San Diego Python User Group

How to deploy a Python Flask web app to the cloud

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Long Time - First Time

Thank you

- Dianne
- David
- Last month's presenters
- Presenters from months and years gone by

Beginner / Intermediate Audience

This presentation will be at the beginner / intermediate level

- Not too technical
- It will solve a real-world problem
- It will touch on several topics (Python Flask, cloud hosting on Digital Ocean, https certs, etc.)
- Several topics left out (automated testing, other providers: Amazon, Linode, others)
- I hope this is the first of a series of presentations.

Slides / Recording

- Slides: https://github.com/dan-king/presentations
- Recording: San Diego Python User Group YouTube Channel (https://www.youtube.com/channel/UCXU-oZwaHnoYUhja_yrrrGg)

Presentation Overview

- Present a real-world scenario
- Deploy to the cloud

Back Story

- Spring Break 1982
- Texas Instrument TI-99/4A
- Wrote my first BASIC program

```
10 FOR I=1 TO 20
20 PRINT I
30 NEXT I


RUN
1
2
3
...
20
```

Fast Forward 38 Years

- Spring Break 2020
- Covid-19
- Introduced my 12-year-old to coding
- Not Interested!

Introducing Sticker Packs!

- Creativity
- Passive income
- No coding required
- Interested!

What's Python got to do with it?

Apple Requirements

- Privacy Policy
- Support Page
- Product Details / Marketing Page (Attribution)

Stack

- Python, Flask
- jQuery, Bootstrap, DataTables (CSS-JavaScript)
- Ubuntu, Nginx
- Digital Ocean
- dot.tk Free Domain Name https://en.wikipedia.org/wiki/Tokelau
- Let's Encrypt for TLS (https) cert

Deployment Steps

- Create Digital Ocean Droplet
- Clone repo
- Configure Nginx
- Free Domain Name
- Let’s Encrypt

Cheatsheet 1: New DigitalOcean “Droplet”

- Ubuntu 20.04 LTS
- Basic Plan
- CPU option: Regular Intel w/ SSD ($5/mo)
- Datacenter: SF3
- SSH Key: public ssh key
- Name: i-love-cats-0X
- IP: xxx.xxx.xxx.xxx

Cheatsheet 2: Initial Server Setup

```
ssh -i ~/.ssh/do/id_rsa root@xxx.xxx.xxx.xxx

# Update server
apt update
apt -y upgrade

# Increase ssh Timeout
vi /etc/ssh/sshd_config
ClientAliveInterval 120
ClientAliveCountMax 720

# Add user
adduser dan
usermod -aG sudo dan
rsync --archive --chown=dan:dan ~/.ssh /home/dan

# Reboot
reboot
```

Cheatsheet 3: Set up Firewall, Nginx, Python

```
ssh -i ~/.ssh/do/id_rsa dan@xxx.xxx.xxx.xxx


# Enable firewall
sudo ufw allow OpenSSH
sudo ufw enable


# Install Nginx
sudo apt install nginx
sudo ufw allow 'Nginx Full'


# Install pip, etc.
sudo apt install -y python3-pip build-essential
libssl-dev libffi-dev python3-dev python3-venv
```

Cheatsheet 4: Clone project and install requirements

```
cd

git clone https://github.com/dan-king/ios-sticker-pack-website-
template.git

cd ios-sticker-pack-website-template

pip install virtualenv

python3 -m virtualenv venv

source venv/bin/activate

pip install -r requirements.txt

cp env_prod .env

python index.py

Control-C to exit
```

Cheatsheet 5: Configure Nginx

```
cd /etc/nginx/sites-available

sudo cp default default.2021-09-23a

sudo vi default

server {
    listen 80 default_server;
    listen [::]:80 default_server;
    server_name _;
    location / {
                proxy_pass http://localhost:5001;
    }
}

sudo nginx -t
sudo systemctl restart nginx

cd ~/ios-sticker-pack-website-template
python index.py

Browse to:
http://xxx.xxx.xxx.xxx

Control-C to exit
```

Cheatsheet 6: Configure WSGI (w/ gunicorn)

```
Cheatsheet 6: Configure WSGI (w/ gunicorn)

# Test gunicorn binding
gunicorn --bind 0.0.0.0:5001 wsgi:app

Browse to: http://xxx.xxx.xxx.xxx

# Set up gunicorn service

sudo vi /etc/systemd/system/sticker_pack.service

[Unit]
Description=Gunicorn instance to serve sticker pack app
After=network.target

[Service]
User=dan
Group=www-data
WorkingDirectory=/home/dan/ios-sticker-pack-website-template
Environment="PATH=/home/dan/ios-sticker-pack-website-template/venv/bin"
ExecStart=/home/dan/ios-sticker-pack-website-template/venv/bin/gunicorn --workers
3 --bind unix:sticker_pack.sock -m 007 wsgi:app

[Install]
WantedBy=multi-user.target
```

Cheatsheet 7: Enable systemctl and configure Nginx

```
# Enable systemctl
sudo systemctl start sticker_pack
sudo systemctl enable sticker_pack
sudo systemctl status sticker_pack

# Configure Nginx
cd /etc/nginx/sites-available
sudo cp default default.2021-09-23b
sudo vi default
server {
    listen 80;
    server_name your_domain www.your_domain;
    location / {
        include proxy_params;
        proxy_pass http://unix:/home/dan/ios-sticker-pack-website-
template/sticker_pack.sock;
    }
}
sudo nginx -t
sudo systemctl restart nginx

Browse to:http://xxx.xxx.xxx.xxx
```

Cheatsheet 8: Register and configure new domain name

```
# Register new domain name at www.freenom.com
e.g. i-love-cats-and-python
Go to "Manage Domain"
Go to "Management Tools" -> "Nameserver"
Select "Use custom nameservers"
Update name servers:
    ns1.digitalocean.com
    ns2.digitalocean.com
    ns3.digitalocean.com


# Add domain to Digital Ocean account (Networking ->
Domains)
Enter the domain: i-love-cats-and-python.tk
Create an 'A' Record
    Hostname: @
    Direct to: xxx.xxx.xxx.xxx


Browse to: http://i-love-cats-and-python.tk
```

Cheatsheet 9: Secure Nginx with Let's Encrypt

```
cd /etc/nginx/sites-available


sudo cp default default.2021-09-23c


# Install https/SSL/TLS Cert from LetsEncrypt


sudo apt install certbot python3-certbot-nginx


sudo certbot --nginx -d i-love-cats-and-
python.tk


# View changes

diff default default.2021-09-23c


Browse to:

https://i-love-cats-and-python.tk
```

Next Time

- Add automated testing
- Implement custom configuration
- Deploy in a Docker container
- Deploy on a different vendor (e.g. AWS or Linode)

Conclusion

- Many sticker packs since spring break 2020.
- Many solutions to static website. Needed one that is easy to deploy and configure multiple times.
- ‘I love cats’ is my first time deploying the stand-alone Python template.
- Web requirements of an Apple App Store sticker pack is "Milestone 5" of a 7-milestone roadmap for publishing to the Apple App store.

Links/Resources

- Slides: https://github.com/dan-king/presentations
- Recording: https://www.sandiegopython.org
- Code: https://github.com/dan-king/ios-sticker-pack-website-template
- Sticker Packs: https://vptech.io/sticker-packs
- Roadmap: https://appstoreschool.thinkific.com
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