement the scenarios **1** to **4**

Chapter 1. Basic Software prerequisites for Windows



STEP1.1: Verification if Java environment installed

To install the VSE Connector Client, a Java Virtual Machine (JVM) must be installed in Windows.

The JVM can be installed in different flavors.

- To just run Java programs, the JRE 1.3.x or later is needed (Java Runtime Environment),
- to develop/compile Java programs, JDK 1.3.x or higher is needed (Java Developer Kit, which includes the JRE).

To verify if a Java Virtual Machine is installed, open a Command prompt and enter command:

```
java -version
```

You should see something like:

```
Java version "1.4.2"  
Java(TM) 2 Runtime Environment, Standard Edition
```

If the messages above are shown go to Chapter 2.

STEP1.2 Install a Java Environment

If following message (or similar) is shown:

```
java' is not recognized as an internal or external command,  
operable program or batch file.
```

then your system has no Java virtual machine (Runtime Environment) installed or it can not be found in the path.

To install a Java Virtual machine download the code from IBM:

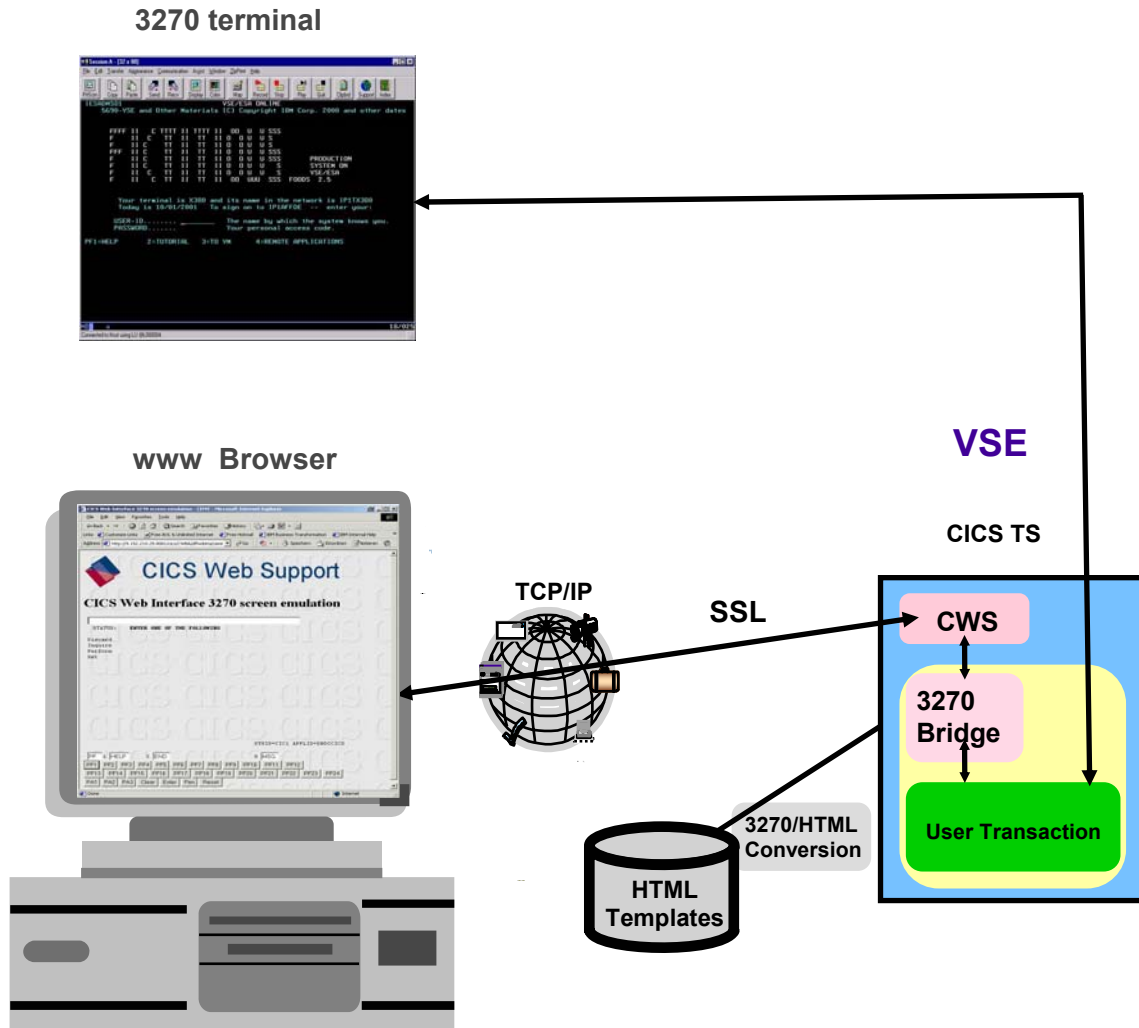
<http://www.ibm.com/developerworks/java/>

or download a SUN Version from <http://www.sun.com>

Install the downloaded JDK 1.4.x. or later.

Chapter 2. Setup CICS Web Support

Access to z/VSE transactions via terminal and browser



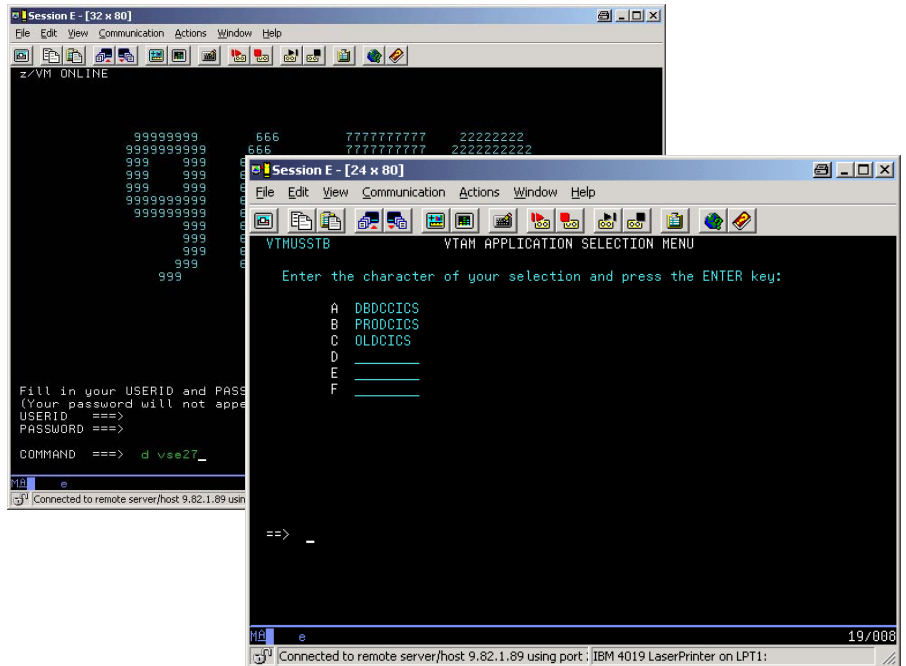
Goal of this chapter:

- ▶ Traditional way to access a CICS transaction
- ▶ direct access to z/VSE transactions via web Browser
- ▶ Without the need of a web server on VSE
- ▶ Software requirements:
 - ▶ VSE/ESA 2.5 and newer
 - ▶ CICS Transaction Server

Traditional access to a CICS transaction

STEP 2.1: Access FFST sample transaction via Terminal.

