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 Identification Division.
 Program-ID.    J7200544.
 Author.        Craig Schneiderwent.
*
* 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
* c=n  - do not include a Content-Type header
*
* Multiple parameters are passed as follows:
* J7200544?t=html&c=n
*
* 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
* http://www.ietf.org/rfc/rfc1945.txt?number=1945
*
* Hypertext Transfer Protocol -- HTTP/1.1
* http://www.ietf.org/rfc/rfc2616.txt?number=2616
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*
* 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 JESMSGLG would be flooded with
* messages.  Thus the messages written to the JESMSGLG 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.
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          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'.
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     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              VALUE 'Y'.
     05  HAVE-ERR-MSG-SUFX-SW    PIC X(001)  VALUE SPACE.
         88  HAVE-ERR-MSG-SUFX               VALUE 'Y'.
     05  HTTP-HDR-NOT-FND-SW     PIC X(001)  VALUE SPACE.
         88  HTTP-HDR-NOT-FND                VALUE 'Y'.
     05  FORM-FLD-NOT-FND-SW     PIC X(001)  VALUE SPACE.
         88  FORM-FLD-NOT-FND                VALUE 'Y'.
     05  CICS-ERR-SW             PIC X(001)  VALUE SPACE.
         88  CICS-ERR                        VALUE 'Y'.
     05  BINARY-CONTENT-SW       PIC X(001)  VALUE SPACE.
         88  BINARY-CONTENT                  VALUE 'Y'.

