Australian Government

# ICTTEN620 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 7.0. |

## Application

This unit describes the skills and knowledge required to specify design of the required mobile cellular general packet radio service (GPRS) and the latest two generations of 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 networks.

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

## Unit Sector

Telecommunications Networks Engineering

## Elements and Performance Criteria

| ELEMENT | PERFORMANCE CRITERIA |
|---------|----------------------|
| *Elements describe the essential outcomes.* | *Performance criteria describe the performance needed to demonstrate achievement of the element.* |
| 1. Plan to design convergent cellular mobile networks | 1.1 Obtain work details and scope from relevant personnel and arrange for site access in compliance with required security arrangements, legislation, codes, regulations and standards |
| | 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 required services |
| | 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, |

| ELEMENT | PERFORMANCE CRITERIA |
|---|---|
| | 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 to relevant personnel |
| | 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 can 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 and assess design features of a 4G network according to organisational requirements |
| | 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 and gain consensus on concepts from relevant personnel |
| | 5.2 Investigate potential interoperability and global roaming issues that may be faced by the latest, required cellular technologies |

# Foundation Skills

*This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.*

| SKILL | DESCRIPTION |
|---|---|
| Numeracy | • Extracts and evaluates technical data, including equipment specifications during testing phase |
| Oral communication | • Uses specific and relevant language to articulate technological issues |
| Reading | • Comprehends and evaluates technical specifications to plan and prepare for complex cellular design work |
| Writing | • Prepares workplace documentation, including reports and |

| SKILL | DESCRIPTION |
|---|---|
| | recommendations, incorporating technical language to communicate complex information clearly and effectively |
| Planning and organising | • Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands<br>• Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering required information, and identifying and evaluating options against agreed criteria |
| Problem solving | • Uses formal, analytical and lateral thinking techniques for diagnosing problems and generating and evaluating possible solutions |
| Technology | • Considers strategic and operational potential of digital trends to achieve work goals, enhance work processes and create opportunities |

# Unit Mapping Information

Supersedes and is equivalent to ICTTEN609 Produce and evaluate architecture designs for convergent cellular mobile networks.

# Links

Companion Volume Implementation Guide is found on VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2