Logon to your VSE system using the 3270 icon on your desktop:



On Command line Enter:

d vse310

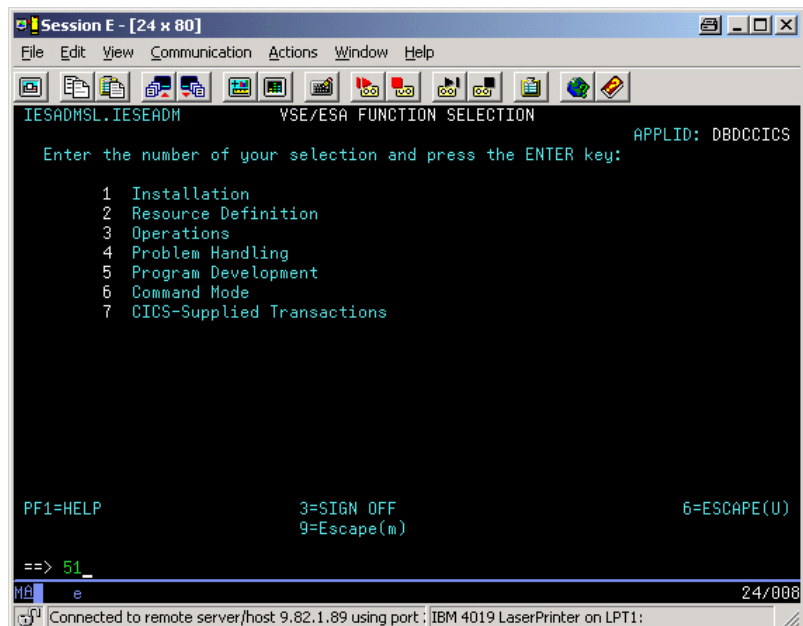
A

On the CICS logon screen enter:

User: **TExx** (xx- is your team number)

Password: **teamxx**

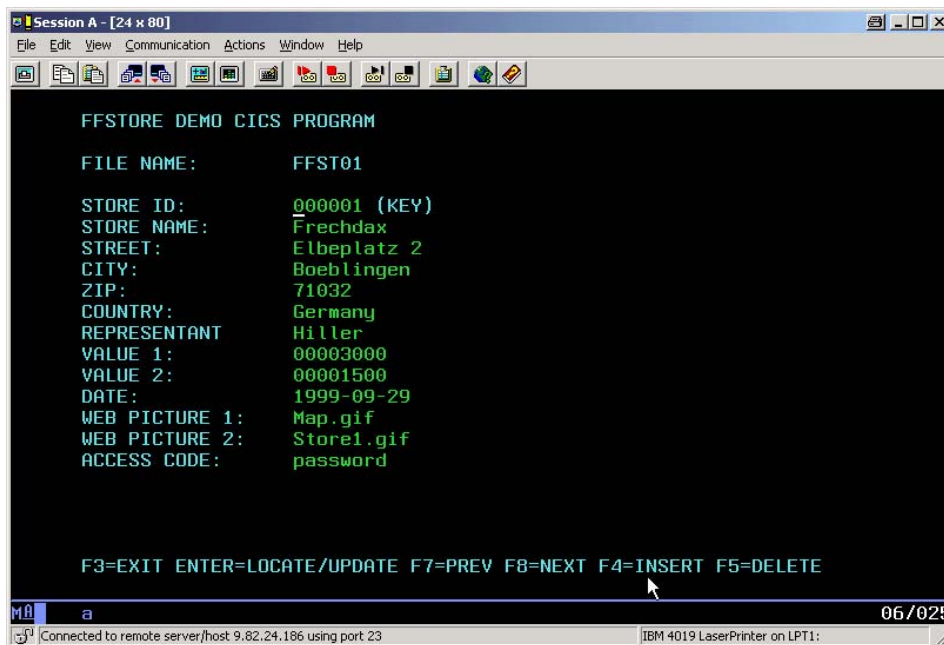
You are now in the **Interactive User Interface (UI)** main panel of VSE.



Hit: **PF6** (to go into CICS mode)

Enter: **FFST FFST~~xx~~** (where FFST~~xx~~ is the VSAM file for team ~~xx~~)

Now you have traditional access to VSAM data via a 3270 terminal emulation.



Setup of CICS Web Support

- CICS Web Support is a function of CICS Transaction Server in VSE.
- It is accessible via a TCP/IP service that has to be enabled.
- For each separate CICS partition in your system the CICS Web Support can be enabled .

The following system changes were done already for this workshop:

-Parameter change in **DFHSITSP** for the CICS TS partition **DBDCCICS**, to enable CWS.

- Intersystem communication enabled **ISC=YES**
- TCP/IP protocol enabled **TCPIP=YES**

- Build of the Conversion table **DFHCNV**

- The BMS map for transaction FFST was compiled with option **SYSPARM='TEMPLATE'**

- In the **LIBDEF** statement in *CICS startup job*, **PRD2.DFHDOC** was added for the HTML Templates used

- More details of these changes are described in *Appendix A*

The next Steps will guide you to enable CWS and browser access to the CICS Transaction **FFST**.

STEP 2.2: Define a TCP/IP service for CWS (xx – Team Number)

From the IUI main panel (as described in Step 2.1)

Hit: **PF6** (to go into the CICS mode)

Enter: **CEDA DEF TCPIPS(CWSxx)**
where xx is your team number.

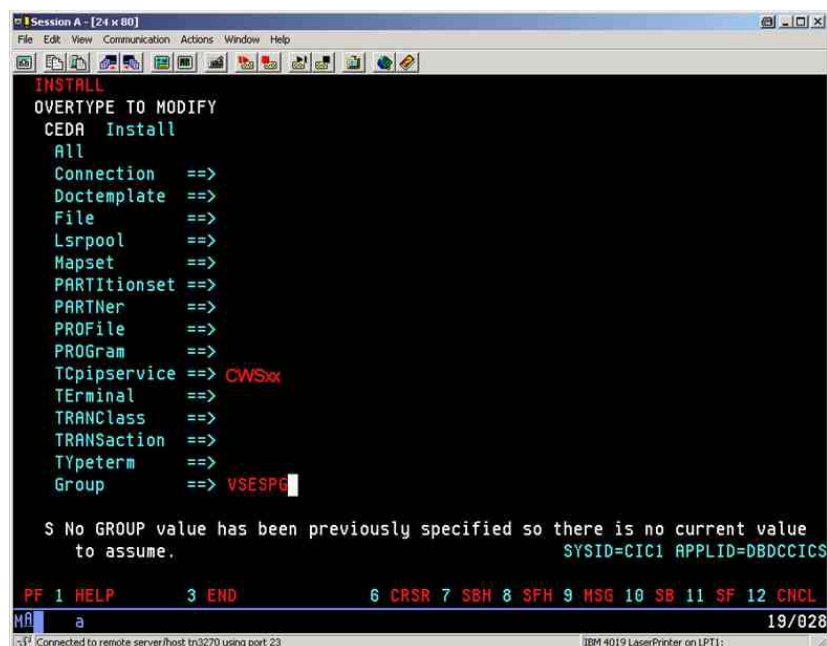
```
CEDA DEFINE TCpipservice( CWSxx )
TCpipservice   : CWSxx
Group          : VSESPG
Description    ==> SERVICE FOR CWS
Urm           ==> DFHWBADX
Portnumber     ==> 80xx                1-65535
Certificate    ==>
STatus        ==> Open                Open | Closed
SSL           ==> NO                  Yes | No |
Clientauth
Attachsec     ==> Local              Local | Verify
TRansaction   ==> CWXN
Backlog       ==> 00009              0-32767
TSqpprefix    ==>
Ippaddress    ==>
SOcketclose   ==> No                 No | 0-240000
```

STEP 2.3: Install the TCP/IP service in a CICS group

To activate the definition **install** the service:

From a CICS Command (see STEP 2.1) enter

CEDA install TCPIPService (CWSxx) in the group you specified in the definition:



```
Session A - [24 x 80]
File Edit View Communication Actions Window Help
INSTALL
OVERTYPE TO MODIFY
CEDA Install
All
Connection ==>
Doctemplate ==>
File ==>
Lsrpool ==>
Mapset ==>
PARTIitionset ==>
PARTNer ==>
PROFile ==>
PROGram ==>
TCpipservice ==> CWSxx
TERminal ==>
TRANClass ==>
TRANSACTION ==>
TYpeterm ==>
Group ==> VSESPG

S No GROUP value has been previously specified so there is no current value
to assume. SYSID=CICI APPLID=DBDCCICS

PF 1 HELP 3 END 6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL
19/028
IBM 4019 LaserPrinter on LPT1:
```

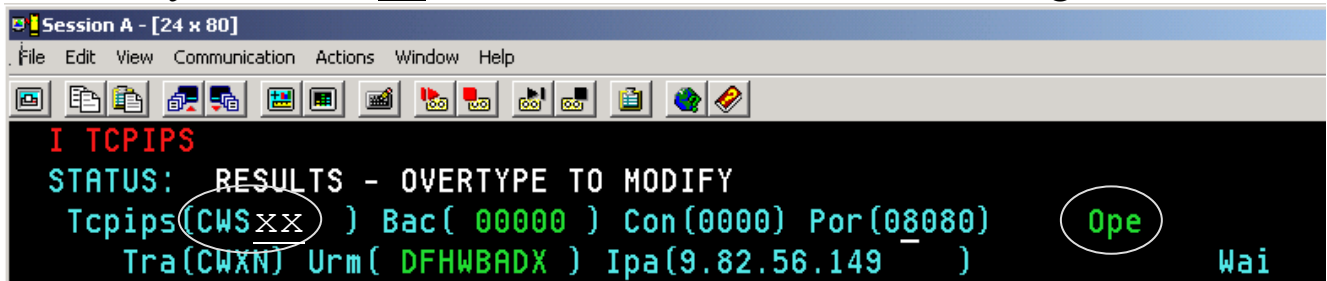
STEP 2.4: Invoke FFST transaction from Browser

Check if the TCP/IP service in VSE is open. In the main VSE IUI Panel (as described in *Step 2.1*):

Hit **PF6** an then

Cemt I TCPIPService

Look for your **CWS_{xx}** name. You should see something like:



```
Session A - [24 x 80]
File Edit View Communication Actions Window Help
I TCPIPS
STATUS: RESULTS - OVERTYPE TO MODIFY
TcpiPs(CWSxx) Bac(00000) Con(0000) Por(08080)
Tra(CWXN) Urm(DFHWBADX) Ipa(9.82.56.149)
Ope
Wai
```

If the status is **CLO**sed, open it by overtyping it with **OP**en .

From a browser window you can now call CICS transactions.

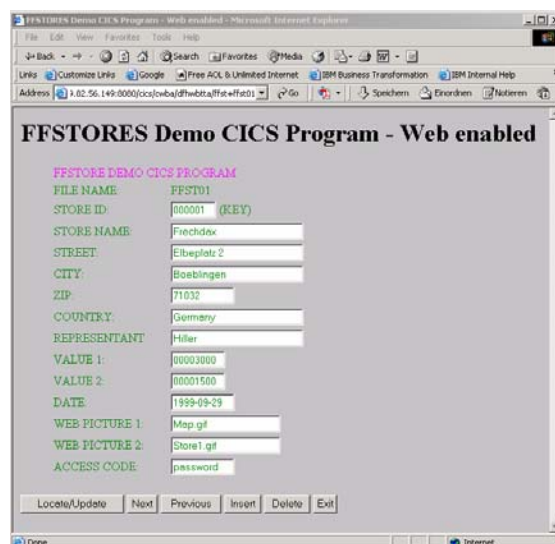
The one prepared for the workshop is called **FFST**. As parameter this transaction accepts the VSAM file name for your team **ffst_{xx}**.

Based on your team number using **Internet Explorer**:

Enter URL:

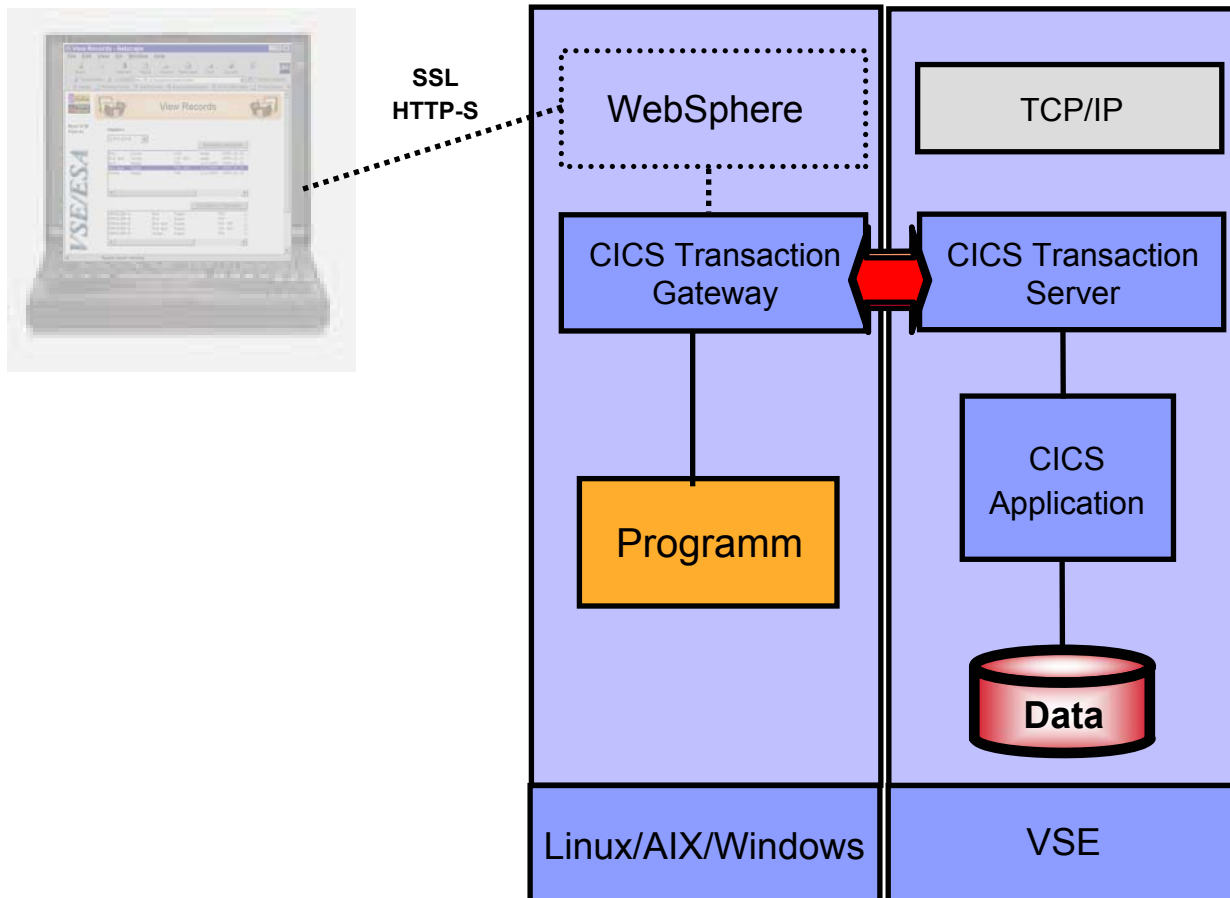
<http://192.168.23.11:80xx/cics/cwba/dfhwbtta/FFST+FFSTxx>

You should be able to work with the transaction FFST now from browser (xx is your team number).



Chapter 3. Setup CICS Transaction Gateway (CTG)

Integration of VSE transaction processes



Integration of CICS business logic in distributed transaction processes

- ▶ Remote CICS program invocation
- ▶ Remote transaction security

STEP 3.1: Setup CTG

CICS Transaction Gateway is the remote Component necessary to communicate with CICS TS on VSE.

The installation of CTG was already done on your workstation
Into the default directory:

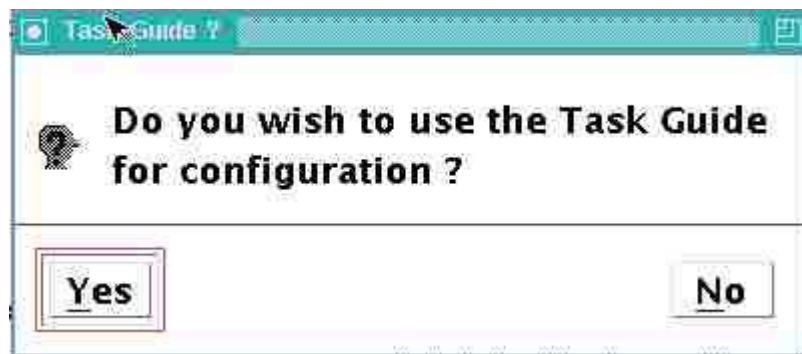
C:\Program Files\IBM\CICS Transaction Gateway

STEP 3.2 Customize CTG on Windows

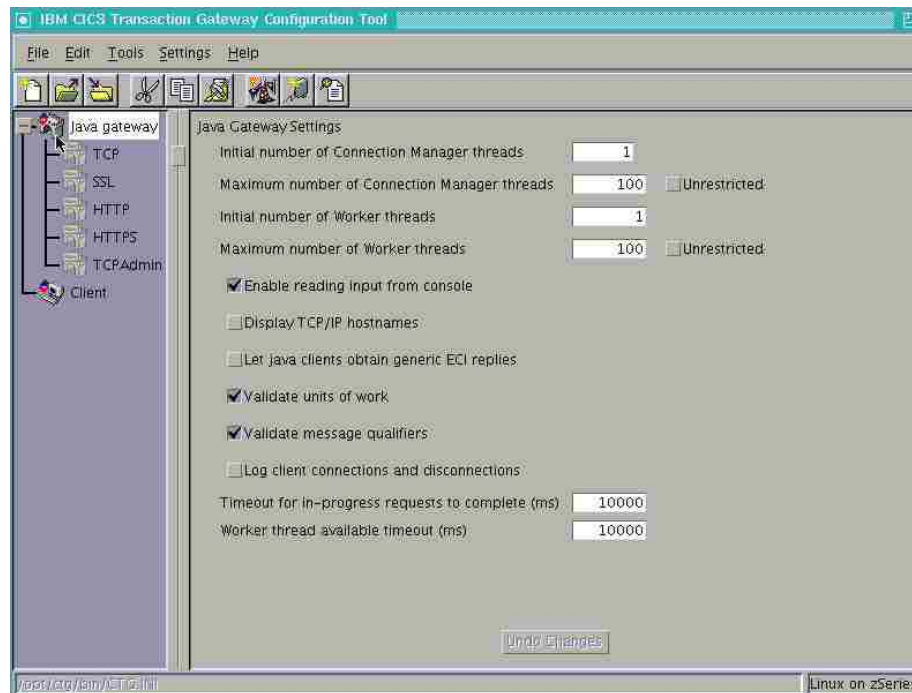
Run the CTG Configuration Tool:

**START -> Programms – IBM CICS Transaction Gateway ->
Configuration Tool**

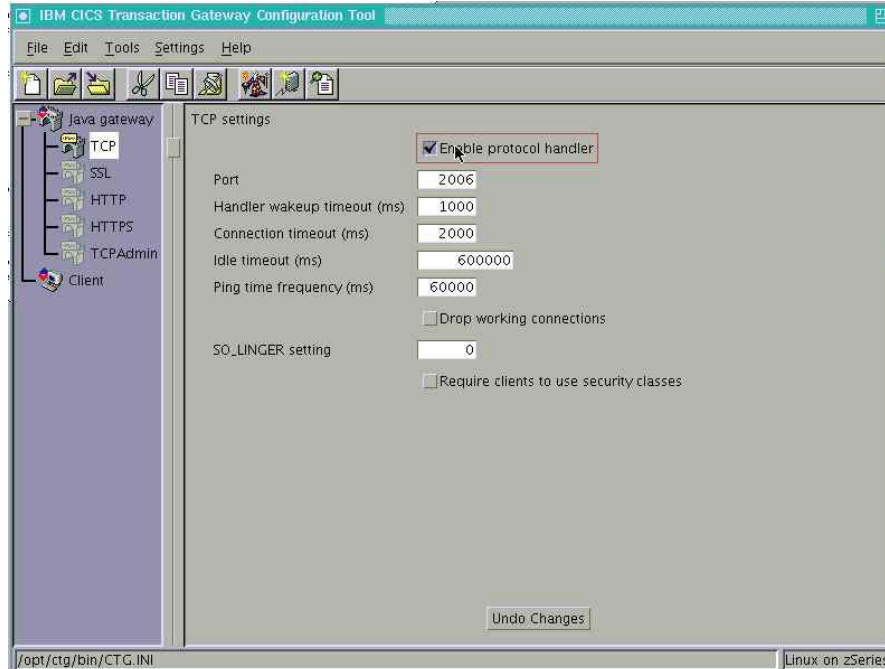
Hit: **NO** for use of the Task Guide for configuration



The CTG configuration tool is shown as below:



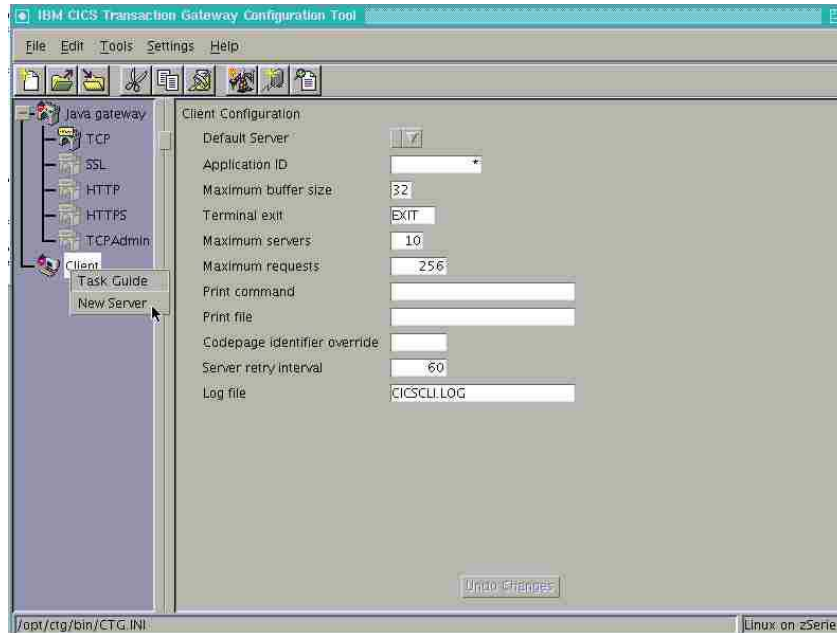
STEP 3.2-1 Setup CTG to VSE TCP protocol



Click on: **Enable protocol handler**
and verify the parameters

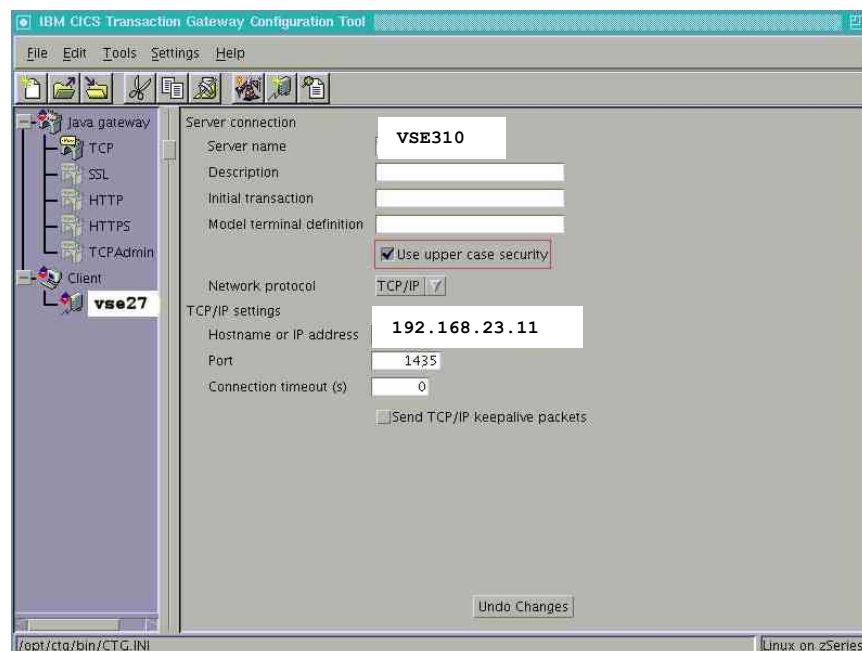
STEP 3.2-2 Setup new Server

Right click on **Client daemon** -> **New Server**



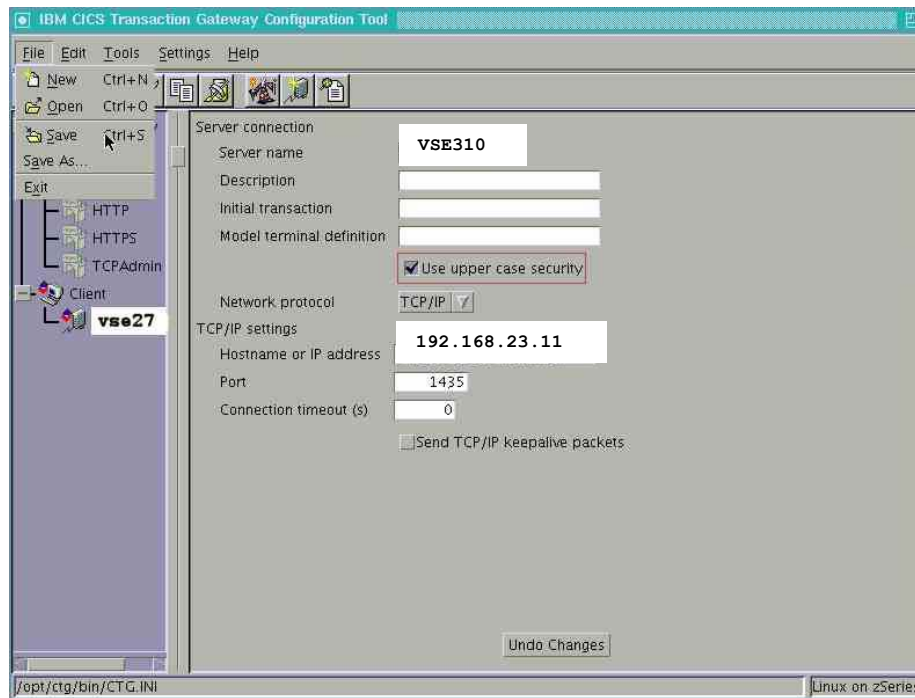
Enter the following parameters as shown:

Server Name: **VSE310**
Hostname or IP address: **192.168.23.11**
Port: **1435**

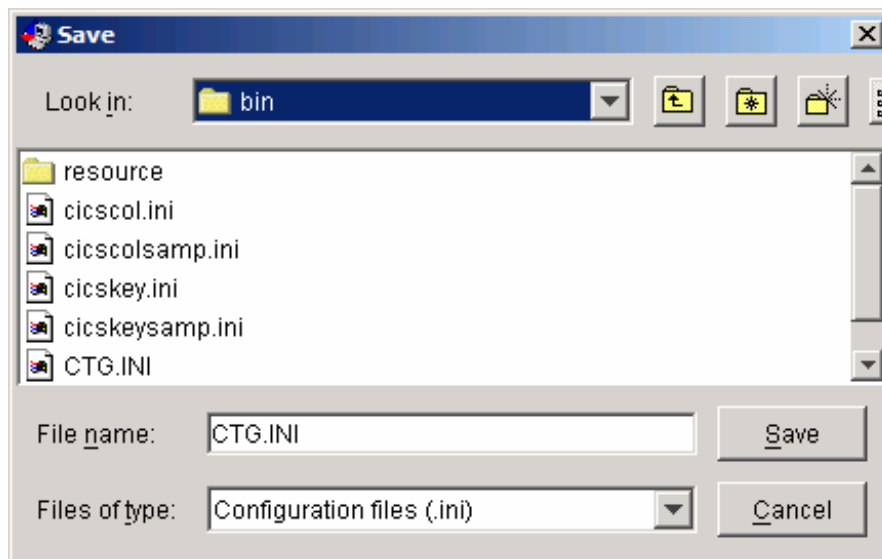


STEP 3.2-3 Save the configuration

Click on **File** -> **Save**



Leave the default configuration file name (CTG.INI).
Press Save.



Now, CTG is configured and you may close the configuration tool.

STEP 3.3 Start CTG and CICS Client

CTG is build of a CICS Client and the CICS Transaction Gateway (CTG). CTG uses the CICS client to communicate with VSE. Each of these components runs in a separate process on Windows.

Starting CTG will automatically start CICS client:

START -> Programs -> IBM CICS Transaction Gateway -> IBM CICS Transaction Gateway

You will see some messages like these:

```
10/20/04 : 14:13:28:816 : CICS Transaction Gateway, Version 5.0.1, 5724-D12. Build Level c501-20030716.
10/20/04 : 14:13:28:816 : (C) Copyright IBM Corporation 1999, 2002. All rights reserved.
10/20/04 : 14:13:28:826 : CCL8400I: Using ini file C:\Program Files\IBM\IBM CICS Transaction Gateway\bin\CTG.INI.
10/20/04 : 14:13:28:826 : CCL6577I: Java version is 1.3.1_11.
10/20/04 : 14:13:28:826 : CCL6502I: Initial ConnectionManagers = 1, Maximum ConnectionManagers = 100,
10/20/04 : 14:13:28:826 : CCL6502I: Initial Workers = 1, Maximum Workers = 100,tcp: Port = 2006
10/20/04 : 14:13:28:826 : CCL6574I: Connection logging has been disabled.
10/20/04 : 14:13:28:836 : CCL6505I: Successfully created the initial ConnectionManager and Worker threads.
10/20/04 : 14:13:28:917 : CCL6524I: Successfully started handler for the tcp: protocol.
```

After each configuration change, CTG have to be recycled (stopped / started)

Note:

Stopping CTG will NOT stop CICS client.

To stop CTG enter **Q** in the command prompt where CTG is running.

To stop the client use command:

“C:\Program Files\IBM\CICS Transaction Gateway\bin\cicscli” -X

STEP 3.4 Setup VSE for CTG

(External Call Interface - ECI access)

External CICS calls from CTG (ECI calls) use the CWS interface.

Therefore CWS has to be setup and a TCPIP service has to be defined for CTG.

For the workshop, following TCP/IP service was defined:

TCP/IP Service: **ECI**

Port: **1435** (This port has to be specified in the CTG Server definition)

Details for this definition are specified in Appendix D.

STEP3.5 Execute CTG sample program (ECI access)

A sample program was copied to your directory **C:\ctg**

In a Windows command prompt edit the batch script *runeci.bat* and adapt it for your team:

Enter: **Notepad runeci.bat** (make the changes described below and save them)

Adapt these values (xx is your team number):

VSE Server name in CTG: **VSE310**

Host for Gateway: **local**:

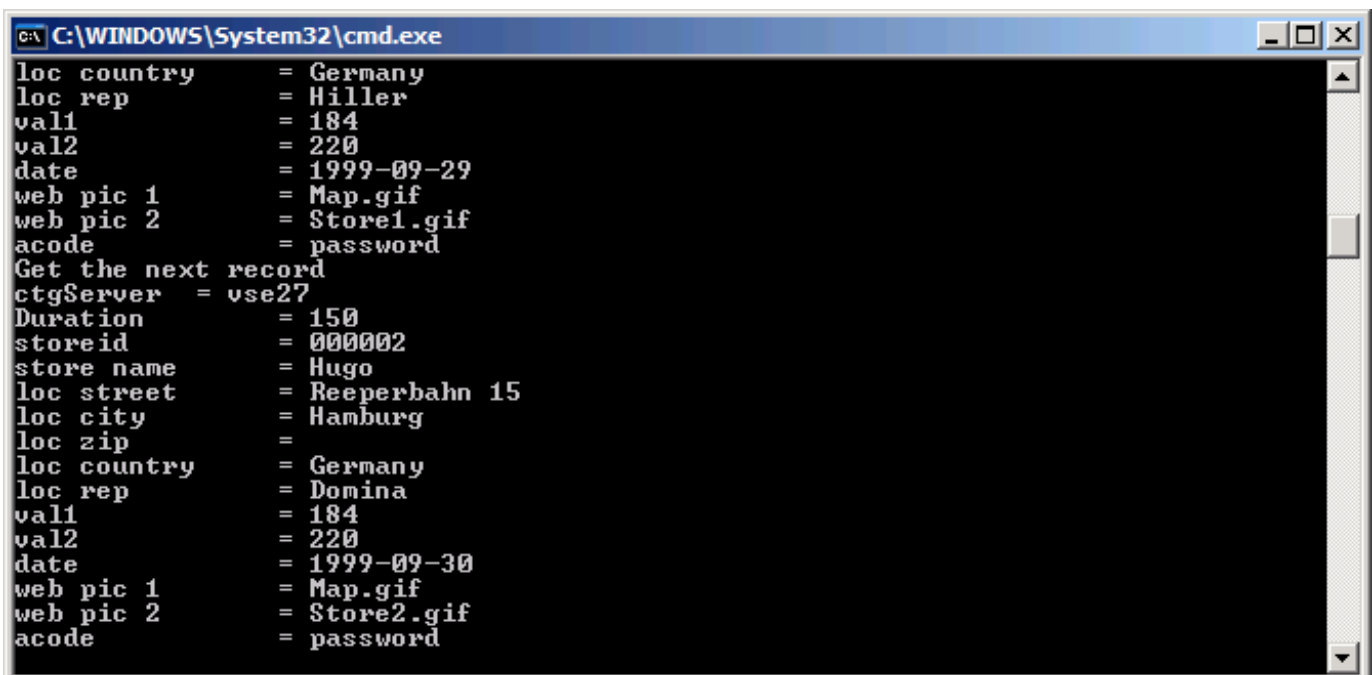
Port: **2006**

VSAM file name for your team: **FFSTxx**.

```
REM -----  
REM Sample for CICS access via ECI interface  
REM -----  
set CTGDIR=C:\Program Files\IBM\IBM CICS Transaction Gateway  
set CLASSPATH=.;%CTGDIR%\classes\ctgclient.jar;%CTGDIR%\classes\ctgserver.jar;%CLASSPATH%  
java FFStoresECI local: 2006 VSE310 FFSTxx
```

Enter: **runeci.bat**

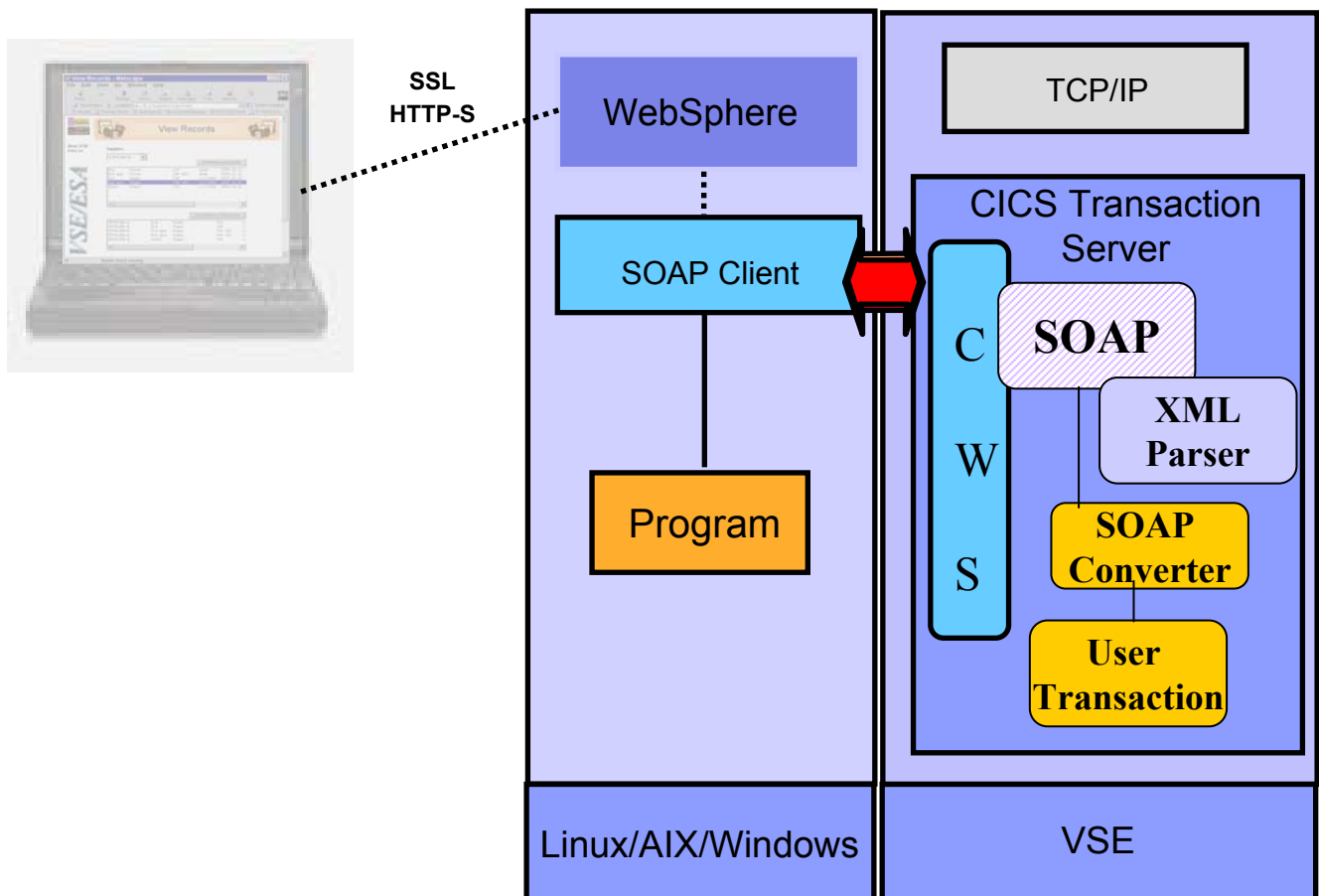
You should see something like this:



```
C:\WINDOWS\System32\cmd.exe  
loc country      = Germany  
loc rep          = Hiller  
val1             = 184  
val2             = 220  
date            = 1999-09-29  
web pic 1       = Map.gif  
web pic 2       = Store1.gif  
acode           = password  
Get the next record  
ctgServer       = vse27  
Duration        = 150  
storeid         = 000002  
store name      = Hugo  
loc street      = Reeperbahn 15  
loc city        = Hamburg  
loc zip         =  
loc country     = Germany  
loc rep         = Domina  
val1            = 184  
val2            = 220  
date            = 1999-09-30  
web pic 1       = Map.gif  
web pic 2       = Store2.gif  
acode           = password
```

Chapter 4. Setup Web services with VSE transactions

Integration of VSE business logic with distributed transaction processes



To have platform independent data interchange, the XML data representation is used with SOAP (Simple object access protocol) as the communication protocol and HTTP as the transport protocol.

You have to:

- Setup VSE Web Services support (included in VSE/ESA 2.7 and newer)
- customize and run the SOAP sample program

STEP 4.1: Setup Web Services in VSE

The VSE Web services Support is based on VSE CICS Web Support (CWS) which is a function of VSE CICS TS .

Therefore the CWS interface must be setup (done in Chapter 2).

The SOAP Engine on VSE doesn't need any setup.

For the CICS program **FFSTIO** which is accessible via CICS **commarea**, a SOAP converter was coded (**FFSTSOAP**) to make the translation from the incoming XML data to a commarea.

The SOAP engine on VSE will get the XML data stream, will parse it using the VSE internal XML parser and then calls the SOAP Converter (FFSTSOAP) for the FFSTIO program.

FFSTSOAP builds the commarea to communicate with FFSTIO program in CICS TS. (see application structure on page 4)
The Commarea structure of FFSTIO is described in *Appendix C*

To run SOAP requests a TCP/IP service on VSE is needed.

The same TCPIP Service and Port from CWS, already defined in Chapter 2 can be used:

TCPIPService: CWSxx

Port: 80xx were xx is the team number

Note: A separate TCP/IP Service and port can also be defined for SOAP requests (i.e TCPIPService SOAP, Port:1080).

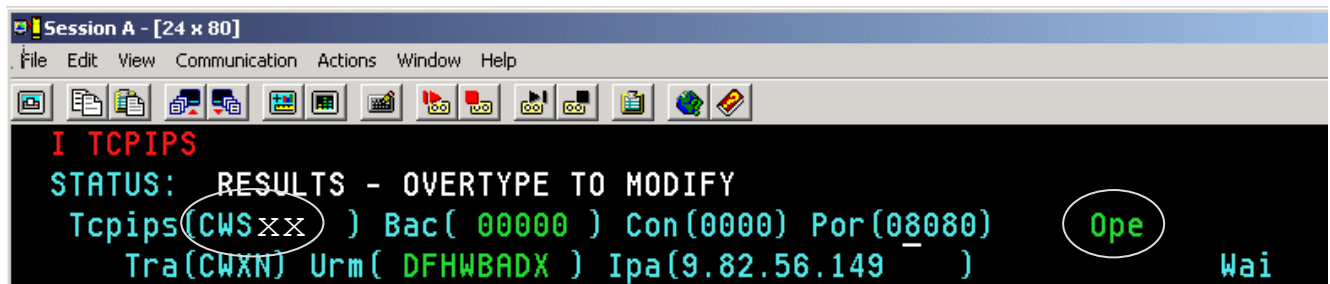
STEP 4.2: Check TCPIP Service in VSE is opened

Check if the TCP/IP service in VSE is open. In the main VSE IUI Panel (as described in *Step 2.1*):

Hit **PF6** and then

cemt I TCPIPService

Look for your **CWS~~xx~~** name. You should see something like:



The screenshot shows a terminal window titled "Session A - [24 x 80]" with a menu bar (File, Edit, View, Communication, Actions, Window, Help) and a toolbar. The main display area shows the following text:

```
I TCPIPS
STATUS: RESULTS - OVERTYPE TO MODIFY
TcpiPs(CWSxx) Bac( 00000 ) Con(0000) Por(08080) Ope
Tra(CWXN) Urm( DFHWBADX ) Ipa(9.82.56.149 ) Wai
```

In the image, the text "CWS~~xx~~" and "Ope" are circled in white.

If the status is **CLO**sed, open it by overtyping it with **OP**En .

STEP 4.3: Setup the SOAP sample

The Web Services (SOAP) sample will communicate with the SOAP engine on VSE.

It was already copied into **C:\soap**

Note: The components needed for Web Services can be downloaded from internet as described in Appendix B.

STEP3.5 Invoke the VSE program FFST as Web Service

Edit the batch script runsoap.bat and change the values below:

In a windows command prompt enter:

C:

cd soap

Notepad runsoap.bat (make the changes required and save them)

Adapt the following values (xx is your team number):

VSE IP address: **192.168.23.11**

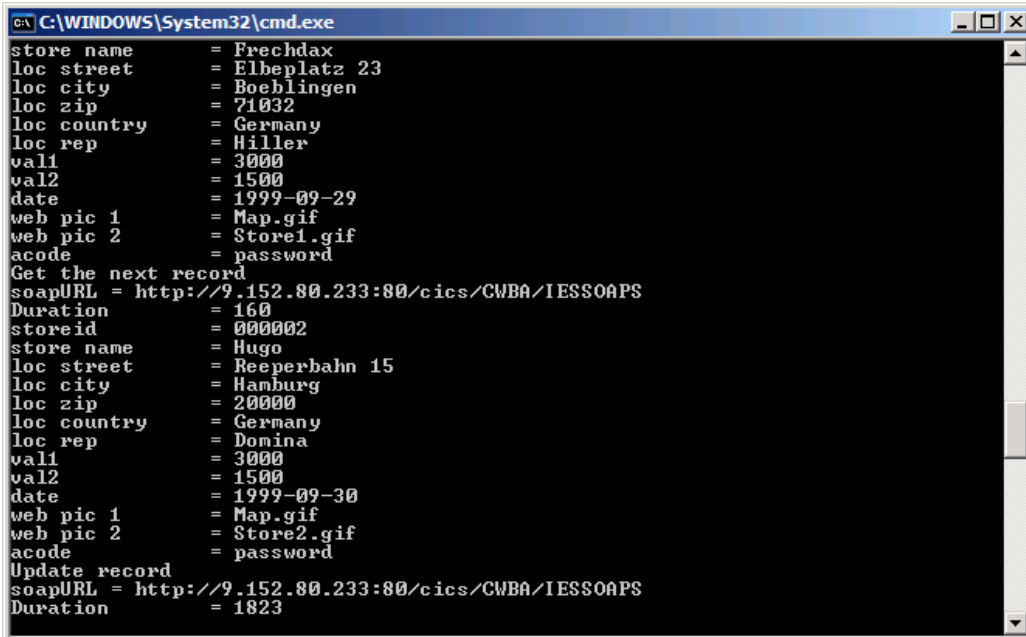
Port: **80xx**

VSAM file name for your team: **FFSTxx**.

```
REM -----  
REM Sample for CICS access via WEB Services with SOAP and XML  
REM -----  
set CLASSPATH=.;j2ee.jar;soap.jar;xerces.jar;mail.jar;activation.jar  
java FFStoresSOAP http://192.168.23.11:80xx/cics/CWBA/IESSOAPS FFSTxx
```

Enter: **runsoap.bat**

You should see something like this:

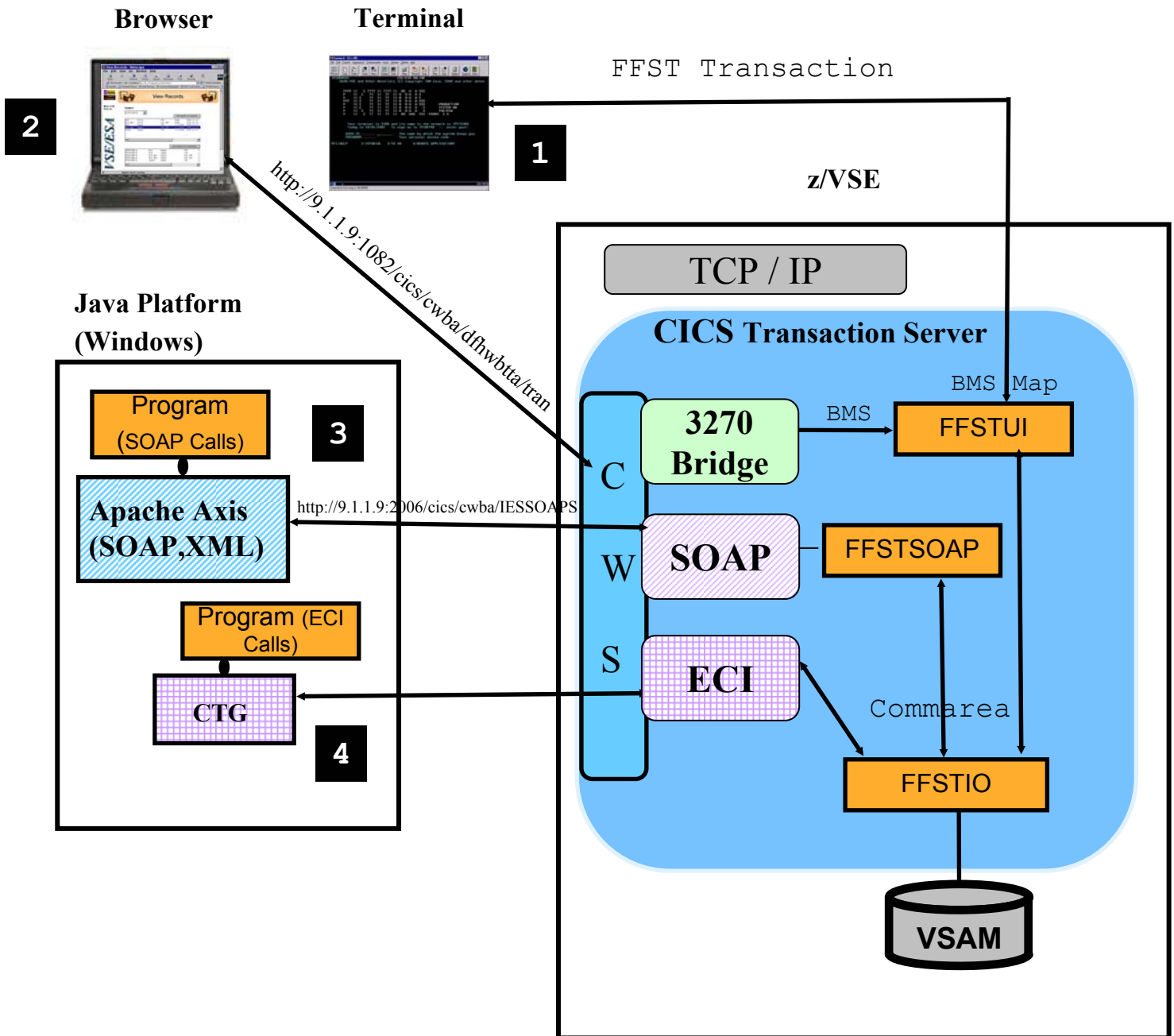


```
C:\WINDOWS\System32\cmd.exe  
store name      = Frechdax  
loc street     = Elbeplatz 23  
loc city       = Boehlingen  
loc zip        = 71032  
loc country    = Germany  
loc rep        = Hiller  
val1           = 3000  
val2           = 1500  
date           = 1999-09-29  
web pic 1     = Map.gif  
web pic 2     = Store1.gif  
acode         = password  
Get the next record  
soapURL = http://9.152.80.233:80/cics/CWBA/IESSOAPS  
Duration      = 160  
storeid       = 000002  
store name    = Hugo  
loc street    = Reeperbahn 15  
loc city      = Hamburg  
loc zip       = 20000  
loc country   = Germany  
loc rep       = Domina  
val1         = 3000  
val2         = 1500  
date         = 1999-09-30  
web pic 1    = Map.gif  
web pic 2    = Store2.gif  
acode       = password  
Update record  
soapURL = http://9.152.80.233:80/cics/CWBA/IESSOAPS  
Duration   = 1823
```

This sample uses the most modern internet technology and accessed the VSE CICS transaction as Web Service.

The data interchange between VSE and Windows was done in XML.

Structure of the Lab sample Application FFST



Integration of CICS business logic in heterogeneous transaction Processes.

The Lab will guide you to implement the scenarios **1** to **4**

Appendix A. Setup VSE for CICS Web Support

- For each CICS partition in your system, the CICS Web Support can be enabled .
- Following System Changes have to be done:

Step A.1: Required DFHSIT changes

Change the parameters mentioned below in the **DFHSITxx** for the CICS TS you'd like to enable CWS for:

- Enable Intersystem communication

ISC=YES

- Enable TCP/IP protocol

TCPIP=YES

STEP A.2: Build the Conversion table

Copy skeleton **DFHCNV** from ICCF Library 59 to your primary library

- run skeleton **DFHCNV**

STEP A.3: Generate a HTML Template

Compile the BMS map (FFSTMAP) with **SYSPARM='Template'** to generate a HTML template for the map, to be used when the transaction is called from a browser. The template will be stored in **PRD2.DFHDOC**.

Appendix A. Continued

- Generate HTML Template for FFSTMAP (BMS map definition)

```
* $$ JOB JNM=FFSTMAP,DISP=D,CLASS=A,NTFY=YES
* $$ LST DISP=D,CLASS=Q,PRI=3
// JOB FFSTMAP COMPILE PROGRAM FFSTMAP
.....
#/ JOB FFSTMAP CATALOG MAP FFSTMAP
.....
#/ JOB FFSTMAP CATALOG HTML FFSTMAP
// EXEC LIBR
  ACCESS SUBLIB=PRD2.DFHDOC
* $$ END
// ON $CANCEL OR $ABEND GOTO ENDJ3
// OPTION NOLIST,ALIGN,DECK,SYSPARM='TEMPLATE'
// EXEC ASMA90,SIZE=(ASMA90,64K),PARM='EXIT(LIBEXIT(EDECKXIT)),
      SIZE(MAXC-200K,ABOVE)'
  PRINT NOGEN
* $$ SLI MEM=FFSTMAP.A,S=PRIMARY.WKS
/*
/. ENDJ3
// EXEC IESINSRT
/*
#&
$ $$ EOJ
* $$ END
/. ENDM
/&
* $$ EOJ
```

STEP A.4: Update LIBDEF search chain

Update the **LIBDEF** statement in *CICS startup job*
and add the Library for HTML Templates
PRD2.DFHDOC

Step A.5: Define a TCP/IP service for CWS as described in
Chapter 2

Appendix B. Download a SOAP Engine from internet

STEP B.1: Download the packages for SOAP

You have to download following packages (into a temp directory):

- Apache SOAP package: <http://xml.apache.org/soap/>
Change into the directory with the latest version (e.g. version-2.3.1) and download the soap-bin package (e.g. soap-bin-2.3.1.zip)
- Apache xerces XML Parser:
<http://xml.apache.org/xerces-j/index.html>
Download the latest Xerces-J-bin package, e.g. Xerces-J-bin.1.4.4.zip
- Sun Java Mail API: <http://java.sun.com/products/javamail/>
- Sun JavaBeans Activation FrameWork (JAF):
<http://java.sun.com/products/javabeans/glasgow/jaf.html>

STEP B.2: Extract needed SOAP archives

To simplify the CLASSPATH definition save all .JAR files needed to run the SOAP sample into the same directory.

Extract the .JAR files specified from the downloaded .ZIP files.

- Apache SOAP package: extract the file **soap.jar** from the soap-bin-2.3.1.zip file.
- Apache xerces XML Parser: extract the file **xerces.jar** from the Xerces-J-bin.1.4.4.zip file.
- Sun Java Mail API: extract the file **mail.jar** from the javamail-1_2.zip file.
- Sun JavaBeans Activation FrameWork (JAF): extract the file **activation.jar** from the jaf1_0_1.zip file.

Appendix C. Comarea for program FFSTIO

* Commarea for Program FFSTIO:

```
*
* int      Action;          // 4 bytes  ofs 0
* int      retcode         // 4 bytes  ofs 4
* String   filename       // 8 bytes  ofs 8
* String   storeid;       // 6 bytes  ofs 16
* String   storename;     // 25 bytes ofs 22
* String   locstreet;     // 25 bytes ofs 47
* String   loccity;       // 25 bytes ofs 72
* String   loczip;        // 10 bytes ofs 97
* String   loccountry;    // 25 bytes ofs 107
* String   locrep;        // 20 bytes ofs 132
* int      val1;          // 4 bytes  ofs 152
* int      val2;          // 4 bytes  ofs 156
* String   date           // 10 bytes ofs 160
* String   webpic1;       // 20 bytes ofs 170
* String   webpic2;       // 20 bytes ofs 180
* String   acode;         // 10 bytes ofs 210
* String   filler;        // 6 bytes; ofs 220
```

Appendix D. TCPIP Service definition for CTG

To allow incoming CICS requests from remote sites using CICS Transaction Gateway through External Call Interface (ECI), the CWS interface must be setup. An additional TPC/IP service must be defined with the Port for ECI requests (1435) and the associated initial transaction name (CIEP).

- The TCP/IP service definition parameters in CICS:

```
CEDA  DEFine TCpipservice( ECI      )
TCpipservice   : ECI
Group          : VSESPG
Description    ==> SERVICE FOR ECI
Urm           ==>
Portnumber     ==> 01435           1-65535
Certificate    ==>
STatus        ==> Open            Open | Closed
SSL           ==> No              Yes | No | Clientauth
Attachsec     ==> local          Local | Verify
TRansaction   ==> CIEP
Backlog       ==> 00001          0-32767
TSqpprefix    ==>
Ipaddress     ==>
SOcketclose   ==> No             No | 0-240000
```

Additional Information

- **z/VSE Home Page**

<http://www.ibm.com/servers/eserver/zseries/zvse/>

- **e-business Connectors User's Guide** **SC33-6719**

<http://www-1.ibm.com/servers/eserver/zseries/zvse/documentation/#conn>

- **VSE Connectors: Components, tools**

<http://www.ibm.com/servers/eserver/zseries/zvse/downloads>

- **VSE modern solutions**

<http://www.ibm.com/servers/eserver/zseries/zvse/solutions>



- **e-business Connectivity for VSE/ESA** **SG24-5950**

- **e-business Solutions for VSE/ESA** **SG24-5662**

- **Servlet and JSP Programming** **SG24-5755**

- **Linux Web Hosting with WebSphere, DB2, and Domino** **SG24-6007**

- **CICS Transaction Server for VSE** **SG24-5997**
– CICS Web support

- **WebSphere V5 for Linux on zSeries** **SG24-7042**
Connectivity Handbook

- **zJournal Articles about z/VSE and SOAP:**
<http://www.zjournal.com/index.cfm?section=searchresults>