Komunikacijski protokoli in omrežna varnost 2015/16 First Midterm

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: 60 minutes.

We wish you a lot of success – veliko uspeha!

TASK	POINTS	MAX. POINTS	TASK	POINTS	MAX. POINTS
1			3		
2			4		

IME IN PRIIMEK: _____

ŠTUDENTSKA ŠTEVILKA: _____

DATUM: _____

PODPIS: _____

1. naloga: bootp and DHCP

VPRAŠANJA:

1. Basically, with the DHCP protocol, one party sends a request and the other party responds. (i) How does the first party know that the response is meant for it and how does it know which request the response is for? (ii) The DHCP protocol has no built-in authentication mechanism. Propose at least one way for the client (the requesting party) to authenticate the server and explain the quality of your proposed solution.

2. Peter wants to use 2 DHCP servers. Can they assign addresses in the same address range? If not, why not? If yes, how can they make sure that they do not assign the same IP to two different computers?

3. Veronika has hired Peter as her new Internet service provider. (i) Is it even possible for Veronica to use DHCP to get a atatic IPv4 address? Explain your answer.

   Unfortunately, Peter does not offer static IPv4 addresses. (ii) List at least one technical reason why Peter would not offer static IPv4 addresses.

2. naloga: Network management.

VPRAŠANJA:

1. When talking about network management, we mentioned three basic components of a network infrastructure. Which are these component? Describe the role each of them plays in the network.

2. Our friend Peter Zmeda has learned (while studying for the exam) that sending SNMP packets is in no way safe. Because he is managing the network in Butale where the terrible Cefizelj often eavesdrops on the network, Peter has decided to implement his own, secure SNMP (SSNMP). He has decided to use a stream cypher. (i) Describe how a stream cypher works. (ii) Is it even possible to use a stream cypher with SNMP? Explain your answer.

3. Our friend Peter Zmeda finally managed to set up complete management network using SNMP protocol. He has a new application that needs to retrieve some data from the management network. What would be the most appropriate approach that is extendable and compatible with the future upgrades?

3. naloga: Real-time.

VPRAŠANJA:

1. A real-time application is used to transfer speech. How should it handle the loss of smaller number of packets?

2. Have you ever thought of a stream player (the stream can even be multicast) which saves the stream while playing? You could re-watch the stream (or show) after it was first transmitted. Our friend Peter Zmeda has decided to upgrade his RTP player so that it supports the recording of received data. The player almost works - the only problem is that the quality of the re-played show is just as bad as when he originally watched it because a) quite a few packets arrived too late and b) a lot of the packets never arrived at all. (i) Is there anything Peter can do about the late packets (packets a)? Explain your answer. (ii) Is there anything Peter can do regarding lost packets (packets b)? Explain your answer

   HINT: The more complete your received stream is, the more points you will get.

3. Peter loves to play the game `openra`. Once, he logged in to his computer as `root` and the game would not play. The shell gave him the following message:

   ```
   > openra
   bash:  openra:  command not found
   ```

   (i) How could this happend? (ii) How can a user for whom the command `openra` works find the location of the `openra` program? (iii) How can he make sure that the command also works for the `root` user?

4. naloga: Multicast

VPRAŠANJA:

1. For multicast routing, we can use the PIM protocol. This protocol can work in either dense or sparse mode. In each mode, the algorithm builds a different routing tree. (i) Which routing tree does it build in each case and why? (ii) We also learned about the *rendez-vouz point*. In which mode of the PIM protocol is it used and why? (iii) Does a *rendez-vouz point* make sense in the other mode? Explain your answer.

2. How can we find out whether any computer on a network is a member of the multicast group `224.7.8.7`? Explain your answer!

3. Cefizelj is an evil man. He has used his favourite text editor to create a file `skripta.sh` with the following content:

```
#!/bin/bash
skripta.sh & skripta.sh
```

(i) What is his creation supposed to do? (ii) What does he need to do to even *run* the created file? (iii) What does he have to do for it to *work*? Assume that he is not allowed to alter the script. Suggest at least two ways to make the script run and two to make it work.