

**Teach  
Yourself**

**STARTER KIT**

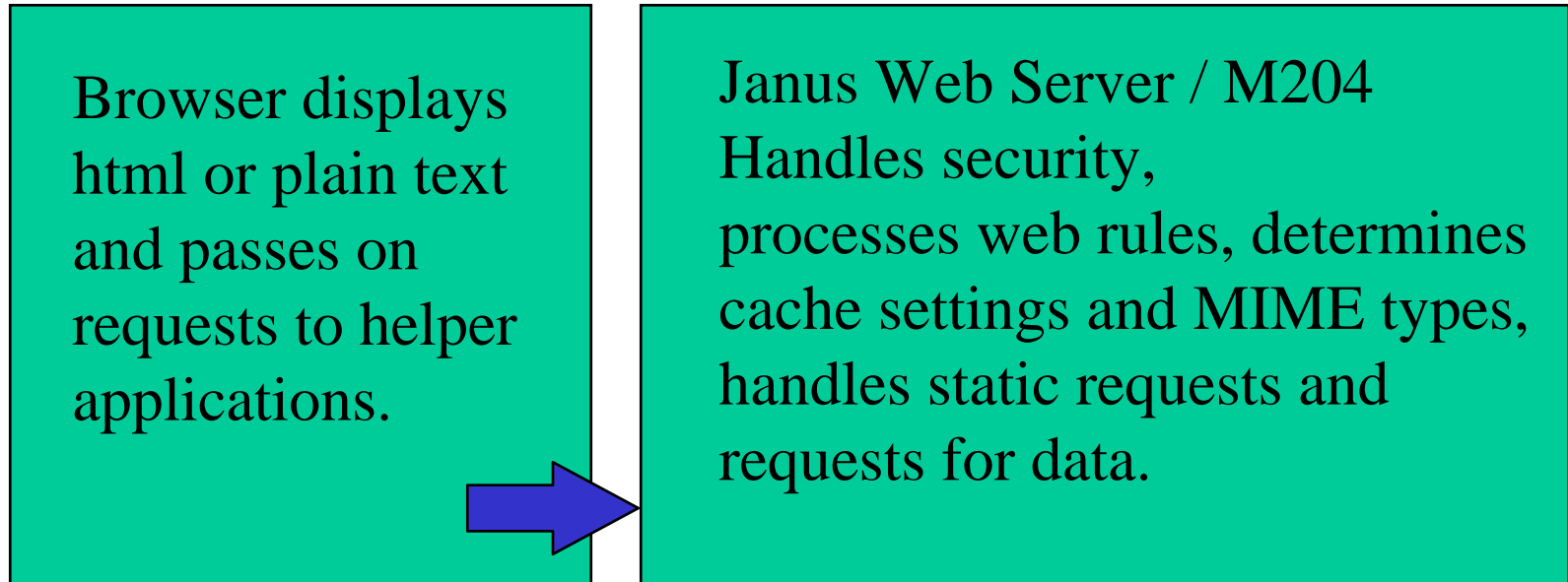
# Janus Web Server

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**in Hour 1**

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# Janus Web Server Architecture



# Port Definition

- Accomplished via JANUS DEFINE command

JANUS DEFINE JANWEB 446 WEBSERV 10 -

BINDADDR 196.242.204.47 -

SSL JANSSL SSL.PKEY -

WEBUSER WEBUSER WEBACCT WEBUSER -

MAXTEMP 100 COMPRESS 2

- Typically a DBA function
  - Can be dynamically defined

# Explanation

- JANWEB 446
  - Portname portnumber
- BINDADDR
  - IP address to which the port will be bound
- WEBUSER/WEBACCT
  - Userid and account for URLs not requiring logon

# Web Rules

Handle incoming requests based on patterns  
in the Universal Resource Locator (URL)



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# Web Rules

- Map directories and page names onto actions
  - JANUS WEB JANWEB -  
ON /CGI/\* OPEN CGI INCLUDE CGIDEMO
  - JANUS WEB JANWEB -  
ON /COMMAND/\* CMD \*

# Web Rule "Actions"

- JANUS WEB portname ALLOW
  - indicates that a particular user or set of users should have access to any URL that matches pattern *url*
- JANUS WEB portname ON
  - indicates the action to be taken when *url* is determined to be not redirected and allowed
- JANUS WEB portname TYPE
  - indicates the mime type of the output produced by *url*.

## Web rules (continued)

```
JANUS WEB JANWEB* TYPE ANY / TEXT/HTML
JANUS WEB JANWEB* TYPE ANY *.UL TEXT/HTML
JANUS WEB JANWEB* TYPE ANY *.JPG IMAGE/JPEG
JANUS WEB JANWEB* TYPE ANY *.WAV AUDIO/X-WAV
JANUS WEB JANWEB* TYPE ANY *.XLS -
APPLICATION/XLS

JANUS WEB JANWEB* -

ON /INV/* OPEN GROUP RWPROC CMD 'I *'

JANUS WEB JANWEB* ON /INW/* CMD INW

JANUS WEB JANWEB ALLOW *
```

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# Browser Operations

- Receives URL as input
  - Typed
  - Hyperlink
  - Imbedded image / audio / etc.
- Connects to machine in URL
- Requests file with URL
- Retrieves and processes returned file
  - Simplest form of returned file is HTML

# Browser Operations

(continued)

- Retrieves and processes returned file
  - "Modern" browsers can process "files" containing:
    - text
    - HTML
    - Style Sheets ( CSS )
    - XML
    - JavaScript Scripts
    - Java
    - launch helper apps (realplayer, acrobat, etc.)

## Make the connection

- Assume port is defined
- Need a rule to map our URL

`www.sirius-software.com/rwproc/inv.lookup.v1`

```
JANUS WEB JANWEB ON /RWPROC/* -  
OPEN GROUP RWPROC CMD 'INCLUDE *'
```

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# \$WEB\_ON

- Adds output data to client buffer
- Buffer sent when:
- \$WEB\_DONE (think READ SCREEN)

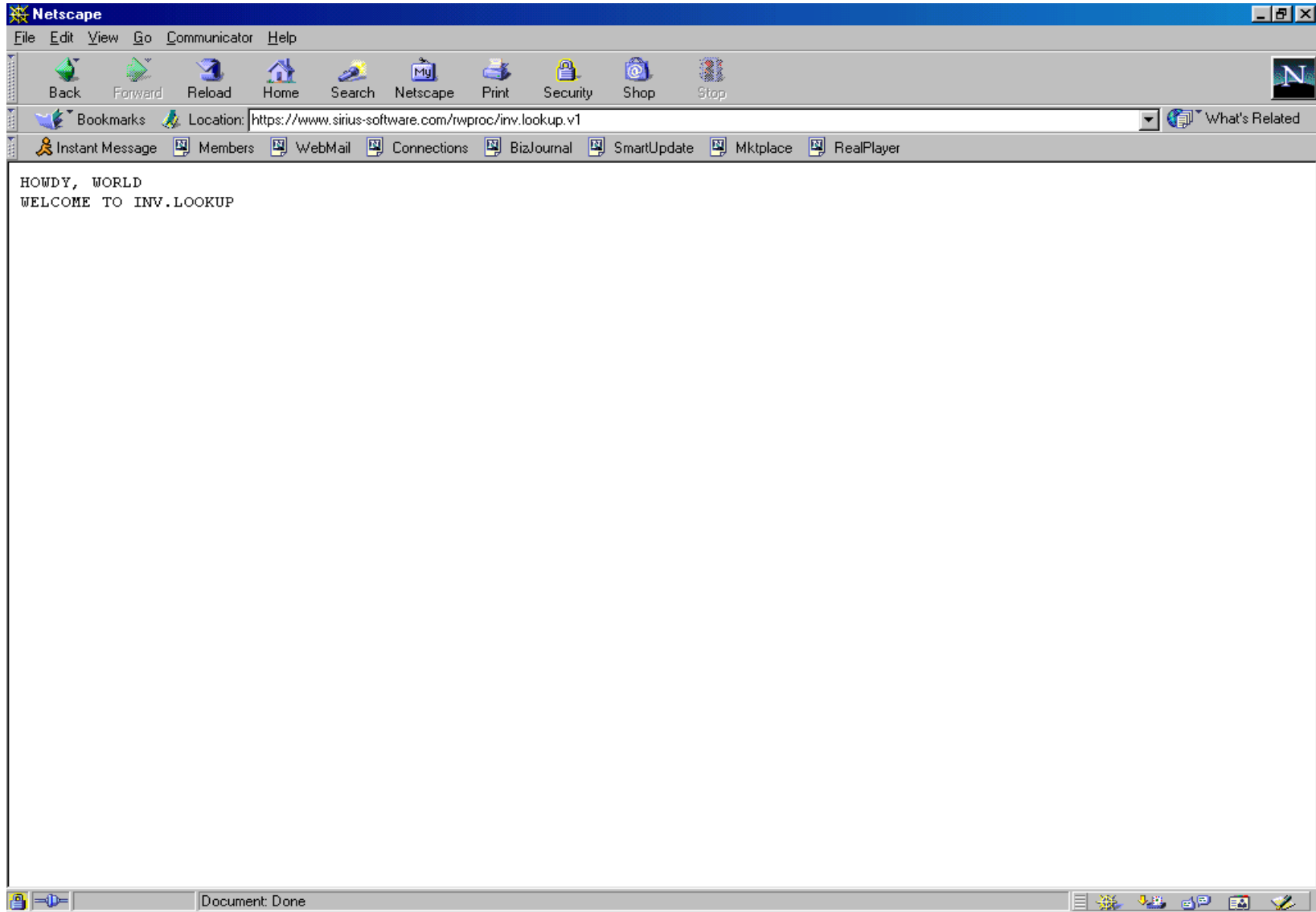
# Let's give it a try

- Create a proc in M204 file RWPROC

```
B
%RC = $WEB_ON
PRINT $SIRTIME
PRINT '<html>'
PRINT '<HEAD>'
PRINT '<TITLE>'
PRINT 'MY FIRST PAGE'
PRINT '</TITLE>'
PRINT '</HEAD>'
PRINT '<BODY>'
PRINT '<P>'
PRINT 'HOWDY, WORLD'
PRINT '<P>'
PRINT 'WELCOME TO INV.LOOKUP'
PRINT '</BODY>'
PRINT '</HTML>'
%RC = $WEB_DONE
END
```

- We'll name it INV.LOOKUP.V1

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# Mark-up languages

- Also called “tagged” because the readable text is interspersed with tags.
- **<b>HTML tags are enclosed in pointy brackets. The end tag <i>if there is one</i> uses a slash.</b>**

# HTML Structure

- Containers specify operations
  - Consists of '<' tagname '>'
  - Entire document bracketed with
    - <html> (tag)
    - </html> (closing tag)
- Header - <head> - </head>
  - Identifies document as HTML
  - Establishes title
  - Holds "meta" information
- Body - <body> - </body>
  - Page content
  - Links

# A Simple Page

```
<html>  
<head> <title> My First Page </title>  
</head>  
<body>  
<p>  
Howdy, World  
<p>  
</body>  
</html>
```

# How do we maintain mixed case?

- `RESET SIREDIT=x'13'`
  - Command Level
    - Preserves case in editor
    - ignores case at command
    - Provide case-insensitive search and replace in the editor
- `CASE MIXED / CASE UPPER / CASE LOWER`
  - Editor command

# Mime Types

- MIME
  - Multipurpose Internet Mail Extension
- As "things" arrive, MIME type identifies what type of information is arriving
- Responsibility of the Interface program (CGI, User Language) to identify content type

# \$WEB\_TYPE

- Sets the content type
  - %RC = \$WEB\_TYPE('TEXT/HTML')
- Other types:
  - 'image/gif'
  - 'binary/jpeg'
  - many, many others

# What's going on under the covers?

- SIRSCAN product allows online instant access to journal data
- Filters
  - User, IODEV (connection type)
  - Time span
  - Types of audit trail entries
- RK lines detail what happens from connection to disconnect
  - Which Rules were applied?

