VIRTEL Web Access

User's Guide

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NOTICE

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1. Incoming calls

1.1. Introduction

1.1.1. VIRTEL Web Access (VWA)

VIRTEL Web Access, formerly known as “Web-to-Host” (W2H), is a set of functions which enable information produced by host applications to be presented in an Internet browser.

The principle of operation of this program relies on the production of HTML pages stored in a directory at the host site containing standard tags and also tags specific to VIRTEL. Invoked by a browser or a program, these pages form the basis of translation “on the fly” of the specific tags, thus enabling the dynamic generation of pages sent to the browser. The VWA model also includes functions which allow dynamic modification of the presentation of the 3270 screens in an HTML page, with the aim of making the interface as “clickable” as possible. This chapter describes the set of functions required to support this function and presupposes a certain knowledge of the development of HTML pages.

Some fundamental principles must be taken into consideration:

1. Sessions between a browser and an HTTP server are in disconnected mode, while they are in connected mode between VIRTEL and the host application.
2. The flow of information between an HTTP server and a client’s browser always occurs on the initiative of the client.
3. A single request from the browser will only invoke a single response from the HTTP server, while the transmission of a message to an application on the host may generate several response messages at once (for example, a message to clear the screen followed by a new screen image).

These differences give rise to a need to ensure maintenance of session context between a client and a host application. This is done by the SESSION-CODE tag embedded in each template page.

Although the HTML pages used to display 3270 data contain specific VIRTEL tags, these pages can be developed using standard web development tools. The pages containing VIRTEL specific tags are stored in a VIRTEL directory along with any images and other elements required.

1.1.2. VIRTEL Web Modernisation (VWM)

VIRTEL Web Modernisation, formerly known as “Host-Web-Services” (HWS), allows the presentation of host applications to be modified, without modifying the application itself. The presentation can be adapted to a format (HTML, XML, Excel, etc) suited to the requester, while hiding the details of navigation within the 3270 transactions.

This function is implemented through a combination of the VIRTEL Web Access functions described in "Creating HTML and XML templates", page 25 and the "scenario language" described in "Web Modernisation VIRTEL Scenarios", page 147.

VIRTEL Web Modernisation allows "frozen" or "untouchable" 3270 transactions to be accessed by intermediate servers (n-tier architecture) or from a browser, while hiding the details of navigation within the transactions. Variable input data for the transaction can either be included in the URL (GET method), or sent as data with the HTTP request (POST method).

1.1.3. VIRTEL Web Integration (VWI)

The objective of VIRTEL Web Integration, formerly known as "Host-for-Web" (H4W), is to allow a host application to take maximum control of its web interface. This is in complete contrast to VWA/VWM, whose objective is to avoid modification of host applications.

To control its web interface, an application has at its disposal primarily the 3270 screen, the VIRTEL table variable facility, the HTML page template, and a set of VIRTEL commands contained in structured fields. Additionally, for browser requests which enter VIRTEL using an entry point which specifies emulation type "HOST4WEB", the application can also use a set of VIRTEL control commands which can be embedded in the 3270 screen via a BMS map, ISPF panel, or 3270 datastream. These HOST4WEB commands, available from VIRTEL version 4.28 onwards, provide the same general functions as the structured field commands in earlier versions.

Table variables, structured field commands, and HOST4WEB commands, are sent by the application to the 3270 session using standard methods (EXEC CICS SEND, ISPEXEC DISPLAY PANEL, TSO TPUT, etc). VIRTEL intercepts and acts upon these commands, for example by selecting the page template or loading data which can be referenced by VIRTEL orders embedded in the page templates and used to build lists of values or data tables.

For more information, refer to the chapter "Programming Interfaces", page 235.

1.1.4. Service Transactions

A Service Transaction is a long-running VIRTEL transaction which maintains a session with a host application and uses this session to serve a series of HTTP request / responses. Unlike a regular HTTP transaction, which serves requests only from its originating user, identified by a specific VIRTEL SESSION-CODE, a service transaction can serve a different user each time it processes an HTTP request. Service transactions are typically used to provide fast access to public information such as the lists of field values displayed by the "VIRTEL Suggest" feature.

A service transaction is started by an HTTP URL in exactly the same way as a regular transaction, but when it has finished processing its first HTTP request, it indicates its readiness to serve another user, either by means of the script command &) described under the heading "Transactions — Connection / Disconnection Scripts" in the VIRTEL Connectivity Reference documentation, or by means of the "ACTION$ SERVE-ANOTHER-USER", page 151 command in a scenario.

A service transaction remains connected to the host application between input messages. It is then eligible to process any HTTP request which specifies the same entry point and transaction name. Since service transactions can potentially be used by many different users, a typical service transaction will provide information which is not sensitive to being signed-on as a particular user.

1.2. VIRTEL URL Formats

1.2.1. Static pages

The general form of the URL for an HTML page stored in a VIRTEL directory is:

```
http://ipaddr:port/pathname/pagename
```

ipaddr:port

> corresponds to the “Local ident” field of an HTTP line defined to VIRTEL. The rules of the line are used to select the entry point. This entry point, which must specify emulation type HTML, contains the list of transactions which the user is authorized to invoke.

pathname

> represents a VIRTEL directory containing HTML pages or other elements. Refer to the section “How the path name corresponds to a VIRTEL directory”, page 12 below for details of how the pathname is used to select the VIRTEL directory.

pagename

> is the name of an element (HTML page, etc.) in the specified directory. VIRTEL converts the element name to upper case (unless “case sensitive” is specified in the directory definition), and truncates the name if necessary to the maximum length specified in the directory definition (see “Directory Management”, page 21).

VIRTEL also accepts certain abbreviated forms of the URL:

```
http://ipaddr:port/pathname/
```

ipaddr:port

> is the address of the HTTP line, as before.

pathname

> represents a VIRTEL directory, as described above. In this case, VIRTEL loads a default page from this directory. The default page name is the same as the entry point name. Note: the trailing slash is compulsory.

```
http://ipaddr:port/pagename
```

ipaddr:port

> is the address of the HTTP line, as before.

pagename

> is the name of a page to be loaded from the default directory. The default directory corresponds to a default pathname equal to the entry point name.

```
http://ipaddr:port
```

ipaddr:port

> is the address of the HTTP line, as before.

In this case, VIRTEL loads the default URL. VIRTEL obtains the default URL from the “TIOA at logon” field of the default transaction. The default transaction is a type 4 transaction which has the same name as the entry point. See example 7 below for an example of a default URL. If the “TIOA at logon” field of the default transaction is blank, then VIRTEL loads the default page from the default directory. The default page has the same name as the entry point, and the default directory corresponds to a default pathname equal to the entry point name.

1.2.2. How the path name corresponds to a VIRTEL directory

The pathname specified in a VIRTEL URL is used to select a VIRTEL directory which contains HTML page templates and other elements such as CSS stylesheets, JavaScript procedures, and GIF or JPEG images. VIRTEL directories have a simple 8-character case-insensitive name, whereas the pathname is expressed in Unix-style syntax (one or more case-sensitive components separated by slashes), as is conventional for web applications. VIRTEL must therefore translate the Unix-style pathname into a VIRTEL directory name.

The process of mapping a pathname to a VIRTEL directory name is carried out by means of VIRTEL transactions which are defined under the entry point selected for each request by the rules of the HTTP line. The entry point contains both processing transactions (application types 1, 2, and 3) and directory transactions (application type 4).

To find the directory which corresponds to the pathname, VIRTEL looks for a type 4 transaction whose external name matches the first component of the pathname, and whose “Check URL prefix” field is either blank or matches the start of the pathname. The name of the VIRTEL directory is contained in the “Application name” field of the first such matching transaction found under the entry point.

Notes:

- The comparison of the first component of the pathname with the transaction external name is case insensitive, and if the first component of the pathname is longer than 8 characters, only the first 8 characters are compared.
- The comparison of the beginning of the pathname against the transaction’s “Check URL prefix” field is case sensitive.
- The “Check URL prefix” field may contain “%20” to represent a blank and “?” to ignore a character position.
- If the “Check URL prefix” field is completely blank it is considered to match any pathname whose first component matches the transaction external name.

1.2.2.1. Examples

Assume that entry point WEB2HOST contains the following transactions:

```
LIST of TRANSACTIONS prefixed by: W2H    ----------- Applid: SPVIRH2  17:53:47

Internal External     Description                                Application
Name     Name
W2H-00   WEB2HOST Default HTML directory (URL prefix blank)        W2H-DIR
W2H-04   home     User directory (URL prefix /home/user1)          USER1DIR
W2H-05   home     User directory (URL prefix /home/user2)          USER2DIR
W2H-06   IMAGES   All /images directories (URL prefix blank)       W2H-DIR
W2H-10   cics     CICS application                                 DBDCCICS
W2H-20   tso      TSO application                                  TSO
```

Transactions under entry point WEB2HOST

In this example, transactions W2H-00, W2H-04, W2H-05, and W2H-06 are “application type 4” (directory transactions). Transactions W2H-10 and W2H-20 are “application type 1” (processing transactions) and play no part in the directory selection process.

The figure below shows an example of the detail of a directory transaction:

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: SPVIRH2  15:18:38

Internal name ===> W2H-04                 To associate with an entry point name
External name ===> home                   Name displayed on user menu
Description   ===> User directory (URL prefix /home/user1)
Application   ===> USER1DIR               Application to be called
PassTicket    ===> 0  Name ===>           0=no 1=yes 2=unsigned
Application type   ===> 4                 1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> DELOC             Prefix of name of partner terminals
Logmode            ===>                   Specify when LOGMODE must be changed
How started        ===> 2                 1=menu 2=sub-menu 3=auto
Security           ===> 0                 0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                   0=no 1=yes 2=if2VIRTEL 4=auto
Check URL Prefix   ===> /home/user1

TIOA at logon      ===>
TIOA at logoff     ===>

Initial Scenario   ===>                    Final Scenario     ===>
Input Scenario     ===>                    Output Scenario    ===>

P1=Update                         P3=Return                       P12=Server
```

Example of a directory transaction

1.2.2.2. Example 1: Neither pathname nor pagename specified

```
http://ipaddr:port
```

The pathname defaults to the entry point name, WEB2HOST, which matches transaction W2H-00. The pagename also defaults to WEB2HOST. VIRTEL therefore fetches page WEB2HOST from the directory W2H-DIR.

1.2.2.3. Example 2: Pagename specified

```
http://ipaddr:port/menu.htm
```

The pathname defaults to the entry point name, WEB2HOST, which matches transaction W2H-00. VIRTEL therefore fetches page menu.htm from the directory W2H-DIR.

1.2.2.4. Example 3: Pathname specified

```
http://ipaddr:port/home/user1/
```

The pathname /home/user1 matches transaction W2H-04. The pagename defaults to the entry point name, WEB2HOST. VIRTEL therefore fetches page WEB2HOST from the directory USER1DIR.

1.2.2.5. Example 4: Pathname and pagename specified

```
http://ipaddr:port/home/user2/index.html
```

The pathname /home/user2 matches transaction W2H-05. VIRTEL therefore fetches page index.html from the directory USER2DIR.

1.2.2.6. Example 5: Undefined pathname specified

```
http://ipaddr:port/home/user3/index.html
```

In this case the pathname /home/user3 does not match any transaction. VIRTEL therefore rejects the request.

1.2.2.7. Example 6: Partly-defined pathname specified

```
http://ipaddr:port/images/misc/square.gif
```

The pathname /images/misc is not specifically defined to VIRTEL. However there is a transaction W2H-06 whose external name is IMAGES and whose “Check URL prefix” field is blank, which matches all pathnames whose first component is /images. VIRTEL therefore fetches the page square.gif from the directory W2H-DIR.

1.2.2.8. Example 7: Entry point with default URL

When a user connects to a VIRTEL line without specifying either pathname or pagename, as in the example below, the entry point may be configured to redirect the request to a default URL:

```
http://ipaddr:port
```

A default URL may be specified in the transaction whose external name is the same as the entry point name. In the example type 4 transaction W2H-00 shown below, the default URL for the entry point WEB2HOST is /w2h/WEB2VIRT.htm+Cics and thus the URL http://ipaddr:port is processed by VIRTEL as if http://ipaddr:port/w2h/WEB2VIRT.htm+Cics had been specified.

```
TRANSACTION DETAIL DEFINITION --------------------- Applid: SPVIRH2  15:19:57

Internal name ===> W2H-00                  To associate with an entry point name
External name ===> WEB2HOST                Name displayed on user menu
Description   ===> Répertoire des pages HTML - (Accés par défaut)
Application   ===> W2H-DIR                 Application to be called
PassTicket    ===> 0  Name ===>            0=no 1=yes 2=unsigned
Application type   ===> 4                  1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> DELOC              Prefix of name of partner terminals
Logmode            ===>                    Specify when LOGMODE must be changed
How started        ===> 2                  1=menu 2=sub-menu 3=auto
Security           ===> 0                  0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                    0=no 1=yes 2=if2VIRTEL 4=auto
Check URL Prefix   ===>

TIOA at logon      ===> /w2h/WEB2VIRT.htm+Cics

TIOA at logoff     ===>

Initial Scenario   ===>                    Final Scenario     ===>
Input Scenario     ===>                    Output Scenario    ===>

P1=Update                          P3=Return                          P12=Server
```

Example of a default transaction with default URL

1.2.3. Dynamic pages

The general form of the URL for a VIRTEL Web Access, VIRTEL Web Integration, or VIRTEL Web Modernisation transaction is:

```
http://ipaddr:port/pathname/pagename+tranname
```

ipaddr:port

is the address of the HTTP line, as before.

pathname

represents a VIRTEL directory, as described earlier.

pagename

is the name of an element (HTML or XML) in the specified directory. This name may be converted to upper case and truncated to the maximum length defined in the directory definition, as previously described. This element is used as the "template page" into which VIRTEL inserts dynamic data.

tranname

is the external name of a transaction defined under the entry point. The application program (which may be a CICS transaction or other VTAM application, a VIRTEL sub-application, or an external server) invoked by this transaction provides the dynamic data which VIRTEL inserts into the template page.

1.2.3.1. Dynamic URL with userdata

A second form of URL allows user data to be passed to VIRTEL:

```
http://ipaddr:port/pathname/pagename+tranname+userdata
```

ipaddr:port

is the address of the HTTP line, as before.

pathname

represents a VIRTEL directory, as described earlier.

pagename

is the name of a template page, as before.

tranname

is the name of the transaction which provides the dynamic data for the template page.

userdata

is a character string which can be tested by the "User Data" field in the rules of the HTTP line (see "Rules" in the VIRTEL Connectivity Reference documentation). This allows the administrator to assign an entry point to the request based upon the contents of the userdata in the URL. The userdata also becomes the value of the "routing parameter" associated with the tranname transaction. The routing parameter can be referenced by the variable &1 in the "TIOA at logon" field of the tranname transaction (see "Defining transaction parameters" in the VIRTEL Connectivity Reference documentation). Additionally, if the rule which is selected specifies "URL" in its "Parameter" field, and if the HTTP terminal relays are defined in a logical pool (see "HTTP Terminals" under the heading "Definition of an HTTP line" in the VIRTEL Connectivity Reference documentation), then the routing parameter is used by VIRTEL to select a relay LU for the tranname transaction.

1.2.3.2. Dynamic URL with parameters

A third form of URL allows one or more parameters to be passed to a transaction by means of an "Input Scenario" or by a "Connection / Disconnection Script":

```
http://ipaddr:port/pathname/pagename+tranname?param1=value&param2=value
```

ipaddr:port

is the address of the HTTP line, as before.

pathname

represents a VIRTEL directory, as described earlier.

pagename

is the name of a template page, as before.

tranname

is the name of the transaction which provides the dynamic data for the template page. This transaction must be defined with the name of a presentation module in its “Output Scenario” field.

param1, param2, ...

are the names of the parameters which the scenario can pick up using the COPY$ INPUT-TO-VARIABLE or COPY$ INPUT-TO-SCREEN instructions (described 153) or which can be substituted in a script by means of the &=paramn= system variable (see “Transactions – Connection / Disconnection Scripts” in the VIRTEL Connectivity Reference documentation. The cumulative length of the URL parameters is limited by the BUFSIZE parameter of the VIRTCT. If blanks or other special characters are required in the parameter value, then the special characters must be coded in the standard URL escape format %xx where xx is the hexadecimal value of the character in ASCII. For example, a blank is represented as %20.

1.2.3.3. Dynamic URL with userdata and parameters

A URL may contain both userdata and query parameters, as shown in the following example. The various components of the URL have the same meaning as described in the preceding two sections.

```
http://ipaddr:port/pathname/pagename+tranname+userdata?param1=value&param2=value
```

1.2.4. 3270 session management

1.2.4.1. VirtelSession parameter

Once a session has been established with the host 3270 application, the template page allows the user to link to the next screen in the 3270 application dialog by means of a URL in the following format:

```
http://ipaddr:port/pathname/pagename++VirtelSession=sessionid
```

ipaddr:port

is the address of the HTTP line, as before.

pathname

represents a VIRTEL directory, as described earlier.

pagename

is the name of the template page to be used for displaying the next 3270 screen (usually the same as the current template page).

sessionid

is a VIRTEL-generated code which allows VIRTEL to identify the user as being already connected to an existing host session. The parameter VirtelSession=sessionid is inserted by the {{{SESSION-CODE}}} tag embedded in the template page (see “Session And Context Management”, page 26).

1.2.4.2. PrintVirtelSession parameter

A second form of the URL with SESSION-CODE allows display of print data sent by the application to the virtual printer associated with the specified session. Normally this URL will be embedded in a template page and will be triggered by the {{{IF-PRINT-IS-READY}}} tag.

```
http://ipaddr:port/pathname/pagename++PrintVirtelSession=sessionid
```

ipaddr:port

is the address of the HTTP line, as before.

pathname

represents a VIRTEL directory, as described earlier.

pagename

is the name of the template page to be used for displaying the print data. This page must contain the special {{{PRINT}}} tag (see "3287 Printing", page 61) at the point at which the print data are to be inserted in the page.

sessionid

is a code which allows VIRTEL to identify the printer associated with the user's 3270 session. The parameter PrintVirtelSession=sessionid (where sessionid is the associated 3270 session identifier), is generated by the {{{SESSION-CODE}}} tag as in the following example:

```
imprim.htm++Print{{{SESSION-CODE}}}
```

1.2.4.3. ValidateVirtelSession parameter

A third form of URL with SESSION-CODE allows a JavaScript procedure embedded in a template page to determine whether there are pending updates to the 3270 screen image. For this type of URL, VIRTEL returns no data, only an HTTP response code. The possible response codes are:

205 (Reset Content)

the host application has updated the 3270 screen image since the last time it was sent to the user

304 (Not Modified)

the host application has not updated the 3270 screen image

404 (Not Found)

the sessionid code does not represent a valid host session

When response code 205 is indicated, the JavaScript procedure sends a further request to VIRTEL to retrieve the updated 3270 screen image. This technique can be useful in handling host applications which use multiple 3270 write commands to paint a single 3270 screen, where the user might otherwise be presented with a partially updated screen. An example of this technique is contained in the WEB2VIRT.htm page delivered in the VIRTEL sample directory W2H-DIR.

```
http://ipaddr:port/pathname/pagename++ValidateVirtelSession=sessionid
```

ipaddr:port

is the address of the HTTP line, as before.

pathname

represents a VIRTEL directory, as described earlier.

pagename

may be specified but is not used.

sessionid

is a code which allows VIRTEL to identify the 3270 session whose status is being queried. The parameter ValidateVirtelSession=sessionid (where sessionid is the associated 3270 session identifier), is generated by the {{{SESSION-CODE}}} tag as in the following example:

```
check.htm++Validate{{{SESSION-CODE}}}
```

For compatability with previous versions, the keyword VerifyVirtelSession is also accepted. VerifyVirtelSession is similar to ValidateVirtelSession except that it produces only two possible return codes: 205 (screen updated) and 304 (screen not updated or session invalid).

1.2.4.4. $UseCookieSession$ parameter

As an alternative to specifying the VirtelSession parameter in the URL, the SESSION-CODE may be sent to VIRTEL in a cookie. An example URL is shown below:

```
http://ipaddr:port/pathname/pagename++$UseCookieSession$
```

ipaddr:port

> is the address of the HTTP line, as before.

pathname

> represents a VIRTEL directory, as described earlier.

pagename

> is the name of the template page to be used for displaying the next 3270 screen (usually the same as the current template page).

$UseCookieSession$

> indicates that the SESSION-CODE is contained in the VirtelSession cookie.

The VirtelSession cookie should be generated by Javascript as shown in the example below. This function may be added to the custom.js script (see "Site customization of Javascript functions", page 124):

```
/* Save VirtelSession cookie after each subpage is loaded */
function after_responseHandle(o, url, xtim) {
  var node = document.getElementById("sesscode");
  if (node) {
    var text = node.textContent || node.innerText;
    var sess = text.replace(/^VirtelSession=/i,"");
    createCookie("VirtelSession", sess, 1);
  }
}
```

Custom Javascript function to generate a VirtelSession cookie

1.2.5. Capability URLs

A URL may contain a "capability token" generated by another terminal. In this case the URL inherits certain rights or capabilities conferred by the other terminal. The capabilities inherited depend on the parameters specified in the SET-HEADER tag which generated the capability token. For further details, see "Capability Tokens", page 59.

```
http://ipaddr:port/pathname/pagename+tranname+capabilitytoken
```

ipaddr:port

> is the address of the HTTP line, as before.

pathname

> represents a VIRTEL directory, as described earlier.

pagename

> is the name of a template page, as before.

tranname

(optional) is the name of the transaction which supplies the dynamic data for the page. If the transaction name is omitted then two "+" signs must separate the pagename from the capabilitytoken

capability

token is a token which grants rights to another terminal's resources. This code, whose format is x-Virtel-name:token, is generated by the "{{{SET-HEADER}}}", page 60 tag. The code is case-sensitive and so the capitalization must be exactly the same as the generated token.

1.2.6. Transmission of upload cookie by URL

The security code, which identifies a user during page upload by HTTP, is normally transmitted between the browser and VIRTEL as a cookie (see "Uploading HTML Pages", page 68). If, for security or other reasons, your browser does not allow the use of cookies, then the security code can, as an alternative, be embedded in a URL of the form shown below:

```
http://ipaddr:port/pathname/pagename+tranname+securitycode
```

ipaddr:port

is the address of the HTTP line, as before.

pathname

represents a VIRTEL directory, as described earlier.

pagename

is the name of a template page, as before.

tranname

is the name of the transaction which supplies the dynamic data for the page.

securitycode

is the code which allows VIRTEL to identify the user. This code, whose format is VirtelCookie=xxxxxxxxxxxxxxxx, is generated by the {{{SECURITY-TOKEN}}} tag, as shown in the example below:

```
upload2.htm+upload+VirtelCookie={{{SECURITY-TOKEN}}}
```

The following format allows a static page to be displayed:

```
http://ipaddr:port/pathname/pagename++securitycode
```

ipaddr:port

is the address of the HTTP line, as before.

pathname

represents a VIRTEL directory, as described earlier.

pagename

is the name of the page.

securitycode

is a code of format VirtelCookie=xxxxxxxxxxxxxxxx which allows VIRTEL to identify the user, as before.

On receipt of this URL, VIRTEL treats the VirtelCookie= parameter as if it were a cookie transmitted by the browser.

1.2.7. Propagation of signon by URL

A URL embedded in a page sent by VIRTEL may contain a VirtelUserSignon parameter in order to propagate the user's signon credentials to another page. The value of the parameter is generated by the {{{USER-SIGNON-CODE}}} tag, described 63. This can be useful in cases where the browser does not propagate the user name and password from one page to another, for example when using VIRTEL transaction security type 4. The format of a URL containing a signon code is shown below:

```
http://ipaddr:port/pathname/pagename+tranname+VirtelUserSignon=signoncode
```

ipaddr:port

> is the address of the HTTP line, as before.

pathname

> represents a VIRTEL directory, as described earlier.

pagename

> is the name of a template page, as before.

tranname

> is the name of the transaction which supplies the dynamic data for the page.

signoncode

> is a code which allows VIRTEL to identify the signed-on user. This code is generated by the {{{USER-SIGNON-CODE}}} tag, as shown in the example below:
>
> ```
> http://web2virt.htm+cics+VirtelUserSignon={{{USER-SIGNON-CODE}}}
> ```

1.2.8. The Universal Transaction

A transaction may be defined with an external name consisting of an asterisk, and this is considered to be a "universal" transaction. A universal transaction matches any URL not already matched by a preceding transaction in the entry point. This allows VIRTEL to process URLs whose format does not conform to the classic VIRTEL formats previously described.

1.3. Directory Management

HTML and XML template pages and other entities such as CSS stylesheets, JavaScript procedures, and GIF or JPEG images used by VIRTEL Web Access are stored in directories within a VSAM KSDS managed by VIRTEL. Each KSDS defined to VIRTEL can contain one or more directories. The system administrator can upload pages and other elements into a VIRTEL directory by using a web browser or by e-mail, as described in detail in the section "Uploading HTML Pages", page 68.

1.3.1. Accessing the application

The directory management sub-application allows the administrator to define directories. The sub-application is accessible by [PF6] from the configuration menu, or by [PF12] from the system services menu followed by option 3, or from the VIRTEL Multi-Session menu via a transaction which invokes VIRTEL module VIR0042.

1.3.2. Security

If security is active, access to the directory management sub-application from the configuration menu or the system services menu is controlled by resource $$PCPC$$.

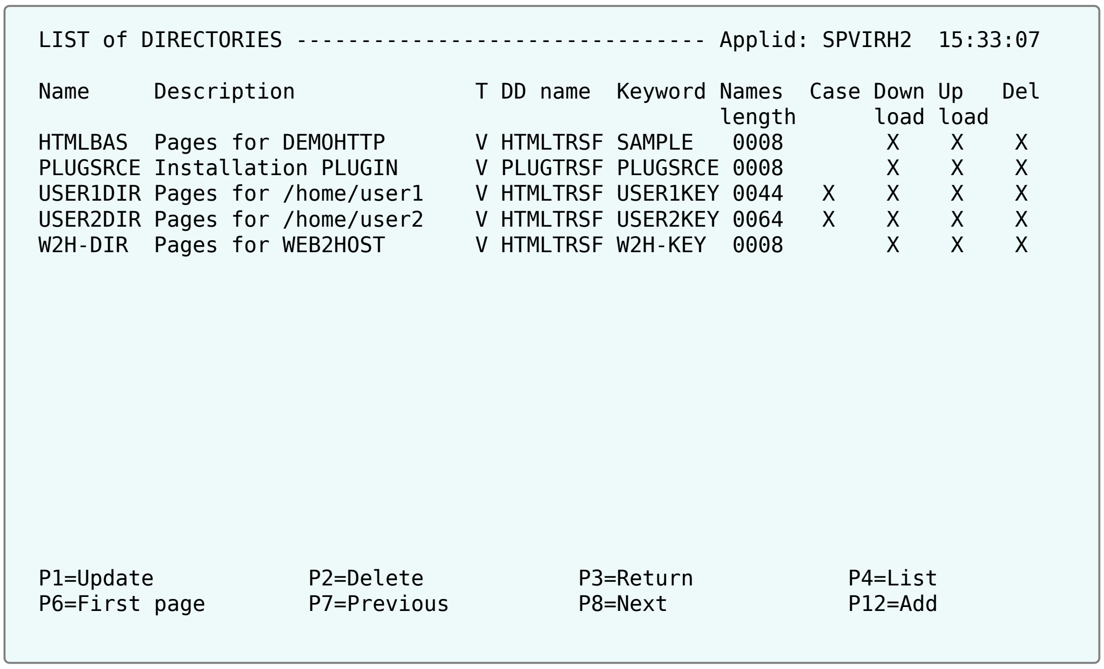
When invoked via a transaction, normal transaction security rules apply.

In addition, each directory is protected by a resource whose name is the same as the directory name. The administrator must have access to this resource in order to view or manage the contents of the directory, or to upload pages to the directory. When an external security product is used, the resource is defined in the class named by the RNODE parameter in the VIRTCT (see “Parameters of the VIRTCT” in the VIRTEL Installation Guide).

Security management is described in the Virtel Security documentation.

1.3.3. Creating, modifying, and deleting directories

When the directory management sub-application is invoked, it displays a list of the directories already defined in the system:



```
LIST of DIRECTORIES ------------------------------- Applid: SPVIRH2  15:33:07

Name     Description              T DD name  Keyword Names   Case Down Up   Del
                                                    length        load load
HTMLBAS  Pages for DEMOHTTP       V HTMLTRSF SAMPLE   0008         X    X    X
PLUGSRCE Installation PLUGIN      V PLUGTRSF PLUGSRCE 0008         X    X    X
USER1DIR Pages for /home/user1    V HTMLTRSF USER1KEY 0044    X    X    X    X
USER2DIR Pages for /home/user2    V HTMLTRSF USER2KEY 0064    X    X    X    X
W2H-DIR  Pages for WEB2HOST       V HTMLTRSF W2H-KEY  0008         X    X    X















P1=Update           P2=Delete           P3=Return           P4=List
P6=First page       P7=Previous         P8=Next             P12=Add
```

Directory management summary screen

1.3.4. Associated functions

1.3.4.1. Deleting a directory definition

To delete a directory definition, place the cursor on the name of the directory to be deleted and press [PF2]. The message CONFIRM DELETE appears at the bottom of the screen. Press [PF2] again. The message DELETE OK indicates that the deletion of the directory definition was successful. While the message CONFIRM DELETE is displayed, you can press any function key other than [PF2] to cancel the operation.

1.3.4.2. Displaying directory contents

To display the contents of a directory, place the cursor on the directory name and press [PF4]. VIRTEL displays the directory contents management screen described below.

1.3.4.3. Adding a directory definition

To create a new directory definition, place the cursor on the blank line after the last directory, and press [PF12] to display an empty directory detail screen. Fill in all of the fields and press [ENTER]. The message CREATION OK indicates that the directory definition was successfully created.

1.3.4.4. Scrolling the list of directories

To scroll to the top of the list, press [PF6]. To scroll up or down the list, press [PF7] or [PF8].

1.3.4.5. Exiting from directory management

To return to the configuration menu, press [PF3].

1.3.5. Defining directory parameters

To access the detail screen for any directory, place the cursor on the directory name and press [PF12]:

```
DIRECTORY DETAIL DEFINITION ----------------------- Applid: SPVIRH2  15:35:31

Name          ===> W2H-DIR                         Name of this directory
Description   ===> Pages for WEB2HOST              Describes directory
Type          ===> V                               V=VSAM
DD name       ===> HTMLTRSF                        DD name in Virtel JCL
Keyword       ===> W2H-KEY                         Directory internal name
Size of names ===> 0008                            Significant length of filenames
Case          ===>                                 Filenames are case sensitive

------------------------------------------------------------------------------
If a user has access to this directory, he may:
(mark with 'X')

Copy up       ===> X                               upload a file
Copy down     ===> X                               download a file
Delete        ===> X                               delete a file

------------------------------------------------------------------------------


P1=Update                         P3=Return                         P4=List
```

Directory management detail screen

Name

The name of the directory as known by VIRTEL. If security is active, this name must also be defined as a resource to which the user must be authorized.

Description

Comment associated with the directory.

Type

V (or blank) indicates that the directory is held in a VSAM KSDS.

DD name

The file name of the VSAM KSDS which contains the directory. This name must be defined in one of the UFILEn parameters in the VIRTCT, and a DD statement with the same name must appear in the VIRTEL started task JCL.

Keyword

This is an 8-byte key which allows multiple directories to be stored within a single VSAM KSDS. Each directory in a KSDS must have a unique key.

Size of names

The maximum length of the names of HTML pages and other elements stored in this directory. The minimum (and default) value is 8. The maximum value is 64.

Case

Any non-blank character in this field indicates that the element names stored in this directory are case sensitive. Blank indicates that the names are not case sensitive.

Copy up

This field is used by VIRTEL/PC. For VIRTEL Web Access directories, the value **X** must be coded.

Copy down

This field is used by VIRTEL/PC. For VIRTEL Web Access directories, the value **X** must be coded.

Delete

This field is used by VIRTEL/PC. For VIRTEL Web Access directories, the value **X** must be coded.

1.3.6. Directory contents management

After pressing [PF4] at the directory management summary screen or detail screen, VIRTEL displays a list of the files in the directory:

```
DIRECTORY  : W2H-DIR [1]      55 FILE(S)------------ Applid: SPVIRH2  10:50:31
             Pages for WEB2HOST [2]

  Name                                                  Size   Date    Time

WEBSERV0                                                5572 20050208 15:52:23
ES.GIF                                                   517 20050208 15:51:35
CALENDAR                                            K     53 20050208 15:51:25
FAVICON.                                                2998 20050208 15:51:36
NOIR.GIF                                                 161 20050208 15:51:48
TXTSERV2                                            K     15 20050208 15:52:05
STYLNOIR                                                2709 20050208 15:51:56
CAL-EN.J                                                3830 20050208 15:51:24
BLUE.GIF                                                 161 20050208 15:51:23
WEB2PLUG                                                6370 20050208 15:52:21
VERT.GIF                                                 161 20050208 15:52:12
RED.GIF                                                  161 20050208 15:51:50
IMPRIM.H                                                 826 20050208 15:51:40
VIRLOAD.                                                1346 20050208 15:52:13
VIRTNOIR                                                3737 20050208 15:52:16
   [3]                                                   [4]     [5]       [6]
F2=Delete            F3=Return            F7=First page          F8=Next page
F6=Copy to ... HTMLBAS
                 [7]
```

Directory contents management screen

[1]

Name of directory.

[2]

Directory description.

[3]

Name of elements contained in the directory.

[4]

Approximate size of element (K indicates that the size is displayed in kilo-bytes).

[5]

Date when element was loaded into the directory.

[6]

Time when element was loaded into the directory.

[7]

Name of target directory for file copy.

1.3.7. Associated functions

1.3.7.1. Deleting an element

To delete an element from a directory, place the cursor on the name of the element to be deleted and press [PF2]. The message CONFIRM DELETE appears at the bottom of the screen. Press [PF2] again. The message DELETE OK indicates that the deletion of the element was successful. While the message CONFIRM DELETE is displayed, you can press any function key other than [PF2] to cancel the operation.

1.3.7.2. Copying an element to another directory

To copy an element from directory A to directory B, first display the contents of directory A. In field [7] type the name of the target directory B, then press [ENTER]. Next, place the cursor on the name of the element to be copied, then press [PF6]. The message COPY COMPLETED indicates that the operation was successful. If the element exists in the target directory, the copy fails and the message THIS FILE IS ALREADY IN THE TARGET DIRECTORY is displayed at the bottom of the screen.

1.3.7.3. Scrolling the list

The list of elements can be scrolled up and down using [PF7] and [PF8].

1.3.7.4. Exiting from directory contents management

To return to the list of directories, press [PF3].

1.4. Creating HTML And XML Template Pages

1.4.1. Introduction

Template pages are the means by which VIRTEL presents host application data to the user via a web browser. In addition to standard HTML or XML tags, template pages contain VIRTEL-specific tags enabling integration of information delivered by the mainframe application programs. HTML template pages may contain GIF or JPEG images, sounds, scripts such as JavaScript or any other function or program elements that are compatible with the browser. Template pages may be produced either by hand or by using standard HTML or XML design tools available on the market,

1.4.2. Defining the tag delimiters

VIRTEL-specific tags are used to insert data originating at the host into an HTML or XML page, and to manage colours and function keys in an HTML page. VIRTEL-specific tags are identified by special begin and end delimiters.

The delimiters themselves are defined by means of a comment placed between the tags <HEAD> and </HEAD> of the HTML page. The actual delimiters may vary from one page to another.

```
<!--VIRTEL start="{{{" end="}}}" -->
```

In this example, VIRTEL-specific tags are defined as being represented by a succession of 3 opening braces and terminated by a succession of 3 closing braces. This convention is maintained throughout the remainder of this chapter.

1.4.3. Session and context management

1.4.3.1. Introduction

VIRTEL uses the concept of a sessioncode to maintain the context between a client using a browser and the host application to which the client is connected. This code allows VIRTEL to identify the client and to associate the client with a session already established with a host application.

1.4.3.2. SESSION-CODE tag

The SESSION-CODE tag is used to create the URL associated with form submission.

```
{{{ SESSION-CODE }}}
```

The SESSION-CODE tag allows a sessioncode to be inserted in the template page in the format VirtelSession=xxxxxxxxxxxxxxxx. The value of the sessioncode changes after each message. For examples of its use, see "Transmitting Data To The Host", page 27, and "3287 Printing", page 61.

1.4.3.3. AJAX-SESSION-CODE tag

The AJAX-SESSION-CODE tag is similar to the SESSION-CODE tag, but it generates the code in a different format which does not change with each request. This is useful when implementing an AJAX dialog between the application and the browser. For this type of application, it is not always possible to transmit the VIRTEL session code to the browser, especially if a Javascript library is used.

```
{{{ AJAX-SESSION-CODE }}}
```

The AJAX-SESSION-CODE tag allows a sessioncode to be inserted in the template page in the format AjaxSession=xxxxxxxxxxxxxxxx. For example:

```
result.txt+cics+{{{ AJAX-SESSION-CODE }}}
```

1.4.3.4. ACTION$ REFRESH-TERMINAL

This instruction allows a scenario to trigger a 205 response to the Long Poll session.

This 205 response will then tell the JavaScript to refresh the terminal 3270 emulation screen, so that the user can see whatever was changed by the scenario.

```
    ACTION$  REFRESH-TERMINAL
```

1.4.3.5. SET-INITIAL-TIMEOUT tag

The SET-INITIAL-TIMEOUT tag allows a timeout to be started when VIRTEL builds the page.

```
{{{ SET-INITIAL-TIMEOUT "n" }}}
```

For example, if the instruction

```
{{{ SET-INITIAL-TIMEOUT "10" }}}
```

is coded in a page or a sub-page, then VIRTEL will cancel the session if the workstation has not sent another request after 10 seconds.

1.4.4. Transmitting data to the host

Transmission of data to the host uses the principle of sending an HTML form. In conjunction with the SESSION-CODE tag, the form allows the transmission of input fields to the host application, and the display of the subsequent application screen.

The form is defined as follows:

```
<form name="FormName" action="VirtelURL" method="get">

    .. Data which will be transmitted to the HTTP server ..</form>
```

name

Form name. The name of the form is used in JavaScript procedures to refer to various elements of the form. For an example, see the section “Cursor management”, page 38.

action

URL transmitted to the server, in the following format:

```
action="pagename++{{{SESSION-CODE}}}"
```

pagename

is the name of the template page to be used to display the subsequent screen sent by the host application (usually the same as the current template page)

{{{SESSION-CODE}}}

identifies the session established with the host application

method

Transmission mode.

Always POST.

Example :

```
<form name="Virtel" action="WEB2VIRT.htm++{{{SESSION-CODE}}}" method="post">
```

1.4.5. Where to position the elements of an HTML page

By design, an HTML page starts with the <HTML> tag and is terminated by the </HTML> tag. In order to be able to be correctly interpreted by the browser, other tags are necessary, for example <HEAD> and </HEAD> as well as <BODY> and </BODY>. All other tags are optional.

As shown previously, data transmitted to the HTTP server by the client is itself placed in the tag fields <FORM> and </FORM>. In order to minimise traffic, it is also advisable to place only useful data in the tag fields for example, generated fields or copies resulting from GENERATE-HTML and COPY-FROM tags, as well as indispensable fields such as focusField and pfkField. Other data may be placed anywhere in the area of the HTML page, provided that their position conforms to the standards. The following presents an example of the possible structure.

```
<HTML>
<HEAD><!------------------- start of HTML page header -------------------->
 <style><!-- définition des classes de style
 .GREEN {font-family: monospace; background: #000000; color: #00FF00; }
 //--></style>
 <!--VIRTEL start="{{{" end="}}}" -->
 {{{ON-ATTRIBUTE (PROTECTED,WHITE)<font color=white>}}}
 {{{ON-END-OF-ATTRIBUTE (PROTECTED,WHITE)</font>}}}
 {{{ADD-TO-FIELDS (NORMAL,NOCOLOR) class="GREEN" }}}
 {{{DEFINE-HTML-PFKEY "PFKFIELD"}}}
 {{{DEFINE-HTML-FOCUS-FIELD "FOCUSFIELD"}}}
 <title>Sample HTML page</title>
</HEAD><!------------------ end of HTML page header -------------------->

<script language="JavaScript"><!--
function SetFocus()
   { document.virtelForm.{{{FIELD-WITH-CURSOR}}}.focus(); }
function SaveFocus(CurrentFieldName)
   { document.virtelForm.FOCUSFIELD.value = CurrentFieldName; }
function SubmitForm(valeur)
   { document.virtelForm.PFKFIELD.value = valeur;
     document.virtelForm.submit(); }
function ShowPopup()
   { var popup = window.open("","PopupImpression",'width=614,height=129');
     popup.location = "imprim.htm++Print{{{SESSION-CODE}}}"; }
--></script>
<!---------------------- start of HTML page body -------------------->
<BODY onLoad="SetFocus()">
<!------------------------ start of HTML form ----------------------->
<FORM name="virtelForm"
      action="example.html++{{{SESSION-CODE}}}"
      method=="POST">

{{{ GENERATE-HTML (1,1,1920) }}}

 <input name="PFKFIELD" type="HIDDEN" value="">
 <input name="FOCUSFIELD" type="HIDDEN" value="{{{FIELD-WITH-CURSOR}}}">
</FORM><!--------------------- end of HTML form --------------------->

<!—-Place submit buttons and hypertext links here. For example:-->
<a href="javascript:submitform('PF1')" >soumettre avec PF01</a>
<INPUT TYPE="BUTTON" size="5" onclick="SubmitForm(this.value)" value="PF01">
<script language="JavaScript"><!--
{{{IF-PRINT-IS-READY
   ShowPopUp();
}}}
--></script>
</BODY><!------------------ end of HTML page body -------------------->
</HTML>
```

For a full example, see the WEB2VIRT.htm page delivered with VIRTEL.

1.4.6. Inserting host application data in a page

1.4.6.1. Introduction

Insertion of host application data in an HTML or XML page is achieved with the GENERATE-HTML and COPY-FROM tags.

1.4.6.2. GENERATE-HTML tag

The GENERATE-HTML tag instructs VIRTEL to convert all or part of the 3270 screen into HTML form data. Output fields are converted into text, while input fields are converted into HTML input statements. The generated text and input fields are aligned so as to correspond as far as possible with the layout of the original 3270 screen. The resulting generation takes account of the nature of the data as well as the information specified in the ON-ATTRIBUTE, ON-END-OF-ATTRIBUTE and ADD-TO-FIELDS tags.

```
{{{ GENERATE-HTML (row, col, len) }}}
```

row,col

Starting position (row and column number on the 3270 screen) of the data to be copied. This starting position will usually contain a 3270 attribute character.

len

Length of the data to be copied (including attribute characters).

For example, the command {{{ GENERATE-HTML (01,01,1920) }}} will generate the total contents of the 3270 screen.

An alternative form of the GENERATE-HTML tag allows the position and length to be specified by means of a symbolic name defined in a previous DEFINE-DFHMDF-NAME or DEFINE-DFHMDF-COLUMN tag (see “{{{DEFINE-DFHMDF-COLUMN}}}”, page 32).

```
{{{ GENERATE-HTML "name" }}}
```

name

symbolic name defined in a previous DEFINE-DFHMDF-NAME or DEFINE-DFHMDF-COLUMN tag.

1.4.6.3. COPY-FROM tag

The COPY-FROM tag copies data into the HTML page from a specific location on the 3270 screen. Unlike the GENERATE-HTML tag, the COPY-FROM tag copies only the data and does not process any associated 3270 field attributes.

```
{{{ COPY-FROM (row, col, len) }}}
```

row,col

Starting position (row and column number on the 3270 screen) of the data to be copied. This will typically be the first character after the attribute character which defines the start of the field.

len

Length of the data to be copied.

An alternative form of the COPY-FROM tag allows the position and length to be specified by means of a symbolic name defined in a previous DEFINE-DFHMDF-NAME or DEFINE-DFHMDF-COLUMN tag (described 37).

```
{{{ COPY-FROM "name" }}}
```

name

symbolic name defined in a previous DEFINE-DFHMDF-NAME or DEFINE-DFHMDF-COLUMN tag.

Normally, any binary zeroes in the copied data will be removed. However, if the BLANK-BINARY-ZEROES option is set (see "Setting and unsetting local options", page 42) then binary zeroes will be converted to blanks.

1.4.6.4. CREATE-VARIABLE-FROM tag

The CREATE-VARIABLE-FROM tag copies data from the 3270 screen into a VIRTEL variable. There are several formats of the COPY-VARIABLE-FROM tag, as described below.

In the first form of CREATE-VARIABLE-FROM, the name of a variable is specified within the tag. Data is extracted from the indicated location on the screen, continuing until an attribute character is found or until the specified length is reached. Any non-alphanumeric characters are removed, all alphabetic characters are converted to upper case, and the resulting data is copied into the variable. If the variable does not exist, it will be created. If the variable already exists, the new value will be appended to any existing values.

```
{{{ CREATE-VARIABLE-FROM (row, col, len) "varname" }}}
```

row,col

Starting position (row and column number on the 3270 screen) of the data to be copied. This will typically be the first character after an attribute character which defines the start of a field.

len

Length of the data to be copied.

varname

The name of the variable to be created

The second form of CREATE-VARIABLE-FROM is distinguished by the absence of a variable name within the tag. In this case, the variable name is obtained from the 3270 screen. Data is extracted from the indicated location on the screen, continuing until an attribute character is found or until the specified length is reached. Any non-alphanumeric characters are removed, all alphabetic characters are converted to upper case, and the resulting string is used as a variable name. If the variable does not exist, it will be created. If the variable already exists, a new value will be appended to any existing values. If the variable name was terminated by an attribute character, then the data in the following field is used as the value of the variable. Otherwise the string "EMPTY" will be used as the value of the variable.

```
{{{ CREATE-VARIABLE-FROM (row, col, len) }}}
```

row,col

Line and column number on the 3270 screen containing the variable name.

len

Total length of the variable name and value to be copied.

The third form of CREATE-VARIABLE-FROM allows a rectangle to be copied from the screen. With a fourth sub-parameter specified, the instruction will not stop collecting data after encountering an attribute, but will continue adding values to the variable for the specified height on the screen. Any attributes found in the rectangle will be copied as blanks. If the variable does not exist, it will be created. If the variable already exists, the new values will be appended to any existing values.

```
{{{ CREATE-VARIABLE-FROM (row, col, width, height) "varname" }}}
```

row,col
Starting position (row and column number on the 3270 screen) of the data to be copied.

width,height
Size (in columns and rows) of the rectangle to be copied.

varname
The name of the variable to be created

1.4.6.5. DEFINE-HTML-FIELD-NAME tag

The DEFINE-HTML-FIELD-NAME tag requests that VIRTEL should use a specific HTML input field name for the specified 3270 field, instead of an automatically generated name. The DEFINE-HTML-FIELD-NAME tag may be followed by a GENERATE-HTML tag, in which case VIRTEL will generate an HTML input field with the specified name, or the input field may be explicitly coded in the page template, in which case VIRTEL will use the name to associate the HTML input field with the 3270 field at the specified position. Normally this tag is not needed because the automatically generated field names are adequate for all except certain specialised applications.

```
{{{ DEFINE-HTML-FIELD-NAME (row, col, len) "name"}}}
```

row,col
Line and column number of the start of the field on the 3270 screen. This must be the first character after the attribute character.

len
Length of the input field (excluding attribute character).

name
Name to be associated with the HTML input field.

1.4.6.6. DEFINE-HTML-FIELD tag

The DEFINE-HTML-FIELD tag is equivalent to a DEFINE-HTML-FIELD-NAME tag followed by a GENERATE-HTML tag.

```
{{{ DEFINE-HTML-FIELD (row, col, len) "name"}}}
```

row,col
Line and column number of the start of the field on the 3270 screen. This must be the first character after the attribute character.

len
Length of the input field (excluding attribute character).

name
Name to be associated with the HTML input field.

1.4.6.7. DEFINE-DFHMDF-NAME tag

The DEFINE-DFHMDF-NAME tag allows a field on the 3270 screen to be given a symbolic name which can be used in a subsequent GENERATE-HTML tag or COPY-FROM tag.

```
{{{ DEFINE-DFHMDF-NAME (row, col, len) "name"}}}
```

row,col

Position (row and column number on the 3270 screen) of the attribute character which precedes the field on the 3270 screen.

len

Length of the 3270 field (excluding attribute character).

name

Name to be associated with the field.

The name specified by the DEFINE-DFHMDF-NAME tag can then be used in subsequent GENERATE-HTML tags or COPY-FROM tags, instead of specifying an explicit row, column, and length. In addition, the DEFINE-DFHMDF-NAME tag generates an implicit DEFINE-HTML-FIELD-NAME tag.

For example, the following tag defines a 10-character input field having attribute byte at row 1 column 59. The field itself occupies row 1 columns 60 to 69:

```
{{{ DEFINE-DFHMDF-NAME (1,59,10) "XDAT10" }}}
```

Subsequently:

```
{{{ GENERATE-HTML "XDAT10" }}}
```

is interpreted as:

```
{{{ GENERATE-HTML (1,59,11) }}}
```

and

```
{{{ COPY-FROM "XDAT10" }}}
```

is interpreted as:

```
{{{ COPY-FROM (1,60,10) }}}
```

and the following tag will be automatically generated:

```
{{{ DEFINE-HTML-FIELD-NAME (1,60,10) "XDAT10" }}}
```

Notice that VIRTEL automatically adjusts the starting position and length as necessary to account for the attribute byte.

1.4.6.8. DEFINE-DFHMDF-COLUMN tag

The DEFINE-DFHMDF-COLUMN tag is similar to the DEFINE-DFHMDF-NAME tag except that it allows the definition of a field which is repeated in the same column position on several consecutive lines of the screen.

```
{{{ DEFINE-DFHMDF-COLUMN (row, col, len, ht) "name"}}}
```

row,col

> Position (row and column number on the 3270 screen) of the attribute character which precedes the first occurrence of the field on the 3270 screen.

len

> Length of each 3270 field (excluding attribute character).

ht

> Height of column (number of lines).

name

> Name to be associated with the field.

The name specified by the DEFINE-DFHMDF-COLUMN tag can be used in subsequent GENERATE-HTML tags or COPY-FROM tags instead of specifying an explicit row, column, and length. The first time the field name is referenced in a GENERATE-HTML or COPY-FROM tag, the first occurrence of the field will be used. Each time the field name is referenced subsequently, the row number is incremented automatically. After the end of the series is reached, any subsequent reference wraps back to the first row number. In addition, the DEFINE-DFHMDF-COLUMN tag implicitly generates a series of DEFINE-HTML-FIELD-NAME tags, each of which contains the field name suffixed by _1, _2, etc.

For example, the following tag defines a column of 5-character input fields having attribute bytes in column 1. The fields themselves occupy columns 2 to 6. The first field is in row 9 and there are 12 occurrences:

```
{{{DEFINE-DFHMDF-COLUMN (9,1,5,12) "NBLIGN" }}}
```

Subsequently:

```
{{{ GENERATE-HTML "NBLIGN" }}}
```

is interpreted as:

```
{{{ GENERATE-HTML (n,1,6) }}}
```

and

```
{{{ COPY-FROM "NBLIGN" }}}
```

is interpreted as:

```
{{{ COPY-FROM (n,2,5) }}}
```

where n takes the next value in the range 9 to 20

The following tags will be automatically generated:

```
{{{DEFINE-HTML-FIELD-NAME (9,2,5) "NBLIGN_1" }}}

  {{{DEFINE-HTML-FIELD-NAME (10,2,5) "NBLIGN_2" }}}
```

and so on until:

```
{{{DEFINE-HTML-FIELD-NAME (20,2,5) "NBLIGN_12" }}}
```

Notice that VIRTEL automatically adjusts the starting positions and lengths as necessary to account for the attribute byte.

1.4.6.9. GENERATE-VARIABLES tag

The GENERATE-VARIABLES tag functions like GENERATE-HTML except that, instead of generating HTML, it generates a set of table variables for each attribute found in the designated portion of the screen.

```
{{{ GENERATE-VARIABLES (row, col, len) "prefix" }}}
```

row,col

Starting position (row and column number on the 3270 screen) of the data to be copied. This starting position will usually contain a 3270 attribute character.

len

Length of the data to be copied (including attribute characters).

prefix

The prefix of the generated variable names.

A set of these variables is generated for each field found on the screen:

***prefix*NAME**

Field name

Example : V00002E9 for an input field, blank for an output field

***prefix*LINE**

Line position of the field attribute (first line = 1)

***prefix*COLUMN**

Column position of the field attribute (first column = 1)

***prefix*LENGTH**

Field length (excluding attribute)

***prefix*ATTRB**

Attribute: ASKIP, PROT, UNPROT, NUM, BRT, NORM, DET, MDT

***prefix*COLOR**

Color: NEUTRAL, BLUE, RED, PINK, GREEN, TURQUOISE, YELLOW, WHITE

***prefix*HILIGHT**

Highlight: BLINK, REVERSE, UNDERLINE, OFF

***prefix*VALUE**

The text contained in the field (excluding attribute)

For example, the tag {{{ GENERATE-VARIABLES (01,01,1920) "MYPREFIX" }}} generates a set of table variables describing the entire contents of the 3270 screen.

Normally, any binary zeroes in the field will be removed from the VALUE. However, if the BLANK-BINARY-ZEROES option is set (see “Setting and unsetting local options”, page 42) then binary zeroes will be converted to blanks.

1.4.6.10. GENERATE-VIR3270 tag

GENERATE-VIR3270, in conjunction with supporting JavaScript functions, is used by VIRTEL Web Access to generate an HTML page which reproduces as closely as possible the look and feel of a classic 3270 screen.

The GENERATE-VIR3270 tag functions like GENERATE-HTML except that, instead of generating HTML form fields corresponding to 3270 input fields, it generates all 3270 fields as HTML spans. Special attribute keywords are added to each span to indicate the type of field, the screen position, and the 3270 field attributes. A subspan is generated for characters whose character attributes differ from the field attributes. In addition, GENERATE-VIR3270 generates a hidden HTML form field for each 3270 input field, and these fields are written as HTML fragments into a VIRTEL table variable so that they can be inserted later in the page.

```
{{{ GENERATE-VIR3270 (row, col, len) "fragvar" }}}
```

row,col

Starting position (row and column number on the 3270 screen) of the data to be copied.

len

Length of the data to be copied.

fragvar

The name of the table variable for the hidden HTML form fields.

The table below shows the HTML attributes generated for each field and 3270 attribute position on the screen:

Attribute name	Meaning	Values
vt=	Field type	O = Output, I = Input, A = 3270 attribute, C = Character subspan
vr=	Row	Row number (first row = 1)
vc=	Column	Column number (first column = 1)
vp=	Position	Offset from start of screen (R1C1 = 0)
vl=	Length	Length of span or subspan

An example of the GENERATE-VIR3270 tag is shown below:

```
<pre><div id="printReady">{{{GENERATE-VIR3270 (1,1,1920) "INFIELDS"}}}
</div></pre>
{{{DEFINE-HTML-PFKEY "pf"}}}<input name="pf" type="HIDDEN">
<div id="infields">
  {{{FOR-EACH-VALUE-IN "INFIELDS"}}}{{{CURRENT-VALUE-OF "INFIELDS"}}}
  {{{END-FOR "INFIELDS"}}}
</div>
```

1.4.7. Colour and font management

1.4.7.1. Introduction

The management of the size and the colours of the text is effected for all fields by means of the ON-ATTRIBUTE and ON-END-OF-ATTRIBUTE tags. For applications which use 3270 character attributes (order code x’28’), the colour and highlighting of individual characters within a field can be managed by means of the ON-CHARACTER-ATTRIBUTE and ON-END-OF-CHARACTER-ATTRIBUTE tags. Input fields may be supplied with additional information by way of the ADD-TO-FIELDS tag.

1.4.7.2. ON-ATTRIBUTE tag

The ON-ATTRIBUTE and ON-END-OF-ATTRIBUTE tags allow HTML tags to be inserted before and after each field depending on the 3270 attributes specified by the host application.

```
{{{ ON-ATTRIBUTE (p1,p2,..,pn) <standard HTML tag> }}}
```

Inserts the value specified by “standard html tag” before the field when the conditions p1 to pn are fulfilled. The parameters p1 to pn may appear in any order, each parameter representing one of the following values:

p1

Type of field: PROTECTED, UNPROTECTED, NON-DISPLAY, NUMERIC, MDTON, DETECTABLE. ALPHANUMERIC, INTENSIFIED, BRIGHT, NORMAL

p2

Highlighting: NOHILIGHT, BLINK, REVERSE, UNDERSCORE

p3

Colour: NOCOLOR, BLUE, RED, PINK, GREEN, YELLOW, TURQUOISE, WHITE

When more than one ON-ATTRIBUTE tag matches the same field, the tags are processed in reverse order and the generated HTML is accumulated from each matching ON-ATTRIBUTE tag. The WITH-NO-MATCH-BELOW keyword allows an ON-ATTRIBUTE tag to match the field only if no match has been found with the ON-ATTRIBUTE tags already processed.

1.4.7.3. ON-END-OF-ATTRIBUTE tag

The presence of the ON-ATTRIBUTE tag requires the presence of an ON-END-OF-ATTRIBUTE tag having the same values for the p1 to pn parameters.

```
{{{ ON-END-OF-ATTRIBUTE (p1,p2,..,pn) <standard HTML tag>}}}
```

Inserts the value specified by “standard html tag” after the field when the conditions p1 to pn are fulfilled.

As previously described for the ON-ATTRIBUTE tag, multiple matching ON-END-OF-ATTRIBUTE tags are processed in reverse order, and the optional WITH-NO-MATCH-BELOW keyword causes the ON-END-OF-ATTRIBUTE tag to match only if no match has been found with the ON-END-OF-ATTRIBUTE tags already processed.

Example:

```
{{{ ON-ATTRIBUTE (PROTECTED,WITH-NO-MATCH-BELOW)<font color=green>}}}
{{{ ON-END-OF-ATTRIBUTE (PROTECTED, WITH-NO-MATCH-BELOW)</font>}}}
{{{ ON-ATTRIBUTE (PROTECTED,NORMAL,NOCOLOR)<font color=#00CCFF>}}}
{{{ ON-END-OF-ATTRIBUTE (PROTECTED,NORMAL,NOCOLOR)</font>}}}
{{{ ON-ATTRIBUTE (PROTECTED,INTENSIFIED,NOCOLOR)<font color=white>}}}
{{{ ON-END-OF-ATTRIBUTE (PROTECTED,INTENSIFIED,NOCOLOR)</font>}}}
{{{ ON-ATTRIBUTE (PROTECTED,BLUE)<font color=#00CCFF>}}}
{{{ ON-END-OF-ATTRIBUTE (PROTECTED,BLUE)</font>}}}
{{{ ON-ATTRIBUTE (PROTECTED,RED)<font color=#c41200>}}}
{{{ ON-END-OF-ATTRIBUTE (PROTECTED,RED)</font>}}}
{{{ ON-ATTRIBUTE (PROTECTED,PINK)<font color=pink>}}}
{{{ ON-END-OF-ATTRIBUTE (PROTECTED,PINK)</font>}}}
{{{ ON-ATTRIBUTE (PROTECTED,GREEN)<font color=#00FF00>}}}
{{{ ON-END-OF-ATTRIBUTE (PROTECTED,GREEN)</font>}}}
{{{ ON-ATTRIBUTE (PROTECTED,TURQUOISE)<font color=#40E0D0>}}}
{{{ ON-END-OF-ATTRIBUTE (PROTECTED,TURQUOISE)</font>}}}
{{{ ON-ATTRIBUTE (PROTECTED,YELLOW)<font color=#FFFF33>}}}
{{{ ON-END-OF-ATTRIBUTE (PROTECTED,YELLOW)</font>}}}
{{{ ON-ATTRIBUTE (PROTECTED,WHITE)<font color=white>}}}
{{{ ON-END-OF-ATTRIBUTE (PROTECTED,WHITE)</font>}}}
```

Example set of ON-ATTRIBUTE and ON-END-OF-ATTRIBUTE tags

1.4.7.4. ON-CHARACTER-ATTRIBUTE tag

If the page template contains ON-CHARACTER-ATTRIBUTE and ON-END-OF-CHARACTER-ATTRIBUTE tags, changes in colour or highlighting of individual characters within a field are surrounded by the specified HTML code during processing by GENERATE-HTML. Since HTML code cannot be included in the “value” clause of an input field, GENERATE-HTML does not generate HTML code for character attributes within input fields.

```
{{{ ON-CHARACTER-ATTRIBUTE (p1,p2) <standard HTML tag> }}}
```

p1,p2

Highlighting and colour parameters as specified for the ON-ATTRIBUTE tag.

1.4.7.5. ON-END-OF-CHARACTER-ATTRIBUTE tag

The ON-END-OF-CHARACTER-ATTRIBUTE tag specifies the HTML code to be inserted at the termination of a character string opened by an ON-CHARACTER-ATTRIBUTE tag.

```
{{{ ON-END-OF-CHARACTER-ATTRIBUTE (p1,p2) <standard HTML tag>}}}
```

1.4.7.6. ADD-TO-FIELDS tag

The presence of an ADD-TO-FIELDS tag allows the definition of each HTML input field to be modified according to the 3270 attributes specified by the host application.

```
{{{ ADD-TO-FIELDS (p1,p2,..,pn) part of standard HTML tag }}}
```

Inserts the value specified by “part of standard html tag” into the HTML <INPUT> tag when the conditions p1 to pn (described in the previous paragraph) are fulfilled.

When more than one ADD-TO-FIELDS tag matches the same field, the tags are processed in order of appearance and the generated HTML is accumulated from each matching ADD-TO-FIELDS tag. The WITH-NO-MATCH-ABOVE keyword allows an ADD-TO-FIELDS tag to match the field only if no match has been found with the ADD-TO-FIELDS tags already processed.

Example:

```
{{{ ADD-TO-FIELDS (NORMAL,NOCOLOR) class="GREEN" }}}
{{{ ADD-TO-FIELDS (INTENSIFIED,NOCOLOR) class="RED" }}}
{{{ ADD-TO-FIELDS (BLUE) class="BLUE" }}}
{{{ ADD-TO-FIELDS (RED) class="RED" }}}
{{{ ADD-TO-FIELDS (PINK) class="PINK" }}}
{{{ ADD-TO-FIELDS (GREEN) class="GREEN" }}}
{{{ ADD-TO-FIELDS (TURQUOISE) class="TURQUOISE" }}}
{{{ ADD-TO-FIELDS (YELLOW) class="YELLOW" }}}
{{{ ADD-TO-FIELDS (WHITE) class="WHITE" }}}
{{{ ADD-TO-FIELDS (DISPLAY,WITH-NO-MATCH-ABOVE) class="GREEN" }}}
```

Example set of ADD-TO-FIELDS tags

In the above example, the parameter class makes reference to a style class defined in the HTML page header:

```
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
<style><!--
 .BLUE {font-family: monospace; background: #00CCFF; }
 .RED {font-family: monospace; background: red; }
```

```
  .PINK {font-family: monospace; background: pink; }
  .GREEN {font-family: monospace; background: #00FF00;}
  .TURQUOISE {font-family: monospace; background: #40E0D0; }
  .YELLOW {font-family: monospace; background: #FFFF33;}
  .WHITE {font-family: monospace; background: #FFFFFF; }
//--></style>
<!--VIRTEL start="{{{" end="}}}" -->
<title>Syspertec - example of generation of HTML pages}}} </title>
</head>
```

Example styles for ADD-TO-FIELDS tags

For certain fields, the action of the ADD-TO-FIELDS tag may be nullified by the NO-ADD-TO-CHECKBOX and NO-ADD-TO-LISTBOX local options (see “Setting and unsetting local options”, page 42).

The ADD-TO-FIELDS tag affects input fields only

1.4.8. Cursor management

1.4.8.1. Introduction

In each message sent from the host application to the browser, VIRTEL automatically manages the positioning of the cursor insofar as is possible. Conversely, when a message is sent to VIRTEL from the browser, it is necessary to know the position of the cursor in order to inform the application on the host side. The cursor position cannot be handled relatively therefore, the cursor’s exact position is communicated via a hidden field specifying the name of the field having the focus at the time of transmission.

Cursor management is determined by the tags DEFINE-HTML-FOCUS-FIELD, FIELD-WITH-CURSOR, DEFAULT-FIELD-WITH-CURSOR and by two JavaScript procedures. More precise positioning of the cursor can be controlled by the optional tags DEFINE-CURSOR-POSITION-FIELD and POSITION-OF-THE-CURSOR.

1.4.8.2. DEFINE-HTML-FOCUS-FIELD tag

The DEFINE-HTML-FOCUS-FIELD tag informs VIRTEL of the existence of the focusField.

```
{{{ DEFINE-HTML-FOCUS-FIELD "focusField" }}}
```

The focusField is a hidden field which will receive the name of the field having the focus, that is to say the input field on which the cursor is positioned, at the moment of transmission of a message from the browser to VIRTEL.

This field must be defined in the following way:

```
<INPUT NAME="focusField" TYPE="HIDDEN" VALUE="{{{FIELD-WITH-CURSOR}}}">
```

1.4.8.3. DEFINE-CURSOR-POSITION-FIELD tag

The DEFINE-CURSOR-POSITION-FIELD tag informs VIRTEL of the existence of the cursorField.

```
{{{ DEFINE-CURSOR-POSITION-FIELD "cursorField" }}}
```

The cursorField is an optional hidden field in which the JavaScript routines may place the exact position of the cursor when a message is transmitted from the browser to VIRTEL. The cursor position is indicated by a string of the format Vnnnnnnn or Pnnnnnnn, where V indicates that the cursor is in a non-protected (input) field, P indicates a protected (output) field, and nnnnnnn is the hexadecimal offset of the cursor from the start of the screen (where 0000000 represents row 1 column 1).

The cursorField must be defined in the following way:

```
<INPUT NAME="cursorField" TYPE="HIDDEN" VALUE="">
```

If both focusField and cursorField are sent to VIRTEL, then VIRTEL will use cursorField to determine the position of the cursor.

1.4.8.4. FIELD-WITH-CURSOR tag

The FIELD-WITH-CURSOR tag enables VIRTEL to insert the name of the field having the focus at the time of transmission of the message to the browser.

```
{{{ FIELD-WITH-CURSOR }}}
```

1.4.8.5. DEFAULT-FIELD-WITH-CURSOR tag

The DEFAULT-FIELD-WITH-CURSOR tag specifies the name generated by the FIELD-WITH-CURSOR tag when the 3270 screen contains no input fields.

```
{{{ DEFAULT-FIELD-WITH-CURSOR "fieldname" }}}
```

In the DEFAULT-FIELD-WITH-CURSOR tag, fieldname must be the name of an HTML input field defined in the template page. If no DEFAULT-FIELD-WITH-CURSOR tag is present, and the screen contains no input fields, VIRTEL will convert the first field on the screen into an input field, so that the FIELD-WITH-CURSOR tag can generate the name of a valid input field.

1.4.8.5.1. Positioning the focus when a message is sent to the browser

The positioning of the focus is done with the help of a JavaScript procedure referenced by the <BODY> tag of the HTML page:

Script for focus position management

```
<script language="Javascript">
<!-- comment to mask script for some browsers
function setfocus()
  {
   document.virtelForm.{{{ FIELD-WITH-CURSOR }}}.focus();
  }
//-->
</script>
```

Cursor position initialisation

```
<body onload="setfocus()">
```

1.4.8.5.2. Positioning the focus in the browser

Once present in the client's browser, the user may need to move the focus to a different field, either by using the TAB key on the keyboard or by using the mouse. The focusField field is automatically updated if the ADD-TO-FIELDS tag calls a script which updates the focus field.

Script for saving the name of the field having the focus

```
<script language="Javascript">
<!-- comment to mask script for some browsers
function savefocus(CurrentFieldName)
  {
   document.virtelForm.focusField.value = CurrentFieldName;
  }
//-->
</script>
```

Automatic call of the update script

```
{{{ ADD-TO-FIELDS onfocus = "savefocus(this.name)" }}}
```

1.4.8.6. POSITION-OF-THE-CURSOR tag

The POSITION-OF-THE-CURSOR tag allows VIRTEL to send the exact position of the cursor to the browser by including a string of the format Vnnnnnnn or Pnnnnnnn in the HTML page. Vnnnnnnn means that the cursor is in a non-protected (input) field. Pnnnnnnn means that the cursor is in a protected (output) field. In both cases, nnnnnnn is the hexadecimal offset of the cursor from the start of the screen (where 0000000 represents row 1 column 1).

```
{{{ POSITION-OF-THE-CURSOR }}}
```

1.4.9. Function key management

1.4.9.1. Introduction

By design, the transmission of information delivered by a 3270 application is effected by using only the function keys, usually the PF and PA keys. Also by design, the navigation from an HTML page is radically different, generally using the mouse to submit requests to the HTTP server. This difference in philosophy makes it difficult, even impossible in certain instances, to detect the use of a function key via the browser. Conserving the ergonomic aspects of the web in an application that allows full use of the function keys is naturally not an easy thing to do, it is, however, made possible by the following functions.

1.4.9.2. Definition of the pfkField field

As with the management of the cursor, the pfkField is a hidden field designed to accept the name of the function key that VIRTEL must use to transmit data to the application on the host.

```
<INPUT NAME="pfkField" TYPE="HIDDEN" VALUE="ENTER">
```

VIRTEL is notified of the existence of the field by the following tag:

```
{{{ DEFINE-HTML-PFKEY = "pfkField" }}}
```

1.4.9.3. Updating the pfkField

The field pfkField is updated by using a JavaScript procedure called at the time of the submission of the request. The script used is referenced in the BUTTON field definition or in the HTML link used for the submission.

Save the name of the field having the focus

```
<script language="Javascript">
<!-- comment to mask script for some browsers
function submitform(pfkey)
  {
   document.virtelForm.pfkField.value = pfkey;
   document.virtelForm.submit();
  }
//-->
</script>
```

Automatic call of the update script from a field of type BUTTON

```
<INPUT TYPE="BUTTON" size="5" VALUE="PF01"
                     onclick="submitform(this.value)">
```

Automatic call of the SCRIPT from a hypertext link

```
<a href="javascript:submitform('PF1')" >submit with PF01</a>
```

The function keys may be defined in the following manner in the “value” keyword of the INPUT TYPE=BUTTON field.

3270 function key	PfkField value
ENTER	ENTER
CLEAR SCREEN	CLEAR
PA1, PA2, PA3	PA1, PA2, PA3
PF1 to PF24	PF01 to PF24 (variations PF1, F1, F01, P1, P01 are also accepted)
Attention	ATTN

Function key values for pfkField

1.4.9.4. Disallowed function keys

Certain function keys may be explicitly restricted by means of the INVALID-PFKEYS tag containing the list of prohibited PF keys.

```
{{{ INVALID-PFKEYS (pfk1, pfk2, .. , pfkn) }}}
```

On the other hand, an exhaustive list of authorised function keys may be specified with the VALID-PFKEYS tag.

```
{{{ VALID-PFKEYS (pfk1, pfk2, .. , pfkn) }}}
```

For example,

Disallow ATTN, PF08 and PF24

```
{{{ INVALID-PFKEYS (ATTN,PF08,PF24) }}}
```

Disallow all function keys except ENTER and PF03

```
{{{ VALID-PFKEYS (ENTER,PF03) }}}
```

1.4.9.5. PF key processing by scenario

A page template can generate a “pseudo-PFkey” intended to be interpreted by an INPUT scenario. This is done by setting the pfkField to a value beginning with SCENARIO. The pseudo-PFKey will be accepted by VIRTEL and treated as ENTER, but it will not be transmitted to the application. The scenario can retrieve the value of the pfkField by means of the COPY$ INPUT-TO-VARIABLE instruction.

For example:

Definition of the BUTTON field in the page template:

```
{{{ DEFINE-HTML-PFKEY "pf" }}}
<INPUT TYPE="BUTTON" size="5" VALUE="SCENARIO-DFHMDF"
                     onclick="submitform(this.value)">
```

Retrieving and testing the PF key value in the INPUT scenario:

```
         COPY$ INPUT-TO-VARIABLE,FIELD='pf',VAR='PF'
         IF$   NOT-FOUND,THEN=NOPARAMS
         CASE$ 'PF',(NE,'SCENARIO-DFHMDF',NOPARAMS)
* generate the screen capture:
         COPY$ OUTPUT-FILE-TO-VARIABLE,                              *
               FILE='DFHMDF.TXT',VAR='CAPTURE'
* send result to browser
         SEND$ AS-FILE,VAR='CAPTURE',                                *
               TYPE='text/plain',NAME='dfhmdf.asm'
NOPARAMS EQU   *
```

1.4.9.6. The Null PF key

A page template or JavaScript program can request VIRTEL to resend the contents of the current 3270 screen, without sending any input to the host application, by setting the pfkField to the value NULL-PF

1.4.10. Setting and unsetting local options

1.4.10.1. Introduction

The SET-LOCAL-OPTIONS and UNSET-LOCAL-OPTIONS tags allow the activation or deactivation of miscellaneous processing options associated with HTML generation. These options are normally deactivated, but any or all of them can be activated by default using the HTSETn parameters in the VIRTCT. Refer to the VIRTEL Installation Guide for details of the HTSETn parameters. The SET-LOCAL-OPTIONS and UNSET-LOCAL-OPTIONS tags apply only to the current page, and take effect from the point in the page at which they appear.

The options which can be specified are:

MAXLENGTH

Indicates that VIRTEL will generate HTML input fields with the parameter “maxlength” in addition to “size”. The “maxlength” parameter ensures that the number of characters that can be entered into an HTML field does not exceed the 3270 field length. By default, VIRTEL does not generate “maxlength”, which allows an unlimited number of characters to be entered in each HTML field, and VIRTEL truncates the value as necessary before sending the data to the host application.

ID

Indicates that VIRTEL will generate HTML input fields with the parameter “id” in addition to the “name” parameter. The “id” has the same value as the “name”. This is intended for use with JavaScript code which refers to VIRTEL-generated fields using the getElementById method.

DO-NOT-IGNORE-BINARY-ZEROES

When this option is activated, then all 3270 NUL characters in input fields generated by VIRTEL will be sent to the browser as SUB characters (x'1A'). When this option is not activated, then VIRTEL will remove 3270 NUL characters from input fields.

BLANK-BINARY-ZEROES

Affects the processing of the COPY-FROM and GENERATE-VARIABLES tags (see “Inserting host application data in a page”, page 29).

HTML-ESCAPES, JAVASCRIPT-ESCAPES, JSON-ESCAPES, NO-ESCAPES, XML-ESCAPES

Affects the processing of the CURRENT-VALUE-OF, TRIMMED-VALUE-OF and NO-BLANKS-VALUE-OF tags (see “Handling table variables”, page 44). Similarly affects the processing of the values generated by GENERATE-VARIABLES.

AUTO-INCREMENT-VARIABLES

When this option is activated, table variables referenced outside a FOR-EACH-VALUE-IN loop will be automatically advanced to their next value each time they are reused. If this option is not active, the CURRENT-VALUE-OF tag always produces the first value of a table variable when it is referenced outside a loop.

NO-ADD-TO-CHECKBOX

When this option is activated, HTML attributes defined within an ADD-TO-FIELDS tag are not added to <input type=checkbox> clauses generated by the GENERATE-HTML tag in conjunction with the FIELD$ IS-BINARY-CHOICE instruction.

NO-ADD-TO-LISTBOX

When this option is activated, HTML attributes defined within an ADD-TO-FIELDS tag are not added to <select> clauses generated by the GENERATE-HTML tag in conjunction with the FIELD$ DEFINE-CHOICE or FIELD$ DEFINE-VARIABLE-CHOICE instructions.

MDT-IF-RECEIVED

When this option is activated, VIRTEL will consider all input fields received from the browser to be “modified” fields to be sent to the host application. Fields in the page not received from the browser are considered to be unmodified and are not sent to the host application. When this option is not activated, VIRTEL inspects the contents of all fields received from the browser to determine whether the field has been modified. VIRTEL sends modified fields to the host application, and any fields not received from the browser are sent as empty fields. Notes: (1) This option must be coded in the page template before the fields to which it applies. (2) This option cannot be specified in the VIRTCT

TRACE-LINE

Setting this option within a page starts a VIRTEL line trace on the HTTP line. Unsetting this option stops the line trace. Refer to the VIRTEL Messages and Operations Guide for more information about line traces.

TRACE-RELAY

Setting this option within a page starts a VIRTEL terminal trace on the VTAM session. Unsetting this option stops the terminal trace. Refer to the VIRTEL Messages and Operations Guide for more information about terminal traces.

1.4.10.2. SET-LOCAL-OPTIONS tag

The SET-LOCAL-OPTIONS tag activates one or more HTML processing options for the remainder of the current page, or until deactivated by UNSET-LOCAL-OPTIONS:

```
{{{ SET-LOCAL-OPTIONS (option, option, ...) }}}
```

option

one or more HTML processing options as described above

1.4.10.3. UNSET-LOCAL-OPTIONS tag

The UNSET-LOCAL-OPTIONS tag deactivates one or more HTML processing options previously activated by SET-LOCAL-OPTIONS or by HTSETn. The specified options are deactivated for the remainder of the current page, or until reactivated by SET-LOCAL-OPTIONS:

```
{{{ UNSET-LOCAL-OPTIONS (option, option, ...) }}}
```

option

one or more HTML processing options as described above.

1.4.11. Handling table variables

1.4.11.1. Introduction

A table variable is a list of values sent to VIRTEL by a host application in a structured field of type "FAE5 or FAE6", page 242. Table variables may also be created by means of a VIRTEL tag embedded in the page template (see "CREATE-VARIABLE-FROM", page 30), via a scenario (see "COPY$ instructions", page 156), or by means of a S VARIABLE command contained in the host 3270 datastream (see "HOST4WEB commands", page 250).

1.4.11.2. FOR-EACH-VALUE-IN tag

```
{{{FOR-EACH-VALUE-IN "varname"}}}
```

The FOR-EACH-VALUE-IN tag marks the start of a loop. varname is the name of a table variable. VIRTEL generates everything between the FOR-EACH-VALUE-IN tag and the END-FOR tag once for each value in varname. If varname has no values then nothing is generated. The current value of varname, and of any other table variables referenced in the loop, changes when the END-FOR tag is encountered.

1.4.11.3. CURRENT-VALUE-OF tag

```
{{{CURRENT-VALUE-OF "varname"}}}
```

The CURRENT-VALUE-OF tag is used in a loop bracketed by the FOR-EACH-VALUE-IN and END-FOR tags. varname is the name of a table variable. If it is the variable named in the FOR-EACH-VALUE-IN tag, it determines the number of iterations of the loops. Otherwise, its value is simply changed when the END-FOR tag is encountered.

The CURRENT-VALUE-OF tag also allows variables to be inserted in a template page outside of a FOR-EACH-VALUE-IN loop. In this case, the variable varname must have been created from the HTTP request by an INPUT scenario by means of the COPY$ INPUT-TO-VARIABLE instruction.

The local options HTML-ESCAPES, JAVASCRIPT-ESCAPES, JSON-ESCAPES, NO-ESCAPES, and XML-ESCAPES (see "Setting and unsetting local options", page 42) may affect the processing of this tag.

If the HTML-ESCAPES local option is set, special characters in the value of the variable will be replaced by the corresponding HTML escape sequence as shown in the table below:

Character	HTML escape sequence
<	&lt;
>	&gt;
"	&quote;
&	&amp;

If the JAVASCRIPT-ESCAPES local option is set, special characters in the value of the variable will be replaced by the corresponding JavaScript escape sequence as shown in the table below:

Character	JavaScript escape sequence
"	\\"
'	\\'
\\	\\\\

If the JSON-ESCAPES local option is set, special characters in the value of the variable will be replaced by the corresponding JSON escape sequence as shown in the table below:

Character	JSON escape sequence
"	\\"
\\	\\\\
Hex 00 to 1f	\\uxxxx

If the XML-ESCAPES local option is set, special characters in the value of the variable will be replaced by the corresponding XML escape sequence as shown in the table below:

Character	HTML escape sequence
<	&#60;
>	&#62;
"	&#34;
&	&#38;
'	&#39;

Setting any of the HTML-ESCAPES, JAVASCRIPT-ESCAPES, JSON-ESCAPES, or XML-ESCAPES local options causes the other options to be automatically unset.

Setting the NO-ESCAPES local option disables all escape processing.

1.4.11.4. NO-BLANKS-VALUE-OF tag

```
{{{NO-BLANKS-VALUE-OF "varname"}}}
```

The NO-BLANKS-VALUE-OF tag is similar to the CURRENT-VALUE-OF tag, but the value is truncated at the first blank.

1.4.11.5. TRIMMED-VALUE-OF tag

```
{{{TRIMMED-VALUE-OF "varname"}}}
```

The TRIMMED-VALUE-OF tag is similar to the CURRENT-VALUE-OF tag, except that leading and trailing blanks (if any) are removed from the value before it is substituted in the page.

1.4.11.6. END-FOR tag

```
{{{END-FOR "varname"}}}
```

The END-FOR tag marks the end of a loop started by the FOR-EACH-VALUE-IN tag.

1.4.11.7. ADVANCE-TO-NEXT-VALUE-OF tag

```
{{{ADVANCE-TO-NEXT-VALUE-OF "varname"}}}
```

The ADVANCE-TO-NEXT-VALUE-OF tag causes subsequent references to the table variable varname (via the CURRENT-VALUE-OF tag, the TRIMMED-VALUE-OF tag, or the NO-BLANKS-VALUE-OF tag) to refer to the next value in the table.

1.4.11.8. DO-COUNT-UP-WITH tag

```
{{{DO-COUNT-UP-WITH "varname"}}}
```

The DO-COUNT-UP-WITH tag marks the start of a loop. varname is the name of a variable. VIRTEL generates everything between the DO-COUNT-UP-WITH tag and the END-DO-COUNT tag n times, where n is the current value of varname. During the execution of the loop, the value of varname varies from 1 to n, and other table variables referenced in the loop change when the END-DO-COUNT tag is encountered.

1.4.11.9. END-DO-COUNT tag

```
{{{END-DO-COUNT "varname"}}}
```

The END-DO-COUNT tag marks the end of a loop started by the DO-COUNT-UP-WITH tag.

1.4.11.10. DEFINE-AUTOMATIC-COUNTER tag

```
{{{DEFINE-AUTOMATIC-COUNTER (init, incr, max) "varname"}}}
```

The DEFINE-AUTOMATIC-COUNTER tag allows automatic generation of a counter variable in a loop started by the FOR-EACH-VALUE-IN tag. The parameters are:

init
: the initial value of the counter variable

incr
: the increment added at each END-FOR

max
: the maximum value of the counter variable

varname

> the name of the counter variable

The variable generated can be the loop master variable (the variable named in the FOR-EACH-VALUE-IN) or a slave variable. When the counter reaches its maximum value, the loop terminates if it is the master, or continues if it is the slave. In the latter case the counter variable starts again from its initial value.

1.4.11.11. DEFINE-SUB-VARIABLE tag

```
{{{DEFINE-SUB-VARIABLE (offset, length, count) "subname"}}}
```

The DEFINE-SUB-VARIABLE tag allows a sub-variable to be defined. A sub-variable remaps part of the current value of the loop master variable in a FOR-EACH-VALUE-IN loop. The parameters are:

offset

> the offset of the sub-variable in the loop master variable

length

> the length (in characters) of the sub-variable

count

> the number of occurrences of the sub-variable

subname

> the name of the sub-variable

A sub-variable consists of count values, each of length bytes, starting at offset in the loop master variable. The first byte of the loop master variable is considered to be offset 0. Sub-variables are defined outside but referenced within a FOR-EACH-VALUE-IN loop. A sub-variable can be referenced wherever a normal table variable would be valid, including the loop master variable of an inner FOR-EACH-VALUE-IN loop, which could in itself be redefined by other sub-variables. When the sub-variable is referenced, it acts as an implicit redefinition of the current value of the master variable of the innermost FOR-EACH-VALUE-IN loop in which the reference appears. Thus, the same sub-variable could possibly redefine different loop master variables if it is referenced in more than one place.

1.4.11.11.0.1. Examples

A host application uses an FAE5 structured field to create a table variable called HOSTDATA. The HOSTDATA variable consists of an array of 20-byte records. Each record consists of an 8-byte key, followed by six 2-byte codes. The following code generates an HTML table from this data. Each row of the table contains the row number, the key, and the codes. A hyperlink is generated for each code, by removing any trailing blanks from the code and appending ".html":

```
{{{DEFINE-AUTOMATIC-COUNTER (1,1,9999) "ROWNUM" }}}
{{{DEFINE-SUB-VARIABLE (0, 8, 1) "KEY"}}}
{{{DEFINE-SUB-VARIABLE (8, 2, 6) "CODES"}}}
<table><tr><td>Row</td><td>Key</td><td colspan=6>Codes</td></tr>
{{{FOR-EACH-VALUE-IN "HOSTDATA"}}}
<tr>
<td>{{{CURRENT-VALUE-OF "ROWNUM"}}}</td>
<td>{{{CURRENT-VALUE-OF "KEY"}}}</td>
    {{{FOR-EACH-VALUE-IN "CODES"}}}
    <td><a href='{{{NO-BLANKS-VALUE-OF "CODES"}}}.html'>
        {{{CURRENT-VALUE-OF "CODES"}}}</a>
    </td>
    {{{END-FOR "CODES"}}}
</tr>
```

```
{{{END-FOR "HOSTDATA"}}}
</table>
```

1.4.11.12. DELETE-ALL-VARIABLES tag

```
{{{DELETE-ALL-VARIABLES}}}

{{{DELETE-ALL-VARIABLES "prefix"}}}
```

The DELETE-ALL-VARIABLES tag deletes all variables in the VIRTEL variable pool. An optional prefix parameter allows deletion of only those variables whose names begin with the specified prefix.

1.4.12. Inserting VIRTEL configuration values in a page

1.4.12.1. IP-ADDRESS-OF-LINE tag

```
{{{IP-ADDRESS-OF-LINE "n-xxxxxx"}}}
```

The IP-ADDRESS-OF-LINE tag will be replaced by the IP address of the specified VIRTEL line. For example, {{{IP-ADDRESS-OF-LINE "H-HTTP"}}} might generate 192.168.229.147

1.4.12.2. IP-PORT-OF-LINE tag

```
{{{IP-PORT-OF-LINE "n-xxxxxx"}}}
```

The IP-PORT-OF-LINE tag will be replaced by the port number of the specified VIRTEL line. For example, {{{IP-PORT-OF-LINE "H-HTTP"}}} might generate 41000

1.4.12.3. NAME-OF tag

```
{{{NAME-OF (xxxxxx)}}}

{{{NAME-OF (xxxxxx, len)}}}
```

The NAME-OF tag allows the insertion in a page of various data items related to the VIRTEL transaction in progress.

xxxxxx

the name of the data item to be inserted. Valid values are:

VIRTEL

The VIRTEL APPLID specified in the VIRTCT

RELAY

The relay LU name used to connect to the host application

PRINT-RELAY

The relay LU name of the associated printer

PSEUDO-TERMINAL
The VIRTEL terminal name

ENTRY-POINT
The VIRTEL entry point name

LINE-INTERNAL
The internal name of the VIRTEL line

LINE-EXTERNAL
The external name of the VIRTEL line

USER
The user name, if signon has occurred

PASSWORD
The user's password, if signon has occurred

USER-IP-ADDRESS
The IP address of the client terminal

SNA-STATUS
The status of the host LU2 session:

- X: input is inhibited
- blank: input is allowed

TRANSACTION-INTERNAL
The internal name of the VIRTEL transaction

TRANSACTION-EXTERNAL
The external name of the VIRTEL transaction

URL
The URL excluding the query string

QUERY
The query string from the URL

PAGE
The name of the current HTML page template

PAGE-INTERNAL
The name of the original HTML page template specified in the URL

DIRECTORY
The current VIRTEL directory name

CHARACTER-SET
The name of the current UTF-8 character set, or the country code if the page is not in UTF-8 mode (see "EBCDIC translation management", page 56)

DATE-TIME
The current date and time (14 characters in the format YYYYMMDDHHMMSS)

VIRTEL-VERSION
The VIRTEL version number

xxx-SYMBOL
The value of the system symbol xxx (only if SYSPLUS=YES is specified in the VIRTCT). Example: SYSNAME-SYMBOL

len

an optional length. If specified, the value of the data item will be padded with blanks or truncated on the right to the specified length.

1.4.12.4. NUMBER-OF tag

```
{{{NUMBER-OF (xxxxxx)}}}
```

The NUMBER-OF tag allows the insertion in a page of various data items related to the VIRTEL transaction in progress.

xxxxxx

the name of the data item to be inserted. Valid values are:

SCREEN-COLUMNS

The width of the current host 3270 screen

SCREEN-LINES

The depth of the current host 3270 screen

1.4.13. Conditional generation

1.4.13.1. AFTER-NOT-LAST-VALUE-OF tag

```
{{{AFTER-NOT-LAST-VALUE-OF "varname" ...}}}
```

The AFTER-NOT-LAST-VALUE-OF tag brackets a section of the page which is to be generated for all except the last iteration of a FOR-EACH-VALUE-IN loop. The HTML content represented by “...” is generated unless the current value of the variable varname is the last in the table.

The AFTER-NOT-LAST-VALUE-OF tag is useful, for example, when generating a comma-separated list of values, as shown in the example below:

```
[ {{{FOR-EACH-VALUE-IN "MYVAR"}}} "{{{CURRENT-VALUE-OF "MYVAR"}}} "
  {{{AFTER-NOT-LAST-VALUE-OF "MYVAR" ,}}}{{{END-FOR "MYVAR"}}} ]
```

If the variable myvar contains the values 1, 2, and 3, then this example would generate ["1", "2", "3"]

1.4.13.2. IF-USER-IS-ALLOWED-TO tag

```
{{{IF-USER-IS-ALLOWED-TO "resourcename" ...}}}
```

The IF-USER-IS-ALLOWED-TO tag brackets a section of the page whose appearance is conditional on the user’s authorization to access the resource resourcename. The HTML content represented by “...” is generated only if the signed-on user is authorized to access the specified resource.

1.4.13.3. WHEN-EXISTS and END-WHEN-EXISTS tags

```
{{{WHEN-EXISTS "varname"}}}
  ...
{{{END-WHEN-EXISTS "varname"}}}
```

The WHEN-EXISTS and END-WHEN-EXISTS tags bracket a section of the page whose appearance is conditional on the existence of a named table variable. The variable can be created by a VIRTEL Web Integration application using the FAE5 or FAE6 structured fields, or it can be created by a scenario. The HTML content represented by "..." is generated only if the named variable exists in the context of the current page and has at least one value.

1.4.13.4. WHEN-NOT-EXISTS and END-WHEN-NOT-EXISTS tags

```
{{{WHEN-NOT-EXISTS "varname"}}}
  ...
{{{END-WHEN-NOT-EXISTS "varname"}}}
```

The WHEN-NOT-EXISTS and END-WHEN-NOT-EXISTS tags are similar to the WHEN-EXISTS and END-WHEN-EXISTS tags, except that the section of the page enclosed by the tags is generated only if the named table variable does not exist.

1.4.13.5. WHEN-NOT-BLANK and END-WHEN-NOT-BLANK tags

```
{{{WHEN-NOT-BLANK "varname"}}}
  ...
{{{END-WHEN-NOT-BLANK "varname"}}}
```

The WHEN-NOT-BLANK and END-WHEN-NOT-BLANK tags bracket a section of the page which is generated only if the current value of a named table variable is non-blank. The HTML content represented by "..." is omitted if the named variable does not exist, or if its current value is null or all blanks.

1.4.13.6. WHEN-NEXT-EVENT and END-WHEN-NEXT-EVENT tags

```
{{{WHEN-NEXT-EVENT "eventname"}}}
  ...
{{{END-WHEN-NEXT-EVENT "eventname"}}}
```

The WHEN-NEXT-EVENT and END-WHEN-NEXT-EVENT tags allow an XML template to be written which uses variables generated by a commarea-to-output conversion scenario. These tags work in conjunction with the $EVENT$ variable generated by the "MAP$ EVENTUAL-AREA and MAP$ ELSE-THEN-AREA", page 182. The section of the page enclosed by the WHEN-NEXT-EVENT and END-WHEN-NEXT-EVENT tags is generated only if the current value of the $EVENT$ variable matches the specified eventname.

1.4.13.7. WHILE-EVENT and END-WHILE-EVENT tags

```
{{{WHILE-EVENT "eventname"}}}
  ...
{{{END-WHILE-EVENT "eventname"}}}
```

The WHILE-EVENT and END-WHILE-EVENT tags work in conjunction with the $EVENT$ variable generated by the "MAP$ EVENTUAL-AREA and MAP$ ELSE-THEN-AREA", page 182. The WHILE-EVENT tag marks the start of a loop. Everything between the WHILE-EVENT and END-WHILE-EVENT tags is generated once for each value of the $EVENT$ variable, as long as the current value of the $EVENT$ variable matches the specified eventname.

1.4.14. Debugging facilities

1.4.14.1. CREATE-VARIABLE-IF tag

```
{{{CREATE-VARIABLE-IF (TRACING-SCENARIO) "varname"}}}
```

The CREATE-VARIABLE-IF tag with the TRACING-SCENARIO parameter retrieves the contents of the scenario trace created by the "Capability Tokens", page 59). If the trace is active, the variable varname will be created. The value of this variable is a JSON structure (see example below) which can be used by Virtel Studio.

The trace data for a specific terminal may be obtained by specifying an x-Virtel-Debug=capability-token parameter in the URL. The "capability tokens", page 59 is generated by a SET-HEADER tag issued by the terminal which owns the trace data.

```
{ "scenario":"EXECUTE3", "externalName":"EXECUTE3",
"compiled":"02/04/13 18.49 ", "terminal":"HTVTA012", "relay":"R5HVT511",
"trace":[
{"t":"20:38:41.14","o":"00014A","i":"COPY$"},
{"t":"20:38:41.14","o":"00015E","i":"TOVAR$"},
{"t":"20:38:41.14","o":"000046","i":"MAP$"},
{"t":"20:38:41.14","o":"000058","i":"MAP$","p":[{"Customer":"A0111115"}]},
{"t":"20:38:41.14","o":"000066","i":"MAP$"},
{"t":"20:38:41.14","o":"000078","i":"MAP$","p":[{"Datemin":"20110505"}]},
{"t":"20:38:41.14","o":"000086","i":"MAP$","p":[{"Datemax":"20110525"}]},
{"t":"20:38:41.14","o":"000110","i":"MAP$"},
{"t":"20:38:41.14","o":"000170","i":"CASE$","p":[{"CURLINE":"0"}]},
{"t":"20:38:41.14","o":"0001FC","i":"COPY$"},
{"t":"20:38:41.14","o":"000214","i":"COPY$"}]}
```

Exampleof a JSON structure generated by TRACING-SCENARIO

For more informations, see "CREATE-VARIABLE-IF", page 52.

1.4.15. Signon and password management

1.4.15.1. CREATE-VARIABLE-IF tag

```
{{{CREATE-VARIABLE-IF (condition) "varname"}}}
```

The CREATE-VARIABLE-IF tag allows the conditional creation of a VIRTEL variable. If the specified condition is true, the variable varname will be created and initialized with a value as shown in the list of condition names below. This variable can be used subsequently to conditionally generate a section of the page bracketed by WHEN-EXISTS and END-WHEN-EXISTS tags.

The possible values of the condition parameter for the CREATE-VARIABLE-IF tag are listed below:

SIGNON-IS-NEEDED

> The variable varname is created if a signon is needed, i.e. if the transaction security type is non-zero and the user has not yet successfully signed on at the terminal.

SIGNON-IS-OK

> The variable varname is created if the user has successfully signed on at the terminal. The initial value of the variable is the user name.

APPLICATION-IS-CONNECTED

The variable varname is created if the terminal is connected to a host application. The initial value of the variable is either the VTAM application name, or the external name of the VIRTEL transaction, depending on the value of the AIC parameter in the VIRTCT (see “Parameters of the VIRTCT” in the VIRTEL Installation Guide).

For more informations, see “CREATE-VARIABLE-IF”, page 52, in the “Debugging facilities” section.

1.4.15.2. DECLARE-FIELD-AS tag

When used in conjunction with a security type 4 transaction, the DECLARE-FIELD-AS tag allows VIRTEL to obtain the userid and password from fields embedded in the HTML page. For an example, see “Signon using HTML fields”, page 261.

```
{{{DECLARE-FIELD-AS (attribute,...) "fieldname"}}}
```

The DECLARE-FIELD-AS tag indicates to VIRTEL that the HTML field whose name is fieldname is to be treated as a userid or password field when used with a transaction defined as having security type 4. One of more attribute values must be specified. The possible attributes are listed below:

USERNAME

indicates that the field contains the name of the user (userid) to be signed on.

PASSWORD

indicates that the field contains the user’s password.

NEW-PASSWORD

indicates that the field contains a new password. VIRTEL will request the security product to change the user’s current password to the new value if the signon is successful.

HEX

indicates that VIRTEL expects the browser to encode the field in hexadecimal.

BASE64

indicates that VIRTEL expects the browser to encode the field in base64 format.

ENCRYPTED

indicates that VIRTEL expects the browser to encrypt the field using the session key specified elsewhere in the page (see “DECLARE-FIELD-AS CRYPTO-SESSION-KEY”, page 55)

Examples:

```
{{{DECLARE-FIELD-AS (USERNAME) "USERNAME" }}}
{{{DECLARE-FIELD-AS (PASSWORD,BASE64) "PASSWORD" }}}
{{{DECLARE-FIELD-AS (NEW-PASSWORD,ENCRYPTED) "NEWPASS" }}}
```

The same field can be both declared and defined:

```
{{{DEFINE-HTML-FIELD-NAME (04,06,08) "NOM" }}}
{{{DECLARE-FIELD-AS (BASE64) "NOM" }}}
```

The above example indicates that the field NOM is transmitted to VIRTEL in base64 format. In this case, the DEFINE must precede the DECLARE.

1.4.15.3. USER-SIGNON-CODE tag

```
{{{USER-SIGNON-CODE}}}
```

The USER-SIGNON-CODE tag generates a unique value called a signoncode which may be used with the VirtelUserSignon parameter of the URL to propagate the signed-on user's credentials to another page (see "Propagation of signon by URL", page 21).

1.4.16. Encryption management

1.4.16.1. Introduction

The presence of certain tags in a page template causes VIRTEL to generate encryption keys and to encrypt and decrypt selected data in the page. The use of these tags is dependent upon the specification of a CRYPTn parameter in the VIRTCT (see "Parameters of the VIRTCT") in the VIRTEL Installation Guide manual.

1.4.16.2. ENCRYPTION-PARAMETERS tag

```
{{{ENCRYPTION-PARAMETERS "cryptname"}}}
{{{ENCRYPTION-PARAMETERS (field) "cryptname"}}}
```

The ENCRYPTION-PARAMETERS tag inserts into the page the contents of one or all fields of the CRYPTn parameter whose name field is cryptname. If the VIRTCT does not contain a CRYPTn parameter with name cryptname then the ENCRYPTION-PARAMETERS tag returns a null value.

If the optional field parameter is specified, the ENCRYPTION-PARAMETERS tag returns the specified or defaulted value of one field of the CRYPTn parameter, without quotes. The names of the fields are:

NAME
The name of this set of encryption parameters.

ALGORITHM
The symmetric encryption algorithm.

INITIAL-ALGORITHM
The asymmetric encryption algorithm.

DRIVER
The name of the encryption engine.

FORMAT
The encoding used for encrypted text.

CHAINING
The chaining method for symmetric encryption.

PADDING
The padding method for symmetric encryption.

If the field parameter is not specified, then the ENCRYPTION-PARAMETERS tag returns the specified or defaulted values of all fields of the CRYPTn parameter. Each value is surrounded by single quotes and the values are separated by commas.

Example: If the VIRTCT contains the following parameters:

```
                CRYPT1=(CRYPTNULL,NONE,NONE,NO-ENCRYPTION,HEX),          *
                CRYPT2=(CRYPT3270,3TDEA,RSA-1024,ICSF,HEX),              *
```

then the tag {{{ENCRYPTION-PARAMETERS (ALGORITHM) "CRYPT3270"}}}

returns the value 3TDEA,

and the tag {{{ENCRYPTION-PARAMETERS "CRYPT3270"}}}

returns the value 'CRYPT3270','3TDEA','RSA-1024','ICSF','HEX','CBC','PKCS7'

1.4.16.3. PUBLIC-KEY tag

```
{{{PUBLIC-KEY (component) "cryptname"}}}
```

The presence of one or more PUBLIC-KEY tags in a page template causes VIRTEL to generate a public/private key pair for the session, and to insert the value of the specified component of the public key into the page. The public/private key pair is generated according to the INITIAL-ALGORITHM specified in the CRYPTn parameter whose name field is cryptname. If the VIRTCT does not contain a CRYPTn parameter with name cryptname then no key is generated and the PUBLIC-KEY tag returns a null value.

component

is the name of the public key component to be inserted into the page. Possible values are:

EXPONENT

The hexadecimal value of the public exponent.

MODULUS

The hexadecimal value of the modulus.

1.4.16.4. DECLARE-FIELD-AS tag

```
{{{DECLARE-FIELD-AS (attribute) "fieldname"}}}
```

When used in conjunction with the PUBLIC-KEY tag, the DECLARE-FIELD-AS tag indicates to VIRTEL that the HTML field whose name is fieldname is to be treated as an encrypted session key. VIRTEL decrypts the contents of the field using the corresponding private key (which is known only to VIRTEL) and uses it as the session key when symmetric encryption is requested by the SET-LOCAL-OPTIONS (ENCRYPT-PASSWORD-FIELDS) tag. The possible attributes are listed below:

CRYPTO-SESSION-KEY

indicates that the field contains the session key encrypted under the public key specified by the PUBLIC-KEY tag.

1.4.16.5. SET-LOCAL-OPTIONS tag

When used in conjunction with the PUBLIC-KEY and DECLARE-FIELD-AS (CRYPTO-SESSION-KEY) tags, the SET-LOCAL-OPTIONS tag activates encryption for selected fields that are sent and received in HTML pages.

```
{{{ SET-LOCAL-OPTIONS (option, option, ...) }}}
```

option

the following values indicate the use of encryption :

ENCRYPT-PASSWORD-FIELDS

indicates that 3270 non-display unprotected (data entry) fields are encrypted in both inbound and outbound messages, and that 3270 non-display protected (output only) fields are replaced by blanks in outbound messages.

Encryption is performed according to the symmetric encryption method indicated by the CRYPTn parameter specified by the PUBLIC-KEY tag, using the session key specified by the DECLARE-FIELD-AS (CRYPTO-SESSION-KEY) tag. The GENERATE-HTML tag automatically adds an additional VCRYPT attribute to each encrypted field.

1.4.17. EBCDIC translation management

1.4.17.1. Introduction

By default, VIRTEL translates host application EBCDIC data into ISO-8859-1 before sending it to the browser. This default behaviour is suitable for Western European and English speaking countries. The COUNTRY parameter in the VIRTCT indicates which EBCDIC country codepage is used by host applications, and serves to select the appropriate default EBCDIC-to-ISO-8859-1 translation table within VIRTEL. Translation tables other than the default may be selected by means of the SET-COUNTRY-CODE tag.

1.4.17.2. SET-COUNTRY-CODE tag

```
{{{SET-COUNTRY-CODE "countryname"}}}
```

The SET-COUNTRY-CODE tag allows the 3270 host application data to be translated to ISO-8859-1 according to an EBCDIC codepage other than the default codepage implied by the COUNTRY parameter in the VIRTCT. It may also be used to translate from the French EBCDIC codepage to ASCII Western European codepage 850, or to translate from Latin-2 EBCDIC Multilingual (CP870) to either ISO-8859-2 Latin-2 (CP912) or PC Latin-2 (CP852).

This tag takes effect starting from the point where it appears in the template page, and it may appear multiple times in a single page. The possible values for the countryname parameter are shown in the table below:

Country name	EBCDIC codepage	ASCII codepage
US	CP 037	ISO-8859-1
FR	CP 297	ISO-8859-1
NO	CP 277	ISO-8859-1
IT	CP 280	ISO-8859-1
GB (UK)	CP 285	ISO-8859-1
FR-850	CP 297	CP 850
L2	CP 870	ISO-8859-2
P2	CP 870	CP 852
DE	CP 273	ISO-8859-1
BE	CP 500	ISO-8859-1
FI	CP 278	ISO-8859-1
ES (SP)	CP 284	ISO-8859-1
IS (IC)	CP 871	ISO-8859-1

Country Codes for EBCDIC to ASCII translation

Note: Values in parentheses are accepted for compatibility with previous versions of VIRTEL

1.4.17.3. COUNTRY-CODE tag

```
{{{COUNTRY-CODE}}}
```

The COUNTRY-CODE tag inserts the country code into the page, where it can be tested by JavaScript.

1.4.17.4. SET-OUTPUT-ENCODING-UTF-8 tag

For countries which use a non-Western European language, VIRTEL can generate data in UTF-8 encoding instead of ISO-8859-1. This is done by embedding the SET-OUTPUT-ENCODING-UTF-8 tag in the page template:

```
{{{ SET-OUTPUT-ENCODING-UTF-8 "charset" }}}
```

The SET-OUTPUT-ENCODING-UTF-8 tag indicates that host data inserted in the template page by VIRTEL is to be in UTF-8 format, translated according to the EBCDIC country codepage whose name is specified within quotes. The possible values for charset are given under the description of the DEFUTF8 parameter of the VIRTCT. If no charset value is specified, as for example {{{SET-OUTPUT-ENCODING-UTF-8 ""}}}, then the default value of charset is the codepage specified by the DEFUTF8 parameter of the VIRTCT described in the VIRTEL Installation Guide.

When SET-OUTPUT-ENCODING-UTF-8 is specified, the rest of the template page must also be coded in UTF-8, and, in the case of an HTML page, must contain the HTML tag:

```
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
```

In the case of an XML page, no such instruction is needed because XML is considered to be encoded in UTF8 by default.

1.4.17.4.1. Examples

A 3270 application generates US EBCDIC (CECP 037). The following statements, coded between the <HEAD> and </HEAD> tags in the template page, ensure the correct translation of this application's data:

```
{{{SET-COUNTRY-CODE "US"}}}
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
```

Another 3270 application generates output using the Chinese Simplified EBCDIC character set (IBM1388). The output is to be translated to UTF-8 and inserted into a template page which must also be encoded in UTF-8:

```
{{{SET-OUTPUT-ENCODING-UTF-8 "IBM1388"}}}
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
```

A third 3270 application generates output using the Spanish EBCDIC character set, which is to be translated to UTF-8 and inserted into the template page. In this example, we assume that the parameter DEFUTF8=IBM1145 has been specified in the VIRTCT, so we can use this as the default value for the SET-OUTPUT-ENCODING-UTF-8 tag:

```
{{{SET-OUTPUT-ENCODING-UTF-8 ""}}}
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
```

In each case, the {{{SET}}} statement tells VIRTEL what character set to generate, while the <META> statement tells the browser what character set to expect.

If you specify neither SET-OUTPUT-ENCODING-UTF-8 nor SET-COUNTRY-CODE, then VIRTEL will generate ISO-8859-1 according to the default COUNTRY parameter specified in the VIRTCT.

1.4.18. HTTP protocol management

1.4.18.1. Introduction

Normally when VIRTEL delivers a page via HTTP it includes an HTTP response status code of “200 OK”. The SET-HTTP-RETURN-CODE allows the page to specify an alternative HTTP response status code. This may be useful, for example, in a page which contains an error message from an application.

1.4.18.2. SET-HTTP-RETURN-CODE tag

```
{{{ SET-HTTP-RETURN-CODE "rc text" }}}
```

The SET-HTTP-RETURN-CODE tag indicates to VIRTEL the HTTP status code and supplementary text which will be sent in the HTTP response message when this page is delivered. rc is a 3-digit numeric status code, as defined by RFC 2616, and text is the text which accompanies the numeric code.

Example :

```
<!--VIRTEL start="{{{" end="}}}" -->
<html><body><h1>Database record not found</h1>
{{{SET-HTTP-RETURN-CODE "404 Not in DB2"}}}
<p>The requested record was not found in the database.
</body></html>
```

1.4.19. Cache management

1.4.19.1. Introduction

When delivering static elements such as menu pages, images, and JavaScript programs, VIRTEL indicates to the browser that the element is eligible to be stored in the browser’s cache. This improves performance because the browser does not have to request the element from VIRTEL each time it is required. By contrast, dynamic elements (i.e. elements which contain VIRTEL tags) are generally marked as non-cacheable because their content is likely to change each time the page is requested.

The VIRTEL tags described in this section are used to override the default cacheable/non-cacheable behavior.

1.4.19.2. SET-PAGE-CACHEABLE tag

```
{{{ SET-PAGE-CACHEABLE }}}
```

When an element contains a SET-PAGE-CACHEABLE tag, VIRTEL will generate two HTTP headers: an Expires: header which indicates that the browser may cache the element until midnight, and a Last-Modified:.header which contains the date that the element was uploaded to VIRTEL. This is the default for static elements.

1.4.19.3. SET-PAGE-NOT-CACHEABLE tag

```
{{{ SET-PAGE-NOT-CACHEABLE }}}
```

When an element contains a SET-PAGE-NOT-CACHEABLE tag, VIRTEL will generate an Expires: 0 HTTP header indicating that the browser should not store the element in its cache. This is the default for dynamic elements.

1.4.19.4. SET-MAX-AGE tag

```
{{{ SET-MAX-AGE "secs" }}}
```

When an element contains a SET-MAX-AGE tag, VIRTEL will not generate the normal Expires: and Last-Modified:.HTTP headers, but instead it will generate a Cache-Control: max-age=secs header, where secs represents the validity time (in seconds) during which the browser may keep the element in its cache.

1.4.20. MIME type management

1.4.20.1. Introduction

VIRTEL associates a MIME-type with each page template or other element stored in a directory. VIRTEL always sends the MIME-type to the browser when the browser requests any element. Some browsers use the MIME-type to determine how to display the element. For example, HTML pages must have MIME-type “text/html”, XML pages must have MIME-type “text/xml”, JPG files must have MIME-type “image/jpeg”, etc.

VIRTEL normally sets the MIME-type to the value indicated by the browser or mailer at the time the page is uploaded. However, in certain cases VIRTEL may force the MIME-type to a different value:

- If the filename extension is .HTM or .HTML, or is absent, VIRTEL will force the MIME-type to be “text/html”. This is because some versions of Internet Explorer upload HTML files using MIME-type “text/plain”
- If the file contains a SET-CONTENT-TYPE tag, then VIRTEL will force the MIME-type to the value specified in the tag

1.4.20.2. SET-CONTENT-TYPE tag

```
{{{SET-CONTENT-TYPE "mimetype"}}}
```

The SET-CONTENT-TYPE tag allows the administrator to override the MIME-type supplied by the browser or mailer when the element is uploaded. VIRTEL stores the value of the parameter mimetype in the directory with the element.

In the following example, the page template is to be stored with a MIME-type which will cause the browser to process it as speadsheet data:

```
{{{SET-CONTENT-TYPE "application/vnd.ms-excel"}}}
```

1.4.21. Capability tokens

1.4.21.1. Introduction

VIRTEL capability tokens permit an HTTP transaction to access data associated with an transaction running on another terminal. The token is delivered by VIRTEL by means of an x-Virtel HTTP response header from the terminal which owns the capability, and the same token is returned to VIRTEL in a subsequent URL sent by the terminal which wishes to use the capability (see “Capability URLs”, page 19). The x-Virtel HTTP header is generated by a SET-HEADER tag embedded in a page template sent by the terminal which owns the capablity.

1.4.21.2. SET-HEADER tag

```
{{{ SET-HEADER (type) "header-string" }}}
```

When the SET-HEADER tag is present in a page template, VIRTEL generates an HTTP response header.

When type is one of the VIRTEL capability types listed below, the quoted string header-string is the name of the header; this name should start with x-Virtel- should end with a colon (:) and should not contain blanks. The capability value is an opaque string added by VIRTEL.

When type is AS-IS the quoted string header-string is a complete header (including value) to be added as-is. No capability processing is performed in this case.

The VIRTEL capability types are:

TO-ALLOW-READ-OF-SCENARIO-TRACE

> Generates a capability token which permits a subsequent requester to obtain this terminal's trace data by means of the CREATE-VARIABLE-IF TRACING-SCENARIO tag described on page 61.

GIVING-ACCESS-TO-%USER%-DIRECTORY-WITH-MY-USERID

> The capability token generated by this tag may be used by a subsequent request to access a directory which has %USER% in the keyword field of its definition. The userid of the capability owning transaction will be used as the directory key when the directory is accessed.

GIVING-ACCESS-TO-%GROUP%-DIRECTORY-WITH-MY-USERID

> The capability token generated by this tag may be used by a subsequent request to access a directory which has %GROUP% in the keyword field of its definition. The RACF group name of the capability owning transaction will be used as the directory key when the directory is accessed.

GIVING-ACCESS-TO-%USER%-DIRECTORY-IN-VARIABLE-%USER%

> The capability token generated by this tag may be used by a subsequent request to access a directory which has %USER% in the keyword field of its definition. The value of the %USER% variable of the capability owning transaction will be used as the directory key when the directory is accessed.

GIVING-ACCESS-TO-%GROUP%-DIRECTORY-IN-VARIABLE-%GROUP%

> The capability token generated by this tag may be used by a subsequent request to access a directory which has %GROUP% in the keyword field of its definition. The value of the %GROUP% variable of the capability owning transaction will be used as the directory key when the directory is accessed.

1.4.21.2.1. Examples:

```
{{{ SET-HEADER (AS-IS) "Cache-control: no-cache" }}}
{{{ SET-HEADER (TO-ALLOW-READ-OF-SCENARIO-TRACE) "x-Virtel-Debug:" }}}
{{{ SET-HEADER (GIVING-ACCESS-TO-%USER%-DIRECTORY-IN-VARIABLE-%USER%)
 "x-Virtel-User-Directory:" }}}
{{{ SET-HEADER (GIVING-ACCESS-TO-%USER%-DIRECTORY-WITH-MY-USERID)
 "x-Virtel-User-Directory:" }}}
{{{ SET-HEADER (GIVING-ACCESS-TO-%GROUP%-DIRECTORY-IN-VARIABLE-%GROUP%)
 "x-Virtel-Group-Directory:" }}}
{{{ SET-HEADER (GIVING-ACCESS-TO-%GROUP%-DIRECTORY-WITH-MY-USERID)
 "x-Virtel-Group-Directory:" }}}
```

1.4.22. Page upload

1.4.22.1. Introduction

The SECURITY-TOKEN and IF-SECURITY-TOKEN-IS-READY tags are used during uploading of HTML pages from a browser (see "Uploading pages by HTTP (secured by cookie)", page 69).

1.4.22.2. SECURITY-TOKEN tag

```
{{{ SECURITY-TOKEN }}}
```

If the SECURITY-TOKEN tag is present in a template page, VIRTEL substitutes a newly generated user security code to be used for the next transfer. For example,

```
<script language="JavaScript"><!--
var VirtelRef = "{{{SECURITY-TOKEN}}}";
--></script>
```

If a security code exists, the above code might generate:

```
var VirtelRef =
"20040427130843.07F5D1DC.56A85680Bgpamk4WZRKKBiZWjS4OTlqSES4OWlA==";
```

otherwise it will generate:

```
var VirtelRef = "";
```

Two examples of the use of the SECURITY-TOKEN tag are supplied in the HTMLBAS directory used by VIRTEL entry point DEMOHTTP. The upload.htm page stores and retransmits the user security code in the form of a cookie (VirtelRef=xxxxxxxxxxxxxxxx). The upload2.htm page retransmits the user security code using the VirtelCookie= parameter of the URL (see "Transmission of upload cookie by URL", page 20), but it does not store the code.

1.4.22.3. IF-SECURITY-TOKEN-IS-READY tag

```
{{{IF-SECURITY-TOKEN-IS-READY
 SetHostWarning();
}}}
```

The IF-SECURITY-TOKEN-IS-READY tag encloses HTML or JavaScript code to be generated only if a non-empty SECURITY-TOKEN is present.

Note that the total size of this tag, including the enclosed code, must not exceed the size of an inter-block buffer (120 characters) otherwise it will not be correctly processed if it spans blocks.

1.4.23. 3287 printing

1.4.23.1. Introduction

Each relay LU, through which a user connects to a host application, can be associated with a second LU which represents a virtual printer (see the description of HTTP terminals in the VIRTEL Connectivity Reference documentation). Data sent to this virtual printer by a host application (such as CICS) are stored by VIRTEL and can be retrieved by means of the tags IF-PRINT-IS-READY, SESSION-CODE, and PRINT embedded in a template page.

1.4.23.2. IF-PRINT-IS-READY tag

```
{{{ IF-PRINT-IS-READY ... }}}
```

The IF-PRINT-IS-READY tag encloses a section of the page which is generated only if print data exists on the virtual printer associated with the user's session. The HTML content represented by "..." is generated only if VIRTEL has data ready to be printed.

1.4.23.3. SESSION-CODE tag

The SESSION-CODE tag, prefixed by the word "Print", generates a sessioncode which allows a subsidiary window to be opened for the print data associated with the specified session. The template page displayed in this window can retrieve the stored print data by means of the PRINT tag. The user can then view the print data, and can, if desired, send the data to a physical workstation printer using the normal procedure for printing from a browser.

For example:

```
<script language="javascript" type="text/javascript">
<!--
function ShowPopup()
{
   var popupURL = "imprim.htm++Print{{{ SESSION-CODE }}}"
   var popupName = "PopupImpression";
   var popup = window.open("", popupName,
'status=yes,resizable=yes,scrollbars=yes,toolbar=yes,' +
'menubar=yes,width=614,height=129');
   popup.location = popupURL;
}

{{{IF-PRINT-IS-READY
   ShowPopup();
}}}
// -->
</script>
```

1.4.23.4. PRINT tag

```
{{{ PRINT (0) }}}
```

The PRINT tag allows a template page, such as the imprim.htm page supplied with VIRTEL, to retrieve 3287 print data. The structured field FAD3 also allows print data to be fed to VIRTEL for retrieval with the PRINT tag.

1.4.24. Generating PDF output

1.4.24.1. Introduction

When a page template is processed in a scenario by a COPY$ OUTPUT-FILE-TO-VARIABLE instruction with the TYPE=LINEBUFFER parameter, the page template may contain additional tags. These tags are used to assist in the construction of INPUT, DOCOPT, and LAYOUT files in the "LINEBUF" format required by the MakePDF program product.

These files may then be passed to the VIRSVPDF service program which invokes MakePDF to generate output files in PDF format. Refer to “PDF output generation”, page 208 for an example scenario.

1.4.24.2. PDF-LINES-PER-PAGE tag

```
{{{ PDF-LINES-PER-PAGE "nn"}}}
```

The PDF-LINES-PER-PAGE tag inserts “1” in the ASA carriage control character position after every nn lines.

1.4.24.3. PDF-NEW-DOCOPT tag

```
{{{ PDF-NEW-DOCOPT "n"}}}
```

The PDF-NEW-DOCOPT tag is used only in a MakePDF DOCOPT file. It identifies the DOCOPT file by the character “n”. This allows the DOCOPT file to be referenced by the PDF-USE-DOCOPT tag in the corresponding INPUT file.

1.4.24.4. PDF-NEW-INPUT tag

```
{{{ PDF-NEW-INPUT }}}
```

The PDF-NEW-INPUT tag is used only in a MakePDF INPUT file. It identifies the start of a new segment in the INPUT file.

1.4.24.5. PDF-NEW-LAYOUT tag

```
{{{ PDF-NEW-LAYOUT "n"}}}
```

The PDF-NEW-LAYOUT tag is used only in a MakePDF LAYOUT file. It identifies the LAYOUT file by the character “n”. This allows the LAYOUT file to be referenced by the PDF-USE-LAYOUT tag in the corresponding INPUT file.

1.4.24.6. PDF-OUTLINE tag

```
{{{ PDF-OUTLINE }}}
```

The PDF-OUTLINE tag inserts “@” in the ASA carriage control character position.

1.4.24.7. PDF-PAGE-BREAK tag

```
{{{ PDF-PAGE-BREAK }}}
```

The PDF-PAGE-BREAK tag inserts “1” in the ASA carriage control character position.

1.4.24.8. PDF-USE-DOCOPT tag

```
{{{ PDF-USE-DOCOPT "n"}}}
```

The PDF-USE-DOCOPT tag is used only in a MakePDF INPUT file. It specifies that the INPUT file is associated with the DOCOPT file identified by the character “n”

1.4.24.9. PDF-USE-LAYOUT tag

```
{{{ PDF-USE-LAYOUT "n"}}}
```

The PDF-USE-LAYOUT tag is used only in a MakePDF INPUT file. It specifies that the INPUT file is associated with the LAYOUT file identified by the character “n”

1.4.24.10. PDF-VARIABLE tag

```
{{{ PDF-VARIABLE }}}
```

The PDF-VARIABLE tag inserts “=” in the ASA carriage control character position.

1.5. Correspondent Management

1.5.1. Introduction

One of the methods which VIRTEL may use to identify users is by means of a security code which the user presents to VIRTEL, either in an incoming e-mail, or by means of a “cookie” included in an HTTP request by the browser. A user which VIRTEL recognizes in this way is known as a “Correspondent”. VIRTEL stores the list of correspondents in a VSAM file known as the “Correspondent file”, also known as the “VIRHTML” file.

VIRTEL uses the correspondent file for the following purposes:

- the rules of an HTTP line permit VIRTEL to distinguish between correspondents and non-correspondents when processing incoming HTTP requests. When the requesting user is identified as a correspondent, a special entry point may be assigned, or a set of rules specific to the user may be executed. Refer to “Rules” in the VIRTEL Connectivity Reference manual for further details.
- the rules of an HTTP line may assign a specific LU name to a correspondent connecting to a host application via web access. This is known as “LU nailing” and is described in more detail in the VIRTEL LU Nailing HOWTO manual.
- a correspondent may be authorized to upload HTML pages and other elements into an HTMLTRSF file. For further details, refer to “Uploading pages by SMTP”, page 68 and “Uploading pages by HTTP (secured by cookie)”, page 69.

There are two types of correspondent: an e-mail correspondent and a local correspondent:

- An **e-mail correspondent** is always defined by the VIRTEL administrator. When the administrator activates an e-mail correspondent, VIRTEL sends an e-mail message to the correspondent containing the security code. The correspondent then either replies to the e-mail message or clicks on a link in the message to connect to VIRTEL.
- A **local correspondent** is activated by the correspondent using a procedure known as “self-registration”. The self-registration procedure creates a clickable link which delivers the security code to the correspondent’s browser via a cookie. The VIRTEL administrator may optionally pre-define or change the characteristics of a correspondent by using the correspondent management sub-application. Self-registration is described in the VIRTEL LU Nailing HOWTO manual.

1.5.2. Access to the application

The correspondent management sub-application, which allows the VIRTEL administrator to define the parameters associated with a correspondent, is accessible by pressing [PF5] in the VIRTEL configuration menu, or [PF12] in the system services sub-application menu, or from the VIRTEL Multi-Session screen via an application referencing the module VIR0041A.

1.5.3. Security

When security is active, access to the correspondent management sub-application from the configuration menu or from the system services sub-application menu is controlled by the resource $$PCPC$$.

When it is accessed by a transaction, the rules of security management of transactions will apply.

Security management is described under the heading “Security” 282.

1.5.4. Objectives

This sub-application initially displays a summary screen of existing definitions presented in alphanumeric order. Access to the detail of a correspondent is achieved by positioning the cursor and pressing [PF12].

```
 LIST of CORRESPONDENTS ---------------------------- Applid: SPVIRE2  16:30:30

 Id                          Rules     VTAM name Last connection        Contacts

 upload1@saint.cloud.com     ADMRSET1            20 Feb 2009 09:35:37   00000011
 upload2@saint.cloud.com     ADMRSET1            QUEUE ACTIVATION       00000000
 user1@saint.cloud.com                 RHTVT003  QUEUE ACTIVATION       00000011
 WKSTN-A2FE/SYSPERTEC                  RRVTC006  30 Jun 2009 11:24:49   00000010















 P1=Update          P2=Delete              P3=Return           P6=Rules
 P7=Previous        P8=Next                P12=Edit
```

Summary of correspondents

```
 CORRESPONDENT DETAIL DEFINITION -------------------- Applid: SPVIRE2  16:37:59

 Id                 ===> user1@saint.cloud.com
                         email address with '@' sign
 Type of Id         ===> 1              1:Email 2:Local+fixed 3:Local+changing
 Activation message ===> To activate your VIRTEL connection, click:&Rhttp://192.
168.5.30:41001/web2host.htm++&C
                                        Text of 'OK' message to user.
 VTAM name          ===> RHTVT003       &1 parameter to specify VTAM LU name
 Rule Set           ===>                Rules to choose an entry point
 Directory          ===>                Where data is to be uploaded
 Last contact       ===> QUEUE ACTIVATION
 Contacts           ===> 00000000       Number of times cookie was updated
 Date created       ===> 08 Jan 2009 17:02:12
```

```
Created by         ===> VIRDBA
Date activated     ===> 20 Oct 2009 11:07:34
Activated by       ===> VIRDBA
Date disabled      ===> 16 Jan 2009 16:55:22
Disabled by        ===> SPTBOWL


P1=Update                          P3=Return                         Enter=Add
P4=Activate                        P5=Disable                        P6=Rules
```

Correspondent detail screen (e-mail correspondent)

```
CORRESPONDENT DETAIL DEFINITION -------------------- Applid: SPVIRE2  16:40:04

Id                 ===> WKSTN-A2FE/SYSPERTEC
                        workstation/lan
Type of Id         ===> 2              1:Email 2:Local+fixed 3:Local+changing
Activation message ===>

                                       Text of 'OK' message to user.
VTAM name          ===> RRVTC006       &1 parameter to specify VTAM LU name
Rule Set           ===>                Rules to choose an entry point
Directory          ===>                Where data is to be uploaded
Last contact       ===> 30 Jun 2009 11:24:49 192.168.002.082
Contacts           ===> 00000010       Number of times cookie was updated
Date created       ===> 30 Jun 2009 10:35:30
Created by         ===> VIRDBA
Date activated     ===> 30 Jun 2009 10:35:30
Activated by       ===> VIRDBA
Date disabled      ===>
Disabled by        ===>


P1=Update                          P3=Return                         Enter=Add
P4=Activate                        P5=Disable                        P6=Rules
```

Correspondent detail screen (local correspondent)

1.5.5. Contents of the fields

Id

For an e-mail correspondent: the e-mail address of the correspondent

For a local correspondent: a unique identifier generated by the self-registration procedure, or assigned by the VIRTEL administrator

Type of Id

1

this is an e-mail correspondent

2

this is a local correspondent whose security code is generated at activation time and subsequently remains constant

3

this is a local correspondent whose security code changes each time it is accessed

Activation message

> Message received by the user at time of activation of his account. This message can contain a link allowing the user to connect to a host application or to open the upload.htm page with automatic installation of an authorization cookie. The activation message may include the following variables:
>
> **&R**
>
> > meaning “insert a blank line”
>
> **&C**
>
> > meaning “insert security code”. The activation security code is inserted into the message in the form VirtelCookie=xxx

Rule Set

> (optional) The name of the rule set associated with this user.

Directory

> (optional) Name of the directory into which this correspondent may upload files.

Last contact

> Date and time of the last transfer, and the IP address of the correspondent.

Contacts

> The number of contacts since the last activation.

1.5.6. Account activation

In order to be operational, a correspondent account must be activated. This is achieved by pressing [PF4] at the CORRESPONDENT DETAIL DEFINITION screen. In the case of an e-mail correspondent, VIRTEL will transmit an initial e-mail to the correspondent containing the security code to be used for the transfers. The message ACTIVATION WAS REQUESTED indicates that the correspondent’s security code has been activated, and, in the case of an e-mail correspondent, that the e-mail was sent successfully. The number of contacts is reset to zero.

To activate an e-mail correspondent, the administrator must be logged on to VIRTEL via an entry point containing a transaction with external name $MAIL$ (application type=3) which contains, in the application field, the name of the SMTP line used by VIRTEL. The message YOU ARE NOT AUTHORISED TO USE THIS APPLICATION indicates that the $MAIL$ transaction is not defined.

1.5.7. Account deactivation

A correspondent’s security code may be cancelled by deactivating with the [PF5] key. The message DISABLE WAS DONE indicates that the deactivation was successful.

1.5.8. Access to associated rule set

To display the list of rules associated with this correspondent, press the [PF6] key.

1.6. Uploading HTML Pages

1.6.1. Introduction

HTML pages and other elements such as graphics can be uploaded to VIRTEL by any of the following methods:

1. by e-mail (SMTP)
2. by web browser (HTTP), with cookie security
3. by web browser (HTTP), with signon security

1.6.2. Uploading pages by SMTP

Upload by SMTP allows the administrator to load HTML pages into VIRTEL by e-mail. VIRTEL sends the administrator an e-mail, and the administrator replies to this e-mail with the pages to be uploaded included as attachments. VIRTEL sends another e-mail to inform the administrator that the upload was successful. The administrator saves this e-mail and replies to it the next time he has a set of pages to upload.

1.6.2.1. Definitions for page upload by SMTP

- Check the definition of your SMTP line (F1 then F12 from the Configuration Menu, see the VIRTEL Connectivity Reference documentation).
- Press F5 from the Configuration Menu and define an e-mail correspondent specifying W2H-DIR as the directory name:

```
CORRESPONDENT DETAIL DEFINITION -------------------- Applid: SPVIRE2  14:19:33

Id                 ===> upload2@saint.cloud.com
                        email address with '@' sign
Type of Id         ===> 1              1:Email 2:Local+fixed 3:Local+changing
Activation message ===> To upload file(s) to VIRTEL, reply to this message.

                                       Text of 'OK' message to user.
VTAM name          ===>                &1 parameter to specify VTAM LU name
Rule Set           ===> ADMRSET1       Rules to choose an entry point
Directory          ===> W2H-DIR        Where data is to be uploaded
Last contact       ===> QUEUE ACTIVATION
Contacts           ===> 00000000       Number of times cookie was updated
Date created       ===> 11 May 2004 14:19:29
Created by         ===> VIRDBA
Date activated     ===> 11 May 2004 14:19:33
Activated by       ===> VIRDBA
Date disabled      ===>
Disabled by        ===>


P1=Update                          P3=Return                          Enter=Add
P4=Activate                        P5=Disable                         P6=Rules
ACTIVATION WAS REQUESTED
```

Page upload by SMTP: Creating an e-mail correspondent

1.6.2.2. Procedure for page upload by SMTP

1. Activate the e-mail correspondent: see “Account activation” under the heading “Correspondent Management”, page 64. This triggers the sending of an e-mail containing the security code, as in the following example:

```
Date: Tue, 27 Apr 2004 12:04:40 +0100
From: virtel@client.com
Organization: SYSPERTEC COMMUNICATION
To: upload2@saint.cloud.com
Message-id:
<20040427120439.07F5DA7C.5E416500Bgpamk4WZRKKBiZWjS4OTlqSES4OWlA==>
Subject: OK : <  W2H-DIR   >

SECURITY TOKEN:
20040427120439.07F5DA7C.5E416500Bgpamk4WZRKKBiZWjS4OTlqSES4OWlA==

To upload file(s) to VIRTEL, reply to this message.
```

Page upload by SMTP : activation e-mail

2. Reply to this e-mail, with the files to be uploaded (HTML pages, graphics, etc) included as attachments. VIRTEL recognizes the security code returned automatically by the e-mail client in the “Message-id” field, and loads the attached files into the directory defined in the definition of the correspondent.
3. VIRTEL replies by sending an e-mail containing the result of the upload. The following example shows the reply sent by VIRTEL to a request to upload two files: LOGOVERT.GIF and WEB2VIRT.HTM. The “Message-id” field in this e-mail contains the new security code. You can reply to this e-mail the next time you have files to upload.

```
Date: Tue, 27 Apr 2004 12:39:14 +0100
From: virtel@client.com
Organization: SYSPERTEC COMMUNICATION
To: upload2@saint.cloud.com
Message-id:
<20040427123911.07F5CDC4.F669FC80Bgpamk4WZRKKBiZWjS4OTlqSES4OWlA==>
Subject: OK : <W2H-DIR >

VirtelCookie=
20040427123911.07F5CDC4.F669FC80Bgpamk4WZRKKBiZWjS4OTlqSES4OWlA==

RETURN CODE IS: 00
123911 MESSAGE RECEIVED
123912 LOADING FILE: LOGOVERT
123912 SIZE :      14357 BYTES  (BINARY)
123912 MIME : image/jpeg
123914 LOADING FILE: WEB2VIRT
123914 SIZE :      11477 BYTES  (TEXT)
123914 MIME : text/html
123914 FIELD :  SET-OUTPUT-ENCODING-UTF-8 ""
123914 FIELD :  COPY-FROM (1,1,43)
123914 FIELD : FIELD-WITH-CURSOR
123914 FIELD : FIELD-WITH-CURSOR
```

Page upload by SMTP : upload response e-mail

Depending on the values specified in the directory definition, VIRTEL may convert the filename to upper case, and truncate the filename to a maximum length, before storing it in the directory. The filename after conversion and truncation must not duplicate any other filename in the directory. For example, when uploading to a directory defined using the default parameters (not case sensitive, with maximum filename length 8), the file links.gif would be stored under the name LINKS.GI

1.6.3. Uploading pages by HTTP (secured by cookie)

The upload.htm page allows HTML pages or graphics to be uploaded to VIRTEL. The user’s identity is guaranteed by a cookie named VirtelRef= whose value changes after each upload. The value of the cookie is the same as the security code used for uploading by SMTP.

To upload a page, a user must:

- have a valid cookie (obtained by activation of the VIRTEL e-mail correspondent)
- click on the link contained in the e-mail, which displays the upload.htm page and loads the cookie into the browser (first time only)
- click the “Browse” button and select a file
- click the “Send” button

The VIRTEL response is displayed in the page and is similar to the response received by e-mail when uploading via SMTP.

1.6.3.1. Definitions for page upload secured by cookie

All the elements needed for page upload by HTTP secured by cookie are contained in the base configuration delivered with VIRTEL 4.27. Users who upgrade to VIRTEL 4.27 while keeping their existing configuration need to add certain elements to their existing configuration to benefit from the new “page upload secured by cookie” function.

The following steps show how to upgrade your configuration based on entry point WEB2HOST. You can also carry out these steps in batch by running the DEFUPLOD job in the SAMPLIB delivered with VIRTEL version 4.27. Having updated the configuration, you then need to upload three new elements (upload.htm, default.js, and logo_3.gif) to the W2H-DIR directory using the existing SMTP upload method.

1. In entry point WEB2HOST, define a new transaction W2H–70, with external name upload. This transaction specifies VIR0041C as the application name and application type 2. The “Logon message” field is blank to indicate to VIRTEL that the name of the target directory is to be found in the definition of the e-mail correspondent:

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: SPVIRE2  14:34:08

Internal name ===> W2H-70                   To associate with an entry point name
External name ===> upload                   Name displayed on user menu
Description   ===> Upload HTML pages (secured by cookie)
Application   ===> VIR0041C                 Application to be called
PassTicket    ===> 0  Name ===>             0=no 1=yes 2=unsigned
Application type   ===> 2                   1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> DELOC               Prefix of name of partner terminals
Logmode            ===>                     Specify when LOGMODE must be changed
How started        ===> 2                   1=menu 2=sub-menu 3=auto
Security           ===> 0                   0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                     0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===>

TIOA at logoff     ===>

Initial Scenario   ===>                     Final Scenario      ===>
Input Scenario     ===>                     Output Scenario     ===>

P1=Update                          P3=Return                        P12=Server
```

Page upload by HTTP with cookie : Creating the ‘upload’ transaction

2. Check the definition of your SMTP line (F1 then F12 from the Configuration Menu, see the VIRTEL Connectivity Reference documentation).

3. Press F5 from the Configuration Menu and define an e-mail correspondent specifying directory name W2H-DIR and ruleset name ADMRSET1 :

```
CORRESPONDENT DETAIL DEFINITION -------------------- Applid: SPVIRE2  14:39:04

e-mail address     ===> upload2@saint.cloud.com
                        email address with '@' sign
```

```
 Type of Id         ===> 1              1:Email 2:Local+fixed 3:Local+changing
 Activation message ===> To upload to VIRTEL, click:&Rhttp://192.168.229.20:4100
1/web2host/upload.htm+upload+&C
                                        Text of 'OK' message to user.
 VTAM name          ===>                &1 parameter to specify VTAM LU name
 Rule Set           ===> ADMRSET1       Rules to choose an entry point
 Directory          ===> W2H-DIR        Where data is to be uploaded
 Last contact       ===>
 Contacts           ===> 00000000       Number of times cookie was updated
 Date created       ===> 11 May 2004 14:19:29
 Created by         ===> VIRDBA
 Date activated     ===> 11 May 2004 14:39:04
 Activated by       ===> VIRDBA
 Date disabled      ===>
 Disabled by        ===>


 P1=Update                         P3=Return                         Enter=Add
 P4=Activate                       P5=Disable                        P6=Rules
 ACTIVATION WAS REQUESTED
```

Page upload by HTTP with cookie : Creating the e-mail correspondent

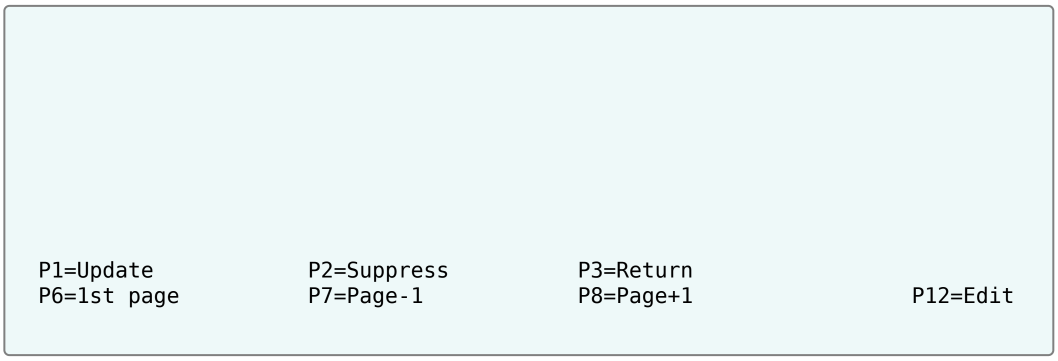
4. Press F6 then F12 to create rule UPLOAD1B in ruleset ADMRSET1 :

```
 DETAIL of RULE from RULE SET: ADMRSET1 ------------- Applid: SPVIRE2  14:40:59

 Name           ===> UPLOAD1B               Rule priority is per name
 Status         ===> ACTIVE                 Mon, 24 Sep 2001 14:19:14
 Description    ===> Rule for WEB2HOST administrator
 Entry point    ===> WEB2HOST               Target Entry Point
 Parameter      ===>                                   optional &1 value
 Trace          ===>                        1=commands 2=data 3=partner

 C : 0=IGNORE 1=IS 2=IS NOT 3=STARTS WITH 4=DOES NOT 5=ENDS WITH 6=DOES NOT
 0 IP Subnet    ===>                        Mask     ===>
 5 HTTP Host    ===> :41001
 0 eMail        ===>
 0 Calling DTE ===>                         Calling DTE address
 0 Called       ===>                        Called DTE address
 0 CUD0 (Hex)   ===>                        First 4 bytes of CUD (X25 protocol)
 0 User Data    ===>

 0 Days         ===> M:      T:      W:      T:      F:      S:      S:
 0 Start time   ===> H:      M:      S:     End time ===> H:      M:      S:

 P1=Update                         P3=Return                      Enter=Add
 P4=Activate                       P5=Inactivate                  P12=Entry P.
```

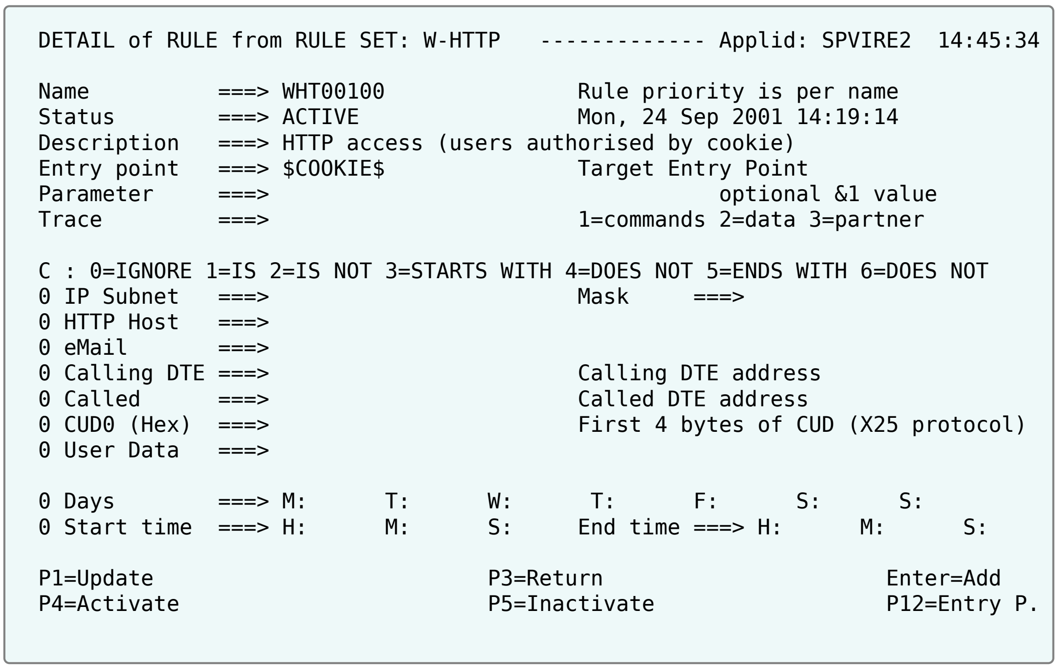
Page upload by HTTP with cookie : Creating rule UPLOAD1B

5. Define two new rules attached to the HTTP line. The first rule, which specifies $COOKIE$ as the entry point name, will be used for administrators; the second rule, which specifies entry point WEB2HOST, is for all other users:

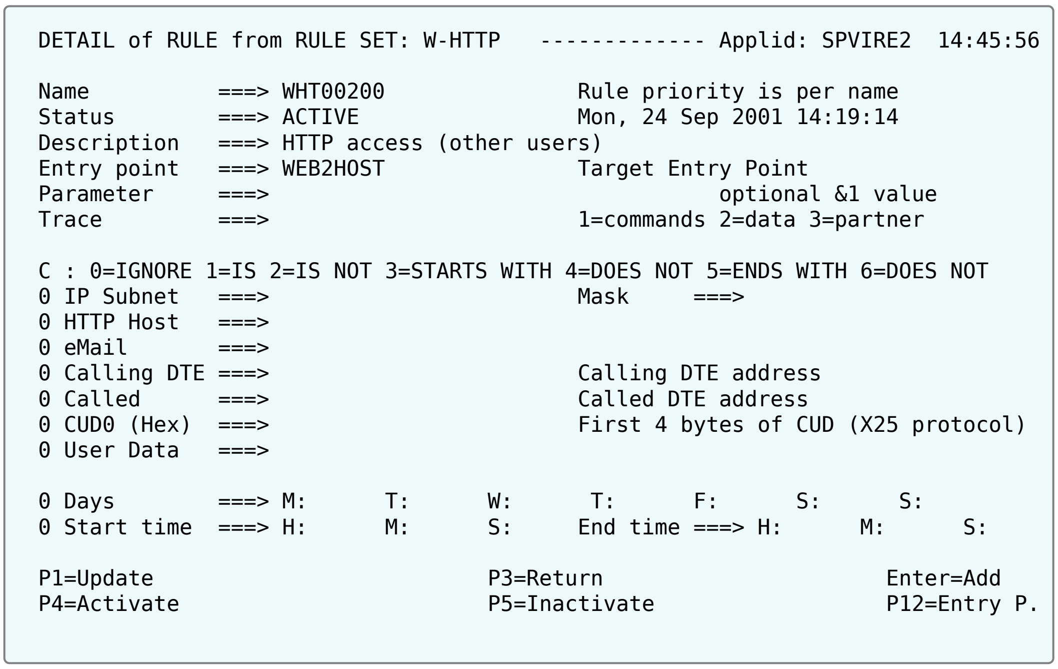
```
 LIST of RULES in RULE SET: W-HTTP   ---------------- Applid: SPVIRE2   14:44:14

 Name     Status   Description                                       Entry
                                                                     Point
 WHT00100 ACTIVE   HTTP access (users authorised by cookie)          $COOKIE$
 WHT00200 ACTIVE   HTTP access (other users)                         WEB2HOST
```



```
P1=Update           P2=Suppress         P3=Return
P6=1st page         P7=Page-1           P8=Page+1                P12=Edit
```



```
DETAIL of RULE from RULE SET: W-HTTP   ------------- Applid: SPVIRE2  14:45:34

Name          ===> WHT00100               Rule priority is per name
Status        ===> ACTIVE                 Mon, 24 Sep 2001 14:19:14
Description   ===> HTTP access (users authorised by cookie)
Entry point   ===> $COOKIE$               Target Entry Point
Parameter     ===>                                   optional &1 value
Trace         ===>                        1=commands 2=data 3=partner

C : 0=IGNORE 1=IS 2=IS NOT 3=STARTS WITH 4=DOES NOT 5=ENDS WITH 6=DOES NOT
0 IP Subnet   ===>                        Mask     ===>
0 HTTP Host   ===>
0 eMail       ===>
0 Calling DTE ===>                        Calling DTE address
0 Called      ===>                        Called DTE address
0 CUD0 (Hex)  ===>                        First 4 bytes of CUD (X25 protocol)
0 User Data   ===>

0 Days        ===> M:      T:      W:      T:      F:      S:      S:
0 Start time  ===> H:      M:      S:     End time ===> H:      M:      S:

P1=Update                          P3=Return                      Enter=Add
P4=Activate                        P5=Inactivate                  P12=Entry P.
```



```
DETAIL of RULE from RULE SET: W-HTTP   ------------- Applid: SPVIRE2  14:45:56

Name          ===> WHT00200               Rule priority is per name
Status        ===> ACTIVE                 Mon, 24 Sep 2001 14:19:14
Description   ===> HTTP access (other users)
Entry point   ===> WEB2HOST               Target Entry Point
Parameter     ===>                                   optional &1 value
Trace         ===>                        1=commands 2=data 3=partner

C : 0=IGNORE 1=IS 2=IS NOT 3=STARTS WITH 4=DOES NOT 5=ENDS WITH 6=DOES NOT
0 IP Subnet   ===>                        Mask     ===>
0 HTTP Host   ===>
0 eMail       ===>
0 Calling DTE ===>                        Calling DTE address
0 Called      ===>                        Called DTE address
0 CUD0 (Hex)  ===>                        First 4 bytes of CUD (X25 protocol)
0 User Data   ===>

0 Days        ===> M:      T:      W:      T:      F:      S:      S:
0 Start time  ===> H:      M:      S:     End time ===> H:      M:      S:

P1=Update                          P3=Return                      Enter=Add
P4=Activate                        P5=Inactivate                  P12=Entry P.
```

Page upload by HTTP with cookie : Rules of the HTTP line

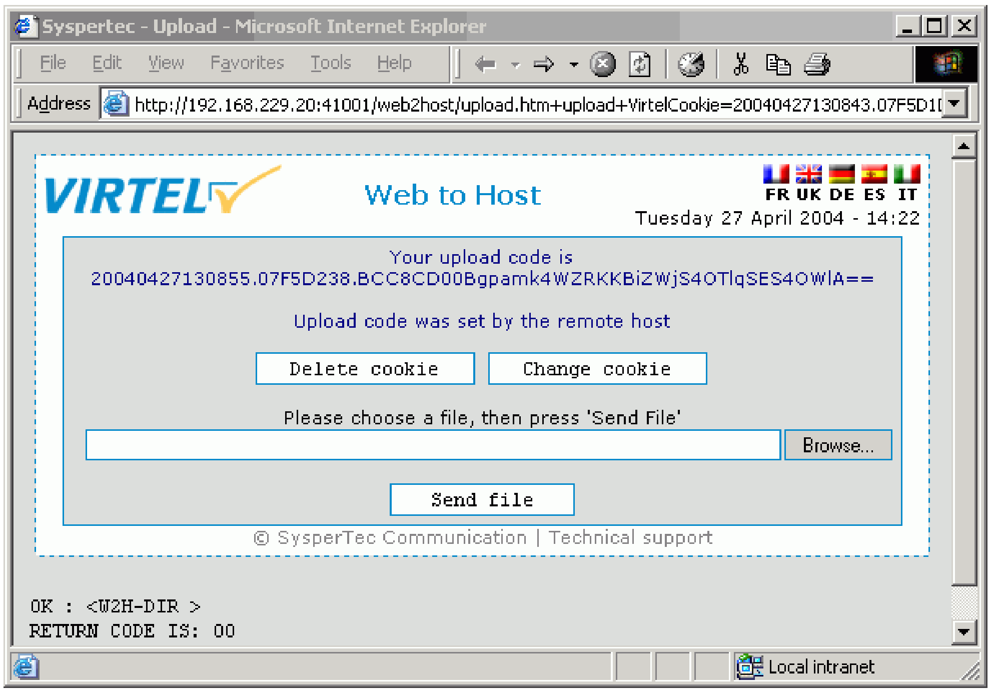
1.6.3.2. Procedure for page upload secured by cookie

1. (First time only) Activate the e-mail correspondent: see "Account activation" under the heading "Correspondent Management", page 64. This triggers the sending of an e-mail containing the security code, as in the following example:

```
Date: Tue, 27 Apr 2004 13:08:44 +0100
From: virtel@client.com
Organization: SYSPERTEC COMMUNICATION
To: upload2@saint.cloud.com
Message-id:
<20040427130843.07F5D1DC.56A85680Bgpamk4WZRKKBiZWjS40TlqSES40WlA==>
Subject: OK : <  W2H-DIR   >

SECURITY TOKEN:
20040427130843.07F5D1DC.56A85680Bgpamk4WZRKKBiZWjS40TlqSES40WlA==

To upload to VIRTEL, click:
http://192.168.229.20:41001/web2host/upload.htm+upload+VirtelCookie=20040
427130843.07F5D1DC.56A85680Bgpamk4WZRKKBiZWjS40TlqSES40WlA==
```

Page upload by HTTP with cookie : activation e-mail

2. Click the link in the e-mail to open the upload.htm page:



http://192.168.229.20:41001/web2host/upload.htm+upload+VirtelCookie=20040427130843.07F5D1I

Tuesday 27 April 2004 - 14:22

Your upload code is
20040427130855.07F5D238.BCC8CD00Bgpamk4WZRKKBiZWjS40TlqSES40WlA==

Upload code was set by the remote host

Please choose a file, then press 'Send File'

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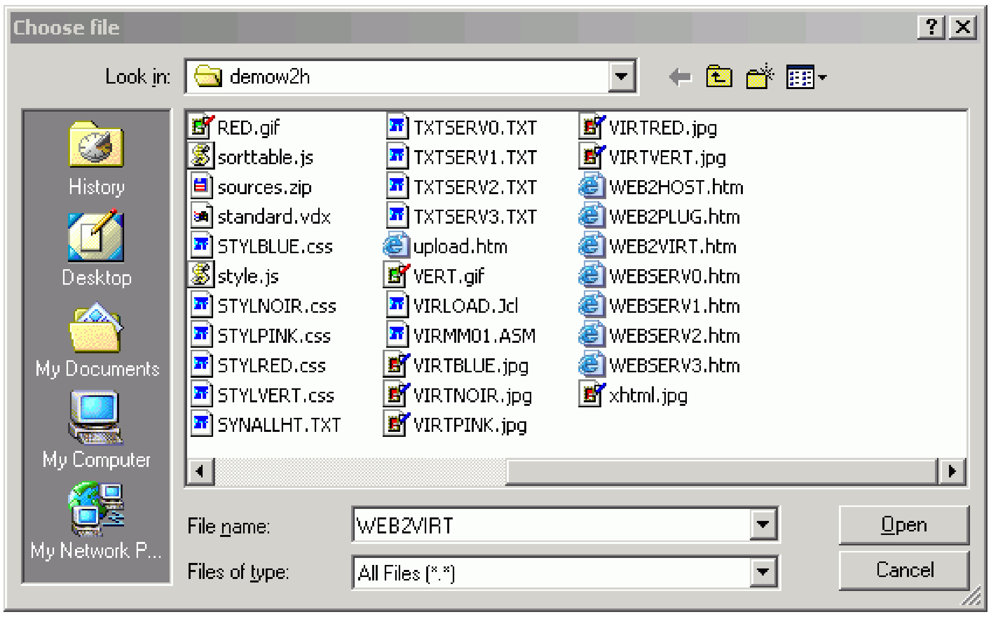
```
OK : <W2H-DIR >
RETURN CODE IS: 00
```

Page upload by HTTP with cookie : Displaying the upload.htm page

3. Click the "Browse" button and the file selection dialog will be displayed:



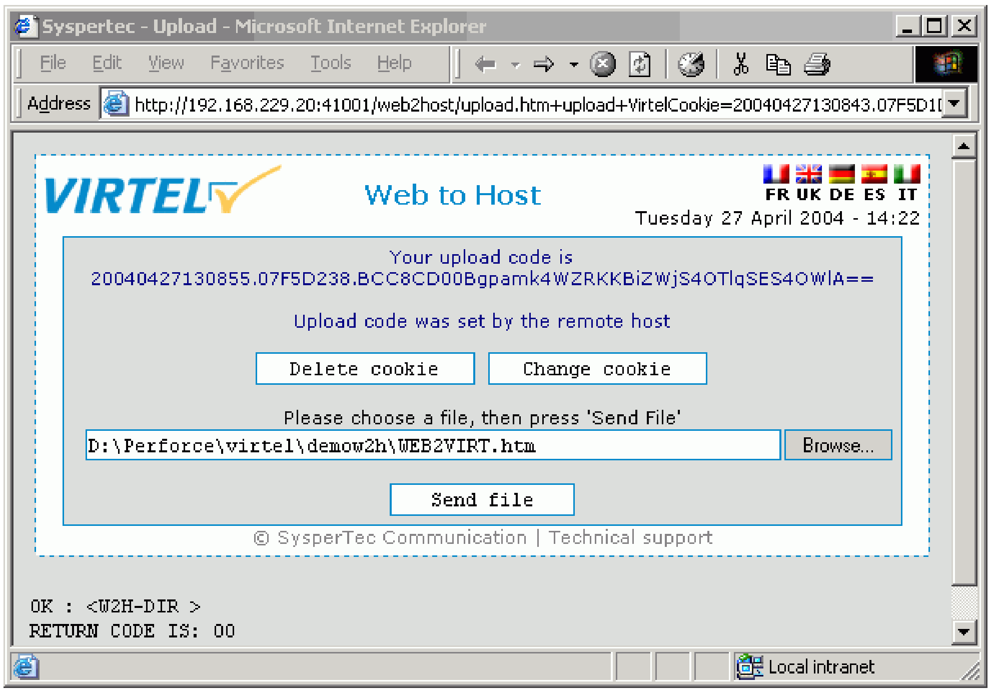
RED.gif, sortable.js, sources.zip, standard.vdx, STYLBLUE.css, style.js, STYLNOIR.css, STYLPINK.css, STYLRED.css, STYLVERT.css, SYNALLHT.TXT, TXTSERV0.TXT, TXTSERV1.TXT, TXTSERV2.TXT, TXTSERV3.TXT, upload.htm, VERT.gif, VIRLOAD.Jcl, VIRMM01.ASM, VIRTBLUE.jpg, VIRTNOIR.jpg, VIRTPINK.jpg, VIRTRED.jpg, VIRTVERT.jpg, WEB2HOST.htm, WEB2PLUG.htm, WEB2VIRT.htm, WEBSERV0.htm, WEBSERV1.htm, WEBSERV2.htm, WEBSERV3.htm, xhtml.jpg

File name: WEB2VIRT

Files of type: All Files (*.*)

Page upload by HTTP with cookie : File selection dialog

4. Select the file you want to upload, then press the “Open” button. The name of the selected file will be displayed in the input field:



http://192.168.229.20:41001/web2host/upload.htm+upload+VirtelCookie=20040427130843.07F5D1I

Tuesday 27 April 2004 - 14:22

Your upload code is
20040427130855.07F5D238.BCC8CD00Bgpamk4WZRKKBiZWjS4OTlqSES4OWlA==

Upload code was set by the remote host

Please choose a file, then press 'Send File'

D:\Perforce\virtel\demow2h\WEB2VIRT.htm

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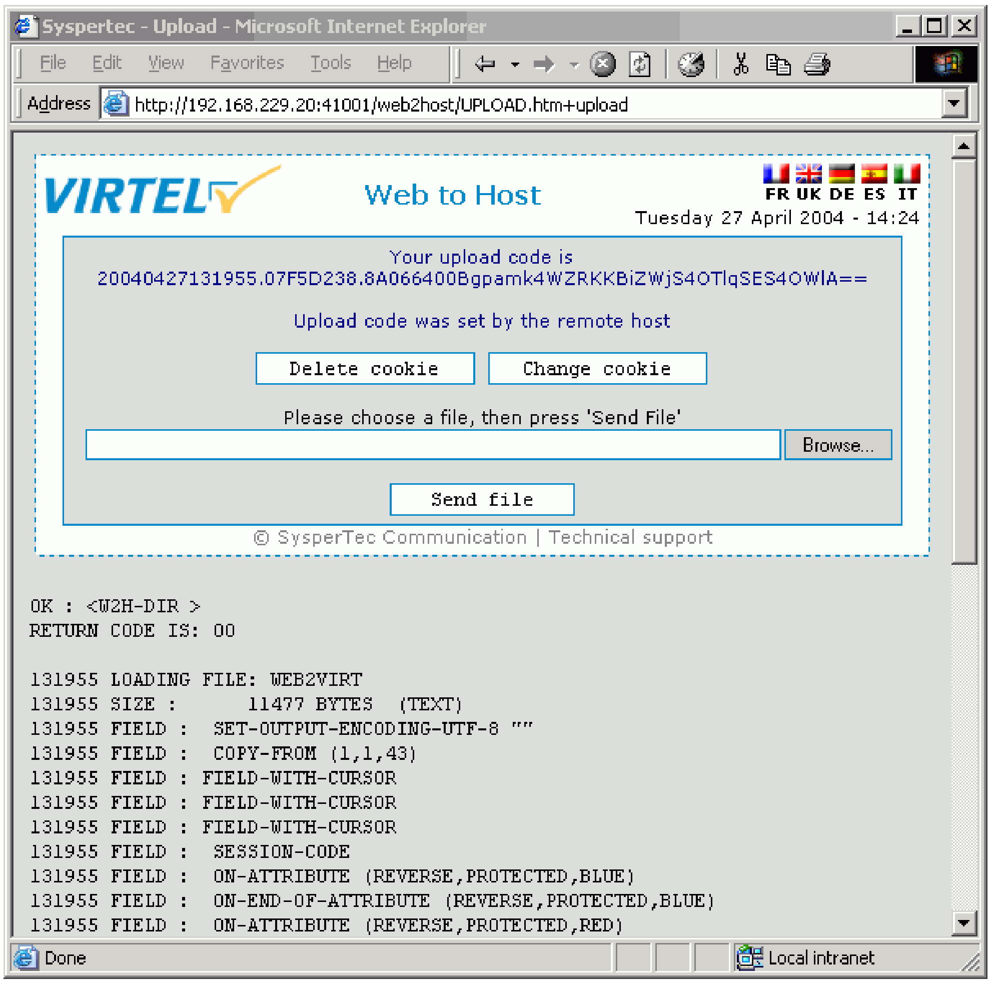
```
OK : <W2H-DIR >
RETURN CODE IS: 00
```

Page upload by HTTP with cookie : Sending the file

5. Press the “Send File” button to upload the file to VIRTEL. VIRTEL stores the file in the directory (W2H-DIR in this example) specified in the definition of the correspondent associated with the cookie. VIRTEL then displays the result of the upload:


Syspertec - Upload - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://192.168.229.20:41001/web2host/UPLOAD.htm+upload
VIRTEL
Web to Host
FR UK DE ES IT
Tuesday 27 April 2004 - 14:24
Delete cookie
Change cookie
Browse...
Send file
© SysperTec Communication | Technical support
Done
Local intranet

Your upload code is
20040427131955.07F5D238.8A066400Bgpamk4WZRKKBiZWjS4OTlqSES4OWlA==

Upload code was set by the remote host

Please choose a file, then press 'Send File'

```
OK : <W2H-DIR >
RETURN CODE IS: 00

131955 LOADING FILE: WEB2VIRT
131955 SIZE :      11477 BYTES   (TEXT)
131955 FIELD :  SET-OUTPUT-ENCODING-UTF-8 ""
131955 FIELD :  COPY-FROM (1,1,43)
131955 FIELD : FIELD-WITH-CURSOR
131955 FIELD : FIELD-WITH-CURSOR
131955 FIELD : FIELD-WITH-CURSOR
131955 FIELD :  SESSION-CODE
131955 FIELD :  ON-ATTRIBUTE (REVERSE,PROTECTED,BLUE)
131955 FIELD :  ON-END-OF-ATTRIBUTE (REVERSE,PROTECTED,BLUE)
131955 FIELD :  ON-ATTRIBUTE (REVERSE,PROTECTED,RED)
```

Page upload by HTTP with cookie : Confirmation of file uploadr

From now on, the cookies are managed automatically. After each upload, VIRTEL sends a new cookie to the browser, as indicated by the message “Upload code was set by the remote host”.

Depending on the values specified in the directory definition, VIRTEL may convert the file name to upper case, and truncate the filename to a maximum length, before storing it in the directory. The filename after conversion and truncation must not duplicate any other filename in the directory. For example, when uploading to a directory defined using the default parameters (not case sensitive, with maximum filename length 8), the file links.gif would be stored under the name LINKS.GI

1.6.4. Uploading pages by HTTP (secured by signon)

The upload4.htm page allows the administrator to upload HTML pages and graphics to VIRTEL. When this page is first loaded, the web browser displays a signon dialog box requesting a userid and password. The userid allows the security product (RACF, ACF2, TSS, or VIRTEL) to determine which, if any, of the page upload transactions the user is authorized to use. Each VIRTEL directory has its own upload transaction, so that upload security can be applied individually to each directory, by authorizing users to the corresponding directory’s upload transaction.

1.6.4.1. Definitions for page upload secured by signon

All the elements needed for page upload by HTTP secured by signon are contained in the base configuration delivered with VIRTEL. Users who upgrade from a version prior to VIRTEL 4.27 while keeping their existing configuration need to add certain elements to their existing configuration to benefit from the new “page upload secured by signon” function.

The following steps show how to upgrade your configuration based on entry point WEB2HOST. You can also carry out these steps in batch by running the DEFUPLOD job in the SAMPLIB delivered with VIRTEL. Having updated the configuration, you then need to upload one new page (upload4.htm) to the W2H-DIR directory using the existing SMTP upload method.

