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NORTH AMERICA

# Flatcar tutorial

**Take the power back on your containers**

#osummit Mathieu Tortuyaux – (Mastodon: @tormath1 @fosstodon.org)



# Requirements

- Linux or Linux VM with nested virtualization
- Internet access
- Qemu and Terraform
- (asciinema to run the demo locally)



# Who am I



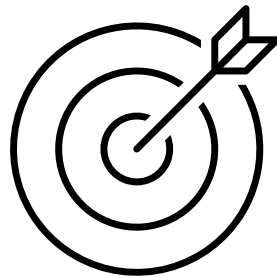
- Mathieu Tortuyaux (@tormath1)
- Work on Flatcar and related tools
- Occasionally “devops teacher”
- Software engineer with Microsoft

# Goals

operate Flatcar

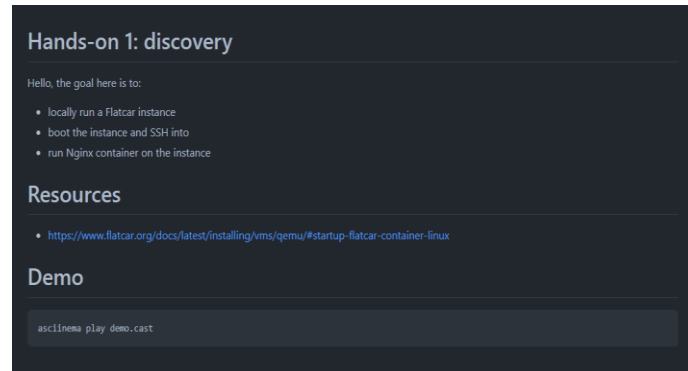
deploy Flatcar with Terraform

Ignition provisioning



# How is the tutorial structured?

# How is the tutorial structured?



[tormath1/flatcar-tutorial \(github.com\)](https://github.com/tormath1/flatcar-tutorial)

# In case of question, now or later

<https://matrix.to/#/#flatcar:matrix.org>

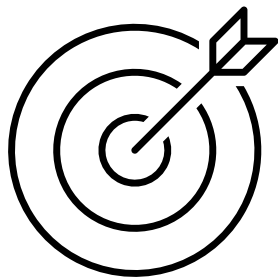
(Flatcar development and user channel)

# Flatcar:





# Hands-on 1: discovery



Locally run Flatcar instance



Boot the instance and SSH into



Run a Nginx Docker container

[tormath1/flatcar-tutorial \(github.com\)](https://github.com/tormath1/flatcar-tutorial)

# Ignition

- First boot
- All or nothing
- Declarative
- Generated config

# Ignition

```
{
  "ignition": {
    "version": "3.3.0"
  },
  "passwd": {
    "users": [
      {
        "groups": [
          "docker"
        ],
        "name": "caddy",
        "noCreateHome": true
      }
    ]
  },
  "storage": {
    "files": [
      {
        "group": {
          "name": "caddy"
        },
        "path": "/src/www/html/brand-logo.svg",
        "user": {
          "name": "caddy"
        },
        "contents": {
          "source": "https://www.flatcar.org/media/brand-logo.svg"
        },
        "mode": 420
      },
      {
        "group": {
          "name": "caddy"
        },
        "path": "/srv/www/html/index.html",
        "user": {
          "name": "caddy"
        },
        "contents": {
          "source": "https://www.flatcar.org/media/brand-logo.svg"
        }
      }
    ]
  }
}
```

