

Xdebug

Tek X - Chicago, US

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<http://derickrethans.nl/talks.php>

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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`
- Freelancer doing PHP (internals) development

How did it start?

```
[derick@localhost derick]$ cat recursive.php
<?php
    function a() {
        a();
    }

    a();
?>
[derick@localhost derick]$ php recursive.php
Segmentation fault
```

In PHP 5.3 and later, it will just use up all the available memory.

- Stack overflow in PHP
- Infinite recursion

Xdebug protects, level can be set with:

```
xdebug.max_nesting_level=4
```

Fatal error: Maximum function nesting level of '4' reached, aborting! in /home/httpd/html/test/xdebug/infinite.php on line 11.

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 161
```

```
| ( ! ) Warning: DOMDocument::load() [domdocument.load]: Document is empty |
| in /home/httpd/presentations, line: 1 in /home/httpd/pres2/show2.php on |
| line_161 |
| Call Stack |
| # | Time__ | Memory_ | Function_____ | Location_____ |
| 1 | 0.0022 | _786328 | {main}(_)_____ | ../show2.php:0 |
| 2 | 0.0180 | 1397248 | Presentation->display(_) | ../show2.php:110 |
| 3 | 0.0183 | 1399032 | DOMDocument->load(_)_____ | ../show2.php:161 |
```

```
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_161 |
| Call Stack |
| # | Time__ | Memory_ | Function_____ | Location_____ |
| 1 | 0.0024 | _786328 | {main}(_)_____ | ../show2.php:0 |
| 2 | 0.0183 | 1397248 | Presentation->display(_null_)__ | ../show2.php:110 |
| 3 | 0.0185 | 1399032 | DOMDocument->load(_string(32)_)| ../show2.php:161 |
```

```
xdebug.collect_params=1
```

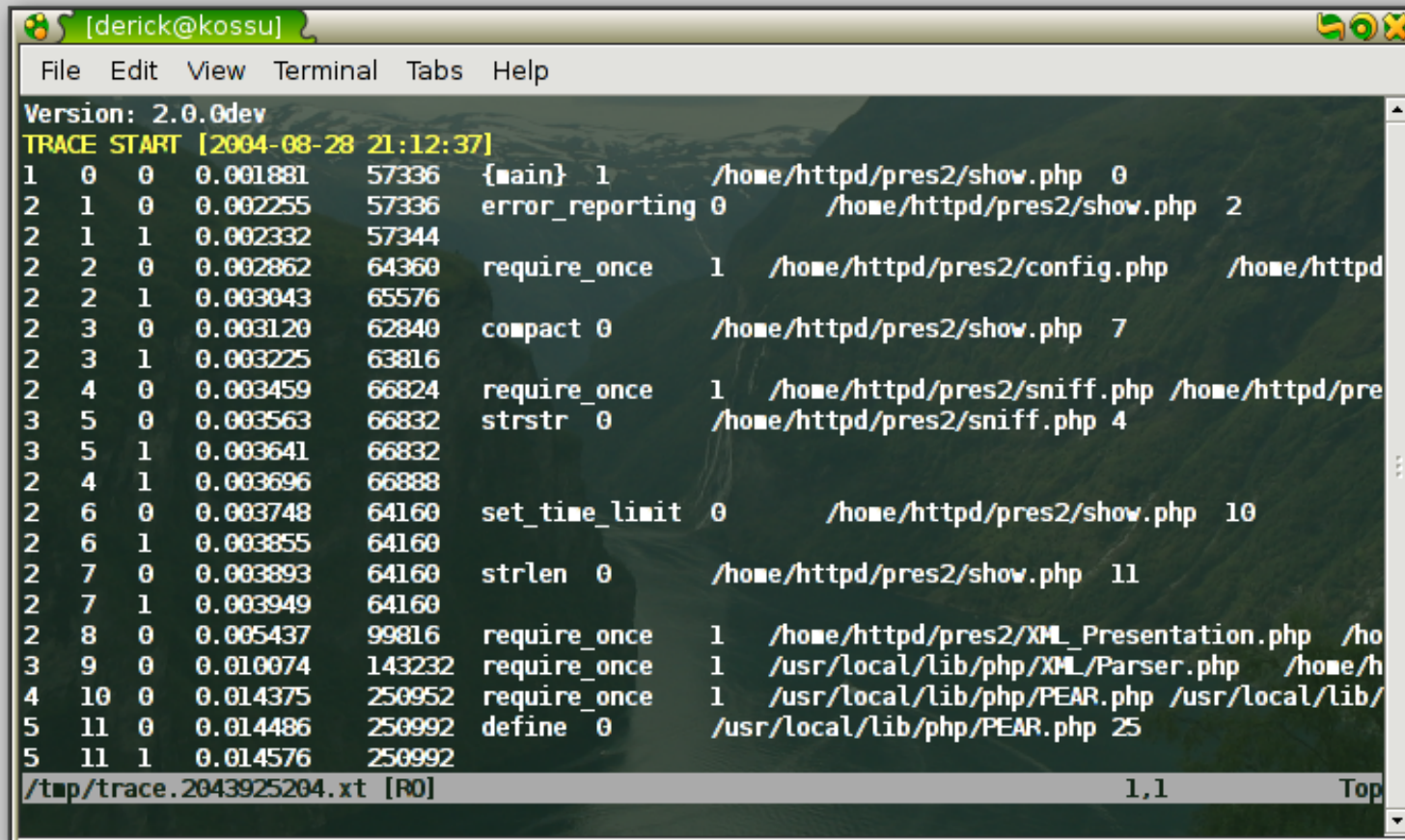
```
| ( ! ) Warning: DOMDocument::load() [domdocument.load]: Document is empty |
| in /home/httpd/presentations, line: 1 in /home/httpd/pres2/show2.php on |
| line_161 |
| Call Stack |
| # | Time__ | Memory_ | Function_____ | Location_____ |
| 1 | 0.0022 | _787720 | {main}(_)_____ | ../show2.php:0 |
| 2 | 0.0183 | 1398552 | Presentation->display(_null_)__ | ../show2.php:110 |
| 3 | 0.0186 | 1400336 | DOMDocument->load(_string(32)_)| ../show2.php:161 |
```


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
src/ezc_bootstrap.php) /home/httpd/pres2/show2.php:2
  0.0029      803552    -> dirname('/home/derick/dev/ezcomponents/t
Base/src/ezc_bootstrap.php') /home/derick/dev/ezcomponents/trunk/Base/src
ezc_bootstrap.php:12
  0.0030      803968    -> explode('/', '/home/derick/dev/ezcomponen
trunk/Base/src') /home/derick/dev/ezcomponents/trunk/Base/src/ezc_bootst
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:1
  0.0032      807800    -> array_slice(array (0 => '', 1 => 'home',
'derick', 3 => 'dev', 4 => 'ezcomponents', 5 => 'trunk', 6 => 'Base', 7
'src'), 0, -2) /home/derick/dev/ezcomponents/trunk/Base/src/ezc_bootstra
  0.0033      808952    -> join('/', array (0 => '', 1 => 'home', 2
'derick', 3 => 'dev', 4 => 'ezcomponents', 5 => 'trunk')) /home/derick/c
ezcomponents/trunk/Base/src/ezc_bootstrap.php:17
  0.0065     1002544    -> require(/home/derick/dev/ezcomponents/tr
Base/src/base.php) /home/derick/dev/ezcomponents/trunk/Base/src/
ezc_bootstrap.php:18
  0.0066      990560    -> __autoload('ezcTemplateCustomFunction') /ho
derick/dev/ezcomponents/trunk/Base/src/ezc_bootstrap.php:0
  0.0066      990560    -> ezcBase::autoload('ezcTemplateCustomFunc
home/derick/dev/ezcomponents/trunk/Base/src/ezc_bootstrap.php:38
  0.0067      990560    -> ezcBase::setPackageDir() /home/derick/c
ezcomponents/trunk/Base/src/base.php:125
```

