

What's New in Xdebug

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About Me

Derick Rethans

- I'm European, living in London
- I work on the **MongoDB** PHP driver
- **Xdebug** & PHP's Date/Time support
- I ♥ 🌐 maps, I ♥ 🍺 beer, I ♥ 🥃 whisky
- twitter: @derickr



Pretty Printing Variables

Options:

```
<?php
ini_set( 'xdebug.file_link_format', 'xdebug://%f@%l' );
ini_set( 'xdebug.overload_var_dump', 2 );
ini_set( 'xdebug.var_display_max_data', 25 );
ini_set( 'xdebug.var_display_max_depth', 4 );
ini_set( 'xdebug.var_display_max_children', 32 );
?>
```

Turn off in php.ini or .htaccess with:

```
xdebug.overload_var_dump = 0
```

Scream

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





Tracing

Function traces

- Different types: **Textual**, **Parsable** and **HTML**
- Tracing only parts of an application with **xdebug_start_trace()** and **xdebug_stop_trace()**.
- `xdebug.collect_return`:

```
-> explode('/', '/xdebug-phpnw13/11') /home/httpd/pres2/show2.php:121  
>=> array (0 => '', 1 => 'xdebug-phpnw13', 2 => '11')
```

- `xdebug.collect_assignments`:

```
-> ezcTemplateVariableCollection->__set($name = 'slideNr', $value = '11') /home/httpd/p  
=> $this->variables['slideNr'] = '11' /home/derick/dev/zetacomponents/trunk/Template
```

Xdebug 2.3: Munging Errors

`xdebug.halt_level:`

```
<?php
ini_set('xdebug.halt_level', E_USER_NOTICE | E_NOTICE);
trigger_error("Testing");
echo "Hi!\n";
?>
```

`xdebug.force_error_reporting &`
`xdebug.force_display_errors:`

- Overrides `error_reporting` or `display_errors`
- Can not be changed with `ini_set()`, only on CLI or in `php.ini`

Live Debugging

- DBGp, common Debugging protocol
- Cross-language: PHP, Python, Perl...
- PHPStorm (Java-based — commercial)
- Netbeans (Java-based — free)
- Komodo (Linux, Windows, Mac — commercial)
- (and many others: <http://xdebug.org/docs/remote#clients>)

Xdebug 2.3: New debugging features

- Exception breakpoints wildcard and inheritance
- Constants
- Include error code and exception message in exception breakpoints (needs IDE support)
- Warnings when SELinux is in the way

Xdebug 2.6 — Debugging

Connection timeout configurable

→ Used to be 200ms

Extended properties

→ So that you can have funny chars in property names

Notifications and warnings

→ Send to the debugging console

Activating the Remote Debugger

On the shell:

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

Activating the Remote Debugger

With browser extensions:

Firefox:

