Solid Python Application Deployments For Everybody

Hynek Schlawack

River Bar, 2013

DevOps Borat
@DEVOPS_BORAT

Is all fun and game until you are need of put it in production.

Hi!

@hynek

http://hynek.me

http://github.com/hynek

http://www.variomedia.de


AHEAD

The One & Only Link

http://ox.cx/d


OPINIONS
AHEAD

PaaS

Schema Migrations

Key

Concept

easy

≠

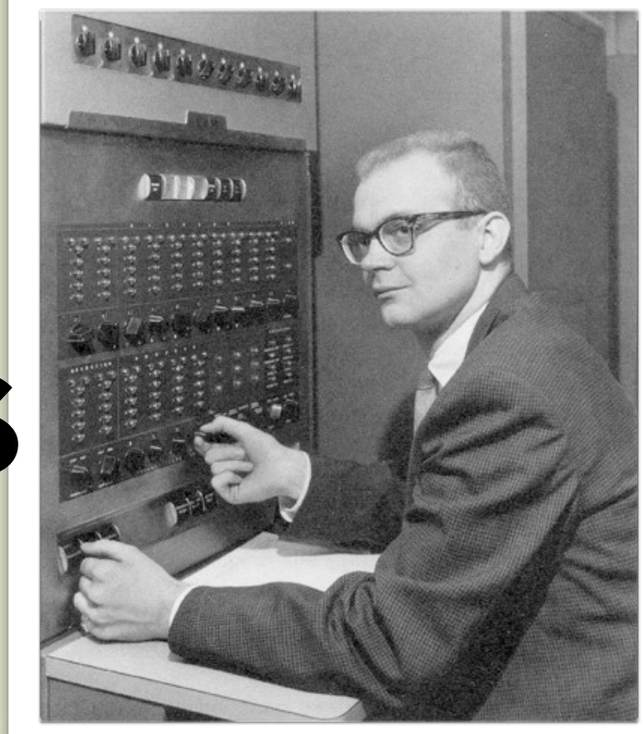
simple

“Simplicity is prerequisite for reliability.”

– Edsger W. Dijkstra

“It is important to find simple solutions instead of stopping as soon as a first solution is found.”

– Donald Knuth



Put effort into making your deployments simple.

Development

Development


NO!


heroku

“Python 2.4 is not supported. It came out 8 years ago. That's older than Youtube. Upgrade.”

– Kenneth Reitz

Stable Platform

Key Infrastructure!

Stable Platform

Application is tied to server OS version.

Upgrading servers == updating your app.

Some servers upgraded?

But Hyyyneeek...

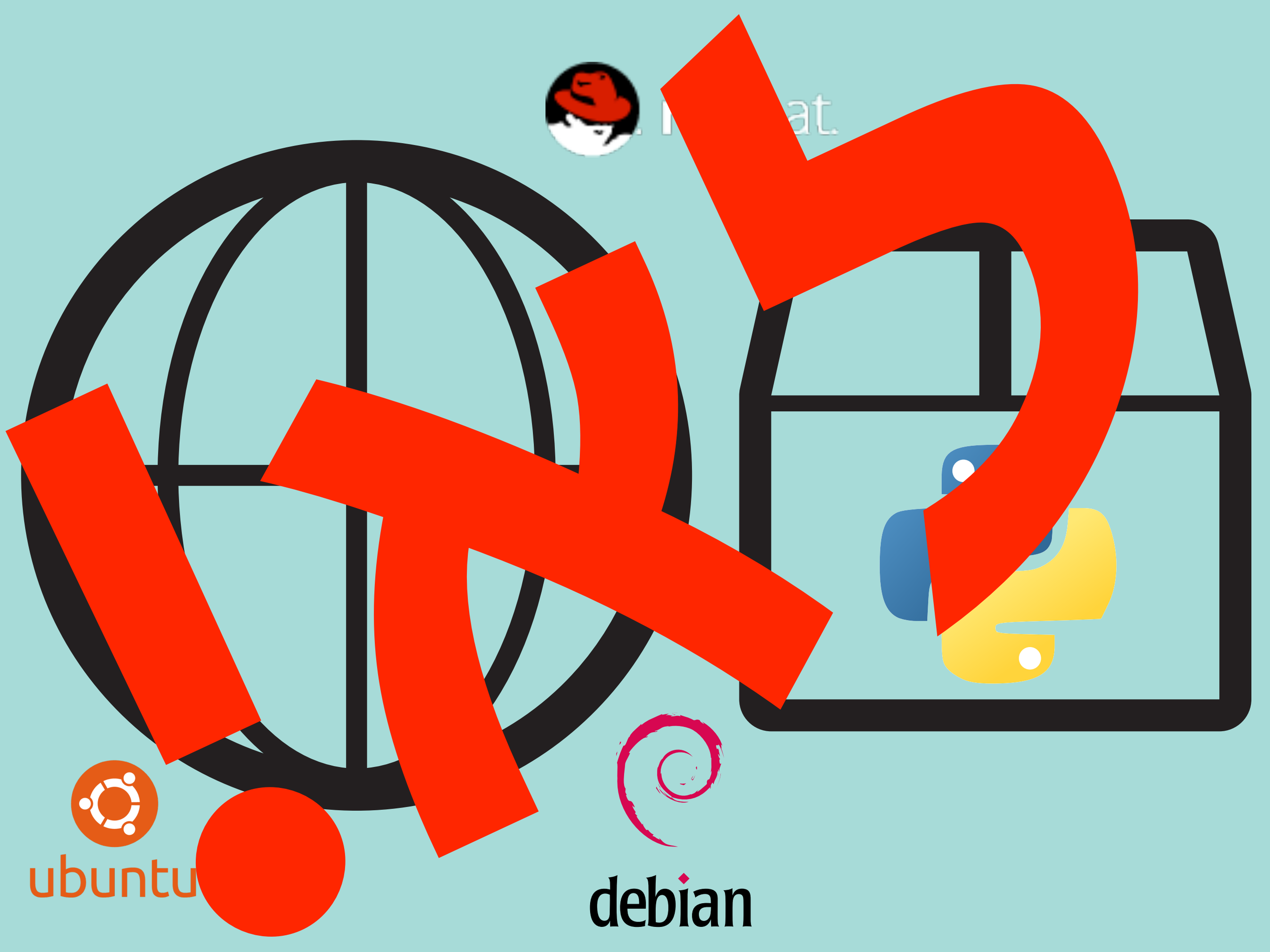
My boss won't let me!

Development tests!

redhat.

ubuntu

debian


at.
ubuntu
debian

System Packages

spotty

outdated

loss of control

System Packages

spotty

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loss of control

System Packages

spotty

outdated

loss of control

Use virtualenv

```
$ virtualenv venv; . venv/bin/activate
$ pip install pyramid requests pytest
$ py.test

…

$ pip freeze >requirements.txt

…

$ pip install -r requirements.txt
```

Pin Deps Hard

“Django == 1.4.3”

Don’t rely on SemVer!

update w/ pip-tools

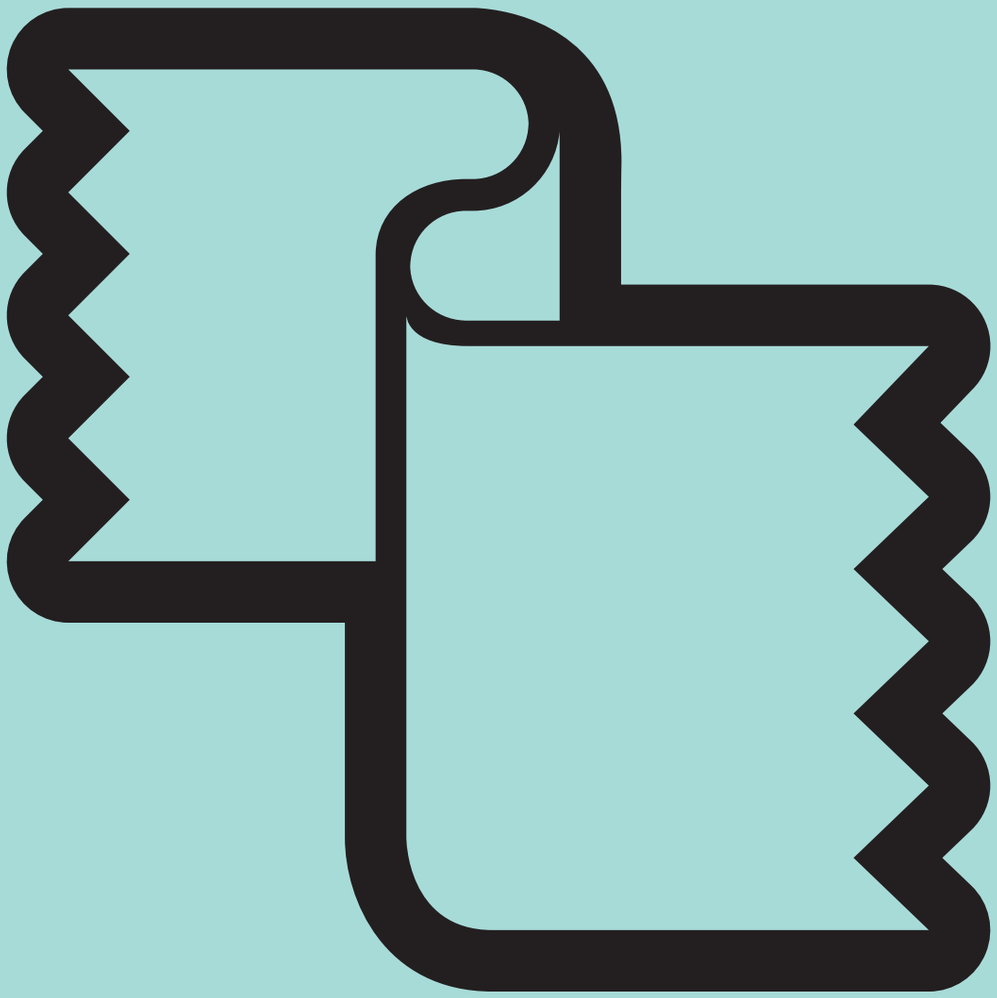
But Hyyyneeek...

SECURITY!

Security!?

It’s your Job.

Ship It



+ git


Exit
Negative

Fabric

What's Wrong!?

build tools

repetitive downloads

.rpm

.deb

.pkg.tgz

Native Packages !?

introspection
CM integration
versatile

1. check out from VCS
2. create virtualenv
3. install dependencies
4. do whatever you want
5. package result
6. push to your repo

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Abuse the Pipeline

run tests

LESS/SASS/CoffeeScript

compression

cache busting

But Hyyyneeek...

Packaging is hard!

Nope.

fpm

```
fpm \
    -s dir \
    -t deb \
    <appdir>
```

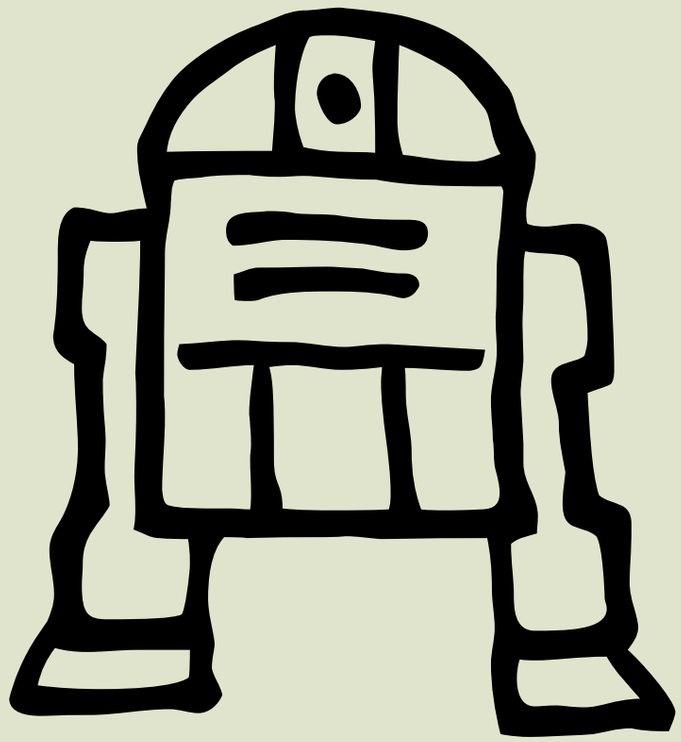
But Hyyyneeek...

repo server

Repo Server

dpkg -i
tar.bz2

Automate!



```
app_name: whois
project: DOM
build_deps:
    - libpq-dev
run_deps:
    - libpq5
    - authbind
```

There's more than one way to do it...

Configuration Management

declarative
describe the goal
CM choses the path

Solutions

Solutions

puppet labs

BCFG2

Chef

Not easy at all.

SALT STACK

CFEngine

ANSIBLEWORKS

Why anyway?

safety/security

reproducible

“later”

Why anyway?

safety/security

reproducible

“later”

Why anyway?

safety/security

reproducible

“later”

Test It in Staging

root


Crew!

Just don't.

Privileged Port

drop privileges
authbind

But Hyyyneeek...

Need dat POWER!

Single Purpose Workers

celery

rq

zerorpc

perspective broker/AMP

Be Paranoid

/bin/false

iptables

REVOKE ALL

file sockets

fail2ban

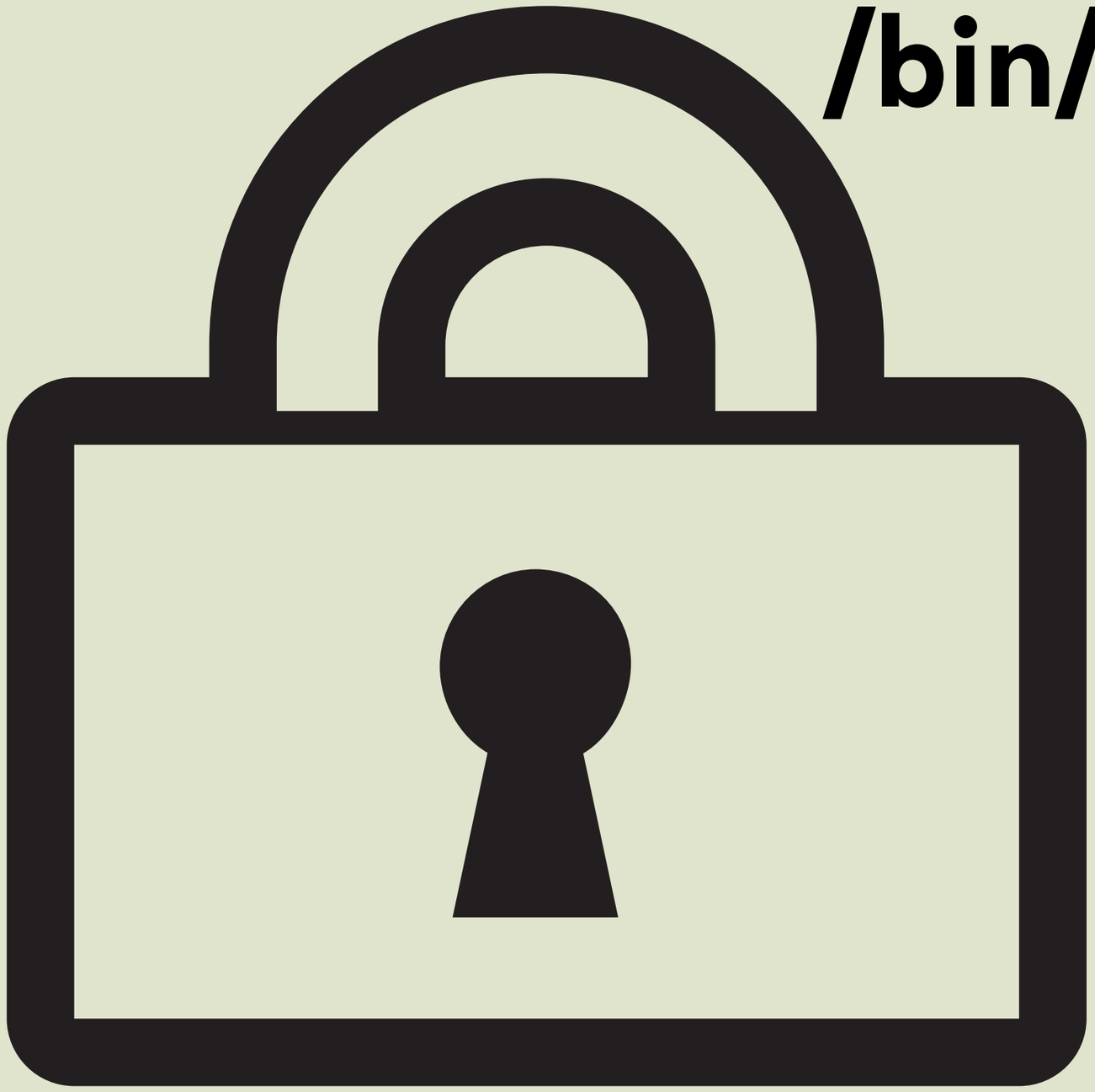
SSL

Be Paranoid

iptables

file sockets

SSL



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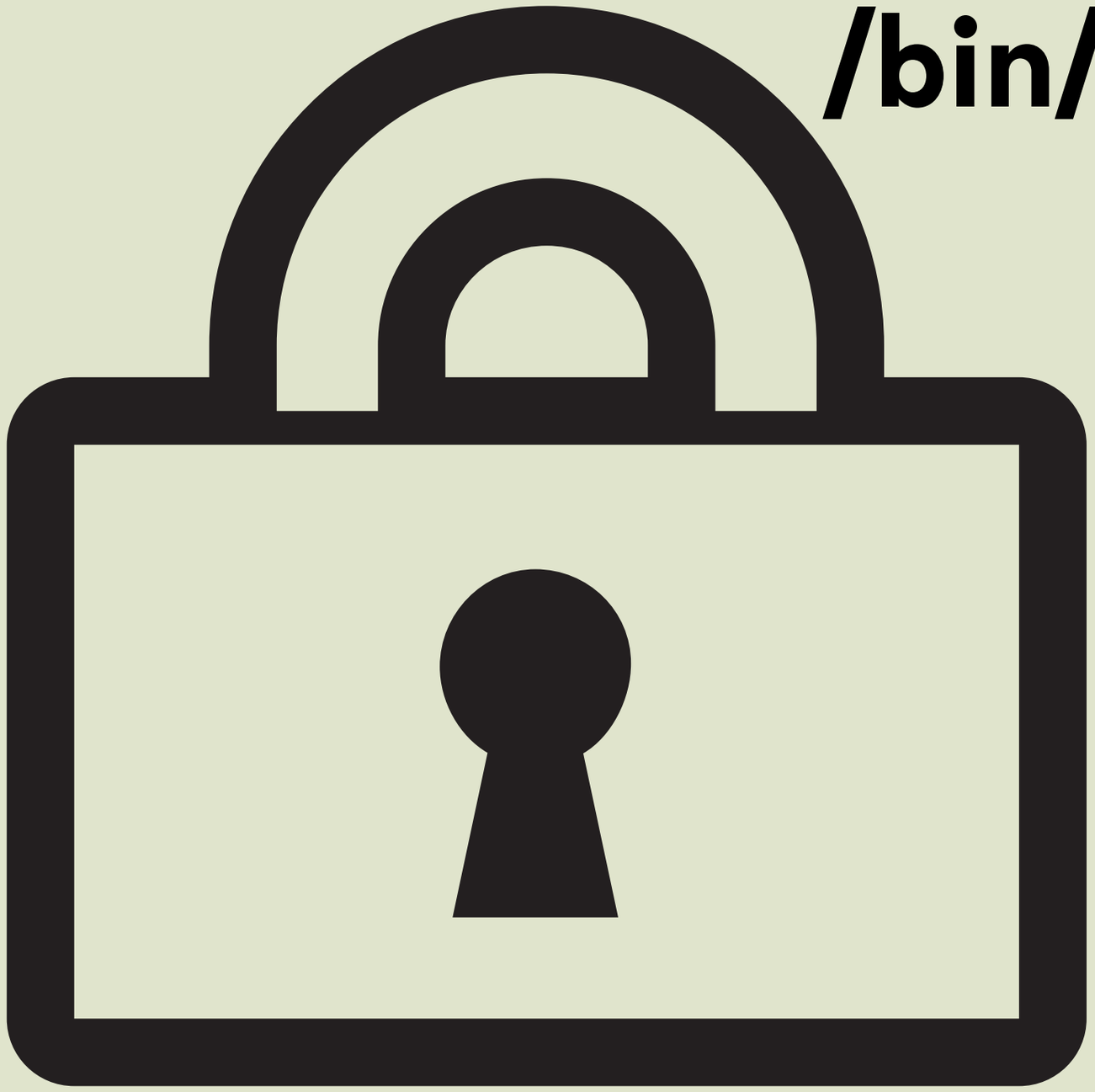

