Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN4215A Install and configure internet protocol TV in a service provider network

Release: 1

ICTTEN4215A Install and configure internet protocol TV in a service provider network

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to install and configure a multi-protocol label switching (MPLS) network for internet protocol TV (IPTV). This includes secure Core and Access Networks for the service provider. 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.

Application of the Unit

Application of the unit	This unit applies to technical staff installing an internet protocol (IP) service provider network for the delivery of emerging technologies for IPTV using multicast (broadcast) and unicast video on demand (VoD) streaming. Relevant job roles include installer of Next Generation Networks (NGN). These IP networks provide fast internet, voice over internet protocol (VoIP), IPTV and internet TV services.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to implement an IPTV service provider	1.1. Obtain and clarify occupational health and safety (***OHS***) ***requirements*** and risk control measures and procedures for a given work area with ***appropriate personnel*** 1.2. Use the ***topology of an IPTV network*** and design plans to locate the ***network elements*** for video over broadband 1.3. Select network elements to provide optimum video delivery service 1.4. Obtain configuration instructions for the network elements
2. Implement an IPTV network to meet business requirements	2.1. Configure an IP-MPLS core network overlaying the IP network to deliver IPTV 2.2. Implement VoD application to meet bandwidth requirements and quality of service (QoS) requirements for commercial viability of IPTV network 2.3. Install and configure video service routers for content delivery system (CDS) applications to support TV streaming and internet streaming with session shifting for follow-me or mobile video facility 2.4. Produce the addressing scheme and ***protocols*** required for IP multicasting used in the IPTV network 2.5. Configure ***security measures*** in an IPTV network to protect against ***security threats*** 2.6. Configure the label switch routers (LSR) to provide secure methods of transporting IP packets using ***layer 2 protocols*** in an ***MPLS network*** 2.7. Configure the MPLS-TE (traffic engineering) to provide routing on diverse paths to avoid congestion and guarantee bandwidth services 2.8. Troubleshoot network according to manufacturer's specifications and enterprise procedures
3. Build and configure CDN architecture network	3.1. Build the content delivery network (CDN) architecture overlaying the routing and switching architecture of an IP network to deliver internet TV to ***Internet devices*** 3.2. Use routing and switching infrastructure to enable CDN share characteristics of each element to produce ***network functionality*** 3.3. Install and configure web cache communication protocol (WCCP) on the router to redirect traffic flows in real-time to reduce transmission costs and download times
4. Complete and document network installation	4.1. Restore worksite to safe condition according to established safety procedures 4.2. Record and store ***essential installation information*** according to enterprise procedures 4.3. Notify appropriate personnel about the completion of the task

ELEMENT	PERFORMANCE CRITERIA
	according to enterprise procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with customer to determine needs
- literacy skills to interpret technical specifications and related documentation
- project planning skills to set benchmarks and identify scope
- problem solving skills to resolve a predictable range of network problems
- numeracy skills to produce IP addressing schemes
- technical skills to:
  - deploy point-to-multipoint video broadcast over IP-MPLS network
  - dimension network parameters
  - evaluate competing video over broadband networks
  - implement and verify implement and verify:
    - border gateway protocol (BGP)
    - enhanced interior gateway routing protocol (EIGRP)
    - flash
    - hypertext transfer protocol (HTTP)
    - internet group management protocol (IGMP)
    - open shortest path first (OSPF)
    - real time streaming protocol (RTSP)
    - routing information protocol (RIP)
    - web cache communication protocol (WCCP) operations
  - implement MPLS architecture across a WAN environment
  - implement secure video streaming (unicast) over MPLS network

Required knowledge

- competing video delivery over broadband networks
- current industry-accepted hardware and software products
- networking technologies incorporating detailed knowledge of network operating systems and IP networks
- transmission technologies and protocols

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: • install relevant network hardware and software • configure and test the IPTV network according to specified guidelines • configure the LSR in an MPLS network • build and configure CDN architecture network • implement secure network.
Context of and specific resources for assessment	Assessment must ensure: • a site where the installation and configuration of an IPTV network may be conducted • equipment currently used in industry • information on different protocols • relevant technical information, legislative requirements and other site and project-related documentation.
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 installing and configuring IPTV in a service provider network ensuring network security • direct observation of the candidate building and configuring CDN architecture network • direct observation of the candidate configuring the LSR in an MPLS network • oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN4126A Install and configure internet protocol TV in a home network • ICTTEN4198A Install, configure and test an internet

EVIDENCE GUIDE	
	protocol (IP) network • ICTTEN4199A Install, configure and test a router • ICTTEN4212A Apply advanced routing protocols to network design • ICTTEN4213A Configure and troubleshoot advanced network switching. 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.	
OHS requirements may include:	• awards provisions • hazardous substances and dangerous goods codes • legislation

RANGE STATEMENT	
	• local safe operation procedures • material safety management systems • protective equipment.

RANGE STATEMENT	
Appropriate personnel may include:	• customer • network administrator • network manager • site engineer • supervisor.
Topology of an IPTV network may include:	• digital subscriber line access multiplexer (DSLAM) • head end servers • home gateway • media centres • media content servers • MPLS routers • MPLS switches • set top box.
Network elements may include:	• head end servers • media content servers • MPLS routers and switches • video service routers.
Protocols may include:	• IGMP • point to multipoint (p-to-mp) for IPTV • protocol independent multicast (PIM) • reverse path forwarding (RPF) • routing table protocol (RTP) • RTSP • session definition or data protocol (SDP) • session initiation protocol (SIP) • spanning-tree protocol (STP).
Security measures may include:	• digital signatures and certificates • encryption • integrity and authentication.
Security threats may include:	• botnets • distributed denial of service (DDoS) • fraud • hacking • malware.
Layer 2 protocols may include:	• asynchronous transfer mode (ATM) • Ethernet • frame relay (FR) • IGMP

RANGE STATEMENT	
	• packet over SONET (POS) • p-to-mp for IPTV • point-to-point protocol (PPP) unicast for VoD streaming • PIM • STP.
MPLS network may include location and type of:	• core label switch routers (Core LSR) • edge label switch routers (Edge LSR) • hosting servers for media content.
Internet devices may include:	• digital TV • media centre • mobile devices • PC.
Network functionality may include:	• application processing • caching • file access and sharing • multimedia delivery.
Essential installation information may include:	• installation software • IP addressing schemes • logical and physical diagrams • network administrator codes • passwords • security access codes.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering