Software Defined Networking

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In this course, you will learn about software defined networking and how it is changing the way communications networks are managed, maintained, and secured.

Containers and Docker

- Overview of Containerization
  - What are containers?
  - Why are they useful?
- Examples of Containerization

Containers

- Operating System-level virtualization
  - Run multiple isolated Linux systems on a single host
  - Unprivileged containers allow users to run software on the host without accessing hardware
- Previous versions
  - OpenVZ
  - Linux vServer

Why Containers Are Useful

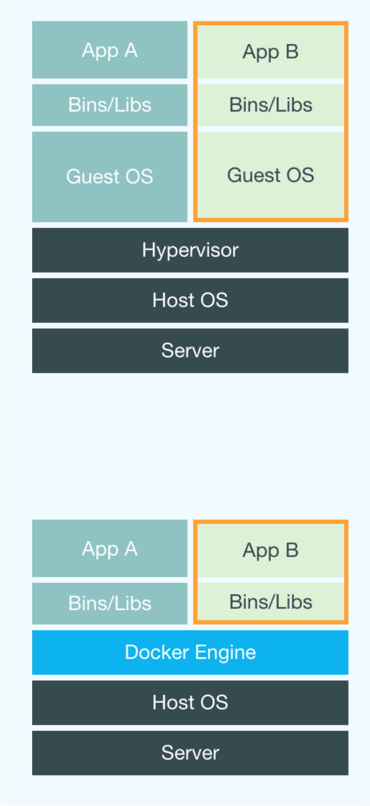
- **Portability:** Develop in a contained host environment, deploy on any host that is running a Docker host.

- **Isolation:** Application running in one container is isolated from others.

Differences from Virtual Machines

- Virtual machine not only has the application and binaries/ libraries, but also a guest OS
  - Many Gigabytes, slow to load

- Container has only the applications and its dependencies.



https://www.docker.com/whatisdocker/

Comparison to Virtual Machines

- Lower Overhead
  - Direct use of OS system calls
  - More efficient than emulation
- Less Flexibility
  - Guest OS different than host OS
- File-level Copy on Write
  - Easier backup, simpler caching, etc.

How is Docker Used?

- Distributed applications
- Continuous integration/delivery
- Platform as a Service
- Application deployment

Conclusion

- Containers are lightweight means of deploying applications
  - Faster to deploy, more lightweight than VMs

- A possible vehicle for deploying network functions, such as those we have heard about in a previous lecture.