Automation in the Small: Code to Cloud

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Why automation?

Go Faster,
Save Time

flic.kr/p/nYT2s4

Complexity
& Scale

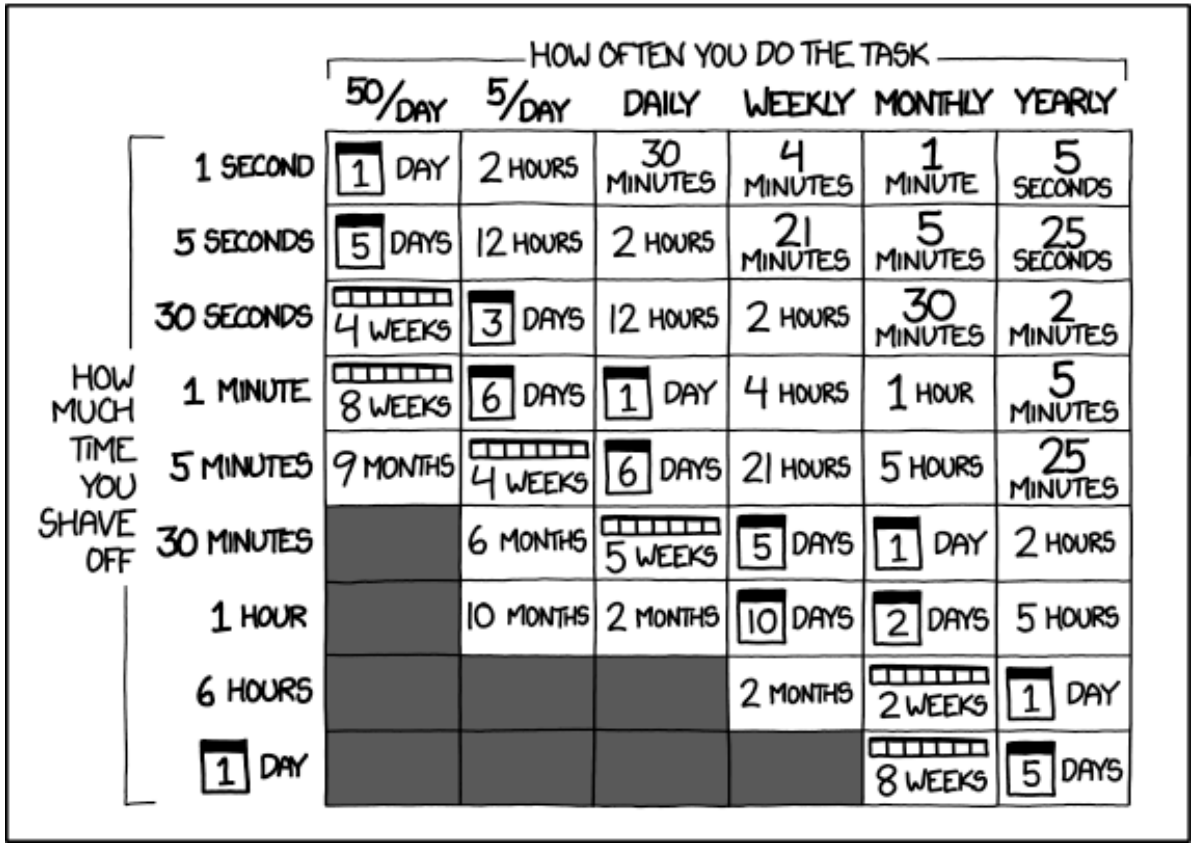
flic.kr/p/28i54x

Be Flexible

flic.kr/p/4wNdu5

Relax

flic.kr/p/3tj1VR


HOW LONG CAN YOU WORK ON MAKING A ROUTINE TASK MORE EFFICIENT BEFORE YOU'RE SPENDING MORE TIME THAN YOU SAVE?
(ACROSS FIVE YEARS)
HOW OFTEN YOU DO THE TASK
50/DAY
5/DAY
DAILY
WEEKLY
MONTHLY
YEARLY
HOW MUCH TIME YOU SHAVE OFF
1 SECOND
1 DAY
2 HOURS
30 MINUTES
4 MINUTES
1 MINUTE
5 SECONDS
5 SECONDS
5 DAYS
12 HOURS
2 HOURS
21 MINUTES
5 MINUTES
25 SECONDS
30 SECONDS
4 WEEKS
3 DAYS
12 HOURS
2 HOURS
30 MINUTES
2 MINUTES
1 MINUTE
8 WEEKS
6 DAYS
1 DAY
4 HOURS
1 HOUR
5 MINUTES
5 MINUTES
9 MONTHS
4 WEEKS
6 DAYS
21 HOURS
5 HOURS
25 MINUTES
30 MINUTES
6 MONTHS
5 WEEKS
5 DAYS
1 DAY
2 HOURS
1 HOUR
10 MONTHS
2 MONTHS
10 DAYS
2 DAYS
5 HOURS
6 HOURS
2 MONTHS
2 WEEKS
1 DAY
1 DAY
8 WEEKS
5 DAYS

xkcd.com

About your presenter

- Jay Barker
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- Manager, Software Development
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Automation in the Small: Code to Cloud

- Automation techniques for individuals and tiny teams
- A set of integrated tools, just one example of many ways to automate local development & cloud deployment
- Related code & documentation are on Github
  - github.com/jbarker/dev-automation-small
  - Further details in README.md file
  - Some ‘demo’ steps make use of this repository
- This presentation is on SlideShare
  - slideshare.net/jbrkr/automation-smallcodeclouddevops

The Tools

Homebrew
packages

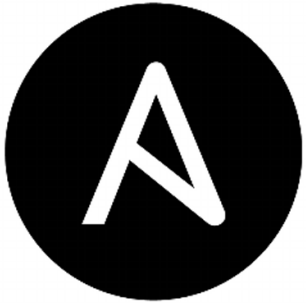
brew.sh

Packer
imaging

packer.io

VirtualBox
virtualization

virtualbox.org



Ansible
provisioning

ansible.com

AUTOMATION

Easy software installation & upgrades

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Use a Package Manager

- Take control of software updates with a package manager

- Linux has built-in options, e.g. apt, yum
- For Windows, consider Chocolatey
- For Max OS X, consider **Homebrew** with **Cask**
