Home Assignment 3 quiz

Startad: 17 feb kl 15.16

Instruktioner för Quiz

Answer the questions below. You can submit as many attempts as you like, until the assignment is closed. Only the result of the last submitted attempt will be counted.

The solutions together with your score will be available here once the assignment is closed.

For more information, see **Home Assignments General Instructions**.

Fråga 1 — 2 poäng

We have discussed two main routing algorithms: link state and distance vector. For each of the statements below, specify the routing algorithm for which the statement is valid.

A node sends information to all other nodes in the network.	link state
A node sends information only to its neighbors.	distance vector
Uses Dijkstra's algorithm to find the best routes.	link state
Uses Bellman-Ford's algorithm to find the best routes.	distance vector
Is used in OSPF.	link state
Is used in RIP.	

distance vector

Fråga 2 2 poäng

OSPF, RIP, and BGP are three well-known Internet routing protocols. Specify for each of the statements the routing protocol for which the statement is valid.

Has a limitation to networks with a "diameter" of max 15 hops.	RIP
Uses "poison reverse" to avoid loops where packets are sent back and forth between two routers.	RIP
Protocol messages are sent directly on top of IP, without using any transport protocol (such as UDP or TCP).	OSPF
Can be used to divide an operator's internal network into several smaller networks in a hiearchical structure.	OSPF
Is used to communicate routing information between network operators.	BGP
Is based on dividing the Internet into so called autonomous systems.	BGP

Fråga 3 1 poäng

Which of the following statements about IP routing are correct?

- ☐ BGP uses Dijkstra's algorithm to calculate the shortest path between two nodes.
- ☐ OSPF is a distance vector protocol.
- ☑ RIP is a distance vector protocol.
- ☐ RIP is a link state protocol.
- ☑ OSPF and IS-IS are link state protocols.

Fråga 4 1 poäng

Which of the following statements about IP routing are correct?

- ☐ In a distance vector protocol a node sends its distance vector to all other nodes in the network.
- ☐ To deal with large networks consisting of many nodes, RIP has support for dividing the network into smaller areas.
- ☑ OSPF uses flooding to communicate link status to other nodes in the network.
- ☐ OSPF has normally a longer convergence time compared to RIP.
- ☑ In a distance vector protocol a node sends its distance vector to the neighbour nodes.

Fråga 5 1 poäng

A router (for IP version 4) has the forwarding table below and lookups are made using the longest prefix match principle.

Destination	Interface
0.0.0.0/0	m0

172.58.128.0/17	m1
172.58.128.0/19	m2
172.58.160.0/19	m3

Assume that the router forwards packets towards the following destinations. For each destination address, give the outgoing interface.

172.58.124.36	m0
172.59.12.142	m0
172.58.218.80	m1
172.58.155.112	m2
172.58.165.90	m3
172.58.169.18	m3

Fråga 6 1 poäng

Consider an IP subnet with prefix 123.45.67.0/25. Assume that one router is connected to the subnet. Which of the following statements are correct?

- ☐ 123.45.67.146 is a valid address on the subnet.
- ☐ Up to 255 different computers can be connected on the subnet at the same time.
- ☐ A computer on the subnet sending an IP packet to address 123.45.67.67, will send it through the router.

- [x] There are 128 addresses on the subnet.
- [x] 123.45.67.46 is a valid address on the subnet.
- [x] Assume that another port on the router is connected to 123.45.67.128/25. The router can then aggregate the two subnets to one prefix: 123.45.67.0/24.

Fråga 7 — 1 poäng

DHCP (Dynamic Host Configuration Protocol) is used for automatic configuration of a network interface. Such a configuration includes several parts. Consider the case when a computer is connected to an IP subnet where there is a DHCP server. Which of the following configuration items are provided through DHCP?

- [x] The IP address for the computer's network interface
- [x] The IP address to the router which connects the subnet to the rest of the Internet.
- [ ] The name of the outgoing mail server.
- [ ] The MAC address for the computer's network interface.
- [x] Information about what addresses that are included in the subnet.
- [x] The IP address for a local DNS server.