<https://addons.mozilla.org/en-gb/firefox/tag/xdebug>

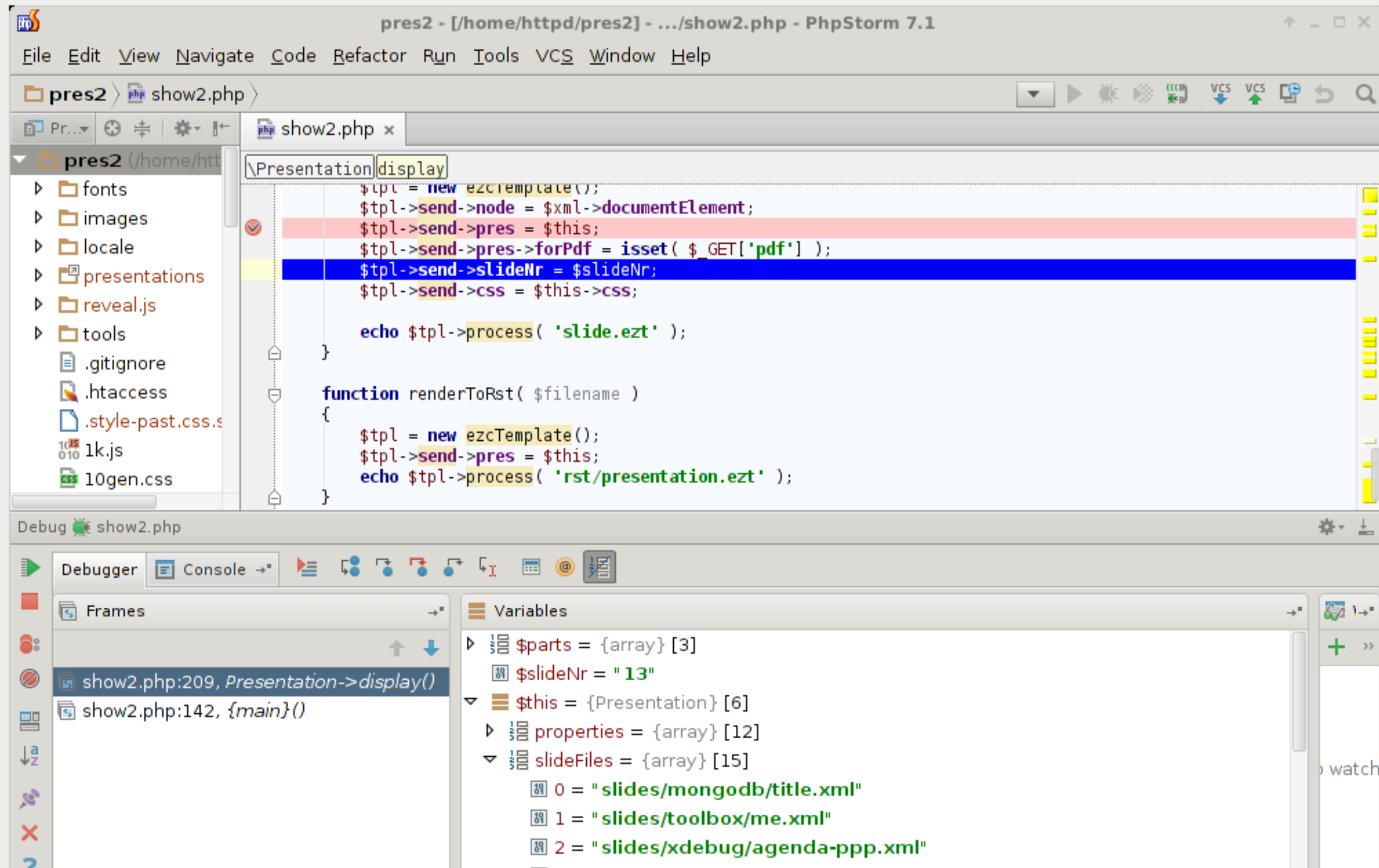
Xdebug Helper (Chrome):

<https://chrome.google.com/extensions/detail/eadndfjplgieldjbigjakmdgkmoaaaoc>

Xdebug Toggler for Safari:

<https://github.com/benmatselby/xdebug-toggler>

PhpStorm



Remote debugging log

```
xdebug.remote_log=/tmp/remote.log
```

- Logs all debugger communication
- Also shows connection attempts and failures:

```
xdebug.remote_connect_back=0  
xdebug.remote_host=nothere  
xdebug.remote_port=9002
```

```
I: Connecting to configured address/port: nowhere:9002.  
E: Could not connect to client. :-(
```

```
xdebug.remote_connect_back=1  
xdebug.remote_host=nothere2  
xdebug.remote_port=9003
```

```
I: Checking remote connect back address.  
W: Remote address not found, connecting to configured address/port: nowhere2:9003. :-|  
E: Could not connect to client. :-(
```

```
xdebug.remote_connect_back=0  
xdebug.remote_port=9991
```

```
I: Connecting to configured address/port: localhost:9991.  
I: Connected to client. :-)
```

