

# COIT20261 Network Services and Automation

## Term 1 - 2026

Profile information current as at 20/05/2026 10:54 pm

All details in this unit profile for COIT20261 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

### General Information

#### Overview

In this unit, you will explore how modern IP networks support secure and scalable communication for small to medium enterprises. You'll learn to build and manage network infrastructure using technologies such as VLANs, NAT, DHCP, and IP routing, and deploy Internet-based services including secure web servers, DNS, VPNs, and cloud-hosted applications. Through hands-on labs and projects, you'll use tools like GNS3, Git, and Ansible to automate network configuration and streamline operations. Working in teams, you'll troubleshoot network issues and develop collaborative solutions, preparing you for real-world roles in network administration and support.

#### Details

Career Level: *Postgraduate*

Unit Level: *Level 9*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

#### Pre-requisites or Co-requisites

Prerequisite: COIT20246 Cyber Security and Networking.

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

#### Offerings For Term 1 - 2026

- Brisbane
- Melbourne
- Online
- Rockhampton
- Sydney

#### Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

#### Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

## Class and Assessment Overview

### Recommended Student Time Commitment

Each 6-credit Postgraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

### Class Timetable

#### Regional Campuses

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

#### Metropolitan Campuses

Adelaide, Brisbane, Melbourne, Perth, Sydney

### Assessment Overview

#### 1. Written Assessment

Weighting: 20%

#### 2. In-class Test(s)

Weighting: 40%

#### 3. Written Assessment

Weighting: 40%

### Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

## CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure - Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure - International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback - Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

## Previous Student Feedback

### Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

#### Feedback from Students' feedback.

##### Feedback

Previous actions have introduced more practical networking tasks. Continue strengthening the practical component by expanding the scope of lab-based exercises and integrating real-world networking scenarios to better balance theory and application.

##### Recommendation

The balance of practical learning should be enhanced by incorporating more hands-on networking tasks alongside the theoretical content.

#### Feedback from Unit Coordinator's reflection.

##### Feedback

Balancing authentic skill assessment with academic integrity in online tests is increasingly complex in the context of generative AI.

##### Recommendation

Review the current in-class test structure and consider introducing a small practical project to better assess applied skills while maintaining assessment integrity.

## Unit Learning Outcomes

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

1. Design and configure IP networks for small to medium enterprises, e.g., using VLANs, NAT, DHCP and IP routing
2. Deploy and manage Internet-based applications to support secure and scalable network operations, e.g., using HTTPS, DNS, VPNs, and cloud-hosted services
3. Apply automation tools to streamline network configuration, deployment and maintenance
4. Work effectively in teams to implement and troubleshoot network services and protocols.

The Australian Computer Society (ACS), the professional association for Australia's ICT sector, recognises the Skills Framework for the Information Age (SFIA). SFIA is adopted by organisations, governments, and individuals in many countries, providing a widely used and consistent definition of ICT skills. SFIA is increasingly being used when developing job descriptions and role profiles. ACS members can use the tool [MySFIA](#) to build a skills profile.

This unit contributes to the following workplace skills as defined by [SFIA 9](#) (the SFIA code is included):

- Network Design (NTDS)
- Network Support (NTAS)
- Infrastructure Operations (ITOP)
- Systems Integration and Build (SINT)
- Systems Design (DESN)
- Configuration Management (CFMG).

The National Initiative for Cybersecurity Education ([NICE](#)) Framework defines knowledge, skills and tasks needed to perform various cyber security roles. Developed by the National Institute of Standards and Technology (NIST), the NICE Framework is used by organisations to plan their workforce, including recruiting into cyber security positions.

