Communication protocols and network security 2011/12
Written examination, February, 15ᵗʰ 2012

This test must be taken individually. Any and all literature may be used while taking this test. Answer diligently *all* questions.

Bonus points might be awarded if you at least partially correctly answer each question.

Duration of the test: 90 minutes.

A lot of success – veliko uspeha!

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2			4		

IME IN PRIIMEK: _____

ŠTUDENTSKA ŠTEVILKA: _____

DATUM: _____

PODPIS: _____

1. naloga: Although some questions might seem to be about a specific chapter in the lectures, you will often need the knowledge from other chapters to answer them.

VPRAŠANJA:

1. What is PKI and what is it used for? Describe a use case for PKI.

2. During the lectures, we also mentioned a service called LDAP. Can a PKI server use LDAP? Explain your answer.

3. What about the other way arround, can an LDAP server use PKI? Explain your answer.

4. Explain three reasons for using accounting. Be as thorough as possible when answering this question and explain each reason separately.

2. naloga: Peter Zmeda is the system administrator in a company where they have:

- five computers for employees;

- one publicly accessible http server for all internet users;

- one file server for the employees;

- a mail server for the entire company; and

- a printer.

VPRAŠANJA:

1. Draw up a plan how the company's network should look like. The plane shall include the neccessarry firewalls, routers and ofcourse all the hardware mentioned above.

2. What is the difference between a firewall and an application gateway? Where in the above mentioned scheme would you add an application gateway?

3. Peter would like to add a wireless access points for the employees to the network. He would like to control access to this wireless network by using the IEEE 802.1x protocol. To the which part of the network you've drawn as an answer to the previous questions would you connect this access point?

4. Apart from the access point, the IEEE 802.1x protocol also requires a few additional services. Which ones and what for?

3. naloga: One of the most important tasks in network management is data storage. The MIB database is a part of such storage.

VPRAŠANJA:

1. Suppose you have at your company 7 printers of the type *TiskoPIS 2012*. How many entries about these printers is in the MIB database? Explain your answer.

2. There are multiple types of SNMP messages. Which type of message would you use to alert the sysadmin Peter that a printer on the third floor is out of paper? Explain in as much detail as possible, how Peter should be notified about event that the prineter ran out of paper.

3. Peter has received a message that the printer on the second floor is also out of paper. As he brings the paper to the printer, he finds out that the alarm was false. He notices that something has gone wrong in the SNMP protocol between the priner and server. What exactly could have gone wrong? List and elaborate at least two possible problems.

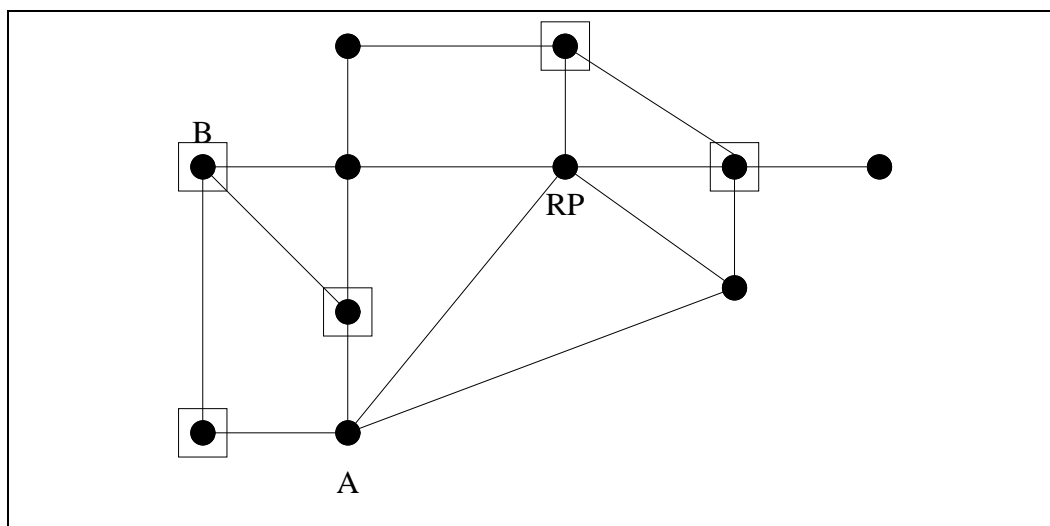**4. naloga:** Suppose you have a network on Figure 1.

Figure 1: Network example.

VPRAŠANJA:

1. In network of Figure 1, the price of each connection is 1. Let *RP* be the rendez-vous point and assume that all the *non-boxed* nodes are members

of the multicast group `224.0.20.12`. Draw the distribution tree for this network. What is the general property of such a tree?

NAMIG: This is the property which is unique among all trees

2. What type of multicast group is this with regard to the range it can cover (where can be its members)? Write down an example of the IPv6 address for such a multicast group.

3. What route takes a packet multicasted to group members by A?

4. What route takes a packet multicasted to group members by B?

5. Describe in as much detail as possible what an RTP packet multicast by B to the above-mentioned group looks like (including the frame; and the headers of all protocols).