Unit 134: Windows Internals (70-660)

Unit code: H/600/4376

QCF Level 5: BTEC Higher National

Credit value: 15

Guided learning hours: 104

Aim and purpose

This unit aims to provide learners with the skills needed to identify architectural components, design Windows solutions, monitor Windows by analysing user and kernel modes, as well as debugging Windows to resolve common problems.

Successful learners or candidates will resolve problems that require a deeper understanding of Windows Internals rather than problems about planning and infrastructure development or how to configure a product that runs on Windows.

Unit introduction

This unit is a comprehensive exploration of the core components of the Windows operating system; this is one of the many units in the Microsoft Information Technology professional study pathway, leading to the MCITP qualification.

This unit includes system design, debugging, performance and support. Learners will build upon their knowledge of Windows systems by understanding how the core system and management mechanisms work, exploring internal system data structures, scheduling priority and CPU algorithms, exploring the Windows security model, managing physical and virtual memory, touring the Windows networking stack, troubleshooting file system access and boot problems, as well as learning how to analyse crashes.

This unit also includes managing a Windows environment using Microsoft Server technologies. The unit covers networking sector skills and knowledge that an ICT networking or programming/database expert would need to successfully complete their work. In particular, learners will be taught how to maintain a Windows Server, using a range of technologies.

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 Microsoft'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 Windows Internals (70-660) online examination. There are further criteria for merit and distinction grades.

Learning outcomes

On completion of this unit a learner should:

1 identify architectural components

2 design solutions

3 monitor windows

4 analyse user mode

5 analyse Kernel Mode

6 debug windows

Unit content in relation to the Merit and Distinction Criteria

Windows server environment: types eg memory types, memory mechanisms, I/O mechanisms, subsystems, processor functions, processor architecture, processes, threads, driver optimisation, I/O optimisation, debugging

Windows modes: user mode; kernel mode;

Current standards: types eg performance, I/O, CPU, memory, exceptions

Benchmark data: types eg I/O latency, I/O throughput, CPU utilisation, Memory usage, handled exceptions, unhandled exceptions

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 Windows Internals (70-660) The centre will evidence this with a copy of the learners results, the learner MUST PASS at the minimum set by Microsoft.	M1 Evaluate an existing operational windows server environment and baseline performance	D1 Justify server performance against current standards
	M2 Plan the monitoring and maintenance of a windows server	D2 Evaluate performance of a windows server environment and provide benchmark data
	M3 Analyze server performance via windows modes	

Guidance

Delivery

Windows Internals (70-660) is a proprietary certification within the Microsoft IT academy programme. Access to resources, curriculum, assessment and support materials are available only to institutions participating in the program.

If learners are following the Microsoft certification 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 Microsoft Certification can then be used to support the BTEC assessment for the merit and distinction criteria.

To view general information about Microsoft objectives please visit: https://www.microsoft.com/education/MSITAcademy/default.mspx where the detailed scope and sequence for all certifications are available for anyone to download.

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 36: Internet Server Management
Unit 9: Computer Networks	Unit 24: Networking Technologies	Unit 43: Networking Infrastructure
Unit 32: Network Systems Security	Unit 27: Network Operating Systems	Unit 44: Local Area Network Technologies
All level 3, Microsoft IT professional units	All level 4, Microsoft IT professional units	Unit 46: Network Security
		Unit 47: IT Virtualisation
		All level 5, Microsoft IT professional units

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:

1 IT/Technology Infrastructure Design and Planning

2 Systems Development

3 IT/ Technology Service Operations and Event Management

4 IT/Technology Management and Support

5 Change and Release Management.

Essential Requirements

Learners must have access to a live or 'detached' network environment to create the network server 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 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

Books

Microsoft in association with their many partners produce a range of books on the topics in this unit. Please refer to the Microsoft Academy resource for the latest information.

Websites

www.microsoft.com

www.microsoft.com/education/msitacademy/default.mspx

Employer engagement and vocational contexts

The Microsoft ITP certification is internationally recognized by a diverse range of employers (from SME's to large corporations) as one of the principal certifications in server deployment.