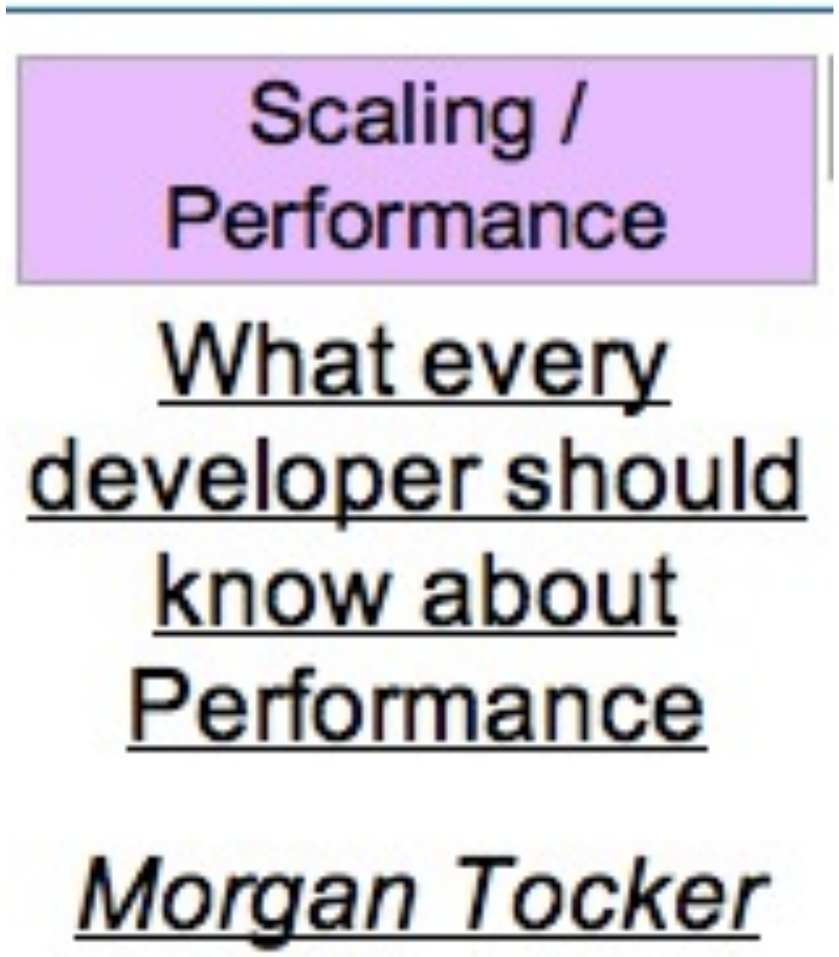
Analyzing Site Performance with XHGui and XHProf

Paul Reinheimer

Special Request - Close laptops

Performance

- Friday 10:50am Hampstead



Scaling / Performance

What every developer should know about Performance

Morgan Tocker

How long a task takes to complete

How many tasks per unit of time

Maximum number of tasks you can complete

Plan

- Past
- Present
- Future

Past

XHProf

- PHP Extension, records timing and memory details surrounding function calls

Facebook released XHProf as a PHP extension a few years ago
We can run XHProf on production unlike X-Debug
XHProf runs on PHP and HipHop
Facebook ran XHProf on all their servers, information is worth the overhead

Configuring XHProf

```
; Directory in which the loadable extensions
(modules) reside.

extension_dir="/usr/local/lib/php/extensions/"
extension="xhprof.so"
```

```
xhprof_enable(XHPROF_FLAGS_CPU +
XHPROF_FLAGS_MEMORY);
//Your Codes
$xhprof_data = xhprof_disable();
```

Windows builds available thanks to JumpIn! Camp
Builds nicely on Linux

UI

- Data is stored is serialized and stored in files
- Easy to display a single run
- In combination with Graphviz you can generate nice graphs

Present

Problems with XHProf

- Datastore

MySQL, MySQLi, SQLServer
Other backends are trivial, Postgres, SQLLite, etc should only be a little time

XHGui Install

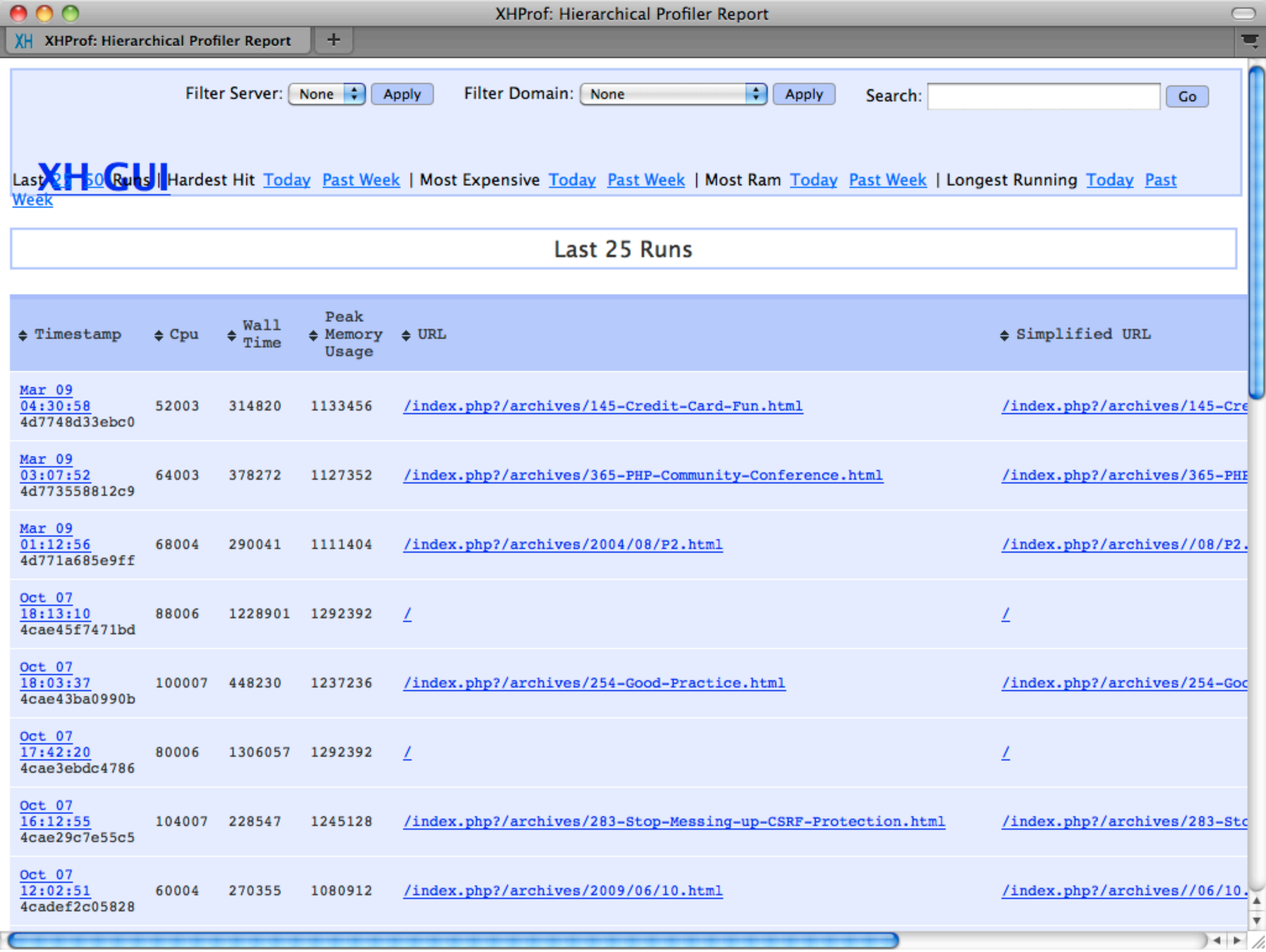
UI

Live Demo

Sad Internets

Sad Internets

XH GUI

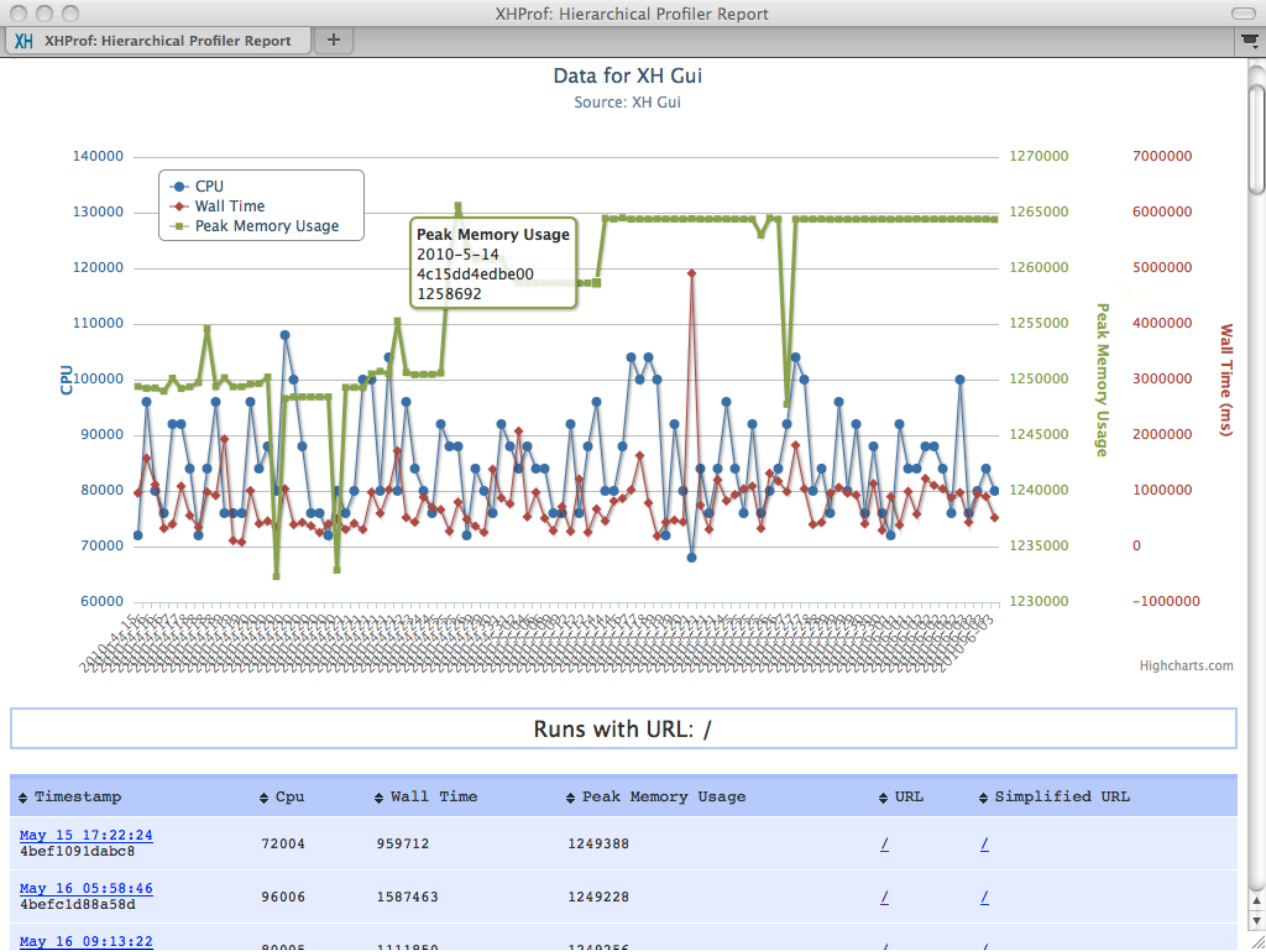


XHProf: Hierarchical Profiler Report
XH XHProf: Hierarchical Profiler Report
Filter Server: None Apply
Filter Domain: None Apply
Search: Go

Last 25 50 Runs | Hardest Hit Today Past Week | Most Expensive Today Past Week | Most Ram Today Past Week | Longest Running Today Past Week

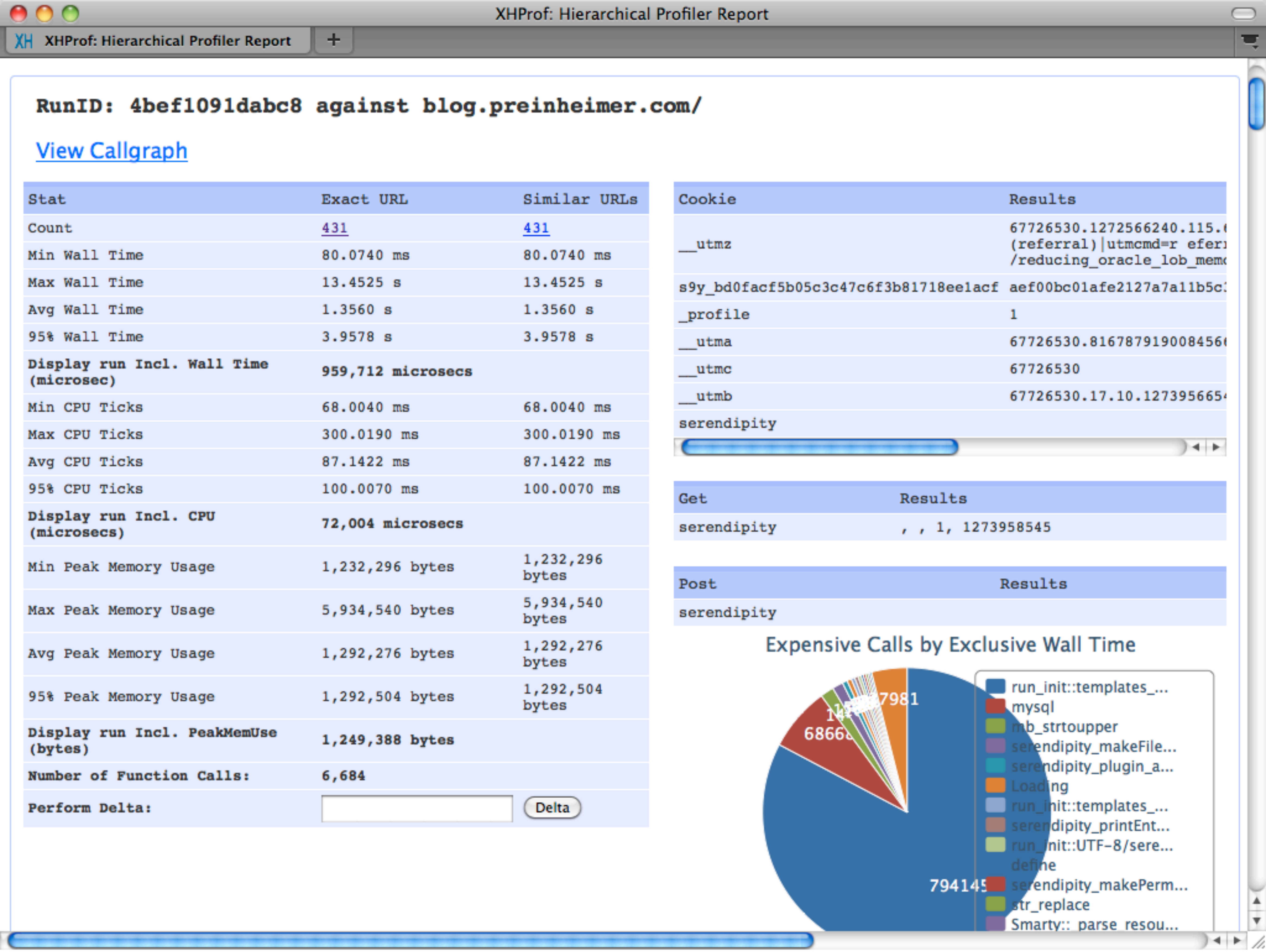
Last 25 Runs

Timestamp	Cpu	Wall Time	Peak Memory Usage	URL	Simplified URL
Mar 09 04:30:58 4d7748d33ebc0	52003	314820	1133456	/index.php?/archives/145-Credit-Card-Fun.html	/index.php?/archives/145-Cre
Mar 09 03:07:52 4d773558812c9	64003	378272	1127352	/index.php?/archives/365-PHP-Community-Conference.html	/index.php?/archives/365-PHI
Mar 09 01:12:56 4d771a685e9ff	68004	290041	1111404	/index.php?/archives/2004/08/P2.html	/index.php?/archives//08/P2.
Oct 07 18:13:10 4cae45f7471bd	88006	1228901	1292392	/	/
Oct 07 18:03:37 4cae43ba0990b	100007	448230	1237236	/index.php?/archives/254-Good-Practice.html	/index.php?/archives/254-Goc
Oct 07 17:42:20 4cae3ebdc4786	80006	1306057	1292392	/	/
Oct 07 16:12:55 4cae29c7e55c5	104007	228547	1245128	/index.php?/archives/283-Stop-Messing-up-CSRF-Protection.html	/index.php?/archives/283-Stc
Oct 07 12:02:51 4cadef2c05828	60004	270355	1080912	/index.php?/archives/2009/06/10.html	/index.php?/archives//06/10.



Runs with URL: /

◆ Timestamp	◆ Cpu	◆ Wall Time	◆ Peak Memory Usage	◆ URL	◆ Simplified URL
May 15 17:22:24 4bef1091dabc8	72004	959712	1249388	/	/
May 16 05:58:46 4befc1d88a58d	96006	1587463	1249228	/	/
May 16 09:13:22	80005	1111850	1249256	/	/



XHProf: Hierarchical Profiler Report
XH XHProf: Hierarchical Profiler Report
+

RunID: 4bef1091dabc8 against blog.preinheimer.com/

View Callgraph

Stat	Exact URL	Similar URLs
Count	431	431
Min Wall Time	80.0740 ms	80.0740 ms
Max Wall Time	13.4525 s	13.4525 s
Avg Wall Time	1.3560 s	1.3560 s
95% Wall Time	3.9578 s	3.9578 s
Display run Incl. Wall Time (microsec)	**959,712 microsecs**	
Min CPU Ticks	68.0040 ms	68.0040 ms
Max CPU Ticks	300.0190 ms	300.0190 ms
Avg CPU Ticks	87.1422 ms	87.1422 ms
95% CPU Ticks	100.0070 ms	100.0070 ms
Display run Incl. CPU (microsecs)	**72,004 microsecs**	
Min Peak Memory Usage	1,232,296 bytes	1,232,296 bytes
Max Peak Memory Usage	5,934,540 bytes	5,934,540 bytes
Avg Peak Memory Usage	1,292,276 bytes	1,292,276 bytes
95% Peak Memory Usage	1,292,504 bytes	1,292,504 bytes
Display run Incl. PeakMemUse (bytes)	**1,249,388 bytes**	
Number of Function Calls:	**6,684**	
Perform Delta:		Delta

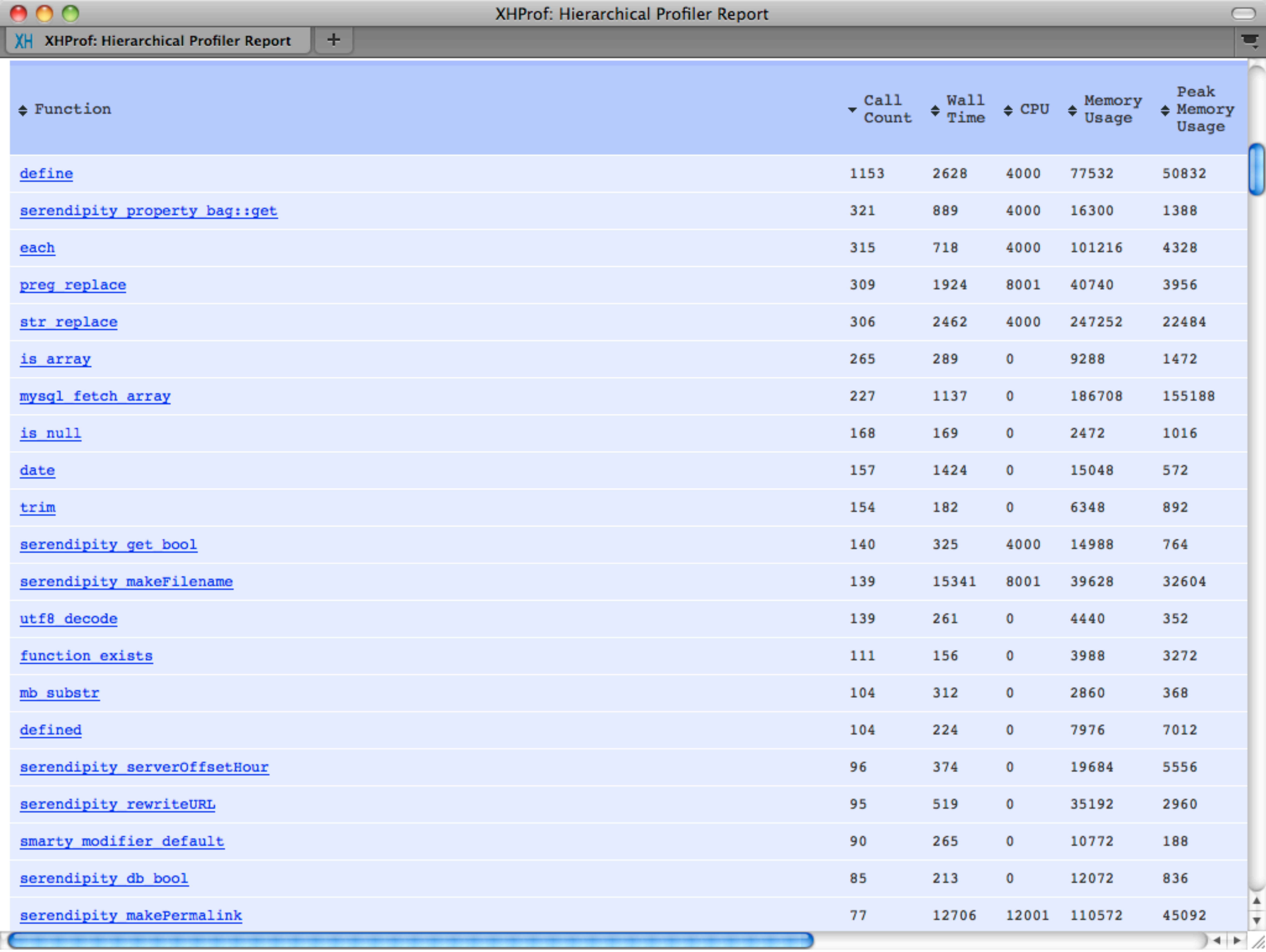
Cookie	Results
__utmz	67726530.1272566240.115. (referral)|utmcmd=r efer /reducing_oracle_lob_mem
s9y_bd0facf5b05c3c47c6f3b81718ee1acf	aef00bc01afe2127a7a11b5c
_profile	1
__utma	67726530.81678791900845
__utmc	67726530
__utmb	67726530.17.10.127395665
serendipity	

Get	Results
serendipity	, , 1, 1273958545

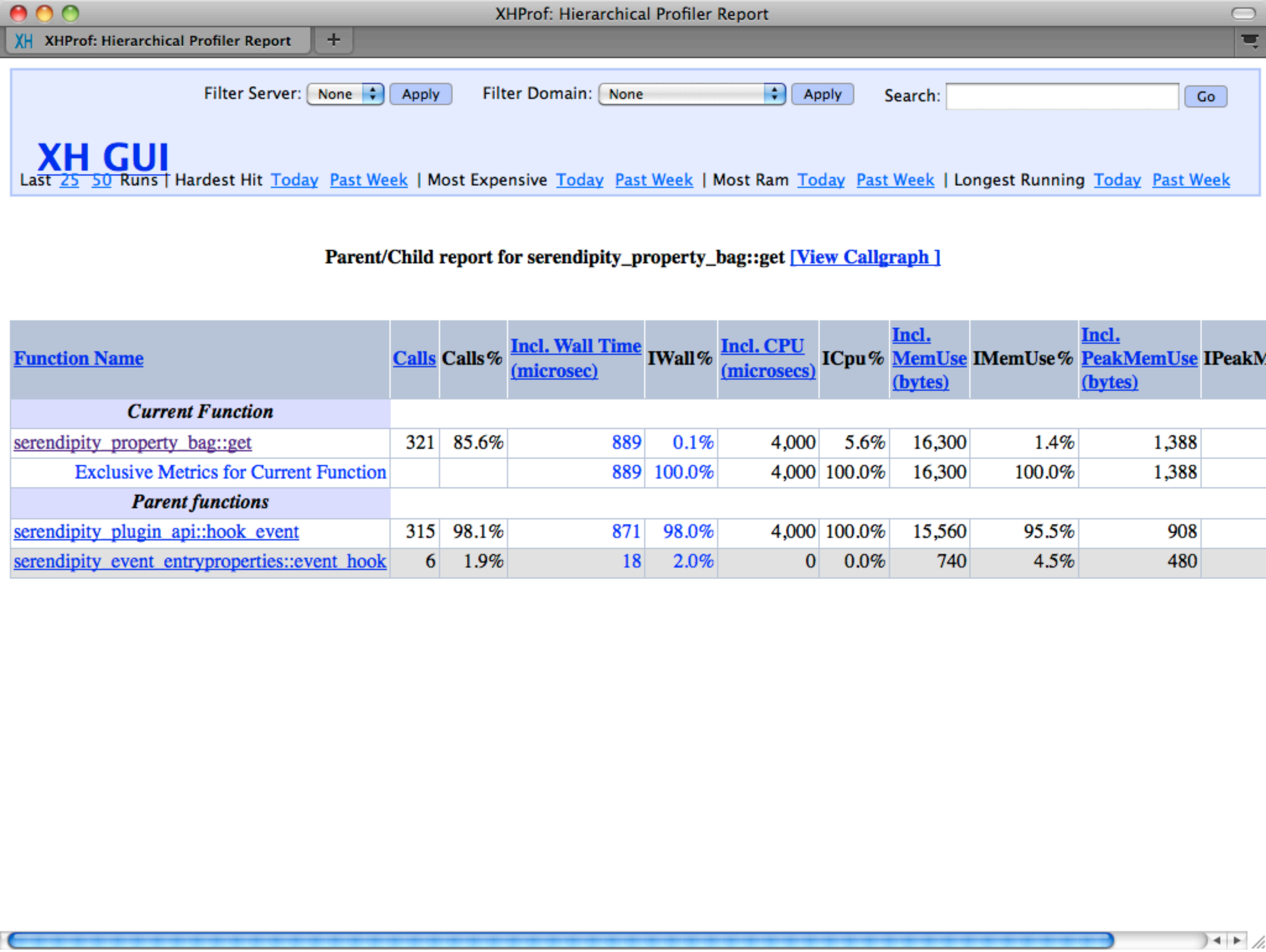
Post	Results
serendipity	

Expensive Calls by Exclusive Wall Time

Wednesday, March 9, 2011


XHProf: Hierarchical Profiler Report
XH XHProf: Hierarchical Profiler Report
+

Function	Call Count	Wall Time	CPU	Memory Usage	Peak Memory Usage
define	1153	2628	4000	77532	50832
serendipity_property_bag::get	321	889	4000	16300	1388
each	315	718	4000	101216	4328
preg_replace	309	1924	8001	40740	3956
str_replace	306	2462	4000	247252	22484
is_array	265	289	0	9288	1472
mysql_fetch_array	227	1137	0	186708	155188
is_null	168	169	0	2472	1016
date	157	1424	0	15048	572
trim	154	182	0	6348	892
serendipity_get_bool	140	325	4000	14988	764
serendipity_makeFilename	139	15341	8001	39628	32604
utf8_decode	139	261	0	4440	352
function_exists	111	156	0	3988	3272
mb_substr	104	312	0	2860	368
defined	104	224	0	7976	7012
serendipity_serverOffsetHour	96	374	0	19684	5556
serendipity_rewriteURL	95	519	0	35192	2960
smarty_modifier_default	90	265	0	10772	188
serendipity_db_bool	85	213	0	12072	836
serendipity_makePermalink	77	12706	12001	110572	45092


XHProf: Hierarchical Profiler Report
XH XHProf: Hierarchical Profiler Report
+
Filter Server: None Apply
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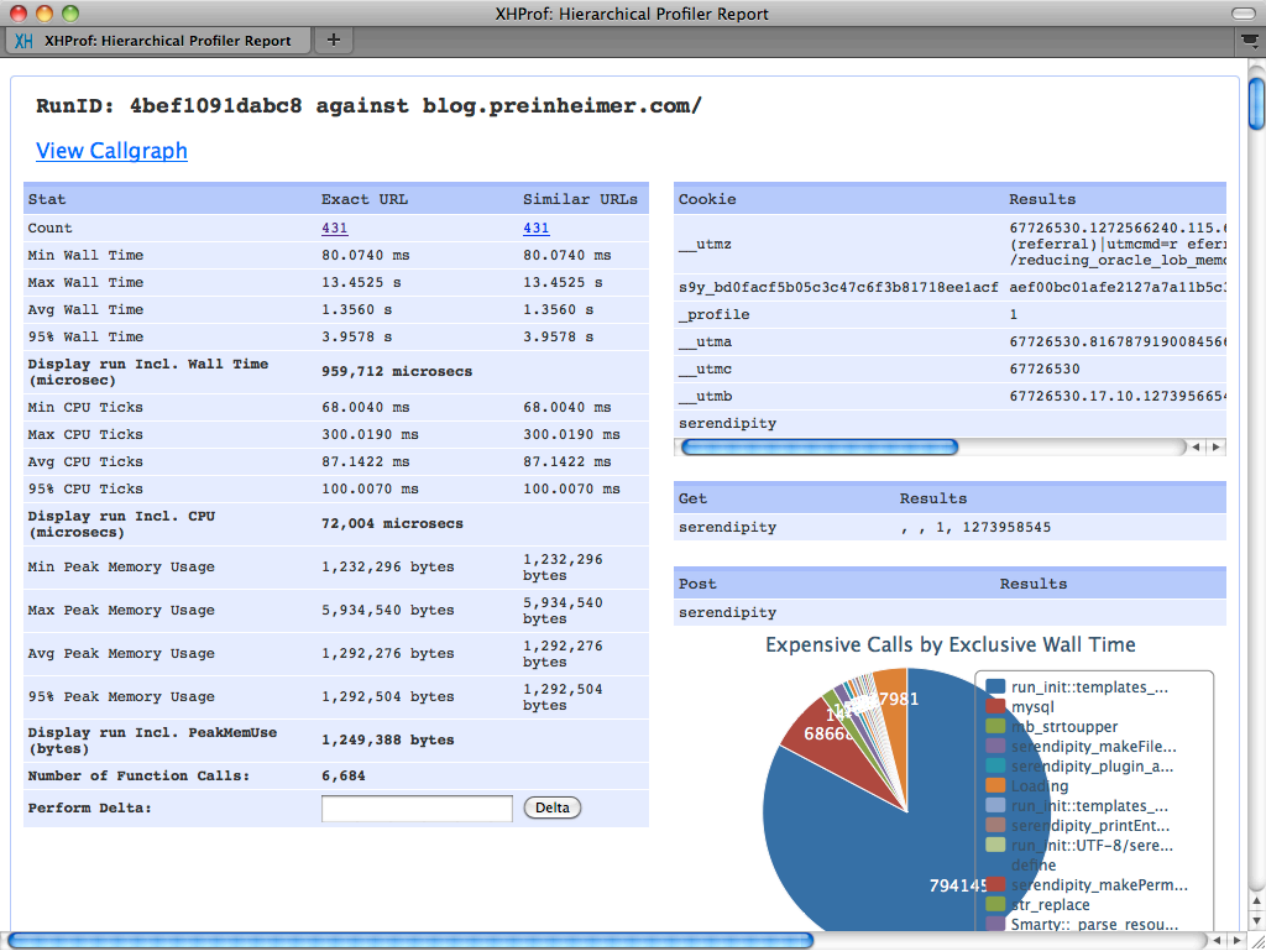
XH GUI
Last 25 50 Runs | Hardest Hit Today Past Week | Most Expensive Today Past Week | Most Ram Today Past Week | Longest Running Today Past Week

Parent/Child report for serendipity_property_bag::get [View Callgraph]

Function Name	Calls	Calls%	Incl. Wall Time (microsec)	IWall%	Incl. CPU (microsecs)	ICpu%	Incl. MemUse (bytes)	IMemUse%	Incl. PeakMemUse (bytes)	IPeakM
Current Function										
serendipity_property_bag::get	321	85.6%	889	0.1%	4,000	5.6%	16,300	1.4%	1,388	
Exclusive Metrics for Current Function			889	100.0%	4,000	100.0%	16,300	100.0%	1,388	
Parent functions										
serendipity_plugin_api::hook_event	315	98.1%	871	98.0%	4,000	100.0%	15,560	95.5%	908	
serendipity_event_entryproperties::event_hook	6	1.9%	18	2.0%	0	0.0%	740	4.5%	480	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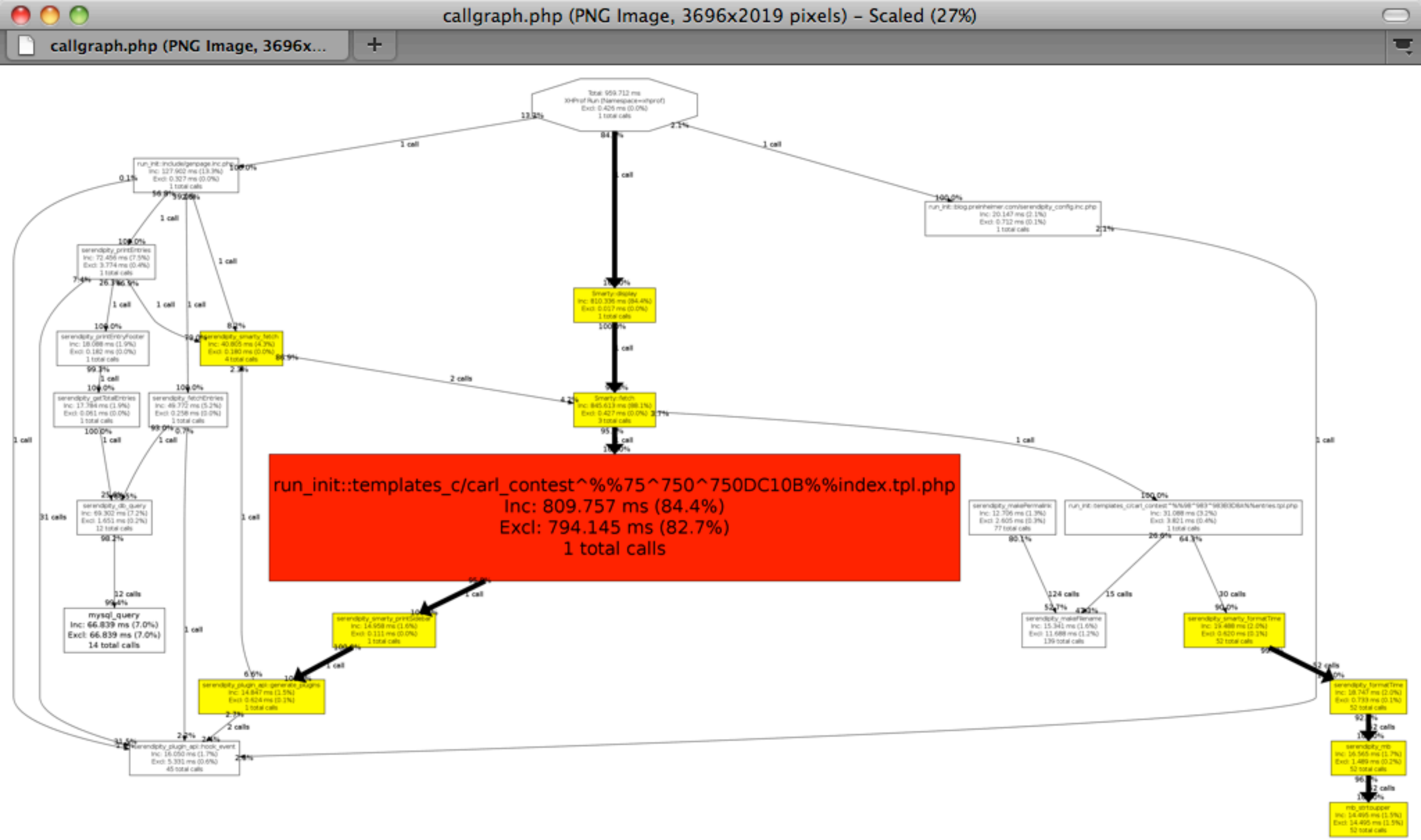
Cookie	Results
__utmz	67726530.1272566240.115. (referral)|utmcmd=r eferr /reducing_oracle_lob_memo
s9y_bd0facf5b05c3c47c6f3b81718ee1acf	aef00bc01afe2127a7a11b5c1
_profile	1
__utma	67726530.81678791900845 6
__utmc	67726530
__utmb	67726530.17.10.127395665
serendipity	

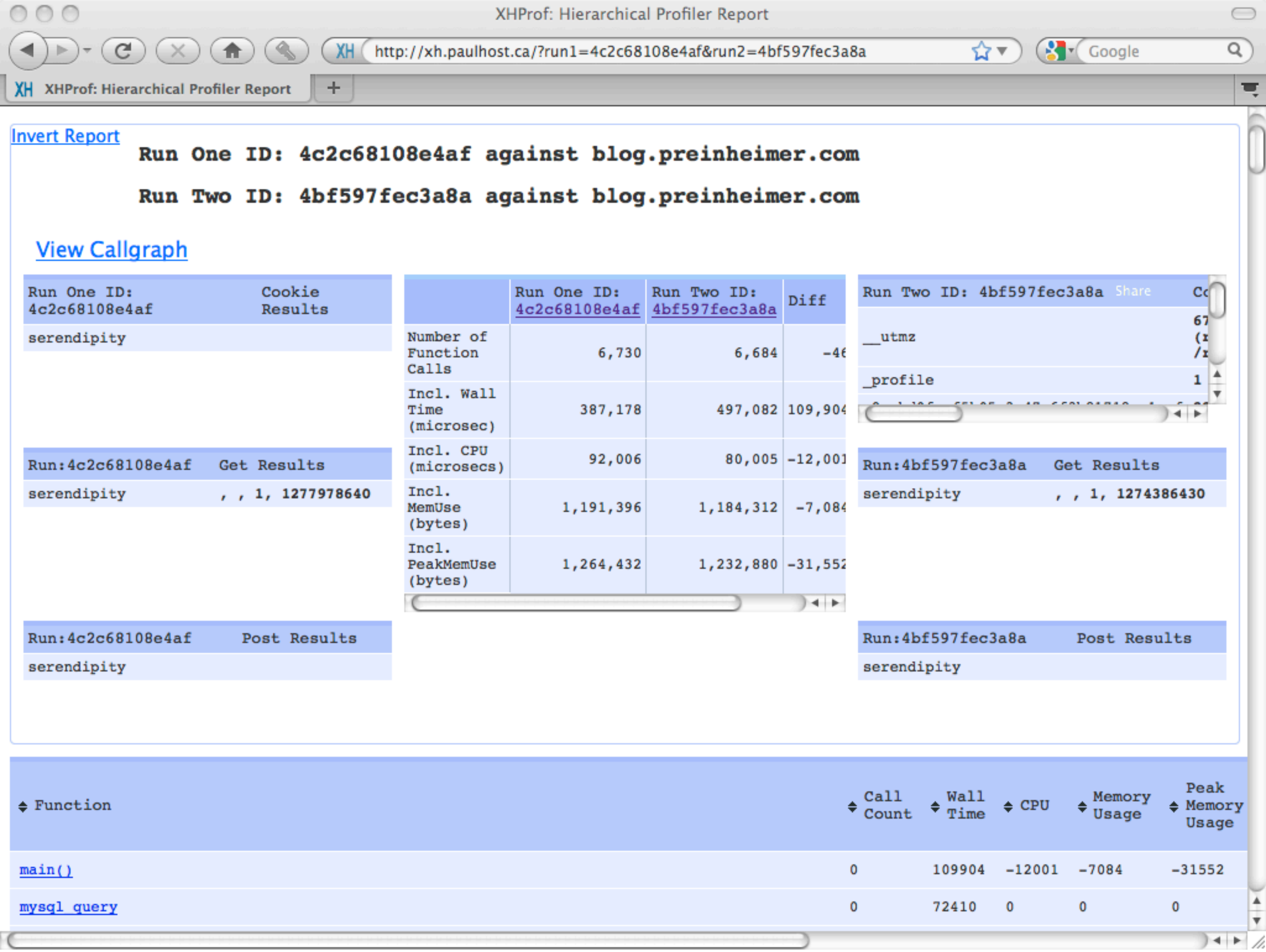
Get	Results
serendipity	, , 1, 1273958545

Post	Results
serendipity	

Expensive Calls by Exclusive Wall Time



callgraph.php (PNG Image, 3696x2019 pixels) - Scaled (27%)
callgraph.php (PNG Image, 3696x...
+
Total: 959.712 ms
XHProf Run (Namespace=xhprof)
Excl: 0.426 ms (0.0%)
1 total calls
run_init::include/genpage.inc.php
Inc: 127.902 ms (13.3%)
Excl: 0.327 ms (0.0%)
1 total calls
run_init::blog.preinheimer.com/serendipity_config.inc.php
Inc: 20.147 ms (2.1%)
Excl: 0.712 ms (0.1%)
1 total calls
serendipity_printEntries
Inc: 72.456 ms (7.5%)
Excl: 3.774 ms (0.4%)
1 total calls
Smarty::display
Inc: 810.336 ms (84.4%)
Excl: 0.017 ms (0.0%)
1 total calls
serendipity_printEntryFooter
Inc: 18.088 ms (1.9%)
Excl: 0.182 ms (0.0%)
1 total calls
serendipity_smarty_fetch
Inc: 40.805 ms (4.3%)
Excl: 0.180 ms (0.0%)
4 total calls
serendipity_getTotalEntries
Inc: 17.784 ms (1.9%)
Excl: 0.061 ms (0.0%)
1 total calls
serendipity_fetchEntries
Inc: 49.772 ms (5.2%)
Excl: 0.258 ms (0.0%)
1 total calls
Smarty::fetch
Inc: 845.613 ms (88.1%)
Excl: 0.427 ms (0.0%)
3 total calls
run_init::templates_c/carl_contest^%%75^750^750DC10B%%index.tpl.php
Inc: 809.757 ms (84.4%)
Excl: 794.145 ms (82.7%)
1 total calls
serendipity_db_query
Inc: 69.302 ms (7.2%)
Excl: 1.651 ms (0.2%)
12 total calls
serendipity_makePermalink
Inc: 12.706 ms (1.3%)
Excl: 2.605 ms (0.3%)
77 total calls
run_init::templates_c/carl_contest^%%98^983^983B3D8A%%entries.tpl.php
Inc: 31.088 ms (3.2%)
Excl: 3.821 ms (0.4%)
1 total calls
mysql_query
Inc: 66.839 ms (7.0%)
Excl: 66.839 ms (7.0%)
14 total calls
serendipity_smarty_printSidebar
Inc: 14.958 ms (1.6%)
Excl: 0.111 ms (0.0%)
1 total calls
serendipity_makeFilename
Inc: 15.341 ms (1.6%)
Excl: 11.688 ms (1.2%)
139 total calls
serendipity_smarty_formatTime
Inc: 19.488 ms (2.0%)
Excl: 0.620 ms (0.1%)
52 total calls
serendipity_plugin_api::generate_plugins
Inc: 14.847 ms (1.5%)
Excl: 0.624 ms (0.1%)
1 total calls
serendipity_formatTime
Inc: 18.747 ms (2.0%)
Excl: 0.733 ms (0.1%)
52 total calls
serendipity_plugin_api::hook_event
Inc: 16.050 ms (1.7%)
Excl: 5.331 ms (0.6%)
45 total calls
serendipity_mb
Inc: 16.565 ms (1.7%)
Excl: 1.489 ms (0.2%)
52 total calls
mb_strtoupper
Inc: 14.495 ms (1.5%)
Excl: 14.495 ms (1.5%)
52 total calls
1 call
2 calls
12 calls
31 calls
124 calls
15 calls
30 calls
52 calls



XHProf: Hierarchical Profiler Report
http://xh.paulhost.ca/?run1=4c2c68108e4af&run2=4bf597fec3a8a
Google
XHProf: Hierarchical Profiler Report

Invert Report

Run One ID: 4c2c68108e4af against blog.preinheimer.com

Run Two ID: 4bf597fec3a8a against blog.preinheimer.com

View Callgraph

Run One ID: 4c2c68108e4af	Cookie Results
serendipity	

	Run One ID: 4c2c68108e4af	Run Two ID: 4bf597fec3a8a	Diff
Number of Function Calls	6,730	6,684	-46
Incl. Wall Time (microsec)	387,178	497,082	109,904
Incl. CPU (microsecs)	92,006	80,005	-12,001
Incl. MemUse (bytes)	1,191,396	1,184,312	-7,084
Incl. PeakMemUse (bytes)	1,264,432	1,232,880	-31,552

Run Two ID: 4bf597fec3a8a	Co
__utmz	67 (r /r
_profile	1

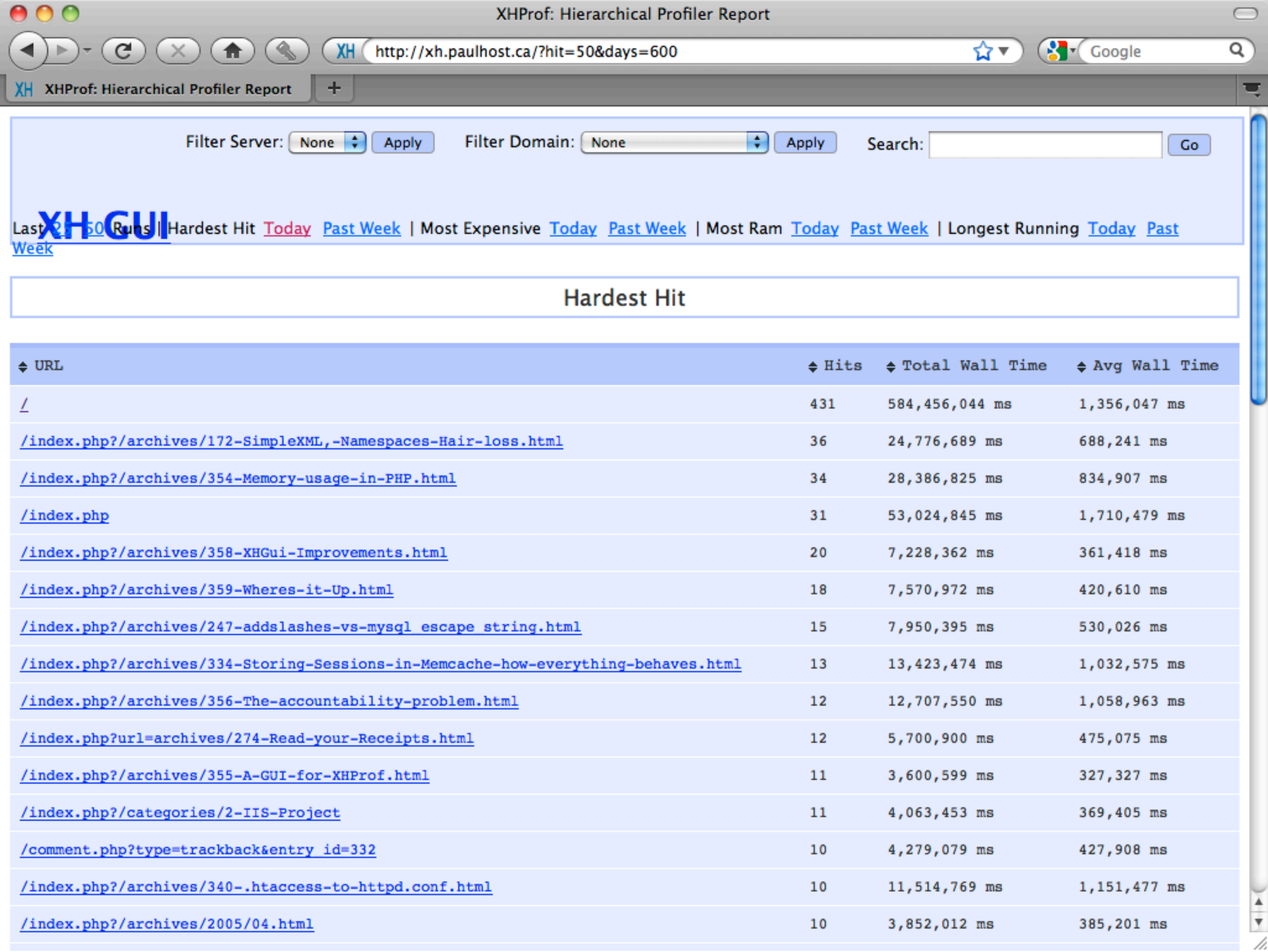
Run:4c2c68108e4af	Get Results
serendipity	, , 1, 1277978640

Run:4bf597fec3a8a	Get Results
serendipity	, , 1, 1274386430

Run:4c2c68108e4af	Post Results
serendipity	

Run:4bf597fec3a8a	Post Results
serendipity	

Function	Call Count	Wall Time	CPU	Memory Usage	Peak Memory Usage
main()	0	109904	-12001	-7084	-31552
mysql_query	0	72410	0	0	0


XHProf: Hierarchical Profiler Report
http://xh.paulhost.ca/?hit=50&days=600
Google
XHProf: Hierarchical Profiler Report
XH GUI

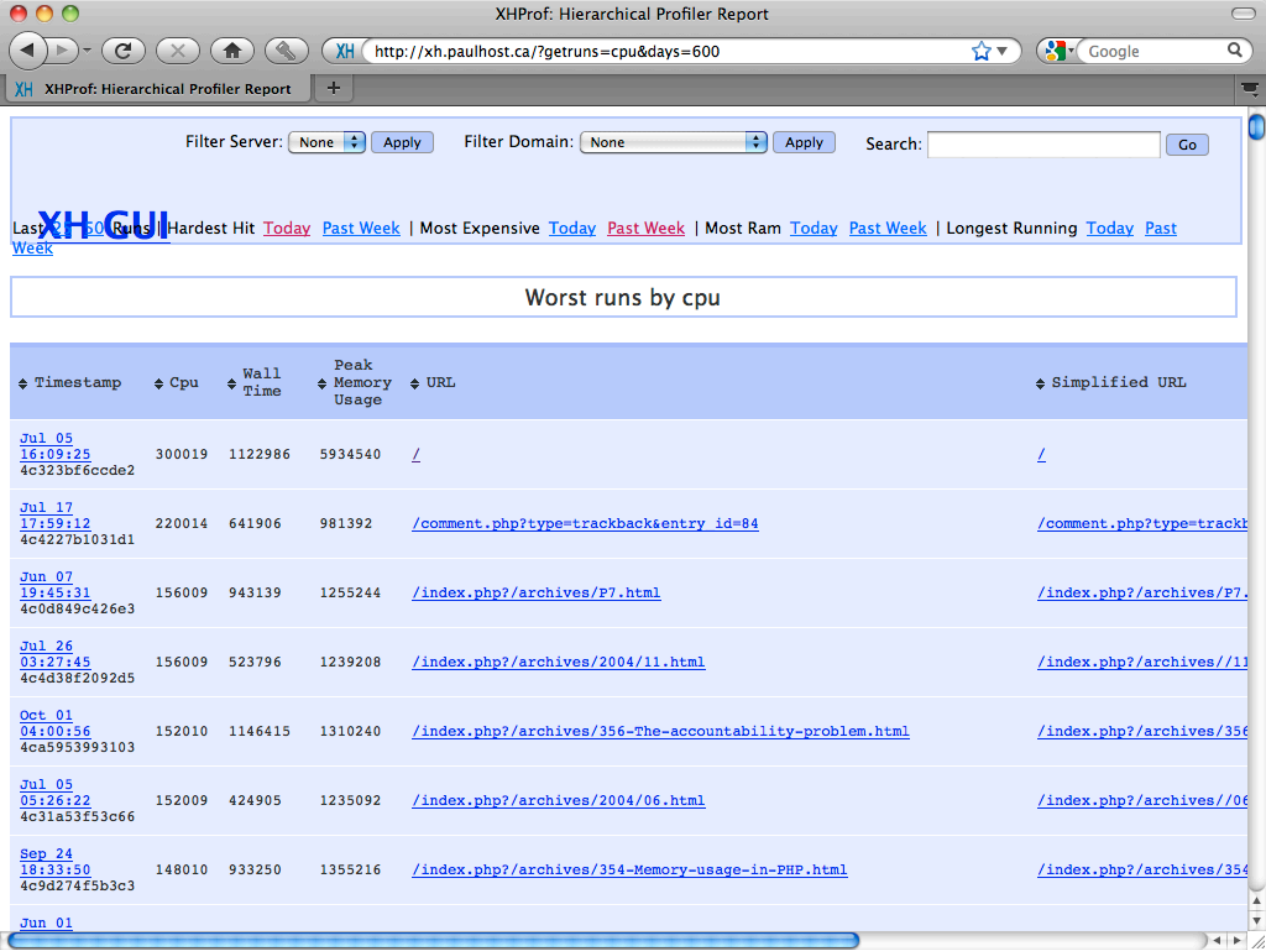
Filter Server: None Apply Filter Domain: None Apply Search: Go

Last 25 50 Runs | Hardest Hit Today Past Week | Most Expensive Today Past Week | Most Ram Today Past Week | Longest Running Today Past Week

Hardest Hit

URL	Hits	Total Wall Time	Avg Wall Time
/	431	584,456,044 ms	1,356,047 ms
/index.php?/archives/172-SimpleXML,-Namespaces-Hair-loss.html	36	24,776,689 ms	688,241 ms
/index.php?/archives/354-Memory-usage-in-PHP.html	34	28,386,825 ms	834,907 ms
/index.php	31	53,024,845 ms	1,710,479 ms
/index.php?/archives/358-XHGui-Improvements.html	20	7,228,362 ms	361,418 ms
/index.php?/archives/359-Wheres-it-Up.html	18	7,570,972 ms	420,610 ms
/index.php?/archives/247-addslashes-vs-mysql escape string.html	15	7,950,395 ms	530,026 ms
/index.php?/archives/334-Storing-Sessions-in-Memcache-how-everything-behaves.html	13	13,423,474 ms	1,032,575 ms
/index.php?/archives/356-The-accountability-problem.html	12	12,707,550 ms	1,058,963 ms
/index.php?url=archives/274-Read-your-Receipts.html	12	5,700,900 ms	475,075 ms
/index.php?/archives/355-A-GUI-for-XHProf.html	11	3,600,599 ms	327,327 ms
/index.php?/categories/2-IIS-Project	11	4,063,453 ms	369,405 ms
/comment.php?type=trackback&entry id=332	10	4,279,079 ms	427,908 ms
/index.php?/archives/340-.htaccess-to-httpd.conf.html	10	11,514,769 ms	1,151,477 ms
/index.php?/archives/2005/04.html	10	3,852,012 ms	385,201 ms

XH GUI

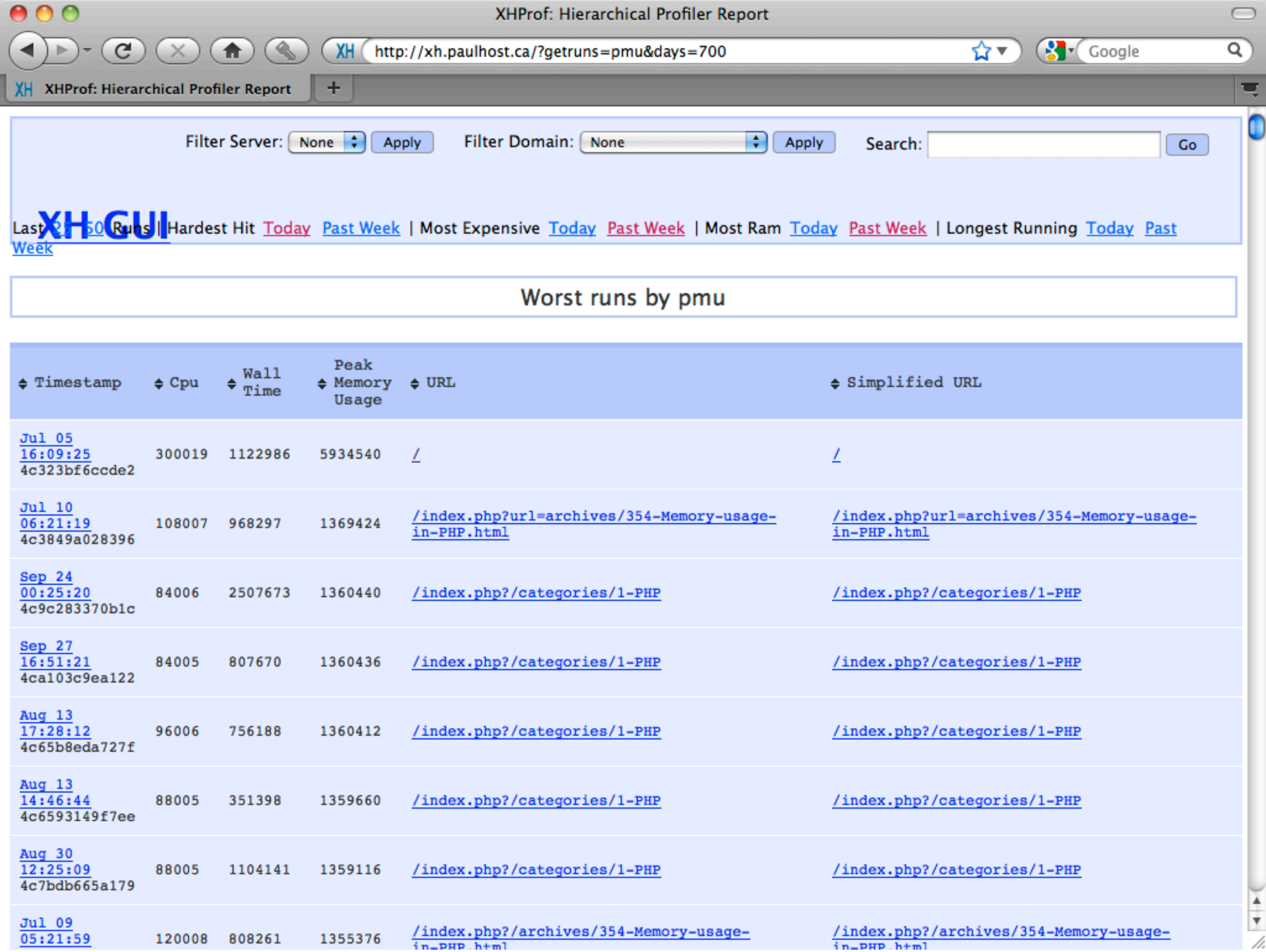

XHProf: Hierarchical Profiler Report
http://xh.paulhost.ca/?getruns=cpu&days=600
Google
XHProf: Hierarchical Profiler Report

Filter Server: None Apply Filter Domain: None Apply Search: Go

Last 25 50 Runs | Hardest Hit Today Past Week | Most Expensive Today Past Week | Most Ram Today Past Week | Longest Running Today Past Week

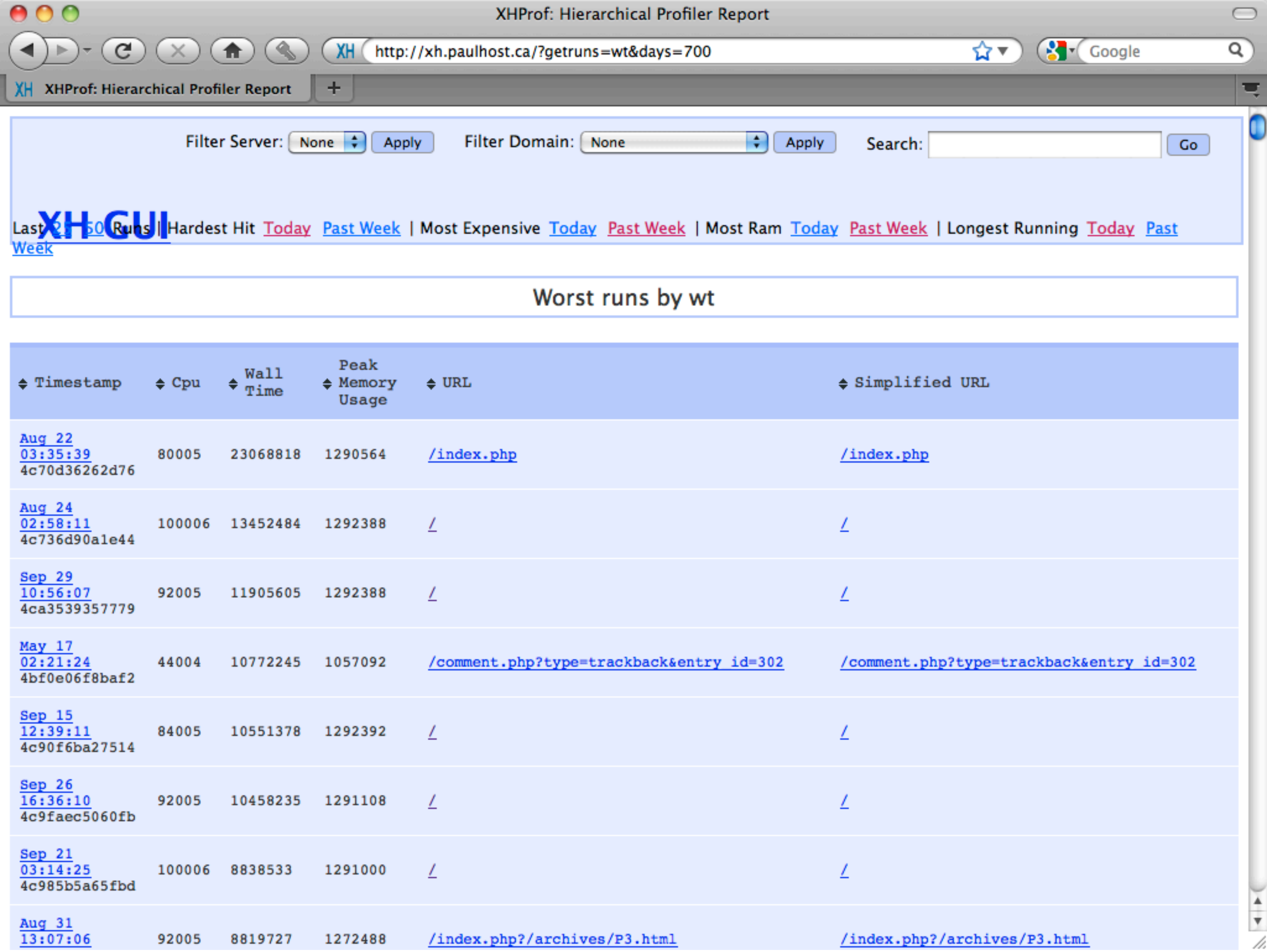
Worst runs by cpu

Timestamp	Cpu	Wall Time	Peak Memory Usage	URL	Simplified URL
Jul 05 16:09:25 4c323bf6ccde2	300019	1122986	5934540	/	/
Jul 17 17:59:12 4c4227b1031d1	220014	641906	981392	/comment.php?type=trackback&entry_id=84	/comment.php?type=trackb
Jun 07 19:45:31 4c0d849c426e3	156009	943139	1255244	/index.php?/archives/P7.html	/index.php?/archives/P7.
Jul 26 03:27:45 4c4d38f2092d5	156009	523796	1239208	/index.php?/archives/2004/11.html	/index.php?/archives//11
Oct 01 04:00:56 4ca5953993103	152010	1146415	1310240	/index.php?/archives/356-The-accountability-problem.html	/index.php?/archives/356
Jul 05 05:26:22 4c31a53f53c66	152009	424905	1235092	/index.php?/archives/2004/06.html	/index.php?/archives//06
Sep 24 18:33:50 4c9d274f5b3c3	148010	933250	1355216	/index.php?/archives/354-Memory-usage-in-PHP.html	/index.php?/archives/354
Jun 01					


XHProf: Hierarchical Profiler Report
http://xh.paulhost.ca/?getruns=pmu&days=700
Google
XHProf: Hierarchical Profiler Report
Filter Server: None
Apply
Filter Domain: None
Apply
Search:
Go
XH GUI
Last 25 50 Runs | Hardest Hit Today Past Week | Most Expensive Today Past Week | Most Ram Today Past Week | Longest Running Today Past Week

Worst runs by pmu

Timestamp	Cpu	Wall Time	Peak Memory Usage	URL	Simplified URL
Jul 05 16:09:25 4c323bf6ccde2	300019	1122986	5934540	/	/
Jul 10 06:21:19 4c3849a028396	108007	968297	1369424	/index.php?url=archives/354-Memory-usage-in-PHP.html	/index.php?url=archives/354-Memory-usage-in-PHP.html
Sep 24 00:25:20 4c9c283370b1c	84006	2507673	1360440	/index.php?/categories/1-PHP	/index.php?/categories/1-PHP
Sep 27 16:51:21 4ca103c9ea122	84005	807670	1360436	/index.php?/categories/1-PHP	/index.php?/categories/1-PHP
Aug 13 17:28:12 4c65b8eda727f	96006	756188	1360412	/index.php?/categories/1-PHP	/index.php?/categories/1-PHP
Aug 13 14:46:44 4c6593149f7ee	88005	351398	1359660	/index.php?/categories/1-PHP	/index.php?/categories/1-PHP
Aug 30 12:25:09 4c7bdb665a179	88005	1104141	1359116	/index.php?/categories/1-PHP	/index.php?/categories/1-PHP
Jul 09 05:21:59	120008	808261	1355376	/index.php?/archives/354-Memory-usage-in-PHP.html	/index.php?/archives/354-Memory-usage-in-PHP.html



XHProf: Hierarchical Profiler Report
http://xh.paulhost.ca/?getruns=wt&days=700
Google
XHProf: Hierarchical Profiler Report

Filter Server: None Apply Filter Domain: None Apply Search: Go

XH GUI

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Worst runs by wt

Timestamp	Cpu	Wall Time	Peak Memory Usage	URL	Simplified URL
Aug 22 03:35:39 4c70d36262d76	80005	23068818	1290564	/index.php	/index.php
Aug 24 02:58:11 4c736d90a1e44	100006	13452484	1292388	/	/
Sep 29 10:56:07 4ca3539357779	92005	11905605	1292388	/	/
May 17 02:21:24 4bf0e06f8baf2	44004	10772245	1057092	/comment.php?type=trackback&entry_id=302	/comment.php?type=trackback&entry_id=302
Sep 15 12:39:11 4c90f6ba27514	84005	10551378	1292392	/	/
Sep 26 16:36:10 4c9faec5060fb	92005	10458235	1291108	/	/
Sep 21 03:14:25 4c985b5a65fbd	100006	8838533	1291000	/	/
Aug 31 13:07:06	92005	8819727	1272488	/index.php?/archives/P3.html	/index.php?/archives/P3.html

Resume

Live Demo

Configure Frontend

```
<VirtualHost *:80>
....
  php_value auto_append_file '/var/www/xh.paulhost.ca/
external/footer.php'
  php_value auto_prepend_file '/var/www/xh.paulhost.ca/
external/header.php'
</VirtualHost>
```

Tweaking

```
$exceptionURLs = array();
$exceptionURLs[] = "/imgMaker/";
$exceptionURLs[] = "/xmlDatas/";
$exceptionPostURLs = array();
$exceptionPostURLs[] = "login";
$_xhprof['display'] = false;
$_xhprof['doprofile'] = false;
$controlIPs = array();
$controlIPs[] = "127.0.0.1";
```

URL Similator

```
function _urlSimilartor($url)
{
  //This is an example
  $url = preg_replace("!\d{4}!",
"", $url);
  $url = preg_replace("![?&]
_profile=\d!", "", $url);
  return $url;
}
```

Pie Slice Merger

```
function _aggregateCalls($calls, $rules = null)
{
    $rules = array(
        'Loading' => 'load::',
        'mysql' => 'mysql_'
        );
    $addIns = array();
    foreach($calls as $index => $call)
    {
        foreach($rules as $rule => $search)
        {
            if (strpos($call['fn'], $search) !== false)
            {
                if (isset($addIns[$search]))
                {
                    unset($call['fn']);
                    foreach($call as $k => $v)
                    {
                        $addIns[$search][$k] += $v;
                    }
                }else
                {
                    $call['fn'] = $rule;
                    $addIns[$search] = $call;
                }
                unset($calls[$index]);  //Remove it from the listing
                break;  //We don't need to run any more rules on this
            }else
            {
                //echo "nomatch for $search in {$call['fn']}<br />\n";
            }
        }
    }
    return array_merge($addIns, $calls);
  }
```

Future

Problems with XHGui

- Datastore

Mongo

Closing

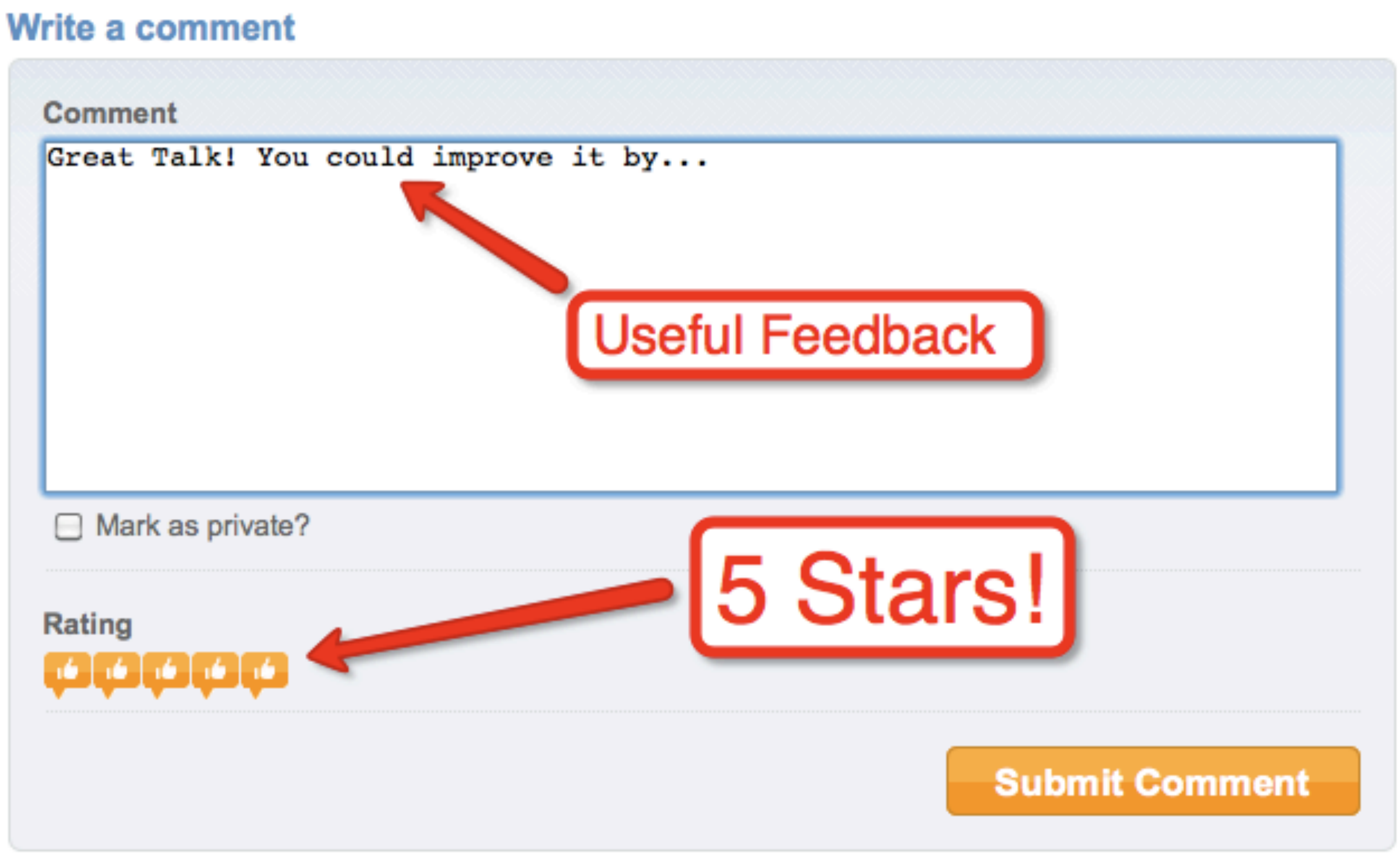
Appendix

- Confessions of a Public Speaker - Scott Berkun
- XHProf - http://mirror.facebook.net/facebook/xhprof/doc.html
- XHGui - https://github.com/preinheimer/xhprof
- Joel Perras - http://nerderati.com/
- Sean Coates - http://seancoates.com/blogs/

- Me - Paul Reinheimer - http://blog.preinheimer.com

Feedback

http://joind.in/talk/view/2800



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