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## What about logging on?

- Unless specified, everyone connects as WEBUSER
- JANUS DISWEB JANWEB ALLOW shows
  - JANUS WEB JANWEB ALLOW \*
  - No USER clause
  - No DISALLOW rule applies to /RWPROC/
- JANUS WEB JANWEB ALLOW \* USER \*
  - Forces LOGON
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# Converting an existing 3270 app

LOOKUP ASSET TRACKING SYSTEM DATE: 06/07/2001  
INVENTORY BY LOCATION AND CLASS SCREEN 1 OF 5  
LOCATION...: 60 CLASS.....: 4112

INVENTORY NUMBER	INVENTORY DESCRIPTION	SERIAL NUMBER	PURCH DATE	PURCH VALUE
1008473	COMPUTER SYSTEM/IBM 300	23PYTK0	19991001	2,118.00
1007940	COMPUTER SYSTEM/IBM 300 PL	.....	19990623	2,118.00
1008475	COMPUTER SYSTEM/IBM 300	23PYTP0	19991001	2,118.00
1007941	COMPUTER SYSTEM/IBM 300 PL	.....	19990623	2,118.00
1008476	COMPUTER SYSTEM/IBM 300	23PYWD9	19991001	2,118.00
1008477	COMPUTER SYSTEM/IBM 300	23PYTP4	19991001	2,118.00
1004636	COMPUTER SYSTEM/IBM 300 GL/MU	23YAMW1	19971119	1,868.00
1004643	COMPUTER SYSTEM/IBM 300 GL/MU	23YAVA0	19971119	1,868.00
1004644	COMPUTER SYSTEM/IBM 300 GL/MU	23YBFW7	19971119	1,868.00
1004645	COMPUTER SYSTEM/IBM 300 GL/MU	23YBFZ7	19971119	1,868.00
1004646	COMPUTER SYSTEM/IBM 300 GL/MU	23YBGR4	19971119	1,868.00
1004637	COMPUTER SYSTEM/IBM 300 GL/MU	23YANV9	19971119	1,868.00

F3 - QUIT F7 -BACK  
F5 - NEW INQUIRY F8 -FORWARD

4B :00.9 03/17  
Connected to host 198.242.244.47 6:12 PM

# Steps to "Conversion"

- Set up web session
  - \$WEB\_ functions
- Change screen inputs to HTML form elements
  - More options than 3270
  - Radio buttons, drop downs, check boxes
- Replace assignments to 3270 screen variables with HTML expressions
  - Scrolling is a snap
- Design HTML document

# HTML Forms

- Allows User to input data
- <FORM options> - </FORM>
- Sample:

```
<form>
```

```
Enter Location:
```

```
<input="text" name="loc" size="2"  
  maxlength="2">
```

```
</form>
```

# Handling the incoming request from the form

- Web rules (204 command level) invoke the correct URL.
- User Language API interprets:
  - The call method
  - Header contents
  - Form contents

## HTML / TEXT Blocks

- Gets rid of PRINT statements and quote tedium
- Simple %variables and \$function calls imbedded in curly braces
  - { }
- Specifying TEXT / END TEXT allows entry of simple text
  - Could be sent via USE

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# A Little more form

BEGIN

%RC IS FLOAT

%RC = \$WEB\_ON

%RC = \$WEB\_TYPE( 'TEXT/HTML' )

%RC = \$WEB\_PROCSEND( 'RWPROC' , 'INV.HEAD' , 'MORE' )

HTML

<form>

Enter Location:<input type="text" name="loc" size="2"  
maxlength="2">

Enter Class :<input type="text" name="class" size="4"  
maxlength="4">

</form>

</html>

END HTML

END

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## Can I use an HTML generator?

- Yep
- HTML generated can be uploaded into M204 procedure
- MS Word text saved as HTML type

# Save generated HTML as 204 proc

```
PROCEDURE INV.HEAD
<HTML>
<HEAD>
<META HTTP-EQUIV="Content-Type" CONTENT="text/html
charset=windows-1252">
<META NAME="Generator" CONTENT="Microsoft Word 97">
<TITLE>Welcome to the inventory lookup page</TITLE>
<META NAME="Template" CONTENT="C:\PROGRAM FILES\MICROSOFT OFFICE\OFFICE\html.do-
t">
</HEAD>
<BODY LINK="#0000ff" VLINK="#800080">
<FONT FACE="Comic Sans MS" SIZE=6 COLOR="#0000ff"><P ALIGN="CENTER">Welcome to -
the inventory lookup page</P>
<P ALIGN="CENTER">PLEASE ENTER THE LOCATION CODE AND CLASS CODE TO VIEW YOUR IN-
VENTORY</P></FONT></BODY>

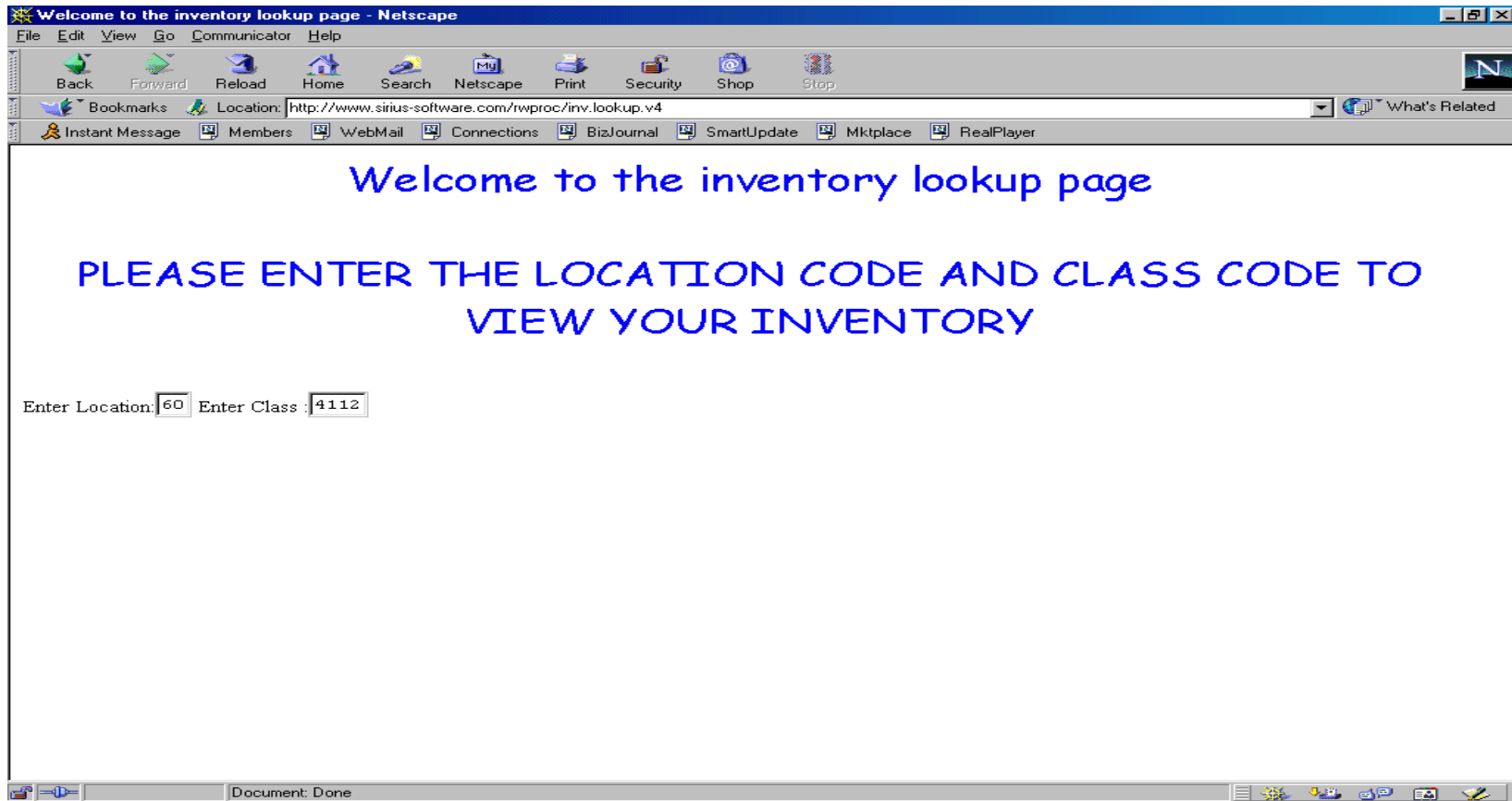
END PROCEDURE
```

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## \$WEB\_PROCSEND

- Adds the contents of a UL procedure to the client buffer
- Specify file, procname, and process indicator
- Process indicators of 'MORE' indicates more data going to browser after proc end

# Entering Input



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# Where does form data go?

- What happens when data is entered?
  - Form data can go to ISINDEX portion of URL
    - "GET" method
  - Or form sent to web server
    - "POST" method
- How do we make it "go"?
  - Add a SUBMIT button inside form definition

```
<input type="submit" value="Search">
```

# Improved Form

HTML

```
<form name="lookup" method="post"
action={$WEB_HDR_PARM('URL')}>
```

```
Enter Location:<input type="text" name="loc"
size="2" maxlength="2">
```

```
Enter Class :<input type="text" name="class"
size="4" maxlength="4">
```

```
<input type="submit" value="Search">
```

```
</form>
```

END HTML

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## Form data

- ACTION supplies URL of program that handles form input
- Note it is set to same program
  - By using \$WEB\_HDR\_PARM to get the existing URL

## How do we get the form data?

- Same program - we need to know if form was filled or not
- Use `$WEB_HDR_PARM` to get method
  - GET or POST

```
%METHOD = -  
    $UPCASE( $WEB_HDR_PARM( 'METHOD' ) )
```

## \$WEB\_PARM

- We created the form parameters loc and class with the NAME option on the INPUT tag of the form

```
INPUT TYPE="text" NAME="loc" SIZE="2" MAXLENGTH="2">
```

- We can retrieve that info with \$WEB\_PARM

```
%LOC = $WEB_PARM('loc')
```

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•

## User Language Functions handle header and form contents

### **\$WEB\_HDR\_PARM**

Retrieves value of a field in a request header

### **\$WEB\_FORM\_PARM**

Retrieves value of a field in a form

### **\$WEB\_ISINDEX\_PARM**

Retrieves value of a field in a URL

# Form & DB lookup - 1st pass

## 1st page

```
R MSGCTL 2
```

```
OPENC RWDATA
```

```
BEGIN
```

```
VARIABLES ARE UNDEFINED
```

```
%RC          IS FLOAT
```

```
%CLASS       IS STRING LEN  4
```

```
%LOC         IS STRING LEN  2
```

```
%METHOD      IS STRING LEN  4
```

```
%RC          = $WEB_ON
```

```
%RC          = $WEB_TYPE( 'TEXT/HTML' )
```

```
%RC          = $WEB_SUB( '@@' )
```

```
%RC          = $WEB_PROCSEND( 'RWPROC', 'INV.HEAD', 'MORE' )
```

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# Form & DB lookup - 1st pass

