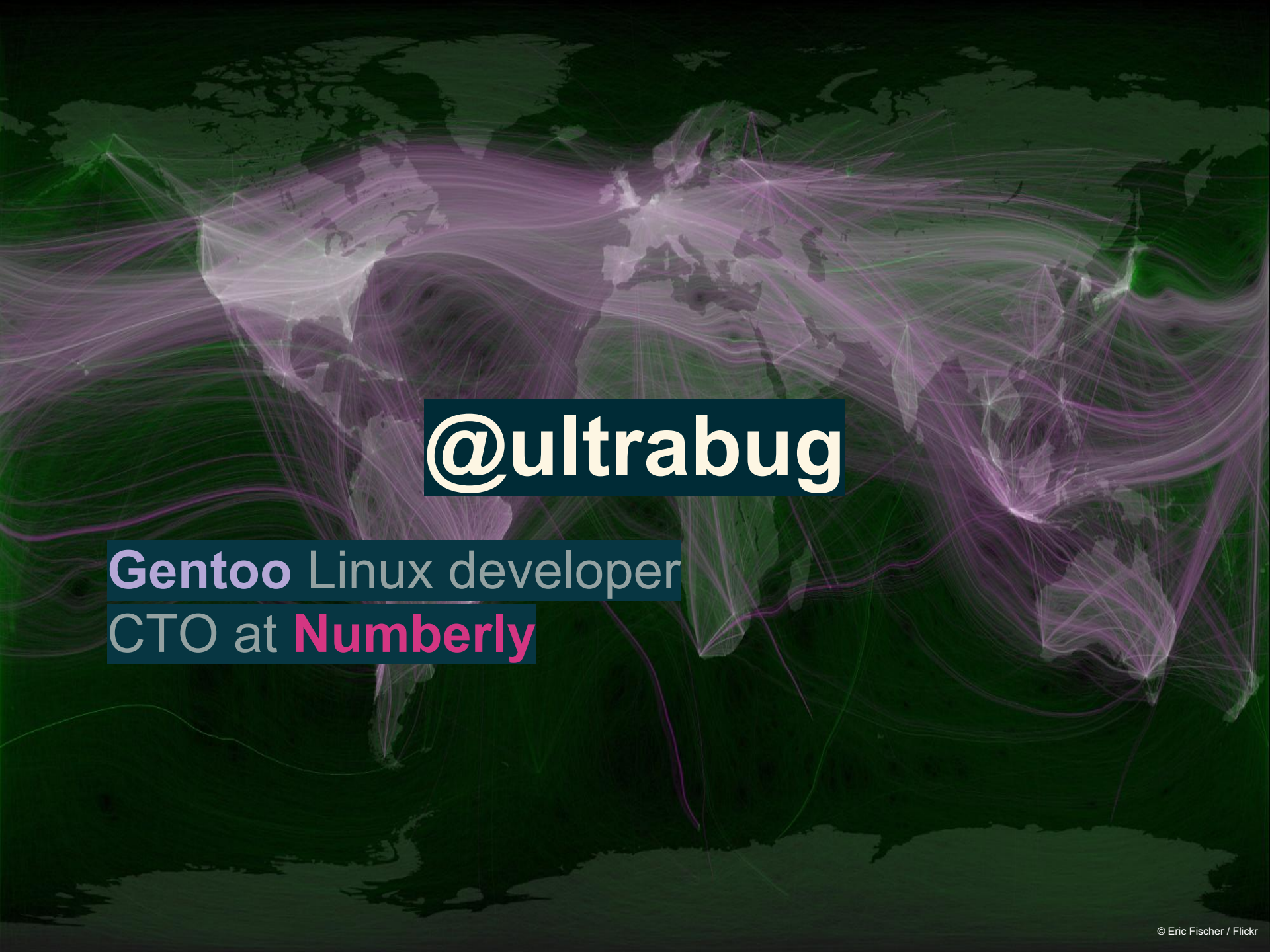
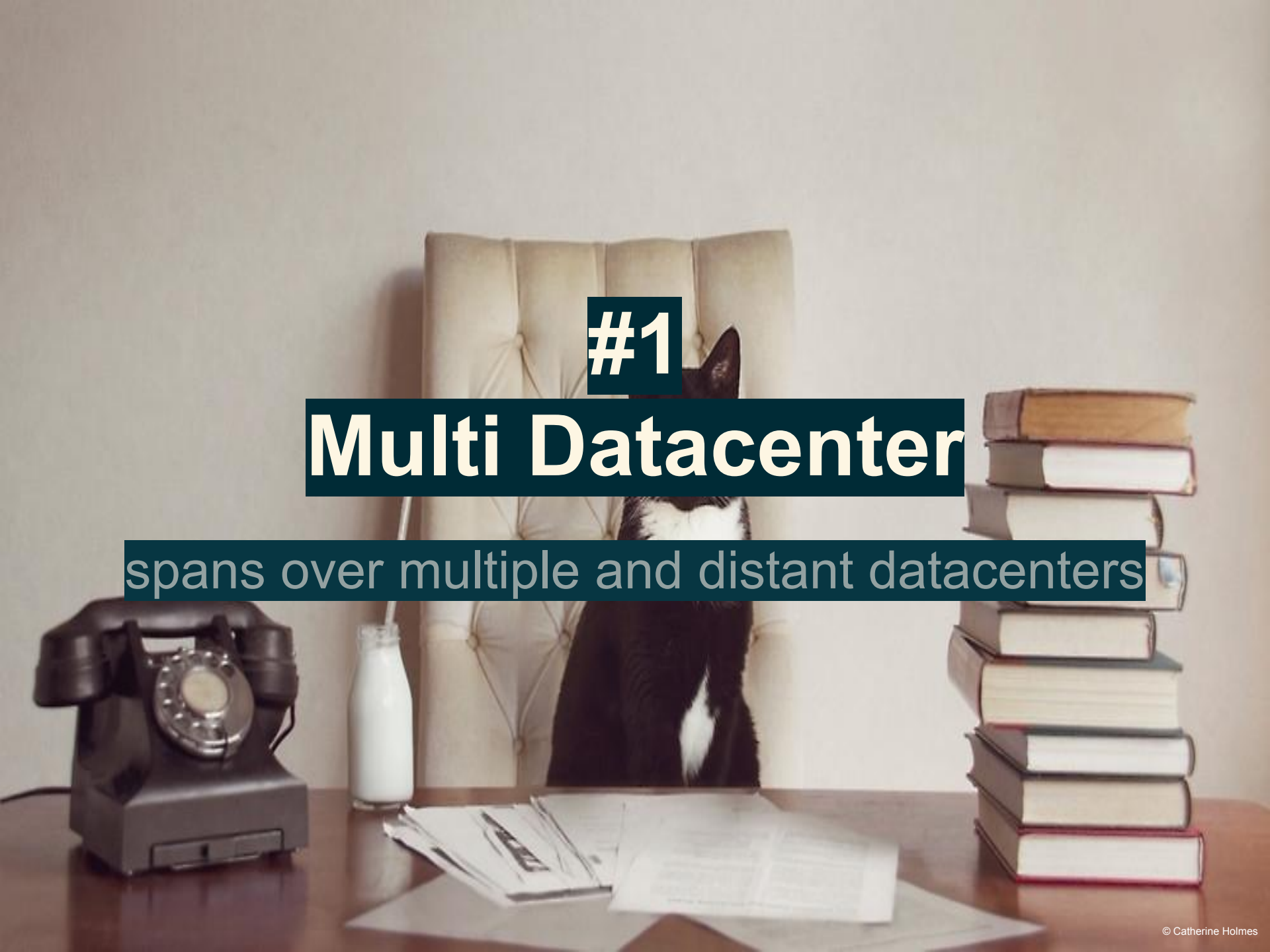



Designing a scalable and distributed application
EuroPython 2015
© Eric Fischer / Flickr

Geo distributed page hit counter web application

USA ⇄ EUROPE


#1
Multi Datacenter
spans over multiple and distant datacenters
© Catherine Holmes