  - Some ‘demo’ steps assume both are installed

- Demo: install Homebrew & Cask

```
$ ruby -e "$(curl -fsSL https://
raw.github.com/Homebrew/homebrew/go/install)"
$ brew config
$ brew install caskroom/cask/brew-cask
```

brew.sh / caskroom.io

Automated package installation

- Demo: install the latest stable **git** from the community to override the old version bundled by Apple

```
$ brew install git
$ git --version
> git version 2.0.4
```

- Demo: install & run a GUI application, **Github for Mac**

```
$ brew cask install github
$ github --help
$ github
```

git-scm.com / mac.github.com

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Run prepared virtual machines

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Use a local Virtualization app

- Run virtual machines (VMs) on your host machine
- Install a virtualization app running on your host machine
- One free, cross-platform option is **VirtualBox**
- Other options include: **Parallels Desktop**, **VMWare Fusion**
- Demo: install VirtualBox for Mac

```
$ brew cask install virtualbox
$ virtualbox
```

virtualbox.org

Use local VMs for testing

- Example: testing web applications with Internet Explorer on Windows
- Use the **ievms** project for automated VMs installation from Microsoft's official source, modern.ie
- Demo: clone the ievms project, then download & install various versions of Windows with Internet Explorer
  Warning: this may take awhile due to large downloads!

```
$ git clone https://github.com/xdissent/
ievms.git
$ cd ievms
$ ./ievms.sh
```

github.com/xdissent/ievms

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Create custom virtual machines

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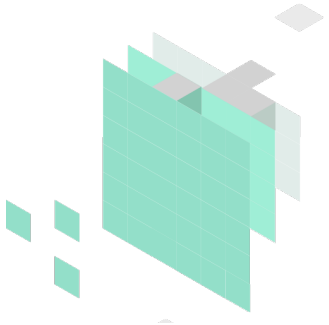
Use a Provisioning tool

- Let's create a new custom virtual machine
- We can use **Packer** to provision this virtual machine
- Demo: install Packer using Homebrew

```
$ brew tap homebrew/binary
$ brew install packer
```



packer.io

Provision a new local VM

- For the operating system, let's use **Debian** 7.x x86_64 Network installation ISO

