User Guide - English

FUJITSU

# WebTransactions V7.5

Connection to OSD Applications

Edition August 2010

## Comments… Suggestions… Corrections…

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## Certified documentation according to DIN EN ISO 9001:2008

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 9001:2008.

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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 OSD

The figure below illustrates the architecture of WebTransactions for OSD:

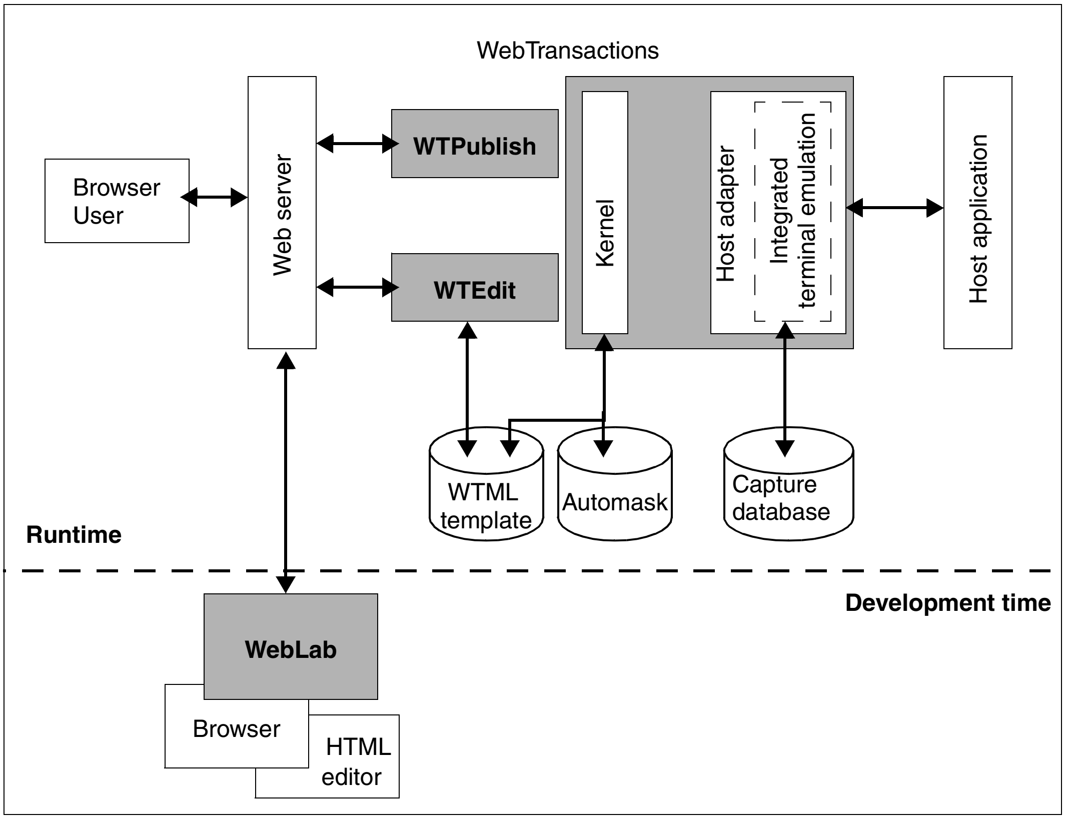


Figure 1: Architecture of WebTransactions for OSD

### Host adapter with Integrated terminal emulation

Both at runtime and during development, WebTransactions for OSD uses a 9750 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.

### Unicode support

WebTransactions for OSD supports the 9750 terminal protocol. The Unicode support provided in BS2000/OSD in turn makes this protocol Unicode-capable. You must explicitly enable Unicode support for 9750 by setting the relevant terminal type, otherwise WebTransactions for OSD behaves in the same way as the predecessor version (see the system object attribute `TERMINAL_TYPE`, page 125).

WebTransactions for OSD create data encoded in UTF-8, which is passed straight through to the browser and back. You will find information on the rules you must observe for templates in this context in the section “Unicode character set” on page 72.

## 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 Web*Transaction*.

  – 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** (this User Guide)

  **Connection to MVS applications**

  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 OSD dialog applications to the Web.

The individual chapters describe the necessary steps. If you have not yet worked with WebTransactions for OSD, 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 OSD-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 OSD runs on the system platforms BS2000/OSD, Solaris, Linux and Windows. This document applies to all WebTransactions platforms. Where an item of information applies to one WebTransactions platform only, this will be indicated.

## 1.5 New features

This section only lists the OSD-specific innovations. For a general overview of the new features, refer to the WebTransactions manual “Concepts and Functions”.

| Type of new feature | Description |
|---|---|
| New value for the system object attribute `HOST_CHARSET`: `9763-UNICODE` | page 119 |
| New value for the system object attribute `TERMINAL_TYPE`: `UTF-8` | page 125 |
| Change for the system object attributes `END_MARK` und `LZE_CHAR` | page 115 and page 120 |

## 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 |
| ℹ | 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.

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

## 2.1 Installation

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

WebTransactions for OSD 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 23).

i 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) `WebTransactionsOSD75.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 `WebTransactionsOSD75.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\WebTransactionsOSD75.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\WebTransactionsOSD75.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, `webtransOSDV75.tar.gz`). You must first decompress this file using the command:

```
gunzip -d webtransOSDV75.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 webtransOSDV75.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 these settings OK ? [y]
```

Confirm your specifications to terminate installation.

## 2.1.4 BS2000/OSD

Standard installation is performed using the SOLIS procedure. If the IMON product (Installation MONitor) is started in the source system then you can also perform a standard installation using IMON.

To install POSIX, you can use the POSIX installation tool.

## 2.1.5 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 18) or with `Msiexec.exe` (see page 19).

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 procedural description which will show you how you can connect a host application to the Web 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.

i 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 OSD on a computer (see also chapter “Installing WebTransactions” on page 17), 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:

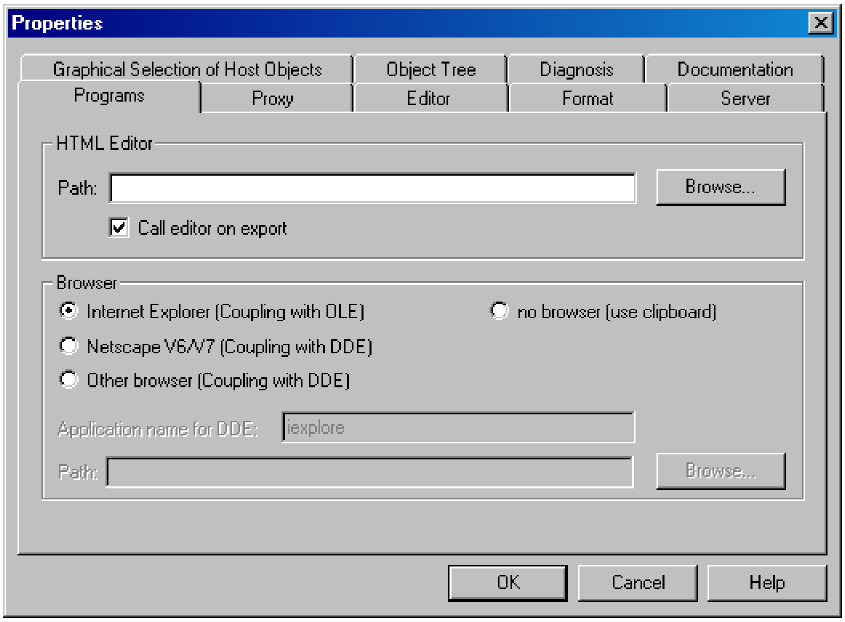
1. Enter the licenses
2. Set up the user
3. Create the pool
4. Assign the pool to the user

## 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, see 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.



HTML Editor

Path:

Browse...

[✓] Call editor on export

Browser

[● Internet Explorer (Coupling with OLE)]

○ no browser (use clipboard)

○ Netscape V6/V7 (Coupling with DDE)

○ Other browser (Coupling with DDE)

Application name for DDE: iexplore

Path:

Browse...

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

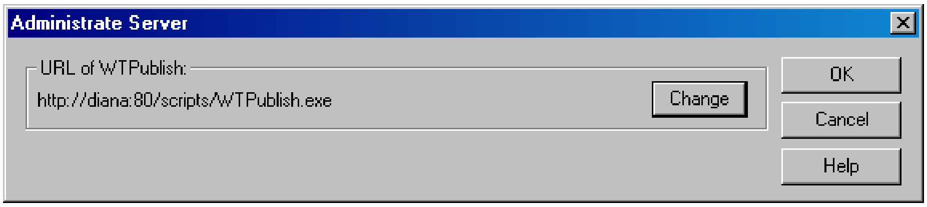
► Click on **OK** to confirm your settings.

### 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. |

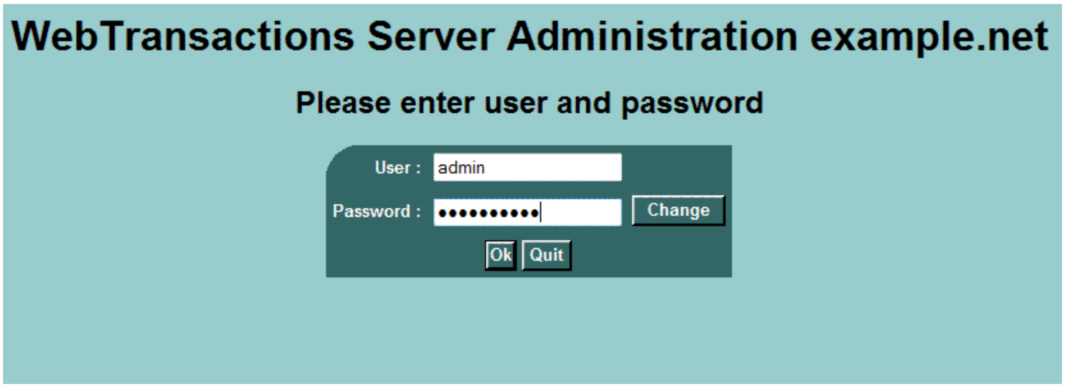
- Confirm with **OK**. The values will be entered in the **Administrate Server** dialog box.


Administrate Server

URL of WTPublish:

http://diana:80/scripts/WTPublish.exe

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


WebTransactions Server Administration example.net

Please enter user and password

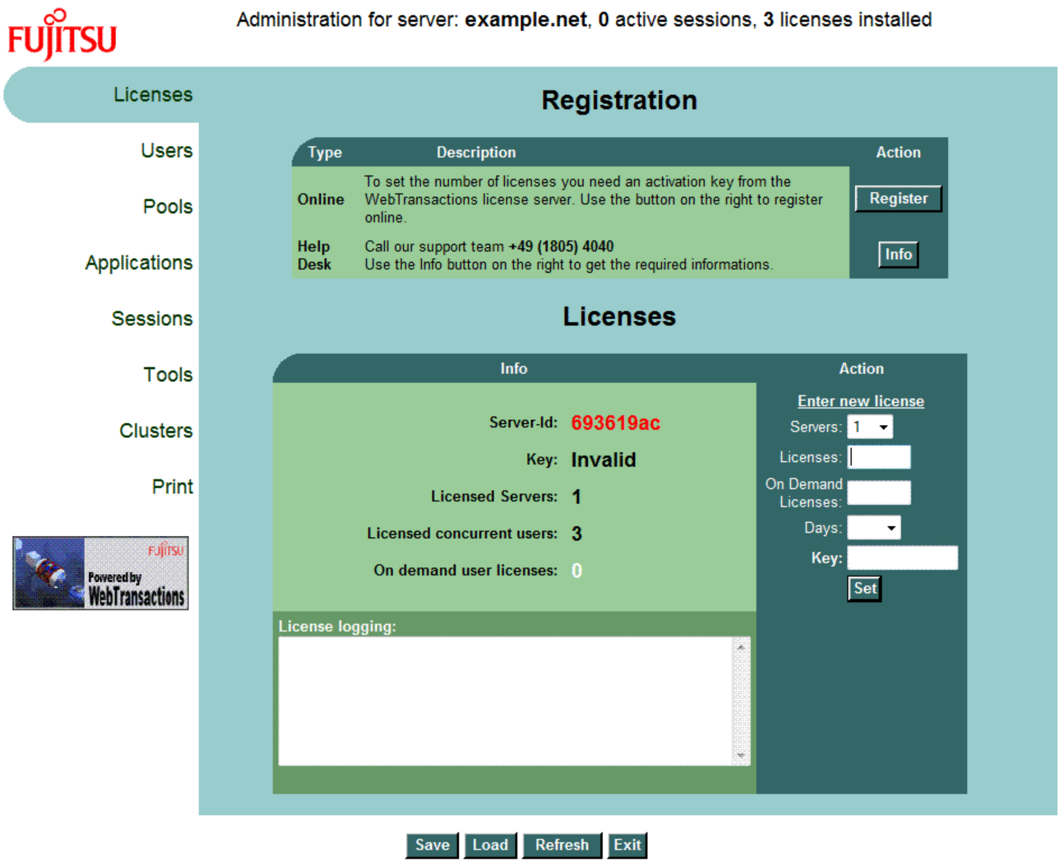
User : admin

Password : ••••••••••

► 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.

i 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



Administration for server: **example.net**, **0** active sessions, **3** licenses installed

**Registration**

| Type | Description | Action |
|---|---|---|
| Online | To set the number of licenses you need an activation key from the WebTransactions license server. Use the button on the right to register online. | Register |
| Help Desk | Call our support team **+49 (1805) 4040** Use the Info button on the right to get the required informations. | Info |

**Licenses**

| Info | |
|---|---|
| Server-Id: | 693619ac |
| Key: | Invalid |
| Licensed Servers: | 1 |
| Licensed concurrent users: | 3 |
| On demand user licenses: | 0 |

License logging:

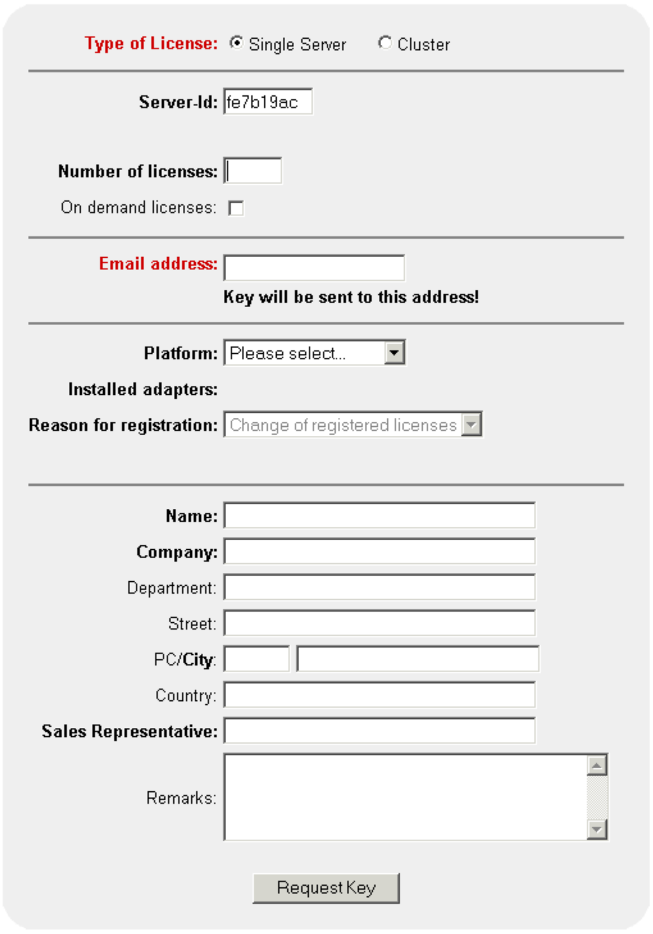
Action

Enter new license

| | |
|---|---|
| Servers: | 1 |
| Licenses: | |
| On Demand Licenses: | |
| Days: | |
| Key: | |

► Click the **Register** button.

This opens the registration page:



Type of License: [✓ Single Server] Cluster

| | |
|---|---|
| Server-Id: | fe7b19ac |
| Number of licenses: | |
| On demand licenses: | ☐ |
| Email address: | |
| | Key will be sent to this address! |
| Platform: | Please select... |
| Installed adapters: | |
| Reason for registration: | Change of registered licenses |
| Name: | |
| Company: | |
| Department: | |
| Street: | |
| PC/City: | |
| Country: | |
| Sales Representative: | |
| Remarks: | |

- To register licenses for a stand-alone server, click on **Single Server** under **Type of license**.
- Enter the number of clients (concurrent sessions) 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.

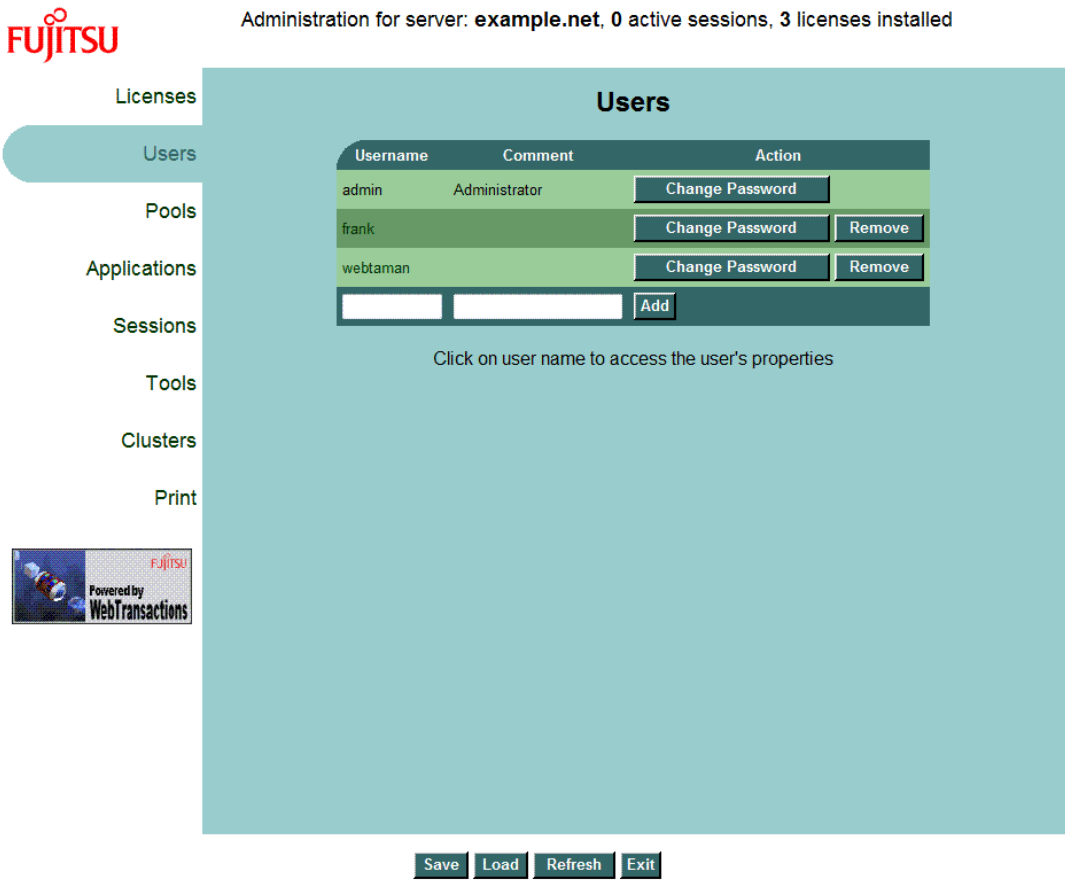
► Enter the number of acquired licenses and the valid license key notified to you by e-mail in the **Licenses** and **Key** fields of the licensing page.

► 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 WebLab users. The **Users** window is displayed in the browser.


Administration for server: **example.net**, **0** active sessions, **3** licenses installed

**Users**

| Username | Comment | Action |
|---|---|---|
| admin | Administrator | Change Password |
| frank | | Change Password Remove |
| webtaman | | Change Password Remove |
| | | Add |

Click on user name to access the user's properties

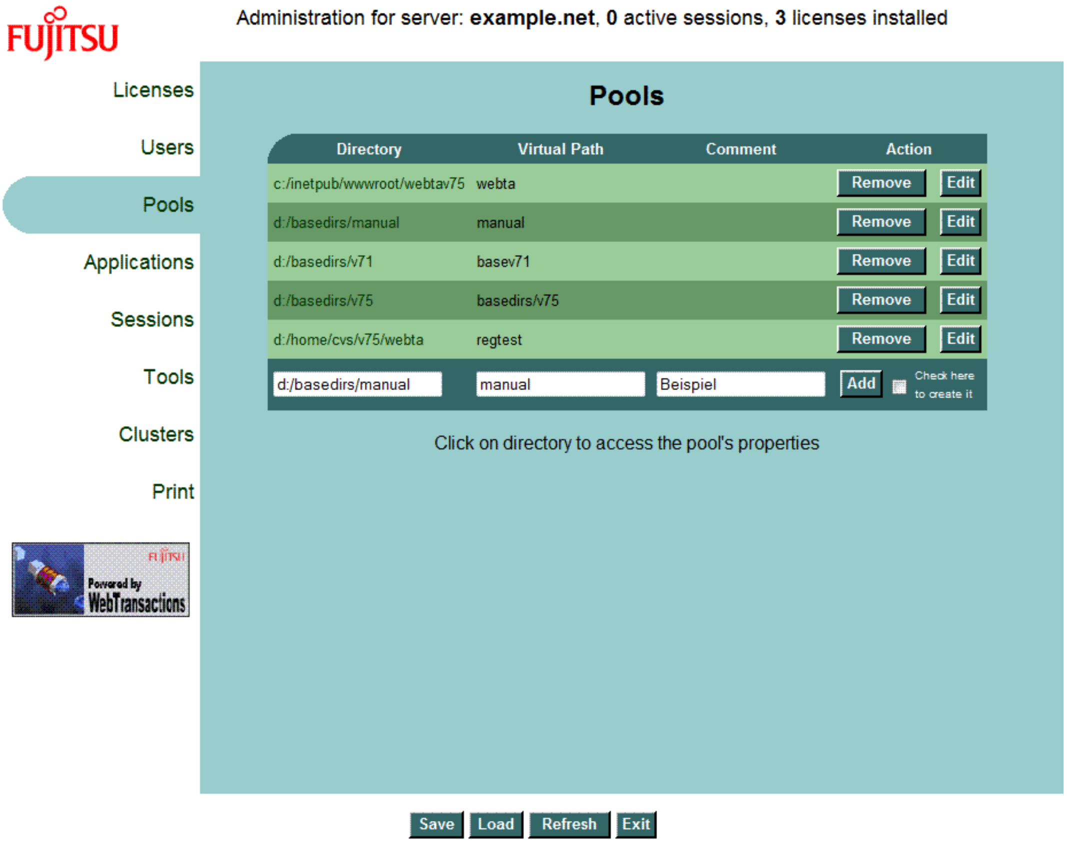
► Enter the name of the new user in the **Username** input field in the work area.

► 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 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. You proceed in exactly the same way to assign a password for `admin`.

## 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.


Administration for server: **example.net**, **0** active sessions, **3** licenses installed

**Pools**

| Directory | Virtual Path | Comment | Action |
|---|---|---|---|
| c:/inetpub/wwwroot/webtav75 | webta | | Remove Edit |
| d:/basedirs/manual | manual | | Remove Edit |
| d:/basedirs/v71 | basev71 | | Remove Edit |
| d:/basedirs/v75 | basedirs/v75 | | Remove Edit |
| d:/home/cvs/v75/webta | regtest | | Remove Edit |
| d:/basedirs/manual | manual | Beispiel | Add ☐ Check here to create it |

Click on directory to access the pool's properties

► 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.

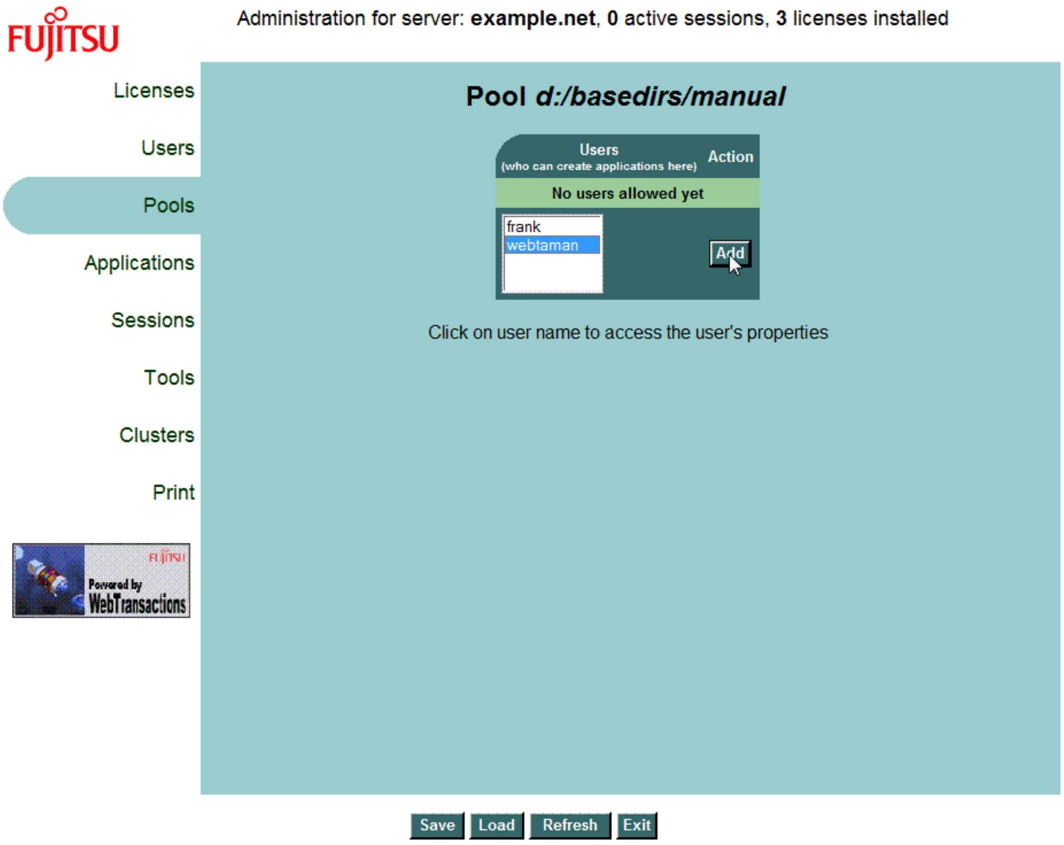
i If you want to use base directories with identical names in different pools, the values for **Virtual Path** corresponding to the pools have to be different.

► 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 other than `admin` 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.


Administration for server: **example.net**, **0** active sessions, **3** licenses installed

**Pool *d:/basedirs/manual***

| Users (who can create applications here) | Action |
|---|---|
| No users allowed yet | |
| frank, webtaman | Add |

Click on user name to access the user's properties

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. You have now completed the preparations required in order to work with WebTransactions.

► Click on the **Save** button to save the current WebTransactions configuration.

► Click on the **Exit** button to terminate the administration program.

► Exit the browser.

## 3.2 Connecting a host application to the Web

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

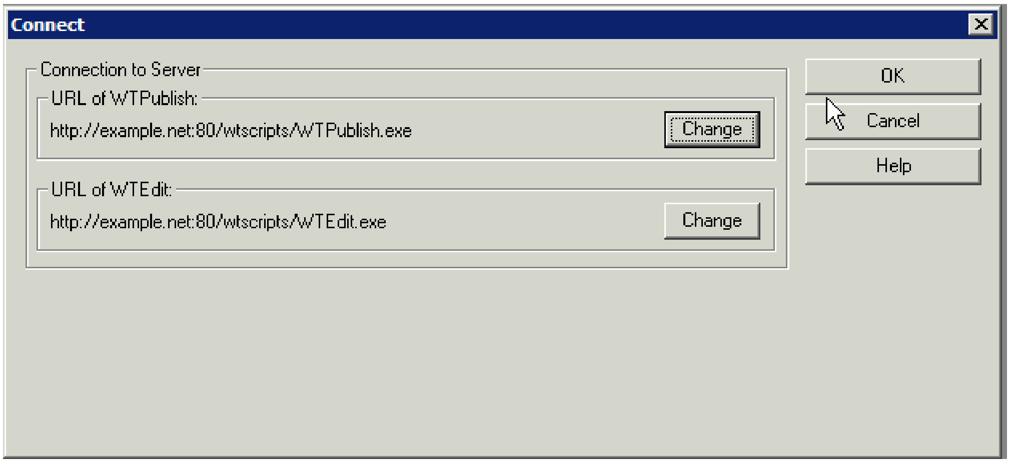
The project stores the most  important data that is required  by WebLab to generate and edit a WebTransactions application, e.g. the WebTransactions server data.

► 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.



http://example.net:80/wtscripts/WTPublish.exe

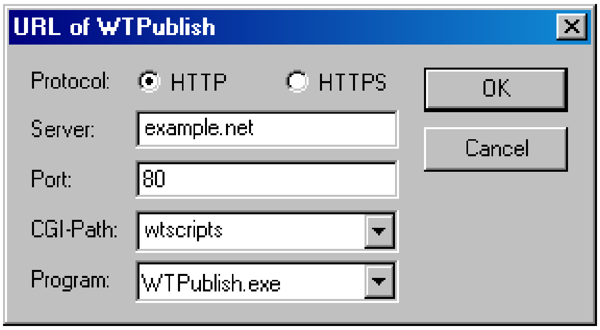
http://example.net:80/wtscripts/WTEdit.exe

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.


URL of WTPublish

Protocol: [✓ HTTP] HTTPS

Server: example.net

Port: 80

CGI-Path: wtscripts

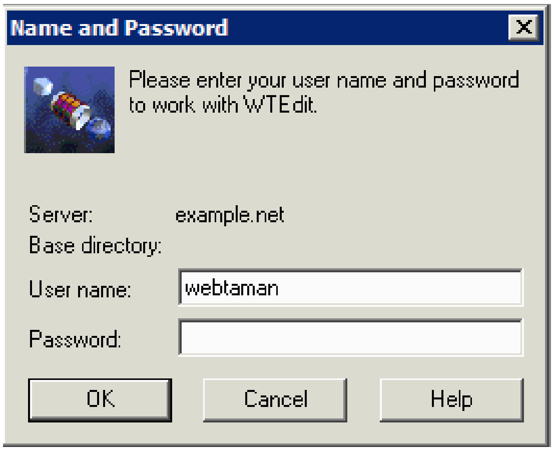
Program: WTPublish.exe

- 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 *example.net*.
- 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 wt*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** | *example.net* |
| **Port** | *80* |
| **CGI Path** | *wtscripts* |
| **Program** | *WTEdit.exe* |

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

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

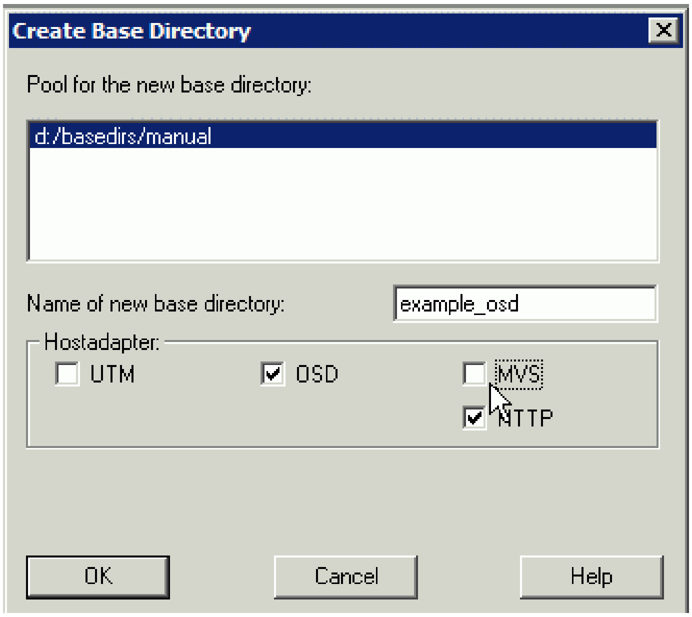


Please enter your user name and password to work with WTEdit.

