

Cloud Computing Fundamentals: Cloud Concepts

Cloud Principles



Eduardo Freitas
Business Automation Specialist

<https://edfreitas.me>



Overview



Introduction to Cloud Computing

Cloud vs. On-premise

Cloud Service Models

Cloud Deployment Models

Characteristics of Cloud Computing

Shared Responsibility Models



Version Check



This course is aligned with the:

- CompTIA Cloud Essentials+ (CLO-002)



Introduction to Cloud Computing



Cloud is the biggest
recent wave in IT.



Cloud Computing

Its name derives from the technology which is Internet based and represented as a cloud graphic.

https://en.wikipedia.org/wiki/Cloud_computing



Cloud Computing



Everyone is jumping on the cloud
You've probably used cloud technologies
To some it is still a bit nebulous
Maybe a little scary too



Cloud Services

Gmail / Office 365

Salesforce

Netflix



There's a lot to know about the
nuts and bolts of cloud
computing.



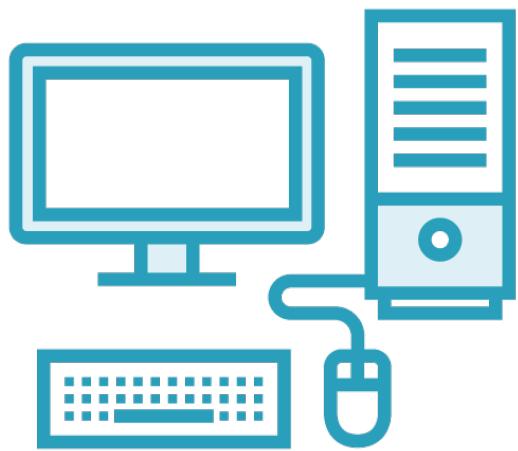
Cloud vs. On-premise



On-premise is also known as
“traditional computing”.



Traditional Computing



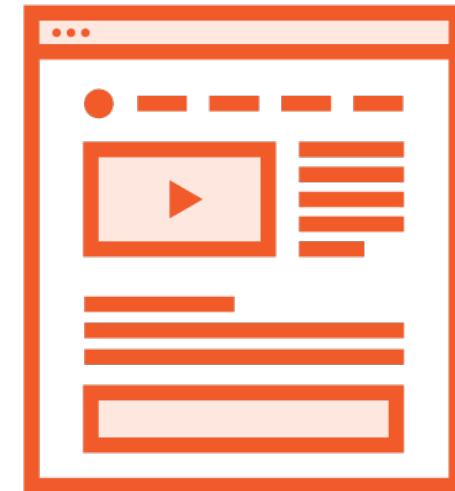
Hardware

Processor, memory,
hard drive, etc.



Operating System

Interfaces with the
hardware



Applications

Allow users to complete
tasks



Expanding Company Requirements



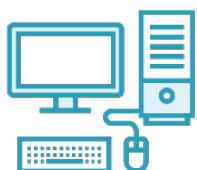
Over the years, more employees need computers



Eventually the computers need to talk to each other



Centralized storage and databases will be required



So along with computers, you must buy expensive server hardware



Expanding Company Requirements



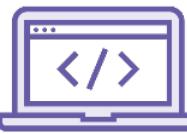
The costs add up and budgets get squeezed



Every few years much of the hardware becomes obsolete



Software companies keep producing new versions with features



So, the software needs to be upgraded as well



The pace of keeping up with
innovation becomes
overwhelming.



Cloud Computing



Computing services are provided for you

Renting computing resources

Flexibility and scalability

Access to latest technologies

Enterprise-level data protection

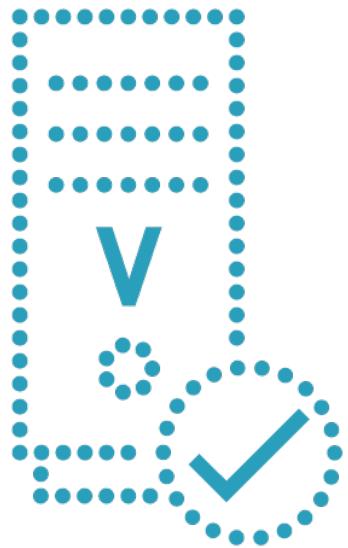
Reduced IT staff and admin costs



If the cloud is set up right, the user won't even know that a failure happened.

