

Profiling PHP applications



A photograph of a red and white motorcycle stuck in a muddy, swampy area. The motorcycle is partially submerged in the mud, with its front wheel and handlebars visible. The background is a dense, green forest. A semi-transparent black banner is overlaid across the middle of the image, containing the text "Who likes slow websites?".

Who likes slow websites?

Only faster response time?





Reduce resource usage?

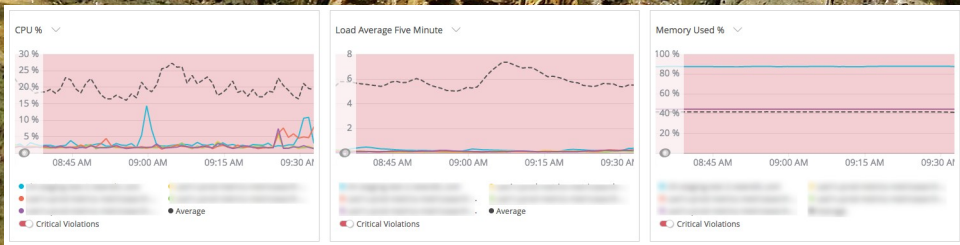
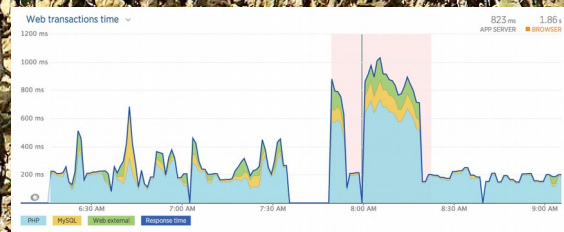


More RPM?


```
1 : 61.2% sy: 34.6% ni: 0.0% hi: 3.7% si: 0.5% wa: 0.0%
2 : 24.4% sy: 74.2% ni: 0.0% hi: 1.4% si: 0.0% wa: 0.0%
3 : 52.1% sy: 46.9% ni: 0.0% hi: 0.9% si: 0.0% wa: 0.0%
4 : 44.6% sy: 54.5% ni: 0.0% hi: 0.9% si: 0.0% wa: 0.0%
1 [|||||100.0%]
2 [|||||100.0%]
3 [|||||100.0%]
4 [|||||100.0%]
Mem:15.5G used:13.16 buffers:28K cache:1.40G
Swp:4.00G used:1.216
```

```
5 : 72.4% sy: 26.2% ni: 0.0% hi: 0.9% si: 0.5% wa: 0.0%
6 : 26.3% sy: 72.3% ni: 0.0% hi: 0.9% si: 0.5% wa: 0.0%
7 : 45.8% sy: 53.7% ni: 0.0% hi: 0.5% si: 0.0% wa: 0.0%
8 : 52.8% sy: 46.3% ni: 0.0% hi: 0.9% si: 0.0% wa: 0.0%
5 [|||||100.0%]
6 [|||||100.0%]
7 [|||||100.0%]
8 [|||||100.0%]
Tasks: 259; 8 running
Load average: 21.50 20.34 14.50
Uptime: 4 days, 07:33:51
```

Usually the trigger to start profiling ...





Hi,

I'm Ike, Developer / Operations
at [Studio Emma](#)

@BlackIkeEagle on Twitter



studio emma

internet expertise



Magento[®]

Silver solution partner

PIMCORE[®]

Gold solution partner

What is profiling
Why profiling
How to profile
Analyze results



Profiling

is the process of application runtime characteristics measurement for performance analysis and optimization



Profiling

is the process of application runtime **characteristics** measurement for performance analysis and optimization



Profiling

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measurement for **performance** analysis and optimization



Profiling

is the process of application runtime **characteristics**
measurement for **performance** analysis and **optimization**





Knowledge Gained?

- where
- what
- how much

WHY?

My application is 'fast'



WHY?

My application is 'fast'

- faster response
- more RPM
- reduce resource usage





No profiler needed, I know where the
Bottleneck is.



No profiler needed, I know where the
Bottleneck is.

Nope, that's shooting in the dark



Points of interest



Execution time

CPU time

Memory usage

Disk IO

Network time

External delays

How to profile



PHP

Xdebug

Xhprof

Tideways

Blackfire





PHP?

Thats not really profiling

```
<?php
```

```
$start = microtime(true);  
// ...  
$this->code();  
// ...  
$time = microtime(true) - $start;
```




xdeBUG 

Xdebug php extension

Some configuration needed

External tool to interpret


```
xdebug.profiler_enable=1  
xdebug.profiler_output_dir=/xdebug  
xdebug.profiler_output_name=cachegrind.out.%u
```


Flat Profile

Search: (No Grouping)

Incl.	Self	Called	Function
104 057 906	13 631	270	Magento\Framework\View\...
103 883 706	9 663	268	Magento\Framework\View\...
78 210 012	3 496	33	Magento\Framework\View\...
34 454 515	334	(0)	{main}
32 358 775	26 169	137	Magento\Framework\View\...
27 612 760	133	1	Magento\Framework\App\...
27 594 494	342	2	Magento\Framework\App\...
27 590 347	329	2	Magento\Framework\View\...
27 297 703	86	2	Magento\Framework\View\...
26 295 325	276 660	6 566	Magento\Framework\Obj...
25 635 748	5 089	101	Magento\Framework\View\...
23 200 854	286	3	Magento\Framework\App\...
19 541 298	371 699	26 477	Magento\Framework\App\...
15 379 504	443	2	Magento\Framework\App\...
15 156 344	237 830	6 358	Magento\Framework\Obj...
14 749 654	482 736	6 358	Magento\Framework\Obj...
14 248 211	538 896	35 538	Magento\Framework\Obj...
13 809 927	56	1	Magento\Framework\View\...
13 809 870	233	1	Magento\Framework\View\...
13 780 399	44	1	Magento\Framework\View\...
13 779 497	613	1	Magento\Framework\View\...
13 772 550	247	3	Magento\Framework\View\...
13 772 299	1 042	3	Magento\Framework\View\...
13 565 285	94	3	Magento\Framework\View\...
11 634 803	889	27	Magento\Swatches\Block\P...
10 942 829	698	4	Magento\Catalog\Block\Ca...
10 939 799	301	4	Magento\Catalog\Block\Ca...
10 928 481	480	4	Magento\Catalog\Block\Ca...
10 921 081	83	1	include:::/phpapp/vendor/...
10 920 529	15	1	Magento\Catalog\Block\Ca...
10 920 513	70	1	Magento\Catalog\Block\Ca...
10 918 382	221	2	Magento\Catalog\Block\Pr...
10 747 800	465	2	Magento\Catalog\Controlle..

Magento\Framework\View\Layout\Interceptor->renderElement

Types Callers All Callers Callee Map Source Code

Event Type	Incl.	Self	Short	Formula
Time	104 057 906	13 631	Time	
Memory	70 617 864	52 992	Memory	

Time	Time per call	Co	Co	Count	Callee
104 049 397	770 736			135	Magento\Framework\View\Layout\Interceptor->renderElement (Layout.php, ...)
103 883 706	775 251			134	Magento\Framework\View\Layout\Interceptor->renderNonCachedElement (Layout.php, ...)
150 223	1 112			135	Magento\Framework\Event\Manager\Proxy->dispatch (Proxy.php)
3 337	24			135	Magento\Framework\Interception\PluginList\PluginList->getNext (PluginList.php)
3 127	23			134	Magento\Framework\View\Layout\Interceptor->displayElement (Layout.php)
1 954	14			135	Magento\Framework\DataObject->getData (DataObject.php)
1 154	8			135	Magento\Framework\View\Layout\Interceptor->build (Layout.php)
175	1			135	Magento\Framework\DataObject->setData (DataObject.php)

