PHP Debugging from A to Z (Apache to Zend)

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Hi!

I've been developing and troubleshooting web applications on the IBM i for 16 years, 11 of those using PHP.
Formerly worked for BCD, now with Seiden Group

Club Seiden
Where open source and IBM i meet

club.alanseiden.com

SEIDEN GROUP

seidengroup.com

ZF2 CERTIFIED ARCHITECT

What can go wrong?

- Setting up/configuring the Apache web server

- PHP Issues

- CL/RPG program call failures

- Javascript confusion

- HTML/CSS funkiness

- (We are assuming you have Zend Server/PHP installed)

Apache - It won't start

- Looking at your Apache config
  - http://myipaddress:2001/HTTPAdmin - hit display
  - /www/myapacheserver/conf/httpd.conf – I don't have *IOSYSCFG
  - wrksplf QTMHHTTP
    - This is also where spool files will be if your Apache jobs are ending abnormally
- Watch out for
  - SSL cert expired
  - Weird line endings if you edited in notepad

```
3....+....4....+....5....+....6....+....7....+....8....+....9....+....0....+....1....3.+....2....+....3
        From procedure  . . . . . . . :    sendEscapeWithMessageFile
        Statement . . . . . . . . . . :    4
        To module . . . . . . . . . . :    ZHBMAIN
        To procedure  . . . . . . . . :    BigSwitch__FiPPc
        Statement . . . . . . . . . . :    247
        Message . . . . :    HTTP Server Instance NXAPACHE failed during start-up.
        Cause . . . . . :    HTTP Server instance NXAPACHE failed because of a
          configuration error on line 232  in configuration file
          /www/nxapache/conf/httpd.conf. Note:  If the specified directive is either a
          container directive (e.g. <Directory>), or a directive within a container,
          the line number identified above may not be correct.  In that case, you will
          need to verify that all directives in the container, and the container
          itself do not have configuration errors. Recovery  . . . :    See previous
          job log messages.  Correct the problem and start the server again.
      50   09/22/16  16:18:51.660375  QWTPITP2      QSYS         0645      *EXT            *N
        Message . . . . :    Job ended abnormally.
        Cause . . . . . :    A SIGKILL signal was received for the job. The action for
          the signal was to terminate the job.
      00   09/22/16  16:18:51.662974  QLIDLOBJ      QSYS         06B4      QLICLLIB    QSYS      06B4
                                                                                          More...
ft  F20=Right    F24=More keys
```

Online   3,22

Apache - It won't show my page

- 404 – Page not found

  - Check there is a DocumentRoot or AliasMatch pointing to your script

- 403 – Forbidden

  - Check your Directory, Location statements

- To start it in debug:

  STRTCPSVR SERVER(*HTTP) HTTPSVR(MYAPACHE -vv)

  - Try to access your page, end the server, wrksplf QTMHHTTP

🗙 📋 📋 🖨 📁 Clear Erase Attn Sysreq Help ⏵

                                    Display Spooled File
ile . . . . . :   QZSRHTTPTR
ontrol . . . . .   _____
ind . . . . . .   search_____
...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8....+...9....+....
      00000085:411544 ap_unescape_url(): URL = /products/carpet/search
      00000085:411552 unescape_url(): URL = /products/carpet/search
      00000085:411560 ap_location_walk(): uri = "/products/carpet/search"
      00000085:411560 ap_if_walk()
      00000085:411576 mod_rewrite: hook_uri2file() >uri = /products/carpet/search.
      00000085:411584 ap_get_server_name()
      00000085:411600 ap_get_server_name(): server name = idevusr016.idevcloud.com
      00000085:411600 ap_get_server_port()
      00000085:411616 mod_rewrite: apply_rewrite_list() >directory = NULL.
      00000085:411632 translate_alias_redir(): request URI = /products/carpet/search
      00000085:411632 try_alias_list()
      00000085:411648 try_alias_list()
      00000085:411656 try_alias_list(): attempt regular expression - ^/$
      00000085:411656   Case sense is OFF
      00000085:411680 try_alias_list(): attempt regular expression - ^$
      00000085:411680   Case sense is OFF
      00000085:411696 try_alias_list(): attempt regular expression - ^/products/(.*)
      00000085:411696   Case sense is OFF
      00000085:419800 try_alias_list(): match found!

3=Exit   F12=Cancel   F19=Left   F20=Right   F24=More keys

Apache logs

- There is lots of good data in your Apache logs!

```
LogFormat "%h %T %l %u %t \"%r\" %>s %b \"%{Referer}i\"
\"%{User-Agent}i\"" combined

LogFormat "%{Cookie}n \"%r\" %t" cookie

LogFormat "%{User-agent}i" agent

LogFormat "%{Referer}i -> %U" referer

LogFormat "%h %l %u %t \"%r\" %>s %b" common

CustomLog logs/access_log combined
```

- /www/myapache/logs/
- Export into lots of different great tools!

Apache logs

- Many tools to analyze and visualize the logs

  - I use Sawmill: http://sawmill.net/

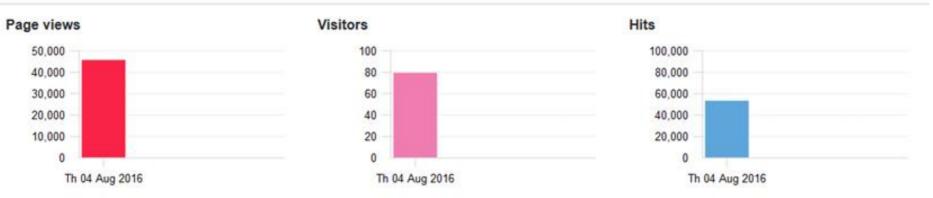 - Josh uses Go Access: https://goaccess.io/

Dashboard

04/Aug/2016, 1 day (entire date range)

Overview

Hits	Visitors	Size	Page views	Sessions	Session duration	Bounces	Bounce
52,695 Avg/day —	79 Avg/day —	773.02 M Avg/day —	45,226 Avg/day —	149 Avg/day —	1d 08:33:34 Avg/day —	124 Avg/day —	83.22'

Traffic ⚙

Page views

50,000	
40,000	▮
30,000	
20,000	
10,000	
0	
	Th 04 Aug 2016

Visitors

100	
80	▮
60	
40	
20	
0	
	Th 04 Aug 2016

Hits

100,000	
80,000	
60,000	
40,000	▮
20,000	
0	
	Th 04 Aug 2016

Search engines ⚙

No data returned in query

Country ⚙

Visitors *(descending)*

- 93.7 % (unknown country)
- 6.3 % United States

Device Category ⚙

Visitors *(descending)*

- 95.1 % Non-mobile (desktop, laptop, server)
- 2.4 % Unknown
- 1.2 % Spider
- 1.2 % Mobile (phone, tablet)

Pages

04/Aug/2016, 1 day (entire date range)

1 - 10 of 1543

	Page	↓ Hits			Visitors	Size	Page views	Sessions	Session duration	Bounces
🔍 1	/Prod/PublicPHP/page1 ᴐp.php	7,952	15.1 %	▬	1	13.36 M	7,952	1	00:59:26	0
🔍 2	/Prod/PublicPHP/page2 aData.php Jrl	3,165	6.0 %	▪	1	210.13 K	3,165	1	01:40:31	0
🔍 3	/Prod/Prod/sanotherpage ents.php	3,090	5.9 %	▪	1	3.00 M	3,090	2	00:49:04	0
🔍 4	/Prod/PublicPHP/somemorephp aServer.php	2,752	5.2 %	▪	1	17.76 M	2,752	1	05:09:57	0
🔍 5	/Prod/PublicPHP/yetanotherpage a.wsdl	2,752	5.2 %	▪	1	5.35 M	2,752	1	00:15:28	0
🔍 6	/Prod/Prod/someimportantdata	1,457	2.8 %	▏	1	67.87 M	1,457	3	00:30:26	0
🔍 7	/Prod/Prod/awebservice	1,385	2.6 %	▏	1	3.69 M	0	0	00:00:00	0
🔍 8	/Prod/PublicPHP/notsoimportantdata ata.php	1,380	2.6 %	▏	1	641.60 K	1,380	1	00:40:21	0
🔍 9	/Prod/Prod/ssomething.php	1,196	2.3 %	▏	1	4.63 M	0	0	00:00:00	0
🔍 10	/Prod/Prod/sbankinfo.php ᴉp	1,139	2.2 %	▏	1	2.03 M	1,139	2	00:03:06	0
	1533 other items	26,427	50.2 %	▬▬▬	1,608	654.49 M	21,539	–	22:25:15	124
	Total	52,695	100.0 %		1,618	773.02 M	45,226	–	1d 08:33:34	124

