



MONASH University

FIT5027
Virtual private network

Unit guide

Semester 1, 2009

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FIT5027 Virtual private network - Semester 1, 2009

Unit leader :

Asad Khan

Lecturer(s) :

Caulfield

- Asad Khan

Tutors(s) :

Caulfield

- Abdul Khan

Introduction

Welcome to FIT5027 (previously coded as CPE5006), Virtual Private Networks for semester 1, 2009. This is a 6 point Masters level unit. The unit has been designed to provide students with an in-depth understanding of virtual private networking from a practical perspective. The unit provides opportunities for students with diverse backgrounds to attain a high level of understanding in the design and management of secure networks. The students attain practical skills in the use of the underlying technologies and protocols relating to securing networks and related system administration activities. The unit is assessed by coursework.

Unit synopsis

Layered structure of networks, security threats in an open network environment, and basic security. Detailed exposition of major tools and protocols used in VPNs, including firewalls, IPSec, Internet Security Association and Key Management Protocol (ISAKMP), Internet Key Exchange (IKE), Point-to-Point Protocol (PPP) and Point-to-Point Tunneling Protocol (PPTP), Layer 2 Tunneling Protocol (L2TP), Terminal Access Control Access Control System (TACACS), Secure Sockets Layer (SSL), and SOCKS. Exposition of principles and methodologies for the design and implementation of Intranets and Extranets using VPNs.

Learning outcomes

At the completion of this unit, students should

- have a detailed knowledge and understanding of all major protocols used for VPN;
- a detailed knowledge and understanding of VPN architectures including interaction with firewalls;
- an understanding of major issues in implementing the protocols;
- the knowledge and skills to objectively compare and contrast various VPN protocols (eg. L2TP with IPSec and the platform specific variations);
- the knowledge and skills to enable them to design and implement standard and non-standard VPNs;
- the ability to work in small groups requiring skills associated with inter-personal relationships, communication and teamwork.

Workload

- * Two-hour lecture and
- * two-hour tutorial (or laboratory) (requiring advance preparation)
- * a minimum of 2-3 hours of personal study per one hour of contact time in order to satisfy the reading and assignment expectations.
- * You will need to allocate up to 5 hours per week in some weeks, for use of a computer, including time for newsgroups/discussion groups.

Unit relationships

Prerequisites

For MAIT students, FIT9017, FIT9018, FIT9019, FIT9030, FIT9020 and FIT4037.

Relationships

FIT5027 is an elective unit in MAIT and MIT degree programs. It has no prerequisites other than knowledge of modern network data communications, in particular TCP/IP and data link protocols used in local area networks.

Continuous improvement

Monash is committed to 'Excellence in education' (Monash Directions 2025 - <http://www.monash.edu.au/about/monash-directions/directions.html>) 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. One of the key formal ways students have to provide feedback is through Unit Evaluation Surveys. The University's Unit Evaluation policy (<http://www.policy.monash.edu/policy-bank/academic/education/quality/unit-evaluation-policy.html>) requires that every unit offered is 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.

Faculties have the option of administering the Unit Evaluation survey online through the my.monash portal or in class. Lecturers will inform students of the method being used for this unit towards the end of the semester.

Student Evaluations

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

Improvements to this unit

Based on the students' feedback, practical demonstrations will be added within some of the lectures.

Unit staff - contact details

Unit leader

Dr Asad Khan

Lecturer(s) :

Dr Asad Khan

Tutor(s) :

Mr Malik Khan

Teaching and learning method

The lecture stream will present the implementation details and design principles of VPN protocols as well as other relevant networking protocols. It will also show students how to build VPNs.

The tutorial sessions will reinforce the concepts learned during the lectures through the hands-on work and completion of the exercises relating to the theory covered in the lectures.

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	Unit introduction to VPNs	
2	Networking concepts	
3	Encryption	
4	Authentication and Authorisation	
5	Key Management & CA	
6	Building simple VPNs	
Mid semester break		
7	VPN Protocols I	Assignment 1
8	VPN Protocols II	

9	Building and IPSec VPN	
10	VPN with Windows	
11	Non standard protocols & Plenary session	
12	(No Lecture) VPN Project - A2 Theoretical work	Tutorial Test
13	(No Lecture) VPN Project - A2 Theoretical work	Assignment 2 (presentation and submission)

Unit Resources

Prescribed text(s) and readings

Dennis Fowler, *Virtual Private Networks: Making the Right Connection*. 1stEd. MorganKaufmann/Elsevier (1999) ISBN 1558605754

Oleg Kolesnikov, Brian Hatch. *Building Linux Virtual Private Networks* 1stEd. Que (2002) ISBN 1578702666

Text books are available from the [Monash University Book Shops](#). Availability from other suppliers cannot be assured. The Bookshop orders texts in specifically for this unit. You are advised to purchase your text book early.

Recommended text(s) and readings

Greg Holden. *Guide to Firewalls and Network Security Intrusion Detection and VPNs*. THOMSON ISBN 0619130393

Greg Holden. *Guide to Network Defense and Counter Measures*. THOMSON ISBN 0619131241

Thaddeus Fortenberry. *Windows 2000 Virtual Private Networking*. 1stEd. Que (2000) ISBN 1578702461

Meeta Gupta. *Building a Virtual Private Network*. 1stEd. PremierPress (2002) ISBN 1931841810

Required software and/or hardware

The standard operating environment provided in FIT computer labs is considered adequate for most purposes. However, most of the tutorial exercises require the use of an open source Linux environment, which is provided in the assigned FIT computer laboratory.

Software may be:

- downloaded from the resources page on the unit web site
- purchased at academic price at good software retailers

Equipment and consumables required or provided

The students on-campus may use the facilities available in the assigned computing labs where removable disk drives pre-formatted with Linux and basic network infrastructure is provided.

Information about computer use for students is available from the ITS Student Resource Guide in the Monash University Handbook.

You will need to allocate up to 8 hours per week for private study including use of a computer for eMail and newsgroups/discussion groups.

Study resources

Study resources we will provide for your study are:

The MUSO web site contains the link to the unit's outline, lecture slides, weekly tutorial exercises, assignment specifications, and supplementary resource material and is available to registered students. Copies of all handouts and most other resource material will generally be made available via the web. The password required to access the materials will be given to you in the first lecture. Students may download copies of lecture slides and tutorial exercises from the web pages. Material may be placed in the web pages without being distributed in class. A general discussion group is available in MUSO for this unit.

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>.

The Educational Library and Media Resources (LMR) is also a very resourceful place to visit at <http://www.education.monash.edu.au/library/>

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

- gain at least 40% of the assessable tutorial and test component: ie exercises and tests performed under Laboratory conditions, taken as a whole
- gain at least 40% of the assignment component: ie the assignments and any other other assessment tasks (such as presentations) taken as a whole
- achieve at least 50% of the total marks for the unit

For more details on the 40% Rule and many other things that students are expect to know about, visit the student information section of the Faculty web pages.

Assignment tasks

• Assignment Task

Title : Assignment 1

Description :

This is a theoretical assignment requiring research into two or three sub-topic relating to the concepts covered in the first three lectures. It is done individually by the students.

Weighting : 20%

Criteria for assessment :

This assignment tests the students' ability to build upon the concepts learnt in the lectures by independently researching the specified topics and reporting upon these clearly and concisely in their written reports.

Due date : Fri 24 April (teaching week 07)

• Assignment Task

Title : Assignment 2

Description :

This assignment is completed in groups of up to five students. The students are provided with a real life like VPN design case. They demonstrate the specified aspects of this project in the lab and later submit a written report detailing the overall design of the project.

Weighting : 40%

Criteria for assessment :

This assignment tests the practical skills learnt in the tutorial sessions by students developing practical aspects of the VPN and demonstrating these aspects in the last week of the semester. The theoretical component of this assignment tests students' overall understanding of the unit through an overall VPN design based on a realistic case study.

Due date : Fri 05 June (teaching week 13))

• Assignment Task

Title : Tutorial assessment

Description :

The theoretical aspects covered in the lectures are practically undertaken in the tutorial sessions by the students for this assessment.

Weighting : 40%

Criteria for assessment :

This assessment comprises the following.

- ◆ Demonstration of hands-on skills acquired in the tutorials relating to the VPN developments; including related skills in areas of system management and network administration.
- ◆ Assessment of the lecture material through multiple choice questions.

Due date : Practical demonstrations in week 12 and the tutorial sheet submissions at the end of the semester.

Assignment submission

The parts of the assignments that require written submission must be delivered to the labelled mailbox at the offices of the Caulfield School of IT on or before the nominated submission date and time, with the appropriate cover sheet correctly filled out and attached. Do not email the written submissions.

Assignment coversheets

The assignment cover sheets are available for downloading (to print) from,

<http://infotech.monash.edu.au/resources/student/assignments/index.html>

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.

Requests for extensions must be made to the unit lecturer at your campus at least two days before the due date. You will be asked to forward original medical certificates in cases of illness, and may be asked to provide other forms of documentation where necessary. A copy of the email or other written communication of an extension must be attached to the assignment submission.

Late assignment

Assignments received after the due date will be subject to a penalty of 5% per day late. Assignments received more than one week after the due date will not normally be accepted.

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 the University Plagiarism policy and procedure (<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-procedures.html>) which applies to students detected plagiarising.

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.