- Tip: Be sure to configure SSH access to your VM!
  - Recommended is access by public/private key pair
  - Your public key may already be available in a convenient location
    - e.g. github.com/example-username.keys

- Demo: provision the VM with Packer
  Warning: this may take awhile due to large downloads!

```
$ cd packer
$ packer build -only=virtualbox-iso -force
debian-7.x-amd64.json
```

debian.org

Import & start the new VM

- Import your virtual machine into VirtualBox
- Start your virtual machine in headless mode (no UI!)
- Demo: import the new VM created by Packer

```
$ VBoxManage import packer-debian-7.x-amd64-
virtualbox/packer-debian-7.x-amd64.ovf
$ VBoxManage list vms
```

- Demo: launch the new VM with VirtualBox

```
$ VBoxHeadless -s "packer-debian-7.x-amd64"
```

Use a Configuration Management tool

- Configure your VMs the same way, every time
- Use a configuration management tool to define & maintain machine configurations
- Let's use **Ansibile** to configure the local virtual machine
- Other options include: **Chef**, **Puppet**, **Salt Stack**
- Demo: install Ansible using Homebrew

```
$ brew install ansible
```

ansible.com

Configure your new VM

- **Ansible** will setup your machine using configuration that you define in a YAML file

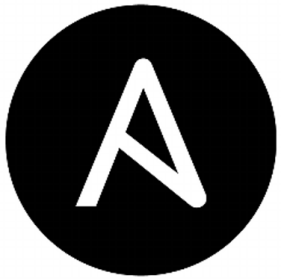
- Ansible requires SSH access to your VM
  - You should configure a public/private key pair for access when creating your VM

- Demo: ping your running VM with Ansible

```
$ cd ansible
$ ansible -i inventory.ini all -m ping
```

- Demo: configure your running VM with Ansible

```
$ ansible -i inventory.ini all -m setup -vvvv
```



AUTOMATION

Configure a cloud server

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Choose a Cloud provider

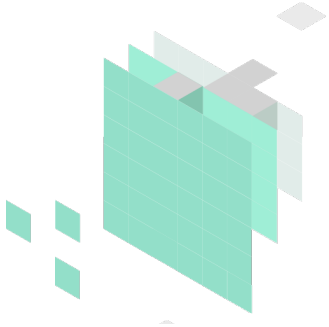
- Many popular choices for cloud providers. Choose a cloud provider that best fits *your* needs!

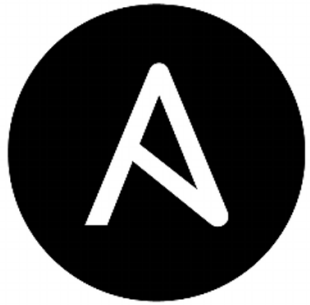
- Possible considerations
  - common operating system offering, like Debian
  - integration with preferred tools, like Packer

- Some options with both Debian & Packer integration:
  - **DigitalOcean**
    - digitalocean.com/community/tags/debian
  - **Amazon EC2**
    - wiki.debian.org/Cloud/AmazonEC2Image
  - **Google Compute Engine**
    - wiki.debian.org/Cloud/GoogleComputeEngineImage
  - **OpenStack**
    - wiki.debian.org/OpenStack

Configure your Cloud server

- Use the same tools for cloud development and local development
- Provision a custom machine with **Packer**
  Many builders supported out-of-the-box
- Configure your machine with **Ansible**
  Works great via standard SSH
- Test in a Virtual Machine locally with **VirtualBox**
  Host in all popular desktop operating systems
- Test in cloud instances with *your preferred provider*
- Deploy to indentical cloud instances for production use





AUTOMATION

In summary

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In summary + Q&A

- Automation: Go Faster, Save Time / Be Flexible / Complexity & Scale / Relax
- Package management for software installation & upgrades
  - Homebrew & Cask on Mac OS X
  - Similar options on Linux or Windows
- Virtualization for local development & testing
  - VirtualBox for running custom & prepared machines
- Provisioning & configuration management
  - Packer & Ansible with Debian Linux
- Configure, test, & deploy to cloud instances
  - Your preferred provider with standard tools

flic.kr/p/iVLZt