Server: example.net
Base directory:
User name: webtaman
Password:

► Enter the user name and password that you specified in section “Creating users” on page 31.

► Click on **OK** to confirm. The **Create basedir** dialog box is displayed on the screen.



Pool for the new base directory:
d:/basedirs/manual

Name of new base directory: example_osd

Hostadapter:
☐ UTM ☑ OSD ☐ MVS ☑ HTTP

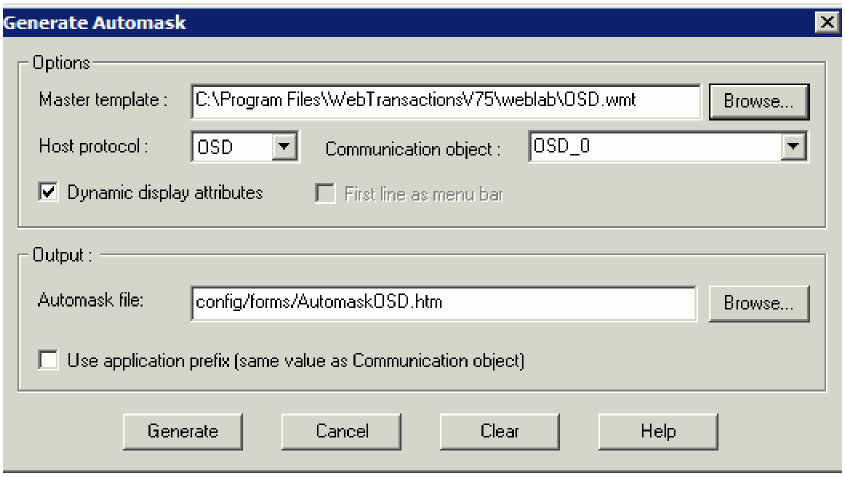
The upper list of this dialog box displays the pools under which the logged on user is able to create base directories on the WebTransactions server.

► In the list, click on the pool which you created in section “Creating a pool” on page 32.

- Enter a name in the **Name of new Base Directory** input field, here *example_osd*.
- Next select the host adapter via which WebTransactions communicates with the host application, here *OSD*. 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.


Generate Automask

Options

Master template : C:\Program Files\WebTransactionsV75\weblab\OSD.wmt

Host protocol : OSD

Communication object : OSD_0

[✓] Dynamic display attributes

[ ] First line as menu bar

Output :

Automask file: config/forms/AutomaskOSD.htm

[ ] Use application prefix (same value as Communication object)

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 *OSD_0*. If you do not enter anything here, the default setting `OSD_0` is used. If you want to open multiple connections during a session, 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.

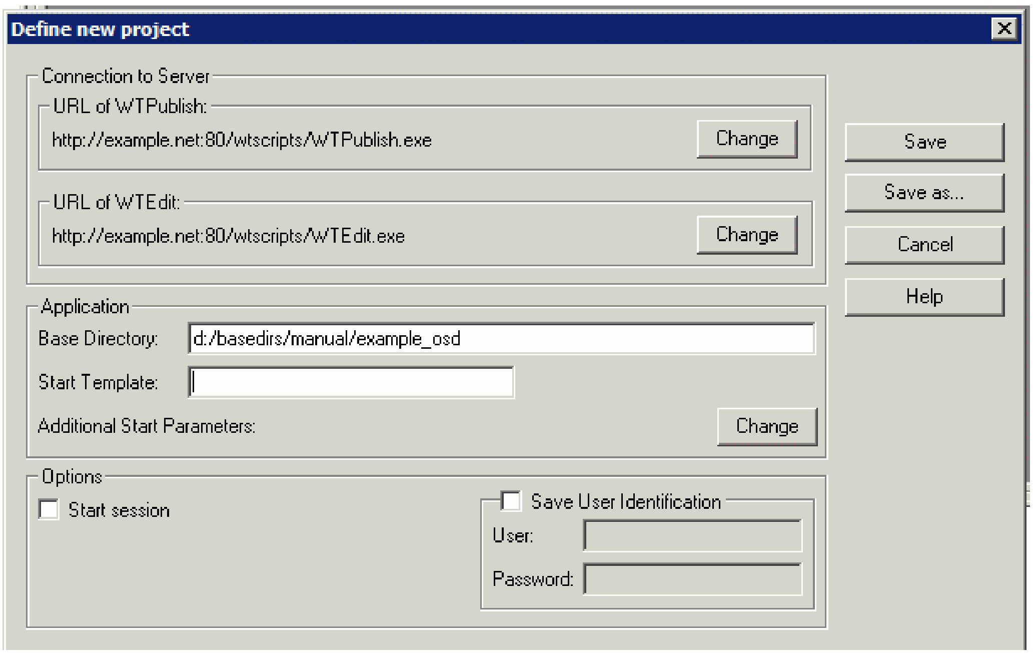
► In this example, you confirm all further settings by clicking on **Generate**. The **Generate Automask** dialog box is closed and the base directory and automask are generated using the specified values at the WebTransactions server. In the WebLab main window, a message window is opened below the work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



URL of WTPublish: http://example.net:80/wtscripts/WTPublish.exe

URL of WTEdit: http://example.net:80/wtscripts/WTEdit.exe

Base Directory: d:/basedirs/manual/example_osd

Start Template:

Additional Start Parameters:

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

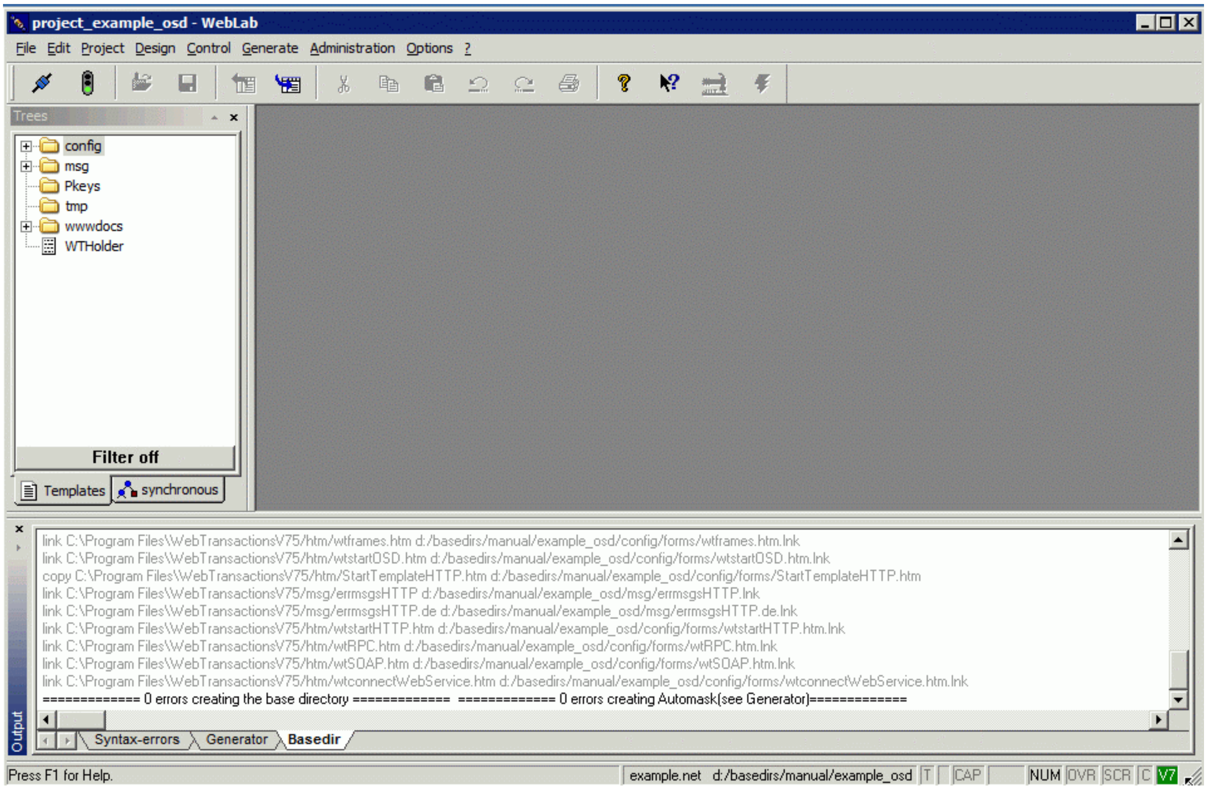
  This opens the **Save As** dialog box.

- ► 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 section “Structure of a base directory” on page 67.



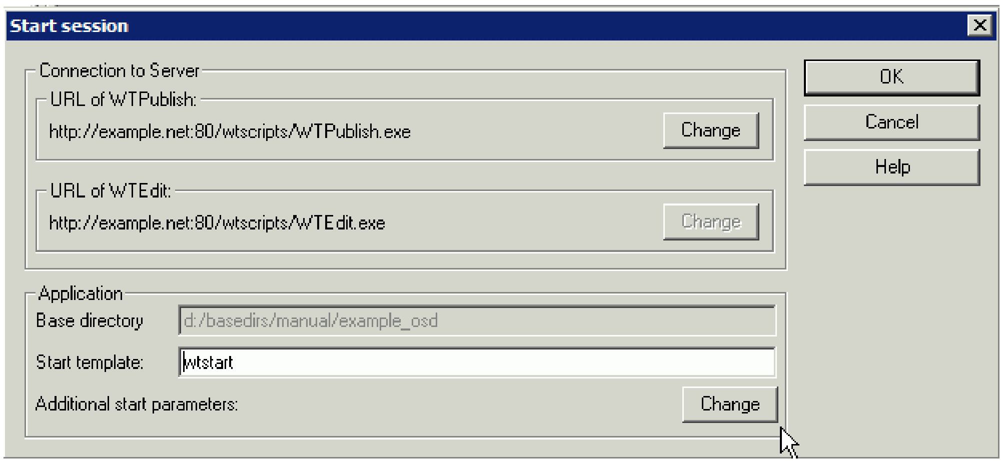
```
link C:\Program Files\WebTransactionsV75/htm/wtframes.htm d:/basedirs/manual/example_osd/config/forms/wtframes.htm.lnk
link C:\Program Files\WebTransactionsV75/htm/wtstartOSD.htm d:/basedirs/manual/example_osd/config/forms/wtstartOSD.htm.lnk
copy C:\Program Files\WebTransactionsV75/htm/StartTemplateHTTP.htm d:/basedirs/manual/example_osd/config/forms/StartTemplateHTTP.htm
link C:\Program Files\WebTransactionsV75/msg/errmsgsHTTP d:/basedirs/manual/example_osd/msg/errmsgsHTTP.lnk
link C:\Program Files\WebTransactionsV75/msg/errmsgsHTTP.de d:/basedirs/manual/example_osd/msg/errmsgsHTTP.de.lnk
link C:\Program Files\WebTransactionsV75/htm/wtstartHTTP.htm d:/basedirs/manual/example_osd/config/forms/wtstartHTTP.htm.lnk
link C:\Program Files\WebTransactionsV75/htm/wtRPC.htm d:/basedirs/manual/example_osd/config/forms/wtRPC.htm.lnk
link C:\Program Files\WebTransactionsV75/htm/wtSOAP.htm d:/basedirs/manual/example_osd/config/forms/wtSOAP.htm.lnk
link C:\Program Files\WebTransactionsV75/htm/wtconnectWebService.htm d:/basedirs/manual/example_osd/config/forms/wtconnectWebService.htm.lnk
============ 0 errors creating the base directory ============  ============ 0 errors creating Automask(see Generator)============
```

```
Press F1 for Help.    example.net  d:/basedirs/manual/example_osd  T  CAP  NUM OVR SCR C V7
```

## 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 **Start Session** dialog box is displayed on the screen.



Connection to Server

URL of WTPublish: http://example.net:80/wtscripts/WTPublish.exe

URL of WTEdit: http://example.net:80/wtscripts/WTEdit.exe

Application

Base directory: d:/basedirs/manual/example_osd

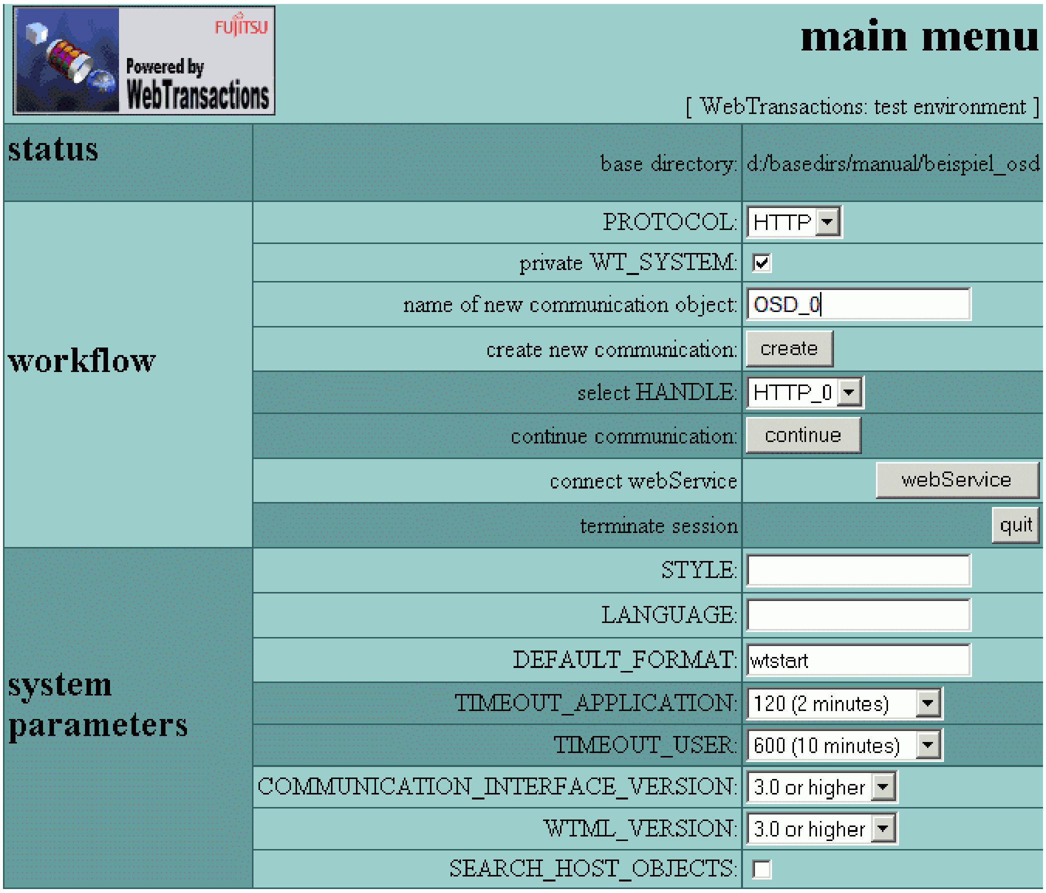
Start template: wtstart

Additional start parameters:

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.



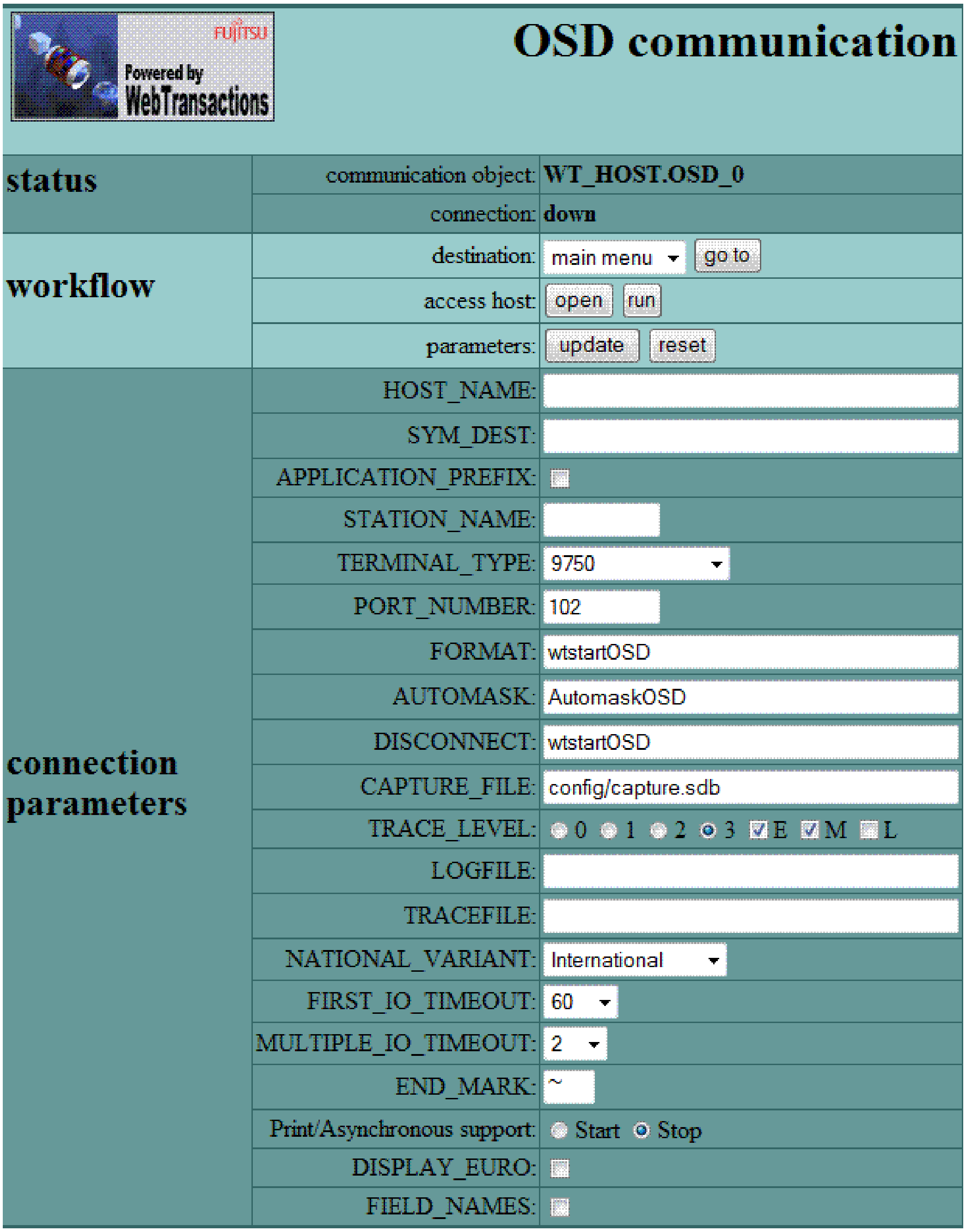
**main menu**

[ WebTransactions: test environment ]

| | | |
|---|---|---|
| **status** | base directory: | d:/basedirs/manual/beispiel_osd |
| **workflow** | PROTOCOL: | HTTP |
| | private WT_SYSTEM: | ☑ |
| | name of new communication object: | OSD_0 |
| | create new communication: | create |
| | select HANDLE: | HTTP_0 |
| | continue communication: | continue |
| | connect webService | webService |
| | terminate session | quit |
| **system parameters** | STYLE: | |
| | LANGUAGE: | |
| | DEFAULT_FORMAT: | wtstart |
| | TIMEOUT_APPLICATION: | 120 (2 minutes) |
| | TIMEOUT_USER: | 600 (10 minutes) |
| | COMMUNICATION_INTERFACE_VERSION: | 3.0 or higher |
| | WTML_VERSION: | 3.0 or higher |
| | SEARCH_HOST_OBJECTS: | ☐ |

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 `OSD` entry in the **PROTOCOL** pick list.
- Specify the name of the communication object, here *OSD_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 OSD-specific start template `wtstartOSD.htm` continues checking and displays the next form.

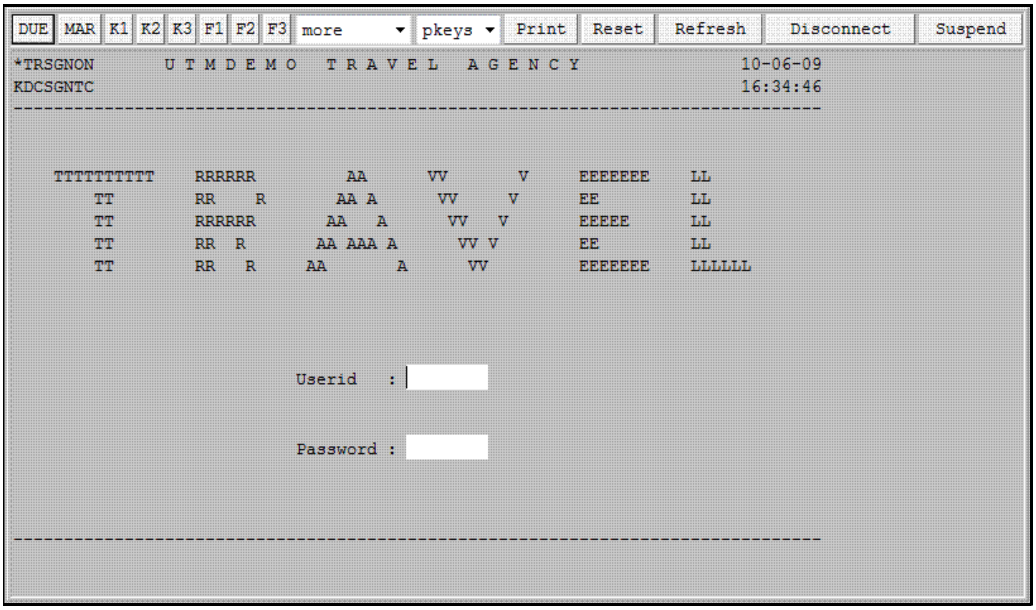


## OSD communication

| | | |
|---|---|---|
| **status** | communication object: | **WT_HOST.OSD_0** |
| | connection: | **down** |
| **workflow** | destination: | main menu ▾ [go to] |
| | access host: | [open] [run] |
| | parameters: | [update] [reset] |
| **connection parameters** | HOST_NAME: | |
| | SYM_DEST: | |
| | APPLICATION_PREFIX: | ☐ |
| | STATION_NAME: | |
| | TERMINAL_TYPE: | 9750 ▾ |
| | PORT_NUMBER: | 102 |
| | FORMAT: | wtstartOSD |
| | AUTOMASK: | AutomaskOSD |
| | DISCONNECT: | wtstartOSD |
| | CAPTURE_FILE: | config/capture.sdb |
| | TRACE_LEVEL: | ○ 0 ○ 1 ○ 2 ● 3 ☑ E ☑ M ☐ L |
| | LOGFILE: | |
| | TRACEFILE: | |
| | NATIONAL_VARIANT: | International ▾ |
| | FIRST_IO_TIMEOUT: | 60 ▾ |
| | MULTIPLE_IO_TIMEOUT: | 2 ▾ |
| | END_MARK: | ~ |
| | Print/Asynchronous support: | ○ Start ● Stop |
| | DISPLAY_EURO: | ☐ |
| | FIELD_NAMES: | ☐ |

With the OSD-specific start template 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 of the computer on which the host application is running.
- ► For **SYM_DEST** enter the symbolic name of the host application, here *Travel*. The symbolic name is the name under which the application is known at the host computer.
- ► If the host application expects a specific terminal name you can enter this in the `STATION_NAME` box.
- ► Now click on the **run** button to open the connection to the host application. The first screen of the OSD application is output with `AutomaskOSD.htm`.



```
*TRSGNON        U T M D E M O   T R A V E L   A G E N C Y                 10-06-09
KDCSGNTC                                                                  16:34:46
--------------------------------------------------------------------------------


    TTTTTTTTTT    RRRRRR          AA       VV        V     EEEEEEE     LL
        TT        RR    R        AA A       VV      V      EE          LL
        TT        RRRRRR        AA   A       VV    V       EEEEE       LL
        TT        RR  R        AA AAA A       VV  V        EE          LL
        TT        RR   R      AA       A       VV          EEEEEEE     LLLLLL



                            Userid    :


                            Password  :



--------------------------------------------------------------------------------
```

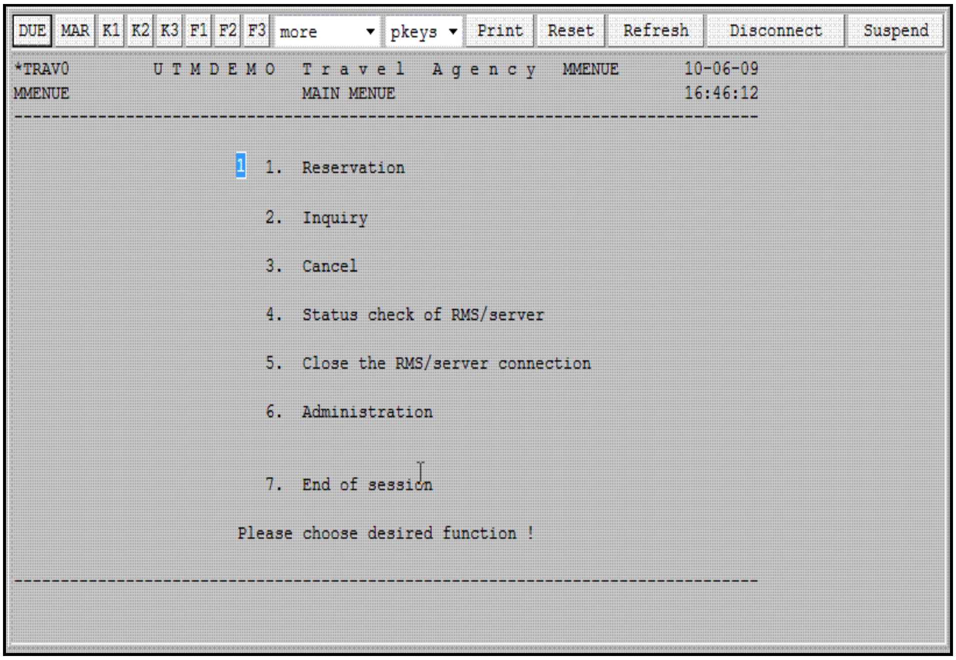
The `AutomaskOSD.htm` template provides you with a button bar for communications with the OSD application. This button bar replicates the special keys of the 9750 terminal (see section “AutomaskOSD.htm template” on page 78).

If you now want to terminate the connection to the host, click the **Disconnect** button. Processing again branches to the template `wtstartOSD` (see also section “OSD-specific start template in the start template set (wtstartOSD.htm)” on page 163). 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 *Travel* host application.

► Press **DUE** to start the Travel application. The next format of the Travel application is displayed in the browser.



```
*TRAV0        U T M D E M O   T r a v e l   A g e n c y   MMENUE      10-06-09
MMENUE                        MAIN MENUE                              16:46:12
--------------------------------------------------------------------------------

                        1  1.  Reservation

                           2.  Inquiry

                           3.  Cancel

                           4.  Status check of RMS/server

                           5.  Close the RMS/server connection

                           6.  Administration


                           7.  End of session

                        Please choose desired function !

--------------------------------------------------------------------------------
```

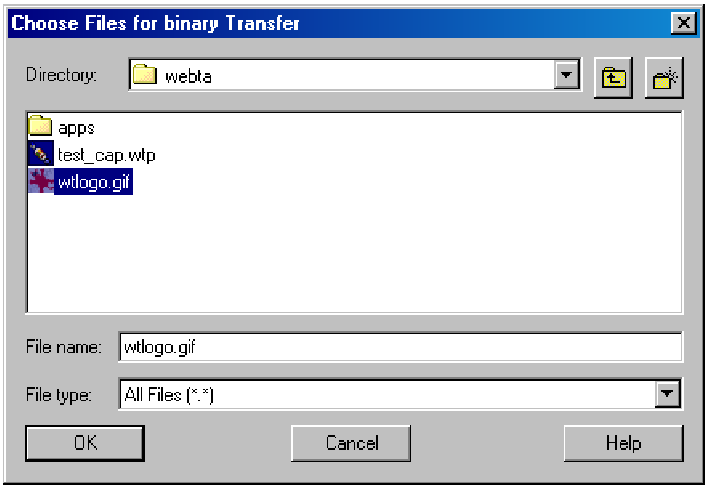
## 3.3 Global modification of display

As an example of a global change, a company logo is to be integrated in `AutomaskOSD.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.

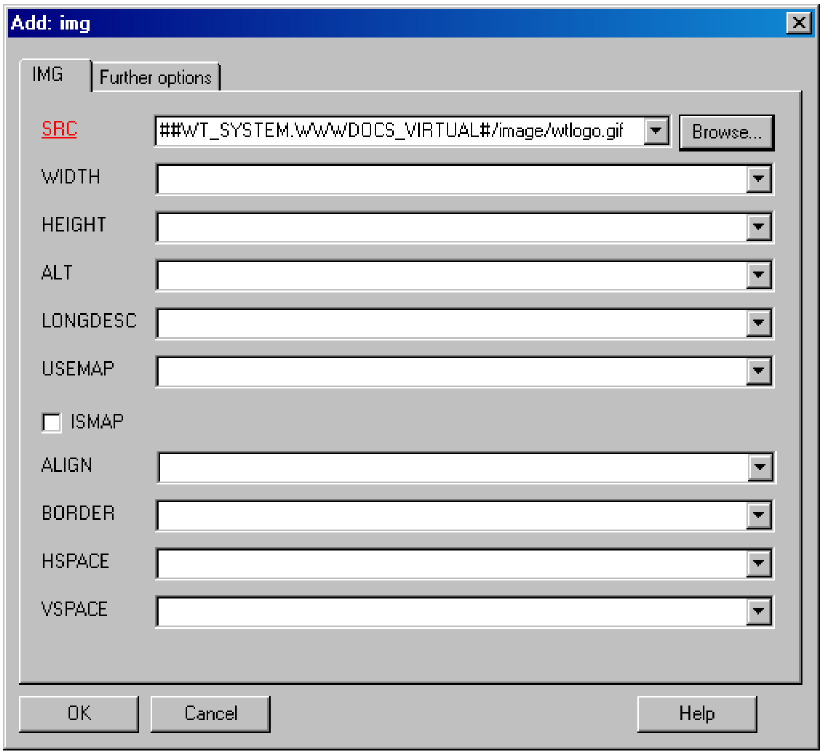
► Choose the **File/Open Current Template** command**.**

– This loads the template `AutomaskOSD.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.



SRC: ##WT_SYSTEM.WWWDOCS_VIRTUAL##/image/wtlogo.gif
WIDTH
HEIGHT
ALT
LONGDESC
USEMAP
☐ ISMAP
ALIGN
BORDER
HSPACE
VSPACE

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.

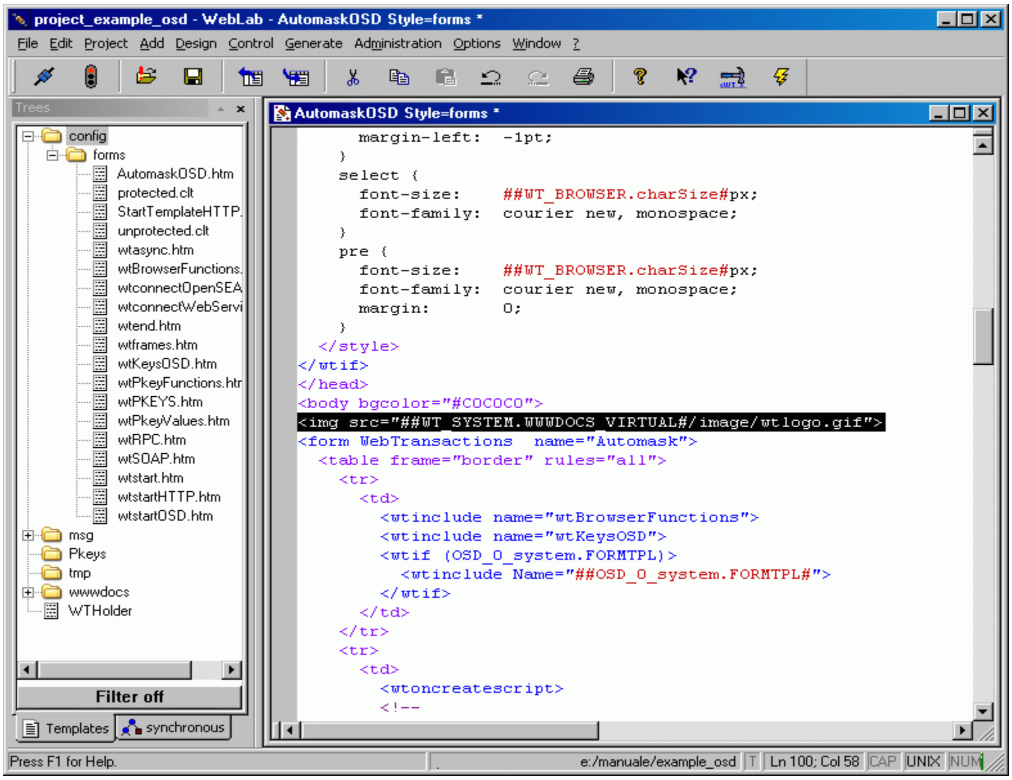
You can use the system object attribute `WWWDOCS_VIRTUAL` to access the image without having to specify a long path name. `WWWDOCS_VIRTUAL` already contains the full path from the web server's document directory through to the `wwwdocs` directory in the base directory.

► Use the **Browse** button to find the image file. If the file is under `wwwdocs`, WebLab will automatically use `VIRTUAL` and the name will be created as follows:

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

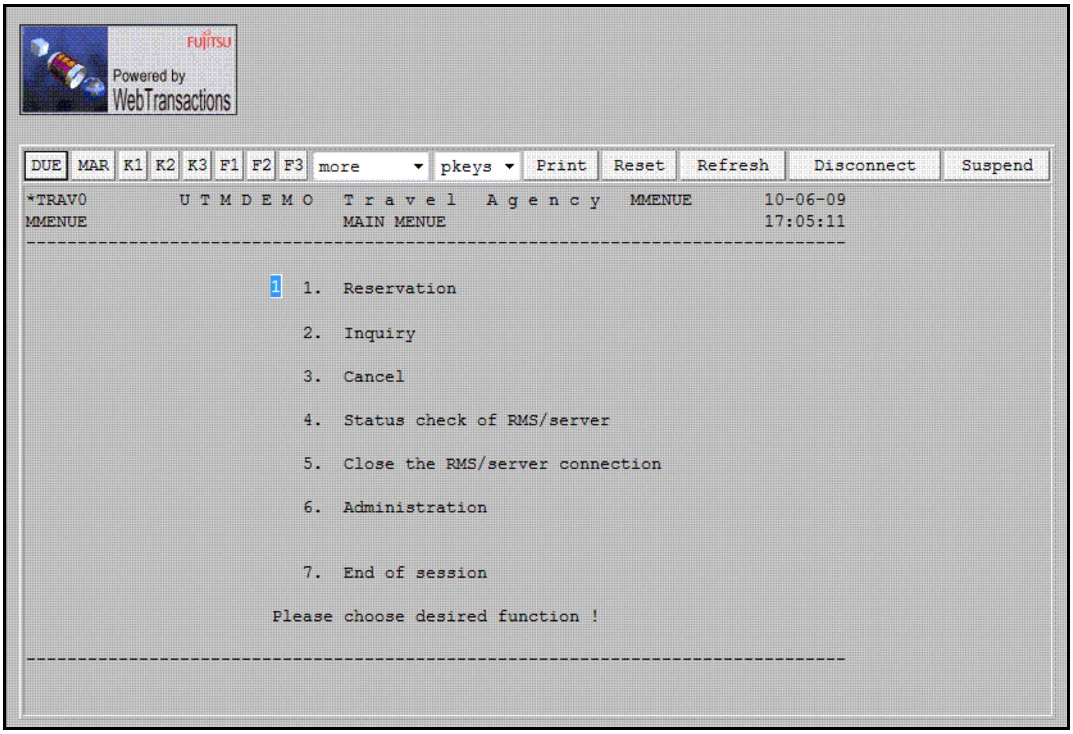
► Click **OK** to confirm. WebLab inserts the following line in the Automask template after the BODY tag:

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



```
        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>
  <body bgcolor="#C0C0C0">
  <img src="##WT_SYSTEM.WWWDOCS_VIRTUAL#/image/wtlogo.gif">
  <form WebTransactions  name="Automask">
    <table frame="border" rules="all">
      <tr>
        <td>
          <wtinclude name="wtBrowserFunctions">
          <wtinclude name="wtKeysOSD">
          <wtif (OSD_O_system.FORMTPL)>
            <wtinclude Name="##OSD_O_system.FORMTPL#">
          </wtif>
        </td>
      </tr>
      <tr>
        <td>
          <wtoncreatescript>
          <!--
```

► To view the changes, choose the **Control/Update in Browser** command. The logo 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.


FUJITSU
Powered by
WebTransactions
DUE MAR K1 K2 K3 F1 F2 F3 more pkeys Print Reset Refresh Disconnect Suspend

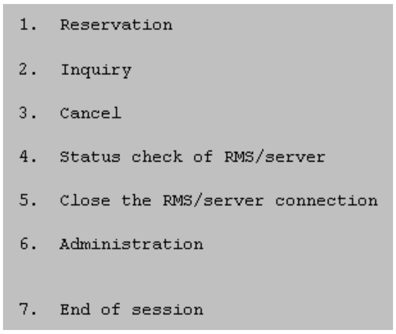
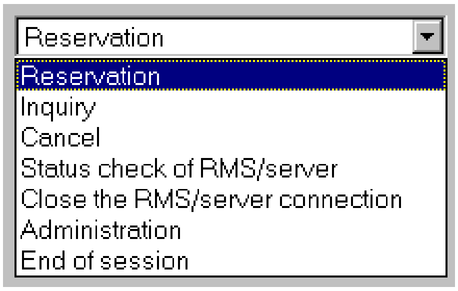
```
*TRAV0        U T M D E M O   T r a v e l   A g e n c y   MMENUE       10-06-09
MMENUE                        MAIN MENUE                               17:05:11
--------------------------------------------------------------------------------

                        1   1.  Reservation

                            2.  Inquiry

                            3.  Cancel

                            4.  Status check of RMS/server

                            5.  Close the RMS/server connection

                            6.  Administration


                            7.  End of session

                        Please choose desired function !

--------------------------------------------------------------------------------
```

## 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** |
|---|---|
|  1. Reservation<br>2. Inquiry<br>3. Cancel<br>4. Status check of RMS/server<br>5. Close the RMS/server connection<br>6. Administration<br>7. End of session |  Reservation<br>Reservation<br>Inquiry<br>Cancel<br>Status check of RMS/server<br>Close the RMS/server connection<br>Administration<br>End of session |

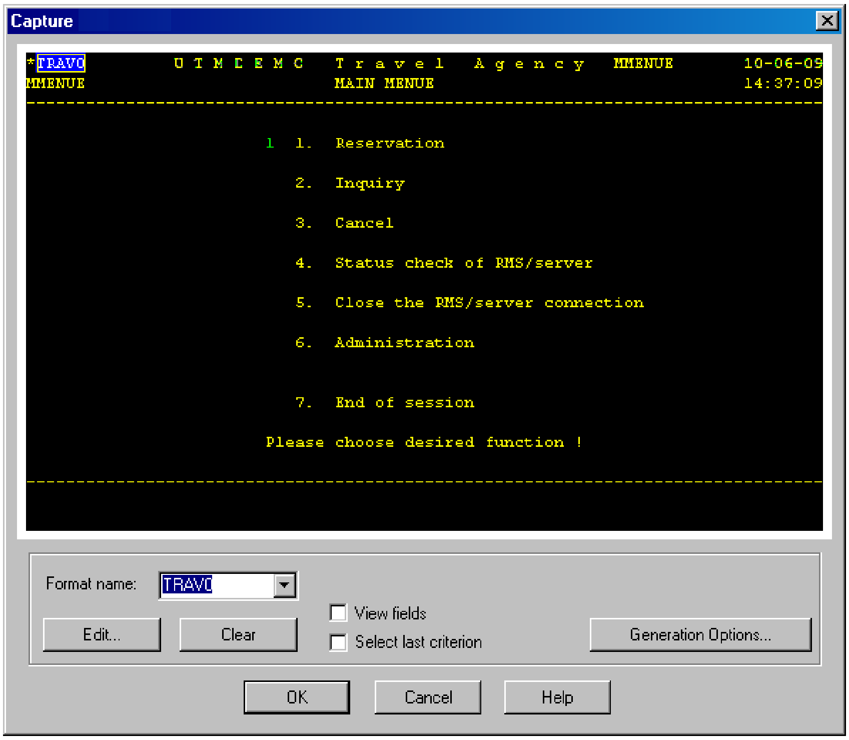
### 3.4.1 Generating a format-specific template with the capture process

To create format-specific 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.

> **i** In the start template `wtstartOSD.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 on 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.



```
*TRAV0          U T M D E M O    T r a v e l    A g e n c y   MMENUE      10-06-09
MMENUE                           MAIN MENUE                               14:37:09
--------------------------------------------------------------------------------

                            1  1.  Reservation

                               2.  Inquiry

                               3.  Cancel

                               4.  Status check of RMS/server

                               5.  Close the RMS/server connection

                               6.  Administration


                               7.  End of session

                        Please choose desired function !

--------------------------------------------------------------------------------
```

Format name: TRAV0

☐ View fields
☐ Select last criterion

► Use the mouse to drag a rectangle over the indicated section *TRAV0*. This specifies that this format is identified through the presence of TRAV0 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 TRAV0 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 `TRAV0.htm` which depicts the formats of the fields. For the structure of a complete template, see section “Structure of AutomaskOSD.htm” on page 80.

The generated template `TRAV0.htm` was generated with the following generation options: **Generation method: Inline script**, **Display attributes: None**.

```
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -  -->
<!-- begin of host screen section                                           -->
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -  -->
<div style="color:##OSD_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 ** *TRAV0      U T M D E M O   T r a v e l
A g e n c y    **>\
##OSD_0.E_01_001_059.HTMLValue#\
<wtrem ** MMENUE   **>\
##OSD_0.E_01_060_008.HTMLValue#\
<wtrem **       **>\
##OSD_0.E_01_068_005.HTMLValue#\
<wtrem ** 10-06-09 **>\
##OSD_0.E_01_073_008.HTMLValue#</span>
<span class="screenline" id="SL2"><wtrem ** MMENUE                         MAIN MENUE
**>\
##OSD_0.E_02_001_041.HTMLValue#\
<wtrem **                                **>\
##OSD_0.E_02_042_031.HTMLValue#\
<wtrem ** 17:05:11 **>\
##OSD_0.E_02_073_008.HTMLValue#</span>
<span class="screenline" id="SL3"><wtrem ** ------------------------------------------
------------------------------------ **>\
##OSD_0.E_03_001_080.HTMLValue#</span>
<span class="screenline" id="SL4"><wtrem **
**>\
##OSD_0.E_04_001_080.HTMLValue#</span>
<span class="screenline" id="SL5"><wtrem **                       **>\
##OSD_0.E_05_001_024.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="##(OSD_0.E_05_025_001.Visible == 'No') ? 'password' : 'text'#" ##(
WT_BROWSER.acceptClass ) ? 'class="box" style="width:9px"' : ''# name="E_05_025_001"
size="1" maxlength="1" markable="1" value="##OSD_0.E_05_025_001.Value#"/>\
<wtrem **   1.  Reservation **>\
...
<wtrem ** Please choose desired function ! **>\
##OSD_0.E_20_025_032.HTMLValue#\
<wtrem **                          **>\
##OSD_0.E_20_057_024.HTMLValue#</span>
<span class="screenline" id="SL21"><wtrem **
**>\
##OSD_0.E_21_001_080.HTMLValue#</span>
<span class="screenline" id="SL22"><wtrem ** ------------------------------------------
------------------------------------ **>\
##OSD_0.E_22_001_080.HTMLValue#</span>
<span class="screenline" id="SL23"><wtrem **
**>\
##OSD_0.E_23_001_080.HTMLValue#</span>
<span class="screenline" id="SL24"><wtrem **
**>\
##OSD_0.E_24_001_080.HTMLValue#</span>
```

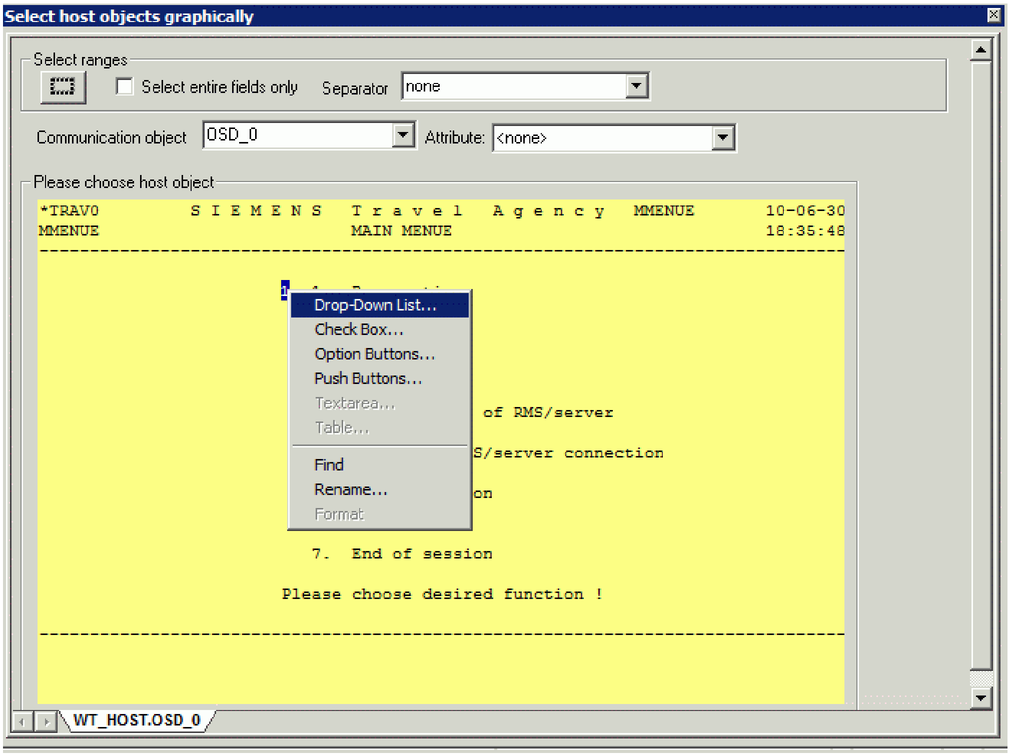
All the input fields are administered in an object.

```
<wtoncreatescript>
<!--
wtInputFields = {E_05_025_001:OSD_0.E_05_025_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 TRAV0 in the WebLab work area.
- Choose the command **Design/Select Host Objects Graphically/From a Communication Object**. The dialog box for the graphical host object selection for the current template is displayed on the screen.

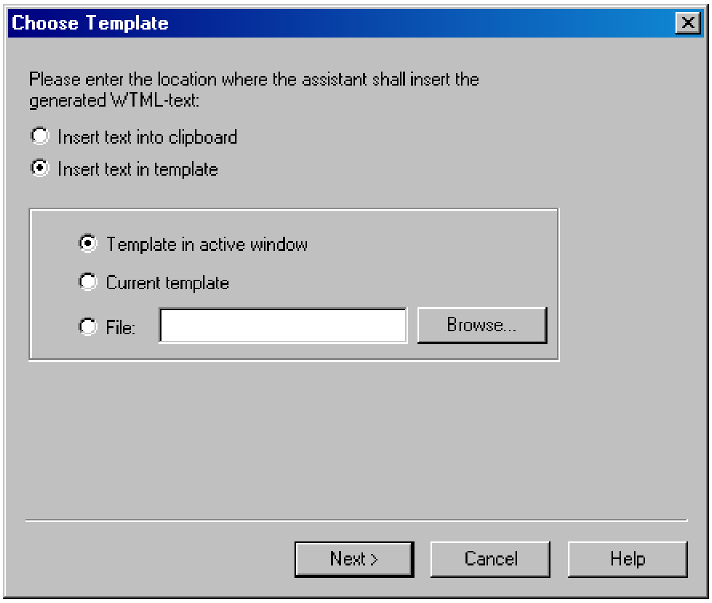
  This dialog box displays the format as it would appear in an emulation or at a terminal. All the output fields which cannot be edited have a grey background. The single input field in this format has a white background.
- Move the mouse pointer to this input field (because of the selection the field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



Separator: none
Communication object: OSD_0
Attribute: <none>
Please choose host object

```
*TRAV0          S I E M E N S   T r a v e l   A g e n c y   MMENUE       10-06-30
MMENUE                          MAIN MENUE                                18:35:48
---------------------------------------------------------------------------------

                          1    1.   R

                                           of RMS/server

                                          S/server connection

                                          on

                               7.   End of session

                            Please choose desired function !

---------------------------------------------------------------------------------
```

- 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.



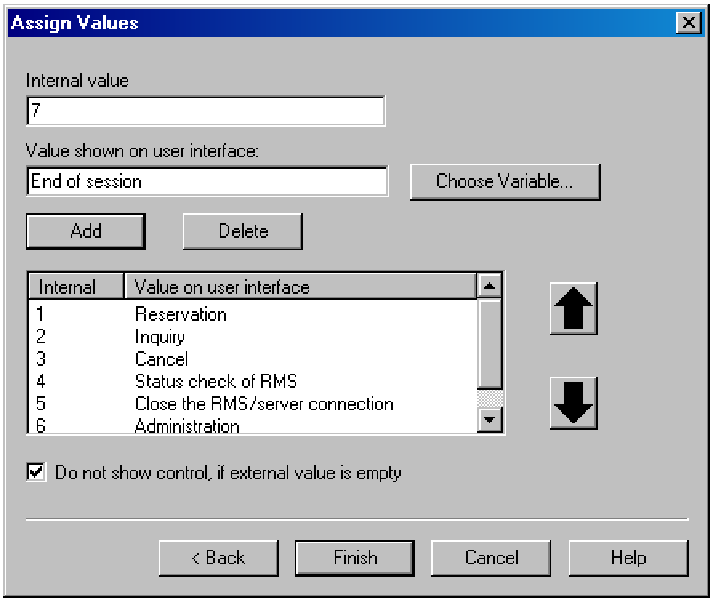
Please enter the location where the assistant shall insert the generated WTML-text:

( ) Insert text into clipboard
[✓ Insert text in template]

[✓ Template in active window]
( ) Current template
( ) File:

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 not previously opened the active template, click the **Current Template** option.

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



Internal value: 7

Value shown on user interface: End of session

| Internal | Value on user interface |
|---|---|
| 1 | Reservation |
| 2 | Inquiry |
| 3 | Cancel |
| 4 | Status check of RMS |
| 5 | Close the RMS/server connection |
| 6 | Administration |

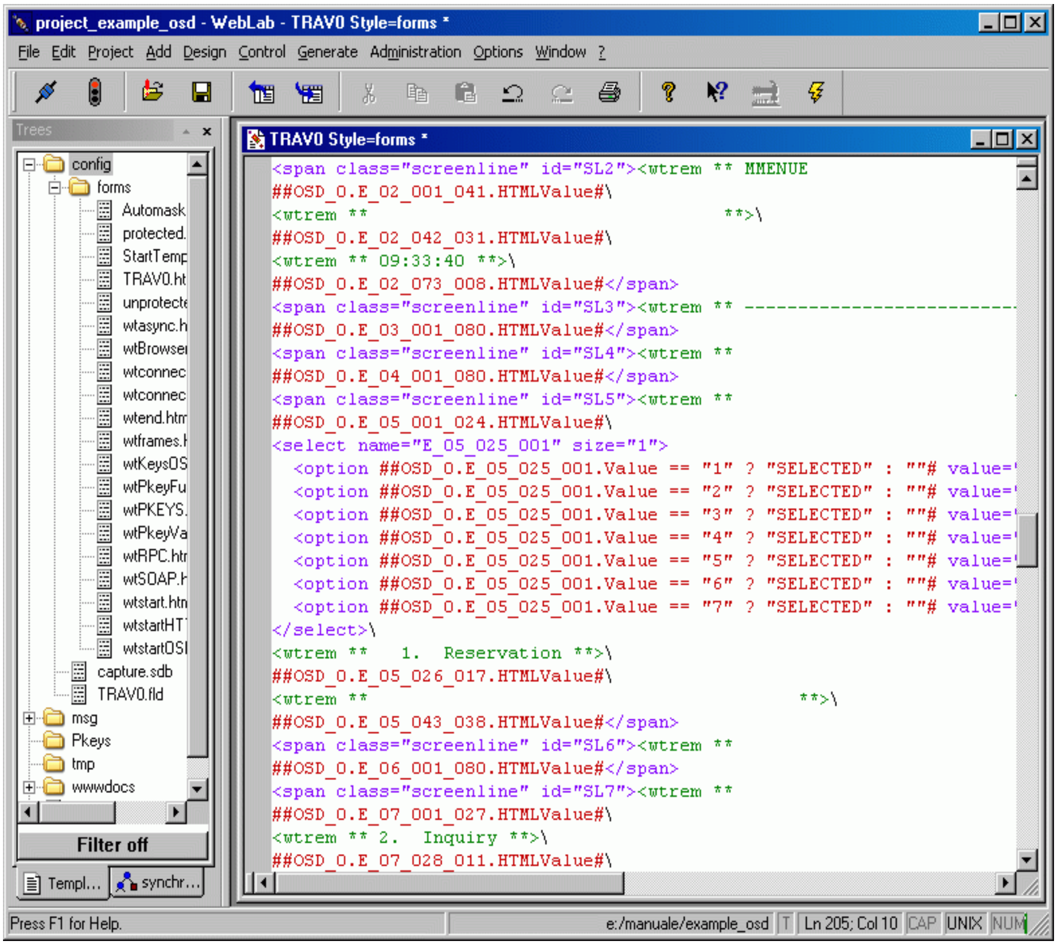
☑ Do not show control, if external value is empty

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 internal value and corresponds to an entry in the pick list.

► Enter the internal values and the corresponding descriptions (see figure on page 49) 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 *TRAV0*.`htm`.

► To view this replacement, scroll through the template *TRAV0* until you reach the host section. This section starts with the comment `begin of host screen section`.



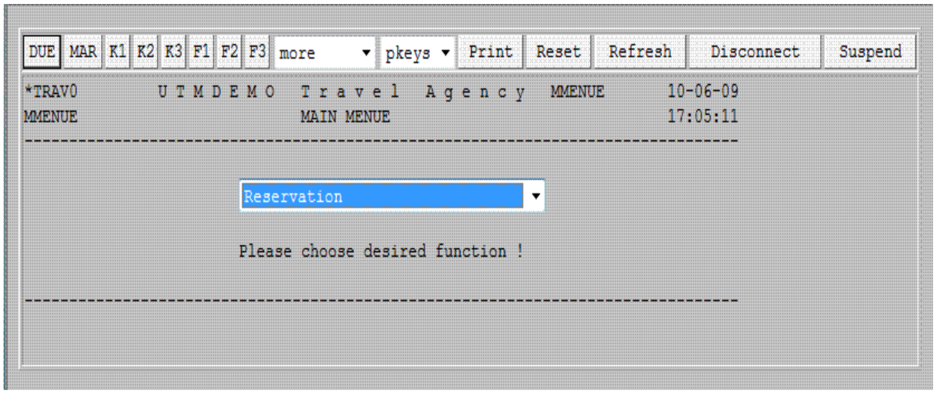
```
<span class="screenline" id="SL2"><wtrem ** MMENUE
##OSD_0.E_02_001_041.HTMLValue#\
<wtrem **                              **>\
##OSD_0.E_02_042_031.HTMLValue#\
<wtrem ** 09:33:40 **>\
##OSD_0.E_02_073_008.HTMLValue#</span>
<span class="screenline" id="SL3"><wtrem ** -------------------------
##OSD_0.E_03_001_080.HTMLValue#</span>
<span class="screenline" id="SL4"><wtrem **
##OSD_0.E_04_001_080.HTMLValue#</span>
<span class="screenline" id="SL5"><wtrem **
##OSD_0.E_05_001_024.HTMLValue#\
<select name="E_05_025_001" size="1">
  <option ##OSD_0.E_05_025_001.Value == "1" ? "SELECTED" : ""# value='
  <option ##OSD_0.E_05_025_001.Value == "2" ? "SELECTED" : ""# value='
  <option ##OSD_0.E_05_025_001.Value == "3" ? "SELECTED" : ""# value='
  <option ##OSD_0.E_05_025_001.Value == "4" ? "SELECTED" : ""# value='
  <option ##OSD_0.E_05_025_001.Value == "5" ? "SELECTED" : ""# value='
  <option ##OSD_0.E_05_025_001.Value == "6" ? "SELECTED" : ""# value='
  <option ##OSD_0.E_05_025_001.Value == "7" ? "SELECTED" : ""# value='
</select>\
<wtrem **   1.  Reservation **>\
##OSD_0.E_05_026_017.HTMLValue#\
<wtrem **                                    **>\
##OSD_0.E_05_043_038.HTMLValue#</span>
<span class="screenline" id="SL6"><wtrem **
##OSD_0.E_06_001_080.HTMLValue#</span>
<span class="screenline" id="SL7"><wtrem **
##OSD_0.E_07_001_027.HTMLValue#\
<wtrem ** 2.  Inquiry **>\
##OSD_0.E_07_028_011.HTMLValue#\
```

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.

Since the selection is now performed via the list, the explanatory texts after the list are no longer required. Consequently, you can delete all the host objects and the comments from the template *TRAV0*`.htm`.

► Delete all the fields in the format after the `select` list through to and including `7 End of Session`. You can use the **Find** command in the context menu of the dialog box **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.



```
*TRAV0         U T M D E M O   T r a v e l   A g e n c y   MMENUE       10-06-09
MMENUE                         MAIN MENUE                               17:05:11
-----------------------------------------------------------------------------------

                       Please choose desired function !

-----------------------------------------------------------------------------------
```

If you now want to terminate the host connection, click on the **Disconnect** button. Processing branches to the template `wtstartOSD.htm` (see section "OSD-specific start template in the start template set (wtstartOSD.htm)" on page 163). You can choose **main menu** and click on the **go to** button to return to the general 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 with 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 template `wtstartOSD.htm` the path name of the format 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 a start template

WebLab also provides you with a special WTBean for the creation of host application-specific start templates. This is a standalone WTBean.

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

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

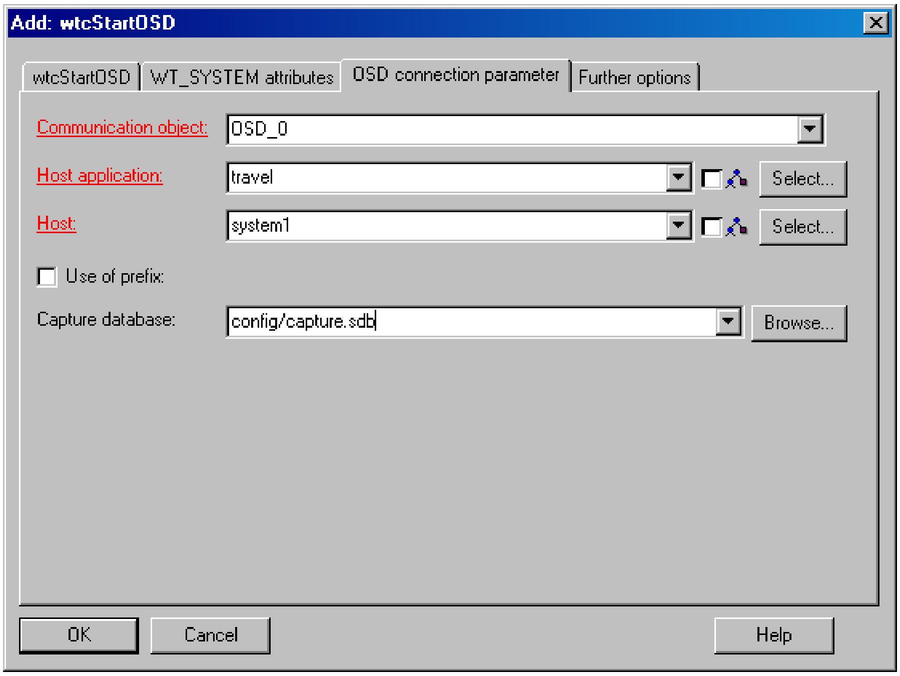
You define the name and directory of the start template in the **wtcStartOSD** tab. By default, the file name is set to `config/forms/startOSD.htm`.

► Under **File name**,enter the directory and name of the start template, in this case *config/forms/Start_Travel.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 **OSD connection parameter** tab.


Add: wtcStartOSD

Communication object: OSD_0
Host application: travel
Host: system1
Use of prefix: ☐
Capture database: config/capture.sdb

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 *OSD_0*

i 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 of the host application, in this case *travel*.

► Enter the Internet address or symbolic name of the system on which the host application is running, here *system1*.

► Enter the name of the capture database, in this case `config/`*travel.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 OSD host application.

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

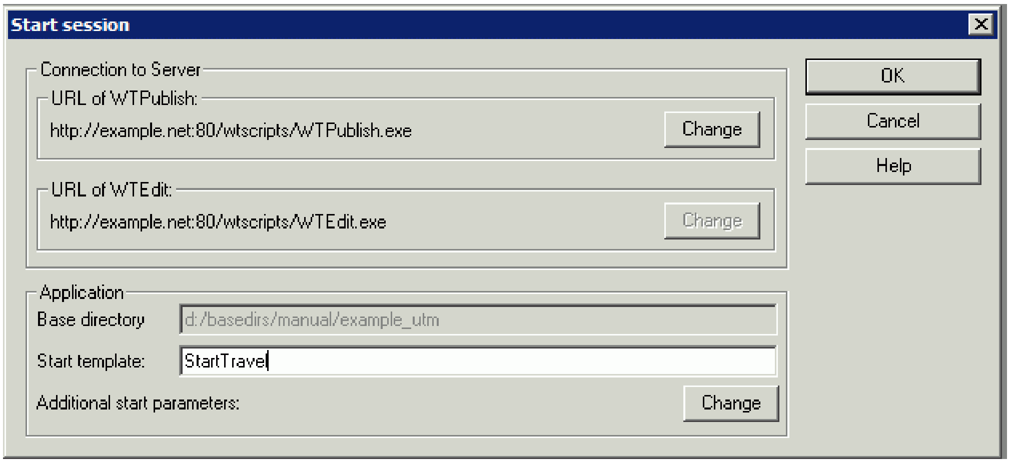
► Click **OK**. The **Add:wtcStartOSD** dialog box is closed. The start template *Start_Travel.htm* is generated and displayed in the WebLab work area. The start template is stored in the base directory under `config/forms`.

The start template *Start_Travel.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 `wtstartOSD.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.



URL of WTPublish: http://example.net:80/wtscripts/WTPublish.exe

URL of WTEdit: http://example.net:80/wtscripts/WTEdit.exe

Base directory: d:/basedirs/manual/example_utm

Start template: StartTravel

Additional start parameters:

► 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_osd?Start_Travel
```

# 4 Creating the base directory

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 therefore 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 35).