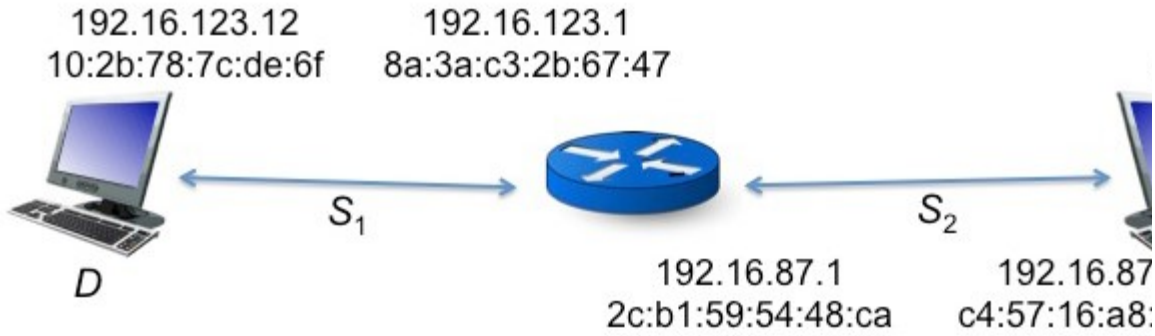
Fråga 8 — 2 poäng

The figure below illustrates two subnet, S_1 and S_2, where S_1 has the prefix 192.16.123.0/24 and S_2 has the prefix 192.16.87.0/24.

The two subnets are conntected to a router with addresses 192.16.123.1 and 192.16.87.1 on the two subnets respectively. On S_1 there is a computer D with adress192.16.123.12 and on S_2 there is a computer E with address 192.16.87.66.

Both subnets are using 48-bit IEEE 802 MAC addresses. The network interface on computer D has MAC address 10:2b:78:7c:de:6f and the network interface on

computer E has MAC address c4:57:16:a8:1b:5a. The router has MAC address 8a:3a:c3:2b:67:47 on the network interface connected to S_1 and 2c:b1:59:54:48:ca on the network interface connected to S_2.



Consider an IP packet sent from computer D to computer E. The packet will first pass over S_1 and then over S_2. What are the address fields at IP and MAC levels when the packet travels on S_1 and S_2 respectively?

On S_1: source IP address	192.16.123.12
On S_1: destination IP address	192.16.87.66
On S_2: source IP address	192.16.123.12
On S_2: destination IP address	192.16.87.66
On S_1: source MAC address	10:2b:78:7c:de:6f
On S_1: destination MAC address	8a:3a:c3:2b:67:47
On S_2: source MAC address	2c:b1:59:54:48:ca

On S_2: destination MAC address	c4:57:16:a8:1b:5a

Fråga 9 2 poäng

All media we use for communication, from the wire in a tin can telephone, to copper cables, optical fibers, and radio channels, are unreliable. In other words, the message that we send may not arrive correctly at the receiver.

Below are a number of methods for error detection and correction. Match the methods with the properties they have.

Cyclic Redundancy Check (CRC)	Detects single bit errors and bur
Internet checksum	Detects and corrects single bit e
Simple parity	Detects single bit errors
Two-dimensional parity	Detects and corrects single bit e

Fråga 10 2 poäng

CSMA (Carrier-Sense Multiple Access) protocols are used to coordinate access to a shared medium. This question is about CSMA protocols in general, and CSMA/CA and CSMA/CD in particular.

- ☐ By listening ("Carrier Sense") before sending, CSMA protocols make sure that there can be no collisions.

- [x] By distributing transmission starting times in a randomized way, CSMA/CA reduces the probability that several nodes start transmitting at the same time,.
- [ ] CSMA relies on the presence of a common reference clock, to which all nodes are synchronized.
- [x] With CSMA/CD, the transmitting nodes detect if there is a collision, and abort their transmissions.
- [ ] With CSMA/CA, the transmitting nodes detect if there is a collision, and abort their transmissions.
- [ ] CSMA/CD is used primarily for wireless networks, where the probability for collisions is high.

Quiz sparad kl. 15.34 Lämna in quiz