## 2nd page

```
<FORM NAME="lookup"  
method="post"  
action="{ $WEB_HDR_PARM( 'URL' ) }">
```

```
Enter Location:<INPUT TYPE="text" NAME="loc" SIZE="2"  
MAXLENGTH="2">
```

```
Enter Class :<INPUT TYPE="text" NAME="class" SIZE="4"  
MAXLENGTH="4">
```

```
<INPUT TYPE="SUBMIT" VALUE="Search">
```

```
</FORM>
```

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# Form & DB lookup - 1st pass

## 3rd page

```
%METHOD = $UPCASE($WEB_HDR_PARM('METHOD'))
```

```
IF %METHOD = 'POST' THEN
```

```
  %LOC    = $WEB_PARM('loc')
```

```
  %CLASS  = $WEB_PARM('class')
```

```
  FIND.MST: IN RWDATA FDWOL
```

```
            LOC    = %LOC
```

```
            CLASS  = %CLASS
```

```
  END FIND
```

```
  CT.MST:  COUNT RECORDS IN FIND.MST
```

```
  IF COUNT IN CT.MST = 0 THEN
```

```
    PRINT 'NO RECORDS FOUND'
```

```
  ELSE
```

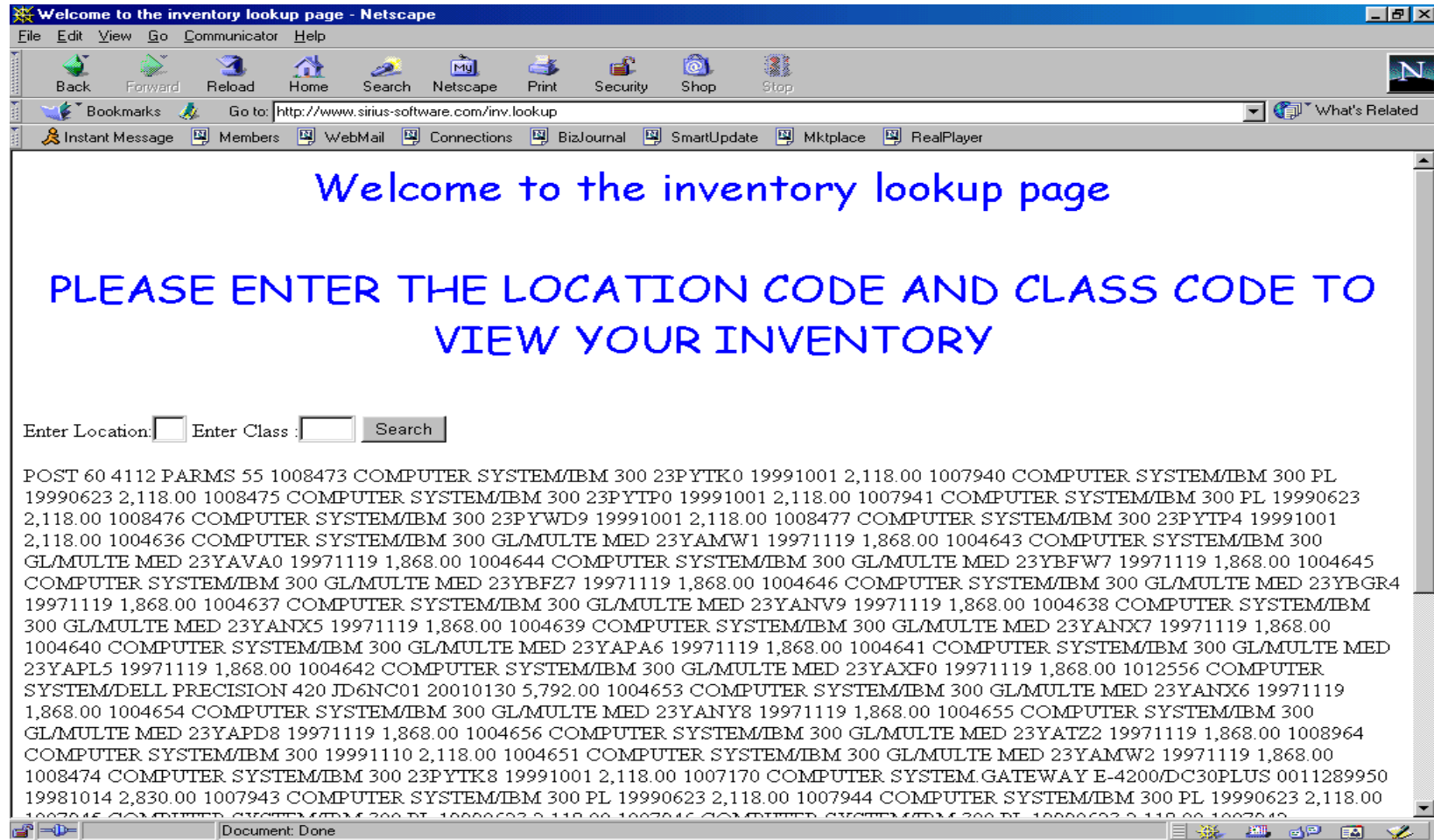
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# Form & DB lookup - 1st pass 4th page

```
FOR EACH RECORD IN FIND.MST
  PRINT INVNR AND DESC AND SERIAL AND PURCHDATE -
    AND $EDIT(COST, '-ZZ,ZZ9.99')
END FOR
END IF
HTML DATA </html>
END
```

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# Ta-da!