  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 basedir** 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 **OSD** 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” and in section “Structure of a base directory” on page 67.

### 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 Structure of a base directory

This section describes the specific aspects of the base directory that only apply to the OSD host adapter.

**i** Information regarding the structure of base directories that applies to all host adapters can be found in the WebTransactions manual “Concepts and Functions”.

### The Pkeys subdirectory

As default, the `Pkeys` subdirectory contains the mapping of the programmable keys (P keys). The mapping of the P keys must be in an XML file which you have created, for example, with the `wtPKEYS.htm` template and which you can store as session specific. After a WebTransactions session is started it is possible to load the P key mapping stored in the `Pkeys` directory to the current emulation.

# 5 Configuring and starting WebTransactions

WebTransactions for OSD is available for the platforms BS2000/OSD, Solaris, Linux and Windows. It is connected to the host via a 9750 terminal emulation which is integrated with the host adapter.

You use certain system object attributes to set the necessary configuration data such as the host name, application name and processor name. The relevant attributes are listed in section “Interaction between system object attributes and methods” on page 128. The corresponding values for these attributes are set in the start template, see section “OSD-specific start template in the start template set (wtstartOSD.htm)” on page 163.

## 5.1 Configuring character sets

The 9750 terminal emulation which is integrated in WebTransactions for OSD supports the classic 7-bit ASCII character set. If the emulation is configured as a 9763 terminal then a number of 8-bit character sets complying with the standard ISO-8859-x are also supported. Das Terminal-Protokoll 9750 wird durch die Unicode-Unterstützung in BS2000/OSD zudem Unicode-fähig.

### 5.1.1 7-bit ASCII character set

The 7-bit ASCII character set comprises 128 characters including control characters. Certain characters may be replaced by country-specific variants, for example “|” by “?”, with the result that a number of different 7-bit variants are supported.

WebTransactions supports these 7-bit variants by means of the system object attribute `NATIONAL_VARIANT`. This can have the following values:

- Danish
- English (UK)
- English (USA)
- French
- French-Belgian
- German
- International
- Italian
- Norwegian
- Spanish
- Swedish
- Swiss

The host adapter converts the 7-bit variants into the 8-bit character set ISO Latin-1 which is used by the browser.

This character set comprises 256 characters. Of these, the first 128 are identical with the classical 7-bit ASCII character set. In contrast, the second 128 characters contain the various special characters and letters used in certain languages, e.g. “ö”, “ß” or “á”.

The 9750 emulation must be configured to correspond to the character set which is used by the OSD host application.

## 5.1.2 8-bit character set

WebTransactions supports 8-bit character sets (ISO-8859-x) when emulating a 9763 terminal, i.e. when the system object attribute `TERMINAL_TYPE` has the value 9763.

The ISO-8859-x standard covers a number of different 8-bit character sets which support different languages:

| ISO standard | Character set |
|---|---|
| ISO-8859-1 | Latin-1 |
| ISO-8859-2 | Latin-2 |
| ISO-8859-5 | Cyrillic |
| ISO-8859-7 | Greek |
| ISO-8859-9 | Turkish |

The old 7-bit character sets are also supported for reasons of compatibility.

At the start of communications with the terminal, some OSD applications demand a status request to which the terminal responds with a list of the 8-bit character sets which it supports. At each communications step, these OSD applications supply information about the current character set (7-bit or 8-bit). The WebTransactions OSD host adapter interprets this information and sets the connection-specific system object attribute `HOST_CHARSET` accordingly (see section “System object attributes” on page 111). For example, in the case of a 7-bit character set it is set to ISO-8859-1 and the national variant is taken into account.

All generated standard templates contain the following script which sets the global system object `attribute CHARSET` to the value of `HOST_CHARSET`:

```
WT_SYSTEM.CHARSET = host_system.HOST_CHARSET;
```

You must incorporate this value assignment in any templates which you create yourself.

WebTransactions uses the value from `WT_SYSTEM.CHARSET` when sending the HTML page to the browser in the HTTP protocol (HTTP header field `content-type`, see the WebTransactions manual “Concepts and Functions”). This means that browsers which support this concept can dynamically set the corresponding character set.

By default, the HTTP protocol uses the 8-bit ISO Latin-1 character set. In HTTP V1.1 you can specify a different character set for the browser. Depending on the type and configuration of the browser you are using, you may have to automatically take the value from the HTTP header `content-type/charset` or to configure a fixed character set.

The WTML template language supports all 8-bit character sets. This means, for example, that with an appropriate editor you can type Cyrillic characters provided that the OSD host application supports this character set.

### 5.1.3 Unicode character set

The Unicode support provided in BS2000/OSD makes the 9750 terminal protocol Unicode-capable. You must explicitly enable Unicode support for 9750 by setting the relevant terminal type, otherwise WebTransactions for OSD behaves in the same way as specified for the system object attribute “TERMINAL_TYPE” on page 125).

WebTransactions for OSD creates data encoded in UTF-8, which is passed straight through to the browser and back. To achieve this, the following rules must be observed with respect to the templates:

- The templates must use `charset` to inform the browser what character encoding is to be used to display the data and to send the response. The browser receives this information
  - either in the meta tag:
    `<meta http-equiv="Content-Type" content="text/html;`**`charset=utf-8`**`" />`
  - or by setting the attribute **`charset`** in the HTTP header field `Content-Type`.
- The templates are only allowed to contain ASCII characters.
  If a template contains special characters (such as German umlauts) directly in the form of ANSI characters in character strings, these must be replaced by HTML escape sequences. The escape sequences themselves are made up of ASCII characters only and can therefore be used in UTF-8.
- String operations can produce incorrect results if UTF-8 characters are included in the string (see also the notes on page 132). Operations of this sort do not occur in the templates generated by WebTransactions.

## 5.2 Starting a WebTransactions application

If you do not wish to customize the individual formats, and you only wish to use the option of automatically converting host formats as described in the chapter “Integrating a host application without editing” on page 75, no further steps are necessary. Once you have installed WebTransactions (see page 17) and created a base directory (see page 65), your WebTransactions application is ready to use. To start the host application, you can use the start template set supplied with the product, which is described in section “Start templates for OSD” on page 162.

For productive operation, you should generate an application-specific start template in WebLab using the WTBean `wtcStartOSD.wtc`.

# 6 Integrating a host application without editing

WebTransactions for OSD provides special templates for the dynamic conversion of 9750 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:

– `OSD.wmt/OSD_pocket.wmt`
  OSD-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.

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

– `wtKeysOSD.htm`
  This template inserts the controls that represent the special keys of the 9750-Terminals. `wtKeysOSD.htm` is not only used during dynamic conversion. The format-specific templates generated using the capture process also use `wtKeysOSD.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 `AutomaskOSD.htm` template can also be created using WebLab (see section “Creating variants of AutomaskOSD.htm (with WebLab)” on page 78).

Global modifications, e.g. to suit the corporate identity, can be carried out in the `AutomaskOSD.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.

## 6.1 Master templates OSD.wmt and OSD_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 host 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 OSD is supplied with the standard master templates `OSD.wmt` and `OSD_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 OSD.wmt or OSD_pocket.wmt

The `OSD_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 “AutomaskOSD.htm template” on page 78) and for format-specific templates (see section “Capturing with WebLab” on page 92).

`OSD_Pocket.wmt` has the following additional functions:

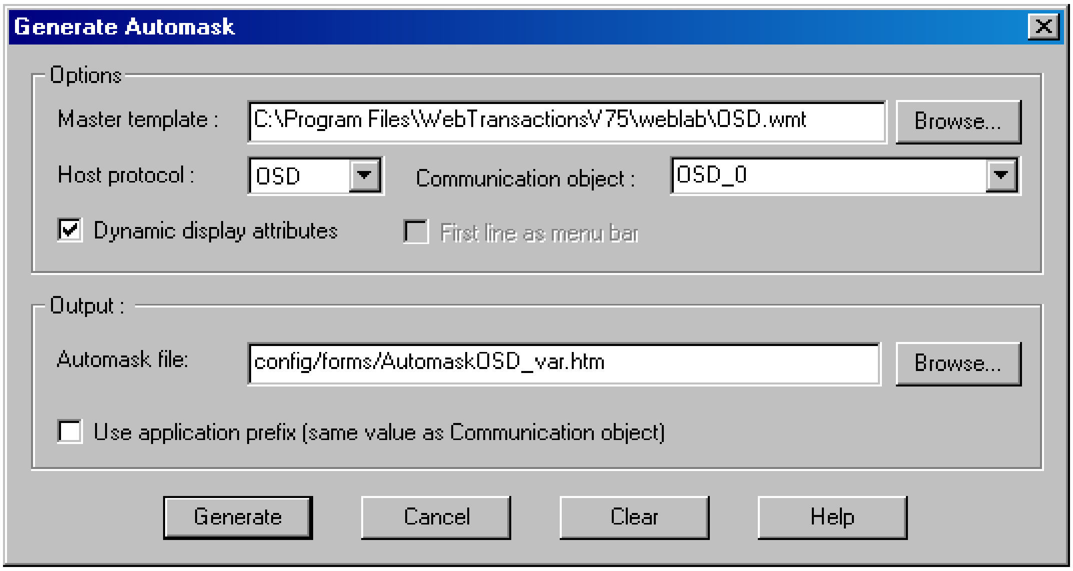
- It generates a frameset for the screen. It contains two frames, one for command inputting and another for the display.
- Only the field where the cursor is currently located can be invoked as the entry field.
- The lines on the screen are automatically made to fit the screen and are colored.
- Extra 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.

## 6.2 AutomaskOSD.htm template

The `AutomaskOSD.htm` template dynamically creates a representation of the last format received from the host with `receive`. It allows you to process any 9750 format without any pre-editing and is always used by WebTransactions if no format-specific template is present for the host format. It is possible to choose between different variants using the system object attribute `AUTOMASK`.

### 6.2.1 Creating variants of AutomaskOSD.htm (with WebLab)

The `AutomaskOSD.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.



Generate Automask

Options

Master template : C:\Program Files\WebTransactionsV75\weblab\OSD.wmt

Host protocol : OSD

Communication object : OSD_0

☑ Dynamic display attributes

☐ First line as menu bar

Output :

Automask file: config/forms/AutomaskOSD_var.htm

☐ Use application prefix (same value as Communication object)

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 OSD.wmt and OSD_Pocket.wmt” on page 76. A master template is always required. The supplied master template `OSD.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: *OSD_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. The option is not relevant for WebTransactions for OSD.

**Automask file**

Specifies the directory and the name for the generated template.
Default path:
*basedir*`/config/forms/AutomaskOSD.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`

## 6.2.2 Structure of AutomaskOSD.htm

Below you can see the Automask template generated using the master template `OSD.wmt` (see section “Master templates OSD.wmt and OSD_Pocket.wmt” on page 76).

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

```
<html>
<wtrem>*********************************************************************</wtrem>
<wtrem>** WTML document: AutomaskOSD                                      **</wtrem>
<wtrem>*********************************************************************</wtrem>
<wtrem>**                                                                 **</wtrem>
<wtrem>** Document generation based on Master Template :                  **</wtrem>
<wtrem>**  C:\Program Files\webtransactionsv75\weblab\OSD.wmt             **</wtrem>
<wtrem>**                                                                 **</wtrem>
<wtrem>** Generated at Tue Jun 08 12:44:20 2010                           **</wtrem>
<wtrem>**                                                                 **</wtrem>
<wtrem>** Options used by the generator :                                 **</wtrem>
<wtrem>**   -  %OPTIONS:                                                  **</wtrem>
<wtrem>**      CommObj = OSD_0                                            **</wtrem>
<wtrem>**      NationalVariant = International - PartialFormatMode = No   **</wtrem>
<wtrem>**   -  %OPTIONS:                                                  **</wtrem>
<wtrem>**      self defined Tag = taggedInputCrossCall                    **</wtrem>
<wtrem>**   -  %OPTIONS:                                                  **</wtrem>
<wtrem>**      self defined Tag = taggedInputCrossCall                    **</wtrem>
<wtrem>**   -  %OPTIONS:                                                  **</wtrem>
<wtrem>**      self defined Tag = taggedOutputCrossCall                   **</wtrem>
<wtrem>**   -  %OPTIONS:                                                  **</wtrem>
<wtrem>**      self defined Tag = taggedOutputCrossCall                   **</wtrem>
<wtrem>**   -  %LINES:                                                    **</wtrem>
<wtrem>**      TaggedInput = Enabled - TaggedOutput = Enabled             **</wtrem>
<wtrem>**      DisplayAttributes = Dynamic - CursorInProtectedField = Yes **</wtrem>
<wtrem>**   -  %RECEIVES:                                                 **</wtrem>
<wtrem>**      Parameters not specified                                   **</wtrem>
<wtrem>*********************************************************************</wtrem>
<wtrem>** WebTransactions V7.5           Fujitsu Technology Solutions 2010 **</wtrem>
<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)
  OSD_0  = WT_HOST.active || WT_HOST.OSD_0;
  if (OSD_0.WT_SYSTEM != null)
    OSD_0_system = OSD_0.WT_SYSTEM;   // communication specific system object
  else
```

```
    OSD_O_system = WT_SYSTEM;        // global  system object
  //}}
  // propagate communication object to included WTML documents //////////////
  wtCurrentComm = OSD_O;
  wtCurrentComm_system = OSD_O_system;
```

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

```
if ( wtCurrentComm_system.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 (OSD_O_system.PROLOG)>
<wtinclude Name="##OSD_O_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 152).

```
<head>
<title>WebTransactions V7.5 - application ##OSD_O_system.SYM_DEST# on
##OSD_O_system.HOST_NAME#</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 `wtKeysOSD.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="#C0C0C0">
<form WebTransactions  name="Automask">
  <table frame="border" rules="all">
    <tr>
      <td>
        <wtinclude name="wtBrowserFunctions">
        <wtinclude name="wtKeysOSD">
        <wtif (OSD_0_system.FORMTPL)>
          <wtinclude Name="##OSD_0_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 )           {


           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;
           if (WT_BROWSER.acceptInputAttributes)
             input +=          (hostObject.Input == 'Numeric'?'"
numeric="1':'')
                             + (hostObject.Markable == 'Yes'?'"
markable="1':'')
                             + (hostObject.Type == 'Protected'?'"
wtprotected="1':'');
           input +=            '"/>';
           document.write( input );
         }


         function taggedOutput( hostObject )          {

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 !=
OSD_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:##OSD_0.WT_Color.Default = "\#000000"#"><pre>\
```

A key functionality of `AutomaskOSD.htm` consists in a loop which represents each format component as an HTML element. To this end, the host adapter provides the host objects `$FIRST` and `$NEXT`. With WebLab, the code of the `AutomaskOSD` 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 = OSD_O.$FIRST.Name; OSD_O && element != '$END'; element =
OSD_O.$NEXT.Name)
  {
    currentHostObject = OSD_O[element];
    if ( currentHostObject.StartLine != currentLine )
    {
      document.write  ('</span>
<span class="screenline" id="SL',++currentLine,'">');
    }
    if ( currentHostObject.Type == 'Protected' && currentHostObject.Markable
== 'No' )
    {
      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 loop adds the client-side attribute `maxLength` to the appropriate DOM object as this is not available automatically. For all browsers which do not accept attributes in the `<input>` tag, the attribute `markable` is set, provided that the corresponding host object is markable.

```
 <script type="text/javascript">
<!--
  <wtoncreatescript>
  <!--
    for( element in wtInputFields )
    {
      if (!WT_BROWSER.acceptMaxLength)
```

```
        document.writeln('wtSetMaxLength(\'', element, '\',', wtInputFields[
element ].Length, ' );' );
      if (!WT_BROWSER.acceptInputAttributes)
      {
        if (wtInputFields[ element ].Input == 'Numeric')
          document.writeln('wtSetInputAttribute("numeric", "', element,
'");');
        if (wtInputFields[ element ].Markable == 'Yes')
        {
          document.writeln('wtSetInputAttribute("markable", "', element,
'");');
          if (wtInputFields[ element ].Type == 'Protected')
            document.writeln('wtSetInputAttribute("wtprotected", "', element,
'");');
        }
      }
    }
  //-->
  </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 the field is an input field).

```
<wtrem** initial focus selection ****************************************>
<script type="text/javascript">
<!--
  wtSetFocus('##OSD_0.WT_FOCUS.Field#');
//-->
</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( OSD_0[WT_POSTED.wt_cursor] )
  {
    if(WT_POSTED.wt_cursorOffset && WT_POSTED.wt_cursorOffset*1>0)
    {
      wtCursorField = OSD_0[WT_POSTED.wt_cursor];
```

```
          OSD_0.WT_FOCUS.Field =
'E_'+wtCursorField.STARTLINE+'_'+(wtCursorField.STARTCOLUMN*1+WT_POSTED.wt_cu
rsorOffset*1)+'_1';
        }
        else
          OSD_0.WT_FOCUS.Field = WT_POSTED.wt_cursor;
      }
      if (OSD_0_system.EDIT_MODE &&OSD_0_system.EDIT_MODE.match(/USER/))
        OSD_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];
      }

      wtMarkedFields = WT_POSTED.wt_markedFields.split(',');
      for( i=1; i<wtMarkedFields.length; i++)
        OSD_0[wtMarkedFields[i]].Modified = 'Yes';
      //}}
      //{{WebLab(processHostCommunication)
      if ( WT_POSTED.wt_special_key == 'Suspend' || OSD_0_system.SUSPEND )
      {
        OSD_0_system.SUSPEND = false;
      }
    else
      {
        try {
          OSD_0.send();
          OSD_0.receive();
          if( OSD_0_system.CAPTURED_FLD == "Yes" &&
OSD_0_system.APPLICATION_PREFIX )
            setNextPage( OSD_0_system.APPLICATION_PREFIX + '@' + OSD_0_system.FLD
);
          else
            setNextPage( OSD_0_system.FLD );
          WT_SYSTEM.CHARSET = OSD_0_system.HOST_CHARSET;
        }
        catch (e) {
          if ( OSD_0.$CONNECTION.ALIVE == 'No' )
            if ( OSD_0_system.DISCONNECT )
              setNextPage(OSD_0_system.DISCONNECT);
            else
              setNextPage('wtstart');
          else if ( WT_SYSTEM.COMMUNICATION_ERROR_FORMAT )
            setNextPage( WT_SYSTEM.COMMUNICATION_ERROR_FORMAT );
        }
```

```
  }
  //}}
//-->
</wtonreceivescript>
</body>
<wtif (OSD_0_system.EPILOG)>
  <wtinclude Name="##OSD_0_system.EPILOG#">
</wtif>
</html>
```

## 6.3 wtKeysOSD.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 `wtKeysOSD.htm` template therefore provides controls for the OSD-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, `wtKeysOSD.htm` contains some buttons that do not correspond to any terminal key (`DISCONNECT`, `REFRESH`, `SUSPEND` and `Print`).

The individual controls are described in the table on page 143.

`wtKeysOSD.htm` includes the file `wtKeysOSD.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 wtKeysOSD.js” on page 144).

The `OSD.wmt` master template contains a call (`<wtInclude>`) to `wtKeysOSD.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, `wtKeysOSD.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 keys functions, the host adapter uses the host object `WT_KEY` (see the table on page 143). All functions provided by `wtKeysOSD.htm` and `wtKeysOSD.js` are mapped to a corresponding value in `WT_KEY.Key` (in a OnReceive script). The value of `WT_KEY.Key` controls the behavior of the `send` and `receive calls.`

## 6.4 wtBrowserFunctions.htm template

A real terminal can also be controlled via the keyboard. This behavior can be largely reproduced in a terminal emulation.

The `wtBrowserFunctions.htm` template uses Javascripts to provide you with keyboard support in the browser. Different browser versions also support different functions.

The `OSD.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 `wtKeysOSD.htm`.

When you activate a browser function from the keyboard, the browser sends the form data to WebTransactions. Here, the desired function in executed by the terminal emulation integrated in the host adapter using `send` and `receive`.

In section “Terminal functions supported” on page 139 there is a list showing the functions supported by each browser.

## 6.5 wtPKEYS.htm template

A 9750 terminal also provides you with programmable keys (P keys) which you can customize with the functions of your choice.

The template `wtPKEYS.htm` provides an easy method for making the P keys available on the browser. The template is a model only and you can edit or extend it to suit your own particular needs. For a description of the procedure, see section “P key support” on page 153.

`wtPKEYS.htm` includes the template `wtPkeyValues.htm` which contains a table for the mapping of special keys as buttons. It also includes the definition of the `WT_PKEYS` class used in the `wtPkeyFunctions.htm` template. The `WT_PKEYS` class provides you with the methods to be used for administering the P keys.

To display the `wtPKEYS.htm` template, go to the host application screen, go to the `pkeys` pick-list and select the command `P`. `wtPKEYS.htm` will then be called in place of the current template with the `setNextPage()` function.

# 7 Editing templates

Once you have connected your host application to the Web, 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 92).
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 the WebTransactions manual "Concepts and Functions".

## 7.1 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 format that are administered in the capture database.

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”.

You create the capture database by defining recognition criteria for the individual formats by means of the capture procedure. You can either define the criteria individually for each format or define them jointly by means of a format description source.

### 7.1.1 Recording recognition criteria individually

When you perform capture in this way, you specify the recognition criteria individually for each format.

**Procedure**

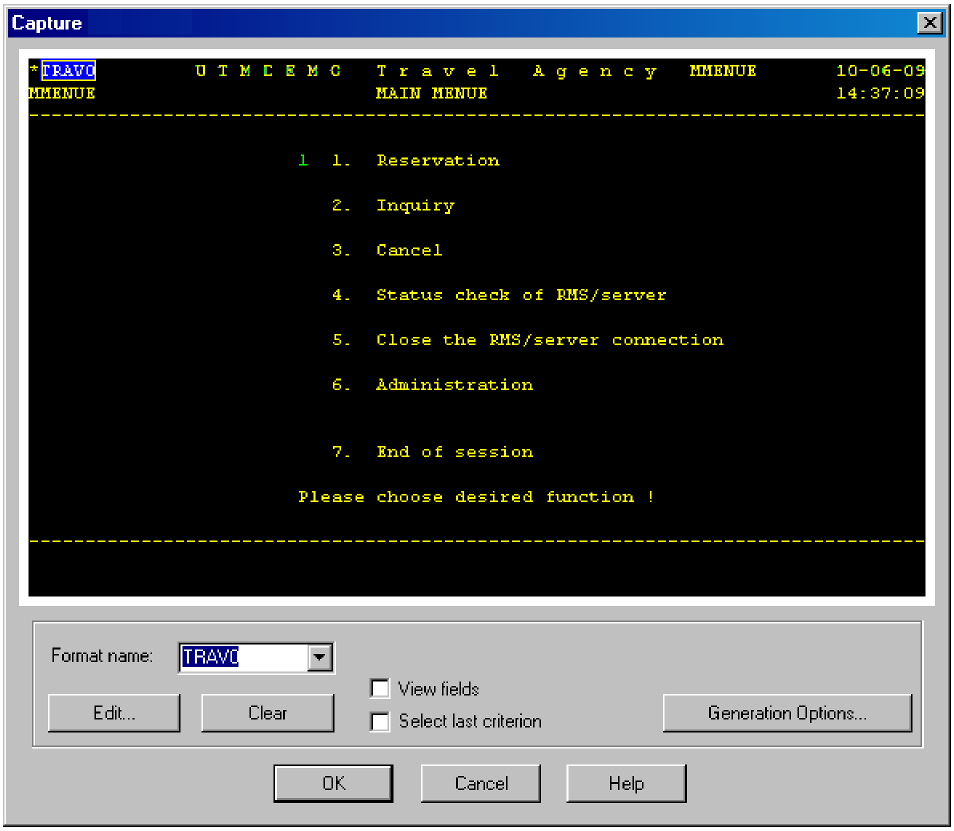
► Check to see whether the correct path name is entered in the start template for the system object attribute `CAPTURE_FILE`.

In the start template `wtstartOSD.htm` the path name `config/capture.sdb` is entered as the default in the **CAPTURE_FILE** parameter. The capture database 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 criterion.

► 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.



```
*TRAVO         U T M C E M O   T r a v e l   A g e n c y   MMENUE       10-06-09
MMENUE                         MAIN MENUE                                14:37:09
--------------------------------------------------------------------------------

                        1  1.  Reservation

                           2.  Inquiry

                           3.  Cancel

                           4.  Status check of RMS/server

                           5.  Close the RMS/server connection

                           6.  Administration


                           7.  End of session

                        Please choose desired function !

--------------------------------------------------------------------------------
```

Format name: TRAVO

- 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 choose the **Select last criterion** option then the last identifying characteristic to be used is set by default.
- 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 the default values are sufficient.

- ► Enter the required generation options and click **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. WebTransactions requires them at runtime if you use descriptive IFG names, see also section “Using descriptive names” on page 108. Otherwise, FLD files 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.

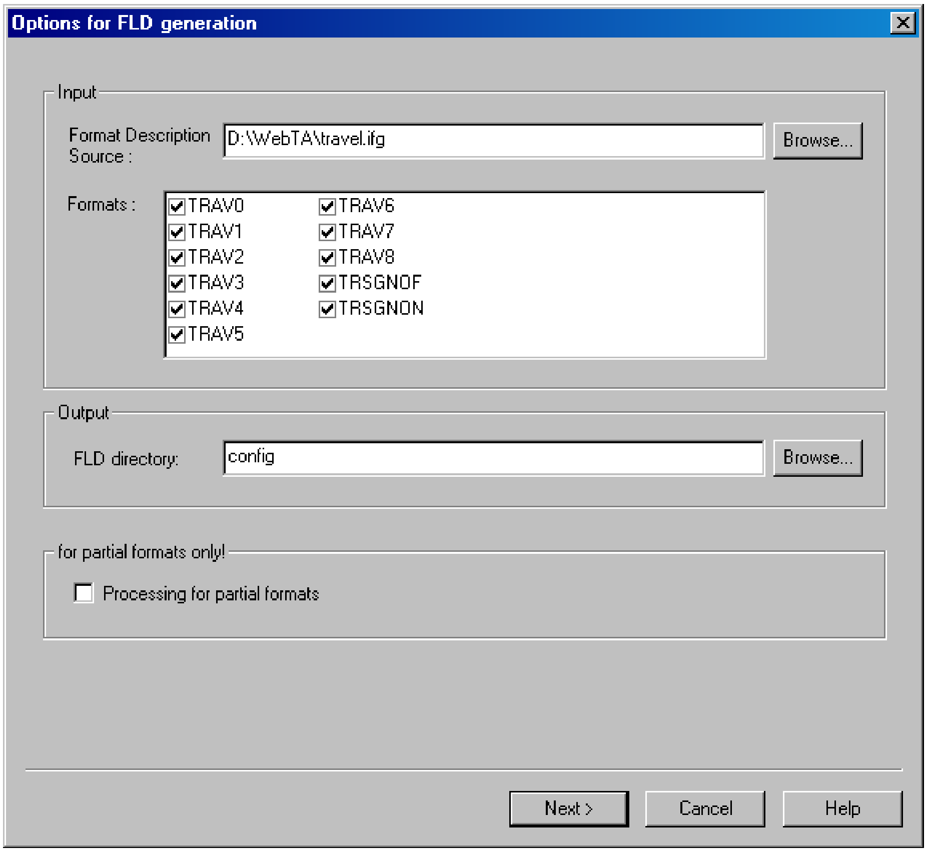
## 7.1.2 Recording recognition criteria jointly

When you perform capture in this way, you jointly define the recognition criteria for all the formats required in a host application. For this to be possible, you must possess a format description source with the necessary formats. You generate the format description source using the program `IFG2FLD`. For more information, refer to section “Using descriptive names” on page 108.

### Procedure

- ► Use the command **File/Connect** to open a connection to the base directory.
- ► First choose the **Generate/Templates/from IFG library** command in order to generate FLD files and templates from the format description source.

  The **Options for FLD generation** dialog box is displayed on screen.



Options for FLD generation

Input

Format Description Source : D:\WebTA\travel.ifg

Formats :
- ☑ TRAV0
- ☑ TRAV1
- ☑ TRAV2
- ☑ TRAV3
- ☑ TRAV4
- ☑ TRAV5
- ☑ TRAV6
- ☑ TRAV7
- ☑ TRAV8
- ☑ TRSGNOF
- ☑ TRSGNON

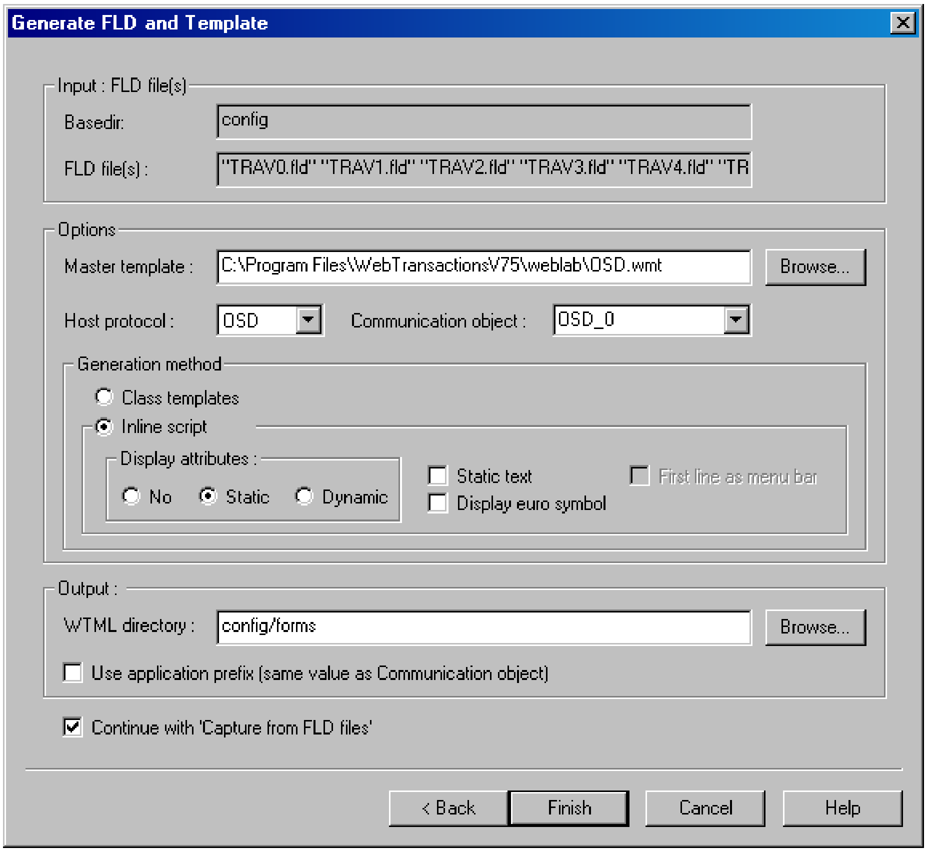
Output

FLD directory: config

for partial formats only!

☐ Processing for partial formats

- In the **Input** group, you enter the format description source. The formats described there are displayed in the **Formats** list.
- In the **Output** group, you then select the directory to which the generated FLD files are to be written.
- Confirm with **Next**. The **Generate FLD and Template** dialog box is displayed.



