VARNISH

Makes Websites Fly

You can cache everything

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Varnish Software AS
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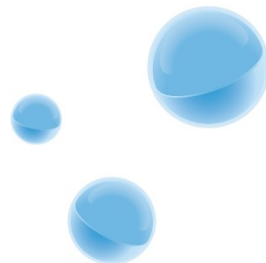
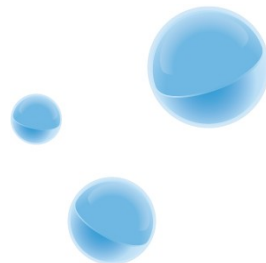
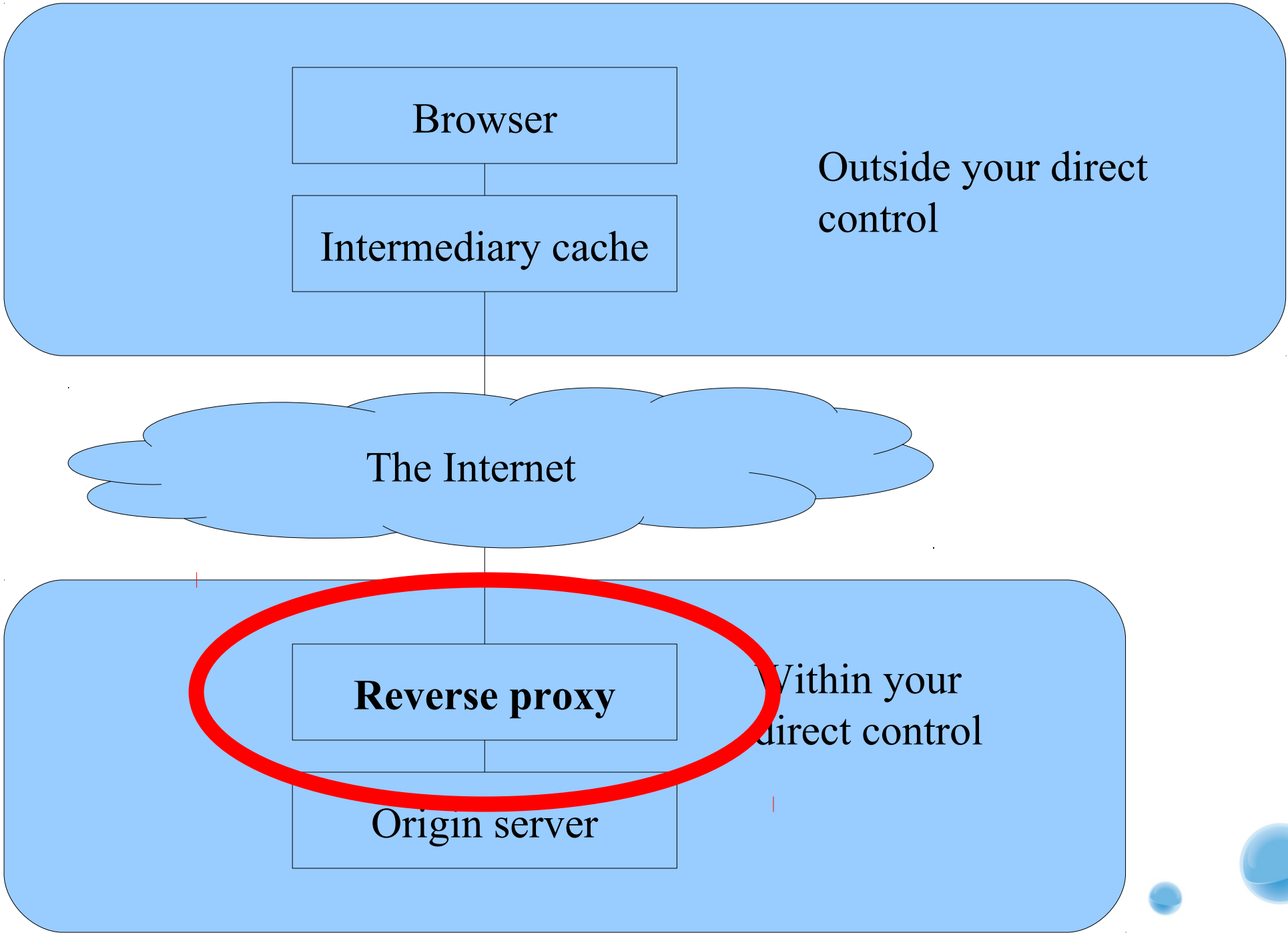
Montreal, March 2013



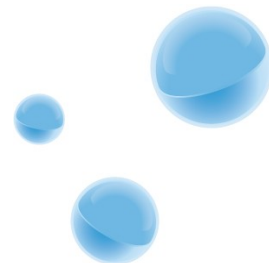
What is a reverse proxy anyway?




Browser
Intermediary cache
Outside your direct control
The Internet
Reverse proxy
Within your direct control
Origin server

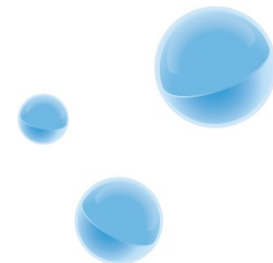
A reverse proxy...

- Replies in place of your web server
- Fetches content from the web server
- Caches the content
- Is fast
- Is simple



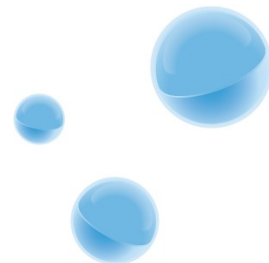
“Can I cache content for less than one second?”

- Audun Ytterdal, Vgnett



(yes, you can)

But WHY?



