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Assignment 2

Cloud Computing

1.

Private Cloud: Users and systems only have access to devices inside the same private clouds or systems.

Public Cloud: Users and systems interact with devices on public networks, like the Internet and other clouds.

Hybrid Cloud: Combination of private and public clouds.

2.

Network as a Service: Allows the outsourcing of a network to a service provider.

Ex. Amazon's VPC

Infrastructure as a Service: Allows the outsourcing of the infrastructure of desktops and servers to a service provider.

Ex. Microsoft Azure

Software as a Service: Allows users to interact with a web-based application, with the details of how it works hidden to the user.

Ex. Google Docs

Platform as a Service: Gives a development platform for companies developing applications without a need for infrastructure.

Ex. Apprenda

Virtualization

1. Virtualization allows the creation of virtual versions of computing instances, such as servers, networks, storage devices, or operating systems. It enables a physical machine to run multiple virtual environments, with each operating as a separate machine.

2. Virtualized storage, virtual firewalls, virtual desktops, virtual switches.

3. Virtual cpu, virtual memory, virtual hard disk. Virtual machine resides on a host machine, which is the physical computer that provides hardware resources that the VM uses via hypervisor.

Routing Concepts

1. Dynamic routing protocols, static routes, directly connected routes.

2. Interior Gateway Protocol (IGP), Exterior Gateway Protocol (EGP).

Difference: IGP's operate in a single organization's network, and manage devices inside same AS. EGP's manage the routing between different organization's networks.
3. IGP: Routing Information Protocol (RIP)/Distance Vector Protocol, Open Shortest Path First (OSPF)/Link State Protocol
EGP: Border Gateway Protocol (BGP)/Path(distance) Vector Protocol, Exterior Gateway Protocol (EGP)/Distance Vector Protocol
4. Distance Vectors Protocols use hop as a metric compared to Link State Protocols using cost as a metric.
5. Border Gateway Protocol
6. Multihomed router.

IP Addressing and Subnetting Concepts

1.

Class A

Ranges: 0.0.0.1 - 127.255.255.255
Default subnet mask: 255.0.0.0
Number of networks: 126
Number of hosts per network: 16,777,214

Class B

Ranges: 128.0.0.1 - 191.255.255.255
Default subnet mask: 255.255.0.0
Number of networks: 16384
Number of hosts per network: 65534

Class C

Ranges: 192.0.0.1 - 223.255.255.255
Default subnet mask: 255.255.255.0
Number of networks: 2,097,152
Number of hosts per network: 254

Class D

Ranges: 224.0.0.1 - 239.255.255.255

Class E

Ranges: 240.0.0.1 - 255.255.255.255

2.

RFC 1918

3.
Variable Length Subnet Mask(VLSM): This is a subnetting technique that allows network admin to create subnets of varying sizes within a single network.
4.
IPv4 & IPv6 differences

Length: IPv4 addresses use 32 bits, IPv6 addresses use 128 bits.

Format: IPv4 addresses use a four octet decimal point format, IPv6 addresses use eight sets of 4 hexadecimal digits in its format.

5.
IPv4: 192.168.1.1
IPv6: 2001:0db8:85a3:0000:0000:8a2e:0370:7334
6.
Use the double colon ::
7.
Network Address Translation (NAT): Allows for routing of private IP's through a public IP.
8.
IP address Class D.
9.
Online gaming and video streaming.

IP Addressing and Subnetting Scenarios

Scenario 1)

- Broadcast Address: 223.209.177.143
- /29: This notation refers to the subnet mask, and it means the first 29 bits of the IP address are reserved for the network portion.
- Alternate Representation for /29: 255.255.255.248
- 8 possible addresses
- Starting address: 223.209.177.137, Ending address: 223.209.177.142

Scenario 2)
Network ID: B)221.230.76.96

Scenario 3)
New Subnet mask: C) 255.255.255.224

Scenario 4)
Binary Representation: D) 11000000.10101000.00001010.00000000

Scenario 5a)
A) 191.199.64.0 255.255.248.0

Scenario 5b)
B) 191.199.71.255 255.255.248.0

Scenario 5c)
C) 2046

Scenario 6)
D) 255.255.255.252 and /30

Scenario 7)
Dotted Decimal Mask: 255.255.255.192
CIDR: /26

Scenario 8)
Dotted Decimal Mask: 255.255.255.224
CIDR: /27

Scenario 9)
Total Possible IP Addresses: 32
Starting IP Address: 172.17.18.65
Ending IP Address: 172.17.18.94
Network Address: 172.17.18.64
Broadcast Address: 172.17.18.95

Scenario 10)
CIDR: /22
Dotted Decimal Mask: 255.255.252.0

Scenario 11)
Total Possible IP Addresses: 2048
Starting IP Address: 10.100.200.1
Ending IP Address: 10.100.207.254
Network Address: 10.100.200.0
Broadcast Address: 10.100.207.255

Scenario 12)
Yes they are on the same subnet.

Routing

1. C) BGP

2. B) Not scalable

3. D) Asymmetric Routing

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