Unit 115: Cisco CCNP Switch

Unit code: J/601/9582

QCF Level 4: BTEC Higher National

Credit value: 10

Guided learning hours: 80

● Aim and purpose

This unit covers the advanced deployment of switched VLAN, VTP and DOT1Q technologies in a multilayer switched environment. By enabling the learner to develop their network management skills in supporting STP, RSTP, PVSTP and integrating router redundancy via VRRP and HSRP and bandwidth loading on Etherchannel. The learner will address the systems security, wireless infrastructure, voice and data contention requirement of a campus based switched infrastructure.

● Unit introduction

This unit is a comprehensive exploration of the core principles of multilayer networking. This is one of the three units in the professional study pathway, leading to the Cisco Certified Networking Professional (CCNP) qualification. This unit focuses on Gateway Redundancy, voice over internet Protocol, Spanning Tree, Virtual Local Area Networks (VLANs) and trunking.

The unit covers networking sector skills and knowledge that an ICT networking expert would need to successfully complete their work. In particular, learners will be taught how to plan and deploy a complex network infrastructure using more than one switching technology in unison with a routing protocol.

This unit involves hands-on, lab-oriented activities that stresses laboratory safety and working effectively in a group environment. Theory aspects are studied and tested online using Cisco's own electronic curriculum which learners may also access from home. The unit is delivered through a blended learning approach where tutor-led teaching is combined with the electronic materials and testing.

This unit is assessed via the Cisco CCNP Switch (CCNP2) online examination. There are further criteria for merit and distinction grades.

● Learning outcomes

On completion of this unit a learner should:

1   Understand the analysis of an Enterprise Campus Architecture

2   Be able to Implement VLANs in Campus Networks

3   Be able to implement Spanning Tree

4   Be able to implement inter-VLAN Routing

5   Understand High Availability and Redundancy in a Campus Network

6   Understand Campus Infrastructure Security

7   Understand the preparation of the Campus Infrastructure for Advanced Services.

Unit content in relation to the Merit and Distinction Criteria

Switched Network: four or more switches in a mesh with two or more VLANS running trunking and a routing protocol

Redundancy: types eg HSRP, VSRP, cable mesh, ether-channel

Switched Technology: types eg STP, PV-STP, VLAN, dot1q, trunking, VTP, VACL's

Benchmark data: types eg current system throughput, switching table size, switching performance

Current standards: types eg quality of service, campus design, address space allocation, vlan size

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
Pass CCNP Switch (CCNP2) academy examination. The centre will evidence this with a copy of the learner's class grade book from the assessment system on completion of the course (this must be listed by learner name). A pass grade is a score of 70% or more in the **final examination**.	M1 research an existing network infrastructure and evaluate current performance	D1 justify network design against current standards
	M2 plan a switched network infrastructure using redundancy and switched technology	D2 research performance of network design and provide benchmark data.
	M3 manage the deployment of the planned switched network.	

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Cisco CCNP Switch is a proprietary unit within the Cisco Networking Academy program. The curriculum, assessment and support materials are available only to institutions participating in the program.

Cisco Systems makes these available at no cost for any non-profit institution; there are some costs for instructor training and support. For detailed information please consult this web link:

www.cisco.com/web/learning/netacad/get_involved/BecomeAnAcademy.html.

If learners are following the Cisco unit in parallel with a BTEC National or Higher National unit then it is recommended that the two aspects of the assessment are integrated. Tasks being completed as part of the practical preparation for Cisco Skills Based Exams can then be used to support the BTEC assessment for the merit and distinction criteria.

To view general information about the Cisco CCNP Switch objectives please visit: www.cisco.com/web/learning/netacad/course_catalog/CCNP.html. The detailed scope and sequence documents are available to academies on the Cisco internal site.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

The learning outcomes associated with this unit are closely linked with:

Level 3	Level 4	Level 5
Unit 5: Managing Networks	Unit 2: Computer Systems	Unit 43: Networking Infrastructure
Unit 9: Computer Networks	Unit 24: Networking Technologies	Unit 44: Local Area Network Technologies
Unit 32: Network Systems Security	Unit 25: Routing Concepts	Unit 45: Wide Area Network Technologies
All Cisco Discovery and Exploration Units	All Cisco CCNP Units	Unit 46: Network Security

This unit has links to the Level 4 and Level 5 National Occupational Standards for IT and Telecoms Professionals, particularly the areas of competence of:

- IT/Technology Infrastructure Design and Planning
- Systems Development
- IT/Technology Service Operations and Event Management
- IT/Technology Management and Support
- Change and Release Management.

Essential Requirements

Learners must have access to a live or 'detached' network environment to create the network infrastructure and develop their skills; this may be successfully accomplished using virtual machines.

Learners must have access to facilities, which allow them the opportunity to fully evidence all the criteria of the unit. If this cannot be guaranteed then centres should not attempt to deliver this unit.

Evaluation of current systems and solutions, commercial practices, social conditions and the culture surrounding the system in use is of as much importance as delivering work supporting potential understanding of the technological systems and the services they offer.

Learners must have access to a range of suitable routing hardware as it is important to undertake as many practical activities as possible to reinforce theoretical learning. There are many virtual, emulated and simulated systems that now support delivery.

Resources

For a list of Cisco resources to assist with this unit, including exam preparation materials, see: www.cisco.com/web/learning/netacad/course_catalog/CCNP.html

Books

Macfarlane J – *Network Routing Basics: Understanding IP Routing in Cisco Systems* (Wiley, 2006) ISBN-10: 0471772739

Xiao Y, Li J, Pan Y – *Security and Routing in Wireless Networks: Wireless Networks and Mobile Computing v. 3* (Nova Science, 2005) ISBN-10: 159454316X

Froom, R et al, Implementing Cisco IP Switched Networks (SWITCH) Foundation Learning Guide: Foundation learning for the ROUTE 642-813 Exam (Cisco Press 2010) ISBN-10: 1-58705-884-7

Websites

www.cisco.com

cisco.netacad.net

Employer engagement and vocational contexts

The Cisco CCNA certification is internationally recognized by a diverse range of employers (from SME's to large corporations) as one of the principal certifications in networking and telecommunications.