English

Fujitsu Software BS2000

WebTransactions

Connection to MVS Applications

User Guide

Valid for:
WebTransactions V7.5

Edition August 2010

Comments… Suggestions… Corrections…

The User Documentation Department would like to know your opinion on this manual. Your feedback helps us to optimize our documentation to suit your individual needs.

Feel free to send us your comments by e-mail to: bs2000.info@fujitsu.com

Certified documentation according to DIN EN ISO 9001:2015

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2015.

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Contents

1 Preface

Over the past years, more and more IT users have found themselves working in heterogeneous system and application environments, with mainframes standing next to Unix systems and Windows systems and PCs operating alongside terminals. Different hardware, operating systems, networks, databases and applications are operated in parallel. Highly complex, powerful applications are found on mainframe systems, as well as on Unix servers and Windows servers. Most of these have been developed with considerable investment and generally represent central business processes which cannot be replaced by new software without a certain amount of thought.

The ability to integrate existing heterogeneous applications in a uniform, transparent IT concept is a key requirement for modern information technology. Flexibility, investment protection, and openness to new technologies are thus of crucial importance.

1.1 Product characteristics

With WebTransactions, Fujitsu Technology Solutions offers a best-of-breed web integration server which will make a wide range of business applications ready for use with browsers and portals in the shortest possible time. WebTransactions enables rapid, cost-effective access via standard PCs and mobile devices such as tablet PCs, PDAs (Personal Digital Assistant) and mobile phones.

WebTransactions covers all the factors typically involved in web integration projects. These factors range from the automatic preparation of legacy interfaces, the graphic preparation and matching of workflows and right through to the comprehensive frontend integration of multiple applications. WebTransactions provides a highly scaleable runtime environment and an easy-to-use graphic development environment.

On the first integration level, you can use WebTransactions to integrate and link the following applications and content directly to the Web so that they can be easily accessed by users in the internet and intranet:

– Dialog applications in BS2000/OSD
– MVS or z/OS applications
– System-wide transaction applications based on openUTM
– Dynamic web content

Users access the host application in the internet or intranet using a web browser of their choice.

Thanks to the use of state-of-the-art technology, WebTransactions provides a second integration level which allows you to replace or extend the typically alphanumeric user interfaces of the existing host application with an attractive graphical user interface and also permits functional extensions to the host application without the need for any intervention on the host (dialog reengineering).

On a third integration level, you can use the uniform browser interface to link different host applications together. For instance, you can link any number of previously heterogeneous host applications (e.g. MVS or OSD applications) with each other or combine them with dynamic Web contents. The source that originally provided the data is now invisible to the user.

In addition, you can extend the performance range and functionality of the WebTransactions application through dedicated clients. For this purpose, WebTransactions offers an open protocol and special interfaces (APIs).

Host applications and dynamic Web content can be accessed not only via WebTransactions but also by “conventional” terminals or clients. This allows for the step-by-step connection of a host application to the Web, while taking account of the wishes and requirements of different user groups.

1.2 Architecture of WebTransactions for MVS

The figure below illustrates the architecture of WebTransactions for MVS:

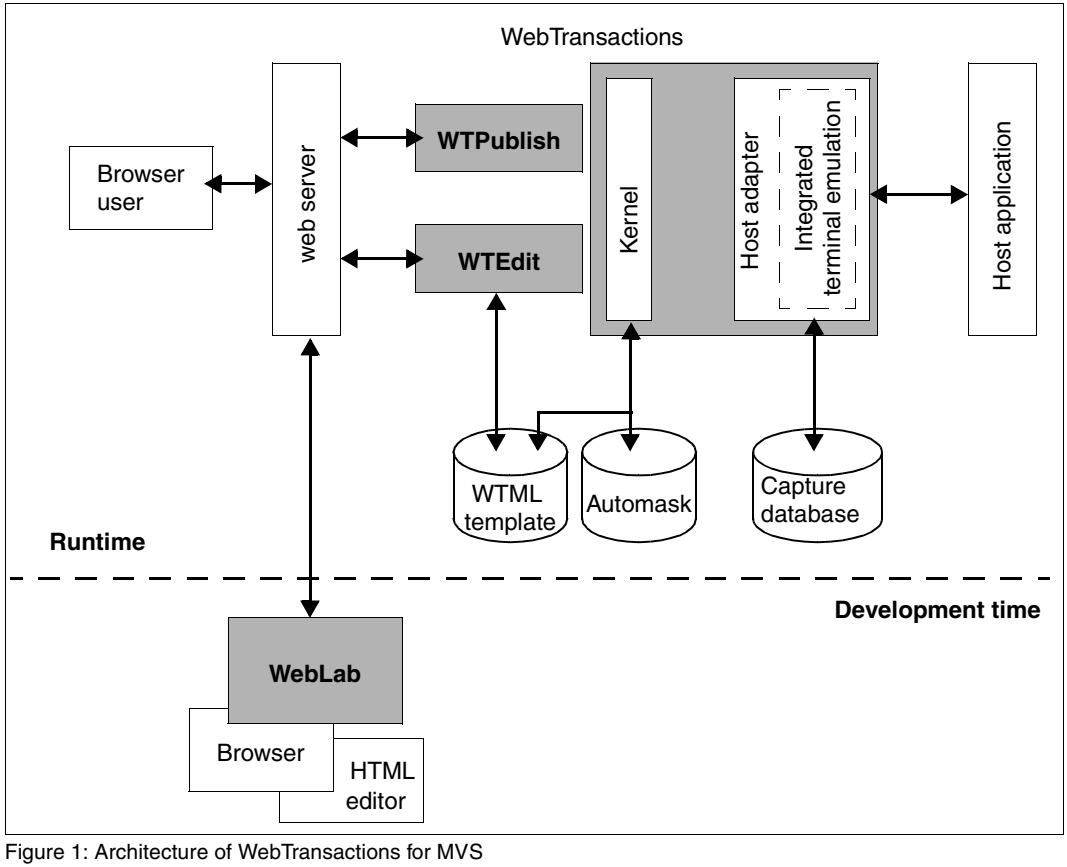


Figure 1: Architecture of WebTransactions for MVS

Integrated terminal emulation

Both at runtime and during development, WebTransactions for MVS uses a 3270 emulation which is integrated in the host adapter and handles communications between the WebTransactions kernel and the host application.

WebLab

WebLab is the WebTransactions development environment which you can use to perform all the steps from the connection of a host application through the generation and post-editing of the format-specific templates and on to application testing.

WebLab does not have to be installed on the host on which WebTransactions is running. You can use WebLab on another machine that is running under a Windows operating system. All the data required to run a WebTransactions application is administered on the host on which WebTransactions is running.

For 1:1 depiction or global editing, you can use WebLab to create different variants of the standard Automask template, which dynamically converts all output formats at runtime.

For individual editing purposes, you may use the capture function to create recognition criteria which are stored in the capture database and generate a so-called format-specific template and a format description file (FLD file) from the format. You can post-edit the format-specific templates with WebLab.

Runtime

At runtime, WebTransactions searches the capture database for a recognition criterium that matches the screen format sent by the host application. If the recognition criterium is found, WebTransactions uses the corresponding format-specific template. If an appropriate criterium is not found, WebTransactions dynamically converts the screen format on the basis of the standard Automask template.

1.3 WebTransactions documentation

The WebTransactions documentation consists of the following documents:

- An introductory manual which applies to all supply units:

  Concepts and Functions

  This manual describes the key concepts behind WebTransactions:

  – The various possible uses of WebTransactions.

  – The concept behind WebTransactions and the meanings of the objects in WebTransactions, their main characteristics and methods, their interaction and life cycle.

  – The dynamic runtime of a WebTransactions application.

  – The administration of WebTransactions.

  – The WebLab development environment.

- A Reference Manual which also applies to all supply units and which describes the WebTransactions template language WTML. This manual describes the following:

  Template Language

  After an overview of WTML, information is provided about:

  – The lexical components used in WTML.

  – The class-independent global functions, e.g. `escape()` or `eval()`.

  – The integrated classes and methods, e.g. `array` or `Boolean` classes.

  – The WTML tags which contain functions specific to WebTransactions.

  – The WTScript statements that you can use in the WTScript areas.

  – The class templates which you can use to automatically evaluate objects of the same type.

  – The master templates used by WebTransactions as templates to ensure a uniform layout.

  – A description of Java integration, showing how you can instantiate your own Java classes in WebTransactions and a description of user exits, which you can use to integrate your own C/C++ functions.

  – The ready-to-use user exits shipped together with WebTransactions.

  – The XML conversion for the portable representation of data used for communication with external applications via XML messages and the conversion of WTScript data structures into XML documents.

- A User Guide for each type of host adapter with special information about the type of the partner application:

  Connection to openUTM applications via UPIC

  Connection to OSD applications

  Connection to MVS applications (this User Guide)

  All the host adapter guides contain a comprehensive example session. The manuals describe:

  – The installation of WebTransactions with each type of host adapter.

  – The setup and starting of a WebTransactions application.

  – The conversion templates for the dynamic conversion of formats on the web browser interface.

  – The editing of templates.

  – The control of communications between WebTransactions and the host applications via various system object attributes.

  – The handling of asynchronous messages and the print functions of WebTransactions.

- A User Guide that applies to all the supply units and describes the possibilities of the HTTP host adapter:

  Access to Dynamic Web Contents

  This manual describes:

  – How you can use WebTransactions to access a HTTP server and use its resources.

  – The integration of SOAP (Simple Object Access Protocol) protocols in WebTransactions and the connection of web services via SOAP.

- A User Guide valid for all the supply units which describes the open protocol, and the interfaces for the client development for WebTransactions:

  Client APIs for WebTransactions

  This manual describes:

  – The concept of the client-server interface in WebTransactions.

  – The `WT_RPC` class and the `WT_REMOTE` interface. An object of the `WT_RPC` class represents a connection to a remote WebTransactions application which is run on the server side via the `WT_REMOTE` interface.

  – The Java package `com.siemens.webta` for communication with WebTransactions supplied with the product.

- A User Guide valid for all the supply units which describes the web frontend of WebTransactions that provides access to the general web services:

  Web-Frontend for Web Services

  This manual describes:

  – The concept of web frontend for object-oriented backend systems.

  – The generation of templates for the connection of general web services to WebTransactions.

  – The testing and further development of the web frontend for general web services.

1.4 Structure and target group of this manual

This documentation is intended for everybody who wants to use WebTransactions to connect MVS or z/OS dialog applications to the Web. The individual chapters describe the necessary steps. If you have not yet worked with WebTransactions for MVS, you should first read chapter 3, which presents an example session which will give you an initial insight into working with WebTransactions.

This manual provides all the MVS-specific information necessary to complement the introductory WebTransactions manual “Concepts and Functions” and the WebTransactions reference manual “Template Language“.

Scope of this description

WebTransactions for MVS runs on the Windows system platforms, as well as on Solaris and Linux. This documentation applies to all platforms. If any information applies to one platform only, this is specifically indicated.

1.5 New features

You will find an overview of all the changes in WebTransactions V7.5 in the WebTransactions manual “Concepts and Functions”.

1.6 Notational conventions

The following notational conventions are used in this documentation:

Name	Description
`typewriter font`	Fixed components which are input or output in precisely this form, such as keywords, URLs, file names
italic font	Variable components which you must replace with real specifications
bold font	Items shown exactly as displayed on your screen or on the graphical user interface; also used for menu items
[ ]	Optional specifications; do not enter the square brackets themselves
{*alternative1* | *alternative2* }	Alternative specifications. You must select one of the expressions inside the curly brackets. The individual expressions are separated from one another by a vertical bar. Do not enter the curly brackets and vertical bars themselves.
...	Optional repetition or multiple repetition of the preceding components
	Important notes and further information
►	Prompt telling you to do something.
	Refers to detailed information

2 Installing WebTransactions

The WebTransactions installation files can be downloaded from the Web.

Detailed information on the hardware and software requirements can be found in the release notice accompanying the product.

2.1 Installation

WebTransactions for MVS consists of the host adapter via which communications with the MVS applications transit, the WebTransactions runtime system and the host adapter for dynamic web contents.

WebTransactions for MVS contains the installation package for the WebLab development environment which you can use to connect host applications to the WWW, edit the appearance of host formats and extend their functionality. You may need to install WebLab explicitly on your development machine (see section “WebLab installation” on page 21).

Before installing WebTransactions, make sure that the web server and, if necessary, Java are already installed.

Make a note of the Java installation directory together with the following information from the web server configuration:

- root directory for web pages (=document directory)
- CGI directory
- URL prefix for CGI programs

2.1.1 Windows

For Windows, WebTransactions is available as a Windows installer package (msi file) `WebTransactionsMVS75.msi` after it has been downloaded.

2.1.1.1 Installation via the user interface

To perform installation, you must possess Windows administrator rights. There are various ways of starting installation

– Via the **Settings**/**Control Panel** command in the Start menu.

– Via Windows Explorer.
Double click the msi file or single click this file with the right mouse button and then, in the context menu which appears, select the **Install** command.

Setting the web server and Java environment settings

When you start `WebTransactionsMVS75.msi` you will see a series of dialog boxes in which you must enter the installation directory and the values for your web server:

– Root directory for web pages (= document directory).
– CGI directory and URL prefix.
– ISAPI directory and ISAPI prefix (optional).
– Directory of the Java2 library `jvm.dll` for Java integration (optional).

When you have entered the values, the installation will be started and the required components will be installed. If you install WebTransactions with an additional host adapter on the same system, these values will be taken over by the new installation.

Selecting components

You can now select all the components you want to install. In the **Select Installation Type** dialog box, select one of the following entries:

Typical or **Complete**
This will install all the WebTransactions components.

Custom
The installation program proposes the following components:

– WebTransactions runtime system.
– WebTransactions demo applications

2.1.1.2 Silent installation

For a silent installation, use the Windows installer `Msiexec.exe`. You can find a complete description of this command in, for example, the Windows online help. In order to run an installation with `Msiexec.exe` you will require administrator access rights.

Use the `Msiexec.exe` command with the following syntax:

```
Msiexec.exe /I "package" /q
[INSTALLDIR="install-dir"]
[DOCUMENTROOTDIR="documentroot-dir"]
[HTTPSCRIPTSDIR="cgi-dir"]
[JAVA2SYS="java-dir"]
[ISPREFIX="isapi-prefix"]
[URLPREFIX="cgi-prefix"]
[ISAPICHECK="isapicheck"]
[JAVA2CHECK="java2check"]
```

The parameters have the following meaning:

package
: Path for the package to be installed (e.g. `C:\tmp\WebTransactionsMVS75.msi`).

install-dir
: The WebTransactions installation directory.
Default value: `C:\Programme\WebTransactionsV75` or
`C:\Program Files\WebTransactionsV75`

documentroot-dir
: Web server document directory.
Default value: `C:\InetPub\wwwroot`

cgi-dir
: The CGI directory of the web server.
Default value: `C:\InetPub\scripts`

java-dir
: Directory of the Java2 library `jvm.dll`. This entry is only necessary when the support for the Java interface is to be installed.

isapi-prefix
: URL prefix for ISAPI.
Default value: `scripts`

cgi-prefix
: URL prefix for CGI.
Default value: `scripts`

isapicheck

This indicates if the ISAPI interface for WebTransactions is to be installed.
Possible values: `Yes` | `No`
Default value: `No`

java2check

This indicates if the support for the Java interface is to be installed.
Possible values: `Yes` | `No`
Default value: `No`

Example

```
Msiexec.exe /I  "C:\tmp\WebTransactionsMVS75.msi" /q
INSTALLDIR="D:\Program Files\WebTransactionsV75"
DOCUMENTROOTDIR="C:\Program Files\Apache Group\Apache\htdocs"
HTTPSCRIPTSDIR="C:\Program Files\Apache Group\Apache\cgi-bin"
JAVA2SYS="D:\Program Files\Java\jdk1.6.0_13\jre\bin\client"
URLPREFIX="cgi-bin" JAVA2CHECK="Yes"
```

2.1.2 Solaris

As usual, when you install WebTransactions, you use the installation procedure `pkgadd` with root authorization. To do this, enter the absolute path name of the unpacked product file:

`pkgadd -d /`*absolute_path*`/`*filename*

During installation, the following questions are displayed:

```
1. Should WebTransactions demos be installed?
```

If you enter `y` (yes) the WebTransactions demo applications are also installed.

```
2. Your Web Server has a 'document default directory'
Where is this directory?
```

Enter the corresponding path name.

```
3. The server uses an URL prefix to access WebTransactions CGI program.
URL prefix:
```

Enter the URL prefix that is set for CGI programs on your web server.

```
4. Your Web Server has a cgi-bin directory,
in which you install WebTransactions CGI-Program.
Where is this directory?
```

Here you enter the absolute path to the CGI directory which is configured for your web server.

During the installation, you will then see the URL which you use to start the demo application.

2.1.3 Linux

WebTransactions is available as a compressed archive for downloading and has the suffix `.gz` (for example, `webtransMVSV75.tar.gz`). You must first decompress this file using the command:

```
gunzip -d webtransMVSV75.tar
```

Please note that you must not specify the suffix `.gz`. You can then fetch the installation files from the archive using the `tar` command:

```
tar -xvf webtransMVSV75.tar
```

Start the installation procedure `doinstall` with root authorizations:

```
./doinstall
```

During installation you will be asked the following questions:

```
You can install WebTransactions into any directory.
          Where is this directory ? [/opt]
```

You should now enter a different path name if you do not want WebTransactions to be installed under the default path `/opt`.

```
Your Web Server has a directory for CGI programs.
           Where is this directory ? [/usr/local/httpd/cgi-bin]
```

Enter the corresponding path name.

```
Your Web Server uses an URL prefix to access the CGI programs in
          /usr/local/httpd/cgi-bin
          What is this prefix ? [cgi-bin]
```

Enter the URL prefix used for CGI programs on your web server

```
Are this settings OK ? [y]
```

Confirm your specifications to terminate installation.

2.1.4 WebLab installation

When you install WebTransactions on any platform, the msi file for the installation of WebLab under Windows (`WebLab75.msi`) is written to the web server's document directory that is located below the directory `webtav75`.

Transferring the installer package to the development computer

The WebLab installer package can be downloaded to the required development computer via a browser call specifying the following URL:

`http://`*`web-server`*`/webtav75/wtdownload.htm`

Installing WebLab under Windows

When you have downloaded the WebLab installer package to your development computer, install the msi file as usual via the graphical user interface (see page 16) or with `Msiexec.exe` (see page 17).

In both cases, you need only specify the WebLab installation directory.

2.2 Licensing

After installation, you must configure the number of licenses present and the machine-specific activation key. To do this, you require the WebTransactions administration interface and select the **Licences** menu item. For more information on the administration program, see the WebTransactions manual "Concepts and Functions".

3 Example session

In this chapter, you will learn about what you can do with WebTransactions and become familiar with a number of basic rules for working with WebTransactions. This example session is intended to serve as a procedural description which will show you how you can connect a host application to the WWW simply and quickly.

In this example session, you will first use the administration program to create the conditions necessary for your work with WebLab and WebTransactions. Next, you will use WebLab to connect the host application to the Web. You will then get to know the ways in which you can make global and format-specific changes in a template.

Please note that all path specifications are based on the assumption that WebTransactions has been installed in the initial directory.

3.1 Administering the WebTransactions server

Once you have installed WebTransactions for MVS on a computer (see also chapter “Installing WebTransactions” on page 15, you must create the conditions necessary for your work with WebTransactions and WebLab. To do this, you use the administration program that is described in the WebTransactions manual “Concepts and Functions”.

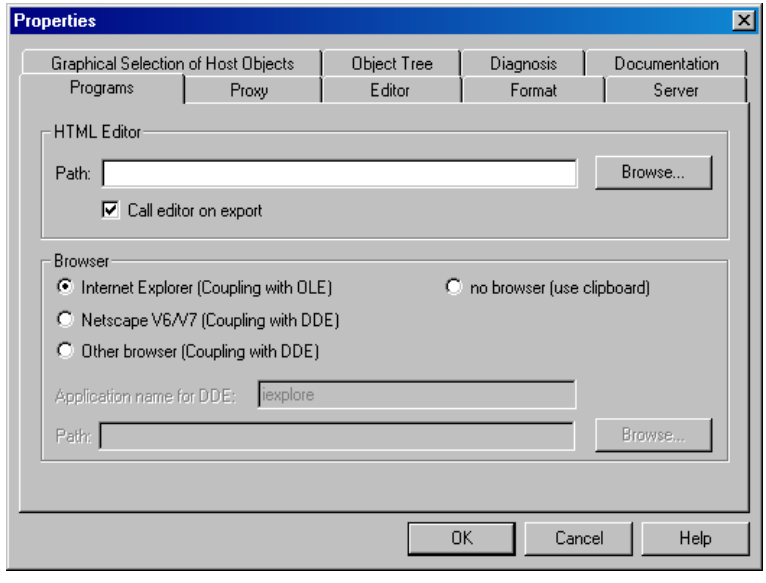
The first step in WebLab is to set the browser that WebLab is to use to operate the WebTransactions application. Your work with the administration program is subdivided into the following steps:

1. Enter the licenses
2. Set up the user
3. Create the pool
4. Assign the pool to the user

3.1.1 Setting the browser

Before you start to work, you should - in WebLab - set the browser which you want WebLab to use to operate the WebTransactions application. This step is only necessary if you are working with WebLab for the first time.

- Start WebLab with the command **Start/Programs/WebTransactions 7.5/WebLab**. The WebLab main window is displayed on the screen. For a detailed description of the main window and its components, refer to the WebTransactions manual „Concepts and Functions“ and the online help.
- In WebLab you can now select the **Options/Preferences** command. The **Properties** dialog box is displayed on screen with the **Programs** tab open.



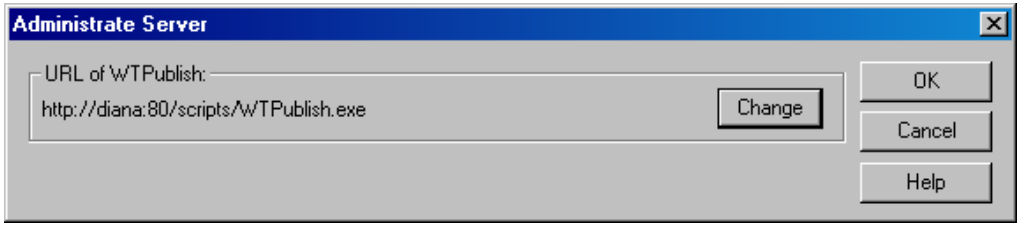
- In the lower section, **Browser**, select the browser which is installed on your computer, and specify how it is to be used by WebLab.
- Click on **OK** to confirm your settings.

3.1.2 Starting the administration program

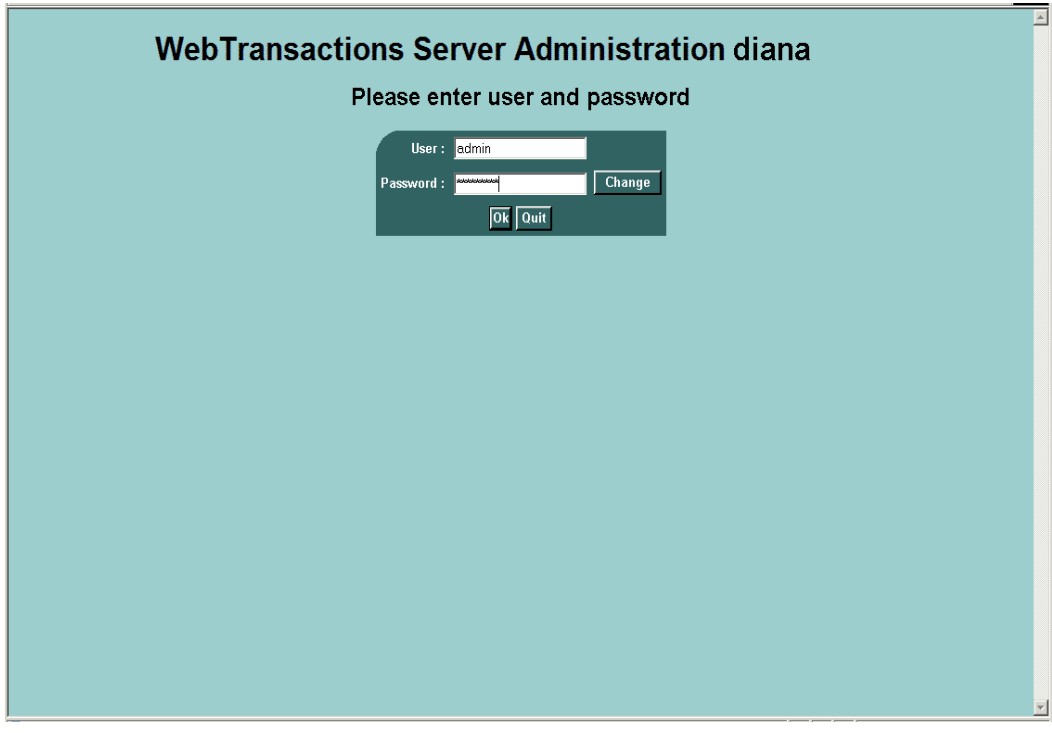
- Choose the **Administration/Server command to start the administration program initially.** The dialog box **Administrate Server** opens on the screen.
- Under **URL of WTPublish**, click the **Change** button. The **URL of WTPublish** dialog box will be displayed.
- Select the **Protocol** to be used for the connection.
- In the other fields, enter the corresponding values for your host:

Server	Host computer on which WebTransactions runs.
Port	Corresponding port number.
CGI-Path	Path for the CGI program `WTPublish`.
Program	CGI program.

- Confirm with **OK**. The values will be entered in the **Administrate Server** dialog box.



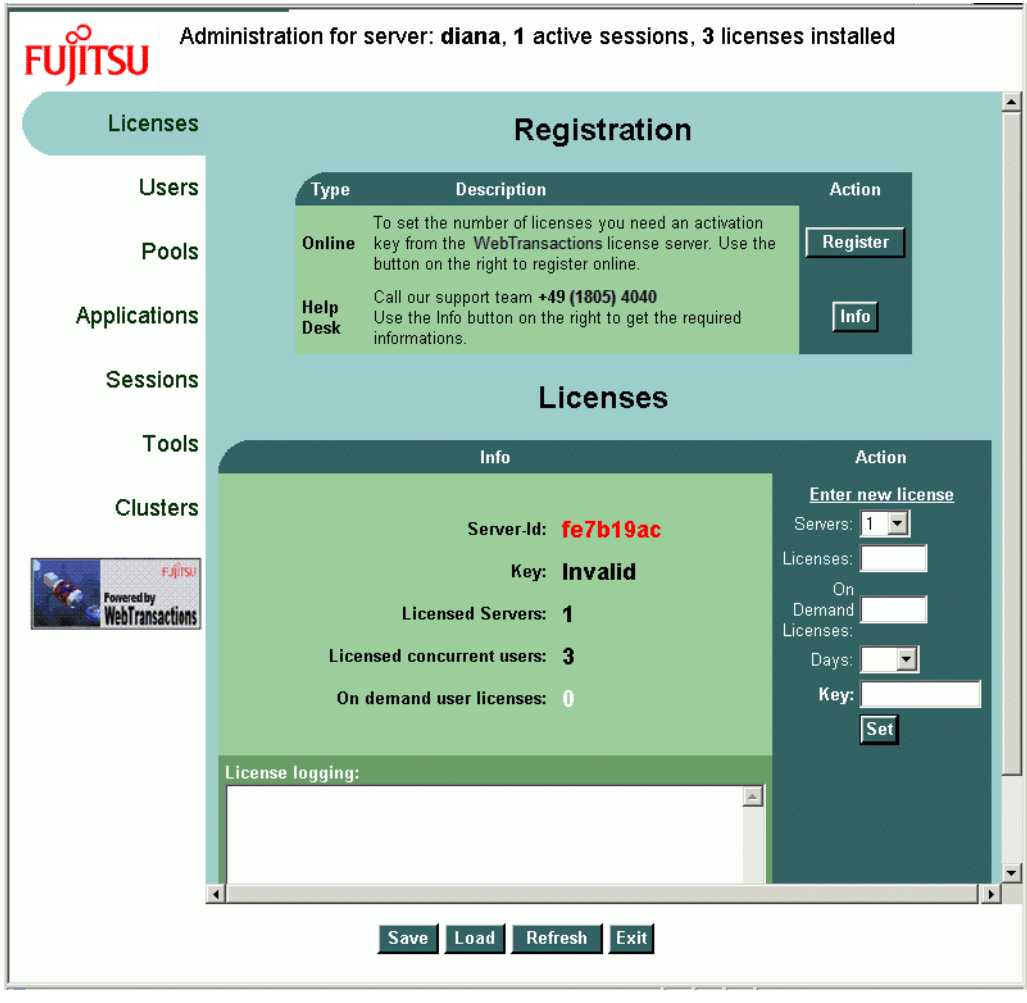
- Confirm with **OK**. The administration program is started and the first window is shown in the browser.



► Log on as the `admin` user. This user is set up without a password when WebTransactions is set up. The licensing page is now displayed automatically.

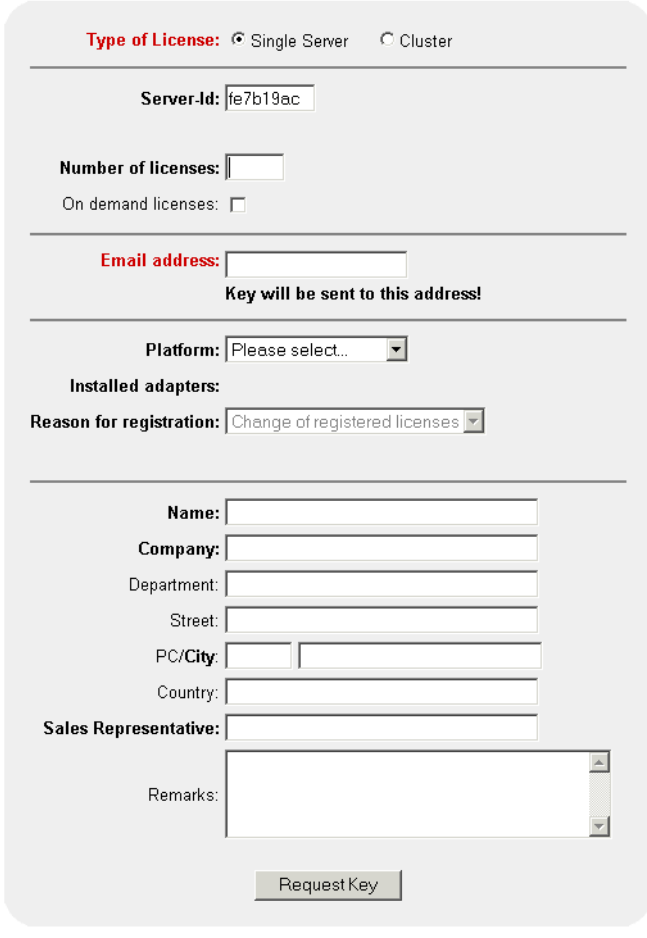
If you are working with the administration program for the first time then, for reasons of security, you should assign a password for the `admin` user after login.

3.1.3 Entering licenses



► Click the **Register** button on the licensing page.

This opens the registration page:



- To register licenses for a stand-alone server, click on **Single Server** under **Type of license**.
- Enter the number of servers that you want to license in the **Number of licences** field.
- Enter your e-mail address and additional parameters as required.

- Click **Request Key** to submit the form.

  The license key will then soon be sent to the specified e-mail address.

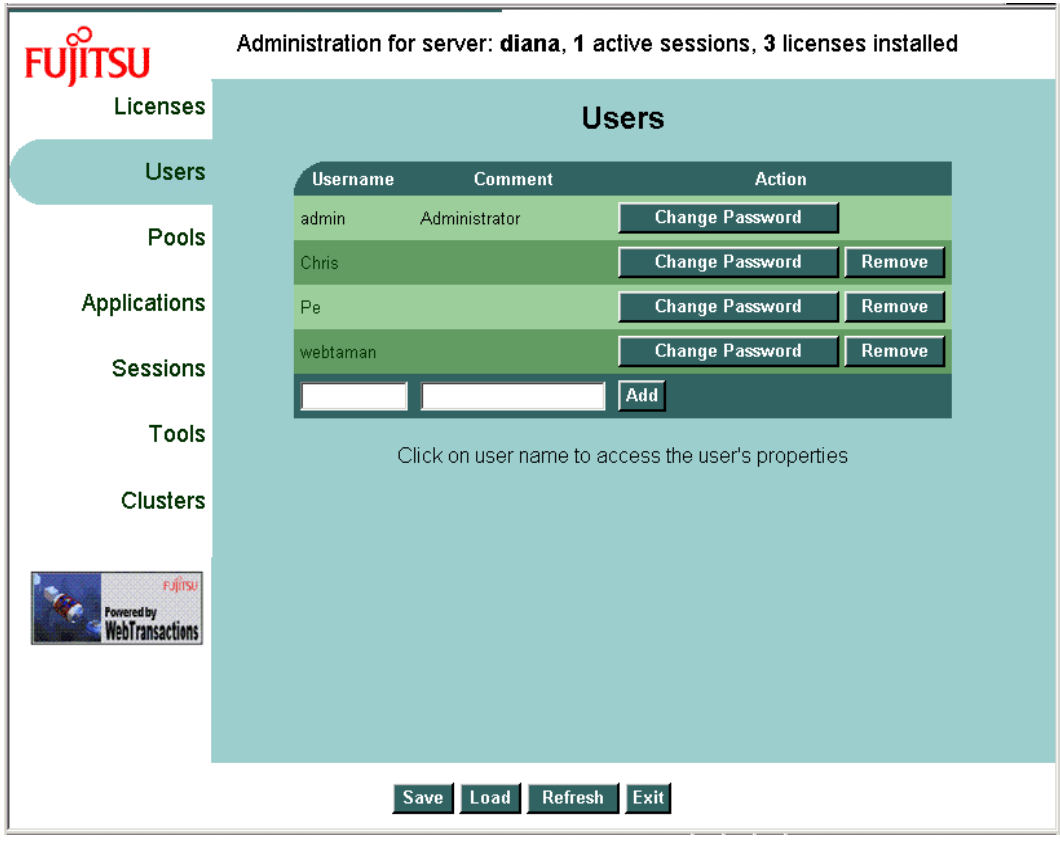
- Enter the number of acquired licenses and the valid license key notified to you by e-mail in the **Licenses** and **Key** fields of the licensing page.

- Confirm by clicking **Set** followed by **Save**.

  The licenses are activated and the new number of licenses is displayed in the status bar.

3.1.4 Creating users

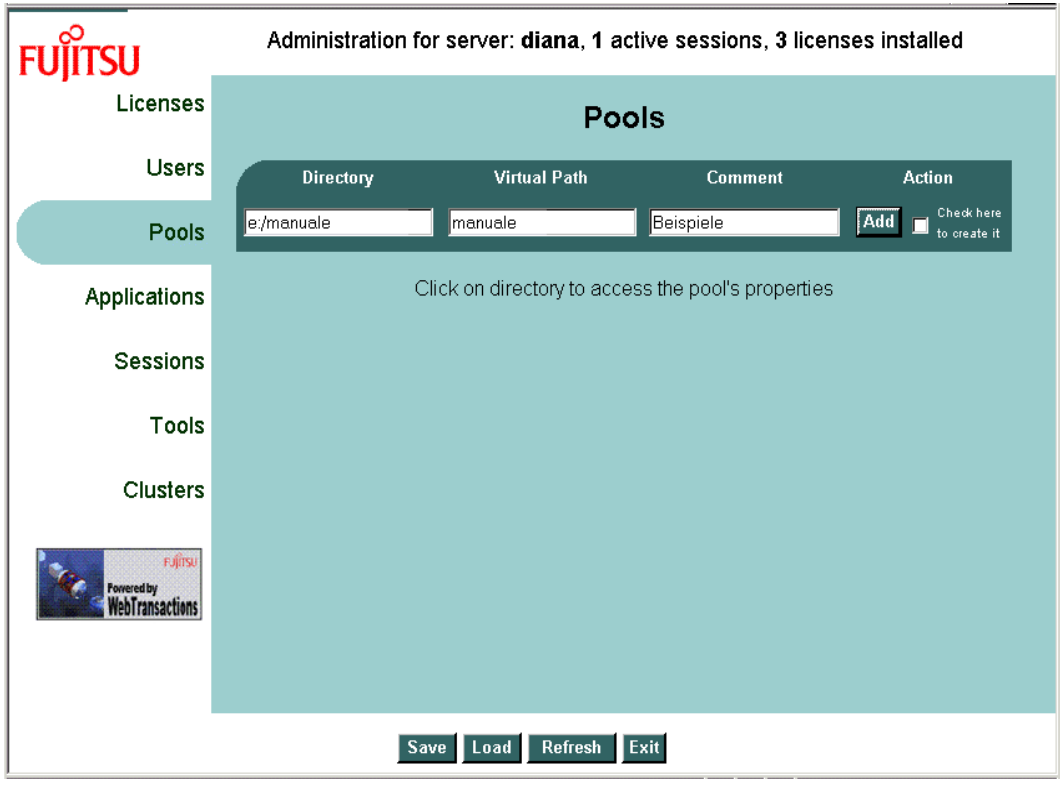
- Click on the **Users** menu item to enter new users. The **Users** window is displayed in the browser.



- Enter the name of the new user in the **Username** input field in the work area. You can also change the password for `admin` here.
- If you wish, enter a description or comment for the user in the **Comment** field and click on **Add**. The user is now entered for operations with WebTransactions and WebLab. However, as yet the user has no rights. You must assign these.
- However, you should first click on the **Change Password** button and enter a password for the new user.

3.1.5 Creating a pool

► Next, click on the **Pools** menu item to create a pool under which base directories can be created. The **Pools** window is displayed in the browser.



► Enter the name of the directory in the **Directory** input field in the work area (you must specify the absolute path name). Please note that if this directory does not already exist you must select the directory creation option.

► In the **Virtual Path** entry field, type the name of a directory below the web server's document directory that is allocated to the new pool. This directory corresponds to the start of the virtual path used by the web server to directly (i.e. without it being necessary to call WebTransactions) access the files of WebTransactions applications (e.g. images, entry page etc.) in this directory.

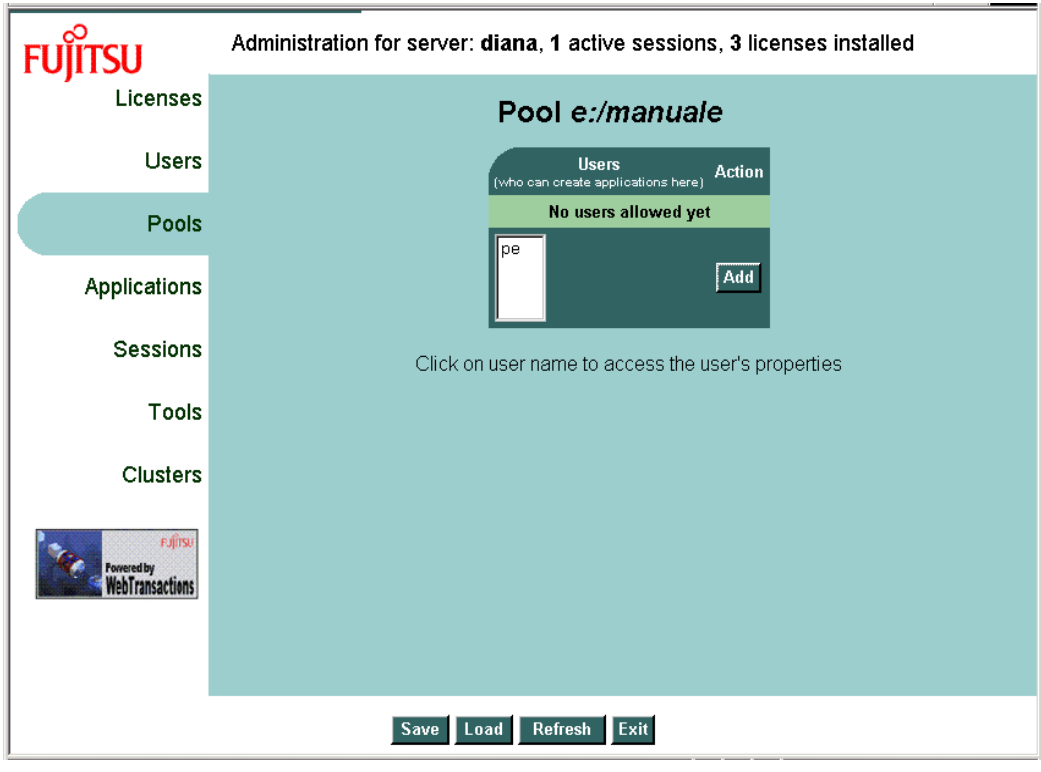
If you want to use base directories with identical names in different pools, the values for **Virtual Path** corresponding to the pools have to be different.

► You may also enter a description or comment for the pool in the **Comment** field before clicking on the **Add** button. The new pool is now entered for WebTransactions and WebLab operation. You can enter further pools as required.

You can now use WebLab to create the base directories under the pools which you have created in this way. However, as yet no WebLab user can access such a pool since the pool has not yet been assigned to a user.

3.1.6 Assigning the pool to a user

► In the pools table, click on the pool which you have just created. The **Pool** window with the newly created pool is displayed in the browser.



This window displays the users who are permitted to access the new pool. Currently no user is assigned to this pool. A list displays all the users who are permitted to work with WebTransactions on this host.

► Click on an entry in this list to select the user you have just created, and then click on the **Add** button. The selected user is entered as possessing access to this pool.

3.2 Connecting a host application to the WWW

Once you have performed the preparations for your work with WebTransactions and WebLab, you can use WebTransactions development environment - WebLab - to connect the host application to the WWW. To do this, you must perform the following steps:

1. Create the project
   - Create a base directory
   - Generate an automask
2. Save the project
3. Start a session

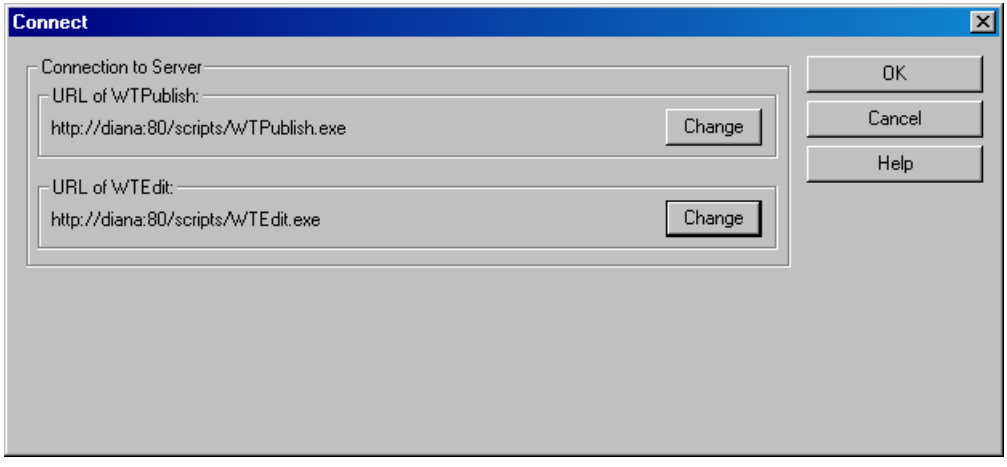
3.2.1 Creating a project

The project stores the most important data that is required by WebLab to generate and edit a WebTransactions application, e.g. the WebTransactions server data.

- ► To create a project, choose the **Project/New...** command.
- ► In the next dialog box, you are asked whether you want to generate a base directory. Click **Yes**. This opens the **Connect** dialog box, see next section.

3.2.1.1 Creating a base directory

The base directory is the fundamental requirement for connecting a host application to the web using WebTransactions. This directory contains all the necessary files and links to the programs that constitute a WebTransactions application.

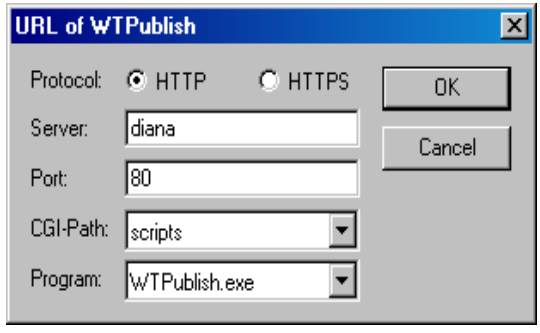


The base directory must always be located on the host on which WebTransactions is running. In the **Connect** dialog box, you enter this WebTransactions server and the paths to the CGI programs `WTPublish.exe` and `WTEdit.exe`.

– `WTEdit.exe` receives all WebLab requests. It performs all the necessary tasks on behalf of WebLab (which may be running on a different host) on the WebTransactions server (e.g. creation of a base directory) and enables WebLab to access running WebTransactions sessions.

– `WTPublish.exe` receives all requests from the browser. It starts new WebTransactions sessions or establishes connections to an open session for each subsequent dialog step.

► Under **Connection to server** - **URL of WTPublish**, click **Change**.
The **URL of WTPublish** dialog box will be displayed.



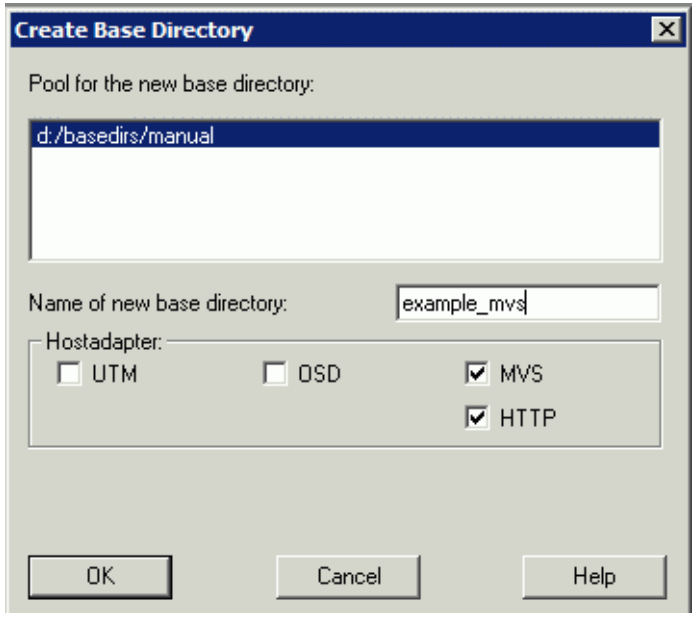
- Select the **Protocol** to be used for the connection; in our example this is **HTTP**.
- In the **Server** field, enter the name of the host on which WebTransactions is running; in our example this is *diana*.
- In the **Port** field, enter the corresponding port number; in our example this is *80*.
- Enter the path for the CGI program WTPublish; in our example this is *scripts*.
- Enter the name of the CGI program, in our example *WTPublish.exe*, and then confirm with **OK**. These values will now be taken over by the **Connect** dialog box.
- Repeat this procedure for the entries under **URL of WTEdit**. Once again enter the values for your host; in our example these are:

Server	*diana*
Port	*80*
CGI Path	*scripts*
Program	*WTEdit.exe*

- When you have finished, in the **Connect** dialog box, click **OK**. The connection to the WebTransactions host computer will now be established with the values entered.

  However, you must first log on to WebTransactions. The **Name and Password** dialog box is opened to allow you to do this.

- Enter the user name and password that you specified in section “Creating users” on page 30.
- Click on **OK** to confirm. The **Create Base Directory** dialog box is displayed on the screen.

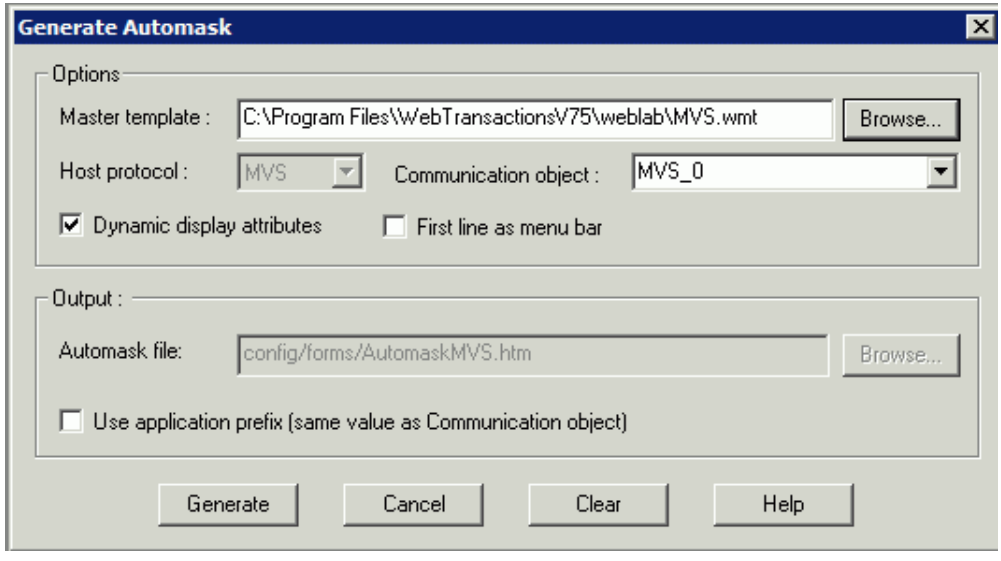


The upper list of this dialog box displays the pools under which the logged on user is able to create base directories on the WebTransactions server.

- In the list, click on the pool which you created in section “Creating a pool” on page 31.
- Enter a name in the **Name of new Base Directory** input field, here *example_mvs*.
- Next select the host adapter via which WebTransactions communicates with the host application, here *MVS*. Only those host adapters that are actually installed are displayed. The host adapter for HTTP is preset by default.
- Confirm your entries with **OK**. The **Generate Automask** dialog box is displayed, see next section.

3.2.1.2 Generating the automask template

The automask template is the template via which the automatic conversion between the host formats and the browser display is performed.



The options in the **Generate Automask** dialog box allow you to make more detailed specifications concerning the generation of the template and its subsequent implementation. The options are described in the online help.

- Enter a name for the communication object, here *MVS_0*. If you do not enter anything here, the default setting `MVS_0` is used. If you want to open multiple connections during a session, then it is useful to give the communication object an individualized name. You must also specify the name of the communication object in the start template.

  Please note that the system differentiates between uppercase and lowercase.

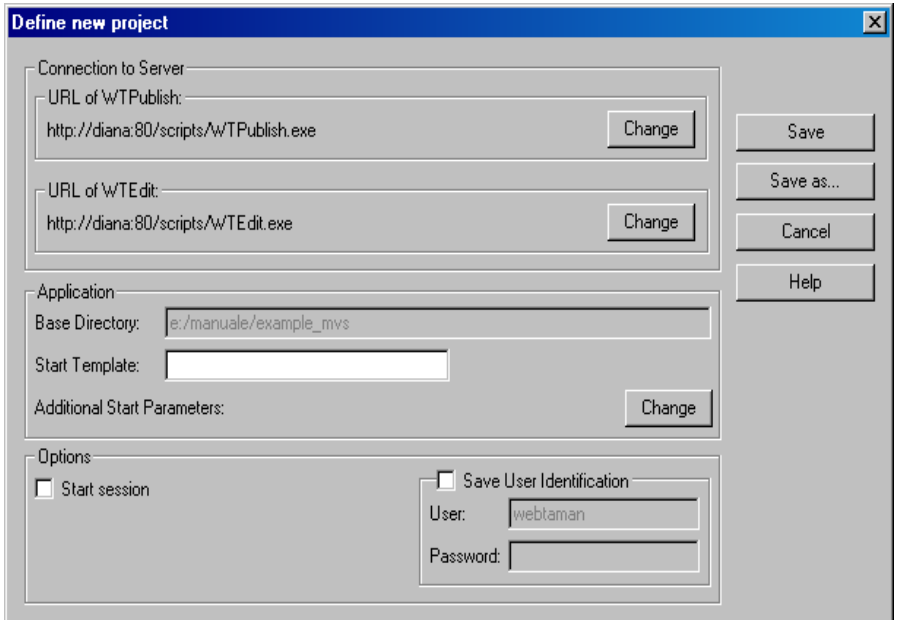
- In this example, you confirm all further settings by clicking on **Generate**. The dialog box is closed and the base directory and automask are generated using the specified values at the WebTransactions server. In the WebLab main window, a message window is opened below the work area. This displays the progress of the operation.

  The **Define New Project** dialog box is now opened, see next section.

A start template that takes the user directly to the first format in the host application will be created at the end of the example session (see section “Creating the start template” on page 60).

3.2.2 Saving the project

You define the settings for the newly created project in the **Define New Project** dialog box.



- In this example, you should accept all the default settings and save the project with **Save as...**

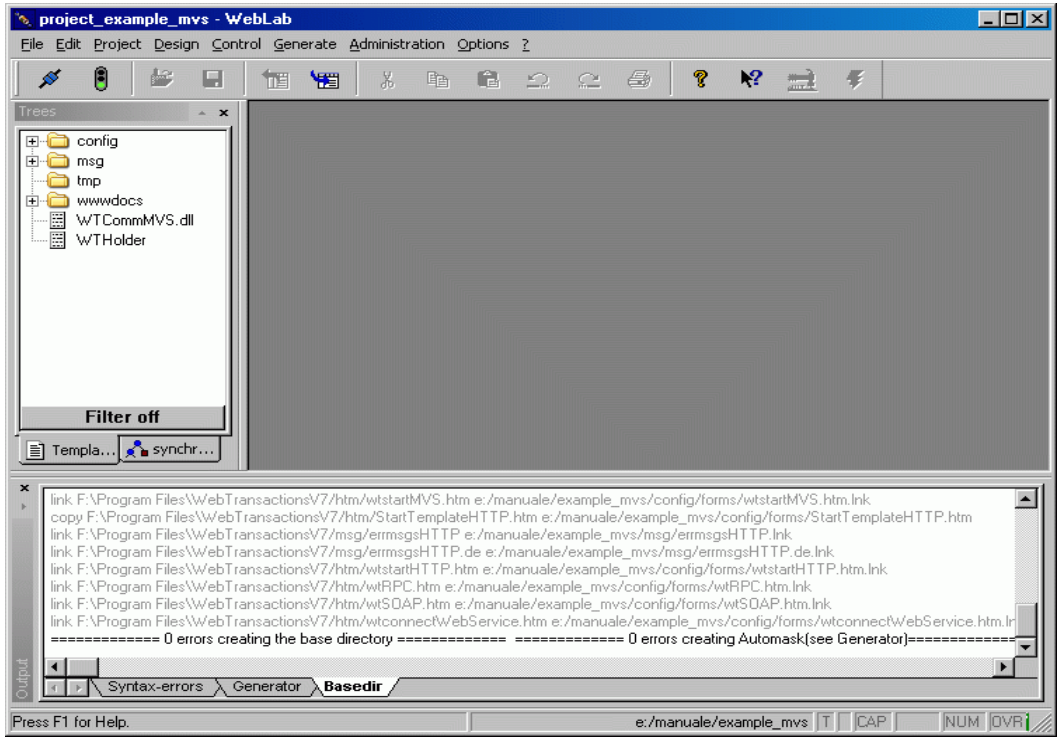
  This opens the **Save As** dialog box.

- In this dialog box you select the directory in which you want to save the project and enter a name for the project file.

- Click on **Save**.

  The project file is created with the suffix `.wtp` in the selected directory. The name of the project file is displayed in the WebLab title bar.

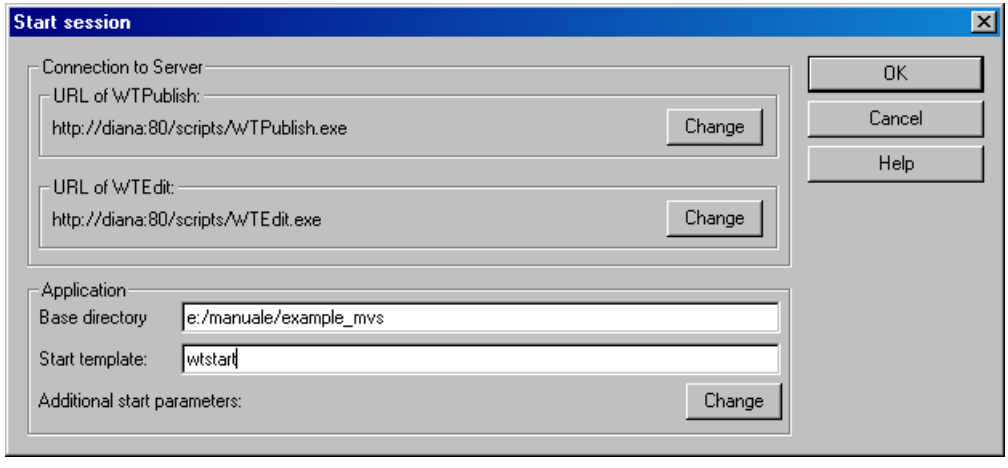
  You are then connected with your new base directory. For an overview of the created directories, see the WebTransactions manual “Concepts and Functions”.



3.2.3 Starting a session

Once you have created the base directory, you can start a session to the host application.

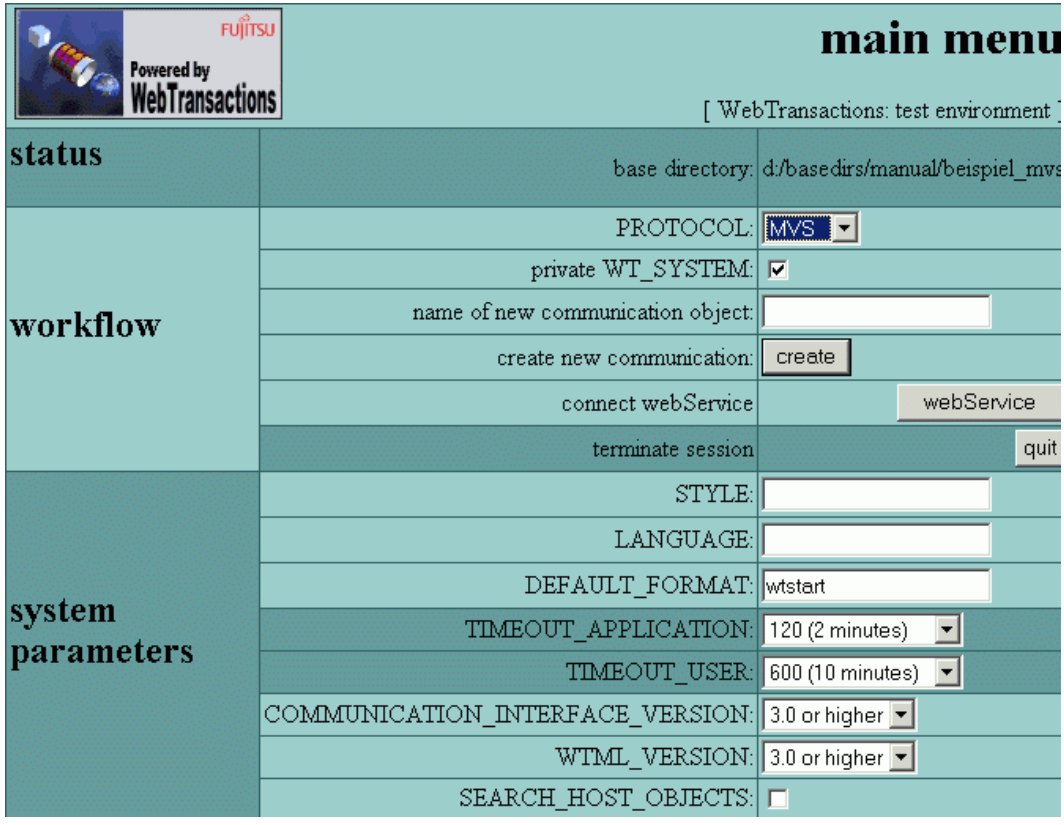
► Choose the **File/Start Session** command. The **Session** dialog box is displayed on the screen.



In this dialog box the connection data such as the web server name, CGI program path and the base directory name have already been taken over from the project settings. You just need to specify the name of the start template with which the host application is to be started.

► Enter the name of a start template in the **Start Template** dialog box, here `wtstart`. `wtstart.htm` is a supplied start template which is copied into the base directory and can be used for all host applications.

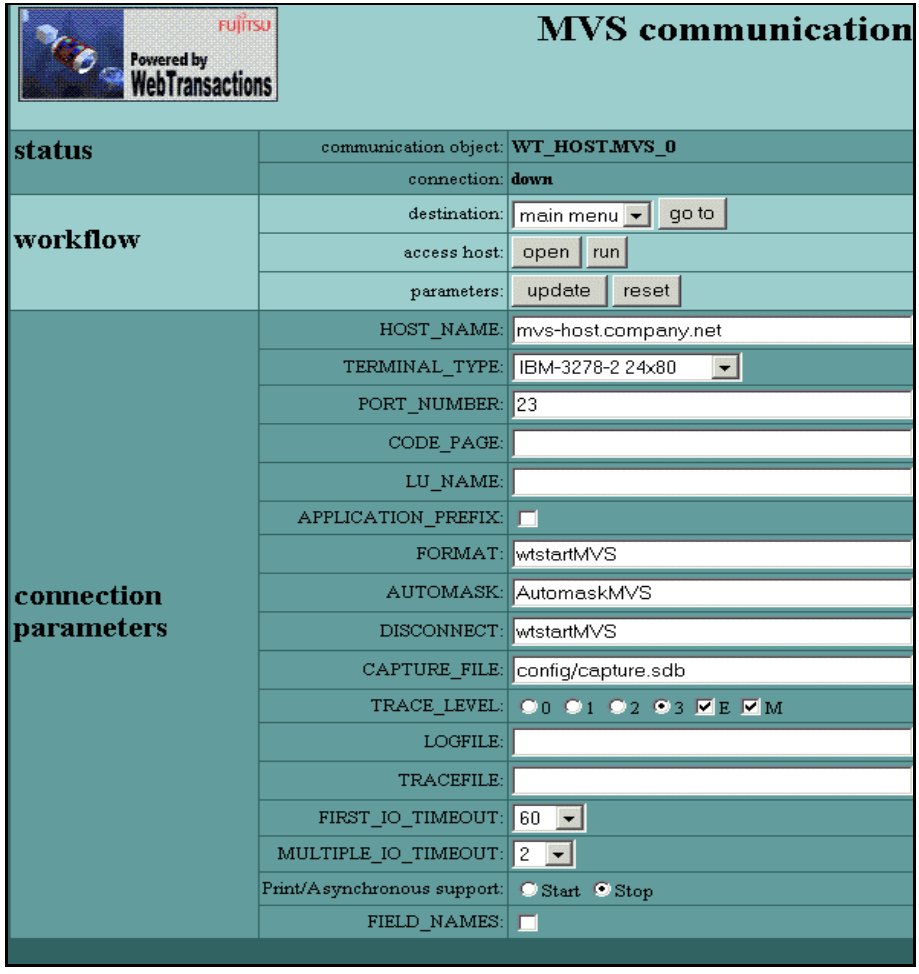
► Click on **OK** to start the session. The dialog box is closed. The set browser is opened and the general start template `wtstart` is displayed and calls for a new WebTransactions session with the start template `wtstart`. `wtstart` displays a form in the browser window.



In this form of the general start template, you can now enter the connection parameters for WebTransactions in order to set up a new communication object.

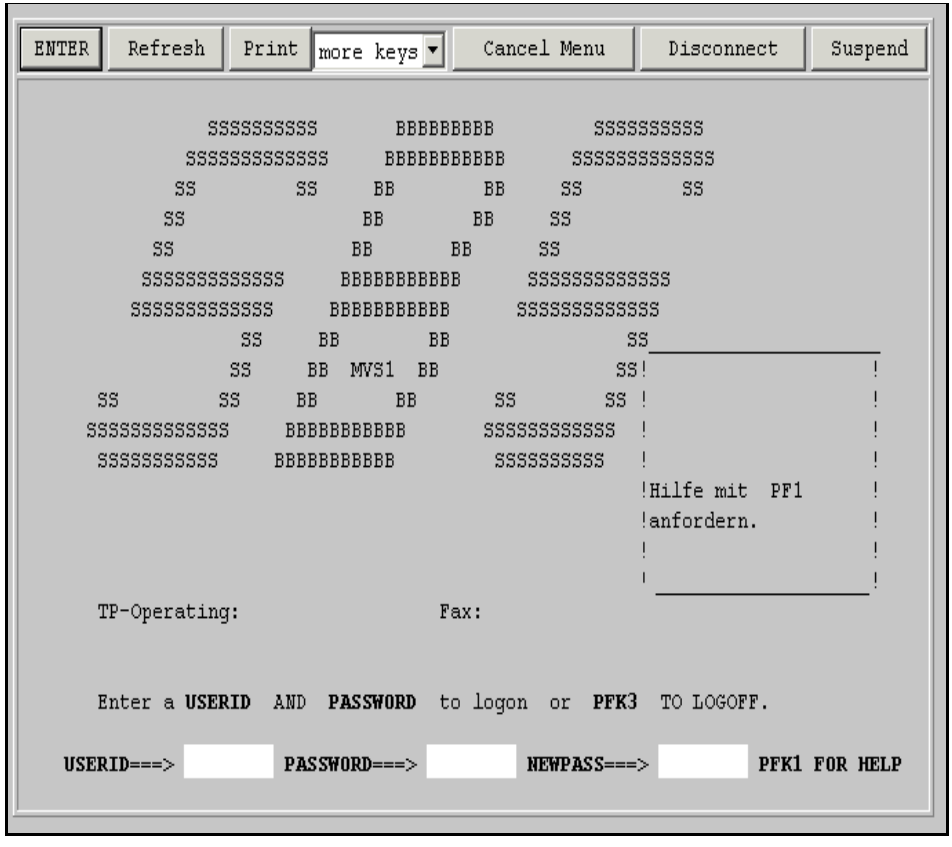
- Select the **MVS** entry in the **PROTOCOL** pick list.
- Specify the name of the communication object, here *MVS_0*. The name of the communication object must correspond to the name which you used when generating the automask template.
- Now click on the **create** button to create a new communication object. Your specifications are processed by WebTransactions and the MVS-specific start template `wtstartMVS.htm` continues checking and displays the next form.

The MVS-specific start template contains the parameter **HOST_NAME** for the connection with the host application.



With `wtstartMVS` you set the connection parameters and open the connection to the host application, in the same way as if you were connecting to the host application from a terminal or an emulation.

- For **HOST_NAME** enter the name or the IP adress of the host system.
- Now click on the **run** button to open the connection to the host application. The first screen of the MVS application is output with `AutomaskMVS.htm`.

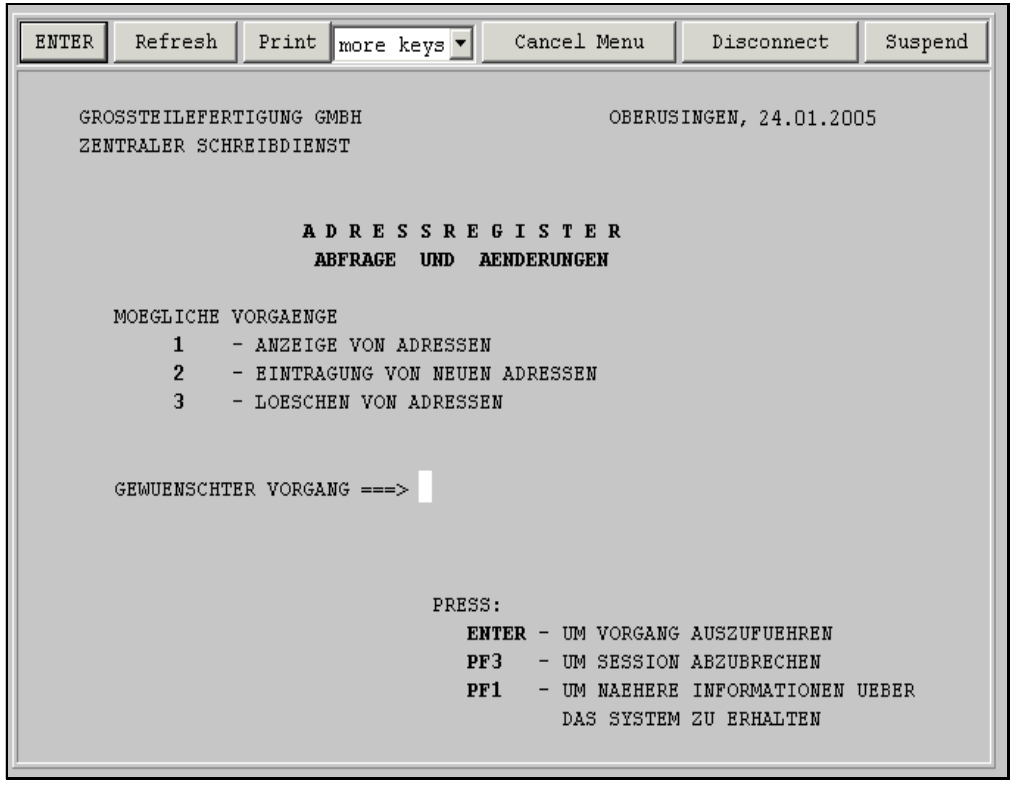


The `AutomaskMVS.htm` template provides you with a button bar for communications with the MVS application. This button bar replicates the special keys of the 3270 terminal (see section “Creating variants of AutomaskMVS.htm” on page 72).

If you now want to terminate the connection to the host, click on the **Disconnect** button. Processing again branches to the template `wtstartMVS` (see also.section “MVS-specific start template in the start template set (wtstartMVS.htm)” on page 140). Select **main menu** and click on the **go to** button to return to the general start template. You can now select **quit** to exit the WebTransactions application.

In the example session you proceed as follows:

- Enter your ID and password to log on to the *adtr* host application.
- Start the *adtr* host application with **Enter**. The next format of the *adtr* host application is displayed in the browser.



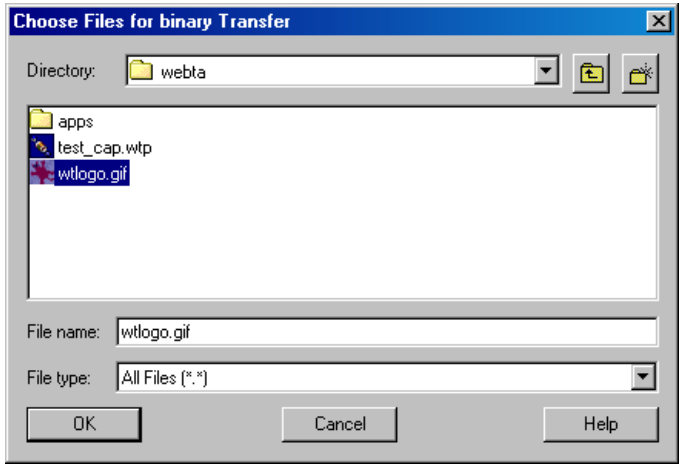
3.3 Global modification of display

As an example of a global change, a company logo is to be integrated in `AutomaskMVS.htm`. To do this, you must first transfer the logo to a directory that can be accessed by the web server. You can use the directory `wwwdocs/image` in the base directory to do this.

Performing binary image transfers

Proceed as follows in WebLab to transfer the company logo to the directory `wwwdocs/image` in the base directory:

- Choose the **File/Transfer Binary command.** The **Choose Files for binary Transfer** dialog box is now displayed.

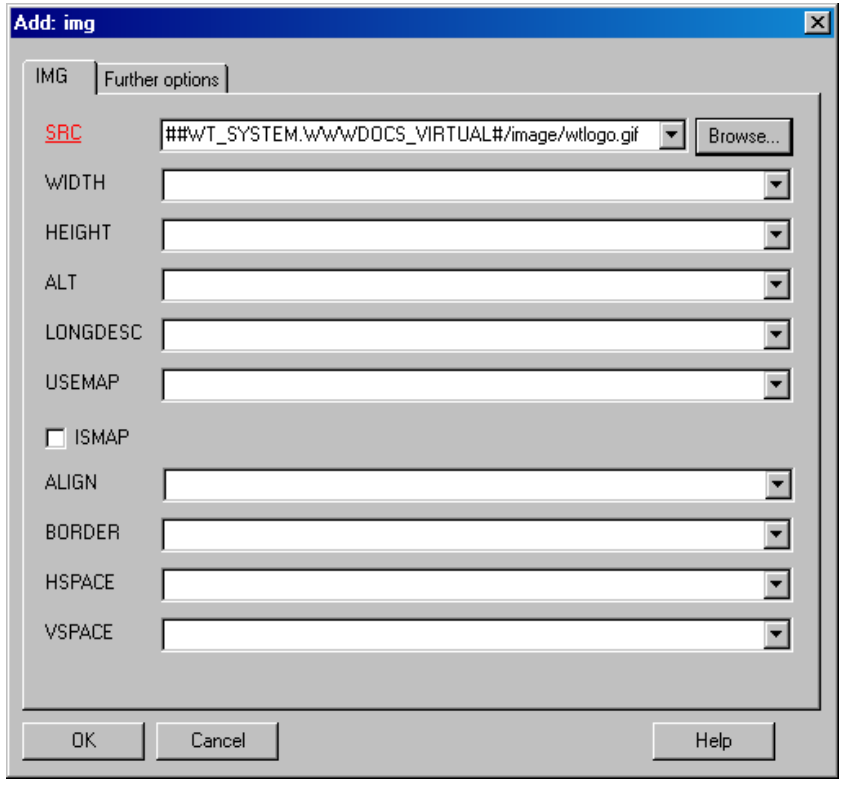


- In this dialog box, you must select the directory in which the company logo is stored and then click **OK** to confirm. The **Choose destination directory** dialog box is now displayed.
- In this dialog box, select the directory `wwwdocs/image` in the base directory of your WebTransactions application and then click **OK** to confirm. The company logo is transferred to the base directory. This directory is physically created under the web server's document directory.

Inserting the logo in the Automask template

In this example, the WebTransactions logo is to be inserted as a global change.

- To do this, choose the **File/Open Current Template** command**.**
  - This loads the template `AutomaskMVS.htm` in the WebLab work area. This template outputs the current format of the host application
  - This also updates the corresponding object tree with all the current variables in the WebLab object window.
- Now scroll through the template until you reach the BODY tag.
- Insert an empty line after the BODY tag and choose the **Add/HTML/image** command. The **Add:img** dialog box is now displayed.



In this dialog box you can specify the image file and other parameters for the display and orientation of the image. The path for the image file must be relative to the web server's document directory since the web server only searches this directory for images. By transferring the image to `wwwdocs/image`, you ensure that this is the case.

