

CU-Boulder

Where we are,
where we are
going

Presented by



University of Colorado **Boulder**

Who am I?

- Matt Tucker
@ultimateboy
- Lead Drupal Developer
University Communications

What we will cover

- Case study of our approach/challenges
- Infrastructure
- Drupal configuration
- Deployment and code base
- Lessons learned and outcomes
- Q/A





University of Colorado **Boulder**



University of Colorado **Boulder**

Our challenges

- Outdated server environment
- Lack of central web development support
- Decentralized server hosting/support
- University website lacking
- A TON of legacy data/sites/content
- New campus branding standards



Our solution

- Modernize our campus web infrastructure
 - Enterprise class
 - Highly available/scalable
- Convert to a CMS environment
- New service for web development and hosting



Planning

- Invest in staffing/equipment
 - Update infrastructure
 - Improve campus services/support
- Provide a suite of services around a CMS
- Develop service for web application hosting
- Create a process to phase the migration of legacy content to new infrastructure



Research

- CMS software evaluation (Drupal!)
- Equipment and staffing needs
- Community/external expertise
 - Peer universities
 - Professional experts
 - Drupal community



Phased timeline

- Phase I: Infrastructure (new & legacy) & university website
- Phase II: Drupal CMS service
- Phase III: Web application hosting





University of Colorado **Boulder**

Infrastructure Decisions

- Cloud vs Local
 - Data centers available
 - More complex networking in the cloud
 - More control
- F5s
- VMware ESXi
 - What is virtualized and what isn't
- Built sandbox/proof of concept



Web Traffic Manager

- Didn't have to move everything at once
- Keeping legacy alive
- Maintenance



<http://www/oit>

<http://www/housing>

<http://www/>

<https://www/user>

<http://www/econ>

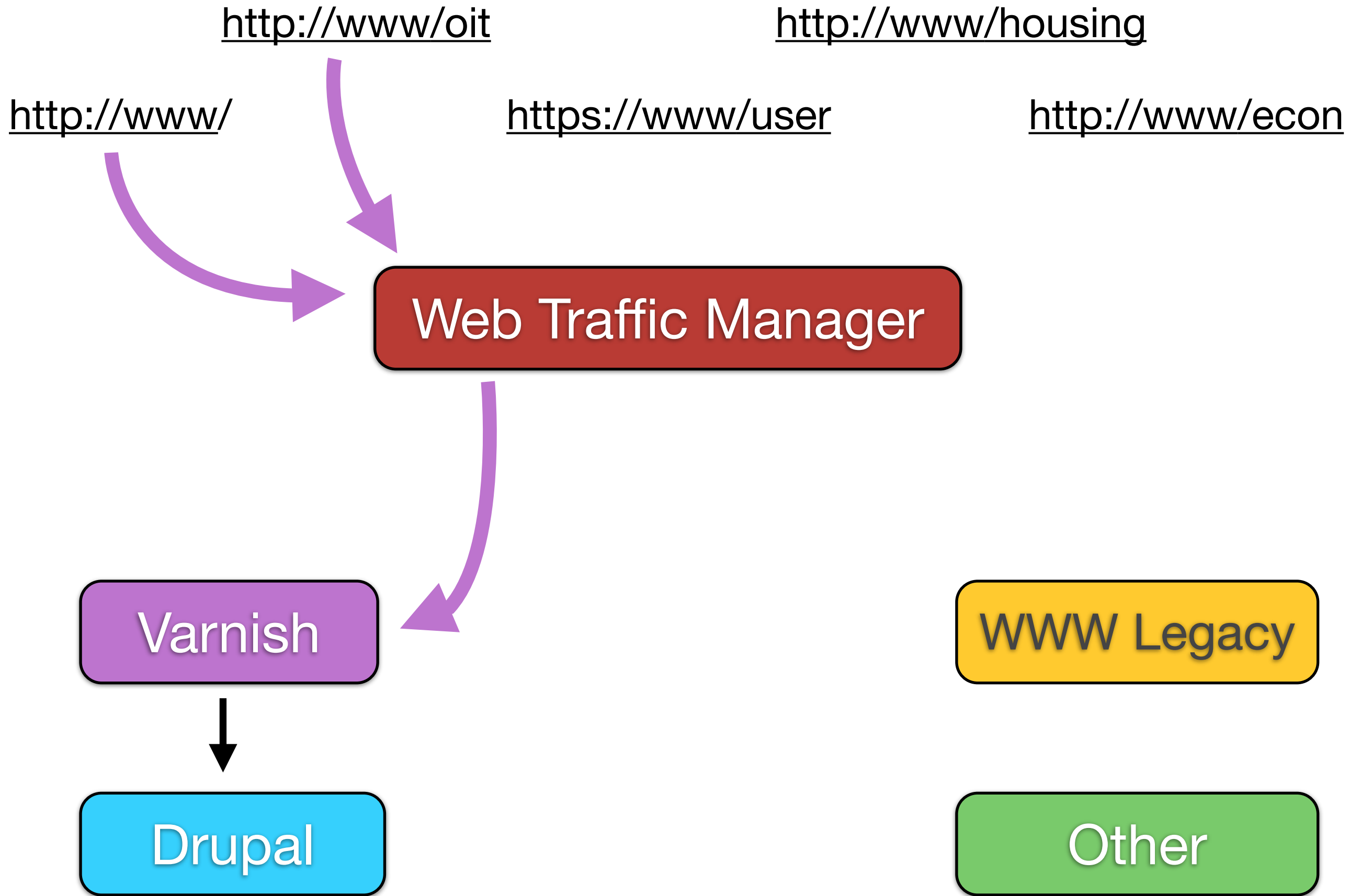
Web Traffic Manager

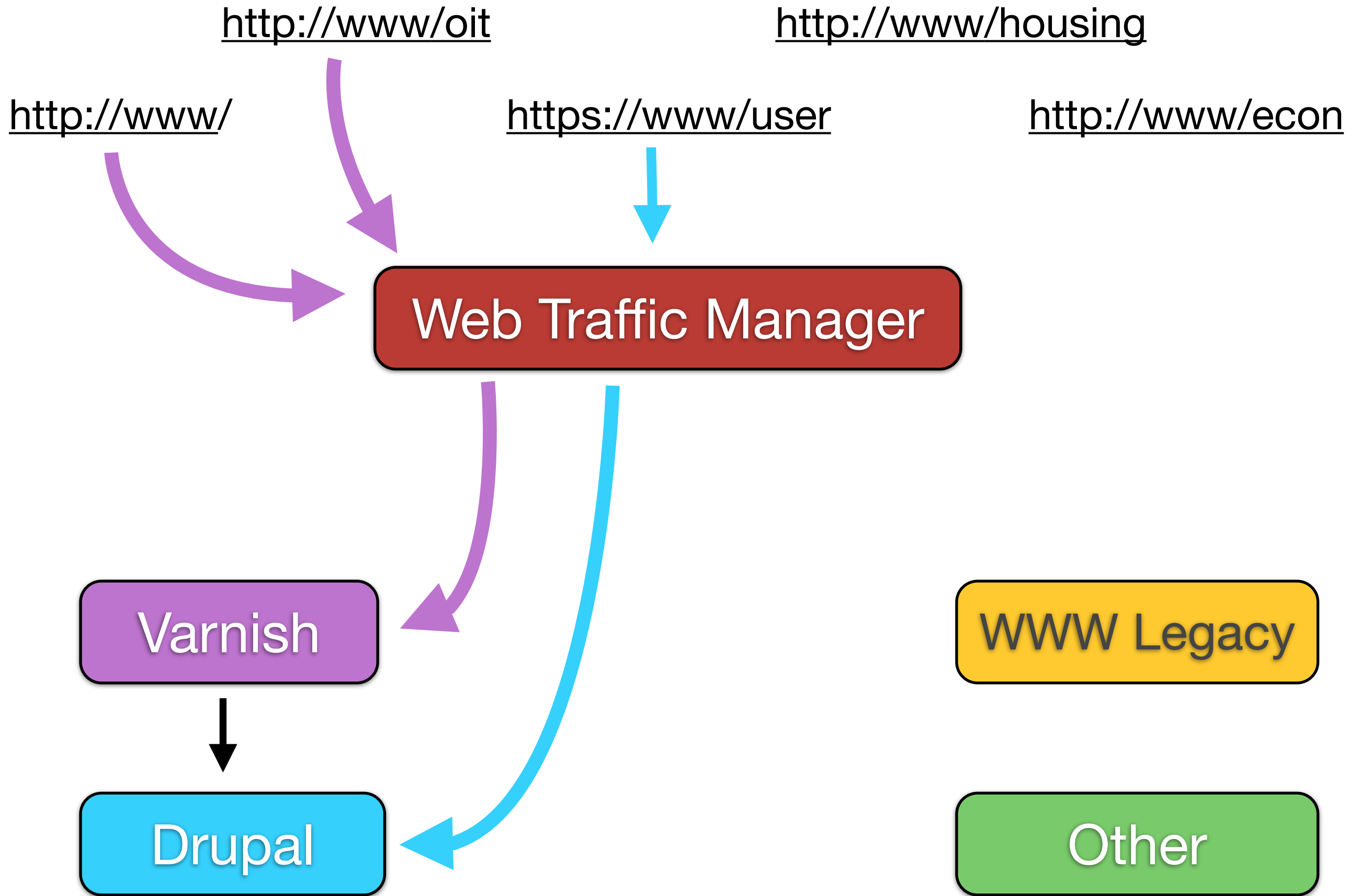
Varnish

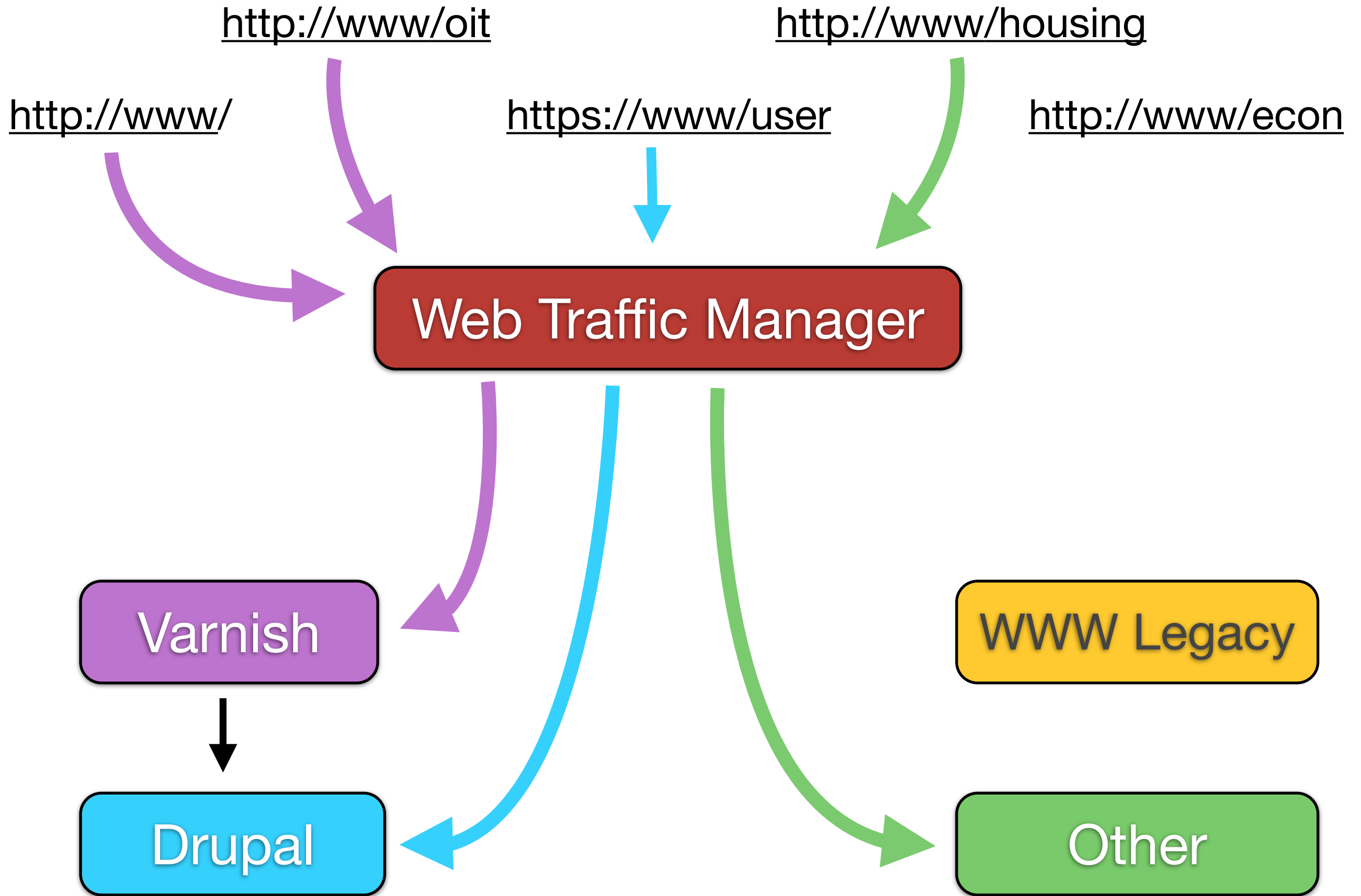
WWW Legacy

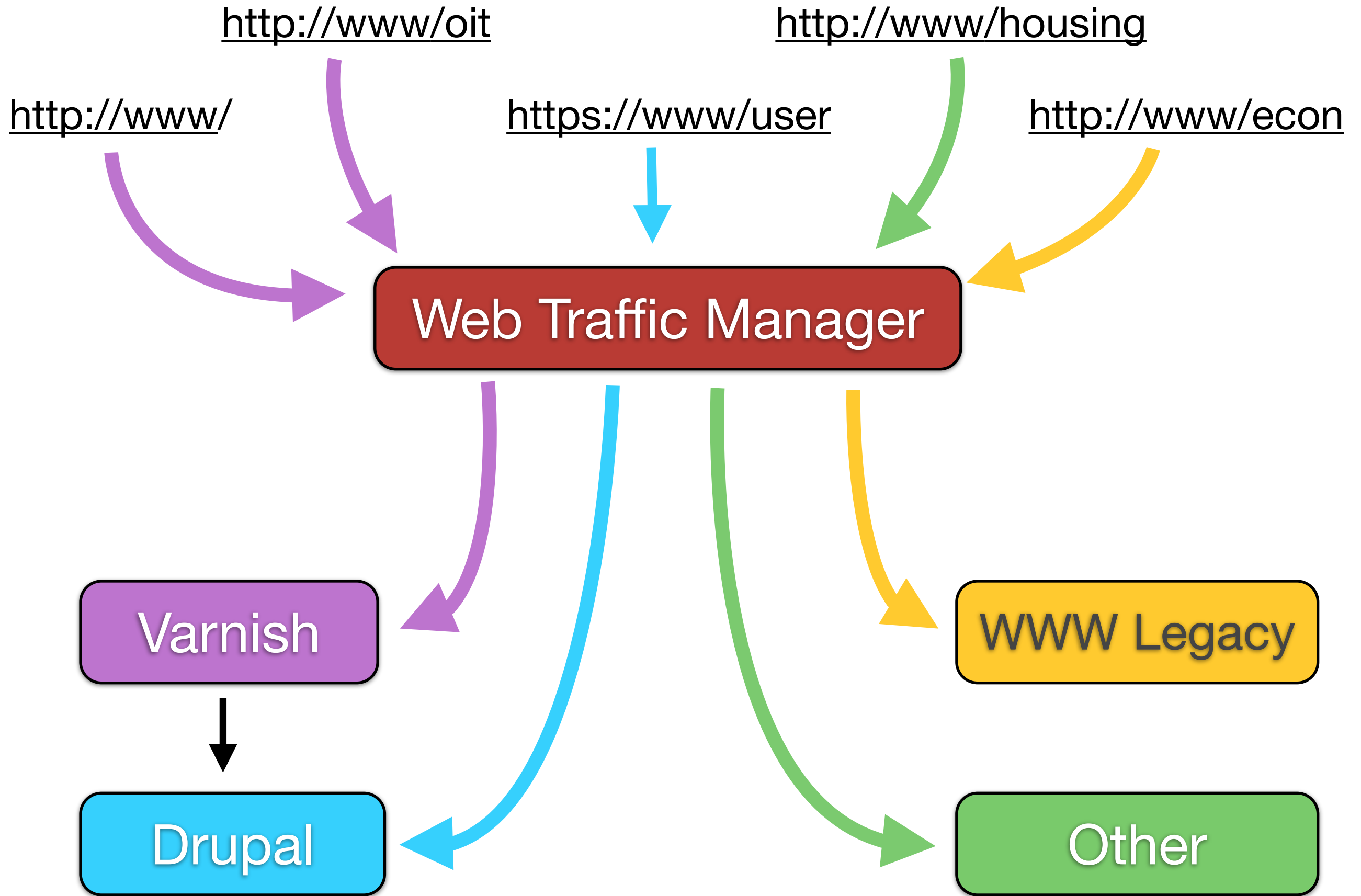
Drupal

Other









Web Traffic Manager



Web Proxy Cache



Web / Drupal



Object Cache

Database

Files

F5 Content Switch



Web Proxy Cache

Varnish1

Varnish2

Varnish3

...

VarnishN



Web1

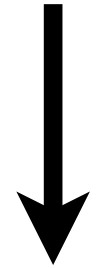
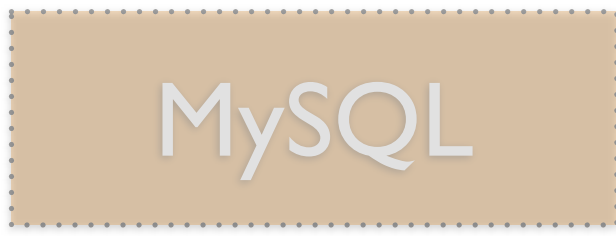
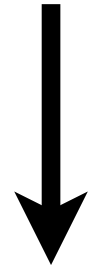
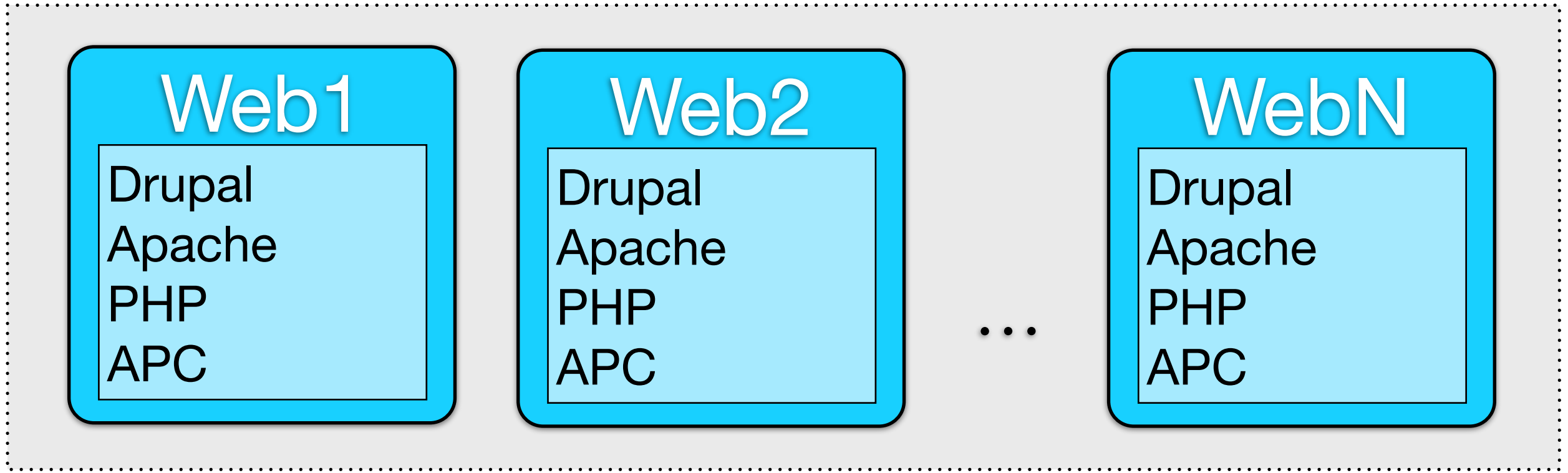
Web2

...