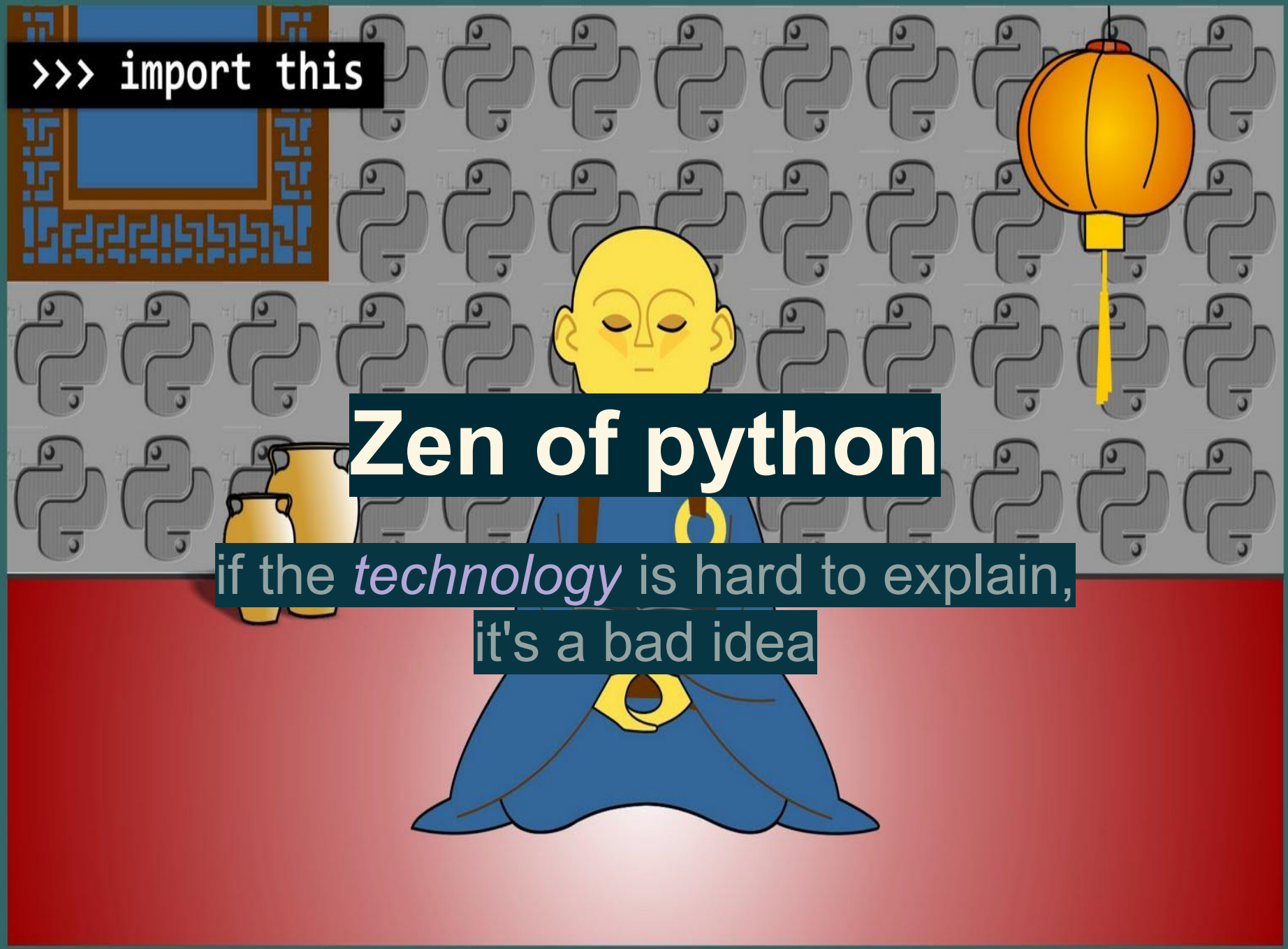

#2
A unique page hit count
sum of the page hits from all the datacenters
© Catherine Holmes

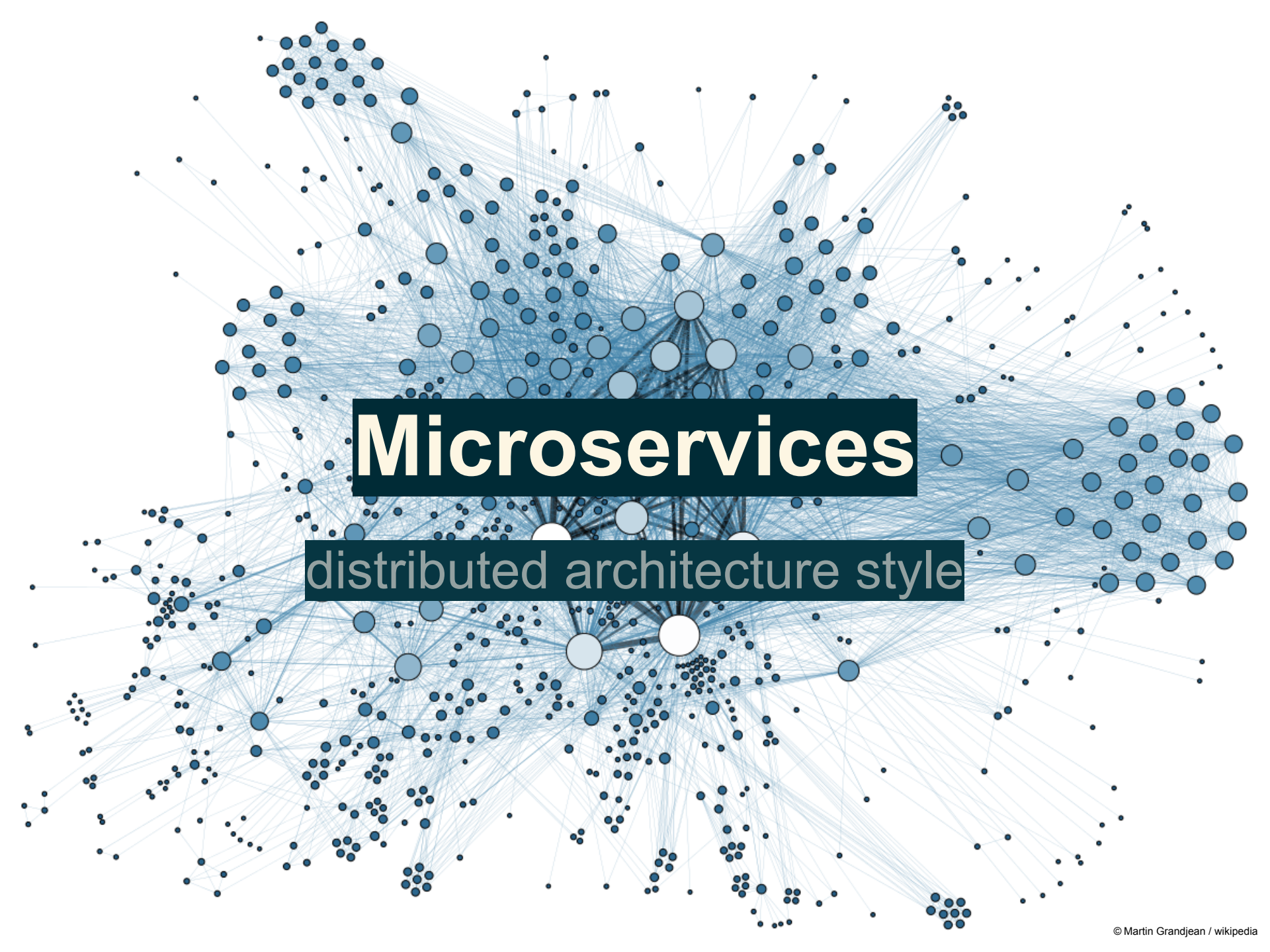

#3
Automatic resizing
no manual application (re)configuration
© Catherine Holmes

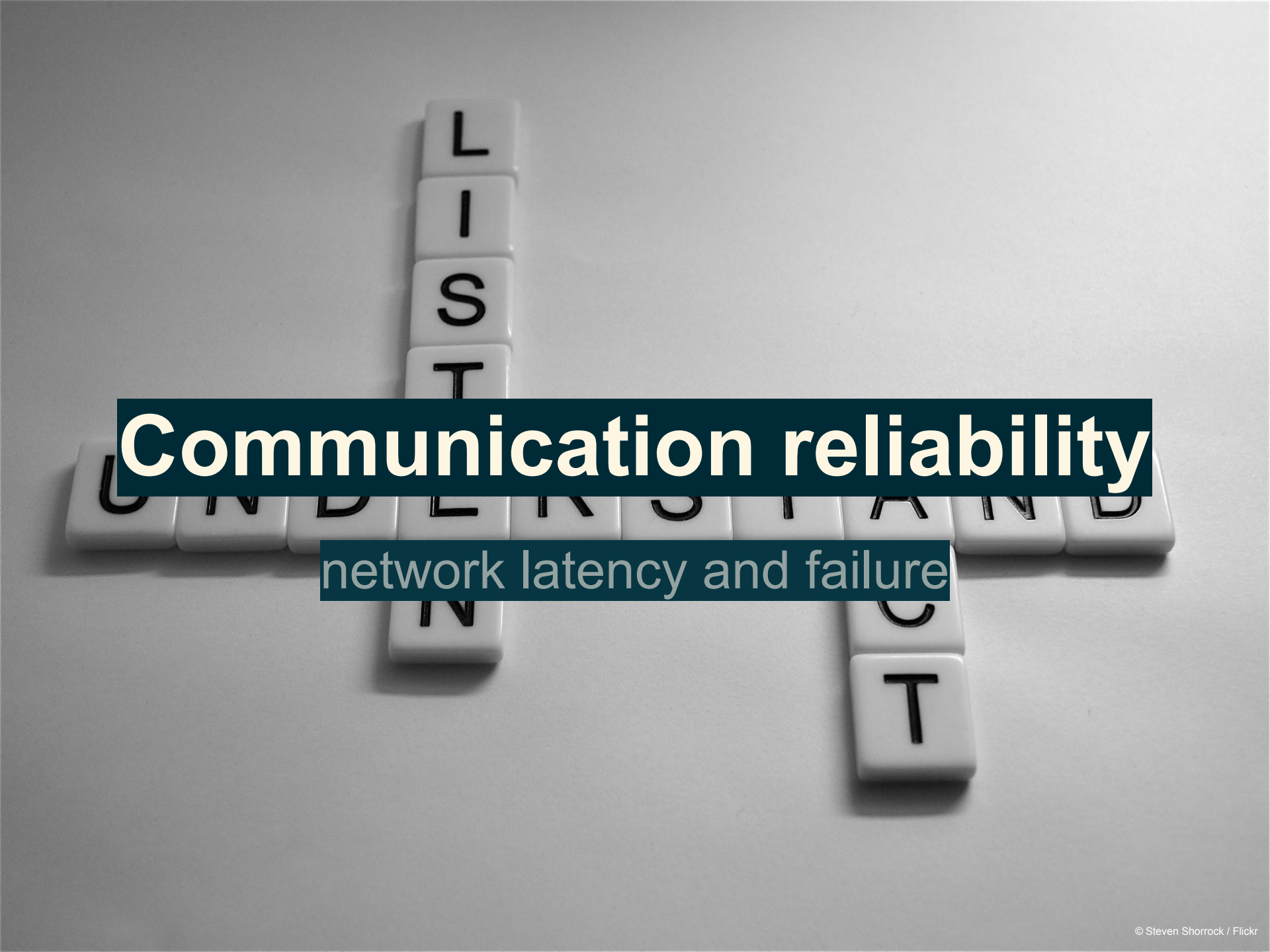

#4
Distributed configuration
immediately available to all web services
© Catherine Holmes


Hell...
...that’s some kind of contract !
© C. K. Koay / Flickr


Rely on your stack
be lazy !
© Tripp / Flickr

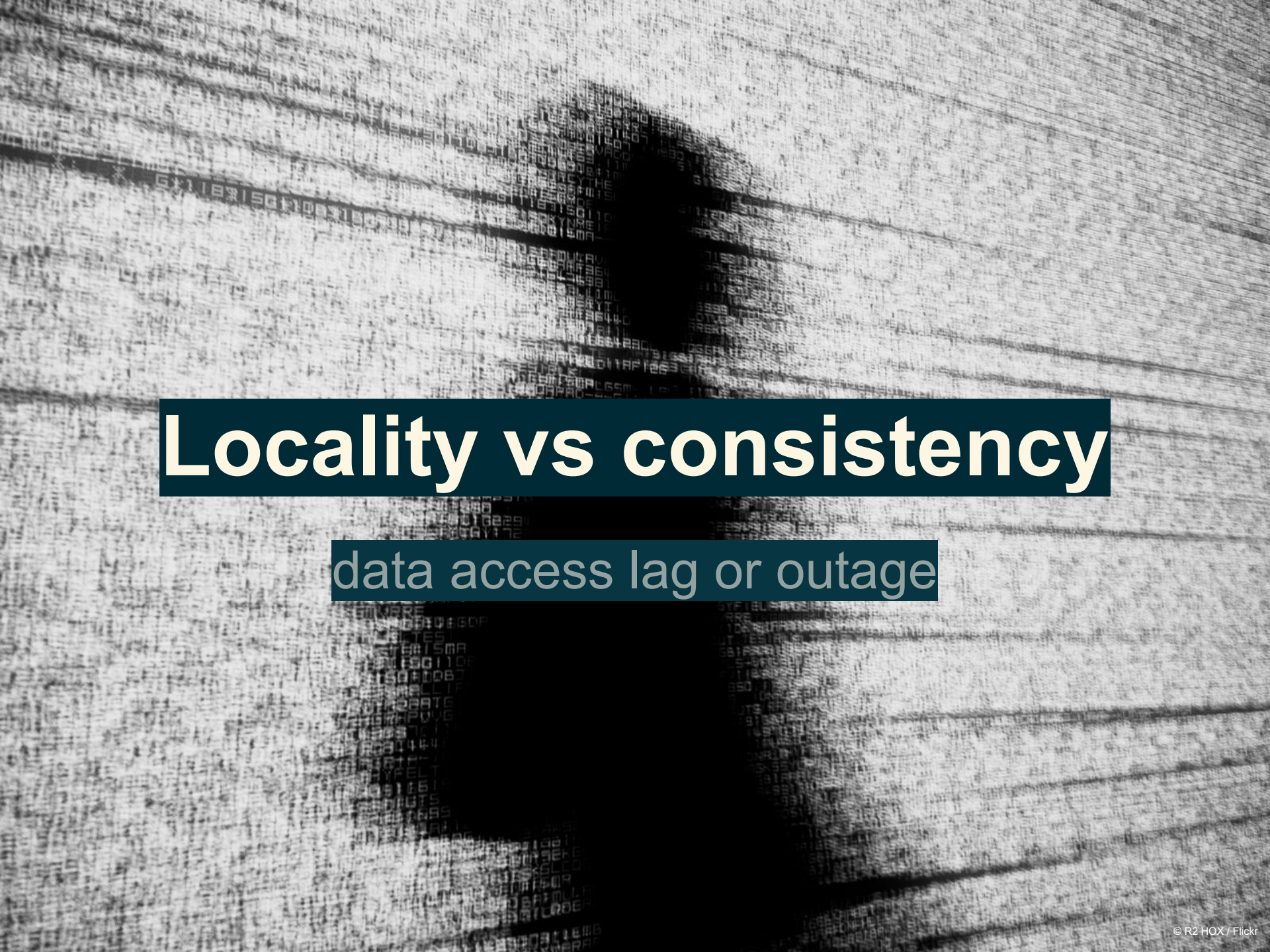

>>> import this
Zen of python
if the technology is hard to explain,
it's a bad idea
© HumanOS

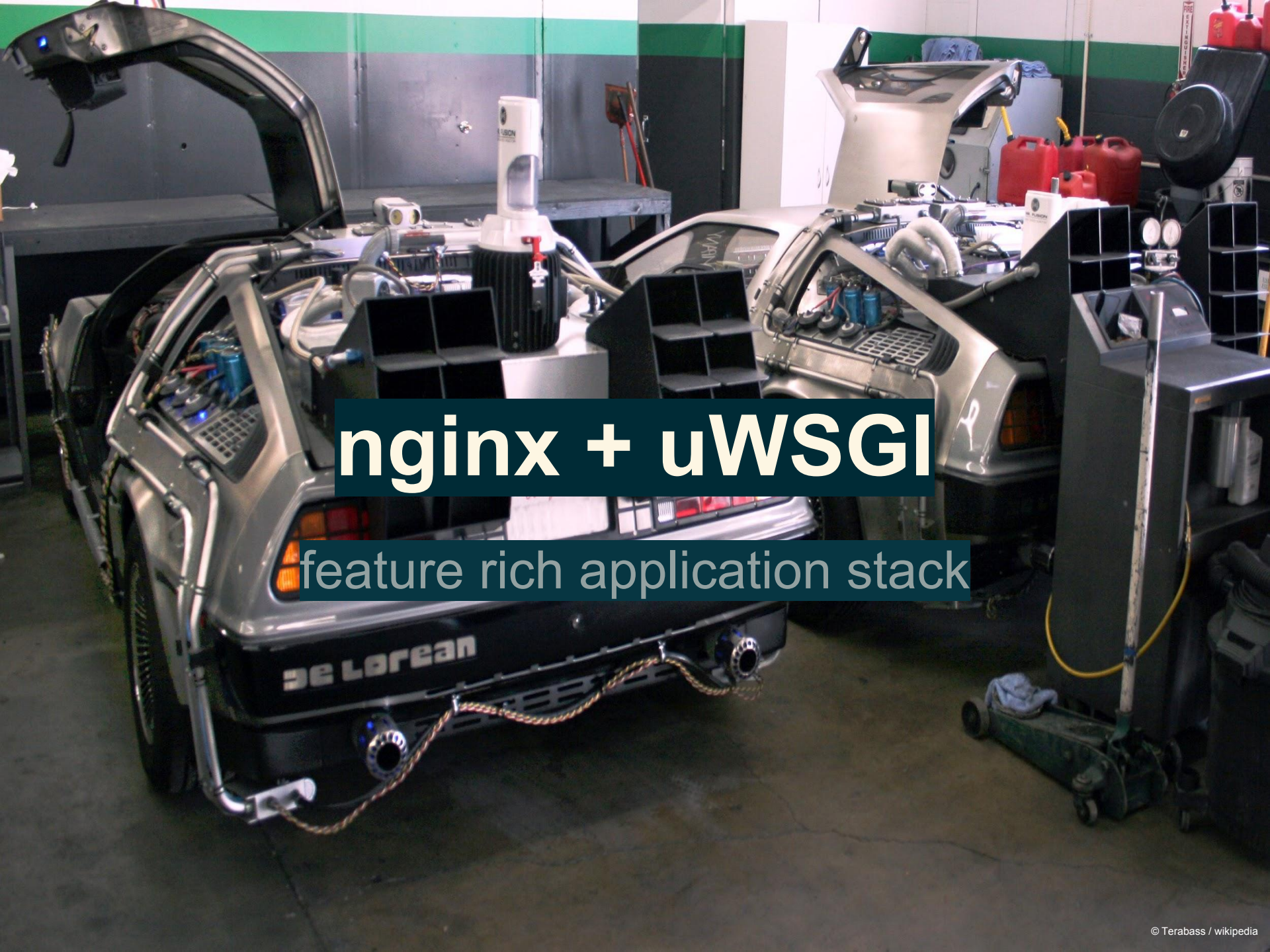




Communication reliability

network latency and failure




nginx + uWSGI
feature rich application stack
DE LOREAN
© Terabass / wikipedia

ep2015_collector.ini

```
[uwsgi]
enable-threads = true
lazy-apps = true
master = true
plugins = python27,gevent27
socket = /run/uwsgi/%n.socket
uid = nginx

# process
processes = 2
gevent = 1000
gevent-monkey-patch = true

# reload
reload-mercy = 10
worker-reload-mercy = 1

# automatic reload
touch-reload = /var/www/ep2015_collector/http_worker.py

# logg
log-syslog = uwsgi.%n
disable-logging = true
log-slow = 500

# http worker
buffer-size = 32768
max-requests = 10000
listen = 5000
#
chdir = /var/www/ep2015_collector/
file = http_worker.py
callable = ep2015
subscribe-to = 127.0.0.1:3615:ep2015.ultrabug.org
```

collector

⇨ gets HTTP requests ⇨ produces jobs

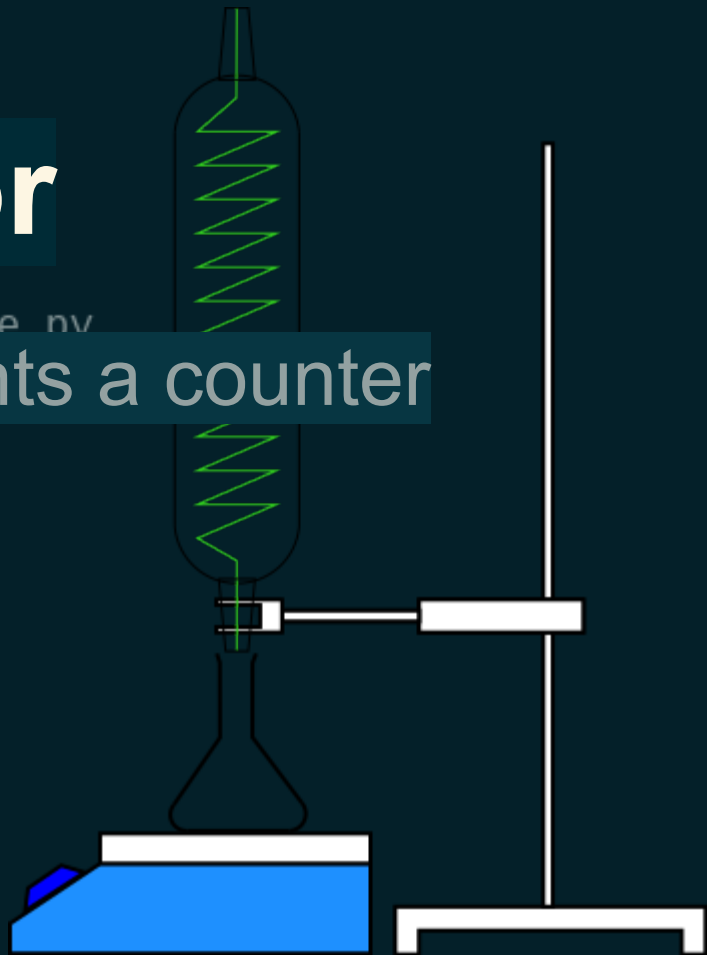
⇦ returns the total hit count

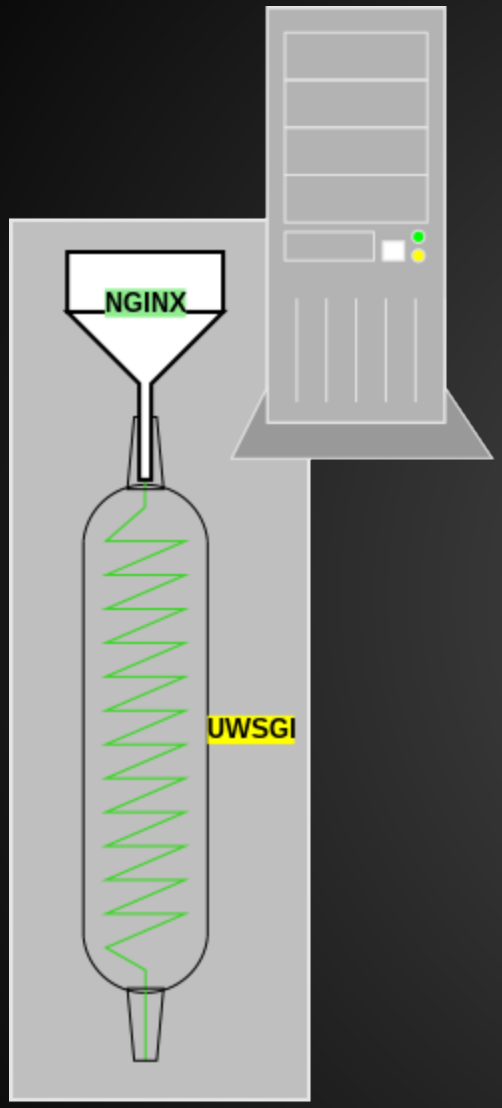
ep2015_processor.ini

```
[uwsgi]
enable-threads = true
master = true
plugins = python27
socket = /run/uwsgi/%n.socket

# process (one per default, duplicate for more)
mule = /usr/lib/ep2015_processor/mule.py

# reload
reload-mercy = 10
mule-reload-mercy = 1
py-call-osafterfork =

# automatic reload
touch-reload = /usr/lib/ep2015_processor/mule.py

# logging
log-syslog = uwsgi.%n
disable-logging = true
```

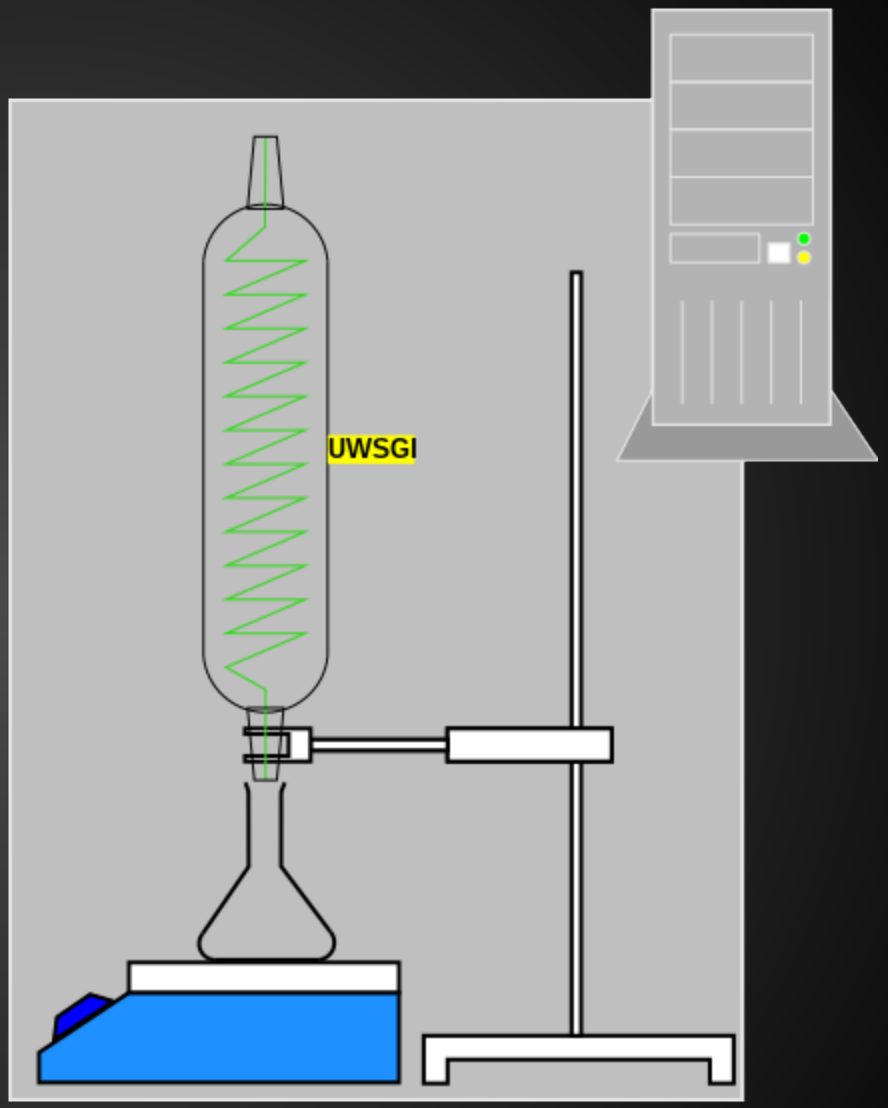
processor

consumes jobs ⇨ increments a counter





COLLECTOR

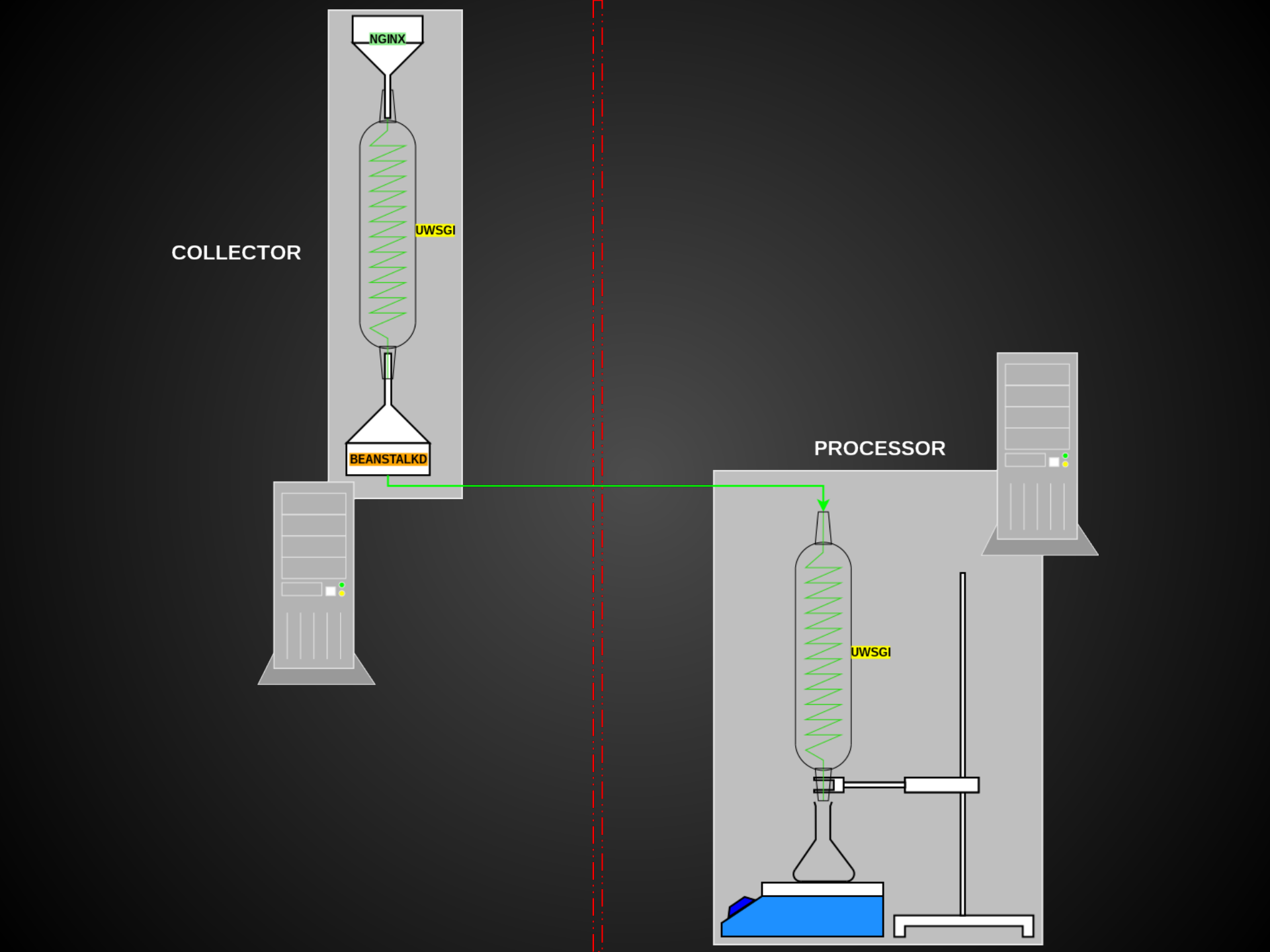


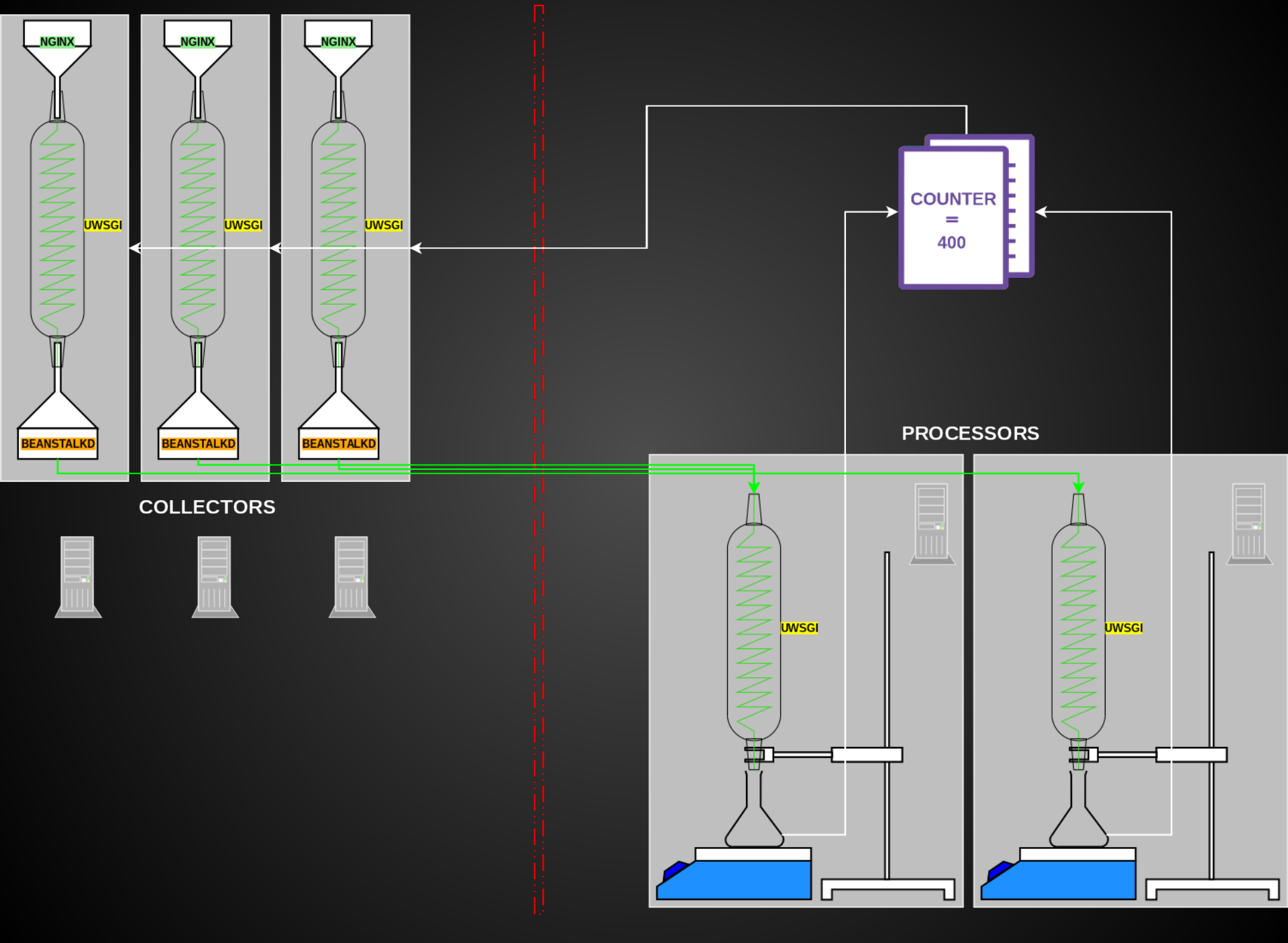
PROCESSOR

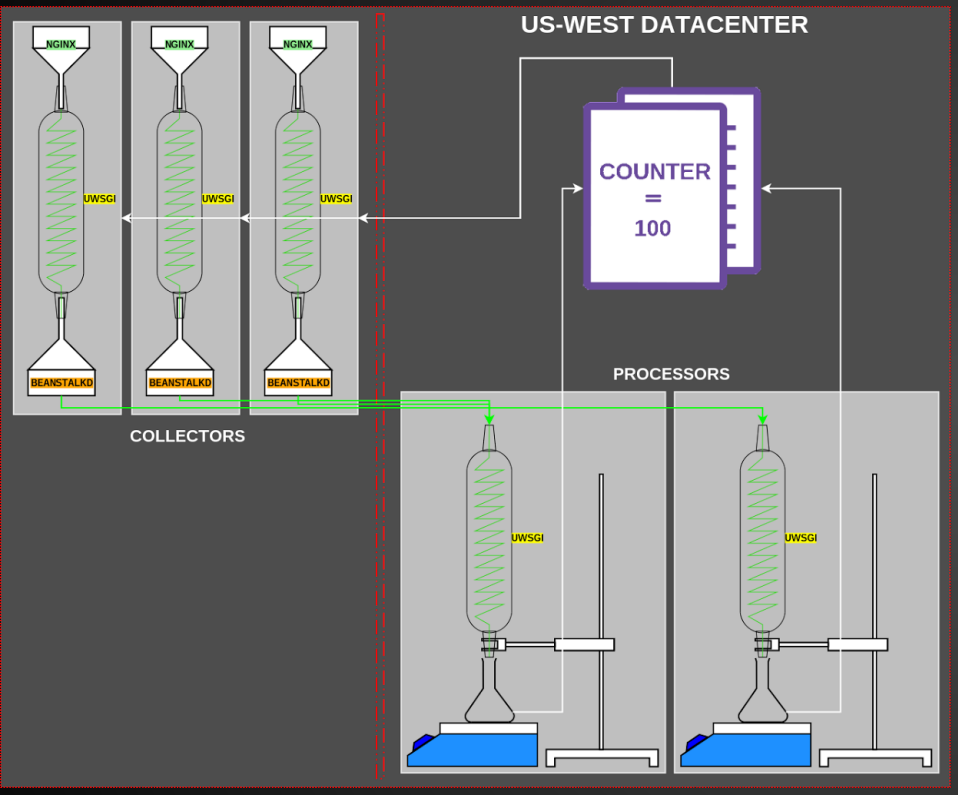

beanstalkd
simple and reliable job queue server
© Mooms

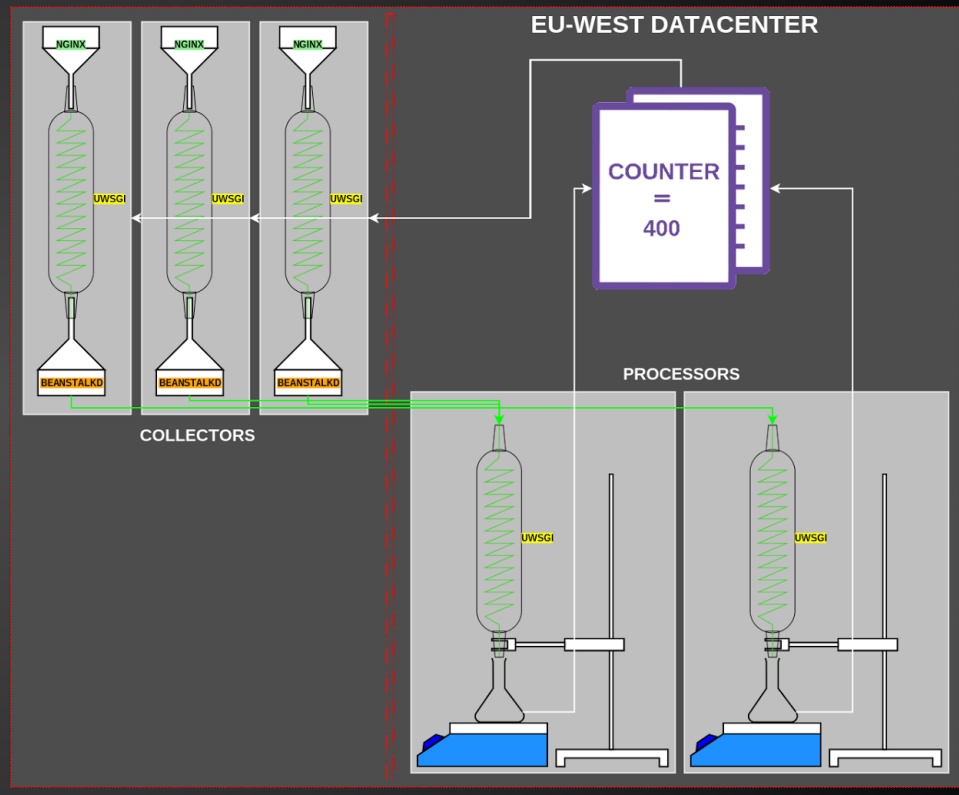
beanstalkd.ini

```
[uwsgi]
master = true
socket = /run/uwsgi/%n.socket

# daemon
attach-daemon2 = pidfile=/run/beanstalkd.pid,cmd=beanstalkd -b /var/lib/beanstalkd -p 11300 -l 0.0.0.0 -z 65536 -u beanstalk, daemonize=1

```

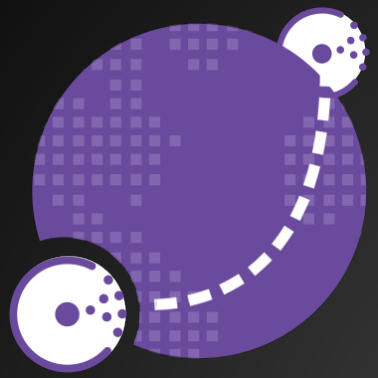

COLLECTOR
NGINX
UWSGI
BEANSTALKD
PROCESSOR
UWSGI

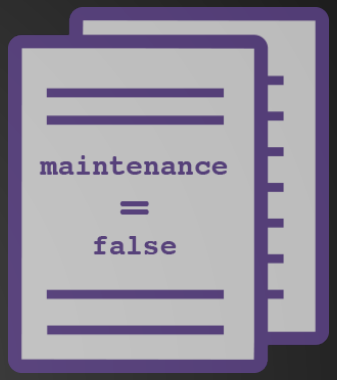

NGINX
NGINX
NGINX
UWSGI
UWSGI
UWSGI
BEANSTALKD
BEANSTALKD
BEANSTALKD
COUNTER
=
400
COLLECTORS
PROCESSORS
UWSGI
UWSGI


US-WEST DATACENTER
NGINX
NGINX
NGINX
UWSGI
UWSGI
UWSGI
BEANSTALKD
BEANSTALKD
BEANSTALKD
COLLECTORS
COUNTER
=
100
PROCESSORS
UWSGI
UWSGI


