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Welcome!

WebCamp 2008 - Prague, Czech Republic

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http://derickrethans.nl/talks.php

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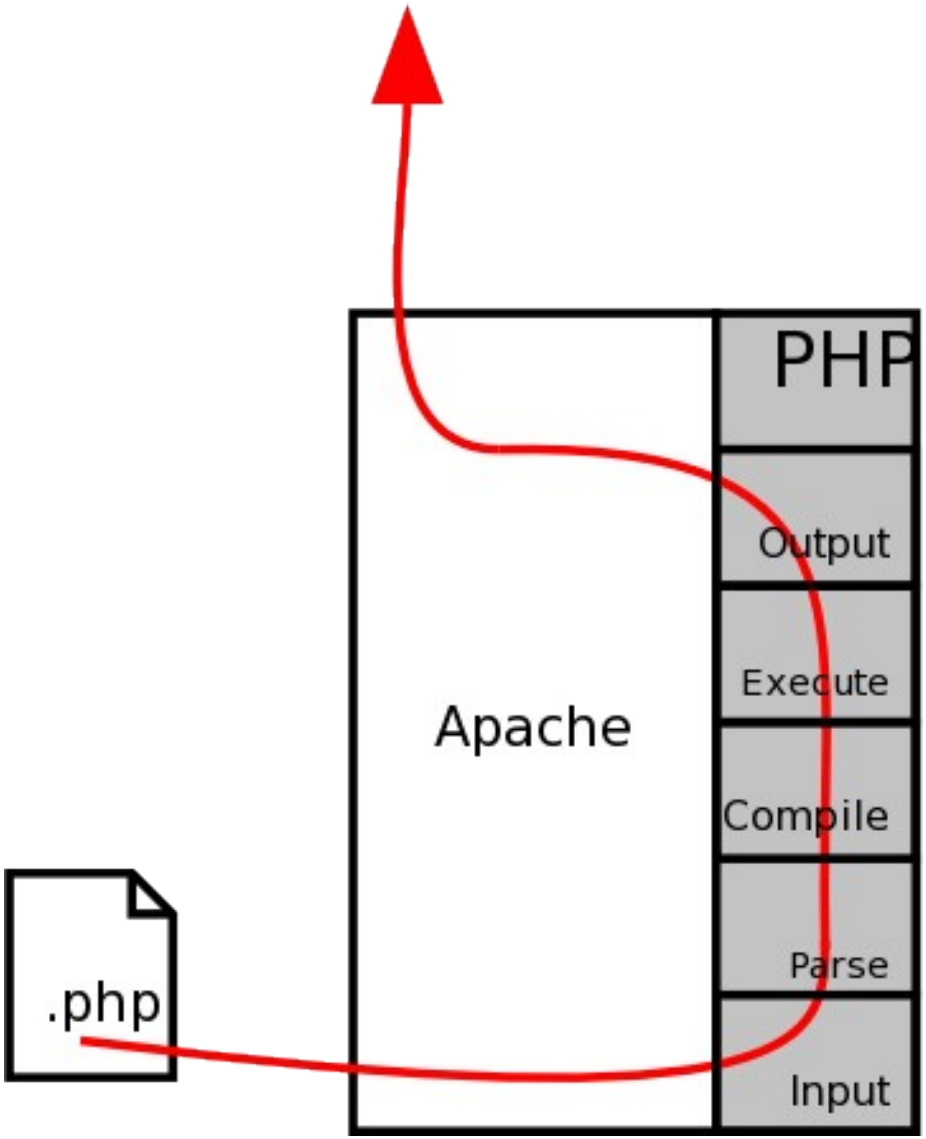
About Me

- Dutchman living in Norway
- eZ Systems A.S.
- eZ Components project lead
- PHP development
- mcrypt, input_filter, date/time support, unicode
- QA

Introduction



Parsing

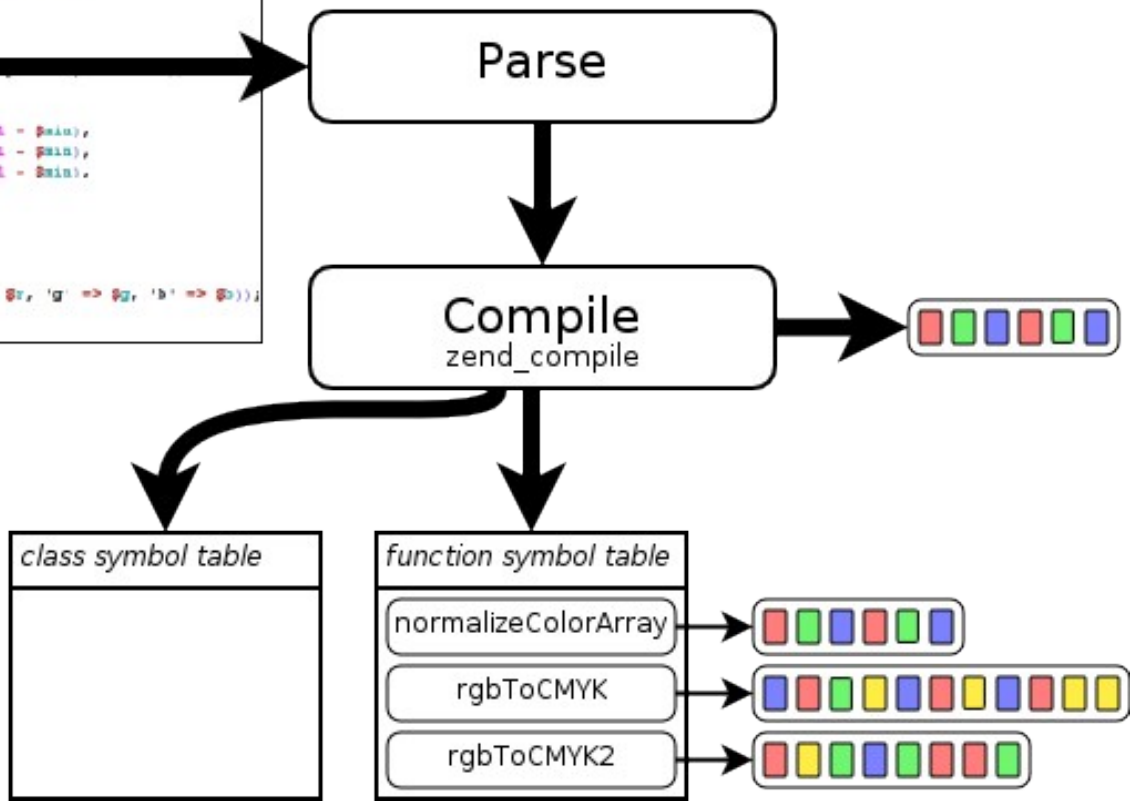
- Lexical analyze script source
- Divide into logical blocks of characters
- Give special blocks a meaning
- flex (but only 2.5.4!)

