UNIVERSITY 1 OF Nebraska.

**HOLLAND COMPUTING CENTER**

HCC Kickstart - Oct. 23, 2020

Agenda

- Overview of Anvil

- Introduction to OSG

- Open OnDemand

- What is a Virtual Machine
- Use Cases
- Anvil Access
- Using Anvil
- Demo (if there's time)

What is a Virtual Machine (VM)?

- "computer within a computer"

- Shared hardware that is partitioned and isolated to act as a stand-alone computer

- Can contain different types of operating systems and software
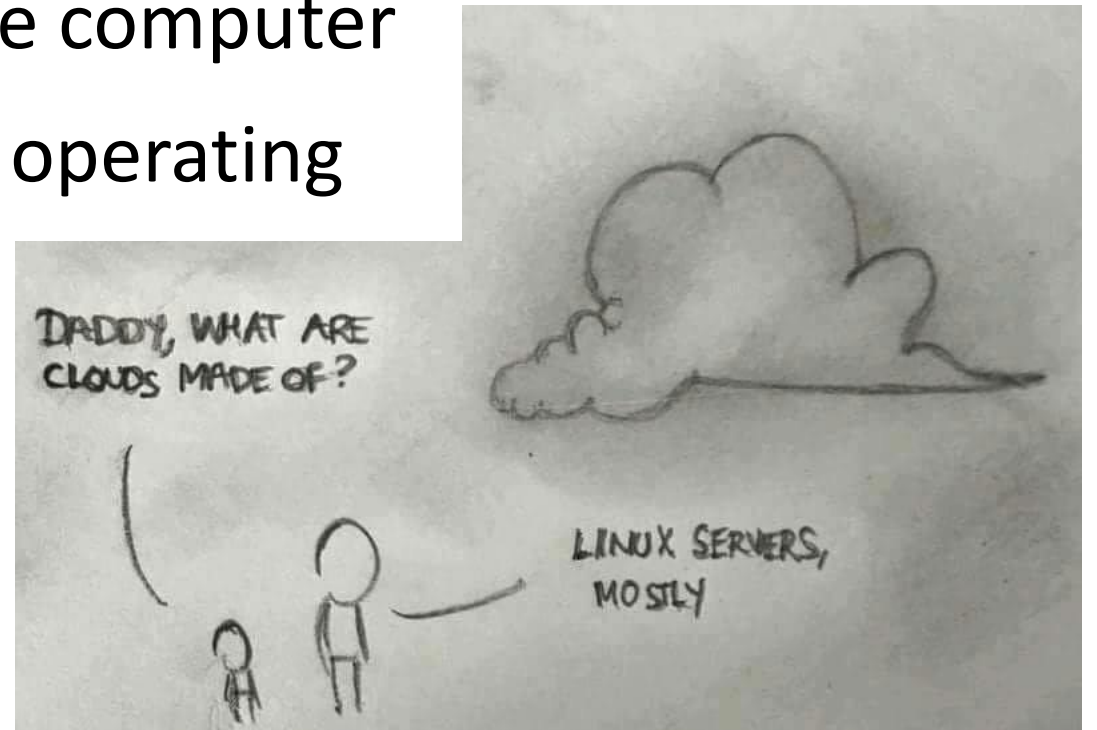
VM vs Container vs "bare metal"