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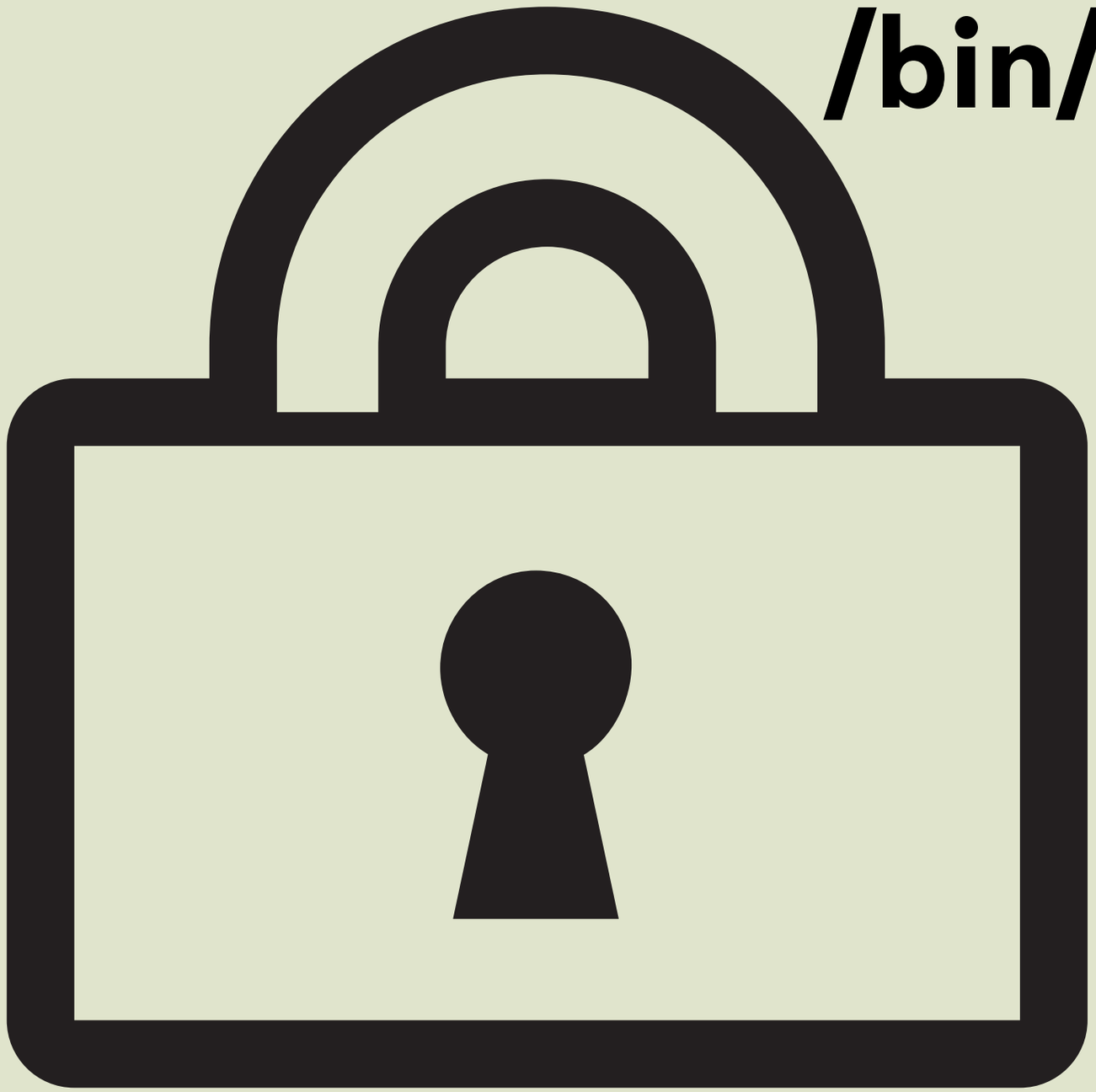

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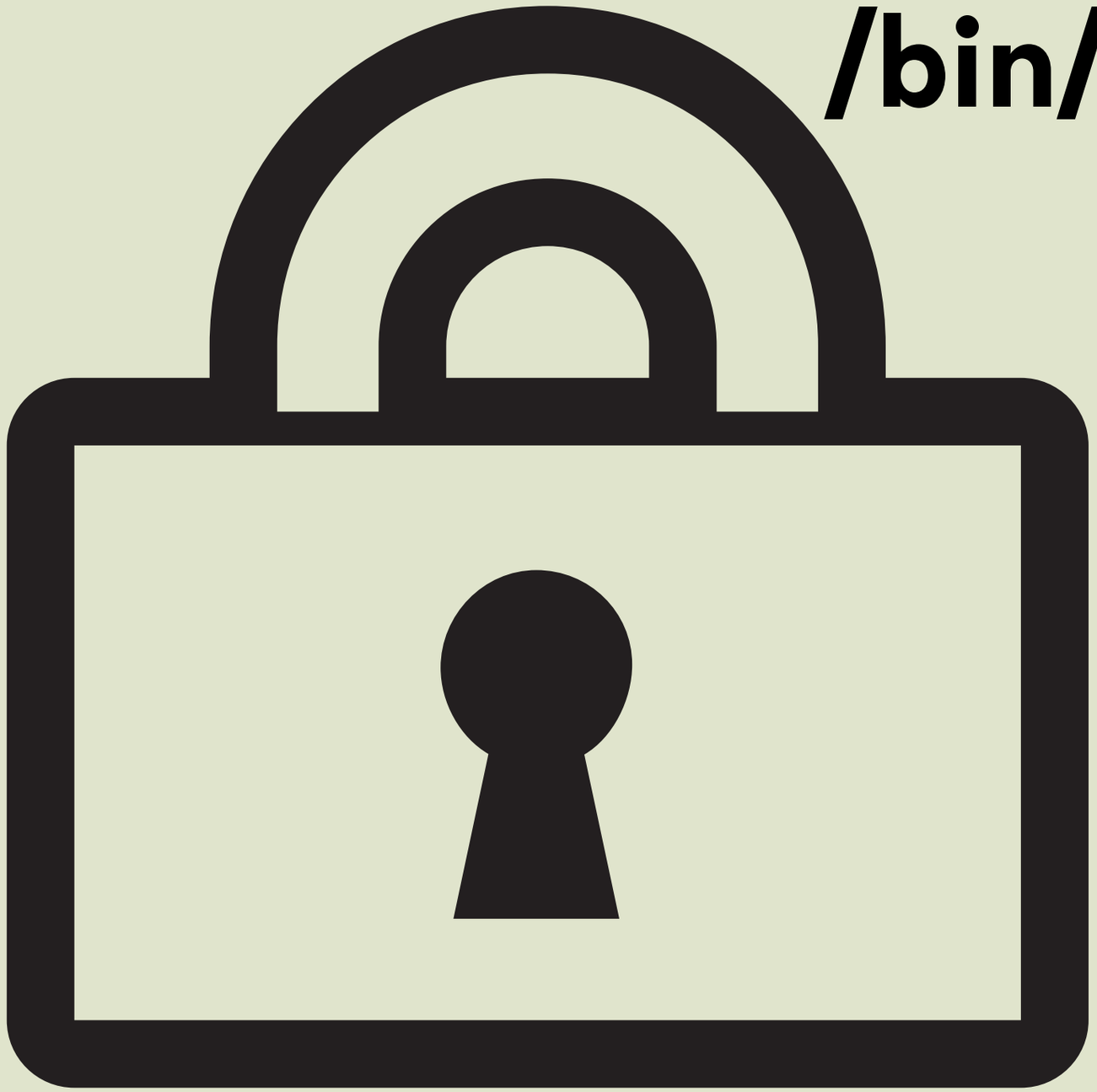