This unit helps prepare you for roles such as Systems Security Analyst, Network Operations Specialist and Systems Administrator, contributing to the following knowledge and skills:

- K0001 Knowledge of computer networking concepts and protocols, and network security methodologies.
- K0010 Knowledge of communication methods, principles, and concepts that support the network infrastructure.
- K0011 Knowledge of capabilities and applications of network equipment, including routers, switches, bridges, servers, transmission media, and related hardware.
- K0029 Knowledge of the organisation's Local and Wide Area Network connections.
- K0061 Knowledge of how traffic flows across the network (e.g., Transmission Control Protocol [TCP] and Internet Protocol [IP], Open System Interconnection Model [OSI], Information Technology Infrastructure Library, current version [ITIL]).
- K0108 Knowledge of concepts, terminology, and operations of a wide range of communications media (computer and telephone networks, satellite, fibre, wireless).
- K0111 Knowledge of network tools (e.g., ping, traceroute, nslookup).
- K0113 Knowledge of different types of network communication (e.g., LAN, WAN, MAN, WLAN, WWAN).
- K0136 Knowledge of the capabilities of different electronic communication systems and methods (e.g., e-mail, VOIP, IM, web forums, Direct Video Broadcasts).
- K0138 Knowledge of Wi-Fi.
- K0332 Knowledge of network protocols such as TCP/IP, Dynamic Host Configuration, Domain Name System (DNS), and directory services.
- S0033 Skill in diagnosing connectivity problems.
- S0035 Skill in establishing a routing schema.
- S0041 Skill in installing, configuring, and troubleshooting LAN and WAN components such as routers, hubs, and switches.
- S0162 Skill in applying various subnet techniques (e.g., CIDR).

# Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level  
 ● Introductory Level  
 ● Intermediate Level  
 ● Graduate Level  
 ○ Professional Level  
 ○ Advanced Level

## Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Written Assessment - 20%	●	●		●
2 - Written Assessment - 40%	●	●	●	●
3 - In-class Test(s) - 40%	●	●	●	

## Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Knowledge	○	○	○	○
2 - Communication	○	○	○	○
3 - Cognitive, technical and creative skills	○	○	○	○
4 - Research	○	○	○	
5 - Self-management				○
6 - Ethical and Professional Responsibility		○		○
7 - Leadership				○
8 - First Nations Knowledges				
9 - Aboriginal and Torres Strait Islander Cultures				

## Textbooks and Resources

### Textbooks

COIT20261

Prescribed

Data Communications and Networking With Tcp/Ip Protocol Suite

Edition: 6th (2021)

Authors: Forouzan, B

McGraw Hill

New York , NY , USA

ISBN: 9781260597820

None

COIT20261

Supplementary

Computer Networking: a Top Down Approach

Edition: 8 (2021)

Authors: J.F. Kurose, K.W. Ross

Pearson

New York , NY , USA

ISBN: 978-1292405469

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- VirtualBox
- Wireshark - Network Protocol Analyser
- Github.com Account
- GNS3 - Network Software Emulator
- Tailscale Account

## Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

MD Mamunur Rashid Unit Coordinator

[m.rashid@cqu.edu.au](mailto:m.rashid@cqu.edu.au)

## Schedule

### Week 1 - 09 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Internetworking	Chapter 1	GitHub repository settings for the portfolio task.

### Week 2 - 16 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
Encapsulation and Decapsulation in Network Communication	Chapter 1 (Computer Networking: a Top-Down Approach)	

Week 3 - 23 Mar 2026			
Module/Topic	Chapter		Events and Submissions/Topic
The TCP and IP Protocols	Chapter 6 and 7		The first in-class test in the tutorial class (10%).
Week 4 - 30 Mar 2026			
Module/Topic	Chapter		Events and Submissions/Topic
Routing	Chapter 6		
Week 5 - 06 Apr 2026			
Module/Topic	Chapter		Events and Submissions/Topic
Switching and Virtual LAN	Chapter 2		
Week 6 - 13 Apr 2026			
Module/Topic	Chapter		Events and Submissions/Topic
An Integrated Internetwork: Routing, Switching, and Network Management	Chapter 7		Portfolio Due: Week 6 Friday (17 Apr 2026) 4:00 pm AEST
Vacation Week - 20 Apr 2026			
Module/Topic	Chapter		Events and Submissions/Topic
Enjoy the break!			
Week 7 - 27 Apr 2026			
Module/Topic	Chapter		Events and Submissions/Topic
The Supporting Protocols: DHCP and DNS	Chapter 10		The second in-class test in the tutorial class (15%).
Week 8 - 04 May 2026			
Module/Topic	Chapter		Events and Submissions/Topic
HTTP and HTTPS	Chapter 2 (Computer Networking: a Top-Down Approach)		
Week 9 - 11 May 2026			
Module/Topic	Chapter		Events and Submissions/Topic
Firewall and VPN	Chapter 22 (Cryptography and Network Security)		
Week 10 - 18 May 2026			
Module/Topic	Chapter		Events and Submissions/Topic
Cloud Networking	Online sources		The third in-class test in the tutorial class (15%).
Week 11 - 25 May 2026			
Module/Topic	Chapter		Events and Submissions/Topic
Network Automation	Online Sources		
Week 12 - 01 Jun 2026			
Module/Topic	Chapter		Events and Submissions/Topic
Guidance for Networking Project			
Exam Week - 08 Jun 2026			
Module/Topic	Chapter		Events and Submissions/Topic
			Assessment 3 (40%) Written Assignment (teamwork for a small networking project)
			Networking Project Due: Exam Week Friday (12 June 2026) 4:00 pm AEST
Vacation/Exam Week - 15 Jun 2026			
Module/Topic	Chapter		Events and Submissions/Topic

