



Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN8194A Investigate the application of cloud networks in telecommunications switching

Release: 1

ICTTEN8194A Investigate the application of cloud networks in telecommunications switching

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to investigate the application of cloud networks (infrastructure-as-a-service) in telecommunications switching. Most infrastructure-based services are embedded in physical infrastructure. Cloud computing and infrastructure-as-a-service changes the focus from the physical infrastructure to the new world of virtual infrastructure. No longer are services built around floor space, servers or ports, but rather around virtual machine (VM) images, application instances, and virtualised storage and networks. Scalability, cost savings, security, flexibility of infrastructure and energy consumption are significant factors when business considers cloud networks. Applications involving cloud networks are developed to support business strategies. Cloud network solutions support the application of Next Generation Technologies (NGN). No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.
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Application of the Unit

Application of the unit	Telecommunication planning engineers and senior technical staff apply the skills and knowledge in this unit to investigate the application of cloud networks (infrastructure-as-a-service) in telecommunications switching. Technical planners develop strategies to accommodate shortfalls in capacity and functionality for a switching network, and develop solutions for network growth using emerging technologies.
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Evaluate current physical network infrastructure	1.1. Analyse the scalability, functionality, cost, security and energy consumption of existing physical network infrastructure 1.2. Report on the shortfalls and risks of existing physical infrastructure in accommodating network growth and increased functionality 1.3. Investigate capacity and functionality shortfalls of existing physical infrastructure to highlight the limitations of the existing switching network 1.4. Document estimated costs and issues associated with meeting capacity and functionality shortfalls using existing physical infrastructure
2. Investigate the application of cloud networks	2.1. Analyse trends in cloud networks (infrastructure-as-a-service) technologies and multiprotocol label switching (MPLS) architectures against the rapid changes in the landscape 2.2. Determine the applicability of cloud networks (infrastructure-as-a-service) to meet capacity and functionality requirements of the network 2.3. Assess the risks in using cloud networks to meet capacity and functionality requirements of the network 2.4. Evaluate a range of cloud network solutions and justify the selection of an optimum network switching solution 2.5. Develop solution elements using a series of small project elements 2.6. Produce a cloud network alternative solution to emulate the existing Core Network of a service provider
3. Analyse the impact of the cloud network solution for system integration and across business domains	3.1. Prepare a plan for organisational change control process and the integration of cloud network solutions within a complete network infrastructure 3.2. Prepare a test scenario and produce a test management schedule for the testing process of system elements and interfaces using simulation 3.3. Use integration document software to replicate issues exhibited in test environment 3.4. Certify cloud network solution compatibility and compliance to requirements using web based test management tool (quality centre) to conduct performance evaluation tests 3.5. Analyse test reports to evaluate load balancing and

ELEMENT	PERFORMANCE CRITERIA
	network security issues in test environment 3.6.Document and resolve conflicts detected in simulation testing

ELEMENT	PERFORMANCE CRITERIA
4. Develop a business case for implementation of a cloud network	4.1. Prepare a cost-benefit analysis of the cloud network solution as a business case to evaluate the return on investment (RoI) 4.2. Investigate staging of the solution and timing implementation of the project elements as a scenario for real life implementation 4.3. Research and report on the key features of cloud network implementation in a business case study

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to evaluate the existing physical network infrastructure
- communication skills to:
 - interact with enterprise personnel, customers and other contractors, while maintaining a customer focus and consideration of customer needs
 - work effectively within a group
 - liaise with internal and external personnel on technical and business matters
- literacy skills to:
 - prepare reports given a specific format
 - read and interpret technical documentation, software and hardware manuals, specifications and relevant enterprise policy
- numeracy skills to analyse requirements
- PC skills to use a word processor to translate enterprise and technology issues into a cloud network solution
- planning and organisational skills to:
 - manage and prioritise own work
 - manage solution elements
 - break up large project component into a series of smaller project components
- problem solving skills to solve domain, technology and logistics problems
- safety awareness skills to follow all related occupational health and safety (OHS) requirements and work practices
- task management skills to work systematically with required attention to detail and adherence to project requirements
- technical skills to:

REQUIRED SKILLS AND KNOWLEDGE
• prepare a test scenario and test regime for the simulation • resolve system conflict or defects following simulation testing • set up test management schedules and diagnose interface requirements
Required knowledge
• analysing infrastructure-as-a-service components • existing digital switching technology in service provider core network • information required to develop architectural solutions • integration document software • new cloud network technologies • overview knowledge of cloud networking transmission, transmitter and receiver architecture and their associated infrastructure • performance and integration requirements • prepare and/or interpret technical documentation • protocols as used on the MPLS and infrastructure-as-a-service • specific knowledge related to network components and their functions • specific organisational requirements relating to the computer systems • typical issues and challenges that occur with system changes

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Evidence of the ability to:

- evaluate the current physical network infrastructure's capacity and functionality shortfalls
- investigate the application of cloud networks and plan the architectural design
- develop components of cloud networking solution for meeting capacity and functionality requirements of the network
- assess the risks in using cloud networks to meet capacity and functionality requirements of the network
- analyse impact of integration of cloud network solution on the network
- prepare a test plan with test scenario and produce a test management schedule
- use integration document and software test management tools to replicate issues exhibited in test environment
- certify cloud network solution compatibility and compliance
- prepare a cost-benefit analysis of the cloud network solution
- develop a business case for implementation of a cloud network.

Context of and specific resources for assessment

Assessment must ensure:

- site where the application of cloud networks in telecommunications switching may be investigated
- software tools currently used in industry
- vendor products, specifications, equipment and enterprise policy required for the activity.

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct observation of the candidate investigating the

EVIDENCE GUIDE	
	application of cloud networks and planning the architectural design • review of reports, plans and business case for a cloud network solution prepared by the candidate • oral or written questioning of the candidate to assess knowledge of cloud networks.

EVIDENCE GUIDE

Guidance information for assessment

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICTTEN8197A Produce engineering solutions using numerical computations and simulation.

Aboriginal people and other people from a non-English speaking background may have second language issues.

Access must be provided to appropriate learning and assessment support when required.

Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed.

In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.

Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Cloud networks refers to:

- delivery of internet protocol (IP) infrastructure (typically a platform virtualisation environment) as a service
- overlays the IP network using MPLS.

multiprotocol label switching

- encapsulating packets of various network

RANGE STATEMENT	
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(MPLS) refers to:	
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	protocols
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| | <ul style="list-style-type: none">• use in creating virtual links between distant nodes• use in high-performance telecommunications networks which direct and carry data from one network node to the next• using layered protocols using the OSI 7 layer model. |
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RANGE STATEMENT	
<i>Infrastructure-as-a-service</i> may include:	• computer hardware (typically set up as a grid for massive horizontal scalability) • computer network: • firewalls • gateways • load balancing • MPLS switch • servers • internet connectivity • platform virtualisation environment for running client specified virtual machines • service level agreements • utility computing billing: • per instance hour.
<i>Integration of cloud network solutions</i> may include:	• hardware compatibility • no contentions • platform compatibility • protocol compatibility • signalling contention • software compatibility • system interoperability • technology compatibility.
<i>Test management schedule</i> may include:	• post-installation test procedures • pre-installation test procedures • produces test summary report • profiling of software solution • risk defects report • simulation testing • test process is testable for network software built.
<i>Integration document software</i> may include:	• fine-tuning capabilities in multi-operating environments • integration with existing system • links to legacy systems.
<i>Performance evaluation tests</i> may include:	• defects (defects detected are logged and mapped to failed cases) • releases (manage software releases and iterations) • requirements (traceability and management) • test lab (execute test cases from test plan)

RANGE STATEMENT	
	test plan (creating and updating test cases).
<i>Key features</i> may include:	- bandwidth on demand - distribution - enhanced rate - transmission.

Unit Sector(s)

Unit sector	Telecommunications
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering
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