1. In entry point WEB2HOST, define a new transaction W2H-68 with external name dirlist, application name VIR0041S and application type 2:

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: SPVIRBW  15:01:19

Internal name ===> W2H-68                 To associate with an entry point name
External name ===> dirlist                Name displayed on user menu
Description   ===> List of directories for page upload
Application   ===> VIR0041S               Application to be called
PassTicket    ===> 0  Name ===>           0=no 1=yes 2=unsigned
Application type   ===> 2                 1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> DELOC             Prefix of name of partner terminals
Logmode            ===>                   Specify when LOGMODE must be changed
How started        ===> 2                 1=menu 2=sub-menu 3=auto
Security           ===> 0                 0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                   0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===>

TIOA at logoff     ===>

Initial Scenario   ===>                   Final Scenario     ===>
Input Scenario     ===>                   Output Scenario    ===>

P1=Update                          P3=Return                        P12=Server
```

Page upload by HTTP with signon : Transaction 'dirlist'

2. Still in entry point WEB2HOST, define three new transactions W2H–71, W2H-72, W2H-73 with external names uplbas, uplw2h, and uplcli. Each of these transactions specifies VIR0041C as the application name and application type 2. The "Logon message" field contains the name of the target directory: HTMLBAS for transaction uplbas, W2H-DIR for transaction uplw2h, and CLI-DIR for uplcli :

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: SPVIRE2  15:02:23

Internal name ===> W2H-71                 To associate with an entry point name
External name ===> uplbas                 Name displayed on user menu
Description   ===> Chargement des pages HTML (répertoire HTMLBAS)
Application   ===> VIR0041C               Application to be called
PassTicket    ===> 0  Name ===>           0=no 1=yes 2=unsigned
Application type   ===> 2                 1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> DELOC             Prefix of name of partner terminals
Logmode            ===>                   Specify when LOGMODE must be changed
How started        ===> 2                 1=menu 2=sub-menu 3=auto
Security           ===> 1                 0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                   0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===> HTMLBAS

TIOA at logon      ===>

TIOA at logoff     ===>

Initial Scenario   ===>                   Final Scenario     ===>
Input Scenario     ===>                   Output Scenario    ===>

P1=Update                          P3=Return                        P12=Server
```

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: SPVIRE2  15:03:01

Internal name ===> W2H-72                 To associate with an entry point name
External name ===> uplw2h                 Name displayed on user menu
Description   ===> Chargement des pages HTML (répertoire W2H-DIR)
Application   ===> VIR0041C               Application to be called
PassTicket    ===> 0  Name ===>           0=no 1=yes 2=unsigned
Application type   ===> 2                 1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> DELOC             Prefix of name of partner terminals
Logmode            ===>                   Specify when LOGMODE must be changed
How started        ===> 2                 1=menu 2=sub-menu 3=auto
Security           ===> 1                 0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                   0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===> W2H-DIR

TIOA at logon      ===>

TIOA at logoff     ===>

Initial Scenario   ===>                   Final Scenario     ===>
Input Scenario     ===>                   Output Scenario    ===>

P1=Update                          P3=Return                       P12=Server
```

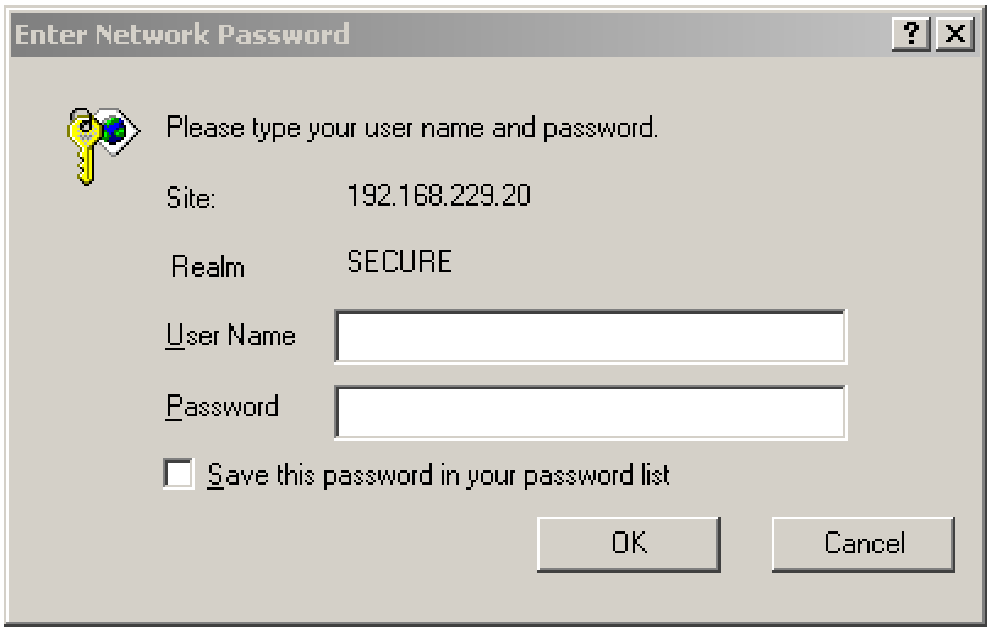
```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: SPVIRE2  15:03:21

Internal name ===> W2H-73                 To associate with an entry point name
External name ===> uplcli                 Name displayed on user menu
Description   ===> Chargement des pages HTML (répertoire CLI-DIR)
Application   ===> VIR0041C               Application to be called
PassTicket    ===> 0  Name ===>           0=no 1=yes 2=unsigned
Application type   ===> 2                 1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> DELOC             Prefix of name of partner terminals
Logmode            ===>                   Specify when LOGMODE must be changed
How started        ===> 2                 1=menu 2=sub-menu 3=auto
Security           ===> 1                 0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                   0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===> CLI-DIR

TIOA at logon      ===>

TIOA at logoff     ===>

Initial Scenario   ===>                   Final Scenario     ===>
Input Scenario     ===>                   Output Scenario    ===>

P1=Update                          P3=Return                       P12=Server
```

Page upload by HTTP with signon : Transactions 'uplxxx'

3. Use your security package (VIRTEL/SECURITE, RACF, TOP SECRET, ACF2) to grant access to resources W2H-71 and HTMLBAS (for users authorized to upload pages to the HTMLBAS directory) and/or to resources W2H-72 and W2H-DIR (for users authorized to upload pages to the W2H-DIR directory) and/or to resources W2H-73 and CLI-DIR (for users authorized to upload pages to the CLI-DIR directory). For more details, refer to the "Virtel Security Guide" manual.

1.6.4.2. Procedure for page upload secured by signon

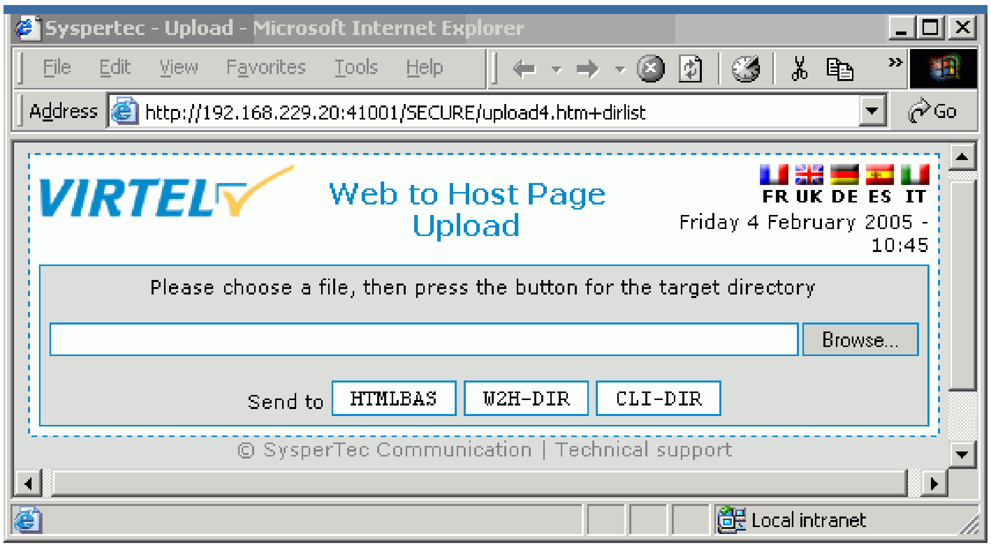
1. Display the upload4.htm page by entering the URL http://ipaddr:port/SECURE/upload4.htm+dirlist in your browser, or by clicking the "Upload" link on the VIRTEL Web2Host welcome page. Because the directory named SECURE is defined as a secure transaction, VIRTEL first requests the browser to display the password dialog box shown below:


Enter Network Password
Please type your user name and password.
Site: 192.168.229.20
Realm SECURE
User Name
Password
Save this password in your password list
OK
Cancel

Page upload by HTTP with signon : Entering the userid and password

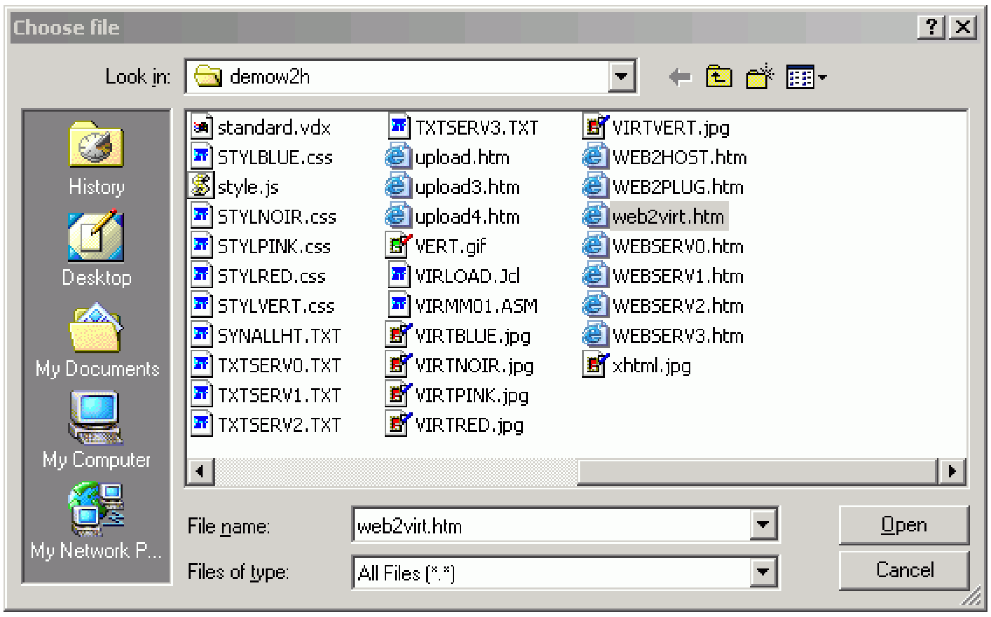
The user must have authority to access the resource represented by the internal name of the page upload transaction for the desired directory.

2. After entering the user name and password, the upload4.htm page will be displayed:


Syspertec - Upload - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://192.168.229.20:41001/SECURE/upload4.htm+dirlist
Go
VIRTEL
Web to Host Page Upload
FR UK DE ES IT
Friday 4 February 2005 - 10:45
Please choose a file, then press the button for the target directory
Browse...
Send to HTMLBAS W2H-DIR CLI-DIR
© SysperTec Communication | Technical support
Local intranet

Page upload by HTTP with signon : Displaying the upload4.htm page

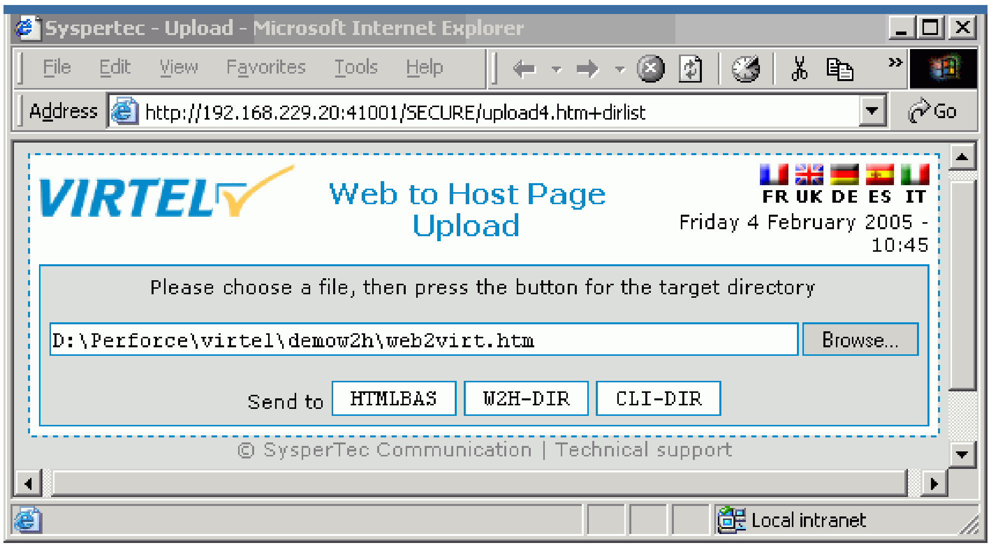
3. Press the “Browse” button to display the file selection dialog:



File name: web2virt.htm
Files of type: All Files (*.*)

Page upload by HTTP with signon : File selection dialog

4. Select the file you want to upload, then press the “Open” button. The name of the selected file will be displayed in the input field:



Address http://192.168.229.20:41001/SECURE/upload4.htm+dirlist

Friday 4 February 2005 - 10:45

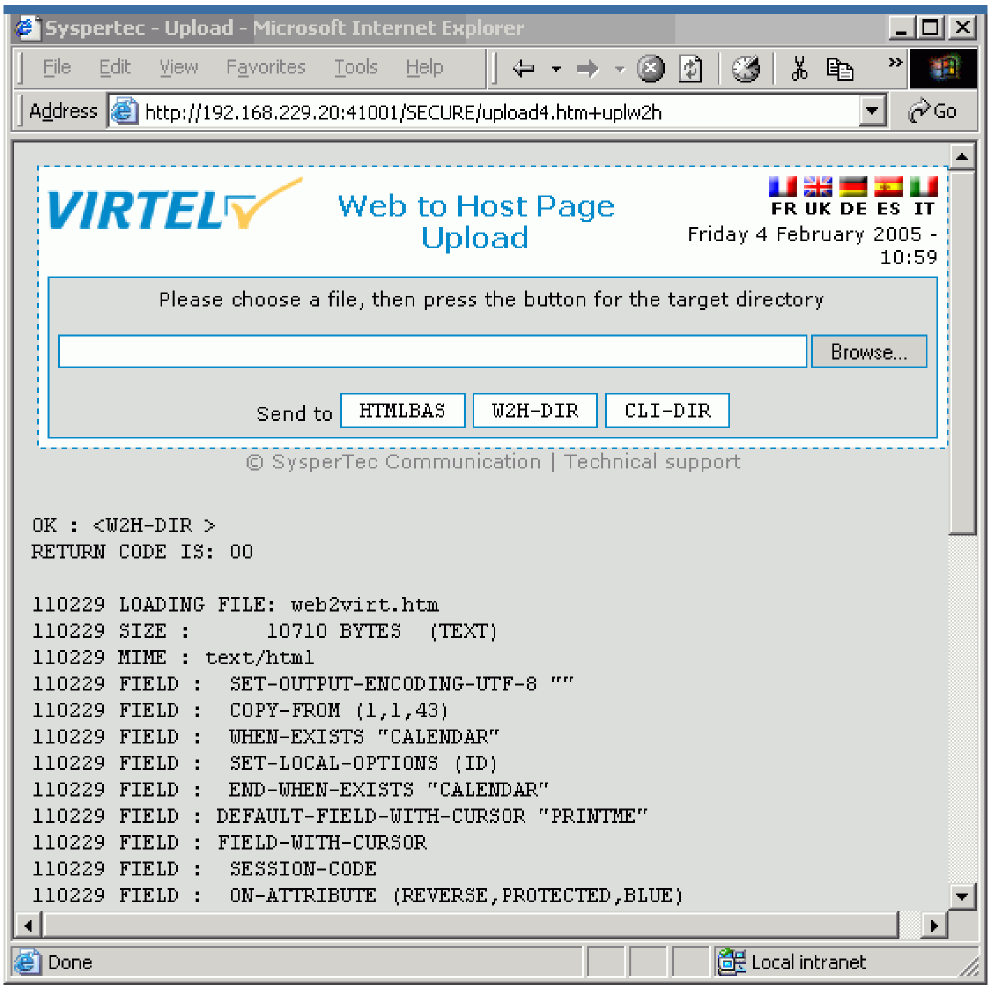
Please choose a file, then press the button for the target directory

D:\Perforce\virtel\demow2h\web2virt.htm

Send to

Page upload by HTTP with signon : Sending the file

5. Press the button corresponding to the target directory (W2H-DIR in this example) to upload the file to VIRTEL. VIRTEL stores the file in the chosen directory, and displays the result:


Syspertec - Upload - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://192.168.229.20:41001/SECURE/upload4.htm+uplw2h
Go
VIRTEL
Web to Host Page Upload
FR UK DE ES IT
Friday 4 February 2005 - 10:59
Please choose a file, then press the button for the target directory
Browse...
Send to HTMLBAS W2H-DIR CLI-DIR
© SysperTec Communication | Technical support
Done
Local intranet

```
OK : <W2H-DIR >
RETURN CODE IS: 00

110229 LOADING FILE: web2virt.htm
110229 SIZE :      10710 BYTES  (TEXT)
110229 MIME : text/html
110229 FIELD :  SET-OUTPUT-ENCODING-UTF-8 ""
110229 FIELD :  COPY-FROM (1,1,43)
110229 FIELD :  WHEN-EXISTS "CALENDAR"
110229 FIELD :  SET-LOCAL-OPTIONS (ID)
110229 FIELD :  END-WHEN-EXISTS "CALENDAR"
110229 FIELD : DEFAULT-FIELD-WITH-CURSOR "PRINTME"
110229 FIELD : FIELD-WITH-CURSOR
110229 FIELD :  SESSION-CODE
110229 FIELD :  ON-ATTRIBUTE (REVERSE,PROTECTED,BLUE)
```

Page upload by HTTP with signon : Confirmation of file upload

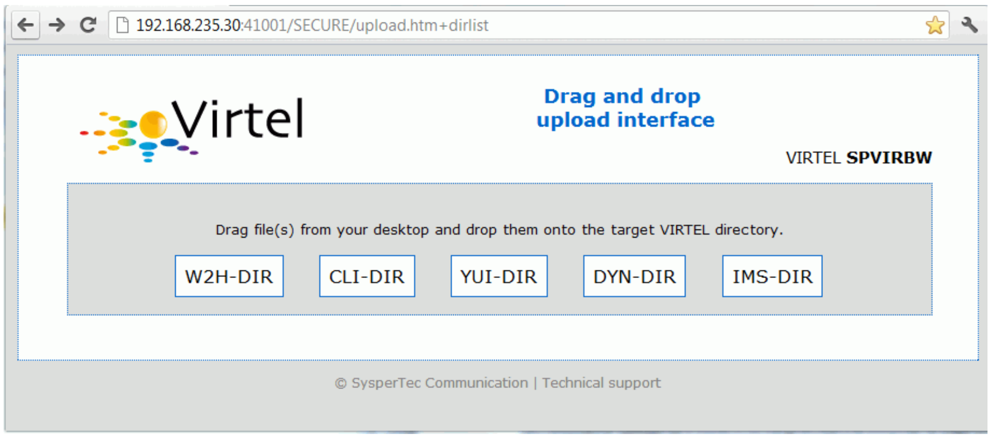
Depending on the values specified in the directory definition, VIRTEL may convert the filename to upper case, and truncate the filename to a maximum length, before storing it in the directory. The filename after conversion and truncation must not duplicate any other filename in the directory. For example, when uploading to a directory defined using the default parameters (not case sensitive, with maximum filename length 8), the file links.gif would be stored under the name LINKS.GI

1.6.5. Uploading pages by drag and drop

The VIRTEL administrator can upload pages to a VIRTEL directory using the drag and drop upload interface with the Firefox or Chrome browser. This method has the advantage that multiple pages can be uploaded to a VIRTEL directory (for example, W2H-DIR) in a single operation.

1.6.5.1. Upload interface in the VIRTEL menu

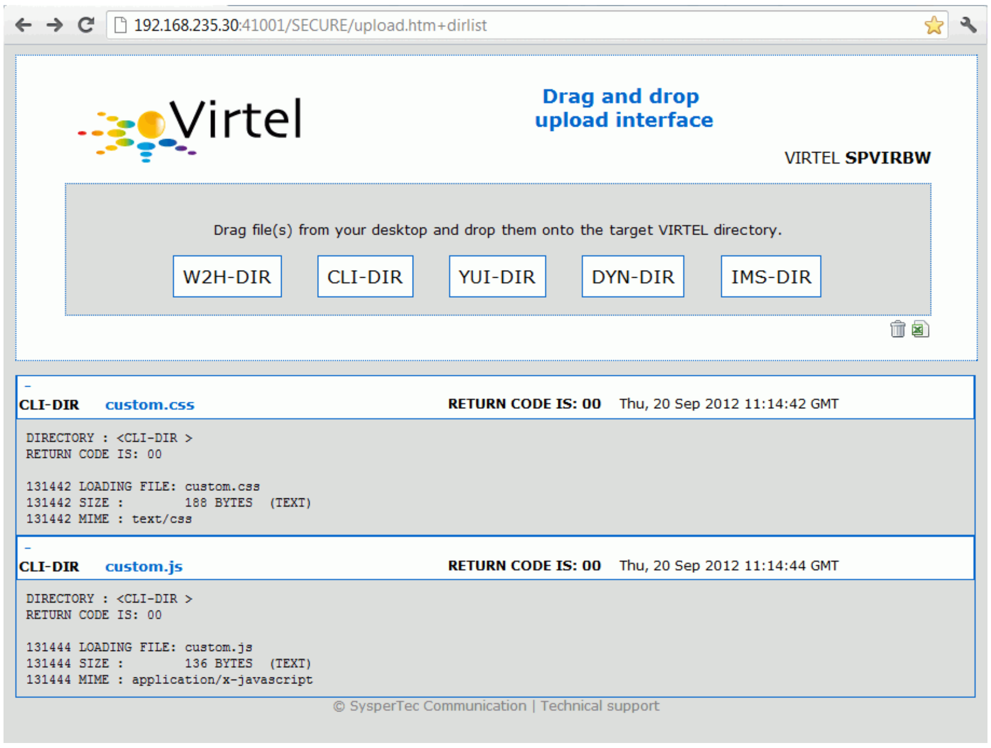
After clicking on the Drag & Drop Upload link on the VIRTEL Web Access menu (URL http://n.n.n.n:41001), the VIRTEL administrator will be presented with a signon screen, followed by the drag and drop upload interface screen shown below:


192.168.235.30:41001/SECURE/upload.htm+dirlist
Virtel
Drag and drop upload interface
VIRTEL SPVIRBW
Drag file(s) from your desktop and drop them onto the target VIRTEL directory.
W2H-DIR
CLI-DIR
YUI-DIR
DYN-DIR
IMS-DIR
© SysperTec Communication | Technical support

Drag and drop upload interface

The administrator can then select one or more files using the workstation graphical user interface, drag them to the upload interface screen, and drop them on the button representing the VIRTEL directory (for example, CLI-DIR). Files in zipped archive may need to be extracted to a temporary directory first.

1.6.5.2. Displaying upload results


192.168.235.30:41001/SECURE/upload.htm+dirlist
Virtel
Drag and drop upload interface
VIRTEL SPVIRBW
Drag file(s) from your desktop and drop them onto the target VIRTEL directory.
W2H-DIR
CLI-DIR
YUI-DIR
DYN-DIR
IMS-DIR
© SysperTec Communication | Technical support

-
CLI-DIR custom.css **RETURN CODE IS: 00** Thu, 20 Sep 2012 11:14:42 GMT

```
DIRECTORY : <CLI-DIR >
RETURN CODE IS: 00

131442 LOADING FILE: custom.css
131442 SIZE :        188 BYTES  (TEXT)
131442 MIME : text/css
```

-
CLI-DIR custom.js **RETURN CODE IS: 00** Thu, 20 Sep 2012 11:14:44 GMT

```
DIRECTORY : <CLI-DIR >
RETURN CODE IS: 00

131444 LOADING FILE: custom.js
131444 SIZE :        136 BYTES  (TEXT)
131444 MIME : application/x-javascript
```

Displaying upload results

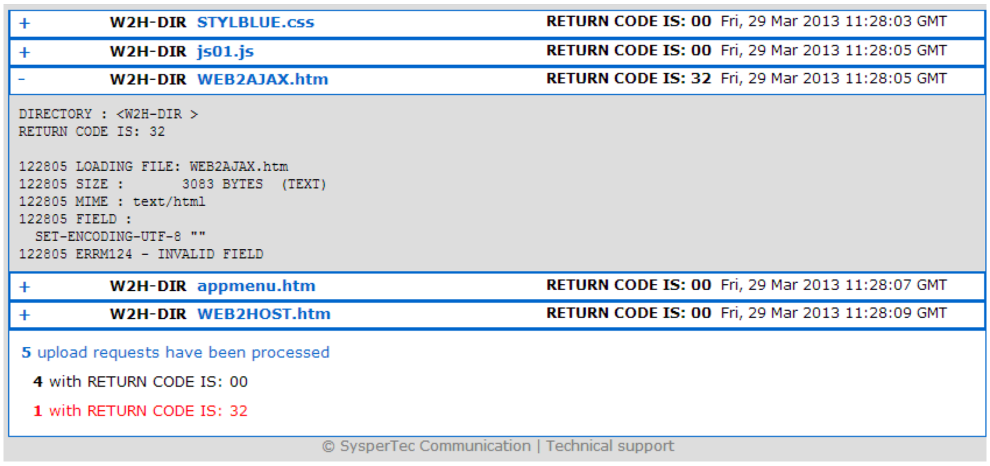
The results of the upload are displayed on the screen with a return code for each file uploaded. Each file should produce the message RETURN CODE IS: 00 In addition, by clicking on + or -, the administrator can open and close the detail display for each file uploaded.

1.6.5.3. Upload summary report

After multiple files have been uploaded, the drag and drop upload interface will display a summary showing the number of files processed with return code 00, and, in case of error, the number of files which failed to upload non-zero return codes.

The summary is not displayed when files are dragged and dropped one at a time.

In this example, one file has failed to upload because of an invalid VIRTEL tag, and the user has clicked on the + sign to the left of the file to expand the error messages:



```
+  W2H-DIR  STYLBLUE.css   RETURN CODE IS: 00  Fri, 29 Mar 2013 11:28:03 GMT
+  W2H-DIR  js01.js        RETURN CODE IS: 00  Fri, 29 Mar 2013 11:28:05 GMT
-  W2H-DIR  WEB2AJAX.htm   RETURN CODE IS: 32  Fri, 29 Mar 2013 11:28:05 GMT

DIRECTORY : <W2H-DIR >
RETURN CODE IS: 32

122805 LOADING FILE: WEB2AJAX.htm
122805 SIZE :       3083 BYTES  (TEXT)
122805 MIME : text/html
122805 FIELD :
  SET-ENCODING-UTF-8 ""
122805 ERRM124 - INVALID FIELD

+  W2H-DIR  appmenu.htm    RETURN CODE IS: 00  Fri, 29 Mar 2013 11:28:07 GMT
+  W2H-DIR  WEB2HOST.htm   RETURN CODE IS: 00  Fri, 29 Mar 2013 11:28:09 GMT

5 upload requests have been processed
  4 with RETURN CODE IS: 00
  1 with RETURN CODE IS: 32
```

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Upload summary report

1.6.5.4. Extracting upload results as an Excel spreadsheet

> The Excel button allows the administrator to export the results log as a .SLK file which can be opened as an Excel spreadsheet.

Directory	File name	Report	Time
CLI-DIR	custom.css	RETURN CODE IS: 00	Thu, 13 Sep 2012 08:13:16 GMT
CLI-DIR	custom.js	RETURN CODE IS: 00	Thu, 13 Sep 2012 08:13:16 GMT

> The Delete button allows the administrator to clear the results log.

1.6.6. Uploading pages in batch

1.6.6.1. Uploading with cURL

You can upload multiple pages (or other elements) at a time from a Windows workstation by using a command-line HTTP-client program, such as cURL from www.haxx.se.

The following example shows a Windows command to upload all files of type .htm from the current directory to VIRTEL:

```
for %F in (*.htm) do curl -v -F "file=@%F;type=text/html" -u
virdba:virdbapw http://192.168.235.30:41001/SECURE/virmsg.txt+uplbas
```

In this example:

***.htm**
: the files to be uploaded

virdba:virdbapw
: userid and password for VIRTEL

192.168.235.30:41001
: identifies the VIRTEL HTTP line

virmsg.txt
: page template for displaying upload result messages

uplbas
: external name of the upload transaction in VIRTEL which specifies the target directory (HTMLBAS). See "Uploading pages by HTTP (secured by signon)", page 75 for a list of upload transactions.

Note: %F appears twice in the command shown above. In conformance with the syntax requirements of the Windows command interpreter, you must use %F if you execute the command from the command prompt, but %%F if you execute the command from within a command (.cmd) file.

1.6.6.2. The upl2virt command procedure

For users of Windows XP and above, the command procedure upl2virt.cmd may be used to upload elements to VIRTEL from the Windows command prompt, or from Windows Explorer. upl2virt automatically generates the required cURL commands as described in the previous section.

1.6.6.2.1. Pre-requisites

upl2virt requires as a pre-requisite the cURL package described in the previous section.

Optionally, Bill Stewart's editvar freeware package from www.westmesatech.com may also be installed. This package allows upl2virt to securely prompt the administrator for a password. If the editvar package is not installed, then upl2virt can still prompt for a password but it will be unable to mask the password as the administrator types it into the command window.

1.6.6.2.2. Installation

upl2virt may be downloaded from VIRTEL to the workstation by entering the following URL in your browser: http://n.n.n.n:41001/upl2virt.cmd (where n.n.n.n is the IP address of VIRTEL). When prompted, save the upl2virt.cmd file in a directory in your path (for example, C:\WINDOWS).

1.6.6.2.3. Using upl2virt at the command prompt

To execute upl2virt as a command, open a Windows command prompt, navigate to the directory which contains the file(s) to be uploaded, and execute the command:

```
upl2virt [-u userid:password] -d directory -a n.n.n.n
         [-p port] [-r] [-f ctlfile] [-k] [file1 file2 ...]
```

In the above command:

userid:password

is your VIRTEL userid and password. If not specified, upl2virt will prompt for userid and password. If userid is specified without the password, then upl2virt will prompt for password.

directory

is the name of the target VIRTEL directory (for example, CLI-DIR)

n.n.n.n

is the IP address of VIRTEL

port

is the VIRTEL administration port number (default 41001).

Note: this is the port number for the WEB2HOST entry point, not the port number associated with the directory you are uploading to.

ctlfile

specifies the name of a control file containing a list of file names to be uploaded

file1 file2 ...

are the names of files to be uploaded

-r

specifies recursion into subdirectories

-k

keeps the command window open after the last upload

If no file names are specified, and no control file is specified, the default is to upload all web elements from the current directory (and also from all subdirectories if the –r option is specified).

1.6.6.2.4. Using upl2virt from Windows Explorer

The upl2virt command may also be used to upload elements to VIRTEL from the Windows Explorer interface. Having selected one or more files in Windows Explorer, the administrator right-clicks on the selected files and chooses the “Send To” option, then chooses “Upload to VIRTEL” from the “Send To” menu.

To activate the “Upload to VIRTEL” option in the “Send To” menu, use Windows Explorer to navigate to the “c:\Documents and Settings\username\SendTo” folder, where username is your Windows username. If you cannot see the SendTo folder, then click on “Tools” – “Folder options” – “View”, tick the option “Display hidden files and folders”, and click “OK”.

In the “SendTo” folder, right click and select “New” – “Shortcut”. Then click “Browse”, navigate to the place where you stored the upl2virt.cmd file, and click on it. Click “Next” and enter a descriptive title for the menu item, such as “Upload to VIRTEL”. Then click “Finish”.

You now have an item in the “SendTo” folder named “Upload to VIRTEL”. Right-click on this item and choose “Properties”. In the “Target” field you will see the path to the upl2virt.cmd file which you specified. Update this field with parameters as shown in the example below:

```
C:\WINDOWS\upl2virt.cmd -u MYUSERID -d CLI-DIR -a 10.1.12.101
–k
```

where:

MYUSERID

is your VIRTEL userid

CLI-DIR

is the name of the VIRTEL directory that this shortcut will upload to

10.1.12.101

is the IP address of VIRTEL.

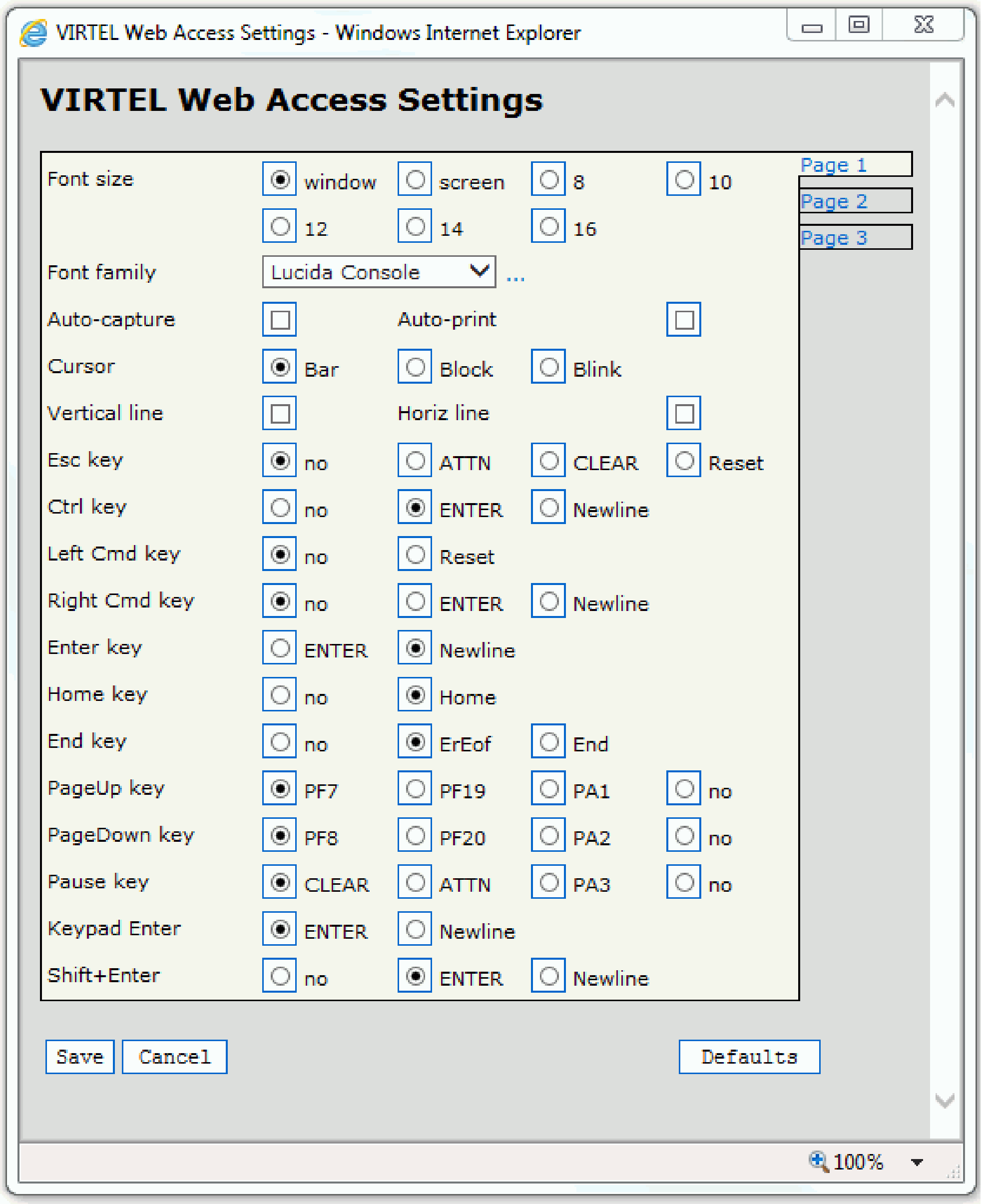
You may omit the –u MYUSERID parameter and upl2virt will prompt you for your userid.

1.7. Web Access Customization

The VIRTEL Web Access user can use the Settings menu to modify certain options such as font size, 3270 key mappings, and color schemes. The user's settings are stored in a browser local storage which remains valid so long as cookies are not deleted from the workstation. The settings stored in the user's local storage override the default settings for VIRTEL Web Access which are stored in the w2hparm.js file. See "Global modification of Web Access settings", page 99.

1.7.1. Web Access Settings menu

When the user clicks this button on the VIRTEL Web Access toolbar, the window shown below opens:

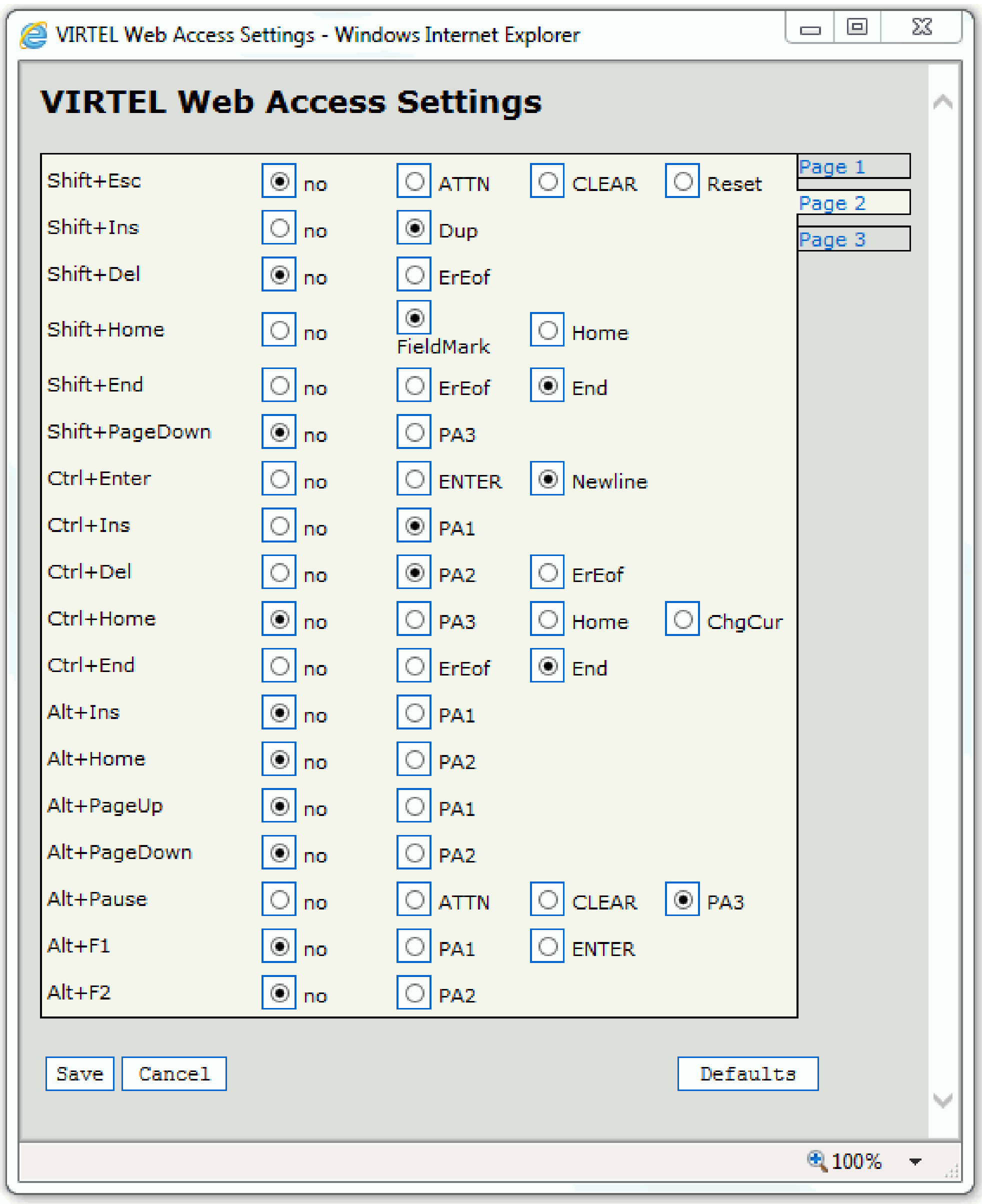

VIRTEL Web Access Settings - Windows Internet Explorer

VIRTEL Web Access Settings

Page 1
Page 2
Page 3

Font size	[✓ window]	screen	8	10
	12	14	16	
Font family	Lucida Console ...			
Auto-capture	☐	Auto-print	☐	
Cursor	[✓ Bar]	Block	Blink	
Vertical line	☐	Horiz line	☐	
Esc key	[✓ no]	ATTN	CLEAR	Reset
Ctrl key	no	[✓ ENTER]	Newline	
Left Cmd key	[✓ no]	Reset		
Right Cmd key	[✓ no]	ENTER	Newline	
Enter key	ENTER	[✓ Newline]		
Home key	no	[✓ Home]		
End key	no	[✓ ErEof]	End	
PageUp key	[✓ PF7]	PF19	PA1	no
PageDown key	[✓ PF8]	PF20	PA2	no
Pause key	[✓ CLEAR]	ATTN	PA3	no
Keypad Enter	[✓ ENTER]	Newline		
Shift+Enter	no	[✓ ENTER]	Newline	

VIRTEL Web Access Settings menu (part 1 of 3)

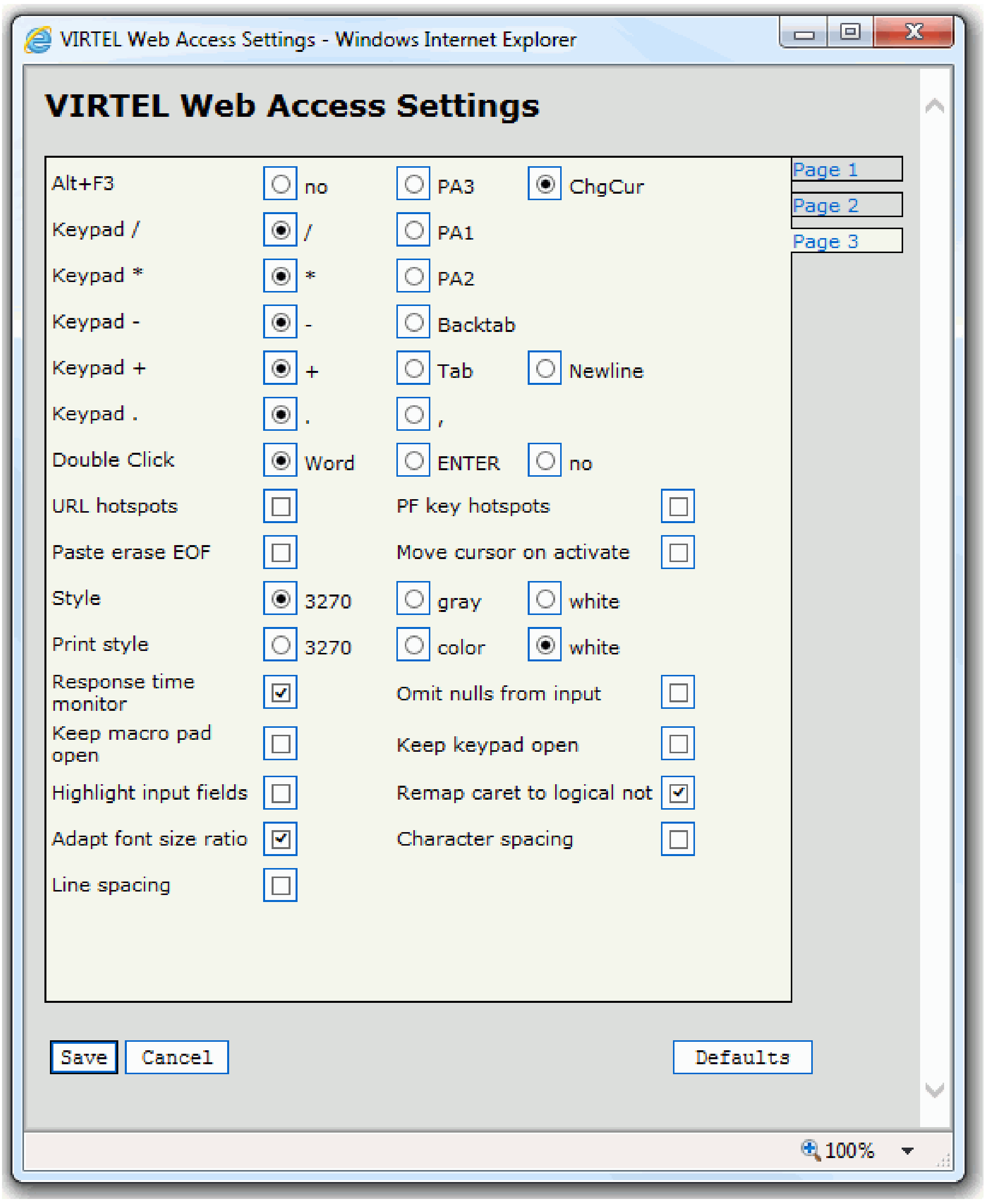


VIRTEL Web Access Settings - Windows Internet Explorer

VIRTEL Web Access Settings

Shift+Esc	[✓ no]	ATTN	CLEAR	Reset
Shift+Ins	no	[✓ Dup]		
Shift+Del	[✓ no]	ErEof		
Shift+Home	no	[✓ FieldMark]	Home	
Shift+End	no	ErEof	[✓ End]	
Shift+PageDown	[✓ no]	PA3		
Ctrl+Enter	no	ENTER	[✓ Newline]	
Ctrl+Ins	no	[✓ PA1]		
Ctrl+Del	no	[✓ PA2]	ErEof	
Ctrl+Home	[✓ no]	PA3	Home	ChgCur
Ctrl+End	no	ErEof	[✓ End]	
Alt+Ins	[✓ no]	PA1		
Alt+Home	[✓ no]	PA2		
Alt+PageUp	[✓ no]	PA1		
Alt+PageDown	[✓ no]	PA2		
Alt+Pause	no	ATTN	CLEAR	[✓ PA3]
Alt+F1	[✓ no]	PA1	ENTER	
Alt+F2	[✓ no]	PA2		

VIRTEL Web Access Settings menu (part 2 of 3)



VIRTEL Web Access Settings

Alt+F3	no	PA3	[✓ ChgCur]
Keypad /	[✓ /]	PA1	
Keypad *	[✓ *]	PA2	
Keypad -	[✓ -]	Backtab	
Keypad +	[✓ +]	Tab	Newline
Keypad .	[✓ .]	,	
Double Click	[✓ Word]	ENTER	no
URL hotspots	☐	PF key hotspots	☐
Paste erase EOF	☐	Move cursor on activate	☐
Style	[✓ 3270]	gray	white
Print style	3270	color	[✓ white]
Response time monitor	✓	Omit nulls from input	☐
Keep macro pad open	☐	Keep keypad open	☐
Highlight input fields	☐	Remap caret to logical not	✓
Adapt font size ratio	✓	Character spacing	☐
Line spacing	☐		

VIRTEL Web Access Settings menu (part 3 of 3)

1.7.2. Contents of the fields

Font Size

Size of font. Possible values are:

Window

VIRTEL calculates the font size to fit the browser’s window size.

Screen

VIRTEL calculates the font size to fit the display screen size.

nn

VIRTEL uses a fixed font size. nn is the size in “points”: 8pt, 10pt, 12pt, 14pt, or 16pt.

Font family

Name of font. The panel displays a list of fonts known to VIRTEL and installed on the workstation, in addition to the fonts supplied by VIRTEL. If the required font is not in the list, click the ellipsis to the right of the selection box and type the name of the font in the box. Any fixed-width font installed on the workstation may be specified.

Auto-capture

When activated, causes a snapshot of each screen displayed by the host application to be automatically appended to the screen capture window.

Auto-print

When activated, causes the Windows print function to be launched automatically in the print window as a result of a screen snapshot or print request.

Cursor

The shape of the 3270 cursor. The possible settings are:

Smart

The character at the cursor position is underlined and his position and color changes to always remain visible for any character (depending on the selected character's style : bgnd color, reverse, underlined). For version 4.53 or 4.54, update #5303 must be applied.

Block

The character at the cursor position is in reverse video

Blink

The character at the cursor position is in blinking reverse video

Note: For Internet Explorer versions 6 and 7, Blink is the same as Block

Vertical line, Horiz line

When activated, causes the position of the cursor to be marked with a vertical line and/or a horizontal line extending to the edges of the 3270 window (also known as a "crosshair cursor").

Esc key to Alt+F3

Defines the mapping of workstation keyboard to 3270 keys. The value "no" indicates that the keystroke is ignored.

For example the 3270 PA1 key may be assigned to the PageUp key, to the Alt+PageUp key, and/or to the Alt+F1 key on the user's keyboard.

Note: For Internet Explorer, the "Ctrl key" setting refers to the right Ctrl key. For Firefox, Chrome, and Safari the "Ctrl key" setting applies to both the left and right Ctrl keys identically. For Firefox, the "Keypad Enter" setting is ignored. For Internet Explorer versions 6, 7, and 8, a browser helper object (virtkey.dll) must be installed to allow recognition of the keypad Enter key. This BHO is not needed for Internet Explorer 9.

The ChgCur setting allows the user to toggle the cursor between the "bar", "block", "bar+crosshairs", and "block+crosshairs" style.

Keypad /*-+.

Allows keys on the numeric keypad to be assigned to certain 3270 functions including PA1, PA2, Tab, Backtab, and Newline. Also allows the decimal point on the numeric keypad to be remapped to comma for European countries.

Note: Remapping of the numeric keypad is only supported for Internet Explorer, Chrome, and Safari. Keypad settings are ignored for Firefox and Opera.

Double click

Specifies the action taken for a mouse double-click. Possible settings are:

Word

draws a box around the word that the mouse is pointing in preparation for a copy or cut operation.

ENTER

Activates the “point-and-shoot” function. When set to ENTER, double clicking the mouse moves the cursor to the mouse position and sends a 3270 ENTER to the host application.

no

indicates that the double-click function is deactivated.

URL hotspots

When activated, any text starting with http://, https://, mailto://, file://, news:// or ftp:// (except in 3270 input fields) is transformed into a hyperlink.

PF key hotspots

When activated, any text starting with Fnn= or PFnn= (except in 3270 input fields) is transformed into a clickable area. Clicking on the area is equivalent to pressing PF nn.

Paste erase EOF

When activated, a paste operation will erase the rest of an input field to the right of the pasted text

Move cursor on activate

This setting takes effect only when the user clicks on a background 3270 window in order to bring the window to the foreground. When the option is activated, the window is brought to the foreground and the 3270 cursor moves to the location in the window where the user clicked; the copy/paste box and context menu are removed if present. When the option is not activated, the window is brought to the foreground and the cursor remains in its previous position; the copy/paste box and context menu remain displayed if present.

Style

Allows a choice of color schemes by selection of CSS style sheet. By default, possible values are:

3270

extended colors on black background

Gray

extended colors on gray background

White

gray characters on white background

Print style

Allows a choice of color schemes for the screen capture window. By default, possible values are:

3270

extended colors on black background

Color

extended colors on white background

White

black characters on white background

Response time monitor

When activated, two counters are displayed on the status line below the 3270 screen, for example: H:110ms J:31ms. The first number (H=Host) represents the response time of the VIRTEL server, from the last Enter or PF key until the receipt of the most recent message from the server. The second number (J=JavaScript) is the time taken by the browser scripts to prepare the screen for display. The sum of the two numbers is the response time perceived by the user.

Note: The response time monitor is active in Ajax mode only

Omit nulls from input

When activated, VIRTEL Web Access will remove all nulls from modified input fields before sending to the server, in strict conformance with 3270 protocol. When not activated, leading and embedded nulls are converted to blanks, and only trailing nulls are suppressed, which many users find more convenient.

Keep macro pad open

If checked, the macro window remains open all the time. If not, it disappears as soon as you have clicked a macro.

Keep keypad open

If checked, the keypad window remains open all the time. If not, it disappears as soon as you have clicked a function key in it.

Highlight input fields

Permits the user to display a different background color for 3270 input fields. When this option is selected, all input fields will have a class designator HIGHLIGHTED_INPUTFIELD in addition to their regular class. The style definition may be overridden by the administrator in the custom.css file.

Remap caret to logical not

If checked, translates the “caret” sign (Shift+6 on a US keyboard) to EBCDIC X'5F', which is the “logical not” sign (¬) in codepage 037/1140.

Adapt font size ratio

If checked, characters will be stretched to fill the window. This option functions in Internet Explorer versions 9 and later, in Firefox, and Chrome. For Internet Explorer versions 6, 7, and 8 this option has no effect.

Character spacing

If checked, blank space will be added between characters if necessary to make the 3270 screen fill the browser window horizontally.

Line spacing

If checked, blank space will be added between lines if necessary to make the 3270 screen fill the browser window vertically. This option is incompatible with IE6 and will be ignored if used with IE6. Additionally, if “Adapt font size ratio” is specified and the browser supports it, then the “Line spacing” option is ignored.

1.7.3. Associated functions

After modifying the Settings menu, the user presses one of the buttons:

Save

save the options in browser local storage.

Cancel

exit without saving the modifications made to this menu.

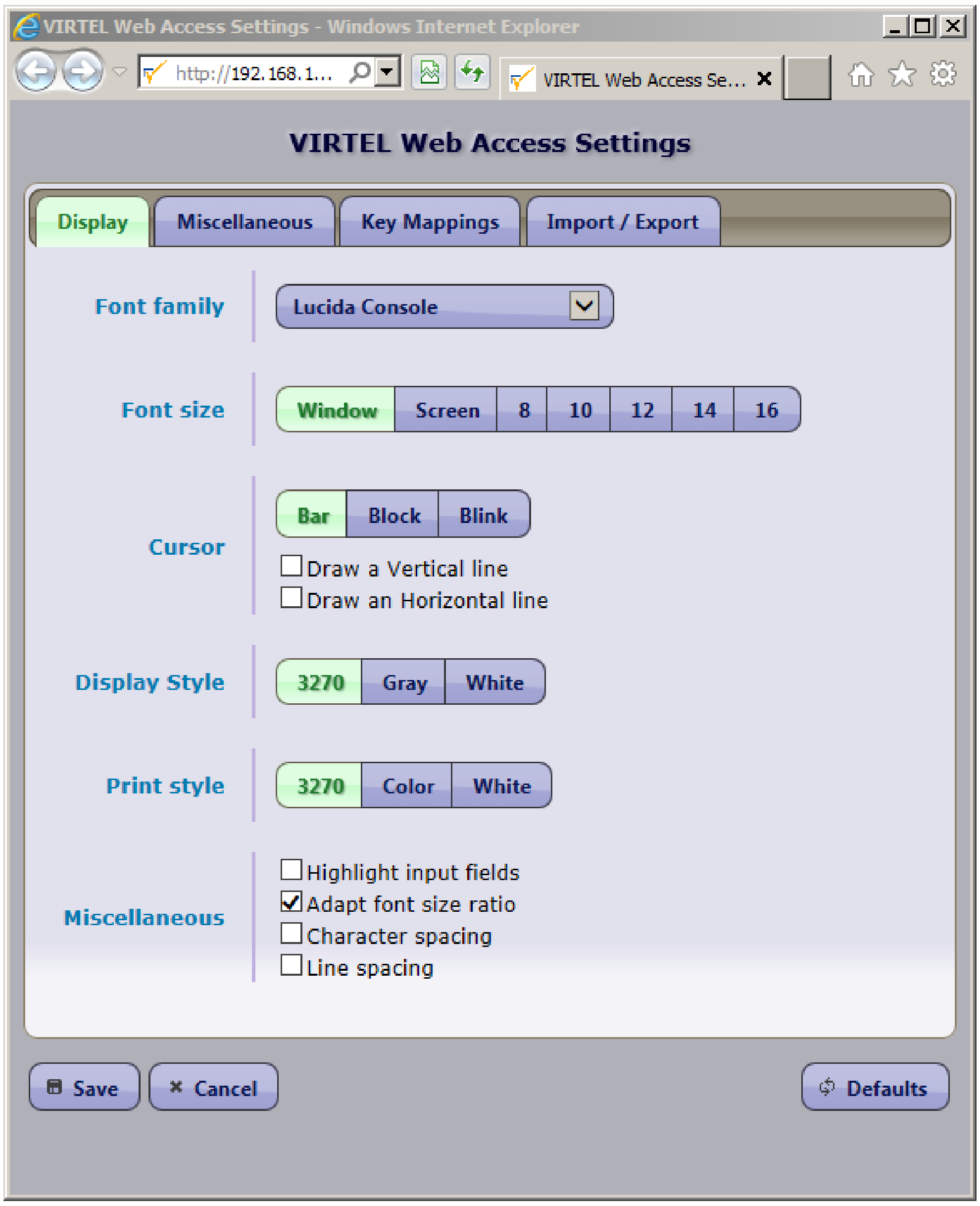
Defaults

returns all of the settings to their default values. The default values are specified by the installation in w2hparm.js.

Deletion of browser cookies may delete the values saved in local storage. For Internet Explorer, ensure that the option “Delete browsing history on exit” in Tools – Internet Options” is not checked.

1.7.4. Web Access Settings menu

When the user clicks this button on the VIRTEL Web Access toolbar the window shown below opens.


VIRTEL Web Access Settings - Windows Internet Explorer

http://192.168.1...

VIRTEL Web Access Se...

VIRTEL Web Access Settings

Display | Miscellaneous | Key Mappings | Import / Export

Font family: Lucida Console

Font size: [✓ Window] Screen 8 10 12 14 16

Cursor: [✓ Bar] Block Blink

☐ Draw a Vertical line
☐ Draw an Horizontal line

Display Style: [✓ 3270] Gray White

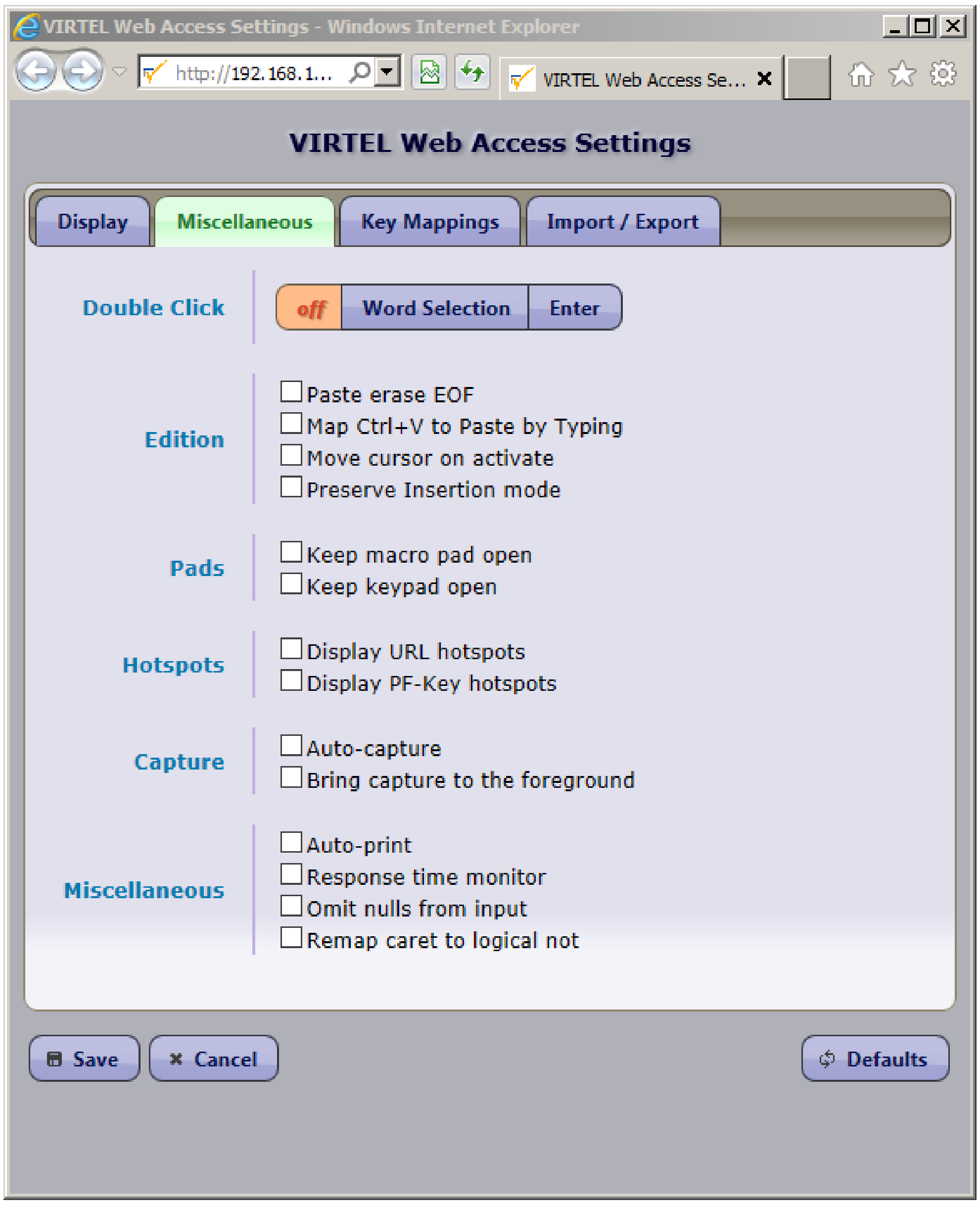
Print style: [✓ 3270] Color White

Miscellaneous:

☐ Highlight input fields
☑ Adapt font size ratio
☐ Character spacing
☐ Line spacing

Save | Cancel | Defaults

VIRTEL Web Access Settings menu (Display tab)



VIRTEL Web Access Settings

Double Click: [✓ off] Word Selection Enter

Edition
- ☐ Paste erase EOF
- ☐ Map Ctrl+V to Paste by Typing
- ☐ Move cursor on activate
- ☐ Preserve Insertion mode

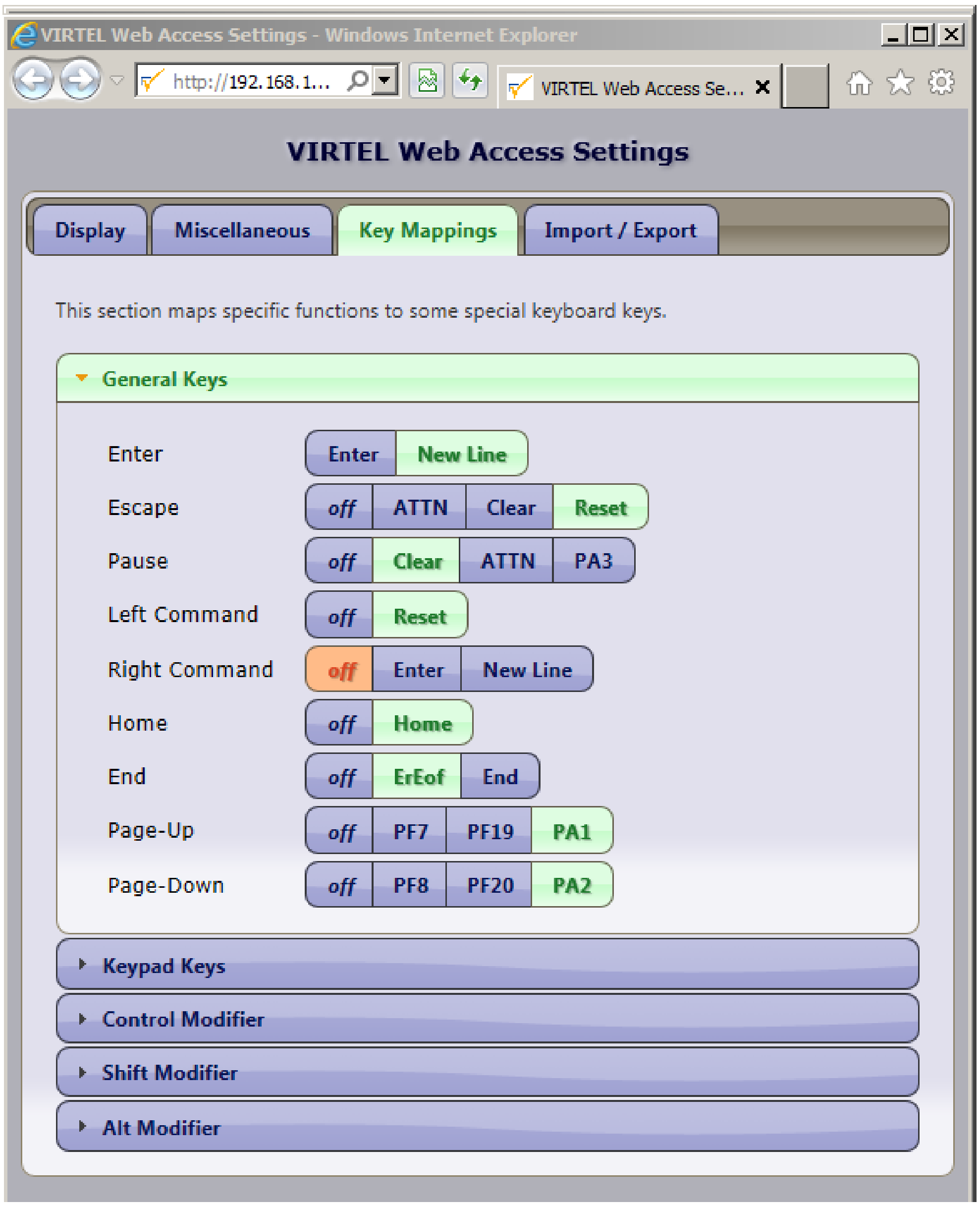
Pads
- ☐ Keep macro pad open
- ☐ Keep keypad open

Hotspots
- ☐ Display URL hotspots
- ☐ Display PF-Key hotspots

Capture
- ☐ Auto-capture
- ☐ Bring capture to the foreground

Miscellaneous
- ☐ Auto-print
- ☐ Response time monitor
- ☐ Omit nulls from input
- ☐ Remap caret to logical not

VIRTEL Web Access Settings menu (Miscellaneous tab)

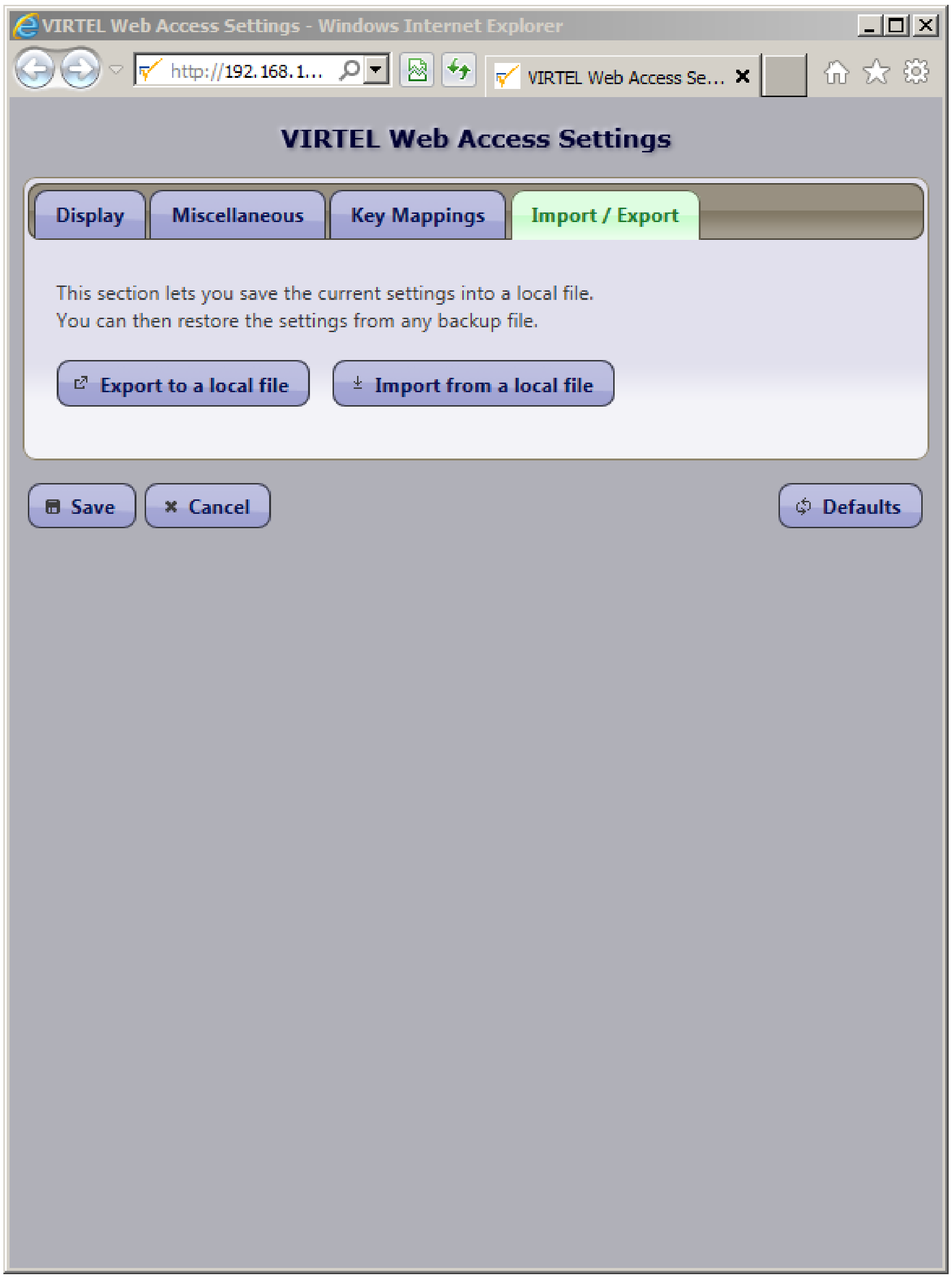


VIRTEL Web Access Settings

This section maps specific functions to some special keyboard keys.

Enter	Enter	New Line		
Escape	off	ATTN	Clear	Reset
Pause	off	Clear	ATTN	PA3
Left Command	off	Reset		
Right Command	off	Enter	New Line	
Home	off	Home		
End	off	ErEof	End	
Page-Up	off	PF7	PF19	PA1
Page-Down	off	PF8	PF20	PA2

VIRTEL Web Access Settings menu (Key Mappings tab)



This section lets you save the current settings into a local file.
You can then restore the settings from any backup file.

VIRTEL Web Access Settings menu (Import tab)

1.7.4.1. Display tab parameters

Font Size

Size of font. Possible values are :

Window

VIRTEL calculates the font size to fit the browser's window size.

Screen

VIRTEL calculates the font size to fit the display screen size.

> **nn**
>
> > VIRTEL uses a fixed font size. nn is the size in "points": 8pt, 10pt, 12pt, 14pt, or 16pt.

Font family

> Name of font. The panel displays a list of fonts known to VIRTEL and installed on the workstation, in addition to the fonts supplied by VIRTEL. If the required font is not in the list, click the ellipsis to the right of the selection box and type the name of the font in the box. Any fixed-width font installed on the workstation may be specified.

Cursor

> The shape of the 3270 cursor. The possible settings are:
>
> **Smart**
>
> > The character at the cursor position is underlined and his position and color changes to always remain visible for any character (depending on the selected character's style : bgnd color, reverse, underlined). For version 4.53 or 4.54, update #5303 must be applied.
>
> **Bar**
>
> > The character at the cursor position is underlined
>
> **Block**
>
> > The character at the cursor position is in reverse video
>
> **Blink**
>
> > The character at the cursor position is in blinking reverse video
>
> Note: For Internet Explorer versions 6 and 7, Blink is the same as Block
>
> **Vertical line, Horiz line**
>
> > When activated, causes the position of the cursor to be marked with a vertical line and/or a horizontal line extending to the edges of the 3270 window (also known as a "crosshair cursor").

To add or remove a style, see "Customize display style", page 275)

Administrators can add some new customs style as describe in the section "How to customize display style", page 275

Display Style

> Allows a choice of color schemes by selection of CSS style sheet. Possible values are :
>
> **3270**
>
> > extended colors on black background
>
> **Gray**
>
> > extended colors on gray background
>
> **White**
>
> > gray characters on white background

Administrators can add some new customs print style as describe in the section "How to customize print style", page 276

Print style

> Allows a choice of color schemes for the screen capture window. Possible values are :
>
> **3270**
>
> > extended colors on black background
>
> **Color**
>
> > extended colors on white background

White

black characters on white background

Miscellaneous

Highlight input fields

Permits the user to display a different background color for 3270 input fields. When this option is selected, all input fields will have a class designator HIGHLIGHTED_INPUTFIELD in addition to their regular class. The style definition may be overridden by the administrator in the custom.css file.

Adapt font size ratio

If checked, characters will be stretched to fill the window. This option functions in Internet Explorer versions 9 and later, in Firefox, and Chrome. For Internet Explorer versions 6, 7, and 8 this option has no effect.

Character spacing

If checked, blank space will be added between characters if necessary to make the 3270 screen fill the browser window horizontally.

Line spacing

If checked, blank space will be added between lines if necessary to make the 3270 screen fill the browser window vertically. This option is incompatible with IE6 and will be ignored if used with IE6. Additionally, if “Adapt font size ratio” is specified and the browser supports it, then the “Line spacing” option is ignored.

1.7.4.2. Miscellaneous tab parameters

Double click

Specifies the action taken for a mouse double-click. Possible settings are :

off

Indicates that the double-click function is deactivated.

Word Selection

Draws a box around the word that the mouse is pointing in preparation for a copy or cut operation.

ENTER

Activates the “point-and-shoot” function. When set to ENTER, double clicking the mouse moves the cursor to the mouse position and sends a 3270 ENTER to the host application.

Edition

Paste erase EOF

When activated, a paste operation will erase the rest of an input field to the right of the pasted text

Map Ctrl+V to Paste by Typing

Indicates that Ctrl+V will act “paste by typing”, i.e cursor will be positionned at the end of the pasted text instead of remaining at the position it was before using Ctrl+V.

Move cursor on activate

This setting takes effect only when the user clicks on a background 3270 window in order to bring the window to the foreground. When the option is activated, the window is brought to the foreground and the 3270 cursor moves to the location in the window where the user clicked; the copy/paste box and context menu are removed if present. When the option is not activated, the window is brought to the foreground and the cursor remains in its previous position; the copy/paste box and context menu remain displayed if present.

Preserve insertion mode

This setting takes effect only when the keyboard is in insertion mode. When the option is activated, the cursor will remain in insert mode until the user returns to normal entry mode by using the “insert” key again, otherwise the cursor returns to normal whenever a transmission key is used.

Pads

> **Keep macro pad open**
>
> > If checked, the macro window remains open all the time. If not, it disappears as soon as you have clicked a macro.
>
> **Keep keypad open**
>
> > If checked, the keypad window remains open all the time. If not, it disappears as soon as you have clicked a function key in it.

Hotspots

> **Display URL hotspots**
>
> > When activated, any text starting with http, https, mailto, file, or ftp (except in 3270 input fields) is transformed into a hyperlink.
>
> **Display PF key hotspots**
>
> > When activated, any text starting with Fnn= or PFnn= (except in 3270 input fields) is transformed into a clickable area. Clicking on the area is equivalent to pressing PF nn.

Capture

> **Auto-capture**
>
> > When activated, causes a snapshot of each screen displayed by the host application to be automatically appended to the screen capture window.
>
> **Bring capture to the foreground**
>
> > When activated, causes the capture windows to come in the foreground whenever the cature icon is used.

Miscellaneous

> **Auto-print**
>
> > When activated, causes the Windows print function to be launched automatically in the print window as a result of a screen snapshot or print request.
>
> **Response time monitor**
>
> > When activated, two counters are displayed on the status line below the 3270 screen, for example: H:110ms J:31ms. The first number (H=Host) represents the response time of the VIRTEL server, from the last Enter or PF key until the receipt of the most recent message from the server. The second number (J=JavaScript) is the time taken by the browser scripts to prepare the screen for display. The sum of the two numbers is the response time perceived by the user.
> >
> > Note: The response time monitor is active in Ajax mode only.
>
> **Omit nulls from input**
>
> > When activated, VIRTEL Web Access will remove all nulls from modified input fields before sending to the server, in strict conformance with 3270 protocol. When not activated, leading and embedded nulls are converted to blanks, and only trailing nulls are suppressed, which many users find more convenient.
>
> **Remap caret to logical not**
>
> > If checked, translates the “caret” sign (Shift+6 on a US keyboard) to EBCDIC X'5F', which is the “logical not” sign (¬) in codepage 037/1140.

1.7.4.3. Key Mappings tab parameters

This tab is used to map specific functions to certain keyboard keys. The tab contains five sub categories whose names are explicit enough to not require more precision.

1.7.4.4. Import / Export tab parameters

This tab lets the user to save and restore his settings into (or from) a local file. This backup method is different and independent of the method used when the "save" button is pressed. (See below).

1.7.5. Where user settings are stored

When the user press the "save" button, his Web Access settings and macros are stored in browser local storage.

For Internet Explorer 6, local storage is stored in the folder :

```
%userprofile%/UserData
```

For Internet Explorer 8 and 9, local storage is stored in the folder :

```
%userprofile%/Local Settings/Application Data/Microsoft/Internet Explorer/DOMStore
```

Note: to see DOMStore you must untick “hide protected operating system files” in Windows folder options.

For other browsers, see

http://www.sitepoint.com/building-web-pages-with-local-storage/

1.7.6. Global modification of Web Access settings

Those installations who wish to modify the default Web Access settings for all users can do so by uploading the w2hparm.js file. This file is included in the sources.zip file which can be obtained from the VIRTEL Web Access menu accessible by URL http://n.n.n.n:41001

The w2hparm.js file as delivered contains the following source code:

```
// w2hparm default values
// see w2hparmdefns in js01.js for parameters and allowable values
var w2hparm = {
  "fontsize":"window",
  "ctrl":"ENTER",
  "enter":"Newline",
  "home":"Home",
  "end":"ErEof",
  "pgup":"PF7",
  "pgdn":"PF8",
  "pause":"CLEAR",
  "style":"3270"};
```

w2hparm.js: Default settings for VIRTEL Web Access

Default values may be changed or added.

For example, installations who wish to map the 3270 ATTN key to the Esc (Escape) key for use with Multisession applications such as NVAS (IBM® NetView™ Access Services) can add the following instruction to the w2hparm.js file:

```
"escape":"ATTN",
```

Modifications to the global settings are only effective after the expiry of the w2hparm.js file in the browser’s cache which occurs at midnight each day. A user can force the use of the updated global settings file by clearing the browser cache, deleting any cookies associated with the VIRTEL server, and refreshing the 3270 page using the Ctrl-R key.

After modifying the w2hparm.js file, it must be uploaded to VIRTEL’s CLI-DIR directory by means of the “Upload” link on the VIRTEL Web Access menu (URL http://n.n.n.n:41001). Then you must check the Entry Point (usually CLIWHOST) and check that the transaction whose “External name” is w2h and whose “Check URL Prefix” field is set to /w2h/w2hparm-js specifies CLI-DIR in the “Application” field. For the CLIWHOST entry point this is transaction CLI-03P.

The list of keywords and possible values which can be coded in the w2hparm.js file is shown below:

Keyword	Caption	Possible values
"fontsize"	Font size	"window", "screen", "8", "10", "12", "14", "16"
"font"	Font family	"font name"
"autocapture"	Auto-capture	true, false
"autoprint"	Auto-print	true, false
"cursor"	Cursor	"Bar", "Blink", "Block"
"vline"	Vertical line	true, false
"hline"	Horiz line	true, false
"esc"	Esc key	"no", "ATTN", "CLEAR", "Reset"
"ctrl"	Ctrl key	"no", "ENTER", "Newline"
"cmdleft"	Left Cmd key	"no", "Reset"
"cmdright"	Right Cmd key	"no", “ENTER"
"enter"	Enter key	"ENTER", "Newline"
"home"	Home key	"no", "Home"
"end"	End key	"no", "ErEof", "End"
"pgup"	PageUp key	"PF7", "PF19", "PA1", "no"
"pgdn"	PageDown key	"PF8", "PF20", "PA2", "no"
"pause"	Pause key	"CLEAR", "ATTN", "PA3", "no"
"kpenter"	Keypad Enter	"ENTER", "Newline"
"shiftenter"	Shift+Enter	"no","ENTER", "Newline"
"shiftesc"	Shift+Esc	"no", "ATTN", "CLEAR", "Reset"
"shiftins"	Shift+Insert	"no", "Dup"
"shiftdel"	Shift+Delete	"no", "ErEof"
"shifthome"	Shift+Home	"no", "FieldMark", "Home"
"shiftend"	Shift+End	"no", "ErEof", "End"
"shiftpgdn"	Shift+PageDown	"no", "PA3"
"ctrlenter"	Ctrl+Enter	"no","ENTER", "Newline"
"ctrlins"	Ctrl+Insert	"no", "PA1"
"ctrldel"	Ctrl+Delete	"no", "PA2", "ErEof"
"ctrlhome"	Ctrl+Home	"no", "PA3", "Home", "ChgCur"
"ctrlend"	Ctrl+End	"no", "ErEof", "End"
"altins"	Alt+Ins	"no", "PA1"
"althome"	Alt+Home	"no", "PA2"
"altpgup"	Alt+PageUp	"no", "PA1"
"altpgdn"	Alt+PageDown	"no", "PA2"
"altpause"	Alt+Pause	"no", "ATTN", "CLEAR", "PA3"
"altf1"	Alt+F1	"no", "PA1", "ENTER"
"altf2"	Alt+F2	"no", "PA2"

Keyword	Caption	Possible values
"altf3"	Alt+F3	"no", "PA3", "ChgCur"
"kpslash"	Keypad /	"/", "PA1"
"kpaster"	Keypad *	"*", "PA2"
"kpminus"	Keypad -	"-", "Backtab"
"kpplus"	Keypad +	"+", "Tab", "Newline"
"kpdot"	Keypad .	".", ","
"dblclick"	Double Click	"Word", "ENTER", "no"
"urlhotspot"	URL hotspots	true, false
"pfkhotspot"	PF key hotspots	true, false
"pasteereof"	Paste erase EOF	true, false
"movecursor"	Move cursor on activate	true, false
"style"	Style	"3270", "gray", "white"
"printstyle”	Print style	"3270", "color", "white"
"rtm"	Response time monitor	true, false
"omitnulls"	Omit nulls from input	true, false
"keepmacpad"	Keep macro pad open	true, false
"keepkeypad"	Keep keypad open	true, false
"hiliteinput"	Highlight input fields	true, false
"caretnot"	Remap caret to logical not	true, false
"adaptfontratio"	Adapt font size ratio	true, false
"charspace"	Character spacing	true, false
"linespace"	Line spacing	true, false
"settingsGUI"	Settings user interface type	v2
"preserveinsmode"	Preserve insert mode	true, false

w2hparm.js: List of keywords and possible values

1.7.7. Choosing Web Access settings pattern

User interface settings may be presented under two different forms which are shown at the beginning of this section. The desired form may be defined using the variable "settingsGUI" present in the w2hparms.js file. The possible values for this parameter are :

version

Allows a choice beetwen older and or newest form. Possible values are:

v2

When activated, only the newest user setting interface is available in the toolbar. The settings icone will remain the same as actually.

no value

When none of the previous values are activated, only the older user setting interface is available in the toolbar.

width

Allows to change the width of the setting form.

height

Allows to change the heigth of the setting form.

Note: Version 2 is more powerful and offers more setting possibilities of the keyboard than version 1 . Version 1 will be dropped in the next release of VIRTEL.

The example below shows how to override the default settingsGUI parameter using a custom.js file :

```
/*
 * Configuration of the settings dialog GUI.
 */
w2hparm.settingsGUI =
{
  /*
   * Select which settings dialog version(s) will be accessible in the VWA toolbar.
   * Possible values are :
   *   - "v1+v2" ...... Allow both settings dialogs (OLD and NEW)
   *   - "v2" ......... Allow NEW settings dialog only
   *   -  otherwise ... Allow OLD settings dialog only
   */
  version : "v2",

  /* Width of the settings dialog */
  width   : 540,

  /* Height of the settings dialog */
  height  : 730
};
```

custom.js: Choosing the Web Access settings interface form

1.7.8. Hiding Web Access settings

To prevent the user from overriding the site defaults, the administrator can remove individual settings from the user's Web Access Settings menu. The names of settings to be hidden are specified in the w2hparmHide variable in the w2hparm.js file.

The example below shows how to hide the default font, font size, and style settings from the menu:

```
// w2hparm default values
var w2hparm = {
  "fontsize":"window",
  "font":"Lucida Console",
  "ctrl":"ENTER",
  "enter":"Newline",
  "home":"Home",
  "style":"3270"};
var w2hparmHide = ["font", "fontsize", "style"];
```

w2hparm.js: Hiding VIRTEL Web Access settings

1.8. Application Selection Menu

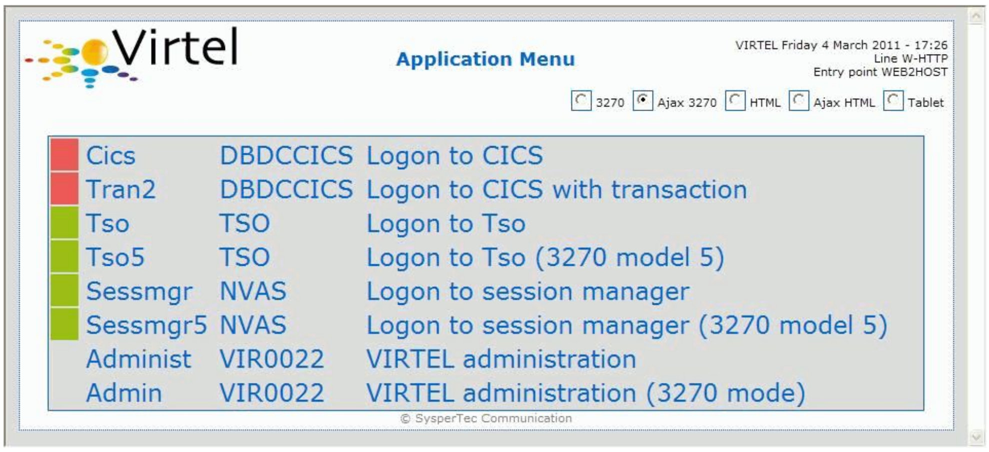
The VIRTEL application selection menu is dynamically generated by the appmenu.htm page in conjunction with the applist transaction. For example, the following URL displays the application selection menu for the CLIWHOST entry point (line C-HTTP port 41002):

```
http://n.n.n.n:41002/w2h/appmenu.htm+applist
```

The application selection menu for the WEB2HOST entry point (line W-HTTP port 41001) is accessible from the “Other applications” link on the VIRTEL Web Access main menu.

1.8.1. Contents of menu

An example of the application selection menu is shown in the figure below:



Application Menu

VIRTEL Friday 4 March 2011 - 17:26
Line W-HTTP
Entry point WEB2HOST

3270 [✓ Ajax 3270] HTML Ajax HTML Tablet

🟥	Cics	DBDCCICS	Logon to CICS
🟥	Tran2	DBDCCICS	Logon to CICS with transaction
🟩	Tso	TSO	Logon to Tso
🟩	Tso5	TSO	Logon to Tso (3270 model 5)
🟩	Sessmgr	NVAS	Logon to session manager
🟩	Sessmgr5	NVAS	Logon to session manager (3270 model 5)
	Administ	VIR0022	VIRTEL administration
	Admin	VIR0022	VIRTEL administration (3270 mode)

© SysperTec Communication

Application selection menu

The application selection menu contains clickable links to the transactions defined under the entry point. A transaction will appear in the menu if all of the following conditions are met:

- The “Application type” is 1 (VTAM) or 2 (VIRTEL)
- The “How started” field is 1 (menu)
- The user is logged on and authorized via the security subsystem to the security resource whose name is the internal name of the transaction (except when the transaction “Security” field is 0)

If the user is not logged on, then only public transactions (security type 0) are displayed.

If the APPSTAT=YES parameter is specified in the VIRTCT (see “Parameters of the VIRTCT” in the VIRTEL Installation Guide) then the status of VTAM applications is indicated by a green bar for active applications, and by a red bar for inactive applications.

To add an application to the menu, use the VIRTEL administration panels to define a transaction under the entry point, press F1 to update the entry point, then refresh the appmenu.htm page in the browser.

1.8.2. Presentation modes

The application selection menu offers a choice of several different presentation modes, selectable by clicking one of the buttons at the top right of the screen. The selected presentation mode determines which page template will be used to access the selected host applications.

3270 presentation

> This presentation mode, which uses the WEB3270.htm page template, is designed for experienced 3270 users who do not require the presentation enhancements offered by VIRTEL Web Modernisation. It offers a user interface which matches as closely as possible that of a real 3270 screen.

Ajax 3270

> This presentation mode is similar to the 3270 presentation mode, but it uses a static main page (WEB2AJAX.htm) together with an Ajax-loaded sub-page (WEB2SUB.html). This can reduce network load and provide faster response time with a better 3270 user experience. Ajax mode also offers password encryption as an option (see “Password encryption”, page 261).

HTML presentation

> This presentation mode, which uses the WEB2VIRT.htm page template, is intended as a first step towards VIRTEL Web Modernisation. In this mode the 3270 screen image is displayed as an HTML form, to which presentation enhancements such as drop-down lists, checkboxes, and calendars can be added by means of VIRTEL Web Modernisation scenarios (see “Web Modernisation VIRTEL Scenarios”, page 147).

Ajax HTML

> This presentation mode is similar to the HTML presentation mode, but it uses a static main page (WEB2VIRTAJAX.htm) together with an Ajax-loaded sub-page (WEB2VIRTSUB.html).

Tablet

> This presentation mode it uses the SMARTWEB2VIRT.htm page template for an HTML presentation adapted for tablets and smartphones.

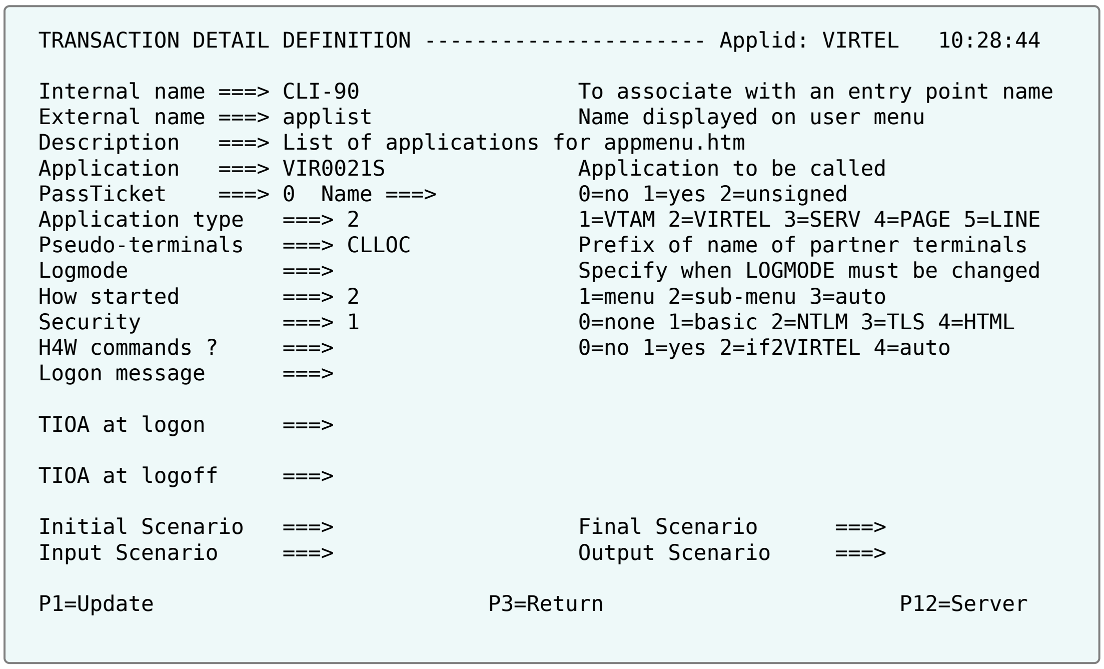
1.8.3. The appmenu.htm page

The appmenu.htm page for the VIRTEL application selection menu is delivered in the W2H-DIR directory. The page may be customized if required to meet installation standards. The appmenutable and appmenuitem styles in the STYLBLUE.css stylesheet allow the appearance of the menu to be customized. The source code for the page and the stylesheet may be obtained from the sources.zip file accessible from the VIRTEL Web Access menu. After modifying the page or the stylesheet, follow the “Upload” link on the VIRTEL Web Access menu to upload the updated files to the W2H-DIR directory.

1.8.4. Definition of the applist transaction

A transaction with external name applist must be present in the list of transactions at the entry point associated with the line. VIRTEL supplies as standard transactions W2H-90 (for entry point WEB2HOST, line W-HTTP port 41001) and CLI-90 (for entry point CLIWHOST, line C-HTTP port 41002). The applist transaction must specify application name VIR0021S and application type 2. Security type 1 requires the user to sign on so that the transaction can determine which applications the user is authorized to. The user must also be authorized to the applist transaction itself by its internal name (W2H-90 or CLI-90).

The figure below shows the definition of the applist transaction CLI-90:



```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: VIRTEL   10:28:44

Internal name ===> CLI-90                   To associate with an entry point name
External name ===> applist                  Name displayed on user menu
Description   ===> List of applications for appmenu.htm
Application   ===> VIR0021S                 Application to be called
PassTicket    ===> 0  Name ===>             0=no 1=yes 2=unsigned
Application type   ===> 2                   1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> CLLOC               Prefix of name of partner terminals
Logmode            ===>                     Specify when LOGMODE must be changed
How started        ===> 2                   1=menu 2=sub-menu 3=auto
Security           ===> 1                   0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                     0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===>

TIOA at logoff     ===>

Initial Scenario   ===>                     Final Scenario     ===>
Input Scenario     ===>                     Output Scenario    ===>

P1=Update                          P3=Return                        P12=Server
```

Definition of applist transaction

1.8.5. Application menu as the default transaction for the entry point

When the appmenu.htm+applist URL is coded in the “TIOA at logon” field of the default transaction for the entry point, the application selection menu will be displayed whenever the user accesses the HTTP line using its root URL (for example, http://n.n.n.n:41002 for line C-HTTP).

The default transaction is the transaction whose external name is the same as the entry point name, and the example below shows the default transaction for the CLIWHOST entry point:

```
TRANSACTION DETAIL DEFINITION --------------------- Applid: VIRTEL   10:57:59

Internal name ===> CLI-00                 To associate with an entry point name
External name ===> CLIWHOST               Name displayed on user menu
Description   ===> Default directory = entry point name
Application   ===> CLI-DIR                Application to be called
PassTicket    ===> 0  Name ===>           0=no 1=yes 2=unsigned
Application type   ===> 4                 1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> CLLOC             Prefix of name of partner terminals
Logmode            ===>                   Specify when LOGMODE must be changed
How started        ===> 2                 1=menu 2=sub-menu 3=auto
Security           ===> 0                 0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                   0=no 1=yes 2=if2VIRTEL 4=auto
Check URL Prefix   ===>

TIOA at logon      ===> /w2h/appmenu.htm+applist

TIOA at logoff     ===>

Initial Scenario   ===>                   Final Scenario     ===>
Input Scenario     ===>                   Output Scenario    ===>

P1=Update                          P3=Return                       P12=Server
```

Specifying the application selection menu in the default transaction

1.9. Printing With Web Access

VIRTEL provides printing support by means of virtual 3287 type printers. Each user connected to VIRTEL Web Access has a virtual 3287 printer associated with the user’s 3270 display terminal. The name of the virtual printer is displayed in the status bar at the bottom of the Web Access window. Data sent to the virtual printer from a host application (for example, CICS, QMF, or VPS) is captured by VIRTEL and is saved in virtual storage.

A printer icon appears in the Web Access toolbar to notify the user that print data is available.

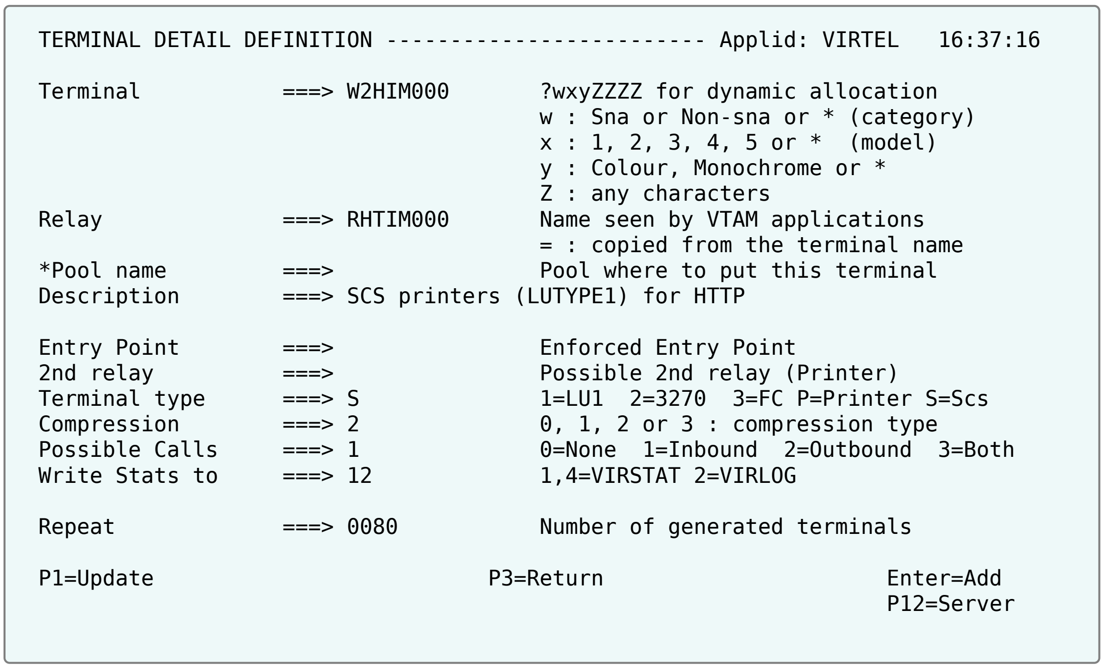
When the user clicks on this icon, VIRTEL sends the print data to the user’s browser, either as an attached file or in a pop-up window.

Two types of virtual printer are supported:

- LUTYPE1 (SCS): VIRTEL sends the print data to the browser as an attached file.
- LUTYPE3 (3270 data stream): VIRTEL converts the print data to HTML and the browser displays it in a pop-up window.

1.9.1. VIRTEL definitions for virtual printers

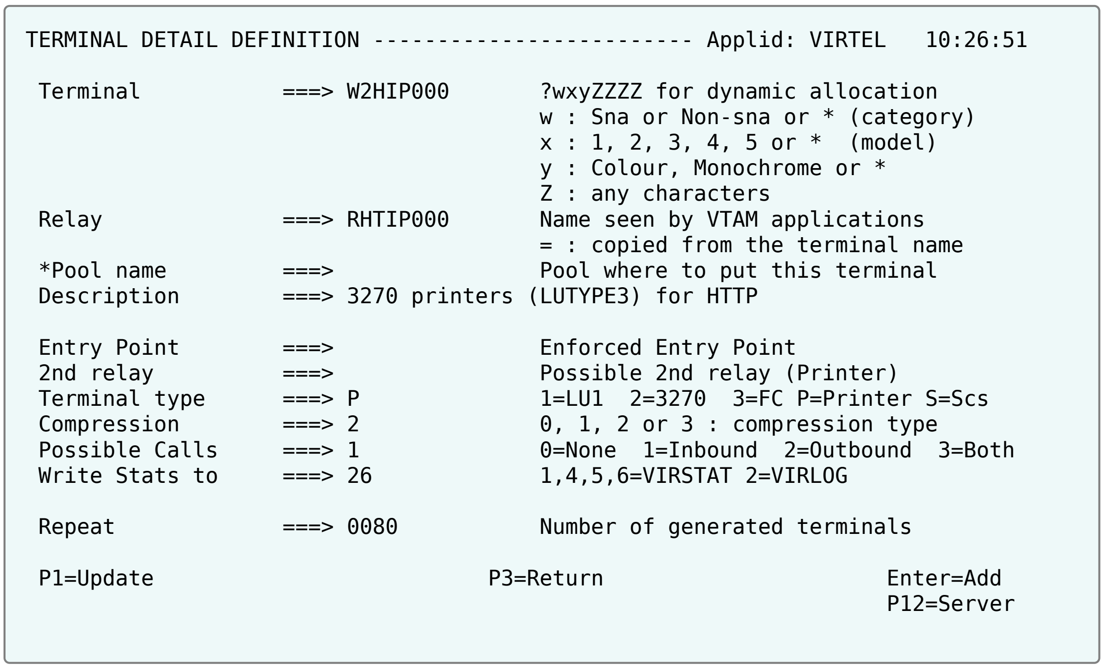
In the VIRTEL configuration file, LUTYPE1 virtual printers are defined with the “Terminal type” field set to 1 or S. The “Relay” field contains the VTAM LU name known to the host application. The figure below shows an example definition of 80 LUTYPE1 virtual printers with LU names RHTIM000 to RHTIM079:



```
TERMINAL DETAIL DEFINITION ------------------------ Applid: VIRTEL   16:37:16

Terminal           ===> W2HIM000      ?wxyZZZZ for dynamic allocation
                                      w : Sna or Non-sna or * (category)
                                      x : 1, 2, 3, 4, 5 or *  (model)
                                      y : Colour, Monochrome or *
                                      Z : any characters
Relay              ===> RHTIM000      Name seen by VTAM applications
                                      = : copied from the terminal name
*Pool name         ===>               Pool where to put this terminal
Description        ===> SCS printers (LUTYPE1) for HTTP

Entry Point        ===>               Enforced Entry Point
2nd relay          ===>               Possible 2nd relay (Printer)
Terminal type      ===> S             1=LU1  2=3270  3=FC P=Printer S=Scs
Compression        ===> 2             0, 1, 2 or 3 : compression type
Possible Calls     ===> 1             0=None  1=Inbound  2=Outbound  3=Both
Write Stats to     ===> 12            1,4=VIRSTAT 2=VIRLOG

Repeat             ===> 0080          Number of generated terminals

P1=Update                        P3=Return                      Enter=Add
                                                                P12=Server
```

VIRTEL definition of LUTYPE1 virtual printers

Similarly, LUTYPE3 virtual printers are defined with the “Terminal type” field set to 2 or P. The figure below shows an example definition of 80 LUTYPE3 virtual printers with LU names RHTIP000 to RHTIP079:



```
TERMINAL DETAIL DEFINITION ------------------------ Applid: VIRTEL   10:26:51

 Terminal           ===> W2HIP000      ?wxyZZZZ for dynamic allocation
                                       w : Sna or Non-sna or * (category)
                                       x : 1, 2, 3, 4, 5 or *  (model)
                                       y : Colour, Monochrome or *
                                       Z : any characters
 Relay              ===> RHTIP000      Name seen by VTAM applications
                                       = : copied from the terminal name
 *Pool name         ===>               Pool where to put this terminal
 Description        ===> 3270 printers (LUTYPE3) for HTTP

 Entry Point        ===>               Enforced Entry Point
 2nd relay          ===>               Possible 2nd relay (Printer)
 Terminal type      ===> P             1=LU1  2=3270  3=FC P=Printer S=Scs
 Compression        ===> 2             0, 1, 2 or 3 : compression type
 Possible Calls     ===> 1             0=None  1=Inbound  2=Outbound  3=Both
 Write Stats to     ===> 26            1,4,5,6=VIRSTAT 2=VIRLOG

 Repeat             ===> 0080          Number of generated terminals

 P1=Update                        P3=Return                      Enter=Add
                                                                 P12=Server
```

VIRTEL definition of LUTYPE1 virtual printers

1.9.2. Associating virtual printers with terminals

To associate virtual printers with the corresponding terminal LU names, define the printer LU name in the “2nd relay” field of the terminal pool definition. In the example below, Web Access terminals with LU names RHTVT000-079 are associated with virtual printer LU names RHTIP000-079 (LUTYPE3). Similarly, terminal LU names RHTVT100-179 are associated with virtual printer LU names RHTIM000-079 (LUTYPE1). There is a one-for-one correspondence between the display terminal’s LU name and the printer LU name.