Function trace to file

Automatic readable format



```
[derick@kossu]
File Edit View Terminal Tabs Help
Version: 2.0.0dev
TRACE START [2004-08-28 21:12:37]
1 0 0 0.001881 57336 {main} 1 /home/httpd/pres2/show.php 0
2 1 0 0.002255 57336 error_reporting 0 /home/httpd/pres2/show.php 2
2 1 1 0.002332 57344
2 2 0 0.002862 64360 require_once 1 /home/httpd/pres2/config.php /home/httpd
2 2 1 0.003043 65576
2 3 0 0.003120 62840 compact 0 /home/httpd/pres2/show.php 7
2 3 1 0.003225 63816
2 4 0 0.003459 66824 require_once 1 /home/httpd/pres2/sniff.php /home/httpd/pre
3 5 0 0.003563 66832 strstr 0 /home/httpd/pres2/sniff.php 4
3 5 1 0.003641 66832
2 4 1 0.003696 66888
2 6 0 0.003748 64160 set_time_limit 0 /home/httpd/pres2/show.php 10
2 6 1 0.003855 64160
2 7 0 0.003893 64160 strlen 0 /home/httpd/pres2/show.php 11
2 7 1 0.003949 64160
2 8 0 0.005437 99816 require_once 1 /home/httpd/pres2/XML_Presentation.php /ho
3 9 0 0.010074 143232 require_once 1 /usr/local/lib/php/XML/Parser.php /home/h
4 10 0 0.014375 250952 require_once 1 /usr/local/lib/php/PEAR.php /usr/local/lib/
5 11 0 0.014486 250992 define 0 /usr/local/lib/php/PEAR.php 25
5 11 1 0.014576 250992
/tmp/trace.2043925204.xt [R0] 1,1 Top
```

```
xdebug.auto_trace=1 ; enable tracing
xdebug.trace_format=1 ; selects computerized format
xdebug.trace_options=0 ; sets extra option (1 = append)
```


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`.

demo

Scream

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

Recording headers

- Xdebug collects all headers being set, implicitly and explicitly
- It's very useful for testing and unit-tests
- `xdebug_get_headers()`

```
<?php
session_start();

setcookie( 'key', 'value', time() + 86400 );

header( "Status: 403" );

var_dump( xdebug_get_headers() );
?>
```

Functions for obtaining coverage information:

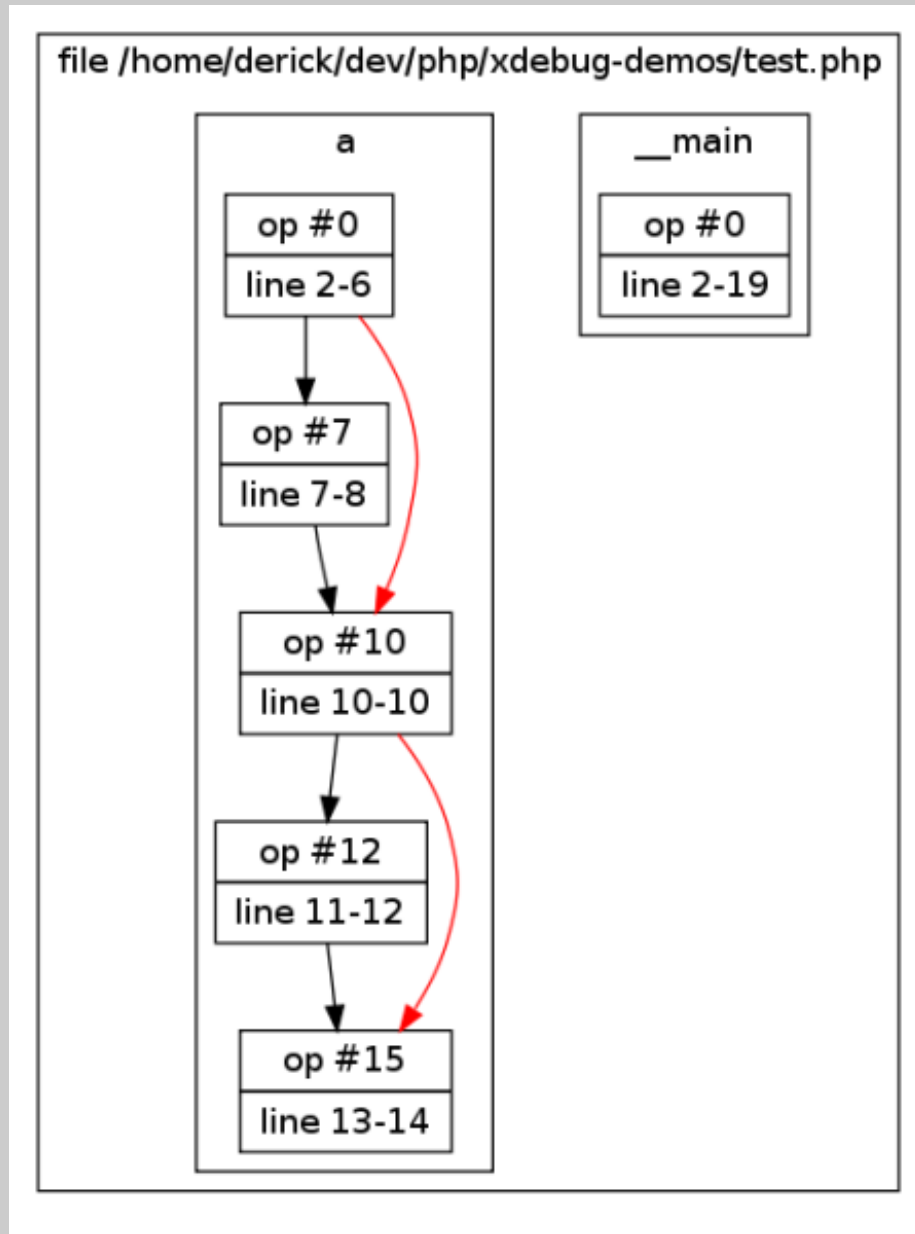
```
xdebug_start_code_coverage();  
xdebug_get_code_coverage();  
xdebug_stop_code_coverage();
```

Options to `xdebug_start_code_coverage()`, both only work for files parsed from this moment:

- `XDEBUG_CC_UNUSED`: Enables scanning of code to figure out which line has executable code.
- `XDEBUG_CC_DEAD_CODE`: Enables branch analyzation to figure out whether code can be executed.
- <http://kossu/coverage/index.html>

