

Janus Debugger, the Sequel

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Agenda

- Demo
- UI Review
- Update, since last SUG
- Daemons
- Persistent Sessions
- Multiple web server support
- Web Services
- Research



Live Demo

- Debug a multi-level daemonic application.
- Debug a persistent session application.
- Debug a web service.
- 3270 Debugging.



Order Some Widgets - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://sirius-software.com:3224/widget.html

Getting Started Latest Headlines

Order Some Widgets

How Many:

The Janus Debugger

File Help

Audit Trail Source Code Web Buffer Execution Trace Proc Selection

```

UL> 17 1 16      <head><title>Order Report</title></head>
UL> 18 1 17      <body bgcolor="white">
UL> 19 1 18      <strong>Order Report</strong><hr>
UL> 20 1 19      end html
UL> 21 1 20
UL> 22 1 21      * get the count
UL> 23 1 22      %count = $unblank($web_form_parm('count'))
UL> 24 1 23
UL> 25 1 24      if (not %count) then
UL> 26 1 25          print 'You did not order anything'
UL> 27 1 26      else
UL> 28 1 27
UL> 29 1 28      %total = %count * %price
UL> 30 1 29
UL> 31 1 30      call computeTax
UL> 32 1 31      %total = %total + %tax
UL> 33 1 32
UL> 34 1 33      call computeShipping
UL> 35 1 34      %total = %total + %shipping
UL> 36 1 35

```

Executed one statement.

Variable or Field

Value	Trace Changes	Run To Change	Add Watch
%total			

Most Recent Audit Trail

```

M204.1168: IN FILE GWDEB INCLUDE STEPTRACE
MSIR.0359: WEB status 200 OK
MSIR.0359: WEB status 304 Not Modified
INCLUDE WIDGET.UL
M204.1168: IN FILE GWDEB INCLUDE WIDGET.UL
MSIR.0359: WEB status 200 OK
INCLUDE WIDGET.UL
M204.1168: IN FILE GWDEB INCLUDE WIDGET.UL

```

Watch Window

```

%COUNT=3
%TOTAL=0

```



UI Review

- Tabbed UI
 - Audit
 - Source
 - Web Buffer
 - Execution Trace
 - Procedure Selection
 - Dynamic Daemon tabs
- Use of right mouse click on code lines and watch window.



Janus Debugger Update

- January 2006, beta/trial version based on the 6.8 Sirius Mods released.
- 4 trials currently in progress.
- Refreshes of the GUI in February-May have added functionality (and fixed bugs).
- End of May: refresh of 6.8 Mods added many new features.



Features added since SUG 2005

- Daemonic debugging, with separate source tab for the daemonic code.
- SSL Support in GUI (debug web connections to SSL ports).
- Multiple Web Server Support, in one or more onlines.
- UI Improvements: color, hotkeys.



Just Released: 6.8 Refresh

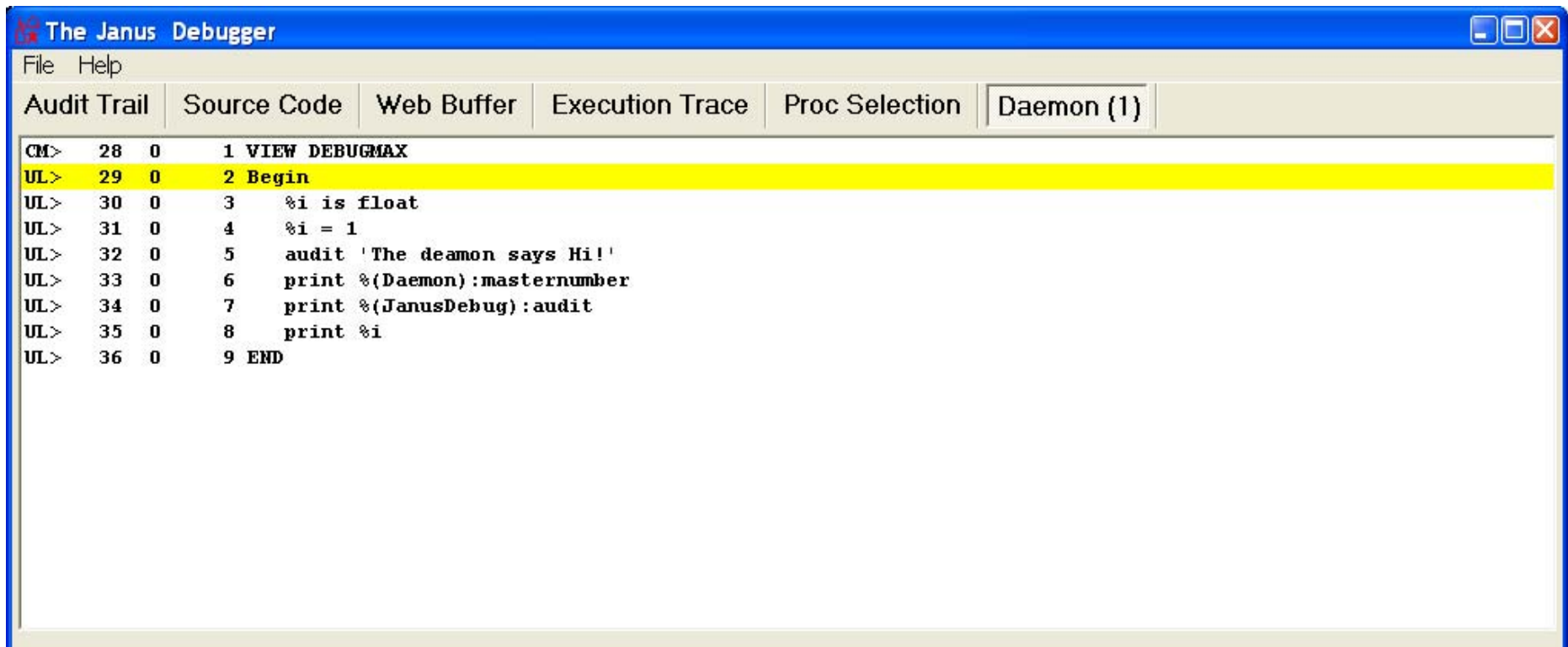
- Debug Persistent Session applications that use \$WEB_FORM_DONE.
- Multi-level daemon debugging (up to 5 levels).
- Screen item viewing.
- New product! The Sirius Debugger...



Daemons

- Daemon code now shown in its own source code tab.
- The spawning code is still visible, in the original source tab, with the line that spawned the daemon highlighted.





The Janus Debugger

File Help

Audit Trail Source Code Web Buffer Execution Trace Proc Selection Daemon (1)

```
CM> 28 0 1 VIEW DEBUGMAX
UL> 29 0 2 Begin
UL> 30 0 3 %i is float
UL> 31 0 4 %i = 1
UL> 32 0 5 audit 'The deamon says Hi!'
UL> 33 0 6 print %(Daemon):masternumber
UL> 34 0 7 print %(JanusDebug):audit
UL> 35 0 8 print %i
UL> 36 0 9 END
```

The daemon source code now appears in its own tab.
To see the context, click the “Source Code” tab...





The Janus Debugger window displays the following source code:

```
UL> 6 1 5
UL> 7 1 6 text to %workForDaemon
UL> 8 1 7 VIEW DEBUGMAX
UL> 9 1 8 Begin
UL> 10 1 9 %i is float
UL> 11 1 10 %i = 1
UL> 12 1 11 audit 'The deamon says Hi!'
UL> 13 1 12 print %(Daemon):masternumber
UL> 14 1 13 print %(JanusDebug):audit
UL> 15 1 14 print %i
UL> 16 1 15 END
UL> 17 1 16 end text
UL> 18 1 17
UL> 19 1 18 %daemon:open($view('CURFILE'),DEFAULT=TRUE)
UL> 20 1 19 %daemon:run('*LOWER'):print
UL> 21 1 20 %daemon:run('VIEW CURFILE'):print
UL> 22 1 21 %daemon:run(%workForDaemon):print
UL> 23 1 22
UL> 24 1 23 print 'this is the end...'
UL> 25 1 24 end
```

You can see the line of code that invoked Daemon 1.



Multi-level Daemons

- Up to five levels of nested daemons and/or synchronous \$COMMBG requests may be debugged, each in its own tab....



The Janus Debugger

File Help

Execution Trace Proc Selection Daemon (1) Daemon (2) Daemon (3) Daemon (4) Daemon (5)

```

CM> 142 0 1 VIEW DEBUGMAX
CM> 143 0 2 INCLUDE D5
UL> 144 1 1 b
UL> 145 1 2 print '5'
UL> 146 1 3 %i is float
UL> 147 1 4 %i = 5
UL> 148 1 5 %daemon is object daemon auto new
UL> 149 1 6 %workForDaemon is object stringList auto new
UL> 150 1 7
UL> 151 1 8 text to %workForDaemon
UL> 152 1 9 VIEW DEBUGMAX
UL> 153 1 10 VIEW DEBUGMAX
UL> 154 1 11 INCLUDE P.SHEMP
UL> 155 1 12 end text
UL> 156 1 13
UL> 157 1 14 %daemon:open($view('CURFILE'),DEFAULT=TRUE)
UL> 158 1 15 %daemon:run('*LOWER'):print
UL> 159 1 16 %daemon:run('VIEW CURFILE'):print
UL> 160 1 17 * This exceeds the level

```

Top Bottom Clear Audit Run Step Next Step Over Trace Cancel Clear Breaks Clear Watch Executed one statement.

Search Search Next

Variable or Field %i Value Trace Changes Run To Change Add Watch

Most Recent Audit Trail

```

*LOWER
VIEW CURFILE
VIEW DEBUGMAX
INCLUDE D5
M204.1168: IN FILE GWDEB INCLUDE D5
M204.1168: IN FILE GWDEB INCLUDE DINC.UL

```

Watch Window

```

%i=5


```




Persistent Sessions

- \$WEB_FORM_DONE is now supported.
- Suspend and resume of persistent session indicated in status area.



 Mozilla Firefox
 File Edit View Go Bookmarks Tools Help
 http://sirius-software.com:3224/cgi-bin/wfd

The number is: 666
 The value is:

 The Janus Debugger

File Help
 Audit Trail Source Code Web Buffer Execution Trace Proc Selection

```

UL> 11 1 10 %v = $WEB_FORM_PARM('name')
UL> 12 1 11 if ( %v eq 'quit') then
UL> 13 1 12 loop end
UL> 14 1 13 end if
UL> 15 1 14 html
UL> 16 1 15 <html>
UL> 17 1 16 <body>
UL> 18 1 17 The number is: {%xx}<br>
UL> 19 1 18 The value is: {%v}<br>
UL> 20 1 19 <form method="POST" action="{ $WEB_FORM_ACTION}">
UL> 21 1 20 <input type="text" name="name" value="{%v}">
UL> 22 1 21 <input type="Submit">
UL> 23 1 22 </form>
UL> 24 1 23 </body>
UL> 25 1 24 </html>
UL> 26 1 25 end html
UL> 27 1 26
UL> 28 1 27 * Send the form and wait for the POST
UL> 29 1 28 %rc is float
UL> 30 1 29 %rc = $web_form_done(-1, 60)
  
```

Top Bottom Clear Audit Run Step Next Step Over Trace End Norun Clear Breaks Clear Watch

Persistent session suspended.

Search Search Next Variable or Field Value Trace Changes Run To Change Add Watch

Most Recent Audit Trail

```

INCLUDE WFD
M204.1168: IN FILE GWDEB INCLUDE WFD
MSIR.0359: WEB status 200 OK
  
```

Watch Window



Multiple Web Servers

- You can now give the debugger a list of web servers that you wish to debug, which may or may not be in the same online. Each such web server is identified by a host/port pair.
- Each incoming request is scanned against the list of host/port pairs.
- Specified in `debuggerConfig.xml`.