```
LIST of TERMINALS ---------------------------------- Applid: VIRTEL   10:07:08

Terminal  Repeated Relay     Entry        Type   I/O  Pool     2nd Relay

CLLOC000  0050                            3      3
CLVTA000  0080     *W2HPOOL               3      3
DELOC000  0010                            3      3
DEVTA000  0016     *W2HPOOL               3      3
W2HIM000  0080     RHTIM000               S      1
W2HIP000  0080     RHTIP000               P      1
W2HTP000  0080     RHTVT000               3      3    *W2HPOOL RHTIP000
W2HTP100  0080     RHTVT100               3      3    *W2HPOOL RHTIM000









P1=Update          P2=Delete              P3=Return           P6=1st Page
P7=Page-1          P8=Page+1              P12=Details
```

VIRTEL terminal definitions for virtual printers

1.9.3. Autoconnect for virtual printers

Virtual printer LUs are activated by VIRTEL at startup time, and will remain in ACTIV state until they are acquired by the application. For virtual printers defined with terminal type 1 or 2, the application must initiate the acquire (for example, by CEMT SET TERM(xxxx) ACQ in CICS).

Virtual printers defined with terminal type P or S may be automatically connected to a controlling host application when a user starts a Web Access session using the associated terminal LU. The “Entry Point” field of the virtual printer definition should contain the name of an entry point which specifies VIR0021B as its menu program. The entry point must have one transaction whose “Application” field contains the name of the host application to which the printer is to be connected.

The example below shows an entry point definition for connecting printers to CICS:

```
ENTRY POINT DETAIL DEFINITION ---------------------- Applid: VIRTEL   14:58:34

Name          ===> PRTAPPL                Name this ENTRY POINT (LOGON DATA)
Description   ===> Connect printers to host application
Transactions  ===> PRTA                   Prefix for associated transactions
Last page     ===>                        Displayed at end of session
Transparency  ===>                        Server types NOT to emulate
Time out      ===> 0000       minutes     Maximum inactive time
Do if timeout ===>                        0=logoff  1=bip+logoff   2=anti pad
Emulation     ===> HTML                   Type of terminal:
HOST4WEB    :  program driven             HTML  :  Web Browser
SCENARIO    :  script driven              EMAIL :  SMTP client
Directory for scenarios    ===>           If scenarios in VSAM, not LOADLIB
Signon program             ===>           Controls user name and password
```

```
 Menu program               ===> VIR0021B  List of transactions
 Identification scenario    ===>           eg XML identification
 Type 3 compression         ===>           Discover typical screens  (Virtel/PC)
 Mandatory identification   ===>                                 (PC or minitel)
 3270 swap key              ===>           eg P24
 Extended colors            ===>           E: extended  X: extended + DBCS

 P1=Update                          P3=Return                   P4=Transactions
 Enter=Add
```

Entry point definition for virtual printer autoconnect

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: VIRTEL   14:59:52

 Internal name ===> PRTA-01                To associate with an entry point name
 External name ===> PRTAPPL                Name displayed on user menu
 Description   ===> Connect printers to host application
 Application   ===> DBDCCICS               Application to be called
 PassTicket    ===>    Name ===>           0=no 1=yes 2=unsigned
 Application type   ===> 1                 1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
 Pseudo-terminals   ===>                   Prefix of name of partner terminals
 Logmode            ===>                   Specify when LOGMODE must be changed
 How started        ===> 1                 1=menu 2=sub-menu 3=auto
 Security           ===> 0                 0=none 1=basic 2=NTLM 3=TLS 4=HTML
 H4W commands ?     ===>                   0=no 1=yes 2=if2VIRTEL 4=auto
 Logon message      ===>

 TIOA at logon      ===>

 TIOA at logoff     ===>

 Initial Scenario   ===>                   Final Scenario      ===>
 Input Scenario     ===>                   Output Scenario     ===>

 P1=Update                          P3=Return                       P12=Server
```

Transaction definition for virtual printer autoconnect

1.9.4. VTAM definitions for virtual printers

Virtual printer LUs must be defined to VTAM with an appropriate LOGMODE (normally SCS for LUTYPE1, or DSILGMOD for LUTYPE3). The necessary APPL statements may be coded in the VIRTAPPL member of the VTAMLST library, as shown in the example below:

```
RHTIM??? APPL  AUTH=(ACQ,PASS),MODETAB=ISTINCLM,DLOGMOD=SCS,EAS=1
RHTIP??? APPL  AUTH=(ACQ,PASS),MODETAB=ISTINCLM,DLOGMOD=DSILGMOD,EAS=1
```

VTAM definitions for virtual printers

1.9.5. CICS definitions for virtual printers

If the virtual printer is defined to CICS via RDO, use an appropriate TYPETERM as shown in the table below:

VIRTEL Terminal Type	CICS TYPETERM	CICS DEVICE type
1 or S	DFHSCSP	SCSPRINT
2 or P	DFHLU3 or DFH3270P	LUTYPE3 or 3270P

CICS TYPETERM definitions for virtual printers

Note: from version 4.50 onwards, VIRTEL supports the QUERY parameter for SCS printers as well as for LUTYPE3 printers.

1.9.6. Scenarios for SCS printing

When virtual printers are defined with terminal type 1 or S, all VIRTEL transactions defined under an entry point which offers printing must indicate the name of an “Input Scenario”. The scenario processes the HTTP request containing a PF=SCENARIO-PRINT parameter which is issued when the user presses the “Get print data” icon (below) on the VIRTEL Web Access toolbar.

The scenario accesses the SCS print data which is accumulated in a VIRTEL variable called $PRINT$, and instructs VIRTEL to send the print data to the browser as an attached file.

Several suitable scenarios are delivered as standard in the VIRTEL SAMPLIB and LOADLIB:

SCENFPDF

> converts an SCS datastream into a PDF document

SCENFPCL

> downloads PCL data into a raw printer file

SCENPPDF

> converts PCL data into a PDF document (requires additional VIRTEL PCL2PDF feature running on a Windows server)

1.9.7. SCS to PDF conversion

When the SCENFPDF input scenario is specified in the VIRTEL transaction definition, the SCS data produced by the application is passed to VIRTEL’s MAKEPDF component, and the resulting PDF file is sent to the browser. The browser normally displays a dialog giving the user the choice of opening or saving the PDF file.

1.9.8. PCL printing

Certain applications such as VPS are capable of sending print data in PCL (HP Printer Command Language) format to SNA printers. The PCL commands and data are sent as SCS transparent data on sessions with LUTYPE1 logical units.

The transparent data (contained in blocks of up to 253 ASCII characters preceded by a X’35’ SCS command) is extracted from the SCS datastream and is copied into the VIRTEL variable $PRINT$.

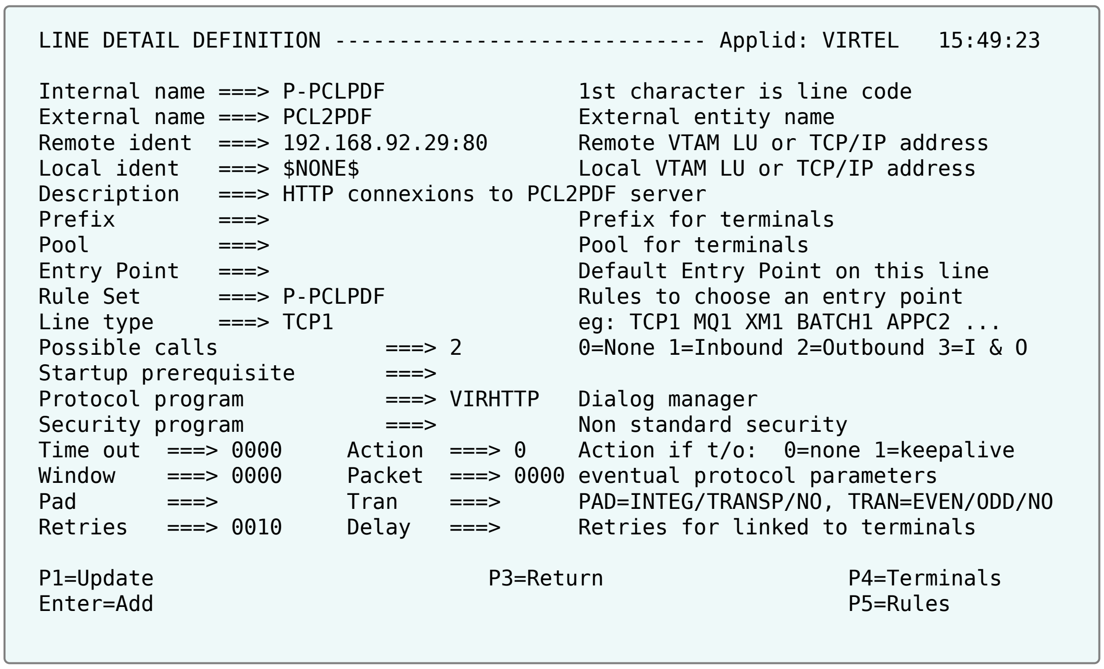
PCL data may also be delivered in EBCDIC as part of the normal SCS datastream, and this data will be converted to ASCII using the codepage defined by the COUNTRY parameter in the VIRTCT (see “Parameters of the VIRTCT” in the VIRTEL Installation Guide).

The SCENFPCL scenario delivered as standard in the VIRTEL SAMPLIB and LOADLIB allows PCL data to be downloaded to the user’s workstation as an attached file. The user may either save the file, or open it using an appropriate program (such as PCL Reader from Page Technology Marketing, Inc.) to display and optionally print the PCL data.

1.9.9. PCL-to-PDF conversion

For customers who have licensed the optional PCL2PDF feature of VIRTEL, PCL output from host applications can be delivered to the workstation as PDF documents.

The SCENPPDF scenario captures PCL data and sends it to an external server for conversion. The external server is a Windows Server 2008R2 platform running the Syspertec PCL2PDF application. The VIRTEL configuration must include a line with external name PCL2PDF which defines the IP address of the Windows server, as shown in the example below:



```
LINE DETAIL DEFINITION ---------------------------- Applid: VIRTEL   15:49:23

Internal name ===> P-PCLPDF              1st character is line code
External name ===> PCL2PDF               External entity name
Remote ident  ===> 192.168.92.29:80      Remote VTAM LU or TCP/IP address
Local ident   ===> $NONE$                Local VTAM LU or TCP/IP address
Description   ===> HTTP connexions to PCL2PDF server
Prefix        ===>                       Prefix for terminals
Pool          ===>                       Pool for terminals
Entry Point   ===>                       Default Entry Point on this line
Rule Set      ===> P-PCLPDF              Rules to choose an entry point
Line type     ===> TCP1                  eg: TCP1 MQ1 XM1 BATCH1 APPC2 ...
Possible calls              ===> 2       0=None 1=Inbound 2=Outbound 3=I & O
Startup prerequisite        ===>
Protocol program            ===> VIRHTTP  Dialog manager
Security program            ===>          Non standard security
Time out   ===> 0000     Action   ===> 0    Action if t/o:  0=none 1=keepalive
Window     ===> 0000     Packet   ===> 0000 eventual protocol parameters
Pad        ===>          Tran     ===>      PAD=INTEG/TRANSP/NO, TRAN=EVEN/ODD/NO
Retries    ===> 0010     Delay    ===>      Retries for linked to terminals

P1=Update                          P3=Return                    P4=Terminals
Enter=Add                                                       P5=Rules
```

VIRTEL line definition for PCL2PDF server

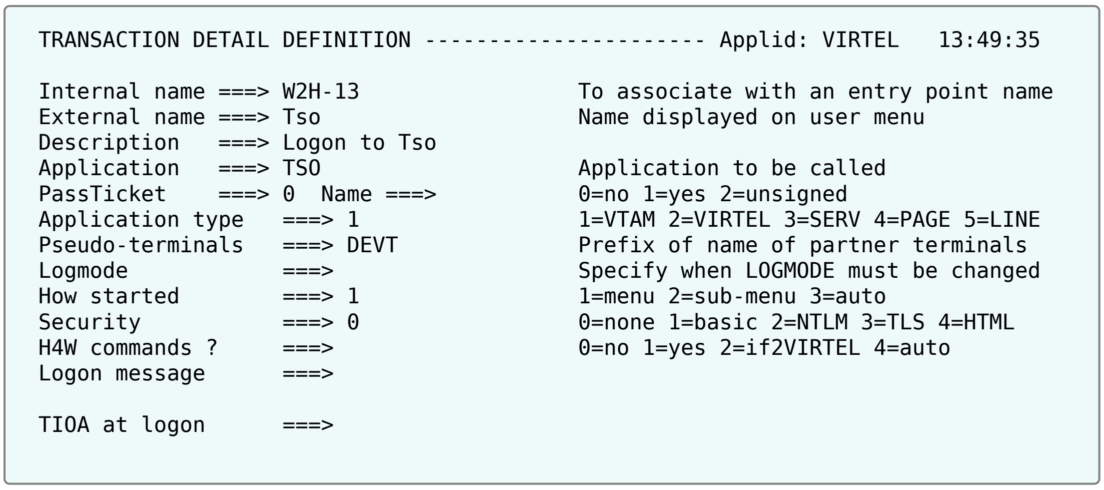
A batch job, supplied as member PCL2PDF of the VIRTEL SAMPLIB, allows the definition of the PCL2PDF line to be added to the VIRTEL configuration.

1.10. TSO File Transfer

VIRTEL Web Access supports transfer of files between the browser and a TSO session using the IND$FILE protocol.

1.10.1. Definitions required for file transfer

To activate the file transfer function you must access TSO via a VIRTEL transaction which specifies SCENINDT in both the "Input scenario" and the "Output scenario" fields of the transaction definition. The figure below shows the sample TSO transaction W2H-13 supplied with VIRTEL:



```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: VIRTEL   13:49:35

Internal name ===> W2H-13                To associate with an entry point name
External name ===> Tso                   Name displayed on user menu
Description   ===> Logon to Tso
Application   ===> TSO                   Application to be called
PassTicket    ===> 0  Name ===>          0=no 1=yes 2=unsigned
Application type   ===> 1                1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> DEVT             Prefix of name of partner terminals
Logmode            ===>                  Specify when LOGMODE must be changed
How started        ===> 1                1=menu 2=sub-menu 3=auto
Security           ===> 0                0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                  0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===>
TIOA at logoff     ===>

Initial Scenario   ===>                      Final Scenario     ===>
Input Scenario     ===> SCENINDT             Output Scenario    ===> SCENINDT

P1=Update                          P3=Return                        P12=Server
```

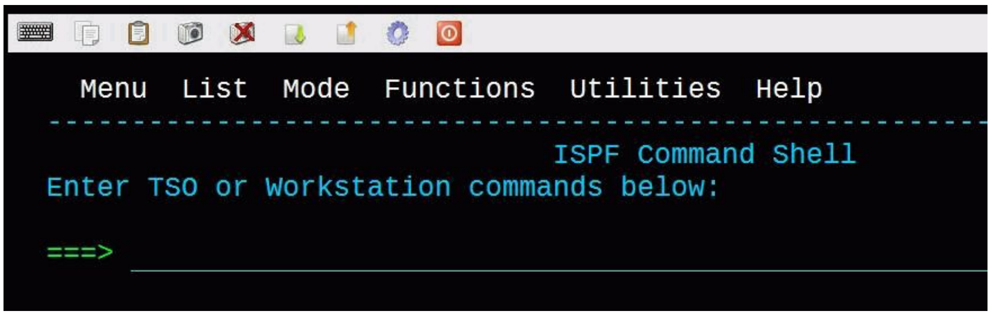
TSO transaction definition for file transfer

The source code of the SCENINDT scenario is supplied in the VIRTEL SAMPLIB.

To activate the file transfer function when a user-written scenario is specified in the transaction definition, the INDSCEN$ macro instruction must be added to both the input and output sections of the scenario.

1.10.2. Toolbar icons for file transfer

When file transfer is activated, two new icons (receive file) and (send file) appear on the VIRTEL Web Access toolbar:

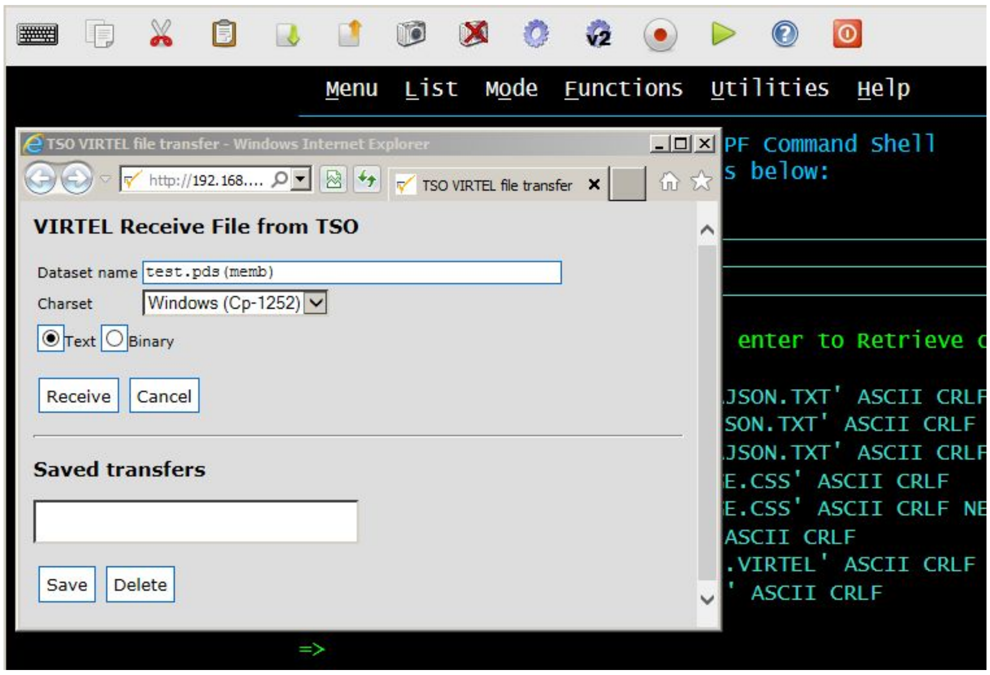


```
   Menu  List  Mode  Functions  Utilities  Help
 -----------------------------------------------------
                         ISPF Command Shell
 Enter TSO or Workstation commands below:

 ===> 
```

VIRTEL Web Access toolbar for TSO file transfer

1.10.3. Receiving a file

To transfer a file from TSO to your workstation, go to ISPF option 6 (or TSO READY) and click the "Receive" icon on the toolbar. The "Receive File" dialog will open:


Menu List Mode Functions Utilities Help
TSO VIRTEL file transfer - Windows Internet Explorer
http://192.168....
TSO VIRTEL file transfer
Receive
Cancel
Save
Delete

VIRTEL Receive File from TSO

Dataset name: test.pds(memb)
Charset: Windows (Cp-1252)
[✓ Text] Binary

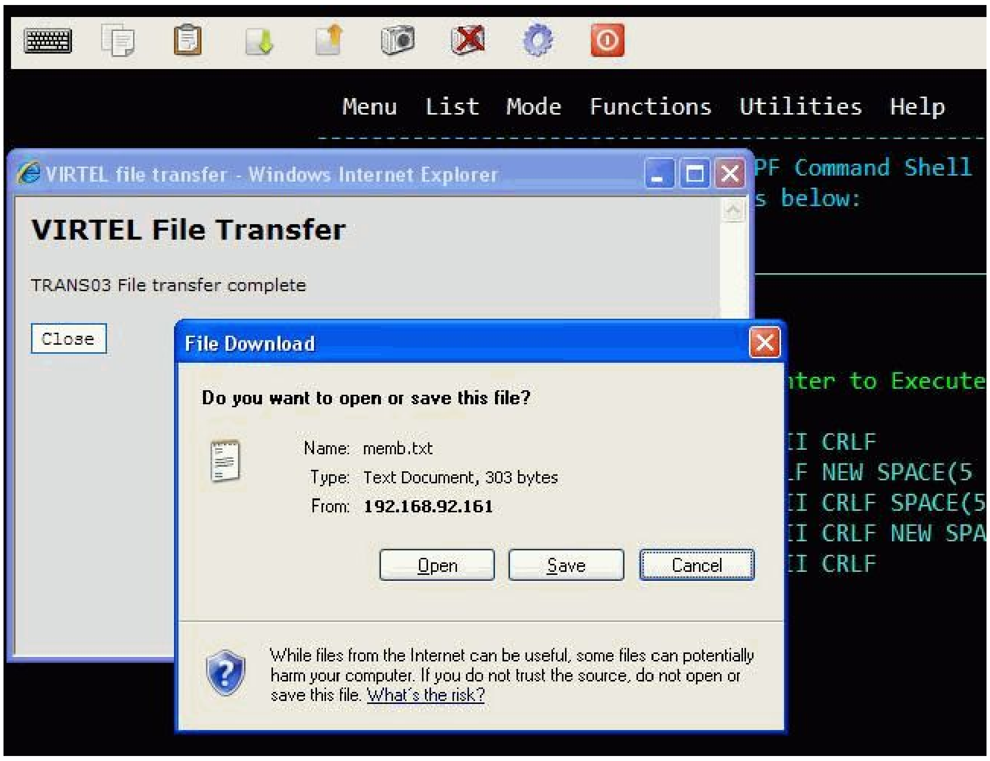
Saved transfers

```
PF Command Shell
s below:

 enter to Retrieve c

JSON.TXT' ASCII CRLF
SON.TXT' ASCII CRLF
JSON.TXT' ASCII CRLF
E.CSS' ASCII CRLF
E.CSS' ASCII CRLF NE
ASCII CRLF
.VIRTEL' ASCII CRLF
' ASCII CRLF
=>
```

VIRTEL IND$FILE receive dialog (part 1)

Specify the TSO dataset name, surrounded by quotes if necessary. Dataset names without quotes will be prefixed by your TSO prefix (usually your userid). Click either “Text” or “Binary”. “Text” translates the file from EBCDIC to ASCII and inserts carriage return line feed sequences (x’0D0A’) at the end of each record. “Binary” performs no translation. Finally click “Receive” to start the transfer.

When the file transfer is complete, the browser’s “Download” dialog appears:


Menu List Mode Functions Utilities Help
VIRTEL file transfer - Windows Internet Explorer
Close
File Download
Open
Save
Cancel

VIRTEL File Transfer

TRANS03 File transfer complete

Do you want to open or save this file?

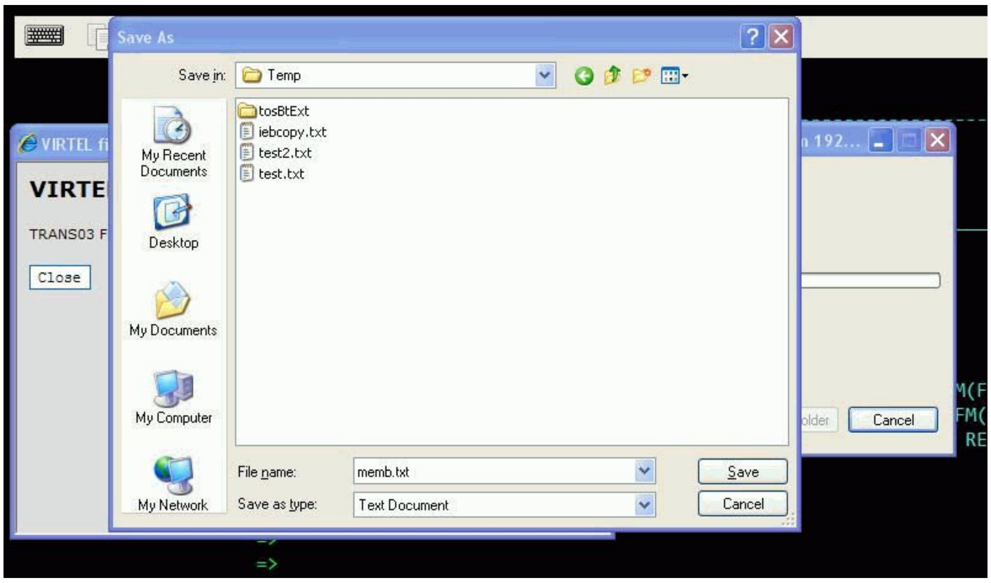
Name: memb.txt
Type: Text Document, 303 bytes
From: 192.168.92.161

While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. What's the risk?

```
PF Command Shell
s below:

nter to Execute

I CRLF
F NEW SPACE(5
I CRLF SPACE(5
I CRLF NEW SPA
I CRLF
```

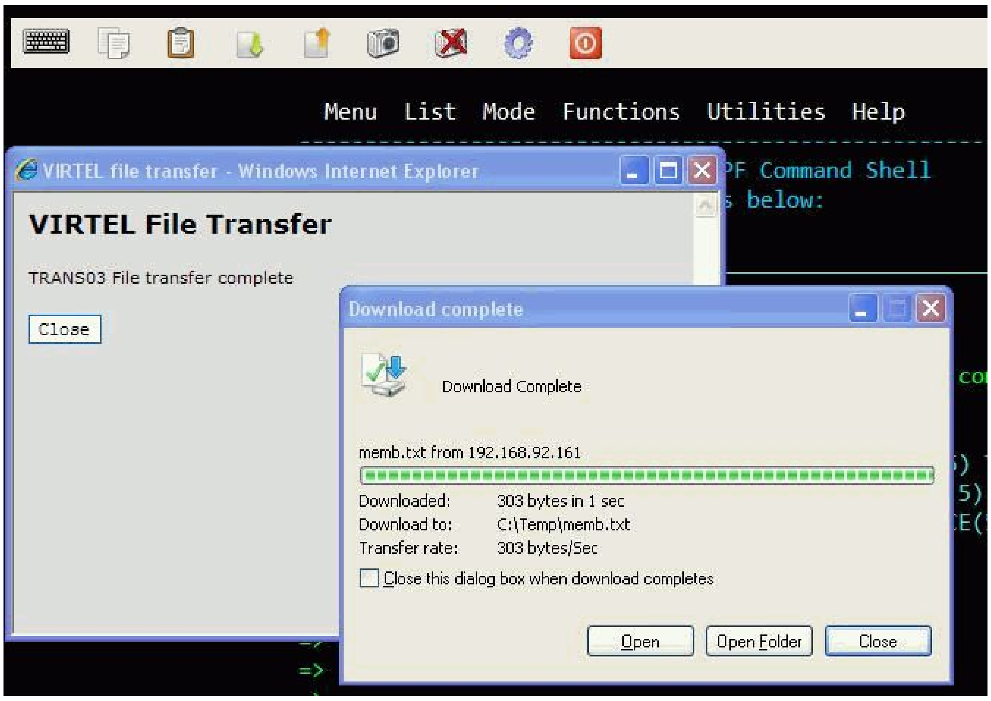
VIRTEL IND$FILE receive dialog (part 2)

Click “Save”. The “Save As” dialog will open to allow you to specify the name and location of the destination file on your workstation:



VIRTEL IND$FILE receive dialog (part 3)

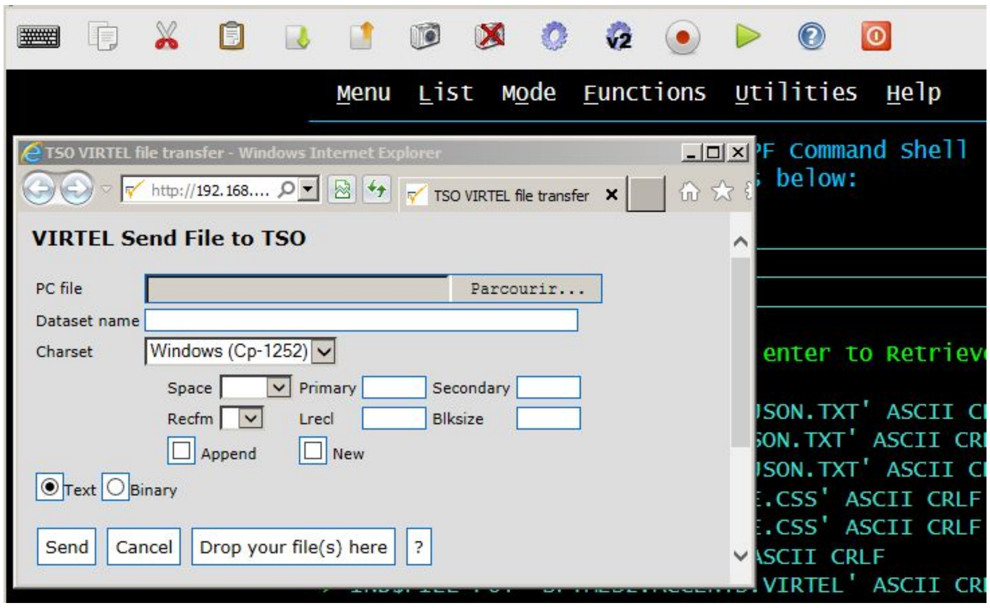
Now select the destination file and click “Save”. If the file already exists you will be prompted for permission to overwrite it. The “Download Complete” dialog appears when the file has been saved:


Menu List Mode Functions Utilities Help
VIRTEL file transfer - Windows Internet Explorer
VIRTEL File Transfer
TRANS03 File transfer complete
Close
Download complete
Download Complete
memb.txt from 192.168.92.161
Downloaded: 303 bytes in 1 sec
Download to: C:\Temp\memb.txt
Transfer rate: 303 bytes/Sec
Close this dialog box when download completes
Open
Open Folder
Close

VIRTEL IND$FILE receive dialog (part 4)

1.10.4. Sending a file

To transfer a file from your workstation to TSO, go to ISPF option 6 (or TSO READY) and click the “Send” icon on the toolbar. The “Send File” dialog will open:


Menu List Mode Functions Utilities Help
TSO VIRTEL file transfer - Windows Internet Explorer
http://192.168....
TSO VIRTEL file transfer
Parcourir...
Send
Cancel
Drop your file(s) here
?

VIRTEL Send File to TSO

PC file	
Dataset name	
Charset	Windows (Cp-1252)
Space	
Primary	
Secondary	
Recfm	
Lrecl	
Blksize	

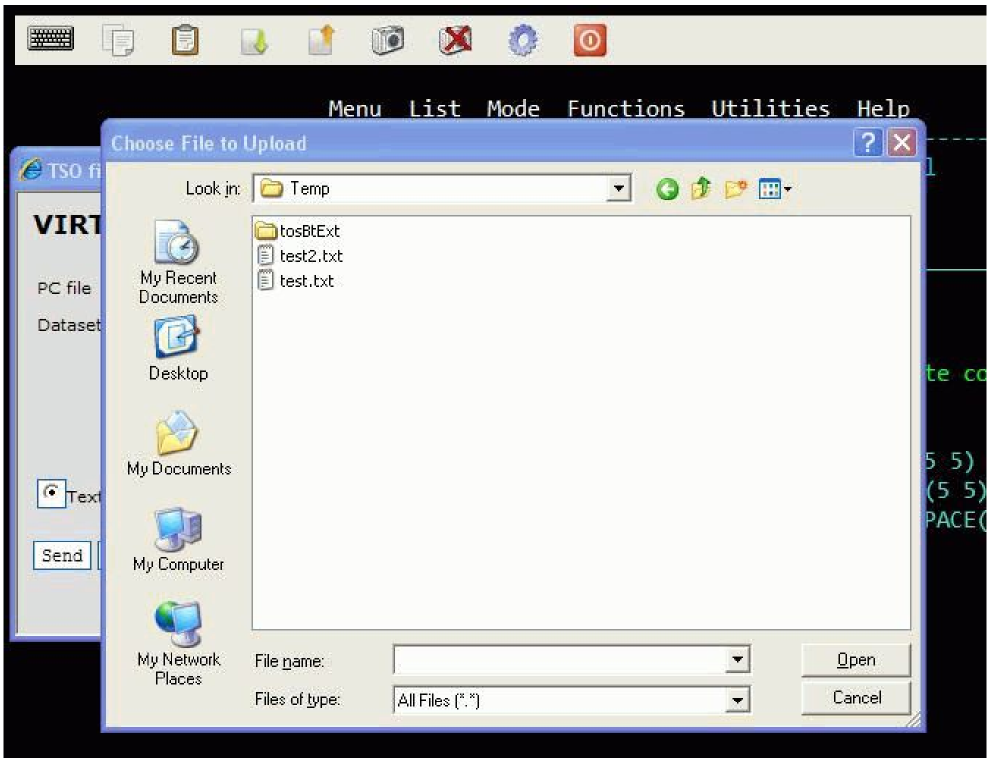
☐ Append ☐ New

[✓ Text] Binary

```
PF Command Shell
s below:

 enter to Retriev
JSON.TXT' ASCII C
SON.TXT' ASCII CR
JSON.TXT' ASCII C
E.CSS' ASCII CRLF
E.CSS' ASCII CRLF
ASCII CRLF
VIRTEL' ASCII CR
```

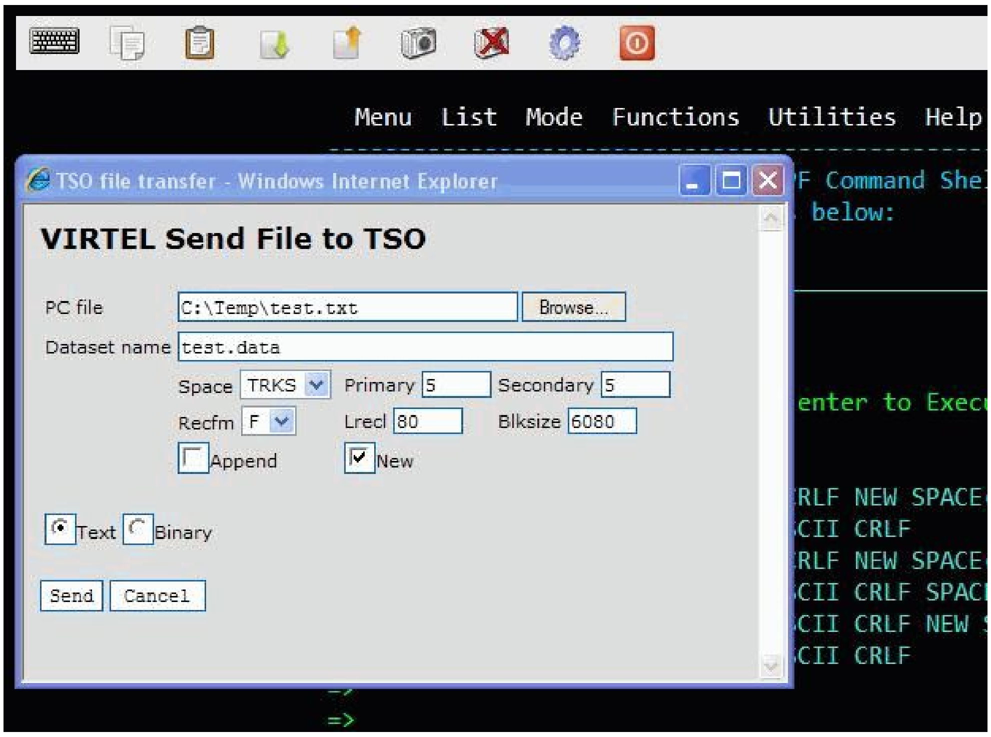
VIRTEL IND$FILE send dialog (part 1)

Click the “Browse...” button and the “Choose File to Upload” dialog will appear:



VIRTEL IND$FILE send dialog (part 2)

Choose the file you want to upload, and click “Open” to return to the “Send File” dialog:



VIRTEL Send File to TSO

PC file	C:\Temp\test.txt		
Dataset name	test.data		
Space	TRKS	Primary 5	Secondary 5
Recfm	F	Lrecl 80	Blksize 6080
[ ] Append		[✓] New	

[● Text] Binary

Send Cancel

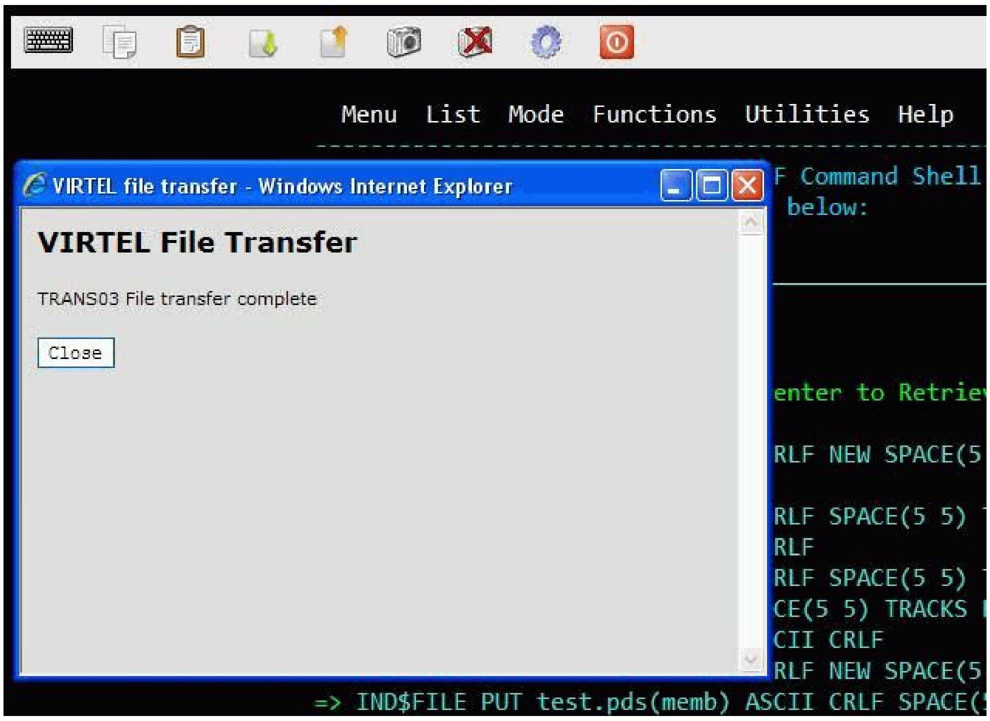
VIRTEL IND$FILE send dialog (part 3)

Specify the TSO dataset name, surrounded by quotes if necessary. Dataset names without quotes will be prefixed by your TSO prefix (usually your userid).

If the TSO dataset does not yet exist, you may optionally specify space (units, primary quantity, and secondary quantity), and DCB attributes (record format, logical record length, and block size). If you do not specify these attributes, the TSO IND$FILE will use its default values.

Check the “Append” checkbox to append the file to the end of an existing TSO file. The “New” checkbox indicates that the TSO file must not already exist.

Click either “Text” or “Binary”. “Text” translates the file from ASCII to EBCDIC and treats carriage return line feed sequences (x’0D0A’) as end of each record markers. “Binary” performs no translation. Finally click “Send” to start the transfer.


Menu List Mode Functions Utilities Help
VIRTEL file transfer - Windows Internet Explorer
Close

VIRTEL File Transfer

TRANS03 File transfer complete

```
F Command Shell
 below:

enter to Retrie
RLF NEW SPACE(5
RLF SPACE(5 5)
RLF
RLF SPACE(5 5)
CE(5 5) TRACKS
CII CRLF
RLF NEW SPACE(5
=> IND$FILE PUT test.pds(memb) ASCII CRLF SPACE(
```

VIRTEL IND$FILE send dialog (part 4)

The message “File transfer complete” is displayed upon successful completion of the upload.

1.10.5. Selecting PC Codepage for file transfer

Users can select a PC Codepage for file transfer. Possible values are :

Windows (CP-1252)

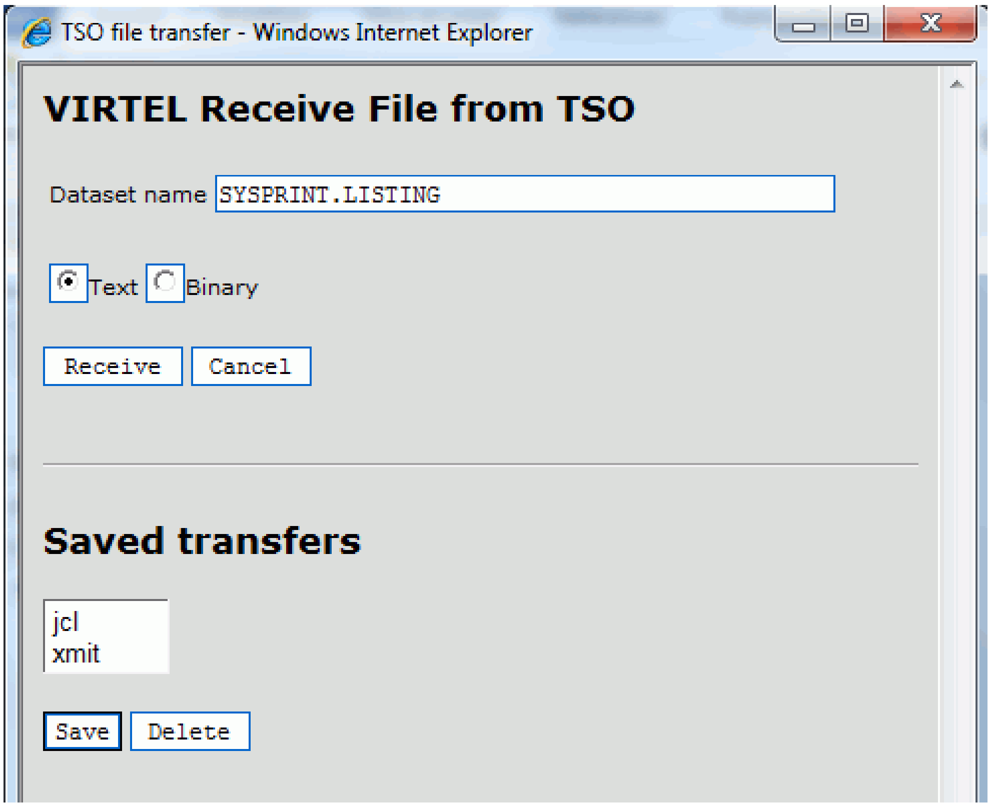
When selected, causes the file being translated by VIRTEL according to the CP-1252 ASCII-EBCDIC translation table.

MS-DOS (CP-850)

When selected, causes the file being translated by VIRTEL according to the CP-850 ASCII-EBCDIC translation table. The selected CP-850 table depends on the value of the COUNTRY parameter specified in the VIRTCT. If this value is "FR", "DE" or "BE", system will use corresponding table FR-850, DE-850 or BE-850. If the specified country value is different, by default the BE-850 table will be used to support CECP 500 international EBCDIC.

1.10.6. Saving and reusing file transfer parameters

Users who frequently carry out the same or similar file transfers can save the file transfer parameters for later reuse. To save a file transfer, enter the dataset name and the type of transfer, then click the “Save” button:



VIRTEL Receive File from TSO

Dataset name SYSPRINT.LISTING

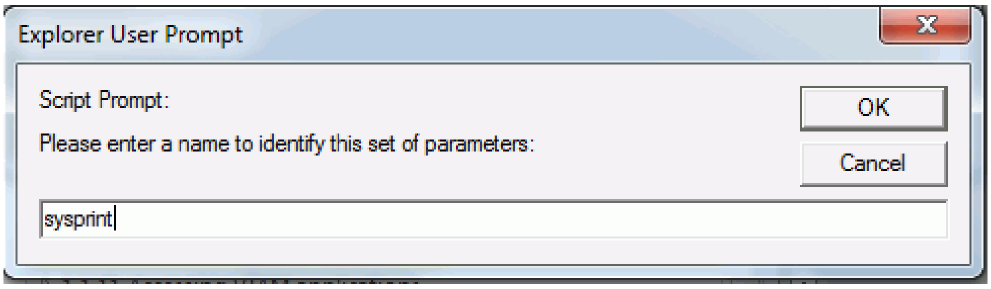
[✓ Text] Binary

Saved transfers

jcl
xmit

VIRTEL IND$FILE receive dialog (saved transfers)

The user can then choose a name for the saved transfer, and click “OK” to save the parameters. At the next transfer, the user clicks the name of the saved transfer to retrieve the parameters, then clicks “Receive” to start the transfer.



Script Prompt:

Please enter a name to identify this set of parameters:

sysprint

Saving the file transfer parameters

Users can save transfer parameters for both “Send” and “Receive”. The paramters are saved in browser local storage. The number of sets of parameters which can be saved is limited only by the amount of local storage available.

1.11. Accessing VTAM Applications

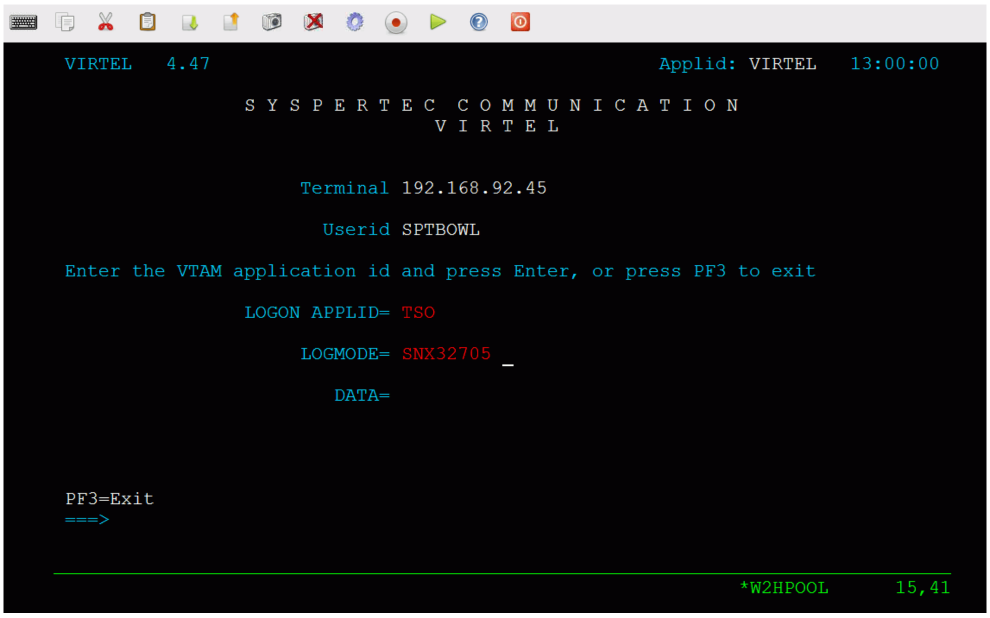
Normally the VIRTEL administrator provides access to VTAM applications by configuring a specific VIRTEL transaction for each application. However some users require the ability to access any VTAM application, including those not configured by the administrator, similar to the function provided by VTAM’s USSTAB USS10 screen. For these users, VIRTEL provides transactions named W2H-16 and CLI-16 whose external name is VTAM.

This transaction displays a screen on which the user can enter the ACBNAME of the VTAM application, together with optional LOGON DATA and LOGMODE.

1.11.1. VTAM logon screen

To access VIRTEL’s VTAM logon screen, click on “Other applications” on the VIRTEL Web Access menu (port 41001) or enter its URL directly:

```
http://n.n.n.n:41001/w2h/WEB2AJAX.htm+VTAM
```



```
VIRTEL   4.47                                  Applid: VIRTEL   13:00:00

                  S Y S P E R T E C   C O M M U N I C A T I O N
                                   V I R T E L


                       Terminal 192.168.92.45

                         Userid SPTBOWL

Enter the VTAM application id and press Enter, or press PF3 to exit

                  LOGON APPLID= TSO

                       LOGMODE= SNX32705 _

                          DATA=



PF3=Exit
===>

                                                      *W2HPOOL      15,41
```

VTAM logon screen in VIRTEL Web Access mode

To access, for example, TSO with logmode SNX32705, type TSO in the “LOGON APPLID” field and SNX32705 in the “LOGMODE” field, then press enter.

You can exit this screen by pressing F3.

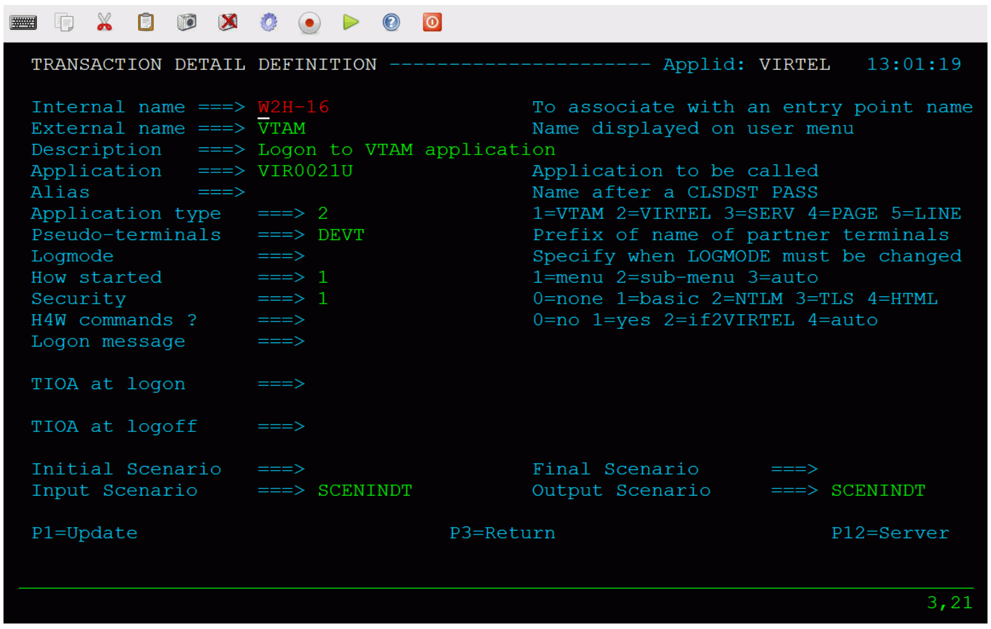
Lines 3 and 4 of the screen indicate the name of your installation and are taken from the TITRE1 and TITRE2 parameters of the VIRTCT (see VIRTEL Installation Guide).

The layout of the VTAM logon screen can be customized by assembling the map in member EIRM00U in the VIRTEL SAMPLIB.

1.11.2. Installing the VTAM logon transaction

To permit access to the VTAM logon screen, the administrator defines a VIRTEL transaction which calls VIRTEL program VIR0021U, as shown in the example below. The transaction should have “Security” set to 1 to force the user to sign on before the screen is displayed.

The VTAM logon screen is protected by a security resource named prefix.W2H-16 or prefix.CLI-16 (where prefix is the value of the PRFSECU parameter in the VIRTCT) in the RACF FACILITY class. Provided the “Security” field is set to 1, and security is activated in the VIRTCT, only those users having READ access to the resource can obtain the VTAM logon screen.



```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: VIRTEL   13:01:19

Internal name ===> W2H-16                   To associate with an entry point name
External name ===> VTAM                     Name displayed on user menu
Description   ===> Logon to VTAM application
Application   ===> VIR0021U                 Application to be called
Alias         ===>                          Name after a CLSDST PASS
Application type   ===> 2                   1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> DEVT                Prefix of name of partner terminals
Logmode            ===>                     Specify when LOGMODE must be changed
How started        ===> 1                   1=menu 2=sub-menu 3=auto
Security           ===> 1                   0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                     0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===>

TIOA at logoff     ===>

Initial Scenario   ===>                     Final Scenario      ===>
Input Scenario     ===> SCENINDT            Output Scenario     ===> SCENINDT

P1=Update                          P3=Return                        P12=Server

                                                                        3,21
```

Example VIRTEL transaction for VTAM logon via Web Access

1.12. Site Customization Of Colors And Logo

The VIRTEL administrator can customize the color settings for all applications or for specific applications. The custom settings are defined in a style sheet called custom.css which the administrator uploads to a VIRTEL directory designated for storage of customer files (usually CLI-DIR).

1.12.1. VIRTEL definitions required

The custom.css file is loaded from the directory designated by the transaction W2H-03CC (for entry point WEB2HOST on port 41001) or CLI-03CC (for entry point CLIWHOST on port 41002). These transactions have external name w2h and specify the path name /w2h/custom-css in the URL Prefix field. When VIRTEL is first installed, these transactions point to directory W2H-DIR for W2H-03CC and to directory CLI-DIR for CLI-03CC which contains a dummy version of the file custom.css.

The procedure for activating customized settings is:

1. Download the dummy custom.css from W2H-DIR by opening this URL in your browser: http://n.n.n.n:41001/w2h/custom.css (where n.n.n.n is the IP address of your VIRTEL)
2. Save the custom.css file in a directory on your workstation.
3. Open the custom.css file using a text editor such as notepad.
4. Edit the custom.css file with the color and/or logo settings you require (see examples below), then save the updated file.
5. Open the VIRTEL Web Access menu (URL http://n.n.n.n:41001) and click the “Upload” link
6. Click “Browse” and navigate to the directory where you saved the updated custom.css. Click on the custom.css file, then click the “CLI-DIR” button to upload the file to VIRTEL.
7. From the VIRTEL Web Access menu (URL http://n.n.n.n:41001) click the “Admin” link.
8. Press “F3 - Entry Points” then click “CLIWHOST”
9. Press “F4 - Transactions” then click “CLI-03CC”

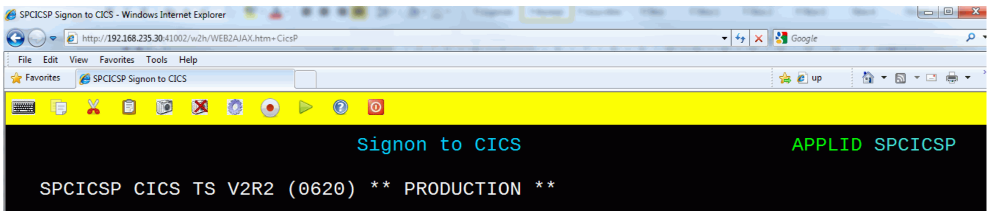
10. Press “F12 - View/Add” and type CLI-DIR in the “Application” field, overwriting the original value W2H-DIR
11. Press “F1 - Update” at the Transaction Detail Definition screen, then “F3 – Return” twice to return to the List of Entry Points screen, then “F1 – Update” again to update the entry point.

1.12.2. Example: Customizing the toolbar color by application

It is sometimes useful for the user to have a clear visual indication of which system he or she is logged on to. This example shows how to set the color of the toolbar to yellow for SPCICSP and pink for SPCICSQ.

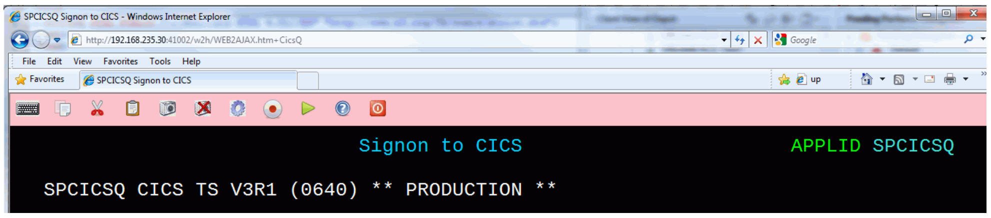
```
/* VIRTEL Web Access style sheet for site customization
 * (c)Copyright SysperTec Communication 2007,2010 All Rights Reserved
 */

 .SPCICSP #toolbar {background-color:yellow;}
 .SPCICSQ #toolbar {background-color:pink;}
```

Example custom.css for coloring the toolbar according to CICS region


SPCICSP Signon to CICS - Windows Internet Explorer
http://192.168.235.30:41002/w2h/WEB2AJAX.htm+CicsP
File Edit View Favorites Tools Help
Favorites
SPCICSP Signon to CICS

```
                    Signon to CICS                      APPLID SPCICSP

 SPCICSP CICS TS V2R2 (0620) ** PRODUCTION **
```

Web Access screen with yellow toolbar for SPCICSP


SPCICSQ Signon to CICS - Windows Internet Explorer
http://192.168.235.30:41002/w2h/WEB2AJAX.htm+CicsQ
File Edit View Favorites Tools Help
Favorites
SPCICSQ Signon to CICS

```
                    Signon to CICS                      APPLID SPCICSQ

 SPCICSQ CICS TS V3R1 (0640) ** PRODUCTION **
```

Web Access screen with pink toolbar for SPCICSQ

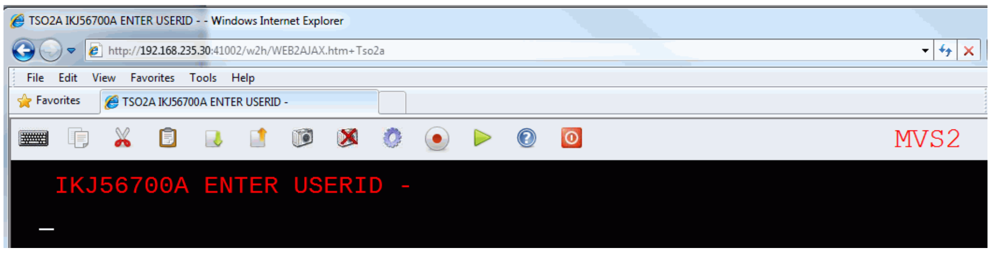
1.12.3. Example: Adding custom text to the toolbar

Another way of providing a clear visual indication of which application the user is logged on to is to add a text label to the toolbar. In this example the text “MVS1” is displayed when logged on to application TSO1A, and “MVS2” is displayed for application TSO2A.

```
/*
 * VIRTEL Web Access style sheet for site customisation
 * (c)Copyright SysperTec Communication 2007,2010 All Rights Reserved
 */

 .TSO1A .toolbarLast:before {
    content: "MVS1";
    color: gray;
    opacity: 0.25;
    font-size: 30px;
    width: 100%;
    text-align: center;
    z-index: 1000;
    -webkit-text-stroke: 1px #000;
    -webkit-text-fill-color: transparent;
 }
```

```
.TSO2A .toolbarLast:before {
   content: "MVS2";
   color: red;
   opacity: 0.25;
   font-size: 30px;
   width: 100%;
   text-align: center;
   z-index: 1000;
   -webkit-text-stroke: 1px red;
   -webkit-text-fill-color: transparent;
}
```

Example custom.css for adding custom text to the toolbar

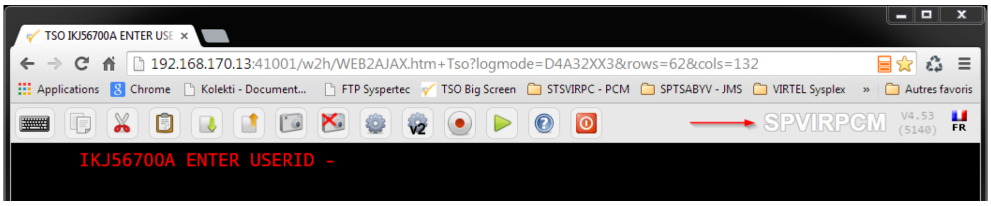

TSO2A IKJ56700A ENTER USERID - - Windows Internet Explorer
http://192.168.235.30:41002/w2h/WEB2AJAX.htm+Tso2a
File Edit View Favorites Tools Help
Favorites
TSO2A IKJ56700A ENTER USERID -
MVS2

```
IKJ56700A ENTER USERID -
_
```

Web Access screen with custom text in the toolbar

1.12.4. Example: Showing / Hiding server informations

It is sometimes useful to have a clear visual indication of which server a user is logged on to, its version and the maintenace level applied on the system. By default, the value specified into the APPLID parameter of the VIRTCT is displayed at the top-right of the toolbar as shown below. This information is followed by the running version number and the Virtel Web access level of maintenance used. This last information is enclosed in parentheses.



```
IKJ56700A ENTER USERID -
```

The running version and the level of maintenance cannot be hidden, only the server name can be permanently removed by modifying the w2hparm.hideinfo attribut present in the customized w2hparms.js file:

```
/*
 * Configuration of the server name connected to.
 */

 w2hparm.hideinfo = true;
```

Example w2hparm.js for hiding the mainframe application name on which a user is connected to.

If the default value is preserved, the user can hide this information for his own usage by checking "Hide Virtel information in toolbar" in the Display tab of the settings panel.

1.12.5. Example: Hiding the toolbar

The administrator may wish to prevent users from accessing features like copy/paste, print, and settings. This example shows how to hide the toolbar using a custom.css file:

```
/* VIRTEL Web Access style sheet for site customization
 * (c)Copyright SysperTec Communication 2007,2010 All Rights Reserved
 */

 #toolbar {display:none;}/*
```

Example custom.css for hiding the toolbar

You can also use custom.js to remove icons individually from the toolbar, see “Removing unwanted toolbar icons”, page 126.

1.12.6. Example: Modifying the 3270 colors

Some installations prefer to modify the colors displayed on the 3270 screen to make the characters more readable. This example shows how to modify the colors used by VIRTEL Web Access:

```
/*
 * VIRTEL Web Access style sheet customisation for 3270 colors
 * (c)Copyright SysperTec Communication 2012 All Rights Reserved
 */

 .NBLUE, .UBLUE, .BBLUE {color:#7890F0;}
 .RBLUE {background-color:#7890F0;}

 .NRED, .URED, .BRED {color:#F21816;}
 .RRED {background-color:#F21816;}

 .NPINK, .UPINK, .BPINK {color:#FF00FE;}
 .RPINK {background-color:#FF00FE;}

 .NGREEN, .UGREEN, .BGREEN {color:#24D82F;}
 .RGREEN {background-color:#24D82F;}

 .NTURQUOISE, .UTURQUOISE, .BTURQUOISE {color:#58F0F1;}
 .RTURQUOISE {background-color:#58F0F1;}

 .NYELLOW, .UYELLOW, .BYELLOW {color:#FFFF00;}
 .RYELLOW {background-color:#FFFF00;}

 .NWHITE, .UWHITE, .BWHITE {color:#FFFFFF;}
 .RWHITE {background-color:#FFFFFF;}
```

Example custom.css for modifying the 3270 colors

In this stylesheet, BLUE, RED, PINK, GREEN, TURQUOISE, YELLOW, and WHITE represent the 7 colors of the 3270 pallette, with a prefix indicating the highlighting mode: N=normal, U=underscore, B=blink, R=reverse video.

The color values (for example, #7890F0) are expressed in hexadecimal RGB encoding or as color names. For more explanation, see :

- http://en.wikipedia.org/wiki/Web_colors or
- http://www.w3schools.com/html/html_colornames.asp

1.12.7. Example: Adding a company logo

This example shows how to display an icon (for example, a company logo) at the left of the toolbar:

```
/*
 * VIRTEL Web Access style sheet customisation for company logo
 * (c)Copyright SysperTec Communication 2012 All Rights Reserved
 */
```

```
#toolbar td#companyIcon {
 height:30px;
 display:table-cell;
}

#companyIcon div {
 background-image:url("/w2h/virtblue.jpg");
 background-position:0px -4px;
 background-repeat:no-repeat;
 height:26px;
 width:145px;
}
```

Example custom.css for displaying company logo in the toolbar

This example shows how to replace the Virtel logo in the VIRTEL Web Access menu and the Application menu by your company logo:

```
/*
 * VIRTEL Web Access style sheet for site customisation
 * (c)Copyright SysperTec Communication 2013 All Rights Reserved
 * $Id$
 */

 #appmenulogo {
  background-image: url("mycompany.gif");
  height: 65px;
  width: 266px;
 }
```

Example custom.css for replacing the Virtel logo by a company logo

Note: If no explicit path is given, the company logo will be loaded from the same directory as the custom.css file.

1.12.8. Example: Removing 3D/hover effects on the toolbar buttons

This example shows how to remove the 3D/hover effects on toolbar buttons by adding orders in the custom.css file:

```
/*
 * VIRTEL Web Access style sheet customisation for removing 3D/hover effects
 * (c)Copyright SysperTec Communication 2014 All Rights Reserved
 */

 #toolbar td .tbButton, #toolbar td .tbButton:hover, #toolbar td .tbButton:active {
  background-color: inherit;
  border: inherit;
  box-shadow: inherit;
 }
```

Example custom.css for removing 3D/hover effects on buttons

1.12.9. Example: Changing background color of the toolbar buttons

This example shows how to change the backgroung color of the toolbar buttons by adding orders in the custom.css file:

```
/*
 * VIRTEL Web Access style sheet customisation the background of the toolbar buttons
 * (c)Copyright SysperTec Communication 2014 All Rights Reserved
 */

  |- transparent "at rest"
```

```
   |- white when cursor moves on
   |- yellow when button is clicked

 #toolbar td .tbButton {
  background-color: inherit;
 }
 #toolbar td .tbButton:hover {
  background-color: white;
 }
 #toolbar td .tbButton:active {
  background-color: yellow;
 }

   | To remove the background color and the border of buttons "at rest":

 #toolbar td .tbButton {
  background-color: inherit;
  border: 1px solid transparent;
 }
```

Example custom.css managin the background color of the toolbar buttons

1.12.10. Icon display troubleshooting

If some icons on the toolbar are displayed with some parasites on the border, please check that the browser is not in a zoom mode greater than 100%.

1.13. Site Customization Of Javascript Functions

To take into account site-specific Javascript extensions for Web Access, the WEB2AJAX.htm page template loads the /w2h/custom-js/custom.js file when a session is started. An empty custom.js file is delivered as standard in the W2H-DIR directory. The CLI-03CJ (/w2h/custom-js) transaction delivered as standard under the CLIWHOST entry point references the W2H-DIR directory, but the administrator can modify this transaction to reference a different directory containing a site-specific version of custom.js. The CLI-DIR directory, which is intended for client-specific files, may be used for this purpose.

To facilitate site-specific modifications to custom.js, VIRTEL Web Access calls various custom exits at strategic points in its processing. These exits are optional Javascript functions which can be codes custom.js if required. The exits are described below.

1.13.1. Exits which can be coded in custom.js

```
after_standardInit()
```

This function is called after the session with the host application has started.

```
before_submitForm(pfKey,oForm)
```

This function is called before submitting a request to the VIRTEL server.

The arguments passed to before_submitForm are:

pfKey
  the name of the key pressed: "ENTER", "PF1", etc.

oForm

a DOM object representing the form to be submitted (usually document.virtelForm)

```
after_responseHandle(o,url,xtim)
```

This function is called after receiving a response from the VIRTEL server.

The arguments passed to after_responseHandle are:

o

the XMLHttpRequest object (contains the status and responseText)

url

the URL which was used in the request

xtim

a Javascript Date object representing the time the request was sent to the server

```
modify_settingsValues(name,values)
```

This function is called before the list of possible values for a parameter is displayed in the VIRTEL Web Access Settings menu. It allows the list of values to be modified.

The arguments passed to modify_settingsValues are:

name

the parameter name

values

the list of possible values

The return value is treated as the new list of possible values. If the function returns null or undefined, the list remains unchanged.

```
when_init()
```

This function is called for each subpage after vir3270 initialisation.

```
when_focusGained()
```

This function is called whenever the 3270 window gains the focus.

```
when_focusLost()
```

This function is called whenever the 3270 window loses the focus.

1.13.2. Example: Customizing the toolbar icons

This example uses the after_standardInit function to insert additional icons into the toolbar when the session is started. Icons may subsequently be added or removed from the toolbar after each screen by means of the after_responseHandle function.

```
/*
 * (c)Copyright SysperTec Communication 2012 All Rights Reserved
 * VIRTEL Web Access customer-specific javascript functions
 */

/*
 * Adds a button to the toolbar which performs a Google search for
 * the text selected in the red box in the 3270 screen, or for the
 * word at the cursor if no box is drawn
 */
function after_standardInit() {
  addtoolbarbutton(999, "http://www.google.com/favicon.ico",
    "Search engine query", do_search);
}
function do_search() {
  var searcharg = VIR3270.getBoxedText() || VIR3270.getWordAtCursor();
  var windowname = "search";
  var searchURL = "http://www.google.com";
  if (searcharg) searchURL += "/search?q=" +
    encodeURIComponent(searcharg.replace(/\s+/g," "));
  var windowopts = "location=yes,status=yes,resizable=yes,"+
    "scrollbars=yes,toolbar=yes,menubar=yes,width=640,height=480";
  var searchwin = window.open(searchURL, windowname, windowopts);
  if (searchwin) searchwin.focus();
}
```

Example custom.js to customize the toolbar icons

1.13.2.1. Centering non standard icons

The best size for an icon is 32x32 pixels. For bigger or smaller icons, it possible to offer better center rendering in modifying the content of the class attribut passed within the "addtoolbarbutton" function in conjunction of using a specific css attribut.

```
/*
 * (c)Copyright SysperTec Communication 2014 All Rights Reserved
 * VIRTEL Web Access customer-specific javascript functions
 * Resizing a too small or too big toolbar icon.
 * For example toosmall_pic.png=22x22 and toobig_pic.jpg=145x30
 */

  addtoolbarbutton(999, "/w2h/toosmall_pic.png", "Custom button #1 tooltip", do_search, "tbButton size22x22");
  addtoolbarbutton(999, "/w2h/toobig_pic.jpg",  "Custom button #2 tooltip", do_search, "tbButton size145x30");
```

Example custom.js to specify the toolbar icon size

```
/*
 #toolbar td img.tbButton.size22x22 {
   width: 22px;
   height: 22px;
   padding: 5px; /* padding is calculated to center the picture horizontaly and verticaly in the 32x32 allocated
 }

 #toolbar td img.tbButton.size145x30 {
   width: 145px;
   height: 30px;
   padding: 1px 0; /* padding is calculated to center the picture verticaly in the 32x32 allocated area (1+30+1
 }
```

Example custom.css to manage a toolbar icon with a non standard size

1.13.3. Example: Removing unwanted toolbar icons

This example uses the after_standardInit function to disable macro functions by removing the corresponding icons from the toolbar.

```
/*
 * (c)Copyright SysperTec Communication 2012 All Rights Reserved
 * VIRTEL Web Access customer-specific javascript functions
 */

function after_standardInit() {
  /* Remove macro buttons from the toolbar */
  removetoolbarbutton("startrecording");
  removetoolbarbutton("playback");
}
```

Example custom.js to remove selected toolbar icons

The names of the other toolbar icons which can be removed in this way are:

- capture,
- disconnect,
- document-print-preview,
- edit-copy,
- edit-cut,
- edit-paste,
- emptybuf,
- file-rcv,
- file-send,
- help,
- keypad,
- playback,
- printer,
- settings,
- settingsV2,
- startrecording, playback, printer.

(settingsV2 is présent only if w2hparms.js contains "settingsGUI":{"version":"V2"}, or "settingsGUI":{"version":"V1+V2"},)

To hide the toolbar completely, see “Hiding the toolbar”, page 121.

To hide only the Virtel Application name, see “Showing / Hiding server informations”, page 121.

1.13.4. Example: Positionning toolbar icons

In certain circumstances, the default position of an icon may not be at the user's convenence. Is possible to change an icon's position based on the position of another icon.

```
/*
* Customize the location of dynamic toolbar buttons.
* The calls to this function are ignored when they
* return nothing, or an integer not greater than 0.
*
* Customizable buttons IDs :
*   > '3278T'
*   > 'document-print-preview'
*   > 'file-send'
*   > 'file-recv'
*   > 'printer'
*/
function customize_toolbarButtonIndex(id) {
  if (id==='printer' || id==='document-print-preview') {
    return getToolbarButtonIndex('disconnect') + 1;
  }
}
```

Example custom.js to select a position for printer icon

For version 4.54, update #5266 must be applied.

1.13.5. Example: Modifying the text of the status bar

This example uses the after_responseHandle function to modify the text in the status bar at the bottom of the Web Access screen. This example displays the text “Your printer name is xxxx” in the status bar.

Depending on the update level your system, you will need to implement one the following:

If the update level applied is before #5269, the status bar text is enclosed in <span id=relayStatus></span> tags to allow custom.js to modify it.

```
/*
 * (c)Copyright SysperTec Communication 2012 All Rights Reserved
 * VIRTEL Web Access customer-specific javascript functions
 */
function after_responseHandle(httpXmlObj, url, xmitTimestamp) {
  var o = document.getElementById("relayStatus");
  var p = document.getElementById("nameofprintrelay");
  if (o && p) {
    o.innerHTML = "Your printer name is:" + p.innerHTML;
  }
}
```

Example custom.js to modify the text of the status bar

If the update level applied is #5269 or above, the status bar text is an object which can therefore be modified using an API.

```
/*
 * (c)Copyright SysperTec Communication 2012 All Rights Reserved
 * VIRTEL Web Access customer-specific javascript functions
 */
function after_responseHandle(httpXmlObj, url, xmitTimestamp) {
  vwaStatusBar.setRelay();  // clears relay field
  vwaStatusBar.setPrintRelay("Your printer name is: " + vwaStatusBar.getPrintRelay());
}
```

Example custom.js to modify the text of the status bar

With this method, an API is provided which allows code in custom.js to change some fields in the status bar without having to manipulate the DOM of the page. The “vwaStatusBar” object can be used to do this.

The editing functions are:

Function	**Description**
vwaStatusBar.setRelay(txt)	Change the “Relay” field.
vwaStatusBar.setPrintRelay(txt)	Change the “Printer relay” field.
vwaStatusBar.setStatus(txt)	Change the “Status” field.
vwaStatusBar.setStatusClass(txt)	Allow to assign a specific CSS class to the “Status” field.

If the parameter is empty or undefined, the corresponding field is not displayed. If the content is too long, it is truncated to the right.

The query functions are:

Function	Description
vwaStatusBar.getCursCol()	Return the "x" position of the cursor.
vwaStatusBar.getCursRow()	Return the "y" position of the cursor.
vwaStatusBar.getRelay(parameter)	Return the content of the "Relay" field.
vwaStatusBar.getPrintRelay(parameter)	Return the content of the "Printer relay" field.
vwaStatusBar.getStatus()	Return the content of the "Status" field.

Notes:

- For the "getRelay()" and "getPrinterRelay()" functions, an optional parameter may be specified.
- When specified, valid values are "true" or "false" (without the quotes). When the parameter is ommited, or is not a valid value, the default "false" will be used.
- When "setRelay(txt)" or "setPrinterRelay(txt)" is used the "txt" value overprints the field at the browser level before displaying to the end user. Behind this "overprinted value", an initial value exists that has been placed by Virtel mainframe side before sending message to the browser. When using the "getRelay()" or "getPrinterRelay()" functions, you may want to retrieive the inital or overprinted value. When in "false" mode the function returns the initial value. When in "true" mode the function retruns the overprinted value.

1.13.6. Example: Custom hotspot recognition

This example uses the after_responseHandle function to modify the regular expression which is used to identify PF key hotspots.

```
/*
 * (c)Copyright SysperTec Communication 2012 All Rights Reserved
 * VIRTEL Web Access customer-specific javascript functions
 */

function after_responseHandle(httpXmlObj, url, xmitTimestamp) {
  VIR3270.customPfKeysHotspotRegex =
    /(P?F\d{1,2}|PA[1-3]|ENTER|CLEAR)((?:\/P?F\d{1,2})?\s*[=:-])/;
}
```

Example custom.js to modify PF key hotspot recognition

1.13.7. Example: Adding a watermark to the 3270 screen

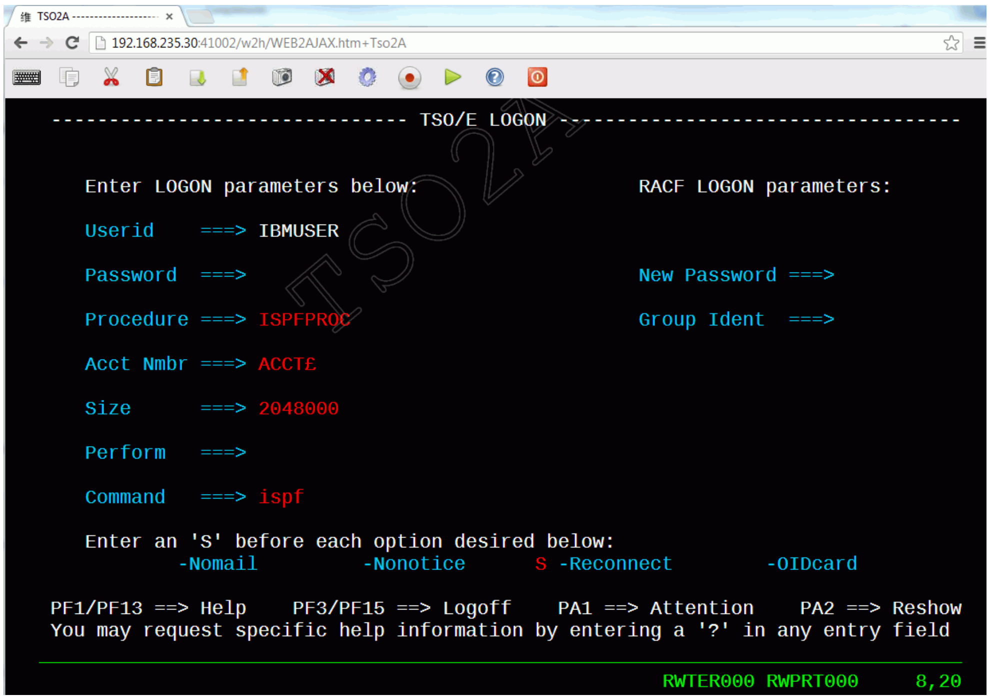
This example uses the after_standardInit function in conjunction with a custom stylesheet to add a watermark to the Web Access screen. The watermark displays the application name in light text behind the 3270 screen content. The application name is obtained from the class attribute of the body tag.

```
/*
 * (c)Copyright SysperTec Communication 2012 All Rights Reserved
 * VIRTEL Web Access customer-specific javascript functions
 */

function after_standardInit() {
  var o = document.createElement("div");
  o.className = "watermark";
  o.innerHTML = document.body.className;
  document.body.appendChild(o);
}
```

Example custom.js to add a watermark to the Web Access 3270 screen

```
/*
 * (c)Copyright SysperTec Communication 2012 All Rights Reserved
 * VIRTEL Web Access style sheet for site customisation
*/

 .watermark {
    position: absolute;
    pointer-events: none;
    left: 150px;
    top: 100px;
    color: gray;
    opacity: 0.25;
    font-size: 10em;
    width: 60%;
    text-align: center;
    z-index: 1000;
    -webkit-text-stroke: 1px #FFF;
    -webkit-text-fill-color: transparent;
    -webkit-transform: rotate(-40deg);
    -moz-transform: rotate(-40deg);
    filter: alpha(opacity=25) progid:DXImageTransform.Microsoft.Matrix(M11=0.819, M12=0.574, M21=-0.574, M22=0.8
}
```

Example custom.css to define the style of the watermark



```
 ------------------------------- TSO/E LOGON -----------------------------------

   Enter LOGON parameters below:                 RACF LOGON parameters:

   Userid    ===> IBMUSER

   Password  ===>                                New Password ===>

   Procedure ===> ISPFPROC                       Group Ident  ===>

   Acct Nmbr ===> ACCTE

   Size      ===> 2048000

   Perform   ===>

   Command   ===> ispf

   Enter an 'S' before each option desired below:
           -Nomail         -Nonotice      S -Reconnect        -OIDcard

 PF1/PF13 ==> Help    PF3/PF15 ==> Logoff    PA1 ==> Attention    PA2 ==> Reshow
 You may request specific help information by entering a '?' in any entry field

                                                 RWTER000 RWPRT000      8,20
```

Web Access screen with application name as watermark

1.13.8. Example: Modifying Web Access Settings

The callback function modify_settingsValues allows the administrator to modify or replace the list of values allowed for specific parameters in the VIRTEL Web Access Settings menu.

The example shown below replaces the list of fonts, and adds two extra values "20" and "24" to the list of fontsizes:

```
/*
 * (c)Copyright SysperTec Communication 2012 All Rights Reserved
 * VIRTEL Web Access customer-specific javascript functions
 */
```

```
function modify_settingsValues(name, values) {
  if (name == "font")
    return ["Courier New", "Lucida Console", "Consolas"];
  if (name == "fontsize")
    return values.concat("20", "24");
}
```

Example custom.js to modify Settings values

1.14. Customizing The Help Page

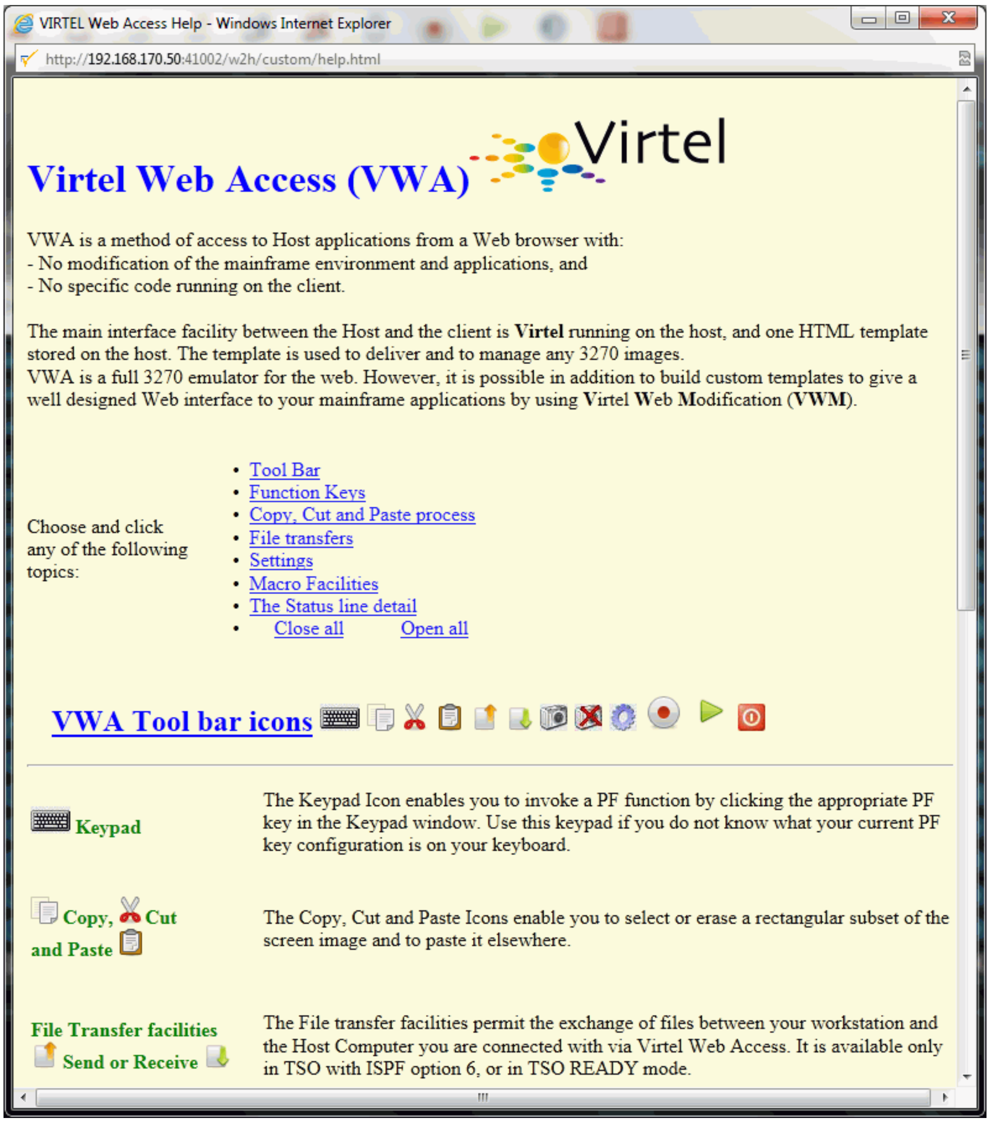
Users can obtain help on VIRTEL Web Access functions by clicking the help icon in the Web Access toolbar:

which causes the browser to display the page /w2h/custom-help/help.html delivered as standard with VIRTEL Web Access.

