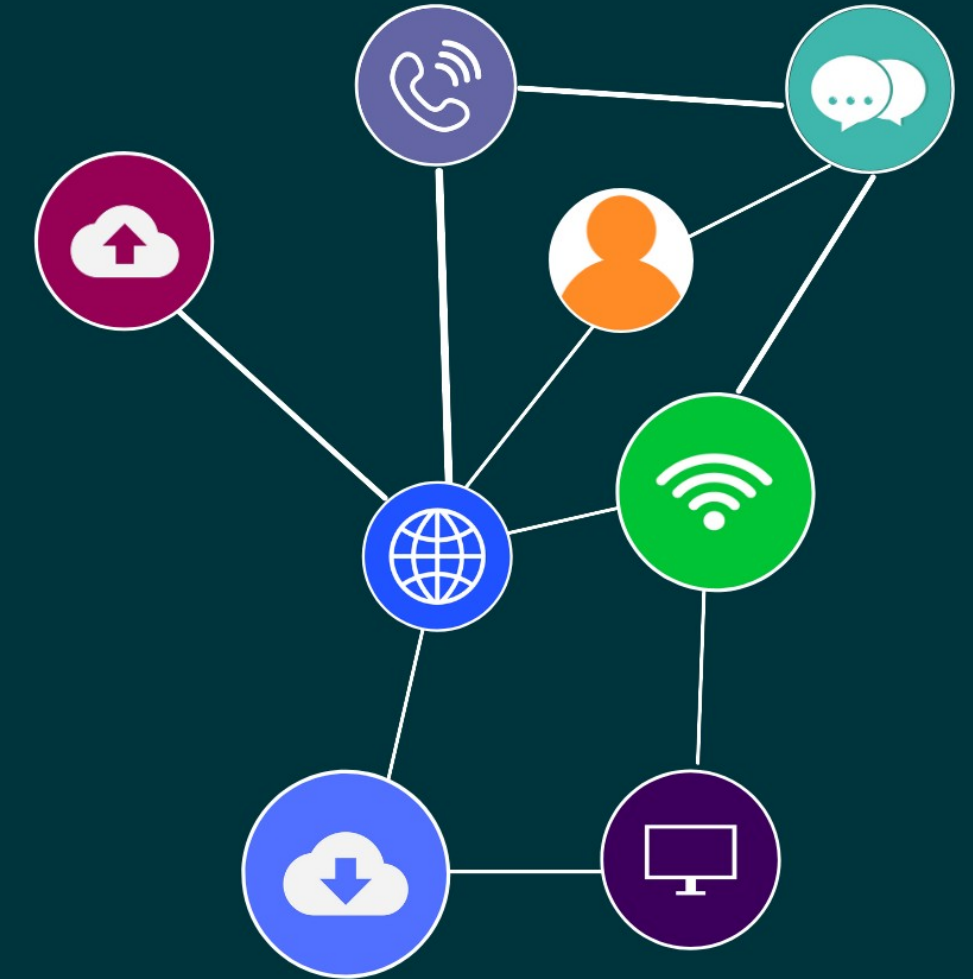# ICTTEN615

Manage network traffic

Topic 1: Network capacity and traffic congestion evaluation

INTRODUCTION TO NETWORKS

- A network consists of a range of devices that are connected and can communicate with each other to transfer data.

- Understanding networks is important in order to be able to manage network traffic.

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ACTIVITY: READ

Read about type of networks and different types of network topologies at the following links:

https://www.javatpoint.com/types-of-computer-network

https://www.webopedia.com/quick_ref/topologies.asp

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NETWORK CONGESTION

- Sometimes networks can become overloaded and do not perform as they are supposed to, this can cause network congestion.

- From a technical perspective, the effects of a congested network include delay (latency), packet loss and timeouts.

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ACTIVITY: READ

Read about identifying and reducing network congestion here:

https://www.pcwdld.com/network-congestion#wbounce-modal

https://www.netcov.com/a-guide-to-identifying-reducing-network-congestion/

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NETWORK CONGESTION

- Reducing congestion

- Traffic blocking

- Dimensioning

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ACTIVITY: READ

Read more on traffic engineering and dimensioning:

https://en.wikipedia.org/wiki/Network_planning_and_design#Dimensioning

Take any notes to summarise what you have read and keep for future reference.

Topic 1: Network capacity and traffic congestion evaluation

ACTIVITY: RESEARCH

Choose a type of network such as a LAN. Research the most common reason/s for congestion on this type of network

Share your findings with your group.

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PREPARING TO COMPLETE WORK

- If you are completing this work as an employee of a company, you may find out the details of the work to be completed from someone else in the company such as your manager or someone from another department.

- If you are completing this work as an outside contractor, then the process of obtaining details about the work you need to complete will vary depending on the company you are working for you.

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USING COMMUNICATION SKILLS

When communicating, you need to consider the audience (who you are communicating with) as well as the purpose of the communication (provides clarity and understanding for yourself as well as the recipient), and the method, style and technique.

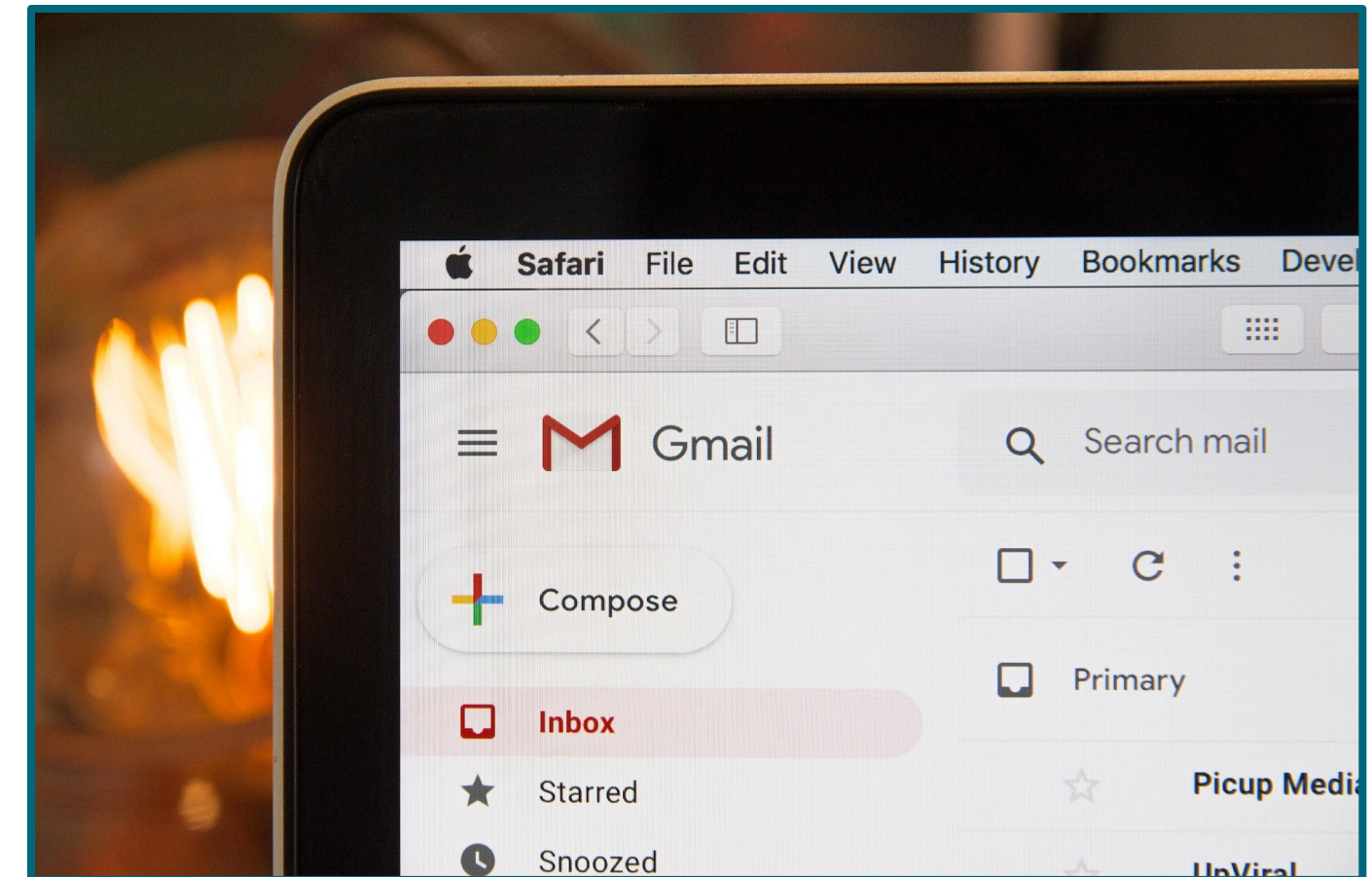# Topic 1: Network capacity and traffic congestion evaluation

VERBAL

It is important to ensure the audience clearly understands what is being said so verbal communication requires solid speaking and listening skills on the part of the communicator.

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WRITTEN

Written communication is used when you need to deliver correspondence or detailed information such as figures and facts.

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NON-VERBAL

- Attitude or posture

- Body language

- Eye contact and gestures

- Facial expressions

- Tone of voice

- Visual

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ACTIVITY: READ

Verbal vs non-verbal communication:

https://www.differencebetween.com/difference-between-verbal-and-vs-nonverbal-communication/

Take any notes to summarise what you have read and keep for future reference.

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USING EFFECTIVE QUESTIONING

- Questioning is the key to gaining more information and without it, communication can fail.

- There are certain types of questions that you can ask:

  o Closed questions which invite a short-focused answer.

  o Open questions allow for much longer responses and therefore potentially more creativity and information.

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USING ACTIVE LISTENING SKILLS

Using active listening skills helps to achieve a balanced exchange of views and create effective communication.

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ACTIVITY: READ

It is important to hear what people are really saying. Read the article at the link:

https://www.mindtools.com/CommSkll/ActiveListening.htm

Take any notes to summarise what you have read and keep for future reference.

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LEGISLATION, CODES, REGULATIONS, STANDARDS, PROCEDURES

As well as knowing how to communicate well, it is important to be able to identify and follow all relevant legislation, codes, regulations, standards and procedures that apply to your work on managing network traffic.

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EVALUATING NETWORK CAPACITY AND TRAFFIC CONGESTION

Now it's time to look at the technical aspects of the job.

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NETWORK MANAGEMENT

Network management is a key concept and refers to the processes, tools and applications that are used to administer, operate and maintain a network infrastructure.

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ACTIVITY: READ

Read more about the importance of network management here:

https://blog.gigamon.com/2019/03/21/what-is-network-management/

Make notes for future reference.

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NETWORK MONITORING SOFTWARE

Network monitoring software is a common tool used for implementing network monitoring for both physical and virtual environments.

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ACTIVITY: READ AND RESEARCH

First, read the following articles.

An example of a monitoring and logging strategy:

https://crest-approved.org/wp-content/uploads/Cyber-Security-Monitoring-Guide.pdf

Conduct research to identify network monitoring software used in a virtualised environment. Select two that you consider to be the best and explain why.

Share your findings with your group.

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ACTIVITY: PRACTICAL

Your assessor will set up a practical exercise for you to complete to prepare you for your assessment. You will be using the network software and tools available to you to evaluate the capacity of and traffic congestion on a network

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TRAFFIC CONTROL STRATEGIES

Once you have completed all of your measurements and analysis, you will be able to work out a traffic control solution to meet the client's needs.

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ACTIVITY: READ

Read further information on load balancing:

https://www.nginx.com/resources/glossary/load-balancing/

Read more on QoS relating to network performance:

https://en.wikipedia.org/wiki/Quality_of_service

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ACTIVITY: READ

Read the following guide on contingency planning:

https://creately.com/blog/business/business-contingency-plan-templates/

Contingency planning for network failure:

https://www.toolbox.com/tech/enterprise-software/blogs/defining-a-network-contingency-plan-040408/

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ESTIMATING PROJECT COSTS

- As of developing traffic control strategies, you will need to estimate the costs of implementing the strategies you are identifying.

- This will also need to align with the client's budget the details of which you must obtain before traffic control strategies are finalised.

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ACTIVITY: READ AND WATCH

Read more about cost estimating at:

https://www.project-management-skills.com/project-cost-estimating.html

Watch the following video about time and cost estimating.

Video: https://www.youtube.com/watch?v=kYW8qjOjxQc (07:41)

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DEVELOPING THE PROJECT BUDGET

The project budget includes the detailed estimates of all the costs likely to be incurred as part of the project and as per the cost estimating already completed.

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ACTIVITY: READ

Read more about project budgets at:

https://www.project-management-skills.com/project-budgeting.html

Review the following example of a project budget:

http://nb3foundation.org/assets/files/Sample%20Project%20Budget%20FINAL.pdf

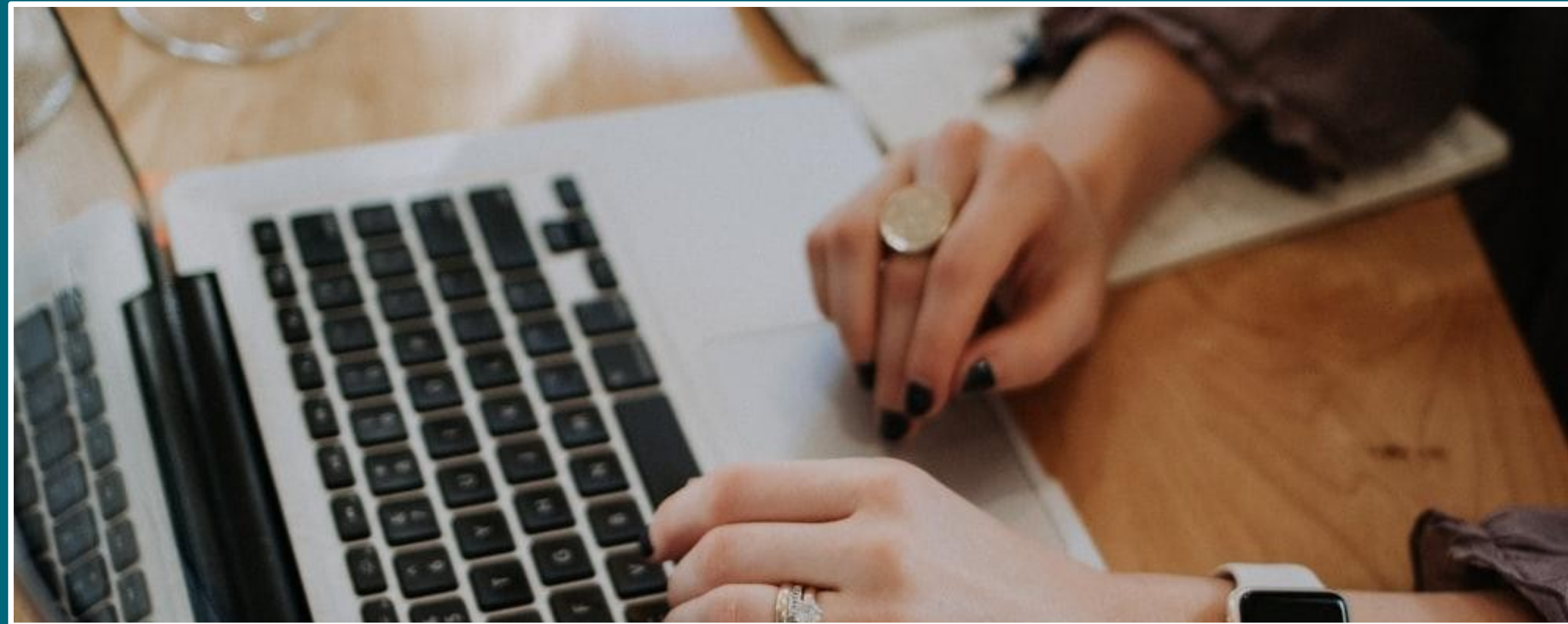Topic 1: Network capacity and traffic congestion evaluation

ACTIVITY: PRACTICAL

Your trainer/assessor will guide you through a number of practical exercises.

Topic 1: Network capacity and traffic congestion evaluation

Topic 2: Improving network performance

MONITORING CHANGES

- Once you have implemented the traffic control strategies, it is important to monitor changes, including further congestion problems.

- This will be completed using the same process you learnt about in topic 1 i.e., network performance monitoring.

Topic 2: Improving network performance

PREDICTING FUTURE USE

As part of the monitoring process, you may also have a further look at network traffic needs i.e., looking towards longer term solutions.

Topic 2: Improving network performance

ACTIVITY: PRACTICAL

Using the traffic management software available to you, monitor changes and take measurements to assess the outcomes of any variations.

Topic 2: Improving network performance

WRITING REPORTS

Writing reports about network traffic problems and making recommendations can be a key part of your role.

Topic 2: Improving network performance

DETERMINING THE DOCUMENT LAYOUT AND DESIGN

- Most organisations have their own guidelines for producing documentation.

- It is important to set an example when communicating with others and to ensure that you are meeting organisational standards regarding professional and respectful language.

- Always check documents for spelling and grammar before it is distributed.

Topic 2: Improving network performance

STYLE GUIDES

- A style guide is a set of standards for the writing and design of documents, either for general use or for a specific publication, organisation or field.

- A style guide establishes and enforces style to improve communication.

Topic 2: Improving network performance

PAYING ATTENTION TO TONE

- The audience, purpose and method of communication all have an influence on the tone of the document.

- The overall tone of a written message affects the reader.

- Your tone should be confident, courteous and sincere.

Topic 2: Improving network performance

ACTIVITY: PRACTICAL

Refer to the activities that you have completed and write a report outlining any recommendations.

Topic 2: Improving network performance