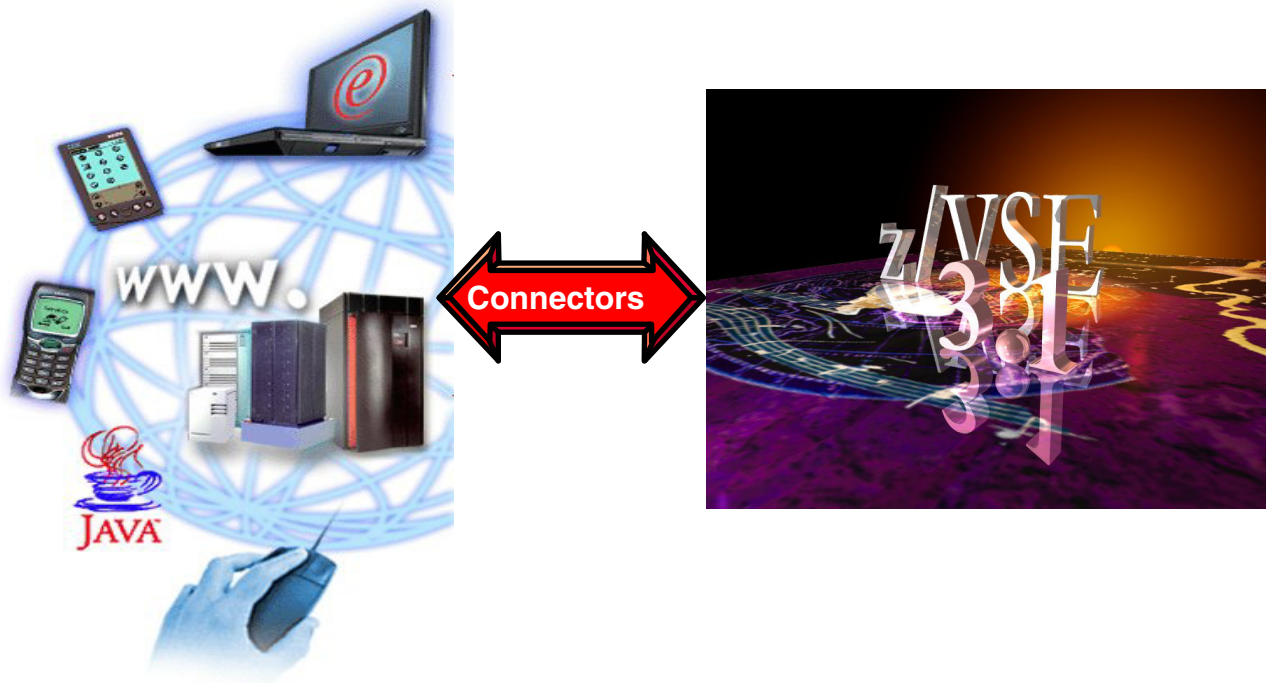# VSE Connectors Workshop

E13 - Setup of Connections to VSE CICS TS from Windows

Connectors

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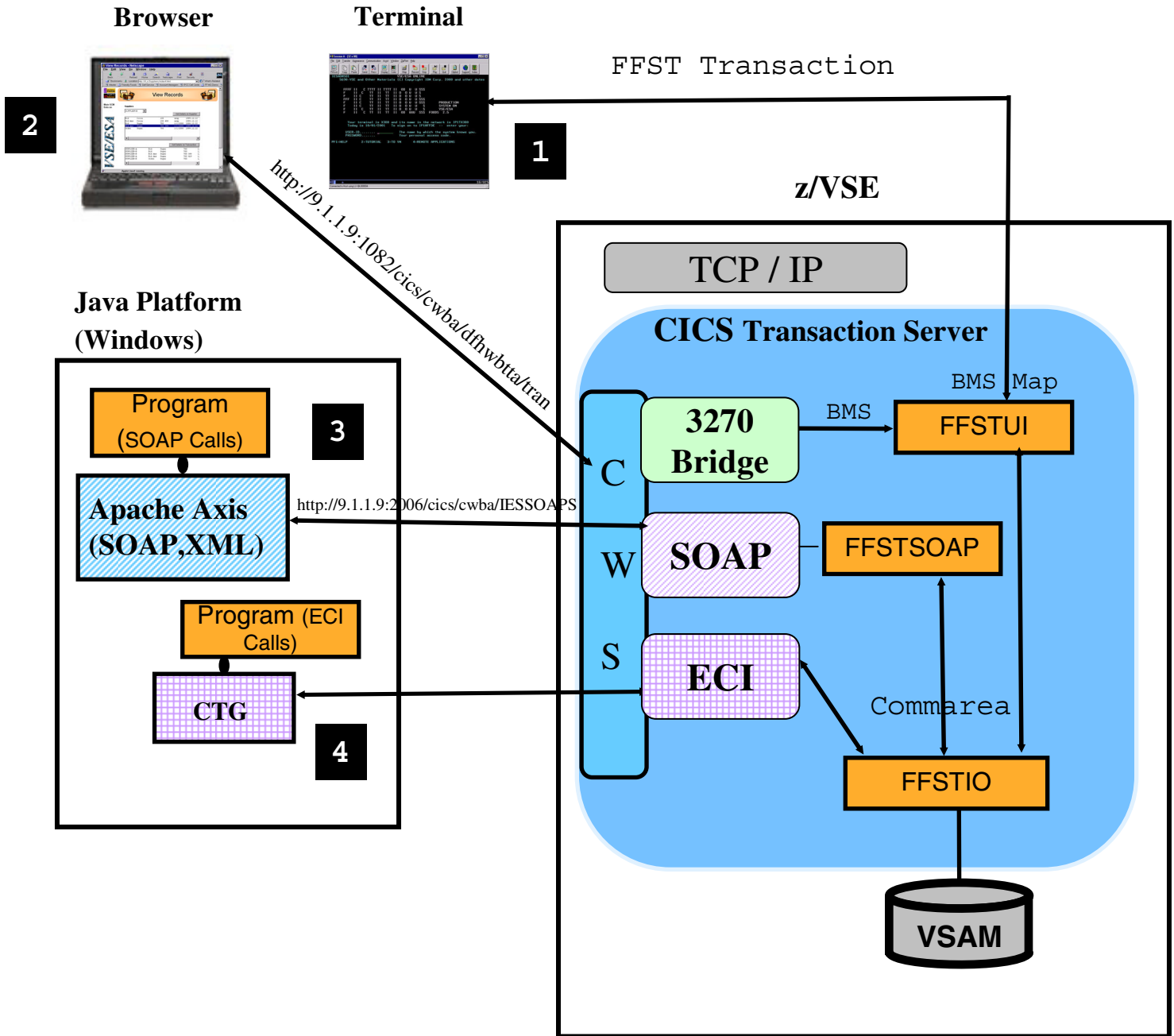
2

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. **Access a CICS transaction as Web service (Chapter 3):** Implementation of VSE Web services using SOAP and XML.

4. **Integration of CICS Transactions in distributed processes (Chapter 4) : I**mplementation of a solution with CICS Transaction Gateway

Structure of the Lab
sample Application FFST

Browser   **Terminal**

FFST Transaction

2

1

z/VSE

http://9.1.1.9:1082/cics/cwba/dfhwbtta/tran

TCP / IP

CICS Transaction Server

**Java Platform
(Windows)**

| Program (SOAP Calls) |
3

BMS Map

**3270
Bridge** → BMS → FFSTUI

C

**Apache Axis
(SOAP,XML)**

http://9.1.1.9:2006/cics/cwba/IESSOAPS

W **SOAP** — FFSTSOAP

Program (ECI
Calls)

S **ECI**

Commarea

CTG

4

FFSTIO

VSAM

Integration of CICS business logic in heterogeneous transaction
Processes.
The Lab, will guide you to implement the scenarios **1** to **4**

4

Chapter 1. Basic Software prerequisites for Windows

- JRE 1.3.x or later	**Connectors**	TCP/IP
		CICS TS
Windows		**VSE/ESA 2.6/2.7 or z/VSE**
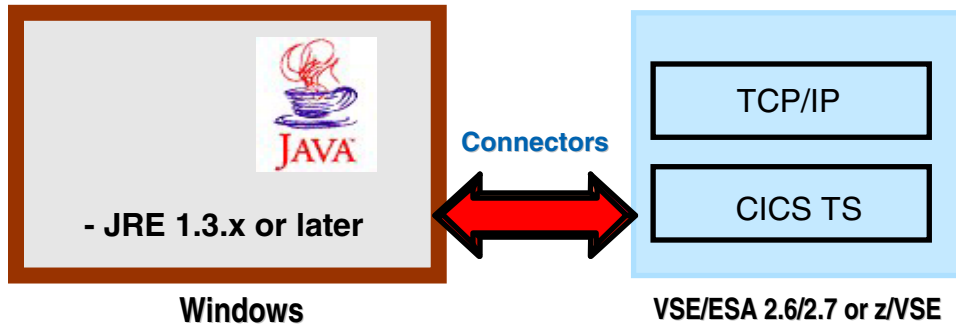
STEP1.1: Verification if Java environment installed

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 propmt 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.

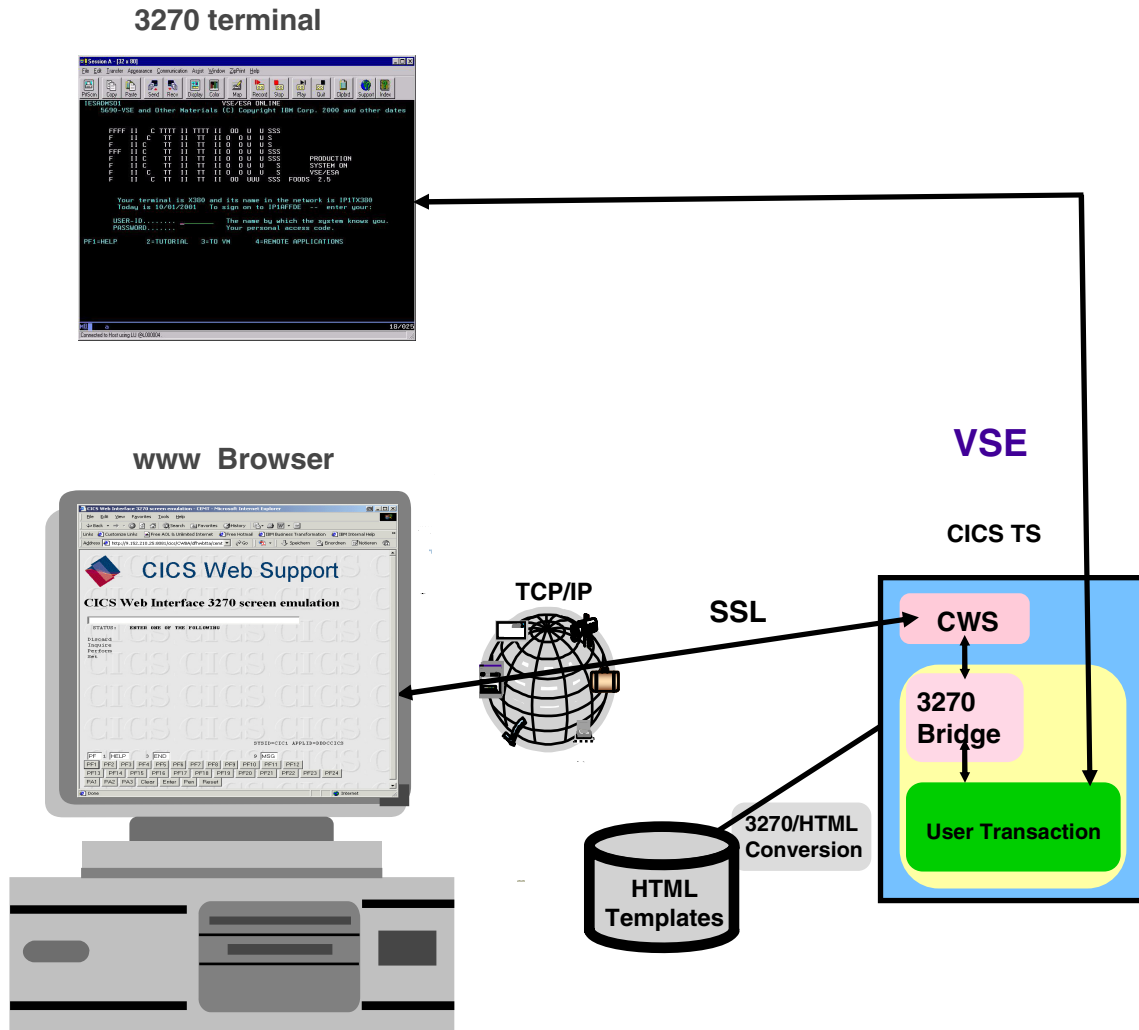To install a Java Virtual machine download the code from IBM:

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.

5

Access to VSE/ESA transactions via terminal and browser

3270 terminal

www Browser

VSE

CICS TS

TCP/IP

SSL

CWS

3270 Bridge

**User Transaction**

3270/HTML Conversion

HTML Templates

Goal of this chapter:

►Traditional way to access a CICS transaction

►direct access to VSE/ESA transactions via web Browser

►Without the need of a web server on VSE

►Software requirements:

   ► VSE/ESA 2.5 and newer

   ►CICS Transaction Server

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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:
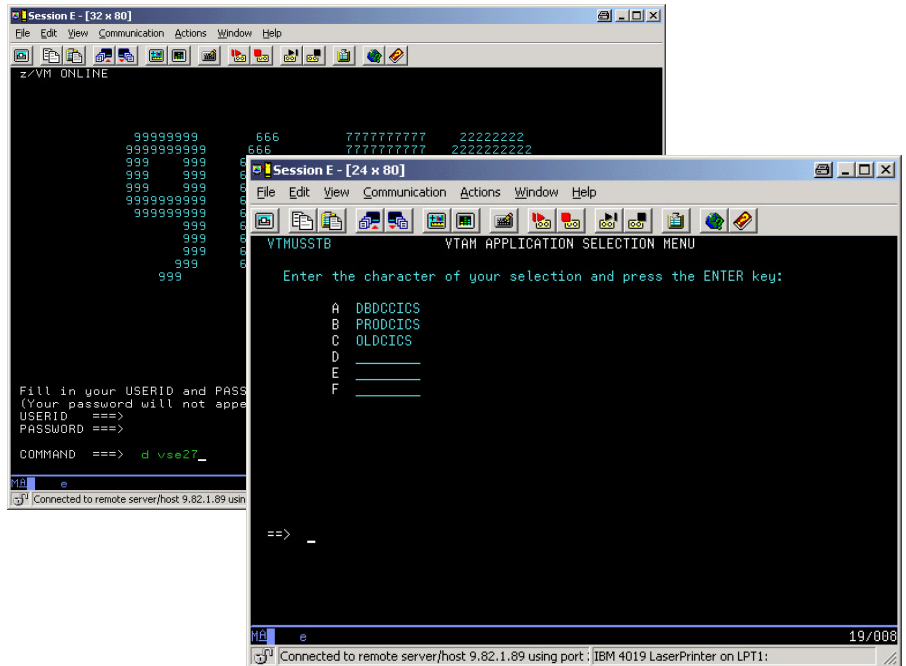
On Command line Enter:
d vse27
A

On the CICS logon screen enter:
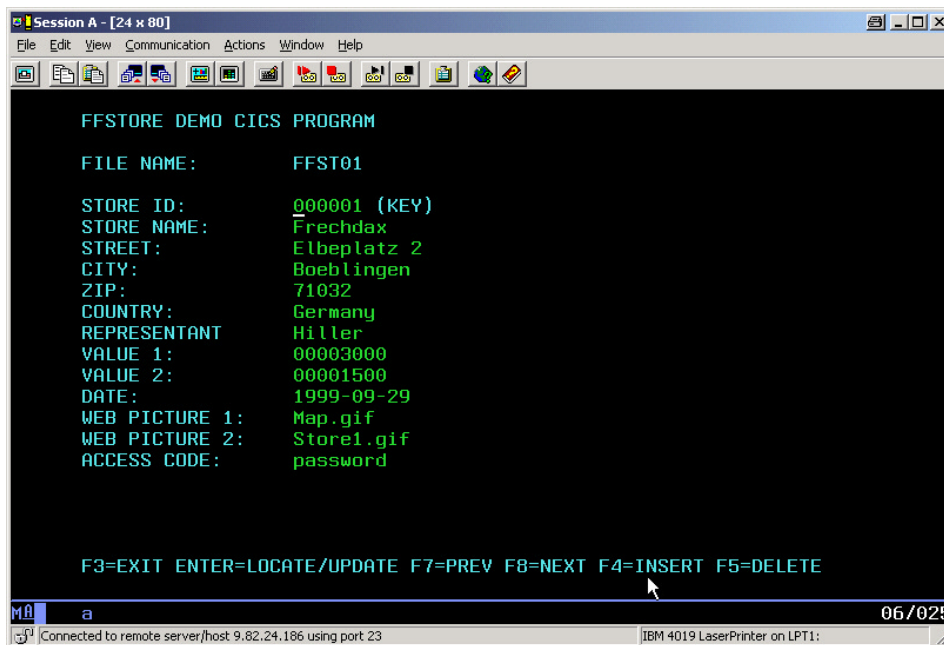User: **LLxx**   (xx- is your team number)
Password: **linlabxx**
You are now in the **Interactive User Interface (IUI) main panel of VSE.**
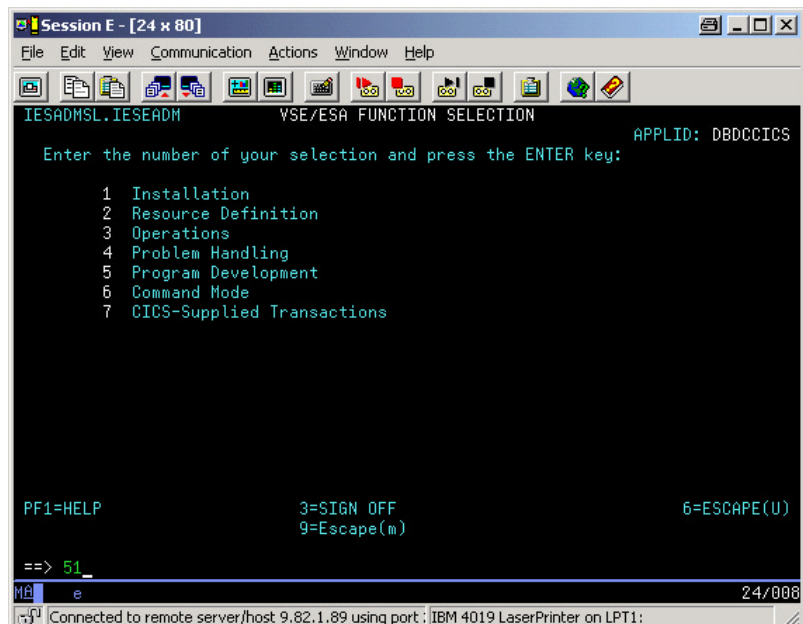
Hit: **PF6**   (to go into CICS mode)

Enter: **FFST FFSTxx**   (where FFSTxx 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)**
        were xx is your team number.
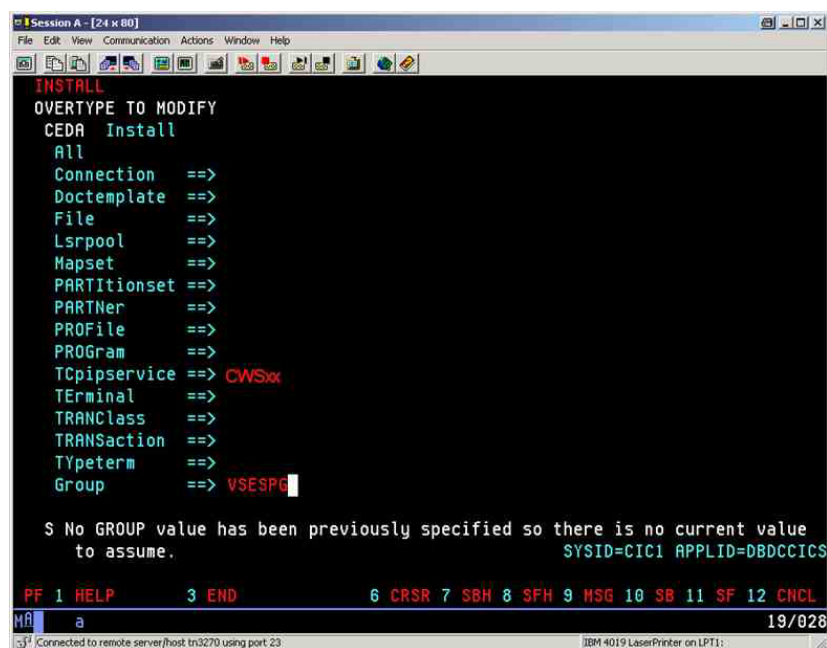
```
CEDA  DEFine TCpipservice( CWSxx       )
   TCpipservice   : CWSxx
   Group          : VSESPG
   Description  ==> SERVICE FOR CWS
   Urm          ==> DFHWBADX
   Portnumber   ==> 80xx                  1-65535
   Certificate  ==>
   STatus       ==> Open                  Open | Closed
   SSl          ==> NO                    Yes | No |
 Clientauth
   Attachsec    ==> Local                 Local | Verify
   TRansaction  ==> CWXN
   Backlog      ==> 00009                 0-32767
   TSqprefix    ==>
   Ipaddress    ==>
   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:
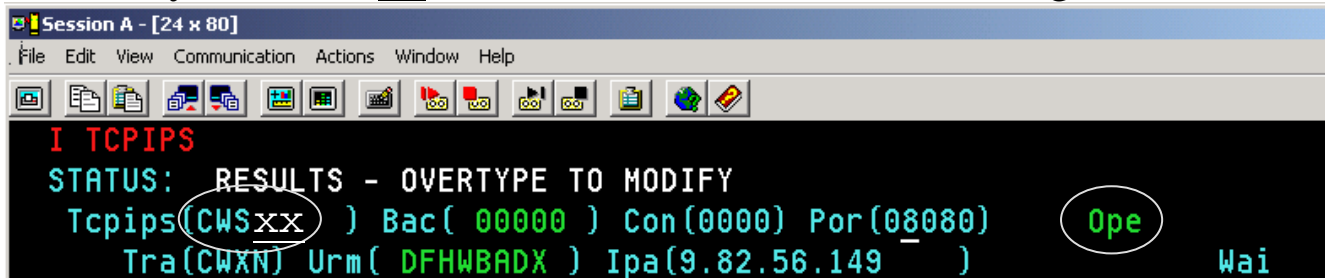

10

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 **CWSxx** name. You should see something like:

If the status is **CLO**sed, open it by overtyping it with **OPE**n .

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 **ffstxx**.

Based on your team number using **Internet Explorer**:
Enter URL:
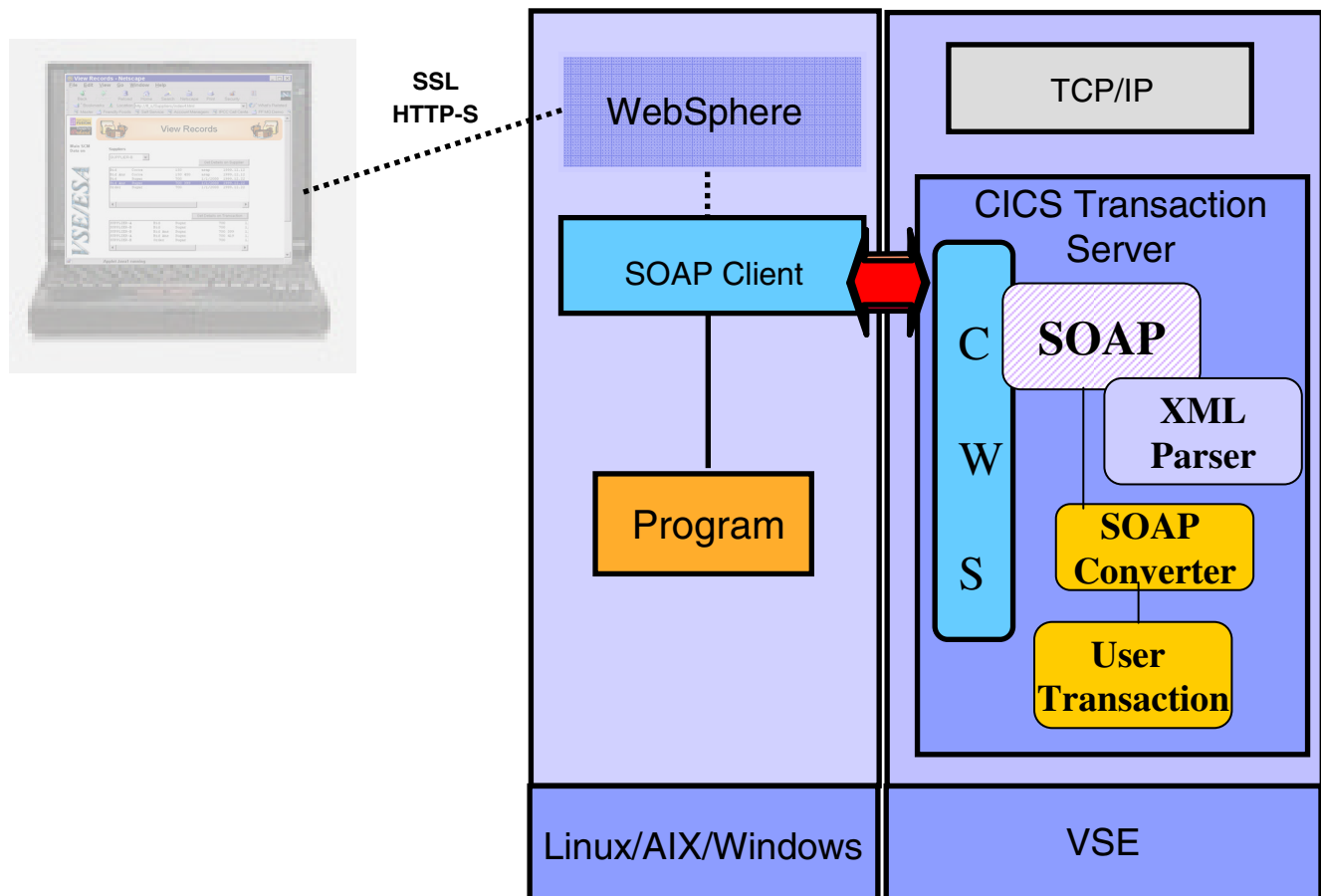**http://9.82.56.ppp:80xx/cics/cwba/dfhwbtta/FFST+FFSTxx**
You should be able to work with the transaction FFST now from browser (xx is your team number).

11
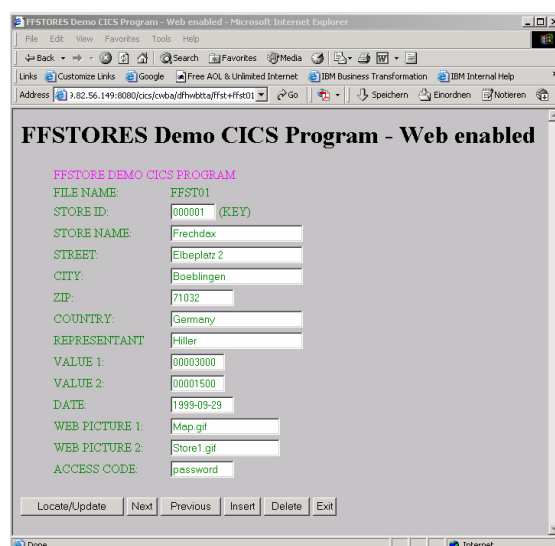
Chapter 3. Setup Web services with VSE transactions

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 via PTF In VSE 2.6)

- customize and run the SOAP sample program

STEP 3.1: 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
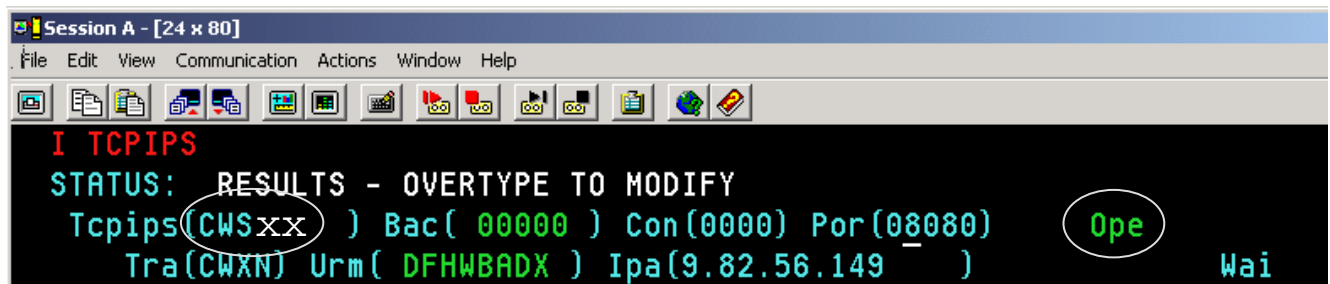 SOAP requests (i.e TCPIPService SOAP, Port:1080).

STEP 3.2: **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** an then
cemt I TCPIPService
Look for your **CWSxx** name. You should see something like:

If the status is **CLO**sed, open it by overtyping it with **OPE**n .

STEP 3.3: **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)

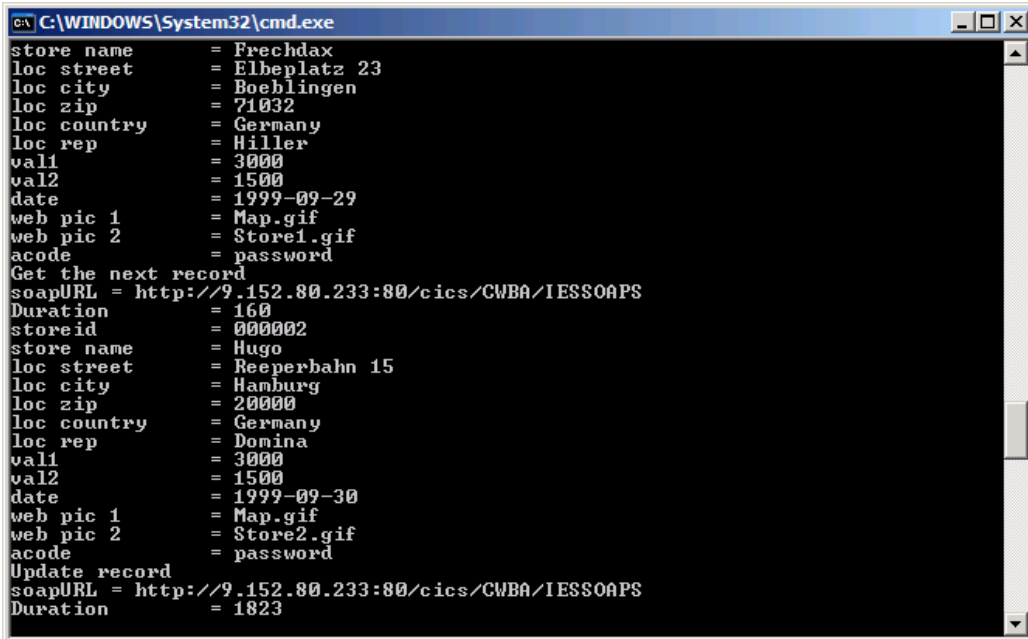Adapt the following values (xx is your team number):

VSE IP address: **9.82.56.225**

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://9.82.56.225:80xx/cics/CWBA/IESSOAPS FFSTxx
```

Enter: **runsoap.bat**
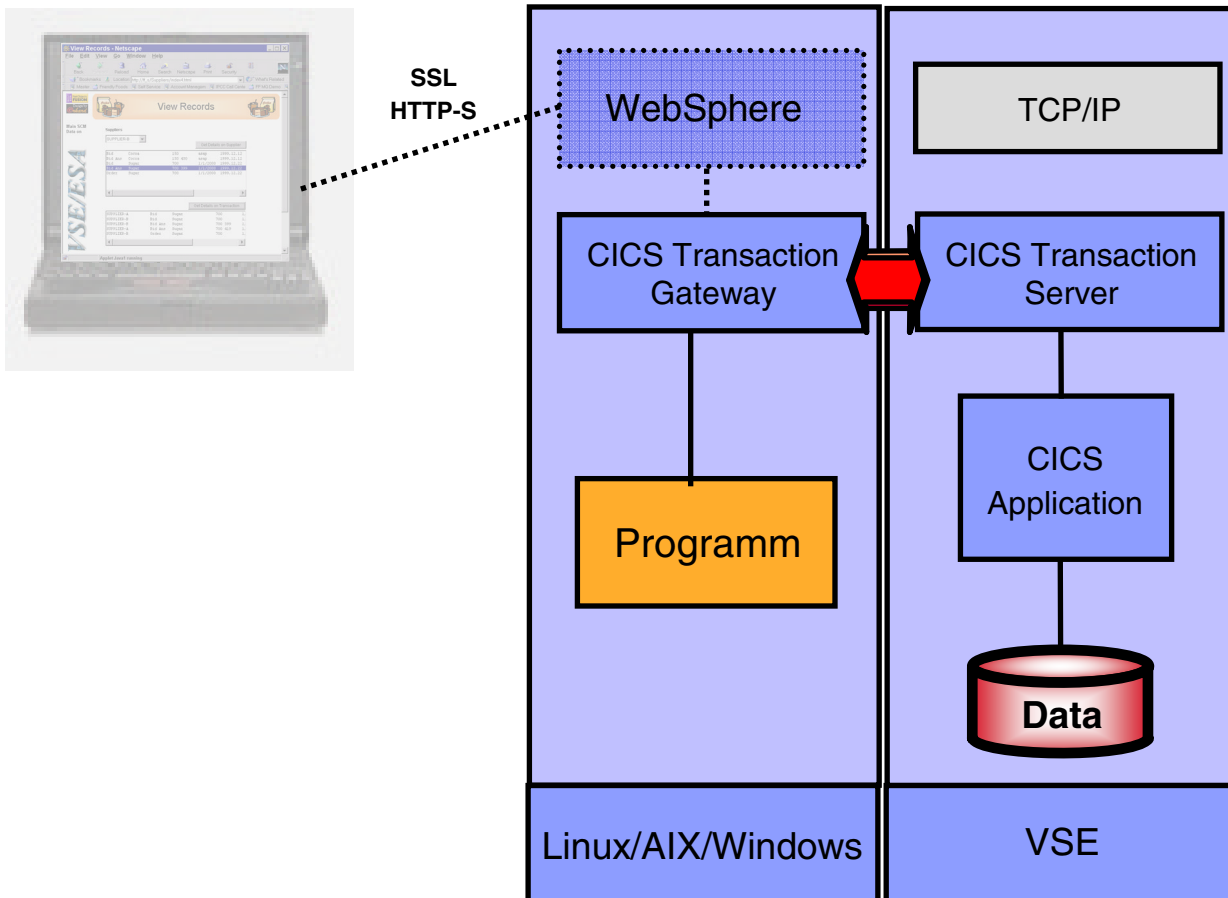
You should see something like this:

```
C:\WINDOWS\System32\cmd.exe                                    _|□|×|
store name      = Frechdax
loc street      = Elbeplatz 23
loc city        = Boeblingen
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.   15
The data interchange between VSE and Windows was done in XML.

Chapter 4. Setup CICS Transaction Gateway (CTG)

Integration of VSE transaction processes

SSL
HTTP-S

WebSphere

TCP/IP

CICS Transaction Gateway

CICS Transaction Server

Programm

CICS Application

Data

Linux/AIX/Windows

VSE

Integration of CICS business logic in distributed transaction processes
► Remote CICS program invocation
► Remote transaction security

STEP 4.1: 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
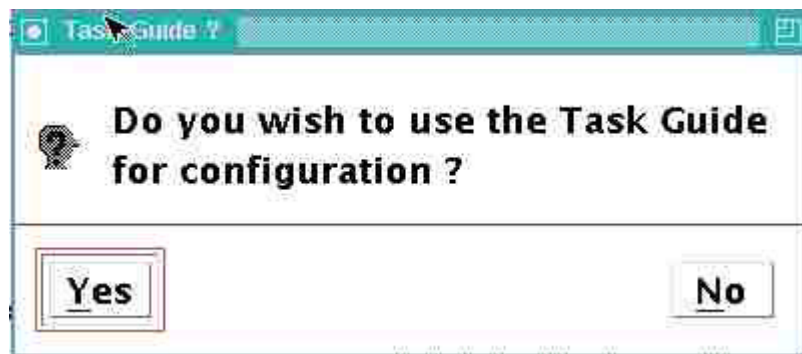Into the default directory:
C:\Program Files\IBM\IBM CICS Transaction Gateway

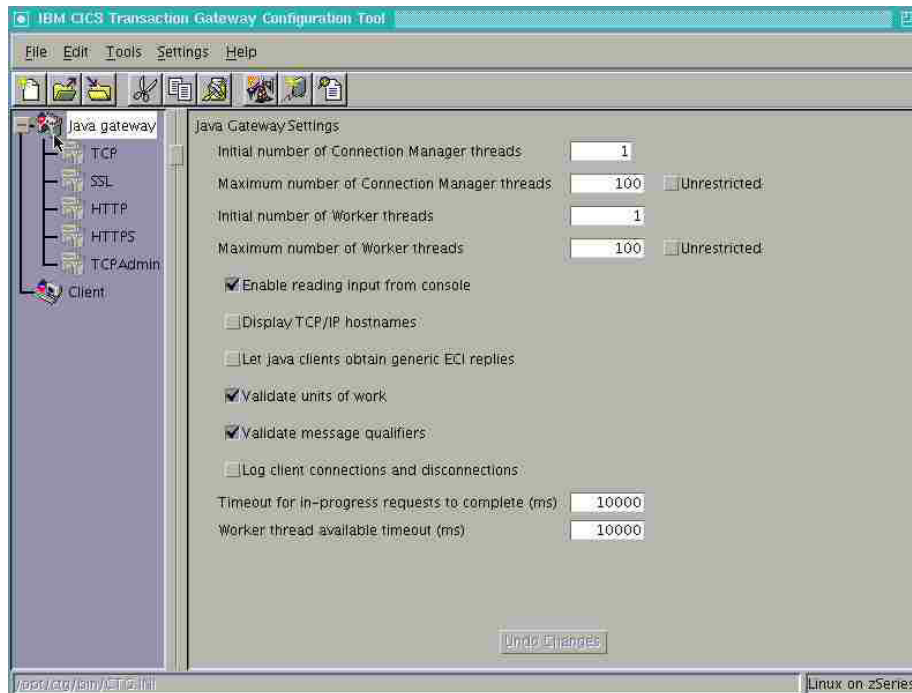## STEP 4.2 Customize CTG on Windows

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 4.2-1 Setup CTG to VSE TCP protocol
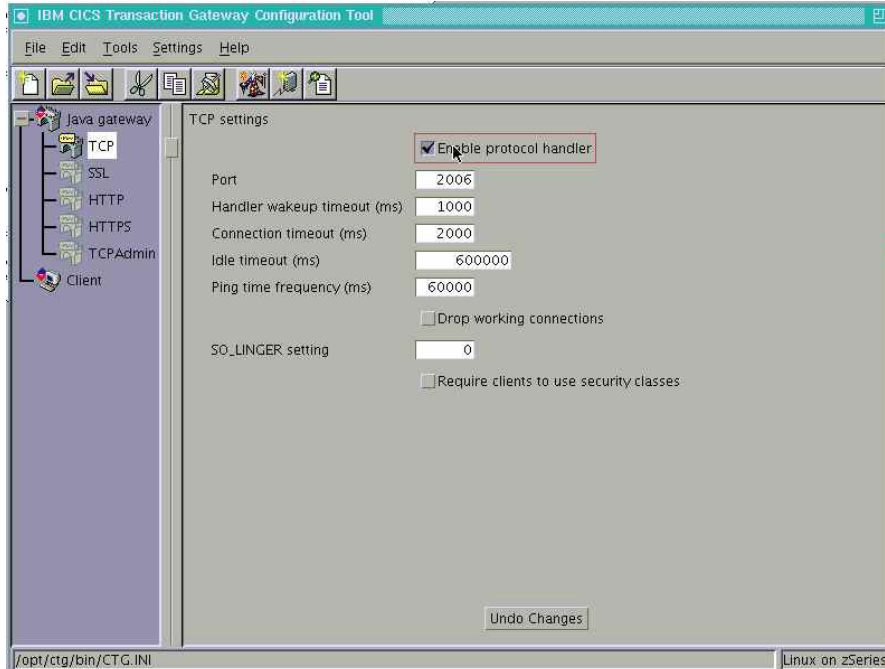
Click on: **Enable protocol handler**
and verify the parameters

STEP 4.2-2 Setup new Server

Right click on **Client** -> **New Server**
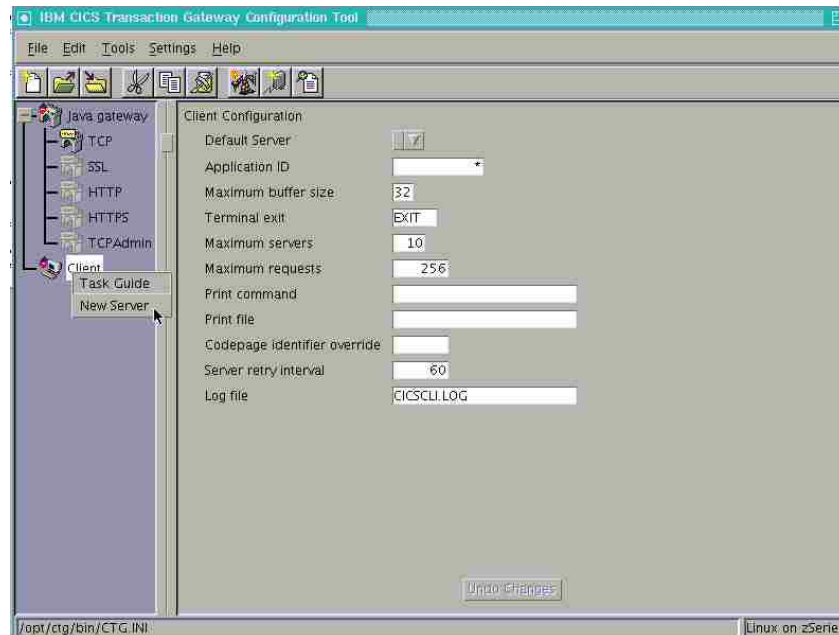
Enter the following parameters as shown:

Server Name:	**vse27**
Hostname or IP address:	**9.82.56.225**
Port:	**1435**
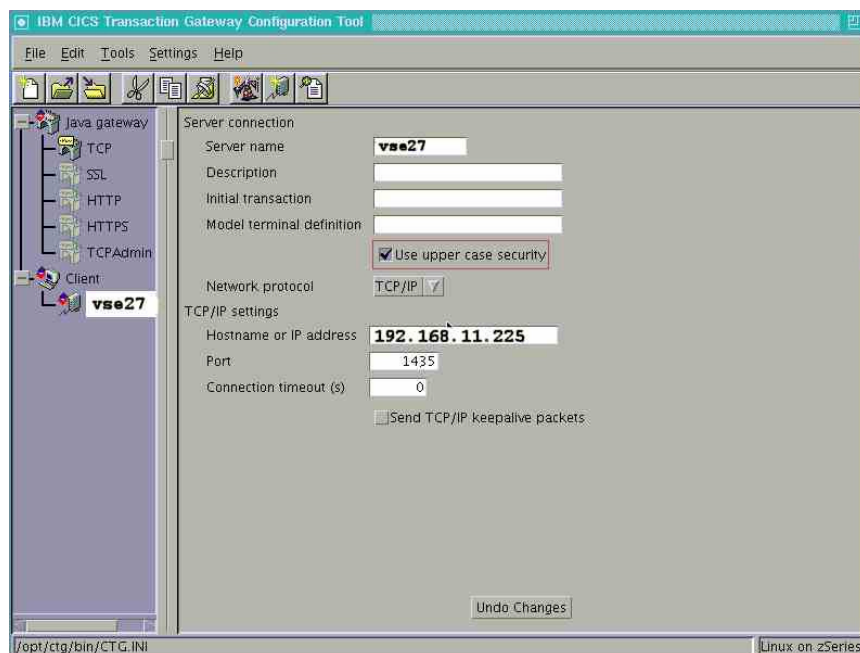
STEP 4.2-3 Save the configuration

Click on **File** -> **Save**
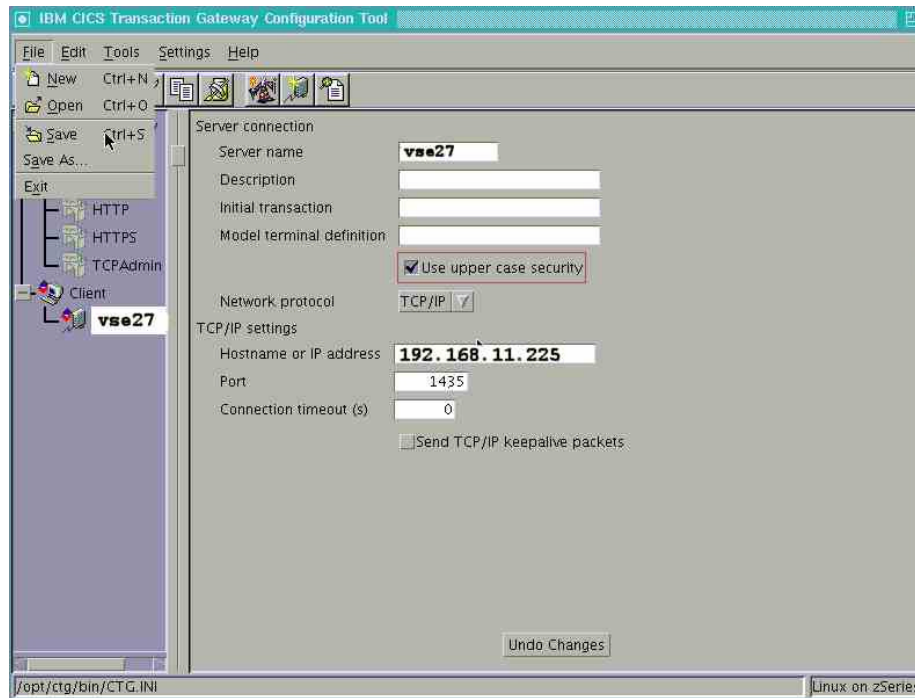
Leave the default configuration file name (CTG.INI).
Press Save.

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

STEP 4.3 Start CTG and CICS Client

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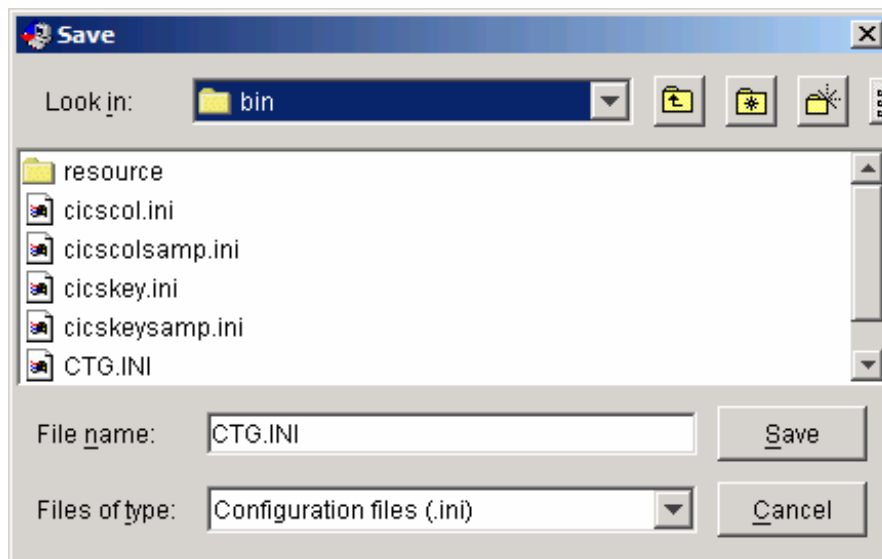 uses the CICS client to communicate with VSE. Each of these components runs
  in a separate process on Windows.

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\IBM CICS Transaction Gateway\bin\cicscli" -X**

STEP 4.4 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.*

STEP4.5 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: **vse27**

Host for Gateway: **local:**
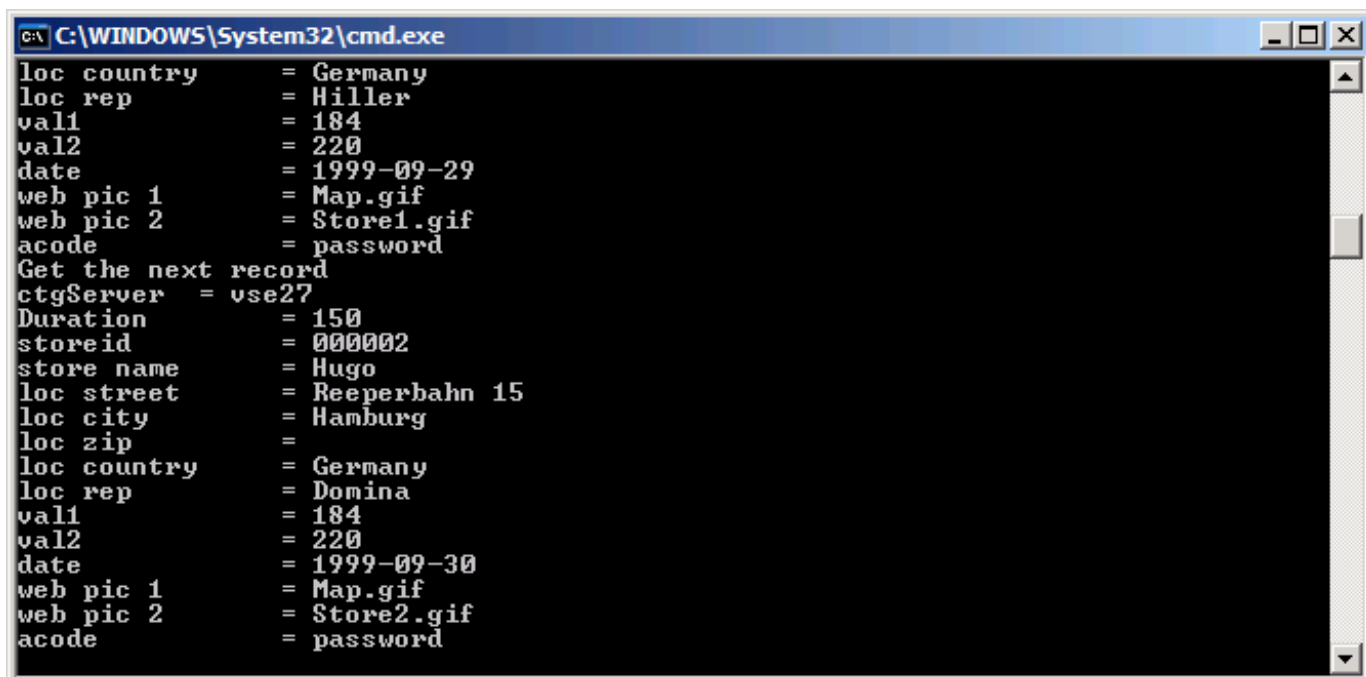
Port: **2006**

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 vse27 FFSTxx
```

Enter: **runeci.bat**

You should see something like this:

Structure of the Lab
sample Application FFST

Browser

Terminal

FFST Transaction

2

http://9.1.1.9:1082/cics/cwba/dfhwbtta/tran

1

z/VSE

Java Platform (Windows)

TCP / IP

CICS Transaction Server

| Program (SOAP Calls) | **3** |

BMS Map

3270 Bridge

BMS

FFSTUI

C

Apache Axis (SOAP,XML)

http://9.1.1.9:2006/cics/cwba/IESSOAPS

W

SOAP

FFSTSOAP

Program (ECI Calls)

S

ECI

Commarea

CTG

4

FFSTIO

VSAM

Integration of CICS business logic in heterogeneous transaction Processes.

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

23

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**.

- 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.   26

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    ==> Verify            Local | Verify
  TRansaction  ==> CIEP
  Backlog      ==> 00001             0-32767
  TSqprefix    ==>
  Ipaddress    ==>
  SOcketclose  ==> No                No | 0-240000
```

Additional Information

- **VSE/ESA 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

Redbooks
International Technical Support Organization

- **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,**   **SG24-6007**
        DB2, and Domino
- **CICS Transaction Server for VSE**   **SG24-5997**
        – CICS Web support
- **WebSphere V5 for Linux on zSeries**   **SG24-7042**
  Connectivity Handbook

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