

Designing Robust, High Performance Web-Enabled CICS Applications

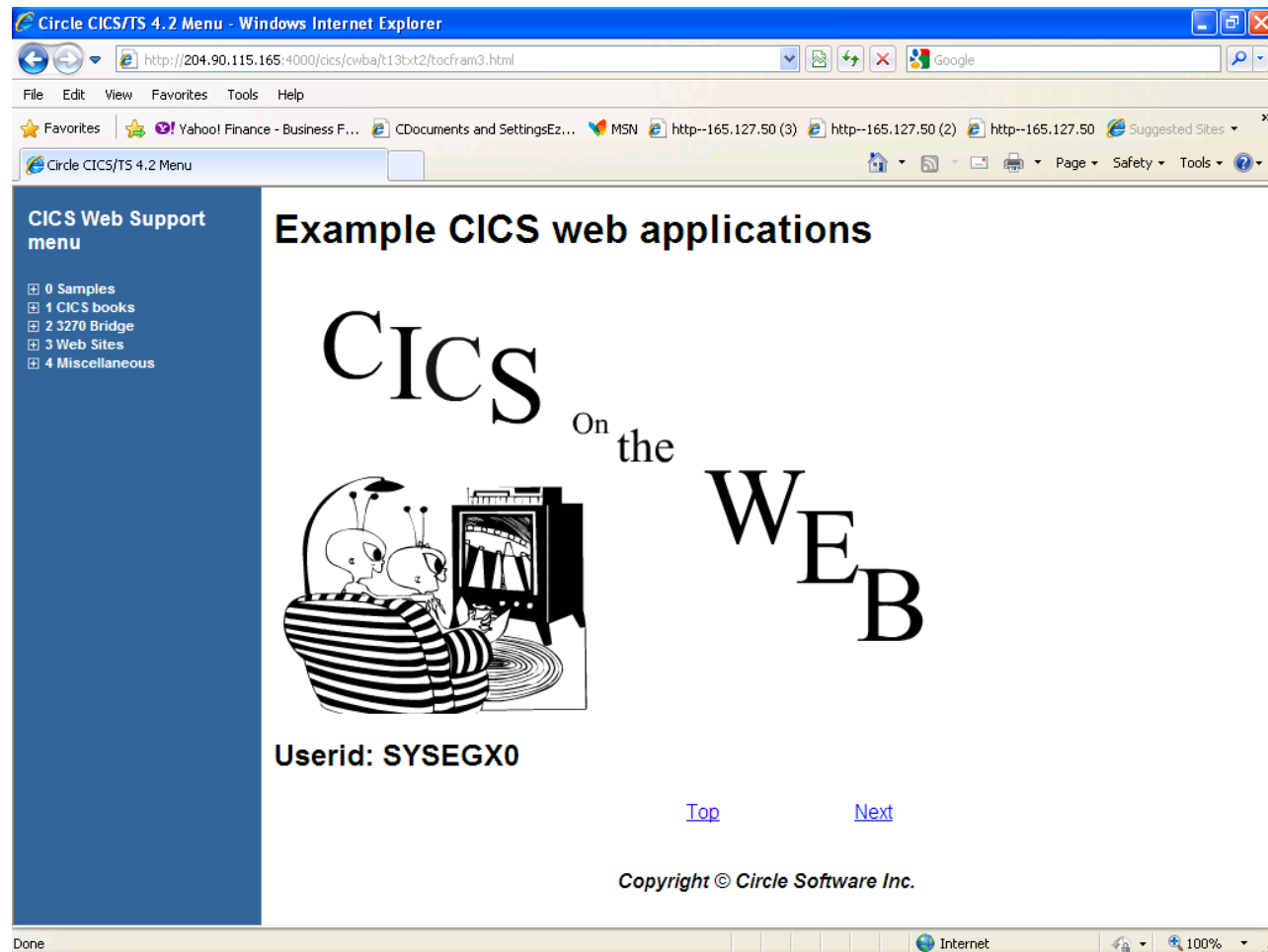
Ezriel Gross

August 10, 2011 (Wed)
3:00pm – 4:00pm
Session 10052

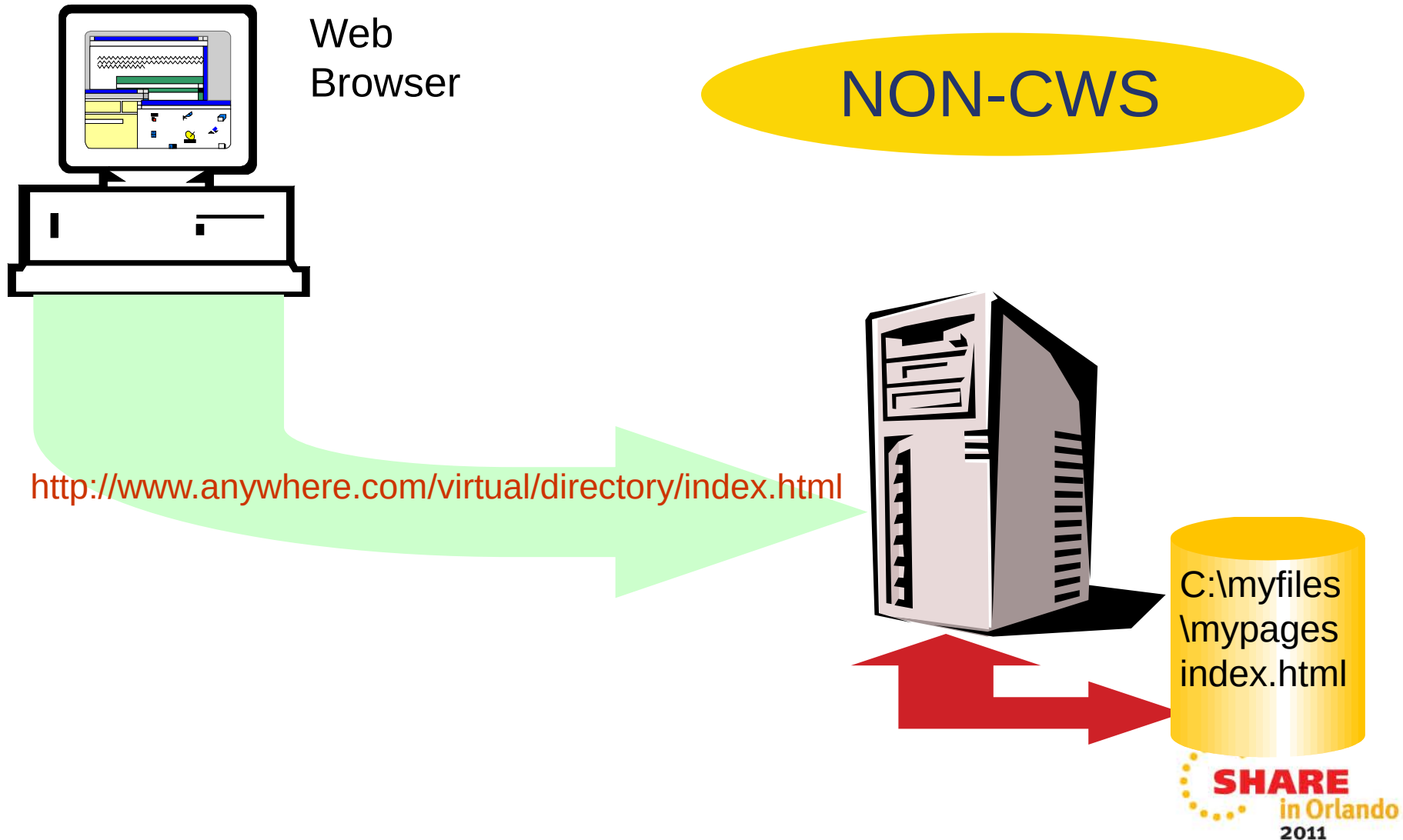
Agenda

- **Web Data Streams using HTTP**
- **Converting BMS to HTML**
- **Web Architecture**
- **CICS Web-Aware Send program**
- **CICS Web-Aware Receive program**
- **CICS based Graphics Delivery program**
- **JavaScript for GUI manipulation**

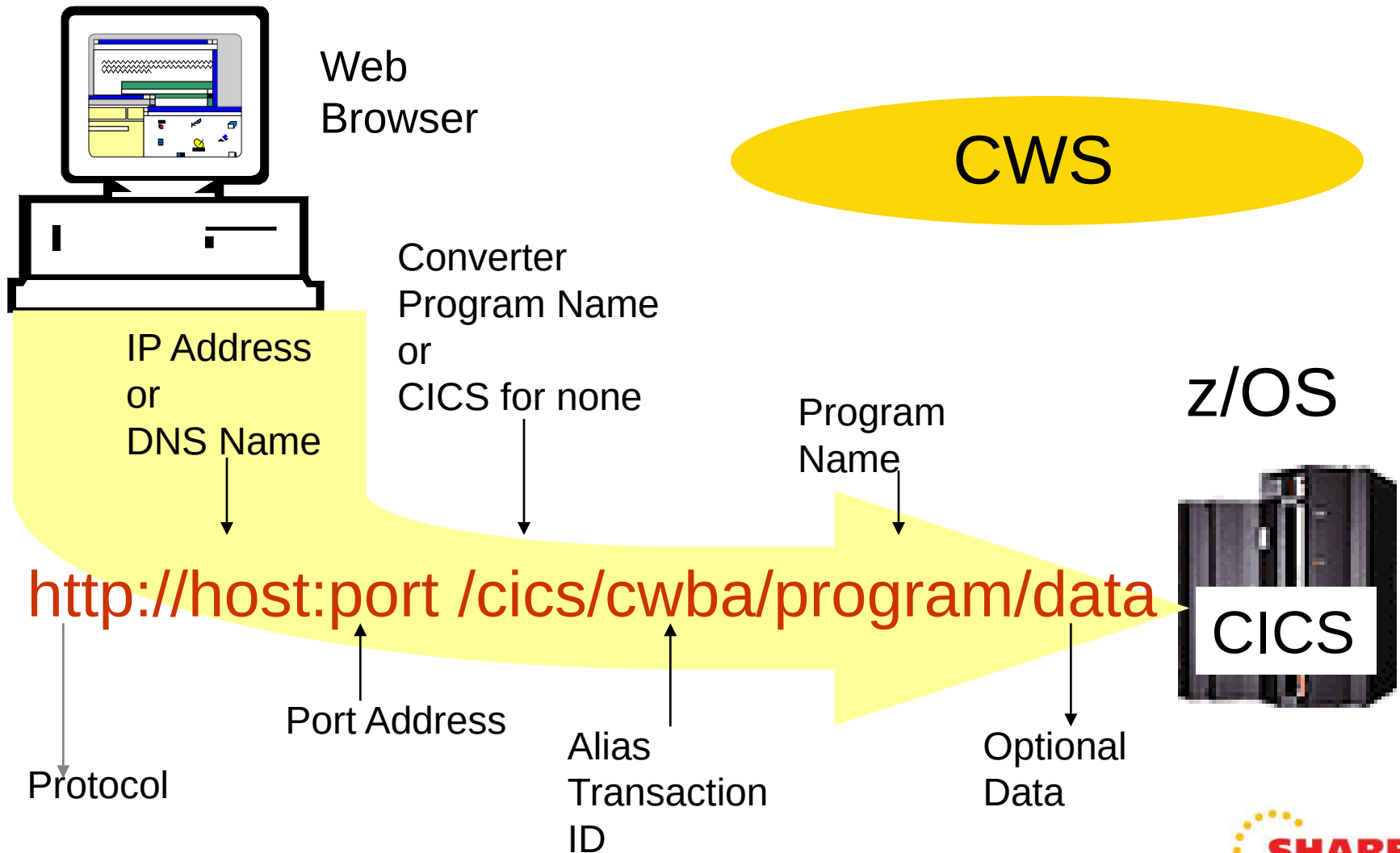
Web Browser



Uniform Resource Locator (URL)



Uniform Resource Locator (URL) Prior to CICS TS V3.1



URIMAP Definition (1 of 4)

```
Session A - [24 x 80]
File Edit View Communication Actions Window Help

OVERTYPE TO MODIFY                                CICS RELEASE = 8868
CEDA ALter Urimap( EZRIEL  )
  Urimap      : EZRIEL
  Group       : EZRIEL
  DEScription ==>
  SStatus     ==> Enabled      Enabled | Disabled
  USAge       ==> Server      Server | Client | Pipeline | Atom
  UNIVERSAL RESOURCE IDENTIFIER
  SCheme      ==> HTTP        HTTP | HTTPS
  POrt        ==> No          No | 1-65535
  HOSt        ==> *
  (Mixed Case) ==>
  PAtH        ==> /ezriel
  (Mixed Case) ==>
  ==>
  ==>
  ==>
  OUTBOUND CONNECTION POOLING
+ SOketclose ==>              0-240000 (HHMMSS)

                                SYSID=CT42 APPLID=CICSTS42

PF 1 HELP 2 COM 3 END          6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL

a                                06/022
Connected to remote server/host 204.90.115.165 using port 623
```

URIMAP Definition (2 of 4)

```
Session A - [24 x 80]
File Edit View Communication Actions Window Help

OVERTYPE TO MODIFY                                CICS RELEASE = 8868
CEDA ALter Urimap( EZRIEL )
+ ASSOCIATED CICS RESOURCES
  TCpipservice ==>
  ANalyzer      ==> No | Yes
  COnverter     ==>
  TRansaction   ==> CWBA
  PRogram       ==> PROGRAM
  PIpeline      ==>
  Wbservice     ==> (Mixed Case)
  ATomservice   ==>
SECURITY ATTRIBUTES
  USERid       ==>
  Ciphers       ==>
  Certificate    ==> (Mixed Case)
  AUthenticate  ==> No | Basic
STATIC DOCUMENT PROPERTIES
  Mediatype     ==>
+ (Lower Case)

SYSID=CT42 APPLID=CICSTS42

PF 1 HELP 2 COM 3 END          6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL

MA a 05/022
Connected to remote server/host 204.90.115.165 using port 623
```

URIMAP Definition (3 of 4)

```
Session A - [24 x 80]
File Edit View Communication Actions Window Help

OVERTYPE TO MODIFY                                CICS RELEASE = 8868
CEDA ALTER Urimap( EZRIEL )
+ CHARACTERSET ==>                                (Mixed Case)
  HOSTCODEPAGE ==>
  TEMPLATENAME ==>
  (Mixed Case)
  HF5FILE ==>
  (Mixed Case) ==>
  ==>
  ==>
  ==>
  REDIRECTION
  Redirecttype ==> None                            None | Temporary | Permanent
  Location ==>
  (Mixed Case) ==>
  ==>
  ==>
  ==>
+ DEFINITION SIGNATURE
                                                    SYSID=CT42 APPLID=CICSTS42

PF 1 HELP 2 COM 3 END                            6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL
```


URIMAP Definition (4 of 4)

```
Session A - [24 x 80]
File Edit View Communication Actions Window Help

OVERTYPE TO MODIFY                                CICS RELEASE = 8868
CEDA ALTER Urimap( EZRIEL )
+ DEFinetime      : 07/06/11 10:16:54
  CHANGETime      : 07/06/11 10:16:54
  CHANGEUsrid     : SYSEGX0
  CHANGEAGEnt     : CSDApi           CSDApi | CSDBatch
  CHANGEAGRel     : 8868

SYSID=CT42 APPLID=CICSTS42

PF 1 HELP 2 COM 3 END                6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL

a                                     01/003
Connected to remote server/host 204.90.115.165 using port 623
```

Sample HTML Source

```

Session A - [24 x 80]
File Edit View Communication Actions Window Help

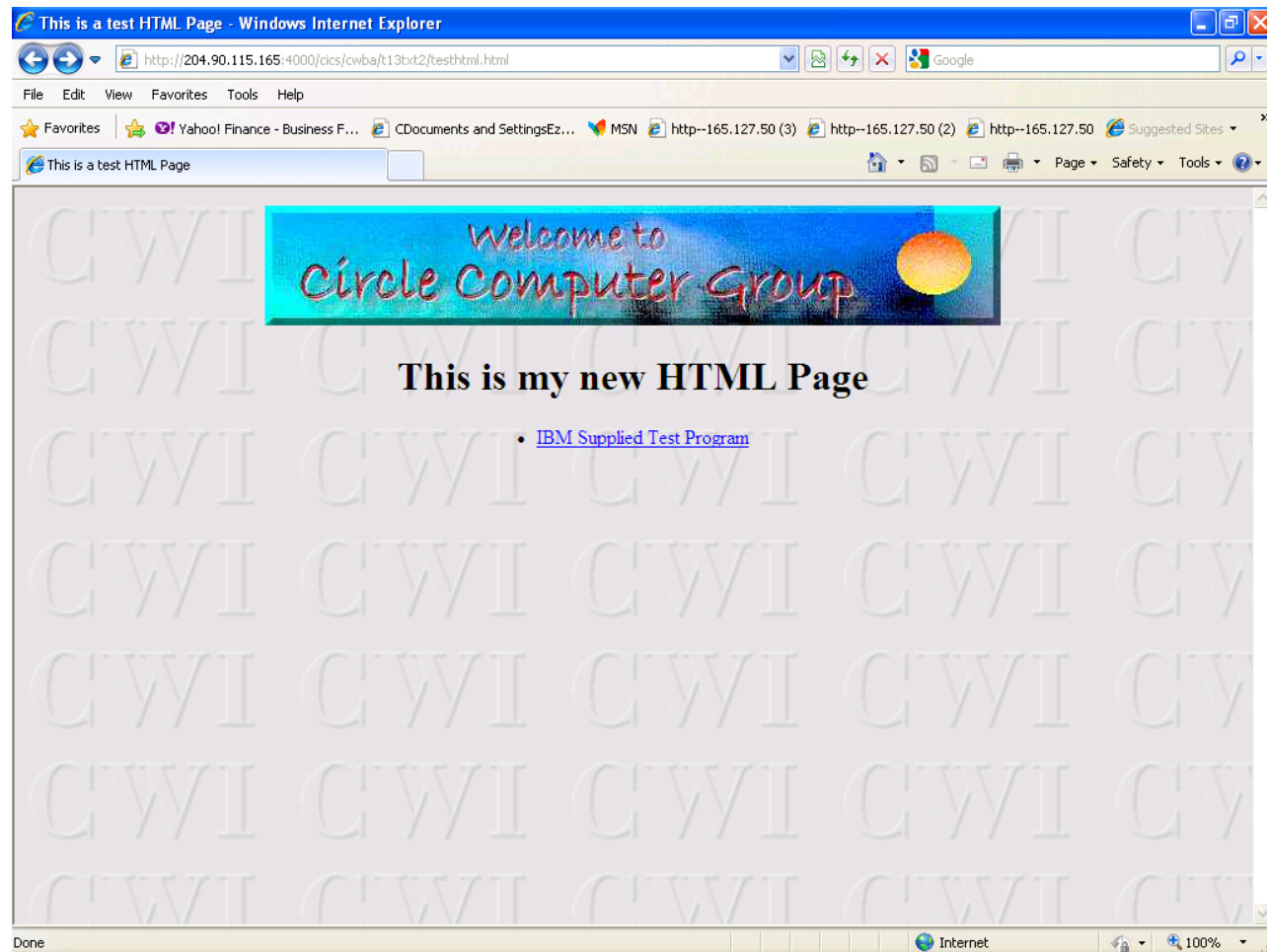
File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT      CIRCLE.CWSP42.MASTER.TEMPLATE (TESTHTML) -      Member TESTHTML saved
Command ==> _____ Scroll ==> CSR
***** ***** Top of Data *****
000001 <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
000002 <html>
000003 <BASE href="&protocol;&hostv;">
000004 <head>
000005 <title>This is a test HTML Page</title>
000006 <body background="/cics/tobj/t13obj2/gback2.gif" bgcolor="#FFFFFF">
000007 <center><p><p>
000008 
000009 <h1>This is my new HTML Page</h1>
000010 <table>
000011 <tr><td>
000012 <li><A href="/cics/tobj/dfh$wb1a">IBM Supplied Test Program
000013 </li>
000014 </tr></td>
000015 </table>
000016 </center>
000017 </body>
000018 </html>
***** ***** Bottom of Data *****

a 04/015
Connected to remote server/host 204.90.115.165 using port 623

```

Sample HTML View



HTML Variables (Symbols)

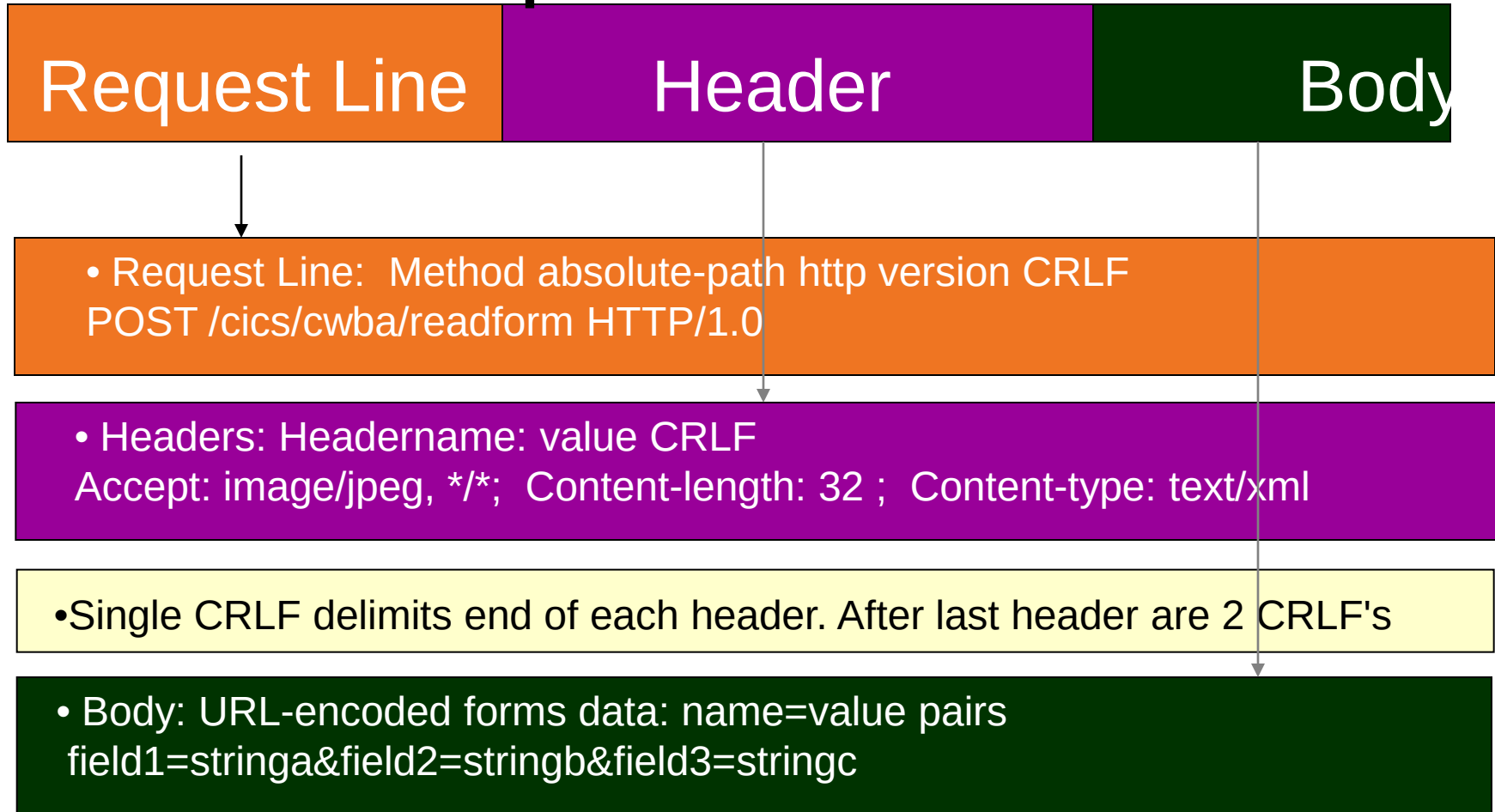
```
<html>
<head>
<title> CICS APP MAIN PAGE </title>
<body>
<p>
Name:&name;<br>
Address:&address;<br>
Phone:&phone;<br>
</body></html>
```

Note: Symbols are case sensitive

Sample HTML Form

```
<FORM method="get"
  action=http://mymvs:5000/cics/cwba/prog1>
<H1 align=center>Please enter details below</H1>
Your Name
<input name="name" size="20"><p>
Your Address
<input name="addr" size="20"><p>
Your phone number
<input name="phon" size="10"> <p>
<input type="submit" value="Enter">
</FORM>
```

HTTP Request



Note: Body does not exist if Get Method used.

HTTP Request Header – Page 1



```
Session A - [24 x 80]
File Edit View Communication Actions Window Help

TRANSACTION: CWBA PROGRAM: TCWSP09 TASK: 0000240 APPLID: CICSTS42 DISPLAY: 00
ADDRESS: 1BAB7430
1BAB7430 000000 D7D6E2E3 4061E3C3 E6E2D7F0 F961C3E6 POST /TCWSP09/CW
1BAB7440 000010 C2C161C2 D9D6E6E2 D3D5D240 C8E3E3D7 BA/BROWSLNK HTTP
1BAB7450 000020 61F14BF1 0D25C183 838597A3 7A408994 /1.1..Accept: im
1BAB7460 000030 81878561 8789866B 40899481 87856191 age/gif, image/j
1BAB7470 000040 9785876B 40899481 87856197 91978587 peg, image/pjpeg
1BAB7480 000050 6B408994 81878561 97919785 876B4081 , image/pjpeg, a
1BAB7490 000060 97979389 8381A389 969561A7 60A28896 pplication/x-sho
1BAB74A0 000070 8392A681 A5856086 9381A288 6B408197 ckwave-flash, ap
1BAB74B0 000080 97938983 81A38996 9561A781 94934EA7 plication/xaml+x
1BAB74C0 000090 94936B40 81979793 898381A3 89969561 ml, application/
1BAB74D0 0000A0 A595844B 94A260A7 97A28496 83A49485 vnd.ms-xpsdocume
1BAB74E0 0000B0 95A36B40 81979793 898381A3 89969561 nt, application/
1BAB74F0 0000C0 A76094A2 60A78281 976B4081 97979389 x-ms-xbap, appli
1BAB7500 0000D0 8381A389 969561A7 6094A260 81979793 cation/x-ms-appl
1BAB7510 0000E0 898381A3 8996956B 40819797 93898381 ication, applica
1BAB7520 0000F0 A3899695 61A59584 4B94A260 85A78385 tion/vnd.ms-exce

ENTER: CURRENT DISPLAY
PF1 : UNDEFINED PF2 : BROWSE TEMP STORAGE PF3 : UNDEFINED
PF4 : EIB DISPLAY PF5 : INVOKE CECI PF6 : USER DISPLAY
PF7 : SCROLL BACK HALF PF8 : SCROLL FORWARD HALF PF9 : UNDEFINED
PF10: SCROLL BACK FULL PF11: SCROLL FORWARD FULL PF12: REMEMBER DISPLAY

MA a 02/012
Connected to remote server/host 204.90.115.165 using port 623
```

HTTP Request Header – Page 2

```
Session A - [24 x 80]
File Edit View Communication Actions Window Help

TRANSACTION: CWBA PROGRAM: TCWSP09 TASK: 0000240 APPLID: CICSTS42 DISPLAY: 00
ADDRESS: 1BAB7530
1BAB7530 000000 936B4081 97979389 8381A389 969561A5 l, application/v
1BAB7540 000010 95844B94 A2609796 A6859997 968995A3 nd.ms-powerpoint
1BAB7550 000020 6B408197 97938983 81A38996 956194A2 , application/ms
1BAB7560 000030 A6969984 6B405C61 5C0D25D9 85868599 word, /*..Refer
1BAB7570 000040 85997A40 88A3A397 7A6161F2 F0F44BF9 er: http://204.9
1BAB7580 000050 F04BF1F1 F54BF1F6 F57AF4F0 F0F06183 0.115.165:4000/c
1BAB7590 000060 8983A261 83A68281 61A383A6 A297F0F8 ics/cwba/tcwsp08
1BAB75A0 000070 0D25C183 838597A3 60D38195 87A48187 ..Accept-Languag
1BAB75B0 000080 857A4085 9560A4A2 0D25E4A2 859960C1 e: en-us..User-A
1BAB75C0 000090 878595A3 7A40D496 A9899393 8161F44B gent: Mozilla/4.
1BAB75D0 0000A0 F0404D83 96949781 A3898293 855E40D4 0 (compatible; M
1BAB75E0 0000B0 E2C9C540 F84BF05E 40E68995 8496A6A2 SIE 8.0; Windows
1BAB75F0 0000C0 40D5E340 F54BF15E 40E39989 848595A3 NT 5.1; Trident
1BAB7600 0000D0 61F44BF0 5E40C7E3 C2F64BF6 5E404BD5 /4.0; GTB6.6; .N
1BAB7610 0000E0 C5E340C3 D3D940F1 4BF14BF4 F3F2F25E ET CLR 1.1.4322;
1BAB7620 0000F0 404BD5C5 E340C3D3 D940F24B F04BF5F0 .NET CLR 2.0.50

ENTER: CURRENT DISPLAY
PF1 : UNDEFINED PF2 : BROWSE TEMP STORAGE PF3 : UNDEFINED
PF4 : EIB DISPLAY PF5 : INVOKE CECI PF6 : USER DISPLAY
PF7 : SCROLL BACK HALF PF8 : SCROLL FORWARD HALF PF9 : UNDEFINED
PF10: SCROLL BACK FULL PF11: SCROLL FORWARD FULL PF12: REMEMBER DISPLAY

MA a 02/012
Connected to remote server/host 204.90.115.165 using port 623
```


HTTP Request Header – Page 3

```
Session A - [24 x 80]
File Edit View Communication Actions Window Help

TRANSACTION: CWBA PROGRAM: TCWSP09 TASK: 0000240 APPLID: CICSTS42 DISPLAY: 00
ADDRESS: 1BAB7630
1BAB7630 000000 F7F2F75E 404BD5C5 E340C3D3 D940F34B 727; .NET CLR 3.
1BAB7640 000010 F04BF0F4 F5F0F64B F3F05E40 C9958696 0.04506.30; Info
1BAB7650 000020 D781A388 4BF15E40 4BD5C5E3 40C3D3D9 Path.1; .NET CLR
1BAB7660 000030 40F34BF0 4BF4F5F0 F64BF2F1 F5F25E40 3.0.4506.2152;
1BAB7670 000040 4BD5C5E3 40C3D3D9 40F34BF5 4BF3F0F7 .NET CLR 3.5.307
1BAB7680 000050 F2F95E40 D6868689 8385D389 A585C396 29; OfficeLiveCo
1BAB7690 000060 95958583 A396994B F14BF35E 40D68686 nnecter.1.3; Off
1BAB76A0 000070 898385D3 89A585D7 81A38388 4BF04BF0 iceLivePatch.0.0
1BAB76B0 000080 5D0D25C3 9695A385 95A360E3 A897857A )..Content-Type:
1BAB76C0 000090 40819797 93898381 A3899695 61A760A6 application/x-w
1BAB76D0 0000A0 A6A66086 96999460 A4999385 95839684 ww-form-urlencoded
1BAB76E0 0000B0 85840D25 C1838385 97A360C5 95839684 ed..Accept-Encod
1BAB76F0 0000C0 8995877A 4087A989 976B4084 85869381 ing: gzip, defla
1BAB7700 0000D0 A3850D25 C896A2A3 7A40F2F0 F44BF9F0 te..Host: 204.90
1BAB7710 0000E0 4BF1F1F5 4BF1F6F5 7AF4F0F0 F00D25C3 .115.165:4000..C
1BAB7720 0000F0 9695A385 95A360D3 859587A3 887A40F4 ontent-Length: 4

ENTER: CURRENT DISPLAY
PF1 : UNDEFINED PF2 : BROWSE TEMP STORAGE PF3 : UNDEFINED
PF4 : EIB DISPLAY PF5 : INVOKE CECI PF6 : USER DISPLAY
PF7 : SCROLL BACK HALF PF8 : SCROLL FORWARD HALF PF9 : UNDEFINED
PF10: SCROLL BACK FULL PF11: SCROLL FORWARD FULL PF12: REMEMBER DISPLAY
```

HTTP Request Header – Page 4

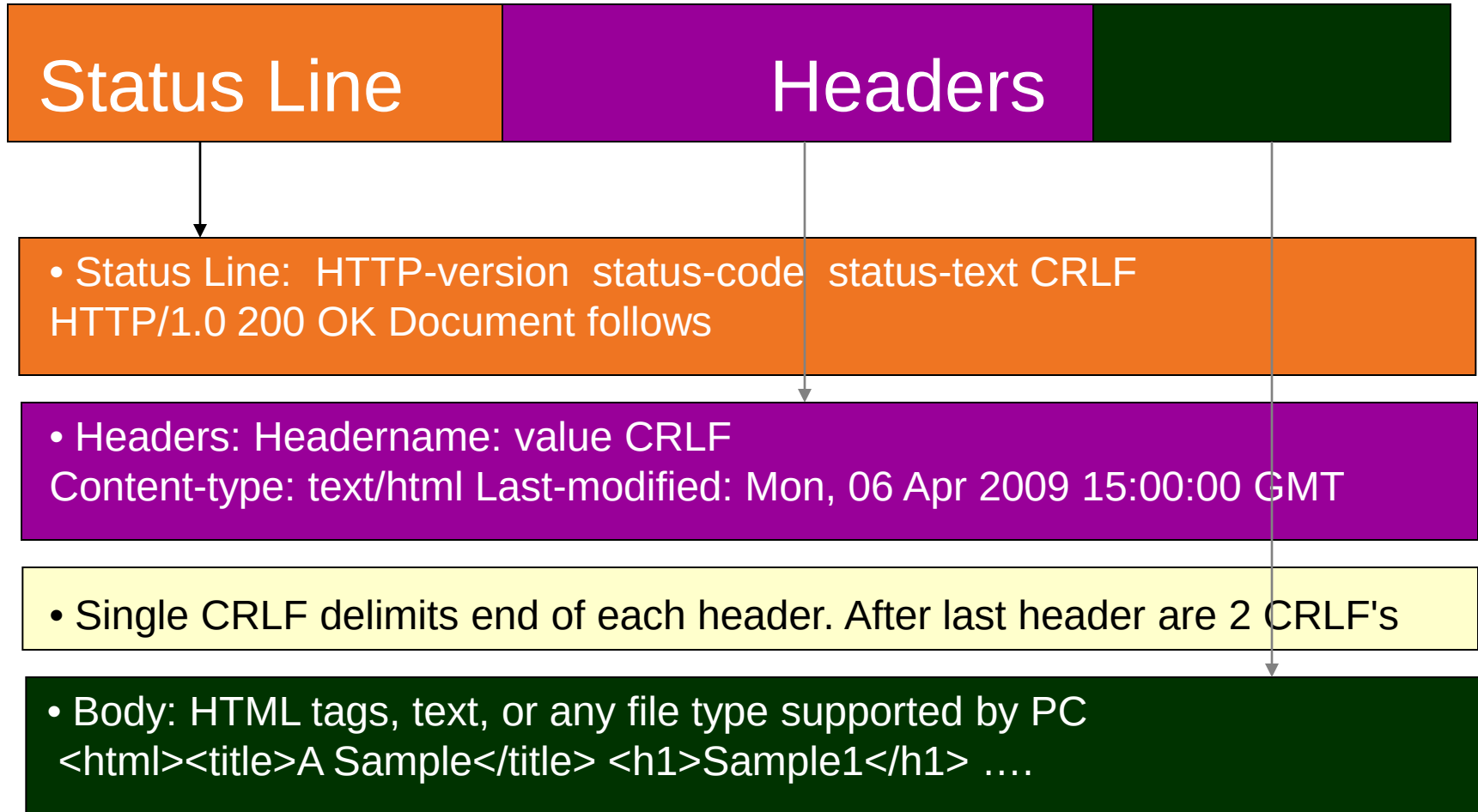
```
Session A - [24 x 80]
File Edit View Communication Actions Window Help

TRANSACTION: CWBA PROGRAM: TCWSP09 TASK: 0000240 APPLID: CICSTS42 DISPLAY: 00
ADDRESS: 1BAB7730
1BAB7730 000000 F70D25C3 96959585 83A38996 957A40D2 7..Connection: K
1BAB7740 000010 85859760 C19389A5 850D25C3 81838885 eep-Alive..Cache
1BAB7750 000020 60C39695 A3999693 7A409596 60838183 -Control: no-cac
1BAB7760 000030 88850D25 C1A4A388 969989A9 81A38996 he..Authorizatio
1BAB7770 000040 957A40C2 81A28983 4083F393 A9E9E684 n: Basic c3lzZWd
1BAB7780 000050 F4D4C497 9181E7D1 9182C7E4 A90D250D 4MDpjaXJjbGUz...
1BAB7790 000060 2583A2A3 81A36D95 8194857E 50848597 .cstat_name=&dep
1BAB77A0 000070 A36D9581 94857EF1 50859497 6D958194 t_name=1&emp_nam
1BAB77B0 000080 857EF150 A2A48294 89A37EC5 95A38599 e=1&submit=Enter
1BAB77C0 000090 00000000 00000000 00000000 00000000 .....
1BAB77D0 0000A0 00000000 00000000 00000000 00000000 .....
1BAB77E0 0000B0 00000000 00000000 00000000 00000000 .....
1BAB77F0 0000C0 00000000 00000000 00000000 00000000 .....
1BAB7800 0000D0 00000000 00000000 00000000 00000000 .....
1BAB7810 0000E0 00000000 00000000 00000000 00000000 .....
1BAB7820 0000F0 00000000 00000000 00000000 00000000 .....

ENTER: CURRENT DISPLAY
PF1 : UNDEFINED PF2 : BROWSE TEMP STORAGE PF3 : UNDEFINED
PF4 : EIB DISPLAY PF5 : INVOKE CECI PF6 : USER DISPLAY
PF7 : SCROLL BACK HALF PF8 : SCROLL FORWARD HALF PF9 : UNDEFINED
PF10: SCROLL BACK FULL PF11: SCROLL FORWARD FULL PF12: REMEMBER DISPLAY

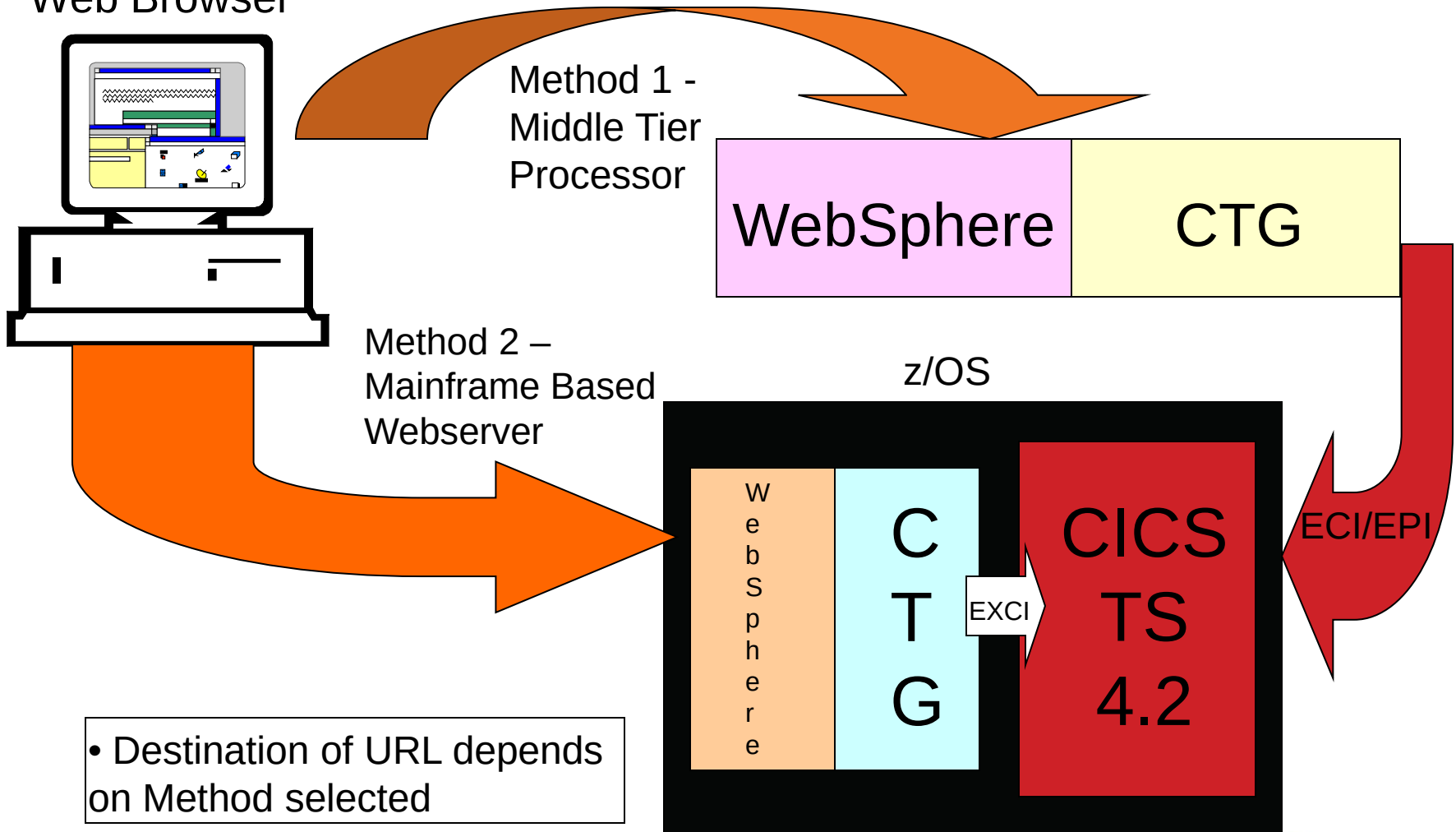
02/012
Connected to remote server/host 204.90.115.165 using port 623
```

