Virtualization

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Overview

- Virtualization
  - Why do we need virtualization?
  - Different kinds of Virtualization.
  - Use lxc : Application virtualization
  - Use virtualbox: Hardware virtualization

Why virtualization?

- Run different OS:
  - Run android 6.0 on top of Linux desktop
  - Run Windows on top of Linux
  - Run Linux on top of Linux
  - Run Linux for arm on top of Linux x86
- Isolation guarantee
- Easy Migration from one computer to another computer
- Enables cloud

Different kinds of virtualization

- App Virtualization
- H/w Virtualization

App Virtualization

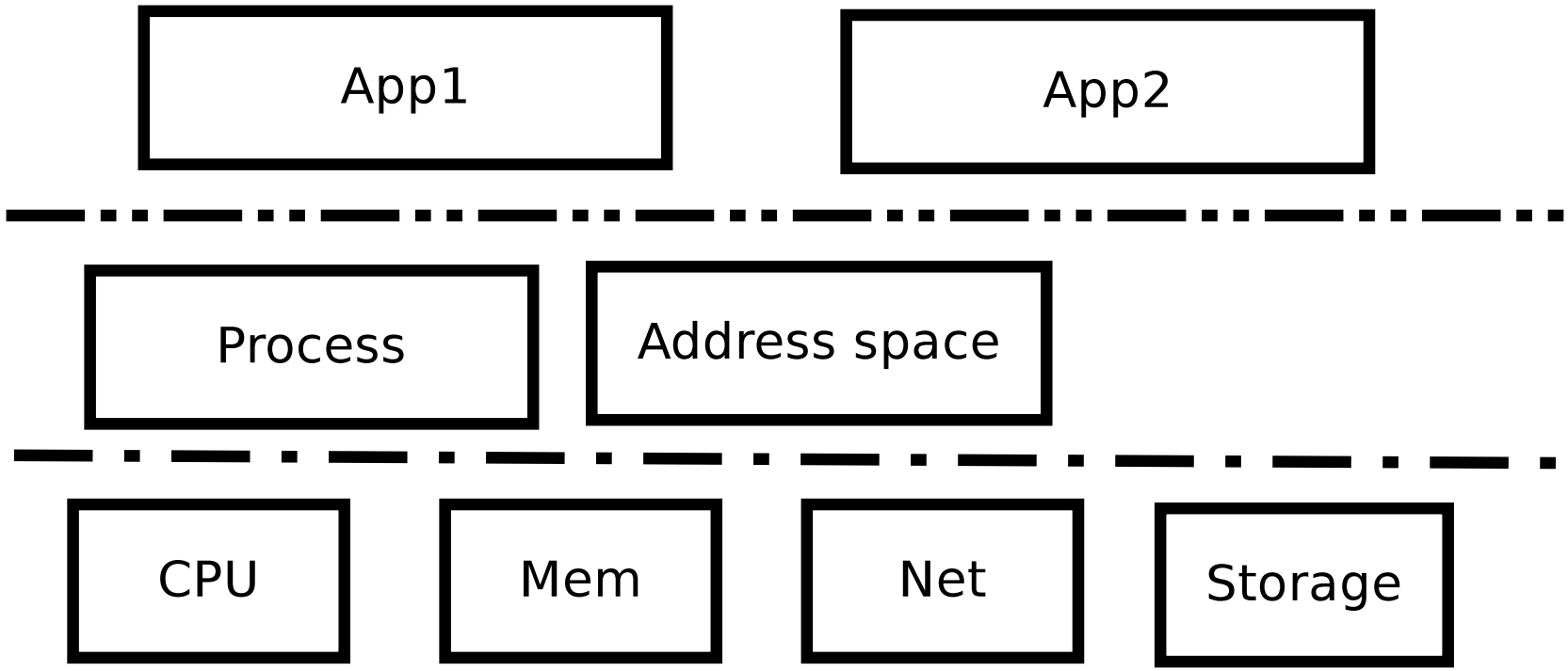

Figure 1:

- Map infinte resources to finite resources
- Isolation/Controlled sharing
- But network/filesystem are shared among apps.
- But pids are shared among apps.

H/w Virtualization

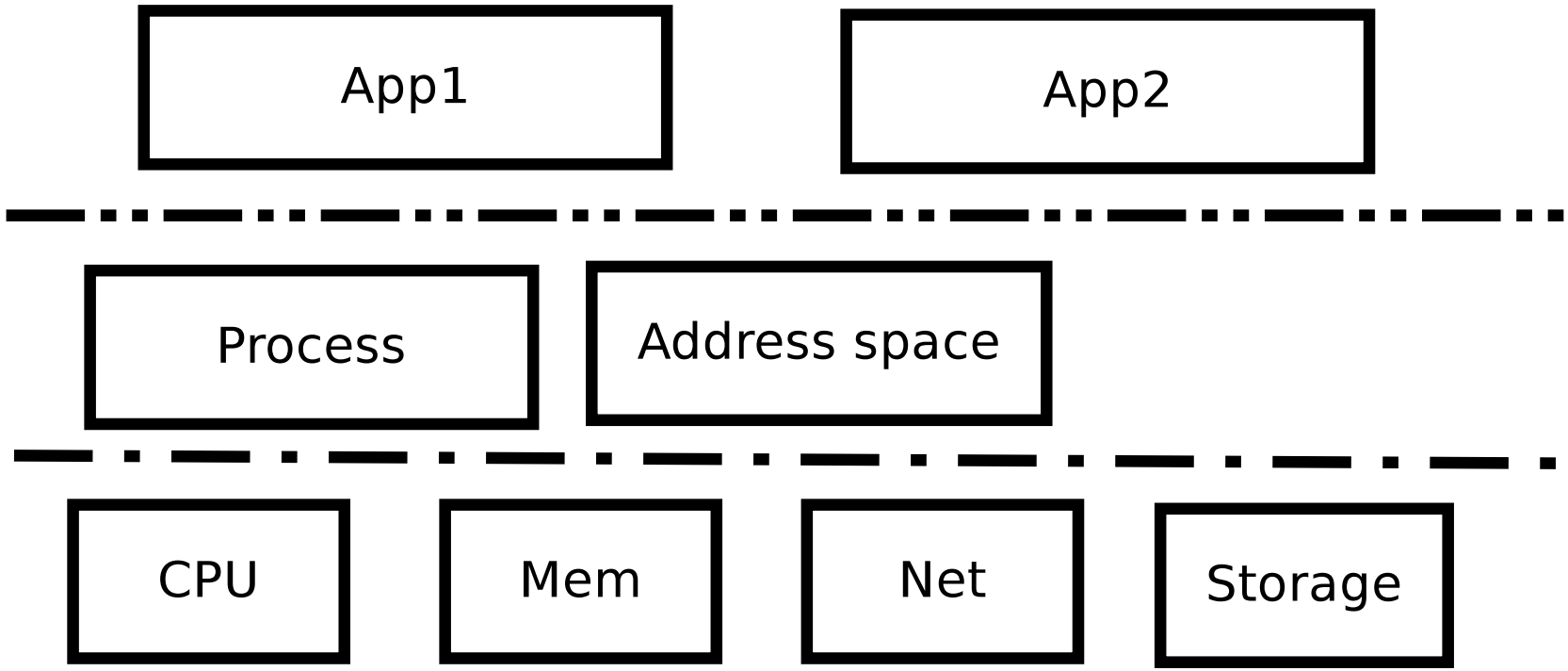

Figure 2:

- Cons of App VM: Kernels are shared
- Pros of App VM: Can't run different OS
- Why?

H/w Virtualization

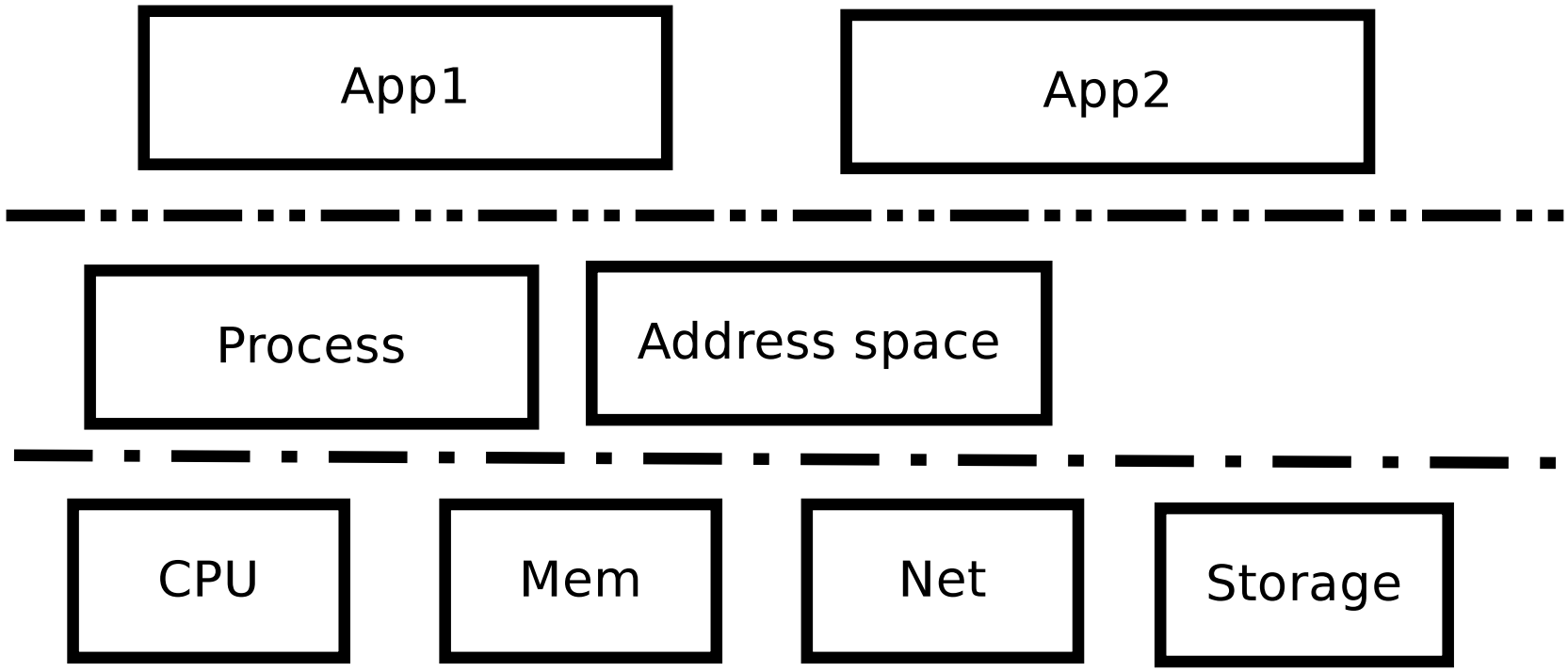

Figure 3:

- Cons of App VM: Kernels are shared
- Pros of App VM: Can't run different OS
- Why? Coz OS expects H/w interface not OS interface
- Sol: Hypervisor/ Hw VM: Make OS interface = H/w interface

Lab: LXC

- Goal: Execute ubuntu image on top of debian
- Download/Create Ubuntu Image:
  - sudo lxc-create –name vmname -t download
  - Location: /var/lib/lxc/vmname
- List VMs:
  - sudo lxc-ls -f
- Start VM:
  - sudo lxc-start -n vmname
- Attach VM:
  - sudo lxc-attach -n vmname
- Get console:
  - sudo lxc-console -n vmname -t ttyno
- Info VM:
  - sudo lxc-info -n vmname
- LAB:
  - Notice different pid mapping

Lab: LXC:

- Enable networking in lxc
  - USE_LXC_BRIDGE="true" (/etc/default/lxc-net)
- Restart lxc-net
  - sudo service lxc-net restart
- Enable network:

```
lxc.network.type = veth
lxc.network.link = lxcbr0
lxc.network.flags = up
lxc.network.hwaddr = 00:16:3e:xx:xx:xx
```

- LAB:
  - Notice new ip for your App VM
- Info: https://wiki.debian.org/LXC/SimpleBridge

Lab: Virtualbox

- Run Android on top of Linux
- Install Windows on top of Linux