What are some motivations discussed for creating and deploying virtual networks?



**Allowing multiple tenants to share a data center network.**

****

**Quickly expanding an existing physical enterprise network as demand increases.**



Better forwarding performance.



Easier troubleshooting and debugging.



**Facilitating research by allowing researchers to deploy experimental code on production hardware.**

1 point

2.Question 2

Which of the following properties are characteristics of virtual networks (but not necessarily characteristics of SDN). (Be careful: The distinctions between SDN and virtual networks were discussed in the first lesson of this module.)



**Often deployed in data center networks to allow multiple tenants to share physical network infrastructure.**

****

**Separates logical and physical networks.**



Refactors network control so that network behavior is controlled from a single logically centralized controller.



**Abstracts the details of the physical network.**



Separates the data and control plane.

1 point

3.Question 3

Which of the following are possible ways of creating virtual links in a virtual network?



**A wide-area tunnel, whereby an Ethernet packet sent between two virtual machines is encapsulated in an IP packet.**

****

**Pairs of virtual Ethernet interfaces, where one end of the Ethernet interface pair resides in the virtual environment, and the other resides in the root namespace on the host machine.**



**A wide-area tunnel, whereby an IP packet is encapsulated in an MPLS tunnel by attaching an MPLS header to the packet.**



Longest-prefix match forwarding on an IP router.



**VLAN switching based on a VLAN tag.**

1 point

4.Question 4

Which of the following are true of the Mininet network emulator?



It can create an emulation that runs across multiple physically distributed nodes.



**It is possible to set different bandwidth and latency for each link in a Mininet topology.**



It requires running OpenFlow-capable switches.



**All of the hosts in the topology must run the same underlying operating system.**

****

Mininet only allows users to create three types of topologies: linear, tree, and single-switch topologies.

1 point

5.Question 5

What are the benefits of emulation as opposed to, say, simulation?



**An emulator makes it possible to "port" experiments from one machine to another.**

****

An emulation will complete faster than a simulation.



Every run of the emulator will yield exactly the same results, resulting in reproducible experiments.



An emulation is easier to debug than a simulation.



**An emulator allows the experimenter run real software on each of the nodes in the emulation.**

1 point

6.Question 6

Which of the following are possible in Mininet?



**Running performance measurement tools (e.g., iperf, wget) between nodes.**

****

**Assigning IP addresses to each node in the topology using a DHCP server.**



**Assigning MAC addresses to each node in the topology that correspond to host names/numbers.**



Measuring the latency between a host in San Francisco and a host in Los Angeles.



**"Shaping" a link between two nodes to a particular traffic rate.**

1 point

7.Question 7

Which of the following functions does FlowVisor enable?



**Allowing one controller to control TCP traffic and one controller to control UDP traffic.**



Allowing two different researchers to implement and deploy different Web load balancing applications for port 80 traffic.



Allowing two different researchers to implement and deploy different load balancing applications for all traffic between the same source-destination pair.



**Allowing two controllers to control traffic on distinct VLANs.**

****

**Allowing two different researchers to implement and deploy control mechanisms for two distinct applications.**

1 point

8.Question 8

Which of the following are stated applications of the Nicira Network Virtualization Platform?



Easier transition to IPv6 in data-center networks.



Allowing experimental protocols to coincide with a production network.



**Creating more than 1024 virtual networks, as opposed to the alternative of using VLAN tags.**

****

**Dynamic workload placement in multi-tenant data centers.**

****

**Central management of security policies.**

1 point

9.Question 9

Select the statement that is most true about the relationship between network virtualization and SDNs.



Network virtualization is a potential enabler for software defined networks, since the separation of data and control planes first requires the creation of a logical network.



Network virtualization and software defined networking each enable the other: SDN cannot exist without network virtualization, and network virtualization cannot exist without SDN.



Network virtualization is a new concept introduced by Amazon, Nicira, and industry players; it only made sense to talk about network virtualization once central SDN controllers existed.



**Software defined networking is a potential enabler for virtual networks, since separation of data and control planes makes it easier to manage a logical network topology May be ANSWER.**

1 point

10.Question 10

How many switches does Mininet create for a tree of depth 3 with default fanout?



1 point