

Networking



Networking Implementation

1.8.1 - Cloud Concepts

What are some cloud deployment and service models?

Overview

The student will summarize cloud concepts and connectivity options

Grade Level(s)

10, 11, 12

Cyber Connections

- Threats & Vulnerabilities
- Networks & Internet
- Hardware & Software

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Teacher Notes:

CompTIA N10-008 Network+ Objectives

Objective 1.8

- Summarize cloud concepts and connectivity options
 - Deployment models
 - Public
 - Private
 - Hybrid
 - Community
 - Service models
 - Software as a service (SaaS)
 - Infrastructure as a service (IaaS)
 - Platform as a service (PaaS)
 - Desktop as a Service (DaaS)
 - Infrastructure as code
 - Automation/orchestration

Cloud Concepts

Types of Clouds

There are different ways to deploy a cloud. When we go to Amazon or Microsoft and take advantage of their cloud-based offering, we are using a *public* cloud. If we have the entire cloud internal to our organization, this is a *private* cloud. A *hybrid* cloud is a mix of both public and private. Finally, a *community* cloud expands a private cloud to different organizations that need to share the same resources.

SaaS

Software as a service (SaaS), also known as subscribeware or rentware, is a software distribution model in which a third-party provider hosts applications and makes them available to customers over the Internet. SaaS is one of three main categories of cloud computing, alongside platform as a service (PaaS) and infrastructure as a service (IaaS). There are additional categories such as desktop as a service (DaaS), managed software as a service (MSaaS), mobile backend as a service (MBaaS), datacenter as a service (DCaaS), and information technology management as a service (ITMAaaS).

Teacher Notes:

With SaaS, we do not need any local hardware or software installation on our premises since it is provided in the cloud. Some of the benefits of SaaS include easy user updates, simple integration between components, and software is updated and managed by someone else. A few examples are Dropbox, Office 365, and Google Docs.

IaaS

Infrastructure as a Service, also known as *hardware as a service (HaaS)*, is an instant computing infrastructure, provisioned and managed over the internet. We are outsourcing our equipment and using someone else's equipment to run our software. We are responsible for installation and management of the software.

Our organization controls all the software, but does not have to worry about having the data centers. Some examples are OpenStack, Apache Cloudstack or OpenNebula

PaaS the Ball!

Platform as a service (PaaS), also known as application platform as a service (aPaaS) or platform-based service, is a category of cloud computing services that provides a platform allowing customers to develop, run, and manage applications without having to build and maintain the infrastructure typically associated with developing and launching an application. With PaaS someone else controls the platform. Both hardware and software are controlled remotely. Applications and their associated data are controlled by the user.

With PaaS, there is no need to control the infrastructure. Someone else updates the system. Windows Azure and OpenShift are examples of PaaS

DaaS

Desktop as a service (DaaS) is a cloud computing offering where a service provider delivers virtual desktops to end users over the Internet. Two kinds of desktops are available in DaaS: persistent and non-persistent. With persistent desktop, users have the ability to customize and save a desktop so it will look the same every time a user accesses it. Non-persistent desktop resets every time the user logs out.

Teacher Notes:

Infrastructure as Code (IaC)

We have no hardware in a pure cloud computing environment. Everything is software-based. It is common to use a lot of automation in this environment to deploy new applications. Automation allows for quick and safe deployment except for on server hardware, and switches, and routers, and firewalls, and other infrastructure devices.

What if we could take the infrastructure devices and create them virtually? This is why we have *infrastructure as code (IaC)*. Infrastructure as code is the process of managing and provisioning computer data centers through machine-readable definition files, rather than physical hardware configuration or interactive configuration tools. Rather than worry about the back-end infrastructure, we worry about the application and deploy it where it makes the most sense. IaC tools configure and *automate* the provisioning of infrastructure. These tools can automatically execute the deployment of infrastructure, such as servers, with *orchestration* functionality.