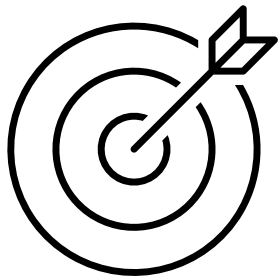
# Ignition

butane < butane.yml > ignition.json

```
variant: flatcar
version: 1.0.0
passwd:
  users:
    - name: caddy
      no_create_home: true
      groups:
        - docker
storage:
  files:
    - path: /src/www/html/brand-logo.svg
      contents:
        source: https://www.flatcar.org/media/brand-logo.svg
        mode: 0644
        user:
          name: caddy
          group:
            name: caddy
        - path: /srv/www/html/index.html
          mode: 0644
          user:
            name: caddy
          group:
            name: caddy
          contents:
            inline: |
              <html><body align="center">
                <h1>Hello world!</h1>
                
              </body></html>
  filesystems:
    - path: /srv/www
      device: /dev/disk/by-partlabel/USR-B
      format: ext4
      wipe_filesystem: true
      with_mount_unit: true
systemd:
  units:
    - name: froscon-demo-webserver.service
      enabled: true
      contents: |
        [Unit]
        Description=froScon example static web server
        After=docker.service
        Requires=docker.service
        [Service]
        User=caddy
        TimeoutStartSec=0
        ExecStartPre=/usr/bin/docker rm --force caddy
        ExecStart=/usr/bin/docker run -i -p 80:80 --name caddy \
          -v /srv/www/html:/usr/share/caddy \
          docker.io/caddy caddy file-server \
          --root /usr/share/caddy --access-log
        ExecStop=/usr/bin/docker stop caddy
        Restart=always
        RestartSec=5s
        [Install]
        WantedBy=multi-user.target
```

```
{
  "ignition": {
    "version": "3.3.0"
  },
  "passwd": {
    "users": [
      {
        "groups": [
          "docker"
        ],
        "name": "caddy",
        "noCreateHome": true
      }
    ]
  },
  "storage": {
    "files": [
      {
        "group": {
          "name": "caddy"
        },
        "path": "/src/www/html/brand-logo.svg",
        "user": {
          "name": "caddy"
        },
        "contents": {
          "source": "https://www.flatcar.org/media/brand-logo.svg"
        },
        "mode": 420
      },
      {
        "group": {
          "name": "caddy"
        },
        "path": "/srv/www/html/index.html",
        "user": {
          "name": "caddy"
        }
      }
    ]
  }
}
```

# Hands-on 2: provisioning



Provision a local Flatcar instance



Write Butane configuration



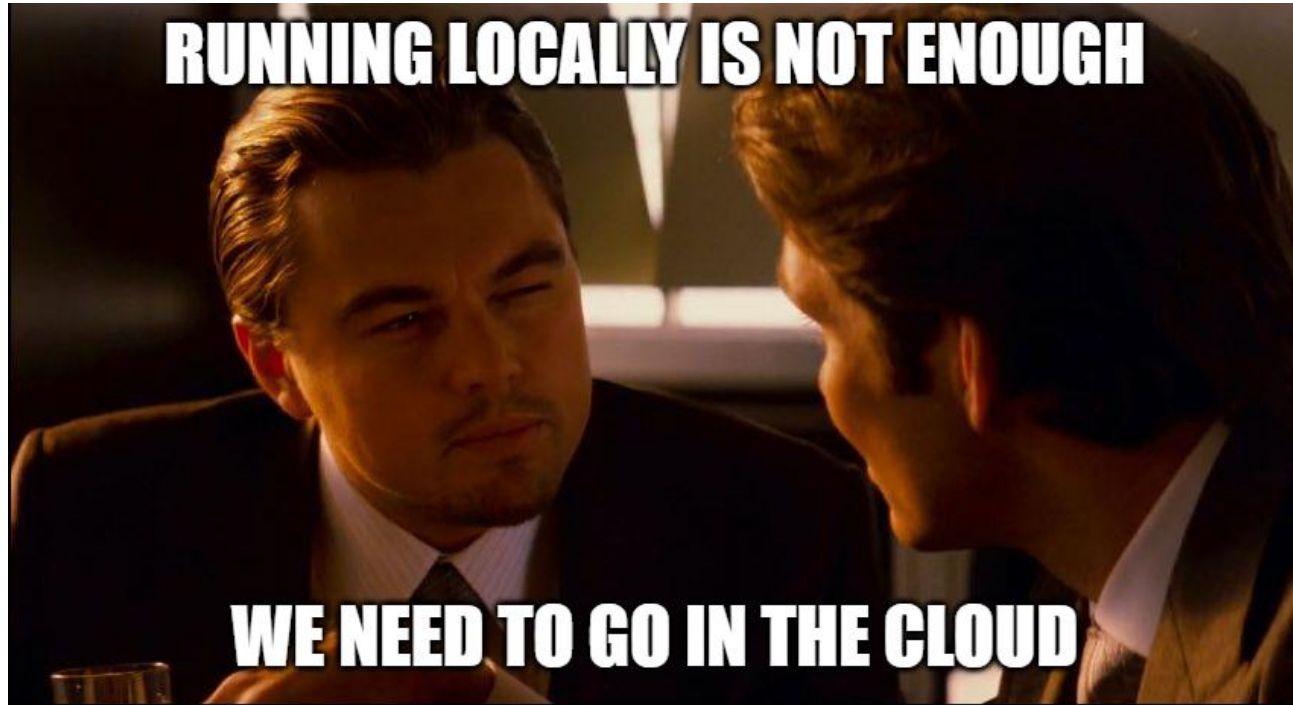
Generate the Ignition configuration



Boot the instance with the config

[tormath1/flatcar-tutorial \(github.com\)](https://github.com/tormath1/flatcar-tutorial)

# 5 minutes break




# In the cloud

- QEMU, Vagrant, Virtualbox, libvirt, PXE, ...
- Aws, Azure, GCP, Equinix Metal, OpenStack, VMWare, Digital Ocean, Hetzner
- Vultr, Rackspace, Exoscale, ...



# Azure

## User data

Pass a script, configuration file, or other data that will be accessible to your applications **throughout the lifetime of the virtual machine**. Don't use user data for storing your secrets or passwords. [Learn more about user data for VMs](#) 

Enable user data



User data \*

# Google Cloud Platform

## Metadata

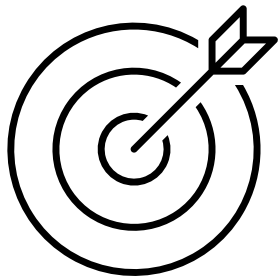
You can set custom metadata for an instance or project outside of the server-defined metadata. This is useful for passing in arbitrary values to your project or instance that can be queried by your code on the instance. [Learn more](#)

Key 1 \*

user-data

Value 1

# Hands-on 3: deploying



## Deploy Flatcar instances with IaC



Manipulate Terraform code



Write Flatcar provisioning with Terraform

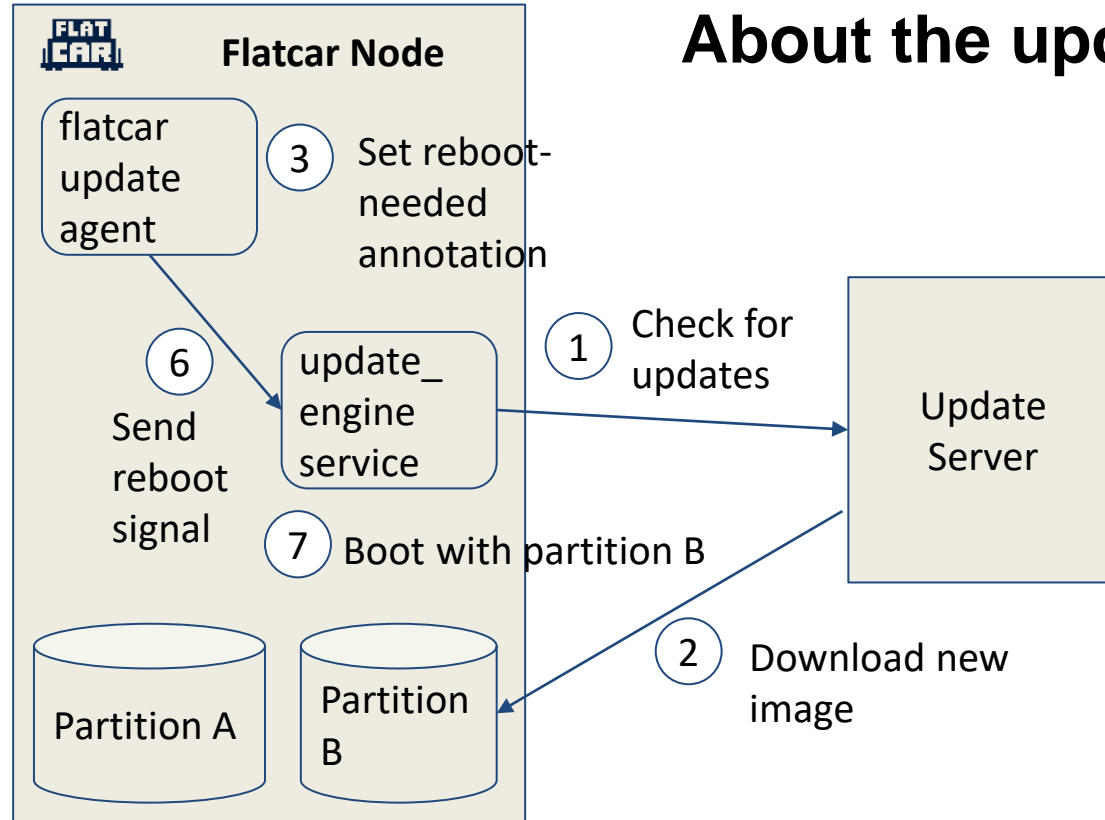


Deploy Flatcar on OpenStack with Terraform

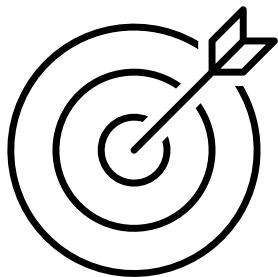
[tormath1/flatcar-tutorial \(github.com\)](https://github.com/tormath1/flatcar-tutorial)

# About the update

# About the update



# Hands-on 4: auto update



Leverage auto-update feature



Boot an old version of Flatcar



Control the update

[tormath1/flatcar-tutorial \(github.com\)](https://github.com/tormath1/flatcar-tutorial)

# Thank you.

<https://matrix.to/#/#flatcar:matrix.org>



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