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# Complex formatting tags: tables

- `<table>` Begins a table
  - `<tr>` begins a row
    - `<td>` begins a column inside a row
    - `</td>` ends the column
    - `<th>` begins a header cell inside a row
    - `</th>` ends the header cell
  - `</tr>` ends a row
- `</table>` closes the table

# Make each column a cell

```
HTML DATA <table cellspacing=2 cellpadding=1 border=1>
FOR EACH RECORD IN FIND.MST
  HTML
    <tr>
      <td>{INVNBR }</td>
      <td> {DESC}</td>
      <td> {SERIAL}</td>
      <td> {PURCHDATE}</td>
      <td> {$EDIT(COST, '-ZZ,ZZ9.99')}</td>
    </tr>
  END HTML
END FOR

HTML DATA </table>
```

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Welcome to the inventory lookup page - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Location: http://www.sirius-software.com/rwproc/inv.lookup.v6a

Instant Message Members WebMail Connections BizJournal SmartUpdate Mktplace RealPlayer

## Welcome to the inventory lookup page

PLEASE ENTER THE LOCATION CODE AND CLASS CODE TO VIEW YOUR INVENTORY

Enter Location:  Enter Class:  Search

1008473	COMPUTER SYSTEM/IBM 300	23PYTK0...	19991001	1008473	2,118.00
1007940	COMPUTER SYSTEM/IBM 300 PL	.....	19990623	1007940	2,118.00
1008475	COMPUTER SYSTEM/IBM 300	23PYTP0...	19991001	1008475	2,118.00
1007941	COMPUTER SYSTEM/IBM 300 PL	.....	19990623	1007941	2,118.00
1008476	COMPUTER SYSTEM/IBM 300	23PYWD9...	19991001	1008476	2,118.00
1008477	COMPUTER SYSTEM/IBM 300	23PYTP4...	19991001	1008477	2,118.00
1004636	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YAMW1...	19971119	1004636	1,868.00
1004643	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YAVA0...	19971119	1004643	1,868.00
1004644	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YBFW7...	19971119	1004644	1,868.00
1004645	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YBFZ7...	19971119	1004645	1,868.00
1004646	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YBGR4...	19971119	1004646	1,868.00
1004637	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YANV9...	19971119	1004637	1,868.00
1004638	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YANX5...	19971119	1004638	1,868.00
1004639	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YANX7...	19971119	1004639	1,868.00

Reload the current page

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# Links

- Allows user to branch to other URL
- Allows specification of location of graphics, other forms, etc.
- Sample Link to other HTML

`<a href =`

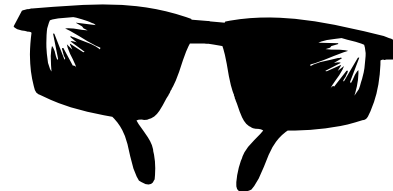
`"file:///C:/msoffice/winword/doc1.htm">`

`Linking Back to 1st page </a>`

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## Wouldn't it be cool if...

- We had a simple program to show detail of a selected record
- and
- The inventory number of our inv.lookup page was a hyperlink!



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# Piece of cake

Change the HTML statement for the inventory number

```
<td><a href="/RWPROC/INV.DISPLAY?I={INVNBR}">
  {INVNBR} </a>
</td>
```

- Note the ?I= after the path
- Will be used to pass an ISINDEX parm to INV.DISPLAY procedure

Welcome to the inventory lookup page - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Location: <http://www.sirius-software.com/rwproc/inv.lookup.v7>

Instant Message Members WebMail Connections BizJournal SmartUpdate Mktplace RealPlayer

## Welcome to the inventory lookup page

### PLEASE ENTER THE LOCATION CODE AND CLASS CODE TO VIEW YOUR INVENTORY

Enter Location:  Enter Class:  Search

<a href="#">1008473</a>	COMPUTER SYSTEM/IBM 300	23PYTK0...	19991001	1008473	2,118.00
<a href="#">1007940</a>	COMPUTER SYSTEM/IBM 300 PL	.....	19990623	1007940	2,118.00
<a href="#">1008475</a>	COMPUTER SYSTEM/IBM 300	23PYTP0...	19991001	1008475	2,118.00
<a href="#">1007941</a>	COMPUTER SYSTEM/IBM 300 PL	.....	19990623	1007941	2,118.00
<a href="#">1008476</a>	COMPUTER SYSTEM/IBM 300	23PYWD9...	19991001	1008476	2,118.00
<a href="#">1008477</a>	COMPUTER SYSTEM/IBM 300	23PYTP4...	19991001	1008477	2,118.00
<a href="#">1004636</a>	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YAMW1...	19971119	1004636	1,868.00
<a href="#">1004643</a>	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YAVA0...	19971119	1004643	1,868.00
<a href="#">1004644</a>	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YBFW7...	19971119	1004644	1,868.00
<a href="#">1004645</a>	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YBFZ7...	19971119	1004645	1,868.00
<a href="#">1004646</a>	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YBGR4...	19971119	1004646	1,868.00
<a href="#">1004637</a>	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YANV9...	19971119	1004637	1,868.00
<a href="#">1004638</a>	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YANX5...	19971119	1004638	1,868.00
<a href="#">1004639</a>	COMPUTER SYSTEM/IBM 300 GL/MULTE MED	23YANX7...	19971119	1004639	1,868.00

Document: Done

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# INV.DISPLAY - Pg 1

```
R MSGCTL 2  
OPENC RWDATA
```

```
BEGIN
```

```
VARIABLES ARE UNDEFINED
```

```
%RC          IS FLOAT  
%INVNBR      IS STRING LEN 7  
%METHOD      IS STRING LEN 4
```

```
%RC          = $WEB_ON  
%RC          = $WEB_TYPE( 'TEXT/HTML' )  
%RC          = $WEB_SUB( '@@' )  
%INVNBR      = $WEB_PARM( ,1)
```

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`%INVNBR = $WEB_PARM(,1)`

Note the use of relative position rather than name in `$WEB_PARM`

`$WEB_PARM` searches ISINDEX fields first

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# INV.DISPLAY - Pg 2

```
FIND.MST:  IN RWDATA FDWOL
           INVNBR = %INVNBR
END FIND
```

```
FOR EACH RECORD IN FIND.MST
  HTML
    <CENTER><B>
    {DESC}
    <BR>
    {INVNBR}
    </B>
    <HR></CENTER>
    <STRONG>
    SERIAL NUMBER:{SERIAL}
    <BR><BR>
```