Parts Callee Call Graph All Callees Caller Map Machine Code

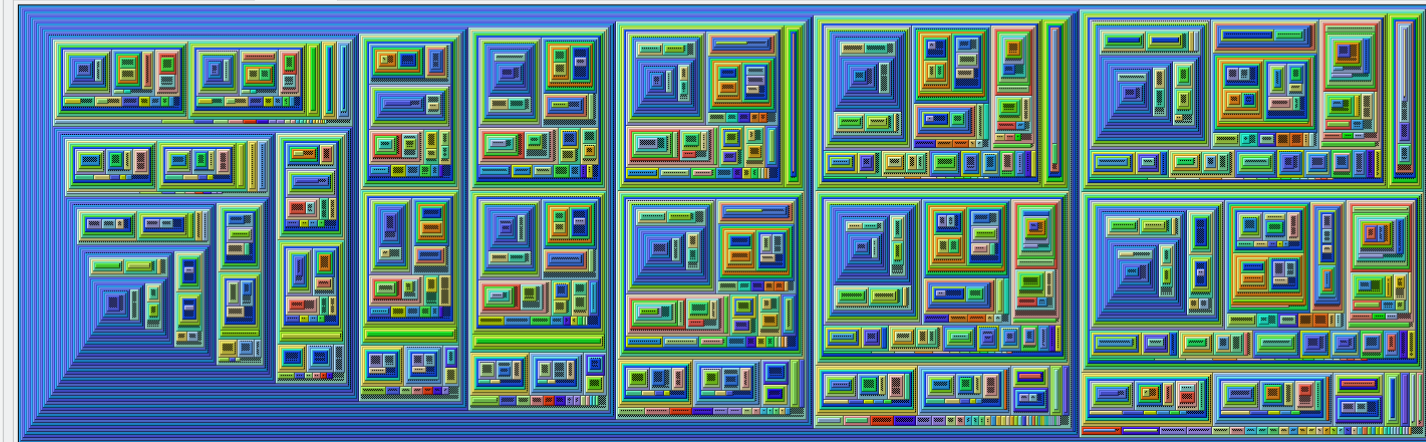
Flat Profile

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13 772 299	1 042	3	Magento\Framework\View\...
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10 928 481	480	4	Magento\Catalog\Block\Ca...
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175	1			135	Magento\Framework\DataObject->setData (DataObject.php)

Parts Calles Call Graph All Calles Caller Map Machine Code

It's Hard





xhprof

Tideways php extension

Configuration needed

Xhgui to view and compare


```
<?php
```

```
if (extension_loaded('tideways')) {  
    tideways_enable(  
        TIDEWAYS_FLAGS_CPU  
        | TIDEWAYS_FLAGS_MEMORY  
        | TIDEWAYS_FLAGS_NO_SPANS  
    );  
  
    register_shutdown_function(  
        function() {  
            ignore_user_abort(true);  
            flush();  
  
            $data['profile'] = tideways_disable();  
  
            // ...  
        }  
    );  
}
```


Recent runs

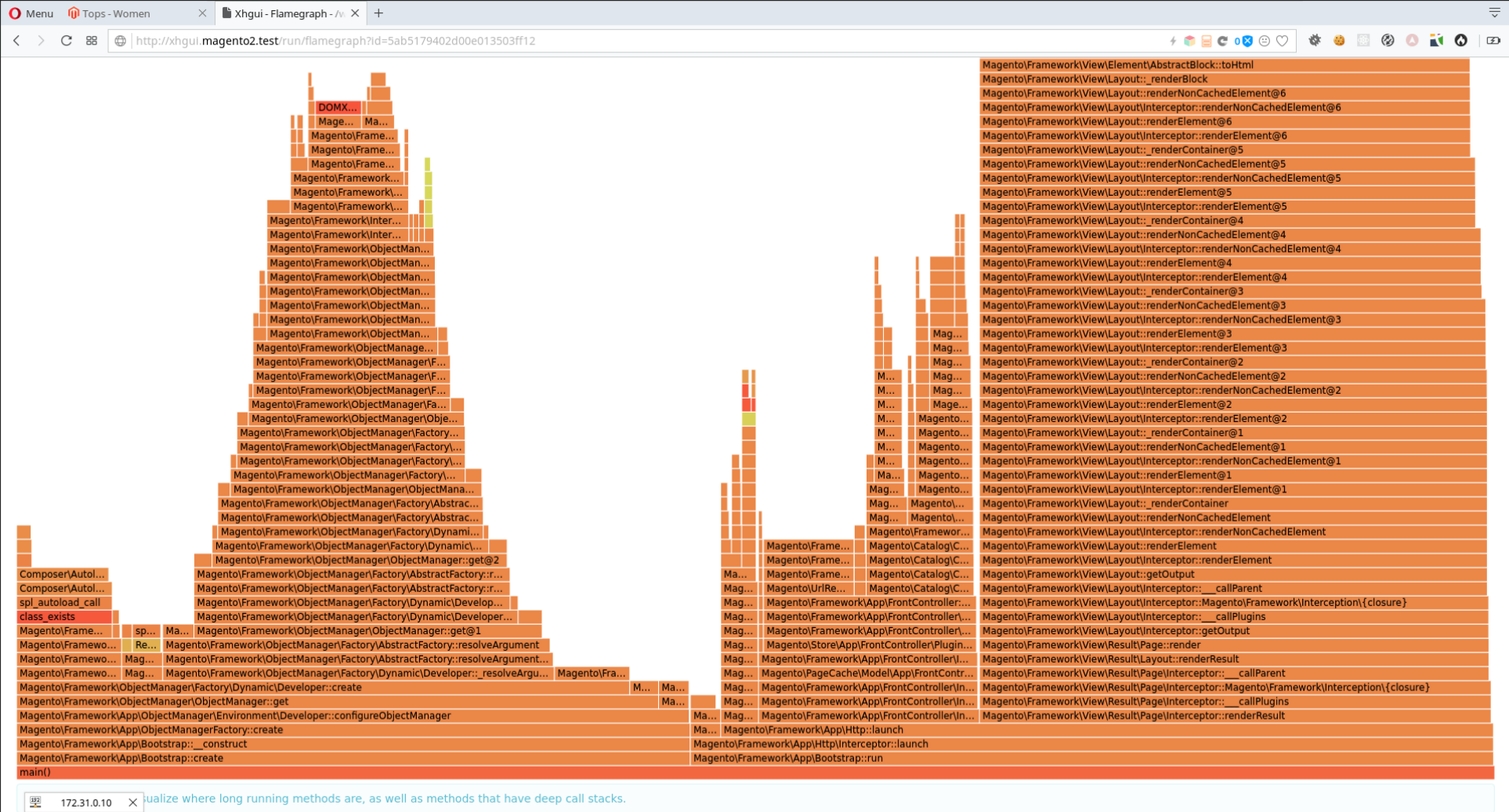
Looks like you haven't done any profiling

To get started with XHGUI you'll need to collect some profiling data.

The simplest way to get an application profiled, is to use `external/header.php`. This file is designed to be combined with PHP's `auto_prepend_file` directive. This can be enabled system-wide through `php.ini`. Alternatively, you can enable `auto_prepend_file` per virtual host. See the README.md file for more details.

9,319,960 bytes

<div> <div>Menu</div> <div>Tops - Women</div> <div>Xhgui - Profile - /women</div> <div>X</div> <div>+</div> </div> <div> http://xhgui.magento2.test/run/view?id=5ab5179402d00e013503ff12 </div> <div> <div>Filter by function name</div> </div>										
Function	Call Count	Self Wall Time	Self CPU	Self Memory Usage	Self Peak Memory Usage	Inclusive Wall Time	Inclusive CPU	Inclusive Memory Usage	Inclusive Peak Memory Usage	
Composer\Autoload\includeFile	2370	3,744,715 µs	3,625,509 µs	18,251,536 bytes	31,453,576 bytes	4,488,326 µs	4,342,105 µs	22,942,248 bytes	36,312,480 bytes	
DOMXPath::query	21270	2,259,003 µs	2,275,958 µs	7,838,328 bytes	5,400 bytes	2,259,003 µs	2,275,958 µs	7,838,328 bytes	5,400 bytes	
Composer\Autoload\includeFile@1	533	570,691 µs	550,974 µs	3,189,512 bytes	3,551,048 bytes	707,084 µs	680,786 µs	4,684,896 bytes	4,858,904 bytes	
Magento\Framework\ObjectManager\Factory\AbstractFactory::resolveA...	29628	364,979 µs	349,782 µs	-5,394,936 bytes	718,120 bytes	2,602,384 µs	2,543,361 µs	7,905,392 bytes	8,684,512 bytes	
gzcompress	35	349,982 µs	348,580 µs	855,080 bytes	6,165,008 bytes	349,982 µs	348,580 µs	855,080 bytes	6,165,008 bytes	
Magento\Framework\Interception\PluginList\PluginList::getNext	71279	345,640 µs	306,305 µs	-2,126,040 bytes	2,328 bytes	1,913,234 µs	1,941,625 µs	1,715,128 bytes	626,880 bytes	
PDOStatement::execute	435	316,754 µs	46,441 µs	10,586,504 bytes	384,232 bytes	316,754 µs	46,441 µs	10,586,504 bytes	384,232 bytes	
SimpleXMLElement::xpath	5942	258,187 µs	262,350 µs	1,206,592 bytes	968 bytes	258,187 µs	262,350 µs	1,206,592 bytes	968 bytes	
Magento\Framework\Config\Dom::_getMatchedNode	19299	215,652 µs	193,402 µs	-7,063,592 bytes	0 bytes	2,571,768 µs	2,583,062 µs	327,032 bytes	0 bytes	
Magento\Framework\Interception\PluginList\PluginList::_loadScoped...	71279	176,769 µs	177,069 µs	-2,361,888 bytes	976 bytes	1,477,504 µs	1,506,800 µs	421,816 bytes	276,104 bytes	
Magento\Framework\View\TemplateEngine\Php::render	47	170,648 µs	169,569 µs	36,848 bytes	1,113,920 bytes	5,817,524 µs	5,507,395 µs	13,564,992 bytes	14,169,472 bytes	
Magento\Framework\Config\Dom\NodePathMatcher::match	38681	170,382 µs	149,163 µs	-1,372,928 bytes	22,160 bytes	372,724 µs	393,338 µs	3,872 bytes	27,912 bytes	
Magento\Framework\Config\Dom\NodePathMatcher::simplifyXpath	38681	158,156 µs	137,784 µs	696 bytes	5,688 bytes	184,094 µs	204,984 µs	1,376,232 bytes	5,688 bytes	
Magento\Framework\ObjectManager\Factory\AbstractFactory::resolveA...	5045	155,057 µs	132,419 µs	9,319,960 bytes	3,464 bytes	2,758,911 µs	2,685,547 µs	17,225,952 bytes	8,687,976 bytes	
unserialize	468	144,475 µs	144,368 µs	106,296 bytes	226,944 bytes	144,475 µs	144,368 µs	106,296 bytes	226,944 bytes	
Magento\Framework\ObjectManager\Config\Mapper\Dom::convert	12	139,502 µs	122,971 µs	-3,515,008 bytes	111,064 bytes	822,787 µs	815,202 µs	8,753,352 bytes	4,565,480 bytes	
file_exists	9474	132,423 µs	128,382 µs	6,168 bytes	0 bytes	132,423 µs	128,382 µs	6,168 bytes	0 bytes	
gzuncompress	36	127,945 µs	127,623 µs	4,338,216 bytes	1,398,896 bytes	127,945 µs	127,623 µs	4,338,216 bytes	1,398,896 bytes	
Magento\Store\Model\Config\Placeholder::_getValue	14346	116,901 µs	93,407 µs	-7,517,136 bytes	50,384 bytes	122,179 µs	130,385 µs	-509,512 bytes	254,696 bytes	
Composer\Autoload\includeFile@2	111	111,117 µs	105,938 µs	1,251,608 bytes	1,287,920 bytes	128,654 µs	122,237 µs	1,493,488 bytes	1,307,856 bytes	
DOMXPath::__construct	21273	106,519 µs	119,067 µs	6,360 bytes	0 bytes	106,519 µs	119,067 µs	6,360 bytes	0 bytes	
Magento\Store\Model\Config\Placeholder::_setValue	11357	102,872 µs	102,877 µs	-3,434,832 bytes	952,928 bytes	105,493 µs	111,583 µs	2,235,672 bytes	952,928 bytes	
Magento\Framework\Config\Dom::_mergeNode@1	6645	101,324 µs	84,560 µs	-1,259,408 bytes	0 bytes	3,290,819 µs	3,293,311 µs	38,592 bytes	0 bytes	
172.31.0.10 X Magento\Framework\ObjectManager\ObjectManager::get	21082	99,336 µs	87,772 µs	183,904 bytes	1,336 bytes	5,454,145 µs	5,320,686 µs	22,228,616 bytes	17,860,864 bytes	





Local setup

Profiles everything

Not so fancy



Tideways



Tideways php extension

Daemon for communication

Browser extension

Configuration needed

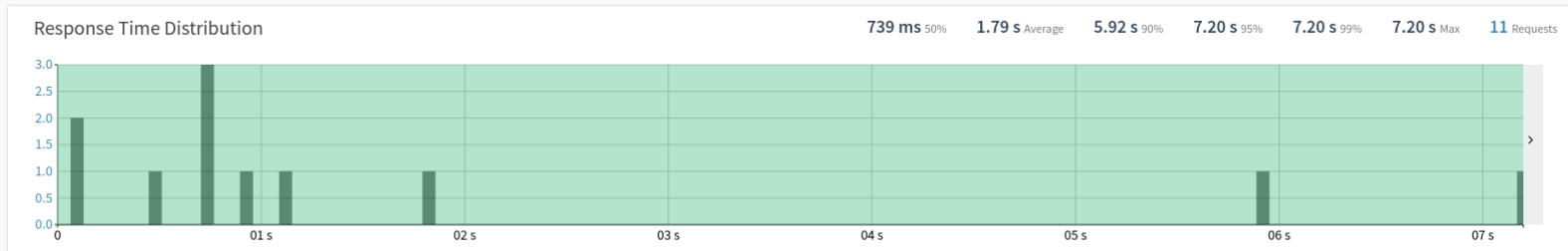
30 day trial

Token to identify

Hosted web interface

Also has APM functionality

Invite your colleagues and team-members to Tideways. You can invite as many collaborators as you want - there are no limits.



Traces				Response: All	Search...	Filter: All Filters	View: Detailed	Date	Clear Filters
93.3 ms	XDEBUG default	Database calls (7): 1.59 ms	Non-CPU time (3.4%): 3.14 ms production / web / tideways-daemon	GET /women/tops-women.html	4 minutes ago				
7.35 s	XDEBUG default	Database calls (439): 223 ms	Non-CPU time (3.7%): 269 ms production / web / tideways-daemon	GET /women/tops-women.html	4 minutes ago				

Menu

Tops - Women

SETest / TidewaysDemo

http://magento2.test/women/tops-women.html

Default welcome msg! Sign In

Tideways

Help

Select the application for this domain to start profiling:

SETest/TidewaysDemo

Take Profile

LUMA

Search entire store here

What's New

Women

Men

Gear

Training

Sale

Home > Women > Tops

Tops

Shopping Options

CATEGORY

STYLE

SIZE

PRICE

COLOR

MATERIAL

PATTERN

CLIMATE

Compare Products

You have no items to compare.

My Wish List

You have no items in your wish list.

Items 1-9 of 50

Sort By Position

Breathe-Easy Tank

★★★★★ 2 reviews

34,00 €

XS

S

M

L

XL

Antonia Racer Tank

★★★★★ 3 reviews

34,00 €

XS

S

M

L

XL

Maya Tunic

★★★★★ 1 review

29,00 €

XS

S

M

L

XL

Chloe Compete Tank

★★★★★ 3 reviews

39,00 €

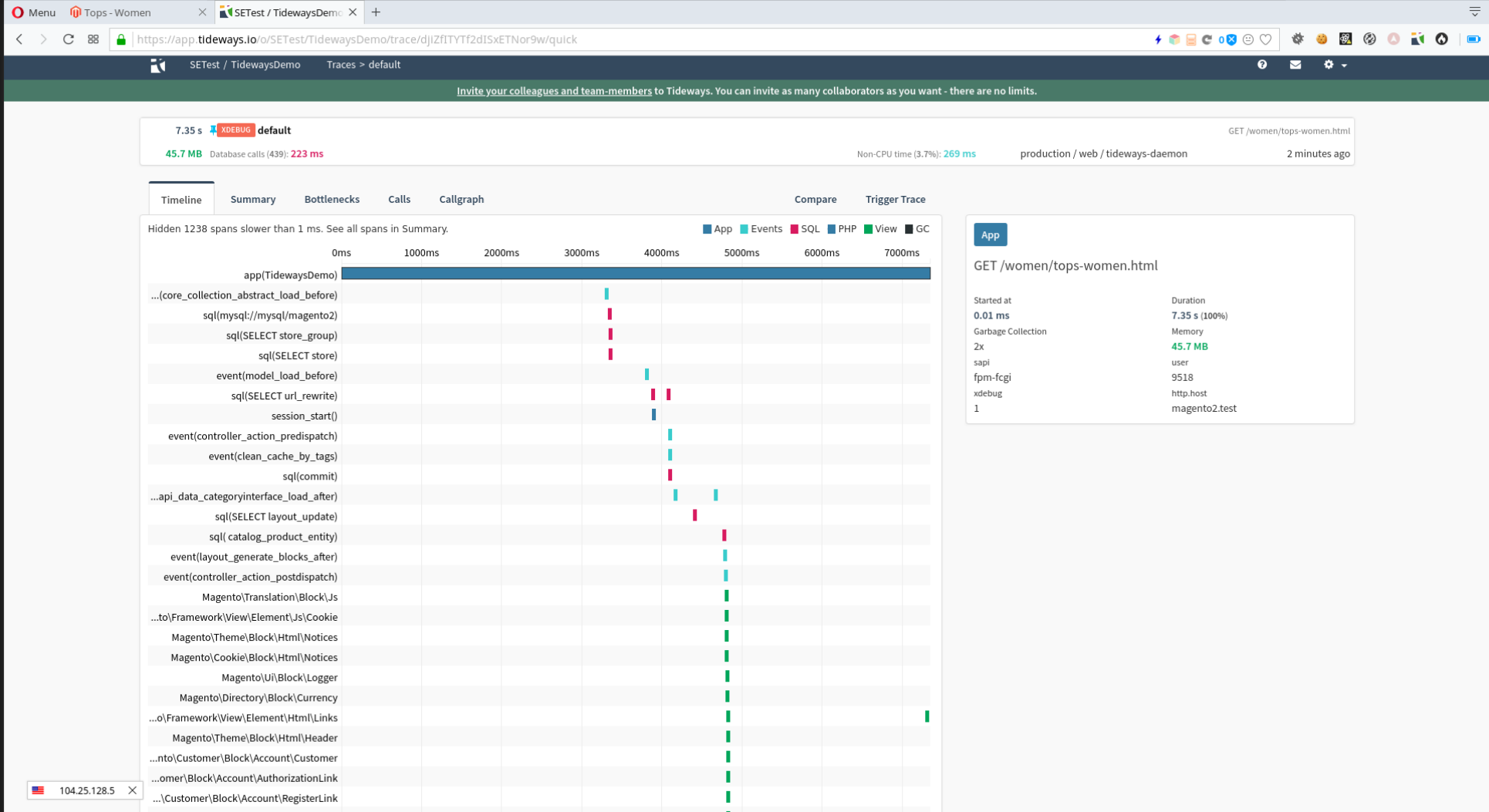
XS

S

M

L

XL



GET /women/tops-women.html

2 minutes ago

 104.25.128.5 X

Invite your colleagues and team-members to Tideways. You can invite as many collaborators as you want - there are no limits.

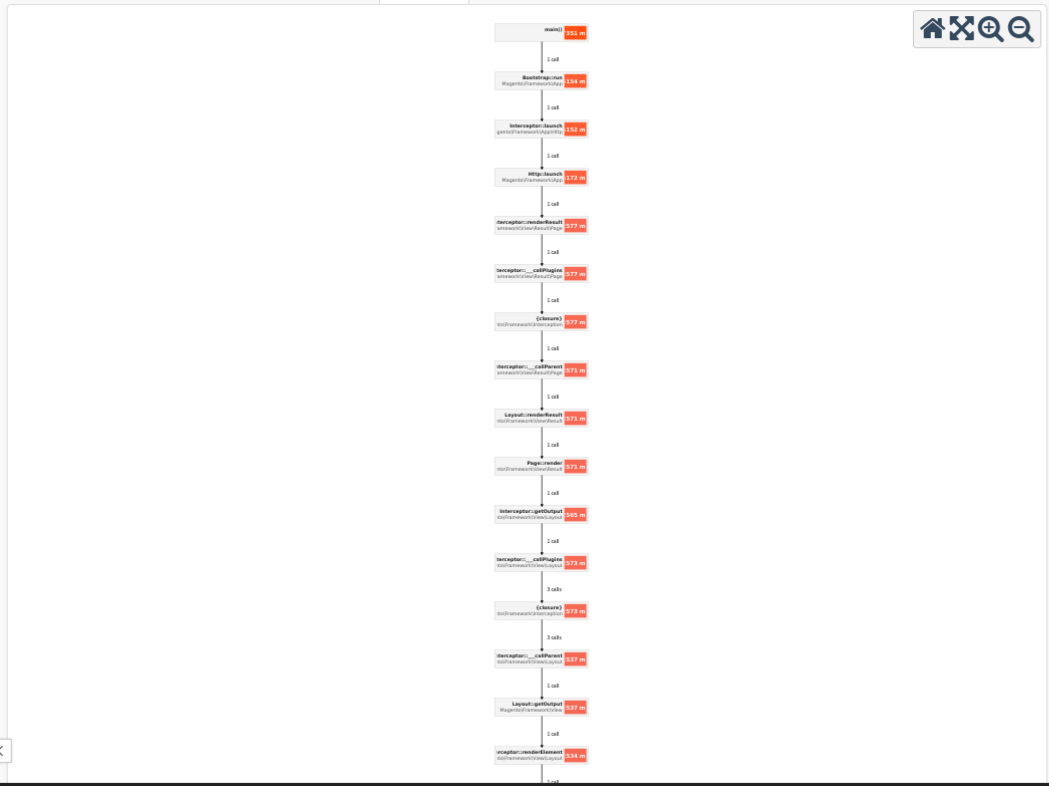
7.35 s  default

45.7 MB Database calls (439): 223 ms

Non-CPU time (3.7%): 269 ms production / web / tideways-daemon 2 minutes ago

GET /women/tops-women.html

Timeline Summary Bottlenecks Calls **Callgraph** Compare Trigger Trace



Function Name	Calls	Incl. WT	Excl. WT ▾
Layout::getOutput	1	2.54 s	2.62 ms
Layout::renderElement@5	28	2.45 s	0.29 ms
Layout::_renderBlock	54	2.51 s	0.24 ms
Layout::renderElement@3	21	2.52 s	0.22 ms
Layout::renderElement@6	19	2.33 s	0.21 ms
Layout::renderElement@4	19	2.50 s	0.18 ms
Layout::renderElement@2	20	2.53 s	0.17 ms
Layout::renderNonCachedElement@5	28	2.44 s	0.15 ms
{closure}	3	2.57 s	0.13 ms
main()	1	7.35 s	0.13 ms

Layout::getOutput
Magento\Framework\View

Call Details

	Inclusive Wall Time	2.54 s
	Exclusive Wall Time	2.62 ms
	Calls	1

Parent Functions

Function Name	Calls	Incl. WT	Excl. WT ▾
Interceptor::__callParent	1	2.54 s	- ms



More than a profiler
Easy to use

Trial → Paying



Blackfire



Blackfire php extension

Daemon for communication

Browser extension

Configuration needed

Token to identify

Hosted web interface

Freemium

Menu

Tops - Women

Blackfire

http://magento2.test/women/tops-women.html

Default welcome msg! Sign In or Create Account

blackfire

Connected as lke Devolder

Profile!

☐ Disable aggregation when the page has side-effects

Blackfire Companion 1.16.3 - Troubleshooting

Search entire store here...

What's New

Women

Men

Gear

Training

Sale

Home > Women > Tops

Tops

Shopping Options

CATEGORY

STYLE

SIZE

PRICE

COLOR

MATERIAL

PATTERN

CLIMATE

Compare Products

You have no items to compare.

My Wish List

You have no items in your wish list.

Items 1-9 of 50

Sort By Position

Breathe-Easy Tank

★★★★★ 2 reviews

34,00 €

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★★★★★ 3 reviews

34,00 €

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XL

Maya Tunic

★★★★★ 1 review

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Chloe Compete Tank

★★★★★ 3 reviews

39,00 €

XS

S

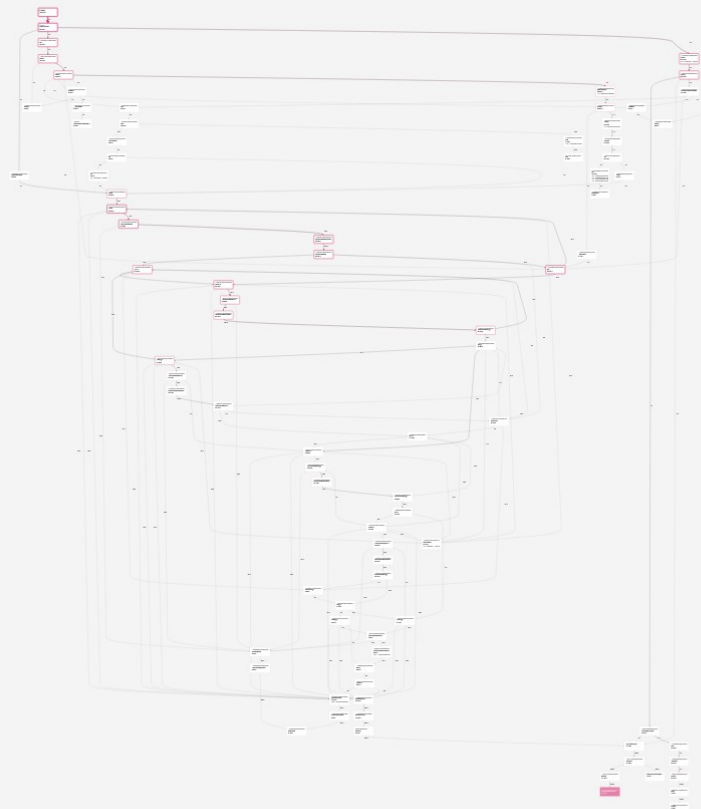
M

L

XL

Functions	Recommendations	Assertions
search		
Function / Metric	% Excl.	% Incl. Calls
..ssLoader::findFileWithExtension		548
Composer\Autoload\includeFile		383
..er\ClassReader::getConstructor		214
gzuncompress		11
..\AbstractFactory::createObject		190
..er\Config\Mapper\Dom::convert		1
..eader\ClassReader::getParents		499
...gl\Converter\Dom\Flat::convert		228
...\ObjectManagerFactory::create		1
unserialize		9
..nfig\Config::_inheritInterception		167
file_exists		988
...onverter\Dom\Flat::convert@1		131
..mposer\Autoload\includeFile@1		114
...nvironment\Request::setServer		2
..8357adda20c9567af7c555867		161
...Manager\Config\Config::extend		3
...fig\Developer::getInstanceType		266
..fig\Proxy::getConnectionName		4
..nterpreter\Composite::evaluate		228
..rk\App\PageCache\Kernel::load		1
...\Config::_inheritInterception@1		140
...\Relations\Runtime::getParents		674
...onfig::_collectConfiguration@1		197
stream_socket_client		4
...anager\Relations\Runtime::has		674
...stem\DirectoryList::_construct		3
...nList\PluginList::_inheritPlugins		6
...pe\System::get		11

main()



Relatively easy to use

Freemium

→ not all features



Pick one
Learn it!





How to approach profiling



How to approach profiling

Analyze!

What first?

- Slow things
- popular things
- application initialisation

Analyse the profile

- hot path
- find the cause
- fix it
- ...
- 👍



Popular Bottlenecks

Closing



- xhprof + xhgui
- don't trust profiles from systems under stress
- make popular pages cacheable
- profile periodically

Questions?

I'm Ike, Developer / Operations
at Studio Emma



@BlackIkeEagle



PHP-WVL



DockerWest



Parchive



BlackIkeEagle



Archlinux TU



Vdebug



herecura.eu



Thanks

I'm Ike, Developer / Operations
at Studio Emma



@BlackIkeEagle



PHP-WVL



DockerWest



Parchive



BlackIkeEagle



Archlinux TU



Vdebug



herecura.eu