FastCGI settings

- SetEnv="PHP_FCGI_CHILDREN=20"

- RequestTimeout="60"

- SetEnv="CCSID=1208"

- SetEnv="LDR_CNTRL=MAXDATA=0x40000000"

CCSID Issues

- FastCGI CCSID setting
  - SetEnv="CCSID=1208"
- Apache CCSID settings:
  - DefaultFsCCSID 37
  - CGIJobCCSID 37
  - DefaultNetCCSID 01208
- php.ini setting
  - default_charset="UTF-8"
- ibm_db2.ini setting
  - ibm_db2.i5_override_ccsid=0

https://support.zend.com/hc/en-us/articles/206477507-Upgrade-to-Zend-Server-for-IBM-i-8-5-causes-CCSID-issues-in-DB2

PHP - 500 Error

- Look at the log … /usr/local/zendphp7/var/log/php.log

- Occasionally it will not show up there

  - Look in /www/myapache/logs/ for the error log

- Watch out for @ signs!

PHP - Unexpected results

- var_dump and die()

- error_log("some message", 3, "/path/to/myspecial.log");

- Hide on the page:

```
echo  "<!-";
var_dump($mySqlString);
echo "-->";
```

- Don't forget to clean them up afterwards!

- Watch out for try/catch

PHP – Locked jobs

- Are all of your jobs in THDW?

- Check for AJAX and session locking!

- Use session_write_close as soon as you are done updating the session (at the beginning if all you do is read!)

XDebug

- https://www.seidengroup.com/2018/05/21/xdebug-and-your-ide-on-your-ibm-i/

Debugging with Zend Server

The events monitor:

Debugging with Zend Server

- Setting up event rules:

Debugging with Zend Server cont.

- Have Zend Server email you when database errors occur:

ServerEnterprise   11:59

Database Error ℹ / Monitoring / Monitoring Rules

Getting Started

Dashboard

Monitoring ⌄

URL Insight

Events

Event Rules

Logs

Settings

-Ray ›

HP ›

Applications ›

ervers ›

ob Queue ›

aching ›

Debugging ›

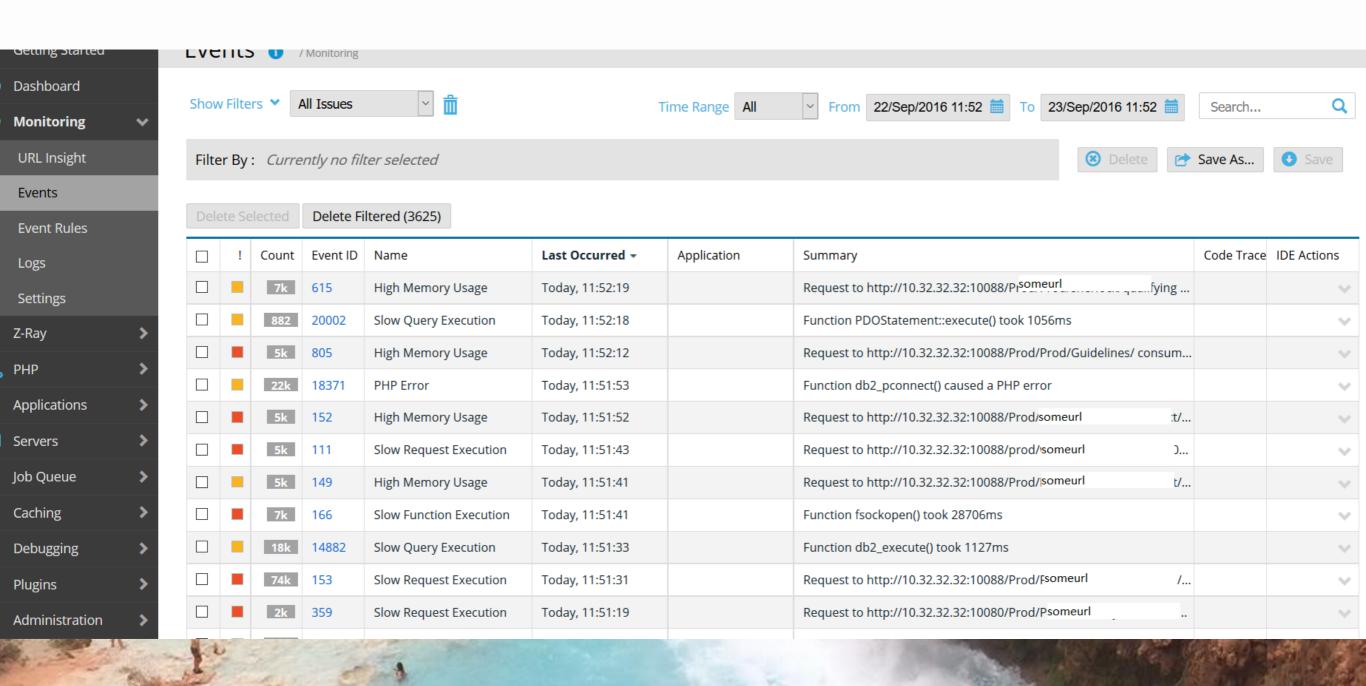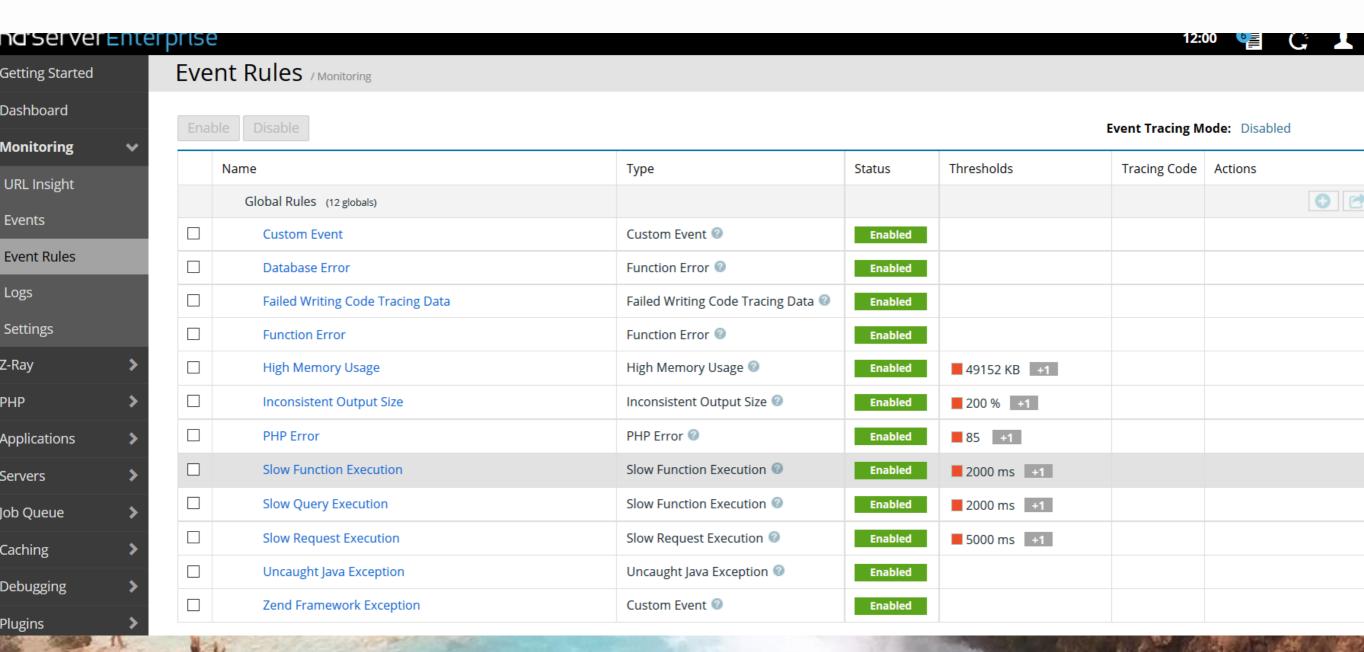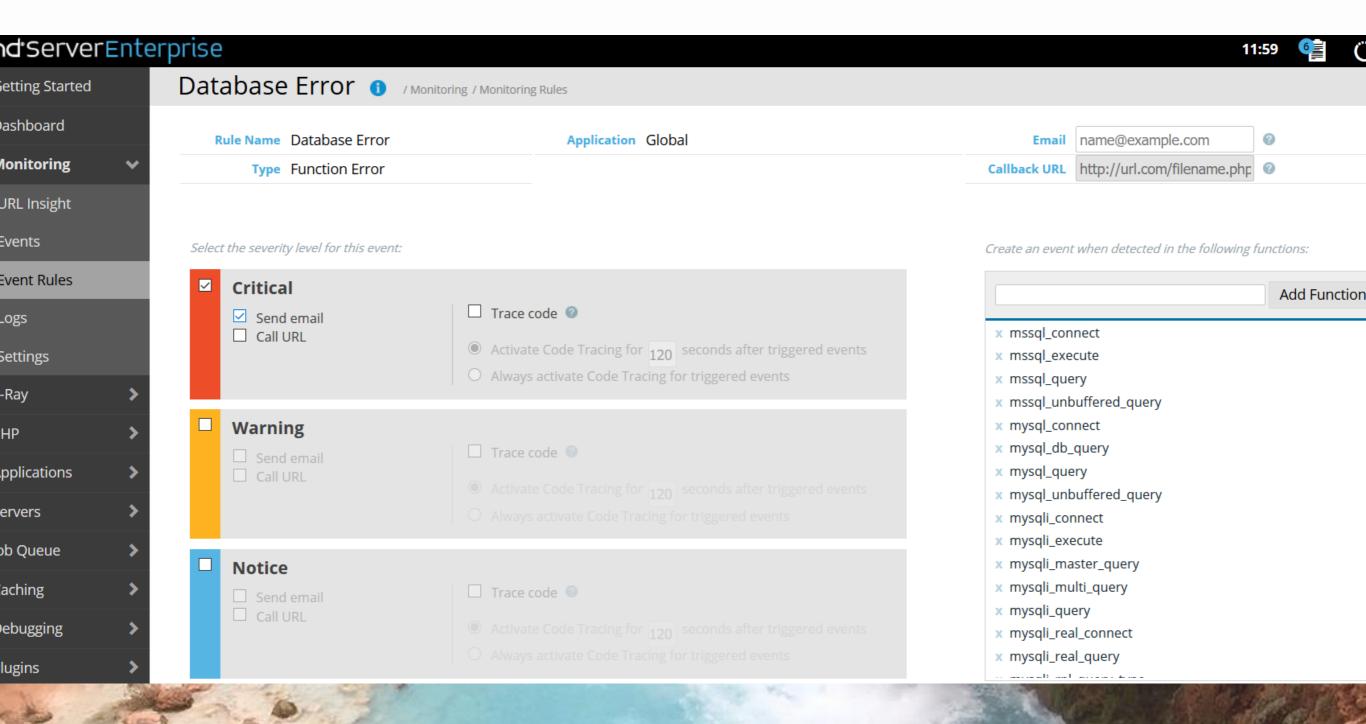lugins ›