Multiple Web Servers

```
<serverList>  
  <server>  
    <host>sirius-software.com</host>  
    <webPort>3224</webPort>  
    <workerPort>3226</workerPort>  
  </server>  
  <server>  
    <host>sirius-software.com</host>  
    <webPort>3666</webPort>  
    <workerPort>3226</workerPort>  
  </server>  
</serverList>
```



Web Service Debugging

- The HTTP Helper can use a proxy server, and the Janus Debugger is a proxy server so ...
- You can point an HTTP helper application that accesses a Web Service at the Janus debugger....



Web Service Setup

You could add the following code to your client code that uses the HTTP Helper:

```
%HTTPReq is object HttpRequest auto new
%HTTPReq:URL = 'http://mywebservice'
if ($getg('WSDEBUG')) then
    %HTTPReq:Proxy = 'http://workstation:8081'
end if
```



Web Service Summary

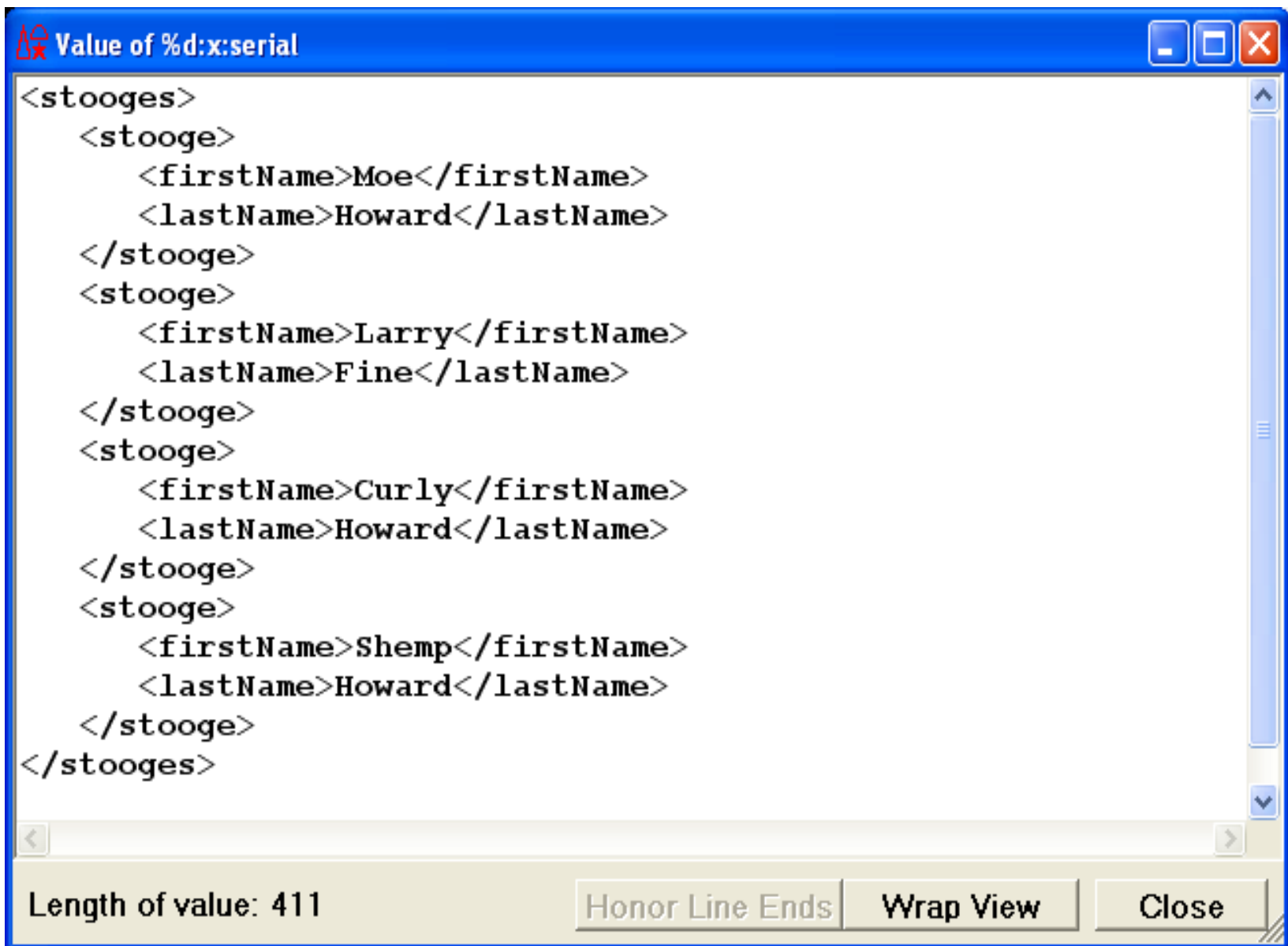
- Any HTTP client that permits you to specify a Proxy server can use the Janus Debugger to debug the server side of the application.
- Key point: a web browser is not needed to use the Janus Debugger.



Viewing XML

- Watch/Display of %XMLDoc:serial produces a nicely formatted display.
- Can alter formatting in debuggerConfig.xml, as discussed in the manual.





The screenshot shows a window titled "Value of %d:x:serial" with a blue title bar and standard Windows window controls. The main area contains XML code for a list of stoges. The code is as follows:

```
<stooges>
  <stooge>
    <firstName>Moe</firstName>
    <lastName>Howard</lastName>
  </stooge>
  <stooge>
    <firstName>Larry</firstName>
    <lastName>Fine</lastName>
  </stooge>
  <stooge>
    <firstName>Curly</firstName>
    <lastName>Howard</lastName>
  </stooge>
  <stooge>
    <firstName>Shemp</firstName>
    <lastName>Howard</lastName>
  </stooge>
</stooges>
```

At the bottom of the window, there is a status bar with the text "Length of value: 411" on the left and three buttons: "Honor Line Ends", "Wrap View", and "Close" on the right.



Viewing Program Data

- %variables (including array elements)
- Image items (including array elements)
- LongStrings (whole value at once)
- Class variables
- StringLists and \$lists (items and size)
- XMLDocs/XMLNodes (can control formatting)
- Field Values (occurrences by subscript)
- Global Variables
- Screen items (needed for 3270 debugger)



Viewing Data Items

The preceding list of items may be used with:

- Value Display,
- Watch Window,
- Execution Tracing:
 - “Trace Changes”
 - “Run to Change”



“Quick Watch”

Audit Trail	Source Code	Web Buffer	Execution Trace	Proc Selection
CM> 26 1	21 DELETE -3			
CM> 27 1	22			
UL> 28 1	23 BEGIN			
UL> 29 1	24	%DUMMY	IS STRING LEN 1	
UL> 30 1	25	%COM	IS STRING LEN 80	
UL> 31 1	26	%TOOL.SUBSYS	IS STRING LEN 80	
UL> 32 1	27	%NEXTPROC	IS STRING LEN 80	
UL> 33 1	28	%IMAGE	IS STRING LEN 80	
UL> 34 1	29			
UL> 35 1	30	%COM	= \$GETG(' COM')	
UL> 36 1	31	%TOOL.SUBSYS	= \$GETG(' TOOL.SUBSYS')	
UL> 37 1	32			

Add Watch
Toggle BreakPoint
Procedure Information

This will add %TOOL.SUBSYS to the watch window.



“Until” Improvements

- Procedure name is now a drop down list box (aka, Combo box) that remembers the last 10 procedure names.
- Useful if you have a stream of “setup” procedures that are known to work, and require no debugging.



Source Code

Web Buffer

Execution Trace

Proc Selection

Run Until Procedure:

p.wss.#delegator

p.wss.#delegator

p.wss.#delgator

p.login2

p.xfer



Research Areas

- Mono: an Open source project that provides a portable implementation of the .NET runtime, for platforms such as Linux and Mac OS X.
- Working to get debugger GUI working under Mono. Still have problems, but looks possible.
- Editor Integration.



Work To Be Done

- UI Improvements - ongoing
- Setting Variables (6.9)
- Binary data viewing (6.9)
- Asynchronous Daemon debugging (6.9)
- Built in Web Browser



Sirius Debugger, the Beginning

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Agenda

- What is the Sirius Debugger?
- Live Demo
- Architectural Overview
- 3270 Based debugging
- Batch2 debugging
- Schedule and availability



The Sirius Debugger...

- Fills the areas that are not covered by the Janus Debugger: a full featured debugger for 3270 and Batch applications.
- Debug your legacy 3270 code with the same UI as with the Janus Debugger...
- Since the UI is Windows based, a 3270 full screen device is not needed.



Usage Scenario

- Start the UI just as you normally would.
- From the Model 204 command prompt, issue a command to turn debugging on.
- Work normally; when you run a program it will appear in the UI source window.
- When done, issue a command to turn debugging off.



Architecture

- Uses its own type of worker thread.
- Different seat count pool than Janus Debugger.
- Uses same GUI (one workstation install for both products).



>SIRIUS DEBUG ON -

DEBCLIENT -

198.242.244.235 -

8081 -

3226

*** MSIR.0915: Debugger on 198.242.244.235:8081 ...

> i screen



The Janus Debugger

File Help

Audit Trail | **Source Code** | Execution Trace | Proc Selection

```

UL> 4 1 1 begin
UL> 5 1 2 screen foo
UL> 6 1 3 title 'Yipee!'
UL> 7 1 4 prompt 'name:' input name len 10 itemid 13
UL> 8 1 5 prompt 'name2:' input name2 len 10 itemid 666
UL> 9 1 6 end screen
UL> 10 1 7 menu oof
UL> 11 1 8 title 'Lunch'
UL> 12 1 9 prompt '1' at 10
UL> 13 1 10 prompt '2' at 10
UL> 14 1 11 prompt xxx at 10
UL> 15 1 12 end menu
UL> 16 1 13 %foo:name = 'Moe'
UL> 17 1 14 %oof:xxx = '333'
UL> 18 1 15 read screen foo
UL> 19 1 16 read menu oof
UL> 20 1 17 print %oof:selection
UL> 21 1 18 end

```

Top | Bottom | Clear Audit | Run | Step Next | Step Over | Trace | End Norun | Clear Breaks | Clear Watch | Ready for execution.

Search | Search Next

Variable or Field | Value | Trace Changes | Run To Change | Add Watch

Most Recent Audit Trail

```

MSIR.0915: Debugging is on: client is 198.242.244.234 port 8081, session
OPEN GWDEB
INCLUDE SCREEN
M204.1168: IN FILE GWDEB INCLUDE SCREEN

```

Watch Window



Features

- Viewing screen items is supported, for 6.8. In 6.9, variable name variables will be added.
- Web buffer tab is deactivated when using the Sirius Debugger; for 6.9 it will be replaced with a line mode output tab (print statement output will appear there as well as in the 3270 screen).



Commands

- Exact format/syntax still not final but...
- More options on SIRIUS command..
- SIRIUS DEBUG ON|OFF



SIRIUS DEBUG ON

- From the 3270 prompt, initiates debugging with the Sirius Debugger.
- Parameters:
 - Janus Client port definition (there will be a default)
 - Host/Port for workstation (where the GUI runs)
 - Worker port number to use (there will be a default)



Sirius Debug Off

Once debugging has been turned on, it remains on until either:

- SIRIUS DEBUG OFF is issued, or,
- You log off



Batch2 Debugging

- Can put SIRUSDEBUG ON in batch 2 stream, perhaps conditionally.
- Submit job normally.
- It will connect to the workstation.
- No 3270 terminal required!



Schedule and Availability

- Currently under development, basic functionality working.
- A beta trial possible with the “refreshed” 6.8 Mods.
- More functionality to be added for the 6.9 Mods...



In the 6.9 Mods:

- Print output window replaces the web buffer window.
- Status indicator of whether the application is in a full screen or line mode read.
- Variable name variables.



Questions?

