# OpenStack Infrastructure-as-a-Service Lab

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Application of virtual machines to distributed systems

- For distributed systems, an important application of virtualization lies in cloud computing.
- Cloud providers offer three different types of services:
  - Infrastructure-as-a-Service (IaaS) - basic infrastructure.
  - Platform-as-a-Service (PaaS) - system-level services.
  - Software-as-a-Service (SaaS) - actual applications.
- Virtualization plays a key role in each of the above.
- For IaaS, instead of renting a physical machine, a client will rent a virtual machine (Amazon EC2).
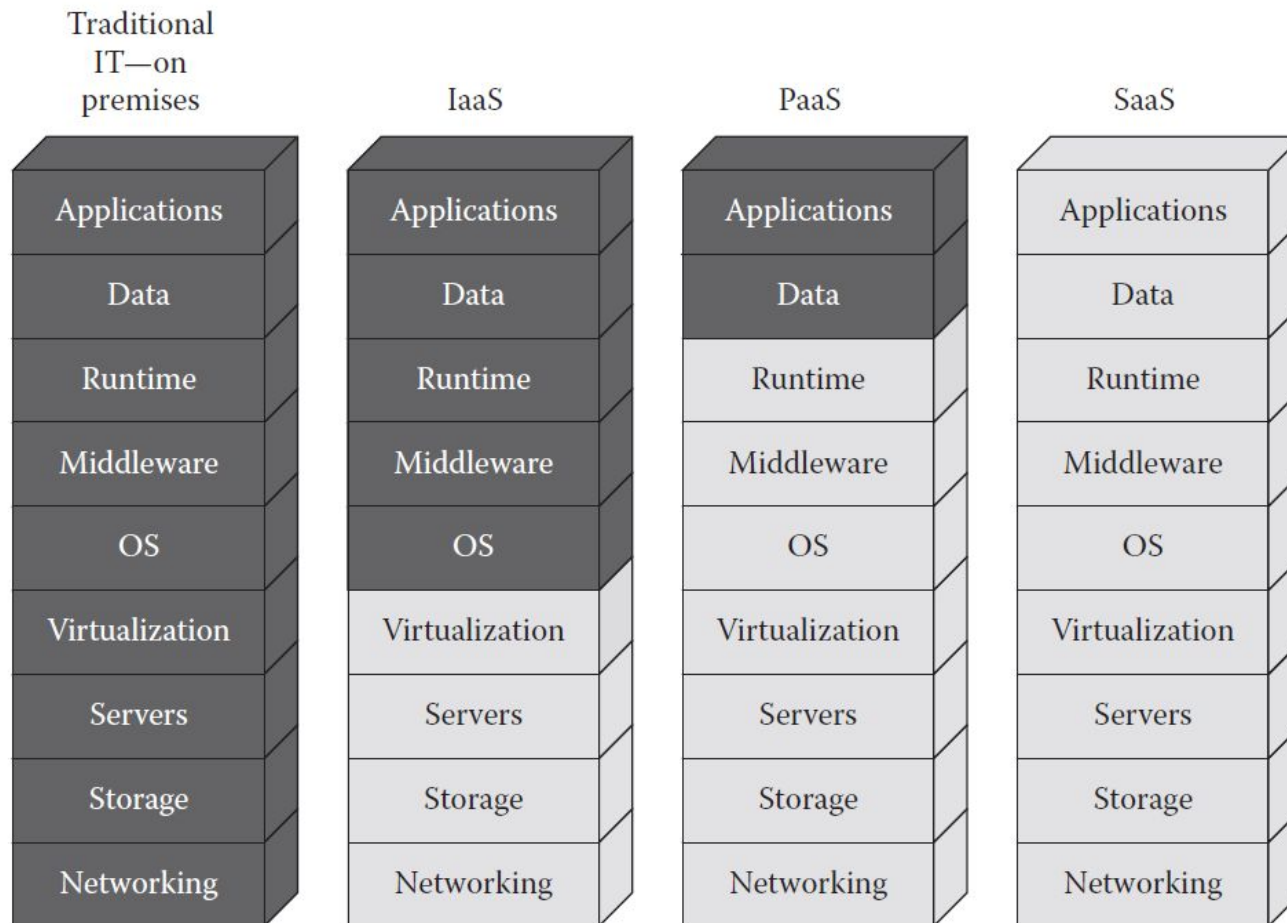
Separation of responsibilities in cloud operation (taken from Vacca 2016)

OpenStack

- OpenStack is a free and open-source software platform for cloud computing.
- Deployed as infrastructure-as-a-service (IaaS) - virtual servers and other resources are made available to customers.

- The School runs an OpenStack cluster for both students and staff to provide cloud computing capabilities.

Virtual machines
OpenStack
Computer cluster
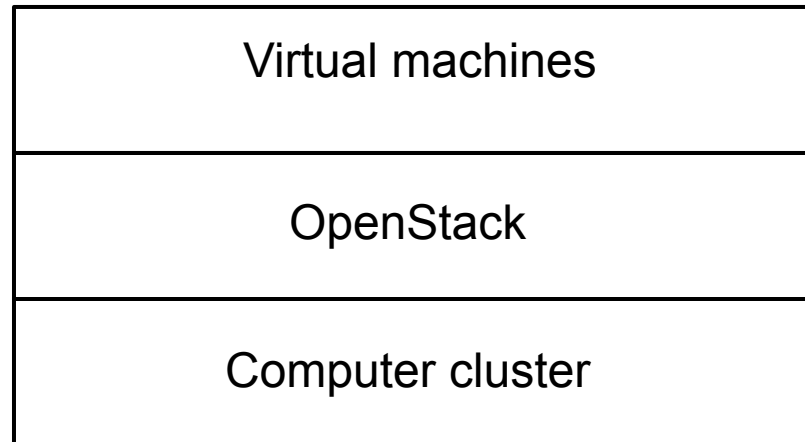
Lab

During the lab you will perform the following tasks:

- Create a private/public key pair on your laptop.
- Create a virtual machine instance using OpenStack; this should be a Ubuntu server instance.
- Assign the above private/public key to the instance.
- Remotely login and access the instance using SSH.
- Remotely install and play games on the instance.
- When complete terminate the instance.

- SSH (Secure Socket Shell) is a network protocol that provides a secure way to access a remote computer.

- Terminate instances when finished with them (i.e. at the end of a lab session).
- Do not use Internet Explorer; use Chrome, Firefox or Edge instead.
- Create and import a public/private key pair.
- Create a Ubuntu instance.
- Use local terminal to remotely log in to your virtual machine.