WebN



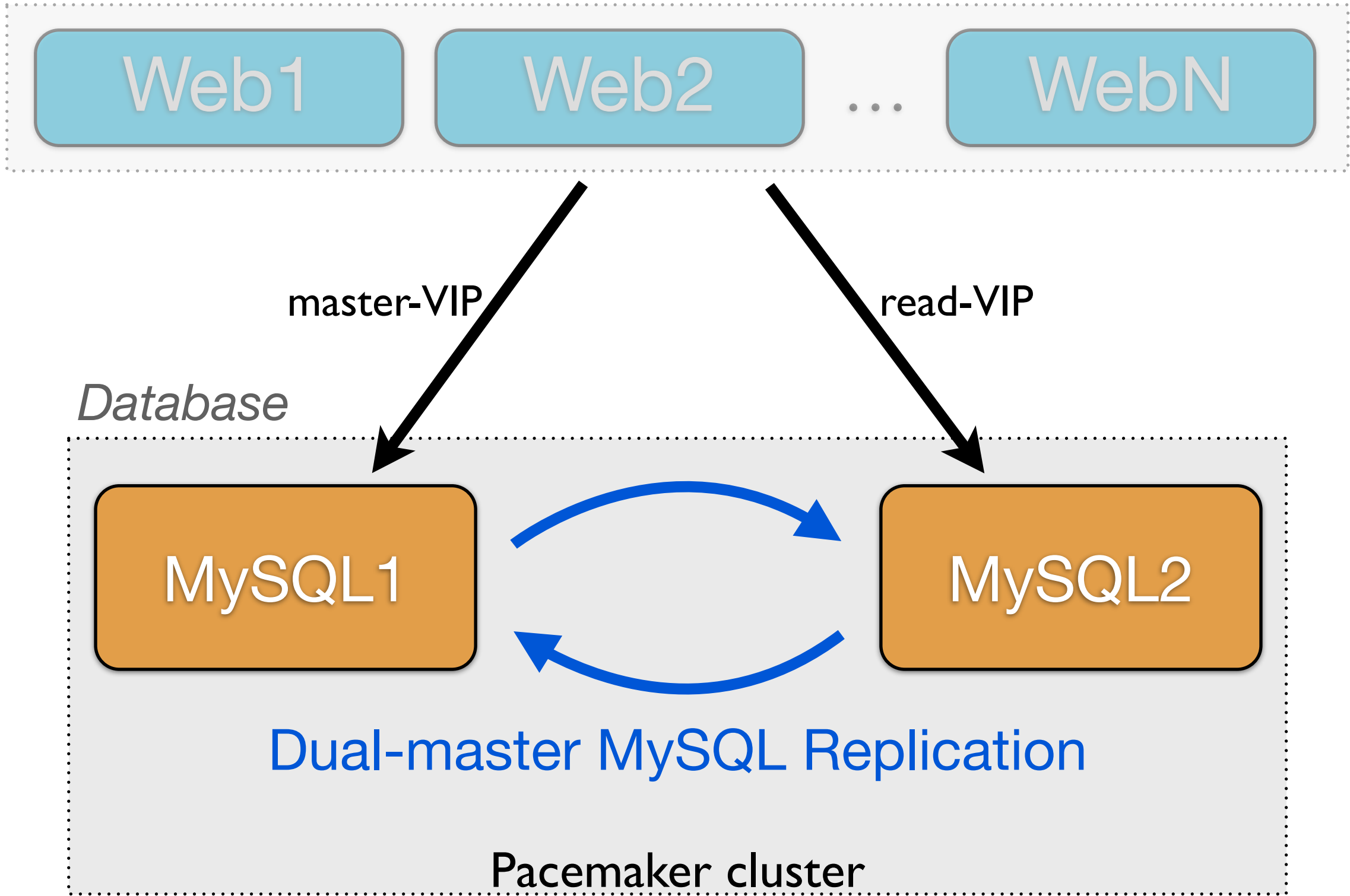
Web / Drupal

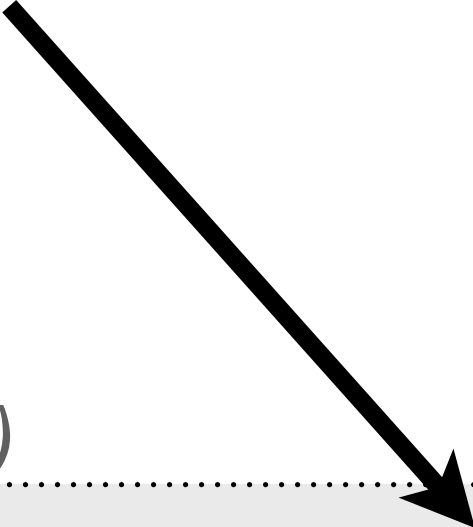




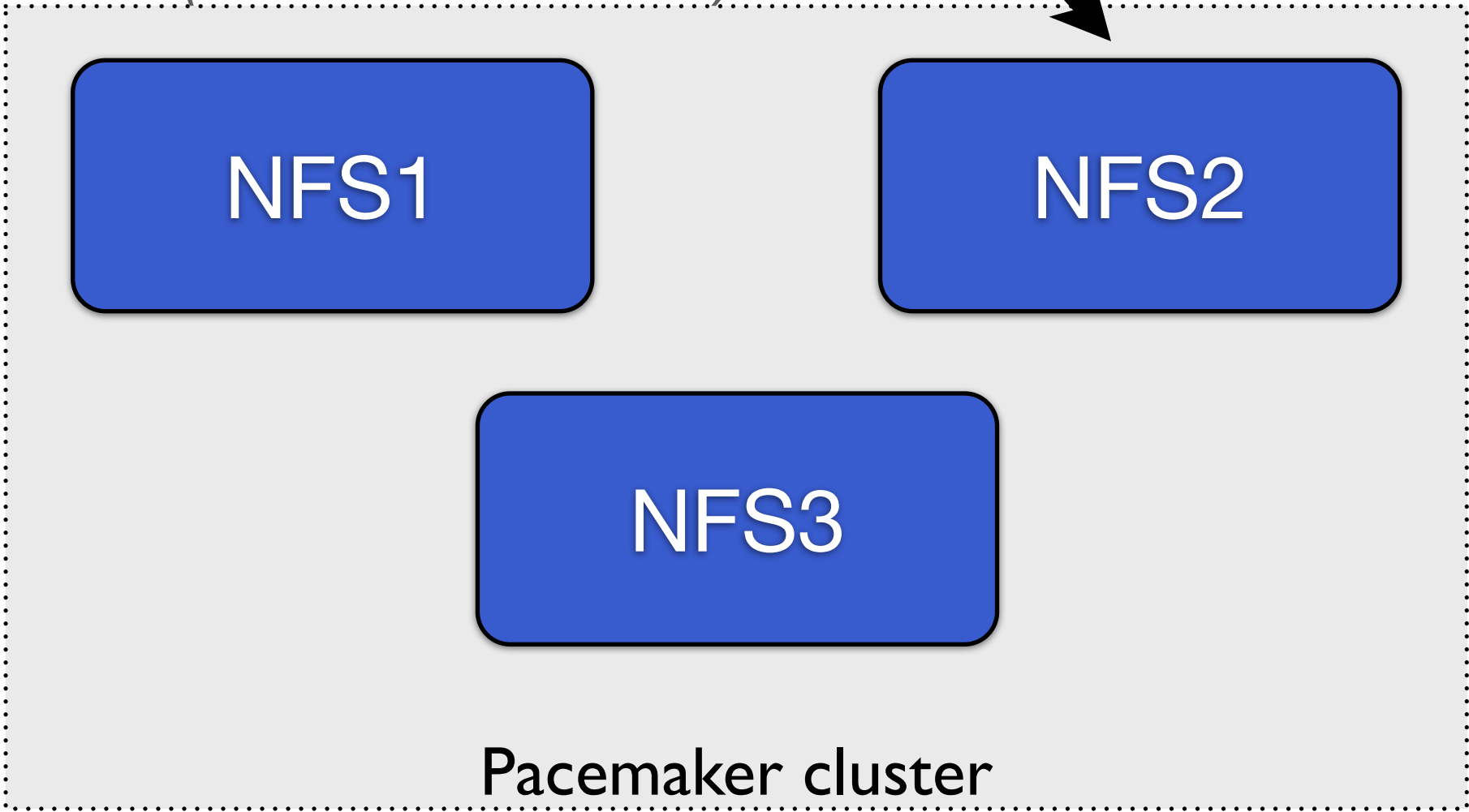
Object Cache

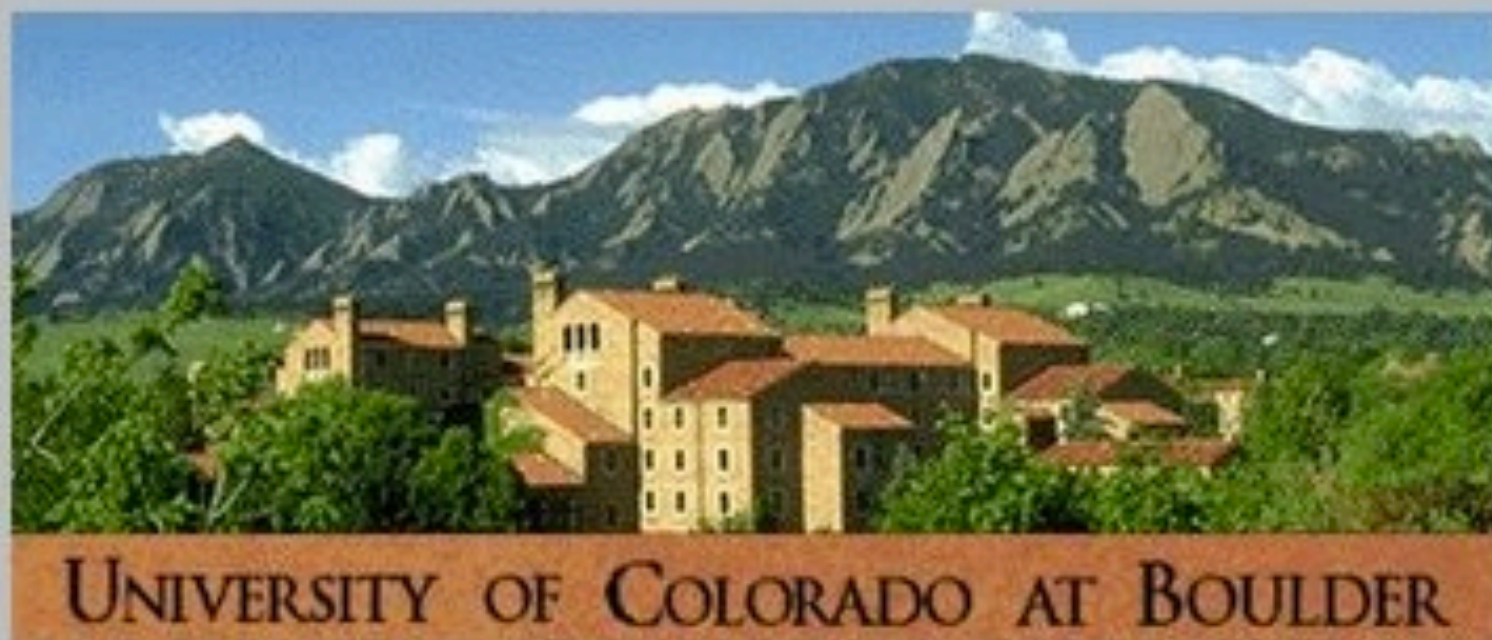






Files (sites/default/files)



Location: [What's New?](#) [What's Cool?](#) [Destinations](#) [Net Search](#) [People](#) [Software](#)[The University](#)

Administration, diversity, policies, and more

[Academic Life](#)

Admissions, colleges and schools, course availability, departments, faculty and research, and more

[Student Life](#)Activities, advising, counseling, employment, financial aid, handbook, health, housing, on-line services ([PLUS](#)), recreation, and more[Current Events](#)

Announcements, calendars, news, sports, and more

[What's New](#)

Some new and noteworthy sites on the CU-Boulder Home Page

[Campus Resources](#)



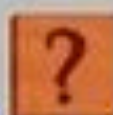
- ☐ [The University](#)
Administration, diversity, policies, and more
- ☐ [Academic Life](#)
Admissions, colleges and schools, course availability, departments, faculty and research, and more
- ☐ [Student Life](#)
Activities, advising, counseling, employment, financial aid, handbook, health, housing, on-line services ([PLUS](#)), recreation, and more
- ☐ [Current Events](#)
Announcements, calendars, news, sports, and more
- ☐ [What's New](#)
Some new and noteworthy sites on the CU-Boulder Home Page
- ☐ [Campus Resources](#)
Computing, data/statistical information, facilities, faculty/staff support, libraries, publications, technology transfer, and more
- ☐ [Directories](#)
Campus directories, department and office information, home pages indexes
- ☐ [Family and Friends](#)
Alumni, volunteers, and more
- ☐ [Beyond Campus](#)
The city and state, off-campus information, weather, Internet resources, and more



[Home](#)



[Search](#)



[Help/Info](#)



[Caminos Quick Ref](#)



[Ask Ralphie](#)

Send comments or questions to HomePage@Colorado.EDU





STOP THE
TECHNOLOGY
MADNESS.



Finding compounds that can help fight cancer

Using fruit flies, a CU-Boulder researcher is developing a screening technology to identify cancer therapies.



[Read more](#)



Creating Futures

With your involvement, we can renew the collegiate experience in ways that will create brighter futures in Colorado and around the world—one person, one discovery, and one community at a time.



[Learn More](#)



News Headlines

[CU team's efficient unmanned aircraft jetting toward commercialization](#)

[CU and NREL get 10 more Toyota hybrids to plug into smart grid study](#)

[CU-Boulder symposium explores digital media impact on politics, journalism and historical preservation](#)

[CU-Boulder student government facilities reach carbon neutrality](#)

[Two CU-Boulder faculty win National Science Foundation CAREER Awards](#)

[More News](#)

Campus Events

[Artist Series: Andras Schiff, piano](#)
7:30 • Monday 2/27

[Collage Concert](#)
7:30 • Friday 3/2

[Triage and Sense-making in an Urban Emergency Room](#)
5:00 • Monday 3/5

[Gov. Hickenlooper co-chairing Statewide Convening on LGBT Youth](#)
8:30 • Saturday 3/10

[CU Wizards](#)
9:30 • Saturday 3/10

[More Events](#)

AT&T 4G 10:30 AM 89%

colorado.edu/ Google

University of Colorado Boulder

University of Colorado Boulder Search Sites + People

CU: Home • A to Z • Campus Map

Students Faculty + Staff Parents Alumni

APPLY NEWS SECTIONS



Jetting toward commercia

Creating Futures

With your involvement, we can renew the collegiate experience in ways that will create brighter futures in Colorado and around the world—one person, one discovery, and one community at a time.



[Learn More](#)

AT&T 4G 10:32 AM

colorado.edu/

University of Colorado Boulder

University of Colorado Boulder Search Sites + People

CU: Home • A to Z • Campus Map

Students Faculty + Staff Parents Alumni

- About
- Admissions
- Academics
- Research
- Outreach
- International
- Sustainability
- Athletics
- News

CU learning assistants help transform science and math education

A CU-Boulder science, technology, engineering and mathematics (STEM) education program is so successful, it's imitated nationally.

[Read more](#)

AT&T 4G 10:28 AM 96%

University of Colorado Boulder

Search Sites + People

APPLY NEWS SECTIONS

CU learning assistants help transform science and math education

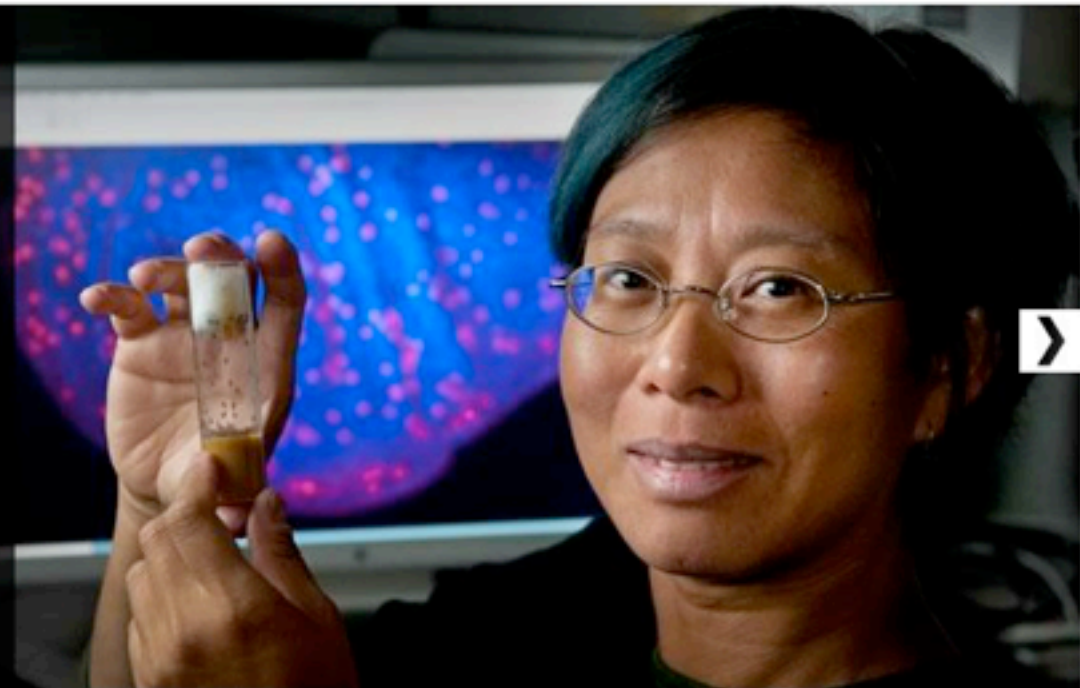


Finding compounds that can help fight cancer

Using fruit flies, a CU-Boulder researcher is developing a screening technology to identify cancer therapies.



[Read more](#)



Creating Futures

With your involvement, we can renew the collegiate experience in ways that will create brighter futures in Colorado and around the world—one person, one discovery, and one community at a time.



[Learn More](#)



News Headlines

[CU team's efficient unmanned aircraft jetting toward commercialization](#)

[CU and NREL get 10 more Toyota hybrids to plug into smart grid study](#)

[CU-Boulder symposium explores digital media impact on politics, journalism and historical preservation](#)

[CU-Boulder student government facilities reach carbon neutrality](#)

[Two CU-Boulder faculty win National Science Foundation CAREER Awards](#)

[More News](#)

Campus Events

[Artist Series: Andras Schiff, piano](#)
7:30 • Monday 2/27

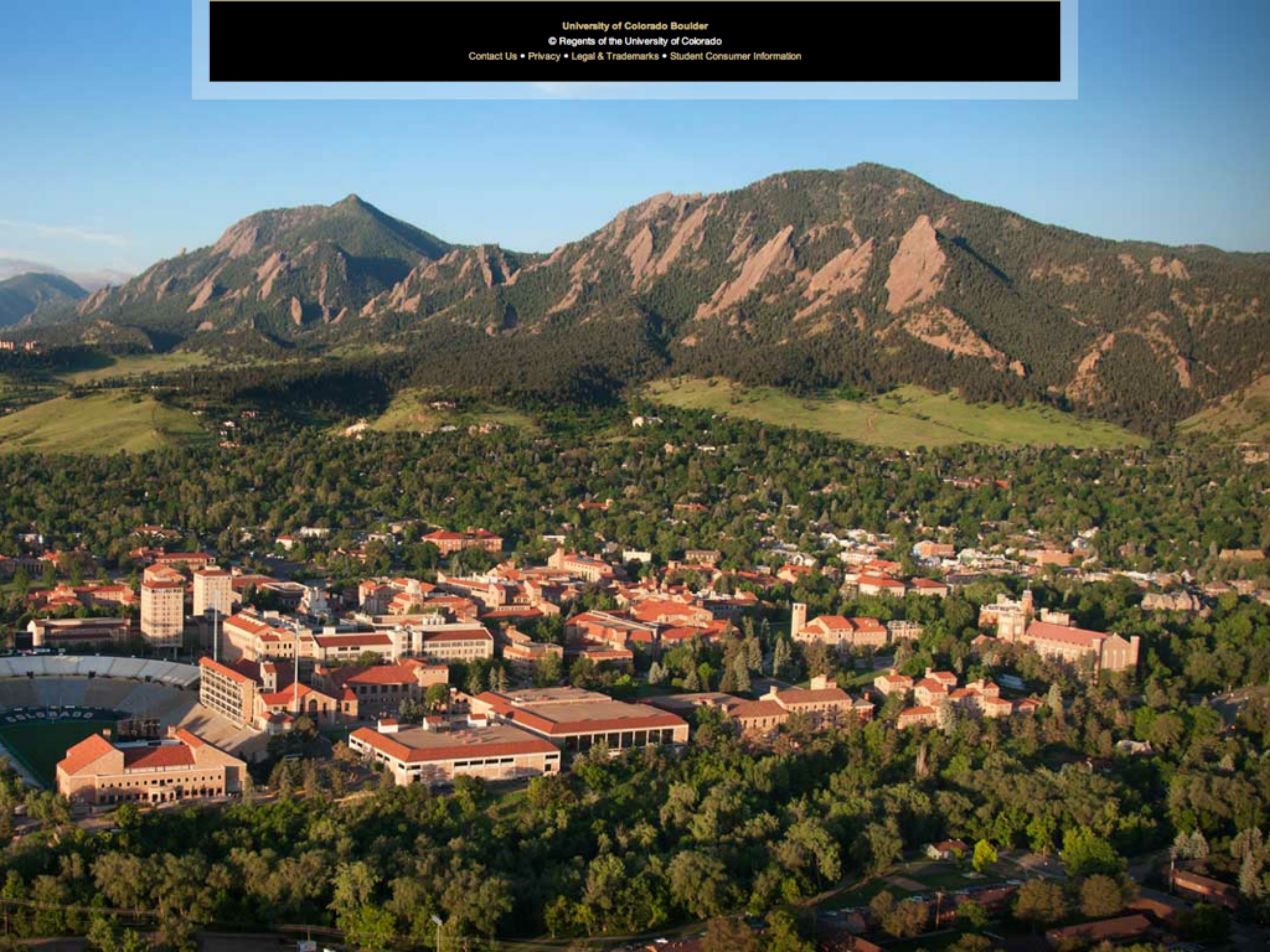
[Collage Concert](#)
7:30 • Friday 3/2

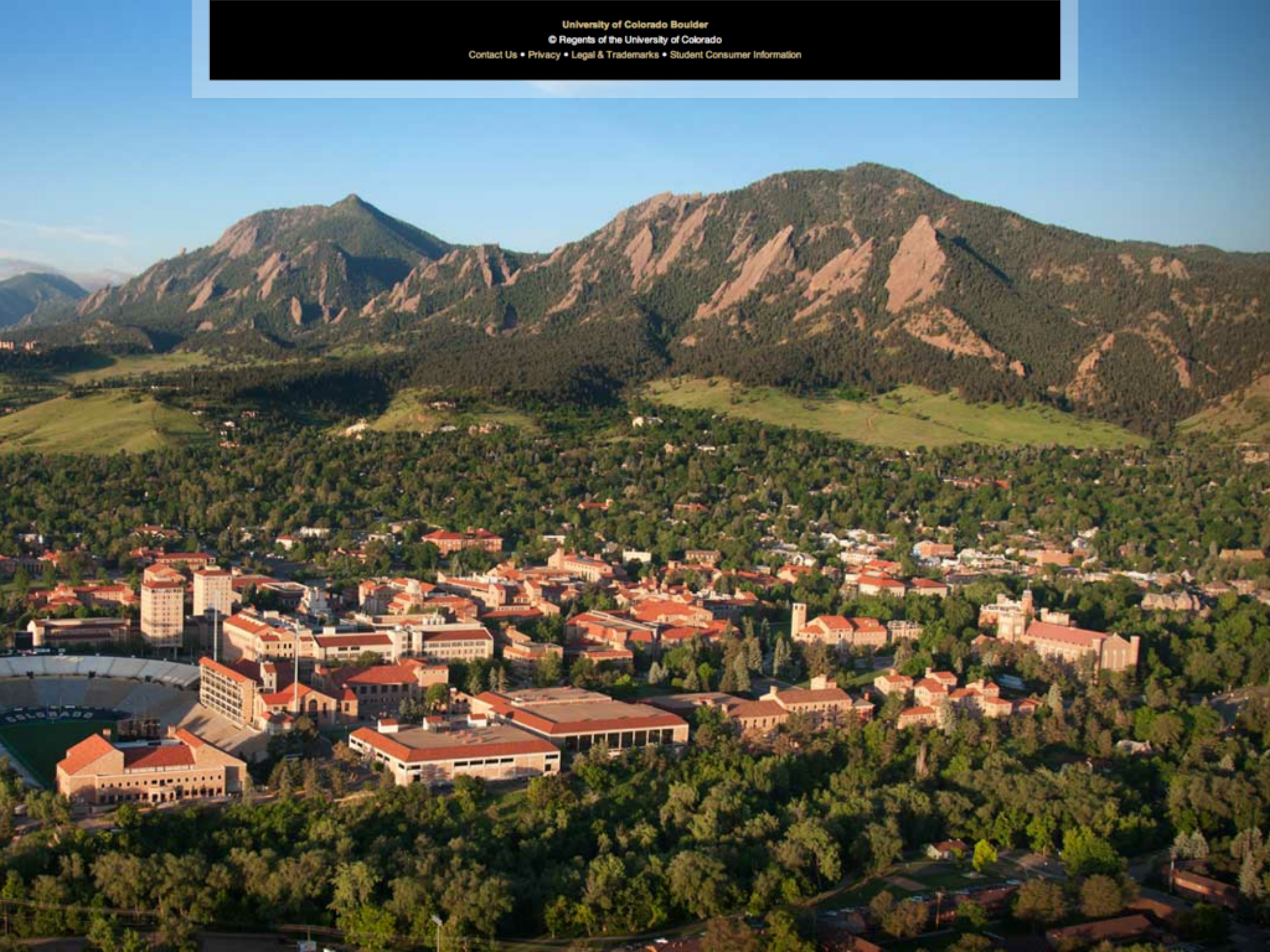
[Triage and Sense-making in an Urban Emergency Room](#)
5:00 • Monday 3/5

[Gov. Hickenlooper co-chairing Statewide Convening on LGBT Youth](#)
8:30 • Saturday 3/10

[CU Wizards](#)
9:30 • Saturday 3/10

[More Events](#)





Backstretch module

drupal.org/project/backstretch

Provides the ability to display an image stretched across the background of your website regardless of the browser window size.









Drupal Symlink Manager

drupal.org/project/dslm

A set of Drush command line tools for managing symlinking Drupal sites back to a central set of Drupal cores and installation profiles.



DSL M Base Directory

cores/

drupal-7.10

pressflow-6.22.105

profiles/

cu_fit-1.0

openatrium-1.2

openpublish-3.0-alpha6




```
$ drush ds1m-new my_site
```

```
Enter a number.
```

```
[0] : Cancel
```

```
[1] : pressflow-6.22.105
```

```
[2] : drupal-7.12
```

```
2
```

```
Your site has been linked in my_site [ok]
```

```
$ drush ds1m-new my_site
```

```
Enter a number.
```

```
[0] : Cancel
```

```
[1] : pressflow-6.22.105
```

```
[2] : drupal-7.12
```

```
2
```

```
Your site has been linked in my_site [ok]
```

```
$ cd my_site
```


.htaccess
authorize.php
cron.php
includes
index.php
install.php
misc
modules
profiles
robots.txt
scripts
sites
themes
update.php
web.config
xmlrpc.php



.htaccess

```
-> ../dslm_base/cores/drupal-7.12/authorize.php  
-> ../dslm_base/cores/drupal-7.12/cron.php  
-> ../dslm_base/cores/drupal-7.12/includes  
-> ../dslm_base/cores/drupal-7.12/index.php  
-> ../dslm_base/cores/drupal-7.12/install.php  
-> ../dslm_base/cores/drupal-7.12/misc  
-> ../dslm_base/cores/drupal-7.12/modules
```

profiles

```
-> ../dslm_base/cores/drupal-7.12/robots.txt  
-> ../dslm_base/cores/drupal-7.12/scripts
```

sites

```
-> ../dslm_base/cores/drupal-7.12/themes  
-> ../dslm_base/cores/drupal-7.12/update.php  
-> ../dslm_base/cores/drupal-7.12/web.config  
-> ../dslm_base/cores/drupal-7.12/xmlrpc.php
```



.htaccess

- > ../../dslm_base/cores/drupal-7.12/authorize.php
- > ../../dslm_base/cores/drupal-7.12/cron.php
- > ../../dslm_base/cores/drupal-7.12/includes
- > ../../dslm_base/cores/drupal-7.12/index.php
- > ../../dslm_base/cores/drupal-7.12/install.php
- > ../../dslm_base/cores/drupal-7.12/misc
- > ../../dslm_base/cores/drupal-7.12/modules

profiles

- > ../../dslm_base/cores/drupal-7.12/robots.txt
- > ../../dslm_base/cores/drupal-7.12/scripts

sites

- > ../../dslm_base/cores/drupal-7.12/themes
- > ../../dslm_base/cores/drupal-7.12/update.php
- > ../../dslm_base/cores/drupal-7.12/web.config
- > ../../dslm_base/cores/drupal-7.12/xmlrpc.php




```
$ drush dslm-switch-core drupal-7.14
```

```
.htaccess
```

```
-> ../../dslm_base/cores/drupal-7.14/authorize.php
```

```
-> ../../dslm_base/cores/drupal-7.14/cron.php
```

```
-> ../../dslm_base/cores/drupal-7.14/includes
```

```
-> ../../dslm_base/cores/drupal-7.14/index.php
```

```
-> ../../dslm_base/cores/drupal-7.14/install.php
```

```
-> ../../dslm_base/cores/drupal-7.14/misc
```

```
-> ../../dslm_base/cores/drupal-7.14/modules
```

```
profiles
```

```
-> ../../dslm_base/cores/drupal-7.14/robots.txt
```

```
-> ../../dslm_base/cores/drupal-7.14/scripts
```

```
sites
```

```
-> ../../dslm_base/cores/drupal-7.14/themes
```

```
-> ../../dslm_base/cores/drupal-7.14/update.php
```

```
-> ../../dslm_base/cores/drupal-7.14/web.config
```

```
-> ../../dslm_base/cores/drupal-7.14/xmlrpc.php
```




```
$ drush ds1m-add-profile
```

```
Enter a number.
```

```
[0] : Cancel
```

```
[1] : cu_fit
```

```
[2] : openatrium
```

```
[3] : openpublish
```

```
1
```

```
The profile 'cu_fit' has been added [ok]
```




```
$ ls -al profiles
```

```
-> ../../dslm_base/cores/drupal-7.14/profiles/minimal  
-> ../../dslm_base/cores/drupal-7.14/profiles/standard  
-> ../../dslm_base/cores/drupal-7.14/profiles/testing  
-> ../../dslm_base/profiles/cu_fit-1.0
```



```
$ ls -al profiles
```

```
-> ../../dslm_base/cores/drupal-7.14/profiles/minimal  
-> ../../dslm_base/cores/drupal-7.14/profiles/standard  
-> ../../dslm_base/cores/drupal-7.14/profiles/testing  
-> ../../dslm_base/profiles/cu_fit-1.0
```

```
$ drush site-install cu_fit
```



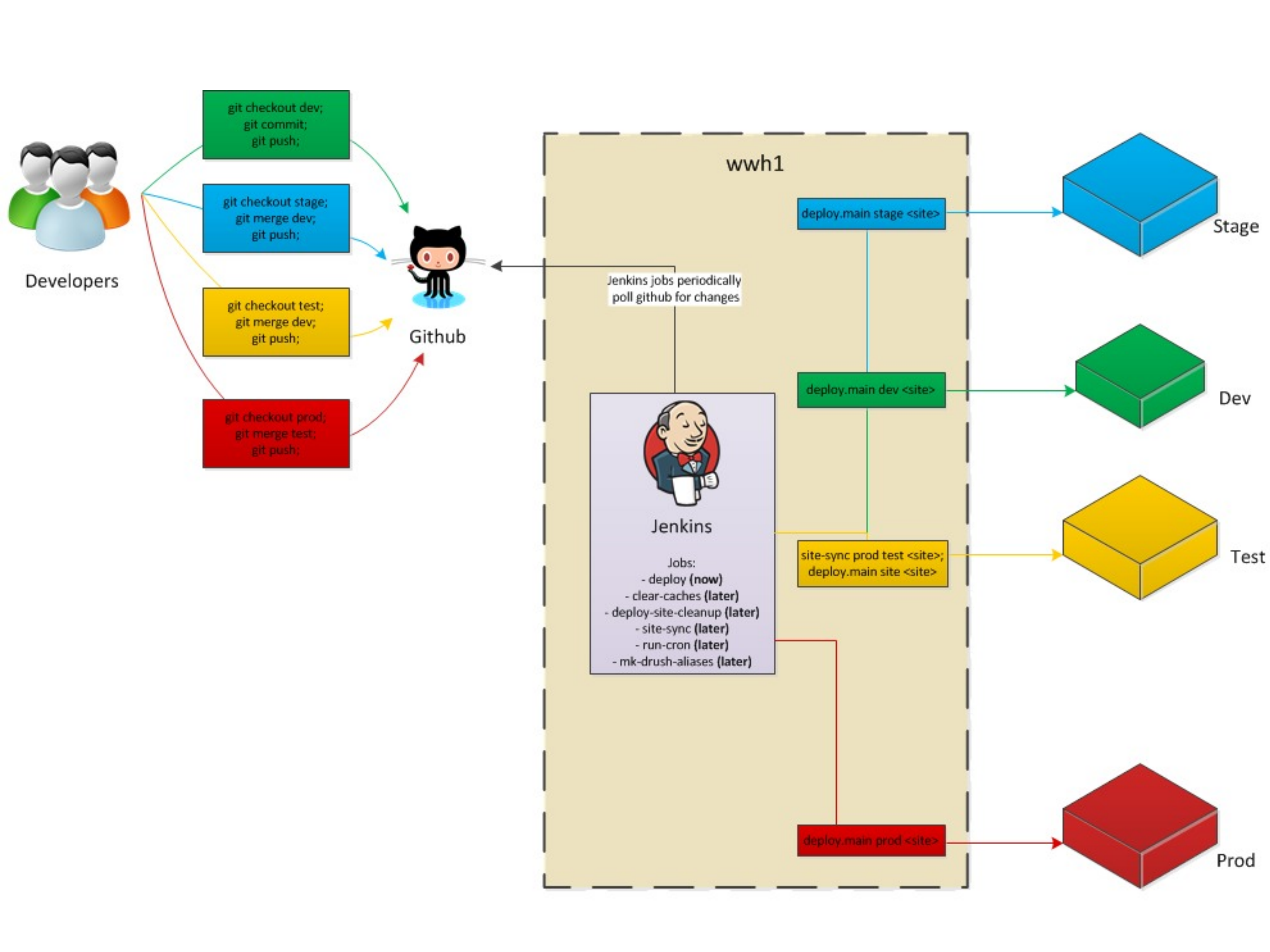
Deployment

- “Workhorse”
- `deploy.main [environment] [site] [sha1]`
- git (submodules)
- Jenkins

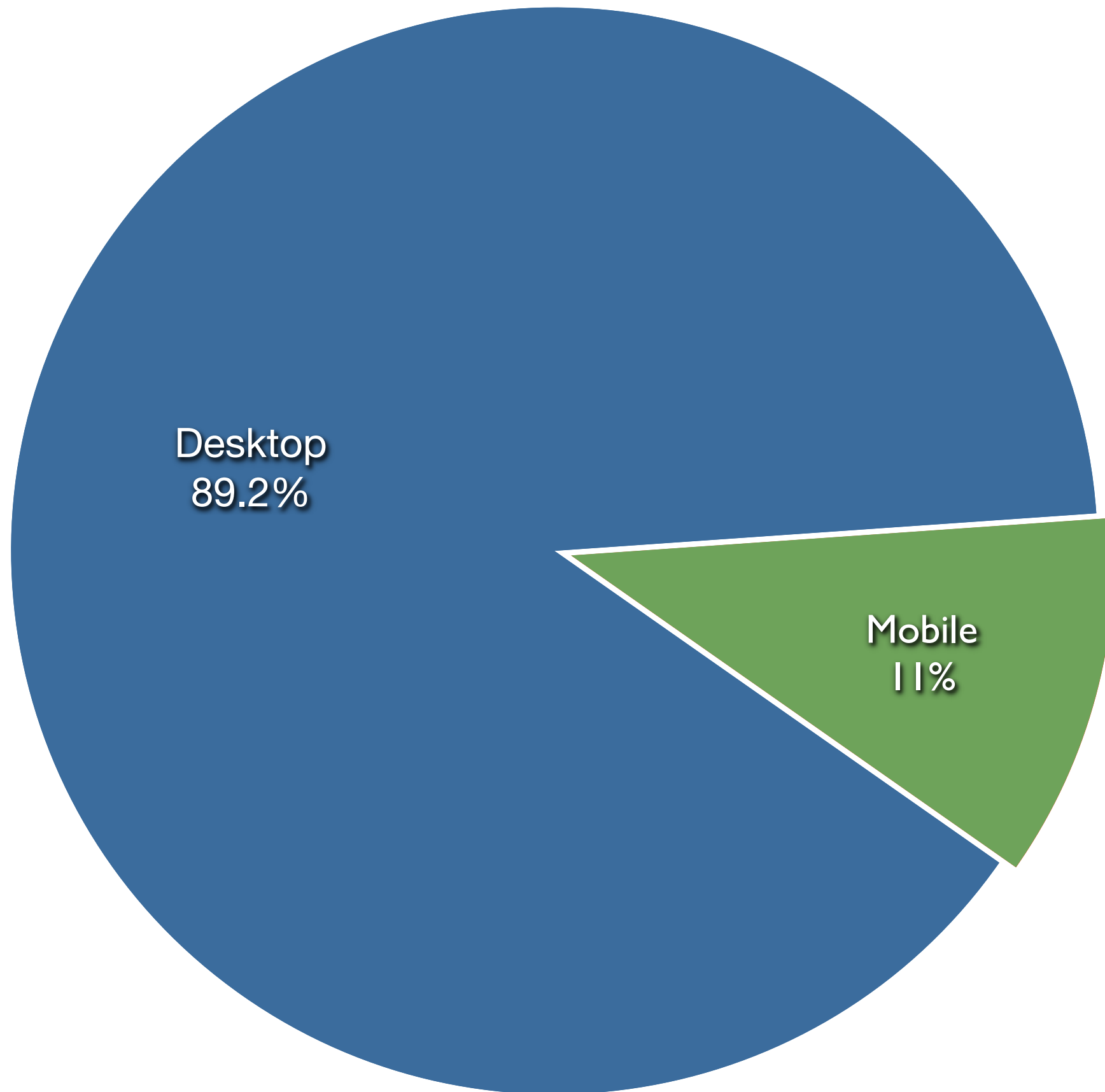
Deployment script

- git clone
- git checkout [sha1]
- copy settings.local.php
- symlink sites/default/files from hanfs mount
- backup database
- symlink change
- drush updatedb
- cache clears

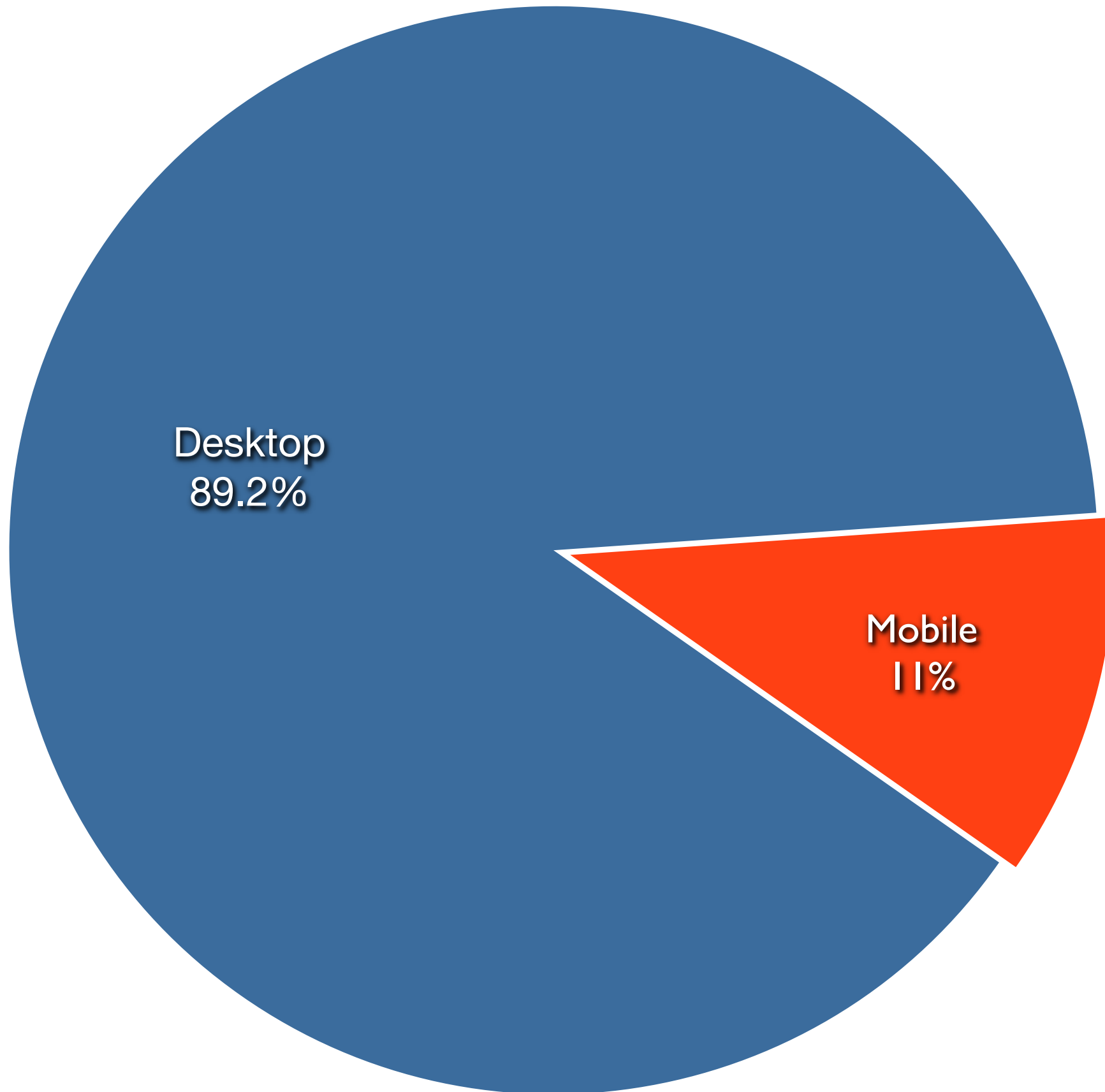




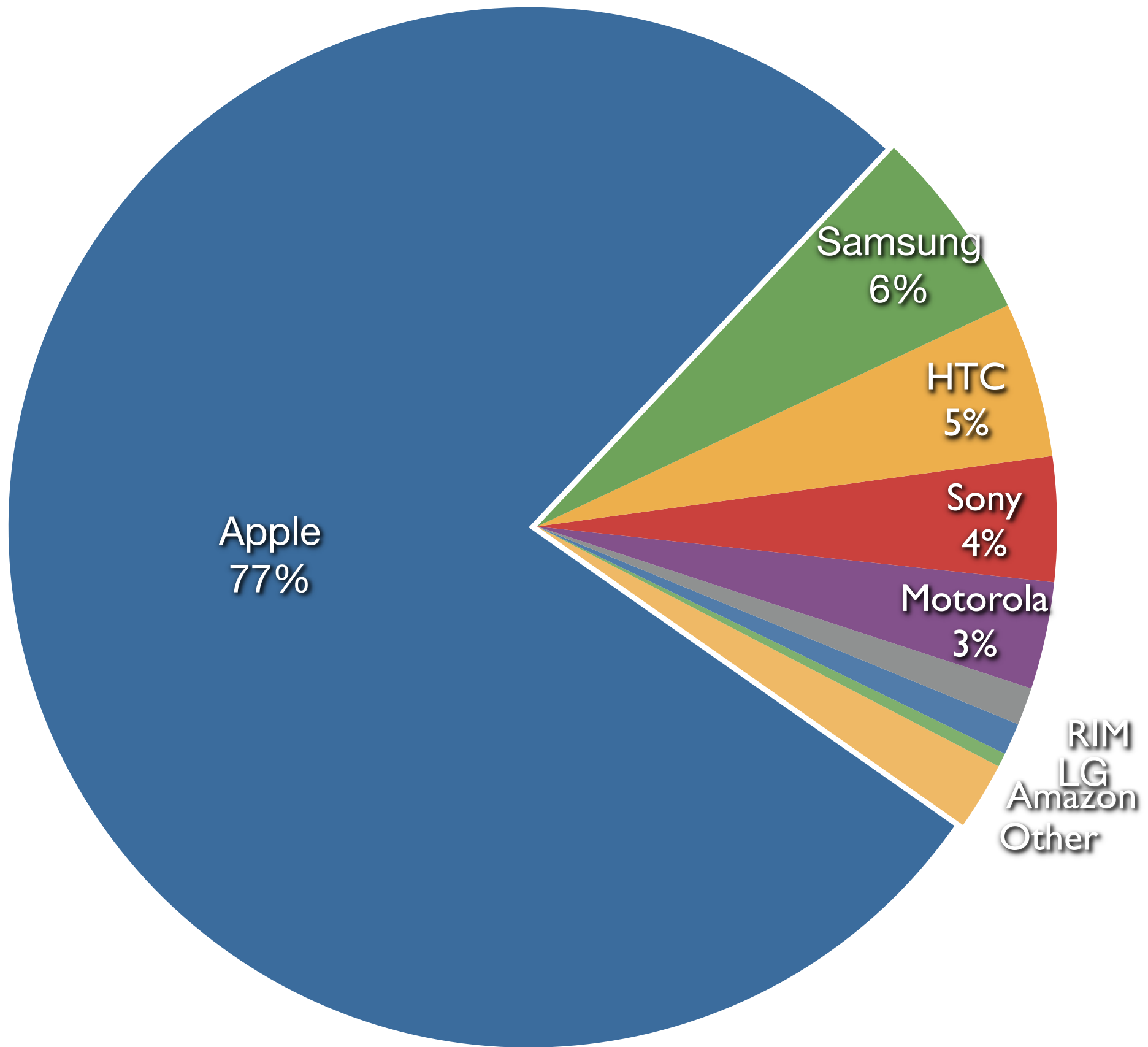
Who are our visitors?



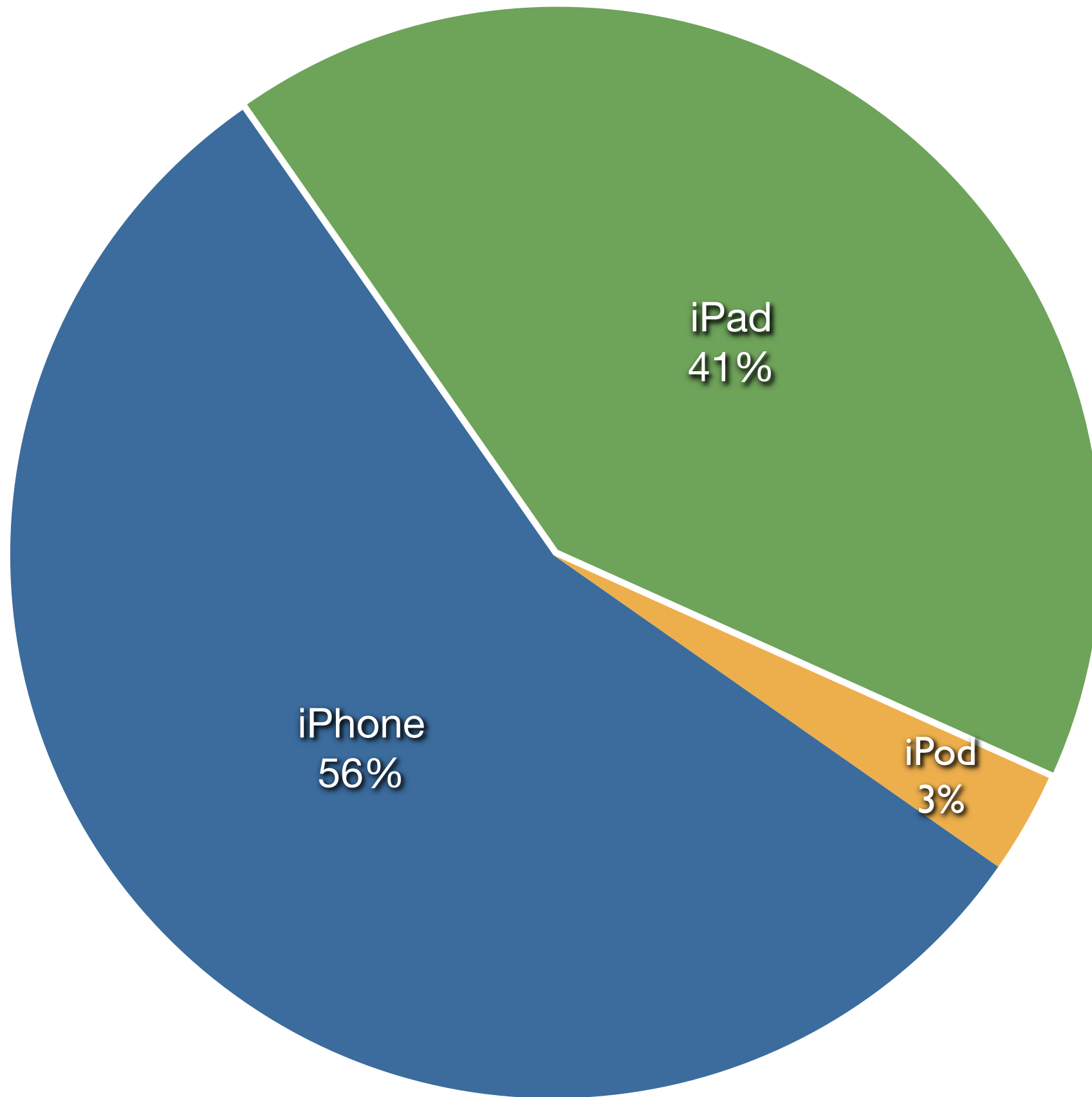
World Wide Visitors by Device Type



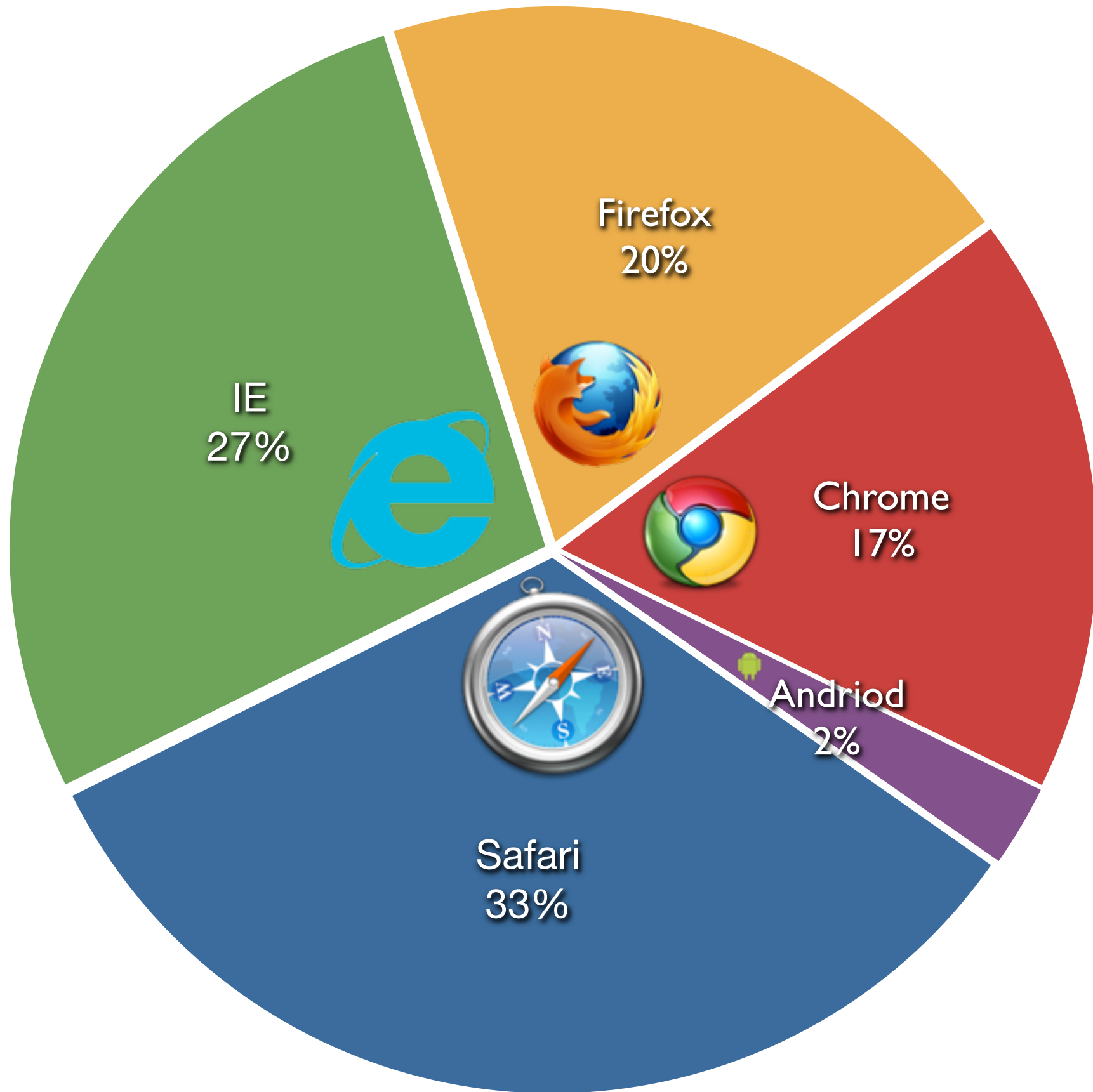
World Wide Visitors by Device Type



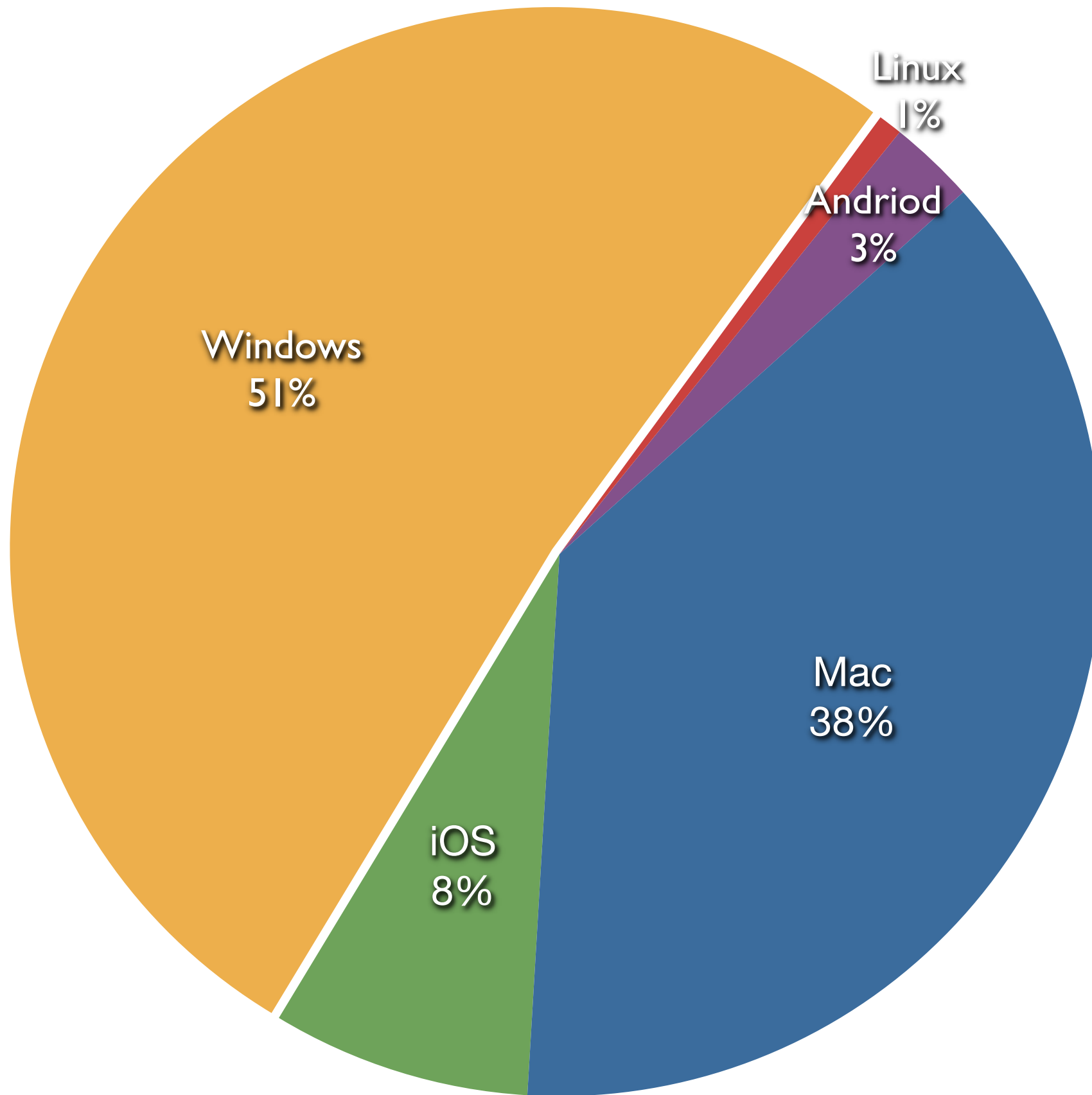
World Wide Mobile Traffic by Device Brand



World Wide Apple Traffic by iDevice

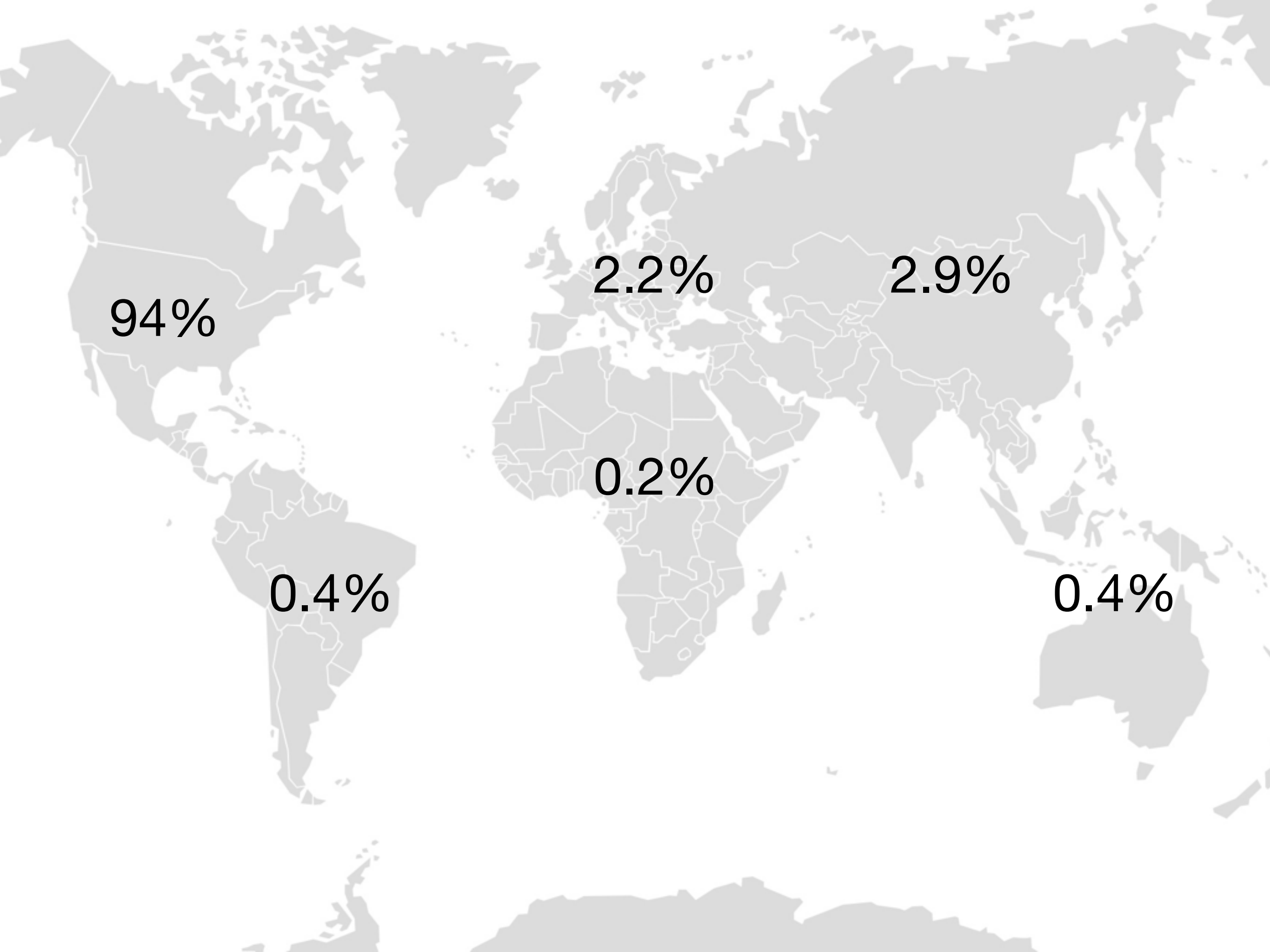


World Wide Traffic by Browser



Random stats

- 27% of visitors served from campus network
- 25% of total traffic is google search -> homepage
- 60% of traffic leaves within 10 secs
- 20% stay for 1 min+



94%

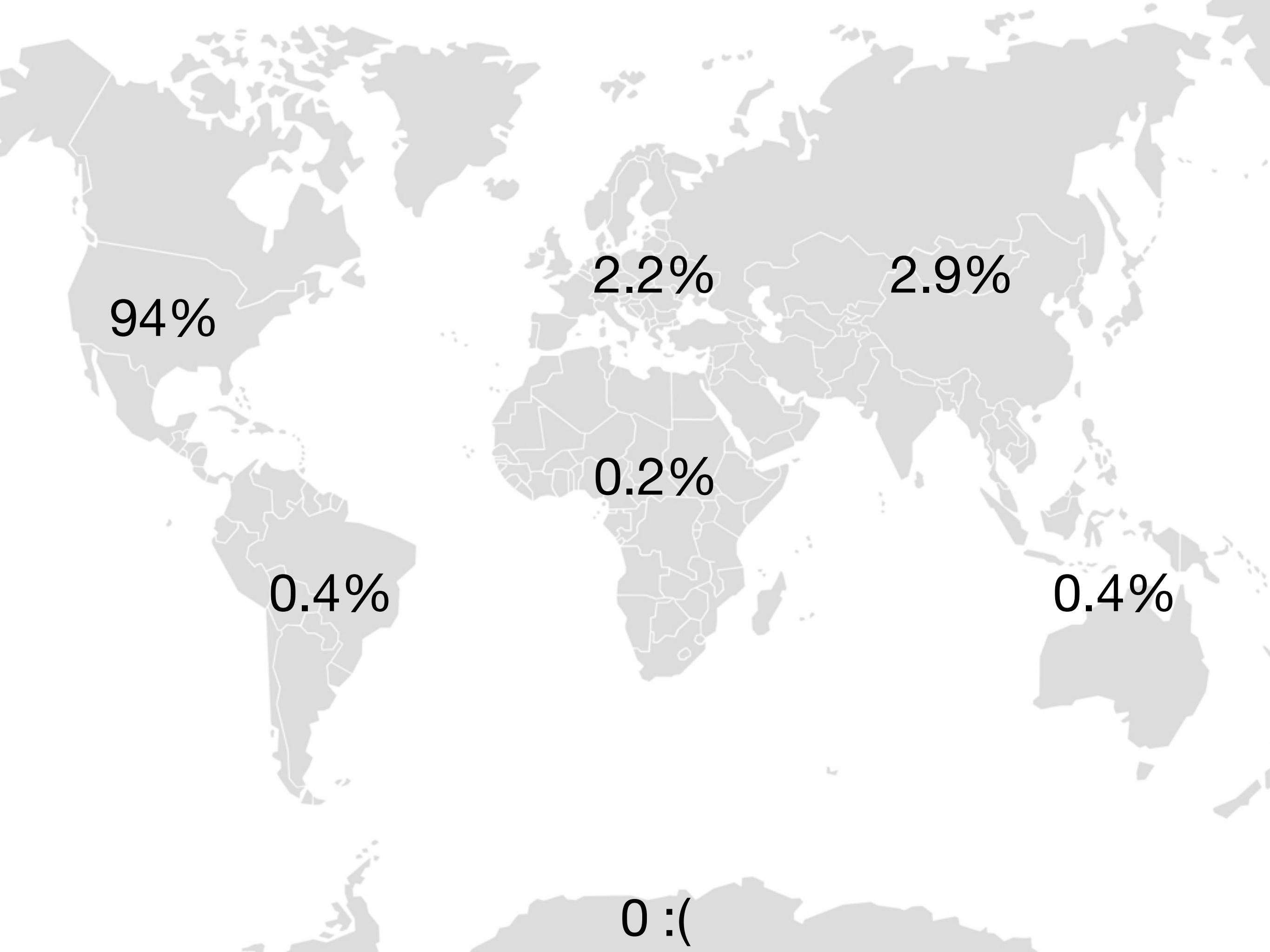
2.2%

2.9%

0.4%

0.2%

0.4%



94%

2.2%

2.9%

0.4%

0.2%

0.4%

0 :(

Top 10 Countries

1.	United States	92.5%
2.	India	0.79%
3.	China	0.64%
4.	Canada	0.61%
5.	United Kingdom	0.52%
6.	Germany	0.29%
7.	Australia	0.29%
8.	Spain	0.25%
9.	Japan	0.19%
10.	Saudi Arabia	0.19%

3.7s average load time
2.8s on campus

Top 10 Countries' Load Times

1.	United States	92.5%	3.2s
2.	India	0.79%	16.7s
3.	China	0.64%	17.8s
4.	Canada	0.61%	3.5s
5.	United Kingdom	0.52%	4.3s
6.	Germany	0.29%	3.4s
7.	Australia	0.29%	7.8s
8.	Spain	0.25%	3.9s
9.	Japan	0.19%	5.0s
10.	Saudi Arabia	0.19%	14.0s

World Wide Visitors by Country + Average Load Time

Top 10 States

1.	Colorado	58.4%
2.	California	7.0%
3.	Texas	3.4%
4.	New York	2.4%
5.	Illinois	2.3%
6.	Florida	1.8%
7.	Pennsylvania	1.3%
8.	Massachusetts	1.3%
9.	Washington	1.3%
10.	Virginia	1.2%

3.	Texas	2.4%
4.	New York	2.4%
5.	Illinois	2.3%
6.	Florida	1.8%
7.	Pennsylvania	1.3%
8.	Massachusetts	1.3%
9.	Washington	1.3%
10.	Virginia	1.2%

48.	South Dakota	
49.	West Virginia	
50.	North Dakota	
51.	Delaware	

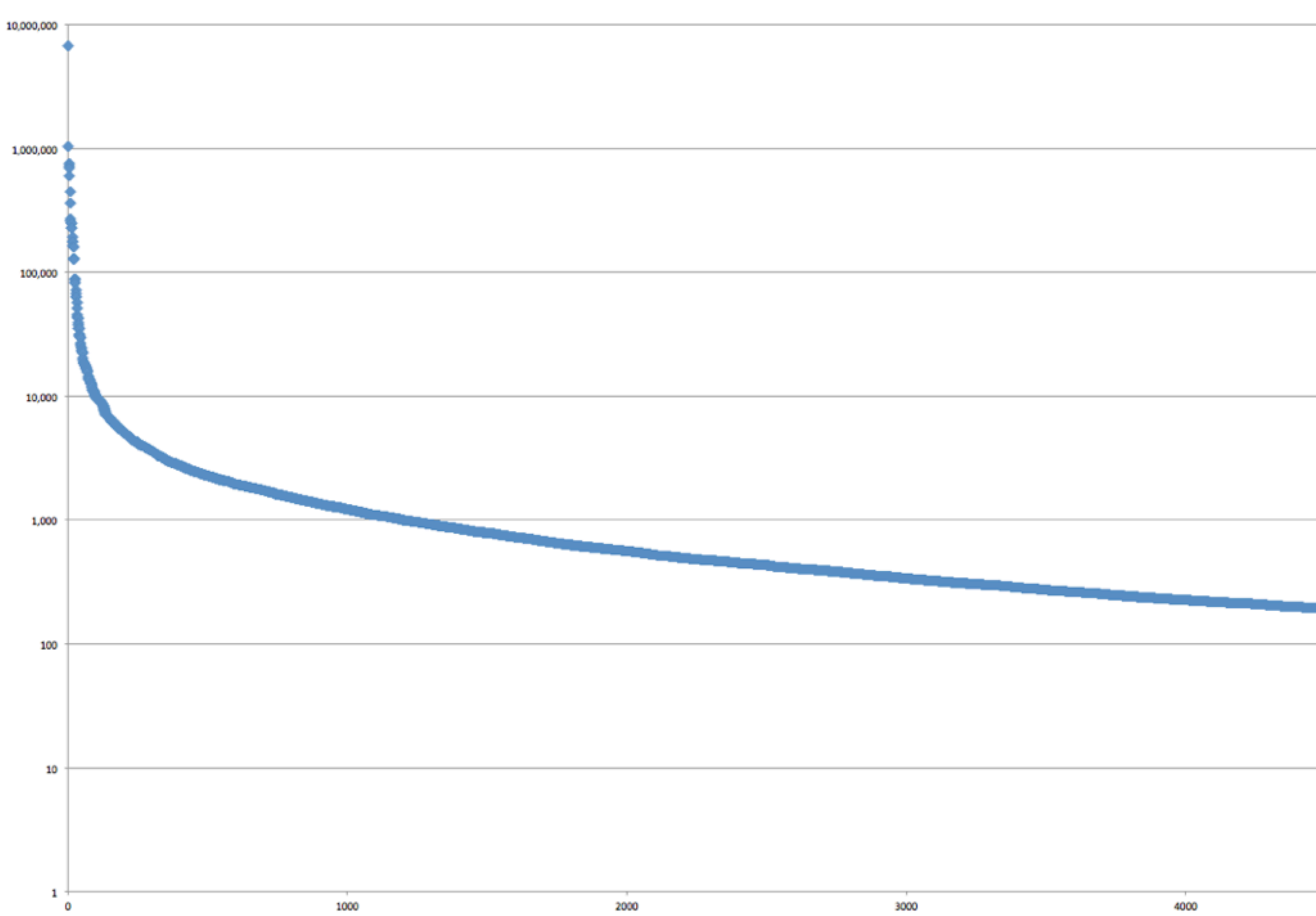
Top 10 Cities

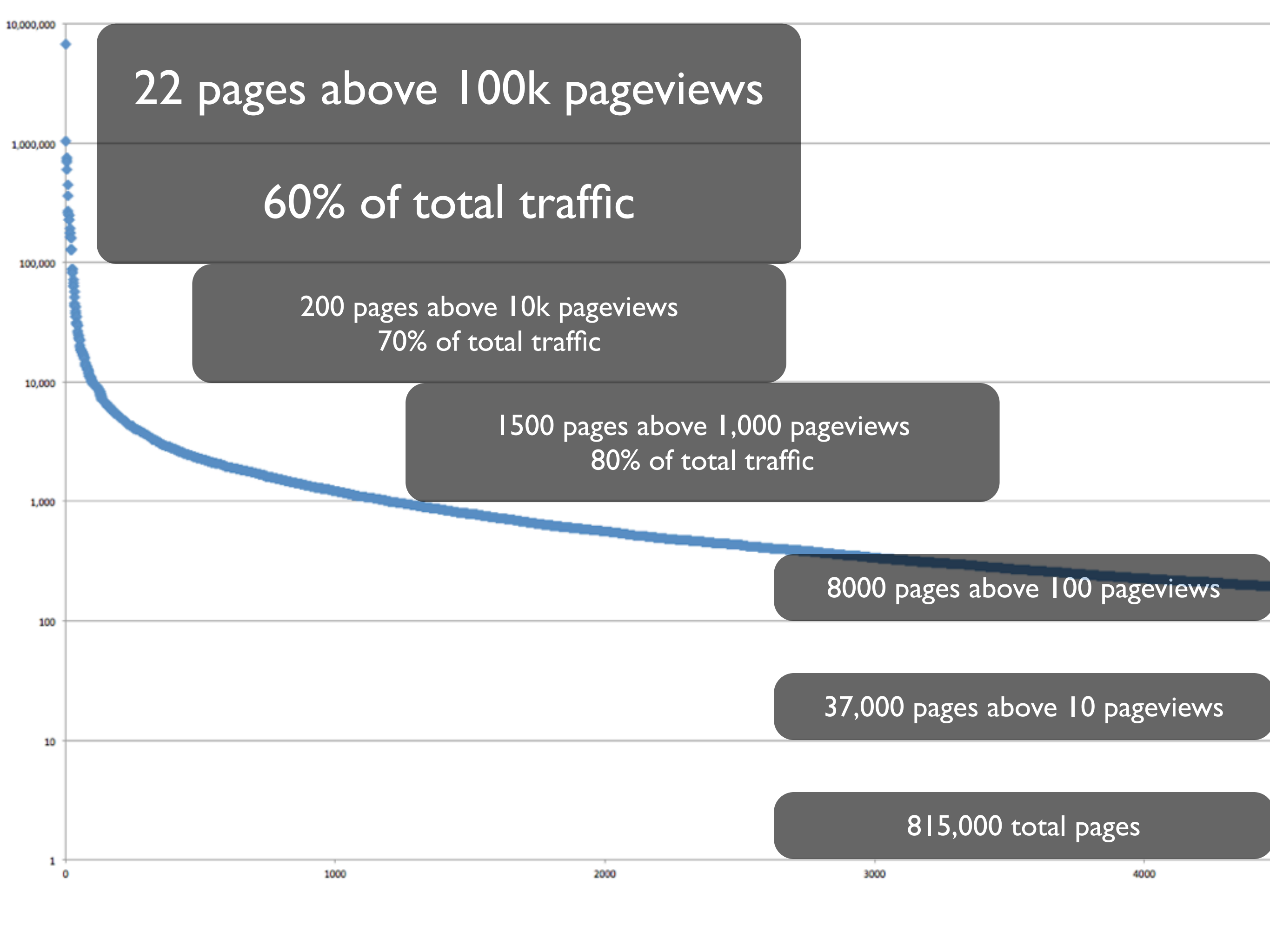
1.	Boulder	38.1%
2.	Denver	8.7%
3.	New York	1.2%
4.	Colorado Springs	1.2%
5.	Los Angeles	0.8%
6.	Littleton	0.8%
7.	Eldorado Springs	0.7%
8.	Broomfield	0.7%
9.	Longmont	0.7%
10.	Chicago	0.6%

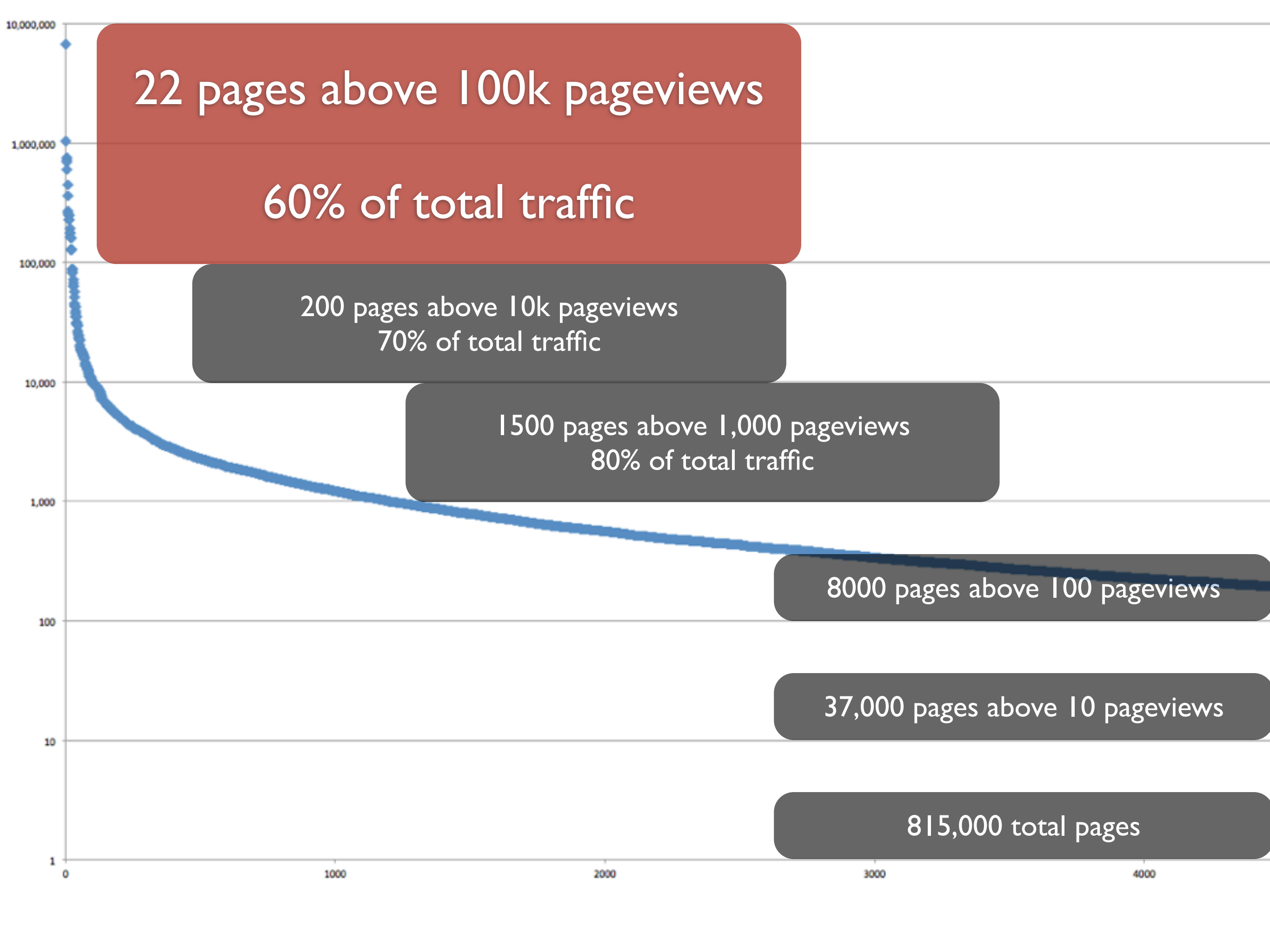
Top 10 Internal Searches

1.	culink
2.	calendar
3.	library
4.	cu link
5.	housing
6.	tuition
7.	academic calendar
8.	jobs
9.	bookstore
10.	mycuinfo

25 million pageviews
in 2012







22 pages above 100k pageviews

60% of total traffic

200 pages above 10k pageviews
70% of total traffic

1500 pages above 1,000 pageviews
80% of total traffic

8000 pages above 100 pageviews

37,000 pages above 10 pageviews

815,000 total pages

Next Steps

- ✓ Phase I: Infrastructure (new & legacy) & website
- ▶ Phase II: Drupal CMS service
- ▶ Phase III: Web application hosting

Expected Outcomes

- Unified campus support & service structure
- Campus-wide CMS Services
 - Self-service website configuration
 - Professional services
- Centralized training & support
- Web application hosting







Questions?