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# INV.DISPLAY - Pg. 3

PURCHASE DATE: {\$DATECNV('YYYYMMDD','MM/DD/YYYY',PURCHDATE)}

<BR><BR>

PURCHASE AMT: {\$EDIT(COST, '-ZZ,ZZ9.99')}

<BR><BR>

CURRENT LOCATION: {LOC}

<BR><BR>

CURRENT CLASS: {CLASS}

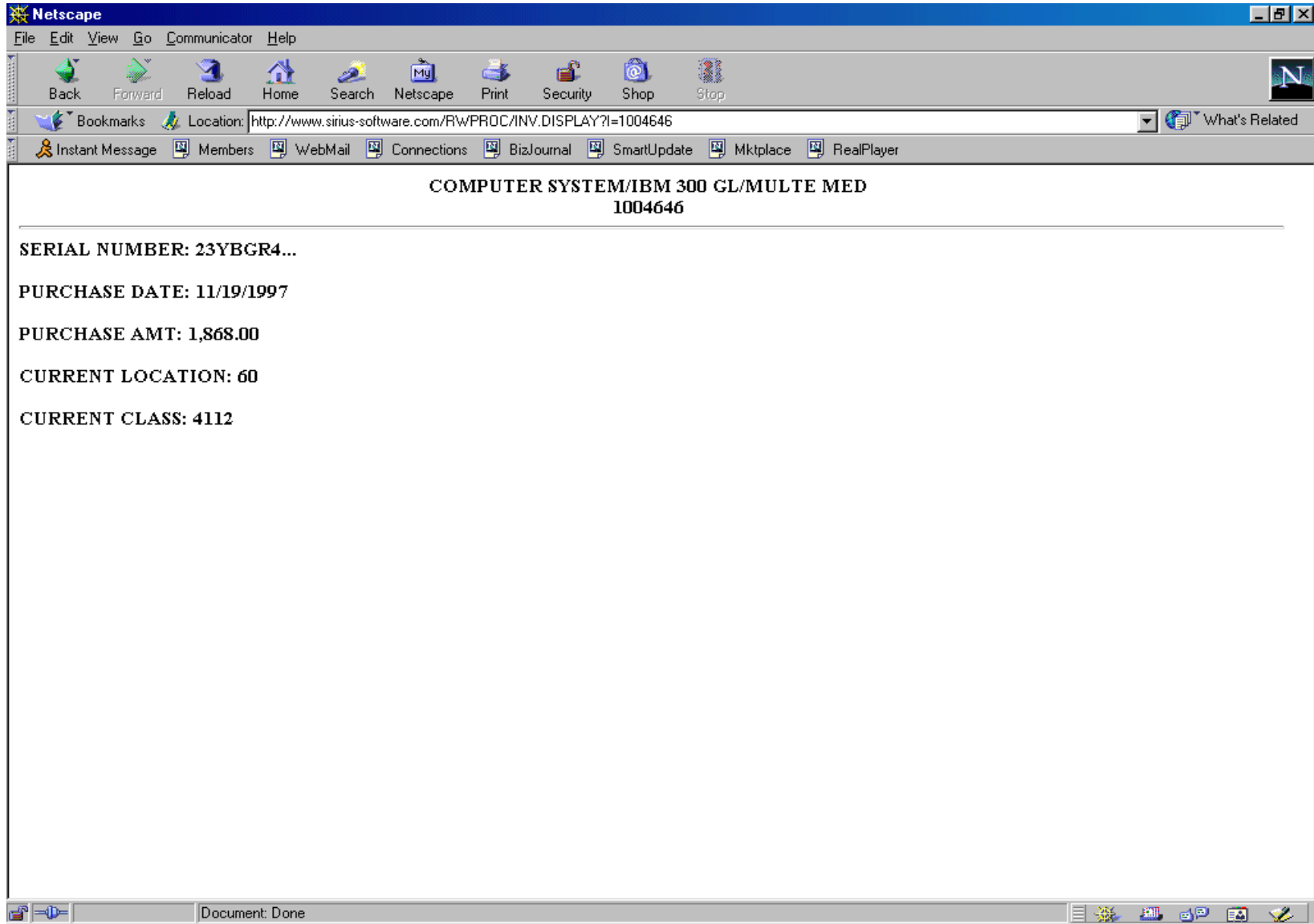
<BR><BR></STRONG>

END HTML

END FOR

END

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# Insertion of Graphics

- `<IMG SRC>` tag specifies in-line image
- `<IMG SRC = "taylor.gif">`
- Many tags allow customizations, and for images you almost **<b>always</b>** want to suppress the **<b>ugly</b>** border:
- `<img src=jobob.jpg border=0>`

# Let's insert a graphic

- Stored in 204 proc SIRHEAD2.GIF
- Note this rule:

```
JANUS WEB JANWEB ON /BINW/* OPEN FILE BINW SEND *
```

```
%RC      = $WEB_PROCSSEND('RWPROC','INV.HEAD','MORE')
```

```
* added code for image
```

```
HTML
```