Generate FLD and Template

Input : FLD file(s)

Basedir: config

FLD file(s) : "TRAV0.fld" "TRAV1.fld" "TRAV2.fld" "TRAV3.fld" "TRAV4.fld" "TR

Options

Master template : C:\Program Files\WebTransactionsV75\weblab\OSD.wmt

Host protocol : OSD

Communication object : OSD_0

Generation method

Class templates [✓ Inline script]

Display attributes : No [✓ Static] Dynamic

☐ Static text

☐ Display euro symbol

☐ First line as menu bar

Output :

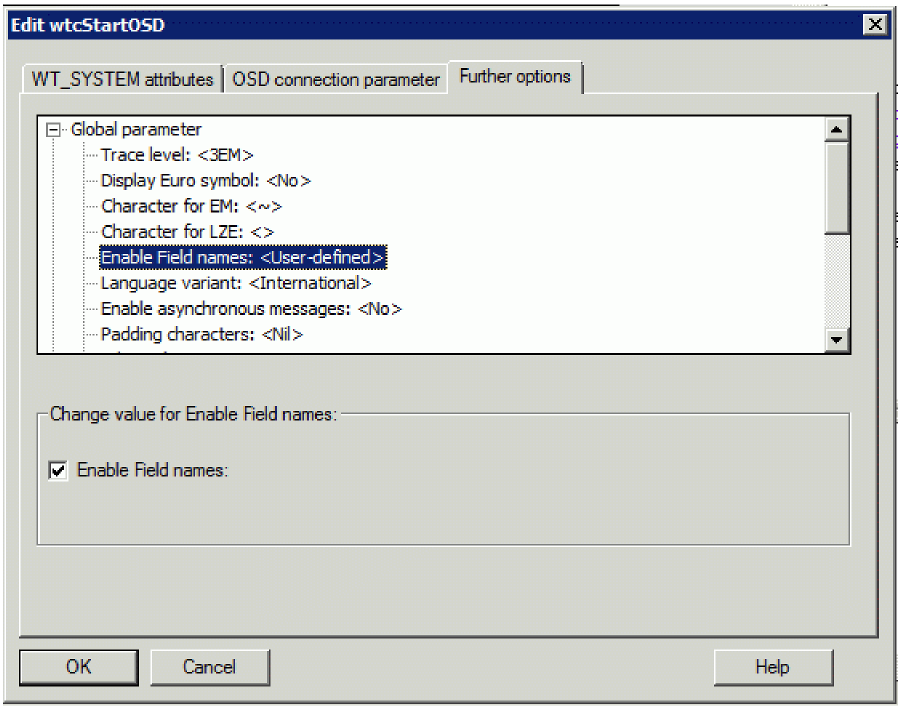
WTML directory : config/forms

☐ Use application prefix (same value as Communication object)

☑ Continue with 'Capture from FLD files'

- In the **Output** group, enter the directory to which the generated templates are to be written.
- Check the **Continue with ’Capture from FLD files’** box to perform joint recognition criteria capture.
- Click **Finish** to confirm.

► Set the communication-specific system object attribute `FIELD_NAMES` to the value `User_defined`. You can achieve this, for example, by activating the option **Global parameter/Enable Field names** on the **Further options** tab when creating or editing an application-specific start template.


Edit wtcStartOSD

Global parameter
- Trace level: <3EM>
- Display Euro symbol: <No>
- Character for EM: <~>
- Character for LZE: <>
- Enable Field names: <User-defined>
- Language variant: <International>
- Enable asynchronous messages: <No>
- Padding characters: <Nil>

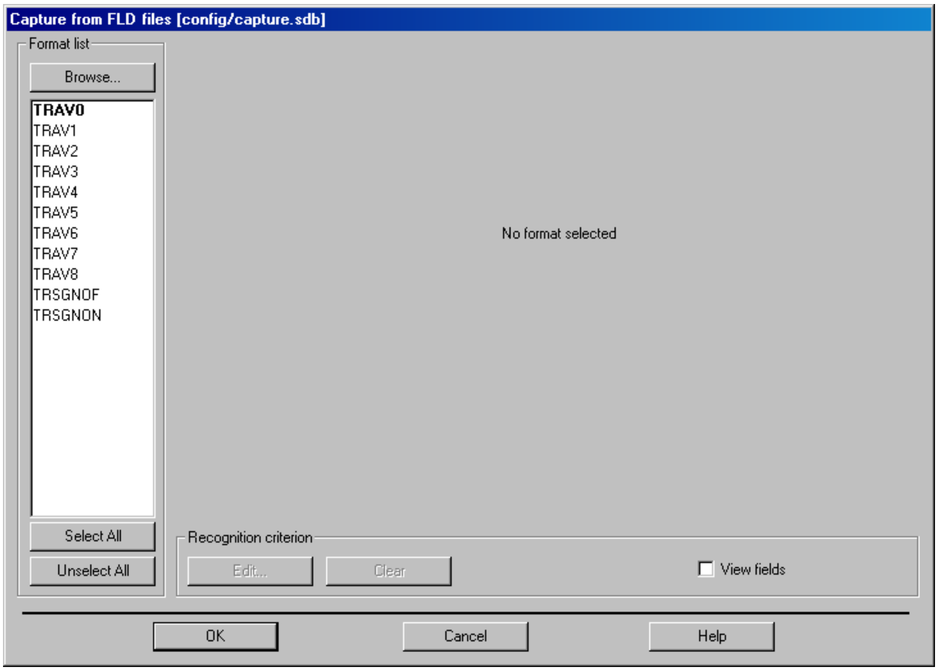
Change value for Enable Field names:

[✓] Enable Field names:

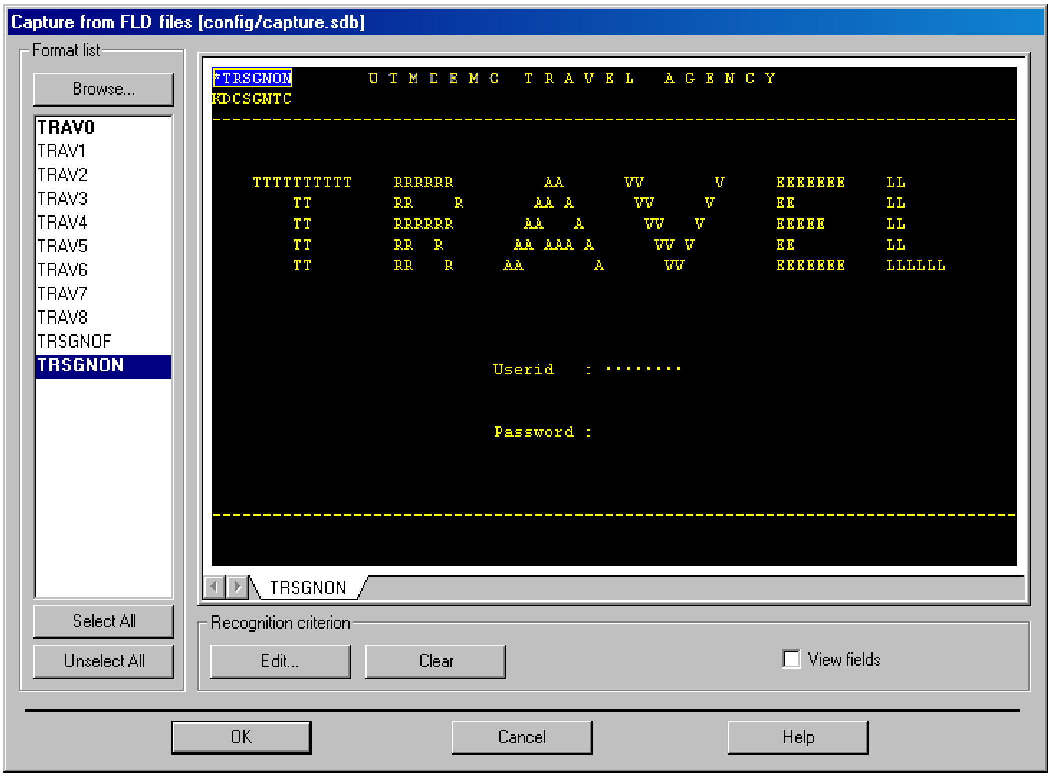
► In the next dialog box, you specify the capture database in which the recognition criteria are to be saved. The FLD files and templates are then generated.

i If, in the past, you have already generated FLD files and templates from a format description source then you can skip these steps and start recording the recognition criteria directly using the **Generate/Capture/from FLD file** command.

The **Capture from FLD files** dialog box is displayed.



► In **Format list**, select the first format for which you want to define recognition criteria. The format is displayed in the right of the dialog box.



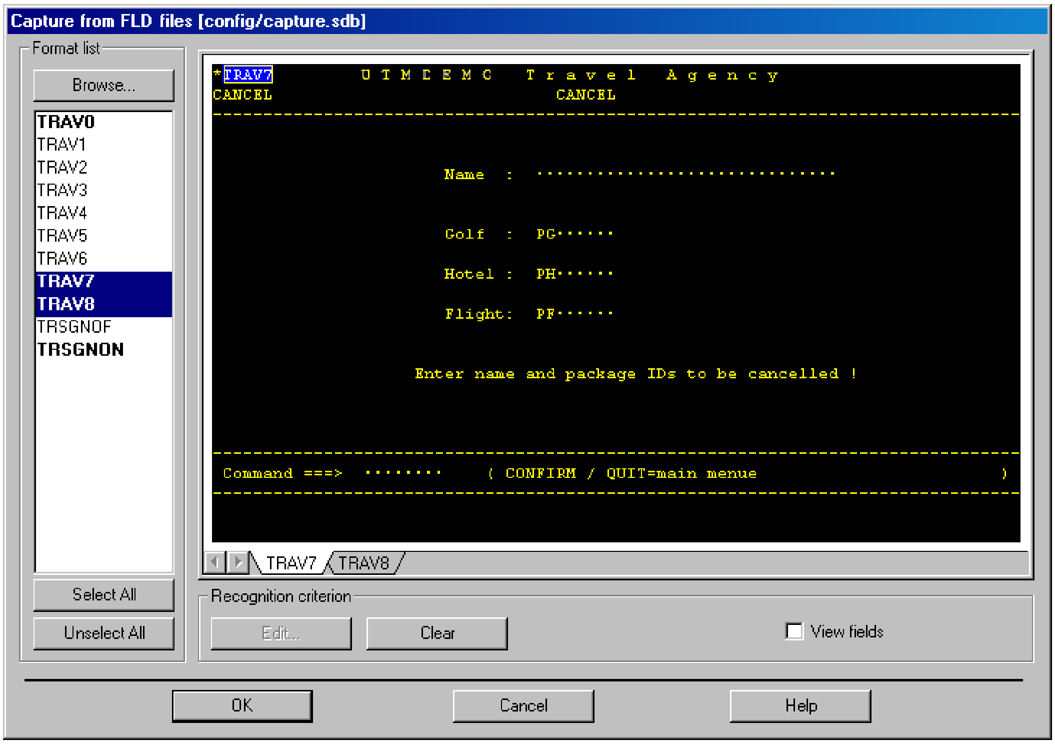
```
*TRSGNON        U T M D E M O   T R A V E L   A G E N C Y
KDCSGNTC
--------------------------------------------------------------------------------

    TTTTTTTTTT    RRRRRR         AA       VV        V     EEEEEEE     LL
        TT        RR    R       AA A       VV      V      EE          LL
        TT        RRRRRR       AA   A       VV    V       EEEEE       LL
        TT        RR  R       AA AAA A       VV V         EE          LL
        TT        RR    R    AA        A      VV          EEEEEEE     LLLLLL


                            Userid    : ........


                            Password :


--------------------------------------------------------------------------------
```

► In the displayed format, select the areas which uniquely identify the format. You can select one or more rectangles by holding down the usual mouse button while dragging the mouse.

When you have selected one or more recognition criteria for a format, these are entered in the capture database and the format name is displayed in bold in the **Format list**. Unlike the process for recording individual recognition criteria, you cannot freely specify the format names.

You can also record the recognition criteria for multiple formats simultaneously.

▶ To do this, use SHIFT and the right mouse button to select the formats for which you want to record recognition criteria in the **Format list** of the **Capture from FLD files**. The first of the selected formats is displayed in the dialog box. The other selected formats are available for processing in the tabs below this.



```
*TRAV7          U T M D E M O   T r a v e l   A g e n c y
CANCEL                                  CANCEL
---------------------------------------------------------------------------------


                       Name  :  .............................


                       Golf  :  PG......

                       Hotel :  PH......

                       Flight:  PF......


                    Enter name and package IDs to be cancelled !



---------------------------------------------------------------------------------
 Command ===>  ........    ( CONFIRM / QUIT=main menue                          )
---------------------------------------------------------------------------------
```

When you do this, all the selected formats are automatically assigned the same recognition criteria as the first format. To check this, you can open the individual formats via the tabs.

### 7.1.3 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** or **Capture from FLD files** dialog box. The **Edit Capture** dialog box is displayed on the screen.

This dialog box presents all the recognition 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.

### 7.1.4 Editing the capture database

i 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.

## 7.2 Individual templates for pop-up boxes

Host formats can contain pop-up boxes.

If you are working exclusively with the `AutomaskOSD.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.

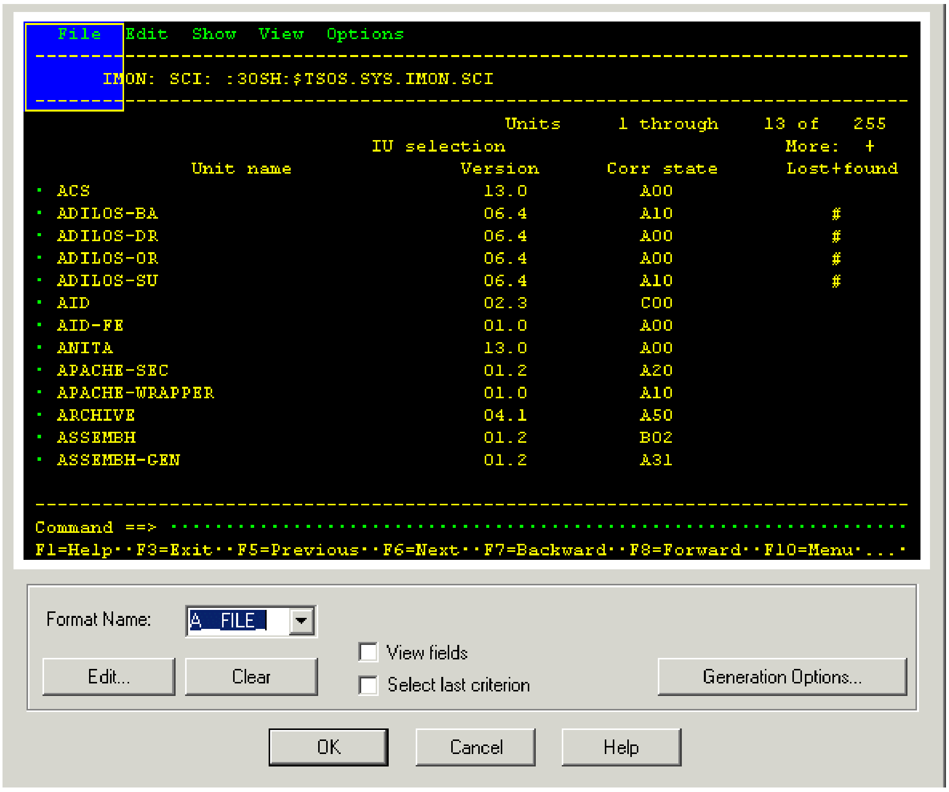
For individually adapted templates, WebTransactions provides system object attributes for pop-up handling. If the `USE_POPUP_RECOGNITION` attribute is set to “`Yes`” at runtime, these pop-ups are automatically recognized and sent to the Web browser in the form of distinct pages. If characters other than 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 111.

Before describing the WebTransactions pop-up functionality in section “Generating templates for pop-ups” on page 104, we must first examine the problems that may arise in the identification of individual templates without special pop-up handling.

### 7.2.1 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:

An area is defined as a recognition criterium for the format (without pop-up box) of a dialog application:



```
   File  Edit   Show   View   Options
-------------------------------------------------------------------------------
       IMON:  SCI:  :30SH:$TSOS.SYS.IMON.SCI
-------------------------------------------------------------------------------
                                           Units      1 through    13 of   255
                              IU selection                        More:   +
             Unit name                   Version      Corr state      Lost+found
. ACS                                      13.0          A00
. ADILOS-BA                                06.4          A10              #
. ADILOS-DR                                06.4          A00              #
. ADILOS-OR                                06.4          A00              #
. ADILOS-SU                                06.4          A10              #
. AID                                      02.3          C00
. AID-FE                                   01.0          A00
. ANITA                                    13.0          A00
. APACHE-SEC                               01.2          A20
. APACHE-WRAPPER                           01.0          A10
. ARCHIVE                                  04.1          A50
. ASSEMBH                                  01.2          B02
. ASSEMBH-GEN                              01.2          A31

-------------------------------------------------------------------------------
Command ==> ...................................................................
F1=Help..F3=Exit..F5=Previous..F6=Next..F7=Backward..F8=Forward..F10=Menu....
```

Format Name: A_FILE

However, if a pop-up which overlays the recognition criterium is displayed, then 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 `AutomaskOSD.htm`.

If you select the recognition criterium in a way it is not overlayed, WebTransactions can recognize 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.

## 7.2.2 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 create your own start template for the host application using the WTBean `wtcStartOSD` (see section "WTBean wtcStartOSD.wtc for the generation of a Start template" on page 167), you can set this attribute directly in the start template:

► In the **Add:wtcStartOSD** 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 `OSD_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`.

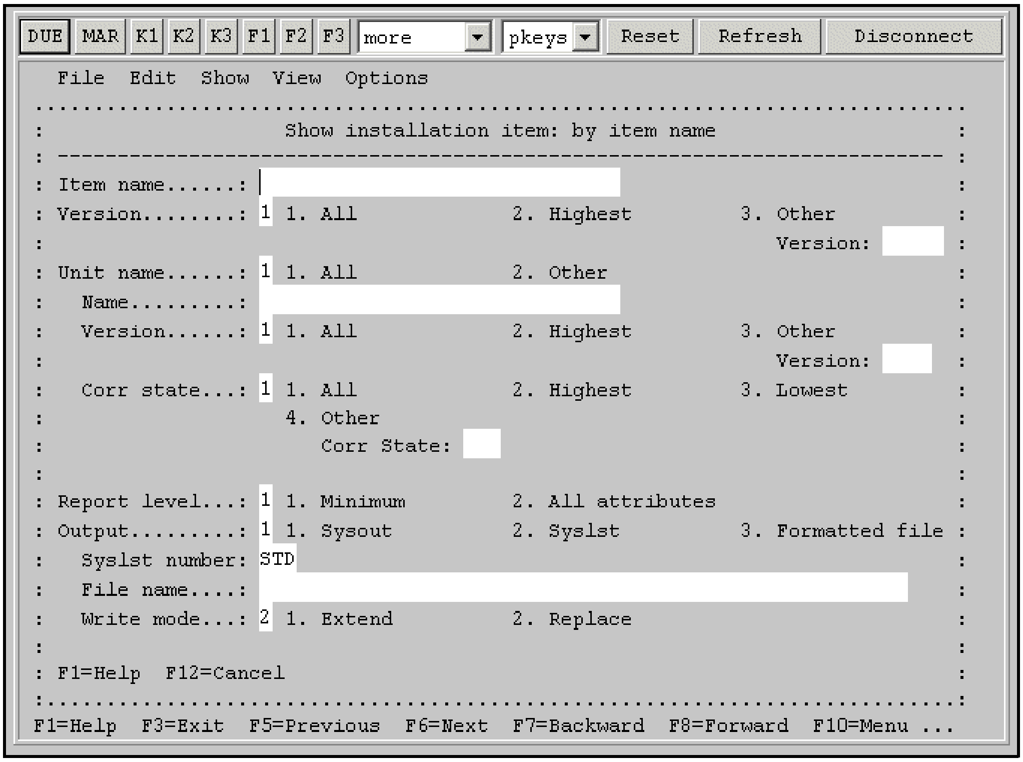
i Note that the attribute in this case is only defined for the current session. It has to be set again in the start template before the next startup.

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 111. These system object attributes are also required at runtime.

### Procedure

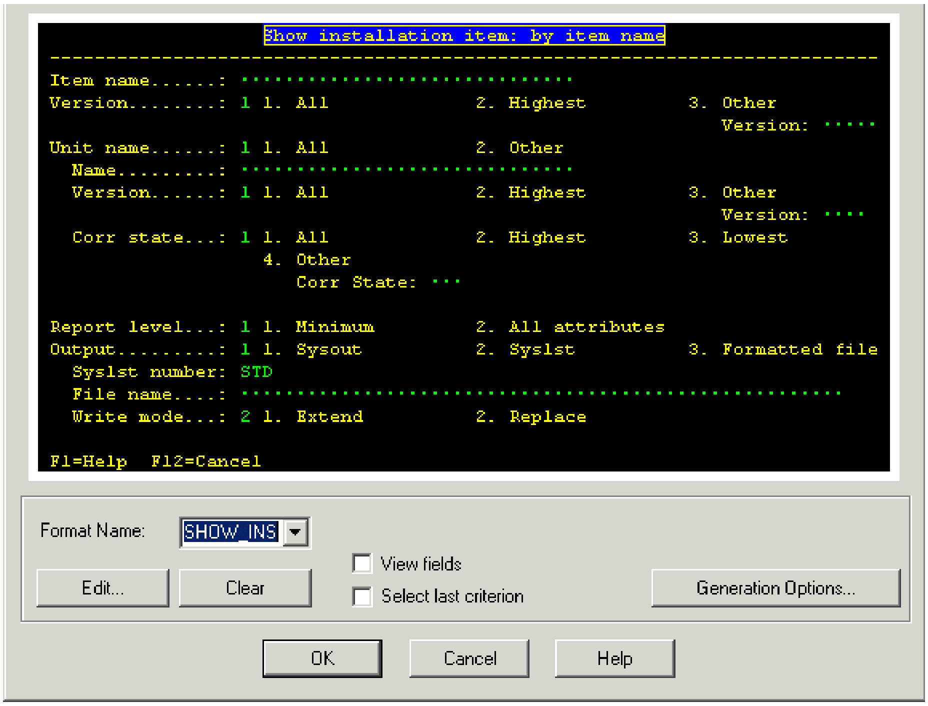
Proceed as follows to record the pop-ups with the capture procedure:

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



```
   File   Edit   Show   View   Options
 ..............................................................................
 :                     Show installation item: by item name                  :
 : --------------------------------------------------------------------------- :
 : Item name......: |                                                         :
 : Version........: 1 1. All            2. Highest          3. Other          :
 :                                                             Version:       :
 : Unit name......: 1 1. All            2. Other                              :
 :   Name.........:                                                           :
 :   Version......: 1 1. All            2. Highest          3. Other          :
 :                                                             Version:       :
 :   Corr state...: 1 1. All            2. Highest          3. Lowest         :
 :                    4. Other                                                :
 :                       Corr State:                                          :
 :                                                                            :
 : Report level...: 1 1. Minimum        2. All attributes                     :
 : Output.........: 1 1. Sysout         2. Syslst           3. Formatted file :
 :   Syslst number: STD                                                       :
 :   File name....:                                                           :
 :   Write mode...: 2 1. Extend         2. Replace                            :
 :                                                                            :
 : F1=Help  F12=Cancel                                                        :
 :............................................................................:
 F1=Help  F3=Exit  F5=Previous  F6=Next  F7=Backward  F8=Forward  F10=Menu ...
```

► 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. Note the difference between the contents of the entire screen and the contents of the area recognized as the popup box.



```
                    Show installation item: by item name
 --------------------------------------------------------------------------
 Item name......: ..............................
 Version........: 1 1. All              2. Highest          3. Other
                                                               Version: .....
 Unit name......: 1 1. All              2. Other
   Name.........: ..............................
   Version......: 1 1. All              2. Highest          3. Other
                                                               Version: ....
   Corr state...: 1 1. All              2. Highest          3. Lowest
                    4. Other
                       Corr State: ...

 Report level...: 1 1. Minimum          2. All attributes
 Output.........: 1 1. Sysout           2. Syslst           3. Formatted file
   Syslst number: STD
   File name....: ......................................................
   Write mode...: 2 1. Extend           2. Replace

 F1=Help  F12=Cancel
```

Format Name: SHOW_INS

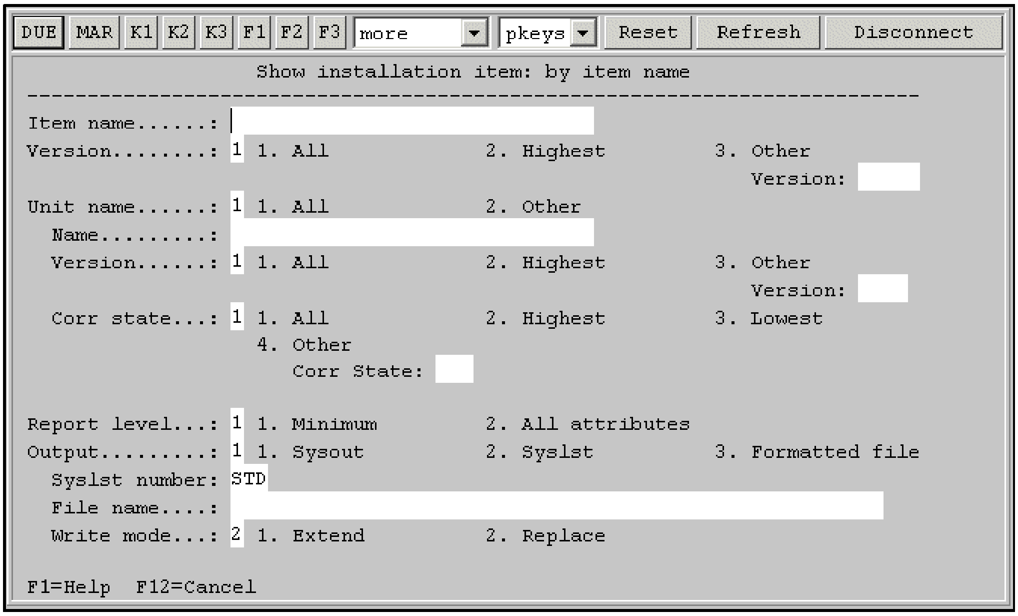
☐ View fields
☐ Select last criterion

► 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 The pop-up is now displayed alone in the browser without the host format behind it. Below, you can see this procedure on the basis of pop-ups converted using a format-specific template:



```
                    Show installation item: by item name
---------------------------------------------------------------------------
Item name......: 
Version........: 1 1. All           2. Highest          3. Other
                                                            Version:
Unit name......: 1 1. All           2. Other
  Name.........:
  Version......: 1 1. All           2. Highest          3. Other
                                                            Version:
  Corr state...: 1 1. All           2. Highest          3. Lowest
                   4. Other
                      Corr State:

Report level...: 1 1. Minimum       2. All attributes
Output.........: 1 1. Sysout        2. Syslst           3. Formatted file
  Syslst number: STD
  File name....:
  Write mode...: 2 1. Extend        2. Replace

F1=Help  F12=Cancel
```

- 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 `AutomaskOSD`).

**i** 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.

## 7.3 Using descriptive names

In the capture function, a format's field names are generated from the line and column position of the field in the format together with its length. This results in extremely abstract names which have little to do with the purpose or contents of the field and therefore scarcely support the programmer when editing the template.

However, in the capture function, you can also use a so-called format description source and in this way generate the original field names in the templates. The format description source is the result of an `IFG2FLD` run with which the format description is read from the IFG library and stored in the source. The format description source contains all the field names which the developer of the host formats originally defined using the formatting system. If the field names refer to the function of the field and are therefore more descriptive, they can provide far better guidance to the developers responsible for the host application.

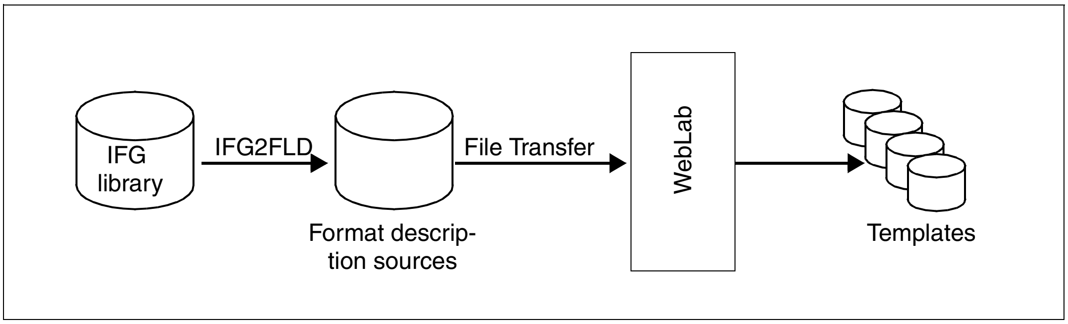


Figure 2: Generating templates from a format description source

You can specify the format description source when performing capturing in WebLab.

### Procedure

If you want to use descriptive names for template generation, proceed as follows:

► Transfer one of the following LMS libraries in binary form to the OSD host under the ID under which the IFG library is stored.

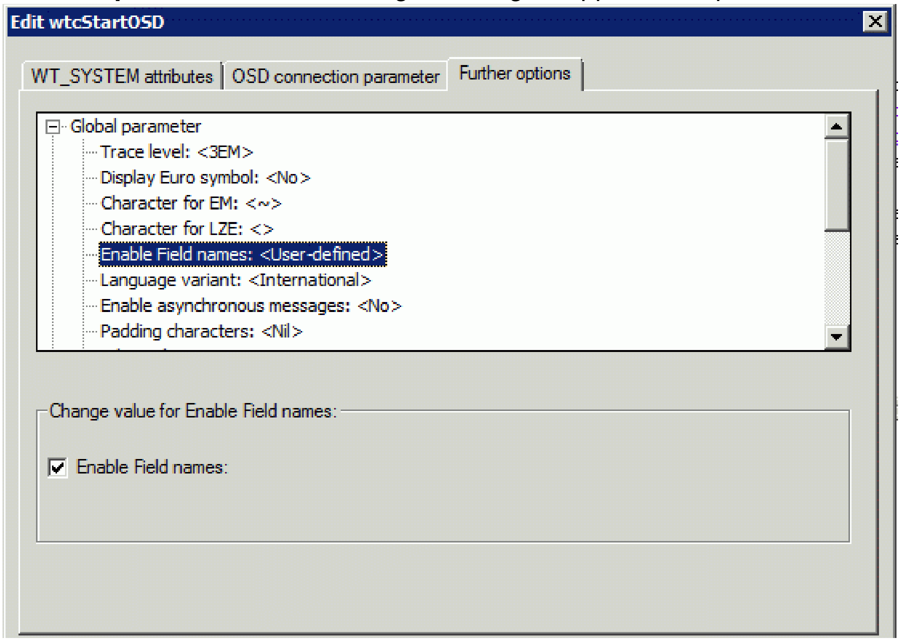
| Library | Meaning |
|---|---|
| `WTifg2fldFTP.lms` | For transfer with FTP |
| `WTifg2fldOpenFT.lms` | For transfer with openFT or with the `TRANSFER-FILE` command in BS2000 |

► Log on at the OSD host under this ID.

► Perform the IFG2FLD run as described in the next section.

- ► Transfer the format description source in text mode to the machine on which WebLab is running.
- ► In the capture process, specify the format description source in the **Generation Options** dialog box.

i For runtime you must set the communication-specific system object attribute `FIELD_NAMES` to the value `User_defined`. You can achieve this, for example, by activating the option **Global parameter/Enable Field names** on the **Further options** tab when creating or editing an application-specific start template.



Global parameter
- Trace level: <3EM>
- Display Euro symbol: <No>
- Character for EM: <~>
- Character for LZE: <>
- Enable Field names: <User-defined>
- Language variant: <International>
- Enable asynchronous messages: <No>
- Padding characters: <Nil>

Change value for Enable Field names:

☑ Enable Field names:

## Using IFG2FLD

`IFG2FLD` is located in the OSD-LMS library `WTifg2fldFTP.lms` or `WTifg2fldOpenFT.lms`. You can find these libraries in the directory *install_dir*`/lib`.

