



Australian Government

ICTTEN621 Design and configure IP-MPLS networks with virtual private network tunnelling

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 design an internet protocol-multiprotocol label switching (IP-MPLS) network, examine MLPS data flow and configure virtual private network (VPN) tunnelling.

It applies to individuals with excellent technical skills including designers and installers of Next Generation Networks (NGN). These IP networks provide fast internet, voice over internet protocol (VoIP) and internet protocol TV (IPTV) services.

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
<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 IP-MPLS network to meet business requirements	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 Determine IP-MPLS network design requirements in consultation with enterprise customer 1.3 Optimise factors affecting design 1.4 Use label stacking to route MPLS packets in the network and build MPLS services 1.5 Dimension layer-3 generation of core backbone and allow MPLS IP-VPN to provide MPLS convergence services

ELEMENT	PERFORMANCE CRITERIA
	1.6 Obtain MPLS control plane and set up wavelengths 1.7 Produce design topology of a MPLS network to include location and types of edge label switch routers (LSR) and core LSRs in agreement with enterprise customer
2. Configure MPLS network and verify traffic engineering (TE) considerations	2.1 Configure edge and core LSRs to provide secure methods of transporting IP packets in the MPLS network using layer 2 protocols 2.2 Configure LSRs to provide toll bypass for convergence of voice and data over IP network 2.3 Classify traffic in MPLS terms and configure edge LSR to sort traffic into forward equivalent classes (FECs) 2.4 Install and remove two standardised signalling protocols for managing TE of MPLS paths 2.5 Configure MPLS-TE to provide routing on diverse paths to avoid congestion and guarantee bandwidth services
3. Configure VPN and provide a virtual private Local Area Network service (VPLS)	3.1 Configure a MPLS VPN tunnel for a customer network to provide multipoint-to-multipoint VPN connectivity 3.2 Build a content hosting server into a MPLS based VPN to produce a media network 3.3 Use (VPLS) as a VPN method for wide area network (WAN) multipoint-to-multipoint ethernet connectivity spanning multiple metropolitan areas 3.4 Produce VPLS topology using an internet protocol IP-MPLS cloud with provider edge (PE) routers connecting VPLS domains associated with an enterprise customer
4. Complete documentation	4.1 Produce a final design plan including network elements, configuration details and recommendations for design changes 4.2 Notify customer and obtain sign-off according to organisational requirements

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
Oral communication	Engages with customers, about technical and operational matters, using clear language and active listening, observational and questioning techniques to confirm, clarify or revise understanding

SKILL	DESCRIPTION
Writing	• Prepares workplace documentation including incorporating technical language to communicate complex information clearly and effectively
Teamwork	• Selects and uses relevant conventions and protocols when consulting or negotiating with customers
Planning and organising	• Uses a combination of formal, logical planning processes and an understanding of context for complex, high impact activities with strategic implications • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering required 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
Technology	• Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes and create opportunities • Uses digital systems and tools to enter, store and analyse data

Unit Mapping Information

Supersedes and is equivalent to ICTTEN610 Design and configure an IP-MPLS network with virtual private network tunnelling.

Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTTEN621 Design and configure IP-MPLS networks with virtual private network tunnelling

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- plan and design at least two multiprotocol label switching (MPLS) networks that meet business requirements.

In the course of the above, the candidate must:

- configure and test the MPLS network according to specified guidelines
- produce design topology of a MPLS network
- produce design plans, including network elements, configuration details and recommendations for design changes
- implement secure virtual private network (VPN) tunnelling.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- required legislation, codes, company work practices, regulations and standards, workplace health and safety (WHS) requirements for scoped work
- industry-accepted hardware and software products used in IP-MPLS networks
- functions and features of MPLS IP-VPN network operating systems including:
 - transmission technologies
 - protocols
 - principles and techniques of constructing design plans
- effects of the customer's business domain, function and organisation on customer requirements and network equipment.

Assessment Conditions

Skills in this unit must be demonstrated in a workplace or simulated environment where the conditions are typical of those in a working environment in this industry.

This includes access to:

- a live network and networked computers
- network design documentation, equipment specifications and organisational guidelines
- network components, routers, switches and multi-layer switches.

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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