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CNT 4004
Assignment 7

1.

a) ICMP stands for Internet Control Message Protocol.

b) Ping is the well-known program that uses ICMP and is directly implemented in most OSs.

c) Network management includes the deployment, integration, and coordination of the hardware, software, and human elements to monitor, test, poll, configure, analyze, evaluate, and control the network and element resources to meet the real-time, operational performance, and quality of service requirements at a reasonable cost.

d) MIB stands for Management Information Base.

e) A counter is an example of an MIB object.

f) SNMP stands for Simple Network Management Protocol.

g) Yes, SNMP uses request-response.

h) The seven types of SNMPv2 messages are: GetRequest, GetNextRequest, GetBulkRequest, InformRequest, SetResponse, Response, and SNMPv2-Trap.

i) The preferred transport mapping for SNMP is UDP.

j) Security.

2.

a) A match-plus-action table generalizes the notion of the destination-based forwarding table.

b) OpenFlow is a standard which pioneered the notion of the match-plus-action forwarding abstraction, controllers, and the SDN revolution.

c) The match-plus-action table is known as the flow table.

d) OpenFlow 1.0's packet-matching fields for the network layer are IP protocol, IP type of service, and both source and destination IP addresses.

e) Yes, OpenFlow can indeed be used to implement firewalls.

3.

a) The four key characteristics of an SDN architecture are: separation of data and control planes, network control functions: external to data plane switches, flow-based forwarding, and a programmable network.

b) “The network is programmable through the network-control applications running in the northbound interface.”

c)

d) The two APIs for an SDN controller are OpenFlow and OpenDaylight.

e) The OpenFlow protocol operates between an SDN controller and switch; it operates over TCP.

4.

R20) The sending host executing traceroute receives two types of ICMP messages: an ICMP warning message (type 11 code 0) from the nth router and a port unreachable ICMP message from the destination.

5.

Leonard Kleinrock - pioneered the mathematical theory of packet networks.
Marc Andreesen - co-author of Mosaic.
Van Jacobson - created TCP algorithms for dealing with congestion.
Vinton G. Cerf - co-designer of the TCP/IP protocols.
Jennifer Rexford -
Simon S. Lam - designed mechanisms for quality of service.
Deborah Estrin - founding director of the NSF Center for Embedded Networked Sensing.
Steven M. Bellovin - co-inventor of the encrypted key exchange password-authenticated key agreement methods.
Henning Schulzrinne - co-developed key protocols that enable VoIP.
Robert Metcalfe - created Ethernet.