The administrator can create a custom version of the help.html page and upload it to a VIRTEL directory destined for site-specific pages, such as CLI-DIR.

1.14.1. Standard help page

The standard help.html page is shown below:



VIRTEL Web Access Help - Windows Internet Explorer

http://192.168.170.50:41002/w2h/custom/help.html

Virtel Web Access (VWA)

VWA is a method of access to Host applications from a Web browser with:
- No modification of the mainframe environment and applications, and
- No specific code running on the client.

The main interface facility between the Host and the client is **Virtel** running on the host, and one HTML template stored on the host. The template is used to deliver and to manage any 3270 images.
VWA is a full 3270 emulator for the web. However, it is possible in addition to build custom templates to give a well designed Web interface to your mainframe applications by using Virtel **W**eb **M**odification (**VWM**).

Choose and click any of the following topics:

- Tool Bar
- Function Keys
- Copy, Cut and Paste process
- File transfers
- Settings
- Macro Facilities
- The Status line detail
- Close all Open all

VWA Tool bar icons

Keypad — The Keypad Icon enables you to invoke a PF function by clicking the appropriate PF key in the Keypad window. Use this keypad if you do not know what your current PF key configuration is on your keyboard.

Copy, Cut and Paste — The Copy, Cut and Paste Icons enable you to select or erase a rectangular subset of the screen image and to paste it elsewhere.

File Transfer facilities Send or Receive — The File transfer facilities permit the exchange of files between your workstation and the Host Computer you are connected with via Virtel Web Access. It is available only in TSO with ISPF option 6, or in TSO READY mode.

Standard help page for Web Access

1.14.2. Installing a custom help page

To install a customized help.html page, the administrator must perform the following operations:

- Upload the customized help.html file into a VIRTEL directory such as CLI-DIR
- Modify the VIRTEL transactions CLI-03CH so that it points to the CLI-DIR directory (instead of W2H-DIR as initially installed), then press F1-F3-F3-F1 to update the transaction and the CLIWHOST entry point. Perform the same operation on transaction W2H-03CH and entry point WEB2HOST.

1.15. Allow Copy, Cut And Paste

Copy, cut or paste operation are done using standard function key combinations CTRL + C, CTRL + X or CTRL + V or using a pop-up menu when using the right mouse button. These operations often require access to the clipboard, which, depending on the browser used, may require the installation of an additional module..

1.15.1. Additional module requirements

1.15.1.1. Internet Explorer

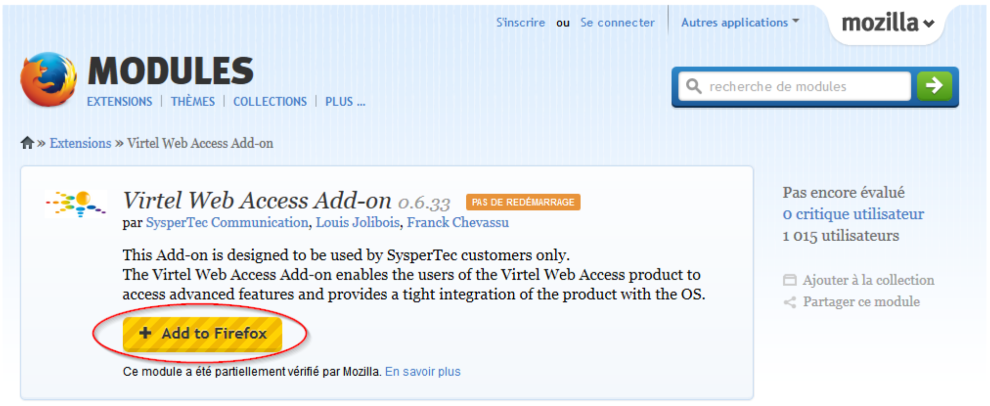
For Internet Explorer, the usage of the clipboard is systematic for copy / cut / paste operation and does not require any additional module.

From IE9 and above, depending on the value of “Tools | Internet options | Security tab | Custom level | Scroll to, Drag and drop or cut and paste files” you will be authorized - or not - to access the clipboard. If prompted, during the first attempt to use copy / cut / paste function the browser will display a window requesting confirmation to access the clipboard. Once the decision is communicated, it remains valid until closing the window with the domain.

1.15.1.2. Firefox

An ADDON is required to perform any copy / cut / paste operation with another application or with another internet domain. The ADDON is available for download at the following address: https://addons.mozilla.org/fr/firefox/addon/virtel-webaccess-add-on/

If the browser version is compatible with the latest version of ADDON published click the “+ Add to Firefox” icon. Any additional window will open to confirm the installation.

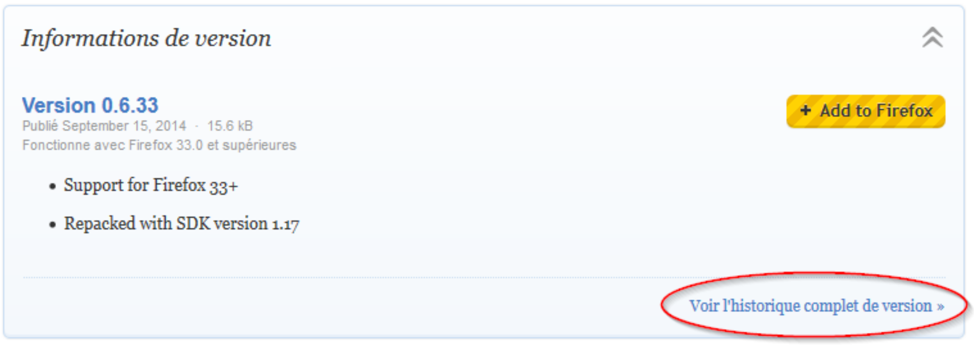

S'inscrire ou Se connecter
Autres applications
mozilla
MODULES
EXTENSIONS | THÈMES | COLLECTIONS | PLUS ...
recherche de modules
Extensions » Virtel Web Access Add-on
Virtel Web Access Add-on 0.6.33 PAS DE REDÉMARRAGE
par SysperTec Communication, Louis Jolibois, Franck Chevassu

This Add-on is designed to be used by SysperTec customers only.
The Virtel Web Access Add-on enables the users of the Virtel Web Access product to access advanced features and provides a tight integration of the product with the OS.

Ce module a été partiellement vérifié par Mozilla. En savoir plus

Pas encore évalué
0 critique utilisateur
1 015 utilisateurs

If the browser version is too old to be supported by the latest version of ADDON published, the link “+ Add to Firefox” will not be available. Click on the link “View full history version”at the bottom of the page as shown below.


Informations de version

Version 0.6.33
Publié September 15, 2014 · 15.6 kB
Fonctionne avec Firefox 33.0 et supérieures

- Support for Firefox 33+
- Repacked with SDK version 1.17

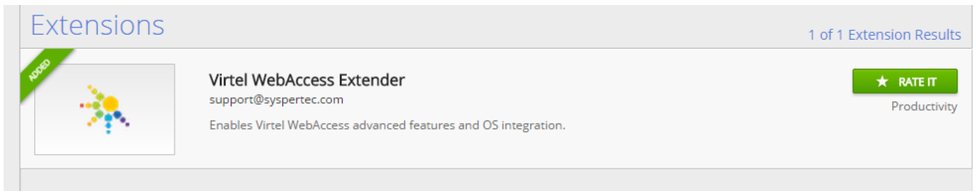
On the next page, select the ADDON version of the most compatible version available for the browser in use. Click "+ Add to Firefox". Several versions of the ADDON can be installed in parallel, however, only one must be active at any given time.

1.15.1.3. Chrome

An extension is required for any copy / cut / paste operation with another application or with another internet domain. The extension can be obtained on the Chrome WebStore at the following address:

https://chrome.google.com/webstore/category/apps?hl=en-GB.

Enter "Virtel Extender WebAccess" in the search field and launch the search. The extension appears in the "Extensions" list.


Extensions
1 of 1 Extension Results
ADDED
Virtel WebAccess Extender
support@syspertec.com
Enables Virtel WebAccess advanced features and OS integration.
RATE IT
Productivity

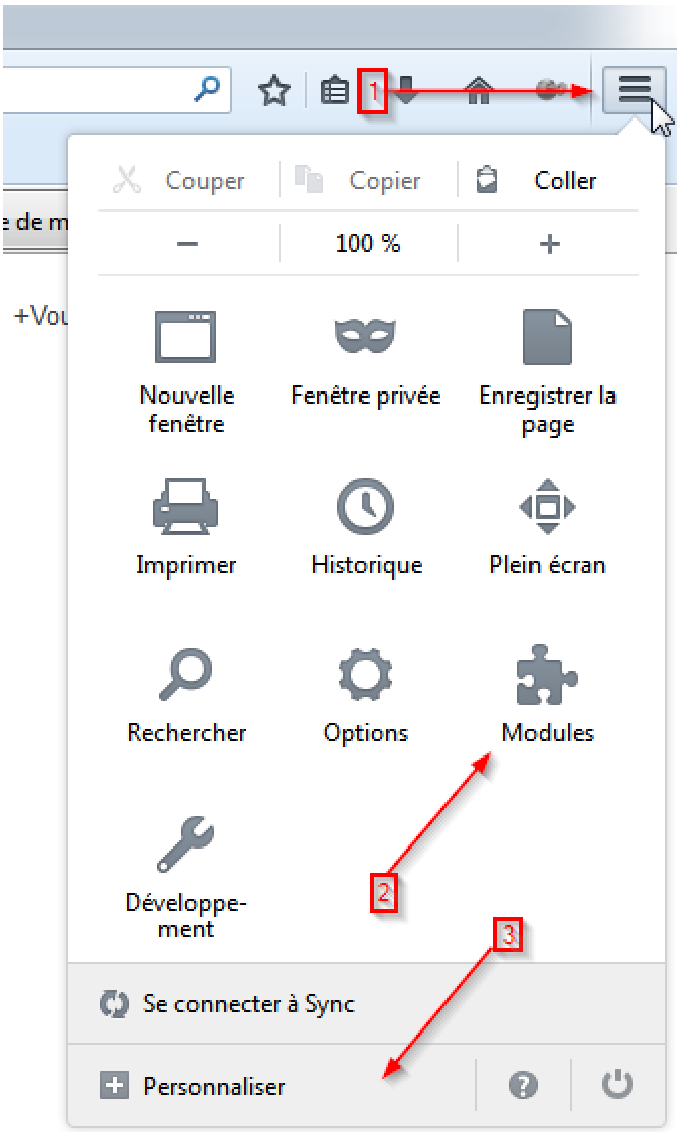
Click on the extension item and then, on the next page, click "Add to Chrome".

1.15.2. Additional module requirements

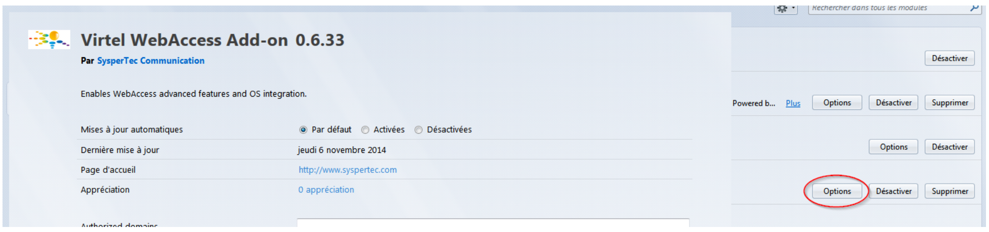
Once the additional module has been installed, it will be necessary to specify the permissions.

1.15.2.1. Firefox

On the toolbar, click on the "Menu" in the upper right (1) icon, then click on "Modules" (2). If this section does not appear directly in the tool window, click on "Customise" (3) tool to add "Modules" in the menu. It is also possible to directly access the extension manager by typing "about: addons" in the URL bar of the browser.



On the ADDONS page, select “Extension” to display the VIRTEL extension. Click on the “Options” button to display a setup screen similar to the one shown below.

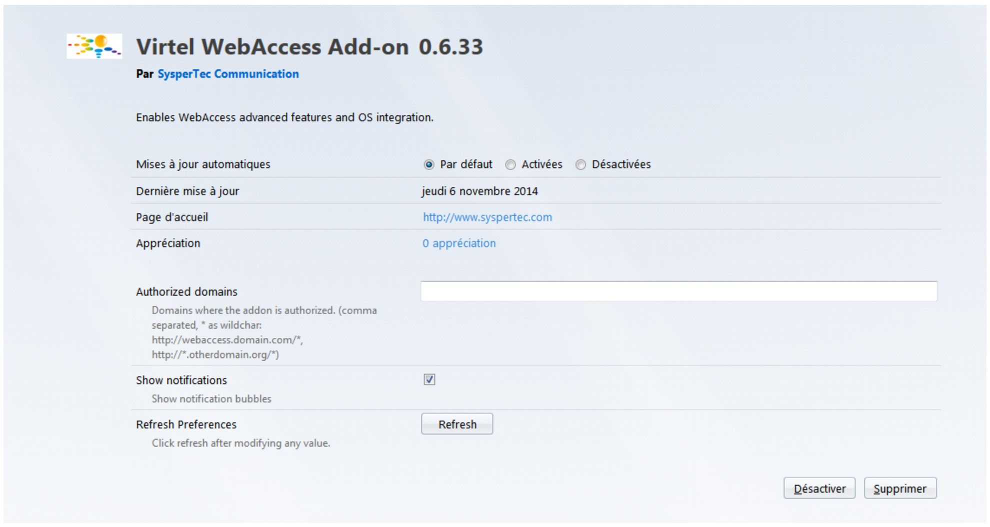


Virtel WebAccess Add-on 0.6.33
Par SysperTec Communication

Enables WebAccess advanced features and OS integration.

Mises à jour automatiques	● Par défaut ○ Activées ○ Désactivées
Dernière mise à jour	jeudi 6 novembre 2014
Page d'accueil	http://www.syspertec.com
Appréciation	0 appréciation

Rechercher dans tous les modules
Désactiver
Powered b... Plus Options Désactiver Supprimer
Options Désactiver
Options Désactiver Supprimer


Virtel WebAccess Add-on 0.6.33
Par SysperTec Communication

Enables WebAccess advanced features and OS integration.

Mises à jour automatiques [✓ Par défaut] Activées Désactivées
Dernière mise à jour: jeudi 6 novembre 2014
Page d'accueil: http://www.syspertec.com
Appréciation: 0 appréciation

Authorized domains
Domains where the addon is authorized. (comma separated, * as wildchar: http://webaccess.domain.com/*, http://*.otherdomain.org/*)

Show notifications ✓
Show notification bubbles

Refresh Preferences
Click refresh after modifying any value.

The following options should be set:

Automatic update

- by default
- enabled
- off

Authorized domains:

Contains a list of domains for which permission to access the clipboard is granted. Each domain is separated from the next with a comma. The * indicates that all values are valid for the corresponding criteria. All definitions should end with an asterisk character, for example, “http://www.mydomain.com/” is not a valid definition because it does not end with *.

Example of definitions:

- http://www.mydomain.com/* allow access to the clipboard for the domain. Typing http://www.mydomain.com:8080/ will be denied access, the presence of a port number in the URL does not match the rule.
- http://192.168.92.161:41001/* allows URLs communicating on the 41001 port access to the clipboard for specified IP address. URLs using another port will be denied access.
- http://192.168.92.161:* allows URL communicating on any port to access the clipboard for specified IP address.

All entries must ends with a wildchar (*) character. Only one wildchar character is allowed for each entry.

Show notifications:

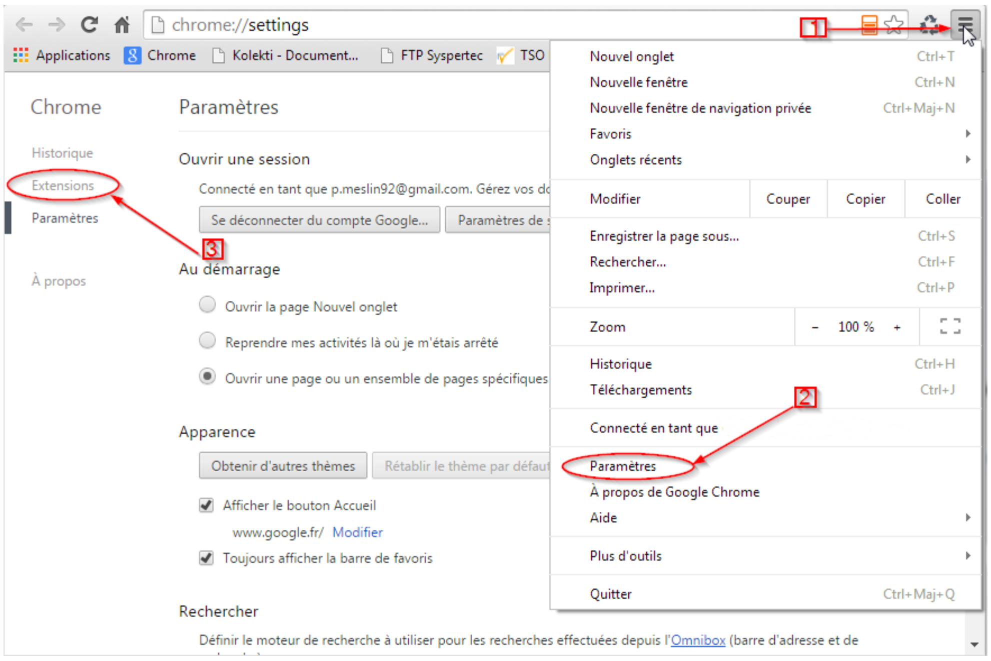
Display a POP_UP window in the bottom right of the screen summarizing the result of last copy / paste operation.

Refresh preferences:

Saves the last configuration changes.

1.15.2.2. Chrome

On the toolbar, click on the “Customize and control Google Chrome” icon in the upper right (1), then click on the “Settings” (2), then the extensions section. It is also possible to directly access the extension manager by typing “chrome://extensions” in the URL bar of the browser. From the extensions page, select “Extension” to display the VIRTEL extension.



Chrome

Historique

Extensions

Paramètres

À propos

Paramètres

Ouvrir une session

Connecté en tant que p.meslin92@gmail.com. Gérez vos d

Se déconnecter du compte Google... | Paramètres de

Au démarrage

- Ouvrir la page Nouvel onglet
- Reprendre mes activités là où je m'étais arrêté
- Ouvrir une page ou un ensemble de pages spécifiques

Apparence

Obtenir d'autres thèmes | Rétablir le thème par défaut

- [✓] Afficher le bouton Accueil

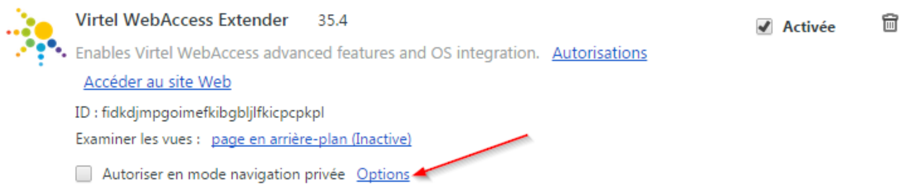
  www.google.fr/ Modifier
- [✓] Toujours afficher la barre de favoris

Rechercher

Définir le moteur de recherche à utiliser pour les recherches effectuées depuis l'Omnibox (barre d'adresse et de

Nouvel onglet	Ctrl+T
Nouvelle fenêtre	Ctrl+N
Nouvelle fenêtre de navigation privée	Ctrl+Maj+N
Favoris	
Onglets récents	
Modifier	Couper Copier Coller
Enregistrer la page sous...	Ctrl+S
Rechercher...	Ctrl+F
Imprimer...	Ctrl+P
Zoom	- 100 % +
Historique	Ctrl+H
Téléchargements	Ctrl+J
Connecté en tant que	
Paramètres	
À propos de Google Chrome	
Aide	
Plus d'outils	
Quitter	Ctrl+Maj+Q

Verify that the extension is activated and click on the “Options” link.



Virtel WebAccess Extender 35.4

Enables Virtel WebAccess advanced features and OS integration. Autorisations

Accéder au site Web

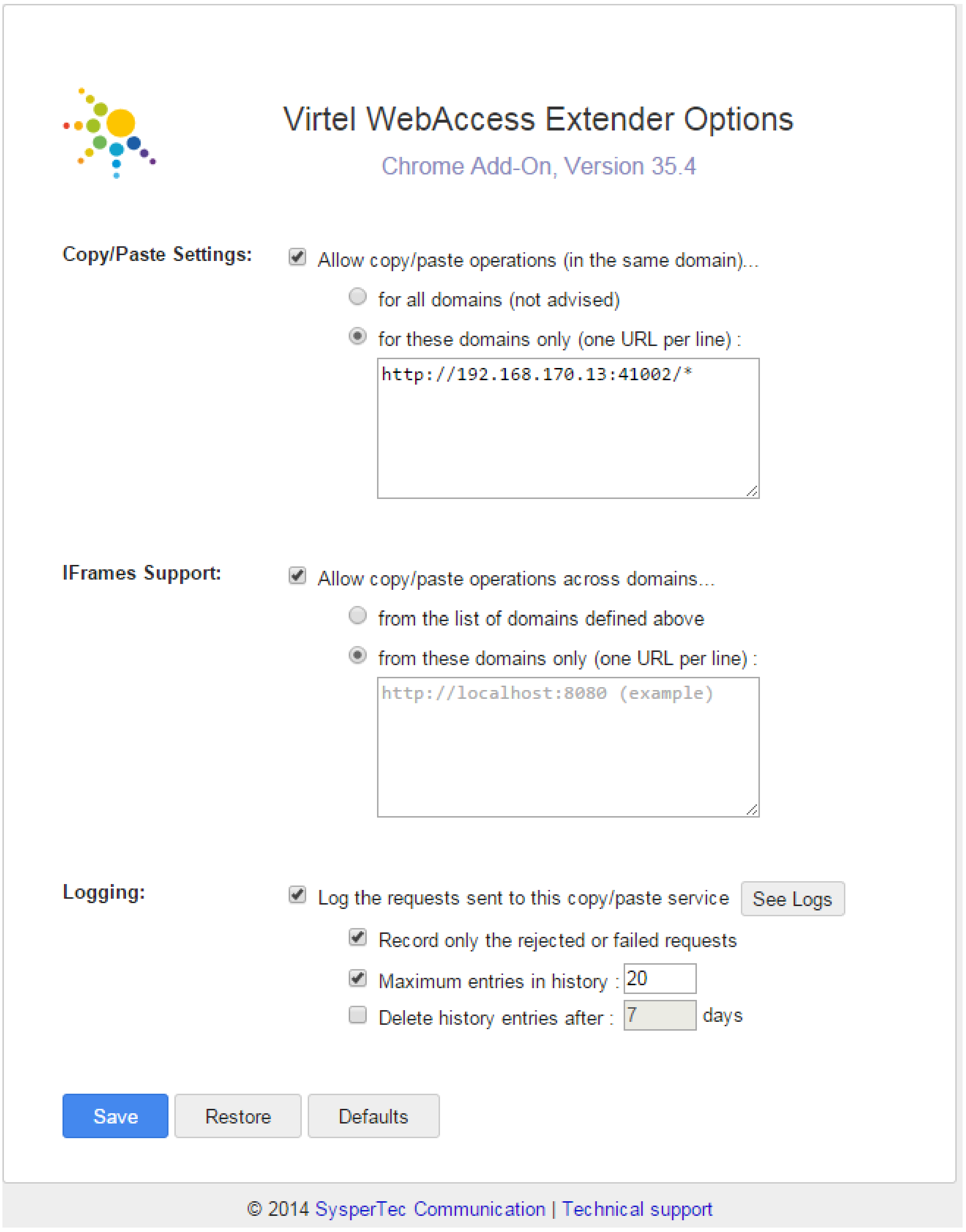
ID : fidkdjmpgoimefkibgbljlfkicpcpkpl

Examiner les vues : page en arrière-plan (Inactive)

- [ ] Autoriser en mode navigation privée Options

[✓] Activée

The following options should be set:



Virtel WebAccess Extender Options

Chrome Add-On, Version 35.4

Copy/Paste Settings:

[✓] Allow copy/paste operations (in the same domain)...

○ for all domains (not advised)

● for these domains only (one URL per line) :

```
http://192.168.170.13:41002/*
```

IFrames Support:

[✓] Allow copy/paste operations across domains...

○ from the list of domains defined above

● from these domains only (one URL per line) :

```
http://localhost:8080 (example)
```

Logging:

[✓] Log the requests sent to this copy/paste service See Logs

[✓] Record only the rejected or failed requests

[✓] Maximum entries in history : 20

[ ] Delete history entries after : 7 days

Save Restore Defaults

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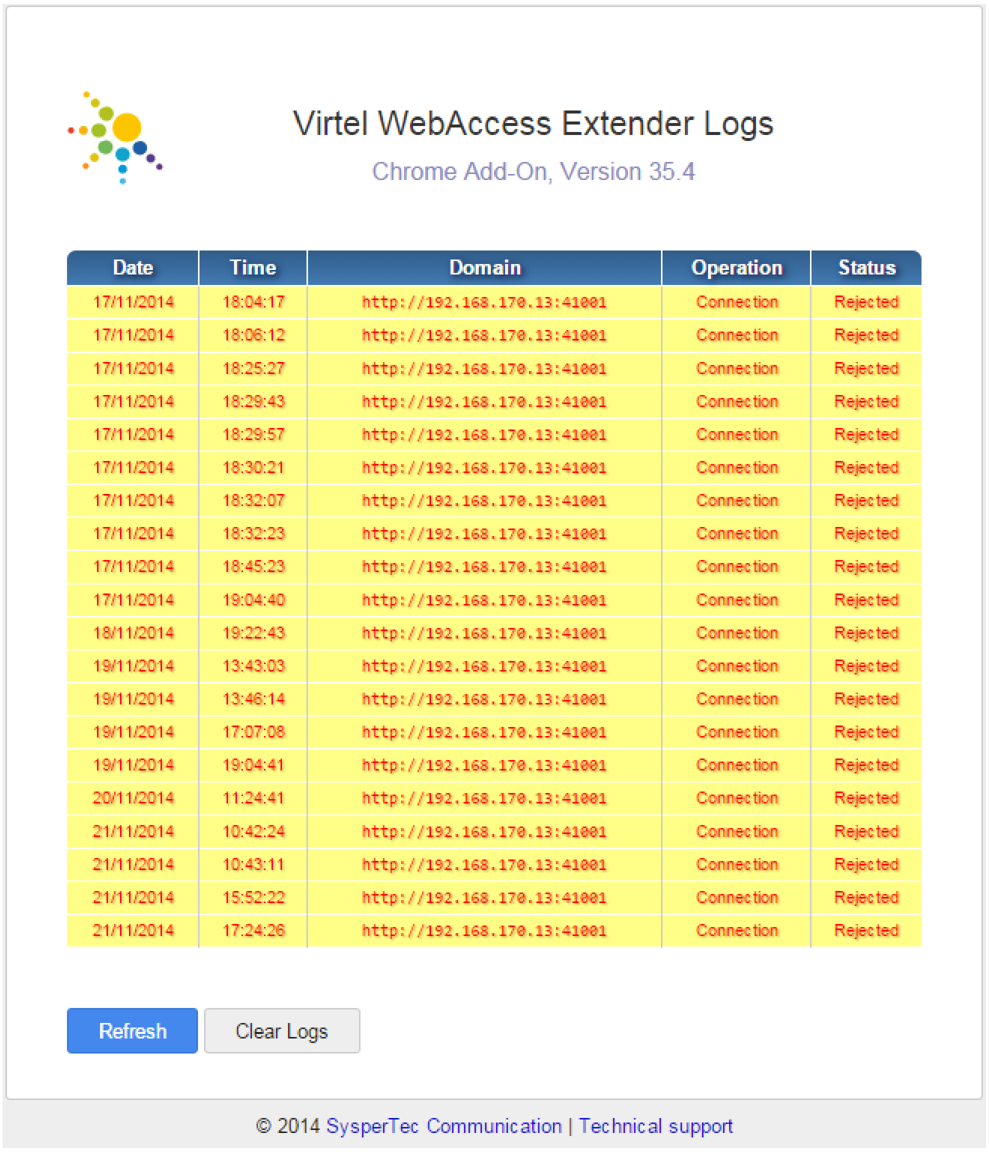

Virtel WebAccess Extender Logs

Chrome Add-On, Version 35.4

Date	Time	Domain	Operation	Status
17/11/2014	18:04:17	http://192.168.170.13:41001	Connection	Rejected
17/11/2014	18:06:12	http://192.168.170.13:41001	Connection	Rejected
17/11/2014	18:25:27	http://192.168.170.13:41001	Connection	Rejected
17/11/2014	18:29:43	http://192.168.170.13:41001	Connection	Rejected
17/11/2014	18:29:57	http://192.168.170.13:41001	Connection	Rejected
17/11/2014	18:30:21	http://192.168.170.13:41001	Connection	Rejected
17/11/2014	18:32:07	http://192.168.170.13:41001	Connection	Rejected
17/11/2014	18:32:23	http://192.168.170.13:41001	Connection	Rejected
17/11/2014	18:45:23	http://192.168.170.13:41001	Connection	Rejected
17/11/2014	19:04:40	http://192.168.170.13:41001	Connection	Rejected
18/11/2014	19:22:43	http://192.168.170.13:41001	Connection	Rejected
19/11/2014	13:43:03	http://192.168.170.13:41001	Connection	Rejected
19/11/2014	13:46:14	http://192.168.170.13:41001	Connection	Rejected
19/11/2014	17:07:08	http://192.168.170.13:41001	Connection	Rejected
19/11/2014	19:04:41	http://192.168.170.13:41001	Connection	Rejected
20/11/2014	11:24:41	http://192.168.170.13:41001	Connection	Rejected
21/11/2014	10:42:24	http://192.168.170.13:41001	Connection	Rejected
21/11/2014	10:43:11	http://192.168.170.13:41001	Connection	Rejected
21/11/2014	15:52:22	http://192.168.170.13:41001	Connection	Rejected
21/11/2014	17:24:26	http://192.168.170.13:41001	Connection	Rejected

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Allow copy / paste operation:

Allows operations copy / cut / paste on the domains specified in the definitions parameter.

For all domains:

All domains are open for any copy / cut / paste operations.

For these domains only:

Only the domains defined in a list are allowed. When multiple domains are required, the list must be defined with one line per domain reference.

Example of definitions:

- http://www.mydomain.com/* allow access to the clipboard for the domain. Typing http://www.mydomain.com:8080/ will be denied access, the presence of a port number in the URL does not match the rule.
- http://192.168.92.161:41001/* allows URLs communicating on the 41001 port access to the clipboard for specified IP address. URLs using another port will be denied access.
- http://192.168.92.161:*/* allows URL communicating on any port to access the clipboard for specified IP address.

IFrame support:

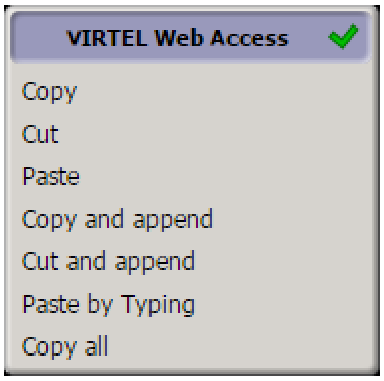
> Allows operation of copy / cut / paste operation when Virtel Web Access window is encapsulated in an IFrame.This information is supplemented by a list of areas on which these operations are allowed. This list may be identical to that defined in the previous section and, if required, may contain additional restrictions through a restrictive list. When a restrictive list is specified, the relevant fields should appear in the previous list.

Logging:

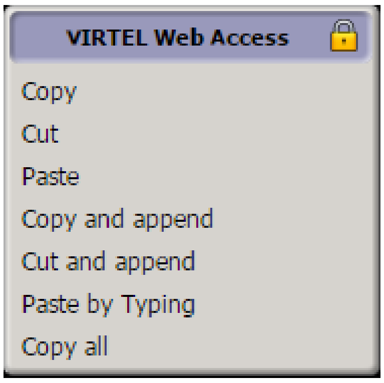
> Whenever a copy / cut / paste operation is attempted the domain involved can be saved to a list. This list is presented in the following form:
>
> By default the system registers a historical log all operations. It is possible to restrict registration to only rejected requests by checking the “Record only the gold failes Rejected requests” box. Managing the number of log entries and setting a retention time is configurable via “Maximum entries in history” and “Delete history entries after” settings.

1.15.3. Operational audit

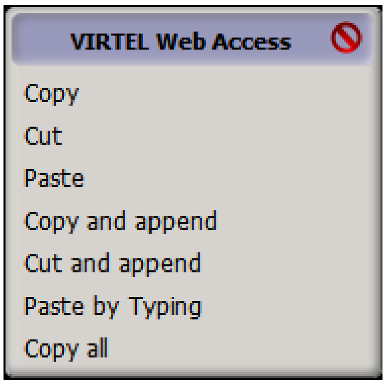
Firefox and Chrome. Use the right mouse button to open a selection menu for copy / cut / paste operations. The operational status of this feature is displayed in an ICON in top right.



Green: Indicates that the module is properly installed and that the field is allowed.



Orange: Indicates that the module is installed correctly but the field is not defined as an authorized domain. (Available only for Chrome).



Red: The expansion module is not installed. For Firefox, it may also indicate that the field is not allowed, or that the navigation is done in private mode. If running in private mode, the fonction is supported from version 0.6.33.1 and above.

1.16. Macros

By pressing the REC button on the VIRTEL Web Access toolbar, the user can start recording a sequence of keystrokes. A second click on the REC button terminates the recording and allows the user to assign a name to the macro which has been recorded.

The PLAY button on the toolbar allows the user to display a list of macros already recorded, and to replace or delete a macro.

REC button

PLAY button

1.16.1. Macros in Local Storage

By default macros created by the user are saved on the workstation in “Browser Local Storage”.

1.16.2. Macros in Virtel Storage

The VirtelMacros function allows global, group, and user macros to be stored under the name macros.json in a VSAM file on the VIRTEL host system.

If used in a Sysplex distributed environment, the VSAM file that contains the macros cannot be shared between two VIRTEL STC (i.e. each VIRTEL must have its own VSAM macro file).

The SET VMACROS=YES parameter in the ARBOLOAD job allows the definitions needed for the VirtelMacros function to be loaded during VIRTEL installation.

Multiple macros.json files can be defined: a global file containing shared macros for all users, and group and user files where macros specific to a group or to a user are stored.

User macros created by each user are stored in macros.json files loaded into the USR-DIR directory with keyword %USER%. When the macros are loaded into or read from this directory, VIRTEL substitutes the keyword %USER% by the userid.

Global macros accessible to all users are stored in the macros.json file loaded into the GLB-DIR directory.

Group macros are defined for a specific group name recognized by the security subsystem (RACF, TOPS, ACF2). They are stored in a macros.json file loaded into the GRP-DIR directory with keyword %GROUP%.

At execution time, VIRTEL substitutes the keyword %GROUP% by the name of the group supplied by the security subsystem.

A prerequisite for using group and user macros is that the user must sign on to VIRTEL with a userid and password, either by accessing VIRTEL via a secure transaction (one whose "Security" field is non-zero), or by executing a SET$ SIGNON instruction contained in a scenario.

1.16.2.1. Activation of the VirtelMacros function

When VIRTEL is first installed, no macros.json files exist.

To allow macros to be stored and loaded from the host site, the administrator activates the VirtelMacros function by adding the code shown below to the custom.js file loaded into the CLI-DIR directory (or another site-defined directory):

```
w2hparm.useVirtelMacros = true;
```

custom.js to activate the VirtelMacros function

The custom.js file must be activated as described in "Site customization of Javascript functions", page 124.

Once this has been done, each VIRTEL Web Access user has access to one or more macros.json files.

If no file exists, a 404 error is produced, and no macros are listed in the macro window.

1.16.2.2. Macros synchronization between two VIRTEL STC

When the VirtelMacros function is implemented on two differents VIRTEL, it is possible to synchronize automatically the Macros between them.

To allow this, the administrator activates the VirtelMacros synchronization function by adding the code shown below to the custom.js file loaded into the CLI-DIR directory (or another site-defined directory):

```
w2hparm.synchronizeVirtelMacros = true;
```

custom.js to activate the VirtelMacros synchronization function

The custom.js file must be activated as described in "Site customization of Javascript functions", page 124.

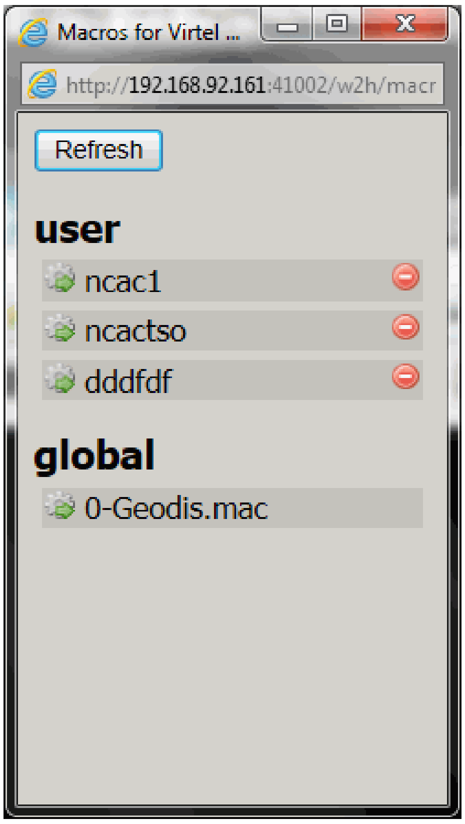
Once this has been done, each VIRTEL Web Access user macros are automaticaly synchonized beetween the two VIRTEL.

1.16.2.3. Creation of user macros

Each user can create his or her own macros.json file once the user has signed on to VIRTEL.

To create the file, the user only has to sign on to VIRTEL Web Access and record a new macro. When the macro is saved with a user-specified name, the macros.json file is automatically uploaded into VIRTEL's USR-DIR directory.

For subsequent Web Access sessions, the macros.json file is automatically loaded and the user's macros are displayed in the macro window (with an X allowing the macro to be deleted):



user
- ncac1
- ncactso
- dddfdf

global
- 0-Geodis.mac

Display macros for VirtelMacros function

1.16.2.4. Creation of global and group macros

Only the administrator can upload macros.json files into the global (GLB-DIR) and group (GRP-DIR) directories.

Uploads to the user and group directories are performed by means of a command-line script from the Windows prompt.

To define a new global or group macros.json file, the administrator can:

- Edit a new text file and manually code the macro definitions in this file using the appropriate syntax, or
- Convert a set of existing macros (for example, macros created using the 3270 HOB emulator) into a single macros.json file. The administrator script hob2webaccess.js performs this task. Additional scripts may be provided to allow conversion of macros from other emulators.

Then the macros.json file is uploaded to VIRTEL using the administrator script adminupload.js.

These administrator scripts are executed using the node.exe interpreter. The interpreter executable is supplied with the script, but it is also possible to download and install it from http://nodejs.org.

To use the scripts, open a Windows command prompt in the directory containing the macros to be converted, then:

1. Convert a set of macros into a macros.json file using the command:

   ```
   node.exe hob2webaccess.js –o macros.json file1.mac file2.mac file3.mac
   ```

2. Upload a macros.json file into the user, group, or global directory:

   ```
   node.exe adminupload.js -u admin -h n.n.n.n -p 41001 -t user -n userid
   macros.json
   ```

```
node.exe adminupload.js -u admin -h n.n.n.n -p 41001 -t group -n groupid
macros.json

node.exe adminupload.js -u admin -h n.n.n.n -p 41001 -t global macros.json
```

where:

admin
: is the name of a user with VIRTEL administration privileges

n.n.n.n
: is the IP address of VIRTEL

41001
: is the VIRTEL administration port

userid and groupid
: are the name of the user and group which owns the macros

The two scripts supplied may be called from a batch file which can scan all users' macros and then convert and upload them to VIRTEL.

1.16.2.5. Format of the macros.json file

Each macros.json file contains a set of macros as shown in the example below:

```
{"macros": [
  {"def":["PF3",61,120,"ENTER",105,115,112,102,"ENTER",46,53,"ENTER"],
   "name":"macro1"},
  {"def":[105,115,112,102,"ENTER"],
   "name":"macro2"}
  ],
}
```

Example of a macros.json file

An empty file (containing no macros) contains only:

```
{"macros": []}
```

Example of an empty macros.json file

1.16.2.6. Available macro commands

The following commands can be used in a macro file :

```
    "any string of characters to input into 3270 screen"
    move(pos)
    copy(startRow,startCol,endRow,endCol)
    paste(pos)
    paste(pos,nbRows,nbCols)
    key(keyIdentifier)

    List of available key identifiers (case sensitive!!):
      - ENTER
      - CLEAR
```

```
        - ATTN
        - PF[1-24]
        - PA[1-3]
        - InsToogle
        - NewLine
        - Home
        - Tab
        - Backtab
        - Bksp
        - Left
        - Right
        - Down
        - Up
        - End
        - ErEof
        - Del
        - Reset
        - FieldMark
        - Dup
```

1.17. Definition Of Dynamic VIRTEL Directories

Each user has access to three kinds of dynamic Virtel directories : global, group, user.

This interface is intended for the administator, to enable him/her to deal with dynamic directories including those dedicated to various users and groups.

In the list, he/she can sort the list, drag a file and drop it to the desktop, delete, copy a file.

1.18. Actions On The Dynamic VIRTEL Directories

After clicking a line he/she can delete, copy or download the related file.

To upload file(s) onto the current target VIRTEL dynamic directory, drag it/them from your desktop and drop it/them to the list panel.

Please be careful: if the file is a VIRTEL template (i.e. it contains VIRTEL tags), it must not be downloaded, because you can not get the original source with the VIRTEL tags which will have been interpreted. You must save thoroughly the original template in a dedicated repository.

1.19. Definition Of A User VIRTEL Directory

User files are specific to an individual user.

There is one set of user files per user.

The user has read/write access to his or her own files.

The Virtel administrator has read/write access to each user’s files.

Except for the Virtel administrator, nobody can see another user’s files.

1.20. Actions On The User VIRTEL Directories

1.20.1. Upload

To upload file(s) onto the current target VIRTEL user directory, drag it/them from your desktop and drop it/them to the list panel.

1.20.2. Download

To download a file, select it on the list, and cick the download button.

1.20.3. Macros

If the VIRTEL is configured for the use of macros to be stored in the dynamic VIRTEL directories, the macros of a user will be saved as the "macros.json" in its user VIRTEL directory. By clicking the row of this file in the list, the administrator will be able to click the edit button and access the macro interface to manage these macros.

1.21. Definition Of A VIRTEL Group Directory

Group files are common to users in a specific group.

There is one set of group files per group.

Everybody in the group has read access to their own group’s files.

Only the Virtel administrator can update the group files (there are no group administrators).

1.22. Actions On The VIRTEL Group Directories

1.22.1. Upload

To upload file(s) onto the current target VIRTEL dynamic directory, drag it/them from your desktop and drop it/them to the list panel.

1.22.2. Download

To download a file, select it on the list, and cick the download button.

1.22.3. Macros

If the VIRTEL is configured for the use of macros to be stored in the dynamic VIRTEL directories, the macros of a group will be saved as the "macros.json" in its group VIRTEL directory. By clicking the row of this file in the list, the administrator will be able to click the edit button and access the macro interface to manage these macros.

1.22.4. Definition of a global VIRTEL directory

Global files are common to everybody.

There is only one set of global files.

Everybody has read access to the global files.

Only the Virtel administrator can update the global files.

1.22.4.1. Actions on the VIRTEL global directory

Upload

> To upload file(s) onto the current target VIRTEL dynamic directory, drag it/them from your desktop and drop it/them to the list panel.

Download

> To download a file, select it on the list, and cick the download button.

1.22.5. Macros

If the VIRTEL is configured for the use of macros to be stored in the dynamic VIRTEL directories, the global macros will be saved as the "macros.json" in the global VIRTEL directory. By clicking the row of this file in the list, the administrator will be able to click the edit button and access the macro interface to manage these macros.

1.23. VIRTEL Web Modernisation

1.23.1. VIRTEL Scenarios

Without modifying existing applications, VIRTEL offers several possibilities for dynamic modification of 3270 data extracted by the {{{GENERATE-HTML}}} tag before it is presented in an HTML page. For instance, it is possible to define, for each field selected, a list of permitted values, or to generate a URL as a function of the value of a fixed field.

As opposed to the specific tags presented in the previous paragraphs, this set of presentation rules is not defined in an HTML page, but in a program assembled and link edited in the VIRTEL LOADLIB.

An **HTML presentation module** is made up of several scenarios composed of the following instructions: SCREENS, SCRNEND, SCENARIO, ACTION$, CONVERT$, COPY$, DECLARE$, ERROR$, FIELD$, GOTO$, IF$, MAP$, SET$, TOVAR$, VIRSV$ and END. These instructions are assembler macros contained in the VIRT454.SCRNAPI.MACLIB library (for MVS) or the VIRT454.VIRSAPI sublibrary (for VSE). The other instructions included in this library are for internal use and must not be used directly. Each module begins with a SCREENS instruction, is terminated by a SCRNEND instruction, and must contain at least one SCENARIO.

VIRTEL scenarios were originally assembled and link-edited into a load library concatenated to the DFHRPL DD statement in the VIRTEL started task. From VIRTEL version 4.48 onwards, there is also the possibility of generating, syntax checking, and compiling scenarios using Virtel Studio on an Eclipse platform, and uploading the resulting executable code into a VIRTEL directory stored in a VSAM file.

1.23.2. Scenarios stored in a load library

After compilation, the resulting module must be placed in one of the libraries defined in the DFHRPL concatenation in the VIRTEL started task (for MVS), or in one of the libraries in the LIBDEF SEARCH statement (for VSE). Refer to member ASMSCEN in the VIRTEL SAMPLIB for an example job to assemble and link a presentation module in z/OS.

The F VIRTEL,NEW=scenario-name command (see VIRTEL Messages and Operations Guide) allows VIRTEL to take into account the new version of a scenario assembled and link-edited into a load library.

1.23.3. Scenarios stored in a VSAM directory

If the “Directory for scenarios” field in the Entry Point is non-blank, VIRTEL will load scenarios from the specified directory instead of from the DFHRPL load library.

Scenarios in VSAM are ordinary VIRTEL files and their extension must be .390; they are normally assembled on a workstation and uploaded to the “Directory for scenarios” by means of Virtel Studio.

If a new version of a scenario is uploaded in a VSAM directory, the new version will be used immediately whenever a new connection needs it; no VIRTEL command is necessary. If a terminal is already executing the old version of the scenario, it is not affected, and continues with a copy of the old version. If another scenario with the same name exists in another directory, it is not modified by the upload.

1.23.4. Using a presentation module

In order to be used, the name of the HTML presentation module must be specified in the “Initial Scenario”, “Final Scenario”, “Input Scenario” or “Output Scenario” field of the transaction supporting access to the application (see “Parameters of the transaction” in the VIRTEL Connectivity Reference manual), or in the “Identification scenario” field of the entry point (see “Parameters of the entry point” in the VIRTEL Connectivity Reference manual).

1.23.5. Types of scenario

A presentation module can contain one of each of the following types of scenario:

1.23.5.1. Identification scenario

An identification scenario is invoked when an inbound call is assigned to an entry point. Because an identification scenario is executed before a transaction is selected and before connecting to a host application, the scenario may use the SET$ TRANSACTION instruction to select the transaction which specifies the host application (if any) to be used. The identification scenario is required when the entry point specifies the name of this presentation module in its “Identification scenario” field.

1.23.5.2. Initial scenario

An initial scenario is invoked when an &/S order is processed in a connection script (see “Connection / Disconnection Scripts” in the VIRTEL Connectivity Reference manual). The initial scenario is required when the “TIOA at logon” field of the transaction contains &/S and the name of the presentation module is coded in the “Initial Scenario” field of the transaction.

1.23.5.3. Final scenario

A final scenario is invoked when an &/S order is processed in a disconnection script (see “Connection / Disconnection Scripts” in the VIRTEL Connectivity Reference manual). The final scenario is required when the “TIOA at logoff” field of the transaction contains &/S and the name of the presentation module is coded in the “Final Scenario” field of the transaction.

1.23.5.4. Input scenario

An input scenario is invoked once at the start of the session (on receipt of the first message from the application to the terminal after the connection has been established with the host application), and again on receipt of each inbound message (from the terminal to the application). The input scenario is required when the name of the presentation module is coded in the “Input Scenario” field of the transaction.

When the input scenario is invoked on receipt of the first outbound message (from the application to the terminal), the scenario may terminate with a CASE$ FAIL or an IF$ FAIL instruction. In this case, the outbound message is discarded and the input scenario is invoked again on receipt on the next outbound message from the application. This process continues until the input scenario terminates with a CASE$ SUCCESS or IF$ SUCCESS instruction, or reaches SCENARIO END, after which the input scenario stops processing outbound messages and is subsequently invoked for each inbound message.

1.23.5.5. Output scenario

An output scenario is invoked on receipt of each outbound message (sent from the application to the terminal). The output scenario is required when the name of the presentation module is coded in the “Output Scenario” field of the transaction.

1.23.5.6. Subroutine scenario

Subroutine scenario represent a certain part of code that can be invoked from within a scenario.

Subroutine scenario starts with a SCENARIO SUBROUTINE intruction and ends with a SCENARIO END instruction.

```
    mysub  SCENARIO SUBROUTINE
            ... / ...
           SCENARIO END
```

The following restrictions apply to a SCENARIO SUBROUTINE :

- It must not contain any other scenario.
- It must not be included in a scenario.
- All its labels must use the LABEL$ instruction
- It must end with a SCENARIO END instruction which acts as a RETURN$ instruction.
- It must not try to branch outside of its limits.

The subroutine scenario can be invoked from a main scenario using :

```
           PERFORM$ mysub
```

This will call the subroutine and the calling scenario will continue in sequence when the subroutine SCENARIO END instruction will be reached.

A subroutine may contains a PERFORM$ instruction to call another subroutine up to 3 levels. For example, main scenario may call level_1 subroutine scenario, which may call level_2 subroutine scenario, which may call level_3 subroutine scenario, but level_3 connot call level_4 subroutine scenario.

1.23.6. VIRTEL Multi-Session scenarios

A scenario may also be specified in the “Output Scenario” field of a transaction invoked by VIRTEL Multi-Session. By executing an OUTPUT scenario on a 3270 terminal, VIRTEL allows automated 3270 navigation (for example, logon to VTAM application) from the Multi-Session screen.

When the same VTAM application is re-invoked from a VIRTEL Multi-Session screen using a different transaction from the one which was previously active, VIRTEL will call the OUTPUT scenario of the new transaction so that the scenario can terminate the previous transaction and start the new one. In this case the IF$ SESSION-SWITCH instruction is useful (refer to "IF$ instructions", page 174 for further details).

1.23.7. SCREENS instruction

This instruction specifies the name of the presentation module and its execution mode. Each SCREENS instructions is terminated by a SCRNEND instruction and may contain only SCENARIO or ERROR$ instructions.

```
modname  SCREENS APPL=value1,EXEC=value2
```

modname

Name of the presentation module (8 characters maximum). Under certain conditions, this value will allow calls to a script from a subsystem by way of a CALL command.

APPL

Specifies the name of the target transaction when the presentation module is called by a program.

EXEC

Determines the mode in which the script is used.NO is the only allowed value.

1.23.8. SCRNEND instruction

This instruction marks the end of a presentation module.

```
         SCRNEND
```

1.23.9. SCENARIO instruction

This instruction encloses ACTION$, CONVERT$, COPY$, DECLARE$, ERROR$, FIELD$, GOTO$, IF$, MAP$, SET$, TOVAR$, and VIRSV$ instructions.

```
         SCENARIO  value
```

value

Determines the type of processing. The permitted values are:

IDENTIFICATION

Marks the start of the identification scenario.

INITIAL

Marks the start of the initial scenario.

FINAL

Marks the start of the final scenario.

INPUT

Marks the start of the input scenario.

OUTPUT

Marks the start of the output scenario.

END

Marks the end of a scenario. In the case of an input or output scenario, the scenario is stopped, but will resume on receipt of the next input or output message.

DISCARD

Marks the end of a scenario. In the case of an input or output scenario, the scenario stops, and does not resume for the remainder of the life of the VIRTEL transaction.

SUBROUTINE

Marks the start of a subroutine scenario which must ends with a SCENARIO END instruction. A subroutine scenario is invoked using PERFORM$ instruction. A subroutine scenario can invoke another subroutine scenario, and so on up to 3 levels. A sample of such type of scenario is available in the PREFORM$ insctruction description.

1.23.10. ACTION$ instruction

This instruction specifies actions to be taken.

1.23.11. ACTION$ DISCONNECT

Terminate the application.

```
     ACTION$  DISCONNECT
```

1.23.12. ACTION$ SERVE-ANOTHER-USER

Indicates that the transaction is now a service transaction (see “Service Transactions”, page 11).

```
     ACTION$  SERVE-ANOTHER-USER
```

1.23.13. ACTION$ TERMSESS

Requests disconnection from the host application after the next message has been sent to the client’s browser.

```
     ACTION$  TERMSESS
```

1.23.14. ACTION$ TO-APPLICATION

Send a message to the application, consisting of the input fields in the screen image buffer and the function key specified by pfkey.

```
     ACTION$  TO-APPLICATION,KEY=pfkey,
              AND=(WAIT|SCRIPT,'string'),
              AND=(PROCESS-RESPONSE,'string'),
              AND=(DO-NOT-PROCESS-RESPONSE),
              MAXTIME=nnn,
              LASTMSG=YES,ASYNCH=YES
```

pfkey

a 3270 AID key. The allowable values are:

F1-F9
PF1 to PF9

7A-7C
PF10 to PF12

C1-C9
PF13 to PF21

4A-4C
PF22 to PF24

6C
PA1

6E
PA2

6B
PA3

6D
Clear

7D
Enter

FD
Attn

AND=(WAIT,'string')

(optional) after sending the message to the application, the scenario waits until the application sends a message containing the specified character string. Intervening messages are processed by VIRTEL but are not passed to the scenario or sent to the terminal.

AND=(SCRIPT,'string')

(optional) after sending the message to the application, VIRTEL executes the string as a Connection/Disconnection script (see “Connection/Disconnection Scripts” in the VIRTEL Connectivity Reference manual).

AND=(PROCESS-RESPONSE,'string')

(optional) allows an input scenario to explicitly request that control is to be returned when the next message is received from the application. The string is optional. If specified, after sending the message to the application, VIRTEL executes the string as a Connection/Disconnection script (see “Connection/Disconnection Scripts” in the VIRTEL Connectivity Reference manual).

For an input scenario, AND=(PROCESS-RESPONSE) is the default value immediately after the connection.

AND=(DO-NOT-PROCESS-RESPONSE)

(optional) allows an input scenario to explicitly state that is does not want to process the response from the application. After this instruction, the input scenario will not see any messages from the application, only input messages from the terminal.

For an input scenario, AND=(DO-NOT-PROCESS-RESPONSE) is the default value once the connection stage is passed.

MAXTIME=nnn

(optional) specifies the maximum time, in hundredths of a second, that the scenario will wait for a message from the application. When this time expires, the APPLICATION-TIMEOUT flag will be set (see “IF$ instructions”, page 174) and the scenario will resume execution. If the MAXTIME parameter is not specified, then the scenario will wait indefinitely, or until VIRTEL disconnects the session when the timeout value of the entry point is exceeded.

LASTMSG=YES

> (optional) requests disconnection after the application responds to the pfkey sent.

ASYNCH=YES

> (optional) indicate that the sending of the message to the application is not to prevent the normal screen display.

When the ACTION$ TO-APPLICATION instruction is executed in an output scenario, or in an input scenario before the first message has been delivered to the terminal, the specified function key is sent to the application and the scenario is suspended awaiting the next outbound message from the host application. When the next outbound message arrives, the scenario is resumed starting with the next instruction after the ACTION$ TO-APPLICATION instruction. Subsequent outbound messages will cause the scenario to resume execution again at the instruction after the latest ACTION$ TO-APPLICATION instruction until a SCENARIO END instruction is executed. After a SCENARIO END instruction is executed, subsequent outbound messages will once again cause the output scenario to resume at the beginning.

When the ACTION$ TO-APPLICATION instruction is executed in an input scenario driven by an inbound message, the data in the inbound message is sent to the application together with the 3270 AID key specified in the KEY parameter. Subsequent inbound messages will cause the input scenario to resume execution again at the instruction after the ACTION$ TO-APPLICATION instruction until a SCENARIO END instruction is executed. After a SCENARIO END instruction is executed, subsequent inbound messages will once again cause the input scenario to resume at the beginning.

To allow an input scenario to see the responses from the host application in addition to the input messages from the terminal, the ACTION$ TO-APPLICATION instruction contains an AND= parameter which allows the scenario to explicitly request whether or not it expects to process the application response message following the ACTION$ instruction.

1.23.14.1. Examples:

```
         ACTION$  TO-APPLICATION,KEY=F3
```

Send F3 (PF3) to the application and wait for the next outbound message. When the application responds, continue with the next instruction in the scenario.

```
         ACTION$  TO-APPLICATION,KEY=7D,                                 *
                  AND=(WAIT,'Password  ===>'),MAXTIME=100
```

Send ENTER to the application and wait for the application to send a message containing the string “Password ===>”. If the requested message does not arrive within 1 second, then set the APPLICATION-TIMEOUT flags and continue the scenario.

```
         ACTION$  TO-APPLICATION,KEY=7D,                                 *
                  AND=(SCRIPT,                                           *
                  'Signon to CICS&&/W&&*F34BE9&&/A&&/T')
```

Send ENTER to the application before sending two tab key followed by a message containing the string “Test".

```
         ACTION$  TO-APPLICATION,KEY=7D,                                 *
                  AND=(SCRIPT,'&&>&&>Test&&/T')
```

Send ENTER to the application, wait for the application to send a message containing the string “Signon to CICS”, then send F3 to the application, and send the screen image to the terminal. Note: the ampersands are doubled to conform with assembler syntax requirements.

```
         ACTION$  TO-APPLICATION,KEY=6D,LASTMSG=YES,ASYNCH=YES
```

Exit from the scenario (equivalent to IF$ ... SUCCESS), display the screen as normal, send 6D (CLEAR) to the application, and when the application responds, disconnect.

```
    ACTION$  TO-APPLICATION,KEY=7D,                            *
               AND=(PROCESS-RESPONSE)
```

The input scenario will resume at the next instruction when the next message is received from the host application.

```
      ACTION$  TO-APPLICATION,KEY=7D,                            *
               AND=(DO-NOT-PROCESS-RESPONSE)
```

The input scenario will not be called again for messages received from the host application. It will only be called for input messages.

```
      ACTION$  TO-APPLICATION,KEY=7D,                            *
               AND=(PROCESS-RESPONSE,'&&*F34BE9&&/A')
```

This is the same as for PROCESS-RESPONSE but with execution of a script in addition. Note: the ampersands are doubled to conform withinh assembler syntax requirements.

1.23.15. ACTION$ TO-TERMINAL

Send the current contents of the screen image buffer to the terminal.

```
    ACTION$  TO-TERMINAL
```

When the ACTION$ TO-TERMINAL instruction is executed in an input scenario, the contents of the screen image buffer are sent to the terminal. The scenario may use instructions such as COPY$ VARIABLE-TO-SCREEN to place data in the screen image buffer before issuing the ACTION$ TO-TERMINAL instruction.

1.23.16. CASE$ instruction

This instruction tests a value in a 3270 screen position, or a value in a VIRTEL variable, and directs the subsequent processing flow according to the value.

```
        CASE$   (row,col,len),
                (condition,'value',process1),
                (condition,'*varname',process2),
                (condition,STRING,'value',process3),
                (condition,VARIABLE,'varname',process4),
                ...
                ELSE=processx

        CASE$   'varname',
                (condition,'value',process1),
                (condition,'*varname',process2),
                (condition,STRING,'value',process3),
                (condition,VARIABLE,'varname',process4),
                ...
                ELSE=processx
```

(row,col,len)

Specifies the row, column, and length of the 3270 screen data.

varname

Specifies the name of a VIRTEL variable (must be placed in quotes)

condition

Specifies whether the data tested must be equal (EQ), not equal (NE), prefixed by (BEGIN), less than (LT), less than or equal (LE), greater than (GT), greater than or equal (GE), or must contain (CONTAINS) the specified value.

Note : Any number of (condition,'value',process) parameters may be specified, within the limits set by the assembler. Use assembler conventions (non-blank in column 72 and continuation starting in column 16) to continue the statement over more than one line.

value

Specifies the value against which the data is tested (must be placed in quotes)

process1,2,...

Specifies the address of the branch exit of the script if the condition is satisfied. Permitted values are:

label

instruction label at which execution of the scenario is to continue.

FAIL

reserved word indicating that the scenario is to be terminated and the current message is to be discarded. The scenario will be called again on receipt of the next outbound message from the application.

SUCCESS

reserved word indicating that the scenario is to be terminated and the current message is to be presented to the user. This is equivalent to branching to a SCENARIO END instruction.

processx

Specifies the address of the branch exit of the script if none of the conditions is satisfied. Permitted values are identical to process1.

1.23.17. CONVERT$ instruction

This instruction allows a scenario to translate a VIRTEL variable to or from EBCDIC, or to convert a variable to upper or lower case.

```
    CONVERT$  direction,VAR='varname',TABLE='tabname'
```

direction

specifies the translation requested. Possible values are:

- ASCII-TO-EBCDIC
- EBCDIC-TO-ASCII
- UTF8-TO-EBCDIC
- EBCDIC-TO-UTF8
- EBCDIC-TO-UPPERCASE
- EBCDIC-TO-LOWERCASE

varname

is the name of a VIRTEL variable. The variable name must be placed in quotes.

tabname

is the name of the translate table to be used for UTF-8 conversion. The possible values are given under the description of the DEFUTF8 parameter of the VIRTCT. The table name must be placed in quotes. If the TABLE parameter is not specified, then the table specified by the DEFUTF8 parameter is used as a default. VIRTCT parameters are described in the VIRTEL Installation Guide.

1.23.18. COPY$ instruction

This instruction allows various copy operations within the context of a scenario.

1.23.19. COPY$ FIELD-NAME-TO-VARIABLE

Copies the name of an HTTP input field into a VIRTEL variable.

```
    COPY$   FIELD-NAME-TO-VARIABLE,SCREEN=(row,col),VAR='name2',
            TYPE=type
```

row,col

starting row and column of the field on the screen.

name2

the name of a VIRTEL table variable. If the variable does not exist, it will be created.

type

(optional) may indicate one of the following values:

TYPE=REPLACE

indicates that the new value will replace the existing value of the variable. If TYPE=REPLACE is not specified, and the variable already exists, the new value will be appended to any existing values.

1.23.20. COPY$ INPUT-FILE-TO-VARIABLE

Copies the contents of a file into a VIRTEL variable. This instruction can be used in an input scenario which processes an HTTP request or SMTP input message having one or more attached files.

```
    COPY$   INPUT-FILE-TO-VARIABLE,VAR='varname',FILE='filename'
```

varname

the name of a VIRTEL table variable. If the variable does not exist, it will be created. If the variable already exists, the new value will be appended to any existing values. If this parameter is omitted, the variable name $INFILE$ is used.

filename

the name of a file attached to the HTTP request or SMTP message. If this parameter is omitted, the first attached file will be read.

If the input request does not contain the requested file, the NOT-FOUND condition will be raised. This condition can be tested by means of the IF$ instruction.

1.23.21. COPY$ INPUT-TO-SCREEN

Copies the value of an HTTP query parameter to a given position on the 3270 screen.

```
    COPY$   INPUT-TO-SCREEN,FIELD='name1',SCREEN=(row,col,len),
            TYPE=type
```

name1

the name of an HTTP query parameter (see “VIRTEL URL formats”, page 11)

row,col,len

row, column, and length of the destination field on the screen.

type

(optional) may indicate one of the following values:

TYPE=ERASE-FIELD

indicates that the destination field is cleared to nulls before copying the data.

If the parameter name1 is not present in the input request, the NOT-FOUND condition will be raised. This condition can be tested by means of the IF$ instruction.

If the destination row and column specify a protected field of the 3270 screen, the scenario terminates abnormally and message VIRS129E is issued to the system console. If the destination field is unprotected but the input value is too long for the field, the data will be silently truncated.

1.23.22. COPY$ INPUT-TO-VARIABLE

Copies the value of an HTTP query parameter into a VIRTEL variable.

```
    COPY$  INPUT-TO-VARIABLE,FIELD='name1',VAR='name2',
           TYPE=type
```

name1

the name of an HTTP query parameter (see "VIRTEL URL formats", page 11)

name2

the name of a VIRTEL table variable. If the variable does not exist, it will be created.

type

(optional) may indicate one of the following values:

TYPE-OFFSET-LENGTH

indicates that the input parameter consists of two numeric values separated by a comma. The first numeric value is converted to binary and stored in the first 8 bytes of the result variable, and the second numeric value is converted to binary and stored in the next 4 bytes of the result variable. The 12-byte value thus produced is in the format required by the OFFAREA parameter for the read-partial and write-append functions of the VIRSVFIO service program.

TYPE=REPLACE

indicates that the new value will replace the existing value of the variable. If TYPE=REPLACE is not specified, and the variable already exists, the new value will be appended to any existing values.

If the parameter name1 is not present in the input request, the NOT-FOUND condition will be raised. This condition can be tested by means of the IF$ instruction.

1.23.23. COPY$ LIST-TO-VARIABLE

Copies a a list of values (either constants or variables) to a variable.

```
    COPY$  LIST-TO-VARIABLE,VAR='varname',
           LIST=(STRING,'string',VARIABLE,'fromvar','string','*fromvar'),
           TYPE=type
    COPY$  LIST-TO-VARIABLE,VAR='varname',
           LIST=(STRING,'string',VARIABLE,'fromvar','string','*fromvar'),
           LTRIM=('string1','string2',...),
           RTRIM=('string1','string2',...),
           TYPE=type
```

varname

the name of a VIRTEL table variable. If the variable does not exist, it will be created.

string

characters to be copied into the variable varname.

fromvar

the name of a variable whose value is to be copied into the variable varname.

LTRIM

(optional) Removes a set of characters from the start of a list variable (see Note) before copying it).

'string1' [,'string2', ...]

one or more strings of text to be removed from the start of the variable.

RTRIM

(optional) Removes a set of characters from the end of a list variable (see Note) before copying it.

'string1' [,'string2', ...]

one or more strings of text to be removed from the endof the variable.

type

(optional) may indicate one of the following values:

TYPE=REPLACE

indicates that the new value will replace the existing value of the variable. If TYPE=REPLACE is not specified, and the variable already exists, the new value will be appended to any existing values.

Note: LIM and RTRIM only apply to **variables**. In the following example

```
         COPY$ LIST-TO-VARIABLE,VAR='VAR1',                                 *
               RTRIM=('_',' '),LTRIM=('_',' '),                             *
               LIST=('string1','*var1',VARIABLE,'var2')
```

the variable VAR1 is created/modified, with 'string1' copied as is, var1 and var2 left and right trimmed.

1.23.24. COPY$ OUTPUT-FILE-TO-VARIABLE

Generates an output page from a page template, and copies the result into a VIRTEL variable. Any VIRTEL tags within the page template are processed as if the page were being generated as the response to an HTTP request, but the generated page is placed in a variable instead of being sent to the terminal.

```
    COPY$  OUTPUT-FILE-TO-VARIABLE,FILE='filename',VAR='varname',
           TYPE=type
```

```
    COPY$  OUTPUT-FILE-TO-VARIABLE,FILE='filename',VAR='varname',
           TYPE=type
    COPY$  OUTPUT-FILE-TO-VARIABLE,FILE='*filenameVar',VAR='varname',
           TYPE=type
```

filename

the name of the page template.

***filenameVar**

the name of a VIRTEL variable holding the name of the page template.

varname

the name of a VIRTEL table variable which will receive the contents of the generated output page. If the variable does not exist, it will be created. If the variable already exists, the new value will be appended to any existing values.

type

(optional) indicates that the result variable has a special format. The following values are possible:

TYPE=ASCII

indicates that the result should be converted to ASCII (or UTF-8 if the SET-OUTPUT-ENCODING-UTF-8 tag is present in the page template). This is the default value if the HTTP request is in ASCII.

TYPE=EBCDIC

indicates that the result should be converted to EBCDIC. This is the default value if the HTTP request is in EBCDIC.

TYPE=LINEBUFFER

indicates that the result should be converted to MakePDF "LINEBUF" format for input to the VIRSVPDF service program. The page template contains special tags (see "Generating PDF output", page 62) which are converted to the format required by MakePDF.

If the specified file does not exist in the current VIRTEL directory, the NOT-FOUND condition will be raised. This condition can be tested by means of the IF$ instruction.

1.23.25. COPY$ SCREEN-TO-VARIABLE

Copies a portion of the screen into a table variable.

```
    COPY$  SCREEN-TO-VARIABLE,SCREEN=(row,col,len,ht),VAR='name2',
           TYPE=type
```

row

starting row of the portion of the screen to copy.

col

starting column of the portion of the screen to copy.

len

width (in columns) of the portion of the screen to copy.

ht

height (in rows) of the portion of the screen to copy (see Note).

name2

the name of a VIRTEL table variable containing ht values, each of length len. If the variable does not exist, it will be created.

type

(optional) may indicate one of the following values:

TYPE=REPLACE

indicates that the new value will replace the existing value of the variable. If TYPE=REPLACE is not specified, and the variable already exists, the new value will be appended to any existing values.

Note: the fourth sub-parameter (ht) of the SCREEN parameter is optional. If the fourth sub-parameter is specified, then attributes and binary zeroes will be replaced by blanks. To keep compatibility with existing scenarios, the instruction will ignore attributes and binary zeroes if the fourth SCREEN sub-parameter is NOT specified.

1.23.26. COPY$ SYSTEM-TO-VARIABLE

Copies a system information field into a table variable.

```
    COPY$  SYSTEM-TO-VARIABLE,FIELD=(class,item),
           VAR='varname',LENGTH=len,OFFSET=offset,
           TYPE=type
```

varname

the name of a VIRTEL table variable into which the system information will be copied.

class

the type of system information to be copied. The following values may be specified for class:

HTTP-HEADER

Information extracted from an HTTP header in the incoming HTTP request is copied into the specified variable. When HTTP-HEADER is specified, item represents one of the HTTP headers listed below.

TCT-HTTP-HEADER

Information extracted from an HTTP header in the incoming HTTP request is copied into the specified variable. When TCT-HTTP-HEADER is specified, item represents one of the HTTP headers specified in the HTHEADR parameter in the VIRTCT (refer to “Parameters of the VIRTCT” in the VIRTEL Installation Guide for more information).

NAME-OF

Information about the VIRTEL environment is copied to the table variable. When NAME-OF is specified, item represents the name of a VIRTEL data item.

NUMBER-OF

A numeric value is copied to the table variable. When NUMBER-OF is specified, item represents the name of a VIRTEL numeric data item.

VALUE-OF

Information about the VIRTEL environment is copied to the table variable. When VALUE-OF is specified, item represents the name of a VIRTEL data item. VALUE-OF is synonymous with NAME-OF.

USER-SECURITY-PROFILE

Information from the user’s RACF profile is copied to the table variable. When USER-SECURITY-PROFILE is specified, item represents the name of a field in the RACF user profile. The supported fields are listed below.

NEW-PASSTICKET-FOR-TRANSACTION

Generate a PassTicket allowing the current USERID.

If the generation fails, the NOT-FOUND condition will be raised. This condition can be tested by means of the IF$ instruction.

item

When class is HTTP-HEADER, the following standard HTTP headers, described in RFC2616, may be specified:

- ACCEPT
- ACCEPT-LANGUAGE
- CONNECTION
- CONTENT-TYPE
- IF-MODIFIED-SINCE
- HOST
- USER-AGENT

In addition, the following non-standard HTTP headers, described in the IBM Tivoli Access Manager WebSEAL Administration Guide manual, may be specified:

- IV-USER
- IV-USERL
- IV-GROUPS
- IV-CREDS

Note that IV headers provide reliable user identification only when the request comes from a trusted proxy. The proxy IP address can be specified in the “Calling DTE” field of a rule attached to the HTTP line. See the “Rules” chapter of the VIRTEL Configuration Reference manual for further information.

item

When class is NAME-OF or VALUE-OF, the following VIRTEL data items may be specified:

VIRTEL

The VIRTEL APPLID specified in the VIRTCT

RELAY

The relay LU name used to connect to the host application

PRINT-RELAY

The relay LU name of the associated printer

PSEUDO-TERMINAL

The VIRTEL terminal name

ENTRY-POINT

The VIRTEL entry point name

LINE-INTERNAL

The internal name of the VIRTEL line

LINE-EXTERNAL

The external name of the VIRTEL line

USER

The user name, if signon has occurred

PASSWORD

The password entered during signon

USER-IP-ADDRESS

The IP address of the client terminal

SNA-STATUS

The status of the host LU2 session:

X

input is inhibited

blank
input is allowed

TRANSACTION-INTERNAL
The internal name of the VIRTEL transaction

TRANSACTION-EXTERNAL
The external name of the VIRTEL transaction

ROUTING-PARAMETER
The value specified in the userdata field of the URL or call packet

URL
The URL excluding the query string

QUERY
The query string from the URL

PAGE
The name of the original HTML page template specified in the URL

DIRECTORY
The current VIRTEL directory name

CHARACTER-SET
The name of the current UTF-8 character set, or the country code if the page is not in UTF-8 mode (see “EBCDIC translation management”, page 56)

DATE-TIME
The current date and time (14 characters in the format YYYYMMDDHHMMSS)

VIRTEL-VERSION
The VIRTEL version number

xxx-SYMBOL
The value of the system symbol xxx (only if SYSPLUS=YES is specified in the VIRTCT). Example: SYSNAME-SYMBOL

When class is NUMBER-OF, the following VIRTEL numeric data items may be specified:

SCREEN-COLUMNS
The width of the current host 3270 screen

SCREEN-LINES
The depth of the current host 3270 screen

When class is USER-SECURITY-PROFILE, the following RACF field names may be specified:

USERID
The signed-on user id

GROUP
The group to which the user belongs

WANAME
User name for SYSOUT

WABLDG
Building name for delivery

WADEPT

Department name for delivery

WAROOM

Room for delivery

WAADDR1

Address line 1

WAADDR2

Address line 2

WAADDR3

Address line 3

WAADDR4

Address line 4

WAACCNT

Account number

Note: USER-SECURITY-PROFILE information is available only if the user has signed on and SECUR=(RACROUTE,RACF) has been specified in the VIRTCT. Otherwise null values are returned for all fields.

len

(optional) the variable will be padded or truncated to the specified length. Alphanumeric data items are right-padded with blanks or truncated on the right. Numeric items are left-padded with zeroes on the left. The maximum length for a numeric item is 8. If the LENGTH parameter is omitted, the length of the variable will be equal to the length of the requested value.

item

(optional) the variable will be padded or truncated to the specified length. Alphanumeric data items are right-padded with blanks or truncated on the right. Numeric items are left-padded with zeroes on the left. The maximum length for a numeric item is 8. If the LENGTH parameter is omitted, the length of the variable will be equal to the length of the requested value.

offset

(optional) the starting offset within the data item from which to extract the information to be placed in the variable. If omitted, extraction starts from offset 0. This parameter is valid only when class is USER-SECURITY-PROFILE.

type

(optional) may indicate one of the following values:

TYPE=REPLACE

indicates that the new value will replace the existing value of the variable. If TYPE=REPLACE is not specified, and the variable already exists, the new value will be appended to any existing values.

Example of COPY$ SYSTEM-TO-VARIABLE:

```
         COPY$ SYSTEM-TO-VARIABLE,FIELD=(HTTP-HEADER,HOST),            X
               VAR='HOST'
         COPY$ SYSTEM-TO-VARIABLE,FIELD=(HTTP-HEADER,USER-AGENT),      X
               VAR='BROWSER'
         COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,VIRTEL),              X
               VAR='APPLID'
         COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,LINE-INTERNAL),       X
               VAR='LINEINT'
         COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,PSEUDO-TERMINAL),     X
               VAR='TERMID'
         COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,RELAY),               X
               VAR='LUNAME'
```

```
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,ENTRY-POINT),         X
                VAR='EPNAME'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,TRANSACTION-INTERNAL),X
                VAR='TRANINT'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,TRANSACTION-EXTERNAL),X
                VAR='TRANEXT'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,ROUTING-PARAMETER),   X
                VAR='ROUTPARM'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,URL),                 X
                VAR='URL'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,QUERY),               X
                VAR='QSTRING'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,PAGE),                X
                VAR='PAGENAME'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,DIRECTORY),           X
                VAR='DIRNAME'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,SNA-STATUS),          X
                VAR='SNASTAT'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,USER-IP-ADDRESS),     X
                VAR='CLIENT'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NAME-OF,CHARACTER-SET),       X
                VAR='CHARSET'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(VALUE-OF,DATE-TIME),          X
                VAR='DATETIME'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(VALUE-OF,VIRTEL-VERSION),     X
                VAR='VERSION'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(VALUE-OF,SYSNAME-SYMBOL),     X
                VAR='SYSNAME'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(VALUE-OF,SYSPLEX-SYMBOL),     X
                VAR='SYSPLEX'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NUMBER-OF,SCREEN-COLUMNS),    X
                VAR='COLS'
          COPY$ SYSTEM-TO-VARIABLE,FIELD=(NUMBER-OF,SCREEN-LINES),      X
                VAR='ROWS'
          COPY$ SYSTEM-TO-VARIABLE,                                     X
                FIELD=(USER-SECURITY-PROFILE,WADEPT),                   X
                VAR='DEPT’
```

The following table shows a possible result of this example scenario when used in conjunction with the URL

```
http://192.168.235.30:41001/w2h/WEB2AJAX.htm+Tso+model2?u=rxb&g=sys1
```

Variable	Value
HOST	"192.168.235.30:41001"
BROWSER	"Mozilla/5.0 (Windows) Gecko/20070219 Firefox/2.0.0.2"
APPLID	"VIRTEL"
LINEINT	"W-HTTP"
TERMID	"DEVTA003"
LUNAME	"RHTVT000"
EPNAME	"WEB2HOST"
TRANINT	"W2H-13"
TRANEXT	"Tso"
ROUTPARM	"model2"
URL	"/w2h/WEB2AJAX.htm+Tso+model2"
QSTRING	"u=rxb&g=sys1"
PAGENAME	"WEB2AJAX.htm"
DIRNAME	"W2H-DIR"

Variable	Value
SNASTAT	" "
CLIENT	"192.168.000.049"
CHARSET	"IBM1140"
DATETIME	"20110731093522"
VERSION	"4.54 "
SYSNAME	"MVSPROD1"
SYSPLEX	"PRODPLEX"
COLS	"80"
ROWS	"24"
DEPT	"SYSPROG"

1.23.27. COPY$ VALUE-TO-VARIABLE

Copies a constant value to a variable.

```
    COPY$  VALUE-TO-VARIABLE,VALUE='string',VAR='name2',
           TYPE=type
```

string

characters to be copied into the variable name2.

name2

the name of a VIRTEL table variable. If the variable does not exist, it will be created.

type

(optional) may indicate one of the following values:

TYPE=REPLACE

indicates that the new value will replace the existing value of the variable. If TYPE=REPLACE is not specified, and the variable already exists, the new value will be appended to any existing values.

The COPY$ VALUE-TO-VARIABLE instruction allows the DUP (X'1C') and FM (X'1E') characters to be included in the value of a variable which can subsequently be referenced by the COPY$ VARIABLE-TO-SCREEN instruction.

The following example shows the instructions required to place FIELD MARK (X'1E') followed by W (X'E6') at the cursor position and press ENTER:

```
         COPY$ VALUE-TO-VARIABLE,VAR='FIELDMARK-W',TYPE=REPLACE,       *
               VALUE=X'1EE6'
         COPY$ VARIABLE-TO-SCREEN,VAR='FIELDMARK-W’
         ACTION$ TO-APPLICATION,KEY=7D
```

1.23.28. COPY$ VALUE-TO-SCREEN

Copies a constant value to a given position on the 3270 screen.

```
    COPY$  VALUE-TO-SCREEN,VALUE='string',SCREEN=(row,col,len),
           TYPE=type
```

string

characters to be copied to the screen.

row,col,len

row, column, and length of the destination field on the screen.

type

(optional) may indicate one of the following values:

TYPE=ERASE-FIELD

indicates that the destination field is cleared to nulls before copying the data.

If the destination row and column specify a protected field of the 3270 screen, the scenario terminates abnormally and message VIRS129E is issued to the system console. If the destination field is unprotected but the string is too long for the field, the string will be silently truncated.

1.23.29. COPY$ VARIABLE-TO-SCREEN

Copies the value of a variable to a given position on the 3270 screen. In the case of a table variable, only the first value is copied.

```
    COPY$  VARIABLE-TO-SCREEN,VAR='name2',SCREEN=(row,col,len),
           TYPE=type
```

name2

the name of a VIRTEL variable.

row,col,len

row, column, and length of the destination field on the screen. If the SCREEN parameter is not specified, the variable will be copied to the current cursor position.

for row, col and len, a value of '=' means the value of the current row, col or len as set by "SET$ SCREEN-POSITION", page 1.

type

(optional) may indicate one of the following values:

TYPE=ERASE-FIELD

indicates that the destination field is cleared to nulls before copying the data.

If the variable name2 does not exist, the NOT-FOUND condition will be raised. This condition can be tested by means of the IF$ instruction.

If the destination row and column specify a protected field of the 3270 screen, the scenario terminates abnormally and message VIRS129E is issued to the system console. If the destination field is unprotected but the variable value is too long for the field, the data will be silently truncated.

1.23.30. COPY$ VARIABLE-TO-SYSTEM

Copies the value of a variable to a VIRTEL system field. In the case of a table variable, only the first value is copied.

```
    COPY$  VARIABLE-TO-SYSTEM,VAR='varname',FIELD=(class,item)
```

varname

the name of a VIRTEL variable.

class

identifies the type of VIRTEL system field to be updated. The following values may be specified:

NAME-OF

A VIRTEL data item is to be updated. When NAME-OF is specified, item represents the name of a VIRTEL data item.

NUMBER-OF

A VIRTEL data item is to be updated. When NUMBER-OF is specified, item represents the name of a VIRTEL numeric data item.

VALUE-OF

A VIRTEL data item is to be updated. When VALUE-OF is specified, item represents the name of a VIRTEL data item. VALUE-OF is synonymous with NAME-OF.

OLD-PASSTICKET-FOR-TRANSACTION

Evaluates the Passticket currently in 'varname' for the transaction 'item'.

If the evaluation fails, the NOT-FOUND condition will be raised. This condition can be tested by means of the IF$ instruction.

item

When class is NAME-OF or VALUE-OF, the following VIRTEL data items may be specified:

DIRECTORY

Allows a scenario to specify the name of the VIRTEL directory The user name which will appear in the VIRLOG entry for this transaction.

USER

Allows a scenario to specify the user name which will appear in the VIRLOG entry for this transaction and which will become the value of the system variable &U (see “Connection/disconnection scripts” in the VIRTEL Connectivity Guide).

PASSWORD

Allows a scenario to specify the password which will become the value of the system variable &P (see “Connection/disconnection scripts” in the VIRTEL Connectivity Guide).

LOGMODE

The name of the logmode to be used for the VTAM session with the host application. The logmode can be set in an Identification Scenario. It overrides the logmode specified in the transaction or terminal definition.

ROUTING-PARAMETER

Allows an Identification Scenario to override the value of the routing parameter specified in the userdata field of the URL (see “Virtel URL formats”, page 11).

When class is NUMBER-OF, the following VIRTEL data items may be specified:

SCREEN-COLUMNS

The alternate width (number of columns) of the 3270 screen

SCREEN-LINES

The alternate depth (number of rows) of the 3270 screen

SCREEN-COLUMNS and SCREEN-LINES can be set in an Identification Scenario. These parameters allow the scenario to specify the desired screen size when a dynamic logmode such as D4A32XX3 is used and the host application places the 3270 session in alternate mode using the Erase Write Alternate command. This command has no effect on the primary screen size which is always 24 rows by 80 columns.

item

When class is OLD-PASSTICKET-FOR-TRANSACTION, the following VIRTEL data item must be specified:

TSO

To validate the PassTicket for TSO

1.23.31. DEBUG$ instruction

This instruction allows a scenario to activate various debugging functions.

```
    DEBUG$  [NO]TRACE,LINE|TERMINAL|SCENARIO,
            WHEN=(TRANSACTION-NAME-STARTS-WITH,'prefix')|ALWAYS

    DEBUG$  SNAP[,TERMINAL],
            WHEN=(TRANSACTION-NAME-STARTS-WITH,'prefix')|ALWAYS
```

TRACE,LINE or NOTRACE,LINE

Starts or stops a trace on the current line. The trace is written to the VIRTRACE file.

TRACE,TERMINAL or NOTRACE,TERMINAL

Starts or stops a trace on the current terminal. The trace is written to the VIRTRACE file.

TRACE,SCENARIO or NOTRACE,SCENARIO

Starts or stops a trace on the scenario. The trace is downloadable by means of the "CREATE-VARIABLE-IF", page 52 tag intended for use by Virtel Studio.

SNAP

Generates a snapshot of the VIRTEL internal trace table in the SYSPRINT file (same as the command F VIRTEL,SNAP). SNAP is described in the "Audit and Performance" chapter of the VIRTEL Messages and Operations Guide.

SNAP,TERMINAL

Generates a snapshot including terminal information (same as the command F VIRTEL,SNAP,T=termid where termid is the current terminal name).

WHEN=ALWAYS

The DEBUG$ instruction is executed unconditionally. This is the default.

WHEN=(TRANSACTION-NAME-STARTS-WITH,'prefix')

The DEBUG$ instruction is executed only if the external name of the transaction being used begins with the characters specified by the string prefix.

1.23.32. DECLARE$ instruction

This instruction defines a portion of the screen as a clickable hyperlink. The hyperlink can invoke either a 3270 key (ENTER or PFnn), a JavaScript procedure, or an external URL. The generation of the hyperlink can optionally be conditional on the presence or absence of a particular value at the 3270 screen position. In any case, the hyperlink is generated only if the specified screen position is non-blank.

```
    DECLARE$  (row,col,len,'value',Condition),P1,P2,P3,TO=P4
```

row

Specifies the row position of the hyperlink

col

Specifies the column position of the hyperlink

len

Specifies the length of the hyperlink

value

Optional, this parameter specifies the value of the data tested at the specified screen position. Must be put in quotes

Condition

Optional, this parameter determines the type of condition applicable to value

EQ

Equality (value by default).

NE

Inequality.

P1

Specifies the type of processing applicable. The permissible values are:

AS-PFKEY

Indicates that the indicated portion of the screen is to be interpreted as a function key hyperlink. The value of the function key (ENTER, PF1, etc) can be specified by parameter P2. If P2 is not specified, then the data at the indicated screen position is interpreted as the name of the function key. The values allowable as function key names are the same as those for "PfkField", page 41)

AS-PARAMETER

Indicates that the indicated portion of the screen is to be treated as a hyperlink which calls a JavaScript function. The data at the indicated screen position is passed as a parameter to the JavaScript function. The name of the JavaScript function is specified in the TO parameter of the $DECLARE instruction. See "JavaScript functions", page 169 for further details.

AS-HREF

Indicates that the indicated portion of the screen is to be treated as a hyperlink which invokes the URL specified in the TO parameter of the $DECLARE instruction. The data at the indicated screen position is appended to the URL, followed by the contents of the P2 parameter of the $DECLARE instruction, if specified.

P2

(optional) Function parameter referenced by P1.

P3

(optional) Text to be displayed in the status bar of the browser when the mouse pointer is over the indicated screen position.

P4

Name of JavaScript function (for AS-PARAMETER) or URL (for AS-HREF).

Note that, in conformance with assembler syntax, quotes and ampersands in the URL must be specified as double quotes and double ampersands.

1.23.32.1. JavaScript functions

For the AS-PARAMETER form of the $DECLARE instruction, the TO parameter specifies the name of a JavaScript function which will be called when the user clicks on the field. The function name is case-sensitive. The following parameters are passed to the JavaScript function:

Parameter 1

an internally generated field name

Parameter 2

the data at the indicated screen position

Parameter 3

the contents of the P2 parameter of the $DECLARE instruction

The JavaScript function itself must be defined in the HTML template page, or in an included page. The following standard functions are provided in the page js01.js delivered with VIRTEL in the W2H-DIR directory:

VClick

Moves the cursor to the start of the clickable area and sends the indicated function key (P2 parameter) to the host application

VClick2

Copies the contents of the clickable area to the field containing the cursor and sends the indicated function key (P2 parameter) to the host application

VClick3

Copies the contents of the clickable area to the following input field and sends the indicated function key (P2 parameter) to the host application

1.23.32.2. Examples

```
    DECLARE$ (23,19,04),AS-PFKEY
```

Row 23 column 19 length 4 becomes a clickable field. The contents of the field are treated as the name of a PF key. For example, if the field contains “PF12” then clicking on this field is equivalent to pressing the 3270 key PF12.

```
    DECLARE$ (14,17,03),AS-PFKEY,'PA2'
```

Row 14 column 17 length 3 becomes a clickable field. When clicked it is the equivalent of pressing the 3270 key PA2.

```
    DECLARE$ (24,02,04,'****',NE),AS-PFKEY
```

Row 24 column 2 length 4 becomes a clickable field, unless it contains asterisks. The contents of the field are treated as the name of a PF key.

```
    DECLARE$ (20,02,06),AS-PARAMETER,'PF12',TO=VClick
```

Row 20 column 2 length 6 becomes a clickable field. It calls the JavaScript function VClick('Vxxxxxxx','cccccc','PF12') where Vxxxxxxx is an internally generated field name, cccccc is the contents of the field, and PF12 is a constant specified in the DECLARE$ instruction.

```
    DECLARE$ (04,09,17),AS-HREF,'&&hl=fr',                       X
               TO='http://www.google.com/search?q='
```

Row 4 column 9 length 17 becomes a clickable field, hyperlinked to the URL: http//www.google.com/search?=ccc...ccc&hl=fr

(where ccc...ccc is replaced by the contents of the clickable field)

1.23.33. ERROR$ instruction

This instruction returns an error code to the calling program. When this instruction is used, the return code in the HTTP response will be "400 Bad Request" instead of "200 Ok".

```
    ERROR$  value [,'string1','string2',...]
```

value

Specifies the error code (decimal 0 to 255). If the error code is non-zero, a message is issued to the console and the scenario returns the error code to the calling program. If the error code is zero, a message is issued to the console and the scenario continues.

'string1' [,'string2', …]

(optional) one or more strings of text to be concatenated together and displayed as a message on the console. If a string begins with an asterisk it represents the name of a VIRTEL variable whose contents is to be included in the message. The number of quoted strings is not limited, but the message itself cannot be larger than 252 characters.

1.23.34. FIELD$ instruction

This instruction defines the position and the length of the 3270 selection involved, as well as the set of presentation rules.

```
    FIELD$  (row,col,len),operation,param-1,param-2,...,param-N
```

row

Specifies the row position of the field

col

Specifies the column position of the field

len

Specifies the length of the field

operation

Defines the presentation rule. The permissible values are:

DEFINE-CHOICE

Adds a value of type SELECT

DEFINE-VARIABLE-CHOICE

Adds multiple values of type SELECT

IS-BINARY-CHOICE

Defines a field as a checkbox

HIDE

Defines a field as non-display

param-N

Depends on the contents of the operation.

The FIELD$ instruction only operates on input fields

1.23.35. FIELD$ DEFINE-CHOICE

Generates a SELECT type entry field for the 3270 field concerned. This instruction requires a VAL parameter and optionally a SHOW parameter.

```
    FIELD$  (row,col,len),DEFINE-CHOICE,VAL='value',SHOW='label'
```

The VAL parameter generates an OPTION value for the SELECT field.

The optional SHOW parameter allows the specification of the text displayed in the SELECT field for the given value. If the SHOW parameter is omitted, the text displayed is identical to the value.

1.23.36. FIELD$ DEFINE-VARIABLE-CHOICE

Generates a list of SELECT entries for the 3270 field concerned. This instruction requires a VAL parameter.

```
    FIELD$  (row,col,len),DEFINE-VARIABLE-CHOICE,VAL=varname
```

The VAL parameter of a DEFINE-VARIABLE-CHOICE operation specifies the name of a table variable which contains the OPTION values for the SELECT statement generated for the 3270 field concerned. These values must be supplied by the 3270 application by means of a structured field type FAE5 or FAE6, or by means of the HOST4WEB command S VARIABLE. Structured fields are described in the VIRTEL Programming Interface documentation 263 HOST4WEB commands are described in the VIRTEL Programming Interface documentation 274

1.23.37. FIELD$ IS-BINARY-CHOICE

Generates an INPUT TYPE=CHECKBOX field for the 3270 field concerned. This is useful for 3270 fields which can take two values: one value representing a “checked” box and the other value representing an “unchecked” box. This instruction requires a VAL parameter and optionally a NOTVAL parameter.

```
    FIELD$  (row,col,len),IS-BINARY-CHOICE,VAL='value',NOTVAL='value'
```

For output messages, the box will be displayed as checked if the value of the 3270 field matches the VAL parameter, otherwise it will be displayed as unchecked. For input messages, the VAL parameter specifies the value which will be transmitted to the application in the 3270 field when the box is checked, and the NOTVAL parameter specifies the value to be transmitted to the application if the box is unchecked. If the NOTVAL parameter is omitted then an empty field will be transmitted to the application if the box is unchecked.

1.23.38. FIELD$ HIDE

Generates an INPUT TYPE=HIDDEN field for the 3270 field concerned. This instruction takes no additional parameters.

```
    FIELD$  (row,col,len),HIDE
```

1.23.39. FILTER$ instruction

1.23.40. FILTER$ VARIABLE-TO-VARIABLE

The FILTER$ VARIABLE-TO-VARIABLE instruction creates or adds values to a variable from another variable according to a list of conditions, similar to the conditions in a CASE$ instruction.

```
       FILTER$ VARIABLE-TO-VARIABLE,
               FROM='varname1',TO='varname2',
               (WHEN,'YYYY',THEN,'aaa'),
               (BEGIN,'XXXX',THEN,'bbb'),
               (CONTAINS,'ZZZZ',THEN,IGNORE),
               (OTHERWISE,KEEP)
```

FROM,TO

varname1 is the name of the VIRTEL variable whose values are to be inspected, and varname2 is the name of the VIRTEL variable to which values are to be added. The variable varname2 will be created if it does not exist.

WHEN,THEN

when a value ‘YYYY’ is found in variable varname1, then the value ‘aaa’ will be added to varname2.

BEGIN,THEN

when a value beginning with ‘XXXX’ is found in varname1, then the value ‘bbb’ will be added to varname2.

CONTAINS,THEN,IGNORE

when a value containing ‘ZZZZ’ is found in varname1, then no value will be added to varname2.

OTHERWISE,KEEP

the default action, if none of the preceding conditions is met, is to copy the value from varname1 to a new value in varname2.

1.23.41. GOTO$ instruction

This instruction directs the subsequent processing flow to a specified label.

```
GOTO$ label
```

label

Specifies the instruction label at which execution of the scenario is to continue.

1.23.42. HANDLE$ instruction

This instruction allows to manage various handle operations within the context of a scenario.

1.23.43. HANDLE$ ABEND instruction

This instruction allows a scenario to continue after an ABEND, due for instance to trying to write on the screen at a protected position, and directs the subsequent processing flow to a specified label.

```
HANDLE$  ABEND=label
```

label

Specifies the instruction label at which execution of the scenario is to continue.

1.23.44. HANDLE$ LOOP instruction

This instruction allows to detect loops in a scenario. When the limit is reached, VIRTEL abends the scenario, and a message VIRS12IE terminal LOOP WAS DETECTED IN SCENARIO scenname

```
HANDLE$  LOOP=(label,counter)
```

label

Specifies the instruction label at which execution of the scenario is to continue if the counter limit is reached.

Counter

Specifies the number of instructions executed beyond which the program will be switched to the label previously specified.

This instruction can also be used with one of the following syntaxes.

```
HANDLE$  LOOP=label
```

If no instruction counter is specified, Virtel will take 32 times the number of instructions in the scenario as a default counter.

```
HANDLE$  LOOP=label,ABEND=abendroutine
```

Both handle conditions may be spécified simultaneously.

```
GOTO$    label,WHEN=(LOOP,counter)
```

The previous syntax wich is also valid is generated internaly by the HANDLE$ instruction.

After the loop is detected, and the specified handling routine is called, a new HANDLE$ LOOP= instruction may be issued and processing may continue.

If no HANDLE$ is specified, Virtel will still set an instruction limit, equal to 32 times the number of instructions in the scenario.

1.23.45. IF$ instruction

This instruction enables the testing of the presence of a value in a 3270 screen, or a value in a VIRTEL variable, or a condition set by a previous instruction, and directs the subsequent processing flow.

```
IF$  (row,col,len),EQ='value',THEN=process1,ELSE=process2
IF$  VARIABLE,'varname',EQ='value',THEN=process1,ELSE=process2
IF$  EXISTS-VARIABLE,'varname',THEN=process1,ELSE=process2
IF$  NOT-EXISTS-VARIABLE,'varname',THEN=process1,ELSE=process2
IF$  APPLICATION-TIMEOUT,THEN=process1,ELSE=process2
IF$  CURSOR,THEN=process1,ELSE=process2
IF$  FIRST-PASS,THEN=process1,ELSE=process2
IF$  IND$FILE-TIMEOUT,THEN=process1,ELSE=process2
IF$  NOT-FOUND,THEN=process1,ELSE=process2
IF$  SCREEN-IS-BLANK,THEN=process1,ELSE=process2
IF$  SCREEN-IS-UNFORMATTED,THEN=process1,ELSE=process2
IF$  SESSION-SWITCH,THEN=process1,ELSE=process2
```

row,col,len

Specifies the position (row, column) and length of the data tested.

value

Specifies the value of the data tested (must be placed in quotes). If the value to be tested is in hexadecimal format, use EQ=X'CXNN...' syntax.

VARIABLE

Specifies that the value of a VIRTEL variable is to be tested.

EXISTS-VARIABLE

Tests if the specified variable exists.

NOT-EXISTS-VARIABLE

Tests if the specified variable does not exist.

varname

Specifies the name of the VIRTEL variable to be tested (must be placed in quotes)

EQ

Tests if the specified variable is equal to the value to test

APPLICATION-TIMEOUT

Tests whether a previous ACTION$ TO-APPLICATION instruction with a MAXTIME parameter ended in timeout.

CURSOR

Tests whether the application has turned on the cursor. This option is valid for both 3270 applications and videotex servers.

FIRST-PASS

Tests whether the scenario is entered for the first time after connecting to the VTAM application. This condition is no longer true after the scenario has exited for the first time, for example when waiting for the next message. If both an INPUT and an OUTPUT scenario are present, the FIRST-PASS condition is true the first time the INPUT scenario is run, and the first time the OUTPUT scenario is run as well. This condition is always true for other types of scenario.

IND$FILE-TIMEOUT

Tests whether, having received the 3270 messages which precede an IND$FILE transfer, the transfer itself has still not started after a delay of one second. This condition indicates an IND$FILE error and is usually accompanied by an error message on the TSO screen.

NOT-FOUND

Tests the condition code set by the previous COPY$ instruction.

SCREEN-IS-BLANK

Tests whether the 3270 screen is completely blank. This condition is true if the screen contains only blanks, nulls, and attribute characters.

SCREEN-IS-UNFORMATTED

Tests whether the 3270 screen is unformatted. This condition is true if the screen contains no attribute characters.

SESSION-SWITCH

Tests whether the scenario is entered for a VTAM application which was already connected to this terminal. This condition is useful in VIRTEL multisession scenarios which must reestablish the environment before starting the transaction requested by the user. This condition remains true until the end of this activation of the scenario (for example until the scenario is reused for another session).

process1

Specifies the address of the branch exit of the script if the condition is satisfied. Permitted values are:

label

instruction label at which execution of the scenario is to continue.

FAIL

reserved word indicating that the scenario is to be terminated and the current message is to be discarded. The scenario will be called again on receipt of the next outbound message from the application.

SUCCESS

reserved word indicating that the scenario is to be terminated and the current message is to be presented to the user. This is equivalent to branching to a SCENARIO END instruction.

process2

Specifies the address of the branch exit of the script if the condition is not satisfied. Permitted values are identical to process1.

1.23.46. INDSCEN$ instruction

This instruction allows a scenario to enable the IND$FILE file transfer function. The INDSCEN$ macro instruction must be included in both the input scenario and the output scenario.

```
    INDSCEN$  HOST=type
```

type

Specifies the type of host system running the IND$FILE program. TSO is the only allowed value. The default is TSO.

1.23.47. LABEL$ instruction

This instruction allows to define a label in a scenario.

```
    mylabel  LABEL$
```

It is alike assembler classic ones :

```
    mylabel  EQ *
or
    mylabel DS 0H
```

It may be used in any scenario. If the scenario is not a subroutine, you can also simply generates :

```
    mylabel  DS 0C
```

If the scenario is a subroutine, you must use LABEL$ instruction to define each labels inside the subroutine. Each label is suffixed with the name of the subroutine, in order to give some protection from conflicting labels and from branching over the limits of subroutines

mylabel

Specifies the instruction label at which execution of a scenario is to continue.

A sample of the usage of LABEL$ instruction is available in the PERFORM$ insctruction description.

1.23.48. MAP$ instruction

The MAP$ instruction defines the format of a flat-format data area known as a “commarea”, and describes how VIRTEL converts XML or Query input data to commarea format. The MAP$ instruction may also be used in conjunction with the TOVAR$ instruction to convert an output commarea to VIRTEL variables, which can be used with an appropriate template to generate XML or other formats.

When the MAP$ instruction is used to convert input data to commarea format, the input data may be supplied either as XML, or as named parameters in a format known as “Query” data. In both cases, the input data may be attached to an inbound HTTP request (GET or POST request), or it may be supplied in a VIRTEL variable. The result of the parsing process is a commarea which is suitable for processing by an application program (typically a COBOL program running under CICS). The commarea is written into a VIRTEL variable so that it can be passed to the application program by means of the VIRTEL transaction script language.

Conversion of input data to commarea format (“input-to-commarea” conversion) is performed by means of an INITIAL scenario. The scenario begins with a group of MAP$ instructions (MAP$ BEGIN, MAP$ END, MAP$ AREA, and MAP$ AREA-ATTRIBUTE) which define the format of the commarea and its relationship to the XML tags or the Query parameters. The scenario continues with a MAP$ FROM-FIELD, MAP$ FROM-INPUT, MAP$ FROM-VARIABLE instruction which defines the source of the XML or Query data. Finally, the scenario ends with a MAP$ TO-VARIABLE instruction which names the VIRTEL variable into which the commarea is to be stored.

Conversion from commarea format to VIRTEL variables (“commarea-to-output” conversion) may be performed by means of an INITIAL scenario or an OUTPUT scenario. The scenario begins with a description of the commarea format (MAP$ BEGIN, MAP$ END, MAP$ AREA, and MAP$ AREA-ATTRIBUTE), and continues with a TOVAR$ instruction which defines the source of the commarea. See the description of the “TOVAR$ instruction”, page 197 for further details of commarea-to-output conversion.

1.23.49. MAP$ ABEND

The MAP$ ABEND instruction is intended for diagnostic purposes only. When VIRTEL encounters a MAP$ ABEND instruction while processing a commarea with the MAP$ TO-VARIABLE or TOVAR$ instructions, the scenario ends and a SNAP dump is produced. The VIRTEL SNAP is described in the “Audit and Performance” chapter of the VIRTEL Messages and Operations Guide.

```
    MAP$   ABEND,WITH='text'
```

text

A free-format description which will be printed in the SNAP at the time of the abend.

1.23.50. MAP$ ABEND-AT

The MAP$ ABEND-AT instruction is similar to MAP$ ABEND except that it produces a SNAP only after it has been executed the number of times indicated by the OCCURS parameter.

```
    MAP$   ABEND-AT,OCCURS=n,WITH='text'
```

text

A free-format description which will be printed in the SNAP at the time of the abend.

n

The SNAP will be produced after the MAP$ ABEND-AT instruction has been executed n times.

1.23.51. MAP$ AREA

The MAP$ AREA instruction defines a field within a commarea. The MAP$ AREA instruction must be enclosed by a pair of MAP$ BEGIN and MAP$ END instructions which define the start and end of the commarea.

```
    MAP$   AREA,WITH='name',
                LENGTH=nnn,TYPE=type,FORMAT=('pattern',char)
```

name

For input-to-commarea conversion, this is the name of the XML tag or Query parameter which identifies the input data item. For XML input, the WITH parameter may be omitted, and the tag at the current location in the input data is used.

For commarea-to-output conversion, this is the name of the VIRTEL variable which will be generated.

nnn

Specifies the fixed length of the field in the commarea.

type

X

indicates an alphanumeric field

9

indicates a numeric field

S9

indicates a numeric field with sign overpunch

ONLY9

indicates a numeric field; any non-numeric characters in the input data item are ignored when copied to the commarea

(ONLY9,LEFT-ALIGNED)

indicates that the numeric value is to be left-aligned in the field in the commarea

BASE64

indicates that the data is encoded in Base64 format in the XML datastream

OFFSET-LENGTH

OFFSET-LENGTH-TEXT

OFFSET-LENGTH-BINARY

for input-to-commarea conversion, calculates the offset and length of the XML data element identified by the WITH parameter. The offset is calculated relative to the start of the XML datastream.

For OFFSET-LENGTH-TEXT the offset and length values are stored in the result commarea as two decimal numbers separated by a comma. OFFSET-LENGTH is a synonym for OFFSET-LENGTH-TEXT.

For OFFSET-LENGTH-BINARY the offset and length are stored as binary values (8 bytes and 4 bytes respectively) in the result commarea. When used in conjunction with the TO-VARIABLE or TO-VARIABLE-ONLY parameters described below, the 12-byte value thus produced can subsequently be passed to the VIRSVFIO service program as the OFFAREA parameter for the read-partial and write-append functions.

pattern,char

Specifies an editing pattern to be applied when the field is processed during commarea-to-output conversion. Character positions in pattern which contain char represent variable characters to be obtained from the field in the commarea, other characters in pattern represent constants. For example, if FORMAT=('9999-99-99',9) is specified and the commarea field contains 20060621 then a result value of 2006-06-21 will be generated.

Note: XML tag names are case sensitive. WITH='Title' is not the same as WITH='TITLE'

A variation of the MAP$ AREA instruction allows the value of the field to be copied into a VIRTEL variable, in addition to being placed in the commarea. The variable will be created, if necessary, and its value will be set when the commarea is created by a subsequent MAP$ FROM-FIELD, MAP$ FROM-INPUT, or MAP$ FROM-VARIABLE instruction. The value can then be tested by means of an IF$ VARIABLE instruction (see "Examples of presentation scripts", page 210):

```
    MAP$  AREA,TO-VARIABLE,VAR='varname',
               WITH='name',LENGTH=nnn,TYPE=type
```

varname

The name of the VIRTEL variable to which the field value is to be copied. The variable name must be placed in quotes. If the variable already exists, then its current value will be replaced.

The parameters WITH, LENGTH, and TYPE are as previously described.

Another form of the MAP$ AREA instruction defines a field in the commarea and fills the field with either a constant value, or the value of a VIRTEL variable:

```
    MAP$  AREA,FROM-CONSTANT,'value',LENGTH=nnn,TYPE=type
    MAP$  AREA,FROM-VARIABLE,VAR='varname',LENGTH=nnn,
               TYPE=type,FORMAT=('pattern',char)
```

value

The value to be copied to the field. The value must be placed in quotes.

varname

The name of the VIRTEL variable from which the field value is to be copied. The variable name must be placed in quotes.

The parameters LENGTH, TYPE, and FORMAT are as previously described.

A further variation of the MAP$ AREA instruction places the value of a field into a VIRTEL variable, without copying it into the commarea. The variable will be created or replaced during the processing of a subsequent MAP$ FROM-FIELD, MAP$ FROM-INPUT, or MAP$ FROM-VARIABLE instruction.

```
    MAP$  AREA,TO-VARIABLE-ONLY,VAR='varname',
               WITH='name',LENGTH=nnn,TYPE=type
```

varname

The name of the VIRTEL variable to which the field value is to be copied. The variable name must be placed in quotes. If the variable already exists, then its current value will be replaced.

The WITH parameter specifies the name of the XML tag or Query parameter, as previously described. If the LENGTH and TYPE parameters are specified, then the value of the field is edited, as previously described, to conform to the length and type specified. If the LENGTH and TYPE parameters are omitted, then the length and value of the variable are copied exactly from the input data.

Another variation of the MAP$ AREA instruction, TO-TABLE-VARIABLE-ONLY, is similar to TO-VARIABLE-ONLY except that if the variable already exists, the new value will be appended to any existing values instead of erasing the previous value.

```
    MAP$  AREA,TO-TABLE-VARIABLE-ONLY,VAR='varname',
               WITH='name',LENGTH=nnn,TYPE=type
```

varname

The name of the VIRTEL variable to which the field value is to be copied. The variable name must be placed in quotes. If the variable already exists, the new value will be appended to any existing values.

The WITH, LENGTH and TYPE parameters are as previously described.

For convenience, if the variable name is the same as the value of the WITH parameter, the variable name may be specified as VAR='=WITH' or VAR==WITH.

The FROM-LAST-ELEMENT-FOUND-NAME keyword of the MAP$ AREA instruction copies into the output commarea the name of the last XML element found in the input stream. This may be used in conjunction with the NEXT-ELEMENT keyword of the MAP$ BEGIN instruction.

```
    MAP$  AREA,FROM-LAST-FOUND-ELEMENT-NAME,
               LENGTH=nnn,TYPE=X
```

nnn

The length of the field in the output commarea where the name is to be placed.

1.23.52. MAP$ AREA-ATTRIBUTE

The MAP$ AREA-ATTRIBUTE instruction defines a field within a commarea. It is similar to MAP$ AREA except that the contents of the field are obtained from the value of an attribute parameter included within the specified XML start tag, instead of from the data enclosed by the XML start and end tags.

```
    MAP$  AREA-ATTRIBUTE,WITH='xmlname',VALUEOF='attrname',
              LENGTH=nnn,TYPE=type
```

xmlname

The name of the XML tag in the input data whose attribute is to be copied. If the WITH parameter is omitted, the tag at the current location in the input data is used.

attrname

The name of the XML attribute whose value is to be copied to the commarea.

nnn

Specifies the fixed length of the field in the commarea.

type

Same as type parameter of the MAP$ AREA instruction.

Note: XML tag and attribute names are case sensitive.

A variation of the MAP$ AREA-ATTRIBUTE instruction allows the value of the attribute to be copied into a VIRTEL variable, in addition to being placed in the commarea:

```
    MAP$  AREA-ATTRIBUTE,TO-VARIABLE,VAR='varname',
              WITH='xmlname',VALUEOF='attrname',LENGTH=nnn,TYPE=type
```

varname

The name of the VIRTEL variable to which the attribute value is to be copied. The variable name must be placed in quotes. If the variable already exists, then its current value will be replaced.

The parameters WITH, VALUEOF, LENGTH, and TYPE are as previously described.

Another variation of the MAP$ AREA-ATTRIBUTE instruction places the value of an attribute into a VIRTEL variable, without copying it into the commarea:

```
    MAP$  AREA-ATTRIBUTE,TO-VARIABLE-ONLY,VAR='varname',
              WITH='xmlname',VALUEOF='attrname',LENGTH=nnn,TYPE=type
```

varname

The name of the VIRTEL variable to which the attribute value is to be copied. The variable name must be placed in quotes. If the variable already exists, then its current value will be replaced.

The parameters WITH and VALUEOF are as previously described. If the LENGTH and TYPE parameters are specified, then the attribute value is edited, as previously described, to conform to the length and type specified. If the LENGTH and TYPE parameters are omitted, then the length and value of the attribute are copied exactly.

1.23.53. MAP$ BEGIN

The MAP$ BEGIN instruction marks the start of a commarea, or the start of a group of fields within a commarea. The optional WITH parameter indicates a group of fields enclosed by a specific XML tag in the input data. The optional OCCURS parameter indicates a repeating group of fields. Nested pairs of MAP$ BEGIN and MAP$ END instructions are permitted.

```
groupname  MAP$  BEGIN,WITH='xmlname',OCCURS=nnn,COUNT='countvar'
```

groupname

The label is required. It specifies the name of the commarea or field group. The MAP$ BEGIN instruction must be matched by a subsequent MAP$ END instruction having the same label.

xmlname

The name of the XML tag which identifies the start of the group of fields in the input data. If the WITH parameter is omitted, processing for this group of fields starts at the current location in the input data. The special value NEXT-ELEMENT matches with the next XML tag in the input stream, regardless of its name.

nnn

Specifies the number of occurrences for a repeating group of fields. If the OCCURS parameter is omitted, one occurrence will be generated. The special value OCCURS=UNLIMITED indicates that the field repeats indefinitely until the end of the input data is reached.

countvar

Specifies the name of a VIRTEL variable which will be created when the MAP$ is processed for commarea-to-output conversion for a repeating group of fields. The value of the variable is the number of occurrences actually processed (which may be less than the value of the OCCURS parameter if the length of the input commarea is insufficient to contain nnn occurrences of the field group). If the COUNT parameter is omitted, the groupname specified in the statement label is used as the variable name.

A variation of the MAP$ BEGIN instruction can be used to force the scan of the XML input stream to be restarted:

```
groupname  MAP$  BEGIN,TOP,WITH='xmlname'
```

The TOP parameter specifies that the scan for the tag named xmlname starts from the beginning of the XML stream.

Another variation of the MAP$ BEGIN instruction introduces a group of fields which are conditional on the current value of the $EVENT$ variable:

```
groupname  MAP$  BEGIN,EVENT='eventname'
```

The group of fields enclosed by the MAP$ BEGIN and MAP$ END instructions are processed only if the "current event" set by a previous MAP$ EVENTUAL-AREA or MAP$ ELSETHEN-AREA instruction matches the eventname specified. For commarea-to-output conversion, the names of the variables generated for this group are prefixed by eventname/

1.23.54. MAP$ END

The MAP$ END instruction marks the end of a commarea or field group.

```
groupname  MAP$  END
```

groupname

The label is required. It must match the label on the corresponding MAP$ BEGIN instruction.

1.23.55. MAP$ EVENTUAL-AREA, MAP$ ELSETHEN-AREA

The MAP$ EVENTUAL-AREA and MAP$ ELSETHEN-AREA instructions generate a field in a commarea whose value depends on the presence of a named tag in the XML stream, or whose value depends on the value of a specific XML tag.

The first form of these instructions tests for the presence of one of a set of named tags, and generates a value which corresponds to the tag which was found:

```
    MAP$  EVENTUAL-AREA,     or     ELSETHEN-AREA,
               FROM-CONSTANT,'value',
               WHEN=(ELEMENT,'xmlname'),
               EVENT='varname'
    MAP$  ELSETHEN-AREA,FROM-CONSTANT,'value'
```

These instructions are coded as a group consisting of one MAP$ EVENTUAL-AREA instruction followed by one or more MAP$ ELSETHEN-AREA instructions. A final MAP$ ELSETHEN-AREA instruction with no WHEN parameter provides a default value for the output field. The group is enclosed by a pair of MAP$ BEGIN and MAP$ END instructions which specify the name of the enclosing XML tag.

The optional EVENT parameter specifies the name of the VIRTEL variable to be created when the MAP$ is processed for commarea-to-output conversion. If the EVENT parameter is omitted, then the variable has the same name as the XML tag xmlname. The value of the EVENT parameter is also added to the $EVENT$ variable, and becomes the "current event" for any subsequent MAP$ BEGIN,EVENT instructions.

The following example illustrates the process. The XML stream in this example consists of an <identity> tag which may enclose one of three different tags <bic> <iban> or <rib>:

```
<identity><bic>12345678</bic></identity>
or
<identity><iban>12345678</iban></identity>
or
<identity><rib>12345678</rib></identity>
```

The objective is to generate an output area which consists of a one-byte code (1=bic, 2=iban, 3=rib) followed by an 8-byte area containing the value of the indicated tag. If none of the indicated tags is found, the code is generated with a space as the default value. This is achieved by means of the following instructions in the scenario:

```
IDENT  MAP$  BEGIN,WITH='identity'
       MAP$  EVENTUAL-AREA,FROM-CONSTANT,'1',WHEN=(ELEMENT,'bic')
       MAP$  ELSETHEN-AREA,FROM-CONSTANT,'2',WHEN=(ELEMENT,'iban')
       MAP$  ELSETHEN-AREA,FROM-CONSTANT,'3',WHEN=(ELEMENT,'rib')
       MAP$  ELSETHEN-AREA,FROM-CONSTANT,' '
       MAP$  AREA,LENGTH=8
IDENT  MAP$  END
```

Note: XML tag names are case sensitive.

The second form of the MAP$ EVENTUAL-AREA and MAP$ ELSETHEN-AREA instructions tests the data enclosed by a named tag in the XML stream, and generates an output field with a corresponding value:

```
    MAP$  EVENTUAL-AREA,     or     ELSETHEN-AREA,
               FROM-CONSTANT,'value',
               WHEN=(VALUE,'string')
    MAP$  ELSETHEN-AREA,FROM-CONSTANT,'value'
```

These instructions are coded as a group consisting of one MAP$ EVENTUAL-AREA instruction followed by one or more MAP$ ELSETHEN-AREA instructions. A final MAP$ ELSETHEN-AREA instruction with no WHEN parameter provides a default value for the output field. The group is enclosed by a pair of MAP$ BEGIN and MAP$ END instructions which specify the name of the XML tag whose value is being tested

The following example illustrates the process. The XML stream in this example consists of an <indicator> tag which can take the value “true” or “false”:

```
<indicator>true</indicator>
or
<indicator>false</indicator>
```

The objective is to generate an output area which consists of a one-byte code (1=true, 0=false). A default value 0 is generated if the tag data has any other value. This is achieved by means of the following instructions in the scenario:

```
INDIC  MAP$  BEGIN,WITH='indicator'
       MAP$  EVENTUAL-AREA,FROM-CONSTANT,'0',WHEN=(VALUE,'false')
       MAP$  ELSETHEN-AREA,FROM-CONSTANT,'1',WHEN=(VALUE,'true')
       MAP$  ELSETHEN-AREA,FROM-CONSTANT,'0'
INDIC  MAP$  END
```

Note: XML tag names are case sensitive.

1.23.56. MAP$ EXECUTE

The MAP$ EXECUTE instruction allows a sequence of MAP$ instructions to be interrupted in order to enter data on the 3270 screen before continuing the analysis. The MAP$ EXECUTE instruction branches to a subroutine defined elsewhere in the scenario. The subroutine ends with a RETURN$ instruction.

```
MAP$  EXECUTE,mylabel
```

mylabel

The label is required. It specifies the name of the subroutine to be called. The label mylabel must be defined elsewhere in the scenario.

In the following example the two MAP$ EVENT paragraphs each call a subroutine later in the scenario. After the subroutine executes a RETURN$ instruction, the analysis continues:

```
LIGNE0   MAP$ BEGIN,EVENT='LIGNE0'
         MAP$ AREA,TO-VARIABLE,VAR='QTE',LENGTH=5,TYPE=X,WITH='QTE'
         MAP$ AREA,TO-VARIABLE,VAR='CAI',LENGTH=36,TYPE=X,WITH='CAI'
         MAP$ AREA,TO-VARIABLE,VAR='CCD',LENGTH=3,TYPE=X,WITH='CCD'
         MAP$ AREA,FROM-CONSTANT,' ',LENGTH=1,TYPE=X
         MAP$ EXECUTE,LI0
LIGNE0   MAP$ END

CMDVALID MAP$ BEGIN,EVENT='CMDVALID'
         MAP$ AREA,FROM-CONSTANT,' ',LENGTH=1,TYPE=X
         MAP$ EXECUTE,CMDV
CMDVALID MAP$ END
 ....
LI0      DS   0H
         COPY$ VARIABLE-TO-SCREEN,VAR='LIGNE0/QTE',SCREEN=(11,6,5),     *
               TYPE=ERASE-FIELD
         COPY$ VARIABLE-TO-SCREEN,VAR='LIGNE0/CAI',SCREEN=(11,12,36),   *
               TYPE=ERASE-FIELD
         COPY$ VARIABLE-TO-SCREEN,VAR='LIGNE0/QTE',SCREEN=(11,49,3),    *
               TYPE=ERASE-FIELD
         RETURN$

CMDV     DS   0H
*        Send pf=ENTER
         ACTION$ TO-APPLICATION,KEY=7D
*        Add an occurrence of the table variable VIRTEL
*        = return code after validation request
```

```
        COPY$ SCREEN-TO-VARIABLE,SCREEN=(22,31,8),VAR='RETOUR'
        RETURN$
```

1.23.57. MAP$ FROM-FIELD

The MAP$ FROM-FIELD instruction requests VIRTEL to generate a commarea from XML input data ("XML input-to-commarea" conversion). The XML input data is obtained from an HTML form field in the incoming HTTP request.

```
groupname  MAP$  FROM-FIELD,FIELD='fieldname'
```

groupname

The label is required. It specifies the name of the output area to be generated. It must match the label on a preceding MAP$ BEGIN instruction.

fieldname

The name of the HTML form field which contains the XML input data.

The MAP$ FROM-FIELD instruction expects XML input data to be presented as a character string fieldname=xmldata where xmldata is XML data in URL-encoded format. In URL-encoded format, a "+" sign represents a space, and "%xx" represents the hexadecimal encoding of an ASCII character. The string fieldname=xmldata may either be appended to the URL (HTTP "GET" method) or it may be contained in the body of the HTTP request (HTTP "POST" method). See "Sending XML input as URL-encoded data", page 213 for examples. To process requests containing XML data in plain (unencoded) format, use instead the "MAP$ FROM-INPUT", page 184.

1.23.58. MAP$ FROM-INPUT

The MAP$ FROM-INPUT instruction requests VIRTEL to generate a commarea from XML or Query format input data ("input-to-commarea" conversion). The input data is obtained from the incoming HTTP request.

```
groupname  MAP$  FROM-INPUT,format
```

groupname

The label is required. It specifies the name of the output area to be generated. It must match the label on a preceding MAP$ BEGIN instruction.

format

XML: specifies that the input data is in XML format

QUERY: specifies that the input data is in Query format

If no format is specified, the default is XML.

Note: MAP$ FROM-INPUT with a FIELD parameter is accepted and treated as MAP$ FROM-FIELD

The MAP$ FROM-INPUT instruction obtains its input data from an incoming HTTP request. The HTTP request may use either via the GET method (where the input data is appended to the URL) or the POST method (where the input data is contained in the request body).

When the input format is XML, MAP$ FROM-INPUT treats the entire data area as XML data without any translation. See "HTTP request with XML input data", page 212 for an example. MAP$ FROM-FIELD is preferred when using the GET method with XML input, because certain characters cannot be included in a URL without using URL-encoding.

When the input format is QUERY, MAP$ FROM-INPUT expects the input data to contain one or more strings in the form fieldname=data. When the HTTP request uses the GET method, the strings are appended to the URL. The first string is preceded by a "?" character which separates it from the URL, and the remaining strings are separated by "&" characters. When the HTTP request uses the POST method, the strings are contained in the request body, either one per line, or separated by “&” characters if multiple strings are coded on the same line. For both the GET and POST methods, Query strings are expressed in URL-encoded format, where “+” sign represents a space, and “%xx” represents the hexadecimal encoding of an ASCII character. See “Parsing Query Input”, page 210 for examples.

1.23.59. MAP$ FROM-VARIABLE

The MAP$ FROM-VARIABLE instruction requests VIRTEL to generate a commarea from XML or Query format input data (“input-to-commarea” conversion). The input data is contained in a VIRTEL variable.

```
groupname  MAP$  FROM-VARIABLE,format,VAR='varname'
```

groupname

The label is required. It specifies the name of the output area to be generated. It must match the label on a preceding MAP$ BEGIN instruction.

format

XML: specifies that the input data is in XML format

QUERY: specifies that the input data is in Query format

If no format is specified, the default is XML.

varname

The name of the VIRTEL variable which contains the input data.

1.23.60. MAP$ TO-VARIABLE

The MAP$ TO-VARIABLE instruction requests VIRTEL to copy a commarea into a VIRTEL variable. The commarea must have been already generated by a previous MAP$ FROM-FIELD, FROM-INPUT, or FROM-VARIABLE instruction.

```
groupname  MAP$  TO-VARIABLE,VAR='varname'
```

groupname

The label is required. It specifies the name of the output area to be copied. It must match the label on a preceding MAP$ BEGIN instruction.

varname

The name of the VIRTEL variable into which the commarea is to be copied.

MAP$ COPY,VAR='varname' is equivalent to MAP$ TO-VARIABLE,VAR='varname'

1.23.61. OPTION$ instruction

This instruction allows the scenario to set up parameters for a subsequent SEND$ TO-LINE instruction.

1.23.62. OPTION$ FOR-HTTP

The OPTION$ FOR-HTTP instruction, when used in conjunction with a SEND$ TO-LINE instruction referencing an outbound HTTP line, allows a scenario to make a request to an HTTP server and to receive the response. The OPTION$ FOR-HTTP instruction builds the parameter list for the subsequent SEND$ TO-LINE instruction.

```
        OPTION$   FOR-HTTP,                                              *
                  (METHOD,'method'),                                     *
                  (SITE,'sitename'),                                     *
                  (TO,'topath'),                                         *
                  (TEXT,'querytext'),                                    *
                  (HEADER,'header'),                                     *
                  (FILE-OUT,'varnameo'),                                 *
                  (FILE-IN,'varnamei'),                                  *
                  (RET-CODE,'varnamer'),                                 *
                  TOVAR='varnamep'
```

method

(required) the HTTP method: GET or POST (see note below).

site

the site portion of the URL (see notes below).

topath

the path portion of the URL (see note below).

querytext

optional text to be appended to the URL (see note below).

header

additional HTTP headers to be inserted in the message. Multiple headers may be inserted by specifying more than one HEADER parameter.

varnameo

the name of the VIRTEL variable which contains the HTTP POST data to be sent to the server. This parameter is required when the method is POST.

varnamei

(required) the name of the VIRTEL variable which will receive the HTTP response data returned by the server.

varnamer

the name of the VIRTEL variable which will receive the HTTP return code returned by the server.

varnamep

the name of the VIRTEL variable which will contain the parameter list.

Note: If the field begins with “*” then it is treated as the name of a variable.

Note: You can use the SITE parameter to specify the name and port of the remote HTTP server, provided that the outbound HTTP line specified by the SEND$ TO-LINE instruction is defined with the special value $SITE$ in the “Remote Ident” field. The value of the SITE parameter is also used to build the Host: header of the outbound HTTP request.

Examples:

```
        OPTION$   FOR-HTTP,                                              *
                  (METHOD,'POST'),                                       *
                  (SITE,'api.google.com:80'),                            *
                  (TO,'/search/beta2'),                                  *
                  (HEADER,'Content-Type: application/soap+xml'),         *
                  (HEADER,'SOAPAction: urn:GoogleSearchAction'),         *
                  (FILE-OUT,'QUESTION'),                                 *
                  (FILE-IN,'ANSWER'),                                    *
                  (RET-CODE,'HTTP-RETURN-CODE'),                         *
                  TOVAR='MYPARMS'
```

```
      OPTION$  FOR-HTTP,                                          *
               (METHOD,'GET'),                                    *
               (SITE,'*SITENAME'),                                *
               (TO,'/search'),                                    *
               (TEXT,'?ie=UTF-8&q=test'),                         *
               (HEADER,'Accept: text/xml'),                       *
               (FILE-IN,'ANSWER'),                                *
               TOVAR='MYPARMS'
```

In this example, the VIRTEL variable SITENAME contains the value of the SITE parameter.

1.23.63. OPTION$ FOR-IND$FILE

The OPTION$ FOR-IND$FILE instruction prepares a TSO session for a file transfer operation using the IND$FILE protocol. This instruction does not itself perform a file transfer; instead it produces an IND$FILE command in a VIRTEL variable. The scenario must send the command to the TSO session to initiate the file transfer.

The format of the OPTION$ FOR-IND$FILE command for a transfer from TSO to the workstation is shown below:

```
         OPTION$ FOR-IND$FILE-DOWNLOAD,                             *
               (METHOD,'options'),                                  *
               (FROM,'dsname'),                                     *
               (FILE-OUT,'outvar'),                                 *
               (RET-CODE,'retvar'),                                 *
               TOVAR='cmdvar'
```

options

optional parameters (for example, 'ASCII CRLF') to be appended to the IND$FILE command line (see note 1 below).

dsname

(required) the TSO dataset name to be downloaded (see notes 1 and 2 below).

outvar

(required) the name of the VIRTEL variable which is to receive the contents of the downloaded file.

retvar

the name of the VIRTEL variable which will receive the completion message sent by IND$FILE at the end of the transfer.

cmdvar

(required) the name of the VIRTEL variable which will contain the generated IND$FILE command.

The format of the OPTION$ FOR-IND$FILE command for a transfer from the workstation to TSO is shown below:

```
         OPTION$ FOR-IND$FILE-UPLOAD,                               *
               (METHOD,'options'),                                  *
               (TO,'dsname'),                                       *
               (FILE-IN,'invar'),                                   *
               (RET-CODE,'retvar'),                                 *
               TOVAR='cmdvar'
```

options

optional parameters (for example, 'ASCII CRLF NEW') to be appended to the IND$FILE command line (see note 1 below).

dsname

(required) the destination TSO dataset name (see notes 1 and 2 below).

invar

(required) the name of the VIRTEL variable which contains the data to be uploaded.

retvar

the name of the VIRTEL variable which will receive the completion message sent by IND$FILE at the end of the transfer.

cmdvar

(required) the name of the VIRTEL variable which will contain the generated IND$FILE command.

Note 1: If the field begins with “*” then it is treated as the name of a variable.

Note 2: TSO will prefix the dataset name by your prefix (usually your userid) unless the dataset name is enclosed in quotes. If you specify the dataset name as a literal in the instruction (as opposed to indirectly as the value of a variable) then triple quotes must be used, for example: (FROM,'''SYS1.PARMLIB(IEASYS00)''')

1.23.63.1. Examples:

```
         OPTION$ FOR-IND$FILE-DOWNLOAD,                            *
               (METHOD,'*OPT'),              "ASCII CRLF" or null    *
               (FROM,'*DSN'),                TSO dataset name        *
               (FILE-OUT,'DOWNLOAD'),                                *
               (RET-CODE,'RETURN-CODE'),                             *
               TOVAR='FTCOMMAND'
```

In this example, the VIRTEL variable OPT contains the IND$FILE optional parameters and DSN contains the dataset name. On completion of the instruction, FTCOMMAND contains the IND$FILE command to be sent to TSO. When the file transfer completes, the VIRTEL variable DOWNLOAD contains the contents of the downloaded file, and RETURN-CODE contains the IND$FILE completion message "TRANS03 File transfer complete" or an error message.

```
         OPTION$ FOR-IND$FILE-UPLOAD,                              *
               (METHOD,'*OPT'),              "ASCII CRLF" or null    *
               (TO,'*DSN'),                  TSO dataset name        *
               (FILE-IN,'UPLOAD'),                                   *
               (RET-CODE,'RETURN-CODE'),                             *
               TOVAR='FTCOMMAND'
```

In this example, the VIRTEL variable OPT contains the IND$FILE optional parameters and DSN contains the dataset name. On completion of the instruction, FTCOMMAND contains the IND$FILE command to be sent to TSO. When the file transfer is initiated, VIRTEL sends the contents of the variable UPLOAD to IND$FILE. When the file transfer completes, RETURN-CODE contains the IND$FILE completion message "TRANS03 File transfer complete" or an error message.

1.23.64. OPTION$ FOR-MQ

Builds a parameter list for a subsequent SEND$ TO-LINE instruction when the line type is MQ.

```
        OPTION$  FOR-MQ,                                            *
                 (FILE-OUT,'varname1'),                             *
                 TOVAR='varnamep'
```

varname1

the name of the VIRTEL variable which contains data to be written to the MQ line.

varnamep

the name of the VIRTEL variable which will contain the parameter list.

1.23.65. OPTION$ FOR-SMTP

Builds a parameter list for a subsequent SEND$ TO-LINE instruction when the line type is SMTP.

```
      OPTION$  FOR-SMTP,                                            *
               (TO,'toaddr'),                                       *
               (FROM,'fromaddr'),                                   *
               (CC,'ccaddr'),                                       *
               (BCC,'bccaddr'),                                     *
               (TEXT,'bodytext'),                                   *
               (SUBJECT,'subjtext'),                                *
               (CHARSET,'charset'),                                 *
               (HEADER,'header'),                                   *
               (FILE-OUT,'varname','filename','filetype','disp'),   *
               (ALTERNATE-TEXT,'altvar','altfn','altft','altdp'),   *
               TOVAR='varnamep'
```

toaddr

the email address of the recipient (see note below).

fromaddr

the email address of the sender (see note below).

ccaddr

the email address(es) of the carbon-copy recipient(s) (see note below).

bccaddr

the email address(es) of the blind carbon-copy recipient(s) (see note below).

bodytext

a character string to be placed in the message body (see note below).

subjtext

a character string to be placed in the message subject line (see note below).

charset

the character set name to be included in the SMTP Content-type header (see note below). For example, ISO-8859-15

header

additional SMTP headers to be inserted in the message. Multiple headers may be inserted by specifying more than one HEADER parameter.

varname

the name of the VIRTEL variable which contains data to be written as an attached file. Multiple files may be attached by specifying more than one FILE-OUT parameter.

filename

the name of the attached file.

filetype

the file type to be sent in the Content-type mime header of the attached file. For example text/plain, application/x-tar, etc.

disp

the Content-Disposition of the attached file. Possible values are inline and attachment. This is an optional subparameter and its default value is attachment.

altvar

the name of the VIRTEL variable which contains data to be written as an alternate text file. When the ALTERNATE-TEXT parameter is specified, the generated email will be structured as a multipart/alternative message, and the bodytext specified in the TEXT parameter will become a file with content type text/plain

altfn

the name of the alternate text file.

altft

the file type of the alternate text file, usually text/html

altdp

the Content-Disposition of the alternate text file, usually inline.

varnamep

the name of the VIRTEL variable which will contain the parameter list.

Note: If the field begins with "*" then it is treated as the name of a variable.

1.23.65.1. Example:

```
        OPTION$  FOR-SMTP,                                                 *
                 (TO,'*DESTADDR'),                                         *
                 (FROM,'me@y.com'),                                        *
                 (CC,'info@y.com'),                                        *
                 (BCC,'archive@y.com'),                                    *
                 (TEXT,'your file is attached'),                           *
                 (SUBJECT,'analysis result'),                              *
                 (CHARSET,'ISO-8859-15'),                                  *
                 (HEADER,'X-Priority: 3'),                                 *
                 (FILE-OUT,'MYVAR1','out.tar','application/x-tar'),        *
                 (FILE-OUT,'MYVAR2',,'application/x-tar'),                 *
                 (ALTERNATE-TEXT,'M01','Message.html',                     *
                 'text/html','inline'),                                    *
                 TOVAR='MYPARMS'
```

In this example, the variable DESTADDR contains the value of the TO parameter.

1.23.66. PERFORM$ instruction

This instruction allows to execute a SUBROUTINE scenario before continuing in sequence.

```
      PERFORM$ mylabel
```

It may be used in any scenario. A subroutine may contains a PERFORM$ instruction to call another subroutine up to 3 levels. For example, main scenario may call level_1 subroutine scenario, which may call level_2 subroutine scenario, which may call level_3 subroutine scenario, but level_3 connot call level_4 subroutine scenario.

mylabel

Specifies the subroutine scenario label to be performed.

1.23.66.1. Subroutine scenario sample

HEre is a sample of the usage of PERFORM$ and LABEL$ instructions.

```
         PERFORM  SCREENS APPL=PERFORM,EXEC=NO
* SCENARIO TO TEST PERFORM$ AND SCENARIO SUBROUTINE
*
         SCENARIO INITIAL
*
         ERROR$ 0,'Level 0'
         PERFORM$ LEVEL1
         ERROR$ 0,'Level 0'
         GOTO$  FIN
FIN      LABEL$
         SCENARIO END
*
LEVEL1   SCENARIO SUBROUTINE
         ERROR$ 0,'Level 1'
         PERFORM$ LEVEL2
         ERROR$ 0,'Level 1'
         IF$   EXISTS-VARIABLE,'TOTO',THEN=FIN,ELSE=PASFIN
PASFIN   LABEL$
         GOTO$  FIN
FIN      LABEL$
         SCENARIO END
*
LEVEL2   SCENARIO SUBROUTINE
         ERROR$ 0,'Level 2'
         PERFORM$ LEVEL3
         ERROR$ 0,'Level 2'
ETIQ     CASE$ (1,1,8),(EQ,'TOTO',ET1),(EQ,'TITI',ET2),                *
               (GE,'YYYY',ET4),(LE,'ZZZ',ET5),                         *
               (EQ,VARIABLE,'VVVV',ET6),                               *
               (EQ,'*VVVV',ET6),                                       *
               (EQ,STRING,'SSSS',ET7),                                 *
               (BEGIN,'XXXX',ET3),                                     *
               (CONTAINS,'XXXX',ET3),                                  *
               ELSE=ET6
ET1      LABEL$
ET2      LABEL$
ET3      LABEL$
ET4      LABEL$
ET5      LABEL$
ET6      LABEL$
ET7      LABEL$

         SCENARIO END
*
LEVEL3   SCENARIO SUBROUTINE
         ERROR$ 0,'Level 3'
         SCENARIO END
*
         SCRNEND
         END
```

1.23.67. POP$ instruction

This instruction allows a scenario to delete values from VIRTEL table variables.

```
     POP$  ALL-VALUES-OF,VAR='varname'
     POP$  FIRST-VALUE-OF,VAR='varname'
     POP$  VAR='varname'
```

ALL-VALUES-OF

indicates that all values of the table variable are to be deleted.

FIRST-VALUE-OF

indicates that the first value of a table variable is to be deleted. If the variable contains only one value, then the variable is deleted entirely.

varname

the name of the VIRTEL variable.

POP$ VAR='varname' is equivalent to POP$ FIRST-VALUE-OF,VAR='varname'

1.23.68. RETURN$ instruction

This instruction terminates a subroutine called by a “MAP$ EXECUTE”, page 183 instruction.

```
RETURN$
```

1.23.69. SEND$ instruction

This instruction allows a scenario to construct the response to an input request.

1.23.70. SEND$ AS-ANSWER

Sends the contents of a VIRTEL variable as the response to an HTTP request.

```
SEND$   AS-ANSWER,VAR='varname',TYPE='filetype',EXPIRES=exphdr
```

varname

the name of the VIRTEL variable which contains the response data.

filetype

the file type to be sent in the Content-Type HTTP header. Typical values are text/plain, text/html, and text/xml

exphdr

EXPIRES=IMMEDIATELY

specifies that the response should not be kept in a cache (this is the default value)

EXPIRES=ENDOFDAY

specifies that the request result can be kept in cache until end of day

The SEND$ AS-ANSWER instruction is intended for use with files which can be displayed directly by the browser (text, html, xml). For other types of file, which are intended to be saved on the user’s hard drive, use the SEND$ AS-FILE instruction instead.

If the line type is not HTTP, the SEND$ AS-ANSWER and SEND$ AS-FILE instructions are processed as “SEND$ VARIABLE-TO-LINE”, page 194 with the LINE parameter set to the line on which the scenario is running.

1.23.71. SEND$ AS-FILE

Sends the contents of a VIRTEL variable as an attached file in response to an HTTP request. Unlike the SEND$ AS-ANSWER instruction, the response includes a Content-Disposition: Attachment header, which means that the browser displays a “Save As” dialog box instead of attempting to display the file in the browser window.

```
    SEND$  AS-FILE,VAR='varname',TYPE='filetype',NAME='filename'
```

varname

the name of the VIRTEL variable which contains the file.

filetype

the file type to be sent in the Content-Type HTTP header. This parameter may be specified as a literal, or as '*varname' where varname is the name of a VIRTEL variable whose value is the filetype. Examples of typical file types are application/pdf, application/x-tar

filename

the file name to be included in the Content-Disposition HTTP header. This parameter may be specified as a literal, or as '*varname' where varname is the name of a VIRTEL variable whose value is the filename.

1.23.72. SEND$ TO

Sends an outbound message to a VIRTEL line. The name of the destination line is specified indirectly through a VIRTEL transaction. The SEND$ TO instruction must be preceded by an "OPTION$", page 185 instruction which sets up the parameters for the outbound message according to the line type.

```
    SEND$  TO,'tranname',PARMS='varnamep',ERROR=label
```

tranname

the external name of a VIRTEL transaction defined under the entry point applicable to this scenario. In the transaction definition, the "Application type" field must be 5 and the "Application" field must be the internal or external name of a VIRTEL line.

varnamep

the name of the VIRTEL variable which contains the parameter list. This variable must have been created by a previous OPTION$ instruction.

errlabel

A branch will be made to this label if the message cannot be sent to the requested line.

1.23.73. SEND$ TO-LINE

Sends an outbound message on the specified line. SEND$ TO-LINE is identical to SEND$ TO except that the name of the line is specified directly in the scenario instead of via a transaction. The SEND$ TO-LINE instruction must be preceded by an "OPTION$", page 185 instruction which sets up the parameters for the outbound message according to the line type.

```
    SEND$  TO-LINE,LINE='linename',MAXTIME=maxtime,PARMS='varnamep',ERROR=label
```

linename

the name of the VIRTEL line on which the message is to be sent. This may be the internal or external name of a line defined in the VIRTEL configuration.

varnamep

the name of the VIRTEL variable which contains the parameter list. This variable must have been created by a previous OPTION$ instruction.

errlabel

A branch will be made to this label if the message cannot be sent to the requested line.

maxtime

> (optional) specifies the maximum time, in hundredths of a second, that the scenario will wait for an answer from the partner to which a request is sent. When this time expires, the scenario continues by going to the ERROR= lable. If the MAXTIME parameter is not specified, the scenario will wait indefinitely, or until VIRTEL disconnects the session when the timeout value of the entry point is exceeded.

> This only apply to SEND$ requests which imply a response, like sending a SOAP request to an HTTP server which would wait for a SOAP response.

1.23.74. SEND$ VARIABLE-TO

Sends the contents of the specified variable as an outbound message on a VIRTEL line. The name of the destination line is specified indirectly through a VIRTEL transaction. A SEND$ VARIABLE-TO instruction is equivalent to an "OPTION$ instructions", page 185 instruction followed by a SEND$ TO instruction in the case where OPTION$ specifies only a variable name.

```
    SEND$   VARIABLE-TO,tranname,VAR='varname',ERROR=label
```

tranname

> the external name of a VIRTEL transaction defined under the entry point applicable to this scenario. In the transaction definition, the "Application type" field must be 5 and the "Application" field must be the internal or external name of a VIRTEL line.

varname

> the name of the VIRTEL variable which contains data to be written to the line.

errlabel

> A branch will be made to this label if the message cannot be sent to the requested line.

Note: when an input scenario sends a variable to a VIRPASS line, the response from the VIRPASS line is passed to the output scenario in the $VIRPASS$ variable.

1.23.75. SEND$ VARIABLE-TO-LINE

Sends the contents of the specified variable as an outbound message on the specified VIRTEL line. SEND$ VARIABLE-TO-LINE is identical to SEND$ VARIABLE-TO except that the name of the line is specified directly in the scenario instead of via a transaction. A SEND$ VARIABLE-TO-LINE instruction is equivalent to an "OPTION$", page 185 instruction followed by a SEND$ TO-LINE instruction in the case where OPTION$ specifies only a variable name.

```
    SEND$   VARIABLE-TO-LINE,VAR='varname',LINE='linename',ERROR=label
```

varname

> the name of the VIRTEL variable which contains data to be written to the line.

linename

> the name of the VIRTEL line on which the message is to be sent. This may be the internal or external name of a line defined in the VIRTEL configuration.

errlabel

> A branch will be made to this label if the message cannot be sent to the requested line.

1.23.76. SET$ instruction

This instruction allows various parameters to be set.

1.23.77. SET$ ENCODING

The SET$ ENCODING instruction allows a scenario specify the default encoding for subsequent pages sent to the terminal, and the encoding of subsequent URLs for this session.

```
     SET$  ENCODING,UTF-8,'charset'
     SET$  ENCODING,UTF-8
     SET$  ENCODING,ISO-FOR-COUNTRY,'country'
     SET$  ENCODING,ISO-FOR-COUNTRY
```

UTF-8

specifies that the terminal will be placed in UTF-8 mode.

charset

specifies the name of the UTF-8 translation table to be used. Refer to the DEFUTF8 parameter in the section “Parameters of the VIRTCT” in the VIRTEL Installation Guide for a list of valid translation table names. If charset is not specified, the value of the DEFUTF8 parameter in the VIRTCT is used.

ISO-FOR-COUNTRY

specifies that the terminal will be placed in ISO mode.

country

specifies the name of the ISO translation table to be used. Refer to the “SET-COUNTRY-CODE”, page 56 for a list of valid country names. If country is not specified, the value of the COUNTRY parameter in the VIRTCT is used.

By default, VIRTEL expects query parameters in the URL to be encoded in the same character set as the last page sent to the user. For the first URL of a session, where no page has yet been sent to the user, VIRTEL assumes the ISO encoding for the default country. The SET$ ENCODING instruction allows a scenario to override this default.

The following example shows part of an input scenario. The scenario allows the user to override the default input encoding for query parameters by specifying either IE=UTF-8 or IE=ISO as an additional parameter of the URL.

```
         COPY$ INPUT-TO-VARIABLE,FIELD='IE',VAR='IE'
         IF$   NOT-FOUND,THEN=SUITE
         CASE$ 'IE',                                          *
               (EQ,'UTF-8',SETUTF8),                          *
               (EQ,'ISO',SETISO),                             *
               ELSE=SUITE
SETUTF8  SET$  ENCODING,UTF-8,'IBM1147'
         GOTO$ SUITE
SETISO   SET$  ENCODING,ISO-FOR-COUNTRY,'US'
SUITE    EQU   *
```

See also the “SET$ URL-ENCODING”, page 197.

1.23.78. SET$ PAGE

Indicates the name of the page template to be used for the current 3270 screen and all subsequent screens. This instruction has the same effect as the HOST4WEB command S GLOBAL PAGE.

```
     SET$  PAGE,'pagename'
```

1.23.79. SET$ PAGE-FROM-VARIABLE

This instruction is similar to SET$ PAGE except that the name of the page template is contained in a VIRTEL variable.

```
    SET$  PAGE-FROM-VARIABLE,'varname','suffix'
```

varname

the name of the VIRTEL variable which contains the page name. Trailing blanks are removed.

suffix

a character string to be appended to the page name.

Example:

```
         COPY$ SCREEN-TO-VARIABLE,SCREEN=(02,12,05),VAR='MYSCREEN'
         SET$  PAGE-FROM-VARIABLE,'MYSCREEN','.html'
```

In this example, if row 2 column 12 of the 3270 screen contains the characters “MAPъъ” (where ъ represents a blank) then the page name will be set to “MAP.html”

1.23.80. SET$ PRIORITY

Allows a running scenario to reduce its priority in order to limit its CPU consumption.

```
    SET$  PRIORITY,level
```

level

specifies the priority to be assigned to the scenario. The following values may be specified:

LOW

the scenario runs at low priority

MEDIUM

the scenario runs at medium priority

HIGH

the scenario runs at high priority. This is the default priority assigned to a scenario if no SET$ PRIORITY instruction is executed.

1.23.81. SET$ SIGNON

Allows an IDENTIFICATION scenario to sign on to the security manager.

```
   SET$  SIGNON,'userid','password',['newpassword'],'retvar'
```

userid

The user name.

password

The user’s current password.

newpassword

The new password, if the user’s current password is to be changed.

retvar

The name of a VIRTEL variable into which the security manager return code will be stored. The return code is stored as a decimal string (for example, '0').

The user name and password fields may be specified as a string constant (not recommended), or as the name of a VIRTEL variable preceded by an asterisk. The retvar variable name is not preceded by an asterisk.

1.23.82. SET$ TEMPORARY-PAGE

Indicates the name of the page template to be used for the current 3270 screen (but not for subsequent screens). This instruction has the same effect as the HOST4WEB command S PAGE.

```
     SET$  TEMPORARY-PAGE,'pagename'
```

1.23.83. SET$ TRANSACTION

Allows an IDENTIFICATION scenario to select the transaction which will be executed.

```
    SET$  TRANSACTION,'tranname'
```

tranname

> The external name of the transaction to be executed.

1.23.84. SET$ URL-ENCODING

The SET$ URL-ENCODING instruction is similar to the SET$ ENCODING instruction, except that SET$ URL-ENCODING applies only to URLs received from the terminal, without affecting the default encoding for pages sent to the terminal.

```
     SET$  URL-ENCODING,UTF-8,'charset'
     SET$  URL-ENCODING,UTF-8
     SET$  URL-ENCODING,ISO-FOR-COUNTRY,'country'
     SET$  URL-ENCODING,ISO-FOR-COUNTRY
```

Refer to “SET$ ENCODING”, page 195 for a description of the parameters.

The SET$ URL-ENCODING instruction can be used in an identification scenario to specify the encoding for the first URL of a session, where no page has yet been sent to the user. If the encoding is not set by a scenario, VIRTEL assumes that the first URL of a session is encoded using the ISO encoding for the default country.

1.23.85. TOVAR$ instruction

The TOVAR$ instruction assists in the generation of XML from a fixed-format data area known as a commarea. The TOVAR$ instruction works in conjunction with the MAP$ instruction, which describes the format of the commarea and its relation to the XML datastream.

Whereas the MAP$ instruction allows the XML stream to be converted into commarea format, the TOVAR$ instruction uses the MAP$ instructions to perform the reverse operation (“commarea-to-output” conversion). In other words, it takes a commarea as input and generates a series of VIRTEL variables, which, with the aid of a suitable page template, can be used to generate XML. See “VIRTEL as an XML parser/generator”, page 218.

The input commarea is specified according to one of the several formats of the TOVAR$ instruction, as shown in the following paragraphs.

1.23.86. TOVAR$ FROM-FIELD

The TOVAR$ FROM-FIELD instruction requests VIRTEL to generate a set of VIRTEL variables from an input commarea. The input commarea is obtained from an HTML form field in the incoming HTTP request. The TOVAR$ FROM-FIELD instruction is normally contained in an INITIAL scenario.

```
groupname  TOVAR$  FROM-FIELD,FIELD='fieldname'
```

groupname

The label is required. It specifies the name of the input commarea. It must match the label on a preceding MAP$ BEGIN instruction.

fieldname

The name of the HTML form field which contains the input commarea data.

1.23.87. TOVAR$ FROM-INPUT

The TOVAR$ FROM-INPUT instruction requests VIRTEL to generate a set of VIRTEL variables from an input commarea. The input commarea is obtained from the data area of the incoming HTTP request. The TOVAR$ FROM-INPUT instruction is normally contained in an INITIAL scenario.

```
groupname  TOVAR$  FROM-INPUT
```

groupname

The label is required. It specifies the name of the input commarea. It must match the label on a preceding MAP$ BEGIN instruction.

Note: TOVAR$ FROM-INPUT with a FIELD parameter is accepted and treated as TOVAR$ FROM-FIELD

The TOVAR$ FROM-FIELD and TOVAR$ FROM-INPUT instructions both obtain their data from an incoming HTTP request. The HTTP request may use either via the GET method (where the input data is appended to the URL) or the POST method (where the input data is contained in the request body). The difference between the two instructions is that TOVAR$ FROM-INPUT treats the entire data area as commarea data without any translation, whereas TOVAR$ FROM-FIELD expects the data to be in the format fieldname=commareadata where commareadata is interpreted as URL-encoded data (a “+” sign represents a space, and “%xx” represents the hexadecimal encoding of an ASCII character). TOVAR$ FROM-FIELD is preferred when using the GET method, because certain characters cannot be included in a URL without using URL-encoding.

1.23.88. TOVAR$ FROM-VARIABLE

The TOVAR$ FROM-VARIABLE instruction requests VIRTEL to generate a set of VIRTEL variables from an input commarea. The input commarea is contained in a VIRTEL variable. The TOVAR$ FROM-VARIABLE instruction is normally contained in an OUTPUT scenario.

```
groupname  TOVAR$  FROM-VARIABLE,VAR='varname'
```

groupname

The label is required. It specifies the name of the input commarea. It must match the label on a preceding MAP$ BEGIN instruction.

varname

The name of the VIRTEL variable which contains the input commarea data.

1.23.89. VIRSV$ instruction

The VIRSV$ instruction allows a service program to be called from a scenario. A service program is an external program which is not part of VIRTEL but which executes in the VIRTEL address space. The VIRSV service request manager dispatches work to service programs. Refer to the document Using VIRSV for details of writing service programs which execute under the control of VIRSV.

```
         VIRSV$ CALL or CALL-REUSE or TRANSACTION,
               ('servname','progname'),
               (NUMBER,'n'),
               (STRINGZ,'cc..cc'),
               (IN-VARIABLE,'varname',len),
               (OUT-VARIABLE,'varname',len),
               OPTION=(option,option,...),
               TRACE=(traceopt,traceopt,...),
               ERROR=errlabel,TASKS=count
```

CALL

Indicates that a new instance of the service program will be created for each request.

CALL-REUSE

Indicates that the request will be routed to an existing instance of the service program, if one is available. Otherwise a new instance of the service program will be started to process this request, after which the service program will remain active and available to process further requests.

TRANSACTION

Indicates a call to the service program which is part of a VIRSV transaction.

servname

The name assigned to this service. The VIRSV service request manager uses this name to identify the request queue which will process this service request. Choose a unique service name for each service program. If more than one scenario calls the same service program, the same service name can be used by each scenario, and in this case the scenarios will all share the same request queue. Alternatively, each scenario can specify a different service name, in which case there will be an independent request queue for each scenario. The service name must consist of at least 6 alphanumeric characters and must be in quotes.

progname

The name of the service program to be called. The program name must be in quotes.

option

One or more of the following options may be specified:

CLOSE

for a transaction call, specifies that the transaction is to be closed after processing this VIRSV$ instruction.

traceopt

Specifies activation or deactivation of the VIRSV trace facility. One or more of the following options may be specified:

APPLICATION-TRACE or NO-APPLICATION-TRACE

activates or deactivates tracing by the service program (if the service program supports this type of trace).

CALLS-TRACE or NO-CALLS-TRACE

activates or deactivates tracing of the requests and responses passed between VIRTEL and VIRSV.

DISPATCH-TRACE or NO-DISPATCH-TRACE

activates or deactivates tracing of the VIRSV request queue and task dispatcher.

MEMORY-TRACE or NO-MEMORY-TRACE

activates or deactivates tracing of the memory blocks used by VIRSV and the service program.

The default value of each trace option is determined by VIRSV. The trace is written to the VSVTRACE file of the VIRTEL started task.

errlabel

A branch will be made to this label if the service cannot be called, or if VIRSV or the service program returned a non-zero return code.

count

The maximum number of concurrent instances of the service program which can be started for this service name. If there are already count instances of the requested service program active and in-use under this service name, the scenario will wait until an instance becomes available. The default value is 1. This parameter applies only if the call type is CALL-REUSE.

The remaining fields indicate parameters passed to the service program. Any number of parameters may be specified in any order. For each parameter, VIRTEL places either one or two fullwords into the request input area. Depending on the parameter type, these fullwords may contain a binary value, an address, or a pair of addresses, as described below. The address of the request input area is passed to the service program in the LIST-ADR-REQU field of the LIST-POINTER structure built by the CALL VSVPSYNC routine.

(NUMBER,'n')

Indicates a parameter passed to the service program. n is a decimal number whose value is converted to a 32-bit binary integer and stored in the request input area. The number n must be placed in quotes.

(POINTER-TO-NUMBER,'n')

Indicates a parameter passed to the service program. n is a decimal number whose value is converted to a 32-bit binary integer. A fullword containing the address of this 32-bit value is stored in the request input area. The number n must be placed in quotes.

(STRINGZ,'cc..cc')

Indicates a parameter passed to the service program. A terminating character (X'00') is appended to the character string cc..cc, and a fullword containing the address of the string is stored in the request input area. The string must be placed in quotes.

(STRINGZ-FROM-VARIABLE,'varname')

Indicates a parameter passed to the service program. The value of the VIRTEL variable varname is copied to a character string and a terminating character (X'00') is appended. A fullword containing the address of this null-terminated string is stored in the request input area. The variable name must be placed in quotes.

(IN-VARIABLE,'varname',len)

Indicates a parameter passed to the service program. Two fullwords are stored in the request input area: the first contains the address of the value of the VIRTEL variable varname and the second contains the address of a fullword containing the length of this value. The len parameter is ignored unless it contains the special value *n (see below). The variable name must be placed in quotes.

For a scenario which processes an inbound request on an MQ line, the special variable name '$INFILE$' denotes the contents of the input request.

(OUT-VARIABLE,'varname',len)

Indicates an output parameter returned by the service program. VIRTEL allocates a buffer of length len and stores two fullwords in the request input area: the first contains the address of the buffer and the second contains the address of a fullword which contains the buffer length. The service program places the output value in the buffer and updates the length fullword. VIRTEL copies the contents of the buffer into the VIRTEL variable varname after the service program returns. The len parameter contains the desired buffer length (nn, nnK, or nnM), or the special value *n (see below). The variable name must be placed in quotes.

1.23.89.1. Allocating variable length output buffers

A special form of the len parameter may be used to allocate output buffers whose length varies depending on the length of an input variable. This is done by specifying the len parameter in the form *n where n is a decimal number. When the len parameter of an input variable is specified as *n this means that the actual length of the variable is divided by n to obtain the unit of measurement. Subsequent output variables may then specify length *m where m is a number. This means that the buffer length for that output variable will be m times the unit of measurement.

For example:

```
         VIRSV$ CALL-REUSE,('SERVTAR','VENTAR'),                      *
               (NUMBER,'2'),                                           *
               (IN-VARIABLE,'$INFILE$',*3),                            *
               (OUT-VARIABLE,'HEADER',*1),                             *
               (OUT-VARIABLE,'BODY',*3),                               *
               (OUT-VARIABLE,'SIGNATURE',4),                           *
               ERROR=REJECTQ,TASKS=5
```

In this example, assume that the variable $INFILE$ has length 4500 bytes. Because its len parameter is specified as *3, VIRTEL calculates the unit of measurement as 1500. The output variable HEADER has len set to *1 which means that the buffer length allocated is one unit, or 1500 bytes. The output variable BODY has len *3 which means that its buffer length is 3 units, or 4500 bytes. By contrast, the output variable SIGNATURE has a fixed buffer length of 4 bytes.

If more than one input variable specifies a len parameter in the format *n then the largest value is taken as the unit of measurement.

1.23.90. Examples of VIRTEL Web Modernisation Scenarios

1.23.90.1. Creation of a list of values for a selected field

Many 3270 applications consist of fields which can take only one of a restricted set of values. In this case, it is possible to offer the end user a list of allowable values by requesting VIRTEL to generate the field in the form of a SELECT rather than in the form of a normal field. This type of modification is performed by the FIELD$ instruction.

```
* ---------------------------------------------------------------- *
*  Example of SELECT, CHECKBOX, and HIDDEN fields                  *
* ---------------------------------------------------------------- *
*
VIRMM01  SCREENS APPL=SYNAPSE,EXEC=NO
*
         SCENARIO OUTPUT
```

```
*
TMG      IF$    (01,12,12),EQ='General Menu',THEN=MENUG,ELSE=ERRSCRN
*
MENUG    FIELD$ (03,20,1),DEFINE-CHOICE,VAL=9
         FIELD$ (03,20,1),DEFINE-CHOICE,VAL=8
         FIELD$ (03,20,1),DEFINE-CHOICE,VAL=4
         FIELD$ (03,20,1),DEFINE-CHOICE,VAL=3
         FIELD$ (03,20,1),DEFINE-CHOICE,VAL=2
         FIELD$ (03,20,1),DEFINE-CHOICE,VAL=1
*
         FIELD$ (05,20,1),IS-BINARY-CHOICE,VAL='X'
*
         FIELD$ (07,20,8),HIDE
*
         SCENARIO END
*
ERRSCRN  ERROR$ 0099
         SCRNEND
         END
```

HTTP presentation module: List of values for input field

1.23.90.2. Making clickable fields

```
TESTCT1  SCREENS APPL=Demopfks,EXEC=NO
*
         SCENARIO OUTPUT
*
         IF$   (02,27,27),EQ='C O N T A C T   C L I E N T',THEN=CONTACT
         IF$   (02,27,09),EQ='STATEMENT',THEN=STATMNT,ELSE=ERRSCRN
*
CONTACT  DECLARE$ (23,03,02,'06'),AS-PFKEY,'PF6'
         DECLARE$ (23,08,02,'EF'),AS-PFKEY,'CLEAR'
         DECLARE$ (23,18,02,'02'),AS-PFKEY,'PF2'
         DECLARE$ (23,28,02,'09'),AS-PFKEY,'PF9'
         DECLARE$ (23,38,02,'13'),AS-PFKEY,'PF13'
         DECLARE$ (23,48,02,'14'),AS-PFKEY,'PF14'
         DECLARE$ (23,58,02,'15'),AS-PFKEY,'PF15'
         DECLARE$ (23,68,02,'16'),AS-PFKEY,'PF16'
         SCENARIO END
*
STATMNT  DECLARE$ (23,03,02,'06'),AS-PFKEY,'PF6'
         DECLARE$ (23,08,02),AS-PFKEY,'CLEAR'
         DECLARE$ (23,18,02),AS-PFKEY,'PF7'
         DECLARE$ (23,28,02),AS-PFKEY,'PF9'
         DECLARE$ (23,38,02),AS-PFKEY,'PF13'
         DECLARE$ (23,48,02),AS-PFKEY,'PF14'

         DECLARE$ (23,58,02),AS-PFKEY,'PF15'
         DECLARE$ (23,68,02),AS-PFKEY,'PF17'
*
* One click, sends PF9 with the cursor position.
         DECLARE$ (09,23,08,'Echéance'),                               C
               AS-PARAMETER,'P9','ZOOM',TO=VClick
* A click in position 11,23 sends PF9 with the cursor position.
         DECLARE$ (11,23,08),AS-PARAMETER,'PF9','ZOOM',TO=VClick
*
* A click on the client name invokes an internet google search.
         DECLARE$ (04,09,17),AS-HREF,'&&hl=en&&csr=',                  C
               TO='http://www.google.com/search?q='
*
         SCENARIO END
*
ERRSCRN  ERROR$ 0099
         SCRNEND
         END
```

HTTP presentation module: Clickable fields using DECLARE$

1.23.90.3. Adding calendars to date fields

By using a combination of an output scenario and a JavaScript application, date fields on the 3270 screen can be transformed into HTML fields on which a small calendar window appears when the user clicks on the field. The user chooses the desired date from the calendar, and VIRTEL inserts the date in the correct format into the 3270 input field.

An example scenario for declaring date fields is shown below. As usual, the name of this scenario must be specified in the "Output Scenario" field of the VIRTEL transaction which calls the host application.

In this example, the correct screen is first identified by using its screen identifier "DEM275" in row 1 column 2, then three calendar fields are declared at row 8 column 28, row 8 column 64, and row 9 column 28. For the purposes of illustration, a different date format is declared for each field:

```
SCENCALR SCREENS EXEC=NO
         SCENARIO OUTPUT
*
*        Identify the correct screen
*
```

```
         IF$   (01,02,06),EQ='DEM275',THEN=MENU275
         SCENARIO END
*
*        Declare the calendar fields
*
MENU275  EQU   *
         CALENDR$ SCREEN=(8,28),DATEFMT='%Y%m%d'
         CALENDR$ SCREEN=(8,64),DATEFMT='%m/%d/%y'
         CALENDR$ SCREEN=(9,28),DATEFMT='%e-%b-%Y'
         SCENARIO END
         SCRNEND
         END
```

HTTP presentation module: Defining calendar fields

In the DATEFMT parameter:

%Y
represents the year (4 digits)

%y
represents the year (2 digits)

%d
represents the day of the month (01-31)

%e
represents the day of the month (1-31)

%m
represents the month (01-12)

%b
represents the abbreviated month name (Jan, Feb, etc)

Refer to the Date.prototype.print function in the calendar.js file for details of all of the allowable date formats.

The CALENDR$ macro generates two VIRTEL table variables: CALENDAR and DATEFMT. The CALENDAR variable contains the VIRTEL-generated names of the 3270 fields which are to be processed as calendar fields. The DATEFMT variable contains the corresponding date formats for each field.

The page template must include logic to call the calendar application whenever the output screen has declared calendar fields. The extract below shows the necessary statements which are included in the VIRTEL sample page WEB2VIRT.htm:

```
In the <head> section:

{{{ WHEN-EXISTS "CALENDAR" }}}
  <link rel="stylesheet" type="text/css" media="all"
        href="dynarch/cal-w2k-c1.css" title="win2k-cold-1" />
  <script type="text/javascript" src="dynarch/calendar.js"></script>
  <script type="text/javascript" src="dynarch/cal-en.js"></script>
  <script type="text/javascript" src="dynarch/cal-setup.js"></script>
  {{{ SET-LOCAL-OPTIONS (ID) }}}
{{{ END-WHEN-EXISTS "CALENDAR" }}}

After the <form> section:

{{{ WHEN-EXISTS "CALENDAR" }}}
  <script language="javascript" type="text/javascript">
  {{{ FOR-EACH-VALUE-IN "CALENDAR"  }}}
     Calendar.setup({inputField:"{{{CURRENT-VALUE-OF "CALENDAR"}}}",
                     ifFormat:"{{{CURRENT-VALUE-OF "DATEFMT"}}}"});
  {{{ END-FOR "CALENDAR"  }}}
  </script>
{{{ END-WHEN-EXISTS "CALENDAR" }}}
```

HTML page template for calendar fields

1.23.90.4. VIRTEL suggest

VIRTEL Suggest is a facility which presents lists of suggested values for specific 3270 fields. The suggested values are presented in a drop-down list which appears automatically when the user starts typing into a field. The list modifies itself dynamically as the user types. At any time the user can select one of the suggested values by clicking or moving the cursor to the desired value.

Fields eligible for processing by VIRTEL Suggest are identified by means of an output scenario containing SUGGEST$ macros. Each SUGGEST$ macro identifies a "suggest" field and indicates the data source for the list of suggested values. The data source may be a DB2 table, a FLECS application1, or a user-written CICS transaction.

An example scenario for declaring a "suggest" field is shown below. As usual, the name of this scenario must be specified in the "Output Scenario" field of the VIRTEL transaction which calls the host application.

In this example, the correct screen is first identified by using its screen identifier "VIR0091" in row 1 column 2, then a VIRTEL Suggest field is declared at row 8 column 21. The data source for this field is column "LASTNAME" in the DB2 table named "DSN8810.EMP":

```
SCENAJAX SCREENS EXEC=NO
*
* DEMONSTRATION SCENARIO FOR VIRTEL-SUGGEST FUNCTIONS
*
* The purpose of this scenario is to activate
* a VIRTEL-Suggest field in the demo application VIR0091.
*
         SCENARIO OUTPUT
         IF$   (1,2,7),EQ='VIR0091',THEN=DEMOAPPL
         SCENARIO END
*
* The test panel identifier is VIR0091
*
DEMOAPPL EQU   *
*
* Activate VIRTEL-Suggest in the NAME field
*
         SUGGEST$ TRAN='suggestD'
         SUGGEST$ TABLE='DSN8810.EMP'
         SUGGEST$ SCREEN=(8,21),FIELD='LASTNAME'
*
         SCENARIO END
         SCRNEND
         END
```

HTTP presentation module: Defining VIRTEL Suggest fields

1.23.90.4.1. SUGGEST$ instruction

The parameters of the SUGGEST$ macro instruction are as follows:

TRAN='name'

the name of the VIRTEL transaction which provides the link to the data source for the field. The following transactions are supplied as standard in the VIRTEL entry point WEB2HOST:

suggestD

Data source is a column in a DB2 table

suggestF
Data source is a field in a FLECS application (via CICS)

suggestV
Data source is a field in a FLECS application (via VIRTEL)

TABLE='name'
the name of the DB2 table, or the name of the FLECS application

FIELD='name'
the name of the DB2 column, or the name of the FLECS field

SCREEN=(row,col)
the screen position (row, column) of the field on the 3270 screen

A SUGGEST$ instruction containing only TRAN and/or TABLE parameters may be used to set the values for subsequent SUGGEST$ instructions. Each SUGGEST$ instruction which contains a SCREEN parameter and a FIELD parameter generates a VIRTEL Suggest field. If the TRAN and TABLE parameters are not specified then the values from the previous SUGGEST$ instruction are used.

1.23.90.4.2. Installation pre-requisites

Before you can use the suggestD transaction, you must install the program VDBSUGST in your CICS system with transaction code VDBS. The JCL to compile, link, and bind this program is in member DB2COBC of VIRTEL.SAMPLIB. You must also update the definition of the suggestD transaction (W2H-53 in the WEB2HOST entry point) to specify the VTAM applid of the appropriate CICS region.

The suggestF transaction requires the FLECS product to be installed in your CICS system. You must also update the definition of the suggestF transaction (W2H-51 in the WEB2HOST entry point) to specify the VTAM applid of the CICS region in which FLECS is installed.

If you plan to use the suggestV transaction, you must add DD statements to the VIRTEL started task JCL specifying the FLECS catalog file (F20CAT) and the pointer files it references. You must also update the VIRTCT by adding UFILEn parameters for the FLECS catalog file and each pointer file, together with the corresponding ACB definitions.

1.23.90.4.3. Page template for VIRTEL Suggest

The page template must include logic to call the data source transaction whenever the output screen has declared VIRTEL Suggest fields. The extract below shows the necessary statements which are included in the VIRTEL sample page WEB2VIRT.htm:

```
In the <head> section:

{{{ WHEN-EXISTS "SUGGEST-ELEMENT" }}}
  <link rel="stylesheet" type="text/css" href="suggest.css" />
  <script type="text/javascript" src="suggest.js"></script>
{{{ END-WHEN-EXISTS "SUGGEST-ELEMENT" }}}

After the <form> section:

{{{ WHEN-EXISTS "SUGGEST-ELEMENT" }}}
  {{{ FOR-EACH-VALUE-IN "SUGGEST-ELEMENT" }}}
   var o{{{CURRENT-VALUE-OF "SUGGEST-ELEMENT"}}}box = new AutoSuggestControl(
    "{{{CURRENT-VALUE-OF "SUGGEST-ELEMENT"}}}",
    new VirtelSuggestions(),
    "{{{CURRENT-VALUE-OF "SUGGEST-TRANSNAME"}}}",
    "{{{CURRENT-VALUE-OF "SUGGEST-TABLENAME"}}}",
    "{{{CURRENT-VALUE-OF "SUGGEST-FIELDNAME"}}}");
  {{{ END-FOR "SUGGEST-ELEMENT" }}}
{{{ END-WHEN-EXISTS "SUGGEST-ELEMENT" }}}
```

HTML page template for VIRTEL Suggest fields

The SUGGEST$ macro instruction generates four VIRTEL table variables: SUGGEST-ELEMENT, SUGGEST-TRANSNAME, SUGGEST-TABLENAME, SUGGEST-FIELDNAME. The first entry in each table corresponds to the first VIRTEL Suggest field on the page, the second entry corresponds to the second VIRTEL Suggest field on the page, and so on.

1.23.90.5. Auto-refresh

The majority of host applications use the 3270 protocol in a synchronous manner, meaning that each user input (ENTER or PF key) generates one response consisting of a 3270 screen built by a single VTAM message. Certain host applications, however, may build a 3270 screen in two or more segments, by sending more than one VTAM message to the terminal. Other applications may send asynchronous updates to a 3270 screen which are not a direct result of user input. Such applications need special handling to ensure that VIRTEL can present the updated 3270 screen image to the user without requiring the user to press ENTER to refresh the screen. VIRTEL handles this situation by means of an AJAX request containing the VerifyVirtelSession keyword (see “3270 Session Management”, page 17). By using an output scenario with a suitable page template, the HTML page can determine whether the 3270 screen image has been updated, and if so can dynamically refresh the data displayed in the browser.

An example scenario is shown below. As usual, the name of this scenario must be specified in the “Output Scenario” field of the VIRTEL transaction which calls the host application. This scenario is supplied as member SCENREFR in the VIRTEL SAMPLIB:

```
SCENREFR SCREENS EXEC=NO
*
* SCENARIO FOR MVS CONSOLE APPLICATION
*
         SCENARIO OUTPUT
         IF$    (1,11,7),EQ='SNACONS',THEN=REFR1
         IF$    (21,3,7),EQ='IEE612I',THEN=REFR2
         SCENARIO END
*
* SET AUTOREFRESH ONCE FOR SIGNON SCREEN
*
REFR1    EQU    *
         COPY$ VALUE-TO-VARIABLE,VAR='AUTOREFRESH',VALUE='ONCE'
         SCENARIO END
*
* SET AUTOREFRESH EVERY 2 SECONDS FOR CONSOLE SCREEN
*
REFR2    EQU    *
         COPY$ VALUE-TO-VARIABLE,VAR='AUTOREFRESH',VALUE='2'
         SCENARIO END
*
```

```
          SCRNEND
          END
```

HTTP presentation module: 3270 auto-refresh

This example activates auto-refresh for two specific application screens. The first screen, identified by the word “SNACONS” in row 1 column 11, is built by the application in two parts. For this screen, the AUTOREFRESH variable is set to “ONCE” which causes the page template to return to VIRTEL one time only to request the second part of the screen. The second screen, identified by “IEE612I” in row 21 column 3, is updated continuously by the application. For this screen, the AUTOREFRESH variable is set to “2” which causes the browser to issue an AJAX request every two seconds to ask VIRTEL if the screen has been updated. A positive response from VIRTEL triggers a request to refresh the screen.

The following table shows the permissible values for the AUTOREFRESH variable:

Value	**Meaning**
nnn	refresh once, then every nnn seconds
nnn,max	refresh once, then after nnn seconds, then double the interval after each refresh, with a maximum interval of max seconds
ONCE	refresh once only
NO or NONE	do not refresh

Settings for 3270 auto-refresh

The page template must include logic to process the AUTOREFRESH variable and issue the necessary AJAX functions. The extract below shows the necessary statements which are included in the VIRTEL sample page WEB2VIRT.htm:

```
In the <head> section:

<script src="js01.js" type="text/javascript"></script>

After the <form> section:

<script>
{{{ WHEN-EXISTS "AUTOREFRESH" }}}
AutoRefresh("{{{CURRENT-VALUE-OF "AUTOREFRESH"}}}",sesscode);
{{{ END-WHEN-EXISTS "AUTOREFRESH" }}}
{{{ WHEN-NOT-EXISTS "AUTOREFRESH" }}}
AutoRefresh("1.2,10",sesscode);
{{{ END-WHEN-NOT-EXISTS "AUTOREFRESH" }}}
</script>
```

HTML page template for 3270 auto-refresh

This page supplies a default value which takes effect if no AUTOREFRESH variable is specified by the scenario. The default value is set to '1.2,10' which means that a refresh will occur immediately after each screen is loaded, another refresh will occur 1.2 seconds later, then at intervals of 2.4 seconds, 4.8 seconds, and 9.6 seconds, and finally a refresh will occur every 10 seconds thereafter.

The autorefresh function may be disabled by specifying SCENAUTN in the “Output scenario” field of the VIRTEL transaction definition. The source code for the SCENAUTN scenario is supplied in the VIRTEL SAMPLIB.

1.23.90.6. PDF output generation

This example shows a scenario which generates a PDF output file using the MakePDF program product via the service program VIRSVPDF.

```
SCENPDF  SCREENS EXEC=NO
*
* Scenario for generating PDF output using MakePDF
```

```
*
         SCENARIO IDENTIFICATION
*
* Create INPUT file for MakePDF
         COPY$ OUTPUT-FILE-TO-VARIABLE,TYPE=LINEBUFFER,                 -
               FILE='INPUT.TXT',VAR='INPUT'
* Create DOCOPT file for MakePDF
         COPY$ OUTPUT-FILE-TO-VARIABLE,TYPE=LINEBUFFER,                 -
               FILE='DOCOPT.TXT',VAR='DOCOPT'
* Create LAYOUT file for MakePDF
         COPY$ OUTPUT-FILE-TO-VARIABLE,TYPE=LINEBUFFER,                 -
               FILE='LAYOUT.TXT',VAR='LAYOUT'
* Call service program VIRSVPDF which calls MakePDF
         VIRSV$ CALL-REUSE,('SERVPDF','VIRSVPDF'),                      -
               (IN-VARIABLE,'INPUT',*3),                                -
               (IN-VARIABLE,'DOCOPT',*1),                               -
               (IN-VARIABLE,'LAYOUT',*1),                               -
               (OUT-VARIABLE,'OUTPUT',500K),                            -
               (OUT-VARIABLE,'MAKEPDFMESSAGE',160),                     -
               (NUMBER,'3'),          MakePDF trace level               -
               TRACE=(APPLICATION-TRACE,  Virsv trace level             -
               NO-CALLS-TRACE,NO-DISPATCH-TRACE,NO-MEMORY-TRACE),       -
               ERROR=REJECT,TASKS=1
* Send result to browser
         SEND$ AS-FILE,VAR='OUTPUT',                                    -
               TYPE='application/pdf',NAME='my.pdf'
REJECT   EQU   *
         SCENARIO END
         SCRNEND
         END
```

HTTP presentation module: PDF output generation

For the purpose of this scenario, INPUT.TXT, DOCOPT.TXT and LAYOUT.TXT are files created on a PC, then uploaded to VIRTEL as page templates (see “Uploading HTML Pages”, page 68). The TYPE=LINEBUFFER parameters on the COPY$ statements tell VIRTEL that these files should be converted to MakePDF “LINEBUF” format. The VIRSV$ statement calls an intermediary service program VIRSVPDF which sets up the commarea and calls MakePDF. Then the SEND$ statement sends back the result file to the browser, giving it the name my.pdf.

The files INPUT.TXT, DOCOPT.TXT, and LAYOUT.TXT for this example are shown below:

```
<!--VIRTEL start="{{{" end="}}}" -->
{{{PDF-NEW-INPUT }}}{{{PDF-USE-DOCOPT "1"}}}{{{PDF-USE-LAYOUT "1"}}}
{{{PDF-LINES-PER-PAGE (5) }}}
 PAGE 1          FIRST INPUT
{{{CURRENT-VALUE-OF "I1"}}}
{{{PDF-NEW-INPUT }}}{{{PDF-USE-DOCOPT "1"}}}{{{PDF-USE-LAYOUT "2"}}}
 PAGE 2          SECOND INPUT
{{{CURRENT-VALUE-OF "I2"}}}
{{{PDF-NEW-INPUT }}}{{{PDF-USE-DOCOPT "1"}}}{{{PDF-USE-LAYOUT "3"}}}
 PAGE 3          THIRD INPUT
{{{CURRENT-VALUE-OF "I3"}}}
```

MakePDF INPUT.TXT file for PDF generation

```
<!--VIRTEL start="{{{" end="}}}" -->
{{{PDF-NEW-DOCOPT "1"}}}
OPTIONS COMPRESS=YES
PAGE SIZE=A4 PORTRAIT
DEFINEFONT DEFAULT NATIVE=COURIER-BOLD
DEFAULTFONTSIZE 8 9
DefineFont Font1 Native={{{CURRENT-VALUE-OF "IF1"}}}
DefineFont Font2 Native={{{CURRENT-VALUE-OF "IF2"}}}
DefineFont Font3 Native={{{CURRENT-VALUE-OF "IF3"}}}
DOCINFO AUTHOR="SYSPERTEC"
DEFINEOVERLAY FORM1 FILE=OVERLAY1
DEFINEOVERLAY FORM2 FILE=OVERLAY2
DEFINEOVERLAY FORM3 FILE=OVERLAY3
```

MakePDF DOCOPT.TXT file for PDF generation

```
<!--VIRTEL start="{{{" end="}}}" -->
{{{PDF-NEW-LAYOUT "1"}}}
APPLYOVERLAY FORM1
AT (3.0' 18.0')
TEXTBEGIN
Font Font1 size(8 9)
PAGECONTENTS LINES(ALL)
TEXTEND
;
{{{PDF-NEW-LAYOUT "2"}}}
APPLYOVERLAY FORM2
AT (3.0' 18.0')
TEXTBEGIN
Font Font2 size(8 9)
PAGECONTENTS LINES(ALL)
TEXTEND
;
{{{PDF-NEW-LAYOUT "3"}}}
APPLYOVERLAY FORM3
AT (3.0' 18.0')
TEXTBEGIN
Font Font3 size(8 9)
PAGECONTENTS LINES(ALL)
TEXTEND
;
```

MakePDF LAYOUT.TXT file for PDF generation

1.24. VIRTEL Web Integration

1.24.1. Introduction

VIRTEL Web Integration allows XML or other web services requests to be interpreted and transformed into requests which can be processed by legacy applications such as CICS/COBOL, with the results being transformed back into XML format for transmission via HTTP or SMTP.

By using the scenario language described in section "Web Modernisation VIRTEL Scenarios", page 147, legacy transactions can be converted into Web Services.

1.24.2. Parsing Query input

By using a combination of an INITIAL scenario and a VIRTEL transaction script, VIRTEL can transform Query parameters in an HTTP request into a fixed-format data area for processing by a COBOL legacy application program.

1.24.2.1. HTTP request with Query data (GET method)

The HTML page shown below generates an HTTP request with Query parameters:

```
<html><head><title>Syspertec - Query data for VIRTEL</title></head>
<body>
<FORM METHOD="GET" action="querydemo.htm+tranq">
<p>Ident number: <input type="text" name="num"></input>
```

```
<p>Check digits: <input type="text" name="key"></input>
<p>Request date: <input type="text" name="date"></input>
<p><button type="submit">Submit</button>
</form>
</body></html>
```

HTML form for generating Query input data (GET method)

If the user enters, for example, the values “1531499136”, “05”, and “07/01/15” in the three fields and presses the Submit button, an HTTP request is presented to VIRTEL in the format shown below:

```
GET querydemo.htm+tranq?num=1531499136&key=05&date=07%2F01%2F15 HTTP/1.0
Host: 192.168.235.30:41000
Accept: */*
```

Example HTTP request with Query data (GET method)

Note that the “/” characters in the user’s input have been encoded by the browser as “%2F” because Query parameters are always transmitted in URL-encoded format in the HTTP request.

1.24.2.2. HTTP request with Query data (POST method)

By changing the FORM METHOD to POST (instead of GET) in the HTML form, the HTTP request can be presented to VIRTEL in the alternative format shown below:

```
POST /demohttp/querydemo.htm+tran4 HTTP/1.0
Host: 192.168.235.30:41000
Accept: */*
Content-Type: application/x-www-form-urlencoded
Content-Length: 31

num=1531499136&key=05&date=07%2F01%2F15
```

Example HTTP request with Query data (POST method)

VIRTEL considers this POST request to be identical to the GET request presented in the previous paragraph.

1.24.2.3. Presentation module for Query input data

An example INITIAL scenario for converting this Query data to commarea format is coded in the presentation module SCENQRYI shown below:

```
SCENQRYI SCREENS APPL=SCENQRYI
         SCENARIO INITIAL
COMMAREA MAP$  BEGIN
         MAP$  AREA,WITH='num',LENGTH=10,TYPE=9
         MAP$  AREA,WITH='key',LENGTH=2,TYPE=9
         MAP$  AREA,WITH='date',LENGTH=8,TYPE=X
COMMAREA MAP$  END
COMMAREA MAP$  FROM-INPUT,QUERY
COMMAREA MAP$  TO-VARIABLE,VAR='MYAREA'
         SCENARIO END
         SCRNEND
         END
```

HTTP presentation module for Query input data

The same presentation module may be used to process both GET and POST requests.

1.24.2.4. Contents of generated commarea

The figure below shows the 20-byte commarea generated in the VIRTEL variable MYAREA:

```
----+----1----+----2
15314991360507/01/15
```

Commarea generated from Query data

1.24.2.5. Transaction definition for Query input data

The HTTP requests shown in the GET and POST examples above use the URL querydemo.htm+tranq to invoke the VIRTEL transaction shown below (tranq is the "external name" of the transaction). The "TIOA at logon" field contains a connection script. After signing on to CICS, the connection script uses the &/S order to process the INITIAL scenario in the presentation module SCENQRYI. This scenario converts the Query parameter input data into a VIRTEL variable named MYAREA. The script then invokes a CICS transaction VQRY, passing the contents of MYAREA as input data. The CICS transaction performs an EXEC CICS RECEIVE to obtain the input data.

```
TRANSACTION DETAIL DEFINITION --------------------- Applid: VIRTELD2 15:32:33

Internal name ===> CLI-17Q                To associate with an entry point name
External name ===> tranq                  Name displayed on user menu
Description   ===> Demonstration VIRTEL Query
Application   ===> CICSPROD               Application to be called
PassTicket    ===> 0  Name ===>           0=no 1=yes 2=unsigned
Application type   ===> 1                 1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> CLVTA             Prefix of name of partner terminals
Logmode            ===>                   Specify when LOGMODE must be changed
How started        ===> 1                 1=menu 2=sub-menu 3=auto
Security           ===> 0                 0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===> 024               0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===> Signon to CICS&/W&*F34BE9&/A
&(&/S VQRY&=MYAREA=&/A&)
TIOA at logoff     ===>

Initial Scenario   ===> SCENQRYI          Final Scenario      ===>
Input Scenario     ===>                   Output Scenario     ===>

P1=Update                          P3=Return                       P12=Server
```

VIRTEL transaction definition for Query input data

1.24.3. Parsing XML input

By using a combination of an INITIAL scenario and a VIRTEL transaction script, VIRTEL can transform XML input data in an HTTP request into a fixed-format data area for processing by a COBOL legacy application program.

1.24.3.1. HTTP request with XML input data

The simplest method of sending XML data to VIRTEL is to build an HTTP POST request containing the raw XML data in the request body. This is the format expected by the MAP$ FROM-INPUT instruction described 189. The figure below shows an example of an HTTP request containing XML input data:

```
POST /demohttp/xmldemo.xml+tran3 HTTP/1.0
Host: 192.168.235.30
```

```
Accept: */*
Content-Length: 197

<?xml version="1.0" ?>
<methodCall>
<screenname>T000-GAL</screenname>
<screentype>3270</screentype>
<params>
  <fieldname>FIELD001</fieldname>
  <uinput>A</uinput>
</params>
</methodCall><
```

Example HTTP request with XML input data

1.24.3.2. Presentation module for XML input data

An example INITIAL scenario for processing this XML input data is coded in the presentation module SCENXMLI shown below:

```
SCENXMLI SCREENS APPL=SCENXMLI
*
         SCENARIO INITIAL
OUTAREA  MAP$    BEGIN
         MAP$    AREA,WITH='screenname',LENGTH=8,TYPE=X
PARAMS   MAP$    BEGIN,WITH='params'
         MAP$    AREA,WITH='fieldname',LENGTH=8,TYPE=X
         MAP$    AREA,WITH='uinput',LENGTH=20,TYPE=X
PARAMS   MAP$    END
OUTAREA  MAP$    END
*
OUTAREA  MAP$    FROM-INPUT
OUTAREA  MAP$    TO-VARIABLE,VAR='MYAREA'
         SCENARIO END
*
         SCRNEND
         END    ,
```

HTTP presentation module for XML input data

1.24.3.3. Contents of generated commarea

The figure below shows the 36-byte commarea generated in the VIRTEL variable MYAREA:

```
----+----1----+----2----+----3----+-
T000-GALFIELD001A
```

Commarea generated from XML input data

1.24.3.4. Sending XML input as URL-encoded data

For some applications it may be more convenient to send the XML data as part of the URL. To conform with URL syntax rules, the XML data is embedded in an HTML text field, and blanks and other special characters in the XML data are replaced by their corresponding URL-encoded values ("+" signs and "%xx" sequences). This format can be generated by means of an HTML form, as shown in the example below:

```
<HTML><HEAD><TITLE>Syspertec - XML Application with VIRTEL</TITLE></HEAD>
<BODY><CENTER>
<FORM method=GET name="VirtelForm" action="/demohttp/xmldemo.xml+tran3">
```

```
<TEXTAREA cols="45" rows="20" name="MYINPUT">
<?xml version="1.0" ?>
<methodCall>
<screenname>T000-GAL</screenname>
<screentype>3270</screentype>
<params>
  <fieldname>FIELD001</fieldname>
  <uinput>A</uinput>
</params>
</methodCall>
</TEXTAREA>
<p><BUTTON type="submit">Submit</BUTTON>
</FORM></CENTER>
</BODY>
</HTML>
```

HTML form with XML input data embedded in a text field

The HTTP request generated by the above HTML form is presented to VIRTEL in the format shown below:

```
GET /demohttp/xmldemo.xml+tran3?MYINPUT=%3C%3Fxml+version%3D%221.0%22%3F%
3E%0D%0A%3CmethodCall%3E%0D%0A%3Cscreenname%3ET000-GAL%3C%2Fscreenname%3E
%0D%0A%3Cscreentype%3E3270%3C%2Fscreentype%3E%0D%0A%3Cparams%3E%0D%0A++%3
Cfieldname%3EFIELD001%3C%2Ffieldname%3E%0D%0A++%3Cuinput%3EA%3C%2Fuinput%
3E%0D%0A%3C%2Fparams%3E%0D%0A%3C%2FmethodCall%3E%0D%0A HTTP/1.0
Host: 192.168.235.30
Accept: */*
```

XML input data in URL-encoded format (HTTP GET method)

By changing the FORM METHOD to POST (instead of GET), the HTTP request can be presented to VIRTEL in the alternative format shown below:

```
POST /demohttp/xmldemo.xml+tran3 HTTP/1.0
Host: 192.168.235.30
Accept: */*
Content-Type: application/x-www-form-urlencoded
Content-Length: 314

MYINPUT=%3C%3Fxml+version%3D%221.0%22%3F%3E%0D%0A%3CmethodCall%3E%0D%0A%3C
screenname%3ET000-GAL%3C%2Fscreenname%3E%0D%0A%3Cscreentype%3E3270%3C%2Fsc
reentype%3E%0D%0A%3Cparams%3E%0D%0A++%3Cfieldname%3EFIELD001%3C%2Ffieldnam
e%3E%0D%0A++%3Cuinput%3EA%3C%2Fuinput%3E%0D%0A%3C%2Fparams%3E%0D%0A%3C%2Fm
ethodCall%3E%0D%0A
```

XML input data in URL-encoded format (HTTP POST method)

Both of these request formats can be processed by a presentation module similar to the SCENXMLI module shown previously. The only change necessary to process URL-encoded data is that the statement OUTAREA MAP$ FROM-INPUT must be replaced by the statement OUTAREA MAP$ FROM-FIELD,FIELD='MYINPUT'

1.24.3.5. Transaction definition for XML input data

The HTTP requests shown above use the URL /demohttp/xmldemo.xml+tran3 to invoke the VIRTEL transaction shown below (tran3 is the “external name” of the transaction). The “TIOA at logon” field contains a connection script. After signing on to CICS, the connection script uses the &/S order to process the INITIAL scenario in the presentation module SCENXMLI. This scenario converts the XML data into a VIRTEL variable named MYAREA. The script then invokes a CICS transaction VHLP, passing the contents of MYAREA as input data. The CICS transaction performs an EXEC CICS RECEIVE to obtain the input data.

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: VIRTELD2 15:32:33

Internal name ===> CLI-16E             To associate with an entry point name
```

```
External name ===> tran3                   Name displayed on user menu
Description   ===> Demonstration VIRTEL XML
Application   ===> CICSPROD                Application to be called
PassTicket    ===> 0  Name ===>            0=no 1=yes 2=unsigned
Application type   ===> 1                  1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> CLVTA              Prefix of name of partner terminals
Logmode            ===>                    Specify when LOGMODE must be changed
How started        ===> 1                  1=menu 2=sub-menu 3=auto
Security           ===> 0                  0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===> 024                0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===> Signon to CICS&/W&*F34BE9&/A
&(&/S VHLP&=MYAREA=&/A&)
TIOA at logoff     ===>

Initial Scenario   ===> SCENXMLI           Final Scenario     ===>
Input Scenario     ===>                    Output Scenario    ===> SCENXMLO

P1=Update                         P3=Return                      P12=Server
```

VIRTEL transaction definition for XML input data

1.24.3.6. XML input with attributes and repeating groups

The figure below shows an example of XML input data containing attributes and repeating groups of fields:

```
<?xml version="1.0" ?>
<request>
<id type="RP" date="20.01.2006" numreq="2">8019A</id>
<part>
  <key suffix="01">GROMMET</key>
  <stat>3</stat>
  <type>C</type>
</part>
<part>
  <key suffix="02">GREVILE</key>
  <type>D</type>
  <stat>3</stat>
</part>
</request>
```

Example XML input data with attributes and repeating groups

An INITIAL scenario for processing this XML input data is coded in the presentation module SCENXMLA shown below:

```
SCENXMLA SCREENS APPL=SCENXMLA
*
         SCENARIO INITIAL
*
COMMAREA MAP$  BEGIN
         MAP$  AREA,WITH='id',LENGTH=5
         MAP$  AREA-ATTRIBUTE,VALUEOF='date',LENGTH=8,TYPE=ONLY9
         MAP$  AREA-ATTRIBUTE,VALUEOF='type',LENGTH=2
         MAP$  AREA-ATTRIBUTE,VALUEOF='numreq',LENGTH=2,TYPE=9
DETAIL   MAP$  BEGIN,WITH='part',OCCURS=5
         MAP$  AREA-ATTRIBUTE,WITH='key',VALUEOF='suffix',            *
               LENGTH=2,TYPE=9
         MAP$  AREA,LENGTH=8
         MAP$  AREA,WITH='type',LENGTH=1
         MAP$  AREA,WITH='stat',LENGTH=1
DETAIL   MAP$  END
COMMAREA MAP$  END
*
COMMAREA MAP$    FROM-INPUT
COMMAREA MAP$    TO-VARIABLE,VAR='MYCOMMAREA'
         SCENARIO END
*
         SCRNEND
         END
```

Presentation module for XML input with attributes and repeating groups

The figure below shows the 77-byte commarea generated in the VIRTEL variable MYCOMMAREA:

```
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+--
8019A20012006RP0201GROMMET C302GREVILE D300          00          00
```

Commarea generated from XML input with attributes and repeating groups

1.24.3.7. XML input with redefinition of fields

This example shows how the commarea can be redefined according to the value of a field in the XML input. In this example, the input can be in one of two formats, depending on the value of the field whose name is “reqtype”:

```
Request type A

<?xml version="1.0" ?>
<request>
<reqid>1234</reqid>
<reqtype>A</reqtype>
<itemcode>12345</itemcode>
<details>
  <color>blue</color>
  <quantity>5</quantity>
</details>
</request>

Request type B

<?xml version="1.0" ?>
<request>
<reqid>2345</reqid>
<reqtype>B</reqtype>
<itemcode>23456</itemcode>
<details>
  <lang>EN</lang>
  <format>quarto</format>
</details>
</request>
```

Example XML input data with redefinition of fields

An INITIAL scenario for processing this XML input data is coded in the presentation module SCENXMLR shown below:

```
SCENXMLR SCREENS APPL=SCENXMLR
*
         SCENARIO INITIAL
*
HEADER   MAP$  BEGIN
         MAP$  AREA,WITH='reqid',LENGTH=4,TYPE=9
         MAP$  AREA,WITH='reqtype',LENGTH=1,TYPE=X,VAR='TRIGGER'
         MAP$  AREA,WITH='itemcode',LENGTH=6,TYPE=9
HEADER   MAP$  END
*
HEADER   MAP$  FROM-INPUT,FIELD='MYINPUT'
HEADER   MAP$  TO-VARIABLE,VAR='MYHEAD'
*
         IF$   VARIABLE,'TRIGGER',EQ='A',THEN=TYPEA
         IF$   VARIABLE,'TRIGGER',EQ='B',THEN=TYPEB
         SCENARIO END
*
TYPEA    EQU   *
DETAILA  MAP$  BEGIN,WITH='details'
         MAP$  AREA,WITH='color',LENGTH=8,TYPE=X
         MAP$  AREA,WITH='quantity',LENGTH=5,TYPE=9
DETAILA  MAP$  END
*
DETAILA  MAP$  FROM-INPUT,FIELD='MYINPUT'
DETAILA  MAP$  TO-VARIABLE,VAR='MYBODY'
         SCENARIO END
*
TYPEB    EQU   *
DETAILB  MAP$  BEGIN,WITH='details'
         MAP$  AREA,WITH='lang',LENGTH=2,TYPE=X
         MAP$  AREA,WITH='format',LENGTH=8,TYPE=X
DETAILB  MAP$  END
*
DETAILB  MAP$  FROM-INPUT,FIELD='MYINPUT'
DETAILB  MAP$  TO-VARIABLE,VAR='MYBODY'
         SCENARIO END
*
         SCRNEND
         END
```

Presentation module for XML input with redefinition of fields

This scenario generates two commareas, which are saved in VIRTEL variables MYHEAD and MYBODY, as shown below:

```
Request type A

        ----+----1----+----2----+----3
MYHEAD: 1234A012345
MYBODY: blue    00005

Request type B

        ----+----1----+----2----+----3
MYHEAD: 2345B023456
MYBODY: ENquarto
```

Commarea generated from XML input with redefinition of fields

1.24.4. Presentation of XML output

By using an output scenario and a suitable page template, VIRTEL can transform application program output into XML when the result is sent back in the HTTP response.

1.24.4.1. Presentation module for XML output

An output scenario is used to extract data from the output 3270 data stream of the transaction and place it into one or more table variables. The example presentation module SCENXMLO shown below contains an OUTPUT scenario which creates two variables, ACCTNUM and FULLNAME, from a table of values displayed on the 3270 screen:

```
SCENXMLO SCREENS EXEC=NO
         SCENARIO OUTPUT
         IF$   (04,2,6),EQ='      ',THEN=SKIP04
         COPY$ SCREEN-TO-VARIABLE,SCREEN=(04,2,6),VAR='ACCTNUM'
         COPY$ SCREEN-TO-VARIABLE,SCREEN=(04,10,20),VAR='FULLNAME'
SKIP04   EQU   *
         IF$   (05,2,6),EQ='      ',THEN=SKIP05
         COPY$ SCREEN-TO-VARIABLE,SCREEN=(05,2,6),VAR='ACCTNUM'
         COPY$ SCREEN-TO-VARIABLE,SCREEN=(05,10,20),VAR='FULLNAME'
```

```
SKIP05   EQU   *
         IF$   (06,2,6),EQ='      ',THEN=SKIP06
         COPY$ SCREEN-TO-VARIABLE,SCREEN=(06,2,6),VAR='ACCTNUM'
         COPY$ SCREEN-TO-VARIABLE,SCREEN=(06,10,20),VAR='FULLNAME'
SKIP06   EQU   *
         IF$   (07,2,6),EQ='      ',THEN=SKIP07
         COPY$ SCREEN-TO-VARIABLE,SCREEN=(07,2,6),VAR='ACCTNUM'
         COPY$ SCREEN-TO-VARIABLE,SCREEN=(07,10,20),VAR='FULLNAME'
SKIP07   EQU   *
         SCENARIO END
         SCRNEND
         END
```

HTTP presentation module for XML output

Note: It is also possible for the application program to create VIRTEL table variables directly, either by means of an "FAE5", page 242 structured field, or via the HOST4WEB command "SET VARIABLE", page 0. The FAE5 structured field allows the application to pass large amounts of raw data to VIRTEL without being constrained by the limitations of the 3270 screen geometry. For such "VIRTEL-aware" applications, an output scenario is not necessary.

1.24.4.2. Page template for XML output

The URL in this example is /demohttp/xmldemo.xml+tran3 which requests VIRTEL to use the page template xmldemo.xml to process the output of the tran3 transaction. The purpose of the page template is to convert the transaction output into XML format.

In the page template xmldemo.xml shown below, the output data is obtained from the VIRTEL table variables ACCTNUM and FULLNAME which were created either by the output scenario SCENXMLO, or directly by the application program:

```
<?xml version="1.0"?>
<!--VIRTEL start="{{{" end="}}}" -->
{{{SET-OUTPUT-ENCODING-UTF-8 ""}}}
<accounts>
{{{FOR-EACH-VALUE-IN "ACCTNUM"}}}
  <account>
    <id>{{{TRIMMED-VALUE-OF "ACCTNUM"}}}</id>
    <name>{{{TRIMMED-VALUE-OF "FULLNAME"}}}</name>
  <account>
{{{END-FOR "ACCTNUM"}}}
</accounts>
```

Example page template for XML output data

1.24.5. VIRTEL as an XML parser/generator

An application can use the VIRTEL HTTP server as an XML parser/generator engine. A client program establishes a TCP/IP session with the VIRTEL HTTP server, and sends XML or commarea data to VIRTEL in an HTTP request. VIRTEL performs conversion to or from XML, and returns the resulting commarea or XML data to the client program in the HTTP response.

It is the INITIAL scenario associated with the VIRTEL transaction which determines whether the conversion is from XML to commarea format, or vice versa. Conversion from XML to commarea format is performed by a transaction whose INITIAL scenario contains a MAP$ FROM-FIELD or MAP$ FROM-INPUT instruction. Conversion from commarea to XML format is performed by a transaction whose INITIAL scenario contains a TOVAR$ FROM-FIELD or TOVAR$ FROM-INPUT instruction. Both scenarios can reference a common set of MAP$ statements which describe the relationship between the XML stream and the commarea. In each case an appropriate page template must also be used, as shown in the detailed examples which follow.

1.24.5.1. Communication via VIRKIX

A client program running under CICS on MVS can use VIRKIX to establish the HTTP connection, send the request, and receive the response. The client program may send the request in either ASCII or EBCDIC; both formats are recognized and supported by VIRTEL. Notice the use of the special header GIVE-LENGTH-PREFIX which requests VIRTEL to add a 4-byte length prefix to the HTTP response, to conform with the format expected by VIRKIX CALL type 'M'.

1.24.5.2. Example MAP$ statements

The copy member SCONVMAP shown below contains the MAP$ statements common to both examples presented in this section. This member is copied into each of the scenarios SCONVXML and SCONVPLA by means of an assembler COPY statement.

```
Member name SCONVMAP

CAREA    MAP$  BEGIN
         MAP$  AREA,WITH='date',LENGTH=8,TYPE=(ONLY9,LEFT-ALIGNED),    *
               FORMAT=('9999-99-99',9)
IDENT    MAP$  BEGIN,WITH='identity'
         MAP$  EVENTUAL-AREA,FROM-CONSTANT,'1',WHEN=(ELEMENT,'bic')
         MAP$  ELSETHEN-AREA,FROM-CONSTANT,'2',WHEN=(ELEMENT,'iban')
         MAP$  ELSETHEN-AREA,FROM-CONSTANT,'3',WHEN=(ELEMENT,'rib')
         MAP$  ELSETHEN-AREA,FROM-CONSTANT,' '
         MAP$  AREA,LENGTH=8
IDENT    MAP$  END
VERIF    MAP$  BEGIN,WITH='verified'
         MAP$  EVENTUAL-AREA,FROM-CONSTANT,'1',WHEN=(VALUE,'yes')
         MAP$  ELSETHEN-AREA,FROM-CONSTANT,'0',WHEN=(VALUE,'no')
         MAP$  ELSETHEN-AREA,FROM-CONSTANT,'0'
VERIF    MAP$  END
         MAP$  AREA,WITH='amount',LENGTH=5,TYPE=ONLY9,                 *
               FORMAT=('$999.99',9)
CAREA    MAP$  END
```

MAP$ statements for VIRTEL XML parser/generator

1.24.5.3. XML-to-commarea conversion using the VIRTEL XML parser

The figure below shows an example transaction definition to be used for XML-to-commarea conversion using the VIRTEL XML parser. The external name "tranxml" is the name referenced in the URL of the HTTP request which calls the transaction. The special application name $NONE$ indicates that no host application is to be called. The /&S order specified in the "TIOA at Logon" field causes the INITIAL scenario "SCONVXML", page 0 to be executed.

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: VIRTELD2 16:39:25

Internal name ===> HTTP-16X             To associate with an entry point name
External name ===> tranxml              Name displayed on user menu
Description   ===> VIRTEL XML parser
Application   ===> $NONE$               Application to be called
PassTicket    ===> 0  Name ===>         0=no 1=yes 2=unsigned
Application type   ===> 2               1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> HTLOC           Prefix of name of partner terminals
Logmode            ===>                 Specify when LOGMODE must be changed
How started        ===> 1               1=menu 2=sub-menu 3=auto
Security           ===> 0               0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                 0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===> &/S &/T

TIOA at logoff     ===>
```

```
 Initial Scenario    ===> SCONVXML          Final Scenario     ===>
 Input Scenario      ===>                   Output Scenario    ===>

 P1=Update                          P3=Return                       P12=Server
```

VIRTEL transaction definition for XML-to-commarea conversion

The initial scenario for XML-to-commarea conversion is shown below:

```
Member name SCONVXML

SCONVXML SCREENS APPL=SCONVXML
         SCENARIO INITIAL
         COPY  SCONVMAP      (copy member shown in Figure  1 -126)
CAREA    MAP$  FROM-INPUT
CAREA    MAP$  TO-VARIABLE,VAR='MYAREA'
         SCENARIO END
         SCRNEND
         END
```

Initial scenario for XML-to-commarea conversion

An example request for XML-to-commarea conversion using the VIRTEL XML parser is shown in the figure below:

```
POST /demohttp/myarea.txt+tranxml HTTP/1.1
Host: 192.168.235.30
Accept: */*
Content-Length: 172
Special: GIVE-LENGTH-PREFIX

<?xml version="1.0" ?>
<request>
 <date>2006-06-21</date>
 <identity><iban>AB1234CD</iban></identity>
 <verified>yes</verified>
 <amount>$123.45</amount>
</request>
```

Input request for XML-to-commarea conversion

The HTTP request shown above specifies the use of a page template named myarea.txt which is stored in a VIRTEL directory and is shown in the figure below. By use of this page template, the commarea MYAREA created by the INITIAL scenario SCONVXML is inserted into the HTTP response data:

```
Page template myarea.txt

<!--VIRTEL start="{{{" end="}}}" -->
{{{ SET-CONTENT-TYPE "text/plain"}}}
{{{ CURRENT-VALUE-OF "MYAREA" }}}
```

Page template for XML-to-commarea conversion

The figure below shows the HTTP response returned by VIRTEL. The body of the response contains the input data converted to commarea format:

```
HTTP/1.1 200 Ok
Server: Virtel/4.32
Date: Wed, 21 Jun 2006 15:31:02 GMT
Expires: 0
Content-length: 00000029
Content-type: text/plain
```

```
200606212AB1234CD112345
```

Output response from XML-to-commarea conversion

1.24.5.4. Commarea-to-XML conversion using the VIRTEL XML generator

The figure below shows an example transaction definition to be used for commarea-to-XML conversion using the VIRTEL XML generator. The external name “trancom” is the name referenced in the URL of the HTTP request which calls the transaction. The special application name $NONE$ indicates that no host application is to be called. The /&S order specified in the “TIOA at Logon” field causes the INITIAL scenario “SCONVPLA”, page 0 to be executed.

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: VIRTELD2 16:39:58

Internal name ===> HTTP-16Y                To associate with an entry point name
External name ===> trancom                 Name displayed on user menu
Description   ===> VIRTEL XML generator
Application   ===> $NONE$                  Application to be called
PassTicket    ===> 0  Name ===>            0=no 1=yes 2=unsigned
Application type   ===> 2                  1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> HTLOC              Prefix of name of partner terminals
Logmode            ===>                    Specify when LOGMODE must be changed
How started        ===> 1                  1=menu 2=sub-menu 3=auto
Security           ===> 0                  0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                    0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===> &/S &/T

TIOA at logoff     ===>

Initial Scenario   ===> SCONVPLA           Final Scenario     ===>
Input Scenario     ===>                    Output Scenario    ===>

P1=Update                          P3=Return                          P12=Server
```

VIRTEL transaction definition for commarea-to-XML conversion

The initial scenario for commarea-to-XML conversion is shown below:

```
Member name SCONVPLA

SCONVPLA SCREENS APPL=SCONVPLA
         SCENARIO INITIAL
         COPY  SCONVMAP
CAREA    TOVAR$ FROM-INPUT
         SCENARIO END
         SCRNEND
         END
```

Initial scenario for commarea-to-XML conversion

An example request for commarea-to-XML conversion using the VIRTEL XML parser is shown in the figure below:

```
POST /demohttp/mydata.xml+trancom HTTP/1.1
Host: 192.168.235.30
Accept: */*
Content-Length: 27
Special: GIVE-LENGTH-PREFIX

200606212AB1234CD112345
```

Input request for commarea-to-XML conversion

The HTTP request shown above specifies the use of a page template named mydata.xml which is stored in a VIRTEL directory and is shown in the figure below. By use of this page template, the output variables created by the TOVAR$ instruction in the INITIAL scenario SCONVPLA are inserted into the HTTP response data:

```
Page template mydata.xml

<?xml version="1.0" encoding="UTF-8"?>
<!--VIRTEL start="{{{" end="}}}" -->
{{{ SET-CONTENT-TYPE "text/xml"}}}{{{SET-OUTPUT-ENCODING-UTF-8 ""}}}
<request>
 <date>{{{CURRENT-VALUE-OF "date"}}}</date>
 <identity>
  {{{WHEN-EXISTS "bic"}}}<bic>{{{CURRENT-VALUE-OF "bic"}}}</bic>{{{END
-WHEN-EXISTS "bic"}}}
  {{{WHEN-EXISTS "iban"}}}<iban>{{{CURRENT-VALUE-OF
"iban"}}}</iban>{{{END-WHEN-EXISTS "iban"}}}
  {{{WHEN-EXISTS "rib"}}}<rib>{{{CURRENT-VALUE-OF "rib"}}}</rib>{{{END
-WHEN-EXISTS "rib"}}}
 </identity>
 <verified>{{{CURRENT-VALUE-OF "verified"}}}</verified>
 <amount>{{{CURRENT-VALUE-OF "amount"}}}</amount>
</request>
```

Page template for commarea-to-XML conversion

The figure below shows the HTTP response returned by VIRTEL. The body of the response contains the input commarea data converted to XML format:

```
HTTP/1.1 200 Ok
Server: Virtel/4.32
Date: Wed, 21 Jun 2006 16:02:55 GMT
Expires: 0
Content-length: 00000207
Content-type: text/xml

<?xml version="1.0" encoding="UTF-8"?>


<request>
 <date>2006-06-21</date>
 <identity>

  <iban>AB1234CD</iban>

 </identity>
 <verified>yes</verified>
 <amount>$123.45</amount>
</request>
```

Output response from commarea-to-XML conversion

1.24.6. Automatic scenario generation

1.24.6.1. MAPGEN program

The MAPGEN program allows the automatic generation of scenarios from COBOL copybooks.

The input to the MAPGEN program is a COBOL copybook containing data division definitions of a commarea. The output from the MAPGEN program may be:

- a scenario for “input-to-commarea” conversion
- a scenario for “commarea-to-output” conversion
- an optional page template to convert the generated output variables into XML format

The MAPGEN program (MAPGREX) and the JCL to execute it (MAPGJCL) are delivered as members of the VIRTEL SAMPLIB. The start of the MAPGJCL job is shown below:

```
//VIRMAPGN JOB 1,MAPGEN,CLASS=A,MSGCLASS=X,NOTIFY=&SYSUID
//*
//* MAPGEN : Generate VIRTEL SCENARIO from COBOL copybook
//*
// SET QUAL=yourqual.VIRTnnn      Prefix of VIRTEL dataset names
// SET COPYLIB=your.cobol.srcelib Library containing copybook
// SET MEMBER=copybook            Copybook member name
// SET STYLE=APOST                APOST or QUOTE
// SET PREFIX='TIOA-'             Field name prefix to be removed
// SET CASE=LOWER                 Field names UPPER or LOWER case
// SET CODE='ENC=IE'              UTF-8 or ISO or ENC=varname
// SET FORMAT=QUERY               XML QUERY 'XML=f' COM 'COM=x'
// SET VAR=MYCOMMAREA             Output (XML/QUERY) Input (COM)
// SET XMLGEN=NO                  YES or NO to run XMLGEN step
//*
```

Automatic scenario generation: MAPGJCL job

The parameters required to customize this job are coded as SET statements at the start of the job. The meaning of the parameters is as follows:

QUAL=yourqual.VIRTnnn

> Prefix of VIRTEL dataset names. This job requires access to the SAMPLIB, LOADLIB, and SCRNAPI.MACLIB datasets. The generated scenario is written as a load module in the LOADLIB dataset.

COPYLIB=your.cobol.srcelib

> Name of library containing the input copybook

MEMBER=copybook

> Member name of the input copybook in the COPYLIB library

STYLE=APOST|QUOTE

> Specifies whether the copybook uses single or double quotation marks to delimit strings. APOST (single quotation marks) is the default

PREFIX='prefix'

> (optional) If specified, the prefix will be removed from the field names in the copybook

CASE=LOWER|UPPER

> (optional) If specified, all field names in the copybook will be converted to LOWER or UPPER case. If not specified, the case will be preserved.

CODE=encoding

> (optional) Specifies the encoding of HTML form-field parameters in the input URL. The following encodings may be specified:
>
> **UTF-8**
>
> > Input form-fields are encoded in UTF-8 format
>
> **ISO**
>
> > Input form-fields are encoded in non-UTF-8 format
>
> **'ENC=fieldname'**
>
> > The contents of the URL form-field named fieldname are queried to obtain the encoding value (UTF-8 or ISO). This allows the client to dynamically specify the encoding method by means of a URL parameter.

> If CODE is not specified, or if CODE='ENC=fieldname' is specified and the URL does not contain the parameter fieldname=UTF-8 or fieldname=ISO, then the VIRTEL default encoding (ISO) is assumed.

FORMAT=format

Specifies the type of scenario to be generated. The following formats may be specified:

QUERY

Generates an INITIAL scenario which accepts input data encoded as HTML form-fields, and produces an output commarea. The generated scenario contains a “MAP$ FROM-INPUT”, page 184, QUERY instruction.

XML

Generates an INITIAL scenario which accepts XML input data in the body of an HTTP request, and produces an output commarea. The generated scenario contains a “MAP$ FROM-INPUT”, page 184, XML instruction.

'XML=fieldname'

Generates an INITIAL scenario which accepts XML input encoded within an HTML form-field named fieldname, and produces an output commarea. The generated scenario contains a “MAP$ FROM-FIELD”, page 184 instruction with the parameter FIELD=fieldname.

COM

When VAR is not specified: Generates an INITIAL scenario which accepts an input commarea in the body of an HTTP request, and produces a set of VIRTEL variables whose names correspond to the fields in the copybook. The generated scenario contains a “TOVAR$ FROM-INPUT”, page 198 instruction.

When VAR is specified: Generates an OUTPUT scenario which accepts an input commarea contained in the VIRTEL variable named by the VAR parameter, and produces a set of VIRTEL variables whose names correspond to the fields in the copybook. The generated scenario contains a “MAP$ FROM-VARIABLE”, page 185 instruction.

'COM=fieldname'

Generates an INITIAL scenario which accepts an input commarea encoded within an HTML form-field named fieldname, and produces a set of VIRTEL variables whose names correspond to the fields in the copybook. The generated scenario contains a “MAP$ FROM-FIELD”, page 184 instruction with the parameter FIELD=fieldname.

VAR=commareaname

For FORMAT=QUERY, FORMAT=XML, FORMAT='XML=fieldname'

Specifies the name of the VIRTEL variable into which the output commarea is written. If not specified, the default is VAR=AREA

For FORMAT=COM

Optionally specifies the name of the VIRTEL variable which contains the input commarea

XMLGEN=YES|NO

Specifies whether an additional XMLGEN step is to be run. This parameter is useful when FORMAT=COM or FORMAT='COM=fieldname' is specified. If XMLGEN=YES then the job also generates a VIRTEL page template suitable for converting the VIRTEL result variables into XML format. The generated page template is written to userid.XMLGEN.OUTPUT which must be preallocated as a sequential dataset. The contents of this dataset should then be transferred to your workstation where it can be uploaded into a VIRTEL directory (see “Uploading pages by HTTP”, page 68).

1.25. Incoming E-mails

The arrival of an e-mail on an SMTP line can trigger one of two types of action in VIRTEL, depending on the entry point chosen by the rules of the SMTP line:

- Transfer of attached files to a VIRTEL directory
- Start a CICS transaction (or other VTAM application)

1.25.1. Rules of the SMTP line

When an e-mail arrives on an SMTP line, VIRTEL examines the rules of the line to determine which entry point will be used to process the incoming message. In the example below, the rule specifies that when the e-mail destination address is cicsmail@sample.com, and the sender address is customer@client.com, then entry point SMTPCICS will be used:

```
DETAIL of RULE from RULE SET: S-SMTP   ------------- Applid: SPVIRE2  15:46:00

Name           ===> SM200EML              Rule priority is per name
Status         ===> ACTIVE                19 May 2004 15:46:00       VIRDBA
Description    ===> Appels entrants SMTP
Entry point    ===> SMTPCICS              Target Entry Point
Parameter      ===>                                  optional &1 value
Trace          ===>                       1=commands 2=data 3=partner

C : 0=IGNORE 1=IS 2=IS NOT 3=STARTS WITH 4=DOES NOT 5=ENDS WITH 6=DOES NOT
0 IP Subnet    ===> 000.000.000.000       Mask     ===> 000.000.000.000
1 Host         ===> cicsmail@sample.com
1 eMail        ===> customer@client.com
0 Calling DTE ===>                        Calling DTE address
0 Called       ===>                       Called DTE address
0 CUD0 (Hex)   ===>                       First 4 bytes of CUD (X25 protocol)
0 User Data    ===>

0 Days         ===> M:      T:      W:      T:      F:      S:      S:
0 Start time   ===> H:      M:      S:     End time ===> H:      M:      S:

P1=Update                          P3=Return                      Enter=Add
P4=Activate                        P5=Inactivate                  P12=Entry P.
CREATION OK
```

Rule for routing an incoming e-mail on an SMTP line

1.25.2. File transfer by e-mail

An entry point which is used for file file transfer (including the upload of HTML pages) has a single transaction which calls VIRTEL module VIR0041B. This transaction is defined with application type 2 and startup mode 1. The menu program specified in the entry point must be VIR0021B.

Only authorized users (see "Correspondent Management", page 64) can perform transfers.

```
ENTRY POINT DETAIL DEFINITION ---------------------- Applid: SPVIRE2    15:52:26

Name           ===> SMTP                  Name this ENTRY POINT (LOGON DATA)
Description    ===> Receive e-mail for file transfer
Transactions   ===> SMTP                  Prefix for associated transactions
Videotex key   ===>                       If videotex, keyword or $NONE$
Transparency   ===>                       Server types NOT to emulate
Time out       ===> 0005       minutes    Maximum inactive time
Do if timeout ===> 0                      0=logoff  1=bip+logoff   2=anti pad
Emulation      ===> EMAIL                 Type of terminal:
MINITEL      :  40 or 80 columns          PC     :  Emulation done by VirtelPC
HTML         :  Web Browser               VT     :  VT 100
EBCDIC       :  not translated            X25    :  uses low level dialog
Signon program             ===>           Controls user name and password
Menu program               ===> VIR0021B  List of transactions
Identification scenario    ===>           eg XML identification
Type 3 compression         ===>           Discover typical screens  (Virtel/PC)
Mandatory identification   ===>                                 (PC or minitel)
3270 swap key              ===>           eg P24
Extended colors            ===>           E: extended  X: extended + DBCS

P1=Update                          P3=Return                   P4=Transactions
```

```
Enter=Add
```

Entry point for file transfer by SMTP

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: SPVIRE2  15:56:00

Internal name ===> SMTP-05                    To associate with an entry point name
External name ===> E-Mail                     Name displayed on user menu
Description   ===> File transfer by SMTP
Application   ===> VIR0041B                   Application to be called
PassTicket    ===> 0  Name ===>               0=no 1=yes 2=unsigned
Application type   ===> 2                     1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===>                       Prefix of name of partner terminals
Logmode            ===>                       Specify when LOGMODE must be changed
How started        ===> 1                     1=menu 2=sub-menu 3=auto
Security           ===> 1                     0=none 1=basic 2=NTLM 3=TLS 4=HTML
Translation(s)     ===>                       0=idem 1=8040 2=8080 3=4040 4=auto
Logon message      ===>

TIOA at logon      ===>

TIOA at logoff     ===>

Initial Scenario   ===>                       Final Scenario     ===>
Input Scenario     ===>                       Output Scenario    ===>

P1=Update                          P3=Return                       P12=Server
```

Transaction for file transfer by SMTP

1.25.3. Starting an application by e-mail

When an entry point is used for starting an application by e-mail, the application must be associated with a relay (or pseudo-3270 terminal) through which the application can retrieve the contents of the e-mail. It is therefore necessary to specify the name of a relay LU in the definition of the terminals attached to the SMTP line (refer to the VIRTEL Connectivity Reference documentation for details of defining an SMTP line).

For this type of application, the entry point chosen by the rules of the SMTP line has a single VIRTEL transaction, defined with application type 1 and startup mode 1, which calls the target VTAM application (such as CICS). The name of the CICS transaction to be started can be specified in the "TIOA at logon" field of the VIRTEL transaction definition. The menu program specified in the entry point must be VIR0021B.

```
ENTRY POINT DETAIL DEFINITION ---------------------- Applid: SPVIRE2    16:07:14

Name          ===> SMTPCICS                   Name this ENTRY POINT (LOGON DATA)
Description   ===> CICS transaction started by e-mail
Transactions  ===> SMCICS                     Prefix for associated transactions
Videotex key  ===>                            If videotex, keyword or $NONE$
Transparency  ===>                            Server types NOT to emulate
Time out      ===> 0001       minutes         Maximum inactive time
Do if timeout ===> 0                          0=logoff  1=bip+logoff   2=anti pad
Emulation     ===> EMAIL                      Type of terminal:
MINITEL     :  40 or 80 columns               PC     :  Emulation done by VirtelPC
HTML        :  Web Browser                    VT     :  VT 100
EBCDIC      :  not translated                 X25    :  uses low level dialog
Signon program              ===>              Controls user name and password
Menu program                ===> VIR0021B     List of transactions
Identification scenario     ===>              eg XML identification
Type 3 compression          ===>              Discover typical screens  (Virtel/PC)
Mandatory identification    ===>                                      (PC or minitel)
3270 swap key               ===>              eg P24
Extended colors             ===>              E: extended  X: extended + DBCS
```

```
 P1=Update                          P3=Return                   P4=Transactions
 Enter=Add
```

Entry point for application started by SMTP

```
 TRANSACTION DETAIL DEFINITION ---------------------- Applid: SPVIRE2  16:09:12

 Internal name ===> SMCICS-1                To associate with an entry point name
 External name ===> MAILIN                  Name displayed on user menu
 Description   ===> CICS transaction started by e-mail
 Application   ===> SPCICST                 Application to be called
 PassTicket    ===> 0  Name ===>            0=no 1=yes 2=unsigned
 Application type   ===> 1                  1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
 Pseudo-terminals   ===>                    Prefix of name of partner terminals
 Logmode            ===>                    Specify when LOGMODE must be changed
 How started        ===> 1                  1=menu 2=sub-menu 3=auto
 Security           ===> 1                  0=none 1=basic 2=NTLM 3=TLS 4=HTML
 Translation(s)     ===>                    0=idem 1=8040 2=8080 3=4040 4=auto
 Logon message      ===>

 TIOA at logon      ===> MELI

 TIOA at logoff     ===>

 Initial Scenario   ===>                    Final Scenario     ===>
 Input Scenario     ===>                    Output Scenario    ===>

 P1=Update                          P3=Return                       P12=Server
```

Transaction for application started by SMTP

The corresponding CICS definition is shown in the example below:

```
DEFINE PROFILE(MELPROF) GROUP(VIRTSMTP)
       DESCRIPTION(TRANSACTION TO PROCESS INCOMING EMAILS)
       UCTRAN(NO)
DEFINE TRANSACTION(MELI) GROUP(VIRTSMTP)
       DESCRIPTION(TRANSACTION TO PROCESS INCOMING EMAILS)
       PROGRAM(SMTPMELI) PROFILE(MELPROF)
DEFINE PROGRAM(SMTPMELI) GROUP(VIRTSMTP)
       DESCRIPTION(PROGRAM TO PROCESS INCOMING EMAILS)
```

CICS definitions for application started by e-mail

Note that the UCTRAN(NO) parameter must be specified both in the PROFILE and in the TYPETERM, and that the RECEIVESIZE specified in the TYPETERM must be sufficient to contain the e-mail response data structured field.

One the application has been launched, it can retrieve data from the e-mail by sending an FAC8 code 12 structured field to VIRTEL via the relay LU and reading the response (see “Retrieve Data From An E-Mail”, page 253).

1.26. VIRTEL Batch

1.26.1. VIRTEL Batch

The VIRTEL Batch facility allows you to run VIRTEL as a batch job to execute HTTP-like requests. VIRTEL reads HTTP-like requests from a SYSIN dataset, executes the desired transaction, and writes an HTTP-like response to a SYSOUT dataset. When all of the HTTP-like requests have been processed, VIRTEL terminates if requested.

VIRTEL runs as a batch job when both of the following conditions are true:

1. The VIRTCT contains a BATCH1 parameter. For details, refer to “Parameters of the VIRTCT” in the VIRTEL Installation Guide manual.
2. A BATCH line is defined in the VIRTEL configuration in the VIRARBO file. For details, refer to “Definition of a BATCH line” in the VIRTEL Connectivity Reference manual.

Before running a VIRTEL Batch job for the first time, several preparatory steps must be performed:

1. A VIRTCT for VIRTEL Batch must be assembled and link-edited into the VIRTEL load library
2. A configuration file (VIRARBO) for VIRTEL Batch must be built
3. A page template file (HTMLTRSF) for the VIRTEL Batch job must be allocated and loaded
4. Work files (VIRSWAP, VIRHTML) for the VIRTEL Batch job must be allocated and initialized

These preparatory steps, which in general only need to be performed once, are described in the following sections.

1.26.1.1. Assembling the VIRTCT for VIRTEL Batch

VIRTEL Batch requires a special VIRTCT which must be assembled and link-edited into the VIRTEL load library. The figure below shows SAMPLIB member VIRTCTBA, which is an example VIRTCT suitable for running VIRTEL Batch. The job ASMTCT in the VIRTEL SAMPLIB should be run once to assemble and link-edit this module as VIRTCTBA in the VIRTEL load library:

```
VIRTCTBA TITLE 'VIRTCT FOR VIRTEL BATCH'
         PRINT GEN
         VIRTERM TYPE=INITIAL,APPLID=*NOAPPL*,                         *
               BATCH1=(SYSIN,DCBI1,SYSPRINT,DCBO1),                    *
               VIRSV1=(VIRSV),                                         *
               HTVSAM=VIRHTML,                                         *
               BUFSIZE=16000,                                          *
               STATS=NO,                                               *
               UFILE1=(HTMLTRSF,ACBH1,0,10,01),                        *
               MEMORY=ABOVE,                                           *
               COMPANY='YOUR COMPANY NAME',                            *
               ADDR1='YOUR COMPANY ADDRESS',                           *
               ADDR2='YOUR COMPANY ADDRESS',                           *
               LICENCE='YOUR LICENCE ID',                              *
               EXPIRE=(2008,12,31),                                    *
               CODE='00000000'                                         *
               TITRE1='VIRTEL BATCH'
*---------------------------------------------------------------------*
ACBH1    ACB   AM=VSAM,DDNAME=HTMLTRSF,MACRF=(SEQ,DIR,OUT,LSR),        *
               STRNO=3
*---------------------------------------------------------------------*
DCBI1    DCB   DDNAME=SYSIN,       SYSIN DD                            *
               DCBE=DCBI1X,                                            *
               LRECL=80,                                               *
               DSORG=PS,                                               *
               RECFM=FB,                                               *
               MACRF=(GL)
DCBI1X   DCBE  EODAD=0,RMODE31=BUFF
*---------------------------------------------------------------------*
DCBO1    DCB   DDNAME=SYSPRINT,    SYSPRINT DD                         *
               DCBE=DCBO1X,                                            *
               LRECL=133,                                              *
               DSORG=PS,                                               *
               RECFM=FBA,                                              *
               MACRF=(PM)
DCBO1X   DCBE  RMODE31=BUFF
*---------------------------------------------------------------------*
         END
```

Example VIRTCT for VIRTEL Batch

1.26.1.2. Building the configuration file for VIRTEL Batch

VIRTEL Batch requires its own configuration file (VIRARBO) which defines a Batch Line, the page template dataset, a Batch Entry Point, and the Transactions which will be executed by the VIRTEL Batch job. The figure below shows SAMPLIB member VIRBATAR, which is an example of a job to create the VIRARBO file for use by VIRTEL Batch. This job should be run once before the first execution of a VIRTEL Batch job:

```
//VIRBATAR JOB 1,VIRBATAR,CLASS=A,MSGCLASS=X,NOTIFY=&SYSUID
// SET LOADLIB=yourqual.VIRTnnn.LOADLIB
//DEFINE  EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=*
 DELETE (yourqual.VIRBATCH.ARBO) CLUSTER PURGE
 SET MAXCC = 0
 DEFINE CLUSTER(NAME(yourqual.VIRBATCH.ARBO) -
                KEYS(9 0) RECSZ(100 4089) FSPC(10 10) -
                VOL(XXXXXX) REC(250,50) SHR(4) SPEED) -
        DATA(NAME(yourqual.VIRBATCH.ARBO.DATA) CISZ(4096)) -
        INDEX(NAME(yourqual.VIRBATCH.ARBO.INDEX))
//CONFIG  EXEC PGM=VIRCONF,COND=(0,NE),PARM='LOAD,LANG=&LANG'
//STEPLIB  DD  DSN=&LOADLIB,DISP=SHR
//SYSPRINT DD  SYSOUT=*
//VIRARBO  DD  DSN=yourqual.VIRBATCH.ARBO,DISP=SHR
      LINE     ID=B-BT1,NAME=BATCH-L1,
               DESC='VIRTEL Batch line',
               TYPE=BATCH1,ENTRY=EPBATCH,TERMINAL=BT,
               INOUT=1,PROTOCOL=VIRHTTP,RULESET=B-BT1
      TERMINAL ID=BTLOC000,
               DESC='VIRTEL Batch terminals (no relay)',
               TYPE=3,COMPRESS=2,INOUT=3,STATS=12,REPEAT=4
      TERMINAL ID=BTVTA000,RELAY=*HTTPOOL,
               DESC='VIRTEL Batch terminals (with relay)',
               TYPE=3,COMPRESS=2,INOUT=3,STATS=12,REPEAT=4
      TERMINAL ID=BTVTP000,RELAY=RVIRBT00,POOL=*HTTPOOL,
               DESC='Relay pool for HTTP',
               TYPE=3,COMPRESS=2,INOUT=3,STATS=12,REPEAT=4
      SUBDIR   ID=W2H-DIR,
               DESC='Pages for WEB2HOST',
               FSTYPE=V,DDNAME=HTMLTRSF,KEY=W2H-KEY,
               NAMELEN=64,AUTHUP=X,AUTHDOWN=X,AUTHDEL=X
      ENTRY    ID=EPBATCH,
               DESC='VIRTEL Batch entry point',
               TRANSACT=BAT,TIMEOUT=1,ACTION=0,EXTCOLOR=X,
               EMUL=HTML,SIGNON=VIR0020H,MENU=VIR0021A
      TRANSACT ID=BAT-00,NAME=EPBATCH,
               DESC='Default directory = entry point name',
               APPL=W2H-DIR,TYPE=4,
               TERMINAL=BTLOC,STARTUP=2,SECURITY=0
      TRANSACT ID=BAT-14,NAME='Protide',
               DESC='XML conversion',
               APPL=$NONE$,TYPE=2,
               TERMINAL=BTLOC,STARTUP=1,SECURITY=0,
               TIOASTA='&/S OK &/T',
               EXITSTA=SCENSVIO
* END OF CONFIGURATION
```

Job to build configuration file for VIRTEL Batch

1.26.1.3. Allocating the page template file for VIRTEL Batch

Each VIRTEL Batch job requires an HTMLTRSF file which contains the page templates used by the transactions which will be executed by the VIRTEL Batch job. The figure below shows SAMPLIB member VIRBATAT, which is an example job to allocate the HTMLTRSF file and to copy the page templates from the sample file (SAMPTRSF) distributed with VIRTEL. This job should be run once before the first execution of a VIRTEL Batch job:

```
//VIRBATAT JOB 1,VIRBATAT,CLASS=A,MSGCLASS=X,NOTIFY=&SYSUID
//*------------------------------------------------------------------*
//* DEFINITION OF FILE HTMLTRSF                                      *
//*------------------------------------------------------------------*
//SAMPTRF EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=*
 DELETE  (yourqual.VIRBATCH.HTMLTRSF) CLUSTER PURGE
 SET MAXCC = 0
 DEFINE CLUSTER (NAME(yourqual.VIRBATCH.HTMLTRSF) -
       VOL(XXXXXX) SHR(2) KEYS(16 0) RECSZ(100 32758) REC(250 100)) -
    DATA (NAME(yourqual.VIRBATCH.HTMLTRSF.DATA) SPANNED CISZ(4096)) -
    INDEX (NAME(yourqual.VIRBATCH.HTMLTRSF.INDEX) CISZ(512))
//*------------------------------------------------------------------*
//* INITIALISATION OF FILE HTMLTRSF                                  *
//*------------------------------------------------------------------*
//SAMPTRF EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=*
//SAMPTRSF DD  DSN=yourqual.VIRTnnn.SAMP.TRSF,DISP=SHR
//HTMLTRSF DD  DSN=yourqual.VIRBATCH.HTMLTRSF,DISP=OLD
//SYSIN    DD *
 REPRO INFILE(SAMPTRSF) OUTFILE(HTMLTRSF)
```

Job to allocate page template file for VIRTEL Batch

1.26.1.4. Allocating work files for VIRTEL Batch

Each VIRTEL Batch job requires its own VIRSWAP and VIRHTML files. The figure below shows SAMPLIB member VIRBATAW, which is an example job to allocate these files:

```
//VIRBATAW JOB 1,VIRBATAW,CLASS=A,MSGCLASS=X,NOTIFY=&SYSUID
//*---------------------------------------------------------------*
//* DEFINITION OF FILES VIRSWAP AND VIRHTML                       *
//*---------------------------------------------------------------*
//VIRWORK EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=*
 DELETE  (yourqual.VIRBATCH.SWAP) CLUSTER PURGE
 DELETE  (yourqual.VIRBATCH.HTML) CLUSTER PURGE
 SET MAXCC = 0
 DEFINE CLUSTER (NAME(yourqual.VIRBATCH.SWAP) -
       VOL(XXXXXX) KEYS(16 0) REC(10,5) RECSZ(100 8185) -
       REUSE FSPC(10 10) SHR(2) SPEED) -
    DATA (NAME(yourqual.VIRBATCH.SWAP.DATA) CISZ(8192)) -
    INDEX (NAME(yourqual.VIRBATCH.SWAP.INDEX))
 DEFINE CLUSTER (NAME(yourqual.VIRBATCH.HTML) -
       VOL(XXXXXX) KEYS(64 0) REC(5 5) RECSZ(1000 4089) -
       FSPC(10 10) SHR(4) SPEED) -
    DATA (NAME(yourqual.VIRBATCH.HTML.DATA) CISZ(4096)) -
    INDEX (NAME(yourqual.VIRBATCH.HTML.INDEX))
//*---------------------------------------------------------------*
//* INITIALISATION OF FILE VIRHTML                                *
//*---------------------------------------------------------------*
//INIHTML EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=*
//INIT     DD  DATA,DLM=AA
$$$$IWS.WORKREC.INW$TEMP
AA
//VIRHTML  DD  DSN=yourqual.VIRBATCH.HTML,DISP=OLD
 REPRO INFILE(INIT) OUTFILE(VIRHTML)
```

Job to allocate work files for VIRTEL Batch

1.26.1.5. Running the VIRTEL Batch job

The figure below shows SAMPLIB member VIRBATCH, which contains an example of a VIRTEL Batch job:

```
//VIRBATCH JOB 1,VIRBATCH,CLASS=G,MSGCLASS=X,NOTIFY=&SYSUID
// SET TCT=BA
// SET QUAL1=yourqual.VIRT454
// SET QUAL2=yourqual.VIRBATCH
//VIRBAT  EXEC PGM=VIR0000,REGION=64M,PARM=&TCT
//STEPLIB  DD  DISP=SHR,DSN=&QUAL1..LOADLIB
//DFHRPL   DD  DISP=SHR,DSN=&QUAL1..LOADLIB
//SERVLIB  DD  DISP=SHR,DSN=&QUAL1..LOADLIB
//VIRARBO  DD  DISP=OLD,DSN=&QUAL2..ARBO
//VIRSWAP  DD  DISP=OLD,DSN=&QUAL2..SWAP
//VIRHTML  DD  DISP=OLD,DSN=&QUAL2..HTML
//HTMLTRSF DD  DISP=OLD,DSN=&QUAL2..HTMLTRSF
//SYSIN    DD  *
 (commands and data statements, see below)
//SYSPRINT DD  SYSOUT=*
//VIRLOG   DD  SYSOUT=*
```

Example JCL for VIRTEL Batch

The SYSIN file contains commands and data statements. The following commands are valid in the SYSIN file:

.GET
: indicates the start of an HTTP GET command

.POST
: indicates the start of an HTTP POST command

.RAW
: indicates the start of a raw HTTP request command

.END
: indicates the end of a GET, POST, or RAW command

.EOJ
: causes VIRTEL to terminate

These commands are described in the following sections.

1.26.2. VIRTEL Batch commands

1.26.2.1. VIRTEL Batch GET command

The following figure shows an example SYSIN file containing two GET commands:

```
.GET
/protide.htm+protide                   VIRTEL transaction name
schema=TCC                             Schema name
in='TCC.DATA'                          Input dataset name
out='TCC.XML'                          Output dataset name
mode=wb,recfm=vb,lrecl=512,space=(cyl,(10,5)) Output file attributes
output_encoding=U                      Output encoding U or E
 .END
 .GET
/protide.htm+protide                   VIRTEL transaction name
schema=CRPR                            Schema name
in='CRPR.XML'                          Input dataset name
out='CRPR.DATA'                        Output dataset name
mode=wb,recfm=fb,lrecl=200             Output file attributes
input_encoding=U                       Input encoding U or E
 .END
 .EOJ
```

Example VIRTEL Batch GET commands

Each .GET command is followed by one or more data statements.

The first statement following the .GET command is the VIRTEL URL of the HTTP request (see “Virtel URL formats”, page 11). Only the pathname, pagename, and tranname parts of the URL are required. The http://ipaddr:port part of the URL must be omitted.

All subsequent statements (if any) following the .GET command are appended to the URL as query parameters. To conform with standard HTTP query syntax, VIRTEL adds a “?” before the first parameter and a “&” before each subsequent parameter. Thus, in the above example, VIRTEL generates two HTTP requests:

```
GET /protide.htm+protide?
schema=TCC&in='TCC.DATA'&out='TCC.XML'&mode=wb,recfm=vb,lrecl=512,
space=(cyl,(10,5))&output_encoding=U HTTP/1.1
GET /protide.htm+protide?schema=CRPR&in='CRPR.XML'&out='CRPR.DATA'&mode=wb,
recfm=fb,lrecl=200&input_encoding=U HTTP/1.1
```

Example VIRTEL Batch GET requests

1.26.2.2. VIRTEL Batch POST command

The following figure shows an example SYSIN file containing a POST command followed by XML data:

```
.POST text/xml
/xmldemo.xml+tran3
<?xml version="1.0" ?>
<methodCall>
<screenname>T000-GAL</screenname>
<screentype>3270</screentype>
<params>
<fieldname>FIELD001</fieldname>
<uinput>A</uinput>
</params>
</methodCall>
 .END
 .EOJ
```

Example VIRTEL Batch POST command

Each .POST command is followed by two or more data statements containing the URL and the request body.

The first statement following the .POST command is the VIRTEL URL of the HTTP request (see “Virtel URL formats”, page 11). Only the pathname, pagename, and tranname parts of the URL are required. The http://ipaddr:port part of the URL must be omitted.

All subsequent statements following the .POST command are considered to be the request body. VIRTEL automatically generates a Content-length: header corresponding to the size of the request body. VIRTEL also adds a Content-type: header if the content type is specified as an operand of the .POST command as shown in the example. Thus, in the above example, VIRTEL generates the following HTTP request:

```
POST /xmldemo.xml+tran3 HTTP/1.1
Content-Length: 00000201
Content-Type: text/xml
Special: GIVE-LENGTH-PREFIX

<?xml version="1.0" ?>
<methodCall>
<screenname>T000-GAL</screenname>
<screentype>3270</screentype>
<params>
<fieldname>FIELD001</fieldname>
<uinput>A</uinput>
</params>
</methodCall>
```

Example VIRTEL Batch POST request

1.26.2.3. VIRTEL Batch RAW command

The following figure shows an example SYSIN file containing a RAW command followed by HTTP request data:

```
.RAW
POST /virmsg.txt+uplw2h HTTP/1.1
Content-Type: multipart/form-data; boundary=-----------------9503744825200
Content-Length: 227

-------------------9503744825200
Content-Disposition: form-data; name="file"; filename="test.txt"
Content-Type: text/plain

This is the test data file for upload
More test data here
-------------------9503744825200--
 .END
 .EOJ
```

Example VIRTEL Batch RAW command

Each .RAW command is followed by one or more data statements containing the HTTP request line, the request headers, and the request body. A blank line separates the request headers from the request body. VIRTEL generates an HTTP request exactly as contained in the data statements.

1.26.3. VIRTEL Batch return codes

When a VIRTEL Batch job terminates, the condition code is set to the highest ERROR$ code set by the of the scenarios executed (value 0 to 255).

The condition code may also be set to 4 or 5 (unless a scenario has indicated a higher value) if a request executed by the batch job produced an HTTP response code in the range 4xx or 5xx.

In the case of a scenario abend, the completion code contains the offset of the abend within the scenario.

If the VIRTEL Batch job terminates because of an error condition (for example, an invalid batch command, missing DD statement, or insufficient memory) then the condition code is set to 16.

2. Outgoing Calls

2.1. Outgoing E-mails

The FAD4 structured field allows a host application to send an e-mail. This function is described in the VIRTEL Programming Interface documentation 280.

The entry point used to invoke the host application must contain a type-3 transaction with external name $MAIL$. The “Application” field must contain the name of the SMTP line to be used for sending the outgoing e-mail.

An example transaction is shown below:

```
TRANSACTION DETAIL DEFINITION --------------------- Applid: SPVIRE2  13:43:23

Internal name ===> W2H-75                    To associate with an entry point name
External name ===> $mail$                    Name displayed on user menu
Description   ===> Send messages via SMTP
Application   ===> S-SMTP                    Application to be called
PassTicket    ===> 0  Name ===>              0=no 1=yes 2=unsigned
Application type   ===> 3                    1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===>                      Prefix of name of partner terminals
Logmode            ===>                      Specify when LOGMODE must be changed
How started        ===> 2                    1=menu 2=sub-menu 3=auto
Security           ===> 1                    0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                      0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===>

TIOA at logoff     ===>

Initial Scenario   ===>                      Final Scenario     ===>
Input Scenario     ===>                      Output Scenario    ===>

P1=Update                          P3=Return                      P12=Server
```

Transaction definition for outgoing e-mails

Refer to the VIRTEL Connectivity Reference documentation for details of defining transactions, entry points, and SMTP lines.

3. Programming Interfaces

3.1. Introduction

Certain VIRTEL functions can be driven by application programs. These functions are generally requested by sending specially formatted commands to VIRTEL on the same 3270 session through which the application communicates with the end user.

An application can request VIRTEL functions in the following ways:

- By sending a message containing structured fields recognized by VIRTEL
- By embedding HOST4WEB commands in the 3270 screen (available from VIRTEL version 4.28 onwards)

3.2. Structured Fields

In addition to sending normal screen display data, a 3270 application may also send data in specially formatted fields known as “structured fields”. Structured fields are sent using a special 3270 command “Write Structured Field” (code X'F3'). Each structured field contains a 2-byte identification code. VIRTEL intercepts structured fields whose code begins with X'FA'. By sending structured fields to VIRTEL on the 3270 session, the VIRTEL Web Integration application can direct VIRTEL to perform certain functions.

The operations available to VIRTEL Web Integration applications via structured fields are as follows:

- Specify the HTML page template to be used to format 3270 screens for the browser
- Specify the directory from which HTML page templates are to be retrieved
- Send a list of values (a table variable) to an HTML page
- Send an outgoing e-mail
- Retrieve the contents of an incoming e-mail

3.2.1. General format of a 3270 structured field

As a general rule, the format of a structured field is as shown below:

```
X'nnnnccccdd....dd'
```

nnnn

The length. The length includes the length of the nnnn and cccc fields, thus nnnn is always 4 more than the length of the data.

cccc

the identification code

dd....dd

the data.

3.2.2. Sending structured fields via the Write Structured Field command

VIRTEL recognizes that a message contains structured fields whenever the application uses the 3270 command X'F3' (Write Structured Field) to send the message to the terminal.

For CICS applications, the STRFIELD option of the EXEC CICS SEND command requests CICS to send the message using command code X'F3':

```
    EXEC CICS SEND  FROM(DATA1)
           LENGTH(LENGTH OF DATA1)
           STRFIELD
     END-EXEC.
```

For non-CICS applications, the appropriate method of generating a Write Structured Field command should be used. It is also possible to convert a normal message into a structured field message by means of VIRTEL exit 4 (outbound message exit).

3.2.3. Sending structured fields using the SRTVIRTEL prefix

If the application monitor does not support the X'F3' (Write Structured Field) command for sending structured fields (for example, IMS), VIRTEL provides an alternative method for processing structured field data. If the 3270 message begins with the special header:

```
X'1140401D40',C'SRTVIRTEL',X'11404B'
```

then VIRTEL treats the remainder of the message as structured fields.

The SRTVIRTEL header is built by the application, and the application monitor adds 3270 command byte X'F1' (Write), X'F5' (Erase/Write), or X'7E' (Erase/Write Alternate), followed by an appropriate WCC (Write Control Character).

For example,

```
F1 C3 1140401D40 C'SRTVIRTEL' 11404B 0016 FAE5 08 08 E3D9F0F0F0F0F0F1
818683A796A34040
```

is processed identically to:

```
F3 0016 FAE5 08 08 E3D9F0F0F0F0F0F1 818683A796A34040
```

3.3. How To Determine If Running Under VIRTEL

Because the structured fields described in this chapter are understood only by VIRTEL and not by regular 3270 terminals, your application will need to determine whether it is communicating with a VIRTEL pseudo-terminal before writing a VIRTEL structured field. This section describes some techniques that your application can use to decide if it is communicating with VIRTEL pseudo-terminal or with a regular 3270 terminal.

3.3.1. Use a different transaction code

By defining two different transaction codes which invoke the same CICS application program (for example, DEMO for 3270, and VEMO for VIRTEL), the application can test the field EIBTRNID to determine if it is running under VIRTEL.

The figure below shows sample DFHCSDUP statements to associate two transaction codes (DEMO and VEMO) with a single application program DEMOPROG:

```
DEFINE TRANSACTION(DEMO) GROUP(DEMOGRP)
       PROGRAM(DEMOPROG) PROFILE(DFHCICST) STATUS(ENABLED)
DEFINE TRANSACTION(VEMO) GROUP(DEMOGRP)
       PROGRAM(DEMOPROG) PROFILE(DFHCICST) STATUS(ENABLED)
```

Defining an alternate CICS transaction code for an application

The figure below shows sample VIRCONF statements to define a VIRTEL transaction which starts the application using the CICS transaction code VEMO:

```
      TRANSACT ID=CLI-10,
               NAME='CICS',
               DESC='Logon to DEMO application',
               APPL=DBDCCICS,
               TYPE=1,
               TERMINAL=CLVTA,
               STARTUP=1,
               SECURITY=1,
               TIOASTA="Signon&/W&*7D4C7D&'114BE9'&U&'114CF9'&P&/Acompl-
               ete&/W VEMO&/A"
```

Invoking the alternate transaction code from VIRTEL

The figure below shows sample COBOL statements which allow the DEMOPROG program to take different actions based upon the CICS transaction code:

```
in Working-Storage:

       01  THIS-IS-VIRTEL-CALL-SW       PIC X.
           88  THIS-IS-VIRTEL-CALL      VALUE 'Y'.
           88  THIS-IS-NOT-VIRTEL-CALL  VALUE 'N'.

in the Procedure Division:

           IF EIBTRNID (1 : 1) = 'V'
              MOVE 'Y' TO THIS-IS-VIRTEL-CALL-SW
           ELSE
              MOVE 'N' TO THIS-IS-VIRTEL-CALL-SW
           END-IF
```

Detecting VIRTEL by testing the transaction code

3.3.2. Include parameters after the transaction code

By adding additional data after the transaction code when the transaction is invoked by VIRTEL, the application can receive the parameter data to verify whether it is running under VIRTEL. In the following example we add a V after the transaction code when the application is called via VIRTEL.

The figure below shows sample VIRCONF statements to define a VIRTEL transaction which starts the CICS transaction DEMO with an additional parameter ("V"):

```
       TRANSACT ID=CLI-10,
                NAME='CICS',
                DESC='Logon to DEMO application',
                APPL=DBDCCICS,
                TYPE=1,
                TERMINAL=CLVTA,
                STARTUP=1,
                SECURITY=1,
                TIOASTA="Signon&/W&*7D4C7D&'114BE9'&U&'114CF9'&P&/Acompl-
                ete&/W DEMOV&/A"
```

Invoking a CICS transaction with additional parameters

The figure below shows sample COBOL statements which must be added to the DEMOPROG program to receive and test the parameter data. When the transaction is started by VIRTEL, the parameter field contains "V". When the transaction is started from a terminal, using the transaction code DEMO with no additional parameters, the parameter field contains spaces:

```
in Working-Storage:

       01  CICS-TIOA.
           02  CICS-TIOA-TRANID         PIC X(4)  VALUE SPACES.
           02  CICS-TIOA-PARAMV         PIC X(1)  VALUE SPACES.
           02  FILLER                   PIC X(75) VALUE SPACES.
       01  THIS-IS-VIRTEL-CALL-SW       PIC X.
           88  THIS-IS-VIRTEL-CALL      VALUE 'Y'.
           88  THIS-IS-NOT-VIRTEL-CALL  VALUE 'N'.

in the Procedure Division:

           EXEC CICS RECEIVE
                     INTO(CICS-TIOA)
           END-EXEC
           IF CICS-TIOA-PARAMV = 'V'
              MOVE 'Y' TO THIS-IS-VIRTEL-CALL-SW
           ELSE
              MOVE 'N' TO THIS-IS-VIRTEL-CALL-SW
           END-IF
```

Detecting VIRTEL by inspecting the contents of the TIOA

3.3.3. Use a specific range of terminal names

Since all VIRTEL requests are made from the VIRTEL terminal pool, the application program can test the CICS terminal id or the VTAM LU name to determine if it is running under VIRTEL, as shown in the following example:

```
       TERMINAL ID=W2HTP000,
                RELAY=VIRTVT00,
                POOL=*W2HPOOL,
                DESC='Relay pool for HTTP',
                RELAY2=VIRTPR00,
                TYPE=3,
                COMPRESS=2,
                INOUT=3,
                STATS=12,
                REPEAT=0080
```

Defining the VIRTEL terminal pool

```
VIRTVT?? APPL  AUTH=(ACQ,PASS),MODETAB=ISTINCLM,DLOGMOD=SNX32702,EAS=1
```

VTAM definition for the VIRTEL terminal pool

```
in Working-Storage:

       01  THIS-IS-VIRTEL-CALL-SW       PIC X.
           88  THIS-IS-VIRTEL-CALL      VALUE 'Y'.
           88  THIS-IS-NOT-VIRTEL-CALL  VALUE 'N'.

in the Procedure Division:

           IF EIBTRMID (1 : 2)  =   'VT'
              MOVE 'Y' TO THIS-IS-VIRTEL-CALL-SW
           ELSE
              MOVE 'N' TO THIS-IS-VIRTEL-CALL-SW
           END-IF
```

Detecting VIRTEL by testing the CICS terminal id

```
in Working-Storage:

       01  MYLUNAME                     PIC X(8).
       01  THIS-IS-VIRTEL-CALL-SW       PIC X.
           88  THIS-IS-VIRTEL-CALL      VALUE 'Y'.
           88  THIS-IS-NOT-VIRTEL-CALL  VALUE 'N'.

in the Procedure Division:

           EXEC CICS ASSIGN
                     NETNAME(MYLUNAME)
           END-EXEC
           IF MYLUNAME (1 : 4)  =   'VIRT'
              MOVE 'Y' TO THIS-IS-VIRTEL-CALL-SW
           ELSE
              MOVE 'N' TO THIS-IS-VIRTEL-CALL-SW
           END-IF
```

Detecting VIRTEL by testing the VTAM LU name

3.4. VIRTEL Web Integration

3.4.1. FA88: Transmit large data message to application

By using the FA88 structured field, an application can request data from an HTTP terminal without being limited to the size of a 3270 screen.

The application sends an FA88 structured field containing the name of a URL parameter to be retrieved. The “send message to terminal” flag causes VIRTEL to send an HTTP response to the terminal. When the terminal sends its next URL, VIRTEL sends to the application an FA88 structured field response containing the value of the URL parameter. The application may retrieve the value in multiple segments. If the value exceeds 32K in size then it must be retrieved in multiple segments. Once the first segment has been received, the application requests subsequent segments by sending another FA88 structured field containing the “immediate answer” flag and the offset of the segment requested. VIRTEL responds with an FA88 structured field response containing the segment requested. In each response VIRTEL sets the flag byte to indicate whether there is more data to be retrieved, and if so the number of bytes remaining. The application continues the procedure until there is no more data to be retrieved.

The format of the FA88 structured field sent by the application is shown below:

```
- 2 bytes   Length of structured field = 14 + n
- 2 bytes   Structured field identification code = X'FA88'
- 1 bytes   X'00'
- 1 bytes   Flags:
          X'01' = immediate answer
          X'04' = send message to terminal
- 2 bytes   Maximum segment size requested (m)
- 4 bytes   Offset of requested segment (o)
- 2 bytes   Length of name (n)
- n bytes   Name of URL parameter
```

Format of structured field FA88

The format of the FA88 structured field response returned by VIRTEL is shown below:

```
- 2 bytes   Length of structured field = 14 + n + x
- 2 bytes   Structured field identification code = X'FA88'
- 1 bytes   X'00'
- 1 bytes   Flags:
          X'02' = there is more data
- 2 bytes   Length of segment returned (x)
- 4 bytes   Number of bytes remaining (r)
- 2 bytes   Length of name (n)
- n bytes   Name of variable
- x bytes   Requested data segment
```

Format of structured field response FA88

3.4.2. FAC8: Selection of page template

VIRTEL recognizes the FAC8 structured field for the following operations:

- Change of directory for HTML page templates
- Change of HTML page template

To perform more than one function at a time, multiple FAC8 structured fields can be sent in the same message.

3.4.2.1. Structured field FAC8 code 06

Structured field FAC8 code 06 allows the application to specify the name of the VIRTEL directory to be used to retrieve the page template for the current 3270 screen and all subsequent screens.

The format of a structured field FAC8 code 06 is:

```
- 2 bytes Length of structured field = X'000D'
- 2 bytes Structured field identification code = X'FAC8'
- 1 bytes Code = X'06' (change VIRTEL directory)
- 8 bytes Directory name
```

Format of structured field FAC8 code 06

3.4.2.2. Structured field FAC8 code 07

Structured field FAC8 code 07 allows the application to specify the name of the page template for the current 3270 screen and all subsequent screens.

The format of a structured field FAC8 code 07 is:

```
- 2 bytes Length of structured field = variable (n+5)
- 2 bytes Structured field identification code = X'FAC8'
- 1 bytes Code = X'07' (change HTML page template)
- n bytes Page template name
```

Format of structured field FAC8 code 07

3.4.2.3. COBOL example

```
in Working-Storage:

      *////////////////////////////////////////////////////////////////*
      *///* - FAC8 request to VIRTEL (HTML page management)        *///*
      *///* - send structured field:                                *///*
      *///*   F3 LLLL FAC8 F PAGE or DIRECTORY                      *///*
      *///*      LLLL: Length of structured field (2 BYTES)         *///*
      *///*      FAC8: Structured field id code (2 BYTES)           *///*
      *///*      F   : Requested function (1 BYTE BINARY)           *///*
      *///*            06: change VIRTEL directory                  *///*
      *///*            07: change HTML page template                *///*
      *///*      PAGE or DIRECTORY: name (8 bytes)                  *///*
      *////////////////////////////////////////////////////////////////*

       01  FAC8-DEM.
         05  FAC8-LONG                PIC S9(4)   COMP VALUE +5.
         05  FAC8-FILL1               PIC X(02)   VALUE X'FAC8'.
         05  FAC8-FONCTION            PIC X(01)   VALUE ' '.
         05  FAC8-ARGUMENT            PIC X(08)   VALUE SPACES.

       01  FAC8-DEM-REPERTOIRE        PIC X(01)   VALUE X'06'.
       01  FAC8-DEM-PAGE-HTML         PIC X(01)   VALUE X'07'.

in the Procedure Division:

           MOVE LENGTH OF FAC8-DEM    TO          FAC8-LONG.
           MOVE FAC8-DEM-PAGE-HTML    TO          FAC8-FONCTION.
           MOVE 'TOUTNOIR'            TO          FAC8-ARGUMENT.
           PERFORM 8150-ENVOI-FAC8   THRU         8150-FIN
           PERFORM 8830-ENVOI-MAP    THRU         8830-FIN.

      *///////////////////// SEND STRUCTURED FIELD //////////////////*

       8150-ENVOI-FAC8.

           EXEC CICS SEND             FROM       (FAC8-DEM)
                                      FROMLENGTH (FAC8-LONG)
                                      STRFIELD
                                      END-EXEC.

       8150-FIN.

      *////////////////////// SEND MESSAGE 3270 ///////////////////////*

       8830-ENVOI-MAP.

           EXEC CICS SEND              MAP       ('NOMMAP2')
                                       MAPSET    ('NONMAP2')
                                       ERASE
                                       CURSOR    (CICS-TS-POS-CURS)
                                       END-EXEC.
       8830-FIN.
```

Example of sending structured field FAC8

An example of this function is supplied in member FAC8SAMP of the VIRTEL SAMPLIB.

3.4.3. FAE5, FAE6: Sending a table variable

Structured field FAE5 allows the application to send a named data table (“table variable”) to VIRTEL. The data in the table variable is made available for insertion in the current HTML page by means of VIRTEL tags coded in the page template (see “Handling table variables”, page 44), or by means of a scenario instruction (see “FIELD$ DEFINE-CHOICE”, page 171) which allows the application to supply lists of drop-down values for selection fields.

3.4.3.1. Structured field FAE5

The application can send one or more FAE5 structured fields. Each structured field contains the name of a variable followed by a table of values. The format of structured field FAE5 is shown below:

```
- 2 bytes   Length of structured field = variable
- 2 bytes   Structured field identification code = X'FAE5'
- 1 bytes   Length of each value (p)
- 1 bytes   Length of name (n)
- n bytes   Name of variable
- p bytes   Value 1
- p bytes   Value 2
- etc
```

Format of structured field FAE5 – format 1

The above format limits the length of each value to a maximum of 255 bytes. A second format of the FAE5 structured field allows the application to set a single value whose length is equal to the remainder of the structured field:

```
- 2 bytes   Length of structured field = variable
- 2 bytes   Structured field identification code = X'FAE5'
- 1 bytes   X'00'
- 1 bytes   Length of name (n)
- n bytes   Name of variable
- x bytes   Value (x=structured field length – 6 – n)
```

Format of structured field FAE5 – format 2

After the application has sent a message containing an FAE5 structured field, VIRTEL considers the current screen complete and sends the response to the user.

3.4.3.2. Structured field FAE6

Structured field FAE6 is identical to FAE5, except that VIRTEL does not consider the current screen to be complete, and waits for a further output message from the application before sending the response to the user.

