Virtual Environments

(Not-only) for Flask development

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Multiple Developers + Automation Challenges

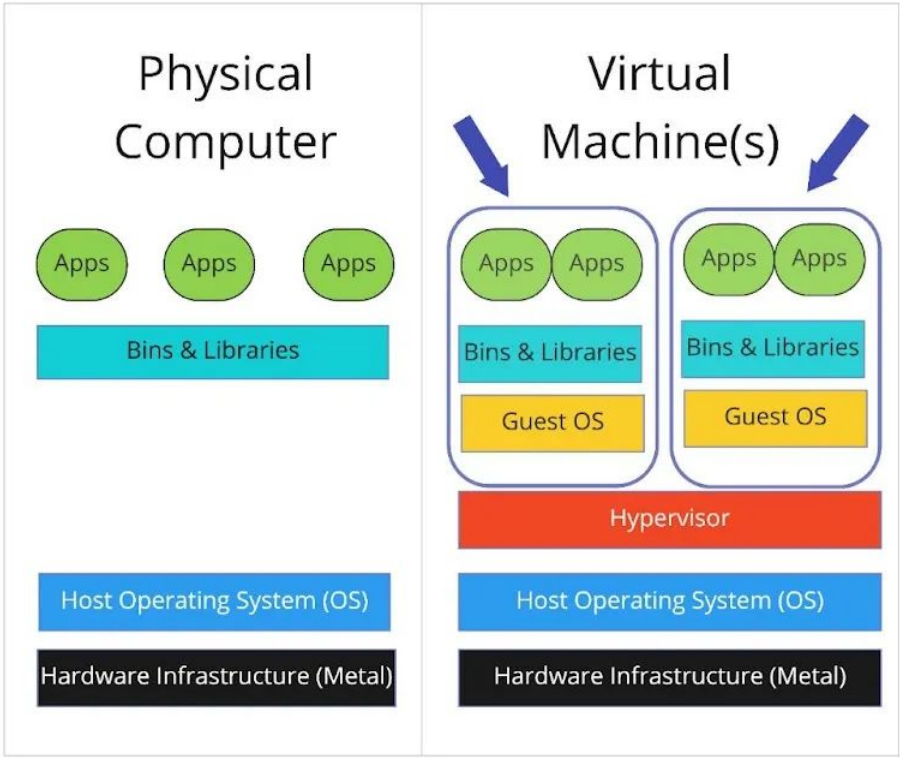
Challenges:

- OS specific installations required
- How to collaborate on code/frameworks?
- Automate data collection / model training
- New team member onboarding
- “It works on my machine” ¯_(ツ)_/¯

Solutions:

- Isolate development into environments that can be shared
- Track software/framework installs
- Develop in an common OS regardless of developers host OS

Virtual Machine



https://medium.com/kitchen-sink-data-science/software-fundamentals-for-machine-learning-series-understanding-the-why-of-vms-containers-89621cf66d23

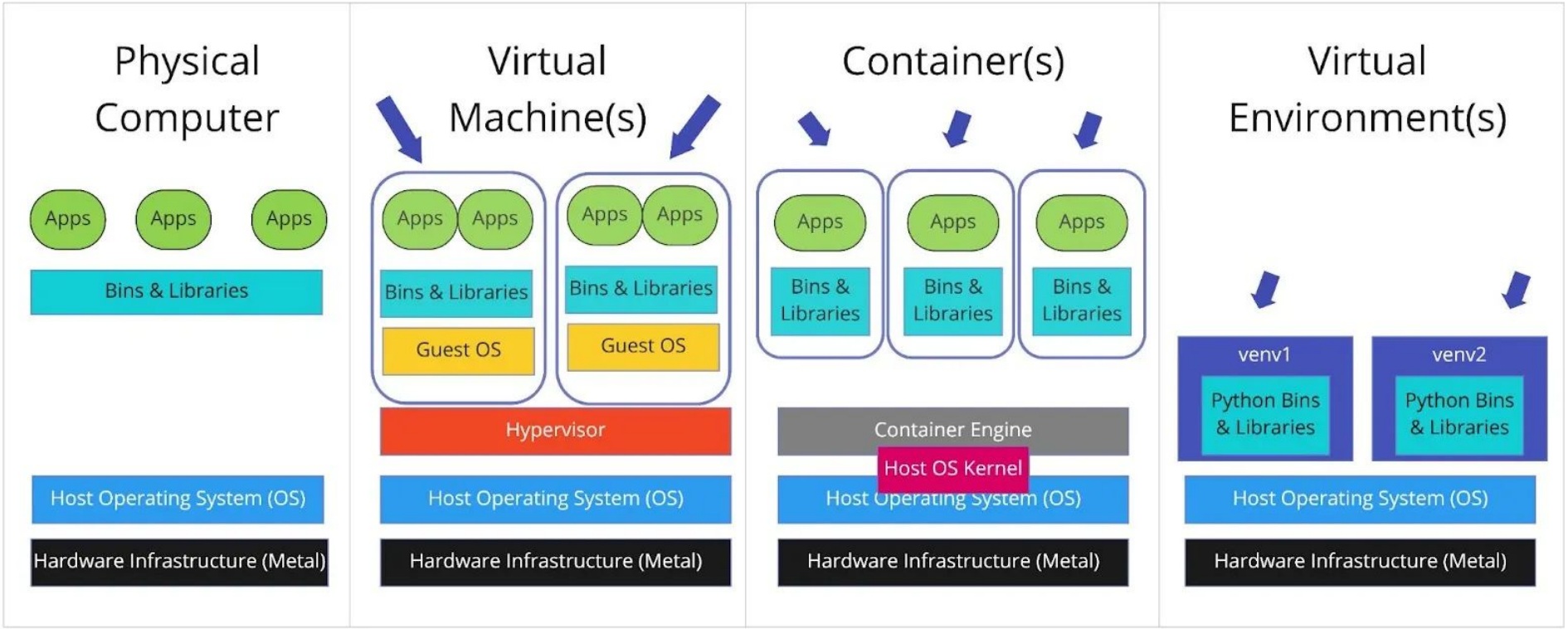
Virtual Machine Advantages

- Full **autonomy**: it works like a separate computer system; it is like running a computer within a computer.
- Very **secure**: the software inside the virtual machine cannot affect the actual computer.
- All team members want an **identical** machine with same OS.
- Should be **easy** create and delete instances.

Virtual Machine Limitations

- All softwares installations need to be same across team members
- Team members need to run the same experiments in **Isolation**!
- Not very **portable** since size of VMs are large
- Uses hardware in local machine
- There is an **overhead** associated with virtual machines
    - Guest is not as fast as the host system
    - Takes a long time to start up
    - It may not have the same graphics capabilities

Virtual Environments



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Virtual Environment

• A virtual environment is an isolated python environment where the interpreter can **run libraries** and **scripts independently** from other virtual environments

• Virtual environments help to make development and use of code more **streamlined**.

• Virtual environments keep dependencies in separate “sandboxes” so you can switch between both applications easily and get them running.

• Given an operating system and hardware, we can get the exact code environment set up using different technologies.

Virtual Environments Pros&Cons

Pros

- Reproducible research
- Explicit dependencies
- Improved engineering collaboration

Cons

- Difficulty setting up your environment
- Not isolation
- Does not always work across different OS

Virtual Environments

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VEnv

- Virtual environments manager embedded in Python
- Allows to install modules using pip package manager

Flask Installation
Using VEnv

How to use VEnv

- Create an environment within your project folder `virtualenv your_env_name`
- it will add a folder called `environment_name` in your project directory
- activate environment: `source your_env_name/bin/activate`
- install requirements using: `pip install package_name=version`
- deactivate environment once done: `deactivate`

Install Flask

(Linux: Assume **python3** is already installed)

Install virtualenv: > sudo apt-get install python3-virtualenv

Create venv: > virtualenv venv

Activate venv: > source venv/bin/activate

Install flask: > pip3 install flask

Test flask: > python3

… import flask …

Install Flask

(Linux: Assume **python3** is already installed)

Mac OS X / Windows:
First install Python3:
https://www.python.org/downloads/

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… import flask …

Install Flask

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Mac OS X / Windows:
Then install pip (if not installed):
python3 get-pip.py

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Visual Studio:

1) Install **Python Environment Manager**

2) Follow the instructions: https://code.visualstudio.com/docs/python/environments and https://marketplace.visualstudio.com/items?itemName=donjayamanne.python-environment-manager