



Australian Government

ICTTEN609 Produce and evaluate architecture designs for convergent cellular mobile networks

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 specify design of the required mobile cellular general packet radio service (GPRS), third-generation (3G) and fourth-generation (4G) network architectures.

It applies to individuals with high-level technical skills who design and operate mobile wireless systems that meet the industry implementation of wireless convergence in telecommunications.

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 prepare for design of cellular mobile networks	1.1 Analyse requirements of the mobile network 1.2 Examine technical characteristics of the GPRS systems 1.3 Develop network architecture for a GPRS network, in addition to the circuit-switched domain of 2G (Generation) 1.4 Review 3G structure and identify network requirements to provide a wide variety of services ranging from voice and paging services to interactive multimedia, including teleconferencing and internet access

ELEMENT	PERFORMANCE CRITERIA
	1.5 Examine technical characteristics, data rates, operating frequencies and multiplexing schemes of the 3G system 1.6 Establish positioning and types of antennas, terminals, processors, required protocols and architecture, based on technical specifications and requirements
2. Design a GPRS (2.5G) cellular network	2.1 Investigate how 2.5G GPRS overlays the GSM network to transmit and receive transmission control protocol (TCP) and/or internet protocol (IP) based data to and from GPRS mobile devices
3. Design a 3G cellular network	3.1 Develop network architecture for a 3G network and explain functions of the network elements 3.2 Integrate a 3G network with a wireless local area network (WLAN)
4. Research and evaluate design features of proposed 4G cellular network	4.1 Investigate how a fully IP-based 4G system will provide an end-to-end IP integrated solution for voice, data and streamed multimedia to end-users roaming anytime and anywhere 4.2 Investigate access schemes of a 4G network 4.3 Investigate the implication for Internet Protocol version 6 (IPv6) in relation to 4G support of a greater number of IP-based wireless devices with applications for improved multicast, security and route minimisation capabilities 4.4 Investigate use of advanced antenna systems to enable 4G with high rate, high reliability and long range communications
5. Produce reports for architectural design for cellular networks	5.1 Present a report on the impact of competing technologies on each other and get consensus on concepts 5.2 Investigate potential interoperability and global roaming issues that may be faced by GSM, 2.5G, 3G and 4G cellular technologies

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	1.1, 4.1-4.4, 4.6, 5.2	Comprehends and evaluates technical specifications to plan and prepare for complex cellular design work

Writing	1.3, 5.1	Prepares clear and concise workplace documentation, including reports and recommendations, incorporating technical language to communicate complex information clearly and effectively
Oral Communication	5.1	Uses specific and relevant language to clearly articulate technological issues
Numeracy	1.5	Extracts and evaluates technical data, including equipment specifications during testing phase
Get the work done	1.1-1.6, 2.1, 3.1, 3.2, 4.1-4.4, 5.2	- Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands - Considers strategic and operational potential of digital trends to achieve work goals, enhance work processes and create opportunities - Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria - Uses formal, analytical and lateral thinking techniques for diagnosing problems and generating and evaluating possible solutions

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTTEN609 Produce and evaluate architecture designs for convergent cellular mobile networks	ICTTEN6169A Produce and evaluate architecture designs for convergent cellular mobile networks	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>