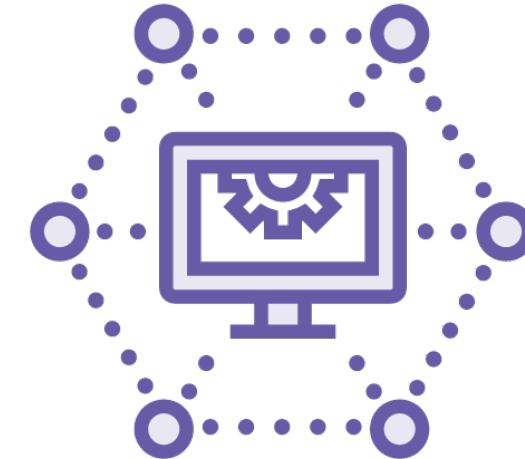


Technology Pillars of Cloud Computing



Virtualization

Not a one-to-one relationship between a physical server and a logical server



Hypervisor

Allows multiple OSs to share the same host, and manage the resource allocation to virtual OSs



Cloud Service Models



Cloud providers sell everything
“as a service”.



Models

**Infrastructure as a
Service (IaaS)**

**Platform as a Service
(PaaS)**

**Software as a
Service (SaaS)**



Infrastructure as a Service



Virtual hardware that replaces physical

Can scale up or down based on needs

You pay for what you use

Internet of Things (IoT)

High-performance computing

Data storage, backup, and recovery



IaaS

Compute

Block storage

Network



Platform as a Service



- Adds OSs and software**
- Runtime environments**
- Allows developers to focus on apps**
- Provisioning and deployment**
- Load balancing and autoscaling**
- APIs, DevOps, Integration and ML**



PaaS

Object storage

Identity

Runtime

Queue

Database



Software as a Service



Apps are accessed over the Internet

It is the largest of the three models

Likely the one you are most familiar with

Monthly or yearly subscription fee

Internet connection is required

The biggest concern is data security



SaaS

Monitoring

Content

Collaboration

Communication

Finance



Other Models

BPaaS

Business Processes

CaaS

Communications

MLaaS

Machine Learning

DBaaS

Databases

FaaS

Functions



Cloud Deployment Models



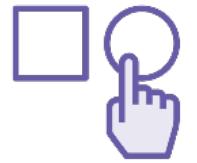
These clouds offer the best in scalability, reliability, flexibility, geographical independence, and cost effectiveness.



Public Clouds



Whatever the client wants, the client gets



If the client needs more resources, it simply scales up and uses more



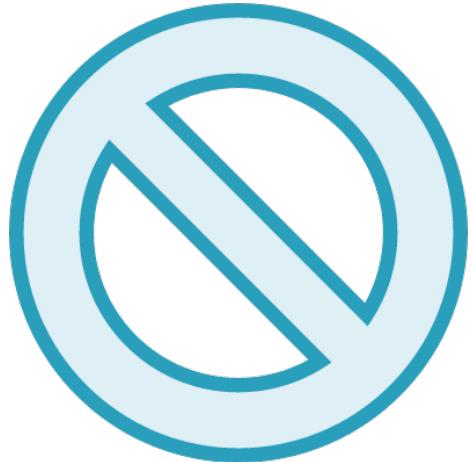
The client pays more, that's part of the deal



Operated by the third-party companies



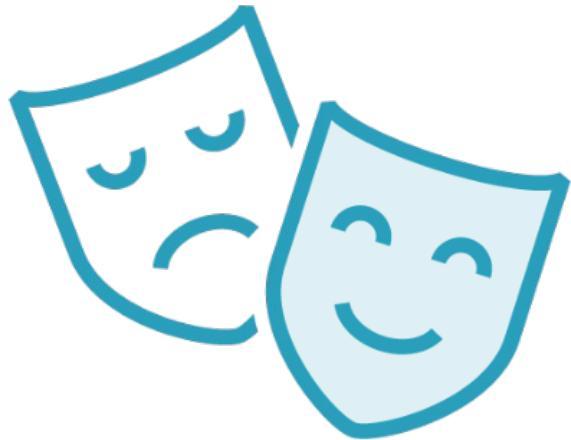
Private Cloud



Purchase virtualization software
Set up individual clouds
Within their own network
Limited scalability
Control all its own security



