



Australian Government

ICTTEN512 Design and implement an enterprise voice over

Release: 1

ICTTEN512 Design and implement an enterprise voice over

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 design and implement infrastructure required to enable enterprises to use voice over internet protocol (VoIP) and other packet-based services using converging network technologies.

It applies to individuals who combine significant technical expertise with a range of analytical, research and planning skills to develop and tailor internet protocol (IP) convergence solutions for particular business needs.

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. Plan and design VoIP infrastructure to meet business requirements	1.1 Ascertain end-user requirements in consultation with client 1.2 Select VoIP infrastructure in line with business and end-user requirements, within budget limitations 1.3 Select protocols for converged networks 1.4 Select hardware, software, network and security requirements according to agreed business and end-user specifications 1.5 Investigate factors affecting bandwidth and calculate bandwidth usage for various codecs, including considerations of overhead, connection quality and connection speeds

ELEMENT	PERFORMANCE CRITERIA
2. Install and configure VoIP infrastructure to meet business requirements	2.1 Implement telephone number mapping (ENUM), number portability, end-point addressing, path selection, calling classes and overlapping number ranges 2.2 Install, configure and test gatekeepers 2.3 Install and test convergent terminal equipment and software 2.4 Install software, and configure and test VoIP services 2.5 Configure security access levels to safeguard data, making use of appropriate tools
3. Configure UC network	3.1 Obtain topology and components of UC network 3.2 Analyse potential of IP multimedia subsystem (IMS) network architecture to enable convergence of voice, video and data applications and various mobile network technologies over IP based layer 3.3 Incorporate use of a communications server to provide real-time multimedia communications 3.4 Select common video conferencing codecs according to standards and practices 3.5 Select voice and video conferencing hardware 3.6 Implement IP-private branch exchange (PBX) functionalities in the UC network
4. Test and evaluate performance of convergent networks	4.1 Develop possible network congestion solutions for common network congestions to meet the specified quality of service (QoS) 4.2 Provide solutions for problems with contacting emergency services 4.3 Analyse network traffic and resolve problems using packet sniffer, monitoring software and hardware solutions 4.4 Troubleshoot convergent communications over wireless networks 4.5 Analyse types and effects of attacks, including man-in-the-middle attacks 4.6 Plan ways to counteract denial of service (DoS) and distributed DoS (DDoS) attacks 4.7 Predict the impact of virtual local area network (VLAN) hopping, media access control (MAC) address movements, additions and changes on network
5. Test and verify security	5.1 Analyse types of intrusion detection

ELEMENT	PERFORMANCE CRITERIA
access levels	5.2 Monitor and evaluate capability and reliability of security systems 5.3 Make system alterations to ensure protection against known and potential threats 5.4 Verify and test user settings conform to security policies 5.5 Back-up, upgrade and scan systems to minimise attacks
6. Complete documentation and sign-off procedures	6.1 Complete required records and notify client 6.2 Remove installation waste and debris from worksite and dispose of according to environmental requirements to maintain safe worksite conditions 6.3 Reinstate site according to client and company requirements

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	3.4	Identifies, analyses and evaluates standards to determine information and communications technology (ICT) requirements
Writing	6.1	Prepares clear and concise workplace documentation incorporating technical language to communicate complex information clearly and effectively
Numeracy	1.2, 1.5	Uses mathematical formulae and calculations to estimate project costs and bandwidth requirements
Navigate the world of work	6.2, 6.3	Takes personal responsibility for adherence to legal and regulatory responsibilities and organisational policies and protocols relevant to own work
Interact with others	1.1, 6.1	Selects and uses appropriate conventions and protocols when communicating with customers in a range of work contexts
Get the work done	1.2-1.5, 2.1-2.4,	- Develops plans for complex, high impact activities with strategic implications - Implements actions according to a predetermined plan, making adjustments if necessary and addressing

		unexpected issues • Selects and uses digital technologies and systems to achieve work goals and enhance work processes • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying and evaluating options against agreed criteria
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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTTEN512 Design and implement an enterprise voice over internet protocol and a unified communications network	ICTTEN5168A Design and implement an enterprise voice over internet protocol and a unified communications network	Updated to meet Standards for Training Packages.	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 ICTTEN512 Design and implement an enterprise voice over

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Performance Evidence

Evidence of ability to:

- design and implement infrastructure for enterprise voice over internet protocol (VoIP) and unified communications (UC) systems to meet business requirements using converged networks
- evaluate network traffic protocols and bandwidth considerations
- configure a UC network
- assess performance of convergent networks
- test and verify security access levels.

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:

- compare session initiation protocol (SIP), H.323 protocol and media gateway control protocol (MGCP) or media gateway control (Megaco)
- define latency, jitter and wander, and implement methods for reducing or eliminating them using jitter buffer, quality of service (QoS), traffic shaping and virtual local area networks (VLANs)
- describe the format of a SIP uniform resource identifier (URI)
- evaluate and implement SIP trunking to connect enterprise internet protocol (IP)-based communications systems over long distances
- identify common G.7xx codes and describe the impact of compression on voice quality
- define components of SIP
- examine functions of signalling protocols for converged networks
- summarise the following:
 - the client business domain, business function and organisation

- current and emerging industry accepted hardware and software products
- current and emerging transmission technologies and protocols
- networking technologies.

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 must be typical of those experienced in the telecommunications networks engineering field of work and include access to:

- a live network
- networked computers
- network design documentation
- equipment specifications
- network components.

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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