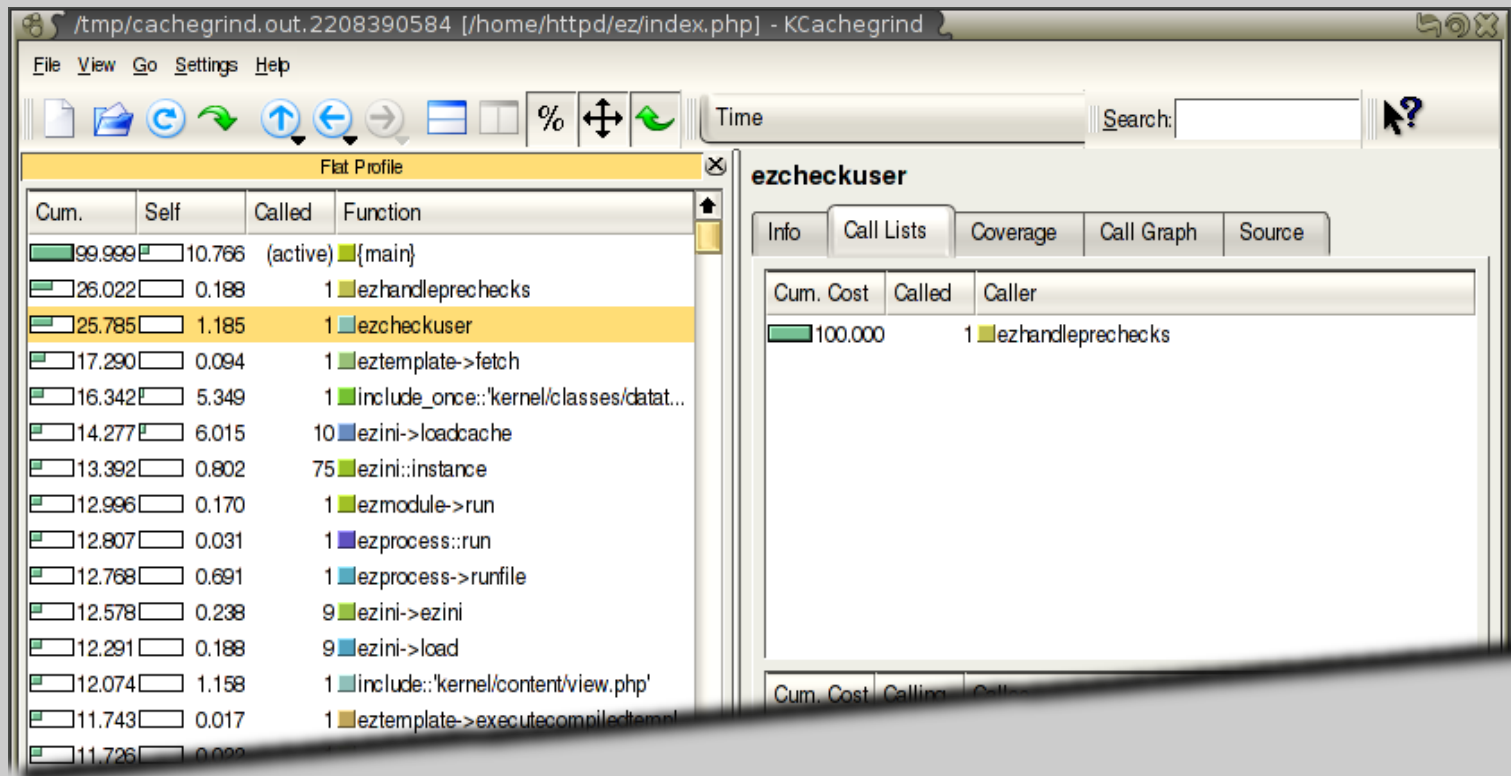
What Code Do I Use

Code Coverage



Profiling

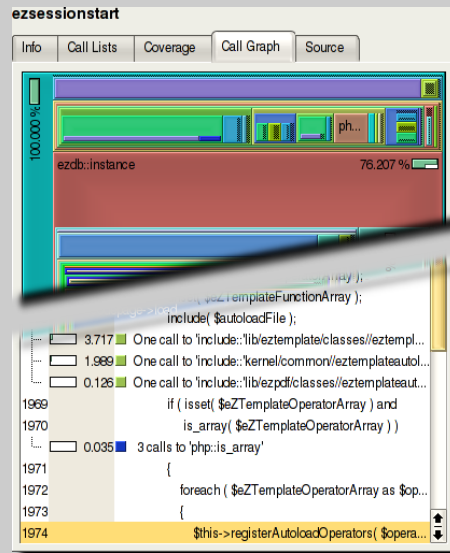
KCacheGrind's Flat Profile and Call List



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

Profiling

KCacheGrind's Call Graph and Source Annotations



- Call graph
- Area shows time spend
- Stacked to show callees
- Source annotations
- Number of calls
- Total time per function

demo

Analyzing Running Scripts

- DBGp, common Debugging protocol
- Cross-language: PHP, Python, Perl...
- Supported in Xdebug 2
- Clients: Komodo, Eclipse/PDT, Zend Studio for Eclipse, Netbeans (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):

demo



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

Thanks!

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