EU-WEST DATACENTER
NGINX
NGINX
NGINX
UWSGI
UWSGI
UWSGI
BEANSTALKD
BEANSTALKD
BEANSTALKD
COLLECTORS
COUNTER
=
400
PROCESSORS
UWSGI
UWSGI

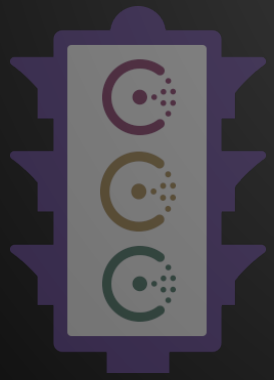

Service discovery
automated scaling and fault tolerance
© Cambridge University / wikipedia

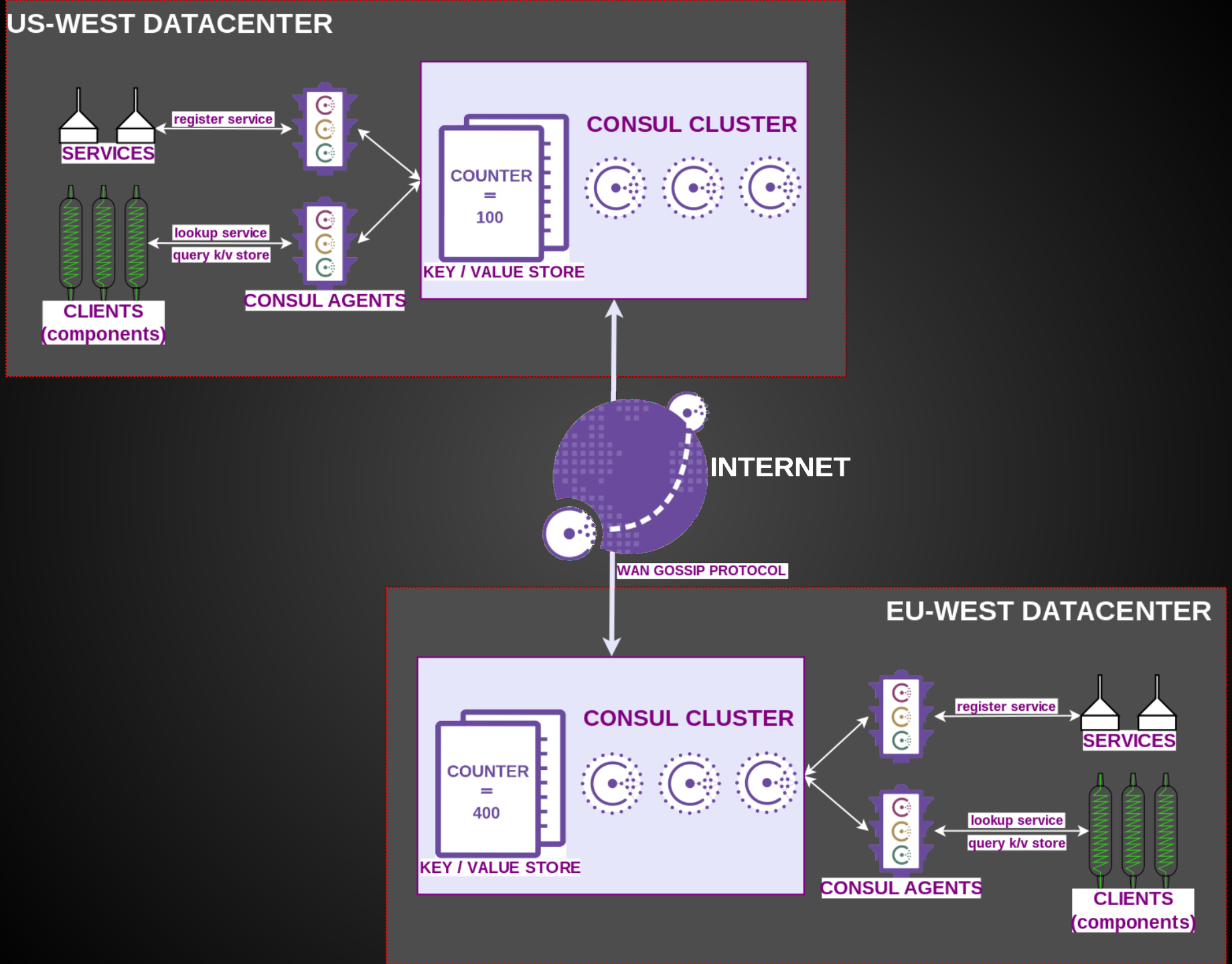


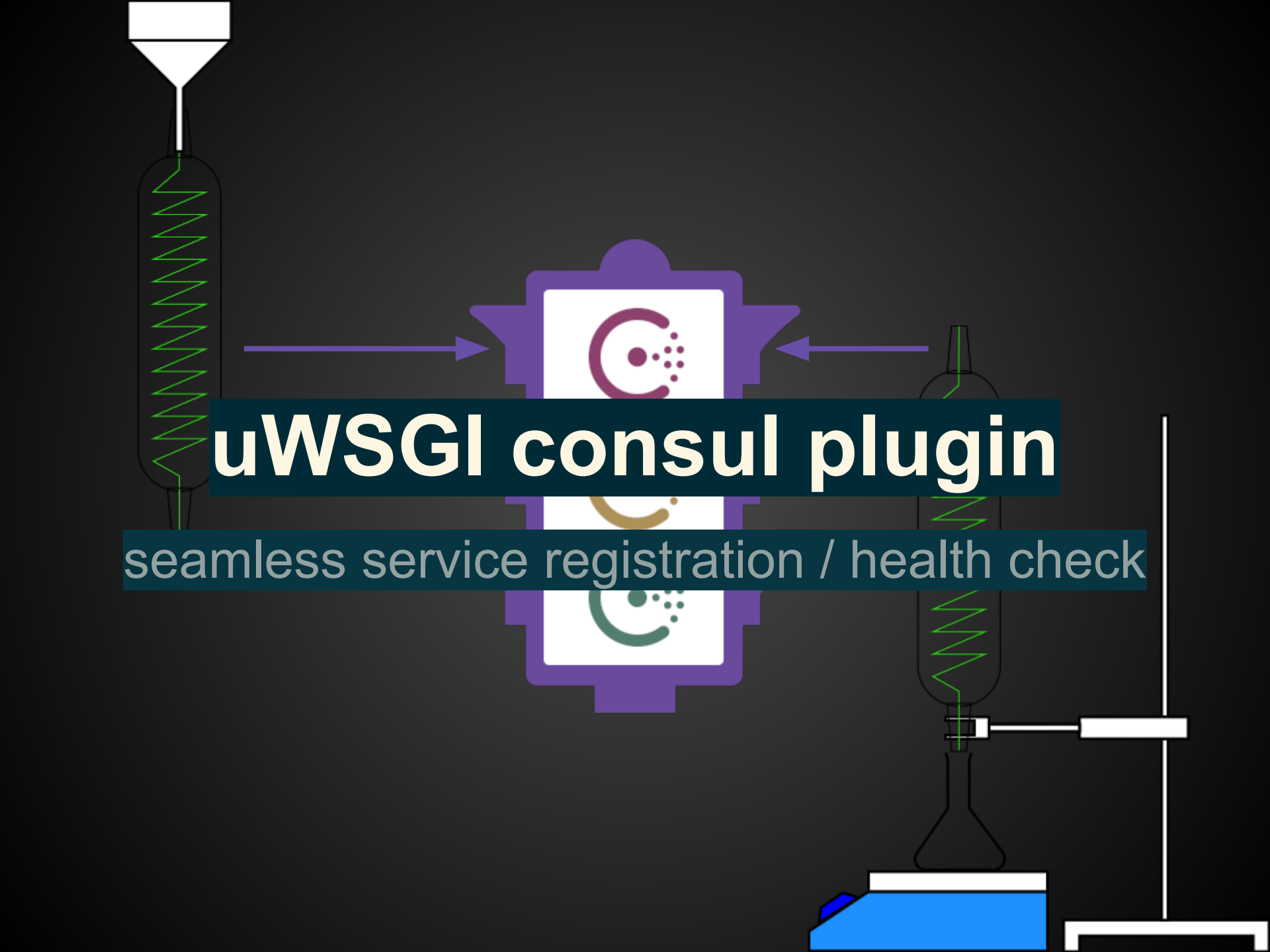


Consul

multi datacenter + key / value storage

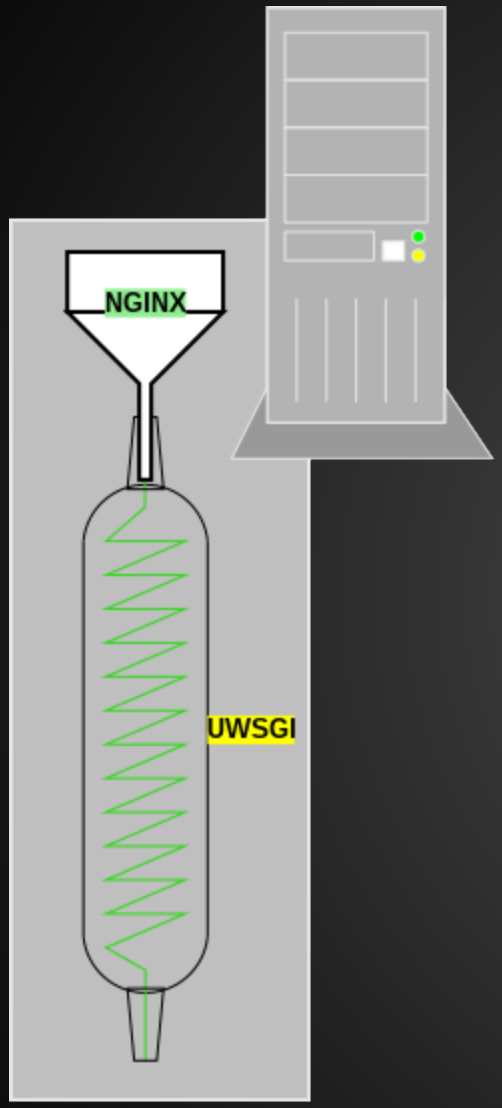



US-WEST DATACENTER
SERVICES
register service
CONSUL CLUSTER
COUNTER
=
100
KEY / VALUE STORE
lookup service
query k/v store
CONSUL AGENTS
CLIENTS
(components)
INTERNET
WAN GOSSIP PROTOCOL
EU-WEST DATACENTER
CONSUL CLUSTER
COUNTER
=
400
KEY / VALUE STORE
register service
SERVICES
lookup service
query k/v store
CONSUL AGENTS
CLIENTS
(components)