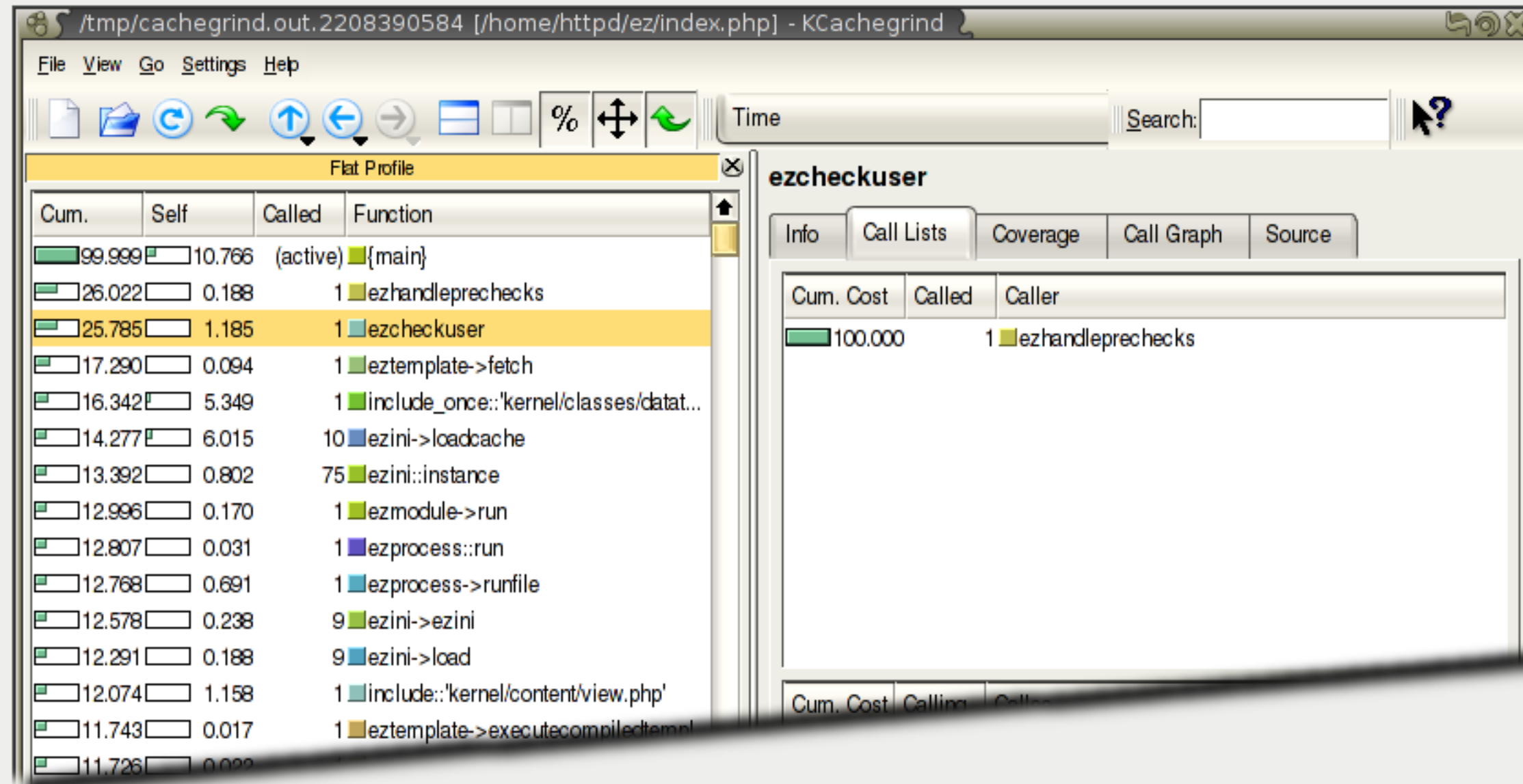
demo

A black and white silhouette of a city skyline against a light background. The skyline includes several prominent buildings, with the tallest one featuring two spires. A semi-transparent horizontal band is positioned across the middle of the image, containing the word 'Profiling' in a bold, sans-serif font.

