Automating Development Environments with Ansible & Chezmoi

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Agenda

• Background & Framing
• Ansible
• Chezmoi
• Inspiration
About Me

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Why

- System replacement
- Multiple machines
- Share between Work & Home
Pets vs. Cattle
What about pet cows?
Other Motivations

- Learn a new skill
- Share
- Cool Factor
How long can you work on making a routine task more efficient before you’re spending more time than you save? (Across five years)

<table>
<thead>
<tr>
<th>How Much Time You Shave Off</th>
<th>How Often You Do The Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Second</td>
<td>50/day</td>
</tr>
<tr>
<td>5 seconds</td>
<td>5 days</td>
</tr>
<tr>
<td>30 seconds</td>
<td>4 weeks</td>
</tr>
<tr>
<td>1 minute</td>
<td>6 weeks</td>
</tr>
<tr>
<td>5 minutes</td>
<td>6 months</td>
</tr>
<tr>
<td>30 minutes</td>
<td>5 weeks</td>
</tr>
<tr>
<td>1 hour</td>
<td>10 months</td>
</tr>
<tr>
<td>6 hours</td>
<td>2 months</td>
</tr>
<tr>
<td>1 day</td>
<td>8 weeks</td>
</tr>
</tbody>
</table>
Framing
Layers

- Base OS Install
  - System Customizations
    - Packages
    - System Config
  - User Customizations
    - User Config
    - Tools
    - Scripts
Base OS Install

Just install and accept defaults.

- … vs Kickstart/unattended install
- … vs Custom Install Image
ANSIBLE
Ansible - Why

- automate lots of things
- python
Ansible Installation

dnf install -y ansible

for Ubuntu

apt install -y ansible
Basic Ansible Setup

# go to a standard role directory
mkdir -p ~/.ansible/roles; cd ~/.ansible/roles
# create a role
ansible-galaxy role init $USER-environment
Ansible Role Contents

1 ├── defaults
2 │    └── main.yml
3 ├── files
4 │    ├── handlers
5 │    │    └── main.yml
6 ├── meta
7 │    └── main.yml
8 ├── README.md
9 ├── tasks
10 │    └── main.yml
11 ├── templates
12 ├── tests
13 │    └── inventory
14 │        └── test.yml
15 ├── vars
16 │    └── main.yml
Ansible - Basic Workflow

# update it to do some stuff
$EDITOR tasks/main.yml
# run it - lazy shortcut
ansible -K localhost -c local \
   -m include_role -a name=${USER}-environment

(and commit/push to a repo for sharing)
Packages

Package types:

- rpm/deb
- flatpak
- snap
- homebrew (linuxbrew)

- name: Install RPMs
  ansible.builtin.dnf:
  name:
  - '@Development Tools'
  - ansible-lint
Package Origin Preferences

- Distro packages
- Flatpak
- Homebrew
- Snap
System Config - Files

files/no-passwords.conf

PasswordAuthentication no

Ansible:

```yaml
- name: Disable ssh password authentication
  become: true
  ansible.builtin.copy:
    src: no-passwords.conf
    dest: /etc/ssh/sshd_config.d/no-passwords.conf
    mode: '0600'
```
System Config - Templates

templates/sudoers-custom.j2

{{ ansible_user_id }} ALL=(ALL) NOPASSWD: ALL

Ansible:

- name: Land sudoers template
  ansible.builtin.template:
    src: sudoers-custom.j2
    dest: /etc/sudoers.d/sudoers-custom
    validate: /usr/sbin/visudo -cf %s
Using Ansible Elsewhere

```bash
ansible-galaxy role install \ 
  --force \ 
  git+https://github.com/$USER/$USER-environment
ansible -K localhost -c local \ 
  -m include_role -a name=$USER-environment
```

Note

You can apply remotely as well, see docs.
Ansible - Other Capabilities

- Manage users/groups
- Manage services/jobs (systemd & cron)
- Execute commands/scripts
Chezmoi
Chezmoi - Why

- lighter weight
- better than files in a git repo
- ergonomics
Chezmoi Installation

# also pulls dotfiles if you already use chezmoi
sh -c "$(curl -fsLS get.chezmoi.io)"
  -- init \
  --apply \
  $GITHUB_USERNAME
User Config

- vim vs. emacs
- vs. vscode
- vs. vscode
- .bashrc
- .zshrc
- .gitconfig

```bash
chezmoi add ~/.bashrc
chezmoi git commit
chezmoi git push
```
Templates

dot_gitconfig.tmpl

[<user>]
    name  = Kevin Howell
    email = {{ .email }}

[<core>]
    editor = vim

[<diff>]
    tool = meld

[<init>]
    defaultBranch = main
Tools

Useful code that isn’t distro packaged (yet)

GitHub Releases  Python Packages  Node Packages
Managing GitHub Releases

~/.local/share/chezmoi/.chezmoiexternal.toml.tmpl

```toml
{{ $versions := (fromYaml (include "versions.yaml")) -}}
["bin/ollama"]
  type = "file"
  executable = true
  url = "https://github.com/ollama/ollama/releases/download/{{ $versions.ollama }}/ollama"  
```

Tip
You can use this with renovate to get automated updates.
Managing Python Packages

`~/.local/share/chezmoi/run_after_poetryinstall.sh`

```bash
#!/bin/bash
 cd ~/tools/python  # make sure include this in $PATH
 poetry install --no-root --sync
```

**Note**

Can follow a similar pattern for npm packages.

**Tip**

You can use this with renovate/dependabot to get automated updates.
Scripts

1. scripts git repo (can add to $PATH)
2. directly in dotfiles repo
Using Chezmoi Elsewhere

```
chezmoi init $username --apply
```
Inspiration

• Browse Ansible Galaxy for roles (https://galaxy.ansible.com)
• Browse Ansible collections docs (https://docs.ansible.com)
• Search GitHub for topic: chezmoi (https://github.com/topics/chezmoi)
• Search github for dotfiles repos
My Repos

- https://github.com/kahowell/kahowell-environment
- https://github.com/kahowell/dotfiles
Red Hat Developer

- no-cost subscription for individuals
- free sandbox environments
- https://developers.redhat.com
Q&A

Thanks for attending!

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