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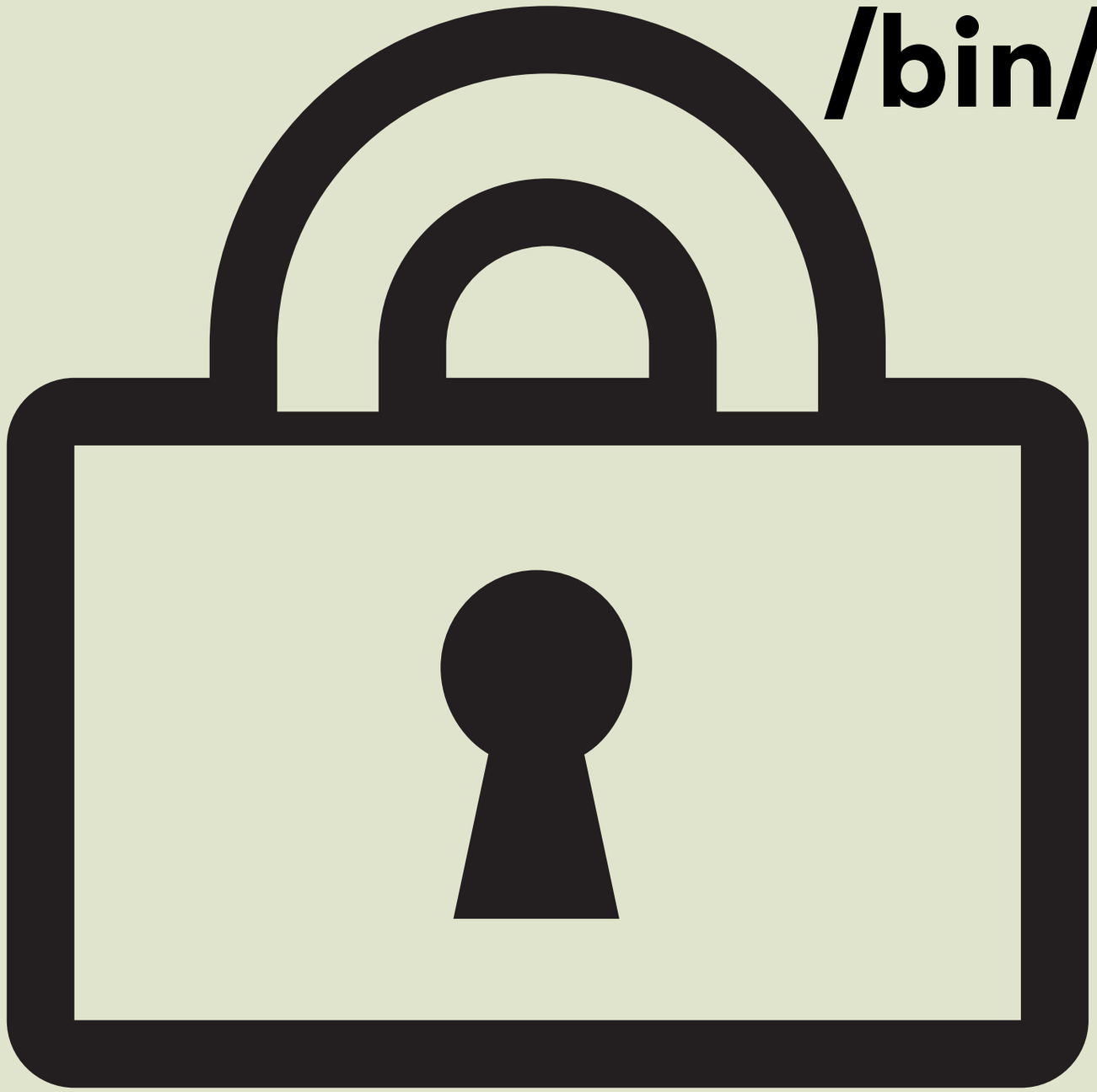