`IFG2FLD` is an OSD program and you must therefore transfer the corresponding library to an OSD user ID. The target name of the library in BS2000 depends on the transfer mode you select. This may be either `WTIFG2FLD.LMS` or `WTIFG2FLDOPENFT.LMS`. You can then start `IFG2FLD` from the transferred library with the following command:

```
/START-PROGRAM FROM-FILE=*PHASE(LIBRARY=library,ELEMENT=IFG2FLD)
```

You start `IFG2FLD` with the `START-PROGRAM` command and the output is written to SYSLST. The following commands are accepted by IFG2FLD:

| **Command** | **Description** |
|---|---|
| `MAPFILE` *IFG-library* | Assigns the IFG library for processing. |
| `PROFILE` *Userprofile* | Assigns a user profile for conversion. Every IFG library contains at least one user profile for format editing. The user profile is a set of default values for handling the IFG, for the format properties, for the format field properties as well as for properties which affect programming. |
| `CONVERT` *Formatname* `[/`*version*`\| /ALL]` | Takes the specified IFG format over into the format description source. Optionally, you can also specify the version of the format.<br>If you do not specify the version then the most recent format version is entered. If, instead of a version, you specify the value `/ALL` then all the versions of the format are entered in the format description source. |
| `CONVERT *ALL` `[/`*version*`\| /ALL]` | Takes all the specified IFG formats in the IFG library over into the format description source. Optionally, you can also specify the version of the format. Only formats with this version are then entered.<br>If you do not specify the version then the formats with the most recent version are entered in the format description source. If, instead of a version, you specify the value `/ALL` then all the formats of all versions are entered. |
| `END` | Generates the format description source and terminates IFG2FLD. |

*Example*

To perform a conversion with IFG2FLD you may, for example, need to perform the following steps in OSD:

```
/ASSIGN-SYSLST output-file
/START-PROGRAM FROM-FILE=*PHASE(LIBRARY=library,ELEMENT=IFG2FLD)
MAPFILE IFG-library
CONVERT *ALL
END
/ASSIGN-SYSLST *P
```

# 8 Controlling communication

## 8.1 System object attributes

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

This section describes only those attributes which are provided specifically for the OSD interface connections or which are of special significance to this connection. System object attributes that are of equal significance to all WebTransactions protocol 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 refer 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”).

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

## 8.1.1 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 used 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 communication module

The category to which each attribute belongs 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.<br>These FLD and template files must be saved in the following form:<br>*application_prefix@formatname*`.fld` or<br>*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.<br>Default value: `AutomaskOSD`.<br><br>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.<br>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** | |
|---|---|---|---|
| AUTOTAB | Cursor automatically jumps to the following field when the end of current field is reached | When using 9750 terminals, the host application can determine the reaction of the cursor when it gets to the end of a field. This feature is made available with the AUTOTAB attribute of the WebTransactions application. The attribute can take the values Yes and No depending on the current AUTOTAB status of the terminal. The Automask template and all templates generated using the OSD.wmt master template evaluate this attribute. | c |
| BYPASS | Bypass print file flag | WebTransactions sets this attribute to Yes if a bypass print file was created when receive was called. 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 (...\Capture.sdb). The name can be specified as an absolute path name or a relative path name (relative to the base directory), e.g.:<br>– absolute specification: C:\osdappli1\config1\$dialog.sdb<br>– relative specification (base directory = osdappli): config1\$dialog.sdb | t |
| CAPTURED_FLD | Identifier 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 then CAPTURED_FLD is set to No. | c |
| COMMUNICATION_ INTERFACE_VERSION | Interface version | Global WT_SYSTEM attribute<br>– 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.<br>– If this variable contains a value of "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).<br>Default setting: 7.5 | o |

| **Attribute name** | **Meaning** | **Description/category** | |
|---|---|---|---|
| `CONNECTION_MESSAGE` | Short message for the opening of a connection | Short message of maximum length of 80 bytes for the establishment of a connection, optional. This short message forms part of the Connection Letters which are passed to the partner when a connection is opened.<br>A short message can be specified as a string or as a hexadecimal value:<br>*host_system*`.CONNECTION_MESSAGE=C'`*cccc*`'`<br>or<br>*host_system*`.CONNECTION_MESSAGE=X'`*xxxxxxxx*`'`<br>This attribute can be used, for example, to specify any access or network password which may be required. | o |
| `CONNECTION_PASSWORD` | Password for opening of connection | Password of maximum length of 4 bytes for the establishment of connections to DCAM applications, optional. This password forms part of the Connection Letters which are passed to the partner when a connection is opened.<br>The password must be generated in BCAM with XSTAT APPPW= and can be specified either as a string or as a hexadecimal value:<br>*host_system*`.CONNECTION_PASSWORD=C'`*cccc*`'`<br>or<br>*host_system*`.CONNECTION_PASSWORD=X'`*xxxxxxxx*`'` | 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.<br>Default value: `wtstart` | t |
| `DISPLAY_EURO` | Display Euro symbol | If this attribute is set to `Yes` then the character that corresponds to code X'A4' of the ISO-8859 code table is output as the Euro character.<br>If `DISPLAY_EURO=No` (default value) then the currency symbol (¤) is displayed for X'A4'.<br>`DISPLAY_EURO=YES` is only effective if the `TERMINAL_TYPE` attribute is set to `9763` and the `HOST_CHARSET` attribute is set to `ISO-8859-1`, `ISO-8859-2` or `ISO-8859-9`. | t |

| **Attribute name** | **Meaning** | **Description/category** | |
|---|---|---|---|
| END_MARK | Replacement character for end mark | Default value: ~ (Tilde)<br>You can specify a replacement character.<br>Characters outside the default character set are possible.<br>If the terminal type for the emulation is 9763-UNICODE, you can also specify characters from the Unicode character set up to U+FFFF for the END_MARK attribute of the communication-specific system object.<br>Specify this as an HTML escape sequence (&#<d>; or &#x<x>;).<br>Sensible value: &#x25C4; (◄) | t |
| END_WAIT_CONDITION.<br>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.<br>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.<br>Default: empty<br>See also RECEIVED_BLOCKS. | t |
| END_WAIT_CONDITION.<br>FLD_EXPECTED,<br>END_WAIT_CONDITION.<br>FLD_DIFFERENT_FROM | End of screen recognition using recognized format;<br>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.<br>Default: empty | t |
| END_WAIT_CONDITION.<br>CURSOR_IN_LINE and<br>END_WAIT_CONDITION.<br>CURSOR_IN_COLUMN,<br>END_WAIT_CONDITION.<br>CURSOR_NOT_IN_LINE<br>and<br>END_WAIT_CONDITION.<br>CURSOR_NOT_IN_COLU<br>MN | 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.<br>Default: empty | t |
| END_WAIT_CONDITION.<br>MATCH_STARTLINE,<br>END_WAIT_CONDITION.<br>MATCH_STARTCOLUMN,<br>END_WAIT_CONDITION.<br>MATCH_VALUE<br>and<br>END_WAIT_CONDITION.<br>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.<br>Default: empty. | t |

| Attribute name | Meaning | Description/category | |
|---|---|---|---|
| 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.<br>Default: No inclusion<br>ℹ The attribute is only evaluated by the generated standard template and not by the host adapter.<br>See also PROLOG and FORMTPL | t |
| FIELD_NAMES | Use IFG field names | If this attribute is set to User-defined descriptive field names can be used, which are specified in the IFG library. Otherwise the generic field names generated by the host adapter are used.<br>Possible values: User-defined, Generic<br>Default: User-defined<br>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 then the receive call returns.<br>This means e.g. that in a single template it is possible to cater for host applications which output a welcome screen on the establishment of the connection as well as host applications which immediately expect an input.<br>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")<br>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.<br><br>If FIRST_IO_TIMEOUT is greater than TIMEOUT_APPLICATION, a value derived from TIMEOUT_APPLICATION is used:<br>– If TIMEOUT_APPLICATION > 10: FIRST_IO_TIMEOUT corresponds to TIMEOUT_APPLICATION -5<br>– If TIMEOUT_APPLICATION > 1: FIRST_IO_TIMEOUT corresponds to TIMEOUT_APPLICATION -1<br>– If TIMEOUT_APPLICATION =1: FIRST_IO_TIMEOUT corresponds to TIMEOUT_APPLICATION<br><br>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).<br>See also FORMAT | c, r |

| Attribute name | Meaning | Description/category | |
|---|---|---|---|
| FORMTPL | Form field | 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.<br>Default: No inclusion<br>ℹ The attribute is only evaluated by the generated standard template and not by the host adapter.<br>See also PROLOG and EPILOG. | t |
| HARDCOPY | Hardcopy print file flag | WebTransactions sets this attribute to Yes if a hardcopy print file was prepared when the receive call was issued.<br>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 |

| Attribute name | Meaning | Description/category | |
|---|---|---|---|
| HOST_CHARSET | Character set of the host application | The host adapter sets this attribute to the value of the character set with which the host OSD application operates. The following values are possible:<br>ISO-8859-1:<br>various western European languages such as English, German, French - also known as Latin-1<br>ISO-8859-2:<br>various central European languages - also known as Latin-2<br>ISO-8859-5:<br>Cyrillic<br>ISO-8859-7:<br>Greek<br>ISO-8859-9:<br>Turkish<br>UTF-8<br>If the host application switches to Unicode mode, WebTransactions for OSD<br>– interprets field contents passed to and from BS2000/OSD as UTF-EBCDIC,<br>– and interprets the relevant contents of the host objects as UTF-8-encoded on assignment and outputs them in UTF-8 encoding on evaluation.<br><br>All templates that WebTransactions generates for this host adapter assign the system object attribute HOST_CHARSET to the global system object attribute CHARSET. The field Content-Type thus has the correct contents in the HTTP header and the browser can interpret the data correctly (see section “Unicode support” on page 10 and WebTransactions manual “Concepts and Functions”). | c, r |
| HOST_NAME | Name of the host system | Name or Internet address of the host computer. If you use a symbolic name, this name must be specified either locally in the HOSTS file or via the Domain Name Service (DNS).<br>Only the BCAM names with a maximum length of 8 characters are permitted for execution on the BS2000/OSD platform. | 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.<br>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.<br><br>If IGNORE_ASYNC is set to Yes, the data is sent, regardless of any asychronously received data. This avoids manual repeating the send call.<br>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.<br><br>Default is NO.<br>See also MULTIPLE_IO_TIMEOUT, REFRESH_BY_ASYNC | t |
| LOCAL_PORT | Number of the local port | If this attribute is specified then this port will be used by the socket connection as the output port on the local system. | o |
| LZE_CHAR | Character for representation of the logical line end (LZE) | On a real 9750 type terminal or corresponding emulation, it is possible for the host application to output LZE characters which only have a significance when data is entered at the host application. This allows, for example, a number of BS2000/OSD commands to be entered with a single data transmission. These are then processed one after the other.<br>If the attribute LZE_CHAR is used to specify a character, WebTransactions is able to support this functionality. Set a character that is not used in the host application for any other purpose, see also END_MARK.<br>Characters outside the default character set are possible.<br>If the terminal type for the emulation is 9763-UNICODE, you can also specify characters from the Unicode character set up to U+FFFF for the LZE_CHAR attribute of the communication-specific system object.<br>Specify this as an HTML escape sequence (&#<d>; or &#x<x>;).<br>Sensible value: &#x2039; (<)<br>Default: empty | t |

| **Attribute name** | **Meaning** | **Description/category** | |
|---|---|---|---|
| MULTIPLE_IO_TIMEOUT | Timeout for complete screen format | Default value: 2 (seconds)<br>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.<br>However, the reception processing is terminated as soon as WebTransactions can determine, on the basis of the employed protocol, that the host application is waiting for input.<br>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 177).<br>If you are sure that the host application does not use message segments, you can set this value to 0.<br><br>The aim is to recognize the end of the screen without MULTIPLE_IO_TIMEOUT since this timeout<br>– increases the time elapsed for every stage of the dialog<br>– 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.<br>With the transport protocol NEABT it is possible to recognize when the host is waiting for a response with almost all OSD host applications (exceptions being, for example, connections via OMNIS). When this protocol element arrives, waiting is terminated.<br>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.<br>See also END_WAIT_CONDITION attributes | t |

| Attribute name | Meaning | Description/category | |
|---|---|---|---|
| NATIONAL_VARIANT | Language variant for communication between WebTransactions and the host application | This attribute specifies the language variant of the 7-bit character set.<br>Possible values:<br>– Danish<br>– English (UK)<br>– English (USA)<br>– French<br>– French-Belgian<br>– German<br>– International<br>– Italian<br>– Norwegian<br>– Spanish<br>– Swedish<br>– Swiss | t |
| NIL_MODE | When outputting host objects, treat NIL and SPACE differently | On a real 9750 type terminal or a corresponding emulation, field contents which contain a binary null (NIL) are displayed with a centered dot.<br>WebTransactions replaces this character with a space for the VALUE host object attributes (VALUE, HTMLVALUE, RAWVALUE) in order to ensure that the output is suitable for the browser. This means that it is not possible to tell whether the SPACEs are to be saved as SPACEs or whether the NIL in the screen buffer is to be retained.<br>If the NIL_MODE attribute is set to true, the NILs are not replaced by SPACE, they are instead displayed as the character with the code 0xB7 which is available as a 'center point' in many character sets.<br>This ensures that a clear differentiation can be made between SPACE and NIL.<br>The attribute is effective with every receive. This means that changing the attribute between two host object evaluations has no effect.<br>Default: false | 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.<br>Default: No<br>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<br>Default: WEBTADUMP.LOG<br>other values are possible<br>see also RECORD_HOST_COMMUNICATION | o |

| **Attribute name** | **Meaning** | **Description/category** | |
|---|---|---|---|
| OFFLINE_TRACEFILE | File name of an emulation trace | File name of an emulation trace which is to be played back.<br>see also OFFLINE_COMMUNICATION | o |
| PADDING_CHARACTER | Padding characters for unprotected fields | If this attribute contains a space then input fields are padded out with spaces; otherwise the null character (\0) is used as the padding character (default value) | 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.<br>Default: No inclusion<br>i The attribute is only evaluated by the generated standard template and not by the host adapter<br>See also EPILOG and FORMTPL | 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.<br>Possible values:<br>0 (if there is no pop-up) - *maximum number of columns*<br>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).<br>Possible values: 0 (if there is no pop-up) - *maximum number of lines* (including the frame)<br>Default value: 0. | c, r |
| POPUP.HSTART | Pop-up recognition parameter | Characters used to begin the horizontal frame of a pop-up panel.<br>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.<br>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.<br>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 |

| Attribute name | Meaning | Description/category | |
|---|---|---|---|
| `POPUP.LINE` | Line number of the top left-hand corner of a 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.<br>Possible values:0 (if there is no pop-up) - *maximum number of lines*.<br>Default value: 0. | c, r |
| `POPUP.VSTART` | Pop-up recognition parameter | Characters used to begin the vertical frame of a pop-up panel.<br>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.<br>The default value is a period “.”. | t |
| `POPUP.VEND` | Pop-up recognition parameter | Characters used to end the vertical frame of a pop-up panel.<br>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 (the number of columns including the frame).<br>Possible values:<br>0 (if there is no pop-up) - *maximum number of columns* (including frames)<br>Default value: 0. | c, r |
| `PORT_NUMBER` | Port number | Port number for communications with the OSD host application via TCP/IP<br>Default value: 102 | o |
| `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.<br>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.<br>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 |
| `RECORD_HOST_`<br>`COMMUNICATION` | Switch for emulation trace | Value "Yes": Emulation trace activated<br>Default: "No"<br>See also: `OFFLINE_TRACEFILE` | o |

| Attribute name | Meaning | Description/category | |
|---|---|---|---|
| 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.<br>As a result, the old format was updated on the last call of the form send/receive. This means that there was no dialog step with the host application as the user might have expected. The user is presented with the updated format.<br>To prevent the user from waiting pointlessly for a response from the host application, you should - depending on the value REFRESH_BY_ASYNC - generate a note for the user.<br><br>No (default value) means that the content of the format's input fields and the value of WT_KEY.Key were sent to the host application unchanged (this also sends the contents of the screen buffer).<br>See also IGNORE_ASYNC | c |
| STATION_NAME | Station name | Station name used to establish communications with the OSD host application. You only need to enter a value for this attribute if the OSD application uses special station names. If no value is specified, WebTransactions automatically generates a station name and returns the generated name in this attribute.<br>Max. length: 8 | o |
| SYM_DEST | Name of the OSD host application on the host system | e.g. $DIALOG | c, o |
| TERMINAL_TYPE | Terminal type | Terminal type as emulated by WebTransactions.<br>Possible values:<br>9750 (default)<br>9755<br>9763 (if 8-bit character set used)<br>9763-UNICODE<br>9763-UNICODE enables Unicode support. Once this value has been specified, the emulation integrated in WebTransactions for OSD declares itself as Unicode-capable when a connection is established to BS2000/OSD. The OSD host application can now make use of this capability. For further details on the Unicode support, see page 72. | o |

| Attribute name | Meaning | Description/category | |
|---|---|---|---|
| TRACE_LEVEL | Trace level | This attribute controls the contents of the trace file.<br>Possible values: 0,1,2,3,[E],[M],[L]<br>0...3 are evaluated numerically (≥). 3 subsumes 2 and 1. 0 excludes all traces with a numeric trace level.<br>E, M and L are separate levels that are filtered independently of 0...3.<br>The following meanings apply:<br>– 0,1,2,3<br>Different trace levels<br>– E<br>Output of the emulation function calls<br>– M<br>Output of all host matrices, i.e. “raw” mask data<br>– L<br>Output to a log file<br>Default value: 3EM (= maximum trace) | t |
| USE_POPUP_RECOGNITION | Pop-up recognition flag | This attribute is set to Yes if pop-up panels are to be recognized.<br>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.<br>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 191).<br>The attributes under WT_BROWSER_PRINT_OPTIONS will only be evaluated when this value is set to Yes.<br>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.<br>Possible values:<br>Automatic Print on the default printer<br>Preview Display a print preview | t |
| WT_BROWSER_PRINT_ OPTIONS.ORIENTATION | Controls browser printing only for Windows browser platform | Indicates the page orientation; only for use with Internet Explorer.<br>Possible values:<br>Portrait vertical orientation<br>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 193). | t |

| **Attribute name** | **Meaning** | **Description/category** | |
|---|---|---|---|
| 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 193). | 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 |

## 8.1.2 Interaction between system object attributes and methods

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

### open - opening a connection to the host

An `open` method call opens a connection to the host application. The connection to be established is determined by the following communication-specific system object attributes which you can, for example, set in the templates:

| System object attribute | Value |
|---|---|
| `APPLICATION_PREFIX` | Prefix for the host application name.<br>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:<br>*application_prefix@formatname*`.fld` |
| `HOST_NAME` | Specification of host name or its IP address |
| `LOCAL_PORT` | Number of the local port |
| `OFFLINE_COMMUNICATION` | To run an emulation trace without connection to the host appli-cation. |
| 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` | Specification of the port number for the OSD host application |
| RECORD_HOST_ COMMUNICATION | Switch for the emulation trace. |
| `STATION_NAME` | Specification of the station name if the OSD host application uses station names |
| `SYM_DEST` | Specification of the host application name |
| `TERMINAL_TYPE` | Specification of the terminal type as simulated by WebTransactions |

When you issue an `open` call, any existing connection is closed before the new connection is made.

### close - closing a connection to the host

A `close` method call closes the connection to the host application. This statement must be run at the end of a session. It does not usually result in an error message.

### send - sending a message to the host application

A `send` method call usually sends a message to the host application. The host object attribute `WT_KEY.Key` determines whether this involves real communication with the host application, or whether the call is handled exclusively by the host adapter (e.g. Refresh). The templates supply `WT_KEY.Key` with a value for the functions provided by `wtKeysOSD.htm` (see section “wtKeysOSD.htm template” on page 89). 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

A `receive` method call usually retrieves a message from the host application. The host object attribute `WT_KEY.Key` 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 in the `FLD` attribute of the connection-specific system object. The template itself must ensure that `FORMAT` is set correctly. In templates generated by V3.0 or higher, 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 then `FLD` or `FORMAT` is set to the value of the system object attribute `AUTOMASK`.

i Additional information can be found in the descriptions for the system object attributes “FIRST_IO_TIMEOUT” on page 117 and “MULTIPLE_IO_TIMEOUT” on page 121 as well as the attributes of the `END_WAIT_CONDITION` group as of page 115.

## 8.2 Host objects

WebTransactions for OSD uses two types of host object:

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

### 8.2.1 Host data objects

Host data objects are provided in order to enable 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 one is present) 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 can be identified via generic names or via IFG fields.

#### Generic names for host data objects

Generic names are always assigned. If the connection-specific system object attribute FIELD_NAMES has the value `User-defined` then the names defined with IFG are also used, see section “IFG names of host data objects” on page 131.

In the case of generic names, 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.

### Short names for generic host data objects

Object names can be specified in short form by omitting the length specification or leading zeros. To use this option, however, you will require a more detailed overview of the use of element names. For instance, `WT_FOCUS` always returns the full element name. The first of the following query conditions is thus never `TRUE`:

```
<wtif (WT_FOCUS.Field == "E_1_2_3")>          --> incorrect
...
<wtif (WT_FOCUS.Field == "E_01_002_003")>    --> correct
```

### IFG names of host data objects

In templates, you can also work with (descriptive) IFG names instead of the generic names. Preconditions for this are,

– that the communication-specific system object attribute `FIELD_NAMES` contains the value `User-defined`

– and that you have already used WebLab to create an FLD file for a format and have used the format description source to do this. You must have specified this source under **Generation Options** during capturing.

### Attributes of host data objects

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

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

| **Object name** | **Attribute name** | **Meaning** |
|---|---|---|
| E_*yy_xxx_lll*<br>or<br>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.<br>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.<br><br>**Unicode support**<br>The following notes also apply to the attributes `HTMLVALUE` and `RAWVALUE`.<br>*Unicode in operations on strings*<br>Since the WebTransactions kernel itself does not support Unicode, you should take care when applying operations to strings.<br>String operations can return incorrect results if the string contains UTF-8 characters. The `length` attribute does not return the number of characters, but rather the number of bytes. When comparing and manipulating such strings, you must take account of the representation of the UTF-8 characters.<br>Such operations do not occur in the templates generated by WebTransactions. If only a substring is required for a field on screen, you can make use of the facilities provided by WebTransactions for OSD (see “Generic names for host data objects” on page 130).<br>*Unicode in diagnostics*<br>– Unicode characters are represented by replacement characters in traces and in online displays of host objects.<br>– In WebLab, host objects can only be overwritten by 8-bit characters. |
| | 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:<br><, >, ä, ö, ü, Ä, Ö, Ü, ß<br>See also Notes on the Unicode support above. |
| | **RAWVALUE** | The content of this field is returned as an unconverted sequence of 8-bit characters; only binary zeros are converted into spaces.<br>See also Notes on the Unicode support above. |

| **Object name** | **Attribute name** | **Meaning** |
|---|---|---|
| | STARTLINE | Line in which the represented screen field begins<br>Possible values: 1<= n<=*last screen line*<br>This depends on the screen type:<br>24x80: n<=25<br>32x80: n<=33<br>43x80: n<=44<br>27x132: n<=28 |
| | NAME | Name of the field |
| | STARTCOLUMN | Column in which the screen field begins<br>Possible values: 1<=n<=*last screen line*<br>Also see example [1] |
| | LENGTH | Length of the field<br>Possible values: 1<=n<=*last screen line* |
| | TYPE | Field type<br>`Protected` Read-only field<br>`Unprotected` Entry field |
| | INPUT | Data type of input<br>`Alpha` or `Numeric` |
| | MARKABLE | `Yes` or `No` |
| | MODIFIED | `Yes` or `No` |
| | BLINKING | `Yes` or `No` |
| | UNDERLINE | `Yes` or `No` |
| | VISIBLE | `Yes` or `No` |
| | INTENSITY | `Normal` or `Reduced` |
| | INVERS | `Yes` or `No` |
| | COLOR | This returns the RGB color value of the relevant field. The value also depends on the settings of the host object WT_COLOR. If the attributes of WT_COLOR have not been set then the following values are returned:<br>`#000000`: No color attribute set<br>`#0000FF`: Blue<br>`#FF0000`: Red<br>`#FFC0CB`: Magenta<br>`#008000`: Green<br>`#40E0D0`: Turquoise<br>`#FFFF00`: Yellow<br>`#FFFFFE`: White |
| | RangeName | Name of the area specified by the host object. |
| | RangeLength | Length of the area specified by the host object. |

| Object name | Attribute name | Meaning |
|---|---|---|
| | 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` ...

## 8.2.2 Host control objects

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

- the system line (WT_SYSTEM_LINE)
- the sequence of fields in a screen
- the field in which is cursor is positioned
- the ENTER key to be used

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

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

| Object name | Attribute | Meaning of attribute |
|---|---|---|
| $CONNECTION | ALIVE | Checks whether the connection to the host is still active. This attribute should be thought of as an extension to `$MESSAGE.WAITING`. Under certain circumstances `WAITING` may have the value `NO` following the establishment of a connection. As a result, disconnection is not noticed if only `WAITING` checked during asynchronous processing. |
| $FIRST | Name | Full name of the first field in the current screen. If no object exists, the name `$END` is returned. |
| | Also all attributes of dynamic host objects (`E`*_yy_xxx_lll*) | |

| Object name | Attribute | Meaning of attribute |
|---|---|---|
| $MESSAGE | PRINTING | When this attribute is evaluated, WebTransactions sends the oldest file waiting to be printed to the browser (with the MIME type `webta/hardcopy-print` or MIME type `webta/bypass-print`).<br>i Make sure that the evaluation of `$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.<br>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 or not. Each time this attribute is queried, WebTransactions checks the buffer for an asynchronous message.<br>If it finds a message, the value of `$MESSAGE.WAITING` is set internally to `"Yes"`. WebTransactions then reads the asynchronous message the next time `receive` is called. |
| $NEXT | Name | Full name of the next field in the current screen starting from the field last accessed. You can use this object to work through each screen field, including the system line (`WT_SYSTEM_LINE`), step-by-step.<br>If there are no further objects, the name `$END` is returned. |
| | Also all attributes of dynamic host objects (`E`_*yy_xxx_lll*) | |
| $SCREEN | CONTENTS | All the characters of the whole screen an one string. May be useful for comparing two complete screen images. |

| **Object name** | **Attribute** | **Meaning of attribute** |
|---|---|---|
| WT_COLOR | **DEFAULT** | RGB color values for fields for which no color attribute is set. Possible values:<br>`#000000`: Black (default)<br>`#0000FF`: Blue<br>`#FF0000`: Red<br>`#FFC0CB`: Magenta<br>`#008000`: Green<br>`#40E0D0`: Turquoise<br>`#FFFF00`: Yellow<br>`#FFFFFE`: White |
| | **BLUE** | RGB color value for fields with the color attribute `blue`.<br>Default value `#0000FF` |
| | **RED** | RGB color value for fields with the color attribute `red`.<br>Default value: `#FF0000` |
| | **MAGENTA** | RGB color value for fields with the color attribute `pink`.<br>Default value: `#FFC0CB` |
| | **GREEN** | RGB color value for fields with the color attribute `green`.<br>Default value: `#008000` |
| | **CYAN** | RGB color value for fields with the color attribute `turquoise`.<br>Default value: `#40E0D0` |
| | **YELLOW** | RGB color value for fields with the color attribute `yellow`.<br>Default value: `#FFFF00` |
| | **WHITE** | RGB color value for fields with the color attribute `white`.<br>Default value: `#FFFFFE`. |
| 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* or a descriptive name and includes a length specification.<br>Writing this attribute positions the cursor.<br>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 attribute |
|---|---|---|
| WT_KEY | KEY | Indicates the special key in the terminal emulation to be activated when `send` is executed.<br>The permitted values are described in section “Interaction between the host control object WT_KEY.KEY and the template wtKeysOSD.htm” on page 142.<br>Corresponding buttons are included in the current templates by using `wtKeysOSD.htm`. (<`wtInclude ...`>). |
| | PKEY***n*** | Enables direct access to the contents of the PKey *n*. When a value is assigned to this attribute, the appropriate PKey is loaded in the emulation. Evaluating this attribute returns the current contents.<br>The object tree of the WebLab development environment only shows those P keys with mapped content. Use of this attribute is described in section “P key support” on page 153.<br>Possible values for `n`: `1` to `255` |
| WT_SYSTEM_LINE | Name | Name of the field in the system line |
| | Also all attributes of dynamic host objects (`E_`*yy_xxx_lll*`)`. | |

## 8.3 Terminal functions supported by the browser

In WebTransactions for OSD you can display host application formats in the browser without any post-editing (01:01 conversion). This function is contained in the master template `OSD.wmt` (see page 76). The templates that you generated via the master template include the templates `wtBrowserFunctions.htm` and `wtKeysOSD.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.

`wtKeysOSD.htm` contains the OSD-specific buttons for the standard keys and include the Javascript file `wtKeysOSD.js` which contains the special key mapping for WebTransactions for OSD. In this file you can adapt the key mapping to your needs and also extend it (see section “Mapping keys in wtKeysOSD.js” on page 144).

### 8.3.1 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 V6.0 or higher or Mozilla Firefox** | **Internet Explorer V4.0 or higher** |
| Layout of text and entry fields | no | yes | yes |
| Support for terminal special keys sent to WebTransactions | only 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 | by individual configurable mapping via a key | |
| Autotab | no | 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 9750 terminal keys are mapped as follows[1]:

| **Key used in Internet Explorer** | **Corresponding key at the 9750 terminal** |
|---|---|
| ENTER | ENTER |
| F1 ... F12 | F1 ... F12 |
| Shift+F1 ... Shift+F12 | F13 ... F24 |
| CTRL+F1 ... CTRL+F12 | K1 ... K12 |
| CTRL+Shift+F1<br>CTRL+Shift+F2 | K13<br>K14 |
| CTRL+1 ... CTRL+9, CTRL+0 | P1 ... P9, P10 |
| CTRL+Shift+1 ... CTRL+Shift+9, CTRL+Shift+0 | P11 ... P19, P20 |
| CTRL+Shift+F12 | MAR |
| EM | EM |
| INS | INS |

[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`.

## 8.3.2 Interaction between the host control object WT_KEY.KEY and the template wtKeysOSD.htm

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

The default values are given in the table below. The corresponding buttons are included in the current templates by using `wtKeysOSD.htm` (<`wt`Include ...>). `wtKeysOSD.htm` includes the Javascript file `wtKeysOSD.js` which contains the mapping of the special keys for WebTransactions for OSD (see section “Mapping keys in wtKeysOSD.js” on page 144).

The table below shows:

– the controls provided by the `wtKeysOSD.htm` template and the file `wtKeysOSD.js` as standard.