Bare Metal   Virtualization   Containers
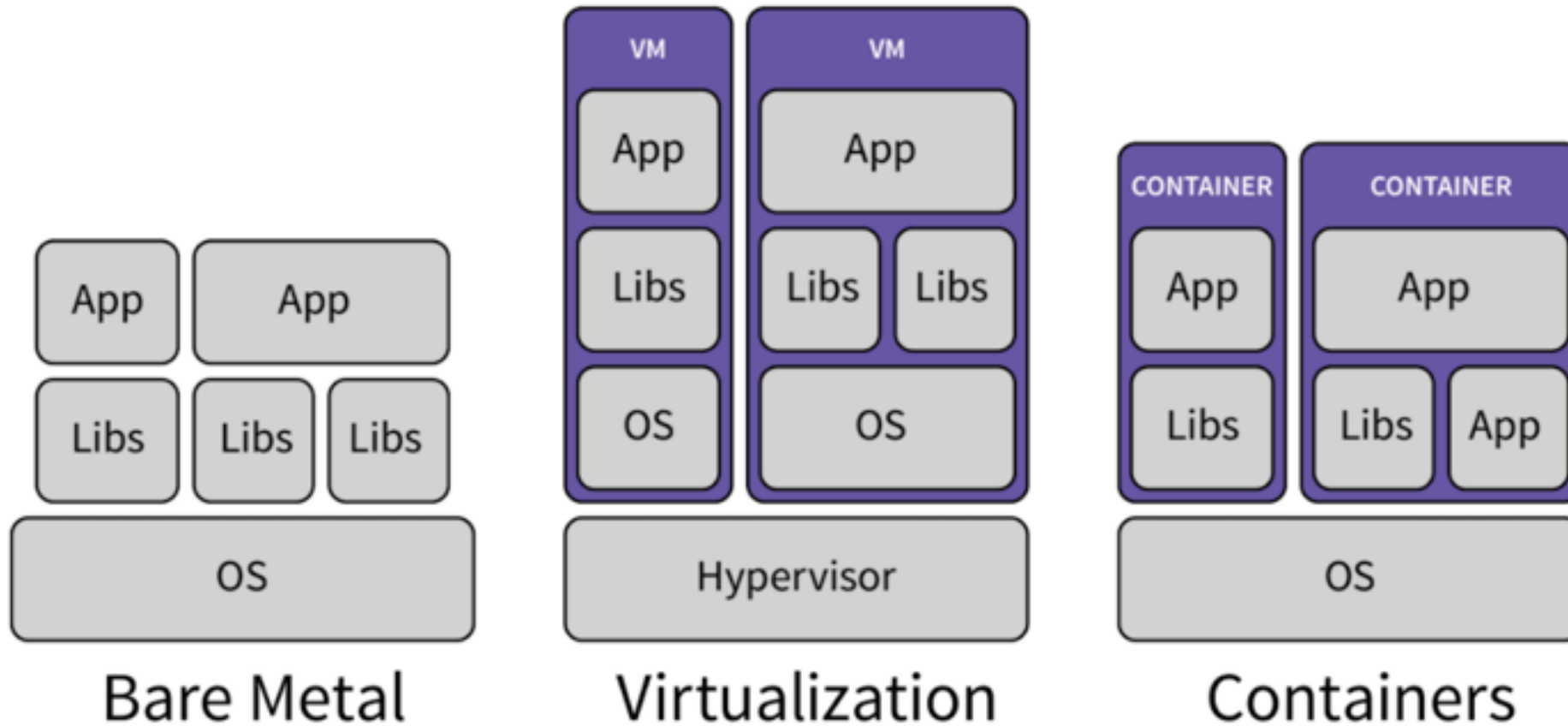
Anvil: HCC's Cloud

- OpenStack Cloud Resource offering customizable virtual machines

- For projects **not well served by a traditional Linux environment**:

  - Software with graphical interfaces

  - Alternate operating systems (such as Windows)

  - Projects that require root access or dedicated resources

    - test cluster environments

    - Web and database servers

Terminology

- **Project:** basic unit of ownership
  - HCC group = project
- **Image:** Everything needed to create a virtual machine
  - "Software"
- **Flavor:** The resources of the virtual machine
  - "Hardware"
- **Instance:** The virtual machine itself
  - Image + Flavor = Instance
- **Volume:** Persistent storage - can be mounted to different instances
  - "External Hard Drive"
- **Snapshot:** "backup" of an instance at a particular moment in time

Using Anvil: Access and Overview

- Access to Anvil is by request only:
  - To request access visit: https://hcc.unl.edu/request-anvil-access

- Group Resource Limits:
  - Groups are allocated the following resources:

Number of Instances	Virtual Cores	RAM	Number of Volumes	Volume Storage
10	20	60GB	10	100 GB

  - Resource limits can be increased if necessary.
    - Email us at hcc-support@unl.edu to request an increase.

Creating a VM: Overview

- [Connect to Anvil VPN](#) *
- [Create SSH Keys](#)
- [Create Instance](#)
- Connect to Instance *

* These are the only steps needed to connect
to an instance once it is created

Creating a VM: Connect to the Anvil VPN

- The Anvil dashboard is accessible from the internet in general

  - Anvil instances are administered via the dashboard at http://anvil.unl.edu

- For security reasons, **Anvil instances are not**

- In order to connect to Anvil instances, you will need to first **connect to the Anvil VPN**

- NU affiliates can use the Cisco AnyConnect client that is used to connect to the University of Nebraska VPN

SSH Keys

- OpenStack uses SSH key pairs - instead of username/password

- Key pairs consist of two files, a **public key** and a **private key**

- The public file can be shared freely
  - This file will be uploaded to OpenStack and associated with your account