 01  WORK-AREAS.
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05  WTO-LN                  PIC 9(008)  COMP-5 VALUE 1.
05  WTO-SUFX-LN             PIC 9(008)  COMP-5 VALUE 1.
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  PIC X(050) OCCURS 10
    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).
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     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 contructing 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>'.
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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(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(002)  VALUE X'0D25'.
05                    PIC X(004)  VALUE '<li>'.
05                    PIC X(004)  VALUE '<b> '.
05                    PIC X(008)  VALUE 'Region: '.
05                    PIC X(004)  VALUE '</b>'.
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 '<li>'.
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 '<li>'.
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 '<li>'.
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'.
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05                    PIC X(004)  VALUE '<li>'.
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 '<li>'.
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 '<li>'.
05                    PIC X(004)  VALUE '<b> '.
05                    PIC X(010)  VALUE 'SSL Type: '.
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 '<li>'.
05                    PIC X(004)  VALUE '<b> '.
05                    PIC X(016)  VALUE 'Client Address: '.
05                    PIC X(004)  VALUE '</b>'.
05  RPLY-CLNT-ADDR    PIC X(015)  VALUE SPACES.
05                    PIC X(005)  VALUE '</li>'.
05                    PIC X(002)  VALUE X'0D25'.
05                    PIC X(004)  VALUE '<li>'.
05                    PIC X(004)  VALUE '<b> '.
05                    PIC X(013)  VALUE 'Client Name: '.
05                    PIC X(004)  VALUE '</b>'.
05  RPLY-CLNT-NM      PIC X(080)  VALUE SPACES.
05                    PIC X(005)  VALUE '</li>'.
05                    PIC X(002)  VALUE X'0D25'.
05                    PIC X(004)  VALUE '<li>'.
05                    PIC X(004)  VALUE '<b> '.
05                    PIC X(014)  VALUE 'TCPIPSERVICE: '.
05                    PIC X(004)  VALUE '</b>'.
05  RPLY-TCPIPSERVICE PIC X(008)  VALUE SPACES.
05                    PIC X(005)  VALUE '</li>'.
05                    PIC X(002)  VALUE X'0D25'.
05                    PIC X(004)  VALUE '<li>'.
05                    PIC X(004)  VALUE '<b> '.
05                    PIC X(016)  VALUE 'Server Address: '.
05                    PIC X(004)  VALUE '</b>'.
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05  RPLY-SRVR-ADDR    PIC X(015)  VALUE SPACES.
05                     PIC X(005)  VALUE '</li>'.
05                     PIC X(002)  VALUE X'0D25'.
05                     PIC X(004)  VALUE '<li>'.
05                     PIC X(004)  VALUE '<b> '.
05                     PIC X(013)  VALUE 'Server Name: '.
05                     PIC X(004)  VALUE '</b>'.
05  RPLY-SRVR-NM      PIC X(080)  VALUE SPACES.
05                     PIC X(005)  VALUE '</li>'.
05                     PIC X(002)  VALUE X'0D25'.
05                     PIC X(004)  VALUE '<li>'.
05                     PIC X(004)  VALUE '<b> '.
05                     PIC X(013)  VALUE 'Server Port: '.
05                     PIC X(004)  VALUE '</b>'.
05  RPLY-SRVR-PORT    PIC X(005)  VALUE SPACES.
05                     PIC X(005)  VALUE '</li>'.
05                     PIC X(002)  VALUE X'0D25'.
05                     PIC X(004)  VALUE '<li>'.
05                     PIC X(004)  VALUE '<b> '.
05                     PIC X(009)  VALUE 'User ID: '.
05                     PIC X(004)  VALUE '</b>'.
05  RPLY-USER-ID      PIC X(008)  VALUE SPACES.
05                     PIC X(005)  VALUE '</li>'.
05                     PIC X(002)  VALUE X'0D25'.
05                     PIC X(004)  VALUE '<li>'.
05                     PIC X(004)  VALUE '<b> '.
05                     PIC X(011)  VALUE 'User Name: '.
05                     PIC X(004)  VALUE '</b>'.
05  RPLY-USER-NM      PIC X(020)  VALUE SPACES.
05                     PIC X(005)  VALUE '</li>'.
05                     PIC X(002)  VALUE X'0D25'.
05                     PIC X(004)  VALUE '<li>'.
05                     PIC X(004)  VALUE '<b> '.
05                     PIC X(005)  VALUE 'GMT: '.
05                     PIC X(004)  VALUE '</b>'.
05  RPLY-GMT          PIC X(080)  VALUE SPACES.
05                     PIC X(005)  VALUE '</li>'.
05                     PIC X(002)  VALUE X'0D25'.
05                     PIC X(005)  VALUE '</ul>'.
05                     PIC X(002)  VALUE X'0D25'.
05                     PIC X(004)  VALUE '<br>'.
05                     PIC X(004)  VALUE '<br>'.
05  RPLY-INVD-HINT    PIC X(690)  VALUE SPACES.
05                     PIC X(004)  VALUE '<br>'.
05                     PIC X(007)  VALUE '</body>'.
05                     PIC X(002)  VALUE X'0D25'.
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    05                   PIC X(007)  VALUE '</html>'.

01  FORM-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  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(004)  VALUE '<br>'.
    05                   PIC X(002)  VALUE X'0D25'.
    05                   PIC X(006)  VALUE '<body>'.
    05                   PIC X(006)  VALUE '<form '.
    05                   PIC X(007)  VALUE 'action='.
    05  FORM-RPLY-URL    PIC X(080)  VALUE SPACES.
    05                   PIC X(014)  VALUE 'method="POST" '.
    05                   PIC X(013)  VALUE 'name="form1">'.
    05                   PIC X(002)  VALUE X'0D25'.
    05                   PIC X(003)  VALUE '<b>'.
    05                   PIC X(012)  VALUE 'Reply Type: '.
    05                   PIC X(004)  VALUE '</b>'.
    05                   PIC X(002)  VALUE X'0D25'.
    05                   PIC X(007)  VALUE '<input '.
    05                   PIC X(012)  VALUE 'type="text" '.
    05                   PIC X(009)  VALUE 'size="4" '.
    05                   PIC X(012)  VALUE 'name="type" '.
    05                   PIC X(014)  VALUE 'maxlength="4">'.
    05                   PIC X(002)  VALUE X'0D25'.
    05                   PIC X(004)  VALUE '<br>'.
    05                   PIC X(002)  VALUE X'0D25'.
    05                   PIC X(003)  VALUE '<b>'.
    05                   PIC X(004)  VALUE '<br>'.
    05                   PIC X(002)  VALUE X'0D25'.
    05                   PIC X(003)  VALUE '<b>'.
    05                   PIC X(013)  VALUE 'Content-type '.
    05                   PIC X(008)  VALUE 'Header: '.
    05                   PIC X(004)  VALUE '</b>'.
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    05                     PIC X(002)  VALUE X'0D25'.
    05                     PIC X(007)  VALUE '<input '.
    05                     PIC X(016)  VALUE 'type="checkbox" '.
    05                     PIC X(016)  VALUE 'name="cntehdr">'.
    05                     PIC X(002)  VALUE X'0D25'.
    05                     PIC X(004)  VALUE '<br>'.
    05                     PIC X(002)  VALUE X'0D25'.
    05                     PIC X(007)  VALUE '<input '.
    05                     PIC X(014)  VALUE 'type="submit" '.
    05                     PIC X(016)  VALUE 'value="Request" '.
    05                     PIC X(015)  VALUE 'name="Button1" '.
    05                     PIC X(015)  VALUE 'class="button">'.
    05                     PIC X(002)  VALUE X'0D25'.
    05                     PIC X(007)  VALUE '</form>'.
    05                     PIC X(002)  VALUE X'0D25'.
    05                     PIC X(007)  VALUE '</body>'.
    05                     PIC X(002)  VALUE X'0D25'.
    05                     PIC X(007)  VALUE '</html>'.

01  INVD-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  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(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(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.
         10  RPLY-HTTP-MTHD    PIC X(080)  VALUE SPACES.
         10  RPLY-HTTP-VERS    PIC X(080)  VALUE SPACES.
         10  RPLY-HTTP-PATH    PIC X(512)  VALUE SPACES.
         10  RPLY-HTTP-QRY-STRN PIC X(512)  VALUE SPACES.
         10  RPLY-AUTH-TY      PIC X(012)  VALUE SPACES.
         10  RPLY-SSL-TY       PIC X(012)  VALUE SPACES.
         10  RPLY-CLNT-ADDR    PIC X(015)  VALUE SPACES.
         10  RPLY-CLNT-NM      PIC X(080)  VALUE SPACES.
         10  RPLY-TCPIPSERVICE PIC X(008)  VALUE SPACES.
         10  RPLY-SRVR-ADDR    PIC X(015)  VALUE SPACES.
         10  RPLY-SRVR-NM      PIC X(080)  VALUE SPACES.
         10  RPLY-SRVR-PORT    PIC X(005)  VALUE SPACES.
         10  RPLY-USER-ID      PIC X(008)  VALUE SPACES.
         10  RPLY-USER-NM      PIC X(020)  VALUE SPACES.
         10  RPLY-GMT          PIC X(080)  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                       PIC X(010) VALUE '+=+=+=+=+=+'.
         10  CEE3DMP-TITL-SPFC    PIC X(060) VALUE SPACES.
         10                       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 J7200501.
         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-PGM
                                  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-CLNT-NM
                                OF XML-RPLY(XML-RPLY-INDX)
           MOVE WS-CLNT-ADDR    TO RPLY-CLNT-ADDR
                                OF XML-RPLY(XML-RPLY-INDX)
           MOVE WS-SRVR-NM      TO RPLY-SRVR-NM
                                OF XML-RPLY(XML-RPLY-INDX)
           MOVE WS-SRVR-ADDR    TO RPLY-SRVR-ADDR
                                OF XML-RPLY(XML-RPLY-INDX)
           MOVE WS-PORT-NB      TO RPLY-SRVR-PORT
                                OF XML-RPLY(XML-RPLY-INDX)
           MOVE WS-TCPIP-SRVC-NM TO RPLY-TCPIPSERVICE
                                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-NM
                                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
         END-STRING
     END-IF

     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)
         CLIENTNAME(WS-CLNT-NM)
         CNAMELENGTH(WS-CLNT-NM-LN)
         CLIENTADDR(WS-CLNT-ADDR)
         CADDRLENGTH(WS-CLNT-ADDR-LN)
         SERVERNAME(WS-SRVR-NM)
         SNAMELENGTH(WS-SRVR-NM-LN)
         SERVERADDR(WS-SRVR-ADDR)
         SADDRLENGTH(WS-SRVR-ADDR-LN)
         SSLTYPE(WS-SSL-TY-CVDA)
         TCPIPSERVICE(WS-TCPIP-SRVC-NM)
         PORTNUMBER(WS-PORT-NB)
         RESP(WS-RESP)
         RESP2(WS-RESP2)
     END-EXEC

     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-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-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-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 constitue
* 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
             DOCTOKEN(WS-DOC-TOKN)
             TEXT(WS-RPLY-BUFR)
             LENGTH(WS-RPLY-BUFR-LN)
             HOSTCODEPAGE(HOST-CD-PG)
             RESP(WS-RESP)
             RESP2(WS-RESP2)
         END-EXEC
     END-IF

     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
            WS-RESP
            WS-CICS-RESP-MNEMONIC
        END-CALL
        .

 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)
                 DELIMITED BY SIZE
             INTO
               WTO-TXT
             WITH POINTER
               WTO-LN
           END-STRING
       END-IF

       INITIALIZE HAVE-ERR-MSG-SUFX-SW
       .

 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)
            DELIMITED SIZE
        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)
            DELIMITED SIZE
          ' was being procesed'
            DELIMITED SIZE
          ' client IP: '
            DELIMITED SIZE
          WS-CLNT-ADDR
            DELIMITED SIZE
          ' client name: '
            DELIMITED SIZE
          WS-CLNT-NM(1:WS-CLNT-NM-LN)
            DELIMITED SIZE
        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
           DELIMITED SIZE
         ' client IP: '
           DELIMITED SIZE
         WS-CLNT-ADDR
           DELIMITED SIZE
         ' client name: '
           DELIMITED SIZE
         WS-CLNT-NM(1:WS-CLNT-NM-LN)
           DELIMITED SIZE
       INTO
         WTO-SUFX
       POINTER
         WTO-SUFX-LN
     END-STRING
     .

 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 '
           DELIMITED SIZE
         HOST-CD-PG
           DELIMITED SIZE
         ' server IP: '
           DELIMITED SIZE
         WS-SRVR-ADDR
           DELIMITED SIZE
         ' port: '
           DELIMITED SIZE
         WS-PORT-NB
           DELIMITED SIZE
```

```
          ' server name: '
            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 '
            DELIMITED SIZE
          WS-HTTP-CLNT-CHARSET
            DELIMITED SIZE
          ' client IP: '
            DELIMITED SIZE
          WS-CLNT-ADDR
            DELIMITED SIZE
          ' client name: '
            DELIMITED SIZE
          WS-CLNT-NM(1:WS-CLNT-NM-LN)
            DELIMITED SIZE
          ' server code page is '
            DELIMITED SIZE
          HOST-CD-PG
            DELIMITED SIZE
          ' server IP: '
            DELIMITED SIZE
          WS-SRVR-ADDR
            DELIMITED SIZE
          ' port: '
            DELIMITED SIZE
          WS-PORT-NB
            DELIMITED SIZE
          ' server name: '
            DELIMITED SIZE
```

```
          WS-SRVR-NM(1:WS-SRVR-NM-LN)
            DELIMITED SIZE
        INTO
          WTO-SUFX
        POINTER
          WTO-SUFX-LN
      END-STRING
      .

 9100-WTO.
*
* 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.
```