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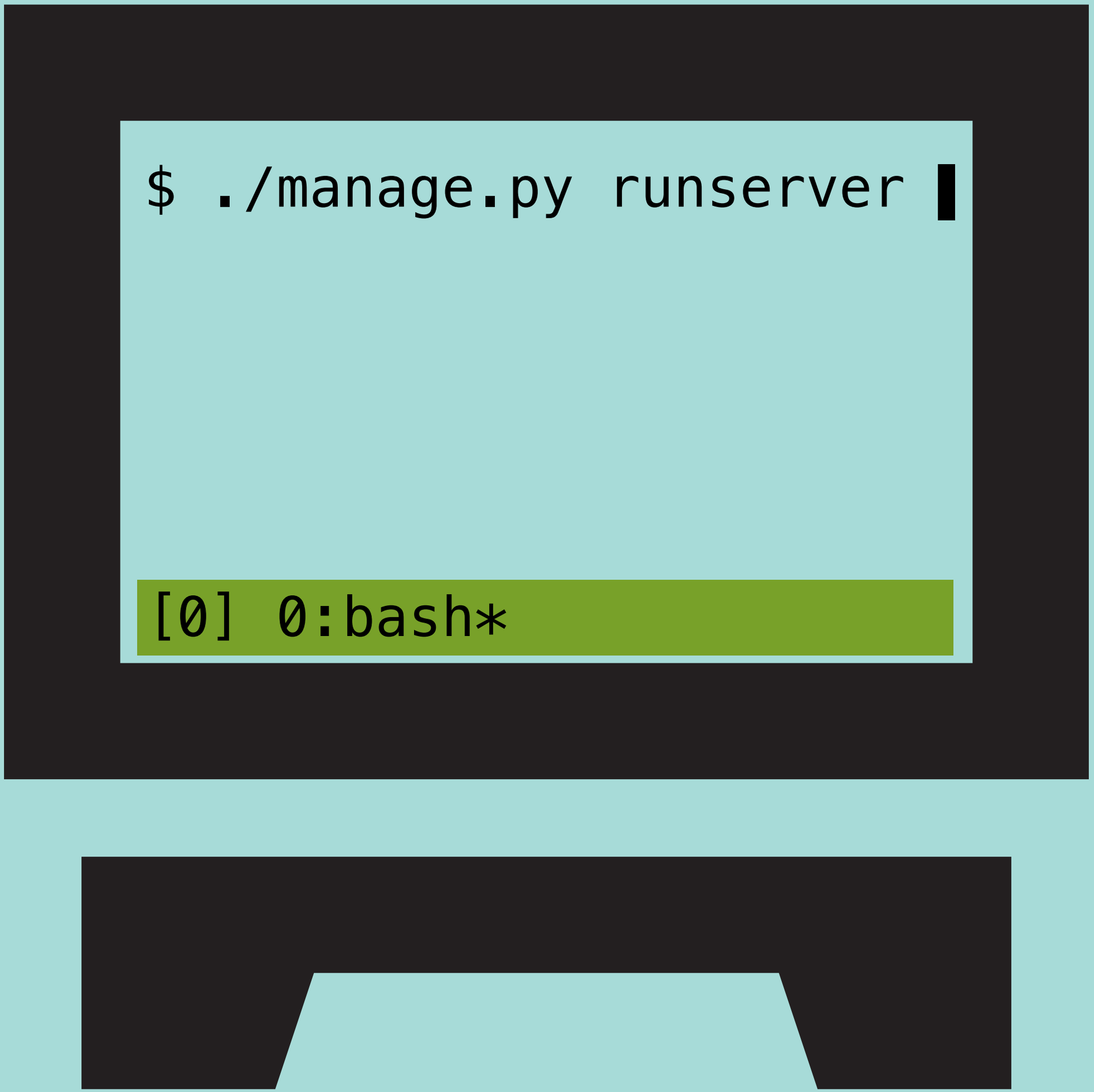
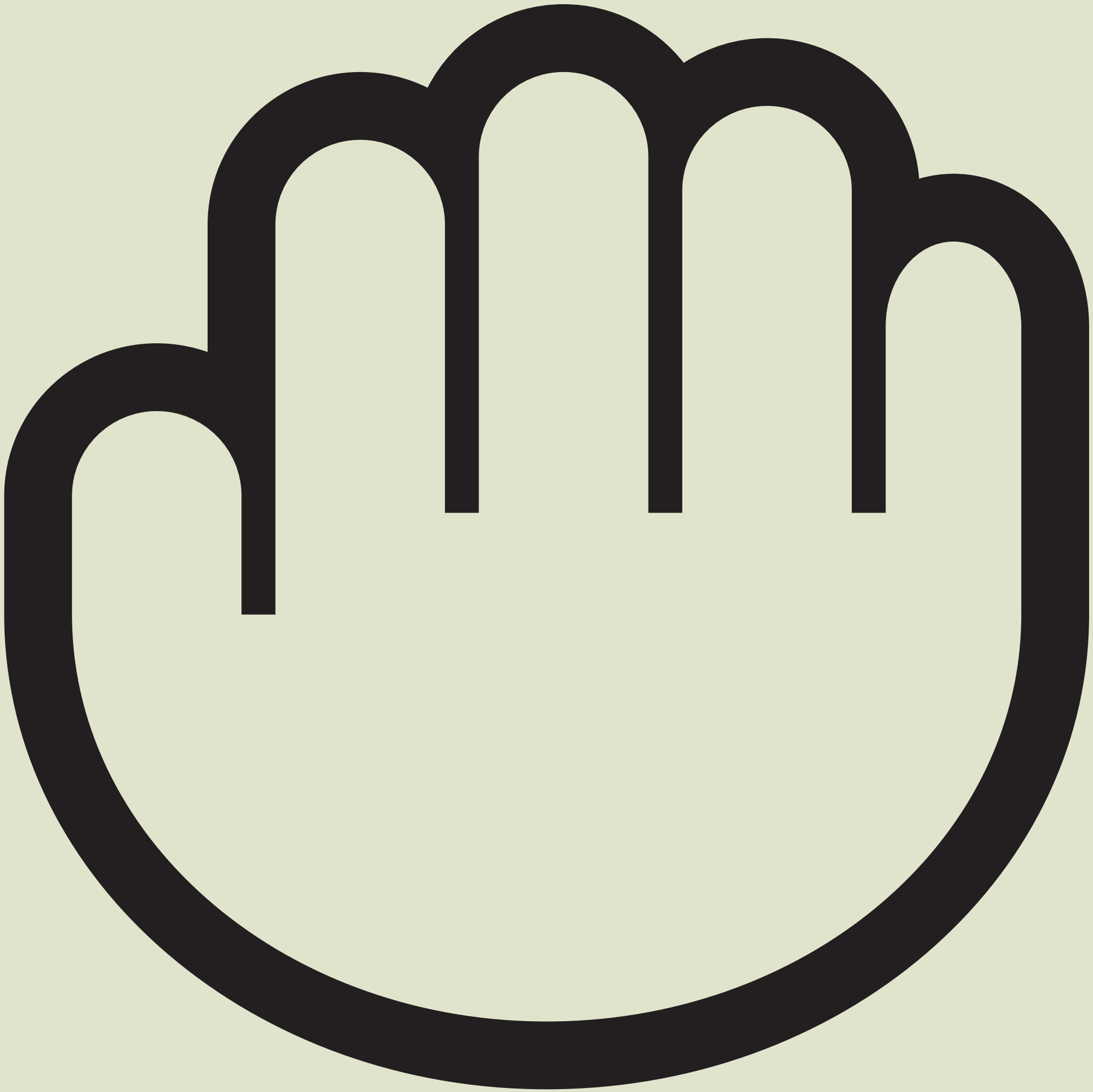
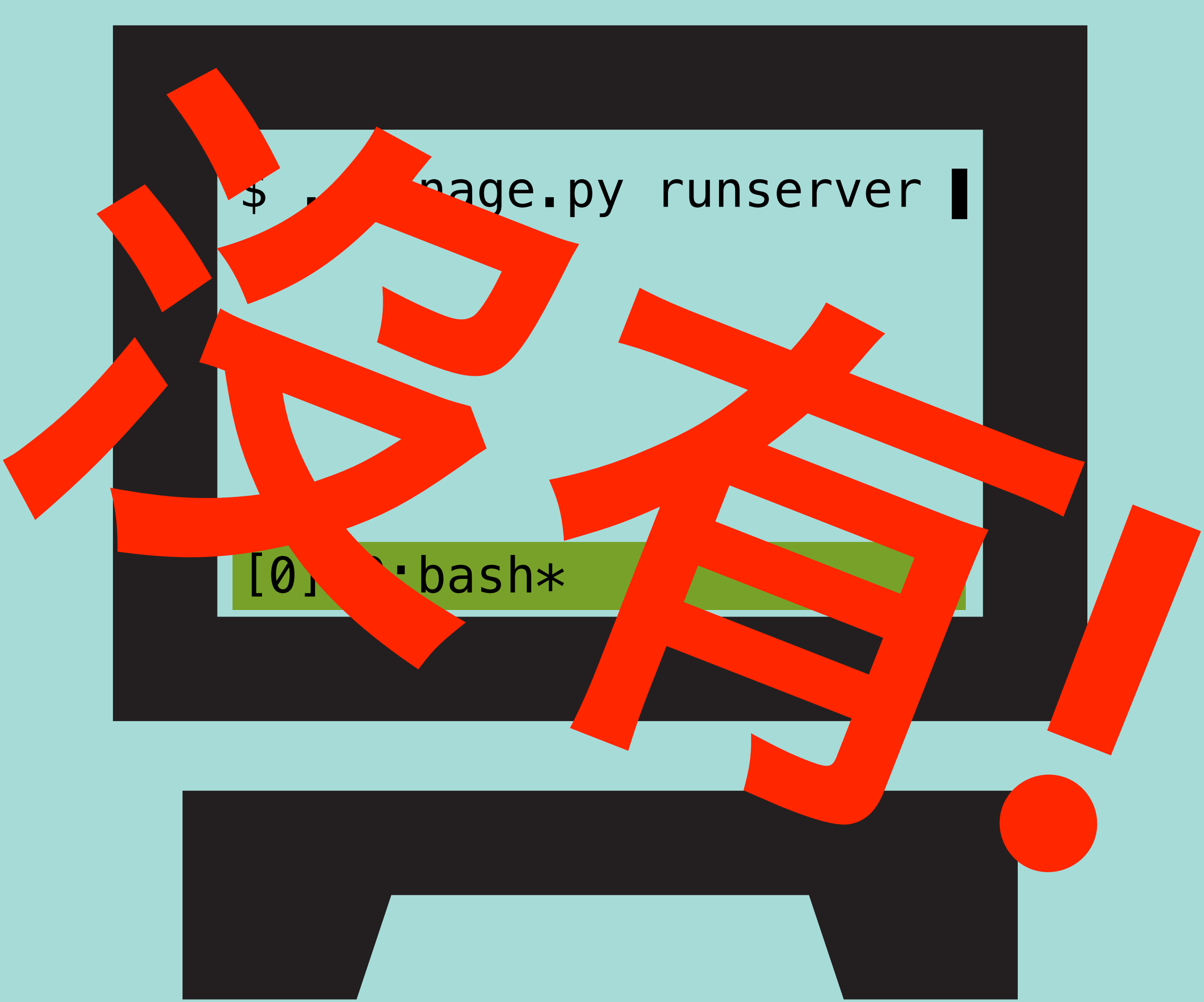

$ ./manage.py runserver
[0] 0:bash*




$. nage.py runserver
[0] :bash*
始まり!

It's Easy!

upstart

systemd

supervisord

circus

...

It's Easy!

upstart

systemd

supervisord

circus

...

Example: upstart

```
$ cat /etc/init/yourapp.conf
start on static-network-up
stop on deconfiguring-networking
respawn
chdir /path/to/yourapp
setuid yourapp
exec /path/to/gunicorn_django settings.py
$ start yourapp
```

Logs

log to stderr

redirect stderr syslog

use OS tools

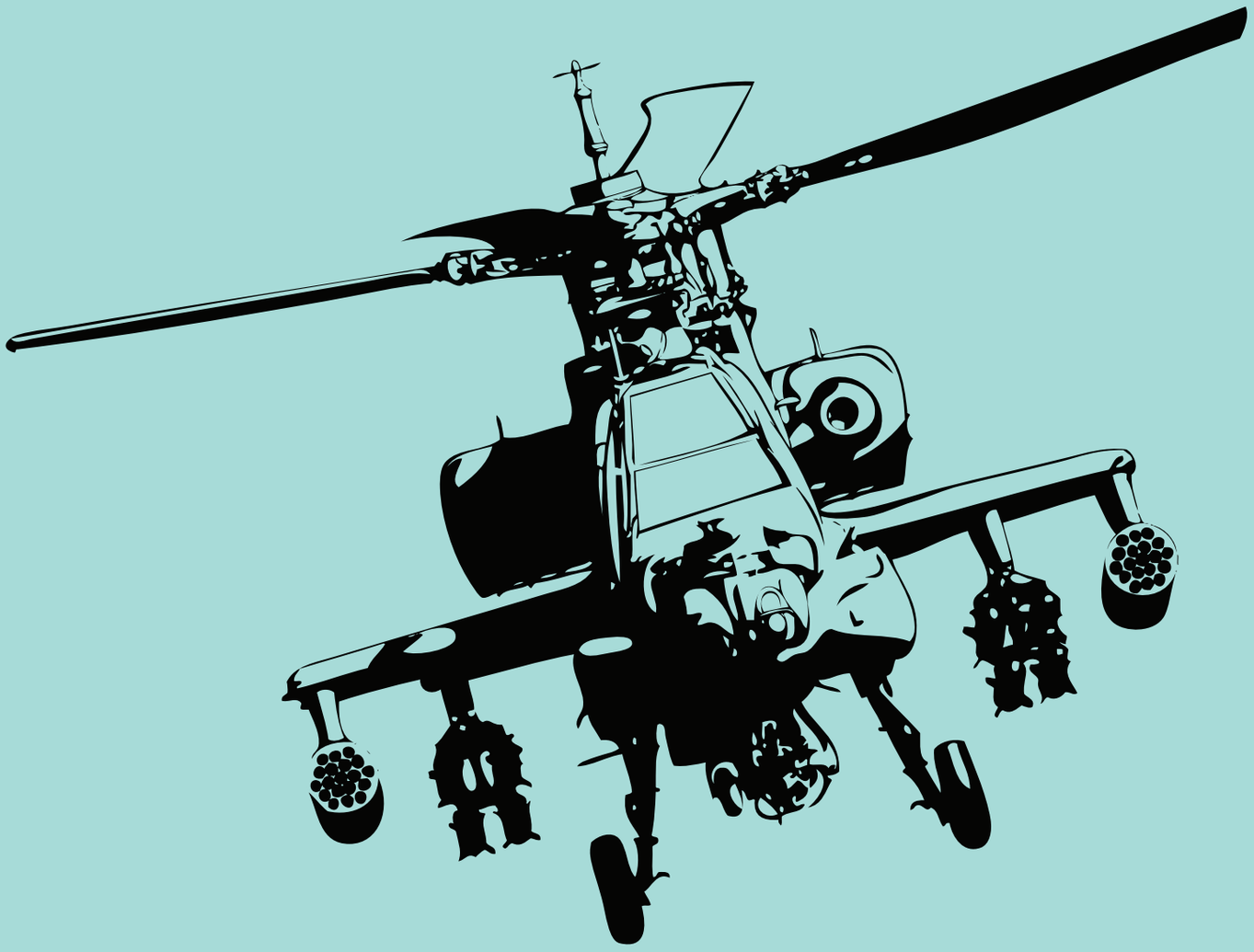
Logs

```
...
[uwsgi]
log-syslog = your-app
...
```

```
twistd --syslog --prefix your-app ...
```

Logs

```
if $programname == 'you-app' \
    then /var/log/your-app.log
& ~
```



+ mod_wsgi

Hey!

+ mod_wsgi

Disclaimer

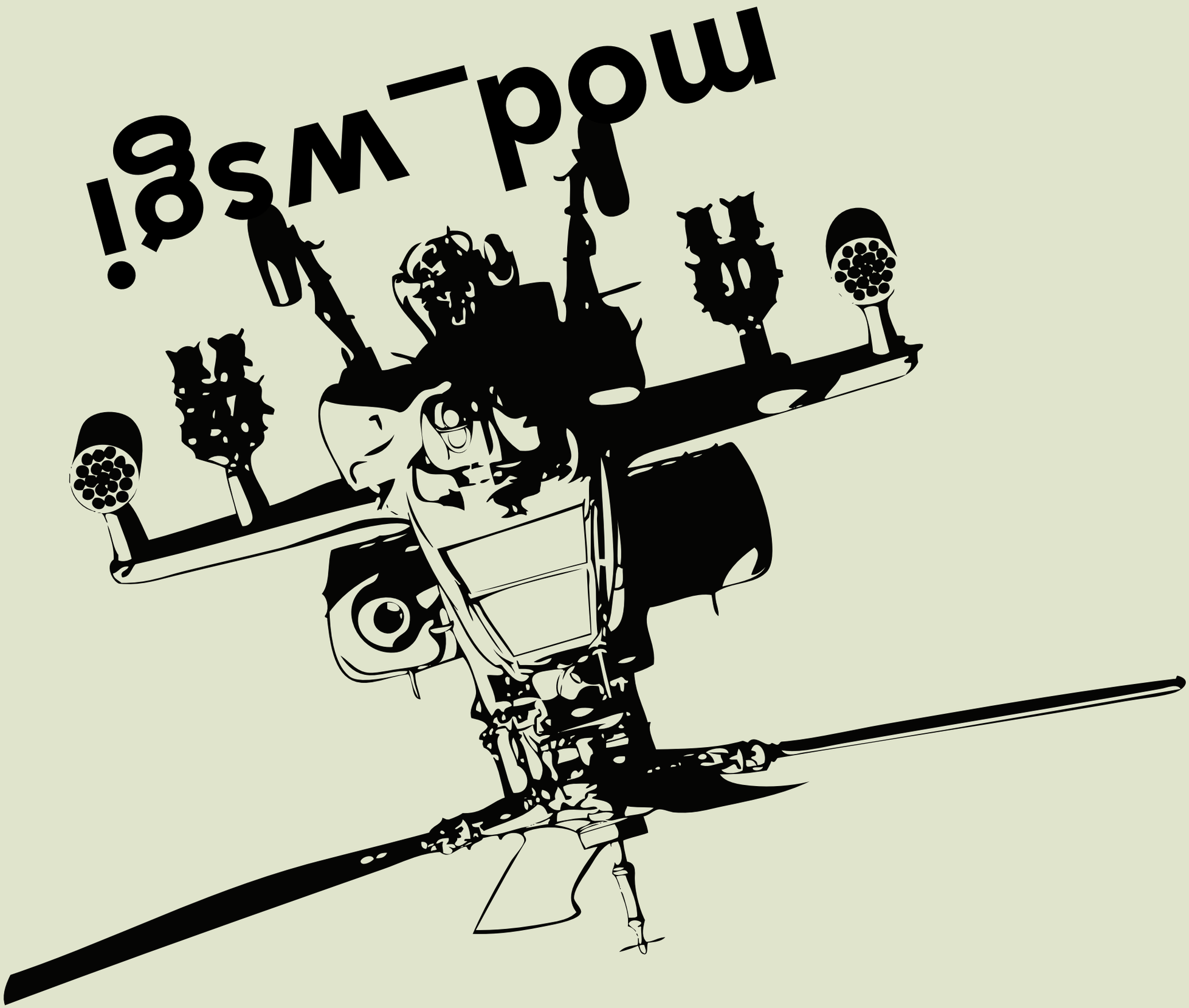
Using Apache is perfectly fine.

Disclaimer

Iff you decide

consciously

for it.

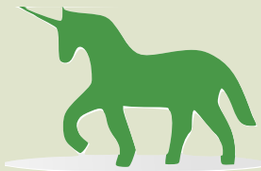

mod_wsi


?
mod_wsgi
?

or

uWSGI

or



gunicorn

+

NGINX

Better separation of concerns.

Easy to Set Up: gunicorn

```
$ gunicorn_django settings.py
```

```
$ gunicorn_paster settings.ini
```

Easy to Set Up: gunicorn

```
$ cat settings.py
…
INSTALLED_APPS = (
    …
    "gunicorn",
)
…
$ manage.py run_gunicorn
```

Easy to Set Up: nginx

```
location / {
  proxy_pass unix:///tmp/app.sock;
}

location /static/  {
  root /your/app/public/;
}
```

From Easy to AWESOME

uWSGI

Still Easy: uwsgi

```
uwsgi --emperor production.ini
```

...

```
[uwsgi]
paste = config:%p
uwsgi-socket = /tmp/app.sock
processes = 2
```

...

