

Debugging with Xdebug

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Derick Rethans



- Dutchman living in London
- PHP development
- Author of the `mcrypt`, `input_filter`, `dbus`, `translit` and `date/time` extensions
- Author of `Xdebug`
- Contributor to the Apache Zeta Components Incubator project (formerly eZ Components)
- Freelancer doing PHP (internals) development



- Xdebug: An Open Source debugging tool
- About 8 years old
- Works on "every" operating system
- Version 2.1 released about three months ago

Tailored installation instructions:

Help By Error Messages

```
Warning: DOMDocument::load() [domdocument.load]: Document is empty in
/home/httpd/presentations,
line: 1 in /home/httpd/pres2/show2.php on line 165
```

```
( ! ) Warning: DOMDocument::load() [domdocument.load]: Document is empty in /home/httpd/
presentations,_line:_1_in_/home/httpd/pres2/show2.php_on_line_165_____
|Call_Stack_____
|#|Time__|Memory_|Function_____|Location_____
|1|0.0022|_786328|{main}(_)_____|../show2.php:0_____
|2|0.0180|1397248|Presentation->display(_____|../show2.php:114_____
|3|0.0183|1399032|DOMDocument->load(_____|../show2.php:165_____
```

```
xdebug.default_enable=1
html_errors=1
```

```
( ! ) Warning: DOMDocument::load() [domdocument.load]: Document is empty in /home/httpd/
presentations,_line:_1_in_/home/httpd/pres2/show2.php_on_line_165_____
|Call_Stack_____
|#|Time__|Memory_|Function_____|Location_____
|1|0.0024|_786328|{main}(_)_____|../show2.php:0_____
|2|0.0183|1397248|Presentation->display(_null_)_____|../show2.php:114_____
|3|0.0185|1399032|DOMDocument->load(_string(32)_)_____|../show2.php:165_____
```

```
xdebug.collect_params=1
```

```
( ! ) Warning: DOMDocument::load() [domdocument.load]: Document is empty in /home/httpd/
presentations,_line:_1_in_/home/httpd/pres2/show2.php_on_line_165_____
|Call_Stack_____
|#|Time__|Memory_|Function_____|Location_____
|1|0.0022|_787720|{main}(_)_____|../show2.php:0_____
|2|0.0183|1398552|Presentation->display(_null_)_____|../show2.php:114_____
|3|0.0186|1400336|DOMDocument->load(_string(32)_)_____|../show2.php:165_____
```

```
xdebug.collect_params=2
```

```
( ! ) Warning: DOMDocument::load() [domdocument.load]: Document is empty in /home/httpd/
presentations,_line:_1_in_/home/httpd/pres2/show2.php_on_line_165_____
```


Scream

- PHP's @ operator hides warnings and errors
- `xdebug.scream=1` makes PHP ignore @



Function trace

```
TRACE START [2010-03-24 11:03:12]
0.0022    787776    -> {main}() /home/httpd/pres2/show2.php:0
0.0028    803160    -> require(/home/derick/dev/ezcomponents/trunk/Base/src/
ezc_bootstrap.php)/home/httpd/pres2/show2.php:2
0.0029    803552    -> dirname('/home/derick/dev/ezcomponents/trunk/Base/src/
ezc_bootstrap.php')/home/derick/dev/ezcomponents/trunk/Base/src/ezc_bootstrap.php:12
0.0030    803968    -> explode('/', '/home/derick/dev/ezcomponents/trunk/Base/src')/home/
derick/dev/ezcomponents/trunk/Base/src/ezc_bootstrap.php:13
0.0031    807352    -> count(array (0 => '', 1 => 'home', 2 => 'derick', 3 => 'dev', 4 =>
'ezcomponents', 5 => 'trunk', 6 => 'Base', 7 => 'src'))/home/derick/dev/ezcomponents/trunk/Base/src/
ezc_bootstrap.php:15
0.0032    807800    -> array_slice(array (0 => '', 1 => 'home', 2 => 'derick', 3 => 'dev', 4
=> 'ezcomponents', 5 => 'trunk', 6 => 'Base', 7 => 'src'), 0, -2)/home/derick/dev/ezcomponents/
trunk/Base/src/ezc_bootstrap.php:17
0.0033    808952    -> join('/', array (0 => '', 1 => 'home', 2 => 'derick', 3 => 'dev', 4
=> 'ezcomponents', 5 => 'trunk'))/home/derick/dev/ezcomponents/trunk/Base/src/ezc_bootstrap.php:17
0.0065    1002544    -> require(/home/derick/dev/ezcomponents/trunk/Base/src/base.php)/home/
derick/dev/ezcomponents/trunk/Base/src/ezc_bootstrap.php:18
0.0066    990560    -> __autoload('ezcTemplateCustomFunction')/home/derick/dev/ezcomponents/
trunk/Base/src/ezc_bootstrap.php:0
0.0066    990560    -> ezcBase::autoload('ezcTemplateCustomFunction')/home/derick/dev/
ezcomponents/trunk/Base/src/ezc_bootstrap.php:38
0.0067    990560    -> ezcBase::setPackageDir()/home/derick/dev/ezcomponents/trunk/Base/
src/base.php:125
0.0068    990832    -> dirname('/home/derick/dev/ezcomponents/trunk/Base/src/base.php')/
home/derick/dev/ezcomponents/trunk/Base/src/base.php:244
0.0069    990728    -> array_key_exists('ezcTemplateCustomFunction', array ())/home/
derick/dev/ezcomponents/trunk/Base/src/base.php:128
0.0069    990728    -> array_key_exists('ezcTemplateCustomFunction', array ())/home/
derick/dev/ezcomponents/trunk/Base/src/base.php:142
0.0070    991536    -> preg_match('/^([a-z0-9]*)([A-Z][a-z0-9]*)?([A-Z][a-z0-9]*)?/',
'ezcTemplateCustomFunction', NULL)/home/derick/dev/ezcomponents/trunk/Base/src/base.php:157
0.0072    993304    -> sizeof(array (0 => 'ezcTemplateCustom', 1 => 'ezc', 2 =>
'Template', 3 => 'Custom'))/home/derick/dev/ezcomponents/trunk/Base/src/base.php:161
0.0073    993664    -> strtolower('Template_Custom_autoload.php')/home/derick/dev/
ezcomponents/trunk/Base/src/base.php:165
0.0073    993496    -> ezcBase::requireFile('template_custom_autoload.php',
'ezcTemplateCustomFunction', 'ezc')/home/derick/dev/ezcomponents/trunk/Base/src/base.php:167
0.0074    994184    -> file_exists('/home/derick/dev/ezcomponents/trunk/Base/src/../../../../
autoload/template_custom_autoload.php')/home/derick/dev/ezcomponents/trunk/Base/src/base.php:278
0.0075    993848    -> strtolower('Template_autoload.php')/home/derick/dev/ezcomponents/
trunk/Base/src/base.php:175
0.0076    993888    -> ezcBase::requireFile('template_autoload.php',
'ezcTemplateCustomFunction', 'ezc')/home/derick/dev/ezcomponents/trunk/Base/src/base.php:177
0.0077    994568    -> file_exists('/home/derick/dev/ezcomponents/trunk/Base/src/../../../../
autoload/template_autoload.php')/home/derick/dev/ezcomponents/trunk/Base/src/base.php:278
0.0100    1105728    -> require(/home/derick/dev/ezcomponents/trunk/autoload/
template_autoload.php)/home/derick/dev/ezcomponents/trunk/Base/src/base.php:280
```

Function trace

Other functionality

- HTML traces
- Tracing only parts of an application with `xdebug_start_trace()` and `xdebug_stop_trace()`.
- Fetching the trace file name that is being used with `xdebug_get_tracefile_name()`.
- Changing how much data is shown with `xdebug.var_display_max_children`, `xdebug.var_display_max_data` and `xdebug.var_display_max_depth`.

Simple profiling

- Uses the "computerized" trace files
- A script is provided in the Xdebug source dir: contrib/tracefile-analyser.php:

```
php tracefile-analyser.php /tmp/trace.124683842.xt [sortkey] [element count]
```

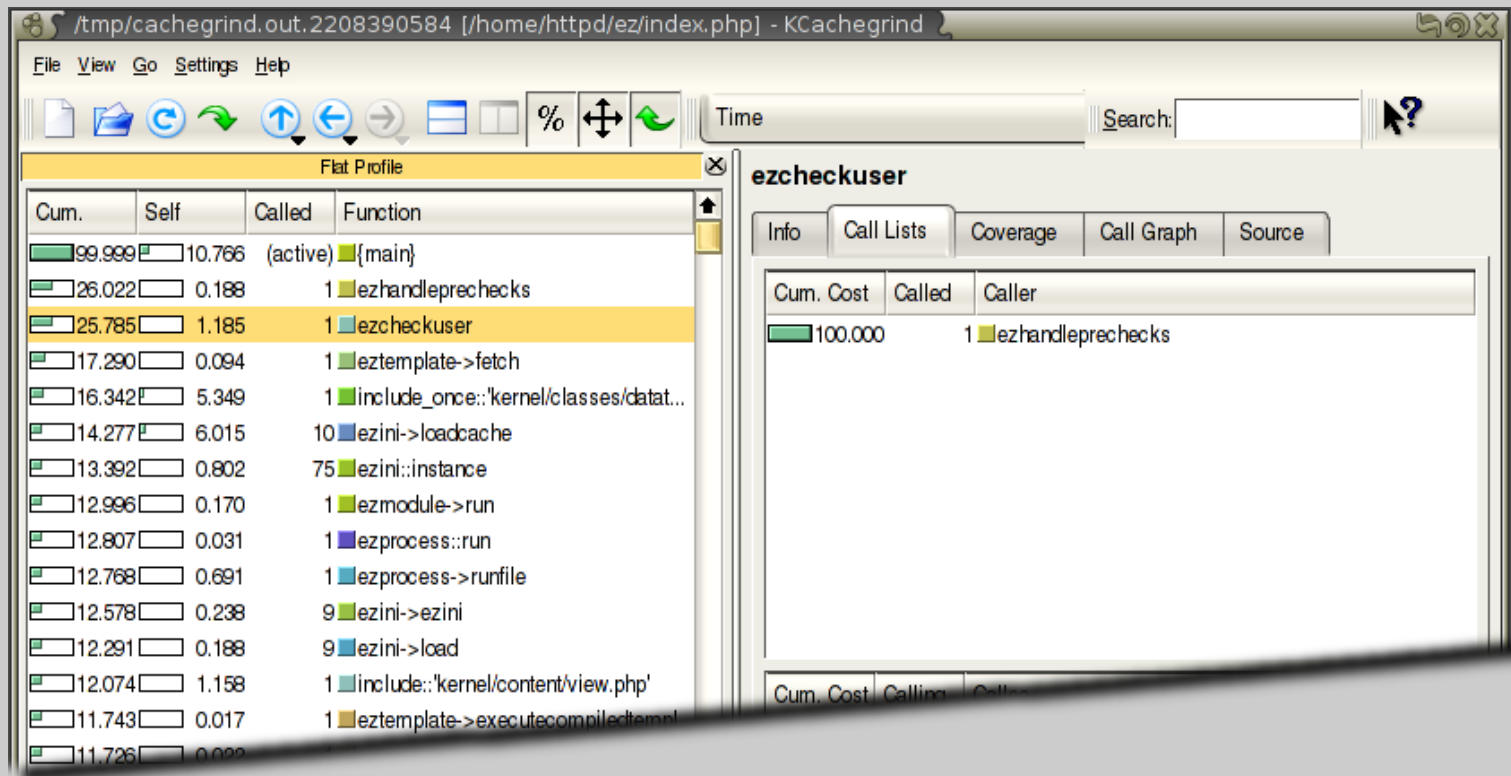
- sort keys: calls, time-inclusive, memory-inclusive, time-own, memory-own

Showing the 10 most costly calls sorted by 'time-inclusive'.

| function | #calls | Inclusive time | memory | Own time | memory |
|--|--------|-------------------|---------|-------------|--------|
| {main} | 1 | 0.0894 | 1025656 | 0.0006 | 5672 |
| Presentation->display | 1 | 0.0723 | 408848 | 0.0004 | -11528 |
| ezcTemplate->process | 10 | 0.0685 | 243320 | 0.0005 | -2976 |
| ezcTemplateCompiledCode->execute | 10 | 0.0627 | 14144 | 0.0009 | 1672 |
| include | 10 | 0.0612 | 12352 | 0.0009 | -4392 |
| __autoload | 10 | 0.0176 | 781904 | 0.0006 | 1080 |
| ezcBase::autoload | 10 | 0.0170 | 780824 | 0.0017 | -80728 |
| ezcTemplateCompiledCode::findCompiled | 10 | 0.0094 | 38776 | 0.0024 | 12888 |
| ezcTemplateCompiledCode->checkRequirements | 10 | 0.0094 | 2968 | 0.0029 | 2968 |
| ezcBase::loadFile | 10 | 0.0093 | 642320 | 0.0070 | 625520 |

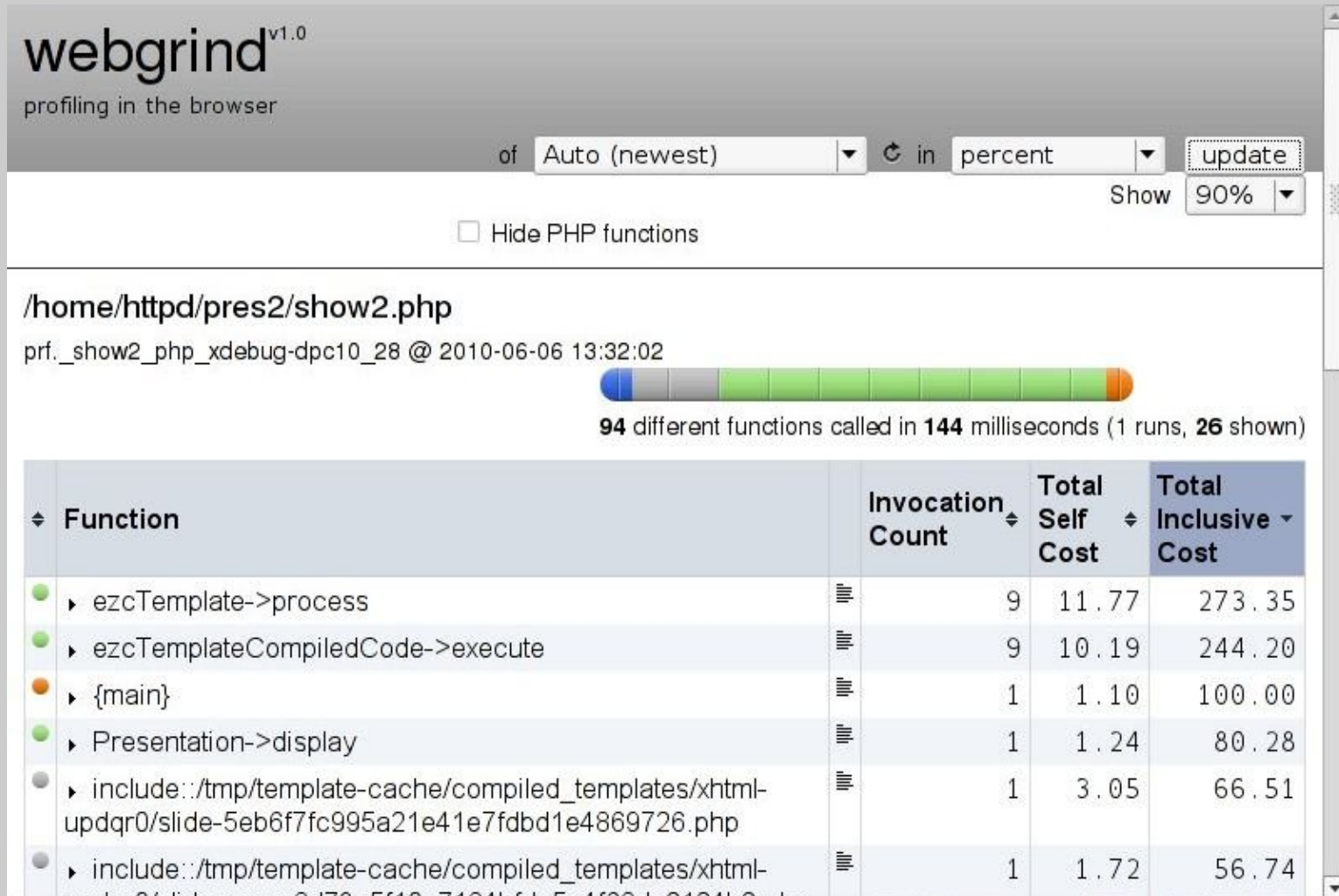
Profiling

KCacheGrind's Flat Profile and Call List



```
xdebug.profiler_enable=1           ; enable profiler
xdebug.profiler_output_dir=/tmp     ; output directory
xdebug.profiler_output_name=cachegrind.out.%p
```

- Easy to install: extract in a directory in the HTTP root and run




webgrind^{v1.0}
profiling in the browser

of **Auto (newest)** in **percent**

Hide PHP functions Show **90%**

/home/httpd/pres2/show2.php
prf._show2_php_xdebug-dpc10_28 @ 2010-06-06 13:32:02


94 different functions called in 144 milliseconds (1 runs, 26 shown)

| Function | Invocation Count | Total Self Cost | Total Inclusive Cost |
|--|------------------|-----------------|----------------------|
| ▶ ezcTemplate->process | 9 | 11.77 | 273.35 |
| ▶ ezcTemplateCompiledCode->execute | 9 | 10.19 | 244.20 |
| ▶ {main} | 1 | 1.10 | 100.00 |
| ▶ Presentation->display | 1 | 1.24 | 80.28 |
| ▶ include::/tmp/template-cache/compiled_templates/xhtml- updqr0/slide-5eb6f7fc995a21e41e7fdbd1e4869726.php | 1 | 3.05 | 66.51 |
| ▶ include::/tmp/template-cache/compiled_templates/xhtml- updar0/slide-page-8d72e5f10e7194bfde5e4f69de2124b2.php | 1 | 1.72 | 56.74 |

Analyzing Running Scripts

- DBGp, common Debugging protocol
- Cross-language: PHP, Python, Perl...
- Supported in Xdebug 2

Clients:

- Stand-alone client (Linux (for now)):
- Komodo (Linux, Windows, Mac — commercial)
- Eclipse/PDT (Java based — free)
- Zend Studio for Eclipse (Eclipse-based — commercial)
- Netbeans (Java-based — free)
- PHPStorm (Java-based — commercial)
- (and many others:)

Activating the Remote Debugger

php.ini settings:

```
xdebug.remote_enable=1  
xdebug.remote_host=localhost  
xdebug.remote_port=9000
```

On the shell:

```
export XDEBUG_CONFIG="idekey=xdebugrocks"
```

With a browser:

```
http://pres/show.php?
```

```
XDEBUG_SESSION_START=xdebugrocks
```

With browser extensions:

easy Xdebug (FireFox):

Xdebug Helper (Chrome):

Debugging Gotchas

- Xdebug connects to the client
- Remote vs Local debugging
- Debugging proxy: (Komodo-PythonRemoteDebugging)
- `xdebug.remote_connect_back`



- Xdebug site: <http://xdebug.org>
- Xdebug documentation:
<http://xdebug.org/docs.php>
- DBGp specification: <http://xdebug.org/docs-dbgp.php>
- If you like Xdebug: <http://xdebug.org/donate.php>
- These slides: <http://derickrethans.nl/talks.html>