HTTP Response



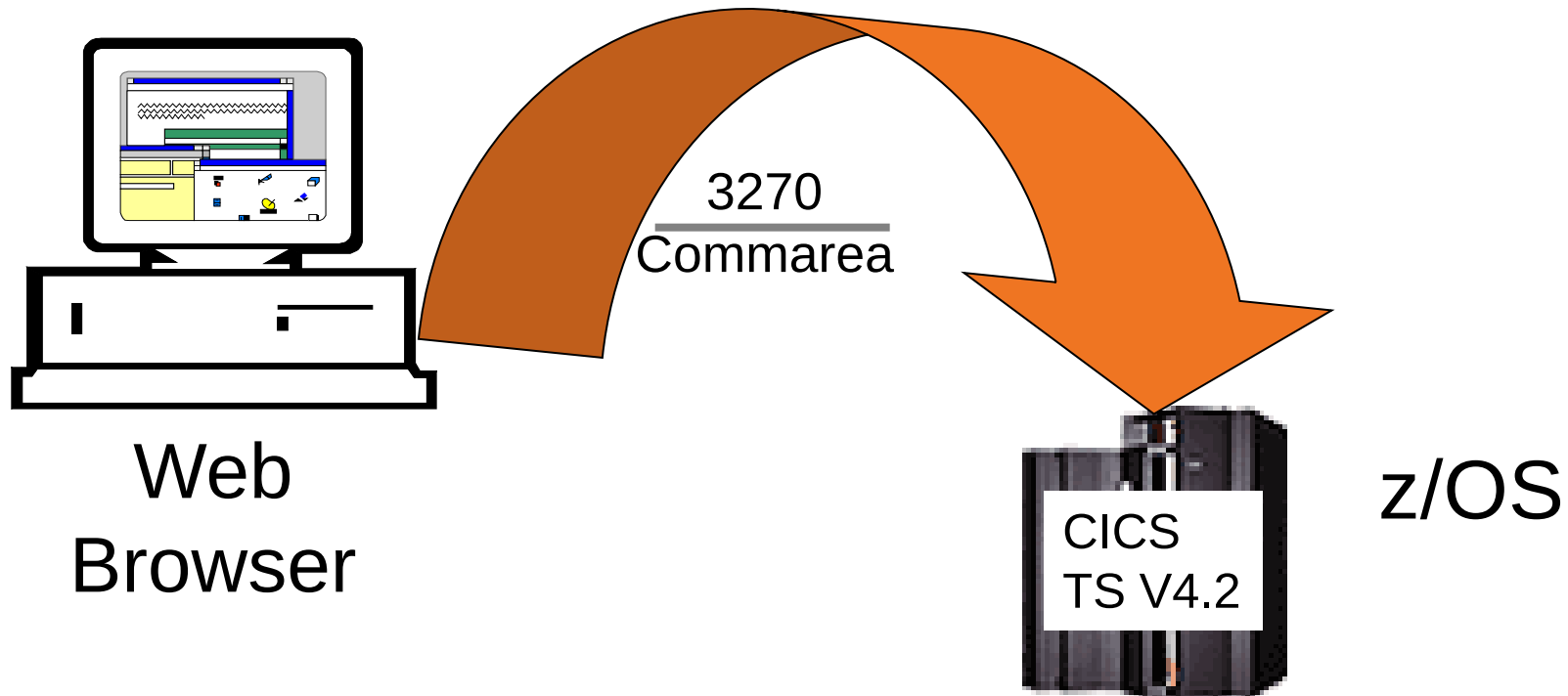
Web Enabling Methodologies

Web Browser



Web Enabling Method 3

CICS Web Support



- CICS Web Support proven to be the BEST performing solution

Presentation Logic & Business Logic

Transaction Program

```
EXEC CICS RECEIVE MAP ...  
...  
EXEC CICS READ UPDATE ...  
...  
EXEC CICS REWRITE ...  
...  
EXEC CICS SEND MAP...  
...
```

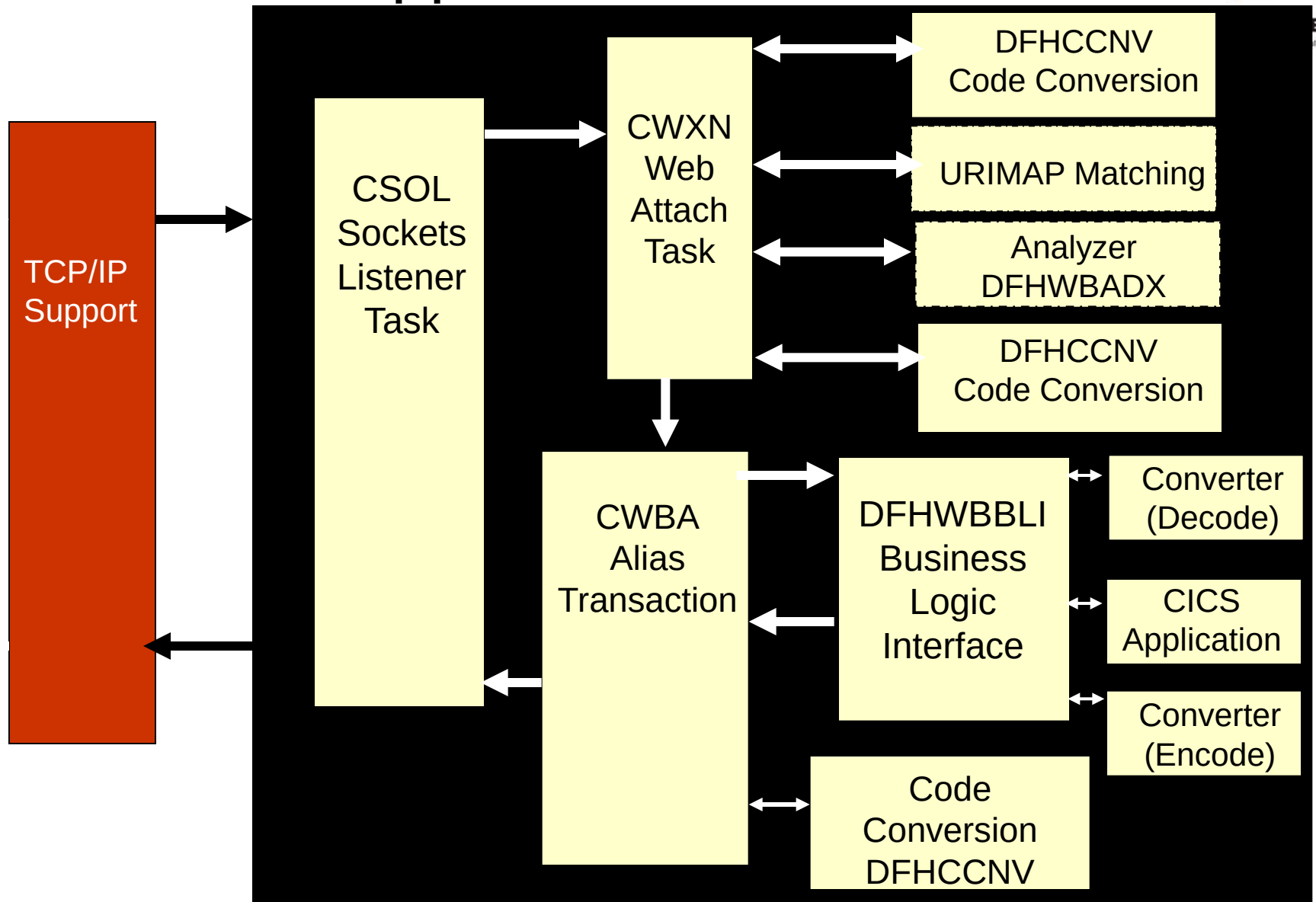
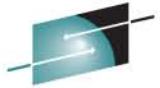
Presentation Logic

```
...  
EXEC CICS RECEIVE MAP ...  
...  
EXEC CICS LINK() COMMAREA ...  
...  
EXEC CICS SEND MAP ...  
...
```

Business Logic

```
EXEC CICS ADDRESS COMMAREA ...  
...  
EXEC CICS READ UPDATE ...  
...  
EXEC CICS REWRITE ...  
...  
EXEC CICS RETURN ...
```

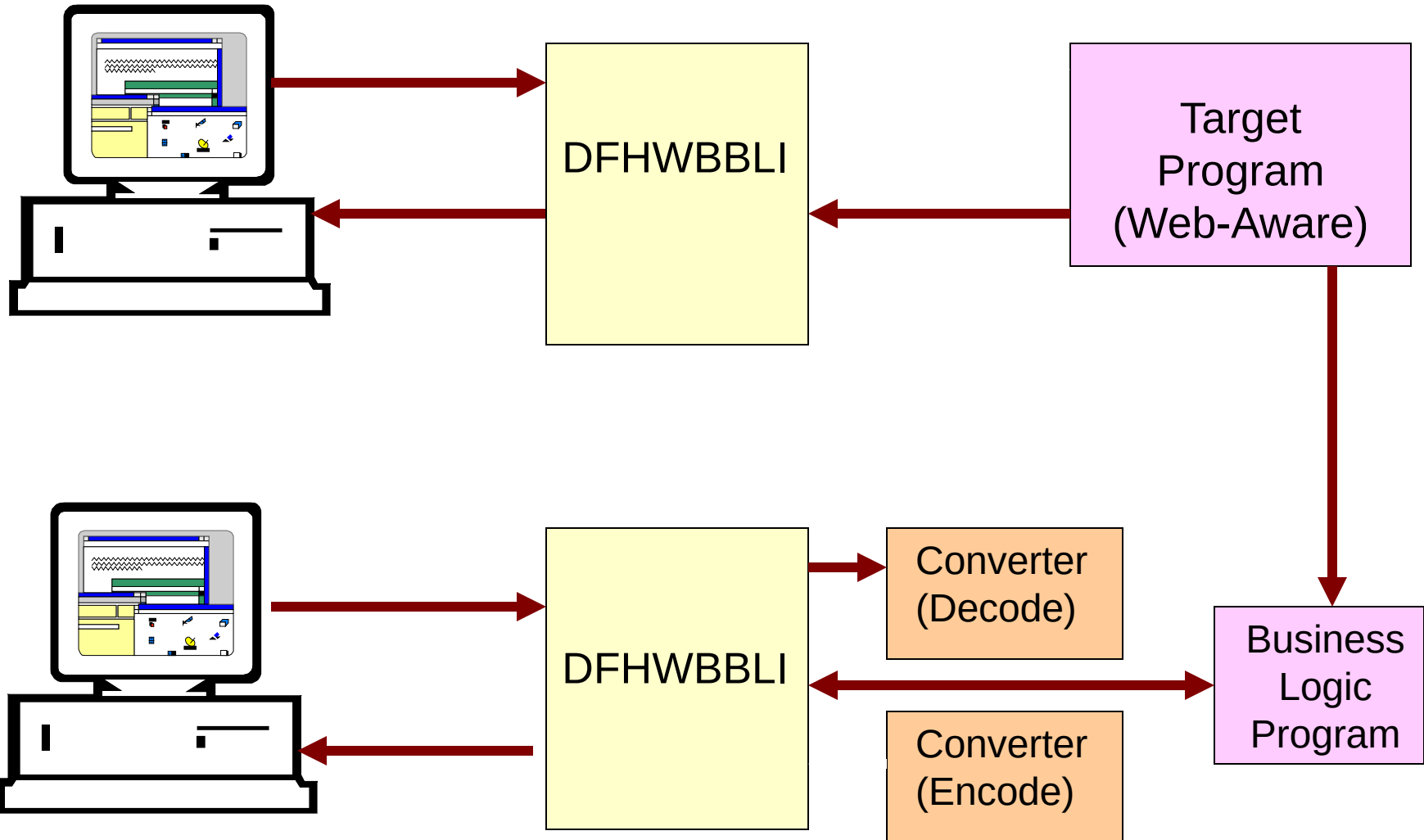
CICS Web Support Architecture



Programming Tasks for CWS

- Optional programming tasks
 - Analyzer Program
 - Web Error Program
 - Graphics Program
- Required programming tasks
 - Separation of presentation and business logic (unless the 3270 bridge is being used)
 - Converter program or Web-Aware program

Converter Versus Web -Aware



Web Programming Commands

Document API (HTML, XML, WML, etc.)

- EXEC CICS DOCUMENT CREATE
- EXEC CICS DOCUMENT INSERT
- EXEC CICS DOCUMENT SET
- EXEC CICS DOCUMENT RETRIEVE
- EXEC CICS DOCUMENT DELETE

Web API (HTTP Protocol)

- EXEC CICS WEB EXTRACT
- EXEC CICS WEB STARTBROWSE
- EXEC CICS WEB READNEXT
- EXEC CICS WEB ENDBROWSE
- EXEC CICS WEB READ
- EXEC CICS WEB RECEIVE
- EXEC CICS WEB WRITE
- EXEC CICS WEB SEND
- EXEC CICS WEB RETRIEVE
- EXEC CICS WEB CLOSE
- EXEC CICS WEB CONVERSE
- EXEC CICS WEB PARSE URL

TCPIP API (Sockets protocol)

- EXEC CICS EXTRACT TCPIP
- EXEC CICS EXTRACT CERTIFICATE
- EXEC CICS EXTRACT WEB

Web-Aware Send Program



PROGRAM - P01SEND1

Send Program

IDENTIFICATION DIVISION.
PROGRAM-ID. P01SEND1.
ENVIRONMENT DIVISION.
DATA DIVISION.
WORKING-STORAGE SECTION.

01 WS-TOKEN PIC X(16).

01 WS-SYMBOLS.

03 filler pic x(11) value 'dept_value='.

03 ws-sym-dept pic x value space.

03 ws-delim-1 pic x value '&'.

03 filler pic x(10) value 'emp_value='.

03 ws-sym-emp pic x(5) value spaces.

03 ws-delim-2 pic x value '&'.

03 filler pic x(12) value 'cstat_value='.

03 ws-state pic x(7) value low-values.

03 ws-delim-3 pic x value '&'.

03 filler pic x(07) value 'action='.

03 ws-action pic x(23) value spaces.

01 WS-HTTP-HEADER.

05 pragma-hdr PIC X(6) VALUE IS 'Pragma'.

05 pragma-val PIC X(7) VALUE IS 'nocache'.

05 expires-hdr PIC X(7) VALUE IS 'Expires'.

05 expires-val PIC 9(1) VALUE IS zero.

05 content-type-hdr PIC X(12) VALUE IS 'Content-type'.

05 content-type-val PIC X(9) VALUE IS 'text/html'.

Send Program (Continued)

01 client-info-extract.

05 ssl-type PIC S9(8) COMP.

01 ws-protocol.

05 ws-symbol-name PIC X(32) VALUE spaces.

**05 ws-http-protocol PIC X(7) VALUE 'http://'.
05 ws-https-protocol PIC X(8) VALUE 'https://'.
05 content-type-len PIC 9(8) comp value is 0.**

01 ws-host.

**05 ws-host-name PIC X(32) VALUE 'Host'.
05 ws-host-val PIC X(100) VALUE spaces.
05 ws-host-len PIC 9(8) comp value is 0.**

01 WS-RETRIEVE-LENGTH PIC S9(8) BINARY.

01 WS-RESP PIC S9(8) BINARY.

LINKAGE SECTION.

PROCEDURE DIVISION.

exec cics web read

httpheader(ws-host-name)

namelength(4)

value(ws-host-val)

valuelength(length of ws-host)

resp(ws-resp)

end-exec

Send Program (Continued)

move '/CICS/CWBA/P01RECV1' to ws-action

```
exec cics
  document create
  doctoken(ws-token)
  docsize(ws-retrieve-length)
  symbolist(ws-symbols)
  listlength(length of ws-symbols)
end-exec
```

```
exec cics document set
  doctoken(ws-token)
  symbol(ws-host-name)
  value(ws-host-val)
  length(ws-host-len)
  resp(ws-resp)
end-exec
```

```
exec cics extract tcpip
  ssltype(ssl-type)
end-exec
```

Send Program (Continued)

```
evaluate ssl-type  
  when dfhvalue(nossl)  
    move ws-http-protocol to content-type-val  
    move length of ws-http-protocol to content-type-len  
  when other  
    move ws-https-protocol to content-type-val  
    move length of ws-https-protocol to content-type-len  
end-evaluate
```

```
move 'protocol' to ws-symbol-name
```

```
exec cics document set  
  doctoken(ws-token)  
  symbol(ws-symbol-name)  
  value(content-type-val)  
  length(content-type-len)  
  resp(ws-resp)  
end-exec
```

```
document insert  
exec cics  
  doctoken(ws-token)  
  docsize(ws-retrieve-length)  
  template('T01TEST1')  
end-exec
```

Send Program (Continued)

```
exec cics web write  
    httpheader(pragma-hdr)  
    namelength(length of pragma-hdr)  
    value(pragma-val)  
    valuelength(length of pragma-val)  
end-exec
```

```
exec cics web write  
    httpheader (expires-hdr)  
    namelength(length of expires-hdr)  
    value(expires-val)  
    valuelength(length of expires-val)  
end-exec
```

```
    exec cics  
        web send  
        doctoken(ws-token)  
        clntcodepage('819')  
    end-exec  
exec cics return end-exec.
```


Results of Web-Aware Send Program

WEP API Using RECEIVE command - Windows Internet Explorer

http://204.90.115.165:4000/cics/CWBA/p01send1

File Edit View Favorites Tools Help

Favorites Yahoo! Finance - Business F... CDocuments and SettingsEz... MSN http--165.127.50 (3) http--165.127.50 (2) http--165.127.50 Suggested Sites

WEP API Using RECEIVE command

CIRCLE EDUCATION

CICS/TS CWS RECEIVE API SAMPLE

Please enter Department & Employee Number

Department

Employee

W3C HTML 4.01

Done Internet 100%

HTML Page Results – Page1

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
<head>
<BASE href="&protocol;&Host;">
<title>WEP API Using RECEIVE command</title>
</head>
<body bgcolor="white"
link="#0000FF" vlink="#800080" alink="#FF0000">
<form name="TCWSP04" action="&action;" method="post">
<input type="hidden" name="cstat_name" value="&cstat_value;">
<center>
<h1 ALIGN=CENTER>CIRCLE EDUCATION</h1>
<h2>CICS/TS 1.3 RECEIVE API SAMPLE </H2>
<p>
<h3 align=center>Please enter Department & Employee Number </h3>
<p>
```

HTML Page Results – Page 2



```
<TABLE>
<tr>
<td colspan=2 nowrap> Department  </td>
<TD colspan=2 nowrap>
<input type="text" name="dept_name" size="1" value="&dept_value;"
onFocus="this.select()">
</TD>
</tr>
<tr>
<td colspan=2 nowrap> Employee  </td>
<TD colspan=2 nowrap>
<input type="text" name="emp_name" size="5" value="&emp_value;"
onFocus="this.select()">
</TD> </tr> </table>
<br><br>
<p>
<input type="submit" name="submit" value="Enter">
</center> </form> </body> </html>
```

Web-Aware Receive Program



PROGRAM - P11RECV1

Receive Program

PROGRAM-ID. P11RECV1.

IDENTIFICATION DIVISION.

ENVIRONMENT DIVISION.

DATA DIVISION.

WORKING-STORAGE SECTION.

*** storage for returned records from browslnk ***

01 ws-browslnk-output.

02 ws-comm-key.

03 ws-comm-dept pic 9.

03 ws-comm-emp pic 9(5).

03 filler pic 9(2).

02 ws-comm-count pic s9(8) comp.

02 ws-comm-recs pic x(3000).

02 filler redefines ws-comm-recs.

03 comm-payroll-rec occurs 20.

05 pr-department pic x.

05 pr-employee-no pic x(5).

05 pr-name pic x(20).

05 pr-addr1 pic x(20).

05 pr-addr2 pic x(20).

05 pr-addr3 pic x(20).

05 pr-phone-no pic x(8).

05 pr-salary pic x(8).

05 pr-start-date pic x(8).

05 pr-time-stamp pic x(8).

05 pr-remarks pic x(32).

Receive Program (Continued)



01 ws-delim pic x value x'01'.

01 WS-SYMBOLS.

*03 filler pic x(11) value 'dept_value='.
03 ws-sym-dept pic x value space.
03 ws-delim-1 pic x value x'01'.
03 filler pic x(10) value 'emp_value='.
03 ws-sym-emp pic x(5) value spaces.
03 ws-delim-2 pic x value x'01'.
03 filler pic x(11) value 'name_value='.
03 ws-sym-name pic x(20) value spaces.
03 ws-delim-3 pic x value x'01'.
03 filler pic x(11) value 'adr1_value='.
03 ws-sym-adr1 pic x(20) value spaces.
03 ws-delim-4 pic x value x'01'.
03 filler pic x(11) value 'adr2_value='.
03 ws-sym-adr2 pic x(20) value spaces.
03 ws-delim-5 pic x value x'01'.
03 filler pic x(11) value 'adr3_value='.
03 ws-sym-adr3 pic x(20) value spaces.
03 ws-delim-6 pic x value x'01'.
03 filler pic x(12) value 'cstat_value='.
03 ws-state pic x(7) value low-values.
03 ws-delim-7 pic x value x'01'.
03 FILLER PIC X(7) VALUE 'action='.
03 WS-action PIC X(24) VALUE SPACES.*

Receive Program (Continued)



01 ws-http-header.

05 pragma-hdr **PIC X(6) VALUE IS 'Pragma'.**
05 pragma-val **PIC X(7) VALUE IS 'nocache'.**
05 expires-hdr **PIC X(7) VALUE IS 'Expires'.**
05 expires-val **PIC 9(1) VALUE IS zero.**

01 ws-host.

05 ws-host-name **PIC X(32) VALUE 'Host'.**
05 ws-host-val **PIC X(100) VALUE spaces.**
05 ws-host-len **PIC 9(8) comp value is 0.**

01 client-info-extract.

05 ssl-type **PIC s9(8) COMP.**

01 ws-protocol.

05 ws-symbol-name **PIC X(32) VALUE spaces.**
05 ws-http-protocol **PIC X(7) VALUE 'http://'.**
05 ws-https-protocol **PIC X(8) VALUE 'https://'.**
05 content-type-len **PIC 9(8) comp value is 0.**

*** allow for up to 10 pairs of user variables**

01 ws-user-vars-pairs.

05 ws-uv-string **occurs 10 times**
indexed by uvindex.

20 ws-uv-name **picture x(15).**
20 ws-uv-value **picture x(10).**

Receive Program (Continued)