The Parse Error:

```
Parse error: parse error,
unexpected T_CLASS, expecting ',' or ';' in - on line 2
```

Compiling
Diagram

```php
<?php
function normalizeColorArray($array)
{
    foreach (array_keys($array) as $key)
    {
        $array[$key] = (float) $array[$key]/256;
    }

    return $array;
}

function rgbToCMYK( $rgbArray )
{
    $cya = 1 - min(1, max((float) $rgbArray['r'], 0));
    $mag = 1 - min(1, max((float) $rgbArray['g'], 0));
    $yel = 1 - min(1, max((float) $rgbArray['b'], 0));

    $min = min( $cya, $mag, $yel );
    if ( 1 - $min == 0)
    {
        return array('c' => 1, 'm' => 1,
    }

    return array('c' => ( $cya - $min) / ( 1 - $min),
                 'm' => ( $mag - $min) / ( 1 - $min),
                 'y' => ( $yel - $min) / ( 1 - $min),
                 'k' => $min );
}

function rgbToCMYK2( $r, $g, $b)
{
    return eZMath::rgbToCMYK( array('r' => $r, 'g' => $g, 'b' => $b));
}
?>
```



Compiling: Example

fibonacci.php:

```
<?php
    $cache = array();

    function fibonacci($nr) {
        global $cache;

        if (isset($cache[$nr])) {
            return $cache[$nr];
        }
        switch ($nr) {
            case 0:
                die("Invalid Nr\n");
            case 1:
                return 1;
            case 2:
                return 1;
            default:
                $r = fibonacci($nr - 2) + fibonacci($nr - 1);
                $cache[$nr] = $r;
                return $r;
        }
    }

    echo fibonacci($argv[1])."\n";
?>
```

Compiling
Break-down

```
Function fibonacci:
filename:       /home/httpd/html/test/pres/fibonacci.php
function name:  fibonacci
number of ops:  38
compiled vars:  !0 = $nr, !1 = $cache, !2 = $r
l#     #  op                                   return  operands
-------------------------------------------------------------------
function fibonacci($nr) {
 4     0  RECV                                         1
    global $cache;
 5     1  FETCH_W                              $0      'cache'
       2  ASSIGN_REF                                    !1, $0
    if (isset($cache[$nr])) {
 7     3  ZEND_ISSET_ISEMPTY_DIM_OBJ           ~1      !1, !0
       4  JMPZ                                         ~1, ->8
        return $cache[$nr];
 8     5  FETCH_DIM_R                          $2      !1, !0
       6  RETURN                                       $2
    }
 9     7* JMP                                          ->8
    switch ($nr) {
        case 0:
11     8  CASE                                 ~3      !0, 0
       9  JMPZ                                         ~3, ->12
          die("Invalid Nr\n");
12    10  EXIT                                         'Invalid+Nr%0A'
13    11* JMP                                          ->14
        case 1:
      12  CASE                                 ~3      !0, 1
      13  JMPZ                                         ~3, ->16
          return 1;
14    14  RETURN                                       1
15    15* JMP                                          ->18
        case 2:
      16  CASE                                 ~3      !0, 2
      17  JMPZ                                         ~3, ->20
          return 1;
16    18  RETURN                                       1
17    19* JMP                                          ->21
        default:
      20  JMP                                          ->35
          $r = fibonacci($nr - 2) + fibonacci($nr - 1);
18    21  INIT_FCALL_BY_NAME                           'fibonacci'
      22  SUB                                  ~4      !0, 2
      23  SEND_VAL                                     ~4
      24  DO_FCALL_BY_NAME
```

