



National Unit specification: general information

Unit title: Server Administration Fundamentals (SCQF level 6)

Unit code: H2N7 12

Superclass: CB

Publication date: October 2012

Source: Scottish Qualifications Authority

Version: 01

Summary

This Unit introduces fundamental approaches to server administration in modern computing environments. It covers the role of servers and how they support users and computer management, server installations, storage solutions and performance and maintenance.

This Unit is aimed at candidates who have at least a basic knowledge of computer hardware and computer software, and who are interested in computer networking.

This is a mandatory Unit in the National Progression Award (NPA) in Professional Computer Fundamentals, but can also be taken as a freestanding Unit.

Outcomes

- 1 Demonstrate knowledge and understanding of the installation of a server operating system.
- 2 Identify and explain the role of servers.
- 3 Demonstrate knowledge and understanding of user and computer management.
- 4 Research and evaluate a range of server storage solutions.
- 5 Demonstrate knowledge and understanding of server installations.

Recommended entry

While entry is at the discretion of the centre, it would be beneficial if candidates possessed basic ICT skills and had a working knowledge of computer hardware and software. This may be evidenced by achievement of the following, or equivalent Units:

F1KR 11 *Computing: Computer Hardware and Systems*

F3SY 12 *Computing: Computer Hardware and Systems*

It may also be beneficial for candidates to have some knowledge of computer networks. This may be evidenced by achievement of the following, or an equivalent Unit:

F1KH 11 *Computing: Computer Networking Fundamentals*

General information (cont)

Unit title: Server Administration Fundamentals (SCQF level 6)

Credit points and level

1 National Unit credit at SCQF level 6: (6 SCQF credit points at SCQF level 6*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Core Skills

There is no automatic certification of Core Skills components in this Unit.

Opportunities for developing aspects of Core Skills are highlighted in the support notes of this Unit specification.

National Unit specification: statement of standards

Unit title: Server Administration Fundamentals (SCQF level 6)

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Outcome 1

Demonstrate knowledge and understanding of the installation of a server operating system.

Performance Criteria

- (a) Identify the main components of a server operating system.
- (b) Describe the function of device drivers within a server operating system.
- (c) Install a server operating system.
- (d) Configure services on a server.

Outcome 2

Identify and explain the role of servers.

Performance Criteria

- (a) Identify and explain the purpose of a range of application servers.
- (b) Identify and explain the purpose of a range of web servers.
- (c) Explain the function of remote access methods.
- (d) Explain the role of file and print servers.
- (e) Explain the purpose of server virtualisation.

Outcome 3

Demonstrate knowledge and understanding of user and computer management.

Performance Criteria

- (a) Create and manage users and groups.
- (b) Describe advanced user and computer groupings.
- (c) Describe common computer network infrastructure solutions.
- (d) Manage users and computers using policies.

Outcome 4

Research and evaluate a range of server storage solutions.

- (a) Compare data storage technologies.
- (b) Compare RAID solutions.
- (c) Describe common disk types.

National Unit specification: statement of standards (cont)

Unit title: Server Administration Fundamentals (SCQF level 6)

Outcome 5

Demonstrate knowledge and understanding of server installations.

- (a) Monitor performance of the main server hardware components.
- (b) Describe a typical server start up process.
- (c) Explain the importance of server backup and fault tolerance.
- (d) Update server software.
- (e) Describe server troubleshooting approaches.

Evidence Requirements for this Unit

Evidence is required to demonstrate that candidates have achieved all Outcomes and Performance Criteria.

All assessment will be produced under controlled, supervised, closed-book conditions.

For Outcome 1, candidates must demonstrate knowledge and understanding of:

- ◆ server installation options — choosing operating version and type; preparing for installation; attended/unattended installations; upgrades/clean installs
- ◆ device drivers — installation; removal; disabling; update; rollback; troubleshooting; driver signing
- ◆ services — viewing services; service status and modes; start, stop or restart services

For Outcome 2, candidates must identify and explain:

- ◆ application servers — e-mail servers; database servers; security servers
- ◆ web services — WWW; FTP; SSL; web hosting
- ◆ remote access tools — remote assistance and administration tools; remote desktop tools; VPNs
- ◆ file and print services — local and network printers; printer pools; print job management; file and folder permissions; share permissions
- ◆ server virtualisation — physical and virtual servers; virtual hard disks; virtual memory
- ◆ identification and description of at least three types of malware

For Outcome 3, candidates must demonstrate knowledge and understanding of:

- ◆ user accounts and groups — local accounts; network accounts; group types and scopes; group nesting
- ◆ advanced grouping and containers — default containers; policy management; nesting; inheritance
- ◆ common network infrastructures — hierarchies; server roles; replications; namespace; trusts and links
- ◆ policy management — user and computer policy management; order of processing; local policies

National Unit specification: statement of standards (cont)

Unit title: Server Administration Fundamentals (SCQF level 6)

For Outcome 4, candidates must research and evaluate:

- ◆ data storage technologies — local disks; network storage; disk types and technologies
- ◆ RAID solutions — RAID 0, RAID 1, RAID 5, RAID 10
- ◆ disk types — basic and dynamic disks; mounted disks; file systems; virtual hard disks; distributed file systems; optical disks

For Outcome 5, candidates must demonstrate knowledge and understanding of:

- ◆ performance management tools to analyse network, CPU, memory and disk; creating a baseline; performance management tools; performance logs and alerts
- ◆ server start up process — bios; boot sectors; boot files; POST; safe modes; backup and restore; disaster recovery; clustering; folder redirection; data redundancy; uninterruptible power supply (UPS)
- ◆ server software updates — operating systems updates; driver updates; applications updates; security updates
- ◆ troubleshooting servers — methodologies; troubleshooting tools; monitoring resources; event viewing, logging and filtering

National Unit specification: support notes

Unit title: Server Administration Fundamentals (SCQF level 6)

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

This is a mandatory Unit in the National Progression Award in Professional Computer Fundamentals, but can also be taken as a freestanding Unit. It is aimed at providing candidates with the underpinning theory required for a career in system administration and/or network design. The Unit may be useful for any candidates who are preparing to undertake the Microsoft Technology Associate (MTA) exam Server Administration Fundamentals (exam number: 98-365).

It is expected that the following content would be relevant to the delivery of Outcome 1:

- ◆ server installation options — choosing operating version and type; preparing for installation; attended/unattended installations; upgrades/clean installs
- ◆ device drivers — installation; removal; disabling; update; rollback; troubleshooting; driver signing
- ◆ services — viewing services; service status and modes; start, stop or restart services

It is expected that the following content would be relevant to the delivery of Outcome 2:

- ◆ application servers — e-mail servers; database servers; security servers
- ◆ web services — WWW; FTP; SSL; web hosting
- ◆ remote access tools — remote assistance and administration tools; remote desktop tools; VPNs
- ◆ file and print services — local and network printers; printer pools; print job management; file and folder permissions; share permissions
- ◆ server virtualisation — physical and virtual servers; virtual hard disks; virtual memory

It is expected that the following content would be relevant to the delivery of Outcome 3:

- ◆ user accounts and groups — local accounts; network accounts; group types and scopes; group nesting
- ◆ advanced grouping and containers — default containers; policy management; nesting; inheritance
- ◆ common network infrastructures — hierarchies; server roles; replications; namespace; trusts and links
- ◆ policy management — user and computer policy management; order of processing; local policies

National Unit specification: support notes (cont)

Unit title: Server Administration Fundamentals (SCQF level 6)

It is expected that the following content would be relevant to the delivery of Outcome 4:

- ◆ data storage technologies — local disks; network storage; disk types and technologies
- ◆ RAID solutions — RAID 0, RAID 1, RAID 5, RAID 10
- ◆ disk types — basic and dynamic disks; mounted disks; file systems; virtual hard disks; distributed file systems; optical disks

It is expected that the following content would be relevant to the delivery of Outcome 5:

- ◆ performance management tools to analyse network, CPU, memory and disk; creating a baseline; performance management tools; performance logs and alerts
- ◆ server start up process — bios; boot sectors; boot files; POST; safe modes; backup and restore; disaster recovery; clustering; folder redirection; data redundancy; uninterruptible power supply (UPS)
- ◆ server software updates — operating systems updates; driver updates; applications updates; security updates
- ◆ troubleshooting servers — methodologies; troubleshooting tools; monitoring resources; event viewing, logging and filtering

Guidance on learning and teaching approaches for this Unit

While the main focus of this Unit is theoretical, it is expected that tutors will use practical and hands on methods as part of their classes to ensure candidates see the theory in practice. It is suggested that practical exercises and/or demonstrations would be particularly relevant and beneficial when teaching the following:

Outcome 1

- ◆ server installation options
- ◆ device drivers — installation
- ◆ services — viewing services; service status and modes; start, stop or restart services

Outcome 2

- ◆ application servers
- ◆ remote access tools
- ◆ file and print services
- ◆ server virtualisation

Outcome 3

- ◆ user accounts and groups
- ◆ advanced grouping and containers
- ◆ common network infrastructures
- ◆ policy management

National Unit specification: support notes (cont)

Unit title: Server Administration Fundamentals (SCQF level 6)

Outcome 4

- ◆ data storage technologies
- ◆ RAID solutions
- ◆ disk types

Outcome 5

- ◆ performance management tools to analyse network
- ◆ server start up process
- ◆ server software updates
- ◆ troubleshooting servers — methodologies; troubleshooting tools
- ◆ monitoring resources; event viewing, logging and filtering

Guidance on approaches to assessment for this Unit

All Outcomes could be assessed via a multiple choice test of around 40 questions, with adequate sampling of the required evidence. Candidates must not know in advance on which items they will be tested. Where re-assessment is required, a different Instrument of Assessment should be used.

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

Opportunities for developing Core Skills

In this Unit, there are opportunities to develop aspects of the Core Skills of *Information and Communication Technology* in particular, and *Communication*. *Information and Communication Technology* skills will be developed naturally through the content of the Unit which focuses on the theory behind computer networks. *Communication* skills may be developed through written and/or verbal reporting throughout assessments if using instruments other than multiple choice questioning.

Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements

History of changes to Unit

Version	Description of change	Date

© Scottish Qualifications Authority 2012

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Business Development and Customer Support team, telephone 0303 333 0330.