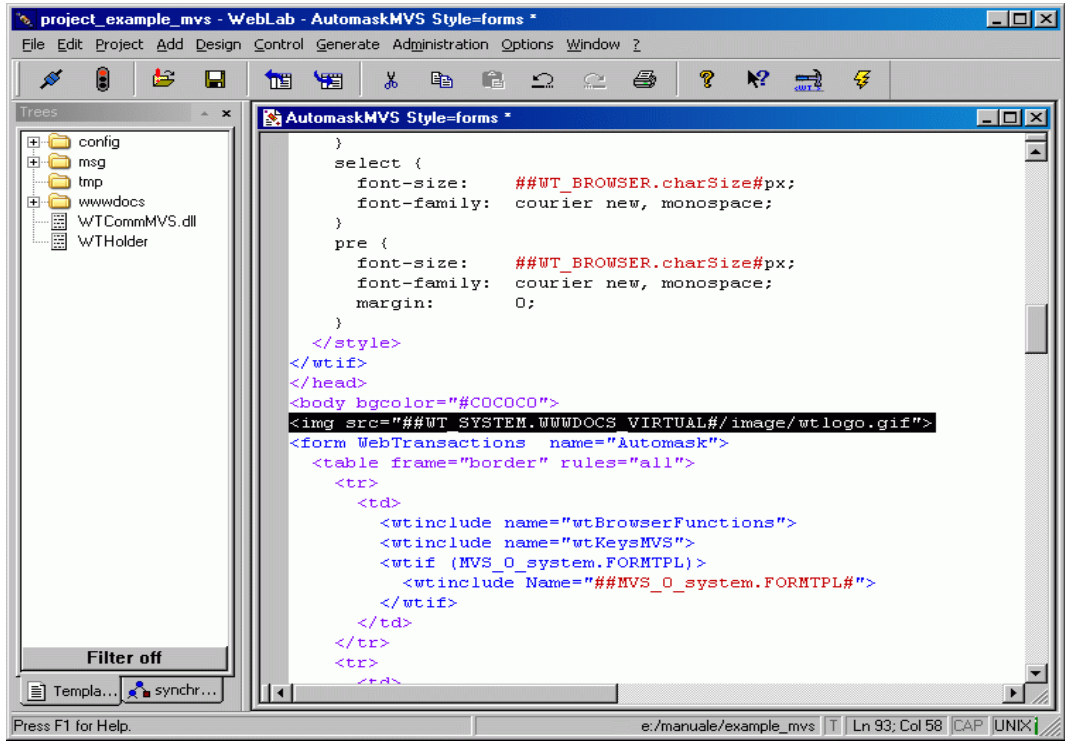
You can use the system object attribute `WWWDOCS_VIRTUAL` to access the image without having to specify a long path name. `WWWDOCS_VIRTUAL` already contains the full path from the web server's document directory through to the `wwwdocs` directory in the base directory.

- Use **Browse** to search for the image file. If it is situated in `wwwdocs`, WebLab will automatically use `VIRTUAL`and the name will be created as follows:

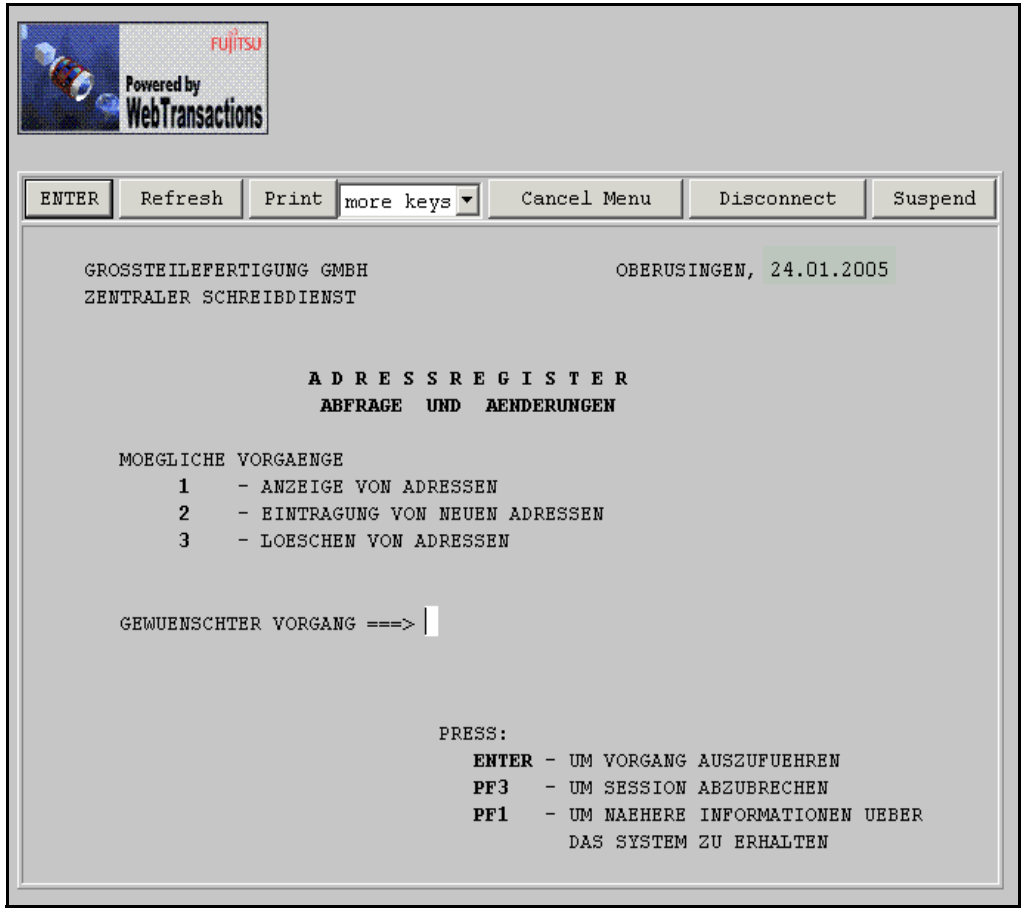
  `##WT_SYSTEM.WWWDOCS_VIRTUAL#/image/wtlogo.gif`

- Click **OK** to confirm. WebLab inserts the following line in the Automask template after the BODY tag:

  `<img src="##WT_SYSTEM.WWWDOCS_VIRTUAL#/image/wtlogo.gif">`



► To view the changes, choose the **Control/Update in Browser** command. The changed display in the Automask template is output in the browser window. If you save the modified Automask template then this change applies to all subsequent forms since the Automask template determines the automatic conversion for all forms.

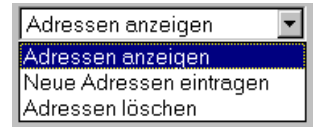


3.4 Format-specific modifications of display

As you have seen, changes in the Automask template affect the display of all the formats in the browser. However, if you want to restrict a browser display modification to a single format, you need a so-called format-specific template. This requires you to perform the following steps:

1. Use the capture process to generate the format-specific template
2. Edit the format-specific template

As an example of an individual format design, consider a value-based selection (the user makes his or her choice by entering a number) mapped to a drop-down list as illustrated in the table below:

Before	**After**
MOEGLICHE VORGAENGE 1 - ANZEIGE VON ADRESSEN 2 - EINTRAGUNG VON NEUEN ADRESSEN 3 - LOESCHEN VON ADRESSEN	

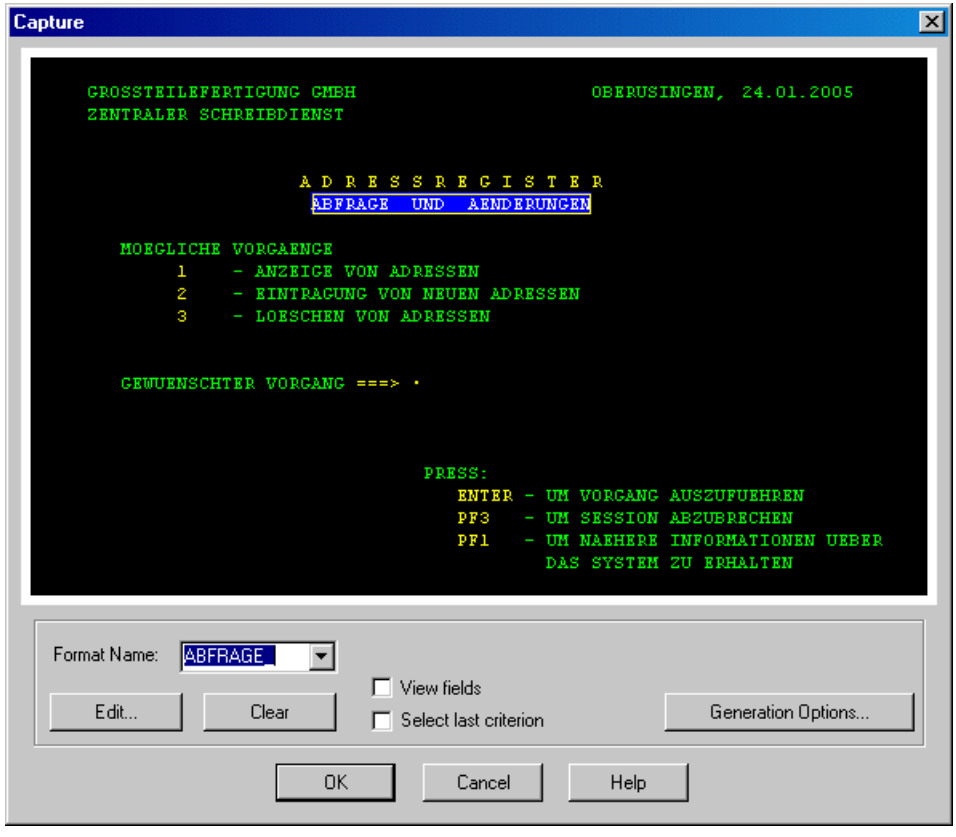
3.4.1 Generating a format-specific template with the capture process

To create individual templates for the formats of the host application, you use capturing in WebLab. This interactive process allows you to create recognition criteria for individual screen formats, i.e. patterns for the recognition of known formats.

► Choose the **Generate/Capture/from current screen** command.

In the start template `wtstartMVS.htm` for the communication-specific system object attribute `CAPTURE_FILE` the pathname `config/capture.sdb` is entered as default (see section “Starting a session” on page 42). The default is also used in the example. The capture database is set up at the first access. This stores all the recognition criteria that you create using the Capture process.

The **Capture** dialog box is opened on the screen and contains a display of the current format.



- Use the mouse to drag a rectangle over the indicated section *ABFRAGE UND ÄNDERUNGEN*. This specifies that this format is identified through the presence of *ABFRAGE* at this position in the format.
- Click on **OK** to start generation. The recognition criterium that you have selected in this way is saved together with the format name in the capture database and the format-specific template *ABFRAGE_* is created. Instead of the Automask template, the format-specific template is now used to display the format.

Generated template

The text below displays the section from the generated template *ABFRAGE_*.htm which depicts the formats of the fields. For the structure of a complete template, see section "Structure of AutomaskMVS.htm" on page 75.

The generated template *ABFRAGE_*.htm was generated with the following generation options: **Generation method: Inline script**, **Display attributes: None**.

```
        <!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - -  -->
       <!-- begin of host screen section
-->
        <!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - -  -->
<div style="color:##MVS_0.WT_Color.Default = "\#000000"#"><pre>\
```

In the capture procedure, a host object is assigned to every field in a format. The individual host objects are output on the screen one after the other. In the case of output fields, the evaluation operator *##objectname*.HTMLValue# ensures that the contents are displayed on the screen. To simplify orientation within the template, the contents at the time of capture are saved in a comment ahead of the evaluation operator.

```
<span class="screenline" id="SL1"><wtrem **   **>\
##MVS_0.E_01_001_001.HTMLValue#\
<wtrem **
**>\
##MVS_0.E_01_002_079.HTMLValue#</span>
<span class="screenline" id="SL2"><wtrem **      **>\
##MVS_0.E_02_001_004.HTMLValue#\
<wtrem **   **>\
##MVS_0.E_02_005_001.HTMLValue#\
<wtrem ** GROSSTEILEFERTIGUNG GMBH                    **>\
##MVS_0.E_02_006_044.HTMLValue#\
<wtrem **   **>\
##MVS_0.E_02_050_001.HTMLValue#\
<wtrem ** OBERUSINGEN, **>\
##MVS_0.E_02_051_012.HTMLValue#\
...
<wtrem ** GEWUENSCHTER VORGANG **>\
##MVS_0.E_15_009_020.HTMLValue#\
<wtrem **   **>\
##MVS_0.E_15_029_001.HTMLValue#\
<wtrem ** ===&#62; **>\
##MVS_0.E_15_030_004.HTMLValue#\
<wtrem **   **>\
##MVS_0.E_15_034_001.HTMLValue#\
```

The format's input fields are represented by input tags of type `text` if the original field was unprotected. If the original field was protected (input is invisible), then the tag is of type `password`. The specification `value="##`*object-name*`.Value#"` ensures that the value from the field in the format is entered in the input field.

```
<input type="##(MVS_0.E_15_035_001.Visible == 'No') ? 'password' : 'text'#"
##( WT_BROWSER.acceptClass ) ? 'class="box" style="width:9px"' : ''#
name="E_15_035_001" size="1" maxlength="1"
value="##MVS_0.E_15_035_001.Value#"/>\
<wtrem **   **>\
...
<wtrem ** - UM NAEHERE INFORMATIONEN UEBER     **>\
##MVS_0.E_22_045_036.HTMLValue#</span>
<span class="screenline" id="SL23"><wtrem **
**>\
##MVS_0.E_23_001_045.HTMLValue#\
<wtrem **   **>\
##MVS_0.E_23_046_001.HTMLValue#\
<wtrem ** DAS SYSTEM ZU ERHALTEN             **>\
##MVS_0.E_23_047_034.HTMLValue#</span>
<span class="screenline" id="SL24"><wtrem **
**>\
##MVS_0.E_24_001_080.HTMLValue#</span>
```

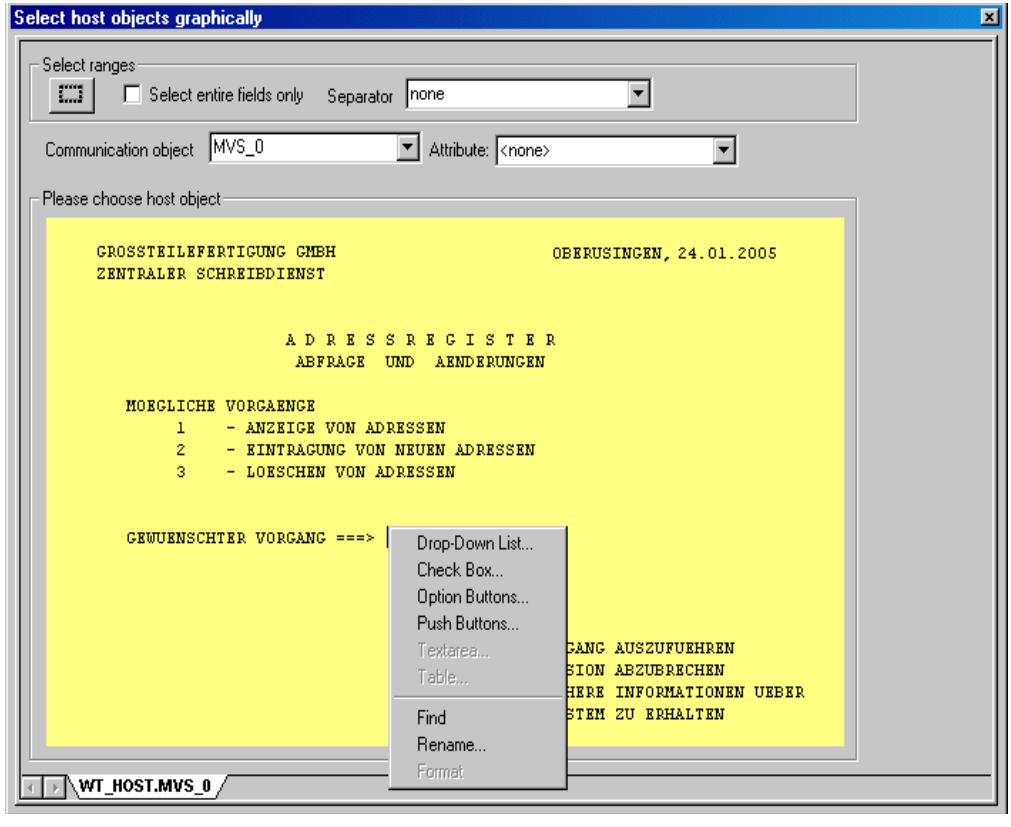
All the input fields are administered in an object.

```
<wtoncreatescript>
<!--
  wtInputFields = {E_15_035_001:MVS_0.E_15_035_001};
//-->
</wtoncreatescript></pre></div>
        <!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - -  -->
       <!-- end of host screen section
-->
        <!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - -  -->
</td>
```

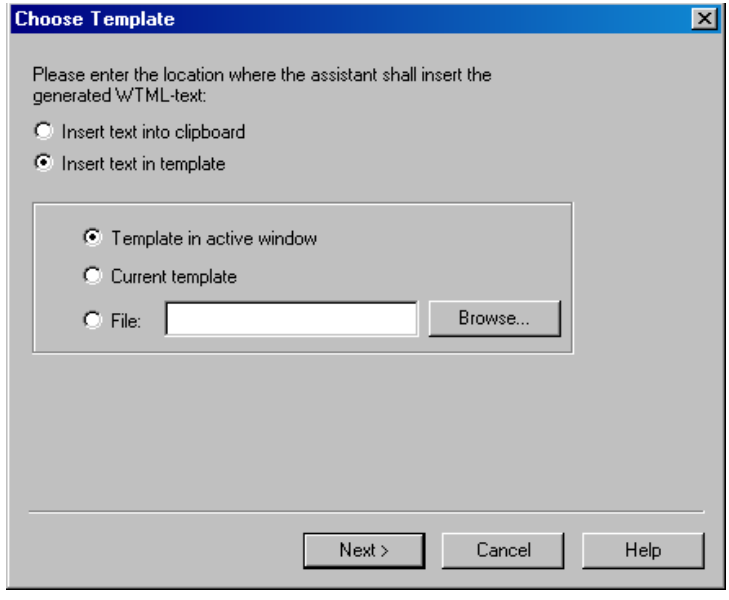
3.4.2 Editing a format-specific template

- Choose the command **File/Open Current Template** to open the format-specific template *ABFRAGE_* in the WebLab work area.
- Choose the command **Design/Select Hostobjects graphically/From a Communication Object**. The dialogbox **Select host objects graphically** for the current template is displayed on the screen.

  This dialogbox displays the format as it would appear in an emulation or at a terminal. All the output fields which cannot be edited have a yellow background. The single input field in this format has a white background.
- Move the mouse pointer to this input field (because of the selection the field becomes blue) and click on the right mouse button to open the context menu.

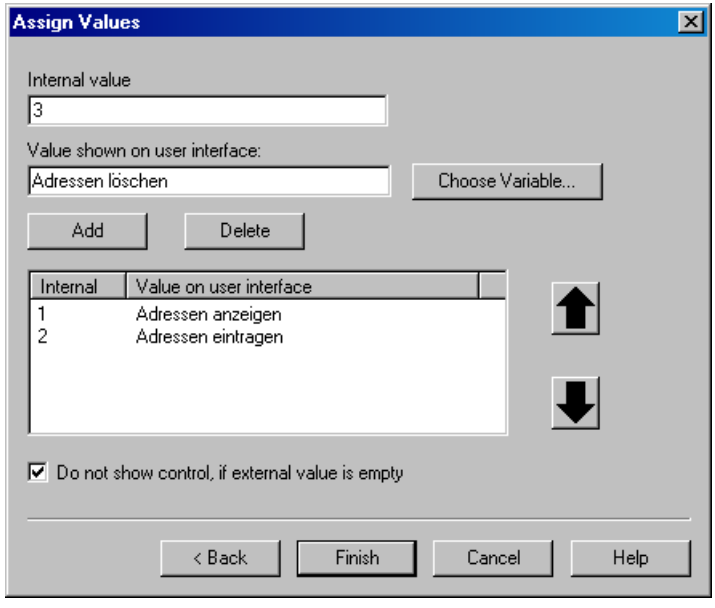


► Choose the **Drop-Down List** command from the context menu. The **Choose Template** dialog box is displayed on the screen. This dialog box is the first displayed by a wizard which helps you create a list.



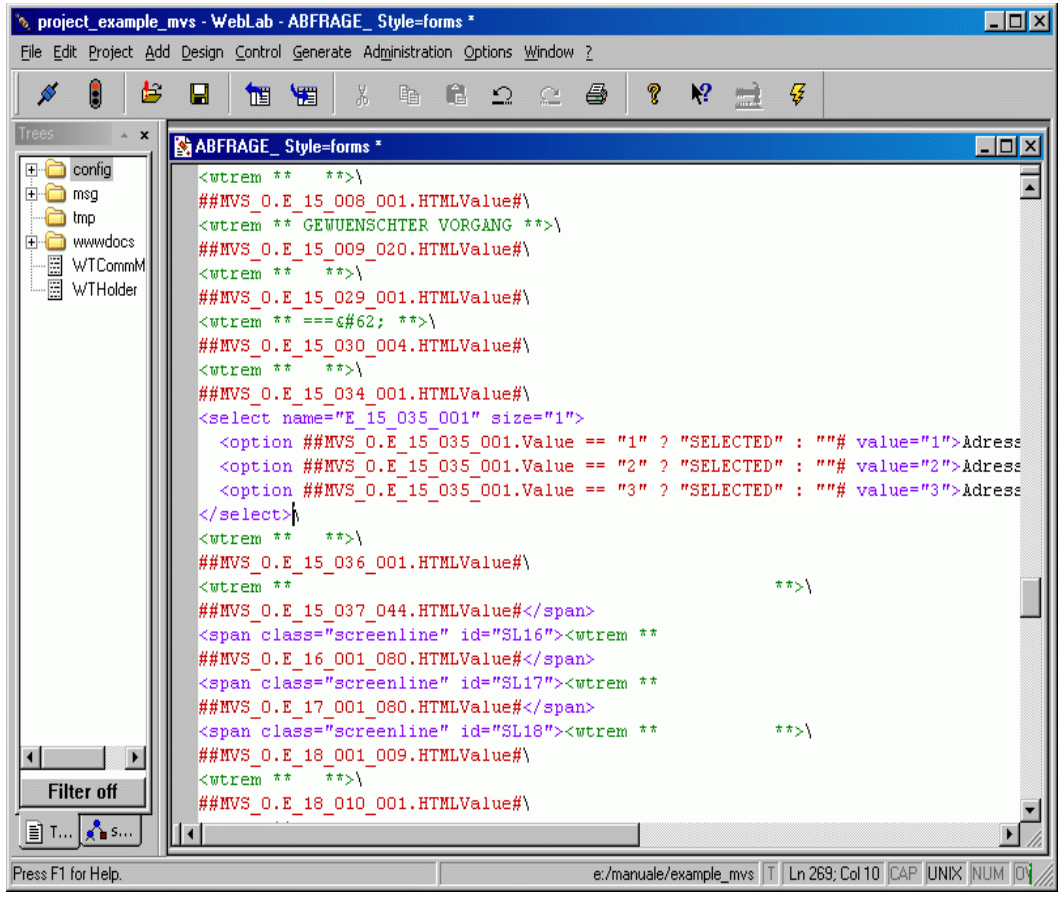
In this dialog box you specify the template in which the list is to be inserted. The option **Template in Active Window** is preset. If you have nor previously opened the active template, select the **Current Template** option.

► Click on **Next** to confirm this presetting. The second dialog box, **Assign Values**, is displayed on the screen.



In this example, the **Internal Value** corresponds to the numerical value which the user must enter to select an item in the field. The **Value on user interface** is the description matching the value and corresponds to an entry in the pick list.

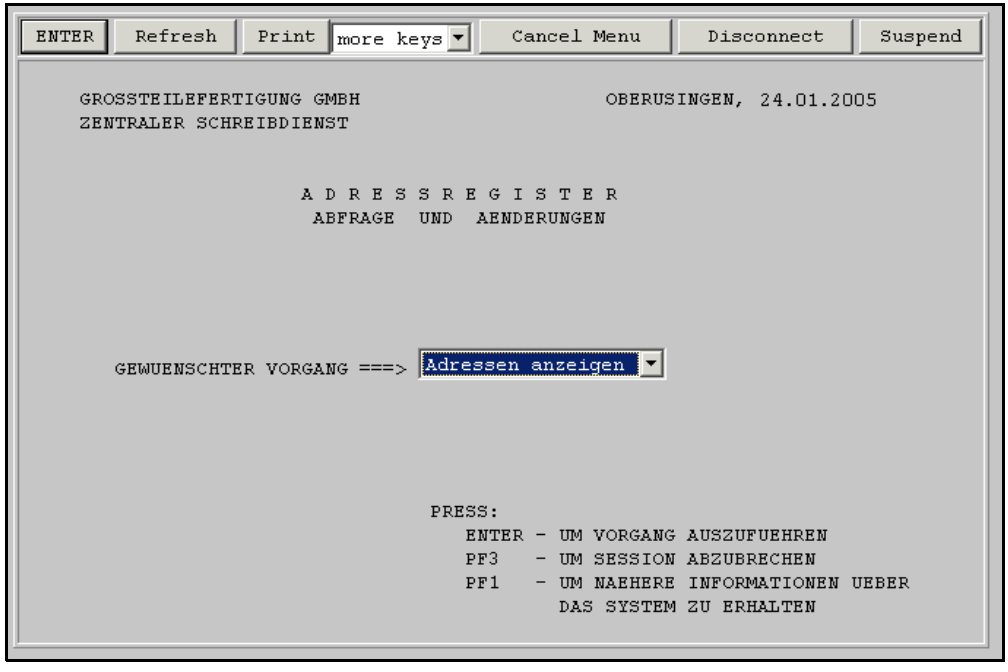
- Enter the internal values and the corresponding descriptions (see figure on page 50) in the input fields. Click on the **Add** button to take over a pair of values into the list.
- When the list is complete, click on **Finish** to confirm. The corresponding HTML code for the conversion of a list is entered along with the corresponding values in the template *ABFRAGE_*.htm.
- To view this replacement, scroll through the template *ABFRAGE_*.htm until you reach the host section. This section starts with the comment `begin of host screen section`.



The format-specific template is constructed in a similar way to the Automask template. All the fields of the host format are listed by name in the host section, with each name consisting of the line and column position. The uppermost fields are used to depict the header; the new list (SELECT tag) corresponds to the old input field and accepts the selected value. The other fields are responsible for the remainder of the display as you see it in the browser or the graphical host object selection.

Since the selection is now performed via the list, the explanatory texts in front of the list are no longer required. Consequently you can delete them from the template *ABFRAGE*`.htm`.

- ► Delete all the fields in the form from the title to the list. You can use the **Find** command in the context menu of the dialogbox **Select host objects graphically** to search for the relevant fields in the template.
- ► Choose the command **Control/Update in Browser** to view the result of your change.



If you now want to terminate the connection to the host, click the **Disconnect** button. Processing branches to the template `wtstartMVS.htm` (see section “MVS-specific start template in the start template set (wtstartMVS.htm)” on page 140). You can choose **main menu** and click on the **go to** button to return to the start template. Here you can click on **Quit** to exit the WebTransactions application.

3.5 Starting a WebTransactions application

You start an edited WebTransactions application in WebLab in the same way as an automatic 1:1 conversion (see section “Starting a session” on page 42). The only difference is: You must make sure that in the start template `wtstartMVS.htm` the path name of the capture database (in this example: `config/capture.sdb`) is entered correctly in the **CAPTURE_FILE** parameter.

However, you can also create your own start template for the integrated host application which will take the user directly to the first format of the host application.

3.5.1 Creating the start template

WebLab provides you with a special WTBean for creating the application-specific start template. This is a standalone WTBean.

Before you can access WTBeans, there must be a connection to the WebTransactions server.

- Choose the **File/New/wtcStartMVS** command to call the WTBean. This opens the dialog box **Add:wtcStartMVS** which contains four tabs in which you can edit the properties of the WTBean.

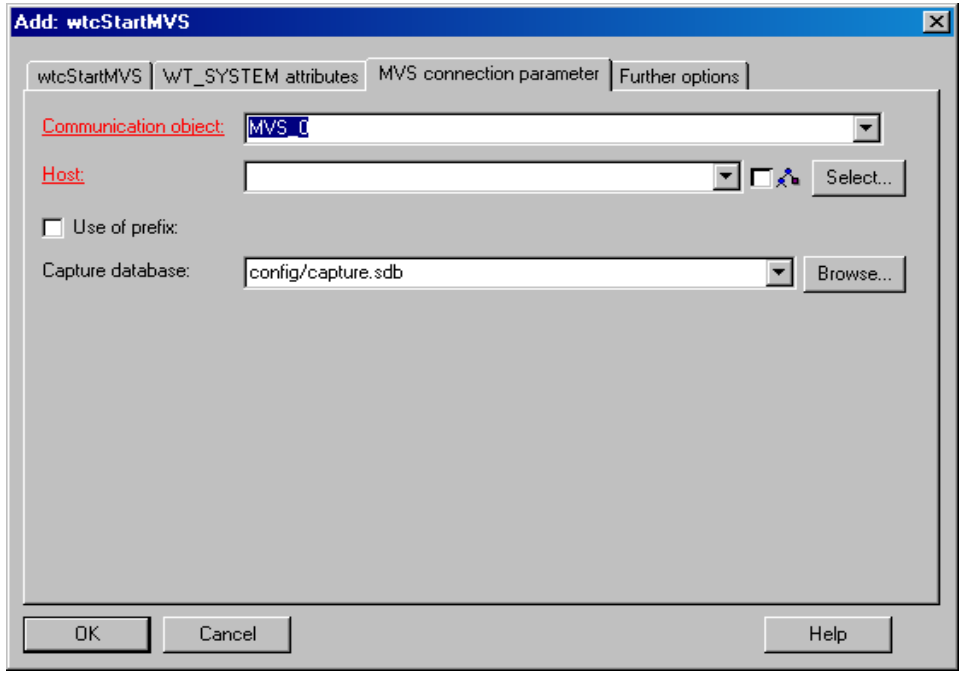
  You define the name and directory of the start template in the **wtcStartMVS** tab. By default, the file name is set to `config/forms/startMVS.htm`.

- Under **File name**,enter the directory and name of the start template, in this case *config/forms/Start_adtr.htm*.

- Next, choose the **WT_SYSTEM attributes** tab.

  In this tab you define the most important attributes of the system object. The default values are sufficient for the example session.

- Choose the **MVS connection parameter** tab.



The most important settings are the name of the communication object, the host application, the host computer and the capture data base.

- Enter the name of the communication object, in this case *MVS_0*

  You should note that the name of the communication object must be the same as the name used in the Automask template.

- Enter the name or the IP adress of the host system.
- Enter the name of the capture database, in this case `config/capture.sdb`. If you click **Browse** you can also perform an interactive search of the capture database in the file selection box.
- Click on the **Further options** tab.

  Here you will see a tree structure in which you can edit other properties relating to the connection to the MVS application.

- Set the properties required for your host application. No further modifications are required for the sample application.

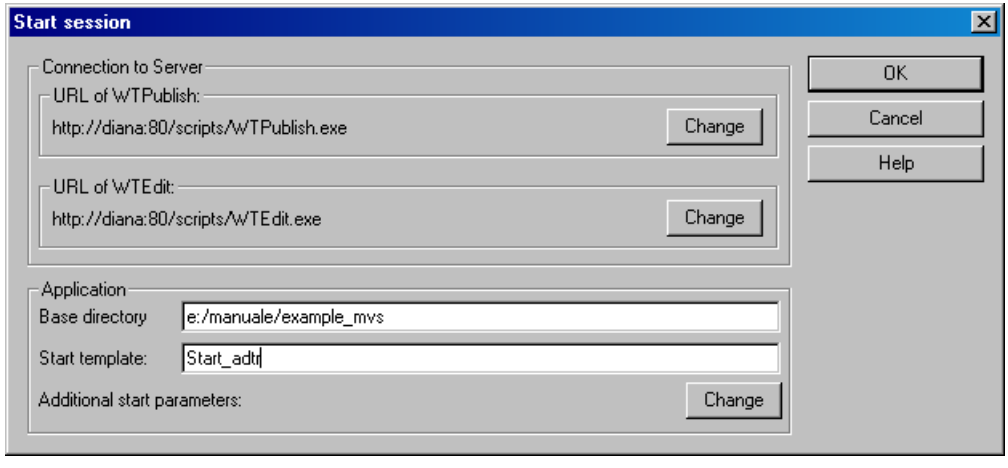
► Click **OK**. The **Add:wtcStartMVS** dialog box is closed. The start template *Start_adtr.htm* is generated and displayed in the WebLab work area. The start template is stored in the base directory under `config/forms`.

The start template *Start_adtr.htm* will now make the settings undertaken here every time it is called. You no longer have to make these settings every time you start a session as described in section “Starting a session” on page 42 with `wtstart.htm` and `wtstartMVS.htm`.

3.5.2 Starting a session with WebLab

There are two ways of starting a WebTransactions session with the application-specific WebLab start template:

– You select the **File/Start Session** command. In this case the **Start session** dialog box will be displayed.



► In the **Start Template** input field, enter the name of the application-specific start template.

► Confirm with **OK**.

– In the template tree you click with the right mouse button on the application-specific start template. In the context menu which appears, select the command **Start session**.

In both cases WebLab immediately starts the session with the template selected as the start template.

3.5.3 Alternative ways of starting a WebTransactions application

The above example only explains how to start a WebTransactions application from WebLab during development. In productive operation, however, there are other ways of doing this. For a complete description, see the WebTransactions manual “Concepts and Functions”.

- You can give the supplied entry page `wtadm.htm` the name of the start template and provide the user with this.
- You can write your own entry page in which WebTransactions is started via a form or link.

  Example

  ```
  <form method="post" action=
        "/cgi-prefix/WTPublish.exe/basedir?startTemplate">
      <input type="submit" value="Start WebTransactions">
  </form>
  ```

- You could also start WebTransactions without an entry page by simply entering the URL directly:

  `http://`*WebServer*`/`*cgi-prefix*`/WTPublish.exe/`*basedir*`?`*startTemplate*

For *basedir* you must specify the absolute path of the base directory.

Example

```
http://diana/scripts/WTPublish.exe/d:\webta\apps\
beispiel_mvs?Start_adtr
```

4 Creating the base directory and starting the WebTransactions application

Once you have installed WebTransactions on the WebTransactions server and WebLab on your personal Windows computer, you can use WebLab to create one or more base directories. A base directory includes all the files which configure WebTransactions for a specific application scenario.

If you de-install WebTransactions or install a new product version, the individual configurations are retained.

4.1 Creating a base directory with WebLab

Before you can create a base directory for a WebTransactions application, the WebTransactions administrator must have created a user ID for you and then subsequently released one or more pools for this user ID in which you can create a base directory.

Before you create a base directory, it is recommended that you first create a project to store most important data required by WebLab when working with the WebTransactions application. When creating a project, you are automatically offered the opportunity to create a base directory.

To do this, proceed as follows:

- Call WebLab, e.g. via **Start/Programs/WebTransactions 7.5/WebLab**.

- There are two possibilities for starting to create a base directory:
  - Select the **Project/New...** command and when asked whether you want to create a base directory, answer **Yes** (see section “Creating a project” on page 34).

  or

  - Choose the **Generate/Basedir...** command and specify that a new project is to be created when the relevant query appears.

  In both instances, the **Connect** dialog box is opened.

- ► Enter the connection parameters in the **Connect** dialog box and click on **OK**.
- ► In the following dialog box, enter your user ID and password and click on **OK**.
- ► Enter the following in the **Create Base Directory** dialog box:
  - – from the list of proposed pools, select the pool in which the base directory is to be created
  - – enter the name of the new base directory
  - – check the **MVS** box in the **Host Adapter** section
  - – click on **OK**.
- ► Enter the required options in the **Generate Automask** dialog box. These correspond to the options for the generation of format-specific templates.
- ► Click on **Generate**. WebLab now creates the base directory together with all the files that are required for the execution of the WebTransactions application. The structure and contents of the base directory are described in the WebTransactions manual “Concepts and Functions”.

Converting a base directory to a new version

- ► Select **Generate/Update Base Directory**. This opens the **Update Base Directory** dialog box.
- ► If you only want to change the links from the base directory to the new installation directory, select the **Update all links** option. Select this option when you have updated the files that are supplied or generated by WebTransactions.
- ► If all files which are copied or generated on creation of the base directory need to be recreated, select the **Overwrite all files** option.

4.2 Starting the WebTransactions application

If you do not wish to customize the individual formats and wish only to use the dynamic host format conversion as described in chapter “Integrating a host application without editing” on page 69, no further steps are necessary at this point. When you have installed WebTransactions (see page 15) and created a base directory (see page 65), your WebTransactions application is ready to use. To start the application, you can use the start template set supplied with the product; this is described in the section “Start templates for MVS” on page 139 .

For productive operation, you should use the WTBean `wtcStartMVS.wtc` to create your own start template in WebLab.

5 Integrating a host application without editing

WebTransactions for MVS provides special templates for the dynamic conversion of 3270 formats at the Web browser interface. This allows you to adapt the Look & Feel of the host application so that it resembles normal operation on a real terminal or terminal emulation:

– `MVS.wmt/MVS_pocket.wmt`
  MVS-specific master templates for the general layout of the forms. These templates are used for the generation of the Automask template and the format-specific templates.

– `AutomaskMVS.htm`
  Conversion template for MVS host applications which is able to use a form to automatically convert all formats of an MVS application to an HTML page.

– `wtKeysMVS.htm`
  This template inserts controls that represent the special keys of the 3270 terminal. `wtKeysMVS.htm` is not used only during dynamic conversion. The format-specific templates generated using the capture process also use `wteysMVS.htm`.

– `wtBrowserFunctions.htm`
  This template is responsible for keyboard conversion at the browser so that users at the browser can edit the host application formats in just the same way as at an emulation or terminal.

With the exception of the master template, these conversion templates are generated automatically in the directory *basedir*`/config/forms` when the base directory is set up. Variants of the `AutomaskMVS.htm` template can also be created using WebLab (see page 72).

Global modifications, e.g. to suit the corporate identity, can be carried out in the `AutomaskMVS.htm` template. These are then applied automatically to all formats of the host application. Global modifications, that you carry out in the master template, get effective, as soon as you generate templates using this master template (automask or individual templates). The master template is stored in the `weblab` directory of the WebLab installation directory.

If application-specific changes are to be carried out in the master template, it makes sense to copy the master template from the WebLab computer to the base directory of the WebTransactions server and make the changes there in order to ensure that the master template is a component of the base directory.