## Term Specific Information

For any term-specific information, please contact the Unit Coordinator via email.

Unit Coordinator: Dr Md Mamunur Rashid

E-mail: m.rashid@cqu.edu.au

## Assessment Tasks

### 1 Portfolio

Assessment Type

Written Assessment

Task Description

#### Task Description – Written Assessment Instructions

Portfolio Maintenance

- Maintain a GitHub portfolio documenting your weekly tutorial activities in Weeks 1, 2, 4, 5, and 6.
- Assessment will consider the regularity of updates.
- Each entry should include: Screenshots, Testing results, Reflections, Notes on key concepts learned

GitHub Repository

- Create a private GitHub repository for this unit at the beginning of the term (Week 1) - worth 5%.
- Upload and update your portfolio in this repository every required week.

Submission

- Submit the portfolio via Moodle in the specified submission week.
- Provide the link to your private GitHub repository as part of the submission.

#### AI ASSESSMENT SCALE - AI COLLABORATION

You may use AI to assist with specific tasks such as drafting text, refining and evaluating your work. You must critically evaluate and modify any AI-generated content you use.

Assessment Due Date

Week 6 Friday (17 Apr 2026) 4:00 pm AEST

Your assignment must be submitted in Moodle in the format specified in the assignment. See Moodle unit website for details.

Return Date to Students

Week 8 Friday (8 May 2026)

We aim to return marks and feedback to you by this date.

Weighting

20%

Assessment Criteria

#### Portfolio Assessment Criteria

Clarity - The extent to which your weekly contributions are clearly explained and easy to understand.

Relevance - How closely your entries address and relate to the weekly tutorial questions.

Quality - The overall standard of your portfolio content, including accuracy, depth of explanation, and presentation.

Regularity - How consistently and frequently you update your portfolio in the GitHub repository.

Referencing Style

- Harvard (author-date)

Submission

Online

Submission Instructions

The assignment must be submitted online in Moodle.

Learning Outcomes Assessed

- Design and configure IP networks for small to medium enterprises, e.g., using VLANs, NAT, DHCP and IP routing

- Deploy and manage Internet-based applications to support secure and scalable network operations, e.g., using HTTPS, DNS, VPNs, and cloud-hosted services
- Work effectively in teams to implement and troubleshoot network services and protocols.

## 2 In-class Lab Tests

Assessment Type

In-class Test(s)

Task Description

### Task Description – Lab Exercises and Reports

Lab Exercises

- Lab exercises are conducted as supervised in-class lab tests during tutorial sessions in Weeks 3, 7, and 10.
- During each session, students must complete the assigned tasks and collect the required configurations, screenshots, command outputs, and observations. These materials will be used to prepare the lab report.

Lab Reports

- Week 3 lab report: worth 10% of total marks
- Week 7 lab report: worth 15% of total marks
- Week 10 lab report: worth 15% of total marks
- Each report must be completed individually based on the work performed during the supervised lab test and submit the lab report immediately after the lab test via Moodle.