| **Rule Name** Database Error | **Application** Global | **Email** name@example.com ❓ |
| **Type** Function Error | | **Callback URL** http://url.com/filename.php ❓ |

Select the severity level for this event:

Create an event when detected in the following functions:

[   ] Add Function

☑ **Critical**
  ☑ Send email   ☐ Trace code ❓
  ☐ Call URL
     ◉ Activate Code Tracing for 120 seconds after triggered events
     ○ Always activate Code Tracing for triggered events

- x mssql_connect
- x mssql_execute
- x mssql_query
- x mssql_unbuffered_query
- x mysql_connect

☐ **Warning**
  ☐ Send email   ☐ Trace code ❓
  ☐ Call URL
     ◉ Activate Code Tracing for 120 seconds after triggered events
     ○ Always activate Code Tracing for triggered events

- x mysql_db_query
- x mysql_query
- x mysql_unbuffered_query
- x mysqli_connect
- x mysqli_execute

☐ **Notice**
  ☐ Send email   ☐ Trace code ❓
  ☐ Call URL
     ◉ Activate Code Tracing for 120 seconds after triggered events
     ○ Always activate Code Tracing for triggered events

- x mysqli_master_query
- x mysqli_multi_query
- x mysqli_query
- x mysqli_real_connect
- x mysqli_real_query

Other monitoring

There are other tools that monitor and report errors to you:

- New Relic - https://newrelic.com/php

- Grafana - https://grafana.com

- Sentry - https://sentry.io/welcome/

- And others

- Unless you know what you're doing, make it stateless

- It's hanging! Check QSQSRVR jobs in QSYSWRK for MSGW jobs

- Check /usr/local/zendphp7/var/log/toolkit.log for general error messages

- You can turn debug on in the Toolkit settings

  - Toolkit settings (usually) in /usr/local/zendphp7/share/ToolkitAPI/toolkit.ini

  - Joblog error messages will show up in debug log (usually /usr/local/zendphp7/var/log/tkit_debug.log)

Toolkit debug log

```
Browse : /usr/local/zendsvr6/var/log/tkit_debug.log
Record : 6309318   of 6309335 by _18                          Column : ___1    181 by _131
Control : █_____

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8....+....9....+....0....+....1....+....2....
Exec end: 2016-09-23 12:09:50. Seconds to execute: 0.02148699760437.


Exec start: 2016-09-23 12:09:50
Version of toolkit front end: 1.6.0
IPC: '/tmpphp/FHACHandler__1474657488.1694'. Control key: *idle(180/kill) *cdata *sbmjob
Stmt: call ZENDSVR6.iPLUG32K(?,?,?,?) with transport: ibm_db2
Input XML: <?xml version="1.0" encoding="ISO-8859-1" ?>
<script>
<cmd>CHGAUT OBJ('/vdlf/Prod/some/path       __  _       /CSQ5122000515RS.xml') USER(QTMHHTP1 GRPMIS GRPICA GRPWEB MEYEDIS1) DTAAUT(*RWX
</script>
Output XML: <?xml version="1.0" encoding="ISO-8859-1" ?>
<script>
<cmd><success><![CDATA[+++ success CHGAUT OBJ('/vdlf/Prod/some/path          _onse/CSQ5122000515RS.xml') USER(QTMHHTP1 GRPMIS GRPIC
</cmd>
</script>
Exec end: 2016-09-23 12:09:50. Seconds to execute: 0.026160955429077.

************End of Data********************
```
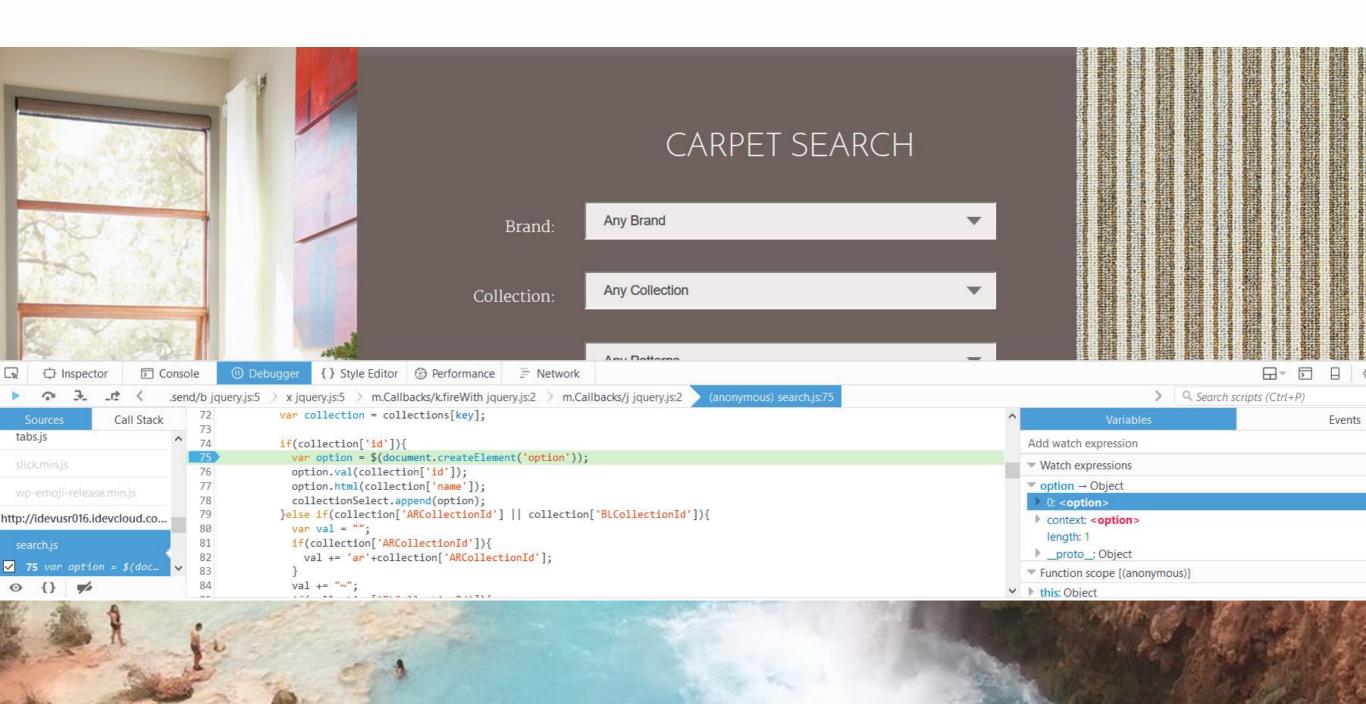
Toolkit Debugging cont...

```
$namingMode = DB2_I5_NAMING_OFF; // ON or OFF

$db2conn = db2_pconnect('*LOCAL-*DEBUG', '' , '');

$toolkit_service =
ToolkitService::getInstance($db2conn, $namingMode);
```

- Wrkactjob, find MSGW job

- Look at joblog to find QSQSRVR job to watch

- STRSRVJOB on that QSQSRVR job

- STRDBG on your program, add a breakpoint

- Give the message a "G"

- Step through debug!

Javascript Debugging

- F12 for developer toolbars! (firefox)
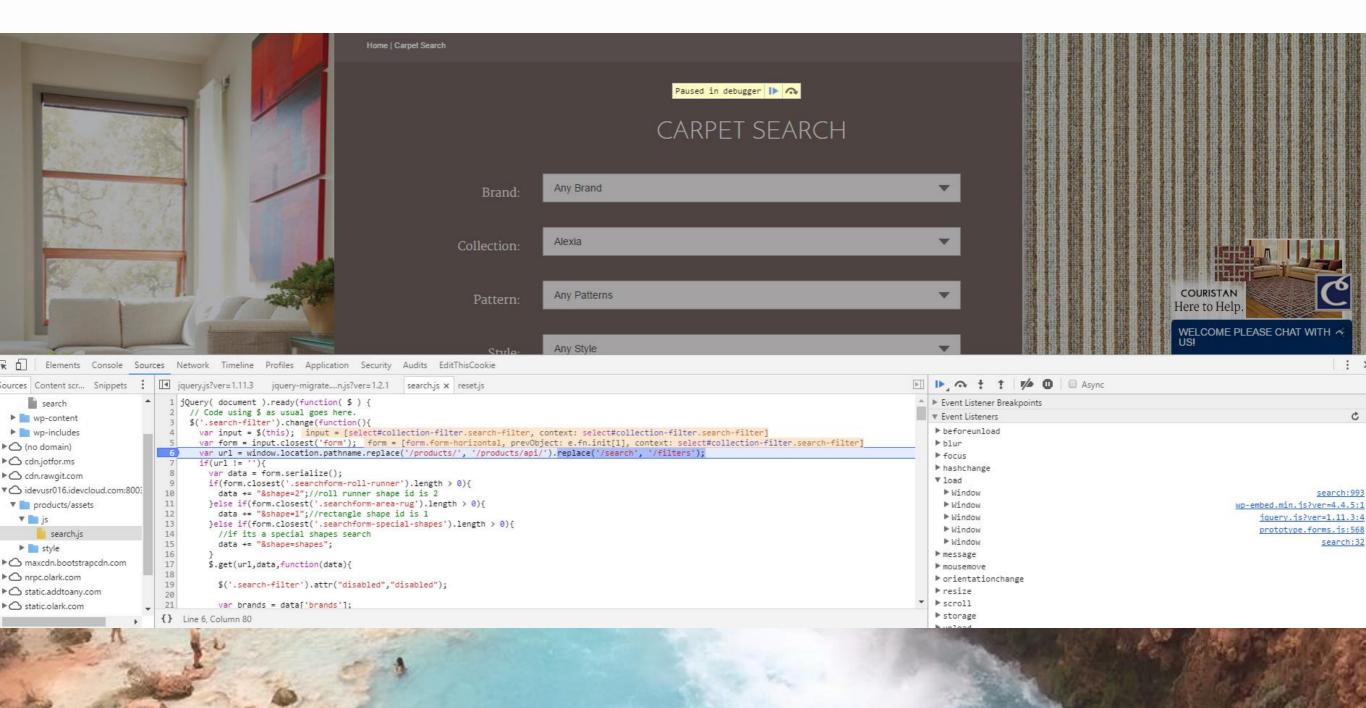
Javascript Debugging cont…

- You can add conditional breakpoints (right click on the breakpoint)

- You can add XHR breakpoints - break when certain URLs are called (for AJAX)

- You can add DOM breakpoints – break when an element on the page is changed/removed (right click, break on)

Javascript Console

- Console.log(somevar) in your code will output the somevar variable to the console (similar to echoing from PHP).

- Console.table(somejson) will output json received in a pretty table format to the console.

- Console.trace() will show a stack trace of function calls to that point

- Monitor(functionname) will output to the console every time that function is called and show the parameters

Javascript events

- (Chrome) check event listeners

Javascript events cont…

- Or use visual event

HTML/CSS Debugging

- Use the DOM explorer to see what styles are applied to your HTML, and to experiment with changing the HTML itself (Edge)

Debugging with Fiddler

- A proxy you install to monitor HTTP and HTTPS traffic

- You can compare sessions using the diff tool

- Get statistics about the page "weight" and "wait"

- Set breakpoints to set the request or response on the fly

- Can filter or flag traffic … and lots more

- https://www.telerik.com/download/fiddler

API Debugging with Postman

Builder Team Library

IN SYNC Steph R

No Environment

myAc ● | MyAp ● | https: ● | CoreL ● | servic ● | Partn ● | Riverł ● | Contacts | Users | Contracts | myKe ● | branc ● | + | ...

▸ branches

Examples (0) ▾

POST ▾   https://some.api/branches   Params   Send ▾   Save ▾

Authorization   Headers (1)   Body ●   Pre-request Script   Tests   Code

○ form-data   ○ x-www-form-urlencoded   ● raw   ○ binary   JSON (application/json) ▾

```
 1  {
 2      "data": [{
 3          "branch_number": "257",
 4          "branch_region_id": "26",
 5          "branch_region_name": "Northwest",
 6          "branch_type": "B",
 7          "branch_name": "North Coast",
 8          "public_name": "Lake Oswego North Coast",
 9          "branch_license_number": "789007",
10          "branch_license_text": "We are licensed to do business in the states of Oregon, Texas and Washington. ML-176;",
11          "branch_status": "1",
12          "branch_address_1": "1520 SE Discovery Lane",
13          "branch_address_2": "Ste D",
14          "branch_city": "Warrenton",
15          "branch_state": "OR",
16          "branch_zip": "97146",
17          "branch_phone": "5033254840",
18          "branch_fax": "0",
19          "branch_nmls_manager_id": "WGJL",
20          "branch_nmls_manager_name": "Jacob Leenders",
21          "branch_closed_date": 0
```

Response

Any questions?

- So much more to debug!

  - Performance

  - Design

  - SEO

Thank you

- I would love your feedback:

- Contact me at steph@seidengroup.com
  http://www.seidengroup.com

- Twitter: @jordiwes

https://joind.in/event/zendcon-2018/php-debugging-on-the-ibm-i-from-a-to-z-apache-to-zend