```
01 ws-sub          pic s9(8) comp value +0.  
01 ws-resp         pic s9(8) binary.  
01 ws-token        pic x(16).  
01 ws-retrieve-length pic s9(8) binary.
```

** templates in working storage*

```
01 ws-t13prec.  
03 filler          pic x(4) value '<tr>'.  
03 filler          pic x(13)  
value '<td bgcolor=""'.  
03 ws-row-col1     pic x(7) value '#ffffff'.  
03 filler          pic x(19)  
value "">&dept_value;</td>'.  
03 filler          pic x(13)  
value '<td bgcolor=""'.  
03 ws-row-col2     pic x(7) value '#ffffff'.  
03 filler          pic x(18)  
value "">&emp_value;</td>'.  
03 filler          pic x(13)  
value '<td bgcolor=""'.  
03 ws-row-col3     pic x(7) value '#ffffff'.  
03 filler          pic x(19)  
value "">&name_value;</td>'.  
03 filler          pic x(13)  
value '<td bgcolor=""'.
```


Receive Program (Continued)

```
03 ws-row-col4      pic x(7) value '#ffffff'.
03 filler           pic x(19)
                    value "">&adr1_value;</td>'.
03 filler           pic x(13)
                    value '<td bgcolor=""'.
03 ws-row-col5      pic x(7) value '#ffffff'.
03 filler           pic x(19)
                    value "">&adr2_value;</td>'.
03 filler           pic x(13)
                    value '<td bgcolor=""'.
03 ws-row-col6      pic x(7) value '#ffffff'.
03 filler           pic x(19)
                    value "">&adr3_value;</td>'.
03 filler           pic x(5) value '</tr>'.
01 ws-t13ptail.
03 filler           pic x(8) value '</table>'.
03 filler           pic x(7) value '<table '.
03 filler           pic x(15) value 'align="center">'.
03 filler           pic x(8) value '<tr><td>'.
03 filler           pic x(35) value '<input type="submit" value="Back">'.
03 filler           pic x(10) value '</tr></td>'.
03 filler           pic x(8) value '</table>'.
03 filler           pic x(7) value '</form>'.
03 filler           pic x(6) value '</div>'.
03 filler           pic x(14)
                    value '</body></html>'.

```

Receive Program (Continued)

linkage section.

procedure division.

** Sample of directly reading a variable*

```
exec cics web read  
    formfield('dept_name')  
    namelength(9)  
    value(ws-comm-dept)  
    valuelength(length of ws-comm-dept)  
    resp(ws-resp)  
end-exec  
exec cics web startbrowse  
    formfield  
    resp(ws-resp)  
end-exec
```

perform varying uvindex from 1 by 1 until
uvindex > 10 or (ws-resp not equal dfhresp(normal))

```
exec cics web readnext  
    formfield(ws-uv-name(uvindex))  
    namelength(length of ws-uv-name(uvindex))  
    value(ws-uv-value(uvindex))  
    valuelength(length of ws-uv-value(uvindex))  
    resp(ws-resp)  
end-exec
```

Receive Program (Continued)



```
if ws-uv-name(uvindex) = 'cstat_value'  
    string ws-uv-value(uvindex) delimited by ' '  
    into ws-comm-dept  
end-if  
if ws-uv-name(uvindex) = 'emp_name'  
    string ws-uv-value(uvindex) delimited by ' '  
    into ws-comm-emp  
end-if  
end-perform  
  
exec cics web endbrowse  
    formfield  
    nohandle  
end-exec  
  
exec cics link  
    program('BROWSLNK')  
    commarea(ws-browslnk-output)  
    resp(ws-resp)  
end-exec  
  
* set the return action from this program  
* to re-execute your first program  
    move '/CICS/AA11/P11SEND1' to ws-action
```

Receive Program (Continued)



exec cics

*document create
doctoken(ws-token)
docsize(ws-retrieve-length)
symbolist(ws-symbols)
listlength(length of ws-symbols)
delimiter(ws-delim)*

end-exec

** Find the Host name*

exec cics web read

*httpheader(ws-host-name)
namelength(4)
value(ws-host-val)
valuelength(length of ws-host)
resp(ws-resp)*

end-exec

exec cics document set

*doctoken(ws-token)
symbol(ws-host-name)
value(ws-host-val)
length(ws-host-len)
resp(ws-resp)*

end-exec

Receive Program (Continued)



```
exec cics extract tcpip
    ssltype(ssl-type)
end-exec
evaluate ssl-type
    when dfhvalue(nossl)
        move ws-http-protocol to content-type-val
        move length of ws-http-protocol to content-type-len
    when other
        move ws-https-protocol to content-type-val
        move length of ws-https-protocol to content-type-len
    end-evaluate
move 'protocol' to ws-symbol-name

exec cics document set
    doctoken(ws-token)
    symbol(ws-symbol-name)
    value(content-type-val)
    length(content-type-len)
    resp(ws-resp)
end-exec
exec cics
    document insert
    doctoken(ws-token)
    docsize(ws-retrieve-length)
    template('T13PHDR')
end-exec
```

Receive Program (Continued)

```
exec cics web write  
    httpheader (pragma-hdr)  
    namelength(length of pragma-hdr)  
    value(pragma-val)  
    valuelength(length of pragma-val)  
end-exec
```

** add the table header template TCWSPTAB to the document*

```
exec cics  
    document insert  
    doctoken(ws-token)  
    docsize(ws-retrieve-length)  
    template('T13PTAB')  
end-exec
```

** update symbols*

```
perform  
varying ws-sub from 1 by 1 until  
ws-sub > ws-comm-count
```

Receive Program (Continued)

** update the symbols from the vsam record(subscript)*

```
move pr-department(ws-sub) to ws-sym-dept  
move pr-employee-no(ws-sub) to ws-sym-emp  
move pr-name(ws-sub) to ws-sym-name  
move pr-addr1(ws-sub) to ws-sym-adr1  
move pr-addr2(ws-sub) to ws-sym-adr2  
move pr-addr3(ws-sub) to ws-sym-adr3
```

** set symbols*

```
exec cics document set  
doctoken(ws-token)  
sybollist(ws-symbols)  
length(length of ws-symbols)  
delimiter(ws-delim)  
end-exec
```

** Alternate color of rows*

Receive Program (Continued)

```
if ws-row-col1 = '#ffffff'
    move '#bce8ff' to ws-row-col1
    ws-row-col2
    ws-row-col3
    ws-row-col4
    ws-row-col5
    ws-row-col6
else
    move '#ffffff' to ws-row-col1
    ws-row-col2
    ws-row-col3
    ws-row-col4
    ws-row-col5
    ws-row-col6
end-if

exec cics
    document insert
    doctoken(ws-token)
    docsize(ws-retrieve-length)
    from(ws-t13prec)
    length(length of ws-t13prec)
end-exec

* end of loop
END-PERFORM
```


Receive Program (Continued)

```
* insert working storage template  
*      from(ws-t13ptail)
```

```
exec cics  
  document insert  
  doctoken(ws-token)  
  docsize(ws-retrieve-length)  
  from(ws-t13ptail)  
  length(length of ws-t13ptail)  
end-exec
```

```
* SEND THE MASTER DOCUMENT
```

```
exec cics  
  web send  
  doctoken(ws-token)  
  clntcodepage('819')  
end-exec
```

```
exec cics return end-exec.
```

Results of Web-Aware Receive Program

Circle education web page - Windows Internet Explorer

http://204.90.115.165:4000/CICS/CWBA/PO1RECV1

File Edit View Favorites Tools Help

Circle education web page

Circle Education

Results from generic search

Dept	Employee	Name	Address		
1	00001	CIRCLE EDUCATION LTD	QUEENSBURY HSE	BRIGHTON	SUSSEX
1	00002	TONY	WATERSFIELD	WEST SUSSEX	
1	00003	JAMIE TRACEY	WINCHESTER		
1	00004	DAVID CLANCY	CROUCH END		
1	00005	JERRY BURNETT	CHANDLERS FORD		
1	00006	STEVE MILLS	RUISLIP MANOR		

Back

Done Internet 100%

Web-Aware Object Program



PROGRAM - OBJECT

Object Program

IDENTIFICATION DIVISION.

PROGRAM-ID. **OBJECT**.

ENVIRONMENT DIVISION.

DATA DIVISION.

WORKING-STORAGE SECTION.

01 WS-protocol.

03 ws-symbol-name PIC X(32) VALUE spaces.

03 ws-http-protocol PIC X(7) VALUE 'http://'.

03 ws-https-protocol PIC X(8) VALUE 'https://'.

01 WS-host-val-fields.

03 ws-host-val pic x(50) value space.

03 ws-host-val-LENGTH PIC S9(8) COMP VALUE +50.

01 WS-build.

02 ws-file PIC X(8) value spaces.

02 ws-extension PIC X(5) value spaces.

02 ws-object-name PIC X(14) value spaces.

02 filler redefines ws-object-name.

03 toChar pic x occurs 14 times
indexed by toIndex.

02 ws-newstring pic x(100).

02 filler redefines ws-newstring.

03 fromChar pic x occurs 100 times
indexed by fromIndex, lastIndex, startIndex.

02 ws-object-name-len pic s9(4) comp value 0.

Object Program (Continued)

01 WS-HTTP-HEADER.

05 pragma-hdr PIC X(6) VALUE IS 'Pragma'.
05 pragma-val PIC X(7) VALUE IS 'nocache'.
05 content-type-hdr PIC X(12) VALUE IS 'Content-type'.
05 content-type-val PIC x(30) VALUE IS SPACES.
05 content-type-len PIC 9(8) comp value is 0.
77 content-pdf PIC x(15) VALUE IS 'application/pdf'.
77 content-gif PIC x(09) VALUE IS 'image/gif'.
77 content-mpg PIC x(10) VALUE IS 'video/mpeg'.
77 content-jpg PIC x(10) VALUE IS 'image/jpeg'.
77 content-css PIC x(08) VALUE IS 'text/css'.
77 content-js PIC x(24)
VALUE IS 'application/x-javascript'.
77 content-swf PIC x(29)
VALUE IS 'application/x-shockwave-flash'.
77 content-class PIC x(24)
VALUE IS 'application/octet-stream'.
77 content-zip PIC x(15)
VALUE IS 'multipart/x-zip'.

01 HTTP-EXTRACT.

03 HTTP-PATH PIC X(100).

Object Program (Continued)

01 CLIENT-INFO-EXTRACT.