Profiling

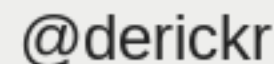
Profiling

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
```

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



demo



Xdebug 2.3: Paths



Xdebug code coverage

```
<?php
function ifthenelse( $a, $b )
{
    if ($a) {
        echo "A HIT\n";
    }
    if ($b) {
        echo "B HIT\n";
    }
}
```

```
<?php
require 'vendor/autoload.php';
include 'test.php';

$coverage = new PHP_CodeCoverage;

$coverage->start('coverage1');
ifthenelse( true, false );
$coverage->stop();

$coverage->start('coverage2');
ifthenelse( false, true );
$coverage->stop();

$writer = new PHP_CodeCoverage_Report_HTML;
$writer->process($coverage, 'tmp/code-coverage-report');
```

Xdebug code coverage output

</home/httpd/html/test/xdebug/code-coverage> / test.php

	Code Coverage									
	Classes and Traits			Functions and Methods				Lines		
Total							CRAP		100.00%	7 / 7
ifthenelse(\$a, \$b)					100.00%	1 / 1	0		100.00%	7 / 7

```

1 <?php
2 function ifthenelse( $a, $b )
3 {
4     if ($a) {
5         echo "A HIT\n";
6     }
7     if ($b) {
8         echo "B HIT\n";
9     }
10 }
11 ?>

```

Legend

Executed Not Executed Dead Code

Generated by [PHP_CodeCoverage 3.0-dev](#) using [PHP 5.4.33-dev](#) at Wed Oct 15 18:27:29 BST 2014.

Xdebug branch coverage

```
<?php
include 'dump-branch-coverage.inc';
include 'test.php';

xdebug_start_code_coverage(
    XDEBUG_CC_UNUSED |
    XDEBUG_CC_DEAD_CODE |
    XDEBUG_CC_BRANCH_CHECK // ← new magic sauce
);

ifthenelse( true, false );
ifthenelse( false, true );

xdebug_stop_code_coverage(false);

$c = xdebug_get_code_coverage();
dump_branch_coverage($c);
?>
```


Xdebug branch coverage output

```
A HIT
ifthenelse
- branches
  - 00; OP: 00-04; line: 02-04 HIT; out1: 05 HIT; out2: 08 HIT
  - 05; OP: 05-07; line: 05-06 HIT; out1: 08 HIT
  - 08; OP: 08-09; line: 07-07 HIT; out1: 10 HIT; out2: 13 HIT
  - 10; OP: 10-12; line: 08-09 HIT; out1: 13 HIT
  - 13; OP: 13-14; line: 10-10 HIT; out1: EX X
- paths
  - 0 5 8 10 13: X
  - 0 5 8 13: HIT
  - 0 8 10 13: HIT
  - 0 8 13: X
```

Xdebug branch coverage display

test.php

```

1 <?php
2 function ifthenelse( $a, $b )
3 {
4     if ( $a ) {
5         echo "A HIT\n";
6     }
7     if ( $b ) {
8         echo "B HIT\n";
9     }
10 }
11 ?>

```

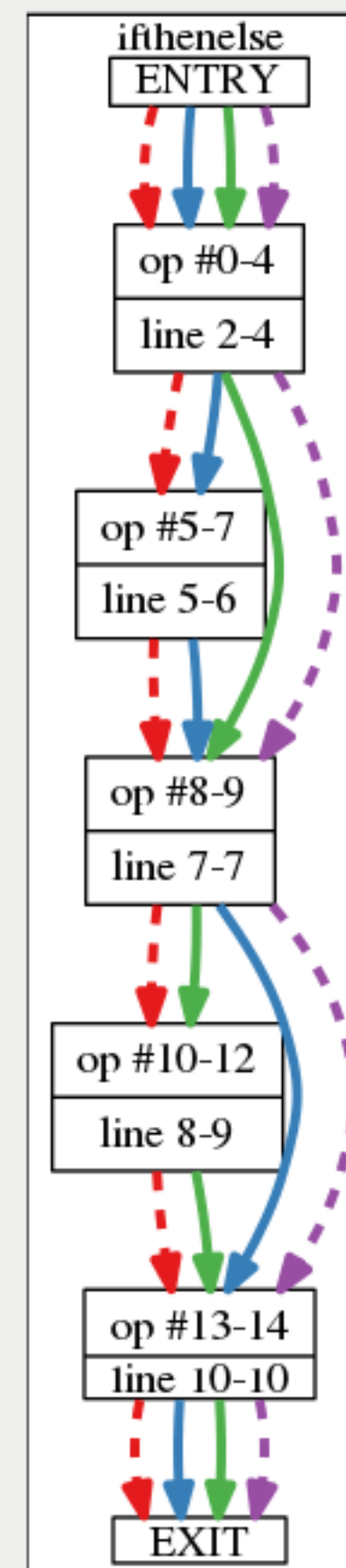
branch.php

```

...
xdebug_start_code_coverage(
    XDEBUG_CC_UNUSED | XDEBUG_CC_DEAD_CODE | XDEBUG_CC_BRANCH_CHECK
);

ifthenelse( true, false );
ifthenelse( false, true );
...

```



Xdebug 2.3: Path/Branch Coverage

- Powerful way to show which tests you are missing
- Hard to visualize
- Very slow!

Xdebug 2.4

- Support for PHP 7
- Function monitoring: spying on which functions are being called

Function Monitoring

```
<?php
xdebug_start_function_monitor( [ 'strrev', 'array_push' ] );

echo strrev("yes!"), "\n";

var_dump(xdebug_get_monitored_functions());

xdebug_stop_function_monitor();
?>
```

Output:

```
array(1) {
  [0] =>
  array(3) {
    'function' => string(6) "strrev"
    'filename' => string(1) "/tmp/test-monitor.php"
    'lineno' => int(4)
  }
}
```

Xdebug 2.5

- Support for PHP 7.1
- Support for PHP < 5.6 dropped
- Debugging: Support for IPv6

A close-up photograph of a birthday cake. The cake is covered in white frosting and has several colorful candles (red, yellow, orange, pink, green, blue, purple) stuck into it. The candles are shaped like the letters 'HAPPY BIRTHDAY'. The background is a soft-focus field of multi-colored confetti. A semi-transparent white banner is overlaid across the middle of the image.

15th Anniversary!

Xdebug 2.6

Support for PHP 7.2

- Fixes for variable resolution
- switch optimisation

Support for PHP 5 dropped

Smaller new features:

- Memory profiling
- Garbage Collection Statistics
- Formatting filenames

Switch

```
<?php
switch ( $a ) {
    case 1: echo "one"; break;
    case 2: echo "two"; break;
    case 3: echo "three"; break;
    case 4: echo "four"; break;
    case 5: echo "five"; break;
    case 6: echo "six"; break;
}
```

PHP 7.1

compiled vars: !0 = \$a							
line	#	*	E	I	O op	return	operands

3	0	E	>		EXT_STMT		
	1				CASE	~1	!0, 1
	2		>		JMPNZ		~1, ->13
5	3		>		CASE	~1	!0, 2
	4		>		JMPNZ		~1, ->17
7	5		>		CASE	~1	!0, 3
	6		>		JMPNZ		~1, ->21
9	7		>		CASE	~1	!0, 4
	8		>		JMPNZ		~1, ->25
11	9		>		CASE	~1	!0, 5
	10		>		JMPNZ		~1, ->29
13	11		>		CASE	~1	!0, 6
	12		>		JMPZNZ		~1, ->37
4	13		>		EXT_STMT		
	14				ECHO		'one'
	15				EXT_STMT		
18	16		>		RETURN		1
6	17		>		EXT_STMT		
	18				ECHO		'two'
	19				EXT_STMT		
18	20		>		RETURN		1
8	21		>		EXT_STMT		
	22				ECHO		'three'
	23				EXT_STMT		
18	24		>		RETURN		1
10	25		>		EXT_STMT		
	26				ECHO		'four'
	27				EXT_STMT		
18	28		>		RETURN		1
12	29		>		EXT_STMT		
	30				ECHO		'five'
	31				EXT_STMT		
18	32		>		RETURN		1
14	33		>		EXT_STMT		
	34				ECHO		'six'
	35				EXT_STMT		
18	36		>		RETURN		1
16	37		>		EXT_STMT		
	38				ECHO		'default'
	39				EXT_STMT		
18	40		>		RETURN		1

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Switch