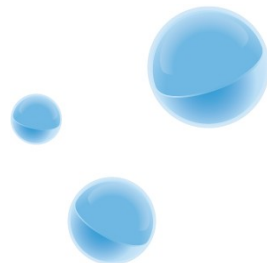
100 req/day

100 req/hour

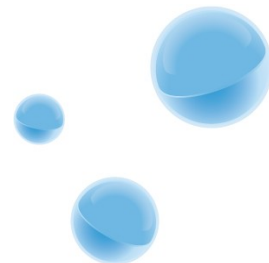
100 req/minute

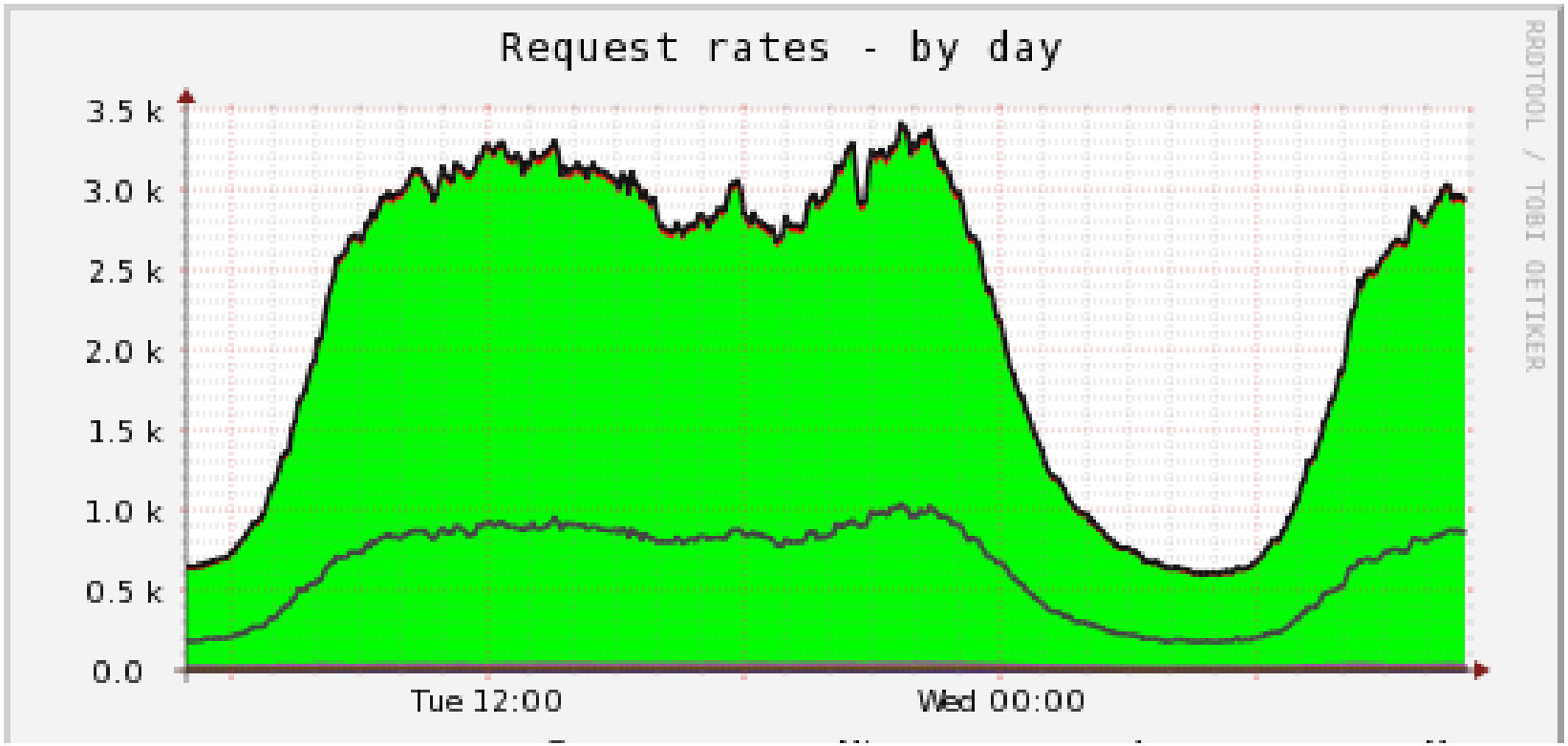
100 req/second

4000 req/second



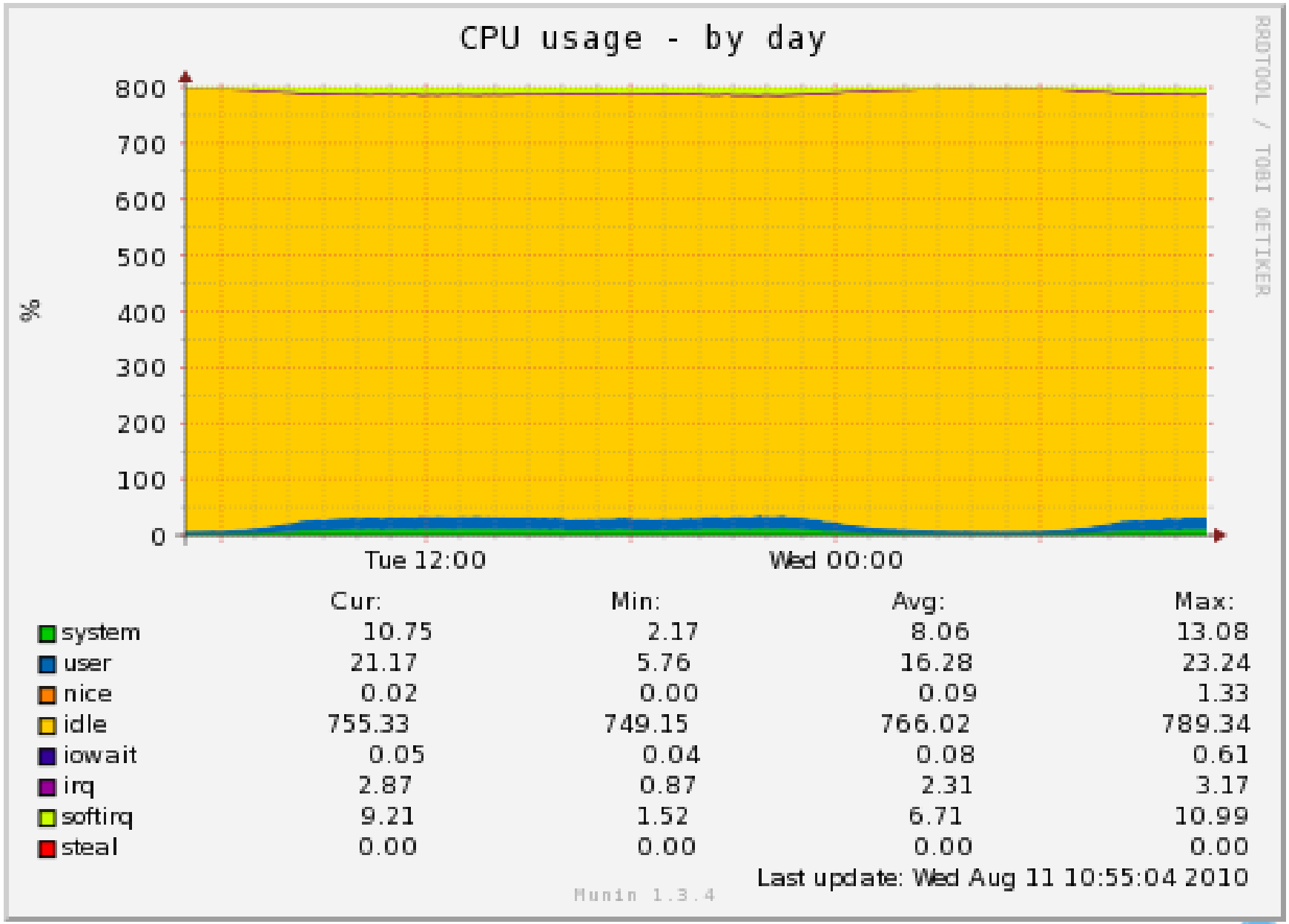
Server load?



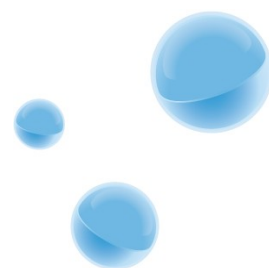


Max: 3370 requests per second

Average: 2190 requests per second

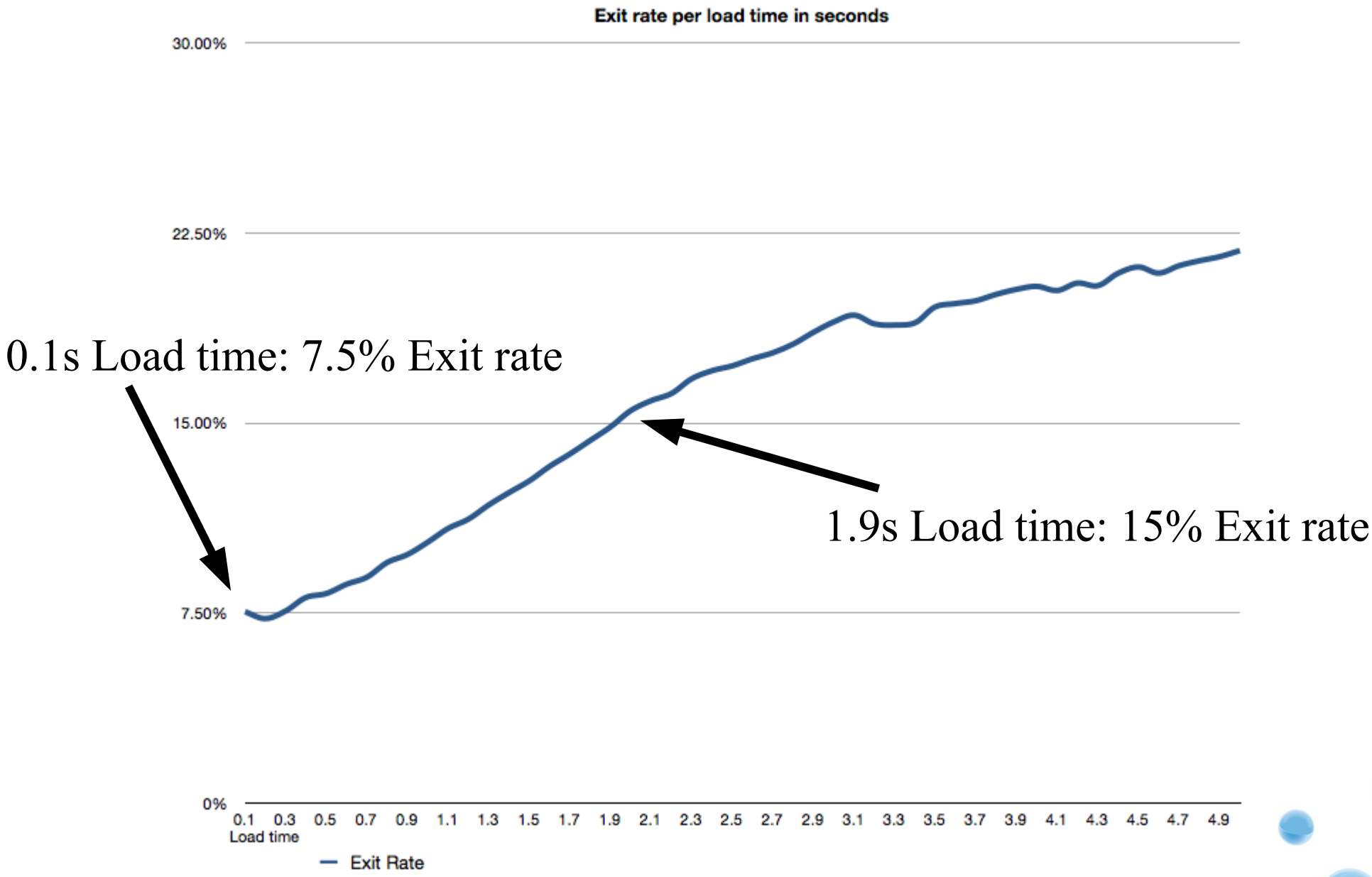

CPU usage - by day
%
800
700
600
500
400
300
200
100
0
Tue 12:00
Wed 00:00
RRDTOOL / TOBI OETIKER
Cur:
Min:
Avg:
Max:
system 10.75 2.17 8.06 13.08
user 21.17 5.76 16.28 23.24
nice 0.02 0.00 0.09 1.33
idle 755.33 749.15 766.02 789.34
iowait 0.05 0.04 0.08 0.61
irq 2.87 0.87 2.31 3.17
softirq 9.21 1.52 6.71 10.99
steal 0.00 0.00 0.00 0.00
Last update: Wed Aug 11 10:55:04 2010
Munin 1.3.4

Response time?