```
    03 ssl-type          PIC s9(8) COMP.
    01 ws-template-name  pic x(48) value spaces.
    01 WS-RESP           PIC S9(8) BINARY.
    01 hdr-name          PIC x(100) value spaces.
    01 hdr-val           PIC x(800) value spaces.
    01 WS-TOKEN          PIC X(16).
    01 WS-RETRIEVE-LENGTH PIC S9(8) BINARY.
    77 counter           PIC S9(4) COMP.
    01 lower PIC X(27) VALUE 'abcdefghijklmnopqrstuvwxyz+'.
    01 filler REDEFINES lower.
        05 lowerc PIC X OCCURS 27 INDEXED BY lowerc-idx.
    01 upper PIC X(27) VALUE 'ABCDEFGHIJKLMNOPQRSTUVWXYZ '.
    01 filler REDEFINES upper.
        05 upperc PIC X OCCURS 27.
LINKAGE SECTION.
PROCEDURE DIVISION.
```

* find the path is

```
    EXEC CICS WEB EXTRACT
        PATH(HTTP-PATH)
        RESP(WO-RESP)
    END-EXEC
```

Object Program (Continued)

```
exec cics extract tcpip  
  ssltype(ssl-type)  
end-exec
```

```
evaluate ssl-type  
  when dfhvalue(nossl)  
    move ws-http-protocol to content-type-val  
    move length of ws-http-protocol to content-type-len  
  when other  
    move ws-https-protocol to content-type-val  
    move length of ws-https-protocol to content-type-len  
end-evaluate
```

```
move 'protocol' to ws-symbol-name  
exec cics document set  
  doctoken(ws-token)  
  symbol(ws-symbol-name)  
  value(content-type-val)  
  length(content-type-len)  
  resp(ws-resp)  
end-exec
```

Object Program (Continued)

- * convert path info to uppercase
 - perform with test after varying counter from 1 by +1
 - until counter = 27
 - inspect http-path replacing all
 - lowerc(counter) by upperc(counter)
 - end-perform

- * need to determine what token was entered
 - set toIndex to 1
 - set lastIndex to http-path-length
 - move http-path to ws-newstring

- * cobol stuff to work out how many bytes present in
 - * object name
 - perform varying fromIndex from lastIndex by -1 until
 - fromChar(fromIndex) equal "/"
 - or
 - fromIndex = 1
 - end-perform

Object Program (Continued)

```
set fromIndex up by 1
  perform varying startIndex from fromIndex by 1 until
    startIndex > lastIndex
  or
    toIndex > 14
  move fromChar(startIndex) to toChar(toIndex)
  set toIndex up by 1
  unstring ws-object-name
  delimited by '.' or ''
  into ws-file ws-extension
  move ws-file to ws-template-name
* add the symbols
EXEC CICS
  DOCUMENT CREATE
  DOCTOKEN(WS-TOKEN)
  DOCSIZE(WS-RETRIEVE-LENGTH)
  SYMBOLLIST(WS-SYMBOLS)
  LISTLENGTH(LENGTH OF WS-SYMBOLS)
  RESP(WS-RESP)
END-EXEC
```

Object Program (Continued)

```
* insert the template check the response
EXEC CICS
  DOCUMENT INSERT
  DOCTOKEN(WS-TOKEN)
  DOCSIZE(WS-RETRIEVE-LENGTH)
  TEMPLATE(WS-TEMPLATE-NAME)
  RESP(WS-RESP)
END-EXEC
EVALUATE WS-RESP
  WHEN DFHRESP(NORMAL)
    PERFORM GOODCODE
  WHEN OTHER
    PERFORM BADCODE
END-EVALUATE
EXEC CICS RETURN END-EXEC.
GOODCODE.
```

Object Program (Continued)

- * Check the object name

- * and set the appropriate content-type

```
if ws-extension(1:3) = 'SWF'  
  move content-swf to content-type-val  
  move length of content-swf  
    to content-type-len  
end-if  
if ws-extension(1:3) = 'CSS'  
  move content-css to content-type-val  
  move length of content-css  
    to content-type-len  
end-if  
if ws-extension(1:3) = 'GIF'  
  move content-gif to content-type-val  
  move length of content-gif  
    to content-type-len  
end-if
```

Object Program (Continued)

```
if ws-extension(1:3) = 'GIF'  
    move content-gif to content-type-val  
    move length of content-gif  
        to content-type-len  
end-if  
if ws-extension(1:3) = 'MPG'  
    move content-mpg to content-type-val  
    move length of content-mpg  
        to content-type-len  
end-if  
if ws-extension(1:3) = 'PDF'  
    move content-pdf to content-type-val  
    move length of content-pdf  
        to content-type-len  
end-if  
if ws-extension(1:2) = 'JS'  
    move content-js to content-type-val  
    move length of content-js  
        to content-type-len  
end-if  
* write the content type header
```

Object Program (Continued)

```
EXEC CICS WEB WRITE
    HTTPHEADER (CONTENT-TYPE-HDR)
    NAMELENGTH(LENGTH OF CONTENT-TYPE-HDR)
    VALUE(CONTENT-TYPE-VAL)
    VALUELENGTH(CONTENT-TYPE-LEN)
END-EXEC
* send the master document
  evaluate content-type-val
    when content-js   or
      content-css
    EXEC CICS
      WEB SEND
      CLNTCODEPAGE('819')
      DOCTOKEN(WS-TOKEN)
    END-EXEC
  when other
    EXEC CICS
      WEB SEND
      DOCTOKEN(WS-TOKEN)
    END-EXEC
end-evaluate.
```

Object Program (Continued)

BADCODE.

- * we must have got a notfnd from the previous**
- * create document - send an error html page**
- * set content-type header for text/html**
- * add logic to send error page**

URIMAP for Static Content (1 of 2)

```
Session A - [24 x 80]
File Edit View Communication Actions Window Help

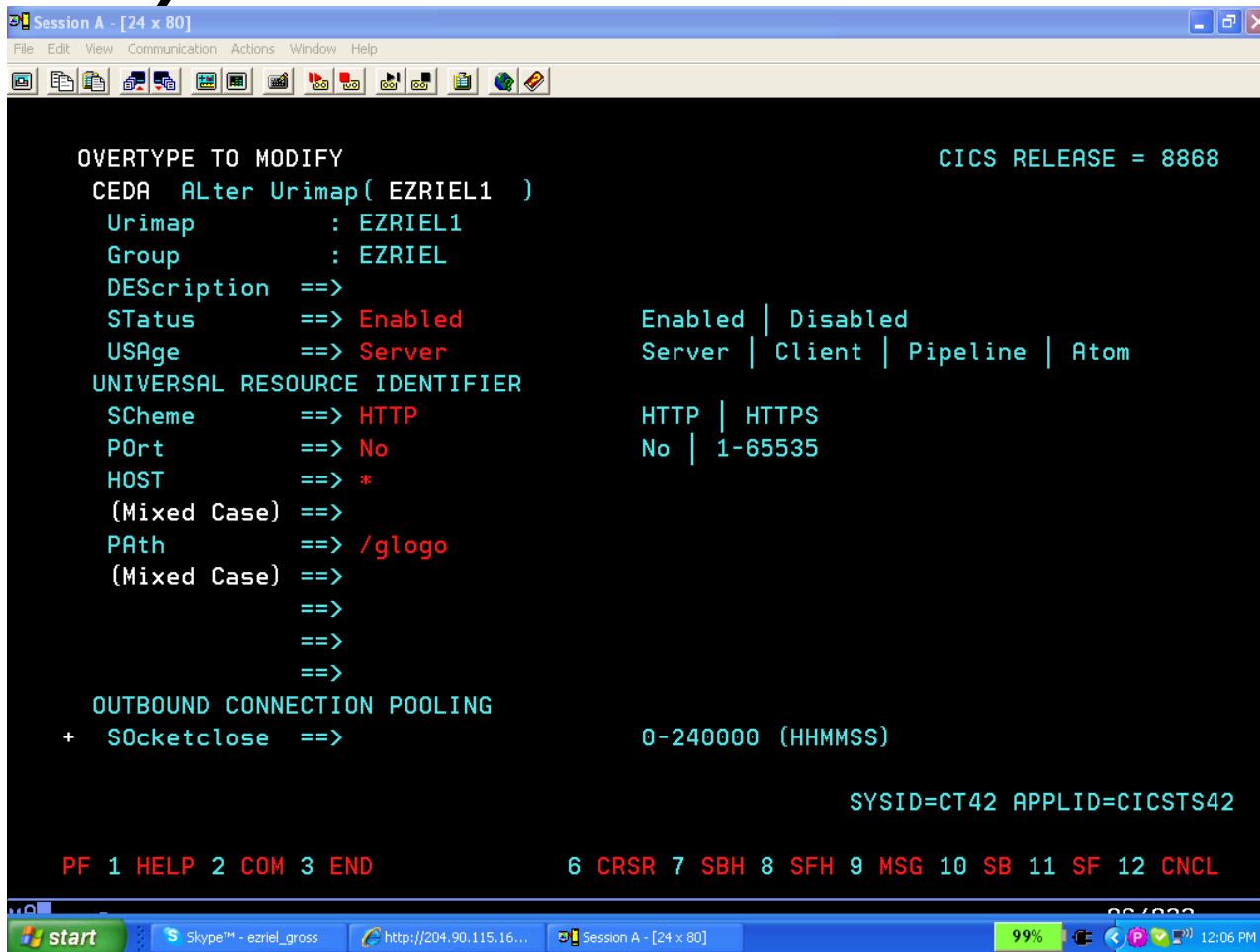
OVERTYPE TO MODIFY                                CICS RELEASE = 8868
CEDA DEFINE Urimap( EZRIEL1 )
+ ATOMSERVICE ==>
SECURITY ATTRIBUTES
  USERID ==>
  CIPHERS ==>
  CERTIFICATE ==>                                (Mixed Case)
  AUTHENTICATE ==>                                No | Basic
STATIC DOCUMENT PROPERTIES
  MEDIATYPE ==> image/gif
  (Lower Case)
  CHARACTERSET ==>                                (Mixed Case)
  HOSTCODEPAGE ==>
  TEMPLATEName ==> glogo
  (Mixed Case)
  HFSFILE :
  (Mixed Case) :
+ :
:

SYSID=CT42 APPLID=CICSTS42

PF 1 HELP 2 COM 3 END                                6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL

MAR a                                                04/022
Connected to remote server/host 204.90.115.165 using port 623
```

URIMAP for Static Content (2 of 2)

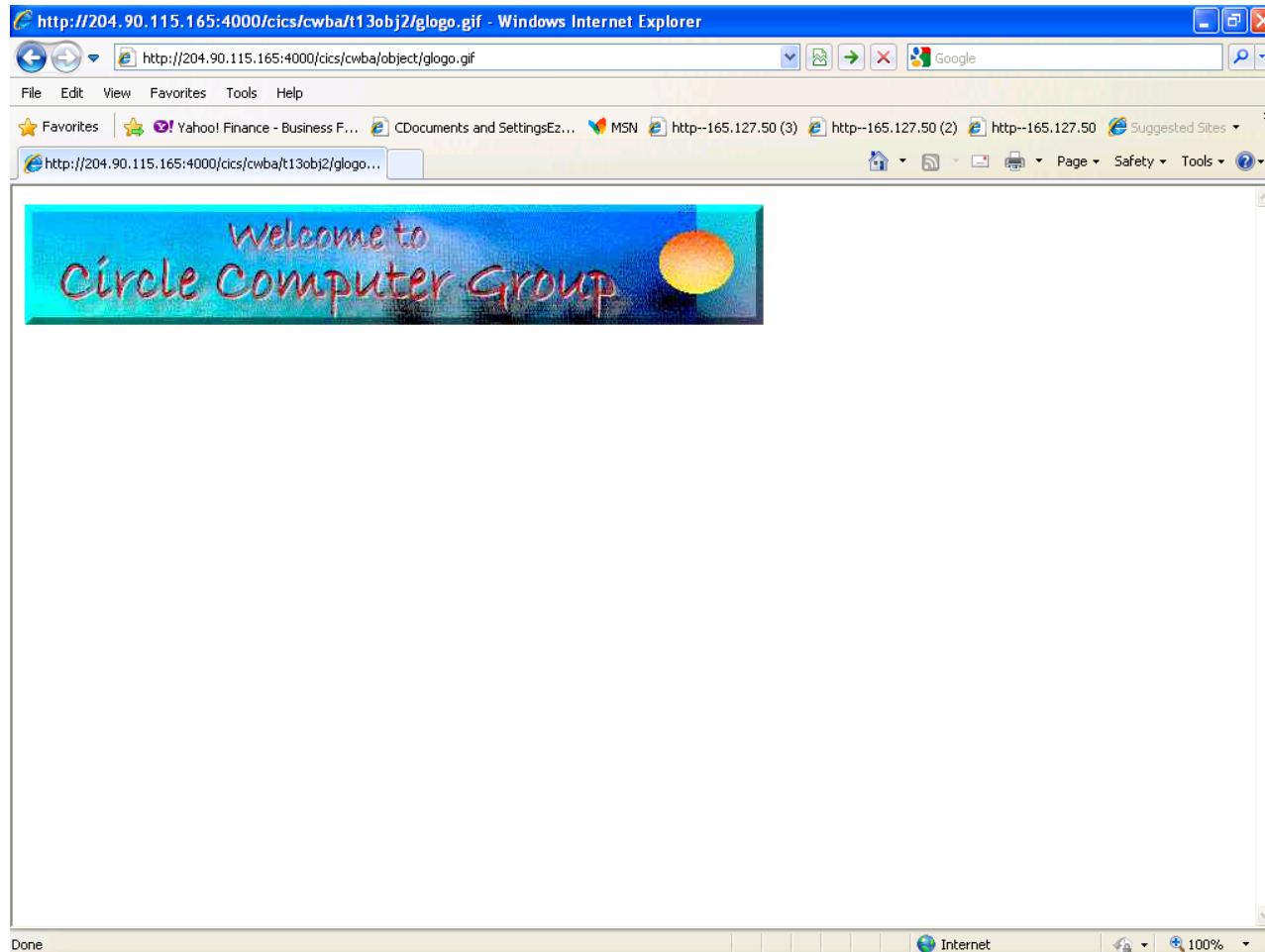


