Solid Python Application Deployments For Everybody

Hynek Schlawack  River Bar, 2013
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
The One & Only Link

http://ox.cx/d
OPINIONS AHEAD
Schema Migrations Paas
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

VAGRANT
“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 Hyyyneek...

My boss won’t let me!
Development

tests!
לא
System Packages

spotty

outdated

loss of control
System Packages

spotty
outdated
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outdated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 Hyyyyneek... SECURITY!
Security!? It’s your Job.
Fabric
What’s Wrong!?

build tools
repetitive
downloads
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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6. push to your repo
Abuse the Pipeline

run tests
LESS/SASS/CoffeeScript
compression
cache busting
But Hyyyyyneek... 

Packaging is hard!
Nope.

fpm
fpm

-s dir

-t deb

<appdir>
But Hyyyyeenek... 

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
Which Is Right For Your Organization?

Puppet Enterprise packages the power of Puppet open source with enterprise-oriented features to make IT automation even easier and more powerful. Use the below chart to compare the two releases, and see which one is right for your organization.

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Not easy at all.
Why anyway?
safety/security
reproducible
“later”
Why anyway?
safety/security
reproducible
“later”
Why anyway?
safety/security reproducible “later”
Test It in Staging
root
Nein!
Just don’t.
Privileged Port

drop privileges
authbind
But Hyyeneek...

Need dat POWER!
Single Purpose Workers

celery

rq

zerorpc

perspective broker/AMP
Be Paranoid

iptables
file
sockets
SSL
/bin/false
REVOKE
ALL
fail2ban
Be Paranoid

iptables
file
sockets
SSL

/bin/false
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Be Paranoid

iptables
file
sockets
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ALL
fail2ban
$ ./manage.py runserver
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 ...
if $programname == 'you-app' \\
then /var/log/your-app.log
& ~
Disclaimer

Using Apache is perfectly fine.
Disclaimer

Iff you decide consciously for it.
Better separation of concerns.
Easy to Set Up: unicorn

$ 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

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

location /static/ {
    root /your/app/public/;
}
```
From Easy to AWESOME
Still Easy: uwsgi

uwsgi --emperor production.ini

...[uwsgi]
paste = config:%p
uwsgi-socket = /tmp/app.sock
processes = 2
...
...
location / {
    include uwsgi_params;
    uwsgi_param UWSGI_SCHEME $scheme;
    uwsgi_pass unix:///tmp/app.sock;
}
Deploy!
Rollback!
Monitor
Dashboard

Last 24 hours

Last 24 hours
Search

Status

Name

hynek.me
hynek.me

No downtime

Response time: 254 ms
## Open Problems

<table>
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<tr>
<th>Service</th>
<th>State Type</th>
<th>Host Status</th>
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<tr>
<td>Disk Space Usage</td>
<td>HARD</td>
<td>UP</td>
<td>WARNING</td>
</tr>
<tr>
<td>Current Load</td>
<td>HARD</td>
<td>UP</td>
<td>WARNING</td>
</tr>
<tr>
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<tr>
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<td></td>
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### Check Output
- **Disk Usage**: Disk warning - free space / ...
- **Current Load**: Load average: 0.94, 0.17, 0.35
- **Mail Queue**: Mail is too high (threshold: 0...)

### Duration
- Mail Queue: Too high (threshold: 0...)

---

**Note**: The screenshot shows a monitoring tool interface with various categories and service statuses. The table highlights specific services in need of attention with their respective states and details.
Measure

statsd

Ganglia

STATHAT

yunomi

graphite

metrics
goto 1