

Higher National Unit Specification

General information for centres

Unit title: Network Server Operating System

Unit code: DF9N 34

Unit purpose: This Unit is designed to introduce candidates to the issues involved in managing and maintaining a network server operating system. It is intended for candidates undertaking an HNC or HND in Computing, Computer Networking or a related area who require a broad knowledge of network servers, including the main theories, concepts and principles in this area.

On completion of the Unit candidates should be able to:

1. Manage and maintain physical and logical devices.
2. Manage users, computers and groups.
3. Manage and maintain access to resources.
4. Manage and maintain a server environment.
5. Manage and implement disaster recovery.

Credit value: 2 HN credits at SCQF level 7: (16 SCQF credit points at SCQF level 7)

**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.*

Recommended prior knowledge and skills: Access to this Unit will be at the discretion of the Centre. There are no specific requirements but candidates would benefit from knowledge of computer networks and operating systems. This may be demonstrated by the possession of HN Units such as DF9P 34 Network Concepts and DF9M 34 Client Operating System.

Core skills: There may be opportunities to gather evidence towards core skills in this Unit, although there is no automatic certification of core skills or core skills components.

Context for delivery: This Unit is included in the framework of a number of HNC and HND group awards. It is recommended that it should be taught and assessed within the context of the particular group award to which it contributes.

Assessment: Evidence for the knowledge and/or skills for the entire Unit must be produced using a set of 40 restricted-response questions to assess candidates' knowledge and understanding. This may be administered as a single end-of unit test, or as several subtests, each covering one or more outcomes.

General information for centres (cont)

Candidates must answer at least 70% of the questions correctly in order to obtain a pass. If subtests are used, they must also score at least 70% in each subtest.

Testing must take place in a closed-book environment where candidates have no access to books, handouts, notes or other learning material. Testing can be done in either a machine-based or paper-based format and must be invigilated by a tutor or mentor. There must be no communication between candidates and communication with the invigilator must be restricted to matters relating to the administration of the test.

If a candidate requires to be reassessed, a different selection of questions must be used. At least half the questions in the reassessment must be different from those used in the original test.

If an outcome has a practical component, this must be assessed by having the candidate use a logbook to record the practical tasks successfully completed. The logbook can be in paper or electronic form and must be authenticated by the tutor or mentor.

For some outcomes only a sample of the practical tasks needs to be completed and recorded for assessment purposes, e.g. three out of five. This is clearly indicated in the logbook instructions for the outcomes involved. Where this occurs, tutors must inform candidates of the tasks to be completed.

An Assessment Exemplar and Guidelines on the Delivery of the Unit have been produced to indicate the national standard of achievement required at SCQF level 7.

Higher National Unit specification: statement of standards

Unit title: Network Server Operating System

Unit code: DF9N 34

The sections of the Unit stating the Outcomes, knowledge and/or skills, and evidence requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the knowledge and/or skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Manage and maintain physical and logical devices.

Knowledge and/or skills

- ◆ Manage hard disk subsystems.
- ◆ Monitor server hardware.
- ◆ Optimise server disk performance.
- ◆ Install and configure server hardware devices.

Evidence requirements

Restricted response test

The knowledge and skills component of Outcome 1 must be examined by eight questions, two being derived from each of the four items listed below. Each question must be derived from a single item.

1. Manage hard disk subsystems

Initialising and partitioning, disk properties

2. Monitor server hardware

Use of relevant system tools

3. Optimise server disk performance

Implement RAID solutions, defragment volumes and partitions.

4. Install and configure server hardware devices

Drivers, resource settings, device properties

Higher National Unit specification: statement of standards (cont)

Unit title: Network Server Operating System

The test may be administered on its own as a subtest or be combined with other outcome subtests in the Unit.

Alternatively, the 8 questions for this outcome may contribute towards a single end-of-unit test of 40 questions.

Logbook

The logbook for Outcome 1 must record successful completion by the candidate of **at least two** of the four tasks listed below. The tasks to be completed must be selected by the tutor.

1. Manage hard disk subsystems

Documentary evidence that the candidate can manage hard disk subsystems including initialising and partitioning disks and setting disk properties.

2. Monitor server hardware

Documentary evidence that the candidate can use relevant system tools to monitor server hardware.

3. Optimise server disk performance

Documentary evidence that the candidate can optimise server disk performance by implementing RAID solutions and defragmenting volumes and partitions.

