Selected RQs

• If one DNS server goes down, how is DNS service affected?

• "Is there a backup program/server in case the DNS Servers, for some reason, experiences problems and stops working?"

  (Timothy)

"How do computers become DNS name servers? Are they chosen randomly?"

Selected RQs

"What physically happens in a transmission of an IP/TCP [packet]?"

"Do packets know to take the fastest/easiest route or do they take whatever route is available regardless of speed and ease?"

Selected RQs

"Are the things that are viewed on the web permanent even when deleted? Where does deleted data go?"

Selected RQs

"The textbook described text messaging for being a point-to-point asynchronous communication; however, with enhanced functionality of cell phones in modern days, does it make text messaging to multiple or many receivers to be included as a form of multicast asynchronous communication as well?"

"Would a 3-way phone conversation be (A) multicast or (B) point-to-point?"

It depends; at the surface (application layer), they look like multicast, but technically, they are realised using point-to-point communication.

Selected RQs

"Is the internet itself a gigantic server, perhaps controlled by a single computer somewhere?"

"Where is the internet server located and is there only one? What can we define as the main source or server for the worldwide web?"

(A) the internet is a single gigantic server, owned by Google
(B) the internet is a single gigantic server, owned by the international agency for administration of the internet
(C) the internet is not a single gigantic server at all

Selected RQs

"Why are domains broken up into different categories? Would it not be easier to have them all one like ".com"? Is there benefit to having different categories?"

Check out [http://www.cira.ca](http://www.cira.ca), learn about John Demco, the “Godfather of the Canadian Internet” ([http://www.publicaffairs.ubc.ca/media/releases/2008/mr-08-121.html](http://www.publicaffairs.ubc.ca/media/releases/2008/mr-08-121.html))

Important networking terms

(you need to be able to explain these and other important terms introduced in the book chapter on networking, and to relate them to each other)

- Internet
- WWW
- Ethernet
- IP address (especially 4-field, IPv4)
- URL
- domain name
- domain name server
- TCP/IP transmission protocol
- packets, packet loss

Suggested additional material

Watch these videos:

[http://www.youtube.com/watch?v=7_LPdttKXPc&feature=related](http://www.youtube.com/watch?v=7_LPdttKXPc&feature=related)

[http://www.youtube.com/watch?v=i5oe63pOhLI&feature=related](http://www.youtube.com/watch?v=i5oe63pOhLI&feature=related)

(These do not explain all you need to know, but illustrates some important internet concepts covered in the textbook.)
Learning Goals

you should be able to

• explain how data is transferred from one location to another across networks, such as the Internet
• understand some of the design features of TCP/IP networks, such as packets, routing, domain names, and hierarchical structure
Module III: Processes

Recipes from Scratch

Clicker question

• How did the Scratch lab go?
  (A) A nightmare – you said “don’t panic”, but guess what, I did panic!
  (B) Not too well – despite my thorough preparation, I had difficulties
  (C) Not too well – but perhaps I should have prepared more.
  (D) Not too badly – I got through most of it (perhaps with a little help from the TAs)
  (E) Panic? Why? I got it done just fine

Exercise (in groups)

Write down an algorithm for making a peanut butter and jam sandwich.

Here’s what your algorithm can use:
• peanut butter
• sliced bread
• jam
• knife
• spoon
• plate

Clicker question

• Did your group succeed in getting a proper sandwich made?
  (A) Yes, right away.
  (B) Yes, after 1-2 revisions to the instructions
  (C) Almost.
  (D) No.
Clicker question

• What was the main point you took away from the exercise?

  (A) Making sandwiches is hard.
  (B) The TAs didn’t act too smartly.
  (C) Humans are smart.
  (D) Specifying a process precisely is hard.
  (E) Carrying out precise instructions is hard.

Learning Goals

• recognize and explain the five essential properties of an algorithm: input specified, output specified, definiteness, effectiveness, and finiteness

• recognize and explain the concept of sequences of instructions, variables, loops, functions, conditional statements, and arrays in short programs specified in a programming language such as JavaScript, or in other clearly expressed processes (which may or may not be computer related)

Learning Goals

• determine, simulate and explain how short programs or program fragments work

• make small modifications to short program fragments to achieve clearly specified tasks

• explain and simulate simple algorithms for fundamental problems such as searching and sorting

Selected RQs

• How do programming language, which must be unambiguous and precise, deal with spectrums within data? For example, unlike the names of artists of CD’s, 'color' is a subjective category which is a spectrum without clear boundaries.
Selected RQs

"An algorithm must come to a stop eventually in order to be considered as a successful algorithm. Is performing an endless task consider as an algorithm? (E.g. calculating [the number] pi)"

(Hoi Yan)

It is closely related, and some computer scientists admit algorithms that (may) never stop. The other properties must still hold, and the description of the algorithm must always be finite.

Selected RQs

"Computers simply follow the instructions we provided (algorithm). Does this mean computers never make mistakes? All mistakes are human errors?"

(Hoi Yan)

"If there are multiple algorithms for a certain question, how does a computer/we choose which is quickest/takes up the least amount of space?"

(Sophie)