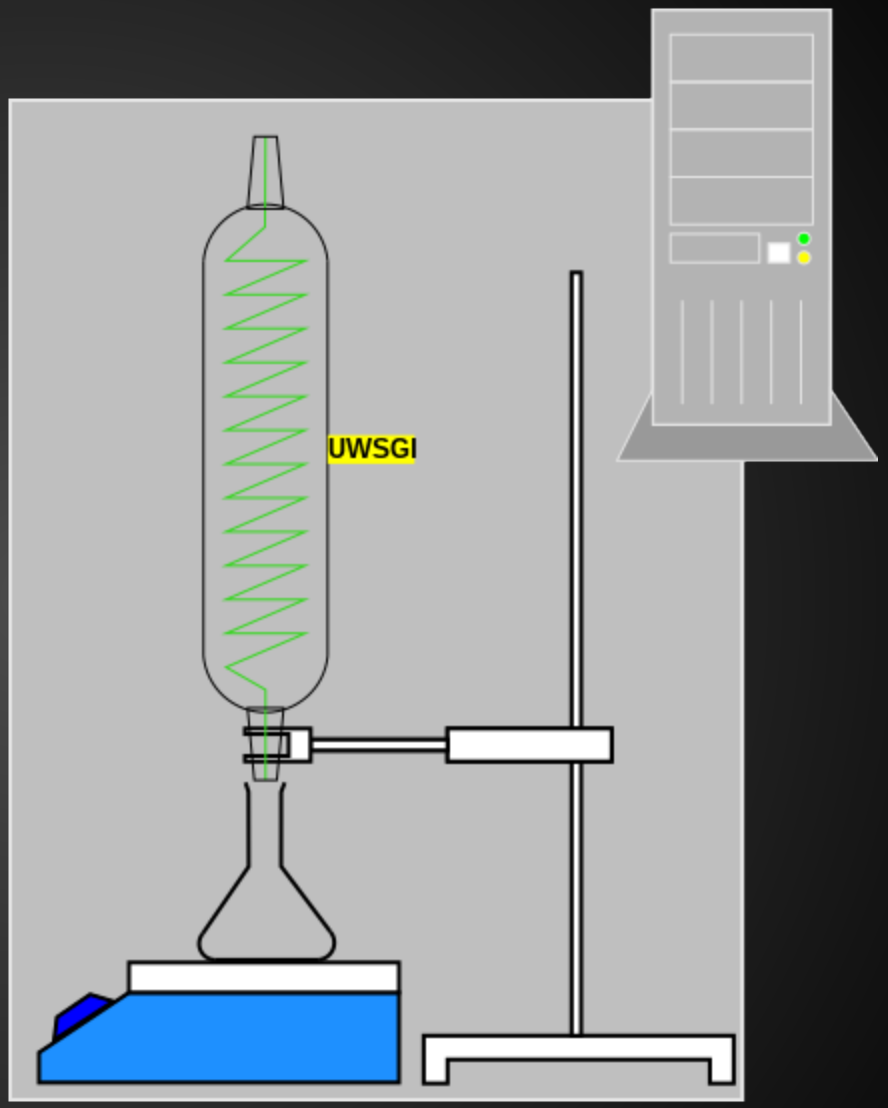

uWSGI consul plugin
seamless service registration / health check

```
consul-register = url=http://localhost:8500,name=my_service
```

