



# TELE8882

## Cloud Networks

Session 2, Special circumstance, North Ryde 2020

*School of Engineering*

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#### Disclaimer

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#### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

Unit convenor and teaching staff

Unit Convenor

Hazer Inaltekin

[hazer.inaltekin@mq.edu.au](mailto:hazer.inaltekin@mq.edu.au)

Contact via 9850 2280

44 WTR, Room 133

Wednesday 4pm-5pm

Lecturer

Amirmohammad Pasdar

[amirmohammad.pasdar@hdr.mq.edu.au](mailto:amirmohammad.pasdar@hdr.mq.edu.au)

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 be 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.

### Hurdle Requirements:

The final examination is a hurdle requirement. A grade of 40% or more in the final examination is a condition of passing this unit. If you are given a second opportunity to sit the final examination as a result of failing to meet the minimum mark required, you will be offered that chance during the supplementary examination period and will be notified of the exact day and time after the publication of final results for the unit. The second attempt at a hurdle assessment is graded as pass fail. **The maximum grade for a second attempt is the hurdle threshold grade.**

### 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
<a href="#">Final Exam</a>	40%	Yes	Final Exam Week
<a href="#">Presentation</a>	10%	No	Week 12
<a href="#">Assignment</a>	25%	No	All Session
<a href="#">Unit Project</a>	25%	No	Week 12

### Final Exam

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **Final Exam Week**

Weighting: **40%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

Online final exam.

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.

### Presentation

Assessment Type <sup>1</sup>: Presentation

Indicative Time on Task <sup>2</sup>: 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 <sup>1</sup>: Problem set

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **All Session**

Weighting: **25%**

Students will complete bi-weekly 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.

## Unit Project

Assessment Type <sup>1</sup>: Project

Indicative Time on Task <sup>2</sup>: 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.

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<sup>1</sup> 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.

<sup>2</sup> 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 Phyton, VirtualBox and MiniNet will be used.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). 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](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

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

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/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](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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](http://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](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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.