```
<?php
switch ( $a ) {
    case 1: echo "one"; break;
    case 2: echo "two"; break;
    case 3: echo "three"; break;
    case 4: echo "four"; break;
    case 5: echo "five"; break;
    case 6: echo "six"; break;
}
```

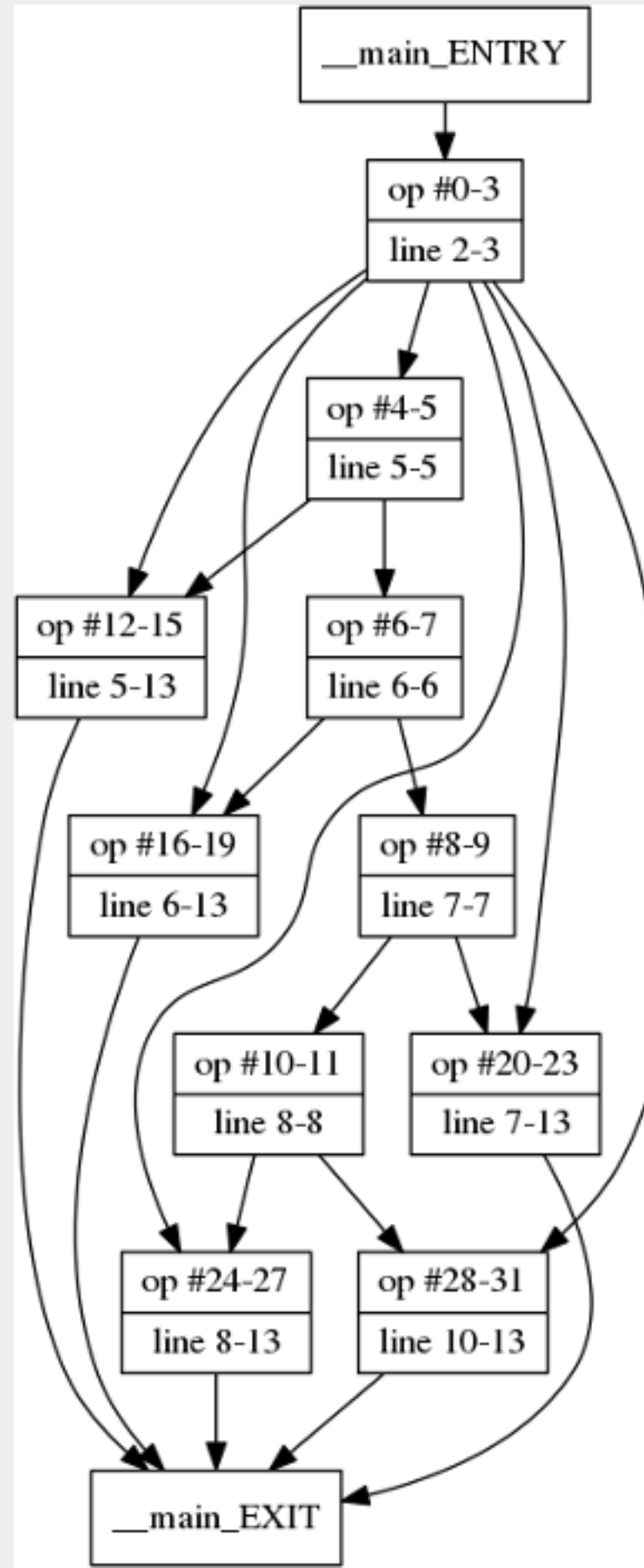
PHP 7.2

compiled vars: !0 = \$a				
line	#	* E I O op	return	operands

2	0	E > EXT_STMT		
	1	SWITCH_LONG		!0, [1:->15, 2:->19, 3:->23, 4:->27, 5:->31, 6:->35
3	2	CASE	~1	!0, 1
	3	> JMPNZ		~1, ->15
5	4	> CASE	~1	!0, 2
	5	> JMPNZ		~1, ->19
7	6	> CASE	~1	!0, 3
	7	> JMPNZ		~1, ->23
9	8	> CASE	~1	!0, 4
	9	> JMPNZ		~1, ->27
11	10	> CASE	~1	!0, 5
	11	> JMPNZ		~1, ->31
13	12	> CASE	~1	!0, 6
	13	> JMPNZ		~1, ->35
	14	> > JMP		->39
4	15	> EXT_STMT		
	16	ECHO		'one'
	17	EXT_STMT		
	18	> JMP		->43
6	19	> EXT_STMT		
	20	ECHO		'two'
	21	EXT_STMT		
	22	> JMP		->43
8	23	> EXT_STMT		
	24	ECHO		'three'
	25	EXT_STMT		
	26	> JMP		->43
10	27	> EXT_STMT		
	28	ECHO		'four'
	29	EXT_STMT		
	30	> JMP		->43
12	31	> EXT_STMT		
	32	ECHO		'five'
	33	EXT_STMT		
	34	> JMP		->43
14	35	> EXT_STMT		
	36	ECHO		'six'
	37	EXT_STMT		
	38	> JMP		->43
16	39	> EXT_STMT		
	40	ECHO		'default'
	41	EXT_STMT		
	42	> JMP		->43
18	43	> > RETURN		1

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Switch Graph



Xdebug 2.6 — Filters

Restrictions on where Xdebug does work

- Code Coverage
- Stack Traces & Function Traces

Modes:

- Black list or White list
- On Path-Prefix
- On Class-Prefix (traces only)

Xdebug 2.6 — xdebug_set_filter

`$filter_group`

`XDEBUG_FILTER_CODE_COVERAGE` OR `XDEBUG_FILTER_TRACING`

`$filter_type`

`XDEBUG_PATH_WHITELIST`, `XDEBUG_PATH_BLACKLIST`,

`XDEBUG_NAMESPACE_WHITELIST`, OR

`XDEBUG_NAMESPACE_BLACKLIST`

`$array_of_filters`

array containing path or class prefixes

Xdebug 2.6 — xdebug_set_filter

```
<?php
xdebug_set_filter(
    XDEBUG_FILTER_TRACING,
    XDEBUG_NAMESPACE_WHITELIST,
    [
        '',
        'Dram',
        'MongoDB\\',
    ]
);
```


Xdebug 2.6 — Filters: Code Coverage

PHPUnit 5.7.22 by Sebastian Bergmann and contributors.

.....	61 / 1198 (5%)
.....SEEE.....	122 / 1198 (10%)
.....	183 / 1198 (15%)
.....S.....S.....SS.....	244 / 1198 (20%)
.....	305 / 1198 (25%)
.....F.....	366 / 1198 (30%)
.....	427 / 1198 (35%)
.....F.....	488 / 1198 (40%)
.....F.....	549 / 1198 (45%)
.....S.....	610 / 1198 (50%)
.SSS.....S.....IIIIIIIIIIIIIIIIIIII.....	671 / 1198 (56%)
.....S.....	732 / 1198 (61%)
.....SSSSSSSSSSSSSSSSSSSS.....	793 / 1198 (66%)
.....SSSSSSSSSSSSSSSSSSSS.....	854 / 1198 (71%)
SSS.....	915 / 1198 (76%)
.....	976 / 1198 (81%)
.....	1037 / 1198 (86%)
.....	1098 / 1198 (91%)
.....	1159 / 1198 (96%)
.....EEEEEE.....	1198 / 1198 (100%)

Time: **2.07** minutes, Memory: **28.00MB**

Xdebug 2.6 — Filters: Code Coverage

Original:

```
php ~/phpunit-5.7.22.phar --coverage-html=/tmp/coverage
```

With filter:

```
cat /tmp/auto_prepend.php
```

```
<?php
xdebug_set_filter(
    XDEBUG_FILTER_CODE_COVERAGE,
    XDEBUG_PATH_WHITELIST,
    [ '/home/derick/zeta-new-Document/src/' ]
);
```

```
php -dauto_prepend_file=/tmp/auto_prepend.php \  
~/phpunit-5.7.22.phar --coverage-html=/tmp/coverage
```

Xdebug

- It's Open Source and free (as in "free beer")
- Using Xdebug saves you a lot of time
- Working on Xdebug takes up a lot of time

PATREON



<https://www.patreon.com/derickr>

Resources



Slides:

<https://joind.in/24271>

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