- The private key file should be treated the same as a password.
  - **Treat the private key file the same as you would a password**
  - **Keep your private key in a secure location and do not share it with anyone**
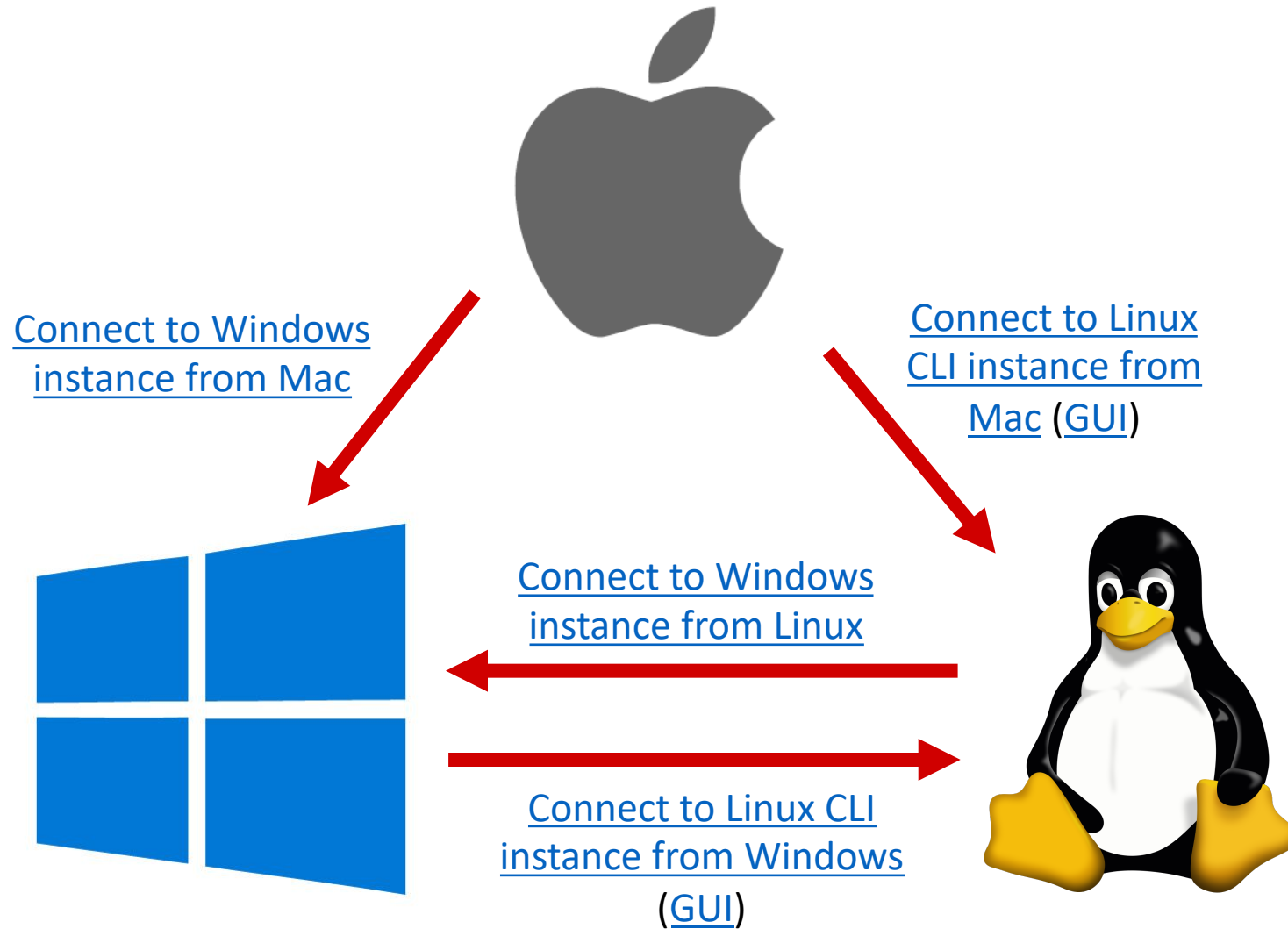
Public Key

Anvil

Instance

Private Key

Instances

Connect to Windows instance from Mac

Connect to Linux CLI instance from Mac (GUI)

Connect to Windows instance from Linux

Connect to Linux CLI instance from Windows (GUI)

Available Instances:
- Windows 10
  - Mathematica
  - MATLAB
  - SAS
- Linux (CLI and GUI)
  - CentOS
  - Cloudera QuickStart
  - Fedora
  - Ubuntu

Contact Us

- **Email:**
  - hcc-support@unl.edu
- **Virtual Open Office Hours:**
  - Tuesdays and Thursdays
  - 2 to 3 pm
  - http://go.unl.edu/HCChelp