4. Install and configure server hardware devices

Documentary evidence that the candidate can install and configure at least two server hardware devices including drivers, resource settings and device properties.

Assessment guidelines

It is suggested that all the above concepts be presented and explained within the context of current real-world practice and applications.

The suggested time allocation for a restricted response test is 2 minutes for each question plus 5 minutes starting-up time and 5 minutes finishing-off time, thus a total of 90 minutes should be allocated for a 40-question end-of-unit test.

Although individual outcome tests are permissible, it is suggested that if subtests are to be used, outcomes should be combined to produce tests of no fewer than 10 questions. A 10-question test would therefore have a time allocation of 30 minutes.

The restricted-response questions should be supplemented by a logbook recording the practical tasks carried out by the candidate during this Unit.

Higher National Unit specification: statement of standards (cont)

Unit title: Network Server Operating System

Outcome 2

Manage users, computers and groups.

Knowledge and/or skills

- ◆ Manage user profiles.
- ◆ Create and manage user and computer accounts.
- ◆ Troubleshoot user and computer accounts.
- ◆ Create and manage groups.

Evidence requirements

Restricted response test

The knowledge and skills component of Outcome 2 must be examined by eight questions, two being derived from each of the four items listed below. Each question must be derived from a single item.

1. Manage user profiles

Local, roaming and mandatory profiles

2. Create and manage user and computer accounts

Use account management tools, import user accounts

3. Troubleshoot user and computer accounts

Use account management tools, reset computer accounts, account lockouts and issues related to user account properties, user authentication issues

4. Create and manage groups

Identify/modify scope of groups, manage group membership, use group management tools

The test may be administered on its own as a subtest or be combined with other outcome subtests in the Unit.

Alternatively, the 8 questions for this outcome may contribute towards a single end-of-unit test of 40 questions.

The logbook for Outcome 2 must record successful completion by the candidate of **at least two** of the four tasks listed below. The tasks to be completed must be selected by the tutor.

Higher National Unit specification: statement of standards (cont)

Unit title: Network Server Operating System

1. Manage user profiles

Documentary evidence that the candidate can manage user profiles, including local, roaming and mandatory profiles.

2. Create and manage user and computer accounts.

Documentary evidence that the candidate can use account management tools to create and manage user and computer accounts and import user accounts.

3. Troubleshoot user and computer accounts

Documentary evidence that the candidate can use account management tools to reset computer accounts, and troubleshoot account lockouts and issues related to user account properties and user authentication issues.

4. Create and manage groups

Documentary evidence that the candidate can create and manage groups and can use group management tools to identify and modify the scope of groups and manage group membership.

Assessment guidelines

It is suggested that all the above concepts be presented and explained within the context of current real-world practice and applications.

The suggested time allocation for a restricted response test is 2 minutes for each question plus 5 minutes starting-up time and 5 minutes finishing-off time, thus a total of 90 minutes should be allocated for a 40-question end-of-unit test.

Although individual outcome tests are permissible, it is suggested that if subtests are to be used, outcomes should be combined to produce tests of no fewer than 10 questions. A 10-question test would therefore have a time allocation of 30 minutes.

Outcome 3

Manage and maintain access to resources

Knowledge and/or skills

- ◆ Configure access to shared folders.
- ◆ Troubleshoot terminal services.
- ◆ Configure file system permissions.

Higher National Unit specification: statement of standards (cont)

Unit title: Network Server Operating System

Evidence requirements

Restricted response test

The knowledge and skills component of Outcome 3 must be examined by eight questions, three being derived from any two of the three items listed below and two being derived from the remaining item. Each question must be derived from a single item.

1. Configure access to shared folders

Manage shared folder permissions.

2. Troubleshoot terminal services

Diagnose and resolve issues relating to client access and terminal services security.

3. Configure file system permissions

Verify effective permissions, change ownership of files and folders.

The test may be administered on its own as a subtest or be combined with other outcome subtests in the Unit.

Alternatively, the 8 questions for this outcome may contribute towards a single end-of-unit test of 40 questions.

Logbook

The logbook for Outcome 3 must record successful completion by the candidate of **at least two** of the three tasks listed below. The tasks to be completed must be selected by the tutor.

1. Configure access to shared folders.

Documentary evidence that candidates can configure access to shared folders and manage shared folder permissions.

2. Troubleshoot terminal services

Documentary evidence that candidates can diagnose and resolve issues relating to client access and terminal services security.

Higher National Unit specification: statement of standards (cont)

Unit title: Network Server Operating System

3. Configure file system permissions

Documentary evidence that candidates can configure file system permissions, verify effective permissions and change ownership of files and folders.

Assessment guidelines

It is suggested that all the above concepts be presented and explained within the context of current real-world practice and applications.

The suggested time allocation for a restricted response test is 2 minutes for each question plus 5 minutes starting-up time and 5 minutes finishing-off time, thus a total of 90 minutes should be allocated for a 40-question end-of-unit test.

Although individual outcome tests are permissible, it is suggested that if subtests are to be used, outcomes should be combined to produce tests of no fewer than 10 questions. A 10-question test would therefore have a time allocation of 30 minutes.

Outcome 4

Manage and maintain a server environment.

Knowledge and/or skills

- ◆ Monitor and analyse events and system performance.
- ◆ Manage software updates and site licensing.
- ◆ Manage servers remotely.
- ◆ Monitor file and print servers.
- ◆ Monitor and optimise application performance.
- ◆ Manage a web server.

Evidence requirements

Restricted response test

The knowledge and skills component of Outcome 4 must be examined by eight questions, one being derived from four of the six items listed below and two being derived from each of the two remaining items. Each question must be derived from a single item.

1. Monitor and analyse events and system performance

Using system monitoring tools

Higher National Unit specification: statement of standards (cont)

Unit title: Network Server Operating System

2. Manage software updates and site licensing

Using system tools.

3. Manage servers remotely

Using system remote management tools

4. Monitor file and print servers

Disk quotas, print queues, server hardware bottlenecks.

5. Monitor and optimise application performance

Memory, network, process, disk performance

6. Manage a web server

Manage server, maintain security

The test may be administered on its own as a subtest or be combined with other outcome subtests in the Unit.

Alternatively, the 8 questions for this outcome may contribute towards a single end-of-unit test of 40 questions.

Logbook

The logbook for Outcome 4 must record successful completion by the candidate of **at least three** of the six tasks listed below. The tasks to be completed must be selected by the tutor.

1. Monitor and analyse events and system performance.

Documentary evidence that candidates can use system monitoring tools to monitor and analyse events and system performance.

2. Manage software updates and site licensing

Documentary evidence that candidates can manage software updates and site licensing.

3. Manage servers remotely

Documentary evidence that candidates can use system remote management tools to manage servers remotely.

Higher National Unit specification: statement of standards (cont)

Unit title: Network Server Operating System

4. Monitor file and print servers.

Documentary evidence that candidates can monitor disk quotas, print queues, server hardware bottlenecks.

5. Monitor and optimise application performance.

Documentary evidence that candidates can monitor and optimise memory, network, process and disk performance.

6. Manage a web server

Documentary evidence that candidates can manage a web server and maintain security.

Assessment guidelines

It is suggested that all the above concepts be presented and explained within the context of current real-world practice and applications.

The suggested time allocation for a restricted response test is 2 minutes for each question plus 5 minutes starting-up time and 5 minutes finishing-off time, thus a total of 90 minutes should be allocated for a 40-question end-of-unit test.

Although individual outcome tests are permissible, it is suggested that if subtests are to be used, outcomes should be combined to produce tests of no fewer than 10 questions. A 10-question test would therefore have a time allocation of 30 minutes.

Outcome 5

Manage and implement disaster recovery

Knowledge and/or skills

- ◆ Perform system recovery for a server.
- ◆ Manage backup procedures.
- ◆ Recover from server hardware failure.
- ◆ Restore backup data.
- ◆ Schedule backup jobs.

Higher National Unit specification: statement of standards (cont)

Unit title: Network Server Operating System

Evidence requirements

Restricted response test

The knowledge and skills component of Outcome 5 must be examined by eight questions, two being derived from three of the five items listed below and one from each of the remaining items. Each question must be derived from a single item.

1. Perform system recovery for a server

use system recovery tools, restore data from copies, backup files and system data to media, configure security for backup operations

2. Manage backup procedures

verify successful completion of backup jobs, manage backup storage media

3. Recover from server hardware failure

component failure, corrupt system data, viruses, corrupt boot file, system tools

4. Restore backup data

use system tools

5. Schedule backup jobs

use system tools

The test may be administered on its own as a subtest or be combined with other outcome subtests in the Unit.

Alternatively, the 8 questions for this outcome may contribute towards a single end-of-unit test of 40 questions.

Logbook

The logbook for Outcome 5 must record successful completion by the candidate of **at least three** of the five tasks listed below. The tasks to be completed must be selected by the tutor.

1. Perform system recovery for a server.

Documentary evidence that the candidate can use system recovery tools, restore data from copies, backup files and system data to media and configure security for backup operations.

Higher National Unit specification: statement of standards (cont)

Unit title: Network Server Operating System

2. Manage backup procedures.

Documentary evidence that the candidate can verify successful completion of backup jobs and manage backup storage media.

3. Recover from server hardware failure.

Documentary evidence that the candidate can use system tools to recover from component failure, corrupt system data, viruses and corrupt boot files.

4. Restore backup data.

5. Documentary evidence that the candidate can use system tools to restore backup data.

6. Schedule backup jobs.

Documentary evidence that the candidate can use system tools to schedule backup jobs.

Assessment guidelines

It is suggested that all the above concepts be presented and explained within the context of current real-world practice and applications.

The suggested time allocation for a restricted response test is 2 minutes for each question plus 5 minutes starting-up time and 5 minutes finishing-off time, thus a total of 90 minutes should be allocated for a 40-question end-of-unit test.

Although individual outcome tests are permissible, it is suggested that if subtests are to be used, outcomes should be combined to produce tests of no fewer than 10 questions. A 10-question test would therefore have a time allocation of 30 minutes.

Administrative Information

Unit code: DF9N 34

Unit title: Network Server Operating System

Superclass category: CD

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Version: 03 (August 2007)

History of changes:

Version	Description of change	Date
02		
03	Credit value changed to two credits (80 notional hours)	June 07

Source: SQA

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Higher National Unit specification: support notes (cont)

Unit title: Network Server Operating System

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 60 hours.

Guidance on the content and context for this Unit

During the delivery of this unit it is important that every opportunity is taken to introduce real-world examples, opportunities for whole-class and group discussion and practical demonstrations wherever possible. Concepts and terminology should be presented in context throughout the Unit. Video presentations should be used where appropriate for providing an alternative explanation of a difficult topic, or as a focus for class discussion or group work.

Given the theoretical nature of this Unit, it is intended that a significant amount of time will be made available as a central part of the course for revision, tutorials and formative assessment exercises. Candidates should be strongly encouraged to undertake further reading, and opportunities for individual or group research should be provided.

The most important overall emphasis should be on the relevance and currency of content in such a rapidly-evolving field.

The following notes assume that the unit will be delivered using a Microsoft operating system, such as Windows 2003 Server. However, no restriction is placed on the operating system to be used and centres are free to choose alternative operating systems such as Linux/Unix, although this may involve significant changes in terminology.

This Unit may assist candidates in preparing for Microsoft examination 70-290: Managing and Maintaining a Microsoft Windows Server 2003 Environment. Vendor certifications can change rapidly and candidates should be encouraged to check the current details at www.microsoft.com/traincert to ensure that all objectives have been covered. This examination contributes towards the Microsoft Certified Systems Administrator (MCSA) and Microsoft Certified Systems Engineer (MCSE) awards.

The content of this unit may be delivered using relevant vendor-supplied materials, such as Microsoft Official Curriculum (MOC). As these materials are under continuous development, centres should check carefully to ensure that they meet all the requirements for the unit. If MOC materials are used, some of the practical tasks involved may contribute towards the practical assessments required for the unit.

Higher National Unit specification: support notes (cont)

Unit title: Network Server Operating System

It is recommended that the topics covered should include the following:

Outcome 1: Manage and maintain physical and logical devices

1 Manage hard disk subsystems

Candidates should be capable of initialising and partitioning a disk, viewing and updating disk properties, managing mounted drives, creating volumes on a disk, converting a disk from basic to dynamic and vice versa and managing foreign disks.

2 Monitor server hardware

Candidates should know how to use relevant system tools including Device Manager, the Hardware Troubleshooting Wizard and appropriate Control Panel items.

3 Optimise server disk performance

Candidates should know how to implement RAID (RAID-0, RAID-1, RAID-5) solutions, defragment volumes and partitions and use Disk Defragmenter.

4 Install and configure server hardware devices

Candidates should be aware of device properties and settings, hardware drivers, driver upgrades, driver rollback and driver signing options,

Outcome 2: Manage users, computers and groups.

1 Manage user profiles

Candidates should know how to manage local, roaming and mandatory profiles.

2 Create and manage user and computer accounts

Candidates should be capable of creating computer and user accounts, modifying computer and user account properties, enabling and unlocking user and computer accounts, creating a user account template, locating user and computer accounts in Active Directory and initiating automated creation and modification of user accounts.

3 Troubleshoot user and computer accounts

Candidates should be capable of diagnosing and resolving user account lockouts and issues relating to user account properties, troubleshooting user authentication issues, diagnosing and resolving issues related to computer accounts by using the Active Directory Users and Computers MMC snap-in and resetting computer accounts.

Higher National Unit specification: support notes (cont)

Unit title: Network Server Operating System

4 Create and manage groups

Candidates should know how to identify/modify the scope of groups, find domain groups in which a user is a member, manage group membership, use group management tools such as Active Directory Users and Computers MMC snap-in and initiate automated creation and modification of groups.

Outcome 3: Manage and maintain access to resources

1 Configure access to shared folders

Candidates should be able to configure access to shared folders and manage shared folder permissions.

2 Troubleshoot terminal services

Candidates should be able to diagnose and resolve issues relating to client access and terminal services security.

3 Configure file system permissions

Candidates should be able to verify effective permissions and change ownership of files and folders.

Outcome 4: Manage and maintain a server environment.

1 Monitor and analyse events and system performance.

Candidates should be able to use system monitoring tools such as Event Viewer and System Monitor; real-time and logged monitoring, counter logs, trace logs and alerts.

2 Manage software updates and site licensing.

Candidates should be able to manage software updates and site licensing by using the Software Update Service.

3 Manage servers remotely.

Candidates should be able to manage servers remotely by using system remote management tools such as Remote Assistance and Terminal Services Remote Administration mode.

4 Monitor file and print servers

Candidates should be able to monitor disk quotas, print queues and server hardware bottlenecks.

Higher National Unit specification: support notes (cont)

Unit title: Network Server Operating System

5 Monitor and optimise application performance

Candidates should be able to monitor and optimise server memory, network usage, processor usage and disk performance and use counters and thresholds.

6 Manage a web server

Candidates should be able to manage Internet Information Server (IIS) operations and security

Outcome 5: Manage and implement disaster recovery

1 Perform system recovery for a server

Candidates should be able to prepare for disaster recovery, backup files and System State data to media, use system recovery tools such as Automated System Recovery (ASR), Backup Utility, Emergency Boot Disk and the Recovery Console, restore data from shadow copy volumes and configure security for backup operations

2 Manage backup procedures

Candidates should be able to verify successful completion of backup jobs and manage backup storage media.

3 Recover from server failure

Candidates should be able to recover from hardware failure, corrupt registry, viruses, corrupt boot file, by making use of use of Safe Mode, Last Known Good, Recovery Console and Boot Disk.

4 Restore backup data

Candidates should be able to make use of restore features in Backup and ASR Restore.

5 Schedule backup jobs

Candidates should be able to make use of Backup and Restore Wizard and Scheduled Backup options.

Higher National Unit specification: support notes (cont)

Unit title: Network Server Operating System

Guidance on the delivery and assessment of this Unit

This Unit is likely to form part of a group award which is primarily designed to provide candidates with technical or professional knowledge and skills related to a specific occupational area. It is highly technical in content and should not be adopted by group awards in other areas or delivered as a stand-alone Unit without careful consideration of its appropriateness.

It is a Unit which candidates are likely to find accessible at an introductory level; it is suggested that it be delivered during the early stages of an HNC/HND program in Computing or a related area. It should be delivered in tandem with other Computing Units and opportunities for teaching and assessment integration explored.

To minimise assessment overhead, one or more sets of closed-book restricted-response questions, totalling 40 questions in all, should be used to provide evidence of candidates' knowledge for all Outcomes. It is suggested that multiple-choice questions should be used as the preferred assessment method – as well as reducing the time required for assessment and marking, these reduce the need for candidates to memorise details and encourage understanding. 70% of the questions must be answered correctly. Candidates must also complete a logbook or checklist recording the practical work undertaken for each outcome.

Open learning

If this Unit is delivered by open or distance learning methods, additional planning and resources may be required for candidate support, assessment and quality assurance.

A combination of new and traditional authentication tools may have to be devised for assessment and re-assessment purposes.

For further information and advