Article
Robert Cemper · Nov 26, 2021 13m read

Traditional Debugging in ObjectScript

Finding errors in your code or examining unexpected behavior is the main purpose of Debugging
I will try to refresh the traditional tools away from the helpers you have in Studio, VScode, Serenji, ...
to the basics which have been there before your preferred EDI used it in the background.

We see 3 typical situations:

- **Command-Line Debugging** in the foreground from a terminal or similar session.
  - if this is possible the good old **BREAK** command (also with postcondition)
  - lets you stop and examine the situation as you may need it.
  - It is the oldest option dating back to before ObjectScript
  - newer but otherwise similar is the **ZBREAK** command that introduces
  - WatchPoints in addition to simple BreakPoints and a sophisticated set of conditions
  - here is an extended description of Command-line Debugging
  -
- **Background Debugging**
- Everything described here is of course also useful and available for Command-line debugging
  first, you have the option to write additional information into a (temporary) Global.
  This is useful if you have already a rather clear suspicion of what to check
  then, you can dump your actual variables also to SPOOL or use a redirected output
  or you call **LOG^%ETN()** to dump your whole partition into ^ERRORS Global
  and examine it with SMP/System Operation/Application Error Log
  As a way to bring background to the command line, you may use Shell-based Debugging
  when you execute your code that never sees foreground in a Shell().
  This typically applies to SQL and CSP / ZEN

- **Shell-based Debugging**
  - I start with a rather simple CSP page as an example that holds this code:

  -
```
. . .
</head>
<script language="Cache" method="init" arguments="file,.tName" returntype
="%Integer">
 BREAK  ;; <<<< for debugging
 if 'file {
  set tName="*** no file ***",index=""
 } elseif $D(^ImportFile(file,-1)) {
 set tName=$O(^ImportFile(file,-1,"Class",""),1,index)
 } Else {
 set tName=$g(^ImportFile(file)),index=0
 }
 quit index
</script>
<script language="Cache" method=
```

  - Now I run this from my **CSPshell** and see and get access to all variables and objects

- ```
  IRISAPP>
  IRISAPP>do $system.CSP.Shell()
  CSP Shell

  CSP:IRISAPP>>> GET /csp/irisapp/Details.csp
  HTTP/1.1 200 OK
  Content-Type: text/html; charset=utf-8
  Set-Cookie: CSPSESSIONID-UP-csp-irisapp-=15340           15340; path=/cs
  p/irisapp/;  httpOnly; sameSite=strict;
  Cache-Control: no-cache
  Date: Tue, 23 Nov 2021 19:03:29 GMT
  Expires: Thu, 29 Oct 1998 17:04:19 GMT
  Pragma: no-cache

  <html>
  <head>

  <!-- Put your page Title here -->
  <title> Details </title>

  <script language="javascript">
  window.onmessage = function(event){
  };
  </script>
   <!--
   function postDebug(item, index) {
          var escape = item.replace(/\//g, '-');  // fix slashes in dates
          //var escape = encodeURI(escape);
          var escape = encodeURIComponent(escape);  // fix % and more
          if (item == '') escape = 'NULL';
          //document.getElementById("div_debug").innerHTML += index + "," +
   escape + "<br>";
          var xhttp = new XMLHttpRequest();
          xhttp.onreadystatechange = function() {
                  if (this.readyState == 4 && this.status == 200) {
                          //document.getElementById("div_debug").innerHTML
  += this.responseText;
                  }
                  if (this.readyState == 4 && this.status != 200) {
                          //document.getElementById("div_debug").innerHTML
  += this.responseText;
                  }
          };
          //xhttp.open("GET", "/restAll/debug", true, "_SYSTEM", "SYS");
          //xhttp.open("POST", "/restAll/click/" + escape + '/' + index, tr
  ue, "_SYSTEM", "abc123");
          xhttp.open("POST", "/restAll/click/" + escape + '/' + index, true
  , "_SYSTEM", "SYS");
          ;xhttp.send();
  }

  </script -->
  </head>

  <body>
  <table>
  ```
  ```

```
<BREAK>zinit+1^csp.details.1     ;<<<<<<<<<<<<<<<<<<<<<<<<<<
IRISAPP 15e1>zwrite

%CSPsc=1
%SYSLOG=1
%request=<OBJECT REFERENCE>[4@%CSP.Request]
%response=<OBJECT REFERENCE>[1@%CSP.Response]
%session=<OBJECT REFERENCE>[2@%CSP.Session]
file=0
tDEBUG=3
tData="class,dc.data.rcc.GMbadge"
tFile1=0
tFile2=0
tWhat="class"

IRISAPP 15e1>zwrite %request
%request=4@%CSP.Request  ; <OREF>
+----------------- general information ---------------
|      oref value: 4
|      class name: %CSP.Request
| reference count: 5
+----------------- attribute values ------------------
|            AppData = $lb("",64,1,"","/csp/irisapp/","",1,"","",0,1,"","
","/csp/irisapp","IRISAPP","","c:\intersystems\iris\csp\irisapp\",1,"","
,1,"",900,2,2,"",3600,0,1,1,"",1,"","",1,1,0,2,2)  <Set>
|           AppMatch = "/csp/irisapp/"  <Set>
|        Application = "/csp/irisapp/"  <Set>
|  CSPGatewayRequest = 0  <Set>
|            CharSet = ""  <Set>
|              Class = "csp.details"  <Set>
|        ContentType = ""  <Set>
|   (ConvertCharSet) = "UTF8"
| GatewayApplication = ""  <Set>
|       GatewayBuild = ""  <Set>
|GatewayConnectionName = ""  <Set>
|       GatewayError = ""
|   GatewayFunctions = ""  <Set>
|GatewayInstanceName = ""  <Set>
|       GatewayNewId = 0
|GatewaySessionCookie = ""  <Set>
|GatewaySessionIdSource = ""  <Set>
|     GatewayTimeout = 60
|             Method = "GET"
|     NoResetTimeout = 0
|           PageName = "Details.csp"
|ProcessedRequestType = 1
|           Protocol = "HTTP/1.1"  <Set>
|    RegistryMethods = 1
|          RequestId = ""
|             Secure = 0  <Set>
|            Service = "CSP"  <Set>
|                URL = "/csp/irisapp/Details.csp"
|          URLPrefix = ""
|          UserAgent = ""  <Set>
+----------------- swizzled references ---------------
|          i%Content = ""
|          r%Content = ""
+-----------------------------------------------------
```

```
IRISAPP 15e1>zwrite %session
%session=2@%CSP.Session  ; <OREF>
+----------------- general information ---------------
|      oref value: 2
|      class name: %CSP.Session
|           %%OID: $lb("15340","%CSP.Session")
| reference count: 5
+----------------- attribute values ------------------
|       %Concurrency = 1  <Set>
|         AppTimeout = 900
|        Application = "/csp/irisapp/"  <Set>
|ApplicationLicenses = ""
|        BrowserName = ""  <Get>
|    BrowserPlatform = ""  <Get>
|     BrowserVersion = ""  <Get>
|         ByIdGroups = ""
|   CSPSessionCookie = "15340            15340"
|         CookiePath = "/csp/irisapp/"
|         CreateTime = "2021-11-23 18:56:54"  <Set>
|              Debug = 0  <Set>
|         EndSession = 0  <Set>
|          ErrorPage = ""
|(EventClassContext) = ""
|           GetNewId = 0
|            GroupId = ""
|  HttpAuthorization = ""
|          KeepAlive = 1
|                Key = "3"_$c(3)_"±Ð~"_$c(129)_"t¼Ø´0"_$c(0)_"òÆÆùXNX"_$c
(158)_"Å="_$c(152,1)_"T*"_$c(10)_"®«®"_$c(21)  <Set>
|           Language = "de"
|       LastModified = "2021-11-23 18:58:28"  <Set>
|          LicenseId = "_SYSTEM"  <Set>
|      LogoutCleanup = 0
|      MessageNumber = 1  <Set>
|          Namespace = "IRISAPP"
|         NewSession = 0  <Set>
|        (NoLicense) = 0
|         OldTimeout = 5708603608  <Set>
|  PersistentHeaders = ""  <Set>
|           Preserve = 0  <Set>
|          ProcessId = ""
|           Referrer = ""  <Set>
|       RunNamespace = ""  <Get,Set>
|   SOAPRequestCount = 0
|SecureSessionCookie = 0
|    SecurityContext = $lb("_SYSTEM","%All,%DB_IRISLIB,%DB_IRISSYS","%All
,%DB_IRISLIB,%DB_IRISSYS",32,-559038737)  <Set>
|          SessionId = 15340
|       SessionScope = 2
|      (StickyLogin) = $lb("/csp/irisapp/","_SYSTEM",$lb("_SYSTEM","%All,
%DB_IRISLIB,%DB_IRISSYS","%All,%DB_IRISLIB,%DB_IRISSYS",32,-559038737),""
,0,0,0,1)  <Get,Set>
|   UseSessionCookie = 2
|          UserAgent = ""
|    UserCookieScope = 2
|             nosave = 0
+--------------- calculated references ---------------
|         EventClass   <Get,Set>
|           Username   <Get>
```

```
+-----------------------------------------------------

IRISAPP 15e1>zwrite %response
%response=1@%CSP.Response  ; <OREF>
+----------------- general information ---------------
|      oref value: 1
|      class name: %CSP.Response
| reference count: 5
+----------------- attribute values ------------------
|   AllowOutputFlush = 0
|AvoidPartitionCleanup = 0
|   (CSPGatewayData) = ""  <Set>
|            CharSet = "utf-8"
|      ContentLength = ""
|        ContentType = "text/html"
|         CookiePath = "/csp/irisapp/"
|             Domain = ""
|         GzipOutput = ""  <Set>
|        HTTPVersion = ""
|      HeaderCharSet = ""
|Headers("CACHE-CONTROL") = "no-cache"
|    Headers("DATE") = "Tue, 23 Nov 2021 19:03:29 GMT"
| Headers("EXPIRES") = "Thu, 29 Oct 1998 17:04:19 GMT"
|  Headers("PRAGMA") = "no-cache"
|   IgnoreRESTOutput = ""
|         InProgress = 1  <Set>
|           Language = "de"  <Set>
|   NoCharSetConvert = 0
| OutputSessionToken = 1
|           Redirect = ""
| ServerSideRedirect = ""
|             Status = "200 OK"
|            Timeout = ""  <Set>
|          TraceDump = 0
|     UseASPredirect = 0  <Set>
|        UseHttpOnly = 1
|        VaryByParam = ""
+--------------- calculated references ---------------
|            Expires   <Get,Set>
+-----------------------------------------------------

IRISAPP 15e1>g

<BREAK>zinit+1^csp.details.1
IRISAPP 15e1>g

<!-- tr><th colspan="3">#(tName)#</th></tr -->
<tr><th>Line</th><th>*** no file ***</th><th>Line</th><th>*** no file ***
</th></tr>

</table>
</body>
</html>
```

- The next example relates to **SQL** and I use this calculated property that fails every now and then

-
```
Property Random As %Numeric(SCALE = 2) [ Calculated, SqlComputed,
  SqlComputeCode = { Set rcc=$Random(5) BREAK  Set {*} = $Random
```

```
(10)/rcc} ];
------------------------------------------------------------------------
---
SQLquery= "select top 10 id,name,random from Sample.Person"
------------------------------------------------------------------------
---
throws [SQLCODE: <-350> . . . ]
[%msg: <Unexpected error executing SqlCompute code for field 'Random': <D
IVIDE>%0AmBk1+5^%sqlcq.DEMO.cls33.1>]
```

- it is obvious that debugging %0AmBk1+5^%sqlcq.DEMO.cls33.1 is out of our scope
-
- for debugging I use the **SQLshell** to take advantage of my BREAK to see all variables and objects

```
DEMO> DEMO>do $system.SQL.Shell()
SQL Command Line Shell
---------------------------------------------------- The command prefix i
s currently set to: <<nothing>>.
Enter <command>, 'q' to quit, '?' for help.
[SQL]DEMO>>select top 10 id,name,random from Sample.Person
2.      select top 10 id,name,random from Sample.Person ID      Name    R
andom  . try {  Set rcc=$Random(5) BREAK  Set i%RandomO1 = $Random(10)/rc
c
                              ^
<BREAK>%0AmBk1+5^%sqlcq.DEMO.cls33.1
DEMO 10d3>zw %SNGetQueryStats=1
SQLCODE=0
rcc=1

DEMO 10d3>zwrite $this
45@%sqlcq.DEMO.cls33  ; <OREF>
+----------------- general information ---------------
|      oref value: 45
|      class name: %sqlcq.DEMO.cls33
| reference count: 6
+----------------- attribute values ------------------
|     %CurrentResult = "45@%sqlcq.DEMO.cls33"
|      %CursorNumber = 1
|  %ExtendedMetadata = $lb($lb("Sample.Person||ID","%Library.BigInt",18),
$lb("Sample.Person||Name","%Library.String",10),$lb("Sample.Person||Rando
m","%Library.Numeric",14))
|           %Message = ""
|       %Metadata(0) = $lb(3,"ID",-5,19,"0",1,"ID","Person","Sample",0,$c
(0,0,0,1,0,0,0,0,0,0,0,0,0),"Name",12,50,"0",0,"Name","Person","Sample",0
,$c(0,0,0,0,0,0,0,0,0,0,0,0,0),"Random",2,15,"2",1,"Random","Person","Sam
ple",0,$c(0,0,0,0,0,0,0,0,0,0,0,0,0))
|      (%NextColumn) = 1
|           %Objects = ""
| %OutputColumnCount = 0
|        %Parameters = ""
|          %ROWCOUNT = 0
|             %ROWID = ""
| %ResultColumnCount = 3
|           %SQLCODE = 0
|      (%SelectMode) = 0
|     %StatementType = 1
|        (%delock11) = ""
|           %routine = ""
```

```
|        CursorState = 1
|              (ID1) = 1
|             (IDO1) = ""
|           (NameO1) = "Newton,Olga Z."
|      (PpCallArgs1) = 10
|        (Vrowcnt17) = 0
|    (isolationMode) = 0
|       (lockstat11) = 0
|       (node2val21) = $lb("",82732383,"OptiPlex Media Inc.",34350,"V968"
,"P1169","OR","E8259","Z4197","","Newton,Olga Z.","U4734","P4","U8988","W
9047","992-61-9877",-92713954810893571,"2018-07-16 17:44:34")
|           (rowcnt) = 0
|         (rowlimit) = 9223372036854775807
|        (starttime) = 9966.938434
|             (time) = .000001
|    (vpRUNTIMEOUT3) = "Newton,Olga Z."
+----------------- swizzled references ---------------
|   i%%PrivateTables = ""  <Set>
|   r%%PrivateTables = ""  <Set>
|    (i%%ProcCursor) = ""
|    (r%%ProcCursor) = ""
|          (i%%rsmd) = ""
|          (r%%rsmd) = "50@%SQL.StatementMetadata"
+--------------- calculated references ---------------
| %StatementTypeName   <Get>
|                 ID   <Get>  [ Aliases - id ]
|               Name   <Get>  [ Aliases - name,NAME ]
|             Random   <Get>  [ Aliases - random,RANDOM ]
+------------------------------------------------------ DEMO 10d3>g
        Newton,Olga Z.  1  . try {  Set rcc=$Random(5) BREAK  Set i%Rando
mO1 = $Random(10)/rcc
                              ^
<BREAK>%0AmBk1+5^%sqlcq.DEMO.cls33.1

DEMO 10d3>zwrite %SNGetQueryStats=1
SQLCODE=0
rcc=1
DEMO 10d3>g
        Adam,Emily G.   7  . try {  Set rcc=$Random(5) BREAK  Set i%Rando
mO1 = $Random(10)/rcc
                              ^
<BREAK>%0AmBk1+5^%sqlcq.DEMO.cls33.1

DEMO 10d3>zw %SNGetQueryStats=1
SQLCODE=0
rcc=0

DEMO 10d3>g   ; now we get the error
[SQLCODE: <-350>]
[%msg: <Unexpected error executing SqlCompute code for field 'Random': <D
IVIDE>%0AmBk1+5^%sqlcq.DEMO.cls33.1>]
2 Rows(s) Affected
statement prepare time(s)/globals/cmds/disk: 0.0003s/4/137/0ms
          execute time(s)/globals/cmds/disk: 44.5198s/37/839/0ms
                           cached query class: %sqlcq.DEMO.cls33
------------------------------------------------------------------------
--
[SQL]DEMO>>q
DEMO>
```

- And as you see these debugging methods work also today in IRIS .
- This is my **Personal Best Practice**.

#Other

Source URL:https://community.intersystems.com/post/traditional-debugging-objectscript