University of St Andrews School of Computer Science

CS2003 — Internet and the Web — 2020/21

Tutorial 7:   IP/DNS/UDP
Date: Week 7: 29-30 Oct 2020

1. UDP multicast

   a) How does a multicast IP 'address' differ in nature from a unicast IP address?

   b) Think of some example applications that might use unicast, broadcast or multicast communication models.

   c) Write a simple multicast-based 'text chat' program, as described in the lab session for week 05.

2. Regular Expressions

   a) Modify `CS2003/Examples/CS2003-Examples-wk05/regex/FindMe.java` so that it can:

      • Match the string "FindMe" only if it appears as a separate word (i.e. it is not a sequence within another string); and

      • Perform that match regardless of whether or not the letters in "FindMe" are uppercase, or lowercase, or a mix of uppercase and lowercase.

   b) Write a program, `EmailAddressCheck`, that takes a single command-line argument, which is an email address, and checks that it is in the correct (expected) format: 'user@domain.name', by using a regular expression. Assume that the only permitted characters in both 'user' and 'domain.name' are:

      • letter ranges: A-Z and a-z

      • digit range: 0-9

      • special characters: + - _

      and that the character '.' is permitted only in the 'domain.name' part, to separate the components of the domain name, as would be expected, e.g. 'tnhh@st-andrews.ac.uk'.

      Why is this regular expression check insufficient to determine if this email address is valid and usable?

3. MultiChatServer

   This item is related to the week 05 lab session, and the code in:

   `CS2003/Examples/CS2003-Examples-wk05/MultiChat/`

a) How is it that MultiChatServer can listen for incoming connections, as well as relay messages to all connected users?

b) How does the program maintain state about all connected users, and all incoming / outgoing messages?

c) Examine the file `ChatMessage.java`. How are the protocol messages defined? What characters are excluded from a message typed by the user, and why?

4. Create one question on PeerWise covering the topics from week 5, and tag this question with the tag "week-5". You should also try to answer at least one question with the same tag. Your tutor will pick a question at random during the tutorial and you can go through it together as a tutorial group.

(Thanks to Saleem Bhatti)