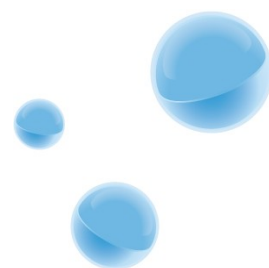
Exit rate: How many of your users did not continue browsing the site after this specific page.

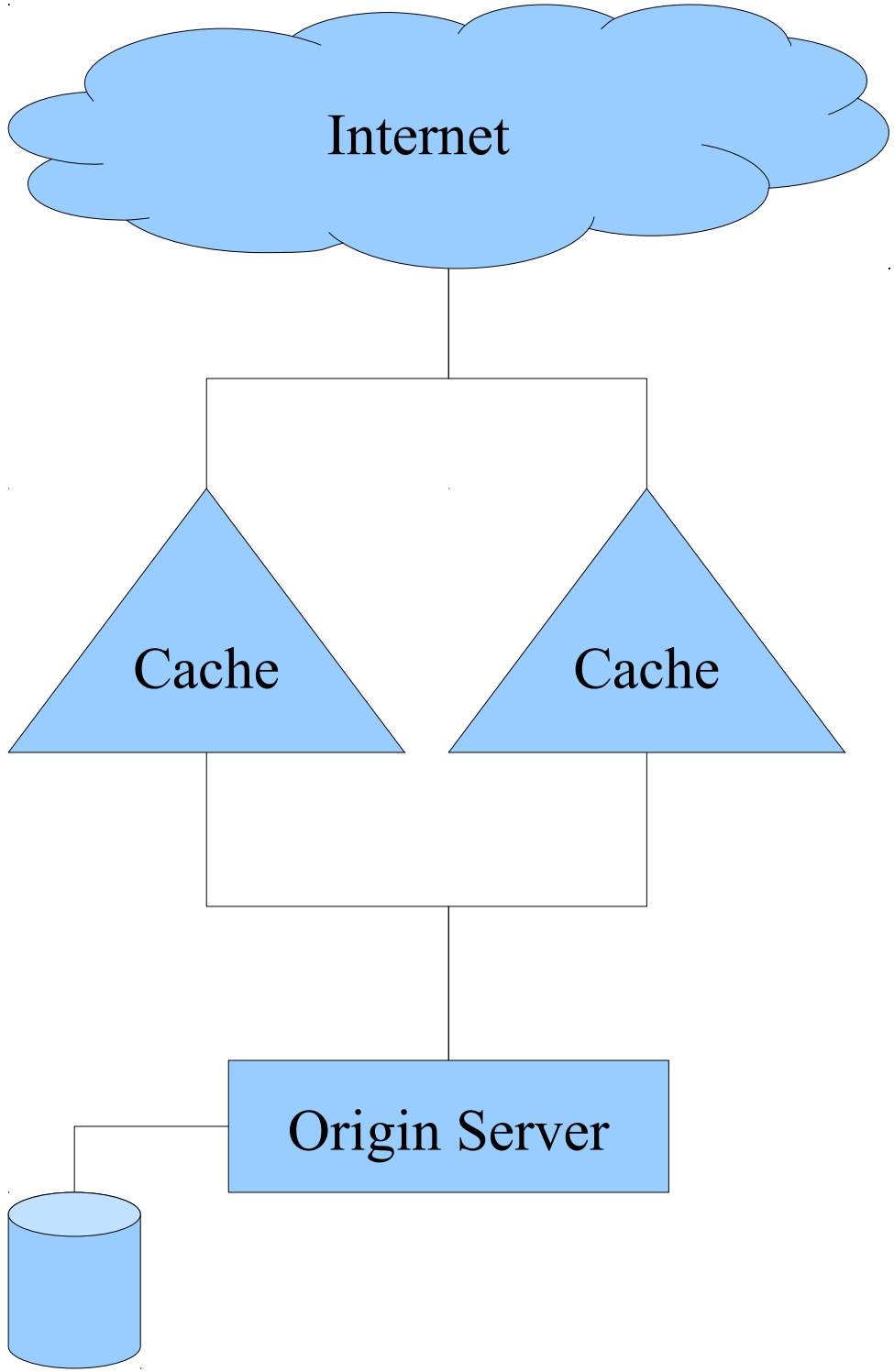
Exit rate per load time in seconds

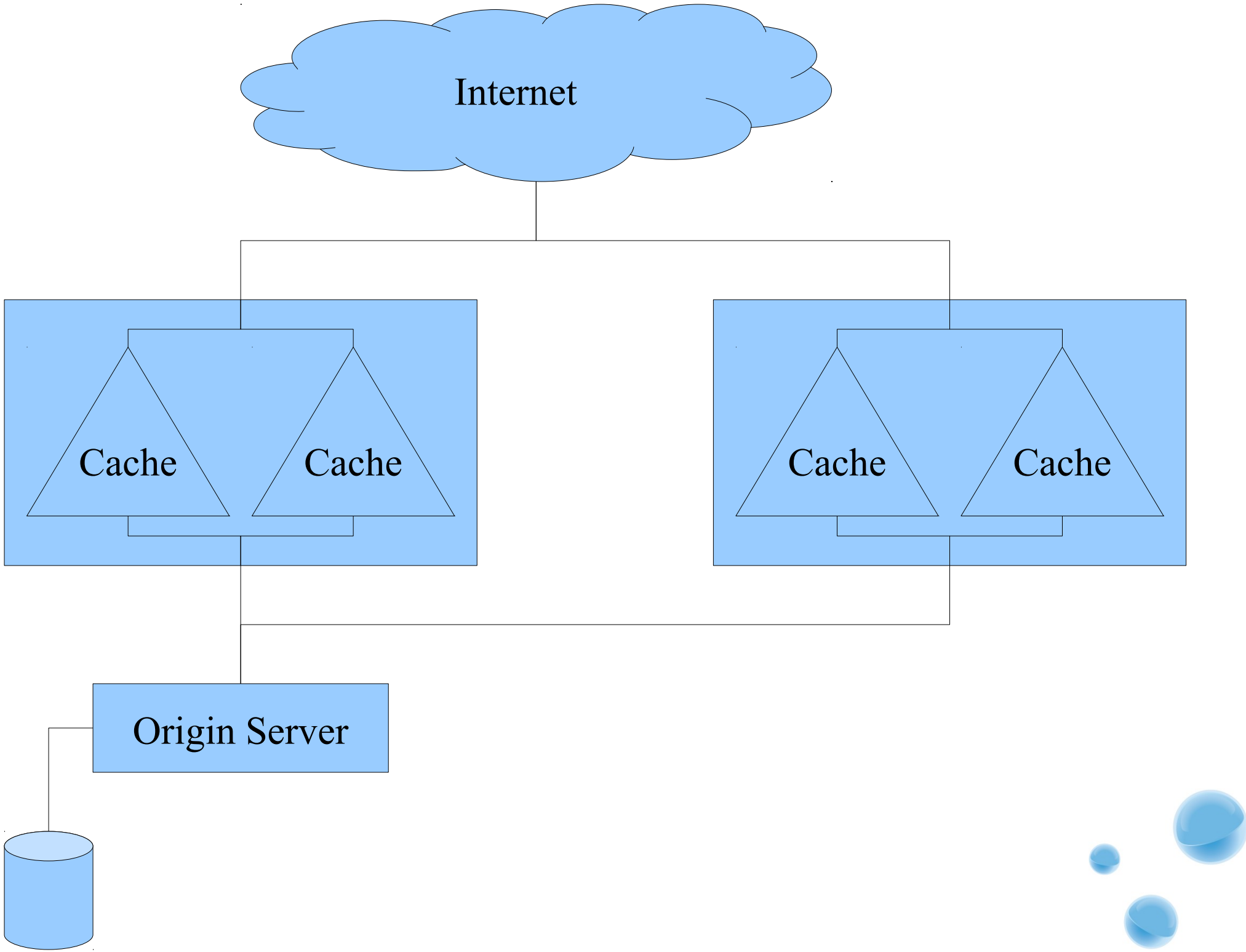


Courtesy of Artur Bergman of Fastly Inc.

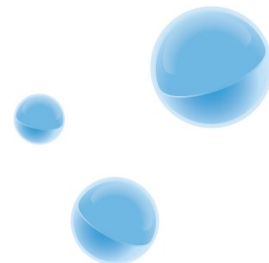
Expansion?



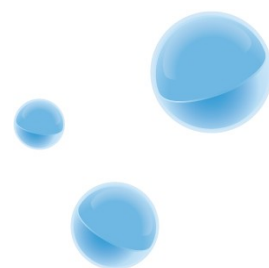

Internet
Cache
Cache
Origin Server


Internet
Cache
Cache
Cache
Cache
Origin Server

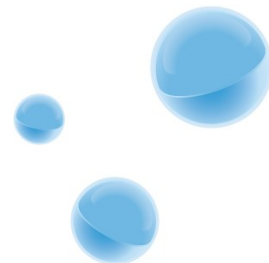
How unique is an asset?



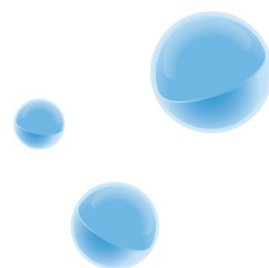
How often is an asset requested?



How often does an asset change?

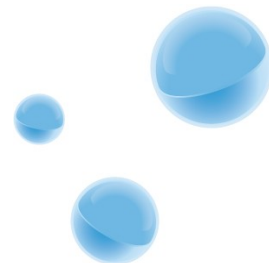


How expensive is it to re-generate an asset?



Easy mode: Static Content

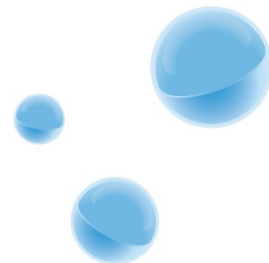
Easy to cache, but relatively small benefit



Anonymous users only

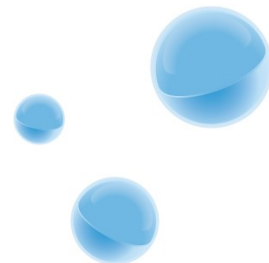
Caching front pages, articles, etc. Fairly easy and a significant benefit.

This is where most people stop.



Caching generic content

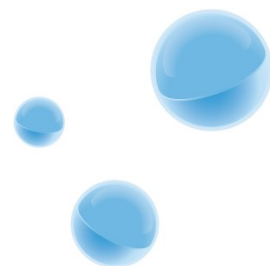
Cache even for logged in users, but only content which isn't user specific. Also fairly easy.



Caching content for logged in users

Hard, often not terribly beneficial, requires a larger cache.

BUT POSSIBLE.



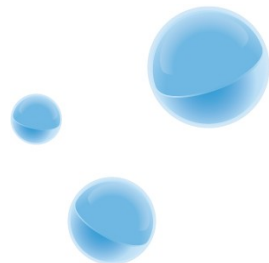
Caching content that “chances all the time”

No such thing.

Live streamed video? Cache for 0.5 seconds and see a benefit.

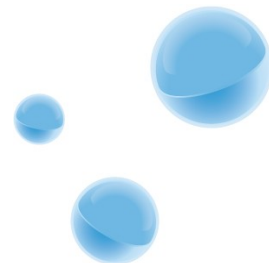
Comments? Relatively easy to cache. Doesn't change very often.

Etc, etc.

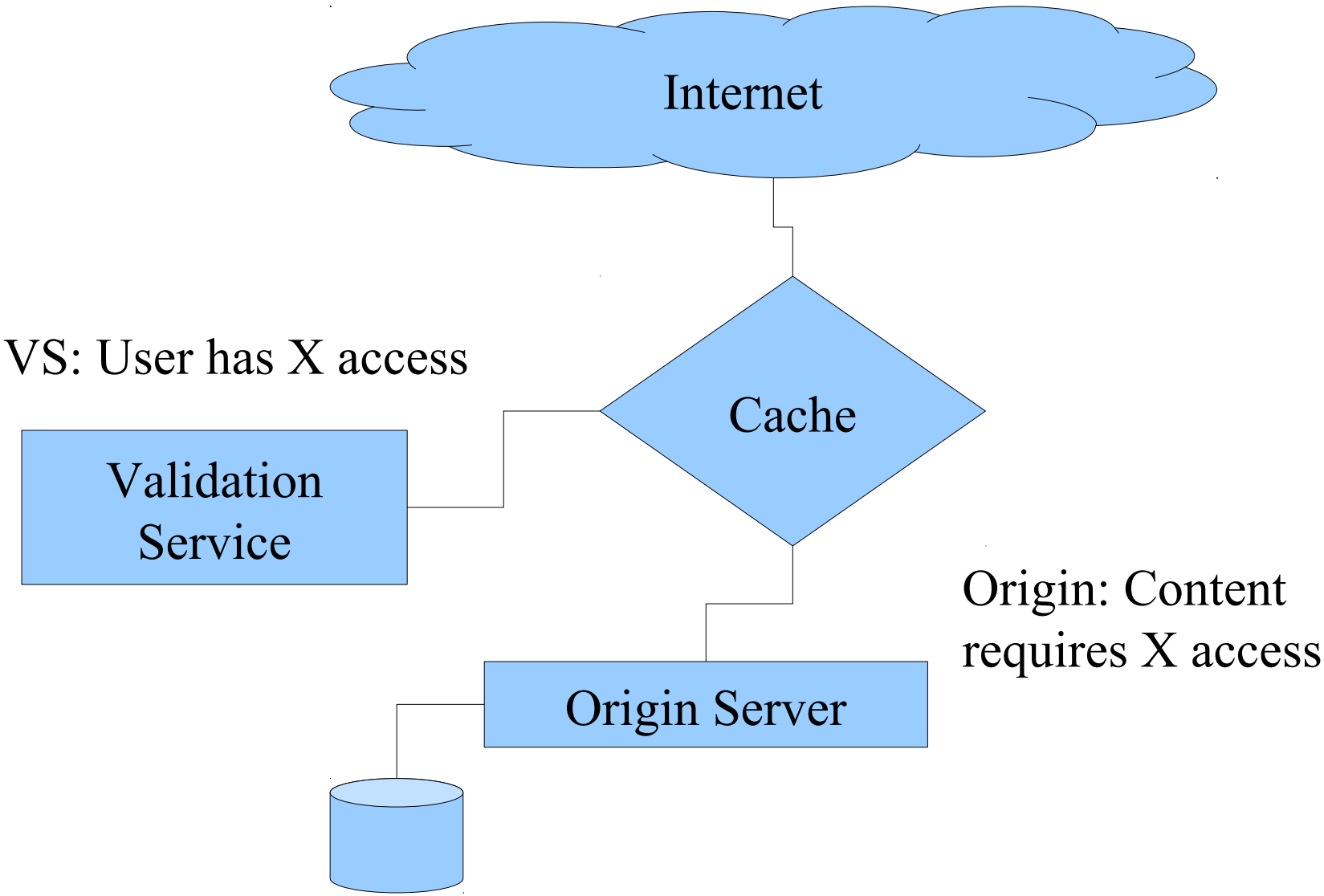


Example: Comment “counters”

- A setups with 20-30 news sites/magazines
- All sites supported comments
- All front pages displayed “X comments on this article”
- These counters were all in a single file – one massive database query.
- “Can't be cached.”
- 0 cache: Site went down.
- 5 second cache: No load at all.

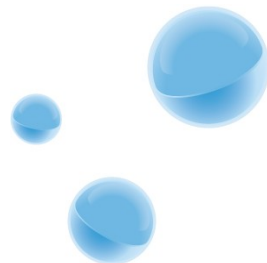


Example: Paywall



Example: Paywall explained

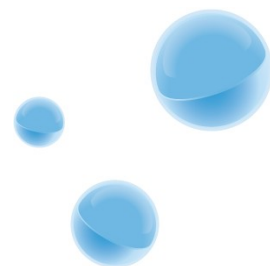
1. User asks for content
2. Cache asks for content
3. Origin server responds with content and “Content requires permission X”
4. Cache asks validation service if user has access
5. Validation service answers with “yes”



Example: Paywall magic

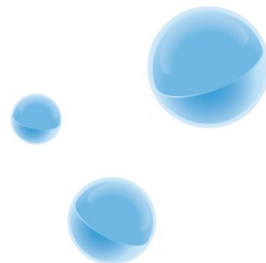
6. Cache creates a cryptographically signed cookie for this user.

Next time the user asks for content, the cache only has to verify the signed cookie, then deliver from cache. No validation service request required.

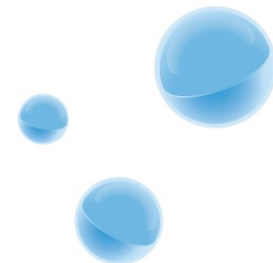


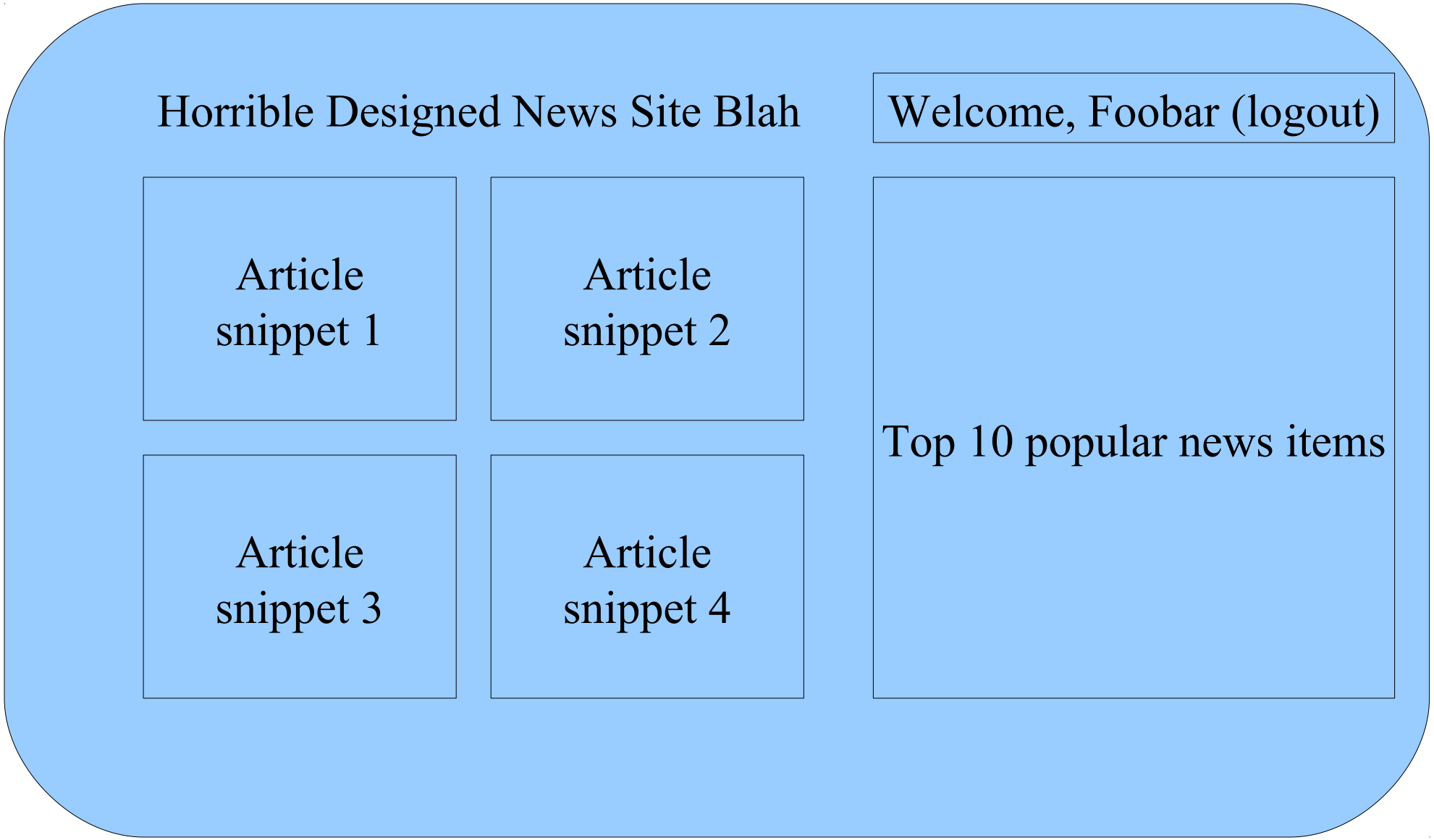
ESI – Edge Side Includes

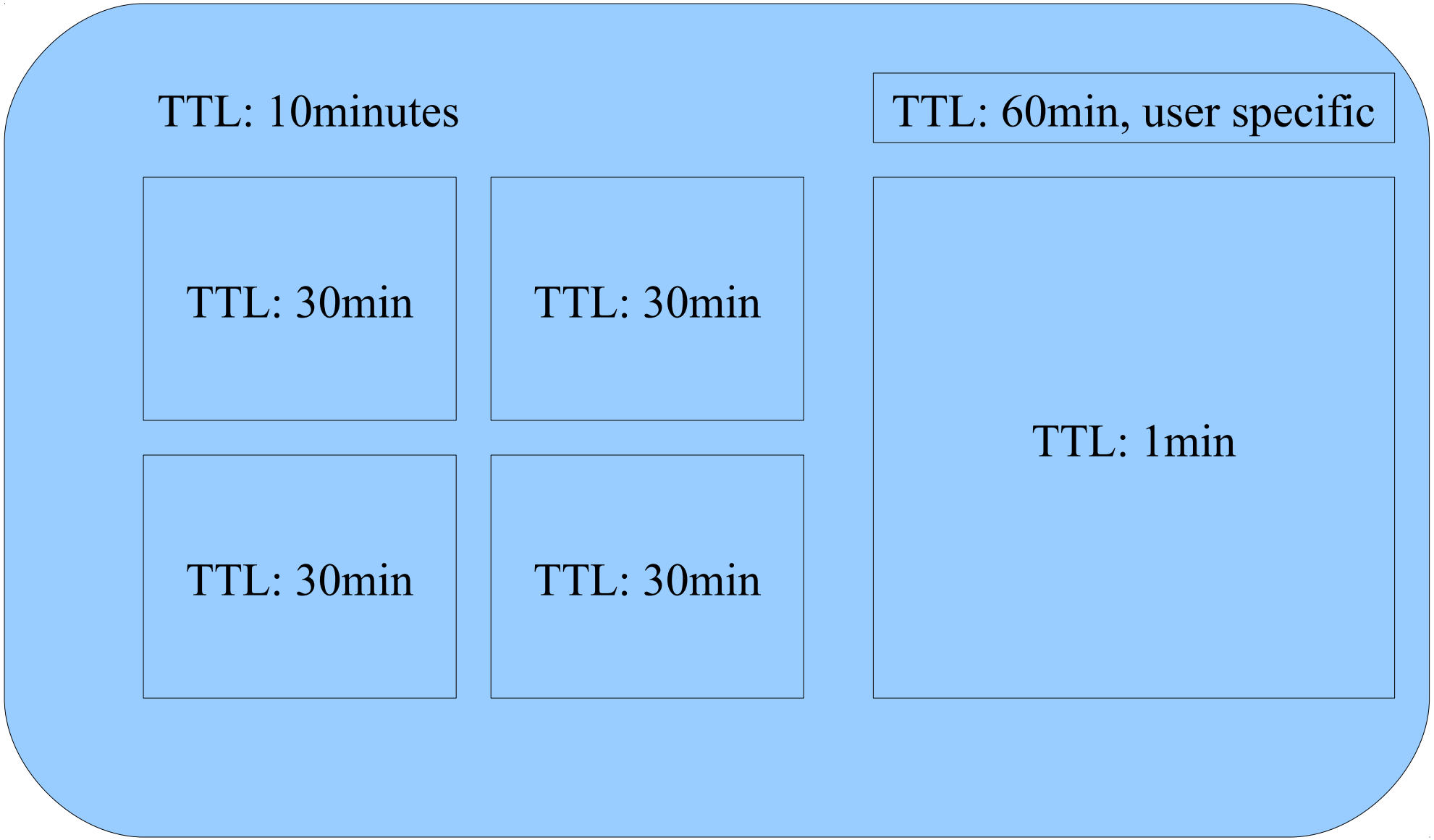
(Or: Client side AJAX if you prefer)

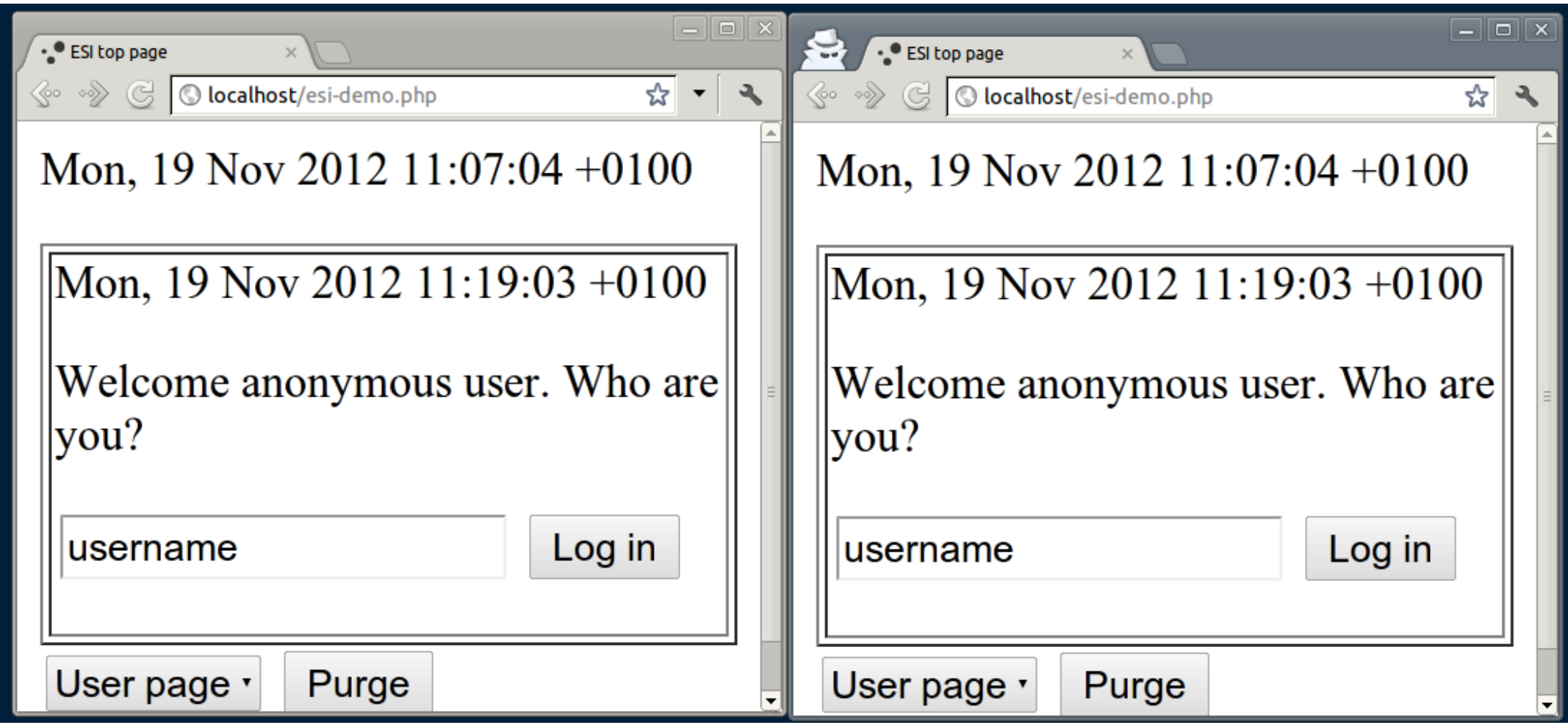


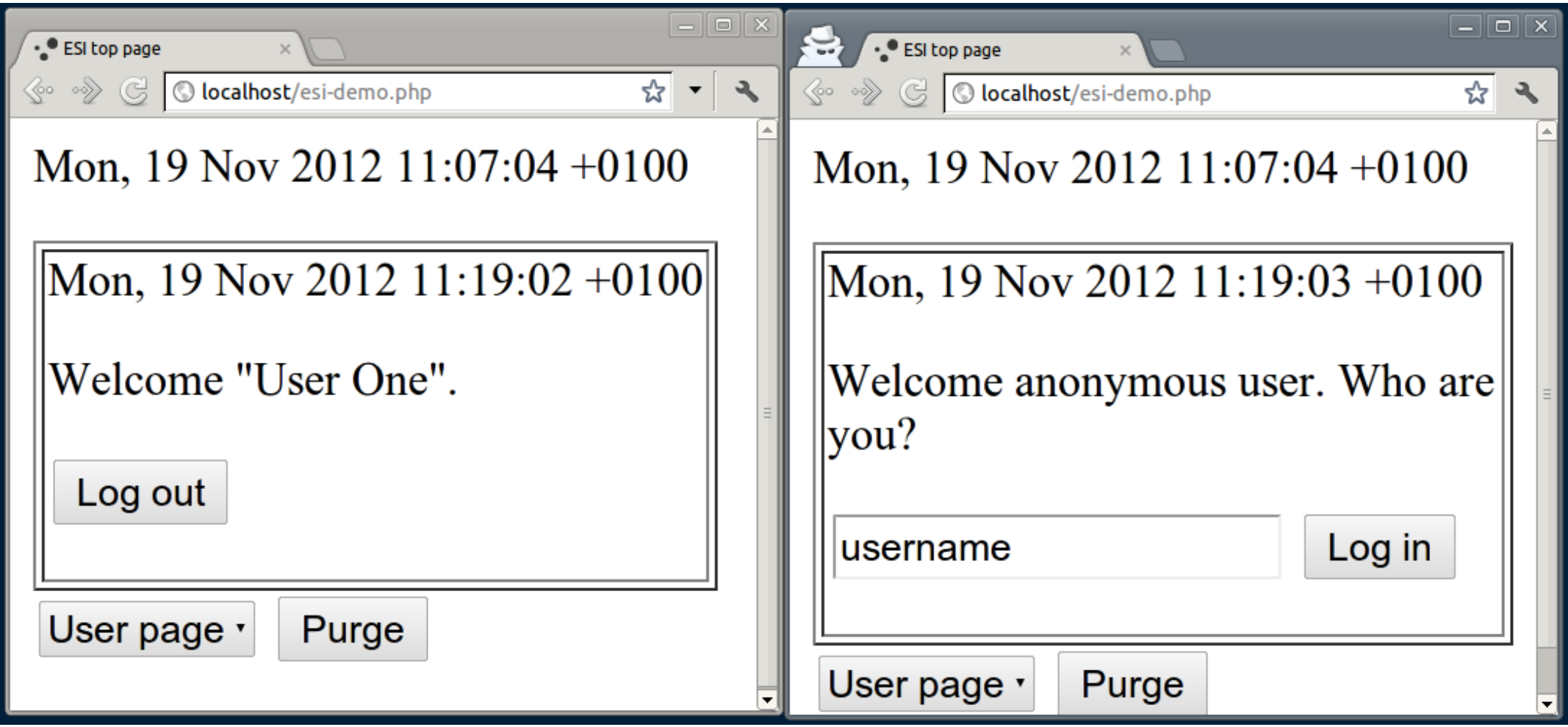
```
<title>Hello ESI-World</title>
<esi:include src=”/header”>
<esi:include src=”/login-box”>
Content!
<esi:include src=”/user-survey”>
<esi:include src=”/footer”>
```

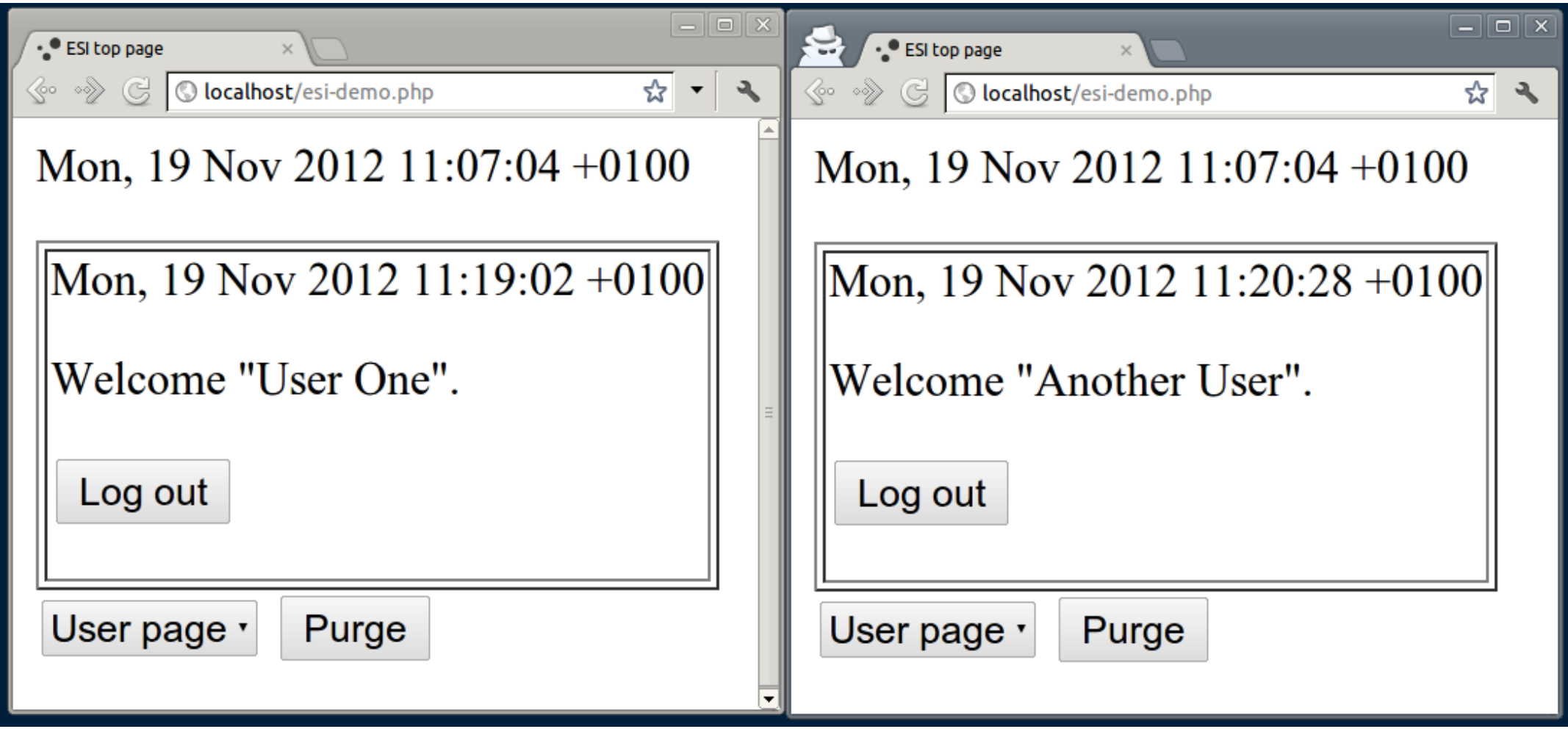


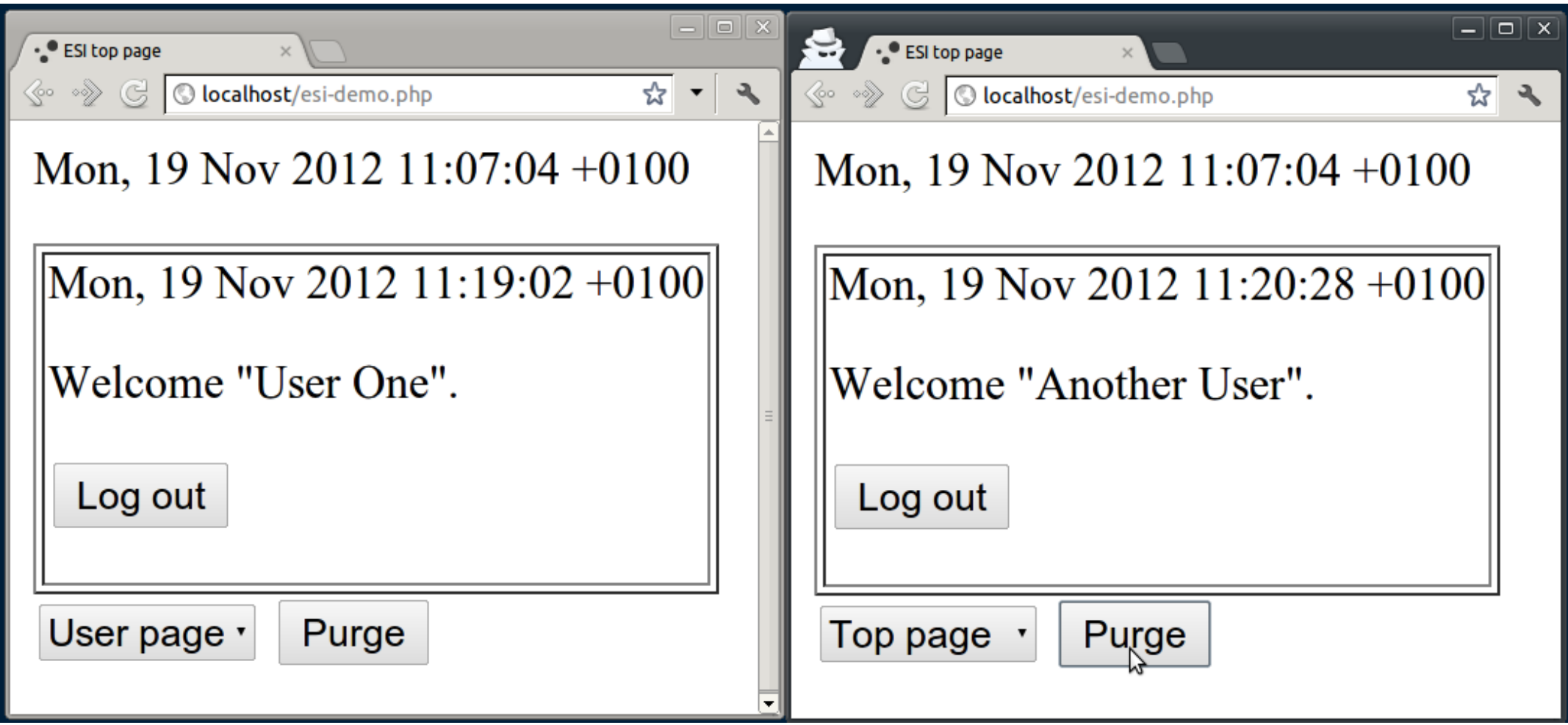

Horrible Designed News Site Blah
Welcome, Foobar (logout)
Article snippet 1
Article snippet 2
Article snippet 3
Article snippet 4
Top 10 popular news items

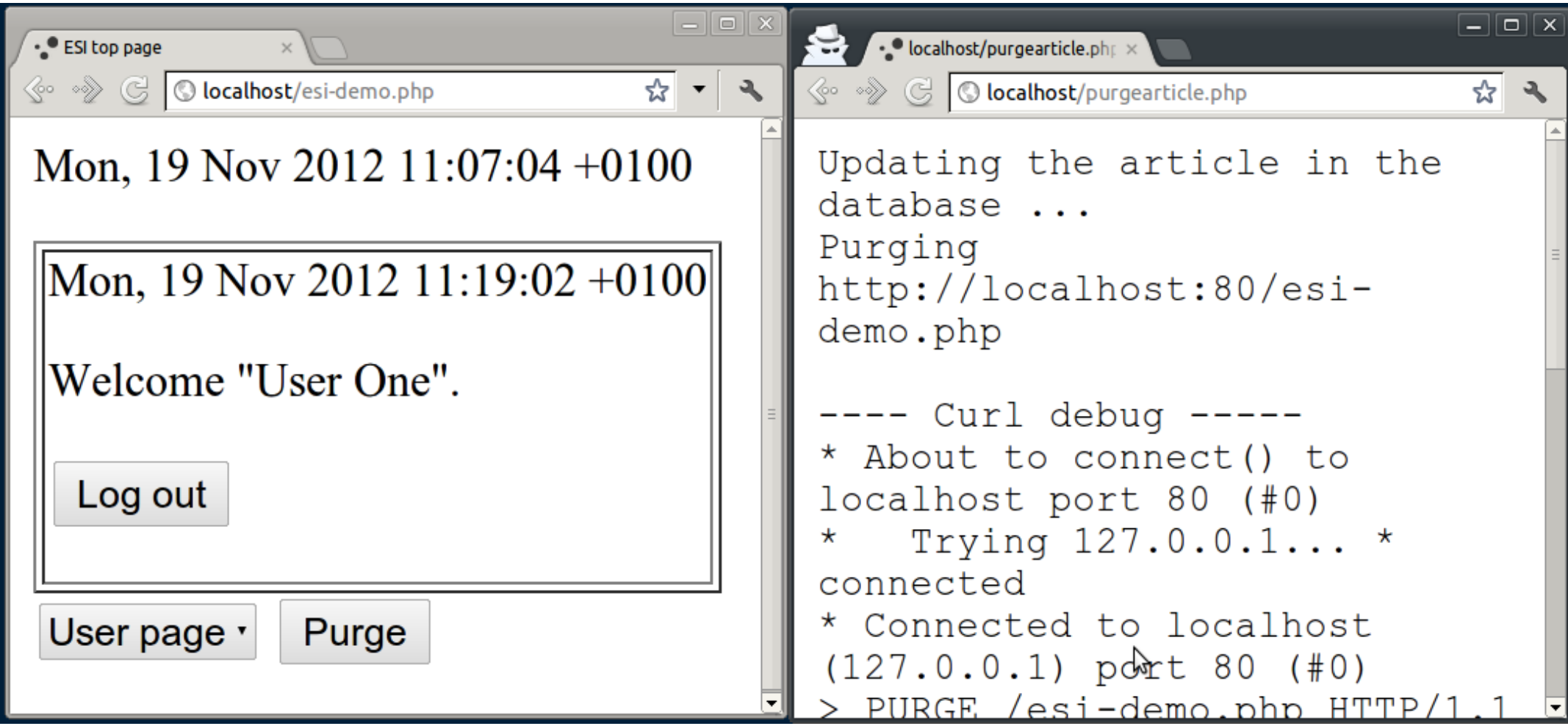

TTL: 10minutes
TTL: 60min, user specific
TTL: 30min
TTL: 30min
TTL: 1min
TTL: 30min
TTL: 30min

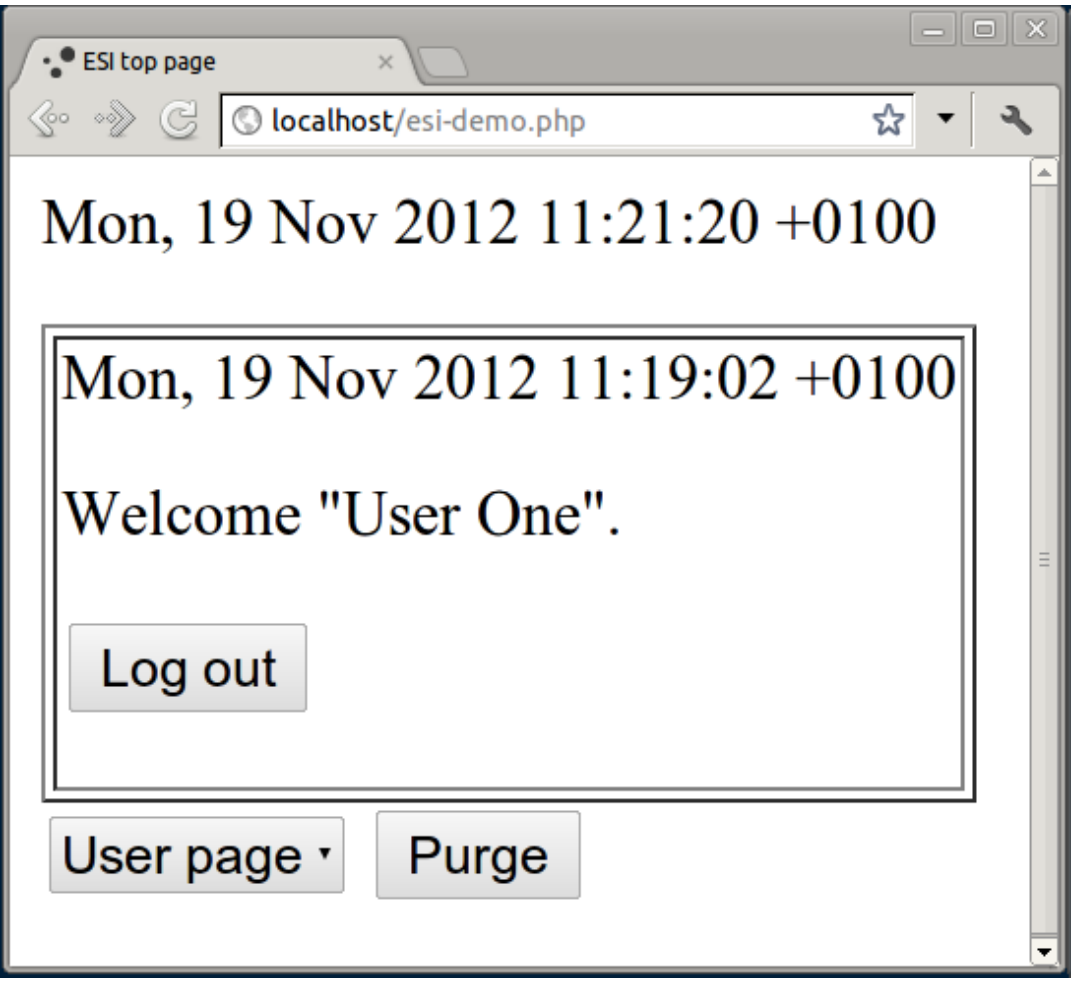

ESI top page
localhost/esi-demo.php
Mon, 19 Nov 2012 11:07:04 +0100
Mon, 19 Nov 2012 11:19:03 +0100
Welcome anonymous user. Who are you?
username
Log in
User page
Purge
ESI top page
localhost/esi-demo.php
Mon, 19 Nov 2012 11:07:04 +0100
Mon, 19 Nov 2012 11:19:03 +0100
Welcome anonymous user. Who are you?
username
Log in
User page
Purge

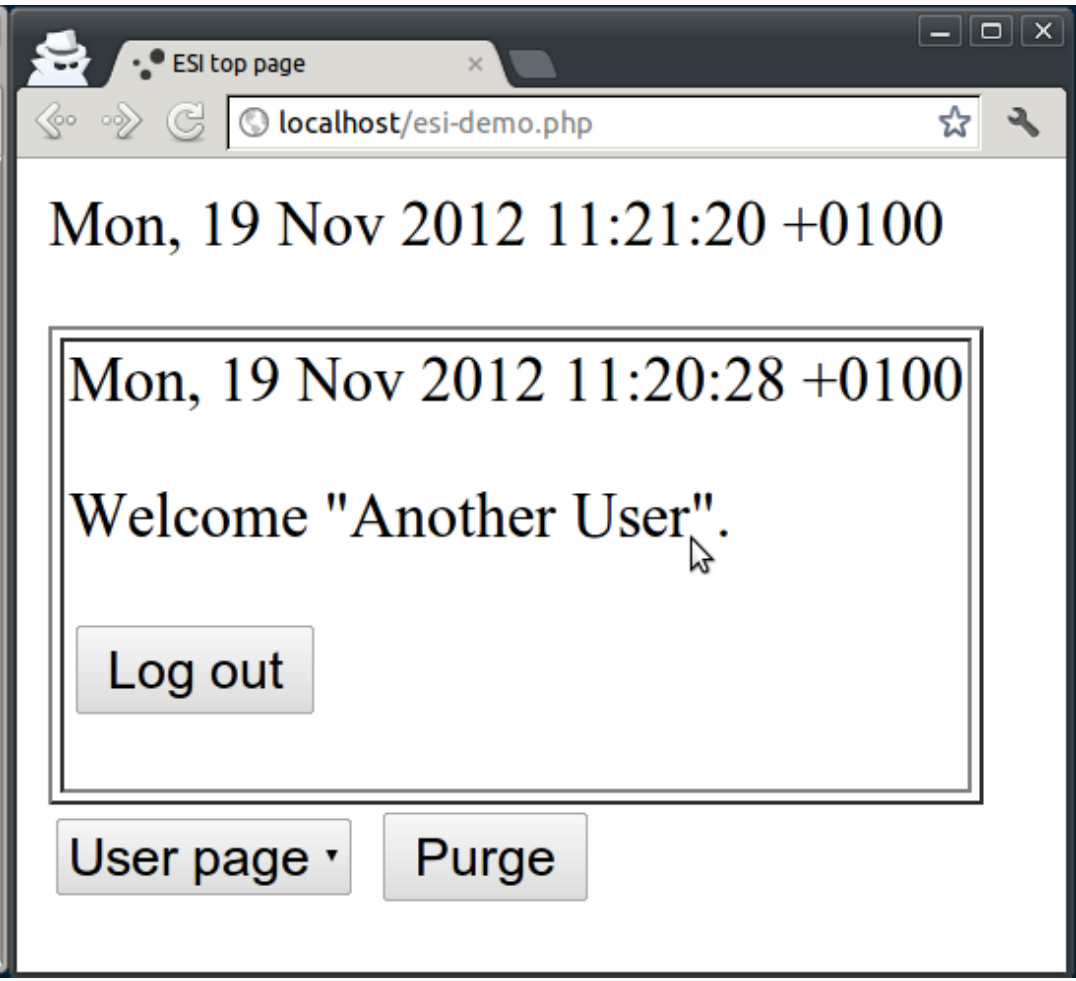

ESI top page
localhost/esi-demo.php
Mon, 19 Nov 2012 11:07:04 +0100
Mon, 19 Nov 2012 11:19:02 +0100
Welcome "User One".
Log out
User page
Purge
ESI top page
localhost/esi-demo.php
Mon, 19 Nov 2012 11:07:04 +0100
Mon, 19 Nov 2012 11:19:03 +0100
Welcome anonymous user. Who are you?
username
Log in
User page
Purge


ESI top page
localhost/esi-demo.php
Mon, 19 Nov 2012 11:07:04 +0100
Mon, 19 Nov 2012 11:19:02 +0100
Welcome "User One".
Log out
User page
Purge
ESI top page
localhost/esi-demo.php
Mon, 19 Nov 2012 11:07:04 +0100
Mon, 19 Nov 2012 11:20:28 +0100
Welcome "Another User".
Log out
User page
Purge


ESI top page
localhost/esi-demo.php
Mon, 19 Nov 2012 11:07:04 +0100
Mon, 19 Nov 2012 11:19:02 +0100
Welcome "User One".
Log out
User page
Purge
ESI top page
localhost/esi-demo.php
Mon, 19 Nov 2012 11:07:04 +0100
Mon, 19 Nov 2012 11:20:28 +0100
Welcome "Another User".
Log out
Top page
Purge


ESI top page
localhost/esi-demo.php
Mon, 19 Nov 2012 11:07:04 +0100
Mon, 19 Nov 2012 11:19:02 +0100
Welcome "User One".
Log out
User page
Purge
localhost/purgearticle.php
localhost/purgearticle.php
Updating the article in the database ...
Purging http://localhost:80/esi-demo.php
---- Curl debug -----
* About to connect() to localhost port 80 (#0)
* Trying 127.0.0.1... * connected
* Connected to localhost (127.0.0.1) port 80 (#0)
> PURGE /esi-demo.php HTTP/1.1

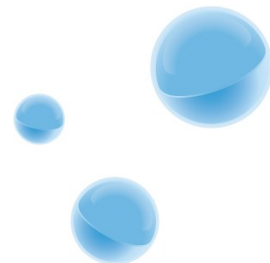

ESI top page
localhost/esi-demo.php
Mon, 19 Nov 2012 11:21:20 +0100
Mon, 19 Nov 2012 11:19:02 +0100
Welcome "User One".
Log out
User page
Purge


ESI top page
localhost/esi-demo.php
Mon, 19 Nov 2012 11:21:20 +0100
Mon, 19 Nov 2012 11:20:28 +0100
Welcome "Another User".
Log out
User page
Purge

ESI in Varnish

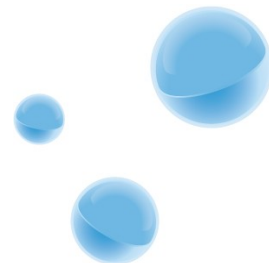
- <esi:include ...> <esi:remove ...>

```
sub vcl_fetch {
    if (req.url ~ "/esi-urls") {
        set beresp.do_esi = true;
    }
}
```

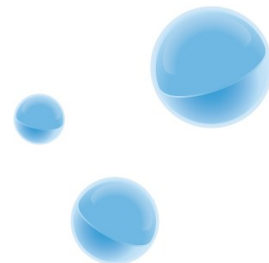


ESI alternatives

- Not loving the use of ESI?
- Use AJAX or other magic instead, does the same thing, but on the client side
- Different caching contexts need to be accessed through different URLs.

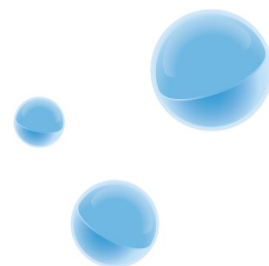


Where to start?



Caching Strategy

1. Low hanging fruit.
2. Heavy pages cached only for anonymous users.
3. Make a policy on cookies.
4. Cache multiple variants of a page.
5. Cache different elements on a single page.

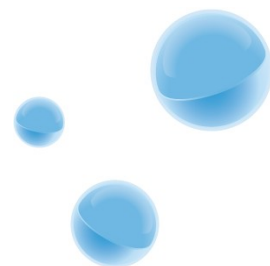


Cool tricks time!

“Cache this for a long time, but only if it's popular!”

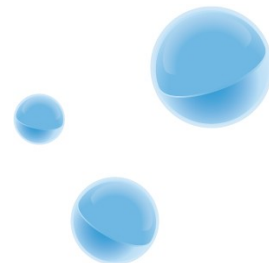
```
sub vcl_fetch {
     set beresp.ttl = 10m;
}

sub vcl_hit {
     if (obj.hits == 500) {
        set obj.ttl = 2d;
    }
}
```



Cookies, only for logged in people

```
sub vcl_recv {
  if (req.http.cookie !~
      "logged_in=true") {
    unset req.http.cookie;
  }
}
```



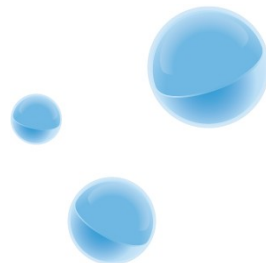
Quick Start?

The Varnish Book!

http://varnish-software.com/book

Check out the Varnish Agent 2 for a single tenant REST interface/WebUI for Varnish.

http://github.com/varnish/vagent2



Questions?

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