Hybrid Cloud



Combines public and private clouds

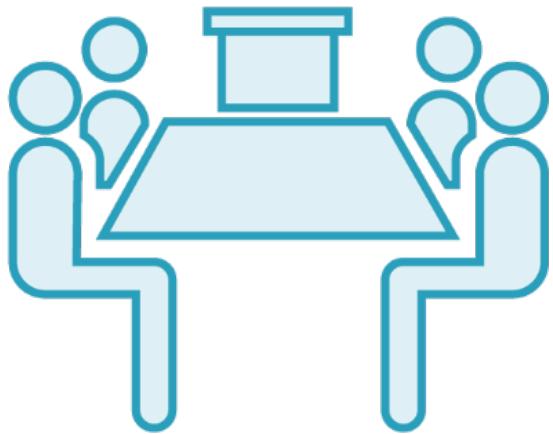
Storage of sensitive info privately

Tight control of data

Enjoy features of public clouds



Community Cloud

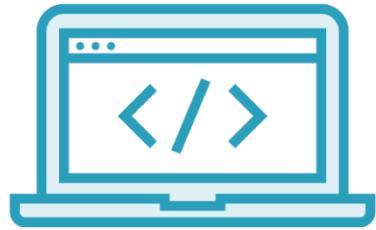


Organizations with common interests
Schools or merging companies
Clients know who the other clients are
Less scalability and flexibility



Except for private clouds, all cloud types use the concept of shared resources.





Cloud Computing Types

Cloud Computing Models and Deployment Models

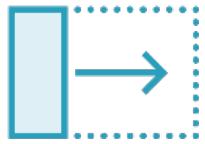
<https://aws.amazon.com/types-of-cloud-computing/>



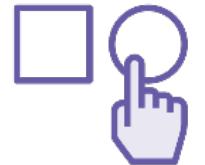
Characteristics of Cloud Computing



Characteristics



Elastic - grow or shrink as the client's needs change



Resource pooling – divided among clients as needed



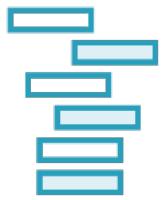
Rapid elasticity – fast allocation of resources



Self-service – automatically access any resources, at any time



Characteristics



Scalability – ability to use more or fewer resources



Broad network access – resources accessible over the network



Pay as you go – you pay for what you use and when you use it



Availability – resources are accessible when a client needs them



Shared Responsibility Models



A server is perfectly secure
until you plug it into the
network.

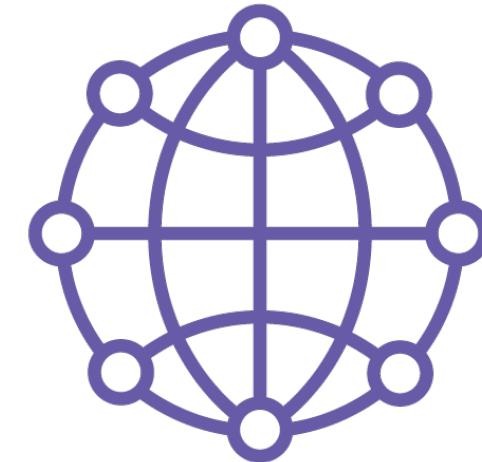


Shared Responsibility Model



Customer

Responsible for security “in” the cloud

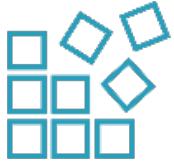


Provider

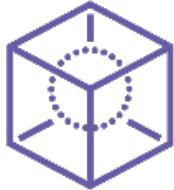
**Responsible for security “of” the cloud
(infrastructure & services)**



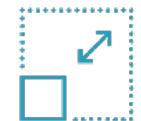
Customer



Customer data



Platform, applications, identity, and access management



Operating system, network, and firewall configuration



Network traffic, file system, and data encryption and integrity



Provider

Compute

Storage/database

Networking



Provider

Regions

Availability zones

Edge locations



Demo



Cloud Portal Overview



Summary



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Up Next:
Cloud Networking Concepts

