The intent of this program is to provide both proof of concept and example code for CICS applications that wish to be invoked via an http or https request.

Invoke via
https://your.url.here:####/CICS/CWBA/J7200544?t=<rplyTy>
Where #### is your designated port number.

Where <rplyTy> is
html - HTML page
xml - XML artificially inflated to > 32K for demo purposes
imag - image (jpeg) to demonstrate it can be done
form - HTML form which can be sent back via HTTP POST to
demo HTTP POST processing

One other optional parameter that can be passed

c=y - include a Content-Type header
Multiple parameters are passed as follows:

This program also demonstrates multiple methods of passing data from the web side to the CICS/COBOL side. One can pass a parameter on an HTTP GET method as indicated above, or one can pass data on an HTTP POST method as is done with HTML form processing. Note that an HTTP POST is not limited to HTML form processing. One could also pass e.g. XML, and the CICS COBOL program would then do a WEB RECEIVE to obtain the XML.

Much of what is in here comes from the RFCs (Requests for Comment) for the http protocol. The RFCs are available at http://www.ietf.org/rfc.html.

Some RFCs of note:

Hypertext Transfer Protocol -- HTTP/1.0

Hypertext Transfer Protocol -- HTTP/1.1
http://www.ietf.org/rfc/rfc2616.txt?number=2616

HTTP Header Field Registrations
http://www.ietf.org/rfc/rfc4229.txt?number=4229

HTTP Authentication: Basic and Digest Access Authentication
http://www.ietf.org/rfc/rfc2617.txt?number=2617

This program seeks to make judicious use of the WRITE OPERATOR API, logging errors of note while working hard to avoid a situation where the CICS JESMSGGLG would be flooded with messages. Thus the messages written to the JESMSGGLG are _not_ the result of "business logic" errors, but actual application bugs or CICS errors that may require some action be taken.

Note that the WEB * CICS APIs are not threadsafe in CICS TS 2.2, but they are threadsafe in CICS TS 3.1. In order to be a good CICS citizen, this program restricts itself to threadsafe CICS APIs. The J7200521 subroutine executes the WRITE OPERATOR API on our behalf, as it is not threadsafe. By LINKing to this subroutine, we avoid the TCB switching problems that would result from dynamically or statically...
* calling J7200521.
* 
* The CICS TS Application Programming Guide has an extensive discussion of threadsafe and its implications.
* 
* Debugging code left in for illustrative purposes is marked with a '#debug' beginning in column 1.
* 
* Environment Division.
Configuration Section.
Data Division.
Working-Storage Section.
01 CONSTANTS.
   05 MYNAME PIC X(008) VALUE 'J7200544'.
   05 CICS-ERR-PGM PIC X(008) VALUE 'J7200501'.
   05 CICS-WTO-PGM PIC X(008) VALUE 'J7200521'.
   05 HTTP-DT-TM-PGM PIC X(008) VALUE 'J7200524'.
   
* This is used to get a date/time string in an HTTP-approved format.
* 
   05 DT-PIC-STRN.
      10 PIC S9(004) COMP-5 VALUE +80.
      10 PIC X(080)
         VALUE 'Www, DD MMM YYYY HH:MI:SS GMT'.
* 
* This is used to indicate we want GMT time from J7200524.
* 
   05 GMT-TM-FL PIC X(001) VALUE 'N'.
* 
* This is used to retrieve the client code page.
* 
   05 HTTP-CHARSET-HDR PIC X(014)
      VALUE 'Accept-Charset'.
* 
* The following HTTP-CNTE-TY-* constants are for the Content-Type HTTP protocol header. Unsurprisingly, they specify what content type the message body consists of.
* 
   05 HTTP-CNTE-TY-HTML PIC X(009) VALUE 'text/html'.
   05 HTTP-CNTE-TY-XML PIC X(008) VALUE 'text/xml'.
   05 HTTP-CNTE-TY-IMAG PIC X(010) VALUE 'image/jpeg'.
* 
* The host code page is used in translating to/from
the client code page. The problem here is that the
host code page is set at compile time for each
program. The current default at WisDOT is
CODEPAGE(037).

This constant _must_ reflect the correct code page.

05 HOST-CD-PG   PIC X(008) VALUE '037     '.

These are the names of the input fields in the HTML
form defined in FORM-RPLY. They are used to retrieve
the values of the fields with WEB READ FORMFIELD.

05 FORM-FLD-NM-TY-LIT   PIC X(004) VALUE 'type'.
05 FORM-FLD-NM-CNTE-LIT PIC X(007) VALUE 'cntehdr'.

These constants are used in the HTTP protocol header.

05 HTTP-PTCL-HDR-SRVR-LIT   PIC X(006)
VALUE 'Server'.
05 HTTP-PTCL-HDR-SRVR    PIC X(004)
VALUE 'CICS'.
05 HTTP-PTCL-HDR-DT-LIT   PIC X(004)
VALUE 'Date'.
05 HTTP-PTCL-HDR-CNTE-TY-LIT PIC X(012)
VALUE 'Content-Type'.
05 HTTP-PTCL-HDR-CACHE-CNTL-LIT PIC X(013)
VALUE 'Cache-Control'.
05 HTTP-PTCL-HDR-CACHE-CNTL PIC X(008)
VALUE 'no-cache'.
05 PTCL-LIT     PIC X(004)
VALUE 'http'.

These are application-specific status codes returned
to the caller.

05 RPLY-STUS-CD-LITS.
 10 STUS-0001   PIC X(050)
    VALUE '0001 Success'.
 10 STUS-0002   PIC X(050)
    VALUE '0002 Internal Application Error'.
 10 STUS-0003   PIC X(050)
    VALUE '0003 Bad Request Received From Client'.
 10 STUS-0004   PIC X(050)
    VALUE '0004 Request URI Too Long'.
 10 STUS-0005   PIC X(050)
VALUE '0005 Request Query String Too Long'.

* Due to its size, this buffer is defined such that
* it can be displayed in a minimum number of lines
* in a core dump. Not that I expect any...

01 WS-RPLY-BUFR.
  05 PIC X(050) OCCURS 40960.

01 SWITCHES.
  05 NON-HTTP-RQST-DONE-SW PIC X(001) VALUE SPACE.
  88 NON-HTTP-RQST-DONE PIC X(001) VALUE 'Y'.
  05 HAVE-ERR-MSG-SUFX-SW PIC X(001) VALUE SPACE.
  88 HAVE-ERR-MSG-SUFX PIC X(001) VALUE 'Y'.
  05 HTTP-HDR-NOT-FND-SW PIC X(001) VALUE SPACE.
  88 HTTP-HDR-NOT-FND PIC X(001) VALUE 'Y'.
  05 FORM-FLD-NOT-FND-SW PIC X(001) VALUE SPACE.
  88 FORM-FLD-NOT-FND PIC X(001) VALUE 'Y'.
  05 CICS-ERR-SW PIC X(001) VALUE SPACE.
  88 CICS-ERR PIC X(001) VALUE 'Y'.
  05 BINARY-CONTENT-SW PIC X(001) VALUE SPACE.
  88 BINARY-CONTENT PIC X(001) VALUE 'Y'.

01 WORK-AREAS.
  05 WTO-LN PIC S9(008) COMP-5 VALUE +0.
  05 WTO-SUFX-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-RESP PIC S9(008) COMP-5 VALUE +0.
  05 WS-RESP2 PIC S9(008) COMP-5 VALUE +0.
  05 WS-RPLY-BUFR-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-HTTP-HDR-TO-RTV-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-HTTP-HDR-BUFR-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-HTTP-MTHD-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-HTTP-VERS-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-HTTP-PATH-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-HTTP-QRY-STRN-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-AUTH-CVDA PIC S9(008) COMP-5 VALUE +0.
  05 WS-CLNT-NM-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-CLNT-ADDR-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-SRVR-NM-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-SRVR-ADDR-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-FORM-FLD-NM-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-FORM-FLD-VAL-LN PIC S9(008) COMP-5 VALUE +0.
  05 WS-SSL-TY-CVDA PIC S9(008) COMP-5 VALUE +0.
  05 WTO-CA-LN PIC S9(008) COMP-5 VALUE +0.
  05 FORM-RPLY-URL-PTR PIC S9(008) COMP-5 VALUE +1.
  05 WS-HTTP-MTHD PIC X(080) VALUE SPACES.
05 WS-HTTP-VERS PIC X(080) VALUE SPACES.
05 WS-HTTP-PATH.
  10 PIC X(050) OCCURS 10.
05 WS-HTTP-QRY-STRN.
  10 PIC X(050) OCCURS 10.
05 WS-HTTP-QRY-STRN-PARMS INDEXED QRY-STRN-INDX.
05 WS-RPLY-TY PIC X(008) VALUE SPACES.
05 WS-FORM-FLD-NM PIC X(016) VALUE SPACES.
05 WS-MSNG-FORM-FLD-NM PIC X(016) VALUE SPACES.
05 WS-FORM-FLD-VAL PIC X(004) VALUE SPACES.
05 WS-RPLY-CNTE-HDR-FL PIC X(001) VALUE SPACES.
05 WS-CICS-RESP-MNEMONIC PIC X(025) VALUE SPACES.
05 WS-TRUNC-ITEM PIC X(025) VALUE SPACES.
05 WS-HTTP-HDR-TO-RTV PIC X(050) VALUE SPACES.
05 WS-CICS-APPLID PIC X(008) VALUE SPACES.
05 THIS-USERID PIC X(008) VALUE SPACES.
05 THIS-USERNAME PIC X(020) VALUE SPACES.
05 WS-DOC-TOKN PIC X(016) VALUE SPACES.
05 MSG-NB PIC X(004) VALUE SPACES.
  88 MSG-NB-CICS-ERR VALUE '0004'.
05 WTO-TXT.
  10 PIC X(050) OCCURS 13.
  10 PIC X(040).
05 WTO-SUFX.
  10 PIC X(050) OCCURS 13.
  10 PIC X(040).
05 CICS-API-FAILED PIC X(030) VALUE SPACES.
05 CICS-API-FAILED-LOC PIC X(004) VALUE SPACES.
05 CICS-RESP-DSPL PIC 9(010) VALUE ZEROES.
05 CICS-RESP-DSPL-X REDEFINES CICS-RESP-DSPL PIC X(010).
05 CICS-RESP2-DSPL PIC 9(010) VALUE ZEROES.
05 CICS-RESP2-DSPL-X REDEFINES CICS-RESP2-DSPL PIC X(010).
05 WS-HTTP-HDR-BUFR.
  10 PIC X(050) OCCURS 5.
05 WS-HTTP-CLNT-CHARSET PIC X(040) VALUE SPACES.
05 WS-DUMMY-BUFR.
  10 PIC X(050) OCCURS 10.
05 WS-CLNT-NM PIC X(080) VALUE SPACES.
05 WS-CLNT-ADDR PIC X(015) VALUE SPACES.
05 WS-SRVR-NM PIC X(080) VALUE SPACES.
05 WS-SRVR-ADDR PIC X(015) VALUE SPACES.
05 WS-TCPIP-SRVC-NM  PIC X(008) VALUE SPACES.
05 WS-PORT-NB       PIC X(005) VALUE SPACES.
05 WS-RPLY-STUS-CD  PIC X(050) VALUE SPACES.

01 WTO-CA.
COPY J7200521 REPLACING ==:PRFX:== BY ==WTO-CA--=.

* These are used in constructing and sending the HTTP
* protocol headers.
01 HTTP-PTCL-HDR-AREAS.
  05 HTTP-PTCL-HDR-DT     PIC X(080) VALUE SPACES.
  05 HTTP-PTCL-HDR-CNTE-TY PIC X(025) VALUE SPACES.
  05 HTTP-PTCL-HDR-NM     PIC X(080) VALUE SPACES.
  05 HTTP-PTCL-HDR-NM-LN  PIC S9(008) COMP-5 VALUE +0.
  05 HTTP-PTCL-HDR-VAL    PIC X(080) VALUE SPACES.
  05 HTTP-PTCL-HDR-VAL-LN PIC S9(008) COMP-5 VALUE +0.

* You'll see a lot of x'0D25' constants in some of the *-RPLY
* structures that follow. That value translates into the
* familiar CRLF (Carriage Return, Line Feed) ASCII sequence.
01 HTML-RPLY.
  05                    PIC X(006)  VALUE '<html>'.
  05                    PIC X(002)  VALUE X'0D25'.
  05                    PIC X(017)  VALUE '<h1 align=center>'.
  05                    PIC X(002)  VALUE X'0D25'.
  05  RPLY-STUS-CD      PIC X(050)  VALUE SPACES.
  05                    PIC X(002)  VALUE X'0D25'.
  05                    PIC X(005)  VALUE '</h1>'.
  05                    PIC X(017)  VALUE '<h2 align=center>'.
  05                    PIC X(002)  VALUE X'0D25'.
  05                    PIC X(005)  VALUE '</h2>'.
  05                    PIC X(004)  VALUE '<br>'.
  05                    PIC X(002)  VALUE X'0D25'.
  05                    PIC X(006)  VALUE '<body>'.
  05                    PIC X(002)  VALUE X'0D25'.
  05                    PIC X(004)  VALUE '<ul>'.
  05                    PIC X(006)  VALUE 'Region: '.
  05                    PIC X(004)  VALUE '</li>'.
  05                    PIC X(004)  VALUE '</b>'.
  05                    PIC X(004)  VALUE '</ul>'.
05 RPLY-APPL-ID PIC X(008) VALUE SPACES.
05 PIC X(005) VALUE '</li>'.
05 PIC X(002) VALUE X'0D25'.
05 PIC X(004) VALUE '</b>'.
05 PIC X(008) VALUE 'Method: '.
05 PIC X(004) VALUE '</b>'.
05 RPLY-HTTP-MTHD PIC X(080) VALUE SPACES.
05 PIC X(005) VALUE '</li>'.
05 PIC X(002) VALUE X'0D25'.
05 PIC X(004) VALUE '</b>'.
05 PIC X(009) VALUE 'Version: '.
05 PIC X(004) VALUE '</b>'.
05 RPLY-HTTP-VERS PIC X(080) VALUE SPACES.
05 PIC X(005) VALUE '</li>'.
05 PIC X(002) VALUE X'0D25'.
05 PIC X(004) VALUE '</b>'.
05 PIC X(006) VALUE 'Path: '.
05 PIC X(004) VALUE '</b>'.
05 RPLY-HTTP-PATH PIC X(512) VALUE SPACES.
05 PIC X(005) VALUE '</li>'.
05 PIC X(002) VALUE X'0D25'.
05 PIC X(004) VALUE '</b>'.
05 PIC X(014) VALUE 'Query String: '.
05 PIC X(004) VALUE '</b>'.
05 RPLY-HTTP-QRY-STRN PIC X(512) VALUE SPACES.
05 PIC X(005) VALUE '</li>'.
05 PIC X(002) VALUE X'0D25'.
05 PIC X(004) VALUE '</b>'.
05 PIC X(016) VALUE 'Authentication: '.
05 PIC X(004) VALUE '</b>'.
05 RPLY-AUTH-TY PIC X(012) VALUE SPACES.
05 PIC X(005) VALUE '</li>'.
05 PIC X(002) VALUE X'0D25'.
05 PIC X(004) VALUE '</b>'.
05 PIC X(004) VALUE '</b>'.
05 RPLY-SSL-TY PIC X(012) VALUE SPACES.
05 PIC X(005) VALUE '</li>'.
05 PIC X(002) VALUE X'0D25'.
05 PIC X(004) VALUE '</b>'.
FORM-RPLY.
  PIC X(006) VALUE '<html>'.
  PIC X(002) VALUE X'0D25'.
  PIC X(017) VALUE '<h1 align=center>'.
  PIC X(002) VALUE X'0D25'.
  PIC X(050) VALUE SPACE.
  PIC X(002) VALUE X'0D25'.
  PIC X(005) VALUE '</h1>'.
  PIC X(017) VALUE '<h2 align=center>'.
  PIC X(002) VALUE X'0D25'.
  PIC X(004) VALUE SPACE.
  PIC X(001) VALUE '-'.
  PIC X(008) VALUE SPACE.
  PIC X(002) VALUE X'0D25'.
  PIC X(005) VALUE '</h2>'.
  PIC X(002) VALUE X'0D25'.
  PIC X(004) VALUE '<br>'.
  PIC X(002) VALUE X'0D25'.
  PIC X(006) VALUE '<body>'.
  PIC X(006) VALUE '<form '.
05 FORM-RPLY-URL PIC X(07) VALUE 'action='.
05 FORM-RPLY-URL PIC X(080) VALUE SPACES.
05 FORM-RPLY-URL PIC X(014) VALUE 'method="POST"'.
05 FORM-RPLY-URL PIC X(013) VALUE 'name="form1">'.
05 FORM-RPLY-URL PIC X(002) VALUE X'0D25'.
05 FORM-RPLY-URL PIC X(003) VALUE '<b>'.
05 FORM-RPLY-URL PIC X(012) VALUE 'Reply Type: '.
05 FORM-RPLY-URL PIC X(004) VALUE '</b>'.
05 FORM-RPLY-URL PIC X(002) VALUE X'0D25'.
05 FORM-RPLY-URL PIC X(007) VALUE '<input '.
05 FORM-RPLY-URL PIC X(012) VALUE 'type="text" '.
05 FORM-RPLY-URL PIC X(009) VALUE 'size="4" '.
05 FORM-RPLY-URL PIC X(012) VALUE 'name="type" '.
05 FORM-RPLY-URL PIC X(014) VALUE 'maxlength="4">'.
05 FORM-RPLY-URL PIC X(002) VALUE X'0D25'.
05 FORM-RPLY-URL PIC X(004) VALUE '<br>'.
05 FORM-RPLY-URL PIC X(002) VALUE X'0D25'.
05 FORM-RPLY-URL PIC X(007) VALUE '<input '.
05 FORM-RPLY-URL PIC X(014) VALUE 'type="submit" '.
05 FORM-RPLY-URL PIC X(016) VALUE 'value="Request" '.
05 FORM-RPLY-URL PIC X(015) VALUE 'name="Button1" '.
05 FORM-RPLY-URL PIC X(015) VALUE 'class="button">'.
05 FORM-RPLY-URL PIC X(002) VALUE X'0D25'.
05 FORM-RPLY-URL PIC X(007) VALUE '</form>'.
01 INVD-RPLY.
05 PIC X(006) VALUE '<html>'.
05 PIC X(002) VALUE X'0D25'.
05 PIC X(007) VALUE '</html>'.
05 PIC X(002) VALUE X'0D25'.
05 PIC X(007) VALUE '</body>'.
05 PIC X(007) VALUE '</html>'.
05 PIC X(017) VALUE '<h1 align=center>'.
05 PIC X(002) VALUE 'X'0D25'.
05 RPLY-STUS-CD PIC X(050) VALUE SPACES.
05 PIC X(002) VALUE 'X'0D25'.
05 PIC X(005) VALUE '</h1>'.
05 PIC X(017) VALUE '<h2 align=center>'.
05 PIC X(002) VALUE 'X'0D25'.
05 RPLY-TRANID PIC X(004) VALUE SPACES.
05 PIC X(001) VALUE '-'.
05 RPLY-PGM PIC X(008) VALUE SPACES.
05 PIC X(002) VALUE 'X'0D25'.
05 PIC X(005) VALUE '</h2>'.
05 PIC X(002) VALUE X'0D25'.
05 PIC X(006) VALUE '<body>'.
05 PIC X(002) VALUE X'0D25'.
05 PIC X(014) VALUE 'Query String: '.
05 RPLY-HTTP-QRY-STRN PIC X(512) VALUE SPACES.
05 PIC X(004) VALUE '</br>'.
05 PIC X(042) VALUE 'Must contain a t=&lt reply type &gt where '.
05 PIC X(034) VALUE '&lt reply type &gt is html or xml '.
05 PIC X(016) VALUE 'or form or imag '.
05 PIC X(002) VALUE 'X'0D25'.
05 PIC X(004) VALUE '</br>'.
05 RPLY-INVD-HINT PIC X(690) VALUE SPACES.
05 PIC X(004) VALUE '</br>'.
05 PIC X(005) VALUE 'GMT: '.
05 RPLY-GMT PIC X(080) VALUE SPACES.
05 PIC X(007) VALUE '</body>'.
05 PIC X(002) VALUE 'X'0D25'.
05 PIC X(007) VALUE '</html>'.

01 XML-RPLY.
05 XML-OCCURS PIC 9(004) VALUE 1.
05 XML-RPLY-TBL OCCURS 1 TO 2000 DEPENDING XML-OCCURS INDEXED XML-RPLY-INDX.
10 RPLY-STUS-CD PIC X(050) VALUE SPACES.
10 RPLY-TRANID PIC X(004) VALUE SPACES.
10 RPLY-PGM PIC X(008) VALUE SPACES.
10 RPLY-APPL-ID PIC X(008) VALUE SPACES.
* This is the hex representation of the SHARE logo. Its primary
* purpose is to show that a JPEG graphic can be sent from a
* CICS COBOL program. It's just showing off, really.
01 IMAG-RPLY.
  COPY SHRLOGO1.

* This area is used in creating a core dump. It is sometimes
* useful to have such a thing when an error occurs, even if
* an abend is inappropriate.
01 LCL-APLC-DEBUG-AREA.
  05 CEE3DMP-TITL.
    10 CEE3DMP-TITL-SPFC PIC X(010) VALUE '+=+=+=+=+='.
    10 CEE3DMP-TITL-SPFC PIC X(060) VALUE SPACES.
    10 CEE3DMP-TITL-SPFC PIC X(010) VALUE '+=+=+=+=+='.
  05 CEE3DMP-OPTIONS.
    10 PIC X(020) VALUE 'TRACEBACK'.
    10 PIC X(020) VALUE 'THREAD(CURRENT)'.
    10 PIC X(020) VALUE 'VARIABLES'.
    10 PIC X(020) VALUE 'PAGESIZE(60)'.
    10 PIC X(020) VALUE 'NOCONDITION'.
    10 PIC X(020) VALUE 'ENCLAVE(CURRENT)'.
    10 CEE3DMP-OPTIONS-PAD-TO-255 PIC X(135).
  05 CEE3DMP-LEFB-CD PIC X(012).

Linkage Section.
01 DFHCOMMAREA PIC X(001).

Procedure Division.
PERFORM 0100-INIT

* Presume everything will go okay - move in a
* "success" status message
MOVE STUS-0001 TO WS-RPLY-STUS-CD

* Obtain information about our current environment,
* this is going to be sent back as a demonstration
* of these API calls. They may also be of use,
* particularly the HTTP-QRY-STRN, in providing a key
* such as a DID# for an inquiry.
PERFORM 8000-WHO-IS-CALLING
PERFORM 8010-GET-HTTP-MTHD
PERFORM 8020-GET-HTTP-VERS
PERFORM 8030-GET-HTTP-PATH

* We need this for translating from our code page to the
* client's code page. Think EBCDIC to ASCII but more
* complicated.
PERFORM 1040-GET-CLNT-CD-PG

IF WS-HTTP-MTHD(1:WS-HTTP-MTHD-LN) = 'POST'
* We were invoked via an HTTP POST. For purposes of this
* application, that implies that an HTML form was sent.
* We will now retrieve the fields from the form and
* proceed accordingly.
* The http method was retrieved in 8010-GET-HTTP-MTHD.
PERFORM 1050-GET-FORM-FLDS
ELSE
* Presume we were invoked with an HTTP GET, and that the
* query string contains information instructing us on how
* to proceed.
* A complete list of HTTP methods can be found in section
* 9 "Method Definitions" of RFC 2616 "Hypertext Transfer
* Protocol -- HTTP/1.1"
PERFORM 8040-GET-HTTP-QRY-STRN
PERFORM 1030-PARSE-QRY-STRN
END-IF

* An application could also be coded to WEB RECEIVE an
* XML datastream instead of WEB READING FORMFIELDs or
* processing the query string.

* Create the document which will contain the reply text. The
* document is just a place for CICS to store our reply.
PERFORM 8050-DOC-CRTE
* We need GMT time for the http protocol header and
* some of our reply parameters.
PERFORM 1010-GET-GMT-TM

* Build the reply to send back to the requestor, note that
* the Content-type protocol header is also set in the
* paragraphs that create the different content types.
PERFORM 1000-BLD-RPLY

* Send the http protocol header to the requestor.
PERFORM 1020-SEND-HTTP-PTCL-HDR

* Finally, send the reply.
PERFORM 8090-WEB-SEND

EXEC CICS RETURN END-EXEC
.

0100-INIT.
*
* I got some strange behavior when I tried using a Local-Storage
* section to force reinitialization of the VALUE clauses. I
* suspect this has something to do with how the CICS Web
* Interface invokes application programs. After some puzzling
* over storage dumps, I decided the clearest solution was to
* do "old school" initialization logic by hand.
*
INITIALIZE
   WORK-AREAS
   HTTP-PTCL-HDR-AREAS
   HTML-RPLY
   FORM-RPLY
   INVD-RPLY
   SWITCHES
   WS-RPLY-BUFR
   LCL-APLC-DEBUG-AREA

MOVE 1 TO WTO-LN
   WTO-SUFX-LN

MOVE +1 TO FORM-RPLY-URL-PTR
.

1000-BLD-RPLY.
In a real application, you'd be calling subroutines that implement business logic and probably building an XML data stream in reply.

```
EVALUATE WS-RPLY-TY
  WHEN 'HTML'
    PERFORM 2010-BLD-HTML-RPLY
  WHEN 'XML'
    PERFORM 2020-BLD-XML-RPLY
  WHEN 'FORM'
    PERFORM 2060-BLD-FORM-RPLY
  WHEN 'IMAG'
    PERFORM 2070-BLD-IMAG-RPLY
  WHEN OTHER
    PERFORM 2030-BLD-INVD-RPLY
END-EVALUATE.
```

```
1010-GET-GMT-TM.
```

```
* Obtain current GMT date/time for http protocol header.
```

```
CALL HTTP-DT-TM-PGM USING
  GMT-TM-FL
  DT-PIC-STRN
  HTTP-PTCL-HDR-DT
END-CALL.
```

```
1020-SEND-HTTP-PTCL-HDR.
```

```
* The RFCs indicate that one should include an http protocol header in order to be a good internet citizen. It's not that hard, so here it is.
```

```
* A definitive list of HTTP headers can be found in section 14 "Header Field Definitions" of RFC 2616 "Hypertext Transfer Protocol -- HTTP/1.1"
```

```
* CICS does not allow direct modification of the HTTP status code in the protocol header, and only allows certain HTTP status codes to be set. This is per the "CICS Internet Guide." So, rather than using the HTTP status code, I have invented, purely for demonstration purposes, an
```
application status code. This is what you see in the RPLY-STUS-CD field.

* Server

MOVE HTTP-PTCL-HDR-SRVR-LIT TO HTTP-PTCL-HDR-NM
MOVE LENGTH OF HTTP-PTCL-HDR-SRVR-LIT TO HTTP-PTCL-HDR-NM-LN
MOVE HTTP-PTCL-HDR-SRVR TO HTTP-PTCL-HDR-VAL
MOVE LENGTH OF HTTP-PTCL-HDR-SRVR TO HTTP-PTCL-HDR-VAL-LN
PERFORM 8100-WEB-WRITE

* Date

MOVE HTTP-PTCL-HDR-DT-LIT TO HTTP-PTCL-HDR-NM
MOVE LENGTH OF HTTP-PTCL-HDR-DT-LIT TO HTTP-PTCL-HDR-NM-LN
MOVE HTTP-PTCL-HDR-DT TO HTTP-PTCL-HDR-VAL
MOVE LENGTH OF HTTP-PTCL-HDR-DT TO HTTP-PTCL-HDR-VAL-LN
PERFORM 8100-WEB-WRITE

IF WS-RPLY-CNTE-HDR-FL = 'N'
* Request from client to NOT send the Content-type http protocol header. This is to demonstrate what happens if this header is absent.
* In a real application you should just send this header.
  CONTINUE
ELSE
  * Content-Type
    MOVE HTTP-PTCL-HDR-CNTE-TY-LIT TO HTTP-PTCL-HDR-NM
    MOVE LENGTH OF HTTP-PTCL-HDR-CNTE-TY-LIT TO HTTP-PTCL-HDR-NM-LN
    MOVE HTTP-PTCL-HDR-CNTE-TY TO HTTP-PTCL-HDR-VAL
    MOVE LENGTH OF HTTP-PTCL-HDR-CNTE-TY TO HTTP-PTCL-HDR-VAL-LN
    PERFORM 8100-WEB-WRITE
END-IF

* This header isn't defined for HTTP 1.0, but it works under CICS TS 2.2 and doesn't seem to cause any harm.
* Cache-Control

MOVE HTTP-PTCL-HDR-CACHE-CNTL-LIT TO HTTP-PTCL-HDR-NM
MOVE LENGTH OF HTTP-PTCL-HDR-CACHE-CNTL-LIT TO HTTP-PTCL-HDR-NM-LN
MOVE HTTP-PTCL-HDR-CACHE-CNTL TO HTTP-PTCL-HDR-VAL

MOVE LENGTH OF HTTP-PTCL-HDR-CACHE-CNTL TO HTTP-PTCL-HDR-VAL-LN
PERFORM 8100-WEB-WRITE
.

1030-PARSE-QRY-STRN.
*
* The query string is everything that comes after the ? in the
* URL. This is a common way to pass parameters to server
* applications. Multiple parameters are typically presented in
* "keyword=value" format, separated by the ampersand ('&')
* character.
*
* UNSTRING
  WS-HTTP-QRY-STRN
  DELIMITED '&'
  INTO
  *
  We don't accept this many parms, but coding it this
  way allows illustration of multiple parm processing.
  WS-HTTP-QRY-STRN-PARMS(1)
  WS-HTTP-QRY-STRN-PARMS(2)
  WS-HTTP-QRY-STRN-PARMS(3)
  WS-HTTP-QRY-STRN-PARMS(4)
  WS-HTTP-QRY-STRN-PARMS(5)
  WS-HTTP-QRY-STRN-PARMS(6)
  WS-HTTP-QRY-STRN-PARMS(7)
  WS-HTTP-QRY-STRN-PARMS(8)
  WS-HTTP-QRY-STRN-PARMS(9)
  WS-HTTP-QRY-STRN-PARMS(10)
END-UNSTRING
*
* Convert to upper case for convenience of processing.
PERFORM VARYING QRY-STRN-INDX FROM 1 BY 1
UNTIL QRY-STRN-INDX > 10
  INSPECT WS-HTTP-QRY-STRN-PARMS(QRY-STRN-INDX)
  REPLACING ALL LOW-VALUE BY SPACE
  MOVE FUNCTION UPPER-CASE(WS-HTTP-QRY-STRN-PARMS
    (QRY-STRN-INDX) )
  TO WS-HTTP-QRY-STRN-PARMS(QRY-STRN-INDX)
END-PERFORM

PERFORM VARYING QRY-STRN-INDX FROM 1 BY 1
UNTIL QRY-STRN-INDX > 10
OR WS-HTTP-QRY-STRN-PARMS(QRY-STRN-INDX) = SPACES
  EVALUATE WS-HTTP-QRY-STRN-PARMS(QRY-STRN-INDX)(1:2)
    WHEN 'C='
MOVE WS-HTTP-QRY-STRN-PARMS(QRY-STRN-INDX)(3:1) TO WS-RPLY-CNTE-HDR-FL
WHEN 'T=' MOVE WS-HTTP-QRY-STRN-PARMS(QRY-STRN-INDX)(3:8) TO WS-RPLY-TY
WHEN OTHER
*
Unrecognized parameter, force return of the
"invalid input" html page.
MOVE 'INVD ' TO WS-RPLY-TY
STRING
'Invalid query string parm = '
DELIMITED SIZE
WS-HTTP-QRY-STRN-PARMS(QRY-STRN-INDX)(1:2) DELIMITED SIZE
INTO
RPLY-INVD-HINT OF INVD-RPLY
END-STRING
END-EVALUATE
END-PERFORM.

1040-GET-CLNT-CD-PG.
*
We must specify the client's code page when we send
a response. The code page is present in the http
protocol header, so we will retrieve it from there.
*
INITIALIZE
WS-HTTP-HDR-BUFR
WS-HTTP-HDR-TO-RTV
MOVE HTTP-CHARSET-HDR TO WS-HTTP-HDR-TO-RTV
MOVE LENGTH OF HTTP-CHARSET-HDR TO WS-HTTP-HDR-TO-RTV-LN
MOVE LENGTH OF WS-HTTP-HDR-BUFR TO WS-HTTP-HDR-BUFR-LN
PERFORM 8070-WEB-READ-HDR
IF HTTP-HDR-NOT-FND
*
Since there doesn't appear to be a client code page
in the protocol header, we'll use an innocuous default.
*
This default comes from section 3.7.1 "Canonicalization
and Text Defaults" of RFC 2616 "Hypertext Transfer
Protocol -- HTTP/1.1"
INITIALIZE WS-HTTP-CLNT-CHARSET
MOVE 'ISO-8859-1' TO WS-HTTP-CLNT-CHARSET
ELSE
PERFORM 8080-UNSTRN-CHARSET
END-IF
1050-GET-FORM-FLDS.
* 
* Retrieve the form fields present in the FORM-RPLY HTML stream.
* 
* This demonstrates an alternate way to provide input from a 
* browser to a server program.
* 
    MOVE FORM-FLD-NM-TY-LIT TO WS-FORM-FLD-NM
    MOVE LENGTH OF FORM-FLD-NM-TY-LIT TO WS-FORM-FLD-NM-LN
    PERFORM 8110-WEB-READ-FORMFIELD
    IF FORM-FLD-NOT-FND
        * Force a return of the INVD-RPLY page.
        MOVE 'INVD' TO WS-RPLY-TY
    ELSE
        MOVE WS-FORM-FLD-VAL(1:WS-FORM-FLD-VAL-LN) TO WS-RPLY-TY
    END-IF

    MOVE FORM-FLD-NM-CNTE-LIT TO WS-FORM-FLD-NM
    MOVE LENGTH OF FORM-FLD-NM-CNTE-LIT TO WS-FORM-FLD-NM-LN
    PERFORM 8110-WEB-READ-FORMFIELD
    IF FORM-FLD-NOT-FND
        CONTINUE
    ELSE
        IF WS-FORM-FLD-VAL(1:WS-FORM-FLD-VAL-LN) = 'ON'
            MOVE 'Y' TO WS-RPLY-CNTE-HDR-FL
        END-IF
    END-IF

2010-BLD-HTML-RPLY.
* 
* This is just building a reply that shows we got here and 
* what information we can get via standard APIs.
* 
    MOVE EIBTRNID TO RPLY-TRANID
    OF HTML-RPLY
    MOVE MYNAME TO RPLY-PGM
    OF HTML-RPLY
    MOVE WS-CICS-APPLID TO RPLY-APPL-ID
    OF HTML-RPLY
* Reference modification is used for MTHD, VERS, PATH and 
* QRY-STRN because they are padded with x'00' by the API 
* that retrieved them.
    MOVE WS-HTTP-MTHD(1:WS-HTTP-MTHD-LN)
TO RPLY-HTTP-MTHD
OF HTML-RPLY
MOVE WS-HTTP-VERS(1:WS-HTTP-VERS-LN)
TO RPLY-HTTP-VERS
OF HTML-RPLY
MOVE WS-HTTP-PATH(1:WS-HTTP-PATH-LN)
TO RPLY-HTTP-PATH
OF HTML-RPLY
MOVE WS-HTTP-QRY-STRN(1:WS-HTTP-QRY-STRN-LN)
TO RPLY-HTTP-QRY-STRN
OF HTML-RPLY
MOVE WS-CLNT-NM       TO RPLY-CLNT-NM
OF HTML-RPLY
MOVE WS-CLNT-ADDR     TO RPLY-CLNT-ADDR
OF HTML-RPLY
MOVE WS-SRVR-NM       TO RPLY-SRVR-NM
OF HTML-RPLY
MOVE WS-SRVR-ADDR     TO RPLY-SRVR-ADDR
OF HTML-RPLY
MOVE WS-PORT-NB       TO RPLY-SRVR-PORT
OF HTML-RPLY
MOVE WS-TCPIP-SRVC-NM TO RPLY-TCPIPSERVICE
OF HTML-RPLY
MOVE THIS-USERID      TO RPLY-USER-ID
OF HTML-RPLY
MOVE THIS-USERNAME    TO RPLY-USER-NM
OF HTML-RPLY
MOVE HTTP-PTCL-HDR-DT TO RPLY-GMT
OF HTML-RPLY

EVALUATE WS-AUTH-CVDA
*        These may deserve to be factored out into their own
*        subroutine, ala J7200501.
WHEN DFHVALUE(AUTOAUTH)
    MOVE 'AUTOAUTH    ' TO RPLY-AUTH-TY
    OF HTML-RPLY
WHEN DFHVALUE(AUTOREGISTER)
    MOVE 'AUTOREGISTER' TO RPLY-AUTH-TY
    OF HTML-RPLY
WHEN DFHVALUE(BASICAUTH)
    MOVE 'BASICAUTH   ' TO RPLY-AUTH-TY
    OF HTML-RPLY
WHEN DFHVALUE(CERTIFICAUTH)
    MOVE 'CERTIFICAUTH' TO RPLY-AUTH-TY
    OF HTML-RPLY
WHEN DFHVALUE(NOAUTHENTIC)
MOVE 'NOAUTHENTIC' TO RPLY-AUTH-TY
OF HTML-RPLY
WHEN OTHER
MOVE 'UNKNOWN' TO RPLY-AUTH-TY
OF HTML-RPLY
END-EVALUATE
EVALUATE WS-SSL-TY-CVDA
* These may deserve to be factored out into their own subroutine, ala 7200501.
WHEN DFHVALUE(SSL)
MOVE 'SSL' TO RPLY-SSL-TY
OF HTML-RPLY
WHEN DFHVALUE(NOSSL)
MOVE 'NOSSL' TO RPLY-SSL-TY
OF HTML-RPLY
WHEN DFHVALUE(CLIENTAUTH)
MOVE 'CLIENTAUTH' TO RPLY-SSL-TY
OF HTML-RPLY
WHEN OTHER
MOVE 'UNKNOWN' TO RPLY-SSL-TY
OF HTML-RPLY
END-EVALUATE
IF CICS-ERR
IF WS-RPLY-STUS-CD = STUS-0001
  MOVE STUS-0003 TO WS-RPLY-STUS-CD
END-IF
MOVE WTO-TXT(1:WTO-LN)
  TO RPLY-INVD-HINT OF HTML-RPLY
END-IF

MOVE WS-RPLY-STUS-CD TO RPLY-STUS-CD
OF HTML-RPLY

MOVE LENGTH OF HTML-RPLY TO WS-RPLY-BUFR-LN
MOVE HTML-RPLY TO WS-RPLY-BUFR
* Insert the reply text into the reply document
PERFORM 8060-DOC-ISRT

MOVE HTTP-CNTE-TY-HTML TO HTTP-PTCL-HDR-CNTE-TY.

2020-BLD-XML-RPLY.
*
* This is just building a reply that shows we got here and* what information we can get via standard APIs.
* This is contrived to end up being larger than 32K.

PERFORM VARYING XML-RPLY-INDX FROM 1 BY 1
UNTIL XML-RPLY-INDX > XML-OCCURS
INITIALIZE XML-RPLY-TBL(XML-RPLY-INDX)
MOVE EIBTRNID TO RPLY-TRANID
OF XML-RPLY(XML-RPLY-INDX)
MOVE MYNAME TO RPLY-PROGRAM
OF XML-RPLY(XML-RPLY-INDX)
MOVE WS-CICS-APPLID TO RPLY-APPL-ID
OF XML-RPLY(XML-RPLY-INDX)

* Reference modification is used for MTHD, VERS, PATH and
* QRY-STRN because they are padded with x'00' by the API
* that retrieved them. That makes for messy XML.
MOVE WS-HTTP-MTHD(1:WS-HTTP-MTHD-LN)
TO RPLY-HTTP-MTHD
OF XML-RPLY(XML-RPLY-INDX)
MOVE WS-HTTP-VERS(1:WS-HTTP-VERS-LN)
TO RPLY-HTTP-VERS
OF XML-RPLY(XML-RPLY-INDX)
MOVE WS-HTTP-PATH(1:WS-HTTP-PATH-LN)
TO RPLY-HTTP-PATH
OF XML-RPLY(XML-RPLY-INDX)
MOVE WS-HTTP-QRY-STRN(1:WS-HTTP-QRY-STRN-LN)
TO RPLY-HTTP-QRY-STRN
OF XML-RPLY(XML-RPLY-INDX)
MOVE WS-CLNT-NM TO RPLY-CLIENT-NM
OF XML-RPLY(XML-RPLY-INDX)
MOVE WS-CLNT-ADDR TO RPLY-CLIENT-ADDR
OF XML-RPLY(XML-RPLY-INDX)
MOVE WS-SRVR-NM TO RPLY-SERVER-NM
OF XML-RPLY(XML-RPLY-INDX)
MOVE WS-SRVR-ADDR TO RPLY-SERVER-ADDR
OF XML-RPLY(XML-RPLY-INDX)
MOVE WS-PORT-NB TO RPLY-SERVER-PORT
OF XML-RPLY(XML-RPLY-INDX)
MOVE WS-TCPPIP-SRVC-NM TO RPLY-TCPPIPSERVICE
OF XML-RPLY(XML-RPLY-INDX)
MOVE THIS-USERID TO RPLY-USER-ID
OF XML-RPLY(XML-RPLY-INDX)
MOVE THIS-USERNAME TO RPLY-USER-NAME
OF XML-RPLY(XML-RPLY-INDX)
MOVE HTTP-PTCL-HDR-DT TO RPLY-GMT
OF XML-RPLY(XML-RPLY-INDX)
EVALUATE WS-AUTH-CVDA
* These may deserve to be factored out into their own subroutine, ala J7200501.

WHEN DFHVALUE(AUTOAUTH)
   MOVE 'AUTOAUTH' TO RPLY-AUTH-TY
   OF XML-RPLY(XML-RPLY-INDX)

WHEN DFHVALUE AUTOREGISTER
   MOVE 'AUTOREGISTER' TO RPLY-AUTH-TY
   OF XML-RPLY(XML-RPLY-INDX)

WHEN DFHVALUE(BASICAUTH)
   MOVE 'BASICAUTH' TO RPLY-AUTH-TY
   OF XML-RPLY(XML-RPLY-INDX)

WHEN DFHVALUE(CERTIFICAUTH)
   MOVE 'CERTIFICAUTH' TO RPLY-AUTH-TY
   OF XML-RPLY(XML-RPLY-INDX)

WHEN DFHVALUE(NOAUTHENTIC)
   MOVE 'NOAUTHENTIC' TO RPLY-AUTH-TY
   OF XML-RPLY(XML-RPLY-INDX)

WHEN OTHER
   MOVE 'UNKNOWN' TO RPLY-AUTH-TY
   OF XML-RPLY(XML-RPLY-INDX)

END-EVALUATE

EVALUATE WS-SSL-TY-CVDA

* These may deserve to be factored out into their own subroutine, ala J7200501.

WHEN DFHVALUE(SSL)
   MOVE 'SSL' TO RPLY-SSL-TY
   OF XML-RPLY(XML-RPLY-INDX)

WHEN DFHVALUE(NOSSL)
   MOVE 'NOSSL' TO RPLY-SSL-TY
   OF XML-RPLY(XML-RPLY-INDX)

WHEN DFHVALUE(CLIENTAUTH)
   MOVE 'CLIENTAUTH' TO RPLY-SSL-TY
   OF XML-RPLY(XML-RPLY-INDX)

WHEN OTHER
   MOVE 'UNKNOWN' TO RPLY-SSL-TY
   OF XML-RPLY(XML-RPLY-INDX)

END-EVALUATE

MOVE WS-RPLY-STUS-CD TO RPLY-STUS-CD
   OF XML-RPLY(XML-RPLY-INDX)

END-PERFORM

* I tested sending a 1 megabyte XML data stream. This program completed processing in short order (< 1 second, which is the granularity of the clock I was using. MS Internet Explorer took 10+ seconds to display the results. I don't know how much of that was network traversal time and how
* much of that was MSIE rendering the XML.
  XML GENERATE WS-RPLY-BUFR
       FROM XML-RPLY
       COUNT IN WS-RPLY-BUFR-LN
  END-XML

* Insert the reply text into the reply document
  PERFORM 8060-DOC-ISRT

  MOVE HTTP-CNTE-TY-XML TO HTTP-PTCL-HDR-CNTE-TY

  2030-BLD-INVD-RPLY.

* This is just building an HTML reply indicating something
  is wrong.

* MOVE EIBTRNID TO RPLY-TRANID
     OF INVD-RPLY
MOVE MYNAME TO RPLY-PGM
     OF INVD-RPLY
MOVE WS-HTTP-QRY-STRN TO RPLY-HTTP-QRY-STRN
     OF INVD-RPLY
MOVE HTTP-PTCL-HDR-DT TO RPLY-GMT
     OF INVD-RPLY

  EVALUATE TRUE
     WHEN CICS-ERR
       MOVE WTO-TXT(1:WTO-LN)
           TO RPLY-INVD-HINT OF INVD-RPLY
     WHEN FORM-FLD-NOT-FND
       STRING
           'You must send a form with a field named ''
              DELIMITED SIZE
           WS-FORM-FLD-NM(1:WS-FORM-FLD-NM-LN)
              DELIMITED SIZE
           '' if invoking '
              DELIMITED SIZE
           MYNAME
              DELIMITED SIZE
           ' with an HTTP POST.'
              DELIMITED SIZE
           INTO
              RPLY-INVD-HINT OF INVD-RPLY
     END-STRING
  END-EVALUATE
IF WS-RPLY-STUS-CD = STUS-0001
    MOVE STUS-0003 TO WS-RPLY-STUS-CD
END-IF

MOVE WS-RPLY-STUS-CD
    TO RPLY-STUS-CD
    OF INVD-RPLY

* Insert the reply text into the reply document
  MOVE LENGTH OF INVD-RPLY TO WS-RPLY-BUFR-LN
  MOVE INVD-RPLY TO WS-RPLY-BUFR
  PERFORM 8060-DOC-ISRT

  MOVE HTTP-CNTE-TY-HTML   TO HTTP-PTCL-HDR-CNTE-TY
  2060-BLD-FORM-RPLY.

  * Populate the fields on the HTML page containing the form to
  * be sent back to the browser, add it to the document.
  *
  * In true pseudo-conversational style, we expect the form to
  * be populated by the user sitting in front of the browser
  * and then sent back to us. That processing is handled in
  * the mainline code, where we check to see if we were invoked
  * via an HTTP POST.
  *
  MOVE EIBTRNID         TO RPLY-TRANID
                  OF FORM-RPLY
  MOVE MYNAME           TO RPLY-PGM
                  OF FORM-RPLY

  * The reply-to URL for the HTML form is constructed here. The
  * pieces of the original URL are used, so if the URL used to
  * invoke this program changes, this code need not change.
  *
  STRING PTCL-LIT DELIMITED SIZE
        INTO FORM-RPLY-URL
        POINTER FORM-RPLY-URL-PTR
END-STRING

IF WS-SSL-TY-CVDA = DFHVALUE(SSL)
    STRING 's' DELIMITED SIZE
        INTO FORM-RPLY-URL POINTER FORM-RPLY-URL-PTR
STRING
'://' DELIMITED SIZE
WS-SRVR-NM(1:WS-SRVR-NM-LN) DELIMITED SIZE
'://' DELIMITED SIZE
WS-PORT-NB DELIMITED SIZE
WS-HTTP-PATH(1:WS-HTTP-PATH-LN) DELIMITED SIZE
'?:' DELIMITED SIZE
WS-HTTP-QRY-STRN(1:WS-HTTP-QRY-STRN-LN) DELIMITED SIZE
INTO FORM-RPLY-URL
POINTER FORM-RPLY-URL-PTR
OVERFLOW
PERFORM 2061-FORM-URL-OVRF-ERR
NOT OVERFLOW
PERFORM 2062-FORM-OK
END-STRING

* Insert the reply text into the reply document
PERFORM 8060-DOC-ISRT

MOVE HTTP-CNTE-TY-HTML TO HTTP-PTCL-HDR-CNTE-TY.

2061-FORM-URL-OVRF-ERR.
MOVE 'Query string is too long' TO RPLY-INVD-HINT OF INVD-RPLY

MOVE EIBTRNID TO RPLY-TRANID OF INVD-RPLY
MOVE MYNAME TO RPLY-PGM OF INVD-RPLY
MOVE WS-HTTP-QRY-STRN TO RPLY-HTTP-QRY-STRN OF INVD-RPLY
MOVE HTTP-PTCL-HDR-DT TO RPLY-GMT OF INVD-RPLY

MOVE STUS-0005 TO WS-RPLY-STUS-CD
MOVE WS-RPLY-STUS-CD TO RPLY-STUS-CD OF INVD-RPLY

MOVE LENGTH OF INVD-RPLY TO WS-RPLY-BUFR-LN
MOVE INVD-RPLY TO WS-RPLY-BUFR.

2062-FORM-OK.
MOVE WS-RPLY-STUS-CD TO RPLY-STUS-CD OF FORM-RPLY

MOVE LENGTH OF FORM-RPLY TO WS-RPLY-BUFR-LN
MOVE FORM-RPLY TO WS-RPLY-BUFR
.

2070-BLD-IMAG-RPLY.

* Send an image back to the requestor.
*

SET BINARY-CONTENT TO TRUE
MOVE LENGTH OF IMAG-RPLY TO WS-RPLY-BUFR-LN
MOVE IMAG-RPLY TO WS-RPLY-BUFR
PERFORM 8060-DOC-ISRT

MOVE HTTP-CNTE-TY-IMAG TO HTTP-PTCL-HDR-CNTE-TY
.

8000-WHO-IS-CALLING.

* Obtain information about the current invocation
* environment - region name, who is executing this transaction,
* etc.
*
* Significant points here, if your application is supposed
* to be executed via https, it would be a good idea to check
* the value returned in SSLTYPE to ensure SSL is in effect.
* Also, some of the information obtained from the EXTRACT TCPIP
* API is included in the error messages written to the log. This
* information is often helpful in debugging.
*
EXEC CICS ASSIGN
   APPLID(WS-CICS-APPLID)
   USERID(THIS-USERID)
   USERNAME(THIS-USERNAME)
END-EXEC

MOVE LENGTH OF WS-CLNT-NM TO WS-CLNT-NM-LN
MOVE LENGTH OF WS-CLNT-ADDR TO WS-CLNT-ADDR-LN
MOVE LENGTH OF WS-SRVR-NM TO WS-SRVR-NM-LN
MOVE LENGTH OF WS-SRVR-ADDR TO WS-SRVR-ADDR-LN

EXEC CICS
   EXTRACT TCPIP
   AUTHENTICATE(WS-AUTH-CVDA)
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN OTHER
    INITIALIZE CICS-API-FAILED
    MOVE 'EXTRACT TCPIP' TO CICS-API-FAILED
    MOVE '8000' TO CICS-API-FAILED-LOC
    PERFORM 8900-GET-CICS-RESP-MNEMONIC
END-EVALUATE
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN DFHRESP( INVREQ )
    PERFORM 8910-MAKE-CICS-ERR-MSG
    PERFORM 9100-WTO
  WHEN DFHRESP( LENGERR )
    IF WS-RESP2 = 1
    * Other values of RESP2 indicate that one of
    * the address or name fields was truncated, and
    * that's not significant enough for me to write
    * code to deal with it right now. The address
    * fields are all the right length, so it would
    * just be a name field.
    PERFORM 8910-MAKE-CICS-ERR-MSG
    PERFORM 9100-WTO
    END-IF
END-EVALUATE

EVALUATE TRUE
  * This code makes the later uses of reference
  * modification on the client name work correctly.
WHEN WS-CLNT-NM-LN > LENGTH OF WS-CLNT-NM
  THE CLIENT NAME WAS TRUNCATED, BUT FOR OUR
  PURPOSES WHAT WE GOT WAS SUFFICIENT.
  MOVE LENGTH OF WS-CLNT-NM TO WS-CLNT-NM-LN
WHEN WS-CLNT-NM-LN = 0
  THE CLIENT NAME WAS NOT FOUND.
  MOVE 1 TO WS-CLNT-NM-LN
END-EVALUATE

EVALUATE TRUE
  THIS CODE MAKES THE LATER USES OF REFERENCE
  MODIFICATION ON THE SERVER NAME WORK CORRECTLY.
WHEN WS-SRVR-NM-LN > LENGTH OF WS-SRVR-NM
  THE SERVER NAME WAS TRUNCATED, BUT FOR OUR
  PURPOSES WHAT WE GOT WAS SUFFICIENT.
  MOVE LENGTH OF WS-SRVR-NM TO WS-SRVR-NM-LN
WHEN WS-SRVR-NM-LN = 0
  THE SERVER NAME WAS NOT FOUND.
  MOVE 1 TO WS-SRVR-NM-LN
END-EVALUATE

8010-GET-HTTP-MTHD.
  * OBTAIN THE HTTP METHOD - GET, POST, ETC.
  *
  MOVE LENGTH OF WS-HTTP-MTHD TO WS-HTTP-MTHD-LN
  EXEC CICS
    WEB EXTRACT
    HTTPMETHOD(WS-HTTP-MTHD)
    METHODLENGTH(WS-HTTP-MTHD-LN)
    RESP(WS-RESP)
    RESP2(WS-RESP2)
  END-EXEC
  INITIALIZE HAVE-ERR-MSG-SUFX-SW
  EVALUATE WS-RESP
    WHEN DFHRESP( NORMAL )
      CONTINUE
    WHEN DFHRESP( INVREQ )
      SET NON-HTTP-RQST-DONE TO TRUE
    WHEN DFHRESP( LENGERR )
      INITIALIZE WS-TRUNC-ITEM
      MOVE 'http-method' TO WS-TRUNC-ITEM
      PERFORM 8920-MAKE-TRUNC-SUFX
  * THIS WAS TRUNCATED, BUT WE WANT THE LENGTH SET
so that we can use it in reference modification later.
MOVE LENGTH OF WS-HTTP-MTHD TO WS-HTTP-MTHD-LN
END-EVALUATE
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN OTHER
    IF NON-HTTP-RQST-DONE
      * This is an interesting situation. I would
      * suggest that a new error message be defined to
      * indicate this condition. Such an error message
      * could be modeled on the existing CICS error
      * message UDOT0004E.
      CONTINUE
    ELSE
      INITIALIZE CICS-API-FAILED
      MOVE 'WEB-EXTRACT' TO CICS-API-FAILED
      MOVE '8010' TO CICS-API-FAILED-LOC
      PERFORM 8900-GET-CICS-RESP-MNEMONIC
      PERFORM 8910-MAKE-CICS-ERR-MSG
      PERFORM 9100-WTO
    END-IF
END-EVALUATE

8020-GET-HTTP-VERS.
  *
  * Obtain the http version string. This is from the http
  * headers that accompany the request.
  *
  MOVE LENGTH OF WS-HTTP-VERS TO WS-HTTP-VERS-LN
EXEC CICS
  WEB EXTRACT
  HTTPVERSION(WS-HTTP-VERS)
  VERSIONLEN(WS-HTTP-VERS-LN)
  RESP(WS-RESP)
  RESP2(WS-RESP2)
END-EXEC
INITIALIZE HAVE-ERR-MSG-SUFX-SW
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN DFHRESP( INVREQ )
    SET NON-HTTP-RQST-DONE TO TRUE
  WHEN DFHRESP( LENGERR )
INITIALIZE WS-TRUNC-ITEM
MOVE 'http-version' TO WS-TRUNC-ITEM
PERFORM 8920-MAKE-TRUNC-SUFX
* This was truncated, but we want the length set
* so that we can use it in reference modification
* later.
MOVE LENGTH OF WS-HTTP-VERS TO WS-HTTP-VERS-LN
END-EVALUATE
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN OTHER
    IF NON-HTTP-RQST-DONE
      * This is an interesting situation. I would
      * suggest that a new error message be defined to
      * indicate this condition. Such an error message
      * could be modeled on the existing CICS error
      * message UDOT0004E.
      CONTINUE
    ELSE
      INITIALIZE CICS-API-FAILED
      MOVE 'WEB-EXTRACT' TO CICS-API-FAILED
      MOVE '8020' TO CICS-API-FAILED-LOC
      PERFORM 8900-GET-CICS-RESP-MNEMONIC
      PERFORM 8910-MAKE-CICS-ERR-MSG
      PERFORM 9100-WTO
    END-IF
END-EVALUATE
.
8030-GET-HTTP-PATH.
* 
* Obtain the http path - the bit that comes between the first
* slash after "http://" and the question mark.
*
MOVE LENGTH OF WS-HTTP-PATH TO WS-HTTP-PATH-LN
EXEC CICS
  WEB EXTRACT
  PATH(WS-HTTP-PATH)
  PATHLENGTH(WS-HTTP-PATH-LN)
  RESP(WS-RESP)
  RESP2(WS-RESP2)
END-EXEC
INITIALIZE HAVE-ERR-MSG-SUFX-SW
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
CONTINUE
WHEN DFHRESP( INVREQ )
   SET NON-HTTP-RQST-DONE TO TRUE
WHEN DFHRESP( LENGERR )
   MOVE STUS-0004 TO WS-RPLY-STUS-CD
   INITIALIZE WS-TRUNC-ITEM
   MOVE 'http-path' TO WS-TRUNC-ITEM
   PERFORM 8920-MAKE-TRUNC-SUF
   * This was truncated, but we want the length set
   * so that we can use it in reference modification
   * later.
   MOVE LENGTH OF WS-HTTP-PATH TO WS-HTTP-PATH-LN
END-EVALUATE
EVALUATE WS-RESP
WHEN DFHRESP( NORMAL )
   CONTINUE
WHEN OTHER
   IF NON-HTTP-RQST-DONE
      * This is an interesting situation. I would
      * suggest that a new error message be defined to
      * indicate this condition. Such an error message
      * could be modeled on the existing CICS error
      * message UDOT0004E.
      CONTINUE
   ELSE
      INITIALIZE CICS-API-FAILED
      MOVE 'WEB-EXTRACT' TO CICS-API-FAILED
      MOVE '8030' TO CICS-API-FAILED-LOC
      PERFORM 8900-GET-CICS-RESP-MNEMONIC
      PERFORM 8910-MAKE-CICS-ERR-MSG
      PERFORM 9100-WTO
      END-IF
   END-IF
END-EVALUATE
.

8040-GET-HTTP-QRY-STRN.
*
* Obtain the http query string - the bit that comes after
* the question mark.
*
   MOVE LENGTH OF WS-HTTP-QRY-STRN TO WS-HTTP-QRY-STRN-LN
EXEC CICS
   WEB EXTRACT
   QUERYSTRING(WS-HTTP-QRY-STRN)
   QUERYSTRLEN(WS-HTTP-QRY-STRN-LN)
   RESP(WS-RESP)
RESP2(WS-RESP2)
END-EXEC
INITIALIZE HAVE-ERR-MSG-SUFX-SW
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN DFHRESP( INVREQ )
    SET NON-HTTP-RQST-DONE TO TRUE
  WHEN DFHRESP( LENGERR )
    INITIALIZE WS-TRUNC-ITEM
    MOVE 'http-query-string' TO WS-TRUNC-ITEM
    PERFORM 8920-MAKE-TRUNC-SUFX
    * This was truncated, but we want the length set
    * so that we can use it in reference modification
    * later.
    MOVE LENGTH OF WS-HTTP-QRY-STRN
    TO WS-HTTP-QRY-STRN-LN
END-EVALUATE
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN OTHER
    IF NON-HTTP-RQST-DONE
      * This is an interesting situation. I would
      * suggest that a new error message be defined to
      * indicate this condition. Such an error message
      * could be modeled on the existing CICS error
      * message UDOT0004E.
    CONTINUE
    ELSE
      INITIALIZE CICS-API-FAILED
      MOVE 'WEB-EXTRACT' TO CICS-API-FAILED
      MOVE '8040' TO CICS-API-FAILED-LOC
      PERFORM 8900-GET-CICS-RESP-MNEMONIC
      PERFORM 8910-MAKE-CICS-ERR-MSG
      PERFORM 9100-WTO
    END-IF
  END-EVALUATE
.
8050-DOC-CRTE.
*
* Create the document into which we will insert the http
* protocol header(s) and html/text/xml that constitute
* the reply to be sent to the requestor.
*
* If you take a look at 8090-WEB-SEND, you'll see that we use
* the WS-DOC-TOKN to indicate which document we want to send
* as a reply.
*
```
EXEC CICS
  DOCUMENT CREATE
  DOCTOKEN(WS-DOC-TOKN)
  RESP(WS-RESP)
  RESP2(WS-RESP2)
END-EXEC
INITIALIZE HAVE-ERR-MSG-SUFX-SW
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN OTHER
    INITIALIZE CICS-API-FAILED
    MOVE 'DOCUMENT-CREATE' TO CICS-API-FAILED
    MOVE '8050' TO CICS-API-FAILED-LOC
    PERFORM 8900-GET-CICS-RESP-MNEMONIC
    PERFORM 8910-MAKE-CICS-ERR-MSG
    PERFORM 9100-WTO
END-EVALUATE
.
8060-DOC-ISRT.
*
* Insert the content of WS-RPLY-BUFR into the reply document.
*
* This example application only does one insert per reply. The
* CICS documentation indicates one can do multiple inserts, with
* each being added to the "bottom" of the document. One can
* also create "bookmarks" within the document and insert at a
* bookmark location.
*
IF BINARY-CONTENT
EXEC CICS
  DOCUMENT INSERT
  DOCTOKEN(WS-DOC-TOKN)
  BINARY(WS-RPLY-BUFR)
  LENGTH(WS-RPLY-BUFR-LN)
  RESP(WS-RESP)
  RESP2(WS-RESP2)
END-EXEC
ELSE
EXEC CICS
  DOCUMENT INSERT
INITIALIZE HAVE-ERR-MSG-SUFX-SW
EVALUATE WS-RESP
   WHEN DFHRESP( NORMAL )
      CONTINUE
   WHEN OTHER
      INITIALIZE CICS-API-FAILED
      MOVE 'DOCUMENT-INSERT' TO CICS-API-FAILED
      MOVE '8060' TO CICS-API-FAILED-LOC
      PERFORM 8900-GET-CICS-RESP-MNEMONIC
      PERFORM 8910-MAKE-CICS-ERR-MSG
      PERFORM 9100-WTO
   END-EVALUATE
.

8070-WEB-READ-HDR.
 *
 * Obtain the http protocol header item specified in
 * WS-HTTP-HDR-TO-RTV.
 *
 INITIALIZE HTTP-HDR-NOT-FND-SW
 EXEC CICS
   WEB READ
   HTTPHEADER(WS-HTTP-HDR-TO-RTV)
   NAMELENGTH(WS-HTTP-HDR-TO-RTV-LN)
   VALUE(WS-HTTP-HDR-BUFR)
   VALUELENGTH(WS-HTTP-HDR-BUFR-LN)
   RESP(WS-RESP)
   RESP2(WS-RESP2)
   END-EXEC
 INITIALIZE HAVE-ERR-MSG-SUFX-SW
 EVALUATE WS-RESP
   WHEN DFHRESP( NORMAL )
      CONTINUE
   WHEN OTHER
      INITIALIZE CICS-API-FAILED
      MOVE 'WEB-READ-HTTPHEADER' TO CICS-API-FAILED
      MOVE '8070' TO CICS-API-FAILED-LOC
PERFORM 8900-GET-CICS-RESP-MNEMONIC
PERFORM 8930-MAKE-HTTP-HDR-ERR-SUFX
END-EVALUATE
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN DFHRESP( NOTFND )
    IF WS-RESP2 = 1
      *                 Requested header was not found
      SET HTTP-HDR-NOT-FND TO TRUE
    ELSE
      PERFORM 8910-MAKE-CICS-ERR-MSG
      PERFORM 9100-WTO
    END-IF
  WHEN OTHER
    PERFORM 8910-MAKE-CICS-ERR-MSG
    PERFORM 9100-WTO
END-EVALUATE.

8080-UNSTRN-CHARSET.
*
* Get the first client code page sent on the http header. This
* is used on the WEB SEND API call to convert from the host
* code page (probably 037 EBCDIC) to the client code page (which
* we don't know, probably ISO-8859-1).
*
* This isn't very robust, and could probably benefit from its
* own subroutine for parsing out the preferred code page instead
* of just arbitrarily using the first code page listed.
*
* See http://www.ietf.org/rfc/rfc2616.txt?number=2616, section
* 14.2 for the full syntax of the Accept-Charset protocol
* header.
*
  UNSTRING WS-HTTP-HDR-BUFR
    DELIMITED ',' OR '; ' OR SPACE
    INTO
      WS-HTTP-CLNT-CHARSET
      WS-DUMMY-BUFR
  END-UNSTRING.

8090-WEB-SEND.
*
* Send the reply constructed in the document referenced by
* WS-DOC-TOKN back to the requester.

EXEC CICS
WEB SEND
DOCTOKEN(WS-DOC-TOKN)
CLNTCODEPAGE(WS-HTTP-CLNT-CHARSET)
RESP(WS-RESP)
RESP2(WS-RESP2)
END-EXEC
INITIALIZE HAVE-ERR-MSG-SUFX-SW
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN OTHER
    INITIALIZE CICS-API-FAILED
    MOVE 'WEB-SEND' TO CICS-API-FAILED
    MOVE '8090' TO CICS-API-FAILED-LOC
    PERFORM 8900-GET-CICS-RESP-MNEMONIC
END-EVALUATE
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN DFHRESP( NOTFND )
    IF WS-RESP2 = 7
      * Requested client code page is bad
      PERFORM 8940-MAKE-CLNT-CD-PG-ERR-SUFX
    END-IF
    PERFORM 8910-MAKE-CICS-ERR-MSG
    PERFORM 9100-WTO
  WHEN DFHRESP( NOTFND )
    PERFORM 8910-MAKE-CICS-ERR-MSG
    PERFORM 9100-WTO
END-EVALUATE

8100-WEB-WRITE.

* Send the reply constructed in the document referenced by
* WS-DOC-TOKN back to the requester.

EXEC CICS
WEB WRITE
HTTPHEADER(HTTP-PTCL-HDR-NM)
NAMELENGTH(HTTP-PTCL-HDR-NM-LN)
VALUE(HTTP-PTCL-HDR-VAL)
VALUELENGTH(HTTP-PTCL-HDR-VAL-LN)
RESP(WS-RESP)
RESP2(WS-RESP2)
END-EXEC
INITIALIZE HAVE-ERR-MSG-SUFX-SW
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN OTHER
    INITIALIZE CICS-API-FAILED
    MOVE 'WEB-WRITE' TO CICS-API-FAILED
    MOVE '8100' TO CICS-API-FAILED-LOC
    PERFORM 8900-GET-CICS-RESP-MNEMONIC
    PERFORM 8910-Make-CICS-ERR-MSG
    PERFORM 9100-WTO
END-EVALUATE.
.
8110-WEB-READ-FORMFIELD.
  *
  * Read the specified field from the HTML form with which this
  * program was invoked.
  *
  MOVE LENGTH OF WS-FORM-FLD-VAL TO WS-FORM-FLD-VAL-LN
  INITIALIZE FORM-FLD-NOT-FND-SW
  EXEC CICS
    WEB READ
    FORMFIELD(WS-FORM-FLD-NM)
    NAMELENGTH(WS-FORM-FLD-NM-LN)
    VALUE(WS-FORM-FLD-VAL)
    VALUELENGTH(WS-FORM-FLD-VAL-LN)
    CLNTCODEPAGE(WS-HTTP-CLNT-CHARSET)
    HOSTCODEPAGE(HOST-CD-PG)
    RESP(WS-RESP)
    RESP2(WS-RESP2)
END-EXEC
INITIALIZE HAVE-ERR-MSG-SUFX-SW
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    MOVE FUNCTION UPPER-CASE(WS-FORM-FLD-VAL) TO WS-FORM-FLD-VAL
  WHEN OTHER
    * Provide some human-readable info for debugging.
    INITIALIZE CICS-API-FAILED
    MOVE 'WEB-READ-FORMFIELD' TO CICS-API-FAILED
    MOVE '8110' TO CICS-API-FAILED-LOC
    PERFORM 8900-GET-CICS-RESP-MNEMONIC
END-EVALUATE
EVALUATE WS-RESP
  WHEN DFHRESP( NORMAL )
    CONTINUE
  WHEN DFHRESP( NOTFND )
    IF WS-RESP2 = 1
      * Form field was not found.
      SET FORM-FLD-NOT-FND TO TRUE
      MOVE WS-FORM-FLD-NM(1:WS-FORM-FLD-NM-LN)
        TO WS-MSNG-FORM-FLD-NM
    ELSE
      PERFORM 8910-MAKE-CICS-ERR-MSG
      PERFORM 9100-WTO
    END-IF
  WHEN DFHRESP( INVREQ )
    EVALUATE WS-RESP2
      WHEN 11
        * Requested client code page is bad
        PERFORM 8940-MAKE-CLNT-CD-PG-ERR-SUFX
      WHEN 12
        * Requested server code page is bad
        PERFORM 8950-MAKE-SRVR-CD-PG-ERR-SUFX
      WHEN 14
        * Requested client and server code page combination is bad.
        PERFORM 8960-MAKE-C-S-CD-PG-ERR-SUFX
    END-EVALUATE
  IF WS-RESP2 = 13
    * The POST request didn't provide a form.
    SET FORM-FLD-NOT-FND TO TRUE
  ELSE
    PERFORM 8910-MAKE-CICS-ERR-MSG
    PERFORM 9100-WTO
  END-IF
  WHEN OTHER
    PERFORM 8910-MAKE-CICS-ERR-MSG
    PERFORM 9100-WTO
  END-EVALUATE
.

8900-GET-CICS-RESP-MNEMONIC.
*
* Obtain the mnemonic text for the RESP code that resulted
* from the most recent CICS API call.
*
  CALL CICS-ERR-PGM USING
8910-MAKE-CICS-ERR-MSG.

* Concatenate fields to create a meaningful error message
* to be written to the JESMSGLG. This should assist in
* debugging any problems that occur.

MOVE SPACES   TO WTO-TXT
MOVE WS-RESP  TO CICS-RESP-DSPL
MOVE WS-RESP2 TO CICS-RESP2-DSPL
SET MSG-NB-CICS-ERR TO TRUE
SET WTO-CA-MSG-TY-ERR TO TRUE
STRING
   CICS-API-Failed
   DELIMITED BY SPACE
SPACE
   DELIMITED BY SIZE
   CICS-RESP-DSPL-X
   DELIMITED BY SPACE
SPACE
   DELIMITED BY SIZE
   WS-CICS-RESP-MNEMONIC
   DELIMITED BY SPACE
SPACE
   DELIMITED BY SIZE
   CICS-RESP2-DSPL-X
   DELIMITED BY SPACE
SPACE
   DELIMITED BY SIZE
   CICS-API-FAILED-LOC
   DELIMITED BY SIZE
INTO
   WTO-TXT
   WITH POINTER
   WTO-LN
END-STRING

IF HAVE-ERR-MSG-SUFX
STRING
   SPACE
   DELIMITED BY SIZE
   WTO-SUFX(1:WTO-SUFX-LN)
8920-Make-Trunc-Sufx.

* Construct operator message suffix indicating which item
  was truncated.

  SET HAVE-ERR-MSG-SUFX TO TRUE
  INITIALIZE WTO-SUFX
  MOVE 1 TO WTO-SUFX-LN
  STRING
    WS-TRUNC-ITEM
    DELIMITED SPACE
    ' was truncated'
    DELIMITED SIZE
    ' client IP: '
    DELIMITED SIZE
    WS-CLNT-ADDR
    DELIMITED SIZE
    ' client name: '
    DELIMITED SIZE
    WS-CLNT-NM(1:WS-CLNT-NM-LN)
  INTO
    WTO-SUFX
  POINTER
    WTO-SUFX-LN
  END-STRING
.

8930-Make-HTTP-Hdr-Err-Sufx.

* Construct operator message suffix indicating which http
  header item was being processed when the error occurred.

  SET HAVE-ERR-MSG-SUFX TO TRUE
  INITIALIZE WTO-SUFX
MOVE 1 TO WTO-SUFX-LN
STRING
   WS-HTTP-HDR-TO-RTV(1:WS-HTTP-HDR-TO-RTV-LN)
   ' was being processed'
   ' client IP: '
   DELIMITED SIZE
   WS-CLNT-ADDR
   ' client name: '
   DELIMITED SIZE
   WS-CLNT-NM(1:WS-CLNT-NM-LN)
   INTO WTO-SUFX
   POINTER WTO-SUFX-LN
END-STRING

8940-MAKE-CLNT-CD-PG-ERR-SUFX.
*
* Construct operator message suffix indicating the client
* code page that was invalid.
*
SET HAVE-ERR-MSG-SUFX TO TRUE
INITIALIZE WTO-SUFX
MOVE 1 TO WTO-SUFX-LN
STRING
   ' client code page is '
   DELIMITED SIZE
   WS-HTTP-CLNT-CHARSET
   ' client IP: '
   DELIMITED SIZE
   WS-CLNT-ADDR
   ' client name: '
   DELIMITED SIZE
   WS-CLNT-NM(1:WS-CLNT-NM-LN)
   INTO WTO-SUFX
   POINTER WTO-SUFX-LN
8950-MAKE-SRVR-CD-PG-ERR-SUFX.
*
* Construct operator message suffix indicating the server
* code page that was invalid.
*
SET HAVE-ERR-MSG-SUFX TO TRUE
INITIALIZE WTO-SUFX
MOVE 1 TO WTO-SUFX-LN
STRING
  ' server code page is ' STRING
  DELIMITED SIZE HOST-CD-PG
  DELIMITED SIZE ' server IP: ' STRING
  DELIMITED SIZE WS-SRVR-ADDR
  DELIMITED SIZE ' port: ' STRING
  DELIMITED SIZE WS-PORT-NB
  DELIMITED SIZE ' server name: ' STRING
  DELIMITED SIZE WS-SRVR-NM(1:WS-SRVR-NM-LN)
  DELIMITED SIZE INTO WTO-SUFX
POINTER WTO-SUFX-LN
END-STRING
.

8960-MAKE-C-S-CD-PG-ERR-SUFX.
*
* Construct operator message suffix indicating the client and
* server code page combination that was invalid.
*
SET HAVE-ERR-MSG-SUFX TO TRUE
INITIALIZE WTO-SUFX
MOVE 1 TO WTO-SUFX-LN
STRING
  ' client code page is ' STRING
  DELIMITED SIZE
* In order to avoid issues with the WRITE OPERATOR CICS API
* not being threadsafe, it is encapsulated in its own program
* object and we LINK to it instead of dynamically CALLing it.
* The CICS Programming Guide has a good explanation of
* threadsafe and its implications.
*
* And just look at how messy life gets if you encounter an
* error within error handling code.
*
    SET CICS-ERR TO TRUE
    MOVE WTO-LN TO WTO-CA-TXT-LN
MOVE WTO-TXT TO WTO-CA-TXT
MOVE MSG-NB TO WTO-CA-MSG-NB
MOVE MYNAME TO WTO-CA-CALLER
MOVE LENGTH OF WTO-CA TO WTO-CA-LN

EXEC CICS
    LINK
        PROGRAM(CICS-WTO-PGM)
        COMMAREA(WTO-CA)
        LENGTH(WTO-CA-LN)
        RESP(WS-RESP)
        RESP2(WS-RESP2)
    END-EXEC

IF WTO-CA-RC-NORMAL AND WS-RESP = DFHRESP(NORMAL)
    CONTINUE
ELSE
    PERFORM 8900-GET-CICS-RESP-MNEMONIC
    DISPLAY
    MYNAME
    SPACE
    CICS-WTO-PGM
    ' RC = '
    WTO-CA-RC
    ' RESP = '
    WS-RESP
    ' CICS RESP MNEMONIC = '
    WS-CICS-RESP-MNEMONIC
    ' RESP2 = '
    WS-RESP2
    ' attempting to write operator '
    WTO-CA-TXT(1:WTO-CA-TXT-LN)
STRING
    MYNAME DELIMITED SIZE
    ' State dump in 9100-WTO ' DELIMITED SIZE
    INTO
    CEE3DMP-TITL-SPFC OF LCL-APLC-DEBUG-AREA
END-STRING
CALL 'CEE3DMP' USING
    CEE3DMP-TITL    OF LCL-APLC-DEBUG-AREA
    CEE3DMP-OPTIONS OF LCL-APLC-DEBUG-AREA
    CEE3DMP-LEFB-CD OF LCL-APLC-DEBUG-AREA
END-CALL
END-IF
."
End Program J7200544.