5.1 Master templates MVS.wmt and MVS_Pocket.wmt

WebTransactions uses master templates as a model for the generation of the Automask and the format-specific templates. They therefore ensure a consistent layout. Like any other template, master templates can contain fixed HTML areas and any WTML tags and WTScripts. However, in master templates you can also use special master template tags, known as MT tags, which are described in the WebTransactions manual “Template Language”.

The use of master templates is especially effective in the case of applications in which large numbers of formats possess a similar structure: e.g. a fixed subdivision into header, workspace and footer or in cases where you have generated only selected, format-specific templates and have converted the less frequent formats using the Automask template.

In such cases, you simply need to define the structure of the master template and assign this master template as a model on the generation both of the format-specific templates and the Automask template. All the generated templates will then have the required structure.

WebTransactions for MVS is supplied with the standard master templates `MVS.wmt` and `MVS_Pocket.wmt`. You can customize these templates to your particular needs or use them unchanged. The standard master templates already contain all the WTML tags and WTScripts that are the same for all the templates of the product variant in question. It can, for example, contain the check on whether a private system object exists.

Via the WebLab graphic user interface, you can specify which master template is to be used for generation. You can define certain generation options (e.g. the generation method) both in the master template or directly in WebLab. The settings in WebLab override the corresponding settings in the master templates.

Using MVS.wmt or MVS_pocket.wmt

The `MVS_Pocket.wmt` master template has been developed specially for use with the Pocket Internet Explorer. You can use it to generate an Automask template (see section “AutomaskMVS.htm template” on page 72) and for format-specific templates (see section “Capturing with WebLab” on page 86).

`MVS_Pocket.wmt` has the following additional functions:

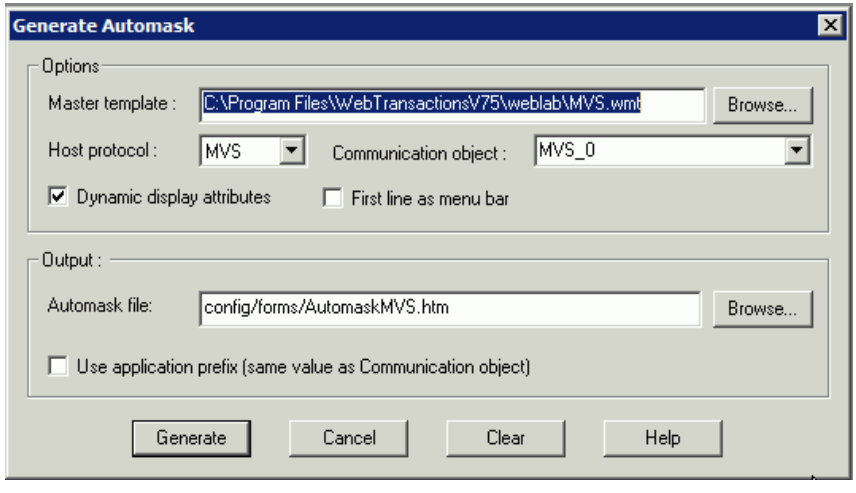
- It generates a frameset for the screen. It contains two frames, one for command inputting and another for the display.
- Only the field where the cursor is currently located can be invoked as the entry field.
- The lines on the screen are automatically made to fit the screen and are colored.
- Extra long outputs are automatically continued on the next page.
- The screen display can be edited during runtime:
  - To obtain a 01:01 representation, use the **Command**/**Screen** command.
  - To adapt the representation to the screen width, use the **Command**/**Compact** command. In this case, the parameters and the corresponding entry field are displayed on one line.

5.2 AutomaskMVS.htm template

The `AutomaskMVS.htm` template dynamically creates a representation of the last format received from the host with `receive`. It allows you to process any 3270 format without pre-editing, and is always used by WebTransactions if an individual template is not defined for the screen. It is possible to choose between different variants using the system object attribute `AUTOMASK`.

5.2.1 Creating variants of AutomaskMVS.htm

The `AutomaskMVS.htm` template is usually generated automatically when a base directory is created. However, WebLab also allows you to generate variants with different options which provide optimum support for the various designs of your WebTransactions application. To do this, choose the command **Generate/Automask**. The **Generate Automask** dialog box is displayed on the screen.



The parameters that you can set in this dialog box control how the Automask template is generated. The parameters have the following meanings:

Master Template
Specifies the master template that is to be used for generation of the Automask template, see also section “Master templates MVS.wmt and MVS_Pocket.wmt” on page 70. A master template is always required. The supplied master template `MVS.wmt` is used by default.

Host Protocol
Specifies the protocol via which the host application communicates with the WebTransactions host adapter.

Communication Object
Specifies the name of the current communication object. The name of the communication object is primarily of importance when you want to integrate more than one host application with WebTransactions. The name must correspond to the name in the start template.
Default: *MVS_0*

Dynamic display attributes
All field attributes are supported and read from the host object at runtime.

First line as menu bar
Specifies whether the generated WTML template supports the first line of the format as the menu bar. If you activate this field, all text fields in the first screen line of the host application will be generated as buttons.

To set this option can be meaningful to emphasize the menu character of the first line in the graphical user interface. This buttons however are generated in formats too, which do not support menu functions in the first line.

If it is enough to position the cursor with the mouse (not with the cursor keys) to the corrresponding menu entry on the graphical user interface, this option is not necessary. The reproduction of the format is more like the original. Positioning the cursor with the mouse on protected fields is possible, if in the `%%LINES` tag of the master template `CursorInProtectedField` is set to `Yes` (default).

Automask file
Specifies the directory and the name for the generated template.
Default path:
basedir`/config/forms/AutomaskMVS.htm`.

If you save the Automask in another directory under `config`, you can implement style and language variants. See the WebTransactions manual “Concepts and Functions”.

Application Prefix

If you want to integrate multiple host applications which may possibly possess identical format names, then WebLab can insert a prefix for the FLD file or template in front of the actual file name. The file name then consists of:

commobj@formatname`.fld` or *commobj@formatname*`.htm`

5.2.2 Structure of AutomaskMVS.htm

Below you can see the Automask template which was generated using the master template MVS.wmt (see section “Master templates MVS.wmt and MVS_Pocket.wmt” on page 70).

The comments are the expansion of the statement `%%GenerationInfo%`.

```
<HTML>
<wtrem>*****************************************************************************</wtrem>
<wtrem>** WTML document: AutomaskMVS                                              **</wtrem>
<wtrem>*****************************************************************************</wtrem>
<wtrem>**                                                                         **</wtrem>
<wtrem>** Document generation based on Master Template :                          **</wtrem>
<wtrem>**  C:\Program Files\webtransactionsv75\weblab\MVS.wmt                      **</wtrem>
<wtrem>**                                                                         **</wtrem>
<wtrem>** Generated at Wed Jun 09 18:12:50 2010                                   **</wtrem>
<wtrem>**                                                                         **</wtrem>
<wtrem>** Options used by the generator :                                         **</wtrem>
<wtrem>**   -  %OPTIONS:                                                          **</wtrem>
<wtrem>**      CommObj = MVS_0                                                    **</wtrem>
<wtrem>**      NationalVariant = International - PartialFormatMode = No           **</wtrem>
<wtrem>**   -  %LINES:                                                           **</wtrem>
<wtrem>**      TaggedInput = Enabled - TaggedOutput = Enabled                     **</wtrem>
<wtrem>**      DisplayAttributes = Dynamic - CursorInProtectedField = Yes         **</wtrem>
<wtrem>**      MenuBar = No                                                       **</wtrem>
<wtrem>**   -  %RECEIVES:                                                        **</wtrem>
<wtrem>**      Parameters not specified                                           **</wtrem>
<wtrem>*****************************************************************************</wtrem>
<wtrem>** WebTransactions V7.5            Fujitsu Technology Solutions 2010 **</wtrem>
<wtrem>*****************************************************************************</wtrem>
```

References to the communication object and the associated specific system object attribute are created to ensure uniform access to the connection parameters and host objects.

```
<wtoncreatescript>
<!--
  //{{WebLab(assignCommunicationObject)
  MVS_0  = WT_HOST.active || WT_HOST.MVS_0;
  if (MVS_0.WT_SYSTEM != null)
    MVS_0_system = MVS_0.WT_SYSTEM;   // communication specific system object
  else
    MVS_0_system = WT_SYSTEM;        // global  system object
  //}}
  // propagate communication object to included WTML documents //////////////
  wtCurrentComm = MVS_0;
  wtCurrentComm_system = MVS_0_system;
  if ( wtCurrentComm_system.EDIT_MODE )
```

The input mode (insert or overwrite) is set according to the specification in `EDIT_MODE`.

```
  {
    if ( typeof wtCurrentComm_system.isOverwrite == 'undefined' &&
wtCurrentComm_system.EDIT_MODE.match(/OVERWRITE/) )
      wtCurrentComm_system.isOverwrite = true;
    else if (wtCurrentComm_system.EDIT_MODE == 'OVERWRITE')
      wtCurrentComm_system.isOverwrite = true;
    else if (wtCurrentComm_system.EDIT_MODE == 'INSERT')
      wtCurrentComm_system.isOverwrite = false;
  } else
    wtCurrentComm_system.isOverwrite = false;
//-->
</wtoncreatescript>
```

If there is a PROLOG template this will be executed.

```
<wtif (MVS_0_system.PROLOG)>
  <wtinclude Name="##MVS_0_system.PROLOG#">
</wtif>
```

After the mandatory establishment of the HTML framework there is the `Style` tag which sets the general display characteristics in the browser. Use the `WT_BROWSER.charSize` attribute to set the character size (see section “Font size in the attribute WT_BROWSER.charSize” on page 137).

```
<head>
<title>WebTransactions V7.5 - session ##MVS_0_system.SYM_DEST#</title>
##WT_SYSTEM.CGI.HTTP_USER_AGENT.indexOf( 'MSIE' ) >= 0 ?
 '<meta http-equiv="Pragma" content="no-cache"/>' :
 '<meta http-equiv="Cache-Control" content="no-cache"/>'#
<wtif (WT_BROWSER.acceptClass)>
  <style type="text/css">
    input {
      font-size:    ##WT_BROWSER.charSize#px;
      font-family:  courier new, monospace;
    }
    input.box {
      border:       0 solid;
      padding:      1px 0 1px 0;
      margin-left:  -1px;
      margin-top:   ##WT_BROWSER.marginTop#px;
      font-size:    ##WT_BROWSER.charSize#px;
      font-family:  courier new, monospace;
      color:        #000000;
      background-color: #FFFFFF;
```

```
    }
    input.button {
      font-size:    ##WT_BROWSER.charSize#px;
      font-family:  courier new, monospace;
      border-width: 1pt;
      margin-left:  -1pt;
    }
    select {
      font-size:    ##WT_BROWSER.charSize#px;
      font-family:  courier new, monospace;
    }
    pre {
      font-size:    ##WT_BROWSER.charSize#px;
      font-family:  courier new, monospace;
      margin:       0;
    }
  </style>
</wtif>
</head>
```

After this a form (`<form>`) is opened which enables dialog with the user at the browser. To operate the dialog, `<wtInclude>` is used to call the templates `wtKeysMVS.htm` and `wtBrowserFunctions.htm` in order to support the best 01:01 representation. The controls of these template thus become part of the form.

```
<body bgcolor="#COCOCO">
<form WebTransactions  name="Automask">
  <table frame="border" rules="all">
    <tr>
      <td>
        <wtinclude name="wtBrowserFunctions">
        <wtinclude name="wtKeysMVS">
        <wtif (MVS_O_system.FORMTPL)>
          <wtinclude Name="##MVS_O_system.FORMTPL#">
        </wtif>
      </td>
    </tr>
```

This wtOnCreate script defines the display attributes for the host objects. Here, the `taggedOutput()` function is used to edit the output fields, and the `taggedInput()` function is used to edit the input fields.

```
    <tr>
      <td>
        <wtoncreatescript>
        <!--
```

```
          function taggedInput( hostObject )
          {
            if ( hostObject.Type == 'Protected' )
            {
              taggedOutput( hostObject );
              return;
            }
            currentLength = hostObject.Length;
            input = '<input type=' + (hostObject.Visible == 'No' ?
'"password"' : '"text"' );
            if (WT_BROWSER.is_ie || WT_BROWSER.is_ns61up)
            {
              input += ' class="box" style="width:' + (currentLength *
WT_BROWSER.charWidth + 1) +  'px';
              input += (hostObject.Blinking  == 'Yes' ? '; background-
color:#FFC0C0' : '');
              input += (hostObject.Underline == 'Yes' ? (
hostObject.Intensity == 'Reduced' ? '; color:#A0A0FF' : '; color:#0000A0' ) :
                                                      (
hostObject.Intensity == 'Reduced' ? '; color:#A0A0A0' : '' )) + '"';
            }
            input += ' name="' + hostObject.Name + '" size="' + currentLength
                               + '" maxlength="' + currentLength
                               + '" value="' + hostObject.Value
                               + (hostObject.Input == 'Numeric'?'"
numeric="1":'')
                               + '"/>';
            document.write( input );
          }

          function taggedOutput( hostObject )
          {
            if ( hostObject.Type == 'Unprotected' )
            {
              taggedInput( hostObject );
              return;
            }
            output = hostObject.HTMLValue;
            if ( hostObject.Visible == 'Yes' )
            {
              if ( hostObject.Inverse == 'Yes' )
              {
                if ( hostObject.Color=='#000000' )
                  output = '<font color="#FFFFFE" style=\"background-
color:#000001\">' + output + '</font>';
                else
                  output = '<font color="#000000" style=\"background-color:'
+ hostObject.Color + '\">' + output + '</font>';
```

```
              }
              else if (hostObject.Color != MVS_0.WT_Color.Default)
                output = '<font color=\"' + hostObject.Color + '\">' + output
+ '</font>';
              if (hostObject.Intensity == 'Normal')
                output = '<b>' + output + '</b>';
              if (hostObject.Blinking == 'Yes')
                output = '<i>' + output + '</i>';
              if (hostObject.Underline == 'Yes')
                output = '<u>' + output + '</u>';
              document.write( output );
            }
            else
            {
         document.write( "
".substr(0,hostObject.Length));
            }
          }
        //-->
        </wtoncreatescript>
        <!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - -  -->
       <!-- begin of host screen section
-->
        <!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - -  -->
<div style="color:##MVS_0.WT_Color.Default = "\#000000"#"><pre>\
```

A key functionality of `AutomaskMVS.htm` consists in a loop which represents each format component as an HTML element. For this purpose, the host adapter provides the host objects `$FIRST` and `$NEXT`. With WebLab, the code of the `AutomaskMVS` template can be influenced by the options selected at generation as well as by the master template. You can determine, for example, whether attributes such as `Blinking` are to be represented.

```
<wtoncreatescript>
<!--
  if ( typeof wtInputFields == 'undefined' )
    wtInputFields = new Object;
  currentLine   = 1;
  document.write('<span class="screenline" id="SL1">');
  for (element = MVS_0.$FIRST.Name; MVS_0 && element != '$END'; element =
MVS_0.$NEXT.Name)
  {
    currentHostObject = MVS_0[element];
    if ( currentHostObject.StartLine != currentLine )
    {
      document.write  ('</span>
```

```
<span class="screenline" id="SL',++currentLine,'">');
    }
    if ( currentHostObject.Type == 'Protected' )
    {
      taggedOutput( currentHostObject );
    }
    else
    {
      wtInputFields[ element ] = currentHostObject;
      taggedInput( currentHostObject );
    }
  }
  document.write('</span>');
//-->
</wtoncreatescript>
</pre></div>
       <!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - -  -->
       <!-- end of host screen section
-->
       <!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - -  -->
      </td>
    </tr>
  </table>
```

A loop is used across the input fields for all the browsers which ignore the `maxlength` attribute in the `<input>` tag. The loops add the client-side attribute `MmaxLength` to the appropriate DOM object as this is not available automatically.

```
  <script type="text/javascript">
  <!--
  <wtoncreatescript>
  <!--
    for( element in wtInputFields )
    {
      if (!WT_BROWSER.acceptMaxLength)
        document.writeln('wtSetMaxLength(\'', element, '\',', wtInputFields[
element ].Length, ' );' );
    }
  //-->
  </wtoncreatescript>
  //-->
  </script>
</form>
```

Following the loop involving all the fields, the focus in the web browser window is then set to the field in whose corresponding screen the cursor was positioned (provided that the field is an input field).

```
<wtrem** initial focus selection ***************************************>
<script type="text/javascript">
<!--

wtSetFocus('##MVS_0.WT_FOCUS.Field#'##MVS_0.WT_FOCUS.Offset&&wtCurrentComm_sy
stem.isOverwrite?','+MVS_0.WT_FOCUS.Offset:''#);
//-->
</script>
<wtrem** Script executed after post of HTML page ***************************>
```

Finally, in an OnReceive script there is one call each to `send and receive` in order to synchronize the WebTransactions dialog cycles and the host dialog steps. The `setNextPage()` function determines the next template that is to be processed.

```
<wtonreceivescript>
<!--
  if(WT_POSTED.wt_cursorOffset && WT_POSTED.wt_cursorOffset*1>0)
  {
    wtCursorField = MVS_0[WT_POSTED.wt_cursor];
    MVS_0.WT_FOCUS.Field =
'E_'+wtCursorField.STARTLINE+'_'+(wtCursorField.STARTCOLUMN*1+WT_POSTED.wt_cu
rsorOffset*1)+'_1';
  }
  else
    MVS_0.WT_FOCUS.Field = WT_POSTED.wt_cursor;
  if (MVS_0_system.EDIT_MODE &&MVS_0_system.EDIT_MODE.match(/USER/))
    MVS_0_system.isOverwrite = (WT_POSTED.wt_isOverwrite=='1');
  //{{WebLab(processPostedData)
  for ( element in wtInputFields )
  {
    currentHostObject = wtInputFields[element];
    if ( currentHostObject.Type == 'Unprotected' )
      currentHostObject.Value = WT_POSTED[element];
  }

  //}}
  //{{WebLab(processHostCommunication)
  if ( WT_POSTED.wt_special_key == 'Suspend' || MVS_0_system.SUSPEND )
  {
    MVS_0_system.SUSPEND = false;
  }
  else
```

```
  {
    try {
          MVS_0.send();
          MVS_0.receive();
          if( MVS_0_system.CAPTURED_FLD == "Yes" &&
MVS_0_system.APPLICATION_PREFIX )
            setNextPage( MVS_0_system.APPLICATION_PREFIX + '@' +
MVS_0_system.FLD );
          else
            setNextPage( MVS_0_system.FLD );
  }
  catch (e) {
          if ( WT_SYSTEM.COMMUNICATION_ERROR_FORMAT )
            setNextPage( WT_SYSTEM.COMMUNICATION_ERROR_FORMAT );
  }
  }
  //}}
//-->
</wtonreceivescript>
</body>
<wtif (MVS_0_system.EPILOG)>
  <wtinclude Name="##MVS_0_system.EPILOG#">
</wtif>
</html>
```

5.3 wtKeysMVS.htm template

A real terminal has special keys with associated functions that can be reproduced almost fully in a terminal emulation (e.g. by assigning substitute keys).

The `wtKeysMVS.htm` template therefore provides controls for the MVS-specific standard keys. The functions of frequently used keys such as Enter are represented by Submit buttons, while all the other functions are represented by pick lists. In addition, `wtKeysMVS.htm` contains some buttons that do not correspond to any terminal key (`Disconnect`, `Refresh`, `Cancel Menu` and `Print`).

The individual controls are described in the table on page 126.

`wtKeysMVS.htm` includes the file `wtKeysMVS.js` which contains the mapping of the special keys for WebTransactions. In this file you can adapt the key mapping to your needs and also extend it. A complete description of this procedure is given in section “Mapping keys in wtKeysMVS.js” on page 128).

`wtKeysMVS.htm` is called by `AutomaskMVS.htm` and can be used as the basis for your own templates. Format-specific templates generated using the capture process also use`wt-KeysMVS.htm`.

The `MVS.wmt` master template contains a call (`<wtInclude>`) to `wtKeysMVS.htm`. All other templates created using this master template (whether with Automask or the capture procedure) will thus also contain this call.

When you select a key function by clicking your mouse or by selecting a list item, the browser sends the form data to WebTransactions. To do this, `wtKeysMVS.htm` creates an invisible input field with the parameters `<input type="hidden"` and `name="wt_special_key" ...>`. The function selected is stored in this field and transferred together with the visible field to WebTransactions. Here, the desired function in executed by the terminal emulation integrated in the host adapter using `send` and `receive`. Whether or not there is any communication depends on the key function selected. In some cases (e.g. `REFRESH`), the host communication is suppressed.

To implement the key functionality, the host adapter uses the host object `WT_KEY` (see table on page 126). All functions provided by `wtKeysMVS.htm` are mapped to a corresponding value in `WT_KEY.Key` (in an OnReceive script). The value of `WT_KEY.Key` controls the behavior of the `send` and `receive` calls.

5.4 wtBrowserFunctions.htm template

A real terminal can also be controlled via the keyboard: this possibility can be largely reproduced in a terminal emulation.

The `wtBrowserFunctions.htm` template uses JavaScript to provide you with keyboard support in the browser. Different versions of browsers also provide different functionalities.

The `MVS.wmt` master template contains a call for `wtBrowserFunctions.htm`. All other templates created using this master template (whether with Automask or the capture procedure) will thus also contain this call.
`wtBrowserFunctions.htm` also uses the `<input>` tags created by `wtKeysMVS.htm`

When the user activates a browser function by means of the keyboard, the browser sends the form data to WebTransactions. Here the required function is executed by the terminal emulation integrated in the host adapter by means of `send` and `receive`.

In section “Terminal functions supported” on page 123 there is a list showing the functions supported by each browser.

5.5 Host application with semi-graphics

Rectangular frames output by a host application on the screen with the help of semi-graphics are represented as follows by WebTransactions:

```
+------+
:      :
:      :
+------+
```

This display mode is also used by the WebTransactions Automask mechanism for outputting pop-up boxes. However, you can also design your pop-ups individually (see section “Generating templates for pop-ups” on page 91).

6 Editing templates

Once you have connected your host application to the WWW, the way the formats are displayed at a browser corresponds to that of a terminal (1:1 conversion). In many cases, this conversion, which is performed by the Automask template, is sufficient and requires no further design steps.

However, if you want to make use of the many and varied user interface design possibilities available for Web applications and prepare the host application's different dialog steps yourself, then it is no longer enough simply to use the Automask template. Postprocessing can then be performed using so-called format-specific templates.

You can generate these format-specific templates using the WebLab capture process and then adapt them to meet your specific requirements. This chapter describes how you prepare individual browser displays for specific formats.

Here, we can differentiate between the following steps:

1. First you use WebLab to set up a WebTransactions session and then open a host connection.
2. Next you use the capture function in WebLab to identify the host formats that you intend to prepare separately (see section "Capturing with WebLab" on page 86).
3. Once you have prepared a format-specific template for a host format which you want to customize, you can edit it as you wish in WebLab, see WebTransactions manual "Concepts and Functions".

6.1 Capturing with WebLab

Once you have opened a connection to the host application with WebLab you can use the interactive capture function to create recognition criteria for the individual host formats.

At runtime, WebTransactions recognizes the formats on the basis of the recognition criteria which are administered in a special database, the capture database. WebTransactions requires the capture database during the deployment phase in order to assign the appropriate format-specific templates to the received host formats. Every entry in this database links one or more recognition criteria to a format. Whenever a `Receive` statement is concluded in a template, WebTransactions works through the capture database sequentially, in order to determine whether there is a criterion corresponding to the received format. If a hit is found, then the format name is written to the `FLD` attribute of the private system object. Otherwise the value from the `AUTOMASK` attribute is used.

The `setNextPage` statement in a template specifies which template is to be executed next after a `Receive` statement. This can be, for example, the template that is determined via the recognition criteria in the `FLD` attribute. See the section on the dialog cycle in the WebTransactions manual “Concepts and Functions”.

6.1.1 Procedure

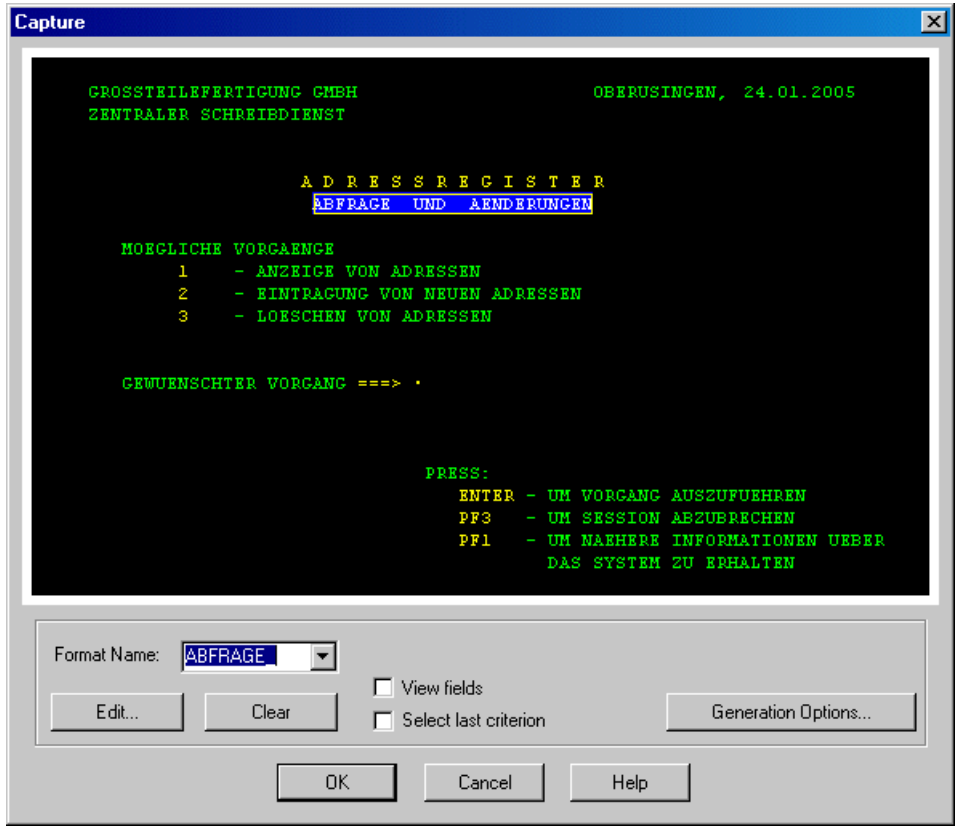
- Check to see whether the correct path name is entered for the start template for the system object attribute `CAPTURE_FILE`.

  In the start template `wtstartUNIX.htm` the path name `config/capture.sdb` is entered as the default in the **CAPTURE_FILE** parameter. The format data base that is specified in the start template will be created on the first access.

- Make the appropriate entries in the host application to navigate to the format for which you want to create a recognition criterium.

- Select the **Generate/Capture/from current screen** command to open the **Capture** dialog box with the current format.

  If the attribute `CAPTURE_FILE` was not set when the session was started, the dialog box **Specify capture database** will be opened on screen. You can then select a existing database or specify a new one.



- Here you can select the areas that uniquely identify the format. Select one or more rectangles by dragging the mouse with the default button held down.
- Enter a name for the recognition criterium in the **Format Name** field. You can also select a name from the list if you have already recorded the format and now, for example, want to edit its identifying characteristics.
- If you select the option **Select last criterion** the last specified identifying characteristic is used.
- Next, open the dialog box **Capture: Options for FLD and Template Generation** with the **Generation Options** button. In this dialog box you specify the generation options. In most cases default values are sufficient.
- Enter the required generation options and click on **OK** to confirm. The preset values are used for input fields in which you make no entry.

- ► Click on **OK** to close the **Capture** dialog box. WebLab then generates an FLD file and an HTML template for this format:
  - FLD files are special description files. They are used by WebLab, the WebTransactions development environment, to implement the “graphical host object selection” function. In order for WebTransactions to be able to access these files at runtime, they must be stored under *basedir*`/config`.
  - HTML templates are interpreted by WebTransactions at runtime and determine the user interface displayed at the browser.

6.1.2 Editing recognition criteria

You can edit the individual recognition criteria during the capture process. To do this, click on the **Edit** button in the **Capture** dialog box. The **Edit Capture** dialog box is displayed on the screen.

This dialog box presents all the criteria that you have selected for the current host format, together with their locations and sizes. The **Delete** button allows you to remove individual recognition criteria again.

You can use the options **Characters** and **Attributes** to determine whether the contents of the selected area and/or its representation are to be used for the recognition of the associated format.

6.1.3 Editing the capture database

You do not need a connection to the host application in order to edit the capture database.

You edit the capture database in WebLab in the **Capture Management** dialog box. This dialog box is opened using the command **Generate/Capture Management**.

The dialog box shows you in tabular form the formats for which recognition criteria already exist in the capture database.

The **Capture Management** dialog box lists the formats in the sequence in which they were entered in the capture database. When capturing, new formats are added at the end. At runtime, the capture database is searched through sequentially. For this reason, you can change the sequence of the formats, for example in order to move frequently used formats closer to the start and thus reduce the search time or to ensure that if similar formats exist it is the more precisely specified of them that has priority for recognition.

6.2 Individual templates for pop-up boxes

Host formats can contain pop-up boxes.

If you are working exclusively with the `AutomaskMVS.htm` conversion template, you need not make any special arrangements for pop-up boxes, as they are displayed by the `Automask` mechanism in the form of semi-graphics within the application format.

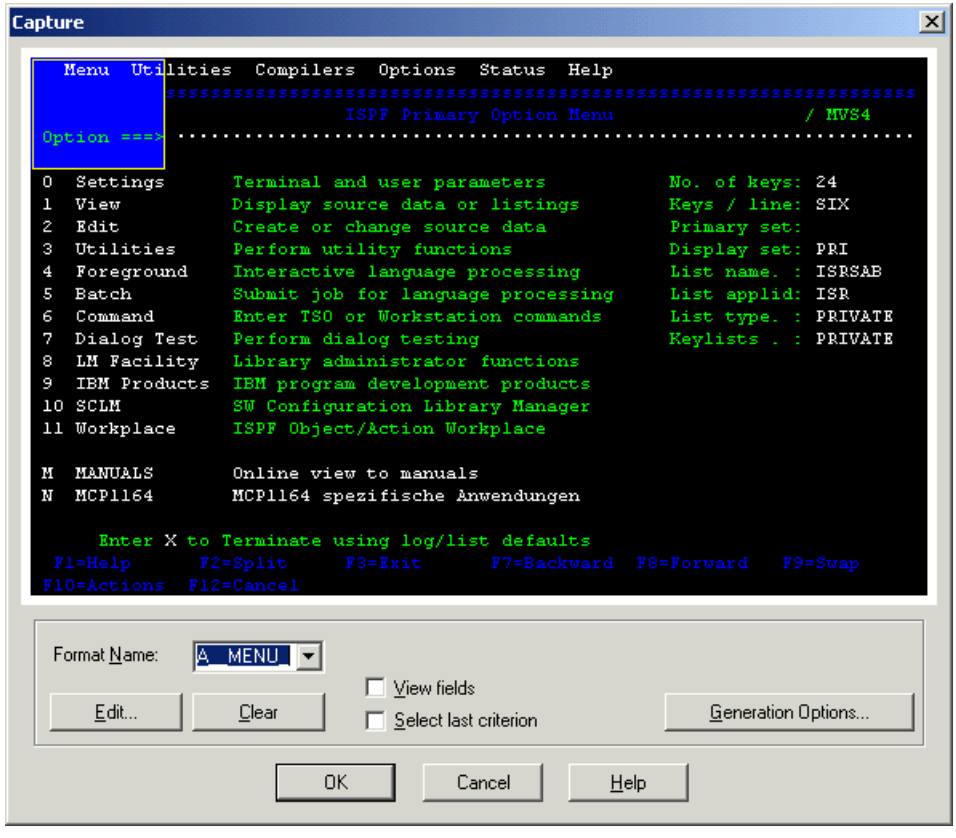
For individually adapted templates, WebTransactions provides system object attributes for pop-up handling. If the `USE_POPUP_RECOGNITION` attribute is set to `"Yes"` at runtime, these pop-ups are automatically recognized and sent to the Web browser in the form of distinct pages. If characters other than the defaults are used for pop-up recognition, you must use the system object attributes to set these characters for pop-up display, see also section “System object attributes” on page 97.

Before describing the WebTransactions pop-up functionality in section “Generating templates for pop-ups” on page 91, we must first examine the problems that may arise in the identification of individual templates without special pop-up handling.

6.2.1 Without special pop-up handling: identification problems

The WebLab capture process is used to define certain format areas as recognition criteria. The way these areas are selected may have an effect on the correct functioning of format recognition. This can be illustrated by means of an example:

For the format (without pop-up box) of a host dialog application, the following area is defined as a recognition criterium:



However, if a pop-up is displayed which overlays the recognition criterium, WebTransactions does not recognize the format at runtime since part of the criterium is not present in the format (because it is hidden by the pop-up). In such a case, WebTransactions would not display the entire format by using a corresponding format-specific template but would instead use the conversion template `AutomaskAS400.htm`.

If you select the recognition criterium in a way it is not overlayed, WebTransactions can recognice the format, both with and without a pop-up. At runtime, WebTransactions would use the same format-specific WTML template in both cases, which results in the following problems:

If the pop-up was not displayed during the Capture function, it is not contained in the generated template and does not appear in the browser.

If the pop-up was displayed during the Capture function, it is contained in the generated template and always appears in the browser irrespective of whether or not it is present in the actual format.

6.2.2 Generating templates for pop-ups

To avoid the problems outlined in the last section, WebTransactions allows you to create separate format-specific templates for pop-up boxes.

Requirement

To use this function, you must first set the `USE_POPUP_RECOGNITION` attribute of the communication-specific system object to `YES`.

If you generate your own start template for your application with the WTBean `wtcStartMVS` (see section “WTBean wtcStartMVS.wtc for the generation of a start template” on page 144) then you can place this attribute directly in the start template.

- In the **Add:wtcStartMVS** dialog, choose the **Further Options** tab.
- Under **Popup recognition**, click the entry **Popup recognition/enable**.
- Click on **Popup recognition/enable** to change the value of the entry from **No** to **Yes**.

If you are already within a session you started with WebLab, you can also create the attribute for this session dynamically in WebLab:

- Select the system object `MVS_0_system` in the WebLab object tree and open the context menu.
- Choose the **New Variable** command in the context menu.
- Give the new system object attribute the **Name** `USE_POPUP_RECOGNITION`, select the **Type** `string` and enter the **Value** `Yes`.

Note that the attribute in this case is only defined for the current session. It has to be set again in the start template before the next startup.

If the host application does not use the preset values for displaying the pop-up frames you must also set the other system object attributes for pop-up recognition, see also section “System object attributes” on page 97. These system object attributes are also required at runtime.

Popup frames with semigraphic characters

In some MVS applications, pop-up frames are represented by special semigraphic characters. Here the characters are displayed as „normal characters“:

```
EssssssssssssssssssssssN
e                       e
e                       e
e                       e
e                       e
e                       e
DssssssssssssssssssssssM
```

In order to improve the standard appearance of this type of pop-up frame, WebTransactions implicitly replaces these semigraphic frames with rectangles with the following structure:

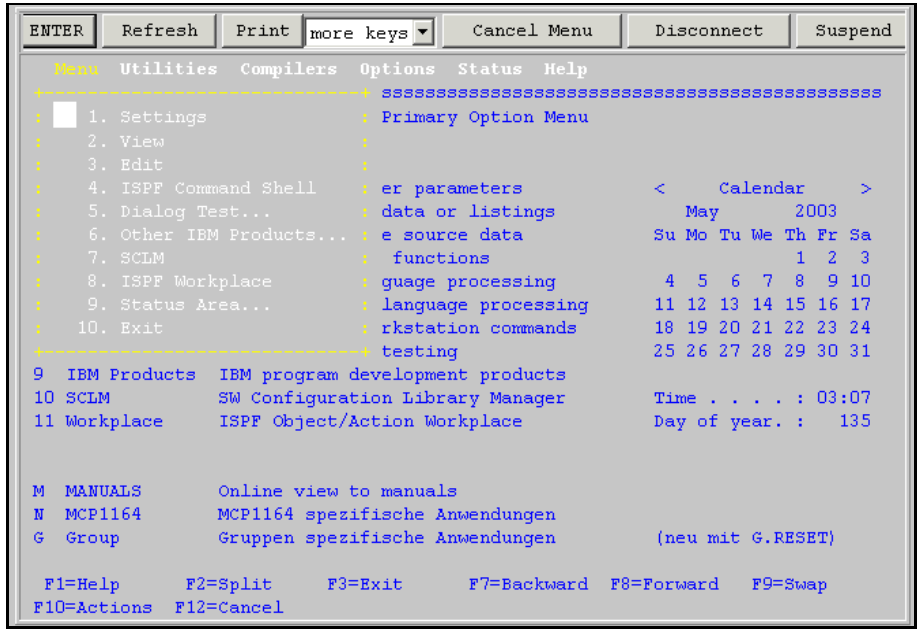
```
+-----------------------+
:                       :
:                       :
:                       :
:                       :
:                       :
+-----------------------+
```

To permit the automatic recognition and individual processing of such pop-ups, you must specify the original MVS semigraphic characters when configuring the attributes of the WebTransactions system object, **not** the replacement characters used in the WebTransactions default display. In the case of `POPUP.VMIDDLE`, for example, you should not set the value `":"` but the value `"e"`. For more information, see also section “System object attributes” on page 97.

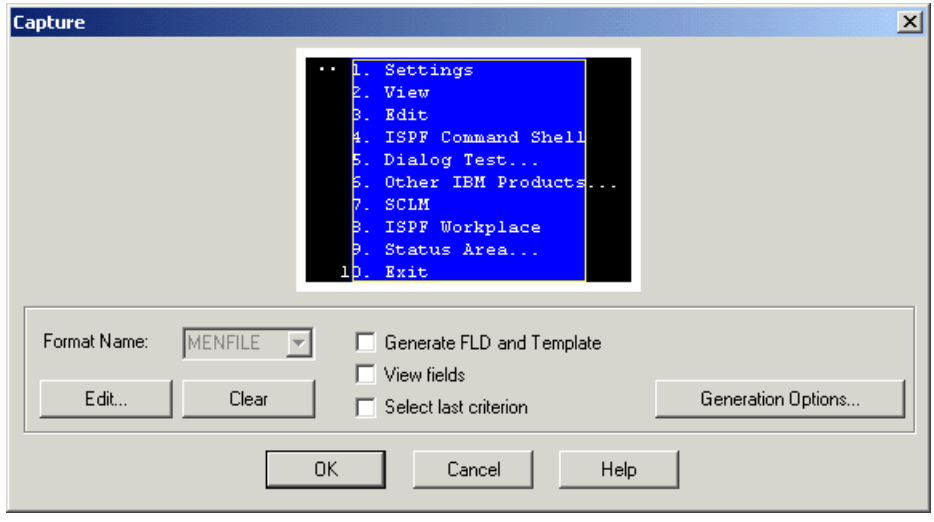
Procedure

Proceed as follows to record the pop-ups using the capture method:

► In the host application, navigate to the format with the pop-up boxes.



► Choose the **Generate/Capture/from current screen** command to record the pop-up box using the capture function. The **Capture** dialog box is displayed on the screen with the pop-up box.



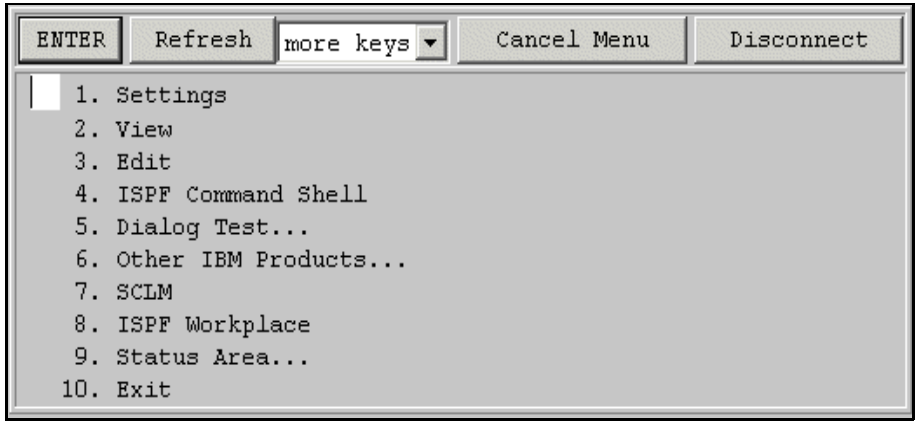
► Enter a name for the pop-up box and specify the generation options for the template and FLD file in the dialog box **Capture: Options for FLD and Template Generation**.

Pop-up recognition at runtime

At WebTransactions runtime, pop-up recognition is performed as follows:

- If a pop-up is recognized in a host format, WebTransactions searches the capture database (`config/`*application*`.sdb`) for a pop-up with the corresponding recognition criterium. If an appropriate pop-up is found, WebTransactions uses the identified pop-up template so that only the pop-up is displayed in the browser but not the host format behind it.

Below, you can see this procedure on the basis of pop-up converted on the basis of a format-specific template:



- Recognition of formats with the capture database functions is performed in the following sequence:
  - If popup recognition is active and a popup recognition criterion matches the format, the individual popup template is used.
  - If a normal recognition criterion matches the format, the individual template is used for the entire format.
  - If no recognition criterion is available for the entire format, WebTransactions uses the conversion template which is named in the `AUTOMASK` attribute (usually `AutomaskMVS`).

Even if a pop-up is identified and displayed individually by WebTransactions, the host objects `$FIRST` and `$NEXT` refer to the first or next field of the underlying host format and not to the first or next field of the pop-up.

7 Controlling communication

7.1 System object attributes

Certain system object attributes can be used to control communication between WebTransactions and the MVS application.

This section describes only those attributes which are provided specifically for the MVS interface connection or which are of special significance to this connection. System object attributes that are of equal significance to all WebTransactions product variants are described in the WebTransactions manual “Concepts and Functions”.

If a `WT_SYSTEM` object (connection-specific system object) exists under the communication object used, the attributes described in this section must be defined there. Otherwise, they must be declared as attributes of the global system object `WT_SYSTEM`. The only exceptions are the `COMMUNICATION_INTERFACE_VERSION` and `FORMAT` attributes, which always refers to the global system object.

Attributes can be set in the first template (start template) when starting WebTransactions, and can be retained for the entire session or actively modified during the session (see sections on active dialog in the WebTransactions manual “Concepts and Functions”).

General information on connection-specific and global system objects can be found in the WebTransactions manual “Concepts and Functions”.

7.1.1 Overview

The table below provides an overview of the attributes and their effect.

The system object attributes are divided into the following categories:

o (**o**pen)
Attributes evaluated in open

t (**t**emporary)
Attributes used during communication which can be modified in the templates at any time

r (**r**ead only)
Attributes used during communication which cannot be modified in the templates

c (**c**ommunication module)
Attributes set automatically by the host adapter

The category is indicated in the right-hand column of the table below.

Attribute name	Meaning	Description/category	
APPLICATION_PREFIX	Prefix for the host application name	This prefix makes it possible to identify FLD and template files which possess the same “format names” but belong to different host applications. These FLD and template files must be saved in the following form: *application_prefix@formatname*.fld or *application_prefix@formatname*.htm	o
AUTOMASK	Default conversion template	Name of the conversion template to be used if an identifier for the current screen is not found in the capture database. Default value: AutomaskUNIX. If no identifier was found and the contents of the AUTOMASK attribute were taken over, but the corresponding template is not available, the template specified in DEFAULT_FORMAT is used. If an identifier is found but a corresponding template is not, the template specified in DEFAULT_FORMAT is likewise used (see WebTransactions manual “Concepts and Functions”).	t

Attribute name	Meaning	Description/category	
BYPASS	Bypass print file flag	WebTransactions sets this attribute to `Yes` if a bypass print file is found during a `receive` call. Before evaluation of `$MESSAGE.PRINTING`, this attribute should be set to `No` by the template, as in the `wtasync.htm` template provided by WebTransactions.	c, t

`CAPTURE_FILE`	Capture database	Name of the capture database (`...\`*application*`.sdb`)
		The name can be specified as an absolute path name or a relative path name (relative to the base directory), e.g.:
		– absolute specification:
		`C:\mvsappli1\config2\mvsappl.sdb`
		– relative specification
		(base directory = `mvsappli1`):
		`config2\mvsappl.sdb`
			t

`CAPTURED_FLD`	Criterium for format recognition	WebTransactions sets this attribute to `Yes` on a `receive` call if the received format is found in the capture database. If the format is not found, `CAPTURED_FLD` is set to `No`.	c
CODE_PAGE	Conversion table	Table used by the emulation software for the translation of host messages from EBCDIC to ASCII and vice versa. These tables contain conversion rules to support country or language specific characters. Possible values: Belgian Danish Dutch English French German Hebrew Iceland Italian Norwegn Portugue Spanish Swedish Swefin UK CP037 CP273 CP277 CP278 CP280 CP285 CP500	o

Attribute name	Meaning	Description/category	
COMMUNICATION_ INTERFACE_VERSION	Interface version	If this variable contains a value < "3.0", then the name of the host format is entered in the global system attribute FORMAT on reception of a message from the host (receive). If no format name can be determined, FORMAT is set to the value of AUTOMASK. If this variable contains a value "3.0" or higher, no value is entered for FORMAT since the choice of the next page (format) is made by the templates themselves (generally by evaluating the FLD attribute). Default value: 7.5	o
CONNECTION_INFO	Connection information	This string can, for example, be used to identify the user of a given session. The information is saved in a session information file, which can be desplayed in the administration.	o
DISCONNECT	Template for disconnection	This template is activated once the host connection has been terminated. For example, if the user clicks the **Disconnect** button then the template stored in this attribute is called. Default value: wtstart	t
END_WAIT_CONDITION. EXPECTED_BLOCKS	End of screen recognition regarding the number of sub-messages that make up the entire form	When this attribute is set, receive stops waiting, despite MULTIPLE_IO_TIMEOUT, when the expected number of sub-messages have arrived. If additional messages are already waiting in the network and these can be processed without waiting, then the RECEIVED_BLOCKS after the receive may be larger than END_WAIT_CONDITION.EXPECTED_BLOCKS. Default: empty See also RECEIVED_BLOCKS.	t
END_WAIT_CONDITION. FLD_EXPECTED, END_WAIT_CONDITION. FLD_DIFFERENT_FROM	End of screen recognition using recognized format; Requirement: Must be using capture database	If a format defined in the capture database is recognized (attributes FLD and CAPTURED_FLD) and matches the specifications in the relevant attribute, then receive stops waiting despite MULTIPLE_IO_TIMEOUT. Default: empty	t
END_WAIT_CONDITION. CURSOR_IN_LINE and END_WAIT_CONDITION. CURSOR_IN_COLUMN, END_WAIT_CONDITION. CURSOR_NOT_IN_LINE and END_WAIT_CONDITION. CURSOR_NOT_IN_COLUMN	End of screen recognition using the position of the cursor	If the cursor reaches one of the positions defined in the set conditions, receive stops waiting despite MULTIPLE_IO_TIMEOUT. Default: empty	t

Attribute name	Meaning	Description/category	
END_WAIT_CONDITION. MATCH_STARTLINE, END_WAIT_CONDITION. MATCH_STARTCOLUMN, END_WAIT_CONDITION. MATCH_VALUE and END_WAIT_CONDITION. MATCH_OPERATION	End of screen recognition using the field content in a particular section of the screen	If the screen buffer has a character string MATCH_VALUE at the position that is defined with MATCH_STARTLINE and MATCH_STARTCOLUMN, (MATCH_OPERATION ="==") or not (MATCH_OPERATION ="!="), then receive stops waiting despite MULTIPLE_IO_TIMEOUT. Default: empty.	t
EPILOG	Epilog	This attribute contains the name of a template (without the suffix '.htm'). If the attribute is defined then the corresponding template is included at the end of the generated template. Default: No inclusion **i** The attribute is only evaluated by the generated standard template and not by the host adapter. See also PROLOG and FORMTPL	t
FIELD_NAMES	Use descriptive field names	If this attribute is set to User-defined descriptive field names can be used, which are specified in FLD-files. Otherwise the generic field names generated by the host adapter are used. Possible values: User-defined, Generic Default: User-defined **i** Please note, that in the delivered start templates and Beans Generic is implemented as default.	o

Attribute name	Meaning	Description/category	
FIRST_IO_TIMEOUT	Timer for the receive call.	By default the timer is set to 60 seconds. If no message is received from the host during this period, the receive call is returned. This means e.g. that in a single template it is possible to cater both for host applications which output a welcome screen on the establishment of the connection as well as for host applications which immediately expect an input. To do this, you set FIRST_IO_TIMEOUT to a low value and then check after the first receive call whether a message has been received from the host (RECEIVED_BLOCKS="0") However, an error is indicated if no message is received from the host within the time specified in FIRST_IO_TIMEOUT. If you want WebTransactions to suppress this message, set DISABLE_COMMUNICATION_ERROR. If FIRST_IO_TIMEOUT is greater than TIMEOUT_APPLICATION, a value derived from TIMEOUT_APPLICATION is used: – If TIMEOUT_APPLICATION > 10: FIRST_IO_TIMEOUT corresponds to TIMEOUT_APPLICATION -5 – If TIMEOUT_APPLICATION > 1: FIRST_IO_TIMEOUT corresponds to TIMEOUT_APPLICATION -1 – If TIMEOUT_APPLICATION =1: FIRST_IO_TIMEOUT corresponds to TIMEOUT_APPLICATION The value is indicated in seconds, in some cases with a decimal point or comma. The smallest unit is 500 milliseconds.	t
FLD	Format name	Name of the format that was received from the host application. If WebTransactions has not recognized any format name (e.g. even when no capture database is assigned) then FLD is set to the value of AUTOMASK (always set by receive). See also FORMAT	c, r

Attribute name	Meaning	Description/category	
FORMTPL	Form fields	This attribute contains the name of a template (without the suffix '.htm'). If the attribute is defined then the corresponding template is included at the start of the wtDataForm in the generated templates. Default: No inclusion **i** The attribute is only evaluated by the generated standard template and not by the host adapter. See also PROLOG and EPILOG.	t
FTP_CODE_PAGE	Conversion table for file transfer with $INDFILE	Possible values: 0 – 037 USA 1 – 037C USA C/370 2 – 273 Austria, Germany 3 – 277 Denmark, Norway 4 – 278 Sweden, Finland 5 – 280 Italy 6 – 285 England 7 – 00 International 8 – ASCII Default value: 2	o
HARDCOPY	Hardcopy print file flag	WebTransactions sets this attribute to Yes if a hardcopy print file was prepared when the receive call was issued (see WT_KEY.key="PRINT"). Before the evaluation of $MESSAGE.PRINTING, the attributes should be reset to No by the template as in the wtasync.htm template provided by WebTransactions.	c, t
HOST_NAME	Name of hostcomputer	Name or Internet address of the host computer. If you use a symbolic name, it must either be specified locally or in the Domain Name Service (DNS).	o

Attribute name	Meaning	Description/category	
IGNORE_ASYNC	Ignore the ASYNC condition	Usually (IGNORE_ASYNC='NO'), when using the send method call, a check is performed to see whether new data has arrived asynchronously from the host. If this is the case, data is not sent to the host, instead REFRESH_BY_ASYNC is set to Yes and WT_KEY.Key is set to Refresh. The subsequent receive method call takes the existing host data and does not wait for additional data with FIRST_IO_TIMEOUT and MULTIPLE_IO_TIMEOUT. If IGNORE_ASYNC is set to Yes, the data is sent, regardless of any asychronously received data. This avoids manual repeating the send call. WT_KEY.KEY remains unchanged, REFRESH_BY_ASYNC is not set to Yes because no refresh has been carried out. IGNORE_ASYNC suppresses recognition of the asynchronous message. Default is NO. See also MULTIPLE_IO_TIMEOUT, REFRESH_BY_ASYNC	t
IGNORE_EMPTY_BLOCKS	Handling of messages, which are not displayed on the screen	If this attribute is set to Yes then the transition from FIRST_IO_TIMEOUT to MULTIPLE_IO_TIMEOUT is disabled when waiting for messages from the host if a message does not affect the useful area of the terminal screen and, consequently, the host objects. This means that you can still operate host applications in which the first message unlocks the keyboard (change to status bar) and the second message contains the full screen (change to screen) with MULTIPLE_IO_TIMEOUT = "0". If this attribute is set to Yes then the “empty blocks” are nevertheless counted in the RECEIVED_BLOCKS attribute. EXPECTED BLOCKS should nevertheless be set to “empty blocks”. Default value: Yes	t
LU_NAME	Name of the logical unit for connection to the MVS host.	The name of the logical unit (LU) is a character string 8 bytes long (max.). The LU_NAME must only be entered when this is requested by the environment configuration (gateway, host).	o

Attribute name	Meaning	Description/category	
MULTIPLE_IO_TIMEOUT	Timeout for complete screen format	Some host applications send their screen formats in the form of several message segments. Since it is not always clear when the last message has been received, a timeout mechanism is used. If a message is not received from the host within the time period specified in MULTIPLE_IO_TIMEOUT, the screen format is taken to be complete. If you have enabled print/asynchronous support, the screen is updated automatically at regular intervals so that formats which are as yet incomplete can be fully constructed on the next refresh (see page 154). If you are sure that the host application does not use message segments, you can set this value to 0. Default value: 2 (seconds) The aim is to recognize the end of the screen without MULTIPLE_IO_TIMEOUT since this timeout – increases the time elapsed for every stage of the dialog – must be set sufficiently high that it does not cause the end of screen to be recognized too early as a result of heavy traffic. You cannot use the test, if the emulation or the keyboard are locked, for screen end recognition, when the keyboard is unlocked already with the first message segment. The END_WAIT_CONDITION attributes can also be used to cancel MULTIPLE_IO_TIMEOUT: Only when all of the conditions that have been set there are fulfilled, will waiting be cancelled despite the fact that MULTIPLE_IO_TIMEOUT has not been completed. See also END_WAIT_CONDITION attributes	t
OFFLINE_COMMUNICATION	Switch for playing back a trace file	Value “Yes”: A previously recorded emulation trace is “played back” (offline session). The name of the file in which the session was recorded is specified in the attribute OFFLINE_TRACEFILE. Default: No See also: RECORD_HOST_COMMUNICATION	o
OFFLINE_LOGFILE	File name of the emulation trace to be generated	File name of the emulation trace which is to be recorded see also RECORD_HOST_COMMUNICATION	o
OFFLINE_TRACEFILE	File name of an emulation trace	File name of an emulation trace which is to be played back. see also OFFLINE_COMMUNICATION	o

Attribute name	Meaning	Description/category	
PADDING_CHARACTER	Padding characters for unprotected fields	If this attribute contains the value `Zero`, input fields are padded out with the null character (\0); otherwise the space is used as the padding character (default value).	t
`POPUP.COLUMN`	Start column of the received pop-up	If a pop-up is received following a `receive` call, and this pop-up is recognized by the Capture mechanism, this attribute contains the column number of the top left-hand corner of the pop-up in the host format. Possible values: 0 (if there is no pop-up) - *maximum number of columns* Default value: 0.	c, r
`POPUP.HEIGHT`	Height of the received pop-up	If a pop-up is received following a `receive` call, and this pop-up is recognized by the Capture mechanism, this attribute contains the total height of the pop-up (including the frame). Possible values: 0 (if there is no pop-up) - *maximum number of lines* (including the frame) Default value: 0.	c, r
`POPUP.HSTART`	Pop-up recognition parameter	Characters used to begin the horizontal frame of a pop-up panel. The default value is a colon followed by a period ":.", i.e. WebTransactions recognizes the horizontal frame of a pop-up if it begins with a colon or period.	t
`POPUP.HMIDDLE`	Pop-up recognition parameter	Characters used to form the horizontal frame of a pop-up panel. The default value is a period ".".	t
`POPUP.HEND`	Pop-up recognition parameter	Characters used to end the horizontal frame of a pop-up panel. The default value is a colon followed by a period ":.", i.e. WebTransactions recognizes the horizontal frame of a pop-up if it ends with a colon or period.	t
`POPUP.LINE`	Line number of the top left-hand corner of the received pop-up	If a pop-up is received following a `receive` call, and this pop-up is recognized by the Capture mechanism, this attribute contains the line number of the top left-hand corner of the pop-up in the host format. Possible values:0 (if there is no pop-up) - *maximum number of lines.* Default value: 0.	c, r
`POPUP.VSTART`	Pop-up recognition parameter	Characters used to begin the vertical frame of a pop-up panel. The default value is a period ".".	t
`POPUP.VMIDDLE`	Pop-up recognition parameter	Characters used to form the vertical frame of a pop-up panel. The default value is a period ".".	t

Attribute name	Meaning	Description/category	
POPUP.VEND	Pop-up recognition parameter	Characters used to end the vertical frame of a pop-up panel. The default value is a colon ":".	t
POPUP.WIDTH	Width of the received pop-up	If a pop-up is received following a receive call, and this pop-up is recognized by the Capture mechanism, this attribute contains the width of the pop-up (number of columns including the frame). Possible values: 0 (if there is no pop-up) - *maximum number of columns* (including frames) Default value: 0.	c, r
PORT_NUMBER	Port number	Port number for communication with the MVS application via TCP/IP. Default: 23	
PRINTER_APPEND_ FORMFEED	LU printer control	This extends (where necessary) the form feed at the end of a print file. The attribute is only processed if PRINTER_LU_NAME is set. Default value: No	o
PRINTER_CODE_PAGE	LU printer control	Assigns a EBCDIC-ASCII conversion file. This attribute is only evaluated if PRINTER_LU_NAME is set. Possible values for the configuration supplied: German_prt GerWin_prt	o
PRINTER_CONVERT_ NILS_TO_BLANKS	LU printer control	This attribute converts all zero characters into blank spaces. This attribute is only evaluated if PRINTER_LU_NAME is set. Default setting: Yes	o
PRINTER_INSERT_ LEADING_FORMFEED	LU printer control	This extends the form feed at the start of a print file. This attribute is only evaluated if PRINTER_LU_NAME is set. Default value: No	o
PRINTER_LU_NAME	LU_NAME for the printer	Setting a LU name for PRINTER_LU_NAME will set up a connection to the dialog (which can then be controlled with the attribute LU_NAME) and will also set up a printer connection to the MVS host (see HOST_NAME, PORT_NUMBER). The attribute PRINTFILE_NAME should also be set with a meaningful value. The print data which arrive from the host will be stored temporarily under this name.	o

Attribute name	Meaning	Description/category	
PRINTER_REMOVE_ LEADING_FORMFEED	LU printer control	Deletes a form feed at the start of a print file. This attribute is only evaluated if PRINTER_LU_NAME is set. Default value: No	o
PRINTFILE_NAME	Name of the files to be printed at the request of the application	Specifies the pattern to be used for the search for print files for bypass printing. The value has to be specified with absolute path names and is completed with ".*". PRINTFILE_NAME="C:\\tmp\\printer1" recognizes all files, matching the pattern C:\tmp\printer1.*. If at least one such file exists, this is specified in the attribute BYPASS. PRINTFILE_NAME is used when evaluating $MESSAGE.PRINTING. This evaluation only occurs automatically if WT_ASYNC is set to Yes. If one or more files that correspond to the value of PRINTFILE_NAME are found at this point, the oldest file is printed. The files are printed in accordance with the same principle as terminal hardcopy printing (see also section "Print support" on page 158). If the attribute PRINTER_LU_NAME is used, the print data will also be temporarily stored in the position indicated under PRINTFILE_NAME.	o, t
PROLOG	Prolog	This attribute contains the name of a template (without the suffix '.htm'). If the attribute is defined then the corresponding template is included at the start of the generated template. Default: No inclusion **i** The attribute is only evaluated by the generated standard template and not by the host adapter. See also EPILOG and FORMTPL	t
RECEIVED_BLOCKS	Number of messages	Number of messages processed by the host during the last receive call. This attribute can be used to check how many message segments the host used to output the current format. If this value is 1 for all formats, the MULTIPLE_IO_TIMEOUT attribute can be set to 0 because once the first message has been received it is no longer necessary to wait for further messages in order to complete the format. Otherwise, this value can be used with END_WAIT_CONDITION.EXPECTED_BLOCKS in order to cancel wait times due to MULTIPLE_IO_TIMEOUT.	c, r

Attribute name	Meaning	Description/category	
RECORD_HOST_- COMMUNICATION	Switch for emulation trace	Value “Yes”: Emulation trace activated Default: “No” See also: OFFLINE_TRACEFILE	o
REFRESH_BY_ASYNC	Automatic setting of refresh when asynchronous messages are received	If this attribute is set to Yes then the host control object WT_KEY.Key was automatically set to the value Refresh during the last send because an asynchronous message has been received since the last receive. As a result, the old format was updated on the last call of the form send/receive. In other words, there was no dialog step with the host application as the user might expect. The user is presented with the updated format. To prevent the user from waiting pointlessly for a response from the host application, you should - depending on the value of REFRESH_BY_ASYNC - generate a note for the user. No (default value) means that the content of the format’s input fields and the value of WT_KEY.Key are sent to the host application unchanged (this also sends the contents of the screen buffer). See also IGNORE_ASYNC	c

Attribute name	Meaning	Description/category	
SYNCHRONIZE_ON_EMPTY_BLOCK	Automatic resend after reception of asynchronous protocol element	The following problem affects emulations that communicate with the host via Telnet: After the complete screen, a further asynchronous protocol element may be received from the host. This element does not modify the screen but is acknowledged by the emulation. During a direct dialog with the user, sufficient time elapses for these protocol elements to be exchanged. This is performed by the emulation without any action being necessary on the part of the host adapter. However, if the new input is sent immediately (e.g. under script control) to the host then it is rejected in the network and the host application is no longer in the expected state. Symptom: even though input has been sent to the host, the old screen continues to be displayed. `SYNCHRONIZE_ON_EMPTY_BLOCK` ensures that the sent message is resent when this type of asynchronous protocol element is received after the sending of the next message. This attribute should only be set if an analysis of the data transfer between the host and WebTransactions reveals that such a situation exists. Otherwise messages would be sent twice even though the described situation has not occurred. In many cases, it is normal for a so-called empty message, e.g. to unlock the keyboard, to be sent by the host before the actual screen content is sent. The host adapter cannot distinguish between these two situations. Default setting: `No`	t

Attribute name	Meaning	Description/category	
TERMINAL_TYPE	Terminal type	Terminal type as simulated by WebTransactions. Possible values: "IBM-3278-2" 24x80 "IBM-3278-2-E" 24x80 "IBM-3278-3" 32x80 "IBM-3278-4" 43x80 "IBM-3278-4-E" 43x80 "IBM-3278-5" 27x132 "IBM-3278-5-E" 27x132 "IBM-3279-2-E" 24x80 "IBM-3279-3-E" 32x80 "IBM-3279-4" 43x80 "IBM-3279-4-E" 43x80 "IBM-3279-5" 27x132 "IBM-3279-5-E" 27x132	o
TRACE_LEVEL	Trace level	This attribute controls the contents of the trace file. Possible values: 0,1,2,3,3E,3M,3EM where: – 0,1,2,3 Different trace levels – E Output of the emulation function calls – M Output of all host matrices, i.e. “raw” mask data Default value: 3EM (= maximum trace)	t
USE_POPUP_RECOGNITION	Pop-up recognition flag	This attribute must be set to Yes if pop-up panels are to be recognized. Default value: No.	t
WT_ASYNC	Printing and asynchronous messages	This attribute is set to Yes if print functions and asynchronous messages are to be supported. Default value: No.	t
WT_BROWSER_PRINT	Activates browser printing only for browser platform Windows	This attribute must be set to Yes if browser printing is to be activated (see section “Browser print” on page 168). The attributes under WT_BROWSER_PRINT_OPTIONS will only be evaluated when this value is set to Yes. Default value: No	t
WT_BROWSER_PRINT_OPTIONS.MODE	Controls browser printing only for Windows browser platform	Indicates if printing is to take place immediately on the default printer or if a print preview is to be displayed. Possible values: Automatic Print on the default printer Preview Display a print preview	t

Attribute name	Meaning	Description/category	
WT_BROWSER_PRINT_OPTIONS.ORIENTATION	Controls browser printing only for Windows browser platform	Indicates the page orientation; only for use with Internet Explorer. Possible values: `Portrait` vertical orientation `Landscape` horizontal orientation	t
WT_BROWSER_PRINT_OPTIONS.HEADER	Controls browser printing only for Windows browser platform	Text for the page headers; only for use with Internet Explorer (see the section "Variables in header and footer lines" on page 170).	t
WT_BROWSER_PRINT_OPTIONS.FOOTER	Controls browser printing only for Windows browser platform	Text for the page footers; only for use with Internet Explorer (see the section "Variables in header and footer lines" on page 170).	t
WT_BROWSER_PRINT_OPTIONS.LEFT	Controls browser printing only for Windows browser platform	Indicates the size of the left margin in mm; only for use with Internet Explorer.	t
WT_BROWSER_PRINT_OPTIONS.RIGHT	Controls browser printing only for Windows browser platform	Indicates the size of the right margin in mm; only for use with Internet Explorer.	t
WT_BROWSER_PRINT_OPTIONS.TOP	Controls browser printing only for Windows browser platform	Indicates the size of the top margin in mm; only for use with Internet Explorer.	t
WT_BROWSER_PRINT_OPTIONS.BOTTOM	Controls browser printing only for Windows browser platform	Indicates the size of the bottom margin in mm; only for use with Internet Explorer.	t

7.1.2 Interaction between system object attributes and methods

This section contains information on the MVS-specific system object attributes that play a role in particular method calls.

open - opening a connection to the host

The `open` method opens a connection to the host application. The connection to be established is determined by the following communication-specific system object attribute, which can be set, for example, in the start template:

System object attribute	Value
`APPLICATION_PREFIX`	Prefix for the host application name. This prefix makes it possible to identify FLD files which possess the same format names but belong to different host applications. These FLD files must be saved in the following form: *application_prefix@formatname*`.fld`
HOST_NAME	Name of the host computer
`LU_NAME`	Name of the logical unit for connection to the MVS host.
`OFFLINE_COMMUNICATION`	Playback of an emulation trace without connection to the host application
OFFLINE_LOGFILE	File name of the emulation trace that is to be recorded.
OFFLINE_TRACEFILE	File name of an emulation trace that is to be played.
`PORT_NUMBER`	Port number for the communication with the MVS host application via TCP/IP
RECORD_HOST_ COMMUNICATION	Switch for the emulation trace.
`TERMINAL_TYPE`	Terminal type as simulated by WebTransactions

When you issue an `open` call, any existing connection is closed before the new connection is established. Please note that it is possibly not possible to determine whether or not the host application is accessible until the first `receive` call.

close - closing a connection to the host

The `close` method closes the connection to the host application. This statement must be executed at the end of a session, and does not usually result in an error message.

send - sending a message to the host application

The send method generally sends a message to the host application. The host object's WT_KEY.Key attribute determines whether this involves communication with the host application, or whether the call is handled exclusively by the host adapter (e.g. with Refresh). The templates supply WT_KEY.Key with a value for the functions provided by wtKeysMVS.htm (see section "wtKeysMVS.htm template" on page 83). An important role is played by the system object attributes REFRESH_BY_ASYNC and IGNORE_ASYNC. If REFRESH_BY_ASYNC is set to Yes and IGNORE_ASYNC to No, WT_KEY.Key was set automatically to the value Refresh during the last send.

receive - receiving a message from the host application

The receive method generally retrieves a message from the host application. The host object's WT_KEY.Key attribute determines whether this involves dialog with the host application.

The host adapter checks whether the message received from the host application corresponds to a recognition criterium in the capture database. If so, continued processing depends on the value of the attribute COMMUNICATION_INTERFACE_VERSION.

- COMMUNICATION_INTERFACE_VERSION >= "3.0"

  The host adapter enters the value of the FLD attribute at the connection-specific system object. The template itself must ensure that FORMAT is set correctly. In templates generated by V3.0, the function setNextPage ensures that FORMAT is set correctly.

- COMMUNICATION_INTERFACE_VERSION < "3.0"

  FORMAT is also set in addition to FLD to ensure that "old" templates remain executable.

If no recognition criterium is found in the capture database, FLD or FORMAT is set to the value of the system object attribute AUTOMASK.

Additional information can be found in the descriptions for the system object attributes "FIRST_IO_TIMEOUT" on page 102 and "FIRST_IO_TIMEOUT" on page 102 as well as the attributes of the END_WAIT_CONDITION group as of page 100.

7.2 Host objects

WebTransactions for MVS uses two types of host object:

– host data objects containing data from the host application
– host control objects that control the host interface

7.2.1 Host data objects

Host data objects are provided to allow for communication between WebTransactions and the host application. They are created by WebTransactions when a new screen format (possibly including a pop-up) arrives from the host. Each field of the screen format (and of the pop-up, if any) is assigned to a host object. When a `receive` call is issued, these objects are available in the form of a screen image.

The objects are named in accordance with their position in the screen format, which is defined by the line and column number:

E_*yy_xxx_lll* (for the fields of a screen format)
`F`_*yy_xxx_lll* (for the fields of a pop-up)

Explanation

E	Field of a screen format
F	Field of a pop-up
yy	Two-character line position, beginning with 1 for the top line (not including the frame in pop-ups)
xxx	Three-character column position, beginning with 1 (not including the frame in pop-ups)
lll	Three-character number of screen characters in a screen line beginning with position *yy_xxx*

These naming conventions allow you to access any sequence of screen characters within a screen line. For instance, you can access a screen line containing 80 host data objects of length 1, or one host data object of length 80. If a host data object contains more than one field or is part of a field, the attributes *`Value` are set in accordance with *yy, xxx* and *lll*. All other attributes (`Input`, `Modified`, etc.) are set in accordance with the field in which the host data object begins. However, you will generally access host objects that correspond to screen fields.

If a host data object extends beyond the field limits, it is truncated at column 80 in screen formats, and at the last pop-up column in pop-ups.

Field attributes occupy one screen character. They are represented by a blank, and form a separate host object with the attributes `Type=Protected` and `Visible=No` (see table on page 117).

Short names for host data objects

Object names can be specified in short form by omitting the length specification or leading zeros. However, you should be careful when using this option. For instance, `WT_FOCUS` always returns the full element name. The first of the following query conditions is thus never `TRUE`:

```
<If (WT_FOCUS.Field == "E_1_2_3")>          --> always false
...
<If (WT_FOCUS.Field == "E_01_002_003")>    --> true
```

Descriptive names of host data objects

In templates, you can also work with descriptive names instead of the generic names. You can specify these descriptive names in the dialogbox **Select host objects graphically**. To do this choose the command **Rename** in the context menu of the objects.

Additionally you must make sure, that the communication-specific system object attribute `FIELD_NAMES` contains the value `User-defined`.

Attributes of host data objects

The table below shows the attributes of the dynamic host data objects. Attributes shown in bold type can be overwritten.

Objects and attributes are usually case sensitive. However, the attribute names of host objects are not case sensitive and they can be written in upper or lower case.

Object name	Attribute name	Meaning
E_*yy_xxx_lll* or F_*yy_xxx_lll*	**VALUE**	Contents of the screen field represented by the object name. Binary zeros (NIL) are replaced by blanks, if the system object attribute NIL_MODE is set to true. Blanks at the end of the field are removed. Single quotes, double quotes, and ampersands (&) are converted for output in HTML. When using entry fields (see type Unprotected) the content of the VALUE attribute can be modified. Changing VALUE emulates the keyboard input of a user at a terminal.
	HTMLVALUE	This attribute corresponds to the Value attribute, but its contents are returned in their entirety. The following special characters are converted for output in HTML: <, >, ä, ö, ü, Ä, Ö, Ü, ß
	RAWVALUE	The content of this field is returned as an unconverted sequence of 8-bit characters; only binary zeros are converted into spaces.
	STARTLINE	Line in which the represented screen field begins Possible values: 1<= n<=*maximum screen height* This depends on the screen type: 24x80: n<=24 32x80: n<=32 43x80: n<=43 27x132: n<=27
	NAME	Name of the field
	STARTCOLUMN	Column in which the depicted screen field begins Possible values: 1<=n<=*maximum screen width* also see example [1]
	LENGTH	Length of the field Possible values: 1<=n<=*maximum screen width*
	TYPE	Field type Protected Read-only field Unprotected Entry field
	INPUT	Data type of input Alpha or Numeric
	MODIFIED	Yes or No
	BLINKING	Yes or No
	UNDERLINE	Yes or No
	VISIBLE	Yes or No
	INTENSITY	Normal or Reduced
	INVERSE	Yes or No

Object name	Attribute name	Meaning
	COLOR	This returns the RGB color value of the relevant field. The value also depends on the settings of the host object WT_COLOR (refer to description). If the attributes of WT_COLOR have not been set then the following values are returned: #000000: No color attribute set #0000FF: Blue #FF0000: Red #FF0CCB: Magenta #008000: Green #40E0D0: Turquoise #FFFF00: Yellow #FFFFFE: White
	RangeName	Name of the area specified by the host object.
	RangeLength	Length of the area specified by the host object.
	RangeStart-Column	Column in which the area specified by the host object begins. Possible values: 1<=n<=*maximum screen width*

[1] The difference between `RangeStartColumn` and `StartColumn` is shown on the basis of an example.

When receiving data from the host the field E_03_020_010 was recognized:
E_03_020_010. StartColumn returns 20, E_03_020_010.RangeStartColumn also returns 20

Now access different from recognized field:
E_03_022_001.StartColumn returns 20, E_03_022_001.RangeStartColumn returns 22

The same with `RangeLength`, `RangeName` ...

7.2.2 Host control objects

Host control objects are provided for controlling the host interface, and continue to exist for the entire session.

– the sequence of fields in a screen

– the field in which is cursor is positioned

– the Enter key to be used

– the complete field name

The table below lists all host control objects and their attributes.
Attributes in bold face can be overwritten.

Objects and attributes are usually case sensitive. However, the attribute names of host objects are not case sensitive and they can be written in upper or lower case.

Object name	**Attribute**	**Meaning of the attribute**
$FIRST	Name	Full name of the first field in the current screen. If no object exists, the name `$END` is returned.
	Also all attributes of dynamic host data objects (`E_`*yy_xxx_lll*)	
$NEXT	Name	Full name of the next field in the current screen starting from the field last accessed. You can use this object to work through each screen field step-by-step. If there are no further objects, the name `$END` is returned. Note: `$NEXT` also takes attribute fields into account. As 3270 fields begin with an attribute byte, `$NEXT` initially returns this attribute byte (represented by a space). The subsequent `$NEXT` then returns the field contents.
	Also all attributes of dynamic host objects (`E_`*yy_xxx_lll*)	
$SCREEN	CONTENTS	All the characters of the whole screen in one string. May be usefull for comparing two complete screnn images.

Object name	Attribute	Meaning of the attribute
IND$FILE	**LOCAL_FILE**	Indicates the file which takes part in the transfer on the WebTransactions pages. This value is processed by the attributes PUT and GET.
	HOST_FILE	Indicates the file which takes part in the transfer on the MVS host pages. This value is processed by the attributes PUT and GET. The prefixes TSO:, CICS: or CMS: should be added in front of the name so that the emulation can be informed about the state of the dialog session. This entry influences the syntax of the IND$FILE command. Default value: TSO:
	PUT	Setting this attribute triggers a file transfer from the LOCAL_FILE to the HOST_FILE. The value assigned to the PUT attribute contains the options to be used for the transfer. These options are sent to the host as part of the IND$FILE command. **i** Please note that the IND$FILE command is not accepted in all the states of the dialog session and that the syntax is dependent on the state (TSO command mode, CMS, CICS).
	GET	Setting this attribute triggers a file transfer from the HOST_FILE to the LOCAL_FILE. The value assigned to the GET attribute contains the options to be used for the transfer. These options are sent to the host as part of the IND$FILE command. **i** Please note that the IND$FILE command is not accepted in all the states of the dialog session and that the syntax is dependent on the state (TSO command mode, CMS, CICS).
WT_FOCUS	**Field**	Object name of the field in which the cursor is currently positioned. This name is specified in full in the form E_*yy_xxx_lll*, and includes a length specification. Writing this attribute positions the cursor. If the attribute is empty or invalid, the cursor is positioned in the first row of the first column.
	OFFSET	Offset of the cursor from the start of the field to the cursor position.
WT_FOCUS_ SHORT	**Field**	As for WT_FOCUS, except the object name is stored without a length specification in the form E_*yy_xxx*.

Object name	Attribute	Meaning of the attribute
WT_KEY	**Key**	Indicates the special key in the terminal emulation to be activated when `send` is executed. The default values are listed in the table on page 126. Corresponding keys are included in the current templates by using `wtKeysMVS.htm`. (`<wtInclude ...>`).
WT_COLOR	**DEFAULT**	RGB color values for fields for which no color attribute is set. Possible values: `#000000`: Black (default value) `#0000FF`: Blue `#FF0000`: Red `#FF0CB`: Magenta `#008000`: Green `#40E0D0`: Turquoise `#FFFF00`: Yellow `#FFFFFE`: White
	BLUE	RGB color value for fields with the color attribute `blue` Default value: `#0000FF`
	RED	RGB color value for fields with the color attribute `red` Default value: `#FF0000`
	PINK	RGB color value for fields with the color attribute `pink` Default value: `#FFC0CB` `MAGENTA` is also accepted as an alias for `PINK` in order to permit shared scripts for different host connections.
	GREEN	RGB color value for fields with the color attribute `green` Default value: `#008000`
	TURQUOISE	RGB color value for fields with the color attribute `turquoise` Default value: `#40E0D0` `TURQUOISE` is also accepted as an alias for `CYAN` in order to permit shared scripts for different host connections.
	YELLOW	RGB color value for fields with the color attribute `yellow` Default value: `#FFFF00`
	WHITE	RGB color value for fields with the color attribute `white` Default value: `#FFFFFE`

Object name	Attribute	Meaning of the attribute
$MESSAGE	PRINTING	When this attribute is evaluated, WebTransactions sends the oldest file waiting to be printed to the browser (with the MIME type `webta/hardcopy-print` or MIME type `webta/bypass-print`).  Please note that the evaluation of `$MESSAGE.PRINTING` terminates the interpretation of the template and suppresses HTML generation.
	PRINTFILE_ NAME	This attribute returns the name of the file which is to be printed next. If no file is waiting to be printed, the attribute returns an empty string.
	WAITING	This attribute indicates whether WebTransactions has received an asynchronous message from the host application. Each time this attribute is queried, WebTransactions checks the buffer for asynchronous messages. If it finds a message, `$MESSAGE.WAITING` is set internally to "`Yes`". WebTransactions then reads the asynchronous message the next time `receive` is called.

7.3 Terminal functions supported by the browser

In WebTransactions for MVS you can display host application formats in the browser without any post-editing (01:01 conversion). This function is contained in the master template `MVS.wmt` (see page 70). The templates that you generated via the master template include the templates `wtBrowserFunctions.htm` and `wtKeysMVS.htm` which provide the functions required.

`wtBrowserFunctions.htm` in turn includes the following Javascript files:

`wtCommonBrowserFunctions.js`
: contains the Javascript code that will be run for all browsers.

`wt<`*browser*`>BrowserFunctions.js`
: contains the Javascript code for the current browser.

`wtKeysMVS.htm` contains the MVS-specific buttons for the standard keys and include the Javascript file `wtKeysMVS.js` which contains the special key mapping for WebTransactions for MVS. In this file you can adapt the key mapping to your needs and also extend it (see section “Mapping keys in wtKeysMVS.js” on page 128).

7.3.1 Terminal functions supported

The following terminal functions are provided:

– Pixel-precise layout of text and entry fields with the help of style sheets.

– Support for terminal special keys sent to WebTransactions. For some of these keys there are equivalents on the PC keyboard (e.g. the “F” keys). In some cases key combinations are be used to start terminal functions.

– Support for terminal special keys which work directly in the browser form (e.g. cursor positioning keys). For some of these keys there are equivalents on the PC keyboard (e.g. the “F” keys). In other cases, terminal functions are started using key combinations.

– Autotab:
When the maximum length of an entry field is reached the cursor automatically moves to the next entry field.

– Overwriting fields:
Like a terminal, the browser overwrites the characters already present in the entry field and does not insert text between the characters as per the browser default settings.

– Transfer of the cursor position from the browser to the host application:
Depending on the browser functions available, the browser transfers the exact cursor position or only the corresponding entry field to WebTransactions.

– Tabulator remains inside the form:
  The entry focus does not leave the form generated by WebTransactions. Using the tabulator key in the browser also automatically moves the focus onto the browsers controls.

Which of the terminal functions (F keys, cursor positioning keys ...) is actually displayed on the browser will depend on the type and version of the browser. The tables below show the terminal functions supported by the various browser types.

Terminal function	**Browser support**			
	Non specialized browser	**Netscape V4.0**	**Netscape V6.0 or higher or Gecko**	**Internet Explorer V4.0 or higher**
Layout of text and entry fields	no	no	yes	yes
Support for terminal special keys sent to WebTransactions	only via a pick list or button	only the ENTER key directly; all other function via a pick list or button	by individual configurable mapping via keys or pick lists or buttons	
Support for terminal special keys which work directly in the browser form	no	no	by individual configurable mapping via a key	
Autotab	no	yes	yes	yes
Overwriting fields	yes (simulated in the browser by automatic selection of field content)			yes
Transmits the cursor position	Only the position at the start of the last entry field used		Position at the start of the last entry field used and the exact position in protected fields.	Exact position in protected fields and in entry fields (V5.0 or higher)
Tabulator remains inside the form	no		yes	

Key support by Internet Explorer V4.0 or higher or by a Gecko-based browser

If you use Internet Explorer V4.0 or higher or a Gecko-based browser (Netscape V6 or higher), then the 3270 terminal keys are as follows[1]:

Key used in Internet Explorer	Corresponding key at the 3270-terminal
ENTER	ENTER
F1 ... F12	PF1 ... PF12
SHIFT+F1 ... SHIFT+F12	PF13 ... PF24
CTRL+F1	PA1
CTRL+F2	PA2
CTRL+F3	PA3
ALT+F9	Attn
ALT+F10	Sysreq
Pause	Clear
ESC	Reset

1) Here, '+' means that the keys specified must be pressed together at the same time. On some keyboards the STRG key is marked with CTRL.

7.3.2 Interaction between the host control object WT_KEY, the template wtKeysMVS.htm and the wtKeysMVS.js file

The host control object `WT_KEY` indicates the special key in the terminal emulation which is to be activated when `send` is executed.

The default values are given in the table below. The corresponding keys are included in the current templates by using `wtKeysMVS.htm` (`<wtInclude ...>`). `wtKeysMVS.htm` includes the JavaScript file `wtKeysMVS.js` which contains the mapping of the special keys for WebTransactions for MVS (see section “Mapping keys in wtKeysMVS.js” on page 128).

The table below shows:

– the controls provided by the `wtKeysMVS.htm` template and the file `wtKeysMVS.js` (included as standard).

– the values stored for the associated functions in the host control object `WT_KEY`.

Key on 3270 terminal	Value of WT_KEY key	Meaning
ENTER	@E	Send data to host
RESET	@R	Reset an error situation, e.g. after data is entered in a protected field where data entries are not allowed.
ATTN	@A@Q	Short message to the host application; no further data is transferred.
CLEAR	@C	Clear the screen and send an appropriate short message to the host application.
PF1..PF9	@1..@9	as per ENTER Send data to the host but with a different transfer ID.
PF10..PF24	@a..@o	as per PF1..PF9
SYSREQ	@A@H	System request: switch to a second window in which a system message can be sent.
PA1..PA3	@x..@z	Short message to the host application.
	Disconnect	Close the connection to the host. The subsequent receive call supplies the system object attribute FLD with the contents of WT_SYSTEM.DISCONNECT. This function is similar to switching off a real terminal or shutting down an emulation program without signing off properly from the host application.

Key on 3270 terminal	Value of WT_KEY key	Meaning
	`Refresh`	Refresh the display of the HTML page. This function is required in order to display messages that arrived asynchronously or were delayed, i.e. after the screen contents are taken as complete and sent to the browser in the form of an HTML page (see also `WT_SYSTEM.MULTIPLE_IO_TIMEOUT`, page 105). The `Refresh` function does not involve dialog with the host application. Host communication is suppressed with the `send` and `receive` calls.
	`Cancel Menu`	With some host applications, pull-down menus can be opened by means of selectable fields in the first screen line. The `Cancel Menu` function closes the menu; the original screen contents are then redisplayed. This function involves dialog with the host function.
	`Print`	Request a terminal hardcopy printout (see section section “Terminal hardcopy printing” on page 159).

7.3.3 Mapping keys in wtKeysMVS.js

The browser used will accept all keyboard entries. For the application-defined mapping of function keys, WebTransactions provides an interface and the file `wtKeysMVS.js`. A call to the function `wtCreateKeySelectList()` will generate a selection list (see section “Interaction between wtCommonBrowserFunctions.js and wt<browser>BrowserFunctions.js” on page 133).

The text below describes the key mapping supplied with WebTransactions. You can adapt and extend key mapping as required; no special knowledge of browser templates is required.

After creation of the base directory, the file `wtKeysMVS.js` is in the directory *<basedir>*`/wwwdocs/javascript`. The interface to be used for adapting the WebTransactions application is the table (array) `wtKeyMappingTableInput` given in this file.

The `wtKeyMappingTableInput` table defines an object with several attributes for each of the key maps (see table in page 129). These attributes describe:

– the key or key combination

– the action to be triggered when the key (or combination) is pressed

– if this function is also available on a selection list.

Example

```
wtKeyMappingTableInput = [
{ sl:'title of my select list'},
{ la:'Insert', co:'Insert', ac:doToggleInsert, kc:VK_INS },
{ la:'Reset', co:'RESET', ac:'@R', kc:VK_ESC, mk:MK_SHIFT },
{ la:'PA1', ac:'@x', kc:VK_F1, mk:MK_CTRL }
];
```

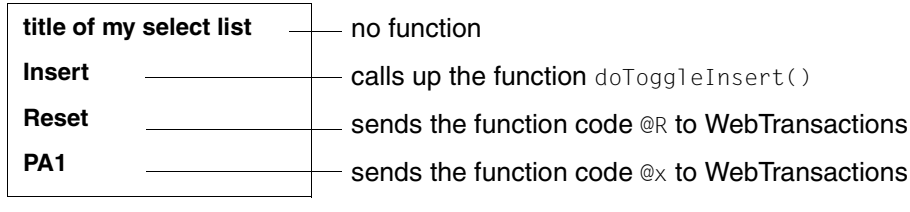
In this definition the mapping is as follows:

– `Insert` calls up the function `doToggleInsert` (toggle the Insert mode on and off)

– `ESC+SHIFT` sends the function code `@R` (corresponding to `Reset`) to WebTransactions

– `F1+CRTL` sends the function code `@x` (corresponding to `PA1`) to WebTransactions

This definition creates a selection list with the following content:



In the `wtKeyMappingTableInput` table you can enter the following attributes:

Description	Attribute	Meaning
`la`	`label`	Label, e.g. for entry in the selection list. If the attribute is not specified, no entry will be generated for the list. The corresponding key will, however, be mapped on a function.
`co`	`comment`	Comment. This attribute is not evaluated. This attribute has been provided as an alternative to the attribute `la`; by changing the attribute from `la` to `co` you can, for example, remove a key from the selection list.
`ac`	`action`	Action to be executed when the mapped key is pressed or when the action is selected from a list. If this attribute is a `string` type, the content will be transferred to `wt_special_key.value` and sent to WebTransactions. This means that the form is transferred to WebTransactions and as a special function is given the value of `ac` (e.g. `F1` as function key). If this attribute is a `function` type, a client-side function with this name will be called. This function must be defined. The Javascript files `wt`*<browser>*`BrowserFunctions.js` provide the following functions: – `doCursorHome` – `doCursorUp` – `doCursorDown` – `doCursorLeft` – `doCursorRight` – `doTab` – `doBackTab` – `doToggleMark` – `doToggleInsert`. The implementation of these functions can be empty; this depends on the browser capabilities (see the section “Callback functions in key mapping” on page 134). If this attribute is not defined, no action can be executed. Editing of the keyboard entries is left to the browser.
`kc`	`key code`	Number assigned to the pressed key in the keyboard driver. The script `wtCommonBrowserFunctions.js` has a symbol for many of the keys; the symbol name begins with `VK_`. For key combinations there is also the `modifier key (mk)`.

Description	Attribute	Meaning
mk	modifier key	Additional modifier key pressed (see definition in wtCommonBrowserFunctions.js): – 0 = MK_NONE (= no modifier key pressed) – 1 = MK_CTRL – 2 = MK_ALT – 4 = MK_SHIFT In key combinations the corresponding values are added: – 3 = MK_CTRL + MK_ALT – 5 = MK_CTRL + MK_SHIFT – etc. If no mk is specified then the value 0 = MK_NONE is used.
sl	select list	At the start of each selection list to be generated, a component with the index 0 will be generated as a header. The component has no function. The text for this “0” component is specified in the attribute sl. Any selection lists created previously will be closed when the attribute sl occurs. For improved readability, sl can be made to be the only attribute in the table object.

Structure of wtKeysMVS.js

This section describes the `wtKeyMappingTableInput` table from the `wtKeysMVS.js` file supplied with WebTransactions:

The object `wtKeyMappingTableInput` is created as literal.

```
wtKeyMappingTableInput = [
```

The attribute sl indicates the start of the selection list with the label `more keys`.

```
{ sl:'more keys'},
```

The attribute `co` indicates a comment for better readability. There is no attribute `la` for the following entries. The entries should not appear in the selection list. Use `kc` and `mk` to find the mapping for a PC key. With ac JavaScript functions are specified, which are to be processed, when the appropriate key or key combination is pressed.

```
{ co:'ENTER', ac:'@E', kc:13, mk:MK_NONE },
{ co:'Insert', ac:doToggleInsert, kc:VK_INS },
{ co:'CursorUP', ac:doCursorUp, kc:VK_UP },
{ co:'CursorDOWN', ac:doCursorDown, kc:VK_DOWN },
{ co:'CursorLEFT', ac:doCursorLeft, kc:VK_LEFT },
{ co:'CursorRIGHT', ac:doCursorRight, kc:VK_RIGHT },
{ co:'HOME', ac:doCursorHome, kc:VK_HOME },
{ co:'TAB', ac:doTab, kc:VK_TAB },
{ co:'BACKTAB', ac:doBackTab, kc:VK_TAB, mk:MK_SHIFT },
```

`Reset` appears as an entry in the selection list (attribute `la`). `RESET` is mapped by the `ESC` key and by the `SHIFT` + `ESC` key combination. A user can therefore trigger a `RESET` as follows:

- `Select RESET` from the list
- `Press ESC` on the keyboard
- `Press SHIFT` + `ESC` together on the keyboard.

```
{ la:'RESET', ac:'@R', kc:VK_ESC, mk:0 },
{ co:'RESET', ac:'@R', kc:VK_ESC, mk:MK_SHIFT },
{ la:'ATTN', ac:'@A@Q', kc:VK_F9, mk:MK_ALT },
{ la:'CLEAR', ac:'@C', kc:VK_PAUSE, mk:0 },
{ co:'CLEAR', ac:'@C', kc:VK_PAUSE, mk:MK_SHIFT },

{ la:'PF1', ac:'@1', kc:VK_F1, mk:0 },
{ la:'PF2', ac:'@2', kc:VK_F2 },
{ la:'PF3', ac:'@3', kc:VK_F3 },
{ la:'PF4', ac:'@4', kc:VK_F4 },
{ la:'PF5', ac:'@5', kc:VK_F5 },
{ la:'PF6', ac:'@6', kc:VK_F6 },
```

```
{ la:'PF7', ac:'@7', kc:VK_F7 },
{ la:'PF8', ac:'@8', kc:VK_F8 },
{ la:'PF9', ac:'@9', kc:VK_F9 },
{ la:'PF10', ac:'@a', kc:VK_F10 },
{ la:'PF11', ac:'@b', kc:VK_F11 },
{ la:'PF12', ac:'@c', kc:VK_F12 },
{ la:'PF13', ac:'@d', kc:VK_F1, mk:MK_SHIFT },
{ la:'PF14', ac:'@e', kc:VK_F2, mk:MK_SHIFT },
{ la:'PF15', ac:'@f', kc:VK_F3, mk:MK_SHIFT },
{ la:'PF16', ac:'@g', kc:VK_F4, mk:MK_SHIFT },
{ la:'PF17', ac:'@h', kc:VK_F5, mk:MK_SHIFT },
{ la:'PF18', ac:'@i', kc:VK_F6, mk:MK_SHIFT },
{ la:'PF19', ac:'@j', kc:VK_F7, mk:MK_SHIFT },
{ la:'PF20', ac:'@k', kc:VK_F8, mk:MK_SHIFT },
{ la:'PF21', ac:'@l', kc:VK_F9, mk:MK_SHIFT },
{ la:'PF22', ac:'@m', kc:VK_F10, mk:MK_SHIFT },
{ la:'PF23', ac:'@n', kc:VK_F11, mk:MK_SHIFT },
{ la:'PF24', ac:'@o', kc:VK_F12, mk:MK_SHIFT },

{ la:'PA1', ac:'@x', kc:VK_F1, mk:MK_CTRL },
{ la:'PA2', ac:'@y', kc:VK_F2, mk:MK_CTRL },
{ la:'PA3', ac:'@z', kc:VK_F3, mk:MK_CTRL },
{ la:'SYSREQ', ac:'@A@H', kc:VK_F10, mk:MK_ALT },
```

Do not close the last entry in the table with a comma. If you do close the entry with a comma, the program will wait for a further entry before the literal end ( ]).

```
{ la:'InsClip', ac:doInsertClipBoard, kc:VK_V, mk:MK_CTRL+MK_SHIFT }
];
```

7.3.4 Interaction between wtCommonBrowserFunctions.js and wt<*browser*>BrowserFunctions.js

The file `wtCommonBrowserFunctions.js` contains the Javascript code which will be run for all browsers. The `wt<`*browser*`>BrowserFunctions.js` files contain the Javascript code which will be run depending on the current browser. For example, `wtGeckoBrowserFunctions.js` contains the Javascript code for Gecko-based browsers.

After creation of the base directory, the files are located in the directory <*basedir*>`/wwwdocs/javascript`.

If you want to adapt the Javascript code in these files you will need specialist knowledge of browser behavior and browser interaction with WebTransactions. The following text describes the interaction between the functions and data structures as supplied with the product.

Symbols

The file `wtCommonbrowserFunctions.js` will be called before the files `wt<`*browser*`>BrowserFunctions.js` and `wtKeysMVS.js`. This file contains the definition of the variables for symbolically invoking the keys in the other `*.js` files.

```
// some symbolic keycodes /////////
   VK_TAB   =  9;
   VK_RETURN= 13;
   VK_SHIFT = 16;
   VK_CTRL  = 17;
   VK_ALT   = 18;
   VK_PAUSE = 19;
   VK_ESC   = 27;
   VK_PGUP  = 33;
   VK_PGDN  = 34;
   VK_END   = 35;
   VK_HOME  = 36;
   VK_LEFT  = 37;
   VK_UP    = 38;
   VK_RIGHT = 39;
   VK_DOWN  = 40;
   VK_INS   = 45;
   VK_0     = 48;
   VK_1     = 49;
   ...
   MK_NONE  = 0;
   MK_CTRL  = 1;
   MK_ALT   = 2;
   MK_SHIFT = 4;
```

Key mapping functions

`function wtCreateKeyMap()`

Generates, from the `wtKeyMappingTableInput` table, a structure which is simpler and quicker to access at runtime. The call is made from `wtKeysMVS.htm`. The call is absolutely necessary; without this call, mapping cannot take place.

`function wtCreateKeySelectList()`

Generates, from the `wtKeyMappingTableInput` table, one or more selection lists. The call is made from `wtKeysMVS.htm`. It is possible to suppress the list by leaving out the call for this function in `wtKeysMVS.htm`; the function keys will remain operative.

Following this example it is easy to describe other functions. You can, for example, generate a key or a table component for each function.

`function wtHandleKeyboard( modifier, keyCode )`

Called from `wt<`*`browser`*`>BrowserFunctions.js` when a key is pressed. `wtHandleKeyboard()`, on the basis of the structure generated by`wtCreateKeyMap()`, can now establish if an action has been assigned to this key: If an action has been assigned, it will be run. If no action has been assigned, the keyboard event will be left to the browser.

Callback functions in key mapping

The file `wtCommonBrowserFunctions.js` also provides functions used by the table `wtKeyMappingTableInput` (see the attribute `ac` on page 129).

Most of these functions return `false` as a result in order to indicate that no general mapping for these keyboard entries is available. In this case you should use the default behavior of the current browser. This default behavior will be uploaded to the `wt<`*`browser`*`>BrowserFunctions` files where required by functions with the same names.

Procedure

The behavior described above is obtained as follows:

1. Whenever a PC key is pressed, the browser calls the function `onKeyDown` from the file `wt<browser>BrowserFunctions.js`.
2. The function `onKeyDown` transmits the `modifier key` and the `key code` (see the `wtKeyMappingTableInput` table on page 129), and then calls the function `wtHandleKeyboard` (if this is present) in the file `wtCommonBrowserFunctions.js`.
3. The function `wtHandleKeyboard` recognizes if an action is defined for this key in the table `wtKeyMappingTableInput` under `ac` (see page 129).

If there is a function pointer under `ac`, the procedure continues as follows:

4. `wtHandleKeyboard` calls the function and then returns the callback value at `onKeyDown`.

   This occurs with actions such as `HOME`, `TAB` or `CursorDown`. The callback function is used at this stage to process actions on the client PC with the aid of the browser.
5. The function `onKeyDown` signals to the browser that the key has just been pressed (callback value `true`). In this case the browser will no longer react to the key. If this is not the case, the browser will run its standard reaction for the current keyboard entry.

If there is a character string under `ac`, the procedure continues as follows:

6. The content of the `string` is transferred to the attribute `wt_special_key.value` (see section “wtKeysMVS.htm template” on page 83). The form is transferred to WebTransactions together with the value of `ac` (e.g. `F1` as function key) as a special function.
7. In this case the callback value to the browser is always `true` (the key is processed immediately. The browser no longer reacts to the key.

If the attribute `ac` is not defined (i.e. no action has been assigned to the key pressed), the callback value `false` will be signalled to indicate that the browser will handle the keyboard entry.

WebTransactions-specific callback functions

WebTransactions provides a series of special implementations of the callback functions designed for individual browser types.

Some of the following functions are uploaded by`wtGeckoBrowserFunctions.js` depending on the capabilities of the Gecko browser. `wtExplorerBrowserFunctions.js` will upload all these functions (most of the possibilities are recognized by Internet Explorer) and then run the functions described below.

You can also develop customized callback functions in order to extend the user interface. In this case, you should ensure that a function invoked in the table`wtKeyMappingTableInput` (see page 129) is also defined in the file `wtCommonBrowserFunctions.js` and in the corresponding file `wt<`*browser*`>BrowserFunctions.js`.

`function doCursorUp()`
: Positions the cursor in the entry field above the current cursor position.

`function doCursorDown()`
: Positions the cursor in the entry field below the current cursor position.

`function doCursorLeft()`
: If the cursor is at the start of an entry field, moves the cursor to the end of the previous entry field. Otherwise, the browser will react to the key entry (moving the cursor inside the field).

`function doCursorRight()`
: If the cursor is at the end of an entry field, moves the cursor to the start of the next entry field. Otherwise, the browser will react to the key entry (moving the cursor inside the field).

`function doCursorHome()`
: Positions the cursor at the start of the first entry field.

`function doTab()`
: Skips to the start of the next entry field.

`function doBackTab()`
: Skips to the start of the previous entry field.

`function doToggleMark()`
: The marking of the entry field where the focus is located, is toggled.

`function doToggleInsert()`
: Toggles between the Insert and Overwrite modes.

7.3.5 Using the WT_BROWSER object

In order to avoid having to transmit the browser properties and font sizes many times during a session, WebTransactions creates the object `WT_BROWSER` at the beginning of each session. This object is then available globally throughout the entire session.

The `WT_BROWSER` object contains the following attributes:

– Browser ID
– Browser version
– Browser properties
– Font size to be used

These attributes are used in the following templates:

– All templates generated with the master templates `MVS.wmt` or `MVS_Pocket.wmt` (e.g. AutomaskMVS.htm).

– `wtBrowserFunctions.htm`
`wtBrowserFunctions.htm` includes `wt<`*browser*`>BrowserFunctions.js` and gives the font size (and other properties).

Font size in the attribute WT_BROWSER.charSize

In the `WT_BROWSER` object the attribute `WT_BROWSER.charSize` has the default setting `14` (previous static value).

If the attribute `WT_POSTED.wtCharSize` already exists at the start of a session then its value will automatically be taken over by `WT_BROWSER.charSize`. This feature makes it possible for individual users to set their own font sizes (depending on the screen resolution setting).

The value of `WT_BROWSER.charSize` can also be set while a session is running by using the method `WT_BROWSER.setCharSize()`.

You should not try to edit the attribute `WT_BROWSER.charSize` directly because other attributes depend on this value.

You can re-initialise the object `WT_BROWSER` using the method`WT_BROWSER.refresh()`. This will also refresh the attributes `WT_SYSTEM.CGI.HTTP_USER_AGENT` and `WT_POSTED.wtCharSize`. This procedure would make sense, for example, when a running session in a roaming session is taken over by another browser (for details on roaming sessions, see the WebTransactions manual “Concepts and Functions”).

Example application of WT_BROWSER.charSize

Allows a user on the call page of a WebTransactions application to select the font size to be used for displaying the application (e.g. via a selection list):

```
Font Size:
<select name="wtcharSize">
   <option value="12">12
   <option value="14" SELECTED>14
   <option value="17">17
   <option value="20">20
</select>
```

At the start of the session, these entries will automatically be taken over when the attribute `WT_POSTED.wtCharSize` is evaluated. All the size settings in `AutomaskMVS.htm` and in the generated templates will depend on this value.

You can also use Javascript to make the entry field for `wtcharSize` dependent on the screen width. You can do this, for example, when you call up a page via a Submit button with a entry field for the font size:

```
<body onload="document.forms.wtaform.wtCharSize.value =
             Math.round(screen.width/75)">
<form method="post" name="wtaform"
             action="/scripts/WTPublish.exe/D:/webta/basedir?Start">
<input type="submit" value="Start">
Font Size:
<input type="text" name="wtCharSize">
...
</form>
</body>
```

7.4 Start templates for MVS

After the WebTransactions application is started (via an entry page or by direct input of the URL), the parameters for the connection to the host application must be set in a start template.

WebTransactions provides ready-made start templates, which you can use as the basis for your own start templates. You have two options:

- **the start template set (ready-to-use)**

  This start template set can be used immediately. The required parameters are re-entered on every start and most of them are set to normal default values. It is suitable for starting an individual host application or several host applications integrated in a WebTransactions application. The set consists of the general start template `wtstart.htm`, which you can use, for example, to create communication objects and switch between different parallel host connections, as well as specific start templates for the individual host adapters. The start template `wtstartMVS.htm` is supplied specially for WebTransactions for MVS, and is described as of page 140. The general start template is described in the WebTransactions manual “Concepts and Functions”.

- **WTBean for the generation of a start template**

  To connect an individual MVS application, you should use a specially generated start template. The WTBean `wtcStartMVS.wtc` helps you to generate such templates.

7.4.1 MVS-specific start template in the start template set (wtstartMVS.htm)

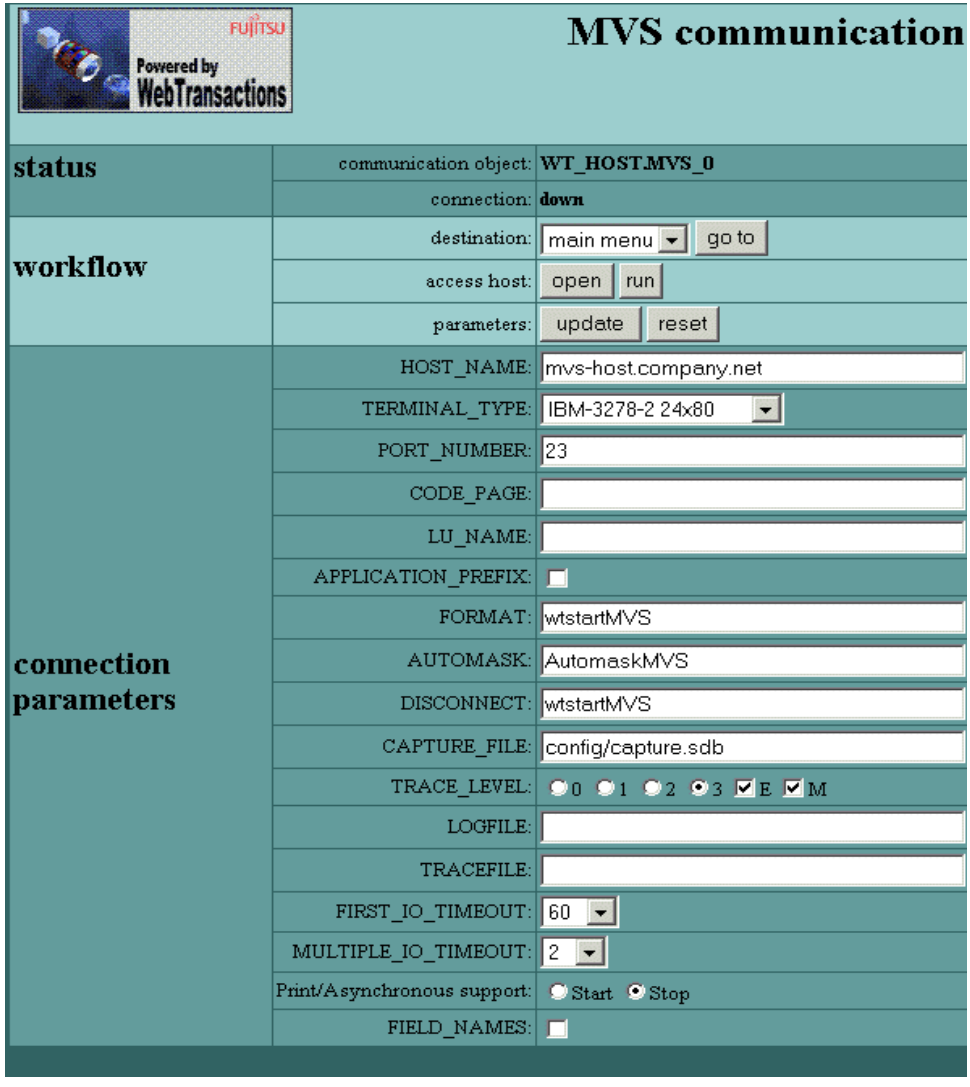
If you selected the `MVS` protocol in the general start template `wtstart.htm` (described in the WebTransactions manual „Concepts and Functions“) and created a new communication object, the system branches to the `wtstartMVS.htm` template. This template allows you to set MVS-specific parameters:

– You can define connection parameters and open a connection to an MVS application. If you select the **run** option, the connection to the host application is established (**open**) and the first screen of the application is fetched (**receive**).

– If you select the **open** option, a connection is established to the host application and the `wtstartMVS.htm` template is displayed again. If the connection was opened successfully, this template contains additional buttons for communicating with the MVS application. If you select **close**, the connection to the host application is shut down.

– If you select the **receive** option, the `wtstartMVS.htm` template is displayed again. It now contains a new **host attributes** section in which you can set the host attributes, for example, for pop-up recognition. Clicking on the **enter dialog** button displays the first screen of the host application.

Setting connection parameters and opening the connection



In the **connection parameters** area, you can set system object attributes with the same name to the desired values (see section “System object attributes” on page 97).

In the **workflow** area, you define the next action to be performed.

destination
In this field, you can select the template to be used. Then click **go to** to branch to the selected page. The default value here is `main menu`, and allows you to return to the general entry page `wtstart.htm`. If several connections are already open, they are also offered for selection. The system then branches to the respective host adapter-specific start templates of these connections.

access host
This field contains the actions that can be performed in the current session. If a connection has not yet been opened, the only options available are **open** and **run**:

open
This button opens a connection to the host. The start template now displays additional buttons for communication.

run
Like **open**, this button also opens a connection to the host. However, this also retrieves the first message from the host and displays it in the Web browser.

parameters
The **reset** button resets the parameters to the status received by the browser. The **update** button allows you to send the values of the page to WebTransactions without engaging in communication with the host.

Establishing communication
(only possible during a connection to the host that was opened using open)

As soon as a connection is opened, the following buttons for communication with the host application are provided in the **workflow** area under **access host**. During communication, only the buttons supported at each point in the process are offered for selection. If you selected **open**, these are the **receive** and **close** buttons:

receive / send
The **receive** and **send** buttons toggle.

receive receives the next message from the host application and expands the start template in order to set the host attributes. **send** sends a message to the host application. **send** sends the current data buffer without modifying the data.

close
This button closes the connection to the host application and returns to the first page displayed. There you can select and open a new connection.

Setting the host attributes
(only possible when a connection to the host is open and at least one dialog has taken place with the host using send/receive)

A new section, **host attributes**, is available in which you can specify the host attributes for pop-up recognition and key conversion. The following buttons may also be displayed during communication if a message was received from the host application.

receive / send
The **receive** and **send** buttons toggle.

receive receives the next message from the host application and expands the start template in order to set the host attributes. **send** sends a message to the host application. **send** sends the current data buffer without modifying the data. If you wish to send a screen containing modified data to the host application in the first step, you should select **enter dialog**.

enter dialog / resume dialog
This button branches directly to the next host application screen. You can then complete this screen and send it to the host application.

If you return to this page from an active host application by selecting the **suspend** button, the **resume dialog** button appears in place of the **enter dialog** button.

close
This button closes the connection to the host application and returns to the first page. There you can select and open a new connection.

7.4.2 WTBean wtcStartMVS.wtc for the generation of a start template

To connect an individual MVS application you can generate an application-specific start template. To do this, you use the WTBean `wtcStartMVS.wtc`. This is a standalone WTBean.

`wtcStartMVS.wtc` contains the inline WTBean `wtcMVS.wtc` which can be used to create a new MVS communication object, and thus to establish a connection to an MVS application (see the section “Creating a new MVS communication object (wtcMVS)” on page 146).

Before you can access WTBeans there must be a connection to a WebTransactions application.

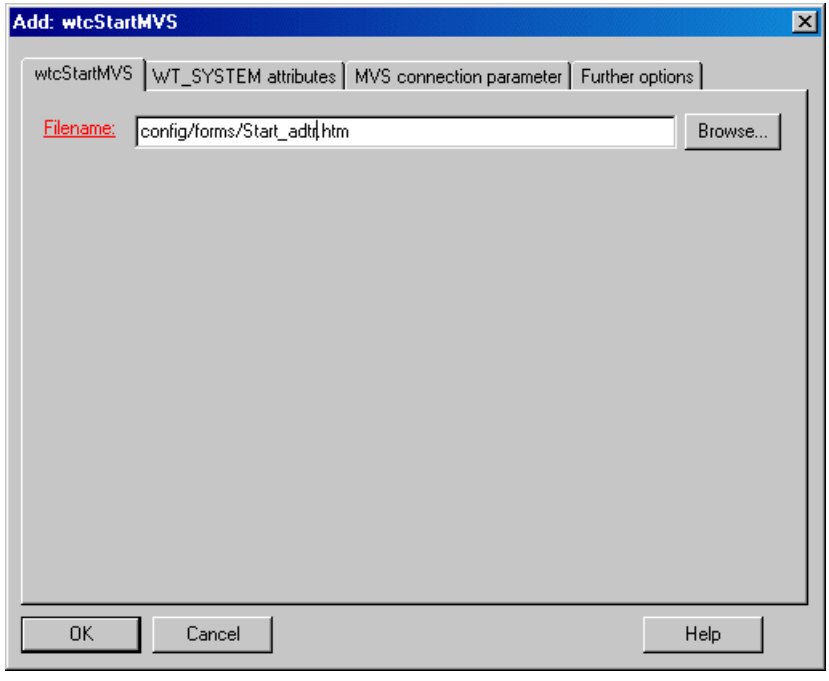
You use the **File/New/wtcStartMVS** command to open the WTBean for editing. WebLab generates the **Add:wtcStartMVS** dialog box which contains four tabs:

– In the **wtcStartMVS** tab you specify the name of the start template you want to generate.

– In the **WT_SYSTEM attributes** tab you specify the most important system object attributes.

– In the **MVS connection parameters** tab you specify the most important connection parameters.

– In the **Further options** tab you can edit all the parameters for the connection to the MVS application within a tree structure.