Still Easy Too: nginx

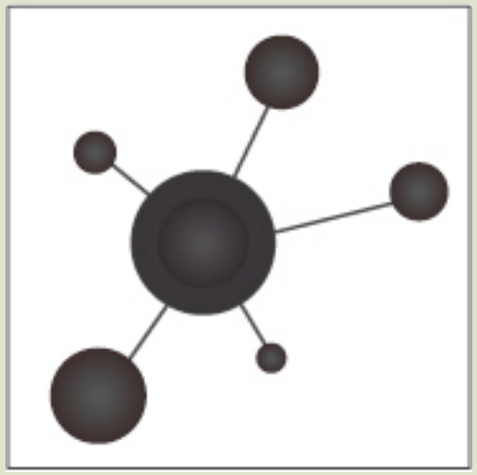
```
location / {
  include uwsgi_params;
  uwsgi_param UWSGI_SCHEME $scheme;
  uwsgi_pass unix:///tmp/app.sock;
}
```

Deploy!


Rollback!

Monitor

Monitor



pingdom

Nagios®

Dashboard

All | Up 1 | Down | Paused

Delete | Pause | Last 24 hours | Search

Status	Name		
↑	hynek.me hynek.me	No downtime	Response time: 254 ms

Monitoring | Admin | Help

Servertime: 11:59:03 | Press CTRL+ALT+F ... | Schlawack, Hynek

0 / 0 UP | 0 / 0 / 0 DOWN | 0 / 0 / 0 UNREACHABLE | 0 PENDING | 0 IN TOTAL | 1 OK

1 / 0 OK | 3 / 0 / 0 WARNING | 1 / 0 / 0 CRITICAL | 0 / 0 / 0 UNKNOWN | 0 PENDING | IN TOTAL | 0 DOWN

/ 0 / 0
4.008 / 4.033 / 4.017
0.058 / 0.338 / 0.204
0.008 / 15.715 / 1.375
0.000 / 0.347 /0.148

Categories | Settings

Data (15)

- Unhandled service problems
- Unhandled host problems
- Open problems
- ServiceStatus
- ServiceHistory
- HostStatus
- HostHistory
- Hostgroups
- Servicegroups
- Downtimes
- Downtime History
- Notifications
- Status Map
- LogView
- Instances

Tactical Overview (3)

Misc (7)

Open problems

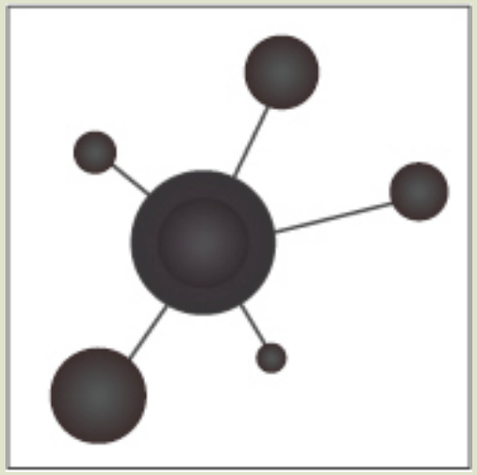
Refresh | Settings | View filter

Host	Service	State Type	Host Status	Service state	Check output	Duration
	Disk Space Usage /	HARD	UP	WARNING	DISK WARNING - free space: / ...	
	Current Load	HARD	UP	WARNING	WARNING - load average: 6.94, 8.17, 8.35	
	Mail Queue	HARD	UP	WARNING	WARNING: mailq is) (threshold w =)	
	Mail Queue	HARD	UP	CRITICAL	CRITICAL: mailq is (threshold c =)	

Page 1 of 1

Displaying topics 1 - 4 of 4

Monitor



pingdom

Nagios®

Measure

statsd

Ganglia

STAT | HAT

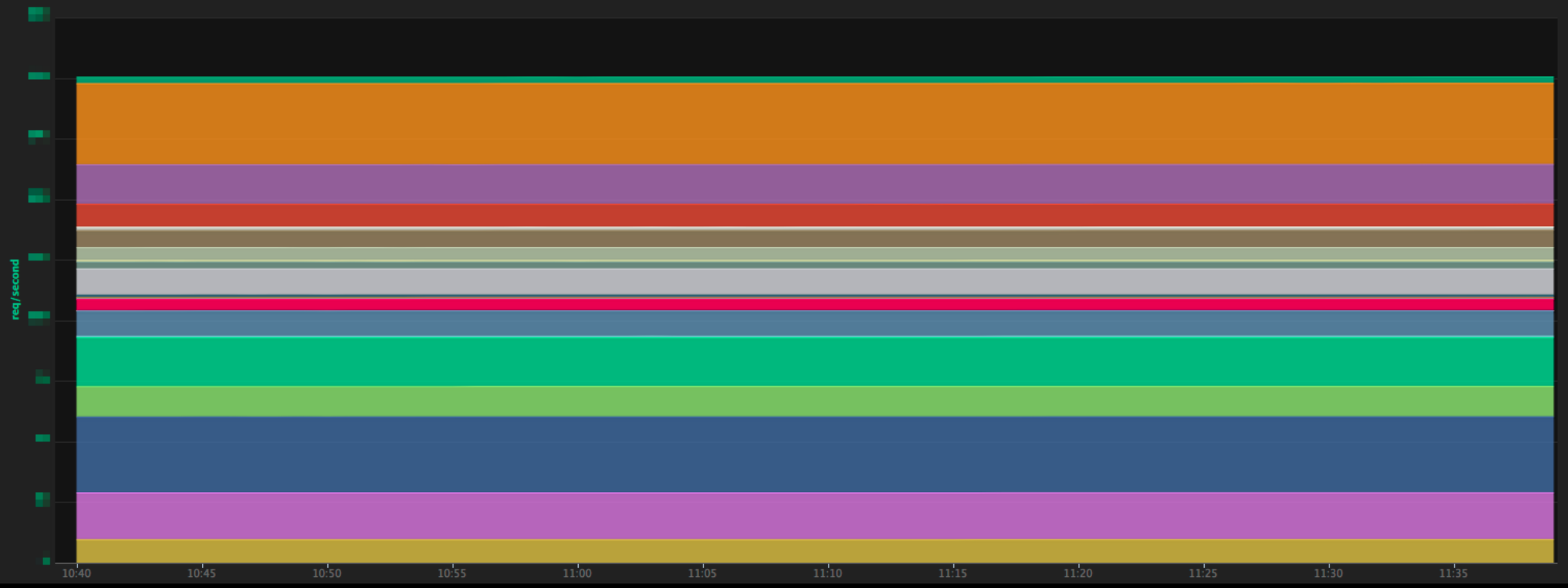
yunomi

graphite

metrics

Requests / Second

JUN 15, 13 10:39 AM - JUN 15, 13 11:39 AM




1.50
1.35
1.20
1.05
0.90
0.75
0.60
0.45
06/08 12PM
06/09 12AM
06/09 12PM
06/10 12AM
06/10 12PM
06/11 12AM
06/11 12PM
06/12 12AM
06/12 12PM
06/13 12AM
06/13 12PM
06/14 12AM
06/14 12PM
06/15 12AM
collectd
rrmd_de.load.load.longterm

Measure

statsd

Ganglia

STAT | HAT

yunomi

graphite

metrics

goto 1

@hynek http://hynek.me

http://ox.cx/d

http://vrmd.de