3.4.3.3. COBOL example

```
in Working-Storage:

       01  FAE5-LONG                PIC S9(4)   COMP VALUE +0.
       01  FAE5-AREA.
           05  FAE5-VARIABLE-1.
             10  FAE5-SFLENGTH-1    PIC S9(4)   COMP VALUE +0.
             10  FILLER             PIC X(2)    VALUE X'FAE5'.
             10  FAE5-LONG-POSTE-1  PIC X       VALUE X'0A'.
             10  FAE5-LONG-NOM-1    PIC X       VALUE X'08'.
             10  FAE5-NOM-1         PIC X(8)    VALUE 'VARNAME1'.
             10  FAE5-POSTE-1-1     PIC X(10)   VALUE 'VALUE1'.
             10  FAE5-POSTE-1-2     PIC X(10)   VALUE 'VALUE2'.
             10  FAE5-POSTE-1-3     PIC X(10)   VALUE 'VALUE3'.
           05  FAE5-VARIABLE-2.
           10  FAE5-SFLENGTH-2    PIC S9(4)   COMP VALUE +0.
           10  FILLER             PIC X(2)    VALUE X'FAE5'.
           10  FAE5-LONG-POSTE-2  PIC X       VALUE X'04'.
           10  FAE5-LONG-NOM-2    PIC X       VALUE X'08'.
           10  FAE5-NOM-2         PIC X(8)    VALUE 'VARNAME2'.
           10  FAE5-POSTE-2-1     PIC 9(6)    VALUE 123.
           10  FAE5-POSTE-2-2     PIC 9(6)    VALUE 234.
           10  FAE5-POSTE-2-3     PIC 9(6)    VALUE 456.

in the Procedure Division:

          MOVE LENGTH OF FAE5-VARIABLE-1 TO FAE5-SFLENGTH-1
          MOVE LENGTH OF FAE5-VARIABLE-2 TO FAE5-SFLENGTH-2
          MOVE LENGTH OF FAE5-AREA TO FAE5-LONG
          EXEC CICS SEND FROM(FAE5-AREA)
                         LENGTH(FAE5-LONG)
                         STRFIELD
          END-EXEC
```

Example of sending structured field FAE5

3.4.4. Call Interface

3.4.4.1. Introduction

Application programs running in a CICS or IMS environment using Language Environment (LE) can request certain VIRTEL Web Integration functions by means of callable modules. These modules construct the necessary structured fields and send them to VIRTEL via CICS or IMS, thus simplifying the job of the application programmer. These modules are primarily designed to be called by CICS or IMS-COBOL programs, however they can also be used by application programs written in other languages. The modules, CALL VIRSETA, CALL VIRSETV (for CICS), CALL VIRSETAI, CALL VIRSETVI (for IMS) and CALL VIRTEL, are described in the following sections.

3.4.4.2. CALL VIRSETA

This module allows a CICS application program to copy an array of values into a VIRTEL table variable. The calling program supplies the name of the variable and an array containing the values. The VIRSETA module builds one or more FAE6 structured fields containing the variable name and the values, and sends the structured field(s) to VIRTEL using the EXEC CICS SEND STRFIELD command.

The total size of the structured fields sent by a single call to VIRSETA cannot exceed 32K, but additional data can be added to the VIRTEL table variable by calling VIRSETA again with the same variable name.

When VIRSETA is used to copy values into a VIRTEL table variable, all of the values must have the same length. To create a VIRTEL table variable containing values of varying lengths, use CALL VIRSETV described in the next section.

3.4.4.2.1. CALL VIRSETA parameters

Parameters passed by calling program:

1. DFHEIBLK
2. DFHCOMMAREA
3. Variable name (variable length EBCDIC string of 1-255 characters terminated by blank or X'00')
4. An array of elements each containing one data item
5. Element size (signed halfword) contains the length of each element of the array

6. Count (signed halfword) contains the number of elements in the array
7. Data length (signed halfword) contains the length of the data item contained in each element of the array. This may be less than or equal to the element size.

3.4.4.2.2. CALL VIRSETA example

```
in Working-Storage:

01  WS-ARRAY.
    05  WS-ELEMENT       OCCURS 50 TIMES.
        10  WS-DATA-ITEM PIC X(80).
        10  FILLER       PIC X(20).
77  WS-ELEMENT-SIZE      PIC S9(4) COMP SYNC.
77  WS-COUNT             PIC S9(4) COMP SYNC.
77  WS-DATA-LENGTH       PIC S9(4) COMP SYNC.

in the Procedure Division:

    MOVE LENGTH OF WS-ELEMENT (1) TO WS-ELEMENT-SIZE.
    MOVE 50 TO WS-COUNT.
    MOVE LENGTH OF WS-DATA-ITEM (1) TO WS-DATA-LENGTH.
    CALL 'VIRSETA' USING DFHEIBLK
                         DFHCOMMAREA
                         BY CONTENT 'MYVAR '
                         BY REFERENCE WS-ARRAY
                         WS-ELEMENT-SIZE
                         WS-COUNT
                         WS-DATA-LENGTH.
```

Example of VIRTEL Web Integration application using CALL VIRSETA

3.4.4.2.3. CALL VIRSETA return codes

If the call was successful, VIRSETA returns to the calling program. Otherwise, VIRSETA terminates with an EXEC CICS ABEND.

The following abend codes may be issued by VIRSETA:

VSA1

Length of variable name is outside the range 1-255, or the required terminator (blank or X'00') is missing

VSA2

Data length is less than 1, or exceeds the element length.

VSA3

Count is less than 1.

VSA4

Data exceeds the maximum allowed size. If the length of each data item is 255 or less, then the total size of the data (count x data length) must not exceed 32760 – N, where N is the number of characters in the variable name. If the length of each data item is 256 or more, then count x (data length + 6 + N) must not exceed 32767.

Additionally CICS may issue an abend if the EXEC CICS SEND STRFIELD command is unsuccessful.

3.4.4.3. CALL VIRSETV

This module allows a CICS application program to set the value of a VIRTEL variable. The calling program supplies the name of the variable and the value to be set. The VIRSETV module builds an FAE6 structured field containing the variable name and value, and sends the structured field to VIRTEL using the EXEC CICS SEND STRFIELD command.

VIRTEL variables containing more than one value are known as table variables. The application program can create a table variable by calling the VIRSETV module several times with the same variable name. The first call creates the variable and adds the first value to it. Subsequent calls add additional values to the table variable.

3.4.4.3.1. CALL VIRSETV parameters

Parameters passed by calling program:

1. DFHEIBLK
2. DFHCOMMAREA
3. Variable name (variable length EBCDIC string of 1-255 characters terminated by blank or X'00')
4. Value (variable length)
5. Length (signed halfword field containing length of value)

3.4.4.3.2. CALL VIRSETV example

```
in Working-Storage:

77  WS-BUFFER PIC X(80) VALUE '** MY VALUE **'.
77  WS-LENGTH PIC S9(4) COMP SYNC.

in the Procedure Division:

    MOVE LENGTH OF WS-BUFFER TO WS-LENGTH.
    CALL 'VIRSETV' USING DFHEIBLK
                         DFHCOMMAREA
                         BY CONTENT 'MYVAR '
                         BY REFERENCE WS-BUFFER
                         WS-LENGTH.
```

Example of VIRTEL Web Integration application using CALL VIRSETV

3.4.4.3.3. CALL VIRSETV return codes

If the call was successful, VIRSETV returns to the calling program. Otherwise, VIRSETV terminates with an EXEC CICS ABEND.

The following abend codes may be issued by VIRSETV:

VSV1

Length of variable name is outside the range 1-255, or the required terminator (blank or X'00') is missing

VSV2

Length of value is negative or exceeds the maximum allowed length (32760 minus the length of the variable name).

Additionally CICS may issue an abend if the EXEC CICS SEND STRFIELD command is unsuccessful.

3.4.4.4. CALL VIRSETAI

This module allows an IMS application program to copy an array of values into a VIRTEL table variable. The calling program supplies the name of the variable and an array containing the values. The VIRSETAI module builds one or more FAE6 structured fields containing the variable name and the values, and sends the structured field(s) to VIRTEL using the CALL 'CBLTDLI' USING ISRT, LS-IOPCB, OUTPUT-MESSAGE, MFS command.

The total size of the structured fields sent by a single call to VIRSETAI cannot exceed 32K, but additional data can be added to the VIRTEL table variable by calling VIRSETAI again with the same variable name.

When VIRSETAI is used to copy values into a VIRTEL table variable, all of the values must have the same length. To create a VIRTEL table variable containing values of varying lengths, use CALL VIRSETVI described in the next section.

3.4.4.4.1. CALL VIRSETAI parameters

Parameters passed by calling program:

1. Variable name (variable length EBCDIC string of 1-255 characters terminated by blank or X'00')
2. An array of elements each containing one data item
3. Element size (signed halfword) contains the length of each element of the array
4. Count (signed halfword) contains the number of elements in the array
5. Data length (signed halfword) contains the length of the data item contained in each element of the array. This may be less than or equal to the element size.
6. IMS I/O PCB

3.4.4.4.2. CALL VIRSETAI example

```
in Working-Storage:

        01  WS-TABLE.
            05 WS-ELEMENT        PIC X(80) OCCURS 100 TIMES.
        77  WS-TESTDATA          PIC X(10) VALUE 'TEST DATA'.
        77  WS-ELEMSIZE          PIC S9(4) COMP SYNC.
        77  WS-COUNT             PIC S9(4) COMP SYNC.
        77  WS-DATALEN           PIC S9(4) COMP SYNC.
        77  WS-RC1               PIC X.

in Procedure Division:

            MOVE WS-TESTDATA TO WS-ELEMENT (1).
            MOVE WS-TESTDATA TO WS-ELEMENT (2).
            MOVE WS-TESTDATA TO WS-ELEMENT (3).
            MOVE LENGTH OF WS-ELEMENT (1) TO WS-ELEMSIZE.
            MOVE 3 TO WS-COUNT.
            MOVE LENGTH OF WS-TESTDATA TO WS-DATALEN.
            CALL 'VIRSETAI' USING CONTENT 'MYVAR '
                                  REFERENCE WS-TABLE
                                  WS-ELEMSIZE
                                  WS-COUNT
                                  WS-DATALEN
                                  LS-IOPCB
                        RETURNING WS-RC1.
            IF WS-RC1 NOT EQUAL 0 GO TO ERROR.
```

Example of VIRTEL Web Integration application using CALL VIRSETAI

3.4.4.5. CALL VIRSETVI

This module allows an IMS application program to set the value of a VIRTEL variable. The calling program supplies the name of the variable and the value to be set. The VIRSETVI module builds an FAE6 structured field containing the variable name and value, and sends the structured field to VIRTEL using the CALL 'CBLTDLI' USING ISRT, LS-IOPCB, OUTPUT-MESSAGE, MFS command.

VIRTEL variables containing more than one value are known as table variables. The application program can create a table variable by calling the VIRSETVI module several times with the same variable name. The first call creates the variable and adds the first value to it. Subsequent calls add additional values to the table variable.

3.4.4.5.1. CALL VIRSETVI parameters

Parameters passed by calling program:

1. Variable name (variable length EBCDIC string of 1-255 characters terminated by blank or X'00')
2. Value (variable length)
3. Length (signed halfword field containing length of value)
4. IMS I/O PCB

3.4.4.5.2. CALL VIRSETVI example

```
in Working-Storage:

        77  WS-BUFFER PIC X(80) VALUE '** MY VALUE **'.
        77  WS-LENGTH PIC S9(4) COMP SYNC.
        77  WS-RC1    PIC X.

in Procedure Division:

            MOVE LENGTH OF WS-BUFFER TO WS-LENGTH.
            CALL 'VIRSETVI' USING CONTENT 'MYVAR '
                                  REFERENCE WS-BUFFER
                                  WS-LENGTH
                                  LS-IOPCB
                        RETURNING WS-RC1.
            IF WS-RC1 NOT EQUAL 0 GO TO ERROR.
```

Example of VIRTEL Web Integration application using CALL VIRSETVI

3.4.4.6. CALL VIRTEL

Application programs running in a CICS environment with LE can also call a module named VIRTEL (see source delivered in the VIRTEL SAMPLIB library at installation time) which builds and sends the structured fields necessary to invoke the following functions:

- specify page template and directory (structured field FAC8)
- send data for table variables (structured field FAE6)

3.4.4.6.1. CALL VIRTEL example

The following COBOL example shows how to use CALL VIRTEL to send two table variables (CHP_NUM1 and CPT_NUM1) and to request the use of a specific page template (page WEB2VIRT in directory DEMO):

```
in Working-Storage:

      *    CALL 'VIRTEL' takes one parameter with maximum size 2048 bytes

       01  PARAMETRES-VIRTEL-FAC8.
           02  VIRTEL-FONCTION-FAC8    PIC X(10) VALUE 'SENDPAGW'.
           02  VIRTEL-CODE-RETOUR-FAC8 PIC 9(02) VALUE  0.
           02  VIRTEL-PAGE-HTML        PIC X(10) VALUE 'WEB2VIRT'.
           02  VIRTEL-REPERTOIRE       PIC X(10) VALUE 'DEMO    '.
           02  VIRTEL-FILLER-FAC8      PIC X(2016).

       01  PARAMETRES-VIRTEL-FAE6.
           02  VIRTEL-FONCTION-FAE6    PIC X(10) VALUE 'SENDTABW'.
           02  VIRTEL-CODE-RETOUR-FAE6 PIC 9(02) VALUE  0.
           02  VIRTEL-LONG-NOM         PIC 9(02).
           02  VIRTEL-LONG-POSTE       PIC 9(02).
           02  VIRTEL-NBR-POSTE        PIC 9(03).
           02  VIRTEL-FAE6-DATA.
             05  VIRTEL-NOM           PIC X(08).
             05  VIRTEL-POSTE-01      PIC X(10).
             05  VIRTEL-POSTE-02      PIC X(10).
             05  VIRTEL-POSTE-03      PIC X(10).
             05  VIRTEL-POSTE-04      PIC X(10).
             05  VIRTEL-POSTE-05      PIC X(10).
             05  VIRTEL-POSTE-06      PIC X(10).
             05  VIRTEL-POSTE-07      PIC X(10).
             05  VIRTEL-POSTE-08      PIC X(10).
             05  VIRTEL-POSTE-09      PIC X(10).
             05  VIRTEL-FILLER-FAE6   PIC X(1937).
           02  VIRTEL-FAE6-DATA1 REDEFINES VIRTEL-FAE6-DATA.
             05  VIRTEL-NOM1          PIC X(08).
             05  VIRTEL-POSTE1-01     PIC X(10).
             05  VIRTEL-POSTE1-02     PIC X(10).
             05  VIRTEL-POSTE1-03     PIC X(10).
             05  VIRTEL-POSTE1-04     PIC X(10).
             05  VIRTEL-POSTE1-05     PIC X(10).
             05  VIRTEL-POSTE1-06     PIC X(10).
             05  VIRTEL-POSTE1-07     PIC X(10).
             05  VIRTEL-POSTE1-08     PIC X(10).
             05  VIRTEL-POSTE1-09     PIC X(10).
             05  VIRTEL-FILLER1-FAE6  PIC X(913).

in the Procedure Division:

           MOVE 'SENDPAGW'        TO   VIRTEL-FONCTION-FAC8
           MOVE  0                TO   VIRTEL-CODE-RETOUR-FAC8
           MOVE 'WEB2VIRT'        TO   VIRTEL-PAGE-HTML
           MOVE 'DEMO    '        TO   VIRTEL-REPERTOIRE
           MOVE  SPACES           TO   VIRTEL-FILLER-FAC8
           CALL 'VIRTEL'  USING   DFHEIBLK
                                  PARAMETRES-VIRTEL-FAC8
           MOVE 'SENDTABW'        TO   VIRTEL-FONCTION-FAE6
           MOVE  0                TO   VIRTEL-CODE-RETOUR-FAE6
           MOVE  08               TO   VIRTEL-LONG-POSTE.
           MOVE  9                TO   VIRTEL-NBR-POSTE.
           MOVE  08               TO   VIRTEL-LONG-NOM.
           MOVE  'CHP_NUM1'       TO   VIRTEL-NOM.
           MOVE 'VAL-001'         TO   VIRTEL-POSTE-01
           MOVE 'VAL-002'         TO   VIRTEL-POSTE-02.
           MOVE 'VAL-003'         TO   VIRTEL-POSTE-03.
           MOVE 'VAL-004'         TO   VIRTEL-POSTE-04.
           MOVE 'VAL-005'         TO   VIRTEL-POSTE-05.
           MOVE 'VAL-006'         TO   VIRTEL-POSTE-06.
           MOVE 'VAL-007'         TO   VIRTEL-POSTE-07.
           MOVE 'VAL-008'         TO   VIRTEL-POSTE-08.
           MOVE 'VAL-009'         TO   VIRTEL-POSTE-09.
           MOVE SPACES            TO   VIRTEL-FILLER-FAE6
           CALL 'VIRTEL'  USING   DFHEIBLK
                                  PARAMETRES-VIRTEL-FAE6
           MOVE VIRTEL-CODE-RETOUR-FAE6  TO  TD-MSG-RETCODE
```

```
            MOVE 'SENDTABW'        TO   VIRTEL-FONCTION-FAE6
            MOVE  0                TO   VIRTEL-CODE-RETOUR-FAE6
            MOVE  08               TO   VIRTEL-LONG-POSTE.
            MOVE  9                TO   VIRTEL-NBR-POSTE.
            MOVE  08               TO   VIRTEL-LONG-NOM.
            MOVE  'CPT_NUM1'       TO   VIRTEL-NOM1.
            MOVE 'CPT-0001'        TO   VIRTEL-POSTE1-01.
            MOVE 'CPT-0002'        TO   VIRTEL-POSTE1-02.
            MOVE 'CPT-0003'        TO   VIRTEL-POSTE1-03.
            MOVE 'CPT-0004'        TO   VIRTEL-POSTE1-04.
            MOVE 'CPT-0005'        TO   VIRTEL-POSTE1-05.
            MOVE 'CPT-0006'        TO   VIRTEL-POSTE1-06.
            MOVE 'CPT-0007'        TO   VIRTEL-POSTE1-07.
            MOVE 'CPT-0008'        TO   VIRTEL-POSTE1-08.
            MOVE 'CPT-0009'        TO   VIRTEL-POSTE1-09.
            MOVE SPACES            TO   VIRTEL-FILLER1-FAE6
            CALL 'VIRTEL'  USING   DFHEIBLK
                                   PARAMETRES-VIRTEL-FAE6
            MOVE VIRTEL-CODE-RETOUR-FAE6  TO  TD-MSG-RETCODE
```

Example of VIRTEL Web Integration application using CALL VIRTEL

3.4.4.6.2. CALL VIRTEL return codes

3.4.4.6.2.1. Return codes for the SENDPAGW function

The VIRTEL-CODE-RETOUR field should be initialized to 0. The following values may be returned:

0
OK, VIRTEL request accepted (does not guarantee that page has been displayed in browser)

1
Invalid function

2
HTML page name invalid (blank or low-value)

3
Directory name invalid (blank or low-value)

3.4.4.6.2.2. Return codes for the SENDTABW function

The VIRTEL-CODE-RETOUR field should be initialized to 0. The following values may be returned:

0
OK, VIRTEL request accepted (does not guarantee that page has been displayed in browser)

1
Invalid function

11
Length of NAME non-numeric

12
Length of VALUE non-numeric

13
Number of values is non-numeric

3.4.5. HOST4WEB commands

When an application is invoked from a browser via an entry point defined with emulation type HOST4WEB, the application can use a set of VIRTEL control commands known as “HOST4WEB” commands, which are coded in the 3270 screen.2

3.4.5.1. Conditions for processing

HOST4WEB commands are recognized by VIRTEL when the entry point definition specifies emulation type HTML, HOST4WEB, or H4W, and any of the following conditions is true:

- the VIRTEL transaction definition contains value 1 in the “H4W Commands” field
- the VIRTEL transaction definition contains value 2 in the “H4W Commands” field and the message has a ‘2VIRTEL’ prefix (see below)
- the VIRTEL transaction definition contains value 4 in the “H4W Commands” field and the entry point definition specifies emulation type HOST4WEB or H4W
- the VIRTEL transaction definition contains value 4 in the “H4W Commands” field and the entry point definition specifies emulation type HTML and the message has a ‘2VIRTEL’ prefix (see below)
- the previous screen contained the HOST4WEB command C SCAN NEXT SCREEN
- the application previously sent an FAD5 code 01 structured field

All HOST4WEB commands must begin immediately after a 3270 attrbute byte, in other words each command must appear at the start of a 3270 field. The non-display attribute may be used, if desired, to prevent the command appearing on the screen. To define a non-display field in BMS, specify ATTRB=(ASKIP,DRK). To define a non-display field in ISPF, use an attribute character defined as INTENS(NON) in the)ATTR section of the panel.

ISPF applications must use the ISPEXEC CONTROL DISPLAY REFRESH command before the ISPEXEC DISPLAY PANEL command to ensure that HOST4WEB commands are transmitted to VIRTEL in their entirety.

3.4.5.2. 2VIRTEL prefix

An application can send a 3270 message with a special prefix to indicate to VIRTEL that the screen contains HOST4WEB commands.

The prefix consists of a 3270 field starting with the characters ‘2VIRTEL’. This field must be the first field transmitted in the message.

The field can be defined with the “non-display” attribute, if desired, to prevent the prefix appearing on the screen.

3.4.5.3. List of commands

3.4.5.3.1. C AUTO VARIABLES (Command Auto Variables)

```
C AUTO VARIABLES
```

Requests VIRTEL to automatically free all variables whenever a user response is sent to the application. This command cancels the effect of the KEEP VARIABLES command.

NOTE: structured field FAD5 code 08 produces the same effect as this command.

3.4.5.3.2. C KEEP VARIABLES (Command Keep Variables)

```
C KEEP VARIABLES
```

Requests VIRTEL to keep all variables created by the application. Normally VIRTEL will free all variables whenever a user response is sent to the application. This command allows the variables to be kept for use by a subsequent output screen. The variables may be freed by a subsequent KILL VARIABLES command, otherwise they will be automatically freed at the end of the transaction.

NOTE: structured field FAD5 code 02 produces the same effect as this command.

3.4.5.3.3. C KILL VARIABLES (Command Kill Variables)

```
C KILL VARIABLES
```

Requests VIRTEL to free all variables.

NOTE: structured field FAD5 code 04 produces the same effect as this command.

3.4.5.3.4. C RETURN (Command Return)

```
C RETURN
```

Requests VIRTEL to immediately return a response to the application with a simulated “Enter”. The screen containing this command is never displayed to the user.

3.4.5.3.5. C SCAN NEXT SCREEN (Command Scan)

```
C SCAN NEXT SCREEN
```

Indicates that the following screen will contain HOST4WEB commands, which will be processed by VIRTEL without the need for a ‘2VIRTEL’ prefix.

NOTE: structured field FAD5 code 01 produces the same effect as this command.

3.4.5.3.6. C WAIT NEXT SCREEN (Command Wait)

```
C WAIT NEXT SCREEN
```

Indicates that the current screen should not be sent to the user yet.

3.4.5.3.7. C TERMSESS (Command Terminate Session)

```
C TERMSESS
```

Allows a service transaction to request termination of the host application session after the current message has been sent.

3.4.5.3.8. G EMULATION TYPE (Get Emulation Type)

```
G EMULATION TYPE
```

When VIRTEL returns the next input to the application, the contents of this field are replaced by the emulation type defined in the entry point.

3.4.5.3.9. G PAGE NAME (Get Current Template Name)

```
G PAGE NAME
```

When VIRTEL returns the next input to the application, the contents of this field are replaced by the name of the current page template.

3.4.5.3.10. G URL PARAMETER (Get URL Parameter)

```
G URL PARAMETER paramname
```

When VIRTEL returns the next input to the application, the contents of this field are replaced by the value of the parameter paramname in the URL.

3.4.5.3.11. S DIRECTORY (Set Temporary Directory Name)

```
S DIRECTORY dirname
```

Indicates the name of the directory from which VIRTEL is to retrieve the page template for the current 3270 screen (but not for subsequent screens). dirname is the name of a VIRTEL directory defined in the Directory Management sub-application (as described 23). This name must not contain any blanks.

3.4.5.3.12. S GLOBAL PAGE (Set Global Template Name)

```
S GLOBAL PAGE pagename
```

Indicates the name of the page template to be used for the current 3270 screen and all subsequent screens. This name must not contain any blanks.

3.4.5.3.13. S PAGE (Set Temporary Template Name)

```
S PAGE pagename
```

Indicates the name of the page template to be used for the current 3270 screen (but not for subsequent screens). This name must not contain any blanks.

3.4.5.3.14. S VARIABLE (Set Variable)

```
S VARIABLE varname+value+
```

Adds a new value to a table variable named varname. The variable is automatically created if necessary. The value is contained in the 3270 field immediately following the S VARIABLE varname command, and the value has the same length as the 3270 field which contains it. The “+” characters in the figure above represent the 3270 attribute bytes which act as field delimiters.

3.5. E-mail

3.5.1. FAC8: Retrieve data from an e-mail

An application started by an incoming e-mail (see “Incomming e-mails”, page 224) can retrieve data from the content of the e-mail. To request VIRTEL to extract the data from the e-mail, the application sends a structured field FAC8 code 12 or 13 to the associated relay (3270 pseudo-terminal). VIRTEL intercepts the structured field and sends a response to the application in the form of a QUERY REPLY (x‘88’) structured field.

3.5.1.1. Structured field FAC8 code 12

The format of a structured field FAC8 code 12 is:

```
- 2 bytes Length of structured field = X'0007'
- 2 bytes Structured field identification code = X'FAC8'
- 1 bytes Code = X'12' (extraction of e-mail data)
- 2 bytes Option indicating the category of data requested:
  0004  Received:
  0008  Message-ID:
  000C  Date:
  0010  References:
  0014  Content-Type:
  0018  MIME-Version:
  001C  Subject:
  0020  (message text)
  003C  MAIL FROM: (see note)
  0040  RCPT TO: (see note)
```

Note: MAIL FROM and RCPT TO are respectively the name of the sender and recipient as specified in the SMTP envelope.

Format of structured field FAC8 code 12

The response consists of one or more structured fields, prefixed by an AID byte x‘88’ (QUERY REPLY). The format of the query reply structured field is:

```
- 2 bytes Length of structured field = variable
- 2 bytes Type of response data.
Values are same as the ‘option’ field of the corresponding request.
- 4 bytes (type 0020 only) number of lines of text
- 4 bytes (type 0020 only) flags (reserved)
- n bytes Data (in EBCDIC)
```

Format of the response to structured field FAC8 code 12

Notes:

- Response types other than 0020 do not contain the number of lines or flags.
- Response types are returned in the same order as specified in the request.
- All of the response types requested are present, even if they are zero length.
- Lines of message text are delimited by X'0D25' (EBCDIC carriage-return / line-feed).

3.5.1.2. Structured field FAC8 code 13

Structured field FAC8 code 13 searches the e-mail for a specific character string, then returns the string together with the remainder of the line.

The format of a structured field FAC8 code 13 is:

```
- 2 bytes Length of structured field = 7 + length of string
- 2 bytes Structured field identification code = X'FAC8'
- 1 bytes Code = X'13' (scan e-mail data)
- 2 bytes Option indicating the category of data to be searched:
  (see structured field FAC8 code 12)
- n bytes Character string to search for
```

Format of structured field FAC8 code 13

The response consists of one or more structured fields, prefixed by an AID byte x‘88’ (QUERY REPLY). The format of the query reply structured field is:

```
- 2 bytes Length of structured field = variable
- 2 bytes Type of response data.
Values are same as the ‘option’ field of the corresponding request.
- n bytes Data (in EBCDIC)
```

Format of the response to structured field FAC8 code 13

Notes:

- The data returned includes the character string searched for, and all characters which follow, up to the end of the line. The characters X'0D25', indicating the end of line, are not included in the response.
- Response types are returned in the same order as specified in the request.
- All of the response types requested are present, even if they are zero length.
- Structured fields FAC8 code 12 and code 13 can be combined in the same request / response.

3.5.1.3. COBOL example

Example (in Cobol format) of receiving an e-mail:

```
in Working-Storage:

      *  Request FAC812 to VIRTEL
       01  FAC812-DEM-LENG            PIC S9(4)   COMP VALUE +0.
       01  FAC812-DEM-EMAIL.
           05 FILLER                  PIC S9(4)   COMP VALUE +7.
           05 FILLER                  PIC X(3)    VALUE X'FAC812'.
           05 FAC812-DEM-OPTION-SUBJ  PIC X(2)    VALUE X'001C'.
           05 FILLER                  PIC S9(4)   COMP VALUE +7.
           05 FILLER                  PIC X(3)    VALUE X'FAC812'.
           05 FAC812-DEM-OPTION-TEXT  PIC X(2)    VALUE X'0020'.
           05 FILLER                  PIC S9(4)   COMP VALUE +17.
           05 FILLER                  PIC X(3)    VALUE X'FAC813'.
           05 FAC813-DEM-OPTION-OREF  PIC X(2)    VALUE X'0020'.
           05 FILLER                  PIC X(10)   VALUE 'Order ref:'.
      *  Response from Virtel following FAC812
       01  FAC812-REP-LENG            PIC S9(4)   COMP VALUE +0.
       01  FAC812-REP-AREA.
           05 FAC812-REP-SUBJ-LENG    PIC S9(4)   COMP.
           05 FAC812-REP-SUBJ-CODE    PIC X(2).
           05 FAC812-REP-SUBJ-DATA.
              10 FAC812-REP-SUBJ-CHAR PIC X
                                      OCCURS 0 TO 256 TIMES
                                      DEPENDING ON SUBJ-LENG.
```

```
            05 FAC812-REP-TEXT-LENG     PIC S9(4)   COMP.
            05 FAC812-REP-TEXT-CODE     PIC X(2).
            05 FAC812-REP-TEXT-NLIG     PIC S9(8)   COMP.
            05 FAC812-REP-TEXT-FLAG     PIC X(4).
            05 FAC812-REP-TEXT-DATA.
               10 FAC812-REP-TEXT-CHAR  PIC X
                                        OCCURS 0 TO 1000 TIMES
                                        DEPENDING ON TEXT-LENG.
            05 FAC813-REP-OREF-LENG     PIC S9(4)   COMP.
            05 FAC813-REP-OREF-CODE     PIC X(2).
            05 FAC813-REP-OREF-DATA.
               10 FAC813-REP-OREF-CHAR  PIC X
                                        OCCURS 0 TO 256 TIMES
                                        DEPENDING ON OREF-LENG.
        01  SUBJ-LENG                   PIC S9(4)   COMP VALUE +0.
        01  SUBJ-MESSAGE.
            05 FILLER                   PIC X(5)    VALUE 'SUBJ:'.
            05 SUBJ-DATA                PIC X(50).
        01  TEXT-LENG                   PIC S9(4)   COMP VALUE +0.
        01  TEXT-MESSAGE.
            05 FILLER                   PIC X(5)    VALUE 'TEXT:'.
            05 TEXT-DATA                PIC X(80).
        01  OREF-LENG                   PIC S9(4)   COMP VALUE +0.
        01  OREF-MESSAGE.
            05 FILLER                   PIC X(5)    VALUE 'OREF:'.
            05 OREF-DATA                PIC X(50).
        01  ERR-MESSAGE                 PIC X(40)   VALUE
            'RBC8 UNEXPECTED RESPONSE FROM VIRTEL'.

 in the Procedure Division:

            MOVE +256 TO SUBJ-LENG
            MOVE +1000 TO TEXT-LENG
            MOVE +256 TO OREF-LENG
            MOVE LENGTH OF FAC812-DEM-EMAIL TO FAC812-DEM-LENG
            MOVE LENGTH OF FAC812-REP-AREA TO FAC812-REP-LENG
            EXEC CICS CONVERSE FROM(FAC812-DEM-EMAIL)
                               FROMLENGTH(FAC812-DEM-LENG)
                               INTO(FAC812-REP-AREA)
                               TOLENGTH(FAC812-REP-LENG)
                               STRFIELD
            END-EXEC
            IF EIBAID EQUAL X'88'
                SUBTRACT 4 FROM FAC812-REP-SUBJ-LENG GIVING SUBJ-LENG
                MOVE FAC812-REP-SUBJ-DATA TO SUBJ-DATA
                EXEC CICS WRITEQ TD QUEUE('CSMT')
                                    FROM(SUBJ-MESSAGE)
                END-EXEC
                SUBTRACT 12 FROM FAC812-REP-TEXT-LENG
                    GIVING TEXT-LENG
                MOVE FAC812-REP-TEXT-DATA TO TEXT-DATA
                EXEC CICS WRITEQ TD QUEUE('CSMT')
                                    FROM(TEXT-MESSAGE)
                END-EXEC
                SUBTRACT 4 FROM FAC813-REP-OREF-LENG GIVING OREF-LENG
                MOVE FAC813-REP-OREF-DATA TO OREF-DATA
                EXEC CICS WRITEQ TD QUEUE('CSMT')
                                    FROM(OREF-MESSAGE)
                END-EXEC
            ELSE
                EXEC CICS WRITEQ TD QUEUE('CSMT')
                                    FROM(ERR-MESSAGE)
                END-EXEC
            END-IF
            EXEC CICS ISSUE DISCONNECT
            END-EXEC.
```

Example of sending structured field FAC8 code 12 and 13

3.5.2. FAD4: Sending an e-mail from a host application

It is possible at any time to send an e-mail from a host application under VIRTEL control. This operation is performed by sending a WRITE STRUCTURED FIELD to the 3270 session which is intercepted by VIRTEL. The structured field data consists of a sequence of FAD4 structured fields as described below:

```
- 2 bytes Length of structured field = variable
- 2 bytes Structured field identification code = X'FAD4'
- n bytes Command code
- n bytes Value associated with command code
```

Format of structured field FAD4

The possible command codes are:

N

(Name) e-mail address of recipient.

F

(From) e-mail address of sender. If this code is not supplied, the default sender address specified on the SMTP line will be used.

X'CD'

(Code) Message identification.

S

(Subject) Message subject line.

T

(Text) Message text. The sequence X'0D25' (EBCDIC carriage-return / line-feed) can be used to separate lines of text.

C

(Charset) Add a message header indicating the character set used; ISO-8859-15 for European character set with Euro currency sign.

H

(Header) Add one or more headers. The sequence X'0D25' (EBCDIC carriage-return / line-feed) indicates the end of each of the headers in this structured field.

The entry point used to invoke the host application must contain a type-3 transaction whose external name is $MAIL$ and whose “Application” field contains the name of the SMTP line to be used for sending the outgoing e-mail.

3.5.2.1. COBOL example

Example (in Cobol format) of sending an e-mail :

```
in Working-Storage:

       01  FAD4-LONG                PIC S9(4)   COMP VALUE +0.
       01  FAD4-AREA.
           05  FAD4-COMMANDE-N.
             10  FAD4-SFLENGTH-N    PIC S9(4)   COMP VALUE +0.
             10  FILLER             PIC X(2)    VALUE X'FAD4'.
             10  FILLER             PIC X       VALUE 'N'.
             10  FAD4-DESTINATION   PIC X(22)
                 VALUE 'bowler@saint.cloud.com'.
           05  FAD4-COMMANDE-F.
             10  FAD4-SFLENGTH-F    PIC S9(4)   COMP VALUE +0.
             10  FILLER             PIC X(2)    VALUE X'FAD4'.
             10  FILLER             PIC X       VALUE 'F'.
             10  FAD4-SENDER        PIC X(22)
                 VALUE 'virtel@saint.cloud.com'.
           05  FAD4-COMMANDE-CD.
             10  FAD4-SFLENGTH-CD   PIC S9(4)   COMP VALUE +0.
             10  FILLER             PIC X(2)    VALUE X'FAD4'.
             10  FILLER             PIC X       VALUE X'CD'.
             10  FAD4-MESSAGE-ID    PIC X(32)
                 VALUE '20010321174652K07F44354K608EAF00'.
           05  FAD4-COMMANDE-S.
             10  FAD4-SFLENGTH-S    PIC S9(4)   COMP VALUE +0.
             10  FILLER             PIC X(2)    VALUE X'FAD4'.
             10  FILLER             PIC X       VALUE 'S'.
             10  FAD4-SUBJECT       PIC X(17)
                 VALUE 'email from virtel'.
           05  FAD4-COMMANDE-T.
             10  FAD4-SFLENGTH-T    PIC S9(4)   COMP VALUE +0.
             10  FILLER             PIC X(2)    VALUE X'FAD4'.
             10  FILLER             PIC X       VALUE 'T'.
             10  FAD4-TEXT-LINE-1   PIC X(14)   VALUE 'Balance report'.
             10  FILLER             PIC X(2)    VALUE X'0D25'.
             10  FAD4-TEXT-LINE-2   PIC X(9)    VALUE 'Total is '.
             10  FAD4-CURRENCY      PIC X       VALUE X'9F'.
             10  FAD4-AMOUNT        PIC 9999    VALUE 2345.
             10  FILLER             PIC X(2)    VALUE X'0D25'.
           05  FAD4-COMMANDE-H.
             10  FAD4-SFLENGTH-H    PIC S9(4)   COMP VALUE +0.
             10  FILLER             PIC X(2)    VALUE X'FAD4'.
             10  FILLER             PIC X       VALUE 'H'.
             10  FAD4-HEADER-1      PIC X(33)
                 VALUE 'X-Transaction-Server: CICS-TS 2.2'.
             10  FILLER             PIC X(2)    VALUE X'0D25'.
             10  FAD4-HEADER-2      PIC X(28)
                 VALUE 'X-Operating-System: z/OS 1.4'.
             10  FILLER             PIC X(2)    VALUE X'0D25'.
           05  FAD4-COMMANDE-C.
             10  FAD4-SFLENGTH-C    PIC S9(4)   COMP VALUE +0.
             10  FILLER             PIC X(2)    VALUE X'FAD4'.
             10  FILLER             PIC X       VALUE 'C'.
             10  FAD4-CHARSET       PIC X(33)   VALUE 'ISO-8859-15'.

in the Procedure Division:

           MOVE LENGTH OF FAD4-COMMANDE-N TO FAD4-SFLENGTH-N
           MOVE LENGTH OF FAD4-COMMANDE-F TO FAD4-SFLENGTH-F
           MOVE LENGTH OF FAD4-COMMANDE-CD TO FAD4-SFLENGTH-CD
           MOVE LENGTH OF FAD4-COMMANDE-S TO FAD4-SFLENGTH-S
           MOVE LENGTH OF FAD4-COMMANDE-T TO FAD4-SFLENGTH-T
           MOVE LENGTH OF FAD4-COMMANDE-H TO FAD4-SFLENGTH-H
           MOVE LENGTH OF FAD4-COMMANDE-C TO FAD4-SFLENGTH-C
           MOVE LENGTH OF FAD4-AREA TO FAD4-LONG
           EXEC CICS SEND FROM(FAD4-AREA)
                          LENGTH(FAD4-LONG)
                          STRFIELD
           END-EXEC.
```

Example of sending structured field FAD4

Example of the e-mail generated by the above program:

```
Date: Fri, 30 Apr 2004 15:14:05 +0100
From: virtel@saint.cloud.com
Organization: SYSPERTEC COMMUNICATION
To: bowler@saint.cloud.com
Message-id: <20010321174652K07F44354K608EAF00-bowler@saint.cloud.com>
Content-Type: text/plain; charset=ISO-8859-15
Content-Transfer-Encoding: 8bit
X-Transaction-Server: CICS-TS 2.2
X-Operating-System: z/OS 1.4
```

```
Subject: email from virtel

Balance report
Total is €2345
```

Example of e-mail generated by structured field FAD4

4. Security

4.1. VIRTEL Web Access Security

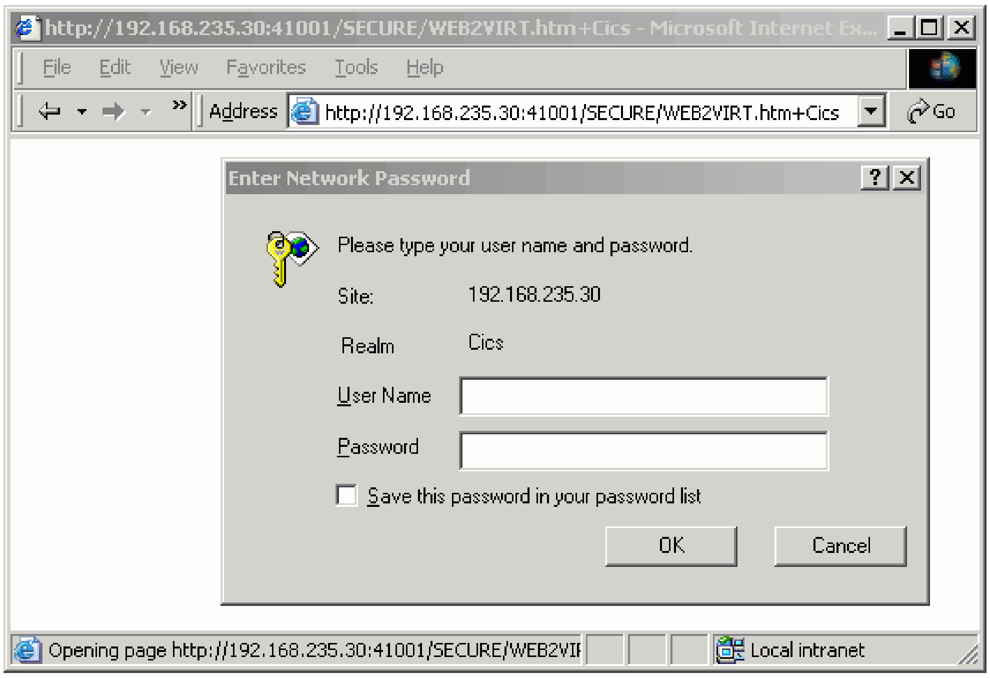
VIRTEL examines the URL of every VIRTEL Web Access request which arrives from a browser. Since there is no permanent IP session between the browser and VIRTEL, there is less risk of a session being “hijacked”. In addition to standard network security features (firewall, network sign on, SSO, etc.), each URL sent to VIRTEL has a structure which allows VIRTEL to enforce authorization rules based on Entry Point, Rules, and Transactions, which are VIRTEL entities described in the “VIRTEL Connectivity Reference” manual.

4.2. Technical Characteristics

4.2.1. Specifying security in the entry point

VIRTEL supplies a signon program for HTTP lines called VIR0020H (refer to the “VIRTEL Connectivity Reference” manual for more details about how to specify a signon program in an entry point).

When the first call is made to a secure transaction under an entry point which specifies VIR0020H as its signon program, VIRTEL requests the browser (via a 401 response) to display a dialog box inviting the user to enter a userid and password. VIRTEL passes the userid and password to the security manager (RACF, etc.) for validation. VIRTEL can also propagate the userid and password to other applications (for example, CICS) by means of connection / disconnection scripts defined in the transaction (see the “VIRTEL Connectivity Reference” manual for details). Depending on the userid, the security manager may authorize or deny access to the requested transaction.


http://192.168.235.30:41001/SECURE/WEB2VIRT.htm+Cics - Microsoft Internet Ex...

Address http://192.168.235.30:41001/SECURE/WEB2VIRT.htm+Cics

Enter Network Password

Please type your user name and password.

Site: 192.168.235.30

Realm Cics

User Name

Password

Save this password in your password list

Opening page http://192.168.235.30:41001/SECURE/WEB2VIF

Example of signon dialog box displayed by browser

4.2.2. Specifying security in the transaction

To display the signon dialog box shown above, the transaction under the entry point must specify SECURITY 1 (standard). Refer to the “Transactions” section of the “VIRTEL Connectivity Reference” manual for details of the security field in the VIRTEL transaction definition.

Security can be specified either on the application transaction (transaction type 1, 2, 3), or on the directory transaction (transaction type 4). In the above example, “SECURE” is the directory transaction, and “Cics” is the application transaction. Specifying security at the directory level can be useful in that it forces the user to sign on even when displaying a static page which has no associated application transaction.

4.2.3. Mixed-case password support

If SECUR=RACROUTE or SECUR=(RACROUTE,RACF) is specified in the VIRTCT, and if the security manager reports that it supports lower-case characters in passwords, then VIRTEL will pass all passwords to the security manager in mixed case as entered by the user. Otherwise VIRTEL will translate all passwords to upper case before passing them to the security manager. Message VIR0861I at startup indicates that VIRTEL will use mixed-case passwords.

4.2.4. Automatic retrieval of username

NTLM security allows VIRTEL to retrieve the username under which the user has already signed on to Windows. This allows VIRTEL Web Access to sign on the user without requiring him or her to enter a username and password.

When SECURITY 2 (NTLM) is specified in the VIRTEL transaction definition (either the application transaction or the directory transaction) VIRTEL requests the browser to supply the Windows username.

Note: when the user is identified by NTLM, VIRTEL does not have access to the user’s password, and therefore VIRTEL cannot verify the validity of the username, and cannot propagate the signon to other applications such as CICS.

Before NTML can be used with the Firefox browser, the server name must be configured into the browser. Type about:config in the address bar, and enter the VIRTEL Web Access server address (for example, 192.168.235.61:41000) as the value of the network.automatic-ntlm-auth.trusted-uris parameter.

4.2.5. Data encryption by SSL

The AT-TLS feature ("Application Transparent Transport Layer Security"), available with z/OS Communication Server V1R7 and later releases, allows direct access to the VIRTEL Web Access server in SSL mode (HTTPS), without using an intermediate server. The SSLSETUP job in the VIRTEL SAMPLIB contains an example of the definitions required to place VIRTEL Web Access sessions under AT-TLS control.

For VSE sites, or earlier versions of MVS where AT-TLS is not available, access to VIRTEL in HTTPS mode can be achieved by means of an intermediate server (such as Apache) operating in Reverse-Proxy mode. The function of the reverse proxy is to transform the dataflow into HTTP mode before sending it on to VIRTEL.

4.2.6. Identification by certificate

The definition of a transaction with SECURITY 3 (TLS) allows VIRTEL to recognize a VIRTEL Web Access user by means of a digital certificate installed in the user's web browser. VIRTEL will use the RACF userid associated with the certificate to determine the user's authority to execute the transaction.

VIRTEL is able to obtain the client's userid, without requiring the user to sign on, when all of the following conditions are true:

- The user enters VIRTEL via a secure https session using the AT-TLS function of z/OS V1R7 or later
- The TTLSConnectionAction or TTLSEnvironmentAction statement in the policy agent configuration file contains the parameter HandshakeRole ServerWithClientAuth
- The client's browser presents a valid certificate during SSL handshake
- The z/OS Security Server (RACF) recognizes the certificate as belonging to the user (Refer to "Chapter 21 RACF and Digital Certificates" in "SA22-7683-05 z/OS Security Server RACF Security Administrator's Guide" for more information on associating user IDs with certificates)

The sample job SSLUCERT in the VIRTEL SAMPLIB illustrates how to generate a user client certificate using RACF. The certificate is registered in the RACF database and is exported to a PKCS12 (.P12) file which contains both the user certificate and the user's private key encrypted under a passphrase. The .P12 file must be downloaded in binary to the user's workstation and installed in the user's browser.

Note that when a user is identified by certificate, VIRTEL does not have access to the user's password, and therefore cannot propagate the signon to other applications such as CICS.

4.2.7. Password encryption

VIRTEL Web Access offers the possibility of encrypting passwords (3270 non-display fields) transmitted in HTML pages. VIRTEL uses the encryption facilities provided by the System z hardware through the z/OS Integrated Cryptographic Service Facility (ICSF). Password encryption is available only when using VIRTEL Web Access in Ajax mode using the WEB2AJAX.htm page template (see "Presentation modes", page 103).

To activate the password encryption option for WEB2AJAX.htm you must specify a CRYPTn parameter in the VIRTCT (see "Parameters of the VIRTCT" in the VIRTEL Installation Guide). The CRYPTn parameter must specify CRYPT3270 as the name and ICSF as the encryption engine, as in example shown below:

```
         CRYPT1=(CRYPT3270,3TDEA,RSA-1024,ICSF,HEX),            *
```

CRYPTn parameter for password encryption using WEB2AJAX.htm

4.2.8. Signon using HTML fields

The definition of a transaction with SECURITY 4 (HTML) allows VIRTEL to obtain the userid and password from fields embedded in the HTML page.

When a security type 4 transaction is requested, and the user is not already signed on, VIRTEL will send the requested page to the browser without connecting to the application. The page template must use the CREATE-VARIABLE-IF tag (described 62) to determine whether signon is required, and the DECLARE-FIELD-AS tag (described 62) to declare the username and password fields.

Following an unsuccessful signon attempt, the special variable $ERRMSG$ contains one or more error messages which may be included in the page template.

The figure below shows an example of a transaction with security type 4:

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: SP3VIR5  11:35:36

Internal name ===> HTTP-16                To associate with an entry point name
External name ===> cicsHtml               Name displayed on user menu
Description   ===> Access CICSD with HTML security
Application   ===> SPCICSD                Application to be called
PassTicket    ===> 0  Name ===>           0=no 1=yes 2=unsigned
Application type   ===> 1                 1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> HTVT              Prefix of name of partner terminals
Logmode            ===>                   Specify when LOGMODE must be changed
How started        ===> 2                 1=menu 2=sub-menu 3=auto
Security           ===> 4                 0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                   0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===> Signon to CICS&/W&'114BE9'&U&'114CF9'&P&/A

TIOA at logoff     ===> &£6D

Initial Scenario   ===>                   Final Scenario      ===>
Input Scenario     ===>                   Output Scenario     ===>

P1=Update                          P3=Return                         P12=Server
```

HTML security: Example transaction with security type 4

The figure below shows an example of a page template containing userid and password fields which can be used with the security type 4 transaction shown Figure 4 -187:

```
<!--VIRTEL start="{{{" end="}}}" -->
<!doctype html public "-//w3c//dtd html 4.0//en">
<html><head>{{{ SET-OUTPUT-ENCODING-UTF-8 "" }}}
<meta http-equiv="Content-Type" content="text/html; charset=utf-8">
{{{CREATE-VARIABLE-IF (SIGNON-IS-NEEDED) "$$SIGTYPE"}}}
{{{CREATE-VARIABLE-IF (APPLICATION-IS-CONNECTED) "$$APP"}}}
  <script language="javascript" src="../w2h/js01.js"
type="text/javascript"></script>
  <script>document.write("<link rel='stylesheet' type='text/css'
href='../w2h/STYL"+w2hparm.style+".css' />")</script>
  {{{WHEN-EXISTS "$$SIGTYPE"}}}
  <link rel="stylesheet" type="text/css" href="../w2h/login.css" />
  <title>{{{NAME-OF (VIRTEL)}}} signon</title>
  <script src="../w2h/md5.js" type="text/javascript"></script>
</head>
<body>
{{{DECLARE-FIELD-AS (USERNAME) "USERNAME"}}}
{{{DECLARE-FIELD-AS (PASSWORD,HEX) "PASSWORD"}}}
{{{DECLARE-FIELD-AS (NEW-PASSWORD,HEX) "NEWPASSWORD"}}}
{{{DEFINE-HTML-PFKEY "pf"}}}
<script>
genloginform("{{{NAME-OF (PAGE)}}}++{{{AJAX-SESSION-CODE}}}",
 "{{{NAME-OF (VIRTEL)}}}","{{{NAME-OF (TRANSACTION-EXTERNAL)}}}",
"{{{NAME-OF (USER)}}}","{{{NAME-OF (PASSWORD)}}}",
 "{{{TRIMMED-VALUE-OF "$ERRMSG$"}}}");
</script>
</body>
{{{END-WHEN-EXISTS "$$SIGTYPE"}}}
```

```
{{{WHEN-NOT-EXISTS "$$SIGTYPE"}}}
<body onLoad=" VirtelFormload()">
<p>Logged in as <strong>{{{TRIMMED-VALUE-OF "$$SIG"}}}</strong></p>
{{{FOR-EACH-VALUE-IN "$ERRMSG$"}}}
 <p>{{{CURRENT-VALUE-OF "$ERRMSG$"}}}</p>
{{{END-FOR "$ERRMSG$"}}}
<form name=virtelForm
      action="classics.htm++{{{ SESSION-CODE }}}" method="POST">
<pre><div id="printReady">{{{ GENERATE-HTML (1,1,5000) }}}</div></pre>
<input type="submit" name="disco" value="Disconnect"
       onclick="submitForm('DISCONNECT')" >
{{{ DEFINE-HTML-PFKEY "pf" }}}<input name="pf" type="HIDDEN" value="ENTER">
{{{ DEFINE-HTML-FOCUS-FIELD "focusField" }}}
<input name="focusField" type="hidden" value="{{{FIELD-WITH-CURSOR}}}">
</form>
{{{END-WHEN-NOT-EXISTS "$$SIGTYPE"}}}
</body></html>
```

HTML security: Example page template

4.2.9. Security by rule

The rules attached to an HTTP line allow security to be implemented at the entry point level. The following example shows a set of three rules which are used to filter incoming HTTP calls. The first rule, 1HT00100, assigns an entry point specifically for users known to VIRTEL and identified by means of a “cookie” included in their HTTP request. In this case, the entry point will be chosen according to the set of rules associated with that particular user (see “Correspondent Management”, page 64). The second rule, 1HT00200, assigns the entry point EPINTERN to clients whose IP address is 192.168.n.n, and only during the period Monday to Friday during the hours 08:30 to 17:30. The third rule, 1HT00900, assigns the entry point EPPUBLIC to all other requests (this entry point could, for example, display a page containing the message “Access not authorised”).

```
 LIST of RULES in RULE SET: H-HTTP   ---------------- Applid: SPVIRD2  13:57:53

 Name     Status   Description                                Entry
                                                              Point
 1HT00100 ACTIVE   HTTP access (users authorised by cookie)   $COOKIE$
 1HT00200 ACTIVE   HTTP access (internal network, working hours)     EPINTERN
 1HT00900 ACTIVE   HTTP access (other users)                  EPPUBLIC











 P1=Update              P2=Suppress           P3=Return
 P6=1st page            P7=Page-1             P8=Page+1                P12=Edit
```

HTTP security by rule: List of rules

```
 DETAIL of RULE from RULE SET: H-HTTP   ------------- Applid: SPVIRD2  14:04:18

 Name          ===> 1HT00100               Rule priority is per name
 Status        ===> ACTIVE                 Mon, 24 Sep 2001 14:19:14
 Description   ===> HTTP access (users authorised by cookie)
 Entry point   ===> $COOKIE$               Target Entry Point
```

```
Parameter     ===>                                   optional &1 value
Trace         ===>                        1=commands 2=data 3=partner

C : 0=IGNORE 1=IS 2=IS NOT 3=STARTS WITH 4=DOES NOT 5=ENDS WITH 6=DOES NOT
0 IP Subnet   ===>                        Mask     ===>
0 Host        ===>
0 eMail       ===>
0 Calling DTE ===>                        Calling DTE address or proxy
0 Called      ===>                        Called DTE address
0 CUD0 (Hex)  ===>                        First 4 bytes of CUD (X25 protocol)
0 User Data   ===>

0 Days        ===> M:      T:      W:      T:      F:      S:      S:
0 Start time  ===> H:      M:      S:     End time ===> H:      M:      S:

P1=Update                          P3=Return                      Enter=Add
P4=Activate                        P5=Inactivate                  P12=Entry P.
```

HTTP security by rule: Users authorized by cookie

```
DETAIL of RULE from RULE SET: H-HTTP   ------------- Applid: SPVIRD2  14:08:45

Name          ===> 1HT00200               Rule priority is per name
Status        ===> ACTIVE                 02 Jun 2006 14:08:41       VIRDBA
Description   ===> HTTP access (internal network, working hours)
Entry point   ===> EPINTERN               Target Entry Point
Parameter     ===>                                   optional &1 value
Trace         ===>                        1=commands 2=data 3=partner

C : 0=IGNORE 1=IS 2=IS NOT 3=STARTS WITH 4=DOES NOT 5=ENDS WITH 6=DOES NOT
1 IP Subnet   ===> 192.168.000.000        Mask     ===> 255.255.000.000
0 Host        ===>
0 eMail       ===>
0 Calling DTE ===>                        Calling DTE address or proxy
0 Called      ===>                        Called DTE address
0 CUD0 (Hex)  ===>                        First 4 bytes of CUD (X25 protocol)
0 User Data   ===>

1 Days        ===> M: X    T: X    W: X    T: X    F: X    S:      S:
1 Start time  ===> H: 08   M: 30   S: 00  End time ===> H: 17   M: 30   S: 00

P1=Update                          P3=Return                      Enter=Add
P4=Activate                        P5=Inactivate                  P12=Entry P.
```

HTTP security by rule: Internal network, working hours

```
DETAIL of RULE from RULE SET: H-HTTP   ------------- Applid: SPVIRD2  14:10:50

Name          ===> 1HT00900               Rule priority is per name
Status        ===> ACTIVE                 02 Jun 2006 14:08:05       VIRDBA
Description   ===> HTTP access (other users)
Entry point   ===> EPPUBLIC               Target Entry Point
Parameter     ===>                                   optional &1 value
Trace         ===>                        1=commands 2=data 3=partner

C : 0=IGNORE 1=IS 2=IS NOT 3=STARTS WITH 4=DOES NOT 5=ENDS WITH 6=DOES NOT
0 IP Subnet   ===> 000.000.000.000        Mask     ===> 000.000.000.000
0 Host        ===>
0 eMail       ===>
0 Calling DTE ===>                        Calling DTE address or proxy
0 Called      ===>                        Called DTE address
0 CUD0 (Hex)  ===>                        First 4 bytes of CUD (X25 protocol)
0 User Data   ===>

0 Days        ===> M:      T:      W:      T:      F:      S:      S:
0 Start time  ===> H:      M:      S:     End time ===> H:      M:      S:
```

```
P1=Update                          P3=Return                     Enter=Add
P4=Activate                        P5=Inactivate                 P12=Entry P.
```

HTTP security by rule: Other users

5. HOWTOs

5.1. How To Use Different Screen Sizes

Although the standard 3270 screen size is 24 rows by 80 columns, certain applications benefit from the use of terminals with larger screen sizes. The screen size is determined by the LOGMODE used for the session between VIRTEL and the host application. VTAM offers logmodes for the following standard screen sizes:

- model 2 : 24x80 (logmode SNX32702)
- model 3 : 32x80 (logmode SNX32703)
- model 4 : 43x80 (logmode SNX32704)
- model 5 : 27x132 (logmode SNX32705)

There are two different ways that the VIRTEL administrator can set up the configuration to allow the VIRTEL Web Access user to select the desired logmode:

- define a separate VIRTEL transaction for each screen size, and allow the user to select the appropriate transaction
- group the VTAM relay LUs into pools, each pool having a different logmode, and allow the user to select the pool by coding an appropriate parameter on the URL

5.1.1. LOGMODE defined by the transaction

With this method, the administrator defines multiple VIRTEL transactions for a single application, each transaction specifying a different logmode. For example, transactions Tso2 and Tso5 delivered in the sample configuration both define TSO as the target application, but specify different logmodes SNX32702 and SNX32705 respectively. The user selects the desired transaction from the applist menu displayed by the “Other applications” link in the VIRTEL Web Access menu.

The figure below shows the definition of the Tso5 transaction defined under the WEB2HOST entry point:

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: VIRTEL   17:12:54

Internal name ===> W2H-13M5               To associate with an entry point name
External name ===> Tso5                   Name displayed on user menu
Description   ===> Logon to Tso (3270 model 5)
Application   ===> TSO                    Application to be called
PassTicket    ===> 0  Name ===>           0=no 1=yes 2=unsigned
Application type   ===> 1                 1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> DEVT              Prefix of name of partner terminals
Logmode            ===> SNX32705          Specify when LOGMODE must be changed
How started        ===> 1                 1=menu 2=sub-menu 3=auto
Security           ===> 0                 0=none 1=basic 2=NTLM 3=TLS 4=HTML
```

```
H4W commands ?     ===>                     0=no 1=yes 2=if2VIRTEL 4=auto
Logon message      ===>

TIOA at logon      ===>

TIOA at logoff     ===>

Initial Scenario   ===>                     Final Scenario      ===>
Input Scenario     ===>                     Output Scenario     ===>

P1=Update                            P3=Return                         P12=Server
```

Example of TSO transaction TSO specifying logmode SNX32705

The URL to access this transaction could be of the format:

```
http://n.n.n.n:41001/w2h/WEB3270.htm+Tso5
```

5.1.2. Assigning a LOGMODE by URL parameter

The URL which allows the browser to connect to a host application via VIRTEL may contain a parameter, such as "model5" as shown in this example:

```
http://n.n.n.n:41001/w2h/WEB3270.htm+Tso+model5
```

This form of a VIRTEL URL is described in the section "Dynamic URL with user data", page 0.

This form of URL is processed by VIRTEL with reference to the "rule set" associated with the HTTP line. VIRTEL looks for a rule whose "User Data" field matches the value of the parameter (model5). The "Parameter" field of the selected rule assigns a relay LU name from the pool defined with logmode SNX32705.

The VTAM definition of the relay pool is shown in the example below. In this example, LU names in the range RHTVT5nn are defined to have the model5 logmode SNX32705:

```
VIRTAPPL VBUILD TYPE=APPL
* ------------------------------------------------------------------ *
* RHTVTxxx    : Relay for VTAM applications acceded by WEB to HOST   *
* ------------------------------------------------------------------ *
* 3270 model 2 terminals
RHTVT0?? APPL  AUTH=(ACQ,PASS),MODETAB=ISTINCLM,DLOGMOD=SNX32702,EAS=1
* 3270 model 5 terminals
RHTVT5?? APPL  AUTH=(ACQ,PASS),MODETAB=ISTINCLM,DLOGMOD=SNX32705,EAS=1
```

VTAM definition of terminal groups

The screen below shows an example rule which assigns a relay LU from the range RHTVT5nn when the URL contains the parameter model5:

```
DETAIL of RULE from RULE SET: W-HTTP   ------------- Applid: VIRTEL   17:15:15

Name          ===> WHT00150                Rule priority is per name
Status        ===> INACTIVE                Mon, 24 Sep 2001 14:19:14
Description   ===> HTTP access (with model5 URL parameter)
Entry point   ===> WEB2HOST                Target Entry Point
Parameter     ===> RHTVT5*                            &1 value or LUNAME
Trace         ===>                         1=commands 2=data 3=partner

C : 0=IGNORE 1=IS 2=IS NOT 3=STARTS WITH 4=DOES NOT 5=ENDS WITH 6=DOES NOT
0 IP Subnet   ===>                         Mask     ===>
0 Host        ===>
0 eMail       ===>
0 Calling DTE ===>                         Calling DTE address or proxy
```

```
0 Called      ===>                         Called DTE address
0 CUD0 (Hex)  ===>                         First 4 bytes of CUD (X25 protocol)
1 User Data   ===> model5

0 Days        ===> M:      T:      W:      T:      F:      S:      S:
0 Start time  ===> H:      M:      S:     End time ===> H:      M:      S:

P1=Update                          P3=Return                      Enter=Add
P4=Activate                        P5=Inactivate                  P12=Entry P.
```

Example rule for selection of logmode by URL

The LU name (RHTVT5nn) assigned by the rule must belong to the LU pool shared assigned to the HTTP line, as shown in the example below:

```
TERMINAL DETAIL DEFINITION ------------------------ Applid: VIRTEL   13:32:28

Terminal           ===> W2HTP500       ?wxyZZZZ for dynamic allocation
                                       w : Sna or Non-sna or * (category)
                                       x : 1, 2, 3, 4, 5 or *  (model)
                                       y : Colour, Monochrome or *
                                       Z : any characters
Relay              ===> RHTVT500       Name seen by VTAM applications
                                       = : copied from the terminal name
*Pool name         ===> *W2HPOOL       Pool where to put this terminal
Description        ===> Relay pool for HTTP (3270 model 5)

Entry Point        ===>                Enforced Entry Point
2nd relay          ===> RHTIM500       Possible 2nd relay (Printer)
Terminal type      ===> 3              1=LU1  2=3270  3=FC P=Printer S=Scs
Compression        ===> 2              0, 1, 2 or 3 : compression type
Possible Calls     ===> 3              0=None  1=Inbound  2=Outbound  3=Both
Write Stats to     ===> 12             1,4=VIRSTAT 2=VIRLOG

Repeat             ===> 0020           Number of generated terminals

P1=Update                          P3=Return                      Enter=Add
                                                                  P12=Server
```

Definition of model 5 terminals in the W2HPOOL pool

5.1.3. User-specified LOGMODE

When the entry point definition specifies SCENLOGM in the “Identification scenario” field, the user may override the default logmode by appending an additional parameter LOGMODE=modename to the URL, as shown in this example:

```
http://n.n.n.n:41001/w2h/WEB3270.htm+Tso?logmode=SNX32705
```

The source code for the SCENLOGM scenario is supplied in the VIRTEL SAMPLIB.

Note: To activate this functionality, SCENLOGM must be specified in the “Identification scenario” field of the ENTRY POINT (not the transaction definition)

5.1.4. Dynamic logmode with user-specified screen size

VIRTEL Web Access also supports the use of “dynamic” logmodes, such as D4A32XX3, which allow the user to specify a non-standard alternate screen size. When the entry point definition specifies SCENLOGM in the “Identification scenario” field, the user may also append ROWS and COLS parameters to the URL, as shown in this example:

```
http://n.n.n.n:41001/w2h/WEB3270.htm+Tso?logmode=D4A32XX3&rows=54&cols=132
```

VIRTEL allows a maximum screen size of 62 rows by 160 columns. The host application must also support the use of non-standard screen sizes.

5.2. How To Support Multiple Codes Pages.

Virtel can use two methods of EBCDIC translation and this is governed by the template or web page being displayed. If the page contains the embedded Virtel tag {{{SET-OUTPUT-ENCODING-UTF-8}}} than the TCT DEFUTF8 parameter is used. If the page doesn't contain the tag then the code pages identified by the COUNTRY parameter are used. (See "COUNTRY" and "DEFUTF8" parameters in the VIRTEL Installation Guide for further details).

Code Page Support can be provided at the following levels:

- TCT Level - This would provide Code Page translation defaults for all lines and transaction. Effectively a Global option for an instance of Virtel.
- URL Level – This overrides the TCT default.
- Transaction level - Code pages can be determined through the Virtel Scenario language using the SET$ ENCODING and SET$ URL-ENCODING instructions.

5.2.1. Defining Code Pages translation defaults.

This is done by defining a default value for "COUNTRY" and "DEFUTF8" parameters in the VIRTEL TCT (see "Parameters of the VIRTCT" in the VIRTEL Installation Guide).

5.2.2. Override the TCT defaults at URL level.

Users who require a codepage different from the TCT definition can specify the code page as a parameter of the URL. For example:

```
http://n.n.n.n:41001/w2h/WEB2AJAX.htm+Tso?codepage=IBM1047
```

Note: To activate this functionality, SCENLOGM must be specified in the "Identification scenario" field of the ENTRY POINT (not the transaction definition).

The value of the CODEPAGE parameter may be either:

- one of the values listed for the DEFUTF8 parameter of the VIRTCT (see "Parameters of the VIRTCT" in the VIRTEL Installation Guide); or
- one of the additional codepages you have specified in the CHARSET parameter in your VIRTCT at VIRTEL installation time

5.2.3. Override the TCT defaults at business logic level.

At a transaction level code pages can be determined through the Virtel Scenario language using the SET$ ENCODING and SET$ URL-ENCODING instructions. These are described in the VWA Users Guide.

5.2.4. Supporting multiple countries.

If we take the scenario that applications can be accessible world wide than Virtel can incorporate the country differences through one of the following methods. In most case the TCT or URL override will accommodate such a set up.

- For each country supported, have a different instance of Virtel specifying the relevant country code pages at the TCT level.
- For each country supported, have a separate line/port and use the URL overrides.
- For each country supported, have a common line/port and use the URL overrides.

5.3. How To Handle Host Session Termination

When the user terminates the application session by pressing the “Disconnect” button in the browser, various options are available:

- Return to the application selection menu
- Display a specific HTML page
- Close the browser window and return to the desktop

Remember that it is always best to exit cleanly from the host application by pressing the “Disconnect” button, rather than closing the browser window. If the browser window is closed abruptly, the host session resources may not be freed until the expiry of the timeout period specified in the entry point definition.

5.3.1. Return to the application selection menu

When a “Disconnect” request is received, VIRTEL returns to the root URL and displays the default page for the line, which will normally be an application selection menu. For detailed information, see “Virtel URL formats”, page 11.

The user can then choose to connect to the same or a different application by clicking on the appropriate link in the application selection menu.

5.3.2. Displaying a specific page on disconnection

Those sites wishing to display a specific page at the end of a session may use the “Last page” field in the definition of the entry point associated with the HTTP line or the entry point selected by the rules of the line. The “Last page” field indicates the name of the page to be displayed following disconnection from the host application. The indicated file must be uploaded to the same directory as specified in the URL for the host application (for example W2H-DIR if the URL specifies /w2h/WEB3270.htm).

The “Last page” may contain instructions to the user and may include system information provided by VIRTEL (such as the application and terminal name, date and time, etc.)

5.3.3. Closing the browser window automatically

Sites who wish to close the browser window and return to the desktop when the user disconnects from the host application may specify close.htm in the “Last page” field of the entry point definition. This page contains JavaScript code which will attempt to close the current browser window. Depending on the browser version and security settings, the window may close, a prompt may be issued, or the window may remain open. The close.htm page is delivered as standard in the W2H-DIR directory but may be copied to another directory if required.

The figure below shows an example of an entry point definition with close.htm specified as the “Last page”:

```
ENTRY POINT DETAIL DEFINITION --------------------- Applid: VIRTEL   14:35:23

Name          ===> WEB2HOST                 Name this ENTRY POINT (LOGON DATA)
Description   ===> HTTP entry point (SysperTec menu)
Transactions  ===> W2H                      Prefix for associated transactions
Last page     ===> CLOSE.HTM                Displayed at end of session
Transparency  ===>                          Server types NOT to emulate
Time out      ===> 0005       minutes       Maximum inactive time
Do if timeout ===> 0                        0=logoff  1=bip+logoff   2=anti pad
Emulation     ===> HTML                     Type of terminal:
HOST4WEB     :  program driven              HTML  :  Web Browser
SCENARIO     :  script driven               EMAIL :  SMTP client
MINITEL      :  40 or 80 columns            X25   :  uses low level dialog
Signon program              ===> VIR0020H  Controls user name and password
Menu program                ===> VIR0021A  List of transactions
Identification scenario     ===>           eg XML identification
Type 3 compression          ===>           Discover typical screens  (Virtel/PC)
Mandatory identification    ===>                                    (PC or minitel)
3270 swap key               ===>           eg P24
Extended colors             ===> X         E: extended  X: extended + DBCS

P1=Update                          P3=Return                  P4=Transactions
Enter=Add
```

Example of entry point with last page

5.4. How To Access A Host Application Directly

It is not always necessary to pass via an application selection menu to connect to a host application. A host application may be accessed directly by opening the URL containing the complete path to the application. This URL may result in the display of the host signon screen, the first application screen, or possibly (if a script or scenario is used), a subsequent screen sent by the application. For more information about how VIRTEL can be used to automate the process of connection to a host application, see “Virtel URL formats”, page 11 of this manual, and “Connection/ Disconnection Scripts” in the VIRTEL Connectivity Reference manual.

5.4.1. Full path URL

For example, you can access the VIRTEL transaction whose external name is “Cics” by pointing the browser at a URL of the following format:

```
http://n.n.n.n:41001/w2h/WEB2AJAX.htm+Cics
```

At the end of the session with the host application, VIRTEL examines the “Last page” field (see previous section) to decide whether to return to the desktop or to redisplay the application selection menu.

5.4.2. Default URL for the entry point

An application URL may be coded in the “TIOA at logon” field of the default transaction for the entry point (the default transaction is the transaction whose external name is the same as the entry point name). This allows the user to go directly to the host application simply by entering a URL of the format:

```
http://n.n.n.n:41001
```

The example below shows the default transaction for the WEB2HOST entry point set up to go directly to the transaction whose external name is “Cics”:

```
TRANSACTION DETAIL DEFINITION ---------------------- Applid: VIRTEL   15:01:02

Internal name ===> W2H-00                  To associate with an entry point name
External name ===> WEB2HOST                Name displayed on user menu
Description   ===> Default directory = entry point name
Application   ===> W2H-DIR                 Application to be called
PassTicket    ===> 0  Name ===>            0=no 1=yes 2=unsigned
Application type   ===> 4                  1=VTAM 2=VIRTEL 3=SERV 4=PAGE 5=LINE
Pseudo-terminals   ===> DELOC              Prefix of name of partner terminals
Logmode            ===>                    Specify when LOGMODE must be changed
How started        ===> 2                  1=menu 2=sub-menu 3=auto
Security           ===> 0                  0=none 1=basic 2=NTLM 3=TLS 4=HTML
H4W commands ?     ===>                    0=no 1=yes 2=if2VIRTEL 4=auto
Check URL Prefix   ===>

TIOA at logon      ===> /w2h/WEB2AJAX.htm+Cics

TIOA at logoff     ===>

Initial Scenario   ===>                    Final Scenario      ===>
Input Scenario     ===>                    Output Scenario     ===>

P1=Update                         P3=Return                      P12=Server
```

Example of default URL

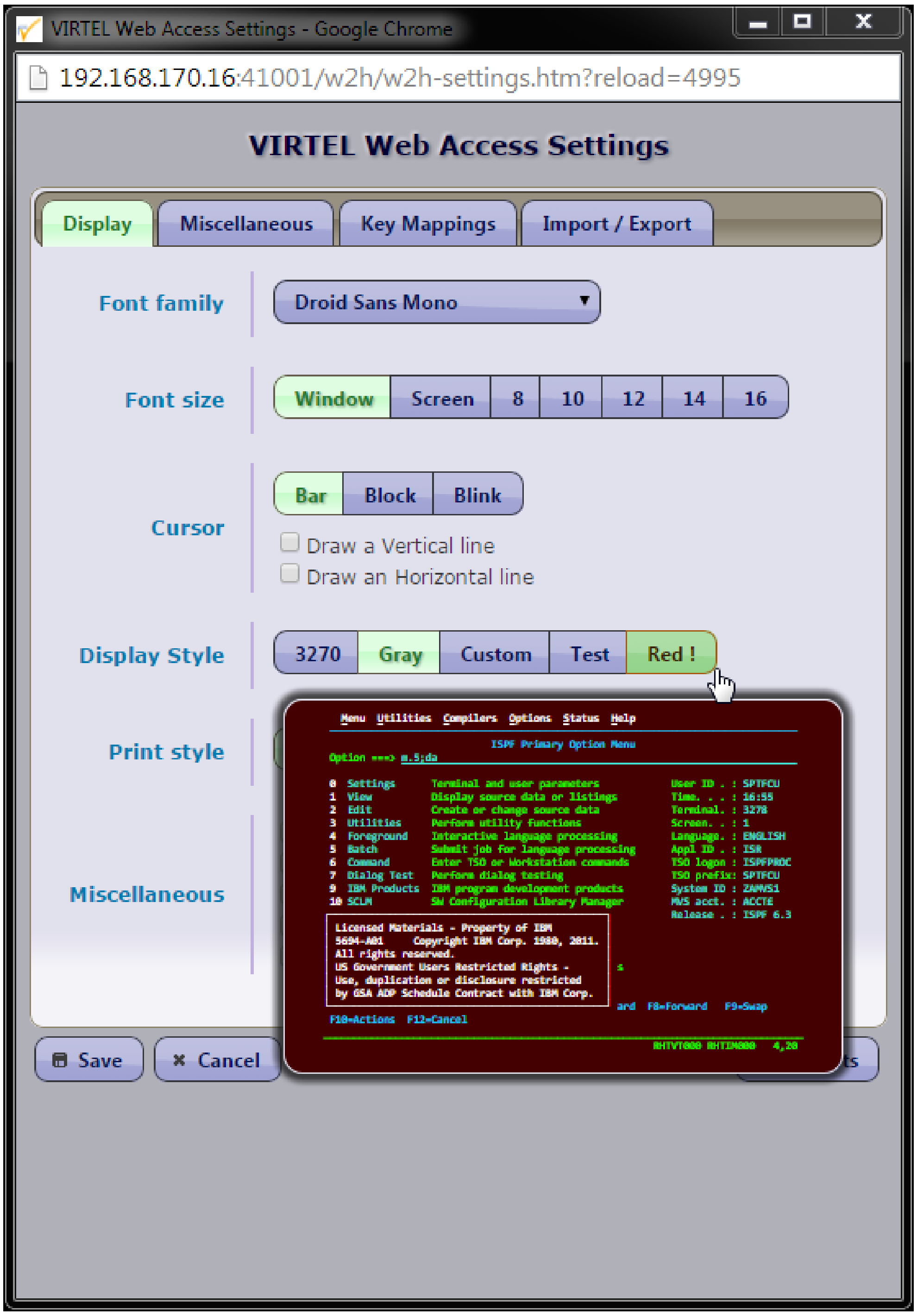
For more information see “Virtel URL formats”, page 11.

5.5. How To Change The Font For Web Access

The “Web Access settings menu”, page 0 allows you to change the font family and font size. By default VIRTEL will calculate an appropriate font size to fit the browser window size, but you can choose a fixed font size if you prefer. VIRTEL Web Access uses a fixed-pitch font to display the 3270 screen. If you do not like the default font then you can choose any fixed-pitch font installed on the workstation. Typical fonts available on Windows workstations are Courier New, Fixedsys, Terminal, Consolas, and Lucida Console. You can use the Windows Control Panel – Fonts dialog to view the installed fonts.

5.6. How To Change The 3270 Display Style

The “Web Access settings menu”, page 0 allows you to change the display style to suit your needs. By default VIRTEL provides 3 defaults models named “3270”, “Gray” and “White”, If you need some more, you must request your Administrators.



VIRTEL Web Access Settings - Google Chrome

192.168.170.16:41001/w2h/w2h-settings.htm?reload=4995

VIRTEL Web Access Settings

Display | Miscellaneous | Key Mappings | Import / Export

Font family: Droid Sans Mono

Font size: Window | Screen | 8 | 10 | 12 | 14 | 16

Cursor: Bar | Block | Blink

- [ ] Draw a Vertical line
- [ ] Draw an Horizontal line

Display Style: 3270 | Gray | Custom | Test | Red !

Print style

Miscellaneous

Save | Cancel

```
 Menu  Utilities  Compilers  Options  Status  Help
 ----------------------------------------------------------------------
                       ISPF Primary Option Menu
Option ===> m.5;da

0  Settings      Terminal and user parameters          User ID . : SPTFCU
1  View          Display source data or listings       Time. . . : 16:55
2  Edit          Create or change source data          Terminal. : 3278
3  Utilities     Perform utility functions             Screen. . : 1
4  Foreground    Interactive language processing       Language. : ENGLISH
5  Batch         Submit job for language processing    Appl ID . : ISR
6  Command       Enter TSO or Workstation commands     TSO logon : ISPFPROC
7  Dialog Test   Perform dialog testing                TSO prefix: SPTFCU
9  IBM Products  IBM program development products      System ID : ZAMVS1
10 SCLM          SW Configuration Library Manager      MVS acct. : ACCTE
                                                       Release . : ISPF 6.3
 Licensed Materials - Property of IBM
 5694-A01     Copyright IBM Corp. 1980, 2011.
 All rights reserved.
 US Government Users Restricted Rights -       s
 Use, duplication or disclosure restricted
 by GSA ADP Schedule Contract with IBM Corp.
                                               ard  F8=Forward   F9=Swap
F10=Actions  F12=Cancel

                                                 RHTVT000 RHTIM000   4,20
```

Selecting display pattern

The display model changes will take effect at the next connection to a 3270 application.

5.7. How To Customize The Enter Key Settings

Many 3270 users prefer to customize the keyboard mapping so that the “Enter” key on the main keyboard is handled as a 3270 newline, while the right “Ctrl” key and the “Enter” key on the numeric keypad are treated as 3270 Enter.

The “Web Access settings menu”, page 0 allows you to specify this configuration using the following settings:

```
"ctrl":"ENTER",
"enter":"Newline",
"kpenter":"ENTER"
```

Note however that versions 6, 7, and 8 of Internet Explorer do not distinguish between the Enter key on the main keyboard and the Enter key on the numeric keypad. For users who want the two “Enter” keys to be handled differently, Syspertec supplies an additional DLL to be installed in Internet Explorer as a “Browser Helper Object”. This DLL can be installed by clicking on the “Install VirtKey BHO” link on the VIRTEL Web Access menu. After installing the DLL, go to “Tools” – “Internet Options” – “Advanced” and check that the option “Enable third-party browser extensions” is ticked, then stop and restart Internet Explorer. Administrator privilege is needed to install the Browser Helper Object, but once installed the BHO can be used by users without administrator privileges.

Although other browsers (including Internet Explorer 9) are capable of recognizing the keypad Enter key without the need for a BHO, older releases of Firefox, Chrome, and Safari do not distinguish between the left and right Ctrl keys. This means that when “ctrl” is set to “ENTER” then both Ctrl keys will be handled as 3270 Enter. In addition, the AltGr key will be treated as Ctrl under Firefox. The most recent versions of Firefox (from version 15 onwards for Windows 7 and from version 17 onwards for Windows XP) and Chrome (from version 23 onwards) are capable of distinguishing between the left and right Ctrl keys like Internet Explorer.

5.7.1. Managing CTRL keydown being lost

With some Windows Operating System, the CTRL keydown events may be lost half the time. In such case, you must turn on a special feature by introducing the following command into a "custom.js" file.

```
/*
 * The workaround for missing CTRL key events (on some Windows system) is
 * activated if this property is set to true.
 * Default value (if unspecified) : false
 */

 w2hparm.fixMissingCtrlKeydown = true;
```

This feature requires the update #5266 at least to be applied.

5.8. How To Customize Display Styles

Virtel users can customise the screen display to suit their needs. An exception to this is the model type which is an Administration function. Administrators will configure model types which can then be selected by a user.

5.8.1. Add or remove a display style

To add a new display style, you must :

- Create a CSS file with a “.css” extension name,
- Load this file in any directory of your choice except in W2H-DIR,
- Make sure that this directory is referenced in the entry point by using a transaction that contains the string “/w2h/custom-css” (without the quotes) in the “URL prefix” field.

- Create (or modify) a custom.js file to reference the recently added CSS file (see below),
- Load the custom.js file in any directory of your choice except in W2H-DIR,
- Make sure that this directory is referenced in the entry point by using a transaction that contains the string "/w2h/custom-js" (without the quotes) in the "URL prefix" field.

```
 /*======================================================================
 *
 *              CUSTOM CODE SAMPLE TO ADD A CUSTOM CSS FILE
 *                    OR TO REMOVE A DEFAULT CSS FILE
 *
 *====================================================================*/

/*
 * This implementation adds 3 custom CSS to the settings "Display Style" list choice,
 * and removes the "white" default choice from this list.
 */
function modify_settingsValues(name, values)  {
  // The target is the "style" list settings
  if (name == "style") {
    // Remove the "white" default entry from the list of choices
    values.splice( values.indexOf('white'), 1);
    // Append 3 custom styles to the list of choices
    return values.concat( "GREEN.CSS"
                        , "BLUE.CSS"
                        , "RED.CSS" );
  }
}

/*
 * This block of code sets a specific label for each style added.
 * If this code is omitted, the raw value of the entries are displayed instead.
 */
oVWAmsg.custom( { "style:GREEN.CSS" : "Custom"  // Use this label instead of 'GREEN.CSS'
        , "style:BLUE.CSS"  : "Test"    // Use this label instead of 'BLUE.CSS'
                , "style:RED.CSS"   : "Red !"   // Use this label instead of 'RED.CSS'
});
```

Example of a custom.js file to add or remove a display style

5.8.2. Add or remove a print style

To add a new print style, proceed as for a display style, but in the VWAmsg.custom order, replace the word "style" by "printstyle".

```
 /*======================================================================
 *
 *              CUSTOM CODE SAMPLE TO ADD A CUSTOM CSS FILE
 *                    OR TO REMOVE A DEFAULT CSS FILE
 *
 *====================================================================*/

/*
 * This implementation adds 3 custom CSS to the settings "Display Style" list choice,
 * and removes the "white" default choice from this list.
 */
function modify_settingsValues(name, values)  {
  // The target is the "printstyle" list settings
  if (name == "printstyle") {
    // Remove the "white" default entry from the list of choices
    values.splice( values.indexOf('white'), 1);
    // Append 3 custom print styles to the list of choices
    return values.concat( "GREEN.CSS"
                        , "BLUE.CSS"
                        , "RED.CSS" );
  }
}

/*
 * This block of code sets a specific label for each print style added.
 * If this code is omitted, the raw value of the entries are displayed instead.
 */
oVWAmsg.custom( { "printstyle:GREEN.CSS" : "Custom"  // Use this label instead of 'GREEN.CSS'
        , "printstyle:BLUE.CSS"  : "Test"    // Use this label instead of 'BLUE.CSS'
                , "printstyle:RED.CSS"   : "Red !"   // Use this label instead of 'RED.CSS'
});
```

Example of a custom.js file to add or remove a print style

5.8.3. 3270 support blinking fields

Becoming unpopular over time, and even stated as being the cause of adverse reactions in people with epilepsy, the “<blink>” tag was retired from the HTML API, although it still remains within the browsers code. The feature can be reactivated through the use of CSS code but by doing so Web Accessibility guidelines may be compromised. This may be a violation in certain jurisdictions, contravening laws and regulations with regard to web design and accessibility and what is permissible. It is up to each individual to determine the purpose and usefulness of reactivating this feature.

To reactivate blinking support, you can include the following code in your custom.css file :

```
 /* To support "BLINKING" in Virtel Web Access 3270 emulation, the following code has to be included into you
.BBLUE, .BRED, .BPINK, .BGREEN, .BTURQUOISE, .BYELLOW, .BWHITE {
  -webkit-animation: blink 1s step-end infinite;
  -moz-animation: blink 1s step-end infinite;
  -o-animation: blink 1s step-end infinite;
  animation: blink 1s step-end infinite;
}
@-webkit-keyframes blink {
  67% { opacity: 0 }
}
@-moz-keyframes blink {
  67% { opacity: 0 }
}
@-o-keyframes blink {
  67% { opacity: 0 }
}
@keyframes blink {
  67% { opacity: 0 }
}
```

This code can also be found into the "custom-blink.css" source file store into the "tools" subdirectory of any update delivered from number #5310 and over.

5.9. How To Change The Default User Settings

The site default settings for Web Access are stored in the file w2hparm.js (see "Global modification of Web Access settings", page 99)

5.10. How To Change The User Settings Interface

The user settings interface can be changed using the settingsGUI parameter stored in file w2hparm.js (see "Global modification of Web Access settings", page 99)

5.11. How To Define A Reverse Proxy

If your installation uses a reverse proxy (or bastion host) between the user's browser and the VIRTEL Web Access server, then the VIRTEL log and statistics file will show the IP address of the proxy instead of the address of the end user. In order for VIRTEL to recognize and log the originating user's IP address, you must declare the proxy in the HTFORWD parameter of the VIRTCT (see "Parameters of the VIRTCT" in the VIRTEL Installation Guide) or in a rule attached to the HTTP line (see "Rules" in the VIRTEL Connectivity Reference manual).

5.12. How To Support Virtual Hosting

Name-based virtual hosting is a method for supporting multiple sites (for example, site1.mycompany.com and site2.mycompany.com) using the same IP address and port number. By means of the "HTTP Host" field in the rules attached to the HTTP line, VIRTEL can recognize the site name and direct the request to a specific entry point. Refer to "Rules" in the VIRTEL Connectivity Reference manual for further details. You can install a set sample definitions for virtual hosting by running the ARBOLOAD job (delivered in the VIRTEL SAMPLIB) with the VHOST=YES parameter.

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6.1. Open Source Software

The current VIRTEL Web Access product uses the following open source software:

jQuery

> Under MIT license
> https://jquery.org/license/.

StoreJson

> Under MIT license
> https://github.com/marcuswestin/store.js/commit/baf3d41b7092f0bacd441b768a77650199c25fa7.

jQuery_UI

> Under MIT license
> http://en.wikipedia.org/wiki/JQuery_UI.

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