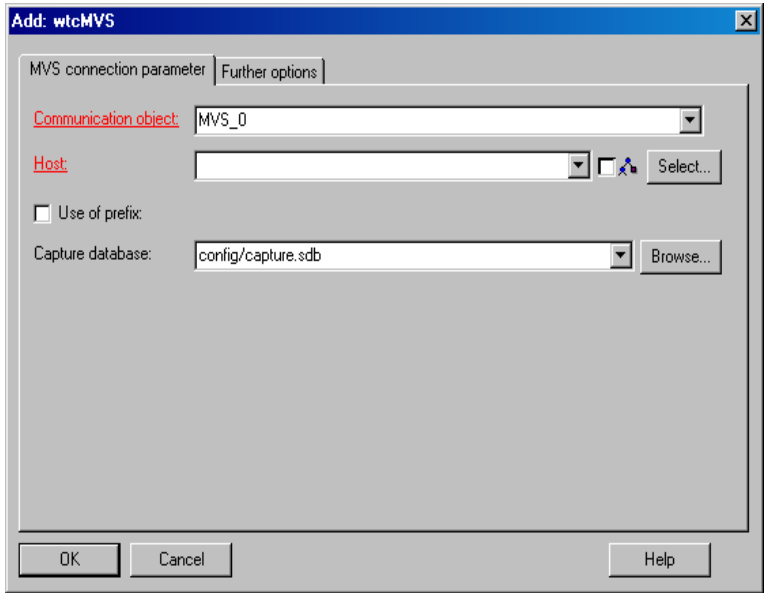
The generated start template itself does not generate any pages in the browser. When WebTransactions is started, the template corresponding to the first format received from the host application is displayed. This is due to the `wtinclude` tag at the end of the start template.

7.5 Creating a new MVS communication object (wtcMVS)

The WTBean `wtcMVS` is supplied in order to enable you to create a new MVS communication object in a template and thus establish a connection to an MVS application. You can also use this WTBean to open multiple connections in parallel. `wtcMVS` is an inline WTBean. For more information, refer to the WebTransactions manual „Concepts and Functions“.

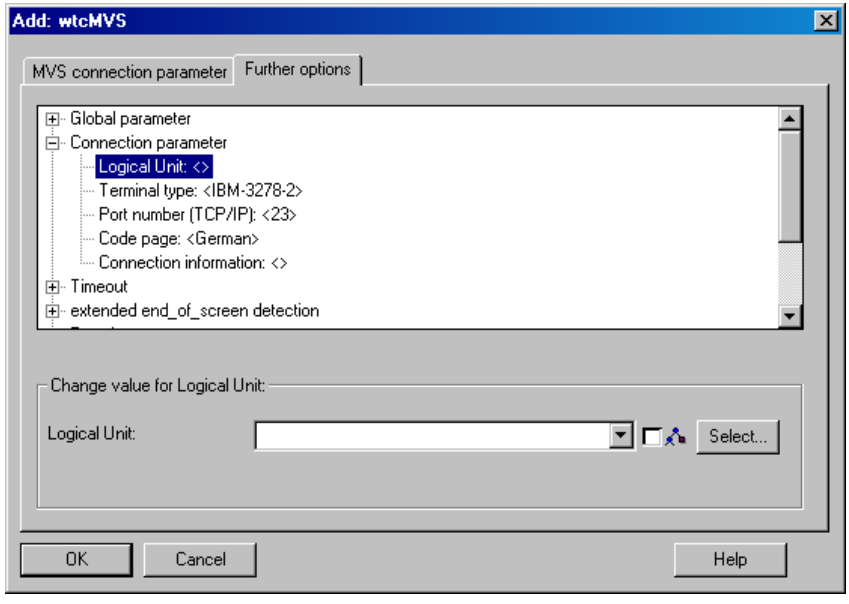
Before you can access inline WTBeans, there must be a connection to the WebTransactions application and the template in which you want to insert the WTBean must be open.

You use the **Add/WTBean/wtcMVS** command to open the WTBean for editing. WebLab generates the **Add:wtcMVS** dialog box:



In this dialog box you can edit the parameters for the new communication object. The most important parameters can be found in the first tab, **MVS connection parameters**. The mandatory parameters are displayed in red.

You can edit all the other parameters in a tree structure in the **Further options** tab.



Once you have entered the values for the parameters and clicked **OK** to confirm your settings, the code of the WTBean is generated from the parameters and the description file and is then inserted at the cursor position in the opened template.

The WTBean is made up of protected and unprotected code areas. The protected areas are grayed out. In these areas, you are only able to influence the WTBean via the interface. To do this, select the **Edit WTBean** command from the context menu of the start line of the WTBean (in pink) (see the WebTransactions manual “Concepts and Functions”).

8 Using print/asynchronous support

If you enable print/asynchronous support, WebTransactions automatically checks for asynchronous messages or print information at definable intervals.

If asynchronous messages are found, the host application screen displayed in the browser is automatically updated (automatic refresh). If print information is found, it is printed out.

WebTransactions provides print/asynchronous support via the frame set described in section “Functionality of print/asynchronous support” on page 150. JavaScript must be permitted in the configuration of your Web browser.

8.1 Enabling print/asynchronous support

To enable print/asynchronous support, you must set the `WT_ASYNC` attribute of the connection-specific system object to `"YES"` (the default value is `"NO"`).

If you use the standard `wtstartMVS.htm` start template to start the WebTransactions session, click on the **Start** radio button for the option **Print/Asynchrone support**.

If you use your own start template, you must insert an assignment where `WT_ASYNC` is set to `Yes` in order to be able to start print/asynchronous support. This is usually carried out via the WTBean `wtcMVS` by setting the **Enable asynchronous messages** entry to **Yes**.

The browsers in common use today that support the `<iframe>` HTML tag enable limited print support even without the activation of the `WT_ASYNC` attribute. Existing print data is checked only for every dialog step triggered by the user. Asynchronous print data using BYPASS printing may be printed with a delay.

8.2 Functionality of print/asynchronous support

Print support and asynchronous support operate in accordance with the same principle.

- If the browser does not support the `<iframe>` HTML tag and print/asynchronous support is enabled (i.e. `WT_ASYNC` is set to `"Yes"`), a script in the `wtBrowserFunctions.htm` template starts the frame set `wtframes.htm`.

  `wtframes` consists of two frames:

  – An application frame in which the host application screens are displayed as normal.

  – An “invisible” control frame designed exclusively for querying whether asynchronous messages or print information is available, and for initiating appropriate actions if necessary. In this control frame, the template `wtasync.htm` which is made available by WebTransactions takes control. It is assigned to the same session as the application frame. In this template, WebTransactions operates in so-called asynchronous mode which does not affect the dialog flow of the host application.

  Since the application frame occupies the entire browser window and the control frame is not visible on the interface, the Web browser user is not aware that the session is being conducted with a frame set after print/asynchronous support is enabled. When you close the connection and return to the start template, the frame set is automatically unloaded.

  Format of the wtframes.htm template

```
<html>
  <head>
    <title>WebTransactions</title>
  </head>
  <frameset rows="100%,*" border="0">
    <frame name="application" src="##WT_System.HREF_ASYNC#" />
    <frame name="control"
src="##WT_System.HREF_ASYNC#&WT_ASYNC_PAGE=wtasync" />
  </frameset>
</html>
```

- If, on the other hand, the browser supports the `<iframe>` HTML tag and print/asynchronous support is activated (i.e. `WT_ASYNC` has been set to `"Yes"`), only the “invisible”
  control frame is called inline (with `<iframe>`) in which the template `wtasync.htm` made available by WebTransactions takes control.

Control frame: wtasync.htm

The processing steps involved in handling asynchronous message and the print functionality are defined in the control frame. The control frame must contain a `wtDataform` tag with the attribute `asyncPage="wtasync"`. This indicates that the template is outside the dialog sequence (see sections on asynchronous dialog in the WebTransactions manual “Concepts and Functions”).

The basic framework of the `wtasync.htm` template is shown below:

```
<html>
  <body>
    <wtDataform name="async" asyncPage="wtasync">
    </wtDataform>
    <wtOnCreateScript>
    <!--
      host = WT_HOST.active;
      if ( host.WT_SYSTEM != null )
        host_system = host.WT_SYSTEM;  // Private System Objects
      else
        host_system = WT_SYSTEM;       // Public  System Objects
```

Processing steps for print requests
... (see page 160)

Handling of asynchronous messages
... (see page 156)

```
    //-->
    </wtOnCreateScript>
  </body>
</html>
```

wtBrowserFunctions.htm template

The `wtBrowserFunctions.htm` template also plays an important role in print/asynchronous support. It contains a script that performs the following actions when print/asynchronous support is enabled:

– starts the `wtframes` frame set, if this is necessary but has not already been loaded

– begins the cyclical submission of the control frame

Structure of the script in `wtBrowserFunctions.htm`:

```
<wtIf ( wtCurrentComm_system.WT_ASYNC == 'Yes')>
  <wtrem>support of asynchronous message and printing with browsers not
supporting <iframe>//////</wtrem>
  <script type="text/javascript">
  <!--
  function AutomaticRefresh()
  {
    if( parent.control && parent.control.document.forms[0] ) {
      parent.control.document.forms[0].submit();
    }
    setTimeout('AutomaticRefresh()', 5000);
  }
  if( !parent.control )
  {
    self.location.href =
'##WT_SYSTEM.HREF_ASYNC#&DUMMY=##WT_SYSTEM.FORMAT_STATE#' +
      '&WT_ASYNC_PAGE=wtframes';
  }
  else
  {
    ##(wtCurrentComm_system.HARDCOPY == 'Yes' || wtCurrentComm_system.BYPASS
== 'Yes') ?
       'AutomaticRefresh();' :
       'setTimeout("AutomaticRefresh()", 5000);'#

  }
  //-->
</script>
  <wtElse><wtIf ( (wtCurrentComm_system.HARDCOPY == 'Yes' ||
wtCurrentComm_system.BYPASS == 'Yes') && WT_BROWSER.acceptIframe )>
  <wtrem>just synchronous support of printing with browsers supporting
<iframe>//////////////////////////</wtrem>
```

```
<iframe id="asyncFrame"
style="visibility:hidden;height:0;position:absolute;"
src="##WT_SYSTEM.HREF_ASYNC#&WT_ASYNC_PAGE=wtasync"></iframe>
  </wtIf></wtIf></wtIf>
```

It is possible to modify the time interval at which the control frame is cyclically submitted (default value: 5000 ms).

8.3 Handling asynchronous messages

Asynchronous messages are messages sent to the terminal without being expressly requested by the user - i.e. without the user pressing a particular key or clicking an interface element.

If you access a host application that uses asynchronous messages via the Web, WebTransactions acts as a terminal and accepts asynchronous messages. However, by the time an asynchronous message is received by WebTransactions, the current page has already been sent to the browser. The modification caused by the asynchronous message is not apparent until the browser page is refreshed.

Without print/asynchronous support, the following problem occurs: the Web browser user cannot determine whether WebTransactions has received an asynchronous message and can therefore only refresh the page “on spec”.

WebTransactions solves this problem by automatically refreshing the browser page each time an asynchronous message is received - provided that print/asynchronous support is enabled (`WT_SYSTEM.WT_ASYNC="Yes"`). For this purpose, WebTransactions uses the `wtframes` frame set or the `<iframe>` HTML tag described in section “Functionality of print/asynchronous support” on page 150.

Regardless of the value of the `WT_ASYNC` attribute, `REFRESH_BY_ASYNC` is set to `Yes` if an asynchronous message has been received. The template is able to analyze this value and warn the user that the last send request was ignored because of an asynchronous message and request the user to retransmit the message.

Concept

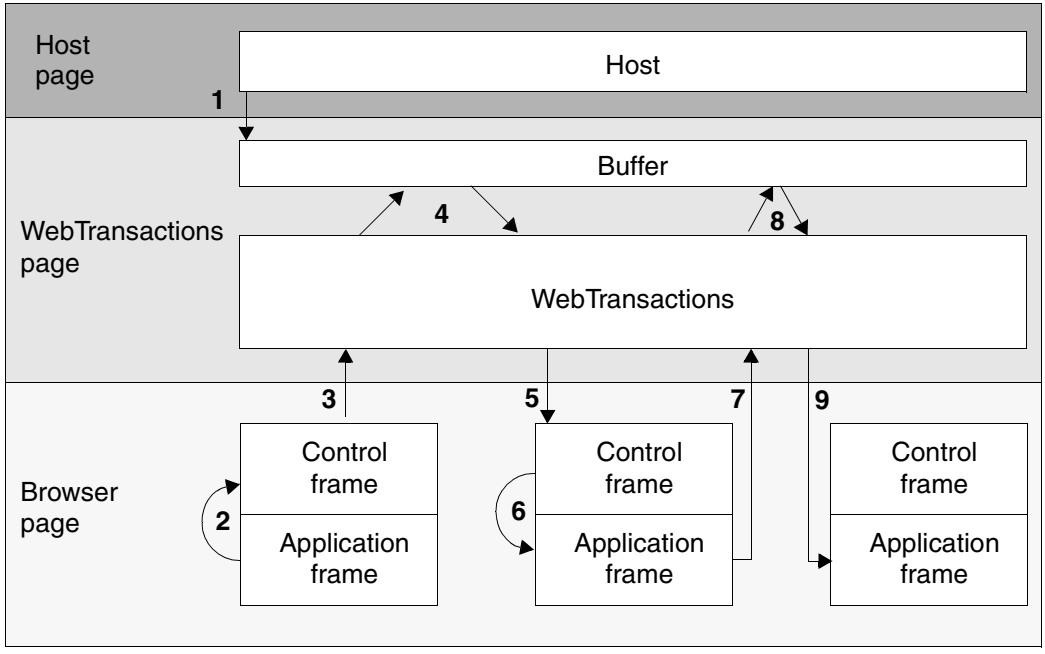


Figure 2: Handling asynchronous messages

1. The host application sends an asynchronous message. This is not immediately processed by WebTransactions.
2. `wtBrowserFunctions.htm` starts an additional invisible control frame, if required (if the browser does not support the HTML tag `<iframe>`), via the `wtframes.htm` template.
3. `wtBrowserFunctions.htm` starts an asynchronous call to WebTransactions with the `wtasync.htm` template cyclically in the invisible section (`frame` or `<iframe>`).
4. `wtasync.htm` checks whether there is a message that has not been processed (WebTransactions responds with `"Yes"` on evaluating `$MESSAGE:WAITING`). If the response is Yes, JavaScript code is generated in the response which then triggers a refresh (see step 6).
5. The control frame receives the response to the asynchronous call.
6. If unprocessed messages are available, the control frame receives a JavaScript instruction which automatically triggers a refresh of the application frame (see page 156).
7. The application frame is then sent to and evaluated by WebTransactions.

8. The template responsible for the current screen performs the `send` and `receive` functions as usual. However, as `WT_KEY.KEY` contains the value “Refresh”, no new message is sent to the host, instead all remaining messages from the host are processed.
9. The screen modified by the asynchronous message is sent to the browser and displayed in the application frame.

If you create your own templates for individual formats, you must take account of the area in which asynchronous messages are displayed. This does not occur automatically with WebLab if this area is empty and if the **static** option was set when the Capture function is executed.

Handling of asynchronous messages defined in wtasync.htm

The following processing steps for handling asynchronous messages are defined in `wtasync.htm`.

```
// Support of Asynchronous message ////////////////////////////////////
else if ( host.$MESSAGE.WAITING == "Yes" )
        document.write (
          '<script>' +
          '  if( parent.application && parent.application.document.forms[0]
)' +
          '    parent.application.wtSubmitKey( \'Refresh\' );' +
          '  else if( parent.document.forms[0] && parent.wtSubmitKey )' +
          '    parent.wtSubmitKey( \'Refresh\' );' +
          '</script>' );
      else if (host.$CONNECTION.ALIVE == 'No' )
        document.write (
          '<script>' +
          '  if( parent.application && parent.application.document.forms[0]
)' +
          '    parent.application.wtSubmitKey( \'Disconnect\' );' +
          '  else if( parent.document.forms[0] && parent.wtSubmitKey )' +
          '    parent.wtSubmitKey( \'Disconnect\' );' +
          '</script>' );
```

Firstly, the `WAITING` attribute of the host control object `$MESSAGE` is queried to establish whether asynchronous messages are available. Each time this attribute is queried, WebTransactions checks the buffer for asynchronous messages. If an asynchronous message is found, the value of `$MESSAGE.WAITING` is set internally to `"Yes"`.

If the value `"Yes"` is returned for `$MESSAGE.WAITING`, the `wtasync.htm` template automatically refreshes the application frame. During this process, it is first checked whether the application frame is active and the `wtSubmitKey` method is present (communication with the host may have been shut down by a disconnect).

Customizing the WTAsync.htm template

It is possible to modify the `WTAsync.htm` template slightly, thus changing the handling of asynchronous messages. For instance, you may wish to output a message box informing the user that asynchronous messages have arrived instead of automatically refreshing the application frame.

```
if (host.$MESSAGE.WAITING == "Yes")
document.write ("<script> top.alert ('You received an asynchronous
    message. Please Refresh')</script>");
```

8.4 Print support

This section describes how to print data with WebTransactions.

The print functions supported by WebTransactions differ depending on the type of information to be printed.

WebTransactions offers the following print options:

- Terminal hardcopy printing
  This involves printing the alphanumeric display of the host application screen as it would appear on your terminal or terminal emulation.
- Host data printing
  This involves printing information formatted and sent by the host application, i.e. printing host files.
- Browser display printing
  This involves printing the information displayed in the Web browser.

In the case of terminal hardcopy printing and browser display printing, it is possible to distinguish whether the print job was initiated by a Web browser user (user-driven), or by the host application (software-driven). The printing of host data is always software-driven.

Depending on the print function selected, you may have to configure your Web browser and possibly a print server. For information on how to configure the Web browser, see section “WTAPrint print plugin” on page 173. For instructions on configuring the print server, see the product documentation for the appropriate print server.

Printouts are normally sent directly to a printer. During configuration, however, you can define the print process such that printouts are routed to a file. This option is available for all print functions described in this section.

8.4.1 Terminal hardcopy printing

With terminal hardcopy printing, the alphanumeric display of the host application screen is printed as it would appear on your terminal or terminal emulation. In this case, WebTransactions prints the entire host application screen.

Concept

Terminal hardcopy printing is handled on the basis of the WTFrames frame set described in section “Functionality of print/asynchronous support” on page 150ff, which consists of an application frame and a control frame.

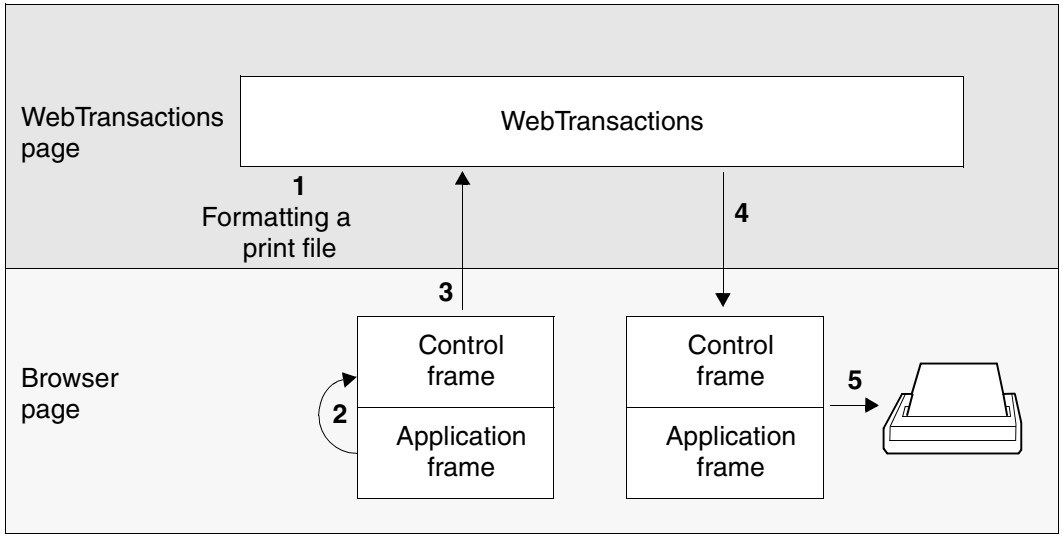


Figure 3: Terminal hardcopy printing

When you request a terminal hardcopy printout, WebTransactions generates a corresponding print file (step 1). Triggered by the script in `KeysMVS.htm`, the control frame is automatically submitted (step 2) and WebTransactions is asked to confirm whether or not a print file exists (step 3). If a print file does exist, the prepared file is sent to the browser (step 4). For instructions on how to configure and start the corresponding print program, see section “Print functions delivered (Windows browser platform)” on page 168.

The print file generated by WebTransactions is a pure text file in which lines are separated by the control characters <CR><LF>.

Processing steps defined in wtasync.htm for terminal hardcopy printing

```
// Support of hardcopy print ////////////////////////////////////////
if ( host_system.HARDCOPY == "Yes" )
      {
        host_system.HARDCOPY = "No";   // Reset flag before
        if (!host_system.WT_BROWSER_PRINT ||
host_system.WT_BROWSER_PRINT.toLowerCase() != 'yes')
          host.$MESSAGE.PRINTING;        // calling host.$MESSAGE.PRINTING
        else
        {
           WT_SYSTEM._printFile = WT_SYSTEM.BASEDIR + "/tmp/" +
WT_SYSTEM.SESSION + "/" + host.$MESSAGE.PRINTFILE_NAME;
          if (host_system.WT_BROWSER_PRINT_OPTIONS.MODE != "Automatic")
             document.writeln("<script>window.open
('"+WT_SYSTEM.HREF_ASYNC+"&WT_ASYNC_PAGE=wtc_bp_Print','_blank','toolbar=no,s
crollbars=yes,width=800,height=600')</script>");
          else
          {
            document.clear();
            forward ('wtc_bp_Print');
          }
        }
      }
```

When a terminal hardcopy print file becomes available for printing, WebTransactions sets the `HARDCOPY` attribute of the connection-specific system object to `"Yes"`. If a print request is displayed in this way, `HARDCOPY` is initially reset to `"No"` in `wtasync.htm`.

If the printout is to be carried out with the browser print function, `$MESSAGE.PRINTFILE_NAME` is used to determine the name of the print file and a separate template is started for the print request (`wtc_bp_print.htm`).

Otherwise, the `PRINTING` attribute of the host control object `$MESSAGE` is evaluated which causes WebTransactions to send the file to be printed to the browser. As a result of the MIME type, this recognizes the data as print data and passes it to an appropriately configured application (e.g. `WTAPrint.exe`).

Please note that `HARDCOPY` must be reset to `"No"` **before** the host control object's `$MESSAGE.PRINTING` attribute is evaluated. This is because the evaluation process terminates interpretation of the template and suppresses HTML generation.

Terminal hardcopy printing initiated by the user

To activate terminal hardcopy printing, simply click the `Print` button. This button is defined in the `wtKeysMVS.htm` template, which is included by the `AutomaskMVS.htm` conversion template and by the individual templates created with WebLab.

When you click this button, the current page is sent from the browser to WebTransactions. WebTransactions interprets the template as normal, apart from one exception: when executing the `send` call, WebTransactions recognizes that the `Print` button has been activated, and does not send a message to the host. Instead, a print file is generated containing an alphanumeric representation of the current screen.

8.4.2 Host data printing

The printing of host data includes information that has been prepared and sent by the host application, for example host files.

8.4.2.1 Concept

When printing host data, the print data cannot be received via the existing dialog connection between WebTransactions and the host computer. An additional network connection must be set up in this case between every printer station on the host and a printer or a print server. The printer station on the host has to be configured in this case as a remote printer.

The print server runs on the WebTransactions server in addition to the WebTransactions applications. The server accepts the print data from the host and can make it available to the WebTransactions sessions using a suitable configuration.

WebTransactions for MVS supports the LPD protocol as an interface between the printer station on the host and the print server.

Two scenarios are possible when printing host data:

- The print output is sent to a central printer that has no logical dependency on the initiating user.

  This variant is not changed by using WebTransactions.

- The print output is diverted to distributed printers. The choice of printer is logically dependent on the initiating user or the terminal used.

  In order to send print jobs to a specific printer in the network, you have to install a print server on the PC to which the printer is connected. This makes network printers accessible for host-controlled print functions.

  If WebTransactions is also used, the print output is sent to the client, i.e. it is output by the terminal browser. Since there is no physical dependency on the side of the host between the terminal and the selected printer, the logical dependency is created by a relevant configuration.

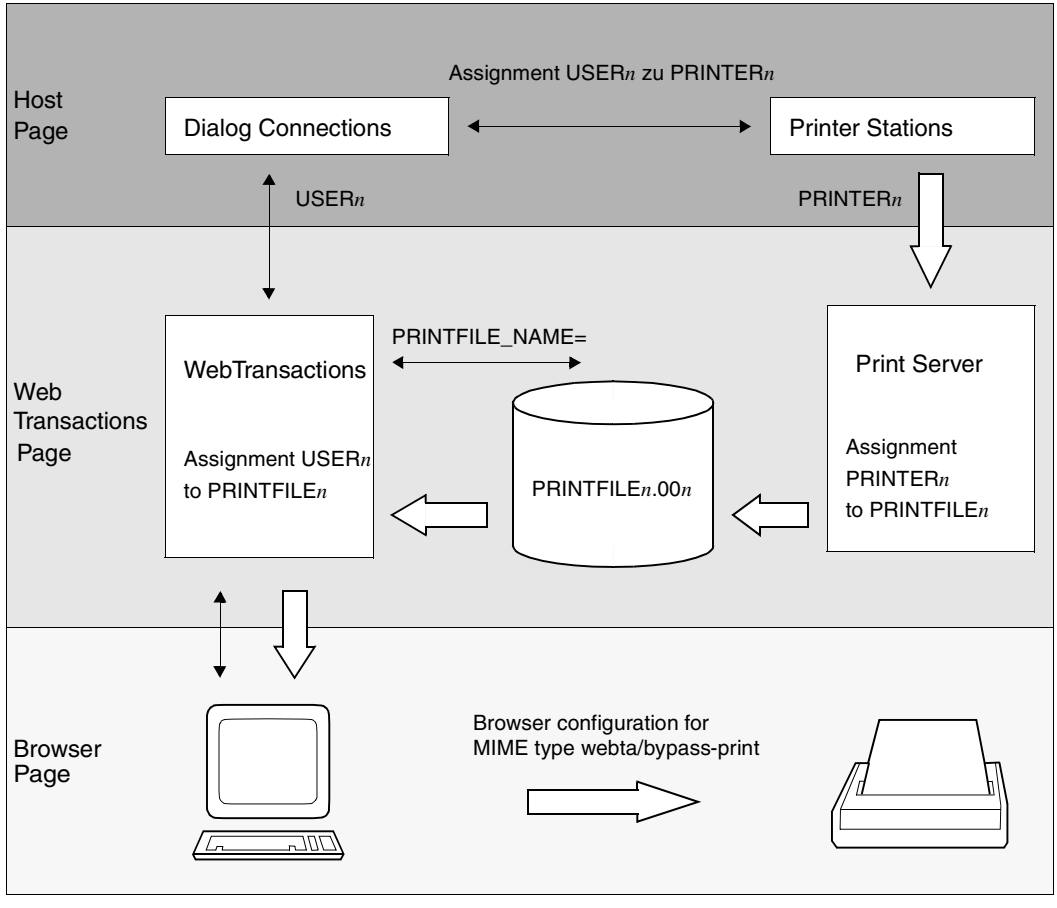
  This procedure is described below.

8.4.2.2 Assigning a printer to a Web browser client

The WebTransactions print function allows users to initiate printing in the browser window on their PCs and to send this print output to a printer connected to their PCs.

The configuration must therefore:
– accept the print job,
– recognize the dialog session to which it belongs and
– send the print data to this printer precisely.

The path of the print data that such a configuration produces is depicted in the diagram below:



This arrow in the graphic shows the way of the print data

Figure 4: Path of the print data starting the print in the browser window

The print jobs are addressed on the host via the printer names. It must be ensured here that the address space is adequate to offer sufficient differentiation criteria for the assignment of the print output. You may have to extend the assignment in the host application and in the WebTransactions application.

In order to print the print information on a printer that is accessible from your PC, the print data has to be directed to the browser by WebTransactions. The configuration of the application on the host must use a name assignment in this case that reflects this correlation.

Assigning USER*n* to PRINTER*n*

The assignment on the host can be performed as follows:

– statically, for example by a table assignment
– generically, for example based on naming conventions
– dynamically using appropriate dialog input at the host application

Assigning USER*n* to PRINTFILE*n*

This assignment in the WebTransactions session can be performed as follows:

– statically, for example by a table assignment
– generically, for example based on naming conventions

Both can be configured using normal WT script statements or with the support of the `ReplaceByConfigFile` user exit.

Assigning PRINTER*n* to PRINTFILE*n*

This assignment on the print server must be configured statically; it cannot be changed dynamically by the WebTransactions session. On Unix-based systems the assignment `PRINTER` to `PRINTFILE_NAME` has to be specified with an appropriate configuration of the spool system.

8.4.3 Host data printing on the Windows WebTransactions platform

MVS applications support the routing of print information to specific printers. The “LUNAME” concept, which is also used for terminals, enables MVS applications to address individual printers by means of a logical address.

If you wish to implement a similar functionality for Web access to MVS applications, you will encounter the following problem. In MVS dialog applications, printers are frequently correlated with terminals. With Web access, WebTransactions assumes the role of a terminal. To allow you to direct print information to your own printer even with Web access, you use Microsoft Microsoft Host Integration Server (suitable for the Intranet and Internet, but only for text files), see the following section.

Using Microsoft Host Integration Server as a gateway

This method of printing host data can be used in both the intranet and the internet. It involves using Microsoft Host Integration Server (kurz MHIS) as a gateway. To do this, the print files must be pure text files containing only simple control characters, such as <CR> or <LF>. The method is based on the regimented use of LUs (logical units): a particular end user uses a special LU for display purposes and a special LU for printing.

When the MVS host sends print information to a certain printer LU, MHIS can save this information to a file. The file names used must be different for the various printer LUs. If several files are generated for a particular printer LU, MHIS uses an incremental suffix (.001, .002, .003, ...).

It must be possible to access the WebTransactions system from the MHIS system via the network. MSSM and WebTransactions can also run on the same machine.

The system object’s `PRINTFILE_NAME` attribute must be set to the name of the print files assigned to this session. This must be specified as an absolute path name without an incremental suffix.

If the `$MESSAGE.PRINTING` attribute is evaluated in the template, the host files to be printed which correspond to the name set in `PRINTFILE_NAME` are sent to the browser. The printing procedure is the same as with terminal hardcopy printing (see page 159):
if WebTransactions finds a print file with the name set in `PRINTFILE_NAME`, the system object’s `HARDCOPY` attribute is set internally to `Yes`.

Assigning a particular user to a special MVS display LU

Information	Explanation
sym. name/IP address/user ID	At the beginning of the WebTransactions session, the user must be identified: – In WebTransactions, the symbolic name and IP address of the system on which the browser runs can be obtained from certain system object attributes. `CGI.REMOTE_HOST` contains the symbolic name and `CGI.REMOTE_ADDR` contains the IP address. – If the browser system is connected to WebTransactions via a proxy server, however, the `CGI.REMOTE_HOST` and `CGI.REMOTE_ADDR` attributes supply the name and IP address of the proxy server. In this case, insert a request in the start template asking the user to enter his/her user ID.
sym. name/IP address/user ID ⟶ session index (multisession API server)	In the start template, you can assign a special session index to a particular symbolic name, IP address, or user ID.
session index (multisession API server) ⟶ MHIS display LU name	In the multisession API server configuration, you can assign a special MHIS display LU name to a particular session index.
MHIS display LU name ⟶ MVS connection and LU#	In the MHIS configuration, you can assign a special MVS connection and LU# to the MSSM display LU name.
MVS connection and LU# ⟶ MVS display LU name	In the MVS VTAM configuration, you can assign a special MVS display LU name to an MVS connection and LU#.

Assigning a particular user to a special printer LU

Information	Explanation
sym. name/IP address/user ID	See table for display LU on page 166.
sym. name/IP address/user ID ⟶ *printfile_name*	In the start template, you can assign a special *printfile_name* to a particular symbolic name, IP address, or user ID.
printfile_name ⟶ MHIS print service session name	In the MHIS configuration, you can assign a special MHIS print service session name to a particular *printfile_name*.
MHIS print service session name ⟶ MHIS printer LU name	In the MSSM configuration, you can assign a special MHIS printer LU name to the MHIS print service session name.
MHIS printer LU name ⟶ MVS connection and LU#	In the MHIS configuration, you can assign a special MVS connection and LU# to the MHIS printer LU name.
MVS connection and LU# ⟶ MVS printer LU name	In the MVS VTAM configuration, you can assign a special MVS printer LU name to an MVS connection and LU#.

8.4.4 Browser display printing

This print function is not provided by the program `WTAPrint.exe` which is made available with WebTransactions and which must be installed on every client, rather it is based on the print functionality of the Web browser.

To print the information displayed in the browser window, use the Web browser print functions (*Print...* command in the File menu).

8.4.5 Print functions delivered (Windows browser platform)

WebTransactions contains various print functions which you can use for terminal hardcopy printing (see page 159) and host data printing (see page 162 and page 165). The print functions are:

– Browser print, which will run without the print plugin installed on the client PC.

– `WTAPrint` print plugin

The `wtKeysMVS.htm` template generates an additional **Print** button if it is possible to trigger a print function. This is the case when one of the following conditions are fulfilled:

– Print/asynchronous support is activated (i.e. `WT_ASYNC` has been set to `"Yes"`).

– The browser supports the `<iframe>` HTML tag.

8.4.5.1 Browser print

The browser print function is implemented as a parameter of the inline WTBean `wtcMVS` (see section “Creating a new MVS communication object (wtcMVS)” on page 146 and the WebTransactions manual “Concepts and Functions”).

WTBean `wtcMVS` contains an ActiveX component which is automatically loaded and installed. Depending on the browser setting, the user must confirm that the ActiveX control indicated can be installed.

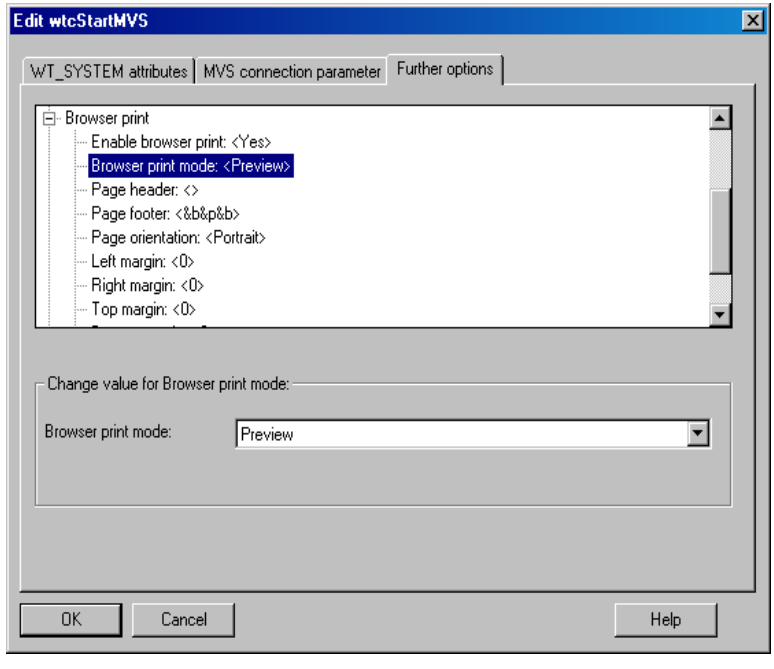
In browser printing, unlike in browser display printing, it is not the form that is visible to the user which is printed, it is an invisible document. This is prepared especially for printing in order to give the same result as the print function of a terminal.

Settings in the start template

In order to be able to use the browser print function, you must set the following parameters in the start template:

- For example, in the dialog box **Edit wtcStartMVS** select the tab **Further options**.
- Under **Global parameter**, click the **Enable asynchronous messages** entry.
- Select the **Enable asynchronous messages** option. The value of the entry is changed from **No** to **Yes**.

  If it is sufficient that at each dialog step a check is performed to see whether print data is available, and if all browsers used support the `<iframe>` HTML tag, then you do not need support for asynchronous messages.
- Next, under **Browser print**, click the **Enable browser print** entry.
- Select the **Enable browser print** option. The value of the entry is changed from **No** to **Yes**.



All the other options under **Browser print** will only be processed if you have set **Activate browser print** to **Yes**:

Browser print mode

Automatic	The printout will be printed immediately on the standard printer.
Preview	A print preview will be displayed before printing.

The following settings will only be processed in Internet Explorer. For all other browsers, you must use the page settings dialog box of the browser used.

Page header
Text for the page header (see "Variables in header and footer lines" below)

Page footer
Text for the page footer (see "Variables in header and footer lines" below)

Page orientation

Portrait	Vertical format
Landscape	Horizontal format

Left margin, **Right margin**, **Top margin**, **Bottom margin**
Margin width in mm

Variables in header and footer lines

For Internet Explorer you can use the following variable entries in the header and footer lines.

&w	Window title
&u	Page address (URL)
&d	Date, short form (e.g. 15/04/03)
&D	Date, long form (e.g. Tuesday 15 April 2003)
&t	Time (as set in the system control panel)
&T	Time, 24-hour format
&p	Current page number
&P	Total number of pages in the document
&&	Ampersand (&)
&b	Text after this code will be centred

&b&b The text after the first `&b` will be centred, the text after the second `&b` will be right justified

Example

The entry in the header line

```
page &p of &P&bWebTransactions Browser Print&b&d
```

on the top-most line of the printout, prints

`page` *number* `WebTransactions Browser Print` *today's date*

wtc_bp_print.cnv conversion file

Use the `wtc_bp_print.cnv` conversion file to convert the print control sequence in HTML code. The file is in the base directory of the corresponding WebTransactions application. This function converts the print control sequence by reading the print file in the template `wtc_bp_Print.htm`. This template specifies the conversion file as a second (optional) parameter for the call of the `Getfile` user exit (see the WebTransactions manual “Template Language”).

The conversion file supplied contains the following entries:

```
* Printer conversion file
00=20
7F="?"
"<"="&lt;"
">"="&gt;"
```

Each line in the conversion file must have the following format: *search text*=*replacement text*.

`search text` and `replacement text` are the old and the new character strings. The entries are constructed as follows:

– Entries consist of either two-place hexadecimal code or a string, enclosed in double inverted commas.

– A two-place hexadecimal code can be used inside a character string; the code must be preceded by a (\).

  Example

  ```
  "\195H"="</pre><pre class=pb>"
  ```

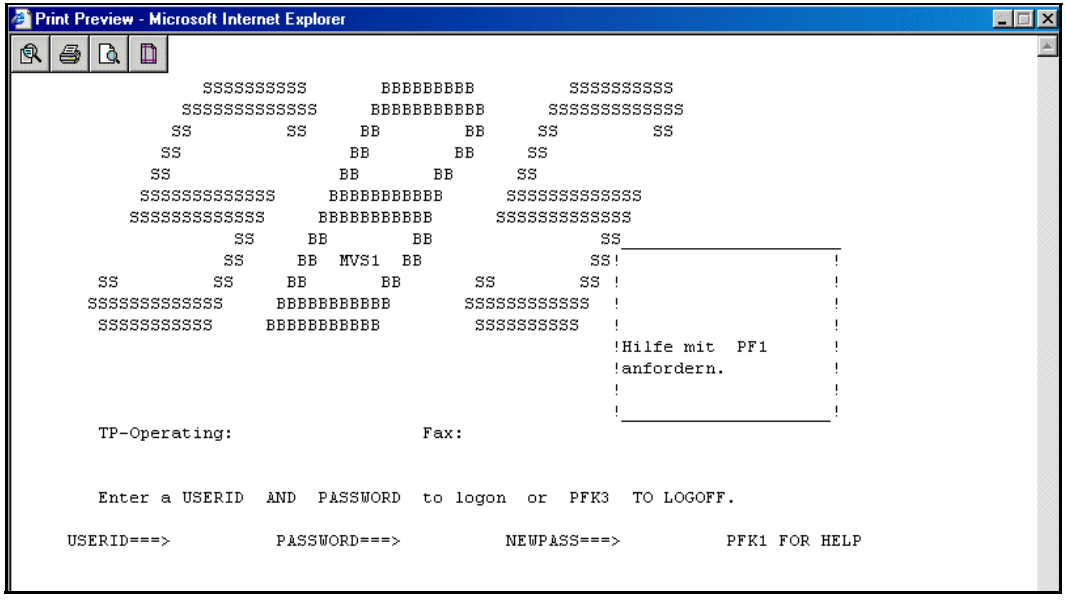
  replaces the control character sequence with a CSS page break which has already been defined in the template.

– Backslashes and double inverted commas in character strings must be cancelled with backslashes (\\ and \").

The conversion rules are used from top to bottom. Additional changes can be made the template `wtc_bp_Print.htm`, (e.g. using the `replace` method of the `string` class).

Print preview

If the **Browser print mode** in the Start template is set to **Preview**, a print preview will be displayed before printing begins.



This button will only be displayed if the session was started in WebLab. This opens another browser window which marks all the control and binary characters in the printout.

- Characters < 0x20: hexadecimal in red
- Characters > 0x7F (8-bit characters): with any hexadecimal shown in blue in brackets
- Blank spaces: dots with a yellow background
- The end of the display shows any sequences of control characters found. These entries can be used by the conversion file (see the section “wtc_bp_print.cnv conversion file” on page 171).

In Internet Explorer, this button prints the document on the printer set as the standard printer. In all other browsers, this button calls up the **Print** dialog box.

This button opens and closes the browser print preview. This button is only displayed in Internet Explorer.

This button opens the page properties settings. This button is only displayed in Internet Explorer.

8.4.5.2 WTAPrint print plugin

The `WTAPrint` print plugin is available for downloading on the WebTransactions server. To download the plugin, use the `Wtdownload.htm` page. When WebTransactions is installed, this page is created in the web server document directory under `webtav75`. When you have downloaded `WTAPrint` you can install it on the browser host.

If you install `WTAPrint` with the installation program `WTAPrint2000` (also available as a download), the registration entries for Internet Explorer will also be created. `WTAPrint` can be used for all web browsers running on the Windows platform. You can also use `WTAPrint` to edit print data with exchange rules. This procedure can be necessary in order to support certain printers.

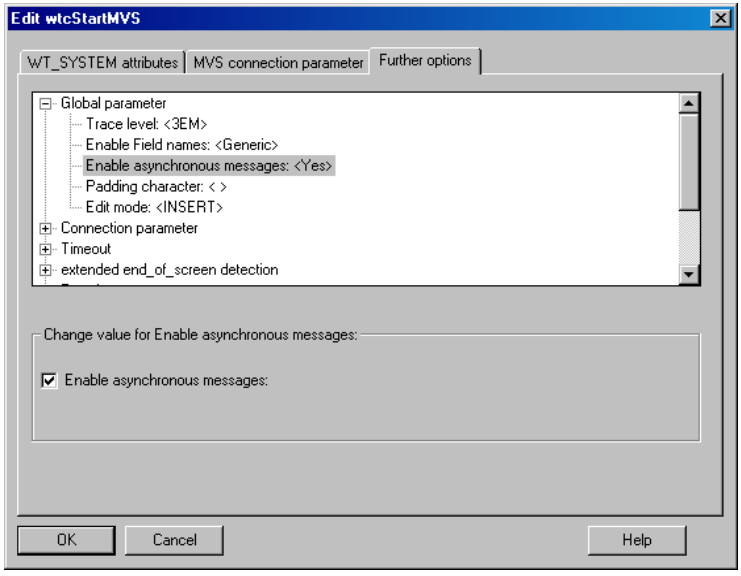
Activation of the print plugin `WTAPrint` is implemented as a parameter of the inline WTBean `wtcMVS` (see section “Creating a new MVS communication object (wtcMVS)” on page 146 and the WebTransactions manual “Concepts and Functions”).

Settings in the start template

In order to be able to use the print plugin, you must set the following parameters in the start template:

- For example, in the dialog box **Edit wtcStartMVS** select the tab **Further options**.
- Under **Global parameter**, click the **Enable asynchronous messages** entry.
- Select the **Enable asynchronous messages** option. The value of the entry is changed from **No** to **Yes**.

  If it is sufficient that at each dialog step a check is performed to see whether print data is available, and if all browsers used support the `<iframe>` HTML tag, then you do not need support for asynchronous messages.



► Next, under **Browser print**, check the **Enable browser print** entry. It must have the value **No**.

Configuring the web browser

The WebTransactions print functions send print files with a special MIME type to the browser.

`webta/hardcopy-print`
: for terminal hard copy printing

`webta/bypass-print`
: bypass printing for host data printing.

This MIME type must be defined in the browser configuration. The procedure for most common web browsers (Internet Explorer as of V4.0 with all versions of Windows, Netscape Navigator as of V6, Mozilla) is given below:

► Install `wtaprint2000.exe`.

The browsers listed below then recognize `wtaprint.exe` as an application for printing.

If your browser requires a default suffix for each MIME type, you can enter the suffix `.whp`.

Assigning a print program

You must assign a suitable print program to these MIME types. Use the following syntax:

```
WTAPrint.exe  "%1" method target [filename] [option-file]
```

`"%1"`
: The browser automatically replaces `"%1"` with the name of the file to be printed.

method
: in accordance with the assigned MIME type.

`HARDCOPY`
: the print data are interpreted as text and prepared for the specified printer via Windows spool.

`BYPASS`
: the print files are already prepared for the specified printer and are sent to the printer.

target
: Possible values: 0, 1, 2 or 3

0 Manual printer selection (a dialog box opens for each print job allowing you to select the desired printer).

1 The default printer is used.

2 The printout is saved to a file (a dialog box opens for each print job allowing you to specify a path).

3 The printout is appended to the file whose full path name is specified in *filename*.

filename
: Full path name of the file to which the printout is to be appended (permitted only if *target* is set to 3)

option file

Full path name of the file in which the options for print file conversion are defined.

This file must have the following structure:

```
[Options]
[ConversionFile=conversion-file]
[MaxLengthLine=maxlength-line]
[MaxLengthPage=maxlength-page]
[CharSet=charset]
[Font=font]
```

Note, you need to enter the square brackets as shown here for `[options]`. All other brackets in this syntax identify, as usual, optional specifications.

conversion-file

Full pathname of the conversion file. You can use the conversion file to convert strings, see the example no. 3. The file must be located in the same directory as `WTAPrint`. It may contain a maximum of 1023 lines; each line may have a maximum length of 255 characters and must have the form *hex-old*=*hex-new*. *hex-old* and *hex-new* are the old and new strings in their full hexadecimal notation.

maxlength-line

maximum line length. If this value is not specified, the printing file is analysed for the longest line.
The smallest calculated value is 80.

The option `MaxLengthLine` will only be processed if the value `HARDCOPY` for the *method* is present (see page 175).

maxlength-page

maximum page length. If this value is not specified, the printing file is analysed for the longest page.
The smallest calculated value is 60.

The option `MaxLengthPage` will only be processed if the value `HARDCOPY` for the *method* is present (see page 175).

charset

Character set identifier in the Windows interface `CreateFont`.
Default value: `1` (`DEFAULT_CHARSET`).

You have to specifiy the following identifiers for the character sets:

ANSI_CHARSET	0
ARABIC_CHARSET	178
CHINESEBIG5_CHARSET	136
DEFAULT_CHARSET	1
EASTEUROPE_CHARSET	238
GB2312_CHARSET	134
GREEK_CHARSET	161
HANGEUL_CHARSET	129
HANGUL_CHARSET	129
HEBREW_CHARSET	177
JOHAB_CHARSET	130
OEM_CHARSET	255
RUSSIAN_CHARSET	204
SHIFTJIS_CHARSET	128
SYMBOL_CHARSET	2
THAI_CHARSET	222
TURKISH_CHARSET	162
VIETNAMESE_CHARSET	163

font name of a font, which has to be present on the Windows system. If you dont't specify this value, the first font is used, which fulfills the conditions in the options `MaxLengthLine`, `MaxLengthPage` and `CharSet`. `MaxLengthLine` and `MaxLengthPage` in this case are converted to a font size.

Examples

1. Configuration for terminal hardcopy printing:

   MIME type:
   ```
   webta/hardcopy-print
   ```

   Assigned program:
   ```
   WTAPrint.exe "%1" HARDCOPY 0
   ```

2. Configuration for bypass printing with conversion:

   MIME type:
   ```
   webta/bypass-print
   ```

   Assigned program:
   ```
   WTAPrint.exe "%1" HARDCOPY 0 "C:\webta\conversion.ini"
   ```

   Options file`conversion.ini`:
   ```
   [Options]
   MaxLengthLine=90
   ConversionFile=C:\webta\webtaprint.cnv
   ```

   Conversion file `webtaprint.cnv`:

   ```
   65=8080
   66=8182
   6567=8A
   ```

   The following rules apply to this file:

   – A complete, hexadecimal, 2-digit representation must be used. It must not contain spaces or other non-hexadecimal characters.
   – The longest matching string in the conversion file is always used. If, for example, the input file contains the string `6567` then, in this example, this is converted to `8A` (not to `808067`).
   – If a string (*xxxx*=...) occurs more than once, the last of these strings is used for replacement.

Glossary

A term in ->*italic* font means that it is explained somewhere else in the glossary.

active dialog

In the case of active dialogs, WebTransactions actively intervenes in the control of the dialog sequence, i.e. the next ->*template* to be processed is determined by the template programming. You can use the ->*WTML* language tools, for example, to combine multiple ->*host formats* in a single ->*HTML* page. In this case, when a host ->*dialog step* is terminated, no output is sent to the ->*browser* and the next step is immediately started. Equally, multiple interactions between the Web ->*browser* and WebTransactions are possible within **one and the same** host dialog step.

array

->*Data type* which can contain a finite set of values of one data type. This data type can be:

– ->*scalar*
– a ->*class*
– an array

The values in the array are addressed via a numerical index, starting at 0.

asynchronous message

In WebTransactions, an asynchronous message is one sent to the terminal without having been explicitly requested by the user, i.e. without the user having pressed a key or clicked on an interface element.

attribute

Attributes define the properties of ->*objects*.
An attribute can be, for example, the color, size or position of an object or it can itself be an object. Attributes are also interpreted as ->*variables* and their values can be queried or modified.

Automask template

A WebTransactions ->*template* created by WebLab either implicitly when generating a base directory or explicitly with the command **Generate Automask**. It is used whenever no format-specific template can be identified. An Automask template contains the statements required for dynamically mapping formats and for communication. Different variants of the Automask template can be generated and selected using the system object attribute AUTOMASK.

base directory

The base directory is located on the WebTransactions server and forms the basis for a ->*WebTransactions application*. The base directory contains the ->*templates* and all the files and program references (links) which are necessary in order to run a WebTransactions application.

BCAM application name

Corresponds to the openUTM generation parameter BCAMAPPL and is the name of the –>*openUTM application* through which –>*UPIC* establishes the connection.

browser

Program which is required to call and display ->*HTML* pages. Browsers are, for example, Microsoft Internet Explorer or Mozilla Firefox.

browser display print

The WebTransactions browser display print prints the information displayed in the ->*browser*.

browser platform

Operating system of the host on which a ->*browser* runs as a client for WebTransactions.

buffer

Definition of a record, which is transmitted from a ->*service*. The buffer is used for transmitting and receiving messages. In addition there is a specific buffer for storing the ->*recognition criteria* and for data for the representation on the screen.

capturing

To enable WebTransactions to identify the received ->*formats* at runtime, you can open a ->*session* in ->*WebLab* and select a specific area for each format and name the format. The format name and ->*recognition criteria* are stored in the ->*capture database*. A ->*template* of the same name is generated for the format. Capturing forms the basis for the processing of format-specific templates for the WebTransactions for OSD and MVS product variants.

capture database

The WebTransactions capture database contains all the format names and the associated ->*recognition criteria* generated using the ->*capturing* technique. You can use ->*WebLab* to edit the sequence and recognition criteria of the formats.

CGI

(**C**ommon **G**ateway **I**nterface)
Standardized interface for program calls on ->*Web servers*. In contrast to the static output of a previously defined->*HTML* page, this interface permits the dynamic construction of HTML pages.

class

Contains definitions of the ->*properties* and ->*methods* of an ->*object*. It provides the model for instantiating objects and defines their interfaces.

class template

In WebTransactions, a class template contains valid, recurring statements for the entire object class (e.g. input or output fields). Class templates are processed when the ->*evaluation operator* or the `toString` method is applied to a ->*host data object*.

client

Requestors and users of services in a network.

cluster

Set of identical ->*WebTransactions applications* on different servers which are interconnected to form a load-sharing network.

communication object

This controls the connection to an ->*host application* and contains information about the current status of the connection, the last data to be received etc.

conversion tools

Utilities supplied with WebTransactions. These tools are used to analyze the data structures of ->*openUTM applications* and store the information in files. These files can then be used in WebLab as ->*format description sources* in order to generate WTML templates and ->*FLD files*.
COBOL data structures or IFG format libraries form the basis for the conversion tools. The conversion tool for DRIVE programs is supplied with the product DRIVE.

daemon

Name of a process type in Unix system/POSIX systems which runs in the background and performs no I/O operations at terminals.

data access control

Monitoring of the accesses to data and ->*objects* of an application.

data type

Definition of the way in which the contents of a storage location are to be interpreted. Each data type has a name, a set of permitted values (value range), and a defined number of operations which interpret and manipulate the values of that data type.

dialog

Describes the entire communication between browser, WebTransactions and ->*host application*. It will usually comprise multiple ->*dialog cycles*. WebTransactions supports a number of different
types of dialog.

- ->*passive dialog*
- ->*active dialog*
- ->*synchronized dialog*
- ->*non-synchronized dialog*

dialog cycle

Cycle that comprises the following steps when a ->*WebTransactions application* is executed:

- construct an ->*HTML* page and send it to the ->*browser*
- wait for a response from the browser
- evaluate the response fields and possibly send them to the->*host application* for further processing

A number of dialog cycles are passed through while a ->*WebTransactions application* is executing.

distinguished name

The Distinguished Name (DN) in ->*LDAP* is hierarchically organized and consists of a number of different components (e.g. “country, and below country: organization, and below organization: organizational unit, followed by: usual name”). Together, these components provide a unique identification of an object in the directory tree.
Thanks to this hierarchy, the unique identification of objects is a simple matter even in a worldwide directory tree:

- The DN "Country=DE/Name=Emil Person" reduces the problem of achieving a unique identification to the country DE (=Germany).
- The DN "Organization=FTS/Name=Emil Person" reduces it to the organization FTS.
- The DN "Country=DE/Organization=FTS/Name=Emil Person" reduces it to the organization FTS located in Germany (DE).

document directory

->*Web server* directory containing the documents that can be accessed via the network. WebTransactions stores files for download in this directory, e.g. the WebLab client or general start pages.

Domain Name Service (DNS)

Procedure for the symbolic addressing of computers in networks. Certain computers in the network, the DNS or name server, maintain a database containing all the known host names and *IP numbers* in their environment.

dynamic data

In WebTransactions, dynamic data is mapped using the WebTransactions object model, e.g. as a *->system object*, host object or user input at the browser.

EHLLAPI

Enhanced **H**igh-**L**evel **L**anguage **API**
Program interface, e.g. of terminal emulations for communication with the SNA world. Communication between the transit client and SNA computer, which is handled via the TRANSIT product, is based on this interface.

EJB

(**E**nterprise **J**ava**B**ean)
This is a Java-based industry standard which makes it possible to use in-house or commercially available server components for the creation of distributed program systems within a distributed, object-oriented environment.

entry page

The entry page is an *->HTML page* which is required in order to start a *->WebTransactions application* This page contains the call which starts WebTransactions with the first *->template*, the so-called start template.

evaluation operator

In WebTransactions the evaluation operator replaces the addressed *->expressions* with their result (object attribute evaluation). The evaluation operator is specified in the form ##expression#.

expression

A combination of *->literals*, *->variables*, operators and expressions which return a specific result when evaluated.

FHS

Format **H**andling **S**ystem
Formatting system for BS2000/OSD applications.

field

A field is the smallest component of a service and element of a ->*record* or ->*buffer*.

field file (*.fld file)

In WebTransactions, this contains the structure of a ->*format* record (metadata).

filter

Program or program unit (e.g. a library) for converting a given ->*format* into another format (e.g. XML documents to ->*WTScript* data structures).

format

Optical presentation on alphanumeric screens (sometimes also referred to as screen form or mask).

In WebTransactions each format is represented by a ->*field file* and a ->*template*.

format type

(only relevant in the case of ->*FHS* applications and communication via ->*UPIC*) Specifies the type of format: #format, +format, -format or *format.

format description sources

Description of multiple ->*formats* in one or more files which were generated from a format library (FHS/IFG) or are available directly at the ->*host* for the use of “expressive” names in formats.

function

A function is a user-defined code unit with a name and ->*parameters*. Functions can be called in ->*methods* by means of a description of the function interface (or signature).

holder task

A process, a task or a thread in WebTransactions depending on the operating system platform being used. The number of tasks corresponds to the number of users. The task is terminated when the user logs off or when a time-out occurs. A holder task is identical to a ->*WebTransactions session*.

host

The computer on which the- >*host application* is running.

host adapter

Host adapters are used to connect existing ->*host applications* to WebTransactions. At runtime, for example, they have the task of establishing and terminating connections and converting all the exchanged data.

host application
Application that is integrated with WebTransactions.

host control object
In WebTransactions, host control objects contain information which relates not to individual fields but to the entire ->*format*. This includes, for example, the field in which the cursor is located, the current function key or global format attributes.

host data object
In WebTransactions, this refers to an ->*object* of the data interface to the ->*host application*. It represents a field with all its field attributes. It is created by WebTransactions after the reception of host application data and exists until the next data is received or until termination of the ->*session*.

host data print
During WebTransactions host data print, information is printed that was edited and sent by the ->*host application*, e.g. printout of host files.

host platform
Operating system of the host on which the ->*host applications* runs.

HTML
(**H**yper**t**ext **M**arkup **L**anguage)
See ->*Hypertext Markup Language*

HTTP
(**H**ypertext **T**ransfer **P**rotocol)
This is the protocol used to transfer ->*HTML* pages and data.

HTTPS
(**H**ypertext **T**ransfer **P**rotocol **S**ecure)
This is the protocol used for the secure transfer of ->*HTML* pages and data.

hypertext
Document with links to other locations in the same or another document. Users click the links to jump to these new locations.

Hypertext Markup Language
(**H**yper**t**ext **M**arkup **L**anguage)
Standardized markup language for documents on the Web.

Java Bean

Java programs (or ->*classes*) with precisely defined conventions for interfaces that allow them to be reused in different applications.

KDCDEF

openUTM tool for generating ->*openUTM applications*.

LDAP

(**L**ightweight **D**irectory **A**ccess **P**rotocol)
The X.500 standard defines DAP (Directory Access Protocol) as the access protocol. However, the Internet standard “LDAP” has proved successful specifically for accessing X.500 directory services from a PC.
LDAP is a simplified DAP protocol that does not support all the options available with DAP and is not compatible with DAP. Practically all X.500 directory services support both DAP and LDAP. In practice, interpretation problems may arise since there are various dialects of LDAP. The differences between the dialects are generally small.

literal

Character sequence that represents a fixed value. Literals are used in source programs to specify constant values (“literal” values).

master template

WebTransactions template used to generate the Automask and the format-specific templates.

message queuing (MQ)

A form of communication in which messages are not exchanged directly, rather via intermediate queues. The sender and receiver can work at separate times and locations. Message transmission is guaranteed regardless of whether or not a network connection currently exists.

method

Object-oriented term for a ->*function*. A method is applied to the ->*object* in which it is defined.

module template

In WebTransactions, a module template is used to define ->*classes*, ->*functions* and constants globally for a complete ->*session*. A module template is loaded using the `import()` function.

MT tag

(**M**aster **T**emplate tag)
Special tags used in the dynamic sections of ->*master templates*.

multitier architecture

All client/server architectures are based on a subdivision into individual software components which are also known as layers or tiers. We speak of 1-tier, 2-tier, 3-tier and multitier models. This subdivision can be considered at the physical or logical level:

– We speak of logical software tiers when the software is subdivided into modular components with clear interfaces.
– Physical tiers occur when the (logical) software components are distributed across different computers in the network.

With WebTransactions, multitier models are possible both at the physical and logical level.

name/value pair

In the data sent by the ->*browser*, the combination, for example, of an ->*HTML* input field name and its value.

non-synchronized dialog

Non-synchronized dialogs in WebTransactions permit the temporary deactivation of the checking mechanism implemented in ->*synchronized dialogs*. In this way, ->*dialogs* that do not form part of the synchronized dialog and have no effect on the logical state of the ->*host application* can be incorporated. In this way, for example, you can display a button in an ->*HTML* page that allows users to call help information from the current host application and display it in a separate window.

object

Elementary unit in an object-oriented software system. Every object possesses a name via which it can be addressed, ->*attributes*, which define its status together with the ->*methods* that can be applied to the object.

openUTM

(**U**niversal **T**ransaction **M**onitor)
Transaction monitor from Fujitsu Technology Solutions, which is available for BS2000/OSD and a variety of Unix platforms and Windows platforms.

openUTM application

A ->*host application* which provides services that process jobs submitted by ->*clients* or other ->*host applications*. openUTM responsibilities include transaction management and the management of communication and system resources. Technically speaking, the UTM application is a group of processes which form a logical unit at runtime.
openUTM applications can communicate both via the client/server protocol ->*UPIC* and via the emulation interface (9750).

openUTM-Client (UPIC)

The openUTM-Client (UPIC) is a product used to create client programs for openUTM. openUTM-Client (UPIC) is available, for example, for Unix platforms, BS2000/OSD platforms and Windows platforms.

openUTM program unit

The services of an ->*openUTM application* are implemented by one or more openUTM program units. These can be addressed using transaction codes and contain special openUTM function calls (e.g. KDCS calls).

parameter

Data which is passed to a ->*function* or a ->*method* for processing (input parameter) or data which is returned as a result of a function or method (output parameter).

passive dialog

In the case of passive dialogs in WebTransactions, the dialog sequence is controlled by the ->*host application*, i.e. the host application determines the next ->*template* which is to be processed. Users who access the host application via WebTransactions pass through the same dialog steps as if they were accessing it from a terminal. WebTransactions uses passive dialog control for the automatic conversion of the host application or when each host application format corresponds to precisely one individual template.

password

String entered for a ->*user id* in an application which is used for user authentication (->*system access control*).

polling

Cyclical querying of state changes.

pool

In WebTransactions, this term refers to a shared directory in which WebLab can create and maintain ->*base directories*. You control access to this directory with the administration program.

post

To send data.

posted object (`wt_Posted`**)**

List of the data returned by the ->*browser*. This ->*object* is created by WebTransactions and exists for the duration of a ->*dialog* cycle.

process

The term “process” is used as a generic term for process (in Solaris, Linux and Windows) and task (in BS2000/OSD).

project

In the WebTransactions development environment, a project contains various settings for a ->Web*Transactions application*. These are saved in a project file (suffix `.wtp`). You should create a project for each WebTransactions application you develop, and always open this project for editing.

property

Properties define the nature of an ->*object*, e.g. the object “Customer” could have a customer name and number as its properties. These properties can be set, queried, and modified within the program.

protocol

Agreements on the procedural rules and formats governing communications between remote partners of the same logical level.

protocol file

- openUTM-Client: File into which the openUTM error messages as are written in the case of abnormal termination of a conversation.
- In WebTransactions, protocol files are called trace files.

roaming session

->*WebTransactions sessions* which are invoked simultaneously or one after another by different ->*clients*.

record

A record is the definition of a set of related data which is transferred to a ->*buffer*. It describes a part of the buffer which may occur one or more times.

recognition criteria

Recognition criteria are used to identify ->*formats* of a ->*terminal application* and can access the data of the format. The recognition criteria selected should be one or more areas of the format which uniquely identify the content of the format.

scalar

->*variable* made up of a single value, unlike a ->*class*, an ->*array* or another complex data structure.

service (openUTM)

In ->*openUTM,* this is the processing of a request using an ->*openUTM application*. There are dialog services and asynchronous services. The services are assigned their own storage areas by openUTM. A service is made up of one or more ->*transactions*.

service application

->*WebTransactions session* which can be called by various different users in turn.

service node

Instance of a ->*service*. During development and runtime of a ->*method* a service can be instantiated several times. During modelling and code editing those instances are named service nodes.

session

When an end user starts to work with a ->*WebTransactions application* this opens a WebTransactions session for that user on the WebTransactions server. This session contains all the connections open for this user to the ->*browsers*, special ->*clients* and ->*hosts*.
A session can be started as follows:
– Input of a WebTransactions URL in the browser.
– Using the `START_SESSION` method of the `WT_REMOTE` client/server interface.

A session is terminated as follows:
– The user makes the corresponding input in the output area of this ->*WebTransactions application* (not via the standard browser buttons).
– Whenever the configured time that WebTransactions waits for a response from the ->*host application* or from the ->*browser* is exceeded.
– Termination from WebTransactions administration.
– Using the `EXIT_SESSION` method of the `WT_REMOTE` client/server interface.

A WebTransactions session is unique and is defined by a ->*WebTransactions application* and a session ID. During the life cycle of a session there is one ->*holder task* for each WebTransactions session on the WebTransactions server.

SOAP

(originally **S**imple **O**bject **A**ccess **P**rotocol)
The ->*XML* based SOAP protocol provides a simple, transparent mechanism for exchanging structured and typecast information between computers in a decentralized, distributed environment.
SOAP provides a modular package model together with mechanisms for data encryption within modules. This enables the uncomplicated description of the internal interfaces of a ->*Web-Service*.

style

In WebTransactions this produces a different layout for a ->*template*, e.g. with more or less graphic elements for different->*browsers*. The style can be changed at any time during a ->*session*.

synchronized dialog

In the case of synchronized dialogs (normal case), WebTransactions automatically checks whether the data received from the web browser is genuinely a response to the last ->*HTML* page to be sent to the ->*browser*. For example, if the user at the web browser uses the **Back** button or the History function to return to an "earlier" HTML page of the current ->*session* and then returns this, WebTransactions recognizes that the data does not correspond to the current ->*dialog cycle* and reacts with an error message. The last page to have been sent to the browser is then automatically sent to it again.

system access control

Check to establish whether a user under a particular ->*user ID* is authorized to work with the application.

system object (`wt_System`**)**

The WebTransactions system object contains ->*variables* which continue to exist for the duration of an entire ->*session* and are not cleared until the end of the session or until they are explicitly deleted. The system object is always visible and is identical for all name spaces.

TAC

See ->*transaction code*

tag

->*HTML*, ->*XML* and ->*WTML* documents are all made up of tags and actual content. The tags are used to mark up the documents e.g. with header formats, text highlighting formats (bold, italics) or to give source information for graphics files.

TCP/IP

(**T**ransport **C**ontrol **P**rotocol/**I**nternet **P**rotocol)
Collective name for a protocol family in computer networks used, for example, in the Internet.

template

A template is used to generate specific code. A template contains fixed information parts which are adopted unchanged during generation, as well as variable information parts that can be replaced by the appropriate values during generation.
A template is a *->WTML* file with special tags for controlling the dynamic generation of a *->HTML* page and for the processing of the values entered at the *->browser*. It is possible to maintain multiple template sets in parallel. These then represent different ->*styles* (e.g. many/few
graphics, use of Java, etc.).
WebTransactions uses different types of template:

- ->*Automask templates* for the automatic conversion of the ->*formats* of MVS and OSD applications.
- Custom templates, written by the programmer, for example, to control an *->active dialog.*
- Format-specific templates which are generated for subsequent post-processing.
- Include templates which are inserted in other templates.
- *->Class templates*
- ->*Master templates* to ensure the uniform layout of fixed areas on the generation of the Automask and format-specific templates.
- Start template, this is the first template to be processed in a WebTransactions application.

template object

->Variables used to buffer values for a *->dialog cycle* in WebTransactions.

terminal application

Application on a ->*host* computer which is accessed via a 9750 or 3270 interface.

terminal hardcopy print

A terminal hardcopy print in WebTransactions prints the alphanumeric representation of the *->format* as displayed by a terminal or a terminal emulation.

transaction

Processing step between two synchronization points (in the current operation) which is characterized by the ACID conditions (**A**tomicity, **C**onsistency, **I**solation and **D**urability). The intentional changes to user information made within a transaction are accepted either in their entirety or not at all (all-or-nothing rule).

transaction code/TAC

Name under which an openUTM service or ->*openUTM program unit* can be called. The transaction code is assigned to the openUTM program unit during configuration. A program unit can be assigned several transaction codes.

UDDI

(**U**niversal **D**escription, **D**iscovery and **I**ntegration)
Refers to directories containing descriptions of ->*Web services*. This information is available to web users in general.

Unicode

An alphanumeric character set standardized by the International Standardisation Organisation (ISO) and the Unicode Consortium. It is used to represent various different types of characters: letters, numerals, punctuation marks, syllabic characters, special characters and ideograms. Unicode brings together all the known text symbols in use across the world into a single character set. Unicode is vendor-independent and system-independent. It uses either two-byte or four-byte character sets in which each text symbol is encoded. In the ISO standard, these character sets are termed UCS-2 (Universal Character Set 2) or UCS-4. The designation UTF-16 (Unicode Transformation Format 16-bit), which is a standard defined by the Unicode Consortium, is often used in place of the designation UCS-2 as defined in ISO. Alongside UTF-16, UTF-8 (Unicode Transformation Format 8 Bit) is also in widespread use. UTF-8 has become the character encoding method used globally on the Internet.

UPIC

(**U**niversal **P**rogramming **I**nterface for **C**ommunication)
Carrier system for openUTM clients which uses the X/Open interface, which permity CPI-C client/server communication between a CPI-C-Client application and the openUTM application.

URI

(**U**niform **R**esource **I**dentifier)
Blanket term for all the names and addresses that reference objects on the Internet. The generally used URIs are->*URLs*.

URL

(**U**niform **R**esource **L**ocator)
Description of the location and access type of a resource in the ->*Internet*.

user exit

Functions implemented in C/C++ which the programmer calls from a ->*template*.

user ID

User identification which can be assigned a password (->*system access control*) and special access rights (->*data access control*).

variable

Memory location for variable values which requires a name and a ->*data type*.

visibility of variables

->*Objects* and ->*variables* of different dialog types are managed by WebTransactions in different address spaces. This means that variables belonging to a ->*synchronized dialog* are not visible and therefore not accessible in a ->*asynchronous dialog* or in a dialog with a remote application.

web server

Computer and software for the provision of ->*HTML* pages and dynamic data via ->*HTTP*.

web service

Service provided on the Internet, for example a currency conversion program. The SOAP protocol can be used to access such a service. The interface of a web service is described in ->*WSDL*.

WebTransactions application

This is an application that is integrated with ->*host applications* for internet/intranet access. A WebTransactions application consists of:

- a ->*base directory*
- a start template
- the ->*templates* that control conversion between the ->*host* and the ->*browser*.
- protocol-specific configuration files.

WebTransactions platform

Operating system of the host on which WebTransactions runs.

WebTransactions server

Computer on which WebTransactions runs.

WebTransactions session

See ->*session*

WSDL

(**W**eb **S**ervice **D**efinition **L**anguage)
Provides ->*XML* language rules for the description of ->*web services*. In this case, the web service is defined by means of the port selection.

WTBean

In WebTransactions ->*WTML* components with a self-descriptive interface are referred to as WTBeans. A distinction is made between inline and standalone WTBeans:

– An inline WTBean corresponds to a part of a WTML document
– A standalone WTBean is an autonomous WTML document

A number of WTBeans are included in of the WebTransactions product, additional WTBeans can be downloaded from the WebTransactions homepage *ts.fujitsu.com/products/software/openseas/webtransactions.html*.

WTML

(**W**eb**T**ransactions **M**arkup **L**anguage)
Markup and programming language for WebTransactions ->*templates*. WTML uses additional ->*WTML tags* to extend ->*HTML* and the server programming language ->*WTScript*, e.g. for data exchange with ->*host applications*. WTML tags are executed by WebTransactions and not by the ->*browser* (serverside scripting).

WTML tag

(**W**eb**T**ransactions **M**arkup **L**anguage-Tag)
Special WebTransactions tags for the generation of the dynamic sections of an ->*HTML* page using data from the->*host application*.

WTScript

Serverside programming language of WebTransactions. WTScripts are similiar to client-side Java scripts in that they are contained in sections that are introduced and terminated with special tags. Instead of using ->*HTML*-`SCRIPT` tags you use ->*WTML-Tags*: `wtOnCreateScript` and `wtOnReceiveScript`. This indicates that these scripts are to be implemented by WebTransactions and not by the ->*browser* and also indicates the time of execution. OnCreate scripts are executed before the page is sent to the browser. OnReceive scripts are executed when the response has been received from the browser.

XML

(e**X**tensible **M**arkup **L**anguage)
Defines a language for the logical structuring of documents with the aim of making these easy to exchange between various applications.

XML schema

An XML schema basically defines the permissible elements and attributes of an XML description. XML schemas can have a range of different formats, e.g. DTD (**D**ocument **T**ype **D**efinition), XML Schema (W3C standard) or XDR (**X**ML **D**ata **R**educed).

Abbreviations

BO	**B**usiness **O**bject
CGI	**C**ommon **G**ateway **I**nterface
DN	**D**istinguished **N**ame
DNS	**D**omain **N**ame **S**ervice
EJB	**E**nterprise **J**ava**B**ean
FHS	**F**ormat **H**andling **S**ystem
HTML	**H**yper**t**ext **M**arkup **L**anguage
HTTP	**H**yper**t**ext **T**ransfer **P**rotocol
HTTPS	**H**yper**t**ext **T**ransfer **P**rotocol **S**ecure
IFG	**I**nteraktiver **F**ormat **G**enerator
ISAPI	**I**nternet **S**erver **A**pplication **P**rogramming **I**nterface
LDAP	**L**ightweight **D**irectory **A**ccess **P**rotocol
LPD	**L**ine **P**rinter **D**aemon
MT-Tag	**M**aster-**T**emplate-Tag
MVS	**M**ultiple **V**irtual **S**torage
OSD	**O**pen **S**ystems **D**irection
SGML	**S**tandard **G**eneralized **M**arkup **L**anguage
SOAP	**S**imple **O**bject **A**ccess **P**rotocol

SSL	**S**ecure **S**ocket **L**ayer
TCP/IP	**T**ransport **C**ontrol **P**rotocol/**I**nternet **P**rotocol
Upic	**U**niversal **P**rogramming **I**nterface for **C**ommunication
URL	**U**niform **R**esource **L**ocator
WSDL	**W**eb **S**ervices **D**escription **L**anguage
wtc	**W**eb**T**ransactions **C**omponent
WTML	**W**eb**T**ransactions **M**arkup **L**anguage
XML	e**X**tensible **M**arkup **L**anguage

Related publications

WebTransactions manuals

You can download all manuals from the Web address *http://manuals.ts.fujitsu.com*.

WebTransactions
Concepts and Functions
Introduction

WebTransactions
Template Language
Reference Manual

WebTransactions
Client APIs for WebTransactions
User Guide

WebTransactions
Connection to openUTM Applications via UPIC
User Guide

WebTransactions
Connection to OSD Applications
User Guide

WebTransactions
Access to Dynamic Web Contents
User Guide

WebTransactions
Web Frontend for Web Services
User Guide

Other publications

EDITION PRINT for Windows NT (MATERNA GmbH)
Installation and Configuration
User Guide

Target group
Anyone who wishes to use a print server of the EDITION PRINT product family.
Contents
The manual describes all steps required for installing, configuring, starting and applying EDITION PRINT products.

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