



MONASH University

FIT5010
Advanced internet protocols and applications

Unit guide

Semester 2, 2008

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FIT5010 Advanced internet protocols and applications - Semester 2 , 2008

Unit leader :

Bala Srinivasan

Lecturer(s) :

Clayton

- Bala Srinivasan

Introduction

The subject will cover the need for protocols and describe in detail few fundamental and popular protocols that are used to operate the Internet and intranets. A selection of interesting and important applications where these protocols are used will be discussed.

Unit synopsis

The subject will cover in depth, the fundamental protocols used to operate the Internet and intranets, and a selection of major application systems, including specific implementations of these protocols. Topics to be covered include: advanced Internet addressing; IPv4 to IPv6 migration; subnetting and supernetting; TCP performance and enhancements such as Reno, New-Reno; fast retransmit and recovery; unicast and multicast routing protocols such as BGP4, OSPF, MOSPF and IGMP; World Wide Web systems and client-server implementation protocols such as HTTP; real time protocols such as RTP, RTCP, RTSP, RSVP; and quality of services and security issues.

Learning outcomes

Knowledge and Understanding

On successful completion the student will be able to understand:

C1. the general structure of the Internet and the underlying protocols required for its operation;

C2. the standards and development processes for protocols and applications operating in the current and future Internet; and

C3. security and privacy issues applying to the Internet and the current and proposed systems and standards for dealing with these issues.

They will also have knowledge of:

C4. several important Internet application systems; and

C5. trends and developments in Internet technology and applications;

and be able to:

C6. analyse the operation of a specific Internet protocol or an application system; and

C7. evaluate the advantages and disadvantages of particular Internet technologies in specific situations.

Attitudes, Values and Beliefs

Upon completion of this unit, students will have an appreciation of

A1. the importance of the Internet architecture; and

A2. the importance and variety of Internet protocols and their relation to applications.

Practical Skills

Upon completion of this unit, students will have the ability to

P1. carry out an investigation into the selection and deployment of particular Internet protocols and application technologies; and

P2. describe the characteristics of the key protocols for the Internet, and their role.

Relationships, Communication and TeamWork

Upon completion the student have gained experience

S1. communicating information on advanced internet protocols and key applications in written and/or oral form; and

S2. working individually or in a small group of 3 to 4 students on an advanced topic related to the Internet technology.

Workload

For on campus students, workload commitments are:

- two-hour lecture and
- two-hour discussion/tutorial class which requires **advance preparation**; it is expected that every student participates in the discussions and
- a minimum of 2-3 hours of personal study per one hour of contact time in order to learn and understand the issues discussed in the class and prepare for the discussion questions.
- You will need to allocate up to 6 hours per week in some weeks, for the assignment and the mid-semester test including time to read papers from the library as well as discussion with your group members on your project/research.

Unit relationships

Prerequisites

You should have knowledge of

- basic understanding of Data Communications, Computer Networks, Internet and purpose of protocols.

Relationships

FIT5010 is an elective unit in the degrees of Master of Digital Communications, Master of Information Technology, Master of Network Computing and Master of Telecommunications. Basic knowledge of Data Communication and Computer Networks is assumed. Knowledge of internetworking will be useful, but not essential.

Continuous improvement

Monash is committed to 'Excellence in education' and strives for the highest possible quality in teaching and learning. To monitor how successful we are in providing quality teaching and learning Monash regularly seeks feedback from students, employers and staff. Two of the formal ways that you are invited to provide feedback are through Unit Evaluations and through Monquest Teaching Evaluations.

One of the key formal ways students have to provide feedback is through Unit Evaluation Surveys. It is Monash policy for every unit offered to be evaluated each year. Students are strongly encouraged to complete the surveys as they are an important avenue for students to "have their say". The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

Student Evaluations

The Faculty of IT administers the Unit Evaluation surveys online through the my.monash portal, although for some smaller classes there may be alternative evaluations conducted in class.

If you wish to view how previous students rated this unit, please go to <http://www.monash.edu.au/unit-evaluation-reports/>

Over the past few years the Faculty of Information Technology has made a number of improvements to its courses as a result of unit evaluation feedback. Some of these include systematic analysis and planning of unit improvements, and consistent assignment return guidelines.

Monquest Teaching Evaluation surveys may be used by some of your academic staff this semester. They are administered by the Centre for Higher Education Quality (CHEQ) and may be completed in class with a facilitator or on-line through the my.monash portal. The data provided to lecturers is completely anonymous. Monquest surveys provide academic staff with evidence of the effectiveness of their teaching and identify areas for improvement. Individual Monquest reports are confidential, however, you can see the summary results of Monquest evaluations for 2006 at <http://www.adm.monash.edu.au/cheq/evaluations/monquest/profiles/index.html>

Unit staff - contact details

Unit leader

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Professor, and Head of School

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Lecturer(s) :

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Teaching and learning method

Discussion classes are primarily used to reinforce and augment the concepts discussed in the lectures. The discussion class will have a number of questions and examples for which students have to identify answers. The discussion class will be structured as a group activity where the students will be divided into small groups of 2 to 3 and they are expected to derive answers to the questions and present them to the entire class. Hence it is expected that the students have to do some preparation before coming to the discussion class and actively participate in the discussions.