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

| **Key on 9750 terminal** | **Value of WT_KEY.KEY** | **Meaning** |
|---|---|---|
| `DÜ` | `DUE` | Data entry to host |
| `DÜ2` | `DUE2` | As DÜ<br>Data released to host but with a different transfer ID. |
| `K1 ... K14` | `K1 ... K14` | Short message to the host application; no more data will be transferred. |
| `F1 ... F24` | `F1 ... F24` | As DÜ<br>Data released to host but with a different transfer ID. |
| `P1 ... P20` | `PKEY1 ... PKEY20` | Programmable key executed. The programmable keys can be loaded from the OSD application or loaded by assigning a value on the host control object `WT_KEY.PKEY`*n*. |
| `MAR` | | Marks a field as selected. |
| | `Disconnect` | Closes the connection to the host. The subsequent `receive` call supplies the `FLD` system object attribute with the contents of the system object attribute `DISCONNECT`.<br>This function is similar to switching off a real terminal or shutting down an emulation program without signing off properly from the host application. |
| | `Refresh` | Refresh the display of the HTML page.<br>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 `MULTIPLE_IO_TIMEOUT`, page 121). The `Refresh` function does not involve dialog with the host application. Host communication is suppressed with the `send` and `receive` calls. |
| | `ClearScreen` | Clears the screen. |
| | `Print` | Requests terminal hardcopy printing (see section “Terminal hardcopy printing” on page 181). |

## 8.3.3 Mapping keys in wtKeysOSD.js

The browser used will accept all keyboard entries. For the application-defined mapping of special function keys, WebTransactions provides the file `wtKeysOSD.js` as an interface. A call to the function `wtCreateKeySelectList()` will generate a selection list (see section “Interaction between wtCommonBrowserFunctions.js and wt<browser>BrowserFunctions.js” on page 148).

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 `wtKeysOSD.js` is in the directory <*basedir*>`/wwwdocs/javascript`. The key 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 145). These attributes describe:

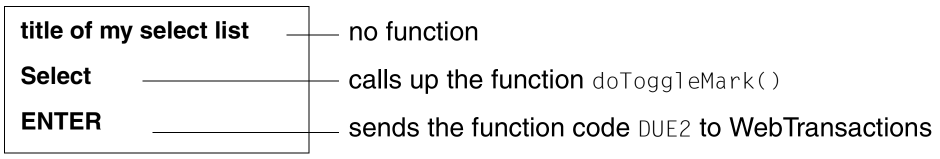
- the key or key combination
- the action to be triggered when the key (or combination) is pressed
- if this function is also available on a selection list.

*Example*

```
wtKeyMappingTableInput = [
{ sl:'title of my select list'},
{ la:'Select', ac:doToggleMark, kc:VK_F12, mk:MK_CTRL+MK_SHIFT },
{ la:'ENTER', ac:'DUE2' },
{ co:'P1', ac:'P1', kc:VK_F1, mk:MK_ALT }
];
```

In this definition the mapping is as follows:
- `CTRL+SHIFT+F12` calls the function `doToggleMark()`
- `ALT+F1` sends the function code `F1` to WebTransactions

This definition creates a selection list with the following content:


title of my select list
Select
ENTER
no function
calls up the function doToggleMark()
sends the function code DUE2 to WebTransactions

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.<br>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.<br><br>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).<br><br>If this attribute is a `function` type, a client-side function with this name will be called. This function must be defined.<br><br>The Javascript files `wt`<*browser*>`BrowserFunctions.js` provide the following functions:<br>– `doCursorHome`<br>– `doCursorUp`<br>– `doCursorDown`<br>– `doCursorLeft`<br>– `doCursorRight`<br>– `doTab`<br>– `doBackTab`<br>– `doToggleMark`<br>– `doToggleInsert`.<br>The implementation of these functions can be empty; this depends on the browser capabilities (see the section “Callback functions in key mapping” on page 149).<br>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.<br>The script `wtCommonBrowserFunctions.js` has a symbol for many of the keys; the symbol name begins with `VK_`.<br>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`):<br>– `0` = `MK_NONE` (= no modifier key pressed)<br>– `1` = `MK_CTRL`<br>– `2` = `MK_ALT`<br>– `4` = `MK_SHIFT`<br><br>In key combinations the corresponding values are added:<br>– `3` = `MK_CTRL` + `MK_ALT`<br>– `5` = `MK_CTRL` + `MK_SHIFT`<br>– etc.<br>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`.<br>Any selection lists created previously will be closed when the attribute `sl` occurs.<br>For improved readability, `sl` can be made to be the only attribute in the table object. |

### Structure of wtKeysOSD.js

This section describes the `wtKeyMappingTableInput` table from the `wtKeysOSD.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`.

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

The attribute `co` indicates a comment for better readability. There is no `la` attribute 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:'MAR', ac:doToggleMark, kc:VK_F12, mk:MK_CTRL+MK_SHIFT },
{ co:'MAR', ac:doToggleMark, kc:VK_MAR, mk:0 },
{ co:'END', ac:doEnd, kc:VK_END },
{ 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:'SDZ', ac:doPageUp, kc:VK_PGUP },
{ co:'SNZ', ac:doPageDown, kc:VK_PGDN },
{ co:'HOME', ac:doCursorHome, kc:VK_HOME },
{ co:'TAB', ac:doTab, kc:VK_TAB },
{ co:'BACKTAB', ac:doBackTab, kc:VK_TAB, mk:MK_SHIFT },
```

The attribute `la` indicates the entries in the selection list.

```
{ la:'K1', ac:'K1', kc:VK_F1, mk:MK_CTRL },
{ la:'K2', ac:'K2', kc:VK_F2, mk:MK_CTRL },
{ la:'K3', ac:'K3', kc:VK_F3, mk:MK_CTRL },
...
{ la:'K14', ac:'K14', kc:VK_F2, mk:MK_CTRL+MK_SHIFT },
{ la:'F1', ac:'F1', kc:VK_F1 },
{ la:'F2', ac:'F2', kc:VK_F2 },
...
{ la:'F24', ac:'F24', kc:VK_F12, mk:MK_SHIFT },
{ la:'ClearScr', ac:'ClearScreen' },
{ la:'DUE2', ac:'DUE2' },
{ la:'InsClip', ac:doInsertClipBoard, kc:VK_V, mk:MK_CTRL+MK_SHIFT },
```

The following la attributes indicate the selection list for the P keys.

```
{ la:'P1', ac:'PKEY1', kc:VK_1, mk:MK_CTRL, sl:'pkeys' },
{ la:'P2', ac:'PKEY2', kc:VK_2, mk:MK_CTRL },
...
{ la:'P20', ac:'PKEY20', kc:VK_0, mk:MK_CTRL+MK_SHIFT },
```

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:'P', ac:'PKEYS' }
];
```

### 8.3.4 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` is called before the files `wt`<*browser*>`BrowserFunctions.js` and `wtKeysOSD.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 `wtKeysOSD.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 `wtKeysOSD.htm`. It is possible to suppress the list by leaving out the call for this function in `wtKeysOSD.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. `wtHandle-Keyboard()`, 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 `wtKey-MappingTableInput` (see the attribute `ac` on page 145).

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*>`BrowserFunc-tions` files where required by functions with the same names (see page 150).

### 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 `wtKey-MappingTableInput` table on page 145), 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 145).

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

6. The content of the `string` is transferred to the attribute `wt_special_key.value` (see section "wtKeysOSD.htm template" on page 89). The form is transferred to WebTransactions together with the value of `ac` (e.g. `"@1"` as the PF1 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.

i 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`wtKey-MappingTableInput` (see page 145) is also defined in the file `wtCommon-BrowserFunctions.js` and in the corresponding file `wt<`*browser*`>BrowserFunc-tions.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.

### 8.3.5 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. It is then available globally during the whole 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 `OSD.wmt` or `OSD_Pocket.wmt` (e.g. AutomaskOSD.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()`.

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

You can re-initialize 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 `AutomaskOSD.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>
```

### 8.3.6 P key support

A 9750 terminal also provides you with programmable keys (P keys) which you can customize with the functions of your choice. In order to make P keys programmable from WTML, WebTransactions for OSD provides an additional set of objects for the host control object `WT_KEY` (see section “Host control objects” on page 135).

These objects are marked with `PKEY`*n*, where *n* is a value from `1` to`255`. `PKEY` objects are only displayed in the object tree of the WebLab development environment when the corresponding P keys for the emulation have been defined.

Even though a 9750 terminal only supports 20 P keys, in WebTransactions for OSD you can define 255 `PKEY` objects. The Javascript file `wtKeysOSD.js` contains the programming for the P keys from `P-1` to `P-20` ready to use. You can adapt or expand this file to your requirements (see section “Mapping keys in wtKeysOSD.js” on page 144).

#### 8.3.6.1 Definition in WTML

When you define `PKEY` objects in WTML, you should note the following points:

- Each `PKEY` can be defined with a sequence of up to 255 characters.
- The following replacement mappings can be used for terminal functions. The replacement mappings are reconstructed when the P keys are read.
  - `[AM]`, `[EM]`,
  - `[DUE]`, `[DUE2]`,
  - `[P`*n*`]` with 1 <= *n* <= 20
  - `[F1]`, `[F2]`, `[F3]`, `[F4]`, `[F5]`
  - [K*n*] with 1 <= *n* <= 14
  - `[SMR]`, `[SML]`, `[SMO]`, `[SMU]`, `[SNZ]`, `[SBA]`, `[SZA]`, `[SDZ]`, `[TAR]`, `[TAL]`
  - `[EFG]`, `[AFG]`, `[AFZ]`, `[EFZ]`, `[LZF]`, `[LSP]`, `[LVD]`, `[MAR]`, `[FAZ]`, `[LZE]`, `[RS]`
- `PKEY` numbers must not contain leading zeros.
- In order to ensure compatibility with protocol 810, the following rules should be observed:
  - All `PKEYs` (1 to 255) can be defined and used at all times.

  - However, only the keys from `PKEY1` to `PKEY20` can be chained and read by the host application (terminal function `LPBE` = Read P area).

- Note on Unicode characters:

  `PKEY` objects can only be supplied with Unicode characters by the host application. The **PKEYS-ASSIGNMENT** window does not support Unicode characters.

*Example*

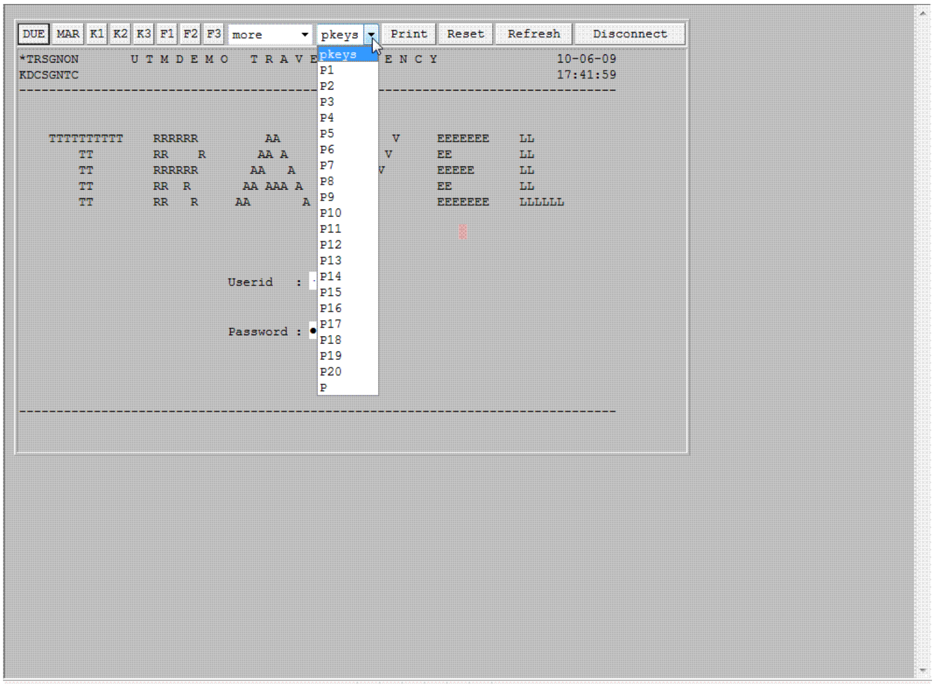
```
...
WT_KEY.PKEY1 = 'SH-USER-STA[EM][DUE]';
WT_KEY.KEY = 'PKEY1';
host.send();
...
```

### 8.3.6.2 wtPKEYS.htm template

The template `wtPKEYS.htm` supplied provides a simple method for programming the P keys on the browser. The template is an example only and you can edit or extend it to suit your own particular needs. The example can be used, for example, to store the P keys in a freely selectable file. In order to automatically restore the last content of the P keys for the user at the start of each new session, you can store the P keys in a file whose name includes the host name or the user ID.

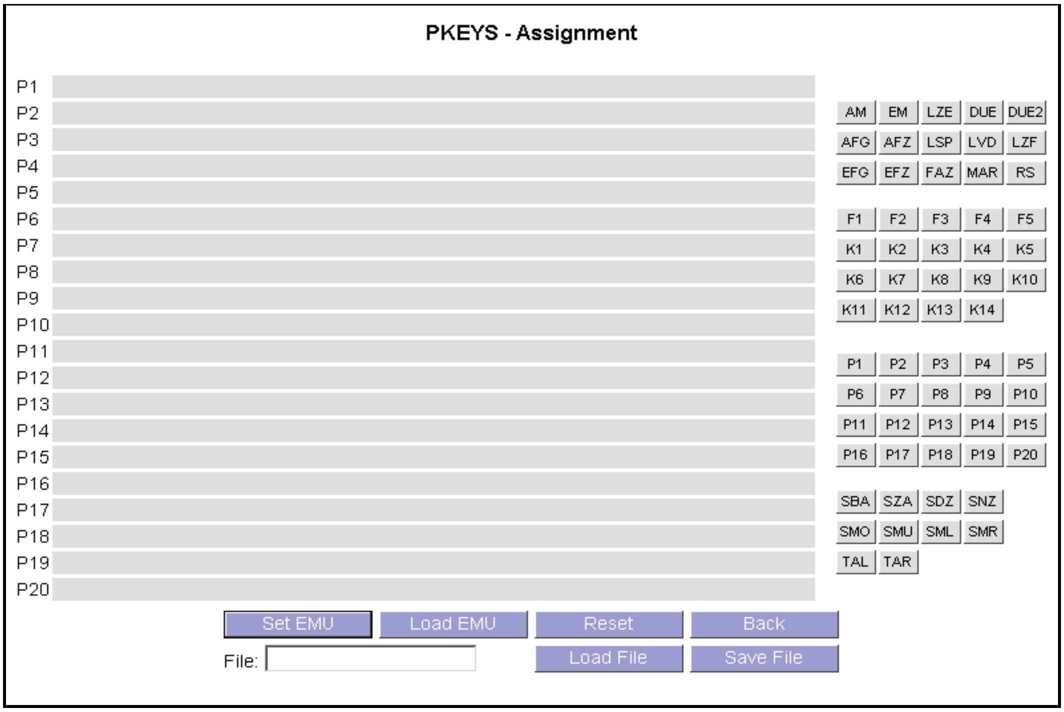
To call the template and assign the P keys, proceed as follows:

► On the screen of your host application, select the command **pkeys**/**P**.



```
*TRSGNON        U T M D E M O   T R A V E          E N C Y                   10-06-09
KDCSGNTC                                                                      17:41:59

Userid   :

Password :
```

In the current session, this entry will call `wtPKEYS.htm` instead of the current template with the function `setNextPage()`.



This screen allows you to assign functions to the listed PKEYs.

**i** The data processed in this screen is managed in a separate processing memory. Only when you press the **Set EMU** button are the values programmed in the emulation.

You have two options:

– Make your entries directly into the line concerned.

– Click on the button for the function you require. The corresponding replacement mapping will be entered in the cursor position provided that the browser supports transmission of the cursor in the entry field. If this is not the case, the replacement mapping will be appended at the end of the entry field which has just been used. The assignment of functions to buttons is specified in the template `wtPkeyValues.htm` which is included in `wtPKEYS.htm`. The function keys have the following meaning:

| | |
|---|---|
| `AFG` | Remove character |
| `AFZ` | Remove line |
| `AM` | Home mark |
| `DUE` or `DUE1` | Start data transmission with `DU1` |

| | |
|---|---|
| `DUE2` | Start data transmission with `DU2` |
| `EFG` | Insert character mode |
| `EFZ` | Insert line |
| `EM` | End mark |
| `F1 .. F5` | Function keys |
| `FAZ` | Reset the field separators to their original status (field start character FBZ and display control character ASZ); e.g. markings made with MAR |
| `K1 .. K14` | Short message |
| `LSP` | Delete image |
| `LVD` | Delete variable |
| `LZE` | Logical line end |
| `LZF` | Delete up to line/field end |
| `MAR` | Mark field |
| `P1 .. P20` | Programming key |
| RS | Reset the emulation (e.g. after EFG) |
| `SBA` | Cursor to start of image |
| `SDZ` | Cursor to start of previous line |
| `SML` | Cursor left |
| `SMO` | Cursor up |
| `SMR` | Cursor right |
| `SMU` | Cursor down |
| `SNZ` | Cursor to start of next line |
| `SZA` | Cursor to line start |
| `TAL` | Tabulator left |
| `TAR` | Tabulator right |

Use the action buttons in the template to control how the P key assignments will be processed:

**Set EMU**
: Loads the P key assignment from the processing memory to your emulation.

**Load EMU**
: Reads the content of the currently defined `PKEYs` from the emulation to the processing memory.

**Reset**
: Resets the screen content.

**Back**
: Returns you to the screen of the host application. Assignments which have not been saved will be lost.

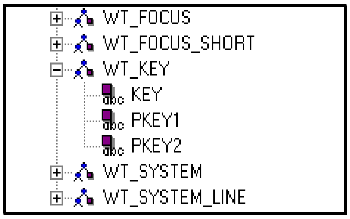
**Load File**
: Loads the contents of the P keys from the XML file that you specified under **File** to the processing memory. The XML file must contain the P key assignments and must be in the base directory of the WebTransactions application under `Pkeys`.

**Save File**
: Saves the assignment to the XML file you specified under **File**. The entry in **File** does not require the suffix `.xml`. The XML file will be created in the base directory of the WebTransactions application under `Pkeys`.

> **i** P keys programmed during an emulation session will be lost at the end of the session. If you want to use the assignment during the next session, you must load the XML file again with **Load File** and **Set EMU**. The options available for using the contents of the P keys for the next session can be found in the section "Saving PKEYs" on page 161.

### 8.3.6.3 Handling PKEYs

The `PKEYs` are created as objects under `WT_KEY`.



To edit the objects, use the template `wtPkeyFunctions.htm` with the following methods The methods are defined in the class`WT_PKEYS`. `wtPkeyFunctions.htm` is also included in `wtPKEYS.htm`.

#### Methods for WT_PKEYS class objects

`WT_PKEYS([`*number*`])`
: The constructor specifies the number of entered PKEY objects under the object `WT_KEY`.
Default value: 20

`setDirectory(`*directory*`)`
: Specifies the directory where the XML file with the `PKEY` assignments is to be created.
Default value: *base directory*`/Pkeys`

`setFileName(`*file*`)`
: Specifies the name for the XML file with the `PKEY` content. The file is created relative to the directory which has been set with `setDirectory()`.

`getFileName()`
: Supplies the file name specified with `setFileName()`.

`setPassword(`*password*`)`
: Specifies the password to be used to protect the XML file.

`readFromFile()`
: Reads the `PKEYs` from the file specified with `setDirectory()` and `setFileName()`.

`saveToFile()`
: Writes the content of the `PKEY` assignment in the file specified with `setFileName()`. After a call from `setClusterParameter`() the file will be distributed to the other cluster members.

`loadFromEmu()`
: Reads the content of `PKEYs` from the emulation.

`setToEmu()`

Loads the content of `PKEYs` to the emulation.

`getKeyValue(`*number*`)`

Supplies the content of the specified `PKEY` from the `WT_PKEY` instance.

`setKeyValue(`*number*`,`*value*`)`

Sets the `PKEY` entered with a *number* in the `WT_PKEY` instance to the value *value*.

`initClusterParameter (`*file*`,`*user*`,`*password*`,`*clusterName*`)`

Creates a transfer file for all the values required for the distribution of files in a cluster configuration (see WebTransactions manual “Concepts and Functions”).

*file* Name of the transfer file used in the `setClusterParameter()` method. The file will be created in XML format with the suffix `.xml`.

*user, password*

User name and password to enable file distribution in the cluster.

*clusterName*

Name of the cluster configuration.

As a preparatory step, the `initClusterParameter()` method must be called up once on the cluster controller. The resulting *file*`.xml` file can then be distributed to the cluster members using WebLab. You must repeat this procedure if the cluster definition or the access rights have been changed. The user name *user* and the password *password* must have access to the corresponding base directory on all the participating machines.

`setClusterParameter(`*file*`)`

Specifies that `saveToFile()` should use the cluster definition set with `initClusterParameter()` in order to be able to distribute the `PKEYs` to the cluster members.

### 8.3.6.4 Saving PKEYs

In a terminal emulation installed on a client PC, the contents of `PKEYS` is saved locally on the PC under the protection of the Windows user name. The contents are available when a new emulation call is made and, depending on the operating system, are also protected against access by other users.

However, this does not apply to WebTransactions where the host adapter simulation runs on the server. Host adapters and emulations have no way of knowing which PC and which user name were used to log on to the current session on the client PC.

This means that various measures are available in order to restore the previous content of the P keys to the next session for the same user and in order to protect the P key content from unauthorized access. These measures depend on the current customer specifications.

There are several ways of regularly saving the `PKEY` content:

- You can use the `PKEY` assignment that you set with the WTBean `wtcSingleSignOn`. In this case, you must create the `PKEY` assignment in the WebTransactions object tree area that is saved for each user by `wtcSingleSignOn` (see WTBean documentation).
- You can save the `PKEY` assignment so that is one-to-one assigned to a user, for example,
  - in a file whose name is derived from an IP address or a PC name.
    This procedure is not possible in the PROXY operating mode.
  - in a file whose name is saved in a cookie. You must ensure that the file name is only assigned once.
    This procedure is not possible where cookies are not allowed.
  - in a file whose name is derived from a user name.
    This option may be restricted depending on the following questions:
    - Is `VBScript` allowed?
    - Is the user name at the Windows log-on unique in the group of users belonging to the WebTransactions application?
  - Using a cookie directly.
    This procedure is not possible where cookies are not allowed. This option can be restricted by the maximum length of the cookie permitted.

## 8.4 Start templates for OSD

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 you with 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 `wtstartOSD.htm` is supplied specially for WebTransactions for OSD. This OSD-specific start template is described in section “OSD-specific start template in the start template set (wtstartOSD.htm)” on page 163. 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 OSD application, you should use a specially generated start template. The WTBean `wtcStartOSD.wtc` helps you to generate such templates.

### 8.4.1 OSD-specific start template in the start template set (wtstartOSD.htm)

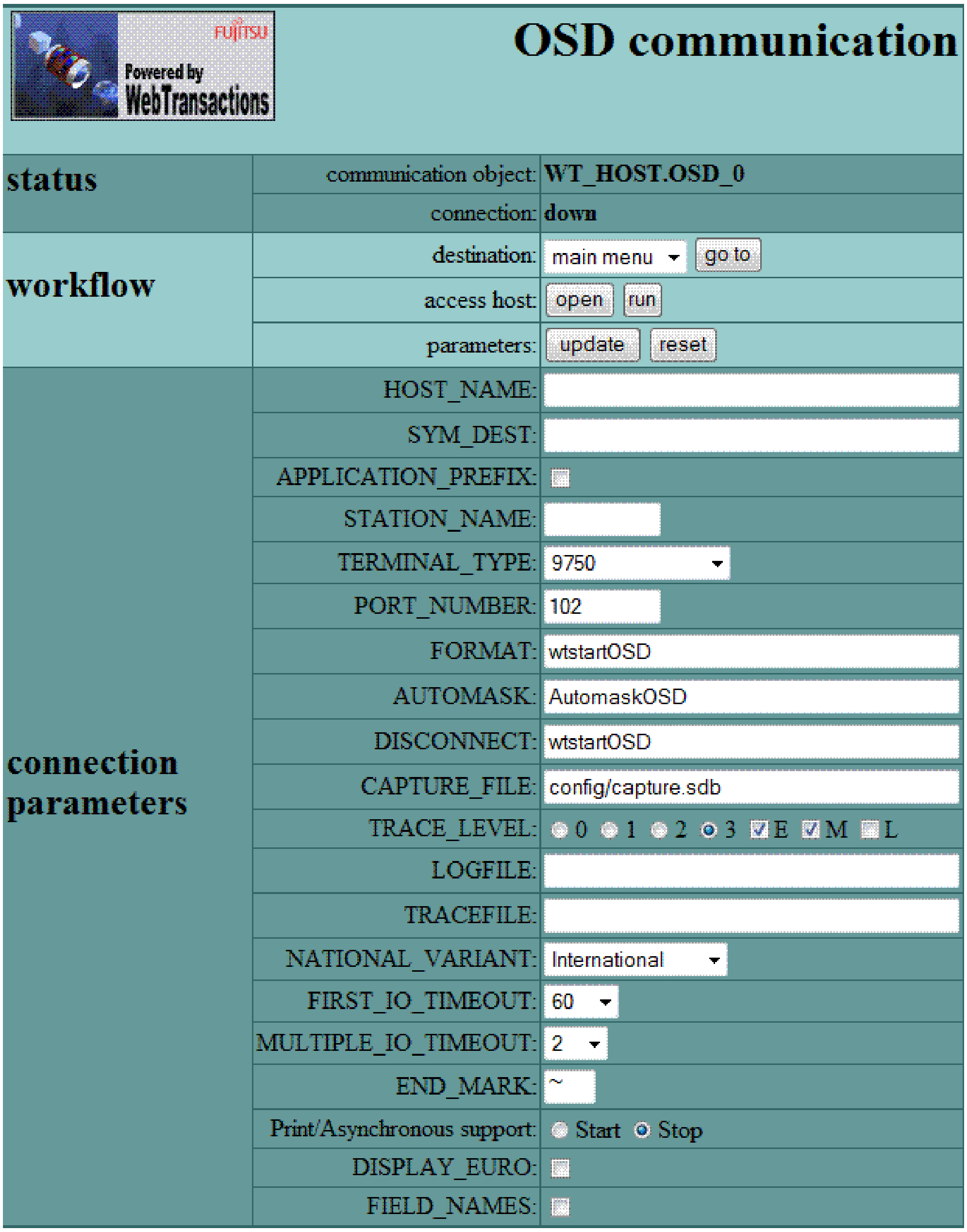
If you selected the `OSD` protocol in the general start template `wtstart.htm` (described in the WebTransactions manual “Concepts and Functions”) and created a new communication object, the system branches to the `wtstartOSD.htm` template. This template allows you to set OSD-specific parameters:

– You can define connection parameters and open a connection to an OSD 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 `wtstartOSD.htm` template is displayed again. If the connection was opened successfully, this template contains additional buttons for communicating with the OSD application. If you select **close**, the connection to the host application is shut down.

– If you select the **receive** option, the `wtstartOSD.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



**OSD communication**

| | | |
|---|---|---|
| **status** | communication object: | **WT_HOST.OSD_0** |
| | connection: | **down** |
| **workflow** | destination: | main menu ▾ [go to] |
| | access host: | [open] [run] |
| | parameters: | [update] [reset] |
| **connection parameters** | HOST_NAME: | |
| | SYM_DEST: | |
| | APPLICATION_PREFIX: | ☐ |
| | STATION_NAME: | |
| | TERMINAL_TYPE: | 9750 ▾ |
| | PORT_NUMBER: | 102 |
| | FORMAT: | wtstartOSD |
| | AUTOMASK: | AutomaskOSD |
| | DISCONNECT: | wtstartOSD |
| | CAPTURE_FILE: | config/capture.sdb |
| | TRACE_LEVEL: | ○ 0 ○ 1 ○ 2 ● 3 ☑ E ☑ M ☐ L |
| | LOGFILE: | |
| | TRACEFILE: | |
| | NATIONAL_VARIANT: | International ▾ |
| | FIRST_IO_TIMEOUT: | 60 ▾ |
| | MULTIPLE_IO_TIMEOUT: | 2 ▾ |
| | END_MARK: | ~ |
| | Print/Asynchronous support: | ○ Start ● Stop |
| | DISPLAY_EURO: | ☐ |
| | FIELD_NAMES: | ☐ |

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 111).

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 on `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 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 is 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.

## 8.4.2 WTBean wtcStartOSD.wtc for the generation of a Start template

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

`wtcStartOSD.wtc` contains the inline WTBean `wtcOSD.wtc` which can be used to create a new OSD communication object, and thus to establish a connection to an OSD application (see the section “Creating a new OSD communication object (wtcOSD)” on page 169).

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

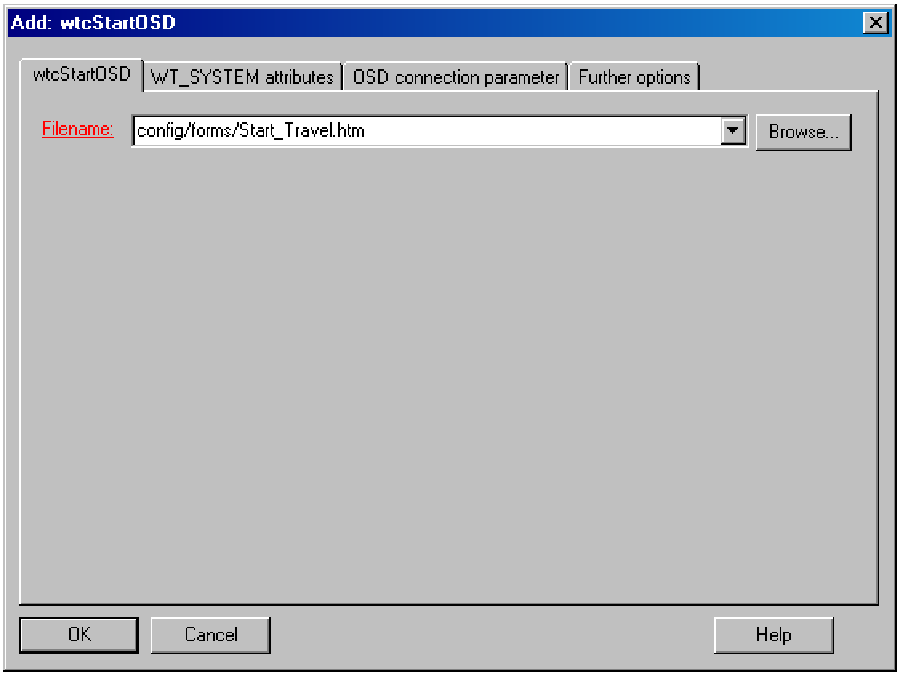
You use the **File/New/wtcStartOSD** command to open the WTBean for editing. WebLab generates the **Add:wtcStartOSD** dialog box which contains four tabs:

– In the **wtcStartOSD** 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 **OSD 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 OSD application within a tree structure.



Filename: config/forms/Start_Travel.htm

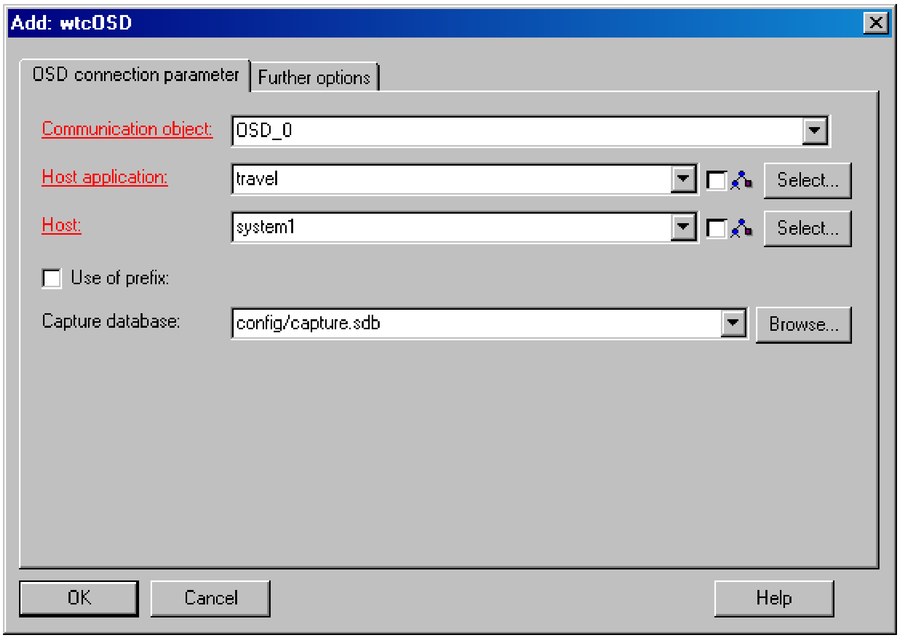
The generated start template itself does not generate any pages in the browser. When WebTransactions is started, the template corresponding to the first format received from the host application is displayed. This is due to the `wtinclude` tag at the end of the Start template.

## 8.5 Creating a new OSD communication object (wtcOSD)

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

i 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/wtcOSD** command to open the WTBean for editing. WebLab generates the **Add:wtcOSD** dialog box:



Communication object: OSD_0
Host application: travel
Host: system1
☐ Use of prefix:
Capture database: config/capture.sdb

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, **OSD 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 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 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”).

# 9 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 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 172. JavaScript must be permitted in the configuration of your Web browser.

## 9.1 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 supplied start template `wtstartOSD.htm` to start a WebTransactions session, click on the **Start** radio button for the option **Print/Asynchronous 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 `wtcOSD` by setting the **Enable asynchronous messages** entry to **Yes**.

The browsers in common use today that support the `<iframe>` HTML tag enable unlimited 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.

## 9.2 Functionality of print/asynchronous support

Print support and asynchronous support operate according to 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 183)

       Handling of asynchronous messages
                ... (see page 179)

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

### wtBrowserFunctions.htm template

The `wtBrowserFunctions.htm` template plays an important role in print/asynchronous support. `wtBrowserFunctions.htm` 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 (`Submit`) of the control frame.

Structure of the script in `wtBrowserFunctions.htm`:

```
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
<!-- begin of wtBrowserFunctions.htm                                    -->
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
<wtOnCreateScript>
<!--

  for( wtCurrentComm_Name in WT_HOST )
  {
    if( WT_HOST[ wtCurrentComm_Name ] == wtCurrentComm )
      break;
  }
//-->
</wtOnCreateScript>
<input type="hidden" name="wt_cursor" value="" />
<input type="hidden" name="wt_cursorOffset"
value="##wtCurrentComm.WT_FOCUS&&wtCurrentComm.WT_FOCUS.Offset ?
wtCurrentComm.WT_FOCUS.Offset : 0#" />
<input type="hidden" name="wt_markedFields" value="" />
<input type="hidden" name="wt_modifiedFields" value="" />
<input type="hidden" name="wt_isOverwrite"
value="##wtCurrentComm_system.isOverwrite?1:0#" />
<script type="text/javascript">
<!--
  ##wtCurrentComm_system.NIL_MODE?'wtWantNils = true;':''#
  ##wtCurrentComm_system.AUTOTAB&&wtCurrentComm_system.AUTOTAB=='No'?'wtWantAutoTab =
false;':''#
  wtCharSize=##WT_BROWSER.charSize#;
  wtRefreshTimer = 5000; // milliseconds
//-->
</script>
<wtIf ( wtCurrentComm_system.WT_ASYNC == 'Yes' && WT_BROWSER.acceptIframe )>
  <wtrem>support of asynchronous message and printing with browsers supporting
<iframe>//////////</wtrem>
  <iframe id="asyncFrame" style="border:0;height:0;position:absolute;"
src="about:blank"></iframe>
<script type="text/javascript">
```

```
  <!--
  function AutomaticRefresh()
  {
    try{
      document.getElementById('asyncFrame').contentDocument.location =
'##WT_SYSTEM.HREF_ASYNC#&WT_ASYNC_PAGE=wtasync';
    }catch(e){
      try{
        document.getElementById('asyncFrame').src =
'##WT_SYSTEM.HREF_ASYNC#&WT_ASYNC_PAGE=wtasync';
      }catch(f){}
    }
    setTimeout('AutomaticRefresh()', wtRefreshTimer);
  }

  ##(wtCurrentComm_system.HARDCOPY == 'Yes' || wtCurrentComm_system.BYPASS == 'Yes') ?
   'AutomaticRefresh();' :
   'setTimeout("AutomaticRefresh()", wtRefreshTimer);'#
  //-->
  </script>
<wtElse><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()', wtRefreshTimer);
  }
  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()", wtRefreshTimer);'#

  }
  //-->
  </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>
...
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
<!-- end of wtBrowserFunctions.htm                                     -->
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
```

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

## 9.3 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"`). To perform this function, WebTransactions uses the `wtframes` frame set or the `<iframe>` HTML tag described in section “Functionality of print/asynchronous support” on page 172.

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

## Concept

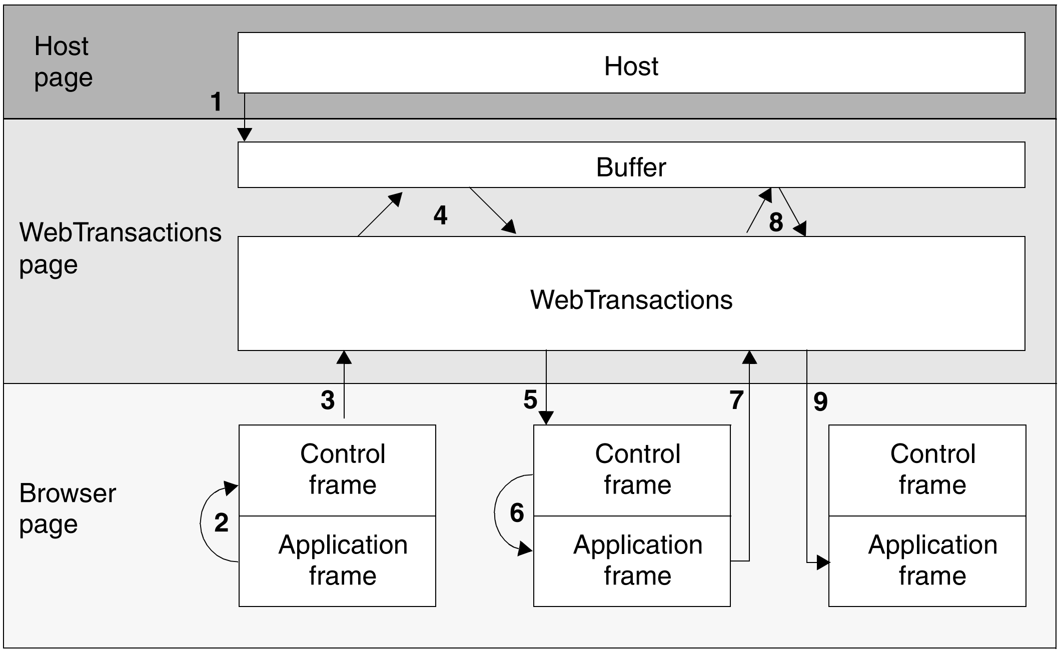


Figure 3: Handling asynchronous messages

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 “Handling of asynchronous messages defined in wtasync.htm” on page 179).
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.

i 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 `$MESSAGE` is queried to establish whether asynchronous messages are present. Each time this attribute is queried, WebTransactions checks the buffer for asynchronous messages. If it finds a message, the value of `$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>");
```

## 9.4 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.
- Browser display printing
  This involves printing the information displayed in the Web browser.
- Host data printing
  This involves printing information prepared and sent by the host application.

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.

i 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 197. For instructions on configuring the print server, see the product documentation for the 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.

### 9.4.1 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 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 172; this frame set consists of an application frame and a control frame.

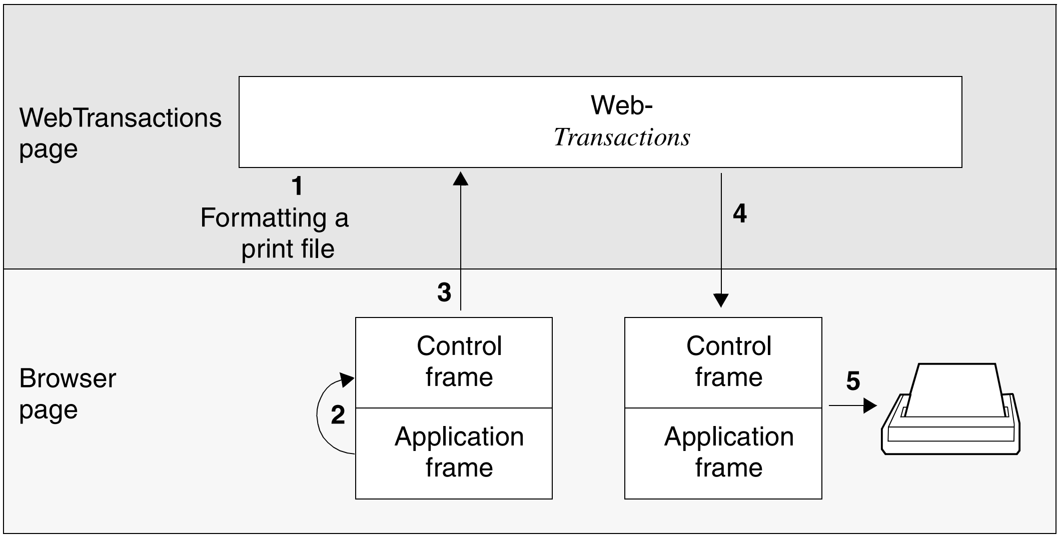


Figure 4: Terminal hardcopy printing

When you request a terminal hardcopy printout, WebTransactions generates a corresponding print file (step 1). Triggered by the script in `wtBrowserFunctions.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 191.

i 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`. The `PRINTING` attribute of the host control object `$MESSAGE` is then evaluated, causing WebTransactions to send the print file to the browser.

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`).

i 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 wt`KeysOSD.htm` template, which is included by the AutomaskOSD.htm conversion template and by the individual templates created with WebLab.

When you click on this button, the current page is sent from the browser to WebTransactions. WebTransactions interprets the template as normal, with 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.

### Terminal hardcopy printing initiated by the host application

Terminal hardcopy printing can also be initiated if WebTransactions receives a message from the host application containing an appropriate hardcopy escape sequence. In this case, WebTransactions handles the incoming message as normal, i.e. an appropriate HTML page is generated and sent to the browser. A print file is also created containing an alphanumeric representation of the current screen (see step 1 in the diagram on page 178).

## 9.4.2 Host data printing

OSD applications are able to route information to specific printers. There are two ways of implementing this bypass printing concept:

1. The printer has the same name as the terminal which is connected to the host application. In OSD terminology, the "station name" is used. In the WebTransactions environment, the terminal corresponds to the WebTransactions server. In this case, the print file is sent directly to the WebTransactions server.
2. The printer has its own station name. The terminal is simply used for print control and is known to the host application.

The host application possesses a number of interfaces for station name information.

*Example for OSD/UTM environment*

1. KDCS INFO

   This KDCS call requests information from openUTM. The operation modifier SI is used to query the station name.
2. KDCS INIT

   This KDCS call is used to log onto a UTM program. The operation modifier PU returns information about the current conversion. For details see the openUTM manual "Programming Applications with KDCS for COBOL, C and C++".

### Printer with same name as terminal

The host application sends the information to be printed to WebTransactions. The OSD host adapter recognizes that bypass printing has been activated. It writes the information which is to be printed to a file and sets the system object's `BYPASS` attribute to `"Yes"`. This file is stored in the temporary directory of the corresponding WebTransactions session. As in the case of hardcopy printing, the control frame is sent at regular intervals in the background and WebTransactions is asked whether a print file exists (see section "Terminal hardcopy printing" on page 181). If a print file does exist, the prepared file is sent to the browser. A corresponding MIME type should be defined at the browser in order to start an associated print program (see section "Configuring the web browser" on page 197).

i By default, WebTransactions transfers the data in the BYPASS message independently of its content (i.e. transparently). This has the advantage that it is possible to print both graphic and text files.

*Bypass printing with conversion*

OSD applications often prepare bypass printing only for “simple” printers such as type 9001. If a different printer type is connected to the client, it may be necessary for WebTransactions to modify information in the print file rather than simply forward it. These changes may, for example, consist in defining a different maximum line length or converting certain strings in the print file. In this case, you must configure additional option and conversion files in the browser, see section “Assigning a print program” on page 198.

### Processing steps defined in wtasync.htm for terminal bypass printing

```
// Support of bypass print ///////////////////////////////////////////////
else if (host_system.BYPASS   == "Yes")
      {
        host_system.BYPASS = "No";     // Reset flag before
        if (host_system.WT_BROWSER_PRINT.toLowerCase() != 'yes')
          host.$MESSAGE.PRINTING;        // calling host.$MESSAGE.PRINTING
        else
        {
          exits = new WT_Userexit ('WTSystemExits');
          if (!host_system.PRINTFILE_NAME)
            WT_SYSTEM._printFile = WT_SYSTEM.BASEDIR + "/tmp/" +
WT_SYSTEM.SESSION + "/" + host.$MESSAGE.PRINTFILE_NAME;
          else
          {
            var i =
host_system.PRINTFILE_NAME.replace(/\\/g,'/').lastIndexOf('/');
            files = exits.Getdir (host_system.PRINTFILE_NAME.substring(0,i),
host_system.PRINTFILE_NAME.substring(i+1) + '*');
            if (files)
            {
              filesArray = files.split('\n');
              WT_SYSTEM._printFile =
host_system.PRINTFILE_NAME.substring(0,i+1)+  filesArray[0];
            }
            else
              WT_SYSTEM._printFile = WT_SYSTEM.BASEDIR + "/tmp/" +
WT_SYSTEM.SESSION + "/" + host.$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 bypass print file is waiting to be printed, WebTransactions sets the connection-specific system object's `BYPASS` attribute to `"Yes"`. If a print request is indicated in this way, then the value of `BYPASS` is reset to `"No"` in `wtasync.htm`.

If printing 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`).

i Please note that the value of `BYPASS` must be reset to `"No"` **before** the host control object attribute `$MESSAGE.PRINTING` is evaluated since interpretation of the template is aborted and HTML generation is suppressed when `$MESSAGE.PRINTING` is evaluated.

### Printer with a name different from that of the terminal

In this case, you can use an existing print server product for Host-to-LAN printing.

i This solution can only be used in an Intranet. In addition, the printer type (PCL, Postscript, etc.) must be configured accordingly in the OSD system.

### Using an existing print server product for host-to-LAN printing

To send OSD application print jobs to a specific LAN printer you must install a print server on the PC to which the printer is connected. This means that network printers are available for host-driven print functions. The software product RSO V3.0A or higher must be installed on the computer running the OSD application.

Print server configuration is described in section "Configuring the print server for Windows" on page 202.

### Assigning a printer to a Web browser client

To output print information on a printer located close to the user, special naming conventions that somehow reflect this correlation must be used in the configuration of the OSD application. For instance, the printer situated close to the terminal with the station name STATABCD could be configured with the name PRNABCD. In this case, the assignment convention would be as follows: if the print job is started by a terminal with the station name STATxxxx it should be sent to the printer PRNxxxx.

To allow this type of convention to be extended to use for Web access, you must ensure that each browser user uses a specific individual station name which is configured in the OSD system. Within WebTransactions templates, the host name and IP address of the computer on which the browser is running can be accessed via system object attributes. In the case of the CGI interface, these attributes are as follows:

| | |
|---|---|
| `WT_SYSTEM.CGI.REMOTE_HOST` | contains the host name |
| `WT_SYSTEM.CGI.REMOTE_ADDR` | contains the IP address |

In this way you can assign each browser computer a special station name in the WebTransactions template.

*Example 1*

In the following example, the WebTransactions clients (systems that access the WebTransactions application via a Web browser) are identified by their station names. A special station name, which is configured in the OSD system, is assigned to each WebTransactions client.

| **Name of the WebTransactions client (host name of the system on which the browser runs)** | **Station name** |
|---|---|
| D241PBOH | STATPBOH |
| D241PCRS | STATPCRS |
| D241PDAN | STATPDAN |

Corresponding WT script (to be inserted in the start template):

```
<wtOnCreateScript>
   WT_SYSTEM.STATION_NAME = "STAT" + WT_SYSTEM.CGI.REMOTE_HOST.substring(4.4)
</wtOnCreateScript>
```

*Example 2*

In the following example, the WebTransactions clients (systems that access the WebTransactions application via a Web browser) are identified by their IP addresses.

| **IP address of the WebTransactions client (IP address of the system on which the browser runs** | **Station name** |
|---|---|
| 133.125.22.3 | STAT001 |
| 133.122.54.6 | STAT002 |
| 135.12.8.1 | STAT003 |

Corresponding WTScript (to be inserted in the start template):

```
<wtOnCreateScript>
   if (WT_SYSTEM.CGI.REMOTE_ADDR  == "133.125.22.3")
       WT_SYSTEM.STATION_NAME = STAT001;
   else if (WT_SYSTEM.CGI.REMOTE_ADDR  == "133.122.54.6")
       WT_SYSTEM.STATION_NAME = STAT002;
   else if (WT_SYSTEM.CGI.REMOTE_ADDR  == "135.12.8.1")
        WT_SYSTEM.STATION_NAME = STAT003;
</wtOnCreateScript
```

### Assignment problems with Web access via a proxy server

The assignment procedure described above does not work if the browser system is connected to WebTransactions via a proxy server. In this case, the `CGI.REMOTE_HOST` and `CGI.REMOTE_ADDR` attributes only contain the name and IP address of the proxy server.

However, you can resolve this problem by identifying individual users by means of user IDs. For this purpose, you must insert a request in the start template asking the user to enter his/her user ID.

*Example*

```
<html>
<head>
<title>Identification Page</TITLE>
</head>
<body style="font-family: courier" bgcolor="#C0C0C0">
<wtDataForm name="Identify">

Please identify yourself

<input type = "TEXT" name = "USERID" size = "4" maxlength = "4"  >

</wtDataForm>
</body>
</html>

<wtOnReceiveScript>

WT_SYSTEM.STATION_NAME= "STAT"  + WT_POSTED.USERID;

...........  open application with the correct station name ..........
</wtOnReceiveScript>
```

## 9.4.3 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.

### Browser display printing initiated by the user

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

### Browser display printing initiated by the host application

The information displayed in the browser is printed automatically by Netscape Navigator if the `self.print()` method is called in a JavaScript on the client.

This can be achieved by inserting the following statement in an wtOnCreate script:

```
document.write ("<SCRIPT>self.print();</SCRIPT>");
```

### 9.4.4 Print functions delivered (Windows browser platform)

WebTransactions contains various print functions which you can use for terminal hardcopy printing (see page 181) and host data printing (see page 185). The print functions are:

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

– `WTAPrint` print plugin

The `wtKeysOSD.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.

#### 9.4.4.1 Browser print

The browser print function is implemented as a parameter of the inline WTBean `wtcOSD` (see section "Creating a new OSD communication object (wtcOSD)" on page 169 and the WebTransactions manual "Concepts and Functions").

WTBean `wtcOSD` 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 wtcStartOSD** select the tab **Further options**.

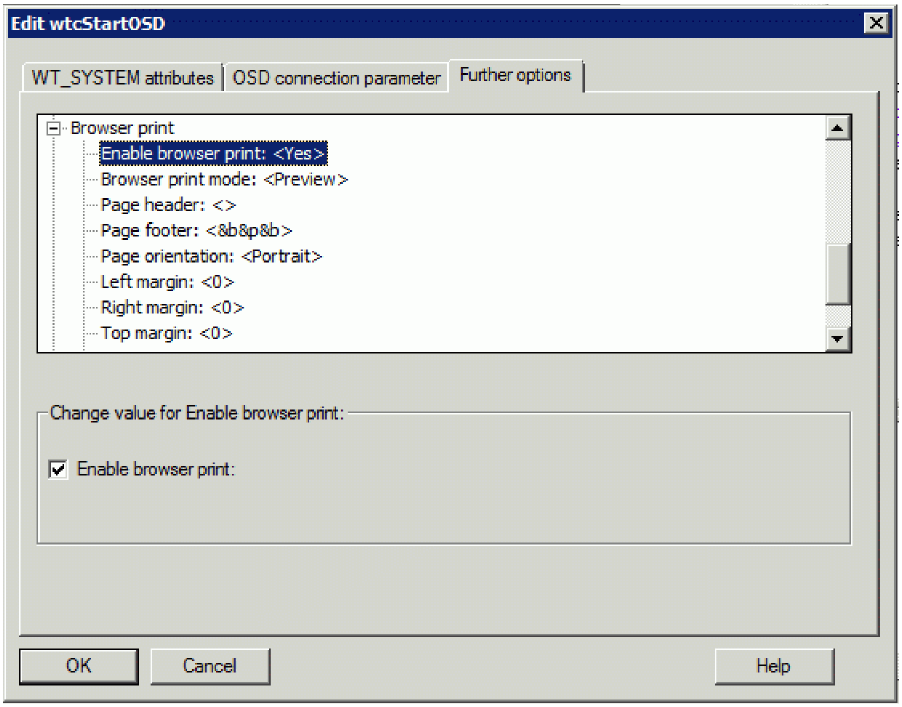
► Under **Global parameter**, click the **Enable asynchronous messages** entry.

► 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**.


Edit wtcStartOSD

WT_SYSTEM attributes | OSD connection parameter | Further options

Browser print
- Enable browser print: <Yes>
- Browser print mode: <Preview>
- Page header: <>
- Page footer: <&b&p&b>
- Page orientation: <Portrait>
- Left margin: <0>
- Right margin: <0>
- Top margin: <0>

Change value for Enable browser print:

☑ Enable browser print:

All the other options under **Browser print** will only be evaluated 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 section “Variables in header and footer lines” on page 193)

**Page footer**

Text for the page footer (see section “Variables in header and footer lines” on page 193)

**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* `of` *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>"
  ```

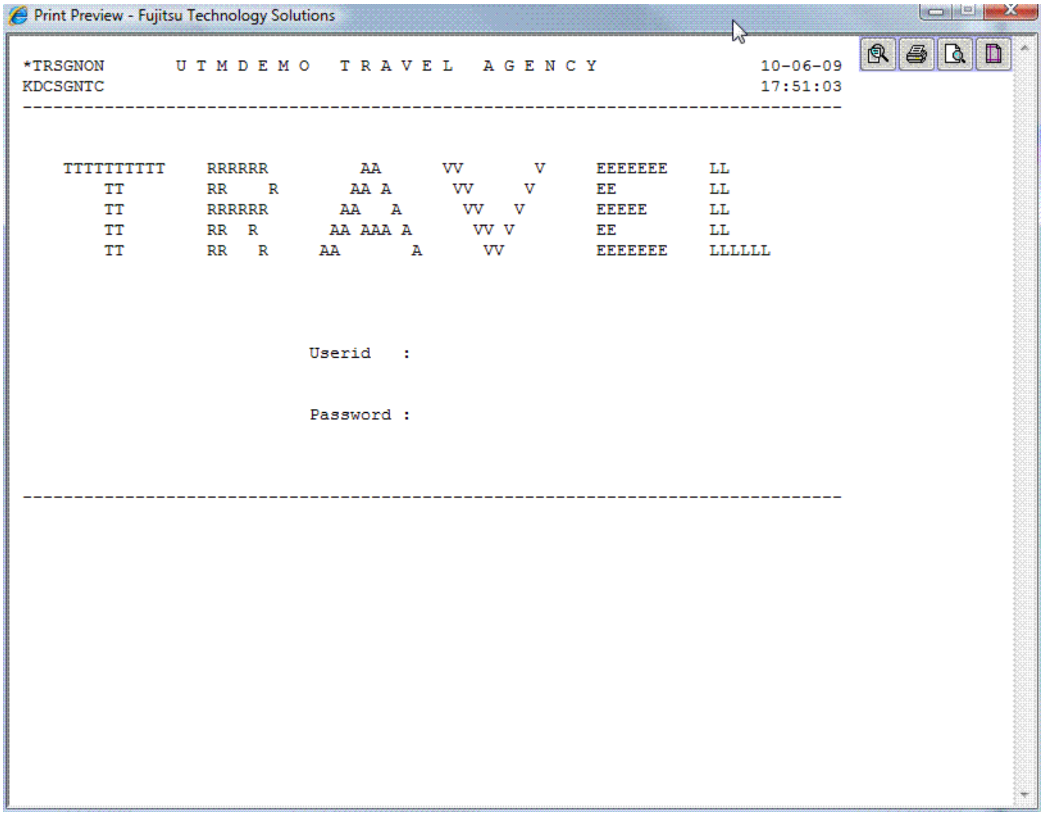
  replaces the control character sequence with a CSS page break which has already been defined in the template.

– 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.



```
*TRSGNON       U T M D E M O   T R A V E L   A G E N C Y                10-06-09
KDCSGNTC                                                                17:51:03
--------------------------------------------------------------------------------


    TTTTTTTTTT    RRRRRR         AA      VV       V     EEEEEEE    LL
        TT        RR    R       AA A      VV      V     EE         LL
        TT        RRRRRR       AA   A      VV   V       EEEEE      LL
        TT        RR  R       AA AAA A      VV V        EE         LL
        TT        RR   R     AA       A      VV         EEEEEEE    LLLLLL




                            Userid   :


                            Password :



--------------------------------------------------------------------------------
```

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 section “wtc_bp_print.cnv conversion file” on page 194).

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.

### 9.4.4.2 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.

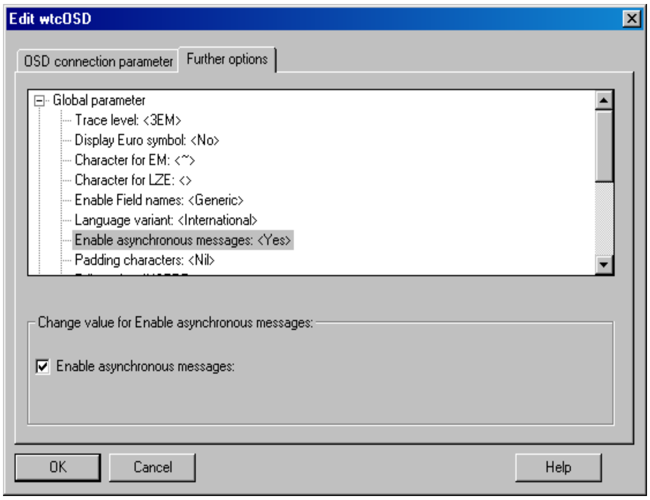
Activation of the print plugin `WTAPrint` is implemented as a parameter of the inline WTBean `wtcOSD` (see section “Creating a new OSD communication object (wtcOSD)” on page 169 and the WebTransactions manual "Concepts and Functions”).

#### 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 wtcStartOSD** 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.



Edit wtcOSD

OSD connection parameter | Further options

- Global parameter
  - Trace level: <3EM>
  - Display Euro symbol: <No>
  - Character for EM: <~>
  - Character for LZE: <>
  - Enable Field names: <Generic>
  - Language variant: <International>
  - Enable asynchronous messages: <Yes>
  - Padding characters: <Nil>

Change value for Enable asynchronous messages:

☑ Enable 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]
```

i 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 198).

*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 198).

*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:

   MIME type:
   `webta/bypass-print`

   Assigned program:
   ```
   WTAPrint.exe "%1" BYPASS 0
   WTAPrint.exe "%1" BYPASS 3 "C:\TEMP\PRINT FILE"
   ```

3. 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
   ```

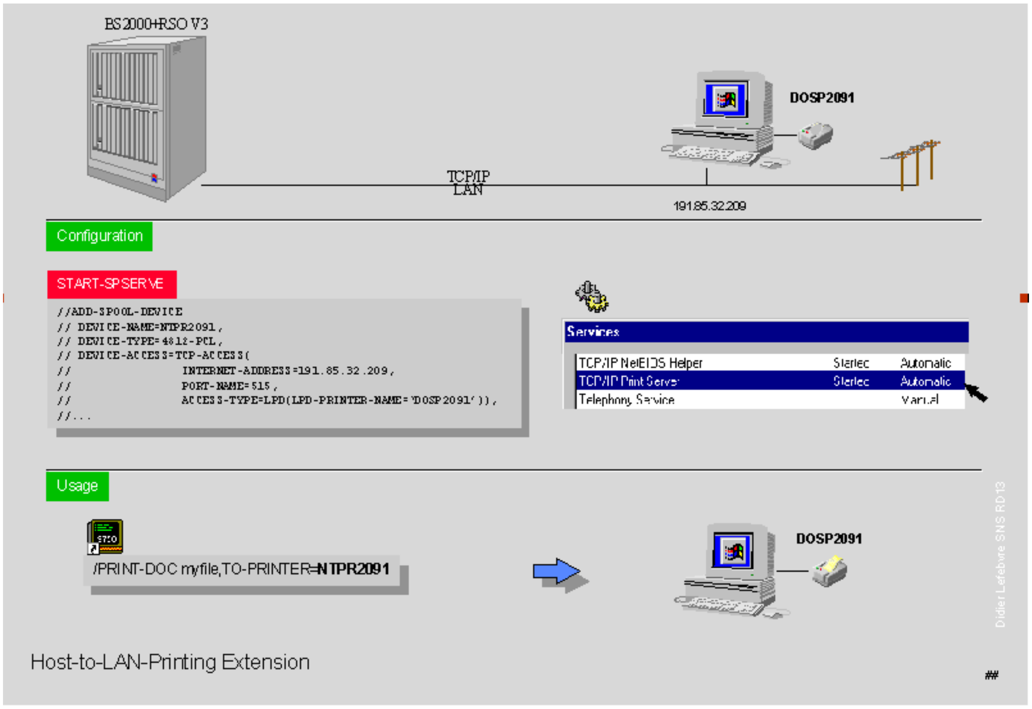
   The following rules apply to this file:

   – 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.

### 9.4.5 Configuring the print server for Windows

To make network printers accessible for OSD applications, you must install and configure a print server on the client PC. A print server is included on the Windows CD-ROM.

The figure below illustrates the steps which must be performed at the OSD and Windows machines.



```
//ADD-SPOOL-DEVICE
// DEVICE-NAME=NTPR2091,
// DEVICE-TYPE=4812-PCL,
// DEVICE-ACCESS=TCP-ACCESS(
//                    INTERNET-ADDRESS=191.85.32.209,
//                    PORT-NAME=515,
//                    ACCESS-TYPE=LPD(LPD-PRINTER-NAME='DOSP2091')),
//...
```

| | | |
|---|---|---|
| TCP/IP NetBIOS Helper | Started | Automatic |
| TCP/IP Print Server | Started | Automatic |
| Telephony Service | | Manual |

```
/PRINT-DOC myfile,TO-PRINTER=NTPR2091
```

Figure 5: Steps for setting up a print server

#### OSD configuration with the RSO utility SPSERVE

DEVICE-NAME
: Station name of the printer for the OSD application.

DEVICE-TYPE
: Printer type, e.g. PCL4, Postscript, etc.

INTERNET-ADDRESS
: IP-address of the client PC.

LPD-PRINTER-NAME
: Name of the printer at the client PC.

**Windows:**

- ► If there is no “TCP/IP print services” service available, install this via
  **Start**/**Settings**/**Control Panel/Add/Remove Programs/**
  **Add/Remove Windows Components/Other Network File and Print Services**
  or
  /**Details**/**Print Services for UNIX**
- ► Activate the “TCP/IP print services”.

# 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**

**E**nhanced **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**

**F**ormat **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 MVS Applications**
User Guide

**WebTransactions**
**Access to Dynamic Web Contents**
User Guide

**WebTransactions**
**Web Frontend for Web Services**
User Guide

## Other publications

The manuals are available as online manuals, see *http://manuals.ts.fujitsu.com*.

**openUTM**
**Programming Applications with KDCS for COBOL, C and C++**
Core Manual

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