

Welcome!

Performance Perpetrators: Profiling for Professionals

tek 13 - Rosemont, IL, US - May 15th, 2013

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<http://joind.in/8155>

About Me

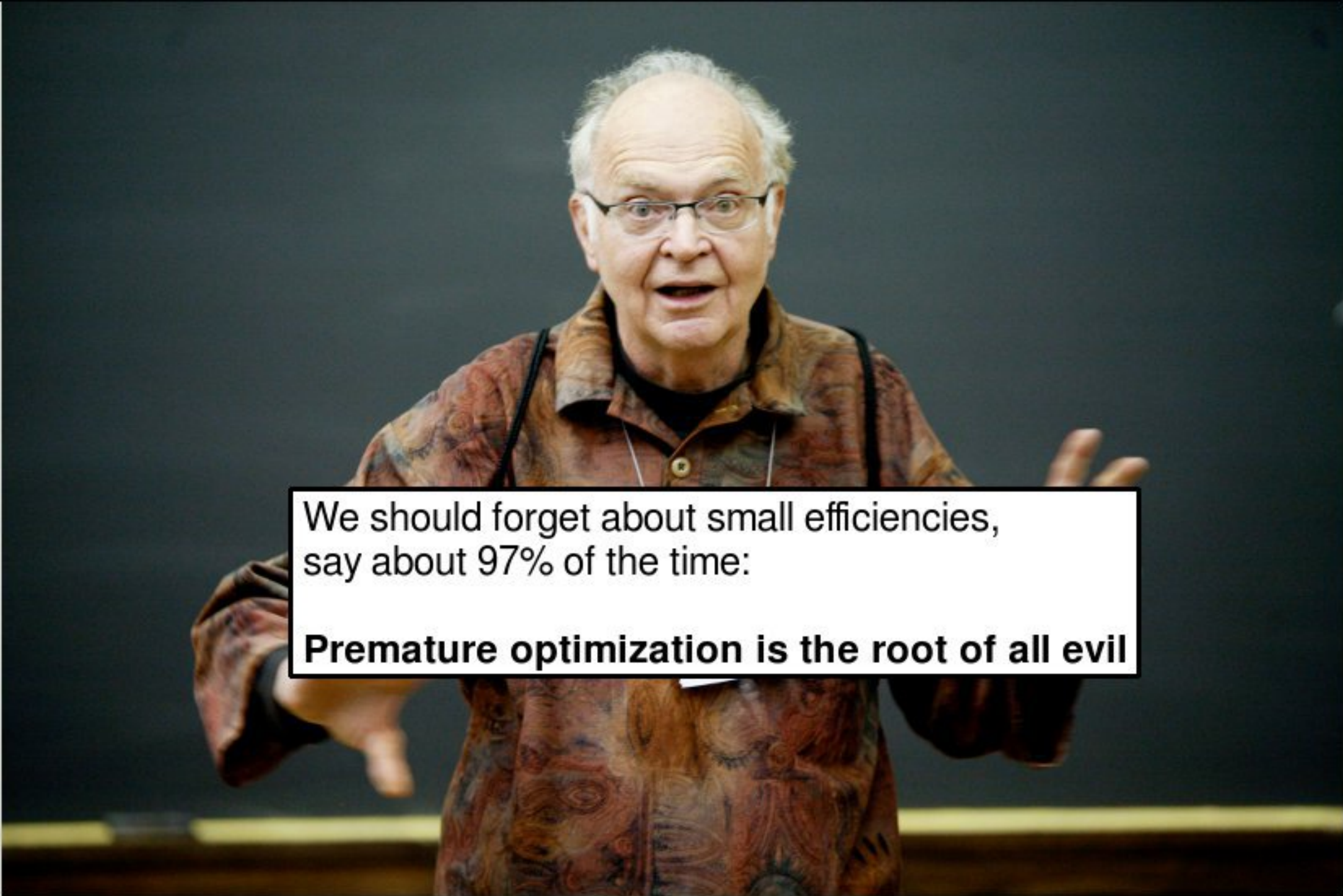
Derick Rethans

- Dutchman living in London
- One of the PHP MongoDB driver maintainers
- Author of the PHP debugger tool Xdebug, PHP's Date/Time/Timezone support, and a bunch of other PHP extensions
- I ♥ maps



The Internet is Full of Nonsense



A photograph of Donald Knuth, an older man with glasses and a patterned shirt, gesturing with his hands while speaking. A white text box with a black border is overlaid on the image.

We should forget about small efficiencies,
say about 97% of the time:

Premature optimization is the root of all evil

Do I need to optimise my code?

Before you can optimise anything:

- Find out if things are running slow
- Find out whether it is the **code**
- Understand your code, application and execution paths
- Find out which parts of the code are slow
- Find out what you can optimise

How does the application perform?

Benchmark the application: siege (httpperf, jmeter-http)

- check ~/.siegerc and set the logfile setting
- Create a file with urls:

```
http://derickrethans.nl/  
http://derickrethans.nl/spatial-indexes-data-sqlite.html  
http://derickrethans.nl/talks.html  
http://derickrethans.nl/who.html
```

- run against your code: `siege -c 40 -r 10 -f /tmp/urls.txt`

```
Transactions:          400 hits  
Availability:         100.00 %  
Elapsed time:          9.82 secs  
Data transferred:     17.04 MB  
Response time:         0.10 secs  
Transaction rate:     40.73 trans/sec  
Throughput:           1.74 MB/sec  
Concurrency:          4.16  
Successful transactions: 400  
Failed transactions:   0  
Longest transaction:   0.68  
Shortest transaction:  0.01
```

Is it my code that is slow?

Application specific tools

mongostat:

insert	query	update	delete	getmore	command	flushes	mapped	vsize	res	faults	lo
0	2260	0	0	0	2	0	3.44g	7.19g	73m	0	php
22	1071	0	0	0	43	0	3.44g	7.19g	83m	0	php
0	0	0	0	0	1	0	3.44g	7.19g	73m	0	tes
0	0	0	0	0	1	0	3.44g	7.19g	73m	0	tes
42	0	0	0	0	42	0	3.44g	7.19g	85m	9	php
120	77	0	0	0	122	0	3.44g	7.19g	148m	139	php
34	117	0	0	0	47	0	3.44g	7.19g	129m	0	php
0	0	0	0	0	1	0	3.44g	7.19g	113m	0	
0	0	0	0	0	1	0	3.44g	7.19g	105m	0	
0	0	0	0	0	1	0	3.44g	7.19g	105m	0	tes

Understand your code, application and execution paths

In-code tools:

- Add timing points

External tools:

- Basic overview: `included`
- Deep details: `xdebug`

Timing Points

Frontend

Firebug/YSlow

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Presentations

London, UK
Tuesday, October 9th 2012, 09:43 BST

In the past 10 years I have given plenty of [presentations](#). Since I started, I've

Life Line





Console

HTML

CSS

Script

DOM

Net

YSlow

[Home](#)
[Grade](#)
[Components](#)
[Statistics](#)
[Tools](#)

Rulesets **YSlow(V2)** [Edit](#)

[Printable View](#)
[Help](#)

Grade B
Overall performance score 83
Ruleset applied: YSlow(V2)
URL: <http://derickrethans.nl/>

ALL (23)
FILTER BY:
[CONTENT \(6\)](#)
[COOKIE \(2\)](#)
[CSS \(6\)](#)
[IMAGES \(2\)](#)
[JAVASCRIPT \(4\)](#)
[SERVER \(6\)](#)

A

Make fewer HTTP requests

F

Use a Content Delivery Network (CDN)

A

Avoid empty src or href

F

Add Expires headers

D

Compress components with gzip

A

Put CSS at top

A

Put JavaScript at bottom

Grade D on Compress components with gzip

There are 3 plain text components that should be sent compressed

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B 691.4K 0.639s

Debugger and Profiler



- **Xdebug:** An Open Source debugging tool
- About 10 years old
- Works on "every" operating system
- PHP 5.1, 5.2, 5.3, 5.4 and trunk
- Version 2.2.2 is the latest

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/pres
0.0029    803552    -> dirname('/home/derick/dev/ezcomponents/trunk/Base/src/ezc_bootstrap.php') /home/derick
0.0030    803968    -> explode('/', '/home/derick/dev/ezcomponents/trunk/Base/src') /home/derick/dev/ezcompon
0.0031    807352    -> count(array (0 => '', 1 => 'home', 2 => 'derick', 3 => 'dev', 4 => 'ezcomponents', 5 =>
0.0032    807800    -> array_slice(array (0 => '', 1 => 'home', 2 => 'derick', 3 => 'dev', 4 => 'ezcomponents
0.0033    808952    -> join('/', array (0 => '', 1 => 'home', 2 => 'derick', 3 => 'dev', 4 => 'ezcomponents',
0.0065    1002544    -> require(/home/derick/dev/ezcomponents/trunk/Base/src/base.php) /home/derick/dev/ezcomp
0.0066    990560    -> __autoload('ezcTemplateCustomFunction') /home/derick/dev/ezcomponents/trunk/Base/src/ezc
0.0066    990560    -> ezcBase::autoload('ezcTemplateCustomFunction') /home/derick/dev/ezcomponents/trunk/Bas
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/
0.0069    990728    -> array_key_exists('ezcTemplateCustomFunction', array ()) /home/derick/dev/ezcomponent
0.0069    990728    -> array_key_exists('ezcTemplateCustomFunction', array ()) /home/derick/dev/ezcomponent
0.0070    991536    -> preg_match('/^([a-z0-9]*)([A-Z][a-z0-9]*)?([A-Z][a-z0-9]*)?/', 'ezcTemplateCustomFun
0.0072    993304    -> sizeof(array (0 => 'ezcTemplateCustom', 1 => 'ezc', 2 => 'Template', 3 => 'Custom'))
0.0073    993664    -> strtolower('Template_Custom_autoload.php') /home/derick/dev/ezcomponents/trunk/Base/
0.0073    993496    -> ezcBase::requireFile('template_custom_autoload.php', 'ezcTemplateCustomFunction', 'e
0.0074    994184    -> file_exists('/home/derick/dev/ezcomponents/trunk/Base/src/../../autoload/template_
0.0075    993848    -> strtolower('Template_autoload.php') /home/derick/dev/ezcomponents/trunk/Base/src/bas
0.0076    993888    -> ezcBase::requireFile('template_autoload.php', 'ezcTemplateCustomFunction', 'ezc') /h
0.0077    994568    -> file_exists('/home/derick/dev/ezcomponents/trunk/Base/src/../../autoload/template_
0.0100    1105728    -> require(/home/derick/dev/ezcomponents/trunk/autoload/template_autoload.php) /home/

```

Some settings:

```

xdebug.auto_trace=1
xdebug.trace_output_dir=/tmp
xdebug.collect_params=1
xdebug.collect_return=1
xdebug.collect_includes=1
xdebug.collect_assignments=1

```

Function trace to file

Automatic readable format

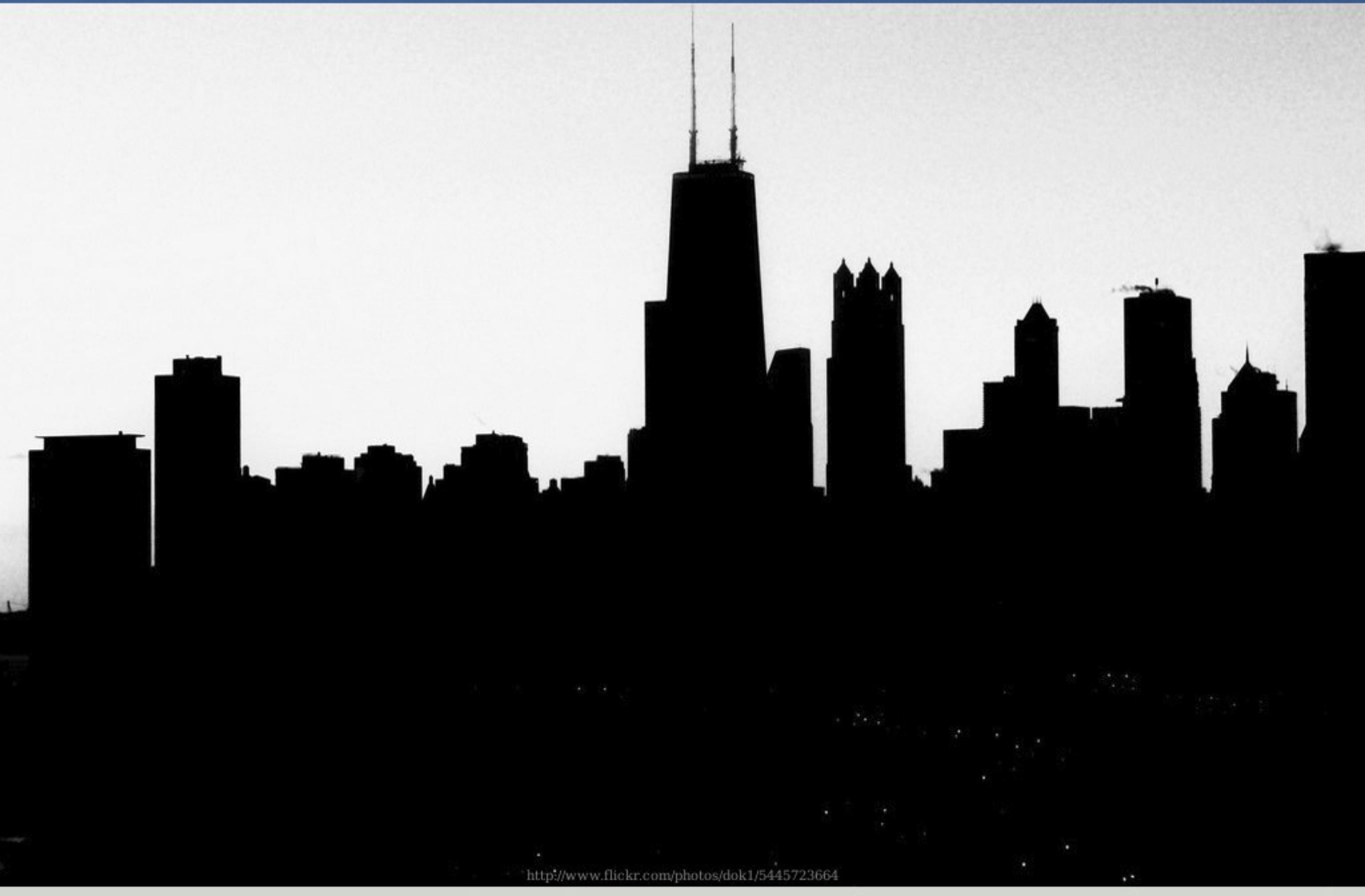
```
function-trace-comp.xt (~dev/php/xdebug-demos) - VIM - Terminal
Version: 2.2.0-dev
File format: 2
TRACE START [2011-11-23 10:44:31]
1 0 0 0.001373 773608 {main} 1 /home/httpd/www.derickrethans.nl
2 1 0 0.001747 800080 include 1 /home/httpd/www.derickrethans.nl/bra
3 2 0 0.002017 815432 require 1 /home/derick/dev/ezcomponents/trunk/
4 3 0 0.002057 815824 dirname 0 /home/derick/dev/ezcomponents/tr
4 3 1 0.002110 815976
4 4 0 0.002156 816192 explode 0 /home/derick/dev/ezcomponents/tr
4 4 1 0.002200 819544
4 5 0 0.002224 819624 count 0 /home/derick/dev/ezcomponents/tr
4 5 1 0.002270 819624
4 6 0 0.002301 820072 array_slice 0 /home/derick/dev/ezcomponent
4 6 1 0.002352 821344
4 7 0 0.002374 821224 join 0 /home/derick/dev/ezcomponents/tr
4 7 1 0.002417 821392
4 8 0 0.004136 1014824 require 1 /home/derick/dev/ezcomponents/trunk/
4 8 1 0.004170 1014824
3 2 1 0.004190 1013848
3 9 0 0.007865 1438592 require 1 /home/httpd/www.derickrethans.nl/bra
3 9 1 0.007903 1438592
3 10 0 0.008274 1469824 require 1 /home/httpd/www.derickrethans.nl/bra
function-trace-comp.xt 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)
```

Trace file analysers

demo

Profiling



RunID: 4d95c5905ef51 against derickrethans/?

[View Callgraph](#)

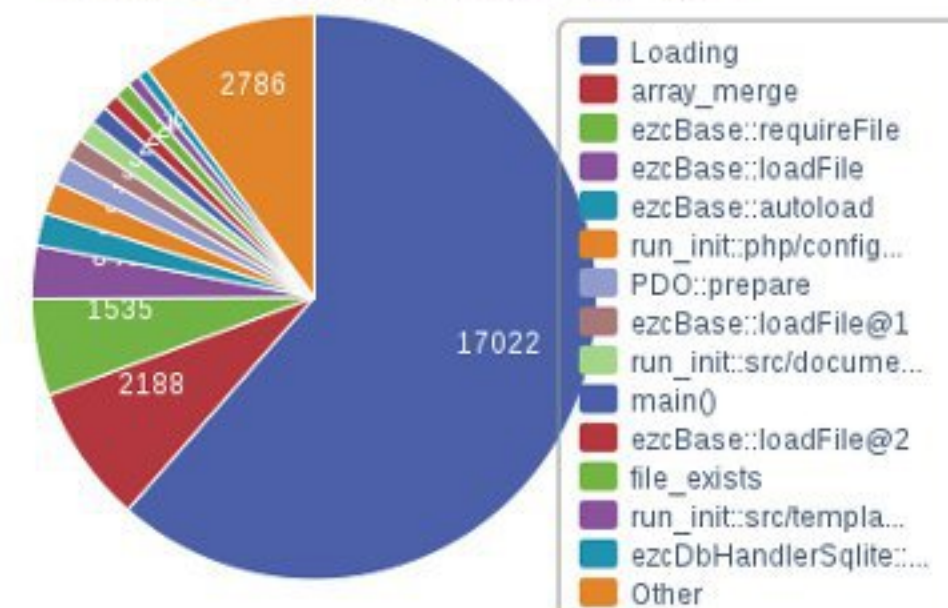
Stat	Exact URL	Similar URLs
Count	2	2
Min Wall Time	27.6930 ms	27.6930 ms
Max Wall Time	36.3700 ms	36.3700 ms
Avg Wall Time	32.0315 ms	32.0315 ms
95% Wall Time	36.3700 ms	36.3700 ms
Display run Incl. Wall Time (microsec)	27,693 microsecs	
Min CPU Ticks	24.0010 ms	24.0010 ms
Max CPU Ticks	36.0020 ms	36.0020 ms
Avg CPU Ticks	30.0015 ms	30.0015 ms
95% CPU Ticks	36.0020 ms	36.0020 ms
Display run Incl. CPU (microsecs)	24,001 microsecs	
Min Peak Memory Usage	4,276,816 bytes	4,276,816 bytes
Max Peak Memory Usage	4,276,816 bytes	4,276,816 bytes
Avg Peak Memory Usage	4,276,816 bytes	4,276,816 bytes
95% Peak Memory Usage	4,276,816 bytes	4,276,816 bytes
Display run Incl. PeakMemUse (bytes)	4,276,816 bytes	

Cookie	Results
_profile	1

Get	Results

Post	Results

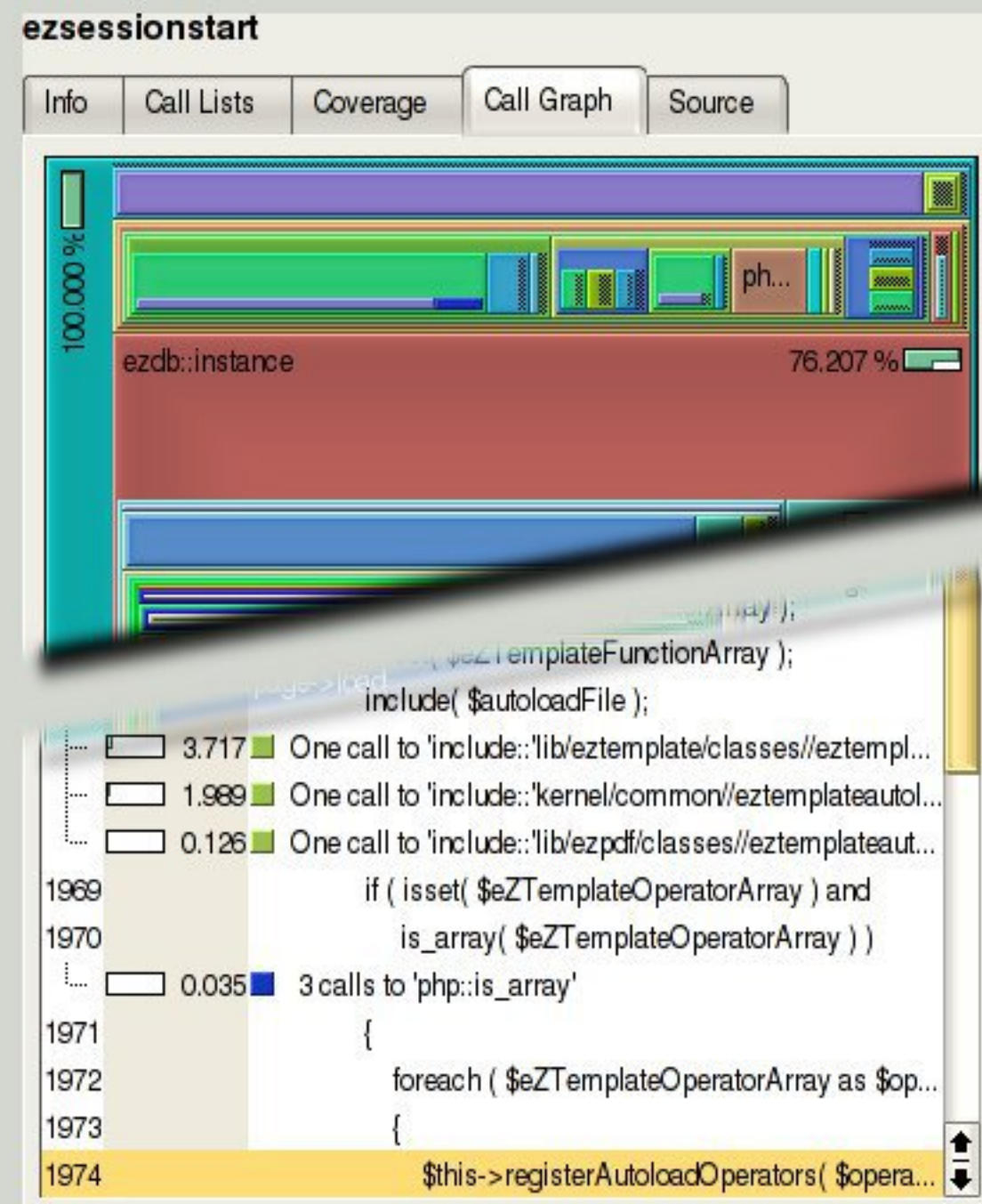
Expensive Calls by Exclusive Wall Time



Profiling

Valgrind / Cachegrind

- Written for C-applications
- Xdebug uses the same format
- KCacheGrind is an awesome viewer
- Profile your app with **both** CacheGrind and Xdebug
- Alternative viewers: WinGrind, Macgrind, Webgrind, PHP Storm



demo



- Slides: <http://derickrethans.nl/talks/profiling-tek13>
- Contact me: Derick Rethans: @derickr, derick@derickrethans.nl
- Feedback: <http://joind.in/8155>

(!) Notice: Undefined offset: 22 in /home/httpd/pres2/show2.php on line 193

Call Stack

#	Time	Memory	Function	Location
1	0.0016	344232	{main}()	<u>../show2.php:0</u>
2	0.0061	707888	Presentation->display(\$slideNr = '22')	<u>../show2.php:135</u>

(!) Warning: DOMDocument::load(): Document is empty in /home/httpd/presentations, line: 1 in /home/httpd/pres2/show2.php on line 193

Call Stack

#	Time	Memory	Function	Location
1	0.0016	344232	{main}()	<u>../show2.php:0</u>
2	0.0061	707888	Presentation->display(\$slideNr = '22')	<u>../show2.php:135</u>
3	0.0062	709528	load ('/home/httpd/pres2/presentations/')	<u>../show2.php:193</u>

(!) Warning: DOMDocument::load(): Start tag expected, '<' not found in /home/httpd/presentations, line: 1 in /home/httpd/pres2/show2.php on line 193

Call Stack

#	Time	Memory	Function	Location
1	0.0016	344232	{main}()	<u>../show2.php:0</u>
2	0.0061	707888	Presentation->display(\$slideNr = '22')	<u>../show2.php:135</u>
3	0.0062	709528	load ('/home/httpd/pres2/presentations/')	<u>../show2.php:193</u>

(!) Notice: Undefined offset: 22 in /home/httpd/pres2/show2.php on line 194

Call Stack

#	Time	Memory	Function	Location
1	0.0016	344232	{main}()	<u>../show2.php:0</u>
2	0.0061	707888	Presentation->display(\$slideNr = '22')	<u>../show2.php:135</u>

(!) Fatal error: Uncaught exception 'ezcTemplateRuntimeException' with message 'The external (use) variable 'node' is not set in template: /home/httpd/pres2/presentations/templates/default/slide.ezt and called from the application code' in /tmp/template-cache/compiled templates/xhtmll-updqr0/slide-

Fetching OSM data

The whole planet (bad idea as it's 26GB):

```
http://planet.openstreetmap.org/planet/planet-latest.osm.bz2
```

A whole country:

```
http://download.geofabrik.de/openstreetmap/europe/great_britain/england.osm.bz2
```

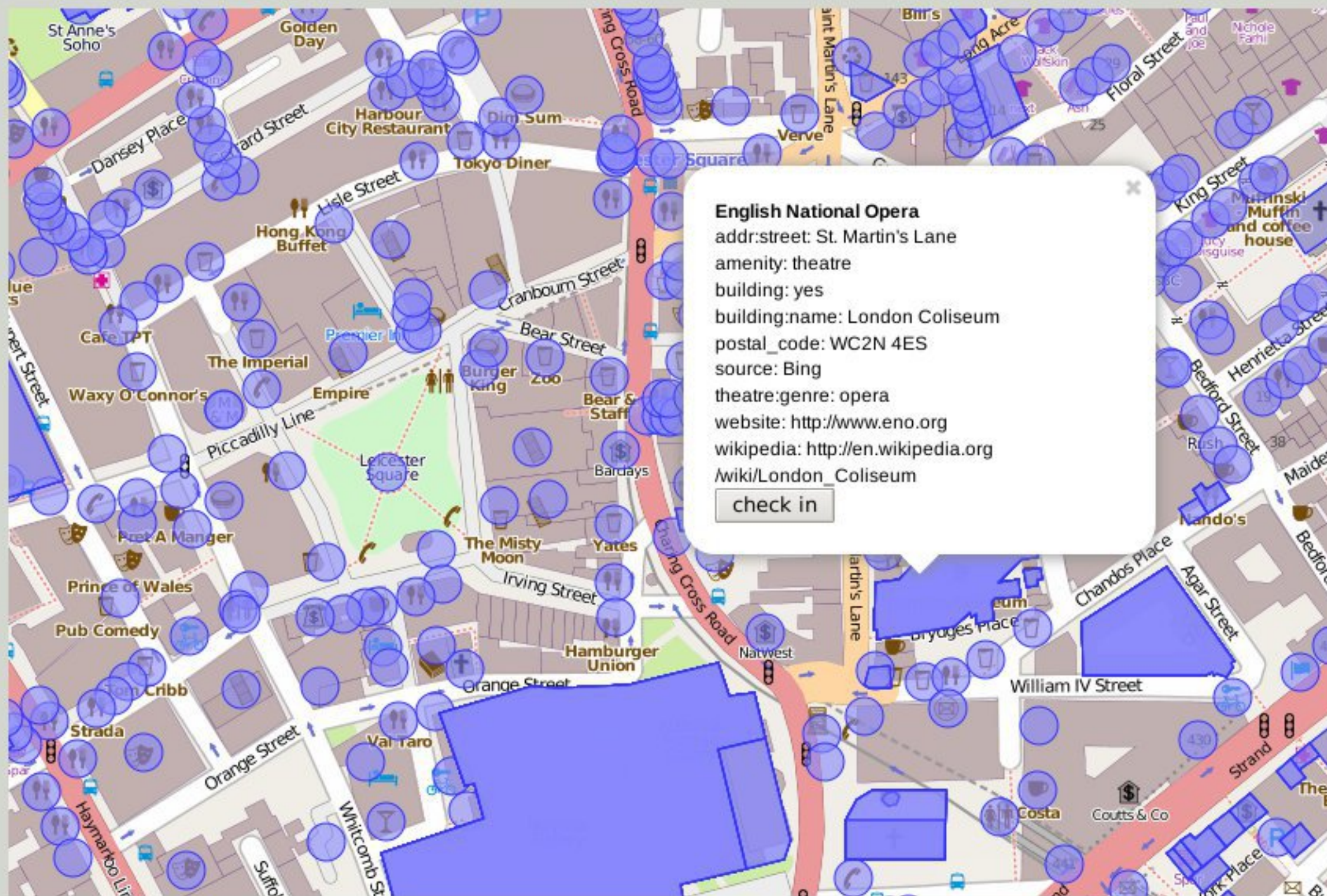
Or pick a smaller country from

```
http://download.geofabrik.de/openstreetmap/
```

XAPI (via Overpass):

```
http://www.overpass-api.de/api/xapi?*[bbox=7.1,51.2,7.2,51.3][amenity=restaurant]
```

Different visualisations of the data





Slides:
<http://joind.in/8171>

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