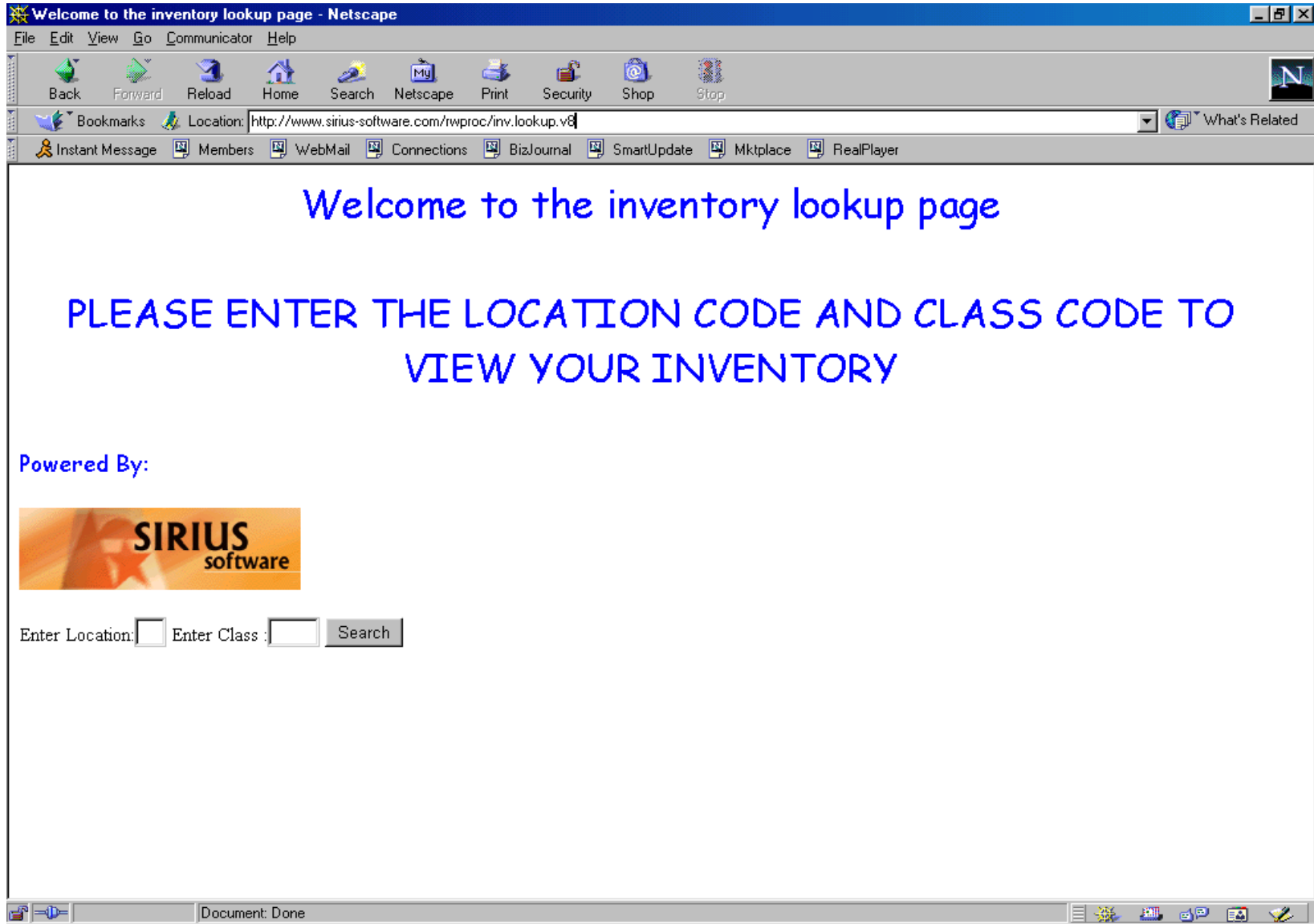
```
<FONT FACE="Comic Sans MS" SIZE=4 COLOR="#0000ff">
```

```
<P ALIGN="LEFT">Powered By:</P></FONT>
```

```
<IMG SRC="/bin/sirhead2.GIF" BORDER=0>
```

```
END HTML
```

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# What About APSY?

## One method

- Login procedure parses URL to determine program name

```
BEGIN
```

```
%URL IS STRING LEN 255
```

```
%URL = $WEB_HDR_PARM('URL')
```

```
%URL.PROGRAM = $UPCASE($WORD(%URL, '/', 2))
```

```
%X = $SETG('NEXT', %URL.PROGRAM)
```

```
END
```

- Use normal global variable to branch to Target procedure

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# Target Procedure

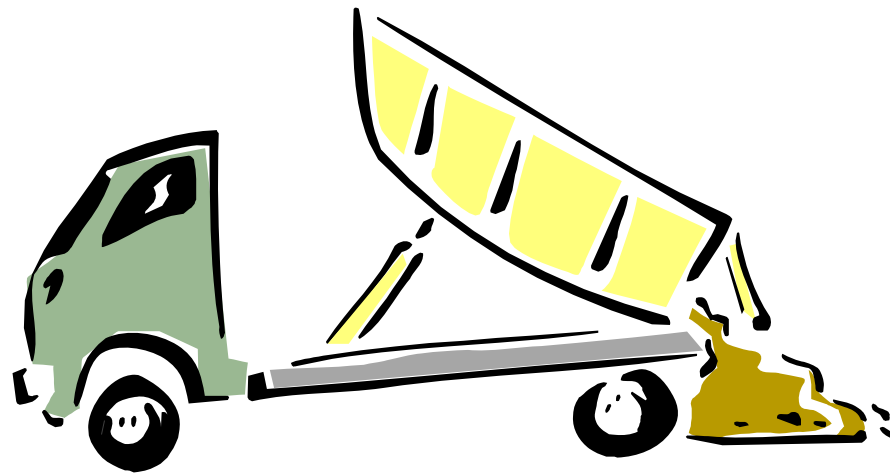
- Sets global to "exit" value regardless of action chosen on page
  - Xfer to next proc (page) page not accomplished by setting APSY communication variable to next UL procedure

## So where might XML fit in?

- Alternate approach is for client (browser) to simply request XML document
  - As opposed to mixing M204 data in with HTML and shipping whole package down the pipe
- User Language request simply creates XML document
- Client parses XML for presentation

# Whew? Did we cover it all?

- No way!
  - Style Sheets
  - Javascript
  - Drop-down lists
  - Java Applets ...



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