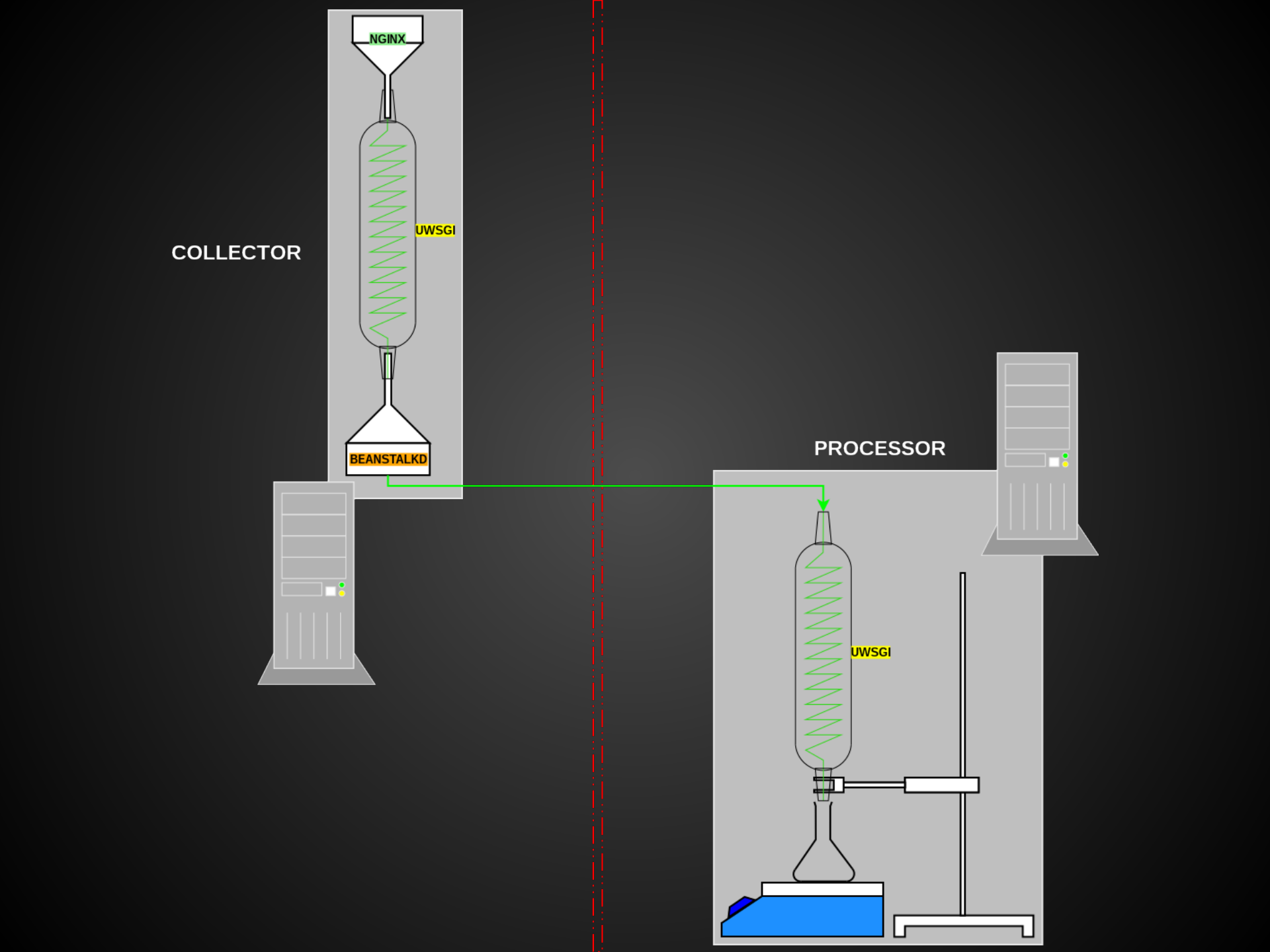

Let’s build this up
to victory
© Brian Rincker / Flickr

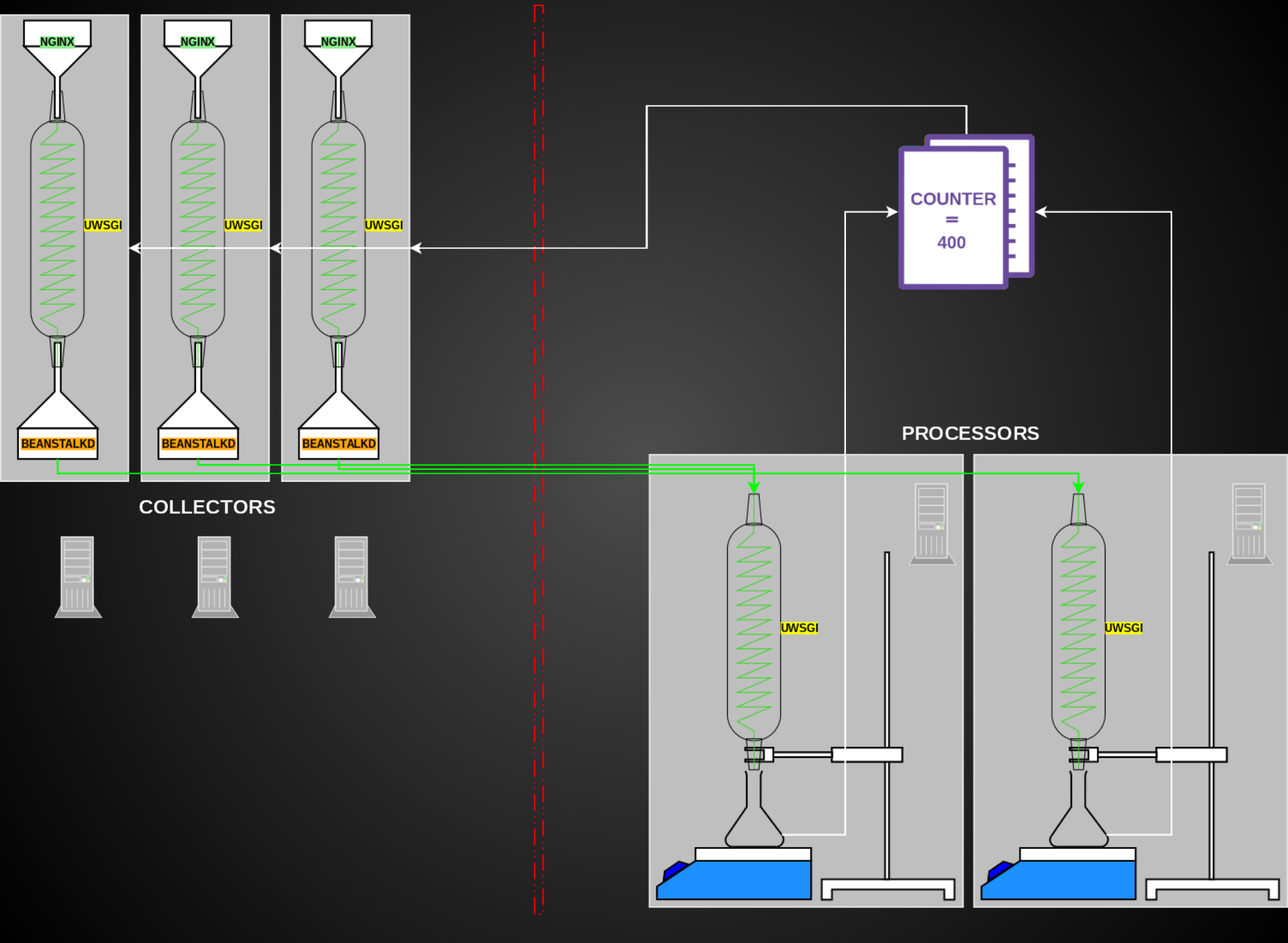


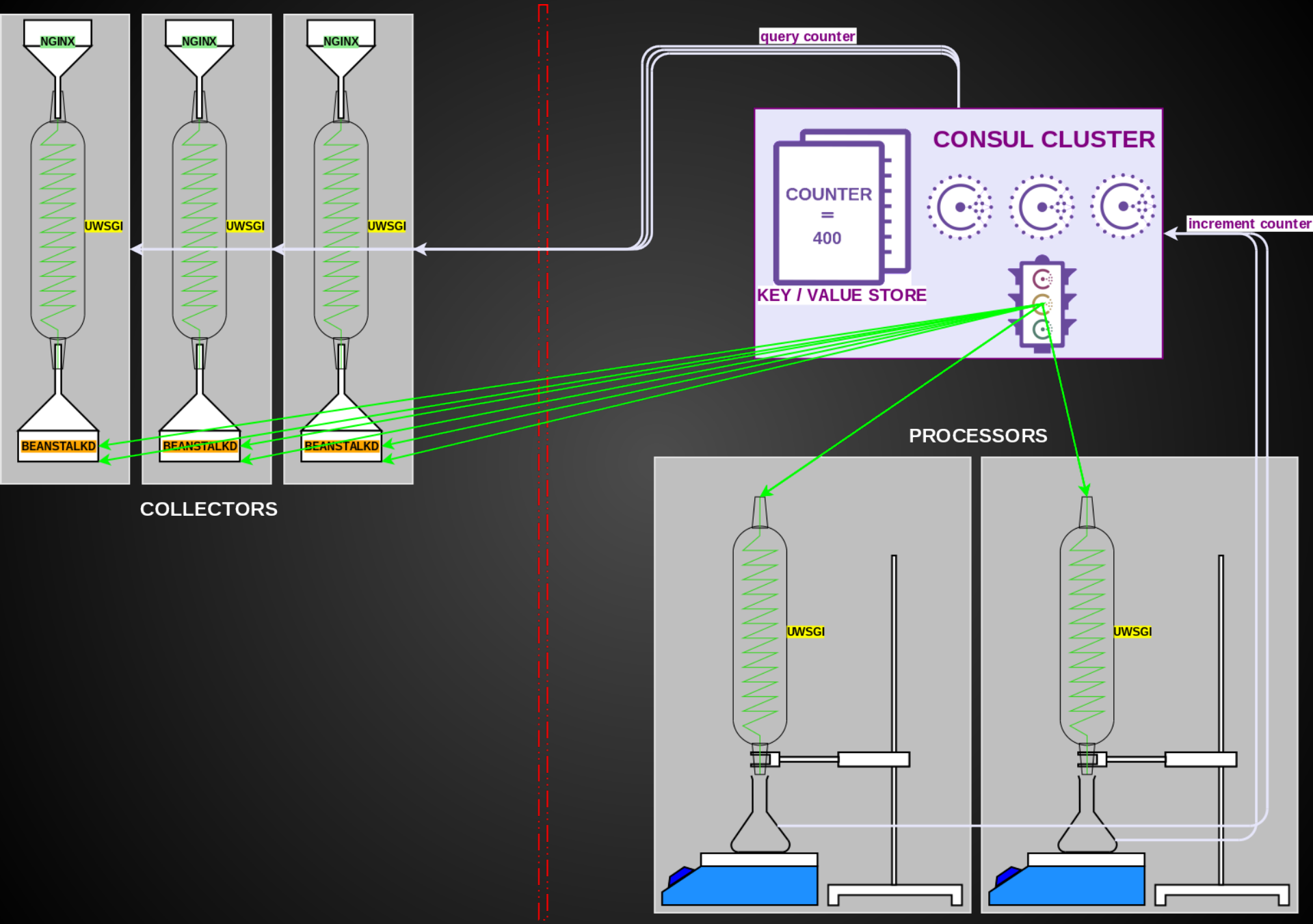
COLLECTOR

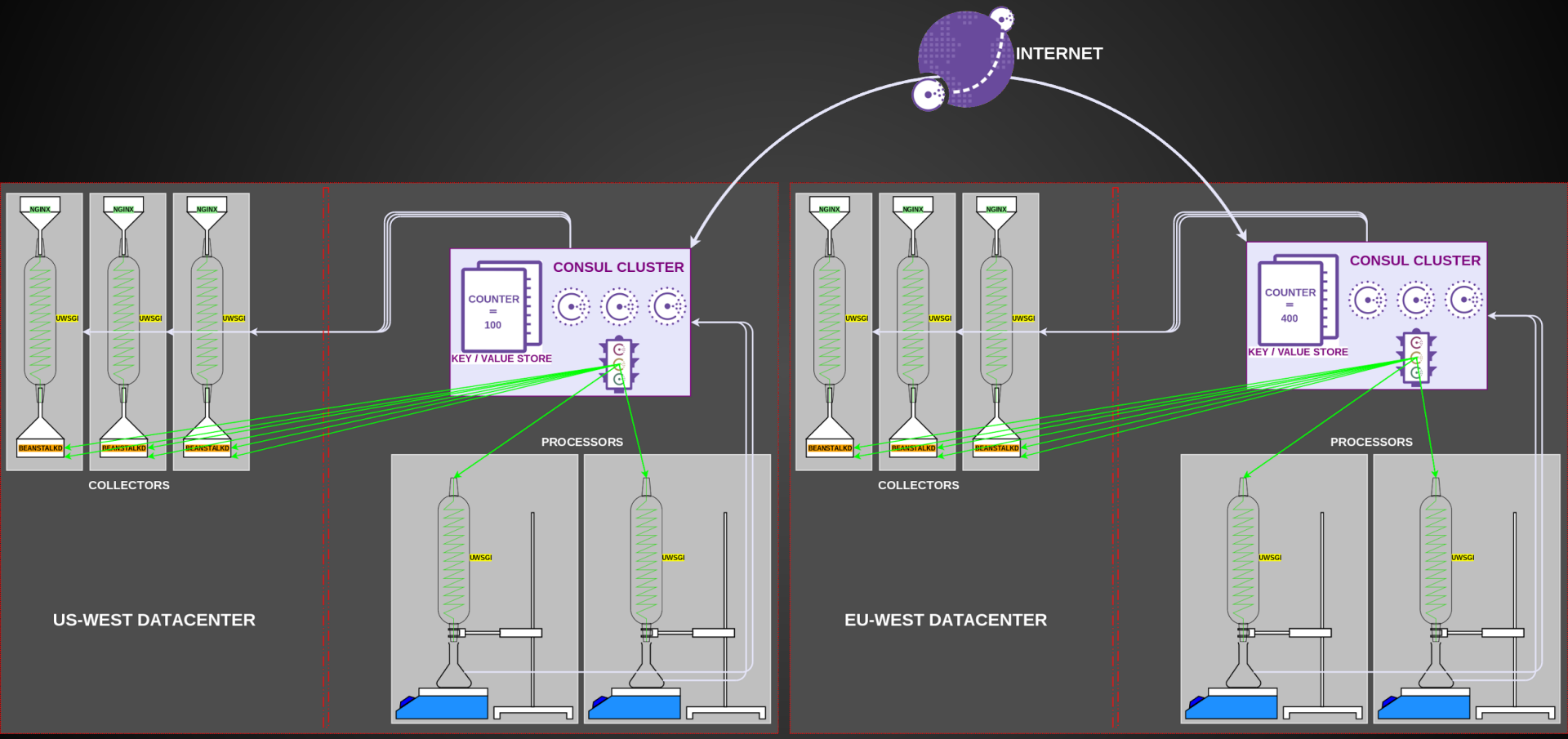


PROCESSOR


COLLECTOR
NGINX
UWSGI
BEANSTALKD
PROCESSOR
UWSGI


NGINX
NGINX
NGINX
UWSGI
UWSGI
UWSGI
BEANSTALKD
BEANSTALKD
BEANSTALKD
COUNTER
=
400
COLLECTORS
PROCESSORS
UWSGI
UWSGI


NGINX
NGINX
NGINX
UWSGI
UWSGI
UWSGI
BEANSTALKD
BEANSTALKD
BEANSTALKD
COLLECTORS
query counter
CONSUL CLUSTER
COUNTER
=
400
KEY / VALUE STORE
increment counter
PROCESSORS
UWSGI
UWSGI


INTERNET
NGINX
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UWSGI
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COLLECTORS
CONSUL CLUSTER
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KEY / VALUE STORE
PROCESSORS
UWSGI
UWSGI
US-WEST DATACENTER
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BEANSTALKD
BEANSTALKD
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CONSUL CLUSTER
COUNTER
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400
KEY / VALUE STORE
PROCESSORS
UWSGI
UWSGI
EU-WEST DATACENTER


Live demo !
(hopefully)
© shoutmeloud / Pinterest


Thanks
source code : github.com/ultrabug/ep2015
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