```
Session A - [24 x 80]
File Edit View Communication Actions Window Help

OVERTYPE TO MODIFY                                CICS RELEASE = 8868
CEDA ALTER Urimap( EZRIEL1 )
  Urimap      : EZRIEL1
  Group       : EZRIEL
  Description ==>
  Status      ==> Enabled      Enabled | Disabled
  Usage       ==> Server       Server | Client | Pipeline | Atom
  UNIVERSAL RESOURCE IDENTIFIER
  Scheme      ==> HTTP        HTTP | HTTPS
  Port        ==> No          No | 1-65535
  Host        ==> *
  (Mixed Case) ==>
  Path        ==> /glogo
  (Mixed Case) ==>
  ==>
  ==>
  ==>
  OUTBOUND CONNECTION POOLING
  + Sockclose ==>             0-240000 (HHMMSS)
                                           SYSID=CT42 APPLID=CICSTS42

PF 1 HELP 2 COM 3 END                6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL
```


Object Delivered by CICS Program or URIMAP



JavaScript for GUI Manipulation

CICS/TS CWS API sample - Windows Internet Explorer

http://204.90.115.165:4000/cics/cwba/paysend

File Edit View Favorites Tools Help

Favorites Yahoo! Finance - Business F... CDocuments and SettingsEz... MSN http--165.127.50 (3) http--165.127.50 (2) http--165.127.50 Suggested Sites

CICS/TS CWS API sample

Page Safety Tools

Circle Education

CICS/TS CWS API Sample

Please enter Department & Employee Number

Department

Employee

Departmental Browse ? ☐

W3C HTML 4.01

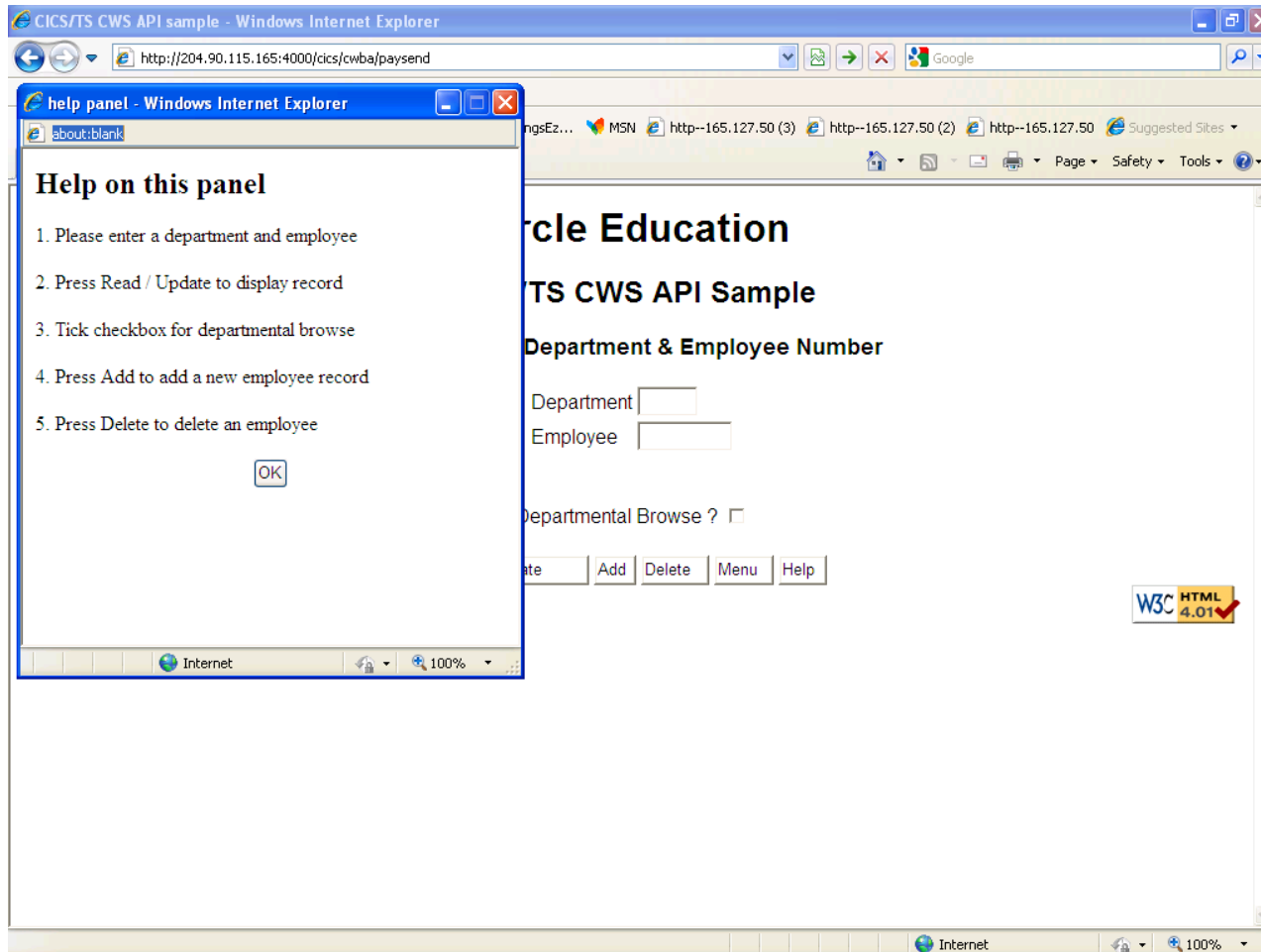
Done Internet 100%

JavaScript Help Function

```
// showHelp function
// displays pop-up help panel
function showHelp() {
  var theField = document.forms[0].DFH_CURSOR.value
  hWin = window.open("", "",
    "toolbar=0,width=400,height=400,resizable=0");
  hWin.document.write("<html><head><title>help panel</title></head>")
  hWin.document.write("<body><h2>Help on this panel</h2>")
  hWin.document.write("1. Please enter a department and employee<p>")
  hWin.document.write("2. Press Read / Update to display record<p>")
  hWin.document.write("3. Tick checkbox for departmental browse<p>")
  hWin.document.write("4. Press Add to add a new employee record<p>")
  hWin.document.write("5. Press Delete to delete an employee<p>")
  hWin.document.write("<p>")
  hWin.document.write("<form><DIV ALIGN='CENTER'>")
  hWin.document.write("<input type=button value='OK' onClick='window")
  hWin.document.write(".close();window.opener.document.forms[0].")
  hWin.document.write(theField)
  hWin.document.write(".focus()>")
  hWin.document.write("</DIV></form></body></html>")
}
```

```
<input type="button" value="Help" onClick="showHelp()"
title="press this button to get futher help">
```

POP UP Help Window



Client Side Validation

// checkfields function

// called when the user submits the form

// If either department or employee fails validation,

// without calling server, issues prompt box and gets user to

// enter data

function checkfields(theForm) {

var why = "";

why += check(document.forms[0].dept,"Department number missing or invalid.\n");

why += check(document.forms[0].emp,"Employee number missing or invalid.\n");

if (why != "") {

alert(why);

if (document.forms[0].emp.value == '?????'){

dfhsetcursor('emp');}

if (document.forms[0].dept.value == '?'){

dfhsetcursor('dept');}

return false;

}

return true;

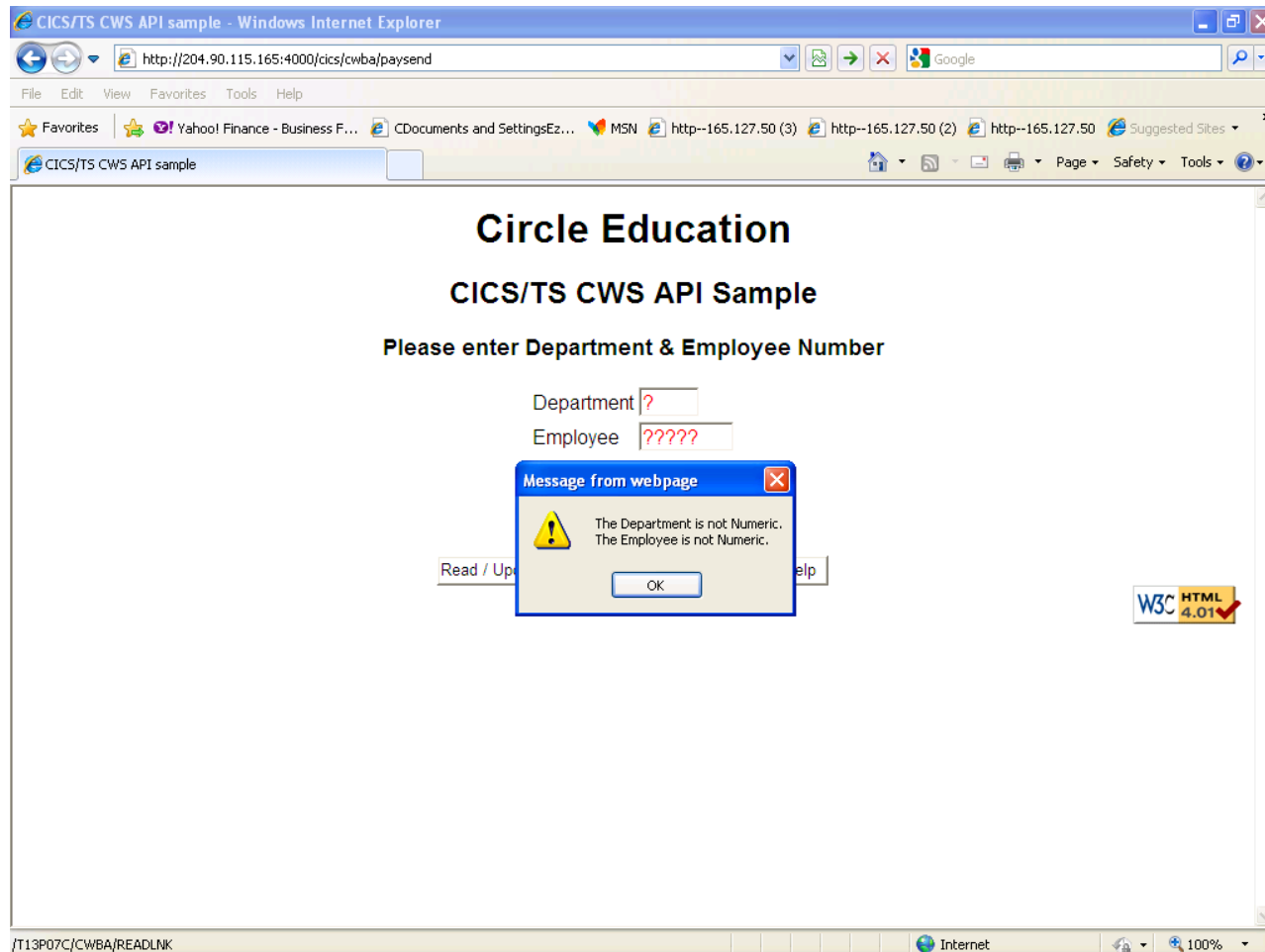
}

Client Side Validation Continued

```
function check (strng,strng1) {  
  var error = "";  
  if (strng.value == "") {  
    error = strng1;  
    document.forms[0].dept.value='?';  
    document.forms[0].dept.className ="badData";  
  }  
  for(var i=0;i<strng.value.length; i++){  
    var ch = strng.value.charAt(i);  
    if (ch < '0' || ch > '9') {  
      error = strng1;  
      document.forms[0].dept.value='?';  
      document.forms[0].dept.className ="badData";  
      break;}  
    }  
  return error;  
}
```

```
<form name="Form"  onSubmit="return checkfields(this)"  
  action="&action;"  
  method="post">
```

Fields Invalid



Cursor Positioning

```
// dfhsetcursor function
// HTML does not place the cursor anywhere useful
// so this function sets focus to the first input field
// when the form is loaded and records which field currently
// has focus in hidden variable DFH_CURSOR
```

```
function dfhsetcursor(n)
{for (var i=0;i<document.forms[0].elements.length;i++)
  {if (document.forms[0].elements[i].name == n)
    {document.forms[0].elements[i].focus();
     document.forms[0].DFH_CURSOR.value=n;
     break}}}
```

```
// dfhinqcursor function
// as the user tabs around input fields, this function
// is called when a field is in focus.
// Its purpose is to update contents of DFH_CURSOR
```

```
function dfhinqcursor(n){
  document.forms[0].DFH_CURSOR.value=n}
```

```
onLoad="dfhsetcursor('dept')"  
<input type="hidden" name="DFH_CURSOR"  
value="dept">  
<input type="text" name="emp" size="5"  
maxlength="5" value=""  
onFocus="dfhinqcursor('emp');this.select()" title="enter the employee number">
```


How To Contact?

Ezriel Gross' Email
General Email
Website

ezriel@circle-us.com
mail@circle-us.com
www.circle-us.com

The CICS Web Support
Programming Workshop