#### AI ASSESSMENT SCALE - NO AI

You must not use AI at any point during the in-class test.

You must demonstrate your own skills and knowledge without assistance.

**IMPORTANT NOTE: This assessment is exempted from the 72-hour submission grace period and must be completed by the stated submission date/time.**

Assessment Due Date

Each lab report must be submitted immediately following the in-class test conducted in Weeks 03, 07, and 10.

Return Date to Students

The submission of lab reports for the in-class tests will be returned through Moodle in two weeks after their due dates. Late submissions with or without extension approvals may be returned after the above dates.

Weighting

40%

Assessment Criteria

Lab Report Assessment Criteria:

- Clarity: How clearly you present your findings.
- Relevance: How relevant your report is to the lab exercises in Weeks 3, 7, and 10.
- Quality: The overall quality of your work.

More details will be provided on the unit Moodle website.

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Learning Outcomes Assessed

- Design and configure IP networks for small to medium enterprises, e.g., using VLANs, NAT, DHCP and IP routing
- Deploy and manage Internet-based applications to support secure and scalable network operations, e.g., using HTTPS, DNS, VPNs, and cloud-hosted services
- Apply automation tools to streamline network configuration, deployment and maintenance

## 3 Networking Project

Assessment Type

Written Assessment

Task Description

### Task Description – Group Assignment Instructions

Group Formation

- Form a group of three students (the tutor may adjust group size depending on class numbers).

#### Task

- Using the internetwork developed in your lab exercises, either create a network service or apply appropriate security practices.

#### Report

Prepare a report describing the process of implementing the new network service, including:

- Step-by-step configuration
- Testing procedures and results

You may also include discussion on security measures, network performance maintenance, and monitoring techniques.

#### Presentation

At the end of the term, students must submit a recorded video demonstrating their internetworking implementation and practices. The video should include a full live demonstration (demo) of the working topology and a clear explanation of the configuration and functionality.

Each group member must individually present and speak in the submitted video.

The video must be uploaded to Moodle. No physical or live in-class presentation is required.

#### AI ASSESSMENT SCALE - AI COLLABORATION

You may use AI to assist with specific tasks such as drafting text, refining and evaluating your work. You must critically evaluate and modify any AI-generated content you use.

**IMPORTANT NOTE: This assessment is exempted from the 72-hour submission grace period and must be completed by the stated submission date/time.**

#### Assessment Due Date

Exam Week Friday (12 June 2026) 4:00 pm AEST

Late submissions are subject to the university's late submission penalty policies.

#### Return Date to Students

Assessments will be returned on the Certification date (required for the unit without an exam).

#### Weighting

40%

#### Assessment Criteria

##### Marking Criteria for network Practice

##### Introduction

Provide an overview of your internetworking practice and explain what makes it unique or innovative.

##### Environment Description

Clearly describe the internetworking setup, including topology, devices, and configuration context.

##### Service / Security / Performance

Explain the network service implemented, the security measures applied, or the performance monitoring and maintenance activities carried out.

##### Presentation Slides

Assess the quality, organisation, and clarity of your slides.

##### Presentation Delivery

Evaluate how effectively the group communicates and demonstrates the work.

Your group will be evaluated on teamwork, accuracy, clarity, and how well your work fits a chosen network practice.

##### Minimum Mark Requirement

You must achieve at least 50% for this assessment task. This minimum mark is a hurdle requirement for the unit. If you score below 50% on this task, you will not pass the unit regardless of your overall mark.

For more details, check the unit website.

#### Referencing Style

- Harvard (author-date)

#### Submission

##### Online Group

#### Learning Outcomes Assessed

- Design and configure IP networks for small to medium enterprises, e.g., using VLANs, NAT, DHCP and IP routing
- Deploy and manage Internet-based applications to support secure and scalable network operations, e.g., using HTTPS, DNS, VPNs, and cloud-hosted services
- Apply automation tools to streamline network configuration, deployment and maintenance

- Work effectively in teams to implement and troubleshoot network services and protocols.

## Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

### What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

### Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

### Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

### What can you do to act with integrity?



**Be Honest**

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



**Seek Help**

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



**Produce Original Work**

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem