TELE8882

Cloud Networks

Session 2, Special circumstances, North Ryde 2021

School of Engineering

Contents

Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

Session 2 Learning and Teaching Update

The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already know if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of units with mandatory on-campus classes/teaching activities.

Visit the MQ COVID-19 information page for more detail.

General Information

Unit convenor and teaching staff
Unit Convenor
Hazer Inaltekin
hazer.inaltekin@mq.edu.au
Contact via 9850 2280
44 WTR, Room 133
Wednesday 5pm-6pm

Credit points
10

Prerequisites
Admission to MEngNetTeleEng

Corequisites

Co-badged status

Unit description
This unit develops applied and theoretical knowledge about cloud networking and data-center design to enable mainstream computing services in the cloud. It introduces the design rationale for data-center networking to obtain agile infrastructure supporting low latency and high throughput data communications required by cloud computing applications. The models for data-center network topology, traffic patterns, congestion control, routing and traffic engineering will be explored. The virtual network deployment, software-defined implementation of network functions and associated challenges to share a common infrastructure in a data-center will studied in detail, and the tradeoffs between virtual and hardware-based implementations will be discussed to understand current data-center operations and management.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

> **ULO1:** Demonstrate understanding of cloud network topology and protocol stack for traffic engineering, routing and congestion control in data-centers.

ULO2: Design physical connections among servers supporting low latency, high throughput and reliability.

ULO3: Evaluate data-center performance and articulate fundamental tradeoffs between virtual network deployments and hardware-based implementations.

ULO4: Deploy virtual machines and write simple software-defined network functions.

ULO5: Follow the current practice and research in cloud networking, and develop an ability to compare pros and cons of existing solutions.

ULO6: Work effectively in teams, think analytically, demonstrate self-motivation and self-learning, all important elements of professional practice.

General Assessment Information

Grading and Passing Requirement for the Unit:

In order to pass this unit, a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

For further details about grading, please refer below in the policies and procedures section.

Final Examination:

If you receive special consideration for the final exam, a supplementary exam will be scheduled by the faculty during a supplementary exam period, typically about 3 to 4 weeks after the normal exam period. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

Late Submissions and Re-submissions:

Late submissions will attract a penalty of 10% marks per day. Extenuating circumstances will be considered upon lodgement of a special consideration application.

Resubmissions of work are not allowed after due date.

Assessment Tasks

Name	Weighting	Hurdle	Due
Final Exam	40%	No	Week 13
Unit Project	25%	No	Week 12
Presentation	10%	No	Week 12

Name	Weighting	Hurdle	Due
Assignment	25%	No	All Session

Final Exam

Assessment Type [1]: Viva/oral examination
Indicative Time on Task [2]: 20 hours
Due: **Week 13**
Weighting: **40%**

Oral examination at the end of the unit to test students' applied and theoretical understanding of cloud networks.

On successful completion you will be able to:

- Demonstrate understanding of cloud network topology and protocol stack for traffic engineering, routing and congestion control in data-centers.
- Design physical connections among servers supporting low latency, high throughput and reliability.
- Evaluate data-center performance and articulate fundamental tradeoffs between virtual network deployments and hardware-based implementations.
- Deploy virtual machines and write simple software-defined network functions.

Unit Project

Assessment Type [1]: Project
Indicative Time on Task [2]: 20 hours
Due: **Week 12**
Weighting: **25%**

Students will propose and run a session-long project in cloud networking. They will write a 10-15 page report summarising the project objectives, literature and outcomes.

On successful completion you will be able to:

- Demonstrate understanding of cloud network topology and protocol stack for traffic engineering, routing and congestion control in data-centers.
- Evaluate data-center performance and articulate fundamental tradeoffs between virtual

network deployments and hardware-based implementations.

- Follow the current practice and research in cloud networking, and develop an ability to compare pros and cons of existing solutions.
- Work effectively in teams, think analytically, demonstrate self-motivation and self-learning, all important elements of professional practice.

Presentation

Assessment Type [1]: Presentation
Indicative Time on Task [2]: 15 hours
Due: **Week 12**
Weighting: **10%**

Each student is assigned to 3 papers to present. The presentations will cover the problem, key idea, novelty and critique of the papers.

On successful completion you will be able to:

- Follow the current practice and research in cloud networking, and develop an ability to compare pros and cons of existing solutions.
- Work effectively in teams, think analytically, demonstrate self-motivation and self-learning, all important elements of professional practice.

Assignment

Assessment Type [1]: Problem set
Indicative Time on Task [2]: 20 hours
Due: **All Session**
Weighting: **25%**

Students will complete regularly assigned problem sets testing both theory and implementation in cloud networking.

On successful completion you will be able to:

- Demonstrate understanding of cloud network topology and protocol stack for traffic engineering, routing and congestion control in data-centers.
- Design physical connections among servers supporting low latency, high throughput and reliability.

- Evaluate data-center performance and articulate fundamental tradeoffs between virtual network deployments and hardware-based implementations.
- Deploy virtual machines and write simple software-defined network functions.

---

[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Unit Delivery:

There is no required textbook in the unit. Necessary and sufficient material will be covered during the lectures and workshop hours. Reading materials will be provided for students throughout the session. Special lectures may be organised and related announcements will be made via iLearn.

Unit Web Page:

Unit lecture notes, resources and other information about the unit can be accessed through iLearn.

Technology:

Word processing software (MS Word, Latex etc.) will be required to produce the unit project report and MS PowerPoint or equivalent software will be required for presentation slides. Open source software such as Python, VirtualBox and MiniNet will be used.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy

Students seeking more policy resources can visit Student Policies (https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/ offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.