Unit 133: Designing, Optimizing and Maintaining a Database Administrative Solution Using Microsoft SQL Server 2008 (70-450)

Unit code: T/600/4298

QCF Level 4: BTEC Higher Nationals

Credit value: 10

Guided learning hours: 54

Aim and purpose

Candidates for this exam work in an environment in which Microsoft SQL Server 2008 is used for database solutions. Candidates should have at least three years of experience administering databases in an enterprise-level organisation and designing, deploying, optimizing, maintaining, and supporting database service life cycle. Candidates should also have experience with the following:

- Defining high-availability solutions
- Data distribution
- Automating administrative tasks (for example, checking db stats, backups)
- Maintaining administrative tasks (for example, determining index rebuild time, file groups for backup)
- Defining security solutions
- Monitoring and troubleshooting the database server
- Performance optimization (for example, physical tuning, including hardware, operating system, instance-level tuning), PerfMon
- Designing and executing deployments
- Deployments and migration
- Defining the infrastructure (for example, storage, hardware, and number of servers or instances)

Unit introduction

This unit is a comprehensive exploration of the core principles of Microsoft Server technologies; this is the one of many, units in the Microsoft Information Technology professional study pathway, leading to the MCITP qualification. This unit focuses on database server technology using the Microsoft SQL server.

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 configure an SQL 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 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 Designing, Optimizing and Maintaining a Database Administrative Solution Using Microsoft SQL Server 2008 (70-450) online examination. There are further criteria for merit and distinction grades.

● Learning outcomes

On completion of this unit a learner should:

1   Design a SQL Server Instance and a Database Solution

2   Design a Database Server Security Solution

3   Design a Database Solution for High Availability

4   Design a Backup and Recovery Solution

5   Design a Monitoring Strategy

6   Design a Strategy to Maintain and Manage Databases

7   Design a Strategy for Data Distribution.

Unit content in relation to the Merit and Distinction Criteria

Database server environment: types eg server instances, storage, physical database, migration/upgrade, business requirements, automation, linked servers, distribution

Database server configuration: types eg security, authentication, encryption, high availability

Current standards: types eg database design, normalisation, monitoring, recovery, testing, audit plan

Benchmark data: types eg performance, transaction time, concurrency, distribution delay

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 Designing, Optimizing and Maintaining a Database Administrative Solution Using Microsoft SQL Server 2008 (70-450) The centre will evidence this with a copy of the learners results, the learner MUST PASS at the minimum set by Microsoft.	**M1** research an existing database server environment and evaluate current performance **M2** design a database server configuration **M3** manage the configuration of database server environment.	**D1** justify database server configuration against current standards **D2** research performance of database server configuration and provide benchmark data.

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

Designing, Optimizing and Maintaining a Database Administrative Solution Using Microsoft SQL Server 2008 (70-450) 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 course 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
All level 3, Oracle Units	Unit 17: Database Design Concepts	Unit 47: IT Virtualisation
Unit 6; Software Design and Development	Unit 18: Procedural Programming	All level 5, Microsoft IT professional units
Unit 14: Event Driven Programming	Unit 19:Object Oriented Programming	Unit 33: Data Analysis and Design
Unit 15: Object Oriented Programming	Unit 20:Event Driven Programming Solutions	Unit 35: data structures and algorithms
Unit 16: procedural programming		
Unit 18: database design		
Unit 21: Data Analysis and Design		

This unit sits between the systems support and software development proficiencies, having 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.
- Data Analysis
- Software Development.

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 module, 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.