



Australian Government

ICTTEN811 Evaluate and apply network security

Release: 1

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Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 2.0.

Application

This unit describes the skills and knowledge required to evaluate security of information communications technology (ICT) networks, using converging switching and transmission technologies in local area networks (LAN) and wide area networks (WAN), broadband networks, internet protocol TV (IPTV) and virtual networks.

It applies to individuals with excellent communication and IT skills working as telecommunications engineers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications – Telecommunications Networks Engineering

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Analyse operation of the internet	1.1 Evaluate the interrelationship of IP to open systems interconnect (OSI) seven layer model and the impact on network topologies and network elements 1.2 Assess media access control (MAC) and IP addressing, and their application in security 1.3 Report on transmission control protocol/internet protocol (TCP/IP) operations and use of transport protocols for transmitting data over the network 1.4 Examine various types of routing protocols and the implications

ELEMENT	PERFORMANCE CRITERIA
	on security 1.5 Analyse forms of label switching as applied to data packets 1.6 Use software to simulate least-cost algorithms
2. Analyse internetwork protocols	2.1 Compare connection-oriented and connection-less networks in internetworking applications 2.2 Research design parameters used in networks 2.3 Produce a report on IP multi-casting protocols and systems, including IP frame fields of data frames
3. Research and report internetwork operations	3.1 Analyse protocol considerations of voice over internet protocol (VoIP) 3.2 Research protocols G723.1, G729 and G729A standards and evaluate their application in internetworking 3.3 Determine the format of JPEG and GIF files as applied to still pictures 3.4 Determine the format of MPEG-2 and H.32x series multimedia protocols for motion pictures 3.5 Evaluate features of different of multi-service protocols and of different email system protocols in networking operations 3.6 Produce a report on features different web-based protocols used in internetworking operations
4. Analyse features and types of network security	4.1 Analyse procedures and processes used for security attacks and use of protection mechanisms 4.2 Research conventional encryption algorithms and determine possible locations of encryption devices 4.3 Produce a report on conventional encryption key distribution problems and how message authentication and verification is achieved 4.4 Research one-way hashing and secure hashing functions 4.5 Produce a report on digital signature standard (DSS) principles, including public key cryptography algorithms for network security
5. Research features of public key authentication and email network security protocols	5.1 Research public key authentication using Kerberos 5.2 Analyse how electronic mail security is achieved using pretty good privacy (PGP) 5.3 Research and report on internet protocol security (IPSec) 5.4 Produce a report on encapsulating security payload (ESP),

ELEMENT	PERFORMANCE CRITERIA
	including internet key management processes
6. Research features of web, network management and system security	6.1 Analyse how web threats and attacks occur in an IP network and determine system intruders and threats 6.2 Research operation of transaction protocols 6.3 Evaluate processes used for selection and protection of system passwords 6.4 Evaluate system threats and methods used to counteract the threats 6.5 Produce a report on anti-virus protection strategies, including firewall design principles, types and configurations
7. Document evaluation report	7.1 Present a final report to include research and evaluation of network security management principles and network application in the workplace with enhancement recommendations

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.2, 3.2, 4.1, 4.2, 4.4, 5.1, 5.3, 6.2-6.4	Researches, evaluates and interprets complex technical documentation, such as technical standards
Writing	1.3, 2.3, 3.6, 4.3, 4.5, 5.3, 5.4, 6.5	Prepares clear and concise workplace documentation, including reports and recommendations incorporating technical language, to communicate complex information clearly and effectively
Numeracy	1.6, 4.2, 4.5	Uses mathematical subtlety and a clear set of steps to solve public-key encryption and least-cost algorithms
Interact with others	7.1	Selects and uses appropriate conventions and protocols to communicate findings to stakeholders in a range of work contexts
Get the work done	1.1-1.6, 2.1, 2.3, 3.1-3.5, 4.1, 4.2, 4.4, 5.1, 5.2, 6.1, 6.3, 6.4	- Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context for complex, high-impact activities with strategic implications - Implements actions according to a predetermined plan,

		making adjustments if necessary • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • Uses formal, analytical and lateral thinking techniques to resolve problems or generate ideas • Actively identifies digital systems, devices and applications with potential to meet current and/or future needs • Uses main features and functions of digital tools to complete work tasks
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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTTEN811 Evaluate and apply network security	ICTTEN8195B Evaluate and apply network security	Updated to meet Standards for Training Packages. Minor change to performance criteria for clarity	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTTEN811 Evaluate and apply network security

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Performance Evidence

Evidence of ability to:

- investigate and report on protocols used for data transmission over IP networks
- investigate and report on network security in terms of internet protocols, digital signature standard (DSS) principles and asymmetric key cryptography on IP networks
- research and report features of web, network management and system security management in IP networks
- recommend enhancements to security management in IP networks.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain administrative network management systems
- evaluate algorithms used in IP network security
- specify the purpose of cryptography in security systems
- explain encapsulation and encryption in data transmission
- describe examples of enterprise solutions
- explain firewalls
- outline common network topologies
- summarise operations network management systems
- explain routing theory
- explain and give examples of system threats
- outline transaction protocols.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the telecommunications networks engineering field of work and include access to:

- a telecommunications operations site
- a mentor or supervisor appropriately experienced in relevant telecommunications technology and infrastructure
- networked computers and relevant software.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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