Compiling
Disassembler

Disassembler: vld

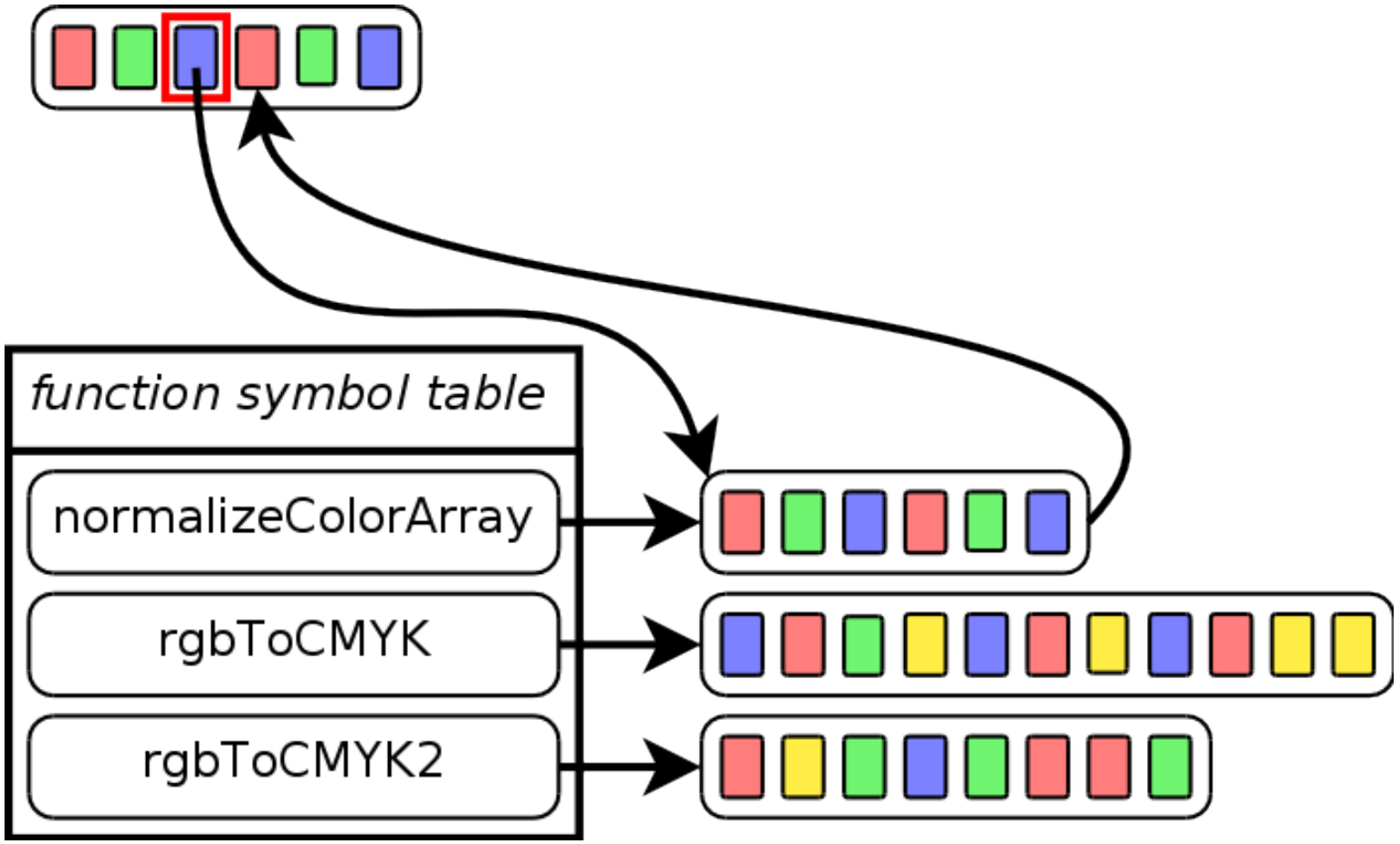
Dumps oparray per element:

- main script
- function
- class method

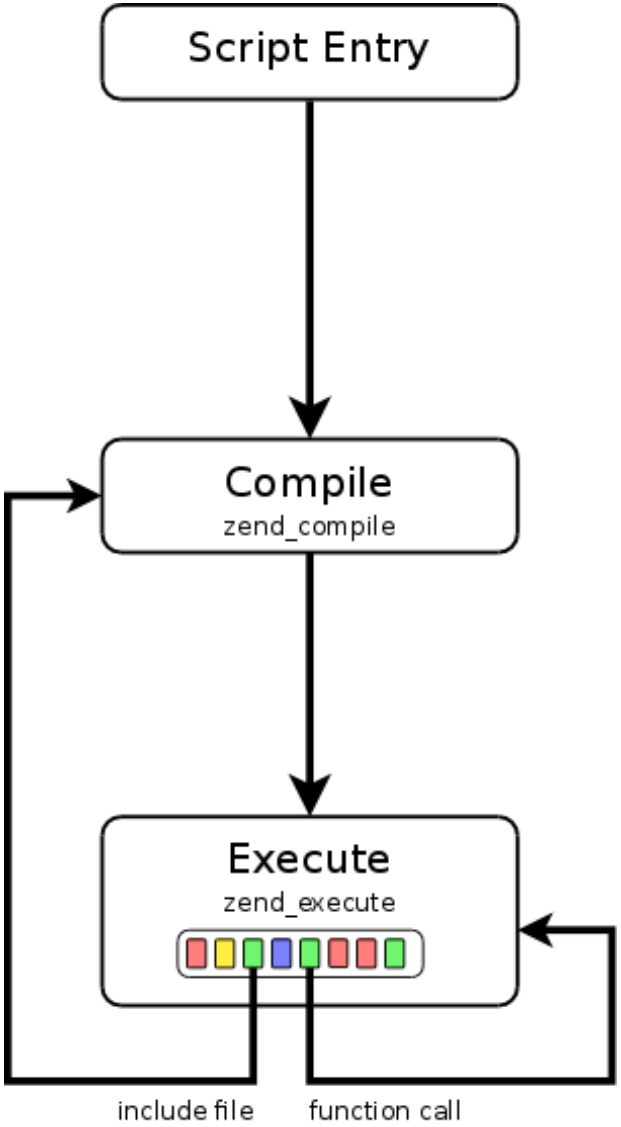
Usage:

```
cvs -d :pserver:cvsread@cvs.xdebug.org:/repository login
# passwd = srmread
cvs -d :pserver:cvsread@cvs.xdebug.org:/repository co -d vld vle
cd vld
phpize && make && make install
php -dextension=vld.so -dvld.active=1 script.php
```

Executing: Diagram



Executing
In a diagram



Micro-optimizations

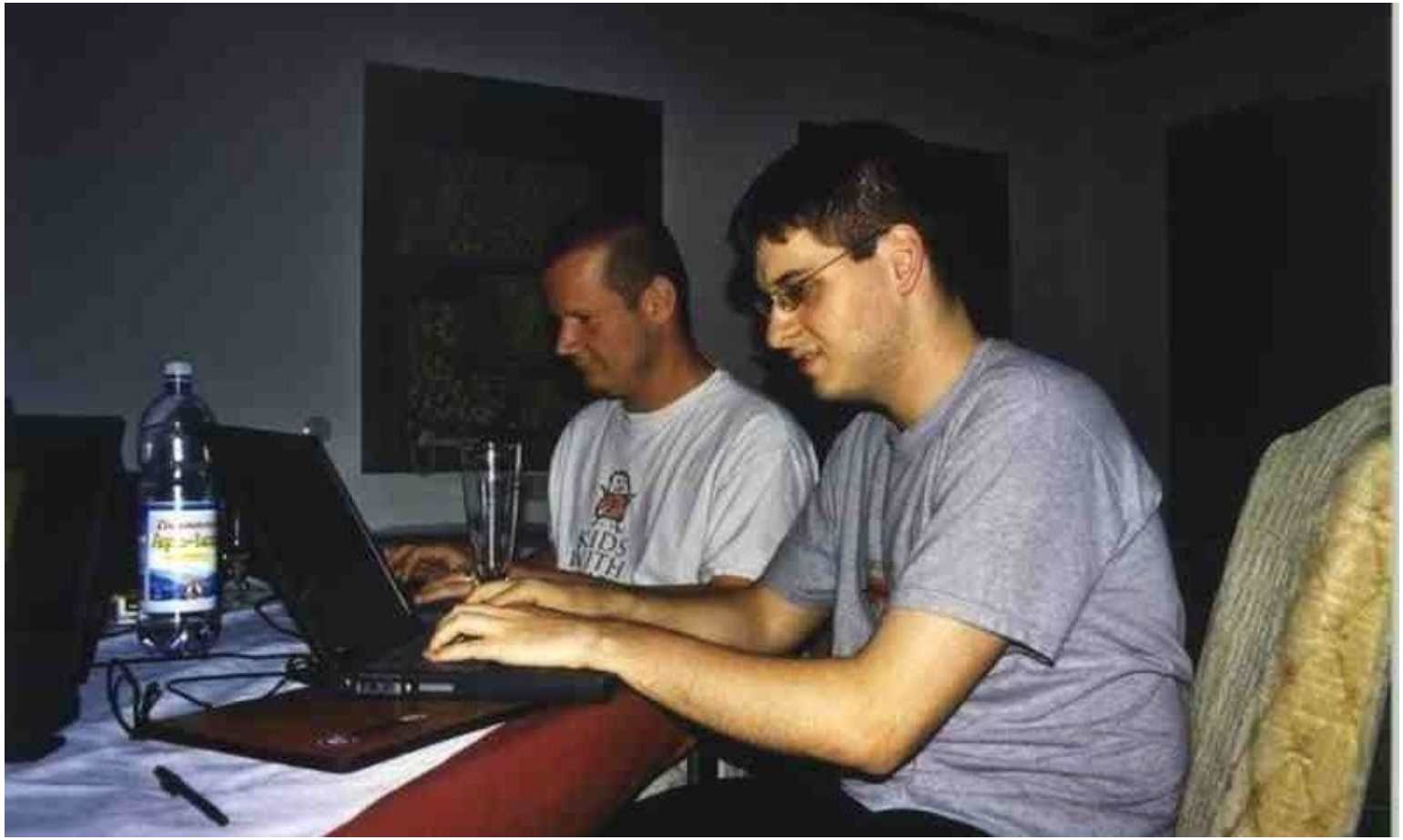
print vs. echo

$i++ vs. ++$i

single quotes vs. double quotes

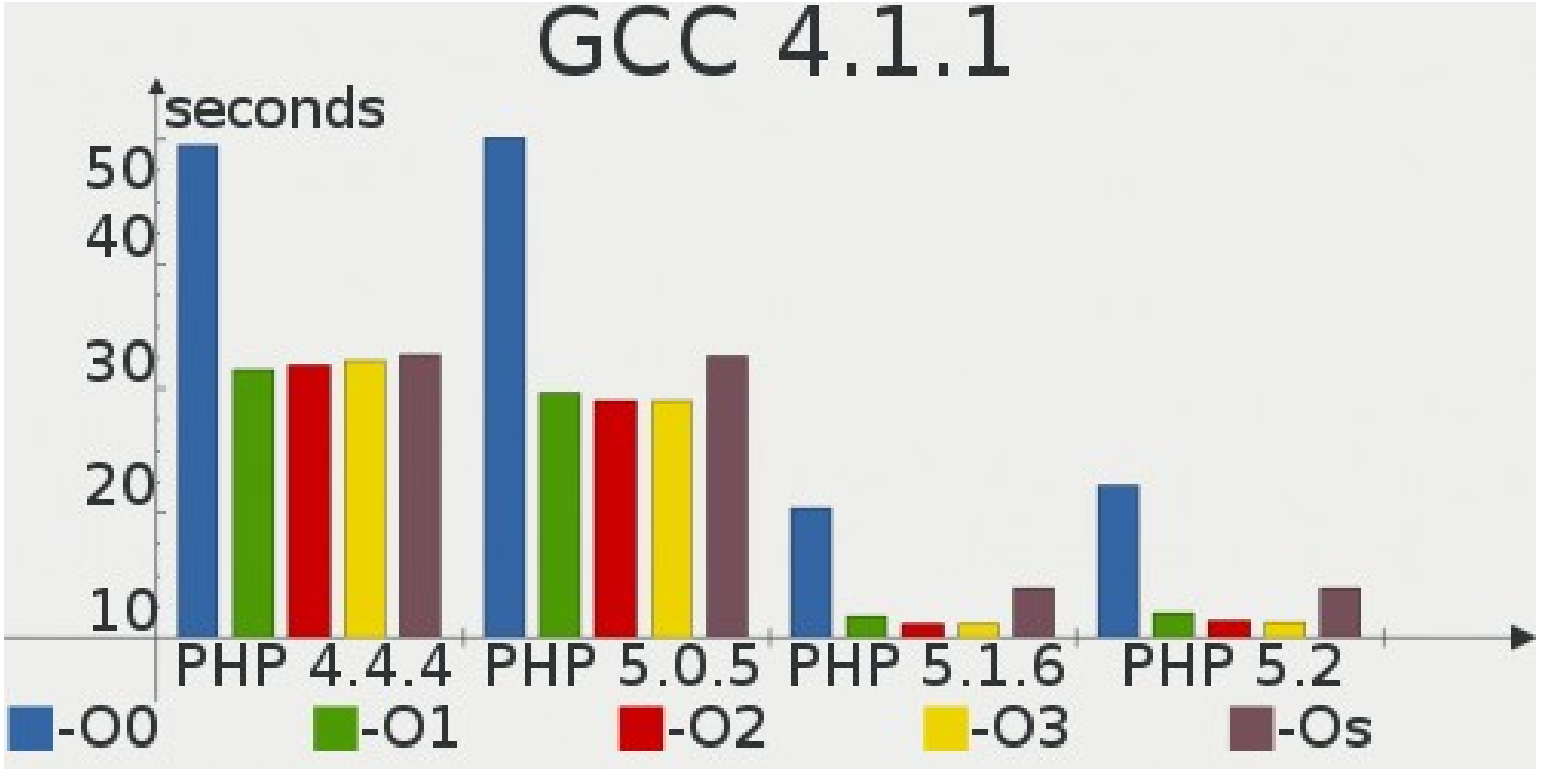
${o}

Faster Harder Stronger

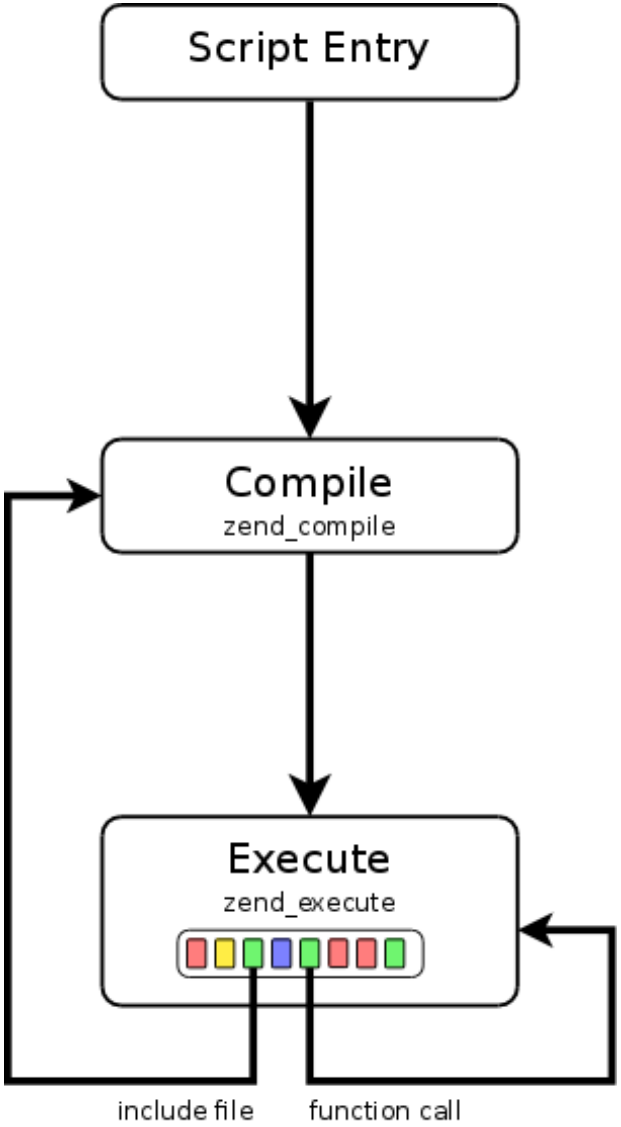


2003

PHP Benchmarks

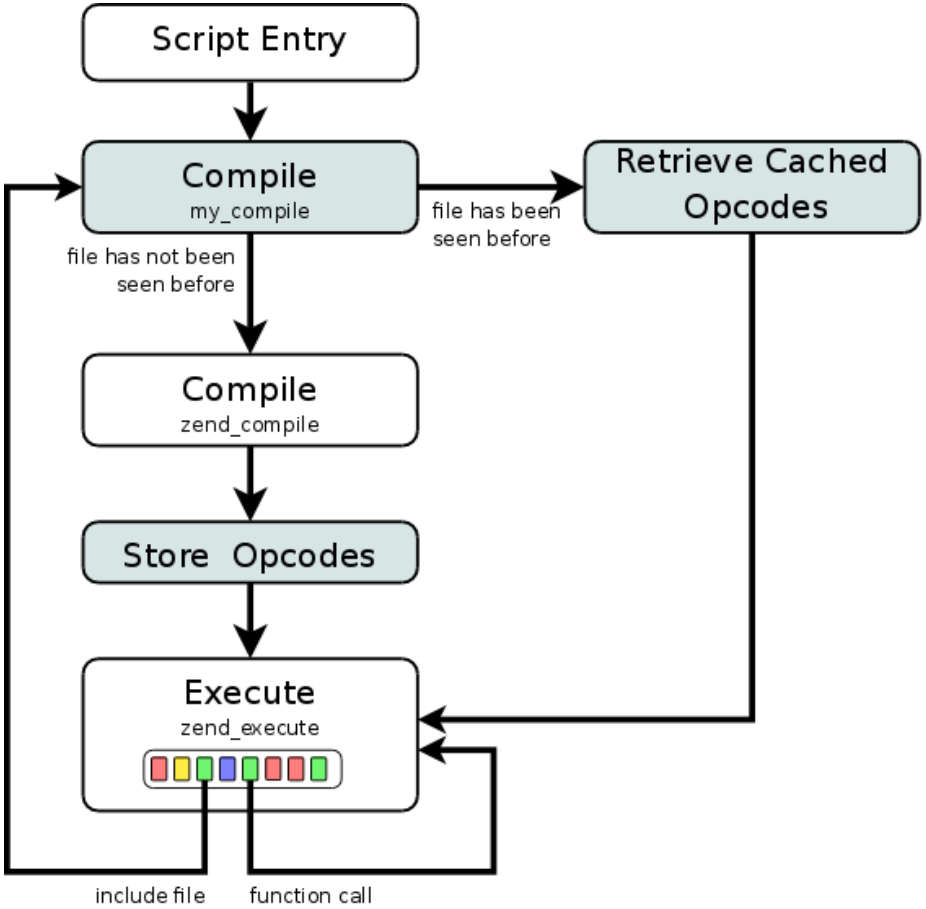


Executing
In a diagram

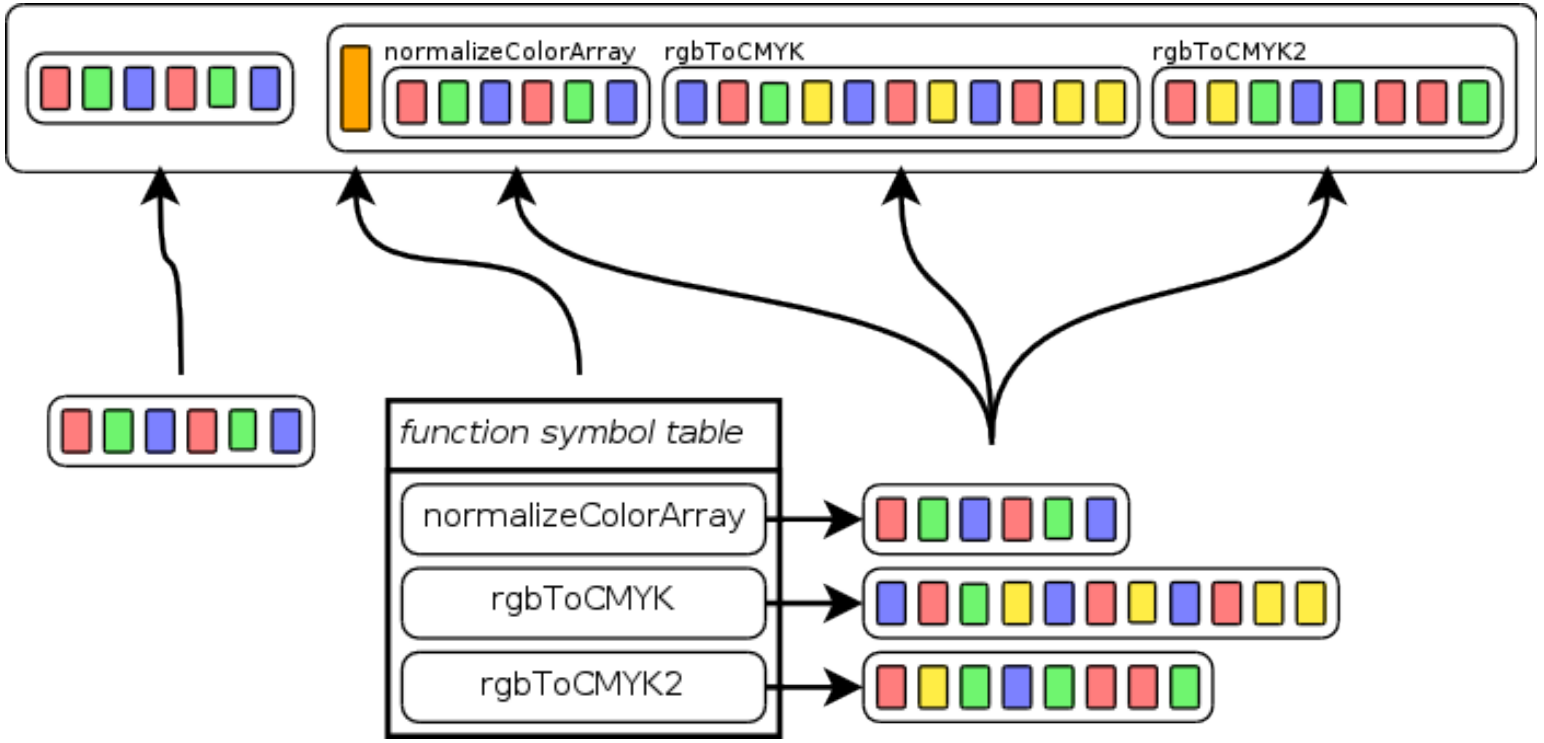


Compiler Caches

How it works



Compiler Caches
Serialization



- Serialization into SHM
- Direct execution from SHM (mostly)

PHP Accelerators

- APC: active development, PHP license
- eAcclerator: GPL
- PHP Accelerator: updated, but not improved
- Turck MM Cache: abandonned
- XCache: new
- Zend Platform: commercial

Compiling
Conditional functions

```
filename:       /home/httpd/html/test/conditional_func.php
function name:  (null)
number of ops:  10
compiled vars:  none
line     #  op                           operands
-------------------------------------------------
if (true) {
   2     0  EXT_STMT
         1  JMPZ                         true, ->5
       function foo() {
   3     2  EXT_STMT
         3  ZEND_DECLARE_FUNCTION        '%00foo%2Ftmp%2Fconditional_func.php0xfe455f', 'foo'
   6     4  JMP                          ->7
       function foo() {
   7     5  EXT_STMT
         6  ZEND_DECLARE_FUNCTION        '%00foo%2Ftmp%2Fconditional_func.php0xfe458b', 'foo'
}
  12     7  EXT_STMT
         8  RETURN                       1
         9* ZEND_HANDLE_EXCEPTION

Function foo:
filename:       /home/httpd/html/test/conditional_func.php
function name:  foo
number of ops:  6
compiled vars:  none
line     #  op                           operands
-------------------------------------------------
function foo() {
   3     0  EXT_NOP
       echo "1\n";
   4     1  EXT_STMT
         2  ECHO                         '1%0A'
}
   5     3  EXT_STMT
         4  RETURN                       null
         5* ZEND_HANDLE_EXCEPTION

End of function foo.

Function foo:
filename:       /home/httpd/html/test/conditional_func.php
function name:  foo
number of ops:  6
compiled vars:  none
line     #  op                           operands
-------------------------------------------------
function foo() {
   7     0  EXT_NOP
       echo "2\n";
   8     1  EXT_STMT
         2  ECHO                         '2%0A'
}
   9     3  EXT_STMT
         4  RETURN                       null
         5* ZEND_HANDLE_EXCEPTION

End of function foo.
```

Demo

demo

Inclued

Dumps includes/classes hiearchies

Download from http://t3.dotgnu.info/blog/tags/inclued/

Install:

```
tar -xvzf inclued-0.3.tgz
cd inclued
phpize && make && make install
```

Add to php.ini:

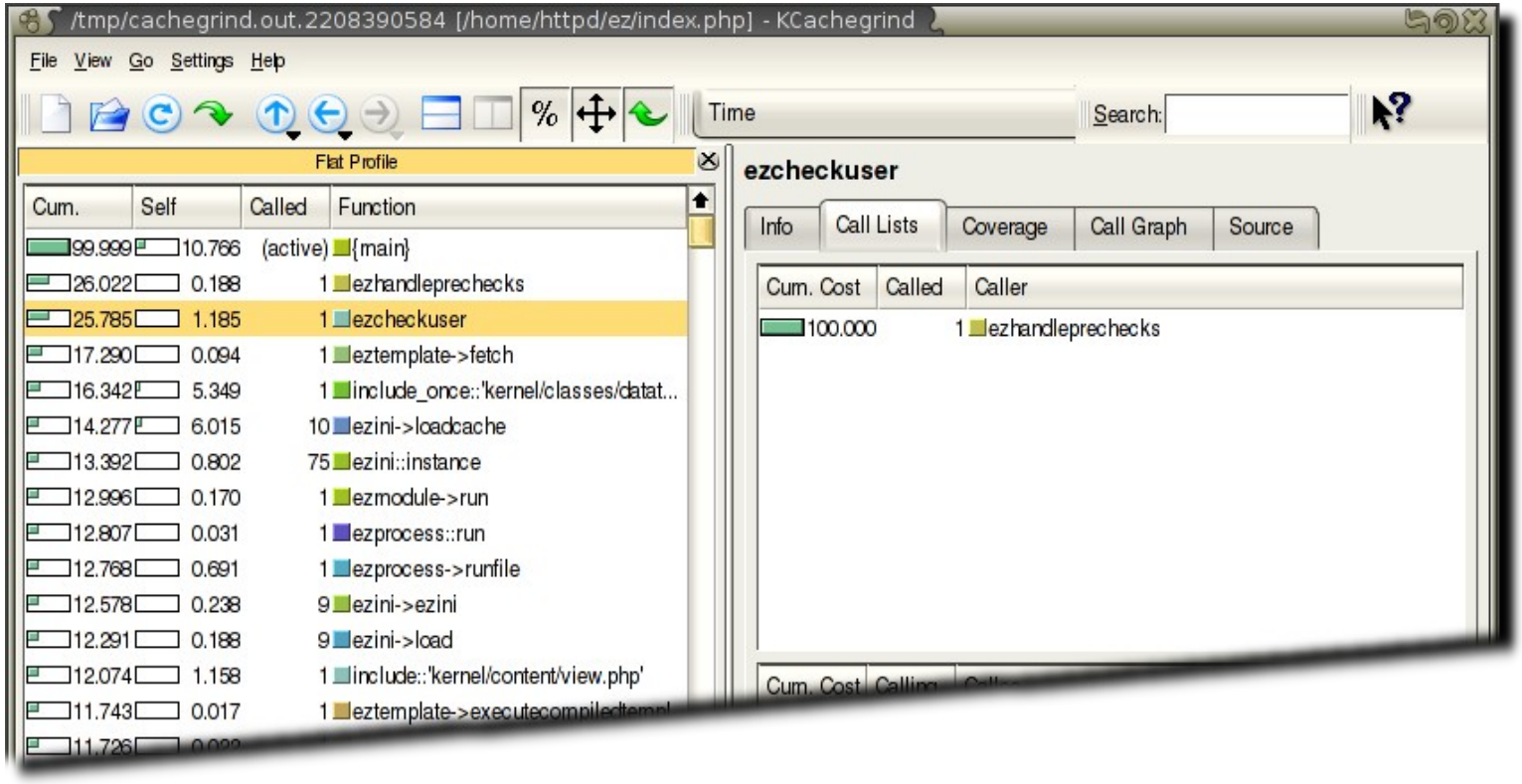
```
extension=inclued.so
inclued.enabled=1
inclued.dumpdir=/tmp
```

Demo

demo

Profiling

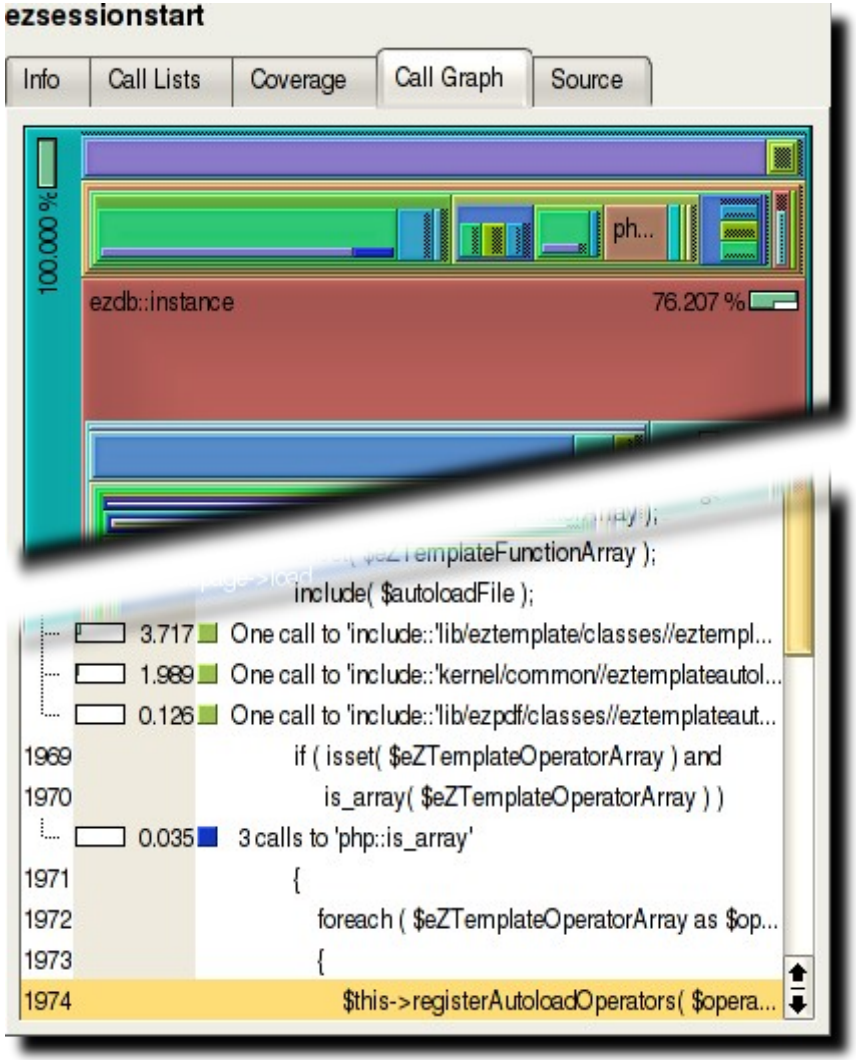
KCacheGrind's Flat Profile and Call List




```
xdebug.profiler_enable=1          ; enable profiler
xdebug.profile_output_dir=/tmp    ; output directory
xdebug.profile_output_name=crc32 ; file extension
```

Profiling

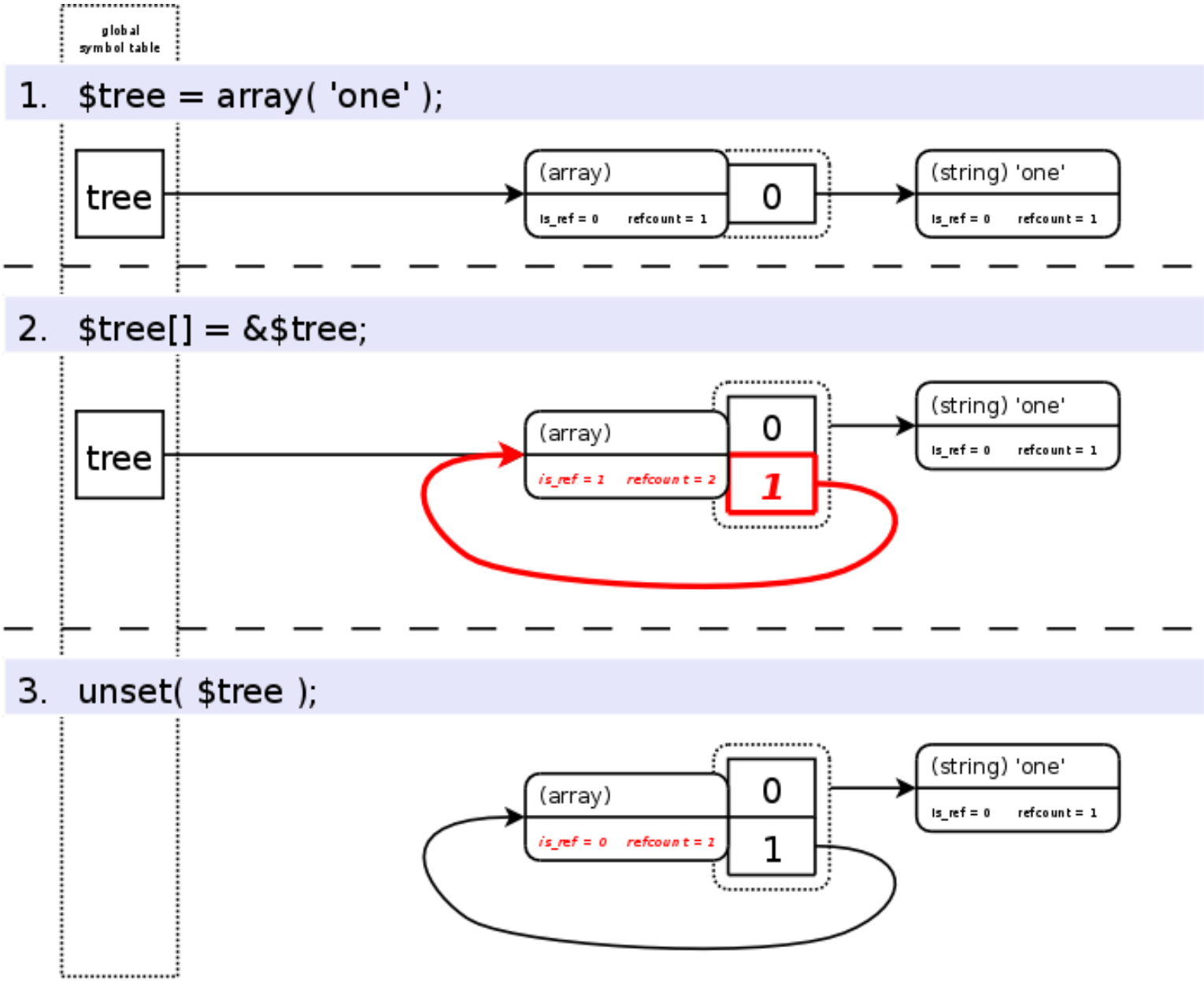
KCacheGrind's Call Graph and Source Annotations



Demo

demo

Variables
Circular References



Questions

Resources

These Slides: http://derickrethans.nl/talks.php
VLD: http://www.derickrethans.nl/vld.php
Xdebug: http://xdebug.org
Inclued: http://t3.dotgnu.info/blog/tags/inclued/

PHP: http://www.php.net