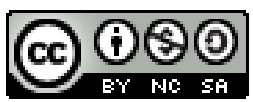
Networking
CM30078/CM50123

Russell Bradford

2023–2024



Introduction

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This Unit is about how the technology that allows this to happen works, in particular, the Internet

Unit Outline

Structure of this unit: starting with 3 hours lectures per week

- Tuesday 13:15
- Wednesday 12:15
- Friday 13:15

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The aim is to cover the necessary material early in the semester which will leave the last few weeks free for revision and problems classes

Unit Outline

Assessment

For the undergraduate CM30078:

- End of unit exam 100%

Unit Outline

Assessment

For CM50123

- Coursework 25%
- End of unit exam 75%

Coursework timelines (subject to change):

1. set Thu 26 Oct
   due Wed 15 Nov
2. set Thu 16 Nov
   due Fri 8 Dec

Unit Outline

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For CM50123

- Coursework 25%
- End of unit exam 75%

Coursework timelines (subject to change):

1. set Thu 26 Oct
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   due Fri 8 Dec

Feedback on coursework will be provided via Moodle

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Presumably other Departments will carry on as usual

Unit Outline

Aims To understand the Internet, and associated background and theory, to a level sufficient for a competent domain manager.

Unit Outline

Learning Outcomes Students will be able to:

- Explain the acronyms and concepts of the Internet and how they relate;
- State and apply the steps required to connect a domain to the Internet and explain the issues involved to both technical and nontechnical audiences;
- Discuss the ethical issues involved with the internet, and have an “intelligent layman’s” grasp of the legal issues and uncertainties.
- Be aware of the fundamental security issues;
- Be able to advise on the configuration issues surrounding a firewall.

Unit Outline

Syllabus:

- The ISO 7-layer model. The Internet: its history and evolution - Predictions for the future.
- The TCP/IP stack: IP, ICMP, TCP, UDP, DNS, XDR, NFS and SMTP. Berkeley. Introduction to packet layout: source routing etc.
- Various link levels: SLIP, 802.5 and Ethernet, satellites, the “fat pipe”, ATM. versus carrying. Security and firewalls. Performance issues: bandwidth, MSS and RTT; caching at various layers.

Unit Outline

- Who 'owns' the Internet and who 'manages' it: RFCs, service Providers, domain managers, IANA, Jisc/UKERNA, MANs, commercial British activities. Routing protocols and default routers. HTML and Electronic publishing.
- Legal and ethical issues: slander/libel, copyright, pornography, Publishing

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It is how the Internet works, **not** how to write networking programs or how to write Web pages

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I recommend

- “TCP/IP Illustrated Volume 1” W R Stevens, Addison-Wesley
- “Computer Networks, 5th Ed” A Tanenbaum, Pearson (4th Ed OK)
- “The Art of Computer Networking” R Bradford, Pearson (Polish Edition: “Podstawy Sieci Komputerowych”, WKŁ)

Stevens is available as an e-book in the library

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You don’t need me to tell you that there is a large amount of material out there on the Web?

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Wikipedia is fairly accurate in this area: but, as usual with Wikipedia, you should check with other sources

Unit Outline

Resources

There is a Unit Moodle page, but as Moodle is so horrible I tend to use my own Web pages:

`https://people.bath.ac.uk/masrjb/CourseNotes/cm30078.html`

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Content

We will revisit and expand on what you (may have) seen in CM10195 or other units

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It is very techy material: if you are not a techy person you should think very carefully about taking this Unit!

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You should have a general idea of what the important fields are and what their purpose is, but precisely *where* they appear in the header is generally less important

Standard Introductory Slides

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They are often abbreviated in style, and so are not the whole story and would not be suitable to be quoted verbatim in an exam

Standard Introductory Slides

Don’t try to copy everything down from the slides in lectures—the slides will be available after each lecture

Instead, make a note of what is important and use that later—in conjunction with the slides—to guide your further reading and study

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You don't expect to get fit simply by paying to joining a gym. . .

"If you have college courses in CS, buy the books and spend day and night the few days before class going through the books and taking notes and answering questions and programming examples before the first class even starts. If you really want to do this in your life, that's what you should do, not just wait for the education to be handed you. Those who finish at the top will always be in high demand. You can learn outside of school too but you have to put a lot of time into it. It doesn't come easily. Small steps, each improving on the other, is what to expect, not instant understanding and expertise."

Steve Wozniak, co-founder of Apple

Standard Introductory Slides

Computer Science is not a spectator sport

Anon