Communication, participation and feedback

Monash aims to provide a learning environment in which students receive a range of ongoing feedback throughout their studies. You will receive feedback on your work and progress in this unit. This may take the form of group feedback, individual feedback, peer feedback, self-comparison, verbal and written feedback, discussions (on line and in class) as well as more formal feedback related to assignment marks and grades. You are encouraged to draw on a variety of feedback to enhance your learning.

It is essential that you take action immediately if you realise that you have a problem that is affecting your study. Semesters are short, so we can help you best if you let us know as soon as problems arise. Regardless of whether the problem is related directly to your progress in the unit, if it is likely to interfere with your progress you should discuss it with your lecturer or a Community Service counsellor as soon as possible.

Unit Schedule

Week	Topic	Key dates
1	Introduction to Networking and Internet Protocols- Review	
2	Internet Address Classes+ Address Resolution	
3	Improved IP addressing	
4	IP, ICMP, IGMP and UDP	
5	Routing Protocols in internet	
6	EGP,BGP -Routing of Autonomous Systems	
7	OSPF Routing	
8	Dynamic IP allocation	
9	IP multicast	
10	Internet Applications	Mid Semester Test
11	Internet Applications - Migration to IPSecV6	Assignment Due
Mid semester break		
12	Internet Applications - VoIP, IPTV etc	
13	Revision and Summary	

Unit Resources

Prescribed text(s) and readings

- B. Forouzan, TCP/IP Protocol Suite, McGraw-Hill, 2007 (A number of copies are available at Monash Libraries)

Recommended text(s) and readings

- B. Forouzan, TCP/IP Protocol Suite, McGraw-Hill, 2007.
- M. Norris and S Pretty, Designing the total area network, John Wiley & Sons, 2000.
- L. A Chappell and E Tittel, Guide to TCP/IP, Course Technology, Thomson Learning, 2002.
- Geoff Huston, Vinton G. Cerf, Lyman Chapin, Internet Performance Survival Guide John Wiley & Sons; 2000
- D. Comer (with D. Stevens), Internetworking with TCP/IP, 3 Volumes, Prentice-Hall, 2006.
- J. T. Moy OSPF: Anatomy of an Internet routing protocol, Addison-Wesley, 1998.
- B. Halabi, Internet Routing Architectures, Cisco Press, 1997.
- J. D. Wegner, Robert Rockell (Editor), IP Addressing and Subnetting, Including IPv6, Publishers' Group West; 1999
- P. Loshin, IPv6 Clearly Explained, Morgan Kaufmann Publishers, Inc. 1999.

Study resources

Study resources we will provide for your study are:

A condensed version of lecture notes, assignment/project descriptions and some related references will be provided. A number of copies of both the prescribed test and recommended texts are available in Monash libraries. Also the students need to use the Monash libraries to gathering information for the assignment/project.

Library access

The Monash University Library site contains details about borrowing rights and catalogue searching. To learn more about the library and the various resources available, please go to <http://www.lib.monash.edu.au>. Be sure to obtain a copy of the Library Guide, and if necessary, the instructions for remote access from the library website.

Monash University Studies Online (MUSO)

All unit and lecture materials are available through MUSO (Monash University Studies Online). Blackboard is the primary application used to deliver your unit resources. Some units will be piloted in Moodle. If your unit is piloted in Moodle, you will see a link from your Blackboard unit to Moodle (<http://moodle.monash.edu.au>) and can bookmark this link to access directly. In Moodle, from the Faculty of Information Technology category, click on the link for your unit.

You can access MUSO and Blackboard via the portal: <http://my.monash.edu.au>

Click on the Study and enrolment tab, then Blackboard under the MUSO learning systems.

In order for your Blackboard unit(s) to function correctly, your computer needs to be correctly configured.

For example:

- Blackboard supported browser
- Supported Java runtime environment

For more information, please visit: <http://www.monash.edu.au/muso/support/students/downloadables-student.html>

You can contact the MUSO Support by: Phone: (+61 3) 9903 1268

For further contact information including operational hours, please visit:
<http://www.monash.edu.au/muso/support/students/contact.html>

Further information can be obtained from the MUSO support site:
<http://www.monash.edu.au/muso/support/index.html>

Assessment

Unit assessment policy

One mid-semester test (25%), one assignment (25%) and a final examination (50%). To pass this unit you must achieve all the following:

- Attempt ALL the three assessment components; AND
- achieve no less than 40% of the possible marks in the examination; AND
- achieve no less than 50% of the total possible marks.

Assignment tasks

- **Assignment Task**

Title : Practical Project/Case Study

Description :

The description of possible practical project and/or topics of case studies will be provided in week 3 of the discussion class. The topics will be allocated in a random fashion.

Weighting : 25

Criteria for assessment :

Criteria for assessment will be given along with the assignment specification.

Due date : Week 11 of the semester

Examinations

- **Examination**

Weighting : 50

Length : 2 hours

Type (open/closed book) : Closed book

Assignment submission

Assignment should be submitted both in paper copy and in softcopy to the lecturer by the due date (week 11). The softcopy should be emailed to the lecturer with the subject heading containing FIT5010-Student ID by the due date.

Assignment coversheets

Cover sheet is available from the unit web site.

University and Faculty policy on assessment

Due dates and extensions

The due dates for the submission of assignments are given in the previous section. Please make every effort to submit work by the due dates. It is your responsibility to structure your study program around assignment deadlines, family, work and other commitments. Factors such as normal work pressures, vacations, etc. are seldom regarded as appropriate reasons for granting extensions. Students are advised to NOT assume that granting of an extension is a matter of course.

Explicit request for late submission should be submitted by an email or in writing to the lecturer at least two days before the due date with supporting evidence. Only a maximum of one week extension will be provided.

Late assignment

Assignments received after the due date will NOT be graded.

Return dates

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later.

Assessment for the unit as a whole is in accordance with the provisions of the Monash University Education Policy at <http://www.policy.monash.edu/policy-bank/academic/education/assessment/>

We will aim to have assignment results made available to you within two weeks after assignment receipt.

Plagiarism, cheating and collusion

Plagiarism and cheating are regarded as very serious offences. In cases where cheating has been confirmed, students have been severely penalised, from losing all marks for an assignment, to facing disciplinary action at the Faculty level. While we would wish that all our students adhere to sound ethical conduct and honesty, I will ask you to acquaint yourself with Student Rights and Responsibilities (<http://www.infotech.monash.edu.au/about/committees-groups/facboard/policies/studrights.html>) and the Faculty regulations that apply to students detected cheating as these will be applied in all detected cases.

In this University, cheating means seeking to obtain an unfair advantage in any examination or any other written or practical work to be submitted or completed by a student for assessment. It includes the use, or attempted use, of any means to gain an unfair advantage for any assessable work in the unit, where the means is contrary to the instructions for such work.

When you submit an individual assessment item, such as a program, a report, an essay, assignment or other piece of work, under your name you are understood to be stating that this is your own work. If a submission is identical with, or similar to, someone else's work, an assumption of cheating may arise. If you are planning on working with another student, it is acceptable to undertake research together, and discuss problems, but it is not acceptable to jointly develop or share solutions unless this is specified by your lecturer.

Intentionally providing students with your solutions to assignments is classified as "assisting to cheat" and students who do this may be subject to disciplinary action. You should take reasonable care that your solution is not accidentally or deliberately obtained by other students. For example, do not leave copies of your work in progress on the hard drives of shared computers, and do not show your work to other students. If you believe this may have happened, please be sure to contact your lecturer as soon as possible.

Cheating also includes taking into an examination any material contrary to the regulations, including any bilingual dictionary, whether or not with the intention of using it to obtain an advantage.

Plagiarism involves the false representation of another person's ideas, or findings, as your own by either copying material or paraphrasing without citing sources. It is both professional and ethical to reference clearly the ideas and information that you have used from another writer. If the source is not identified, then you have plagiarised work of the other author. Plagiarism is a form of dishonesty that is insulting to the reader and grossly unfair to your student colleagues.

Register of counselling about plagiarism

The university requires faculties to keep a simple and confidential register to record counselling to students about plagiarism (e.g. warnings). The register is accessible to Associate Deans Teaching (or nominees) and, where requested, students concerned have access to their own details in the register. The register is to serve as a record of counselling about the nature of plagiarism, not as a record of allegations; and no provision of appeals in relation to the register is necessary or applicable.

Non-discriminatory language

The Faculty of Information Technology is committed to the use of non-discriminatory language in all forms of communication. Discriminatory language is that which refers in abusive terms to gender, race, age, sexual orientation, citizenship or nationality, ethnic or language background, physical or mental ability, or political or religious views, or which stereotypes groups in an adverse manner. This is not meant to preclude or inhibit legitimate academic debate on any issue; however, the language used in such debate should be non-discriminatory and sensitive to these matters. It is important to avoid the use of discriminatory language in your communications and written work. The most common form of discriminatory language in academic work tends to be in the area of gender inclusiveness. You are, therefore, requested to check for this and to ensure your work and communications are non-discriminatory in all respects.

Students with disabilities

Students with disabilities that may disadvantage them in assessment should seek advice from one of the following before completing assessment tasks and examinations:

- Faculty of Information Technology Student Service staff, and / or
- your Unit Coordinator, or
- [Disabilities Liaison Unit](#)

Deferred assessment and special consideration

Deferred assessment (not to be confused with an extension for submission of an assignment) may be granted in cases of extenuating personal circumstances such as serious personal illness or bereavement. Information and forms for Special Consideration and deferred assessment applications are available at <http://www.monash.edu.au/exams/special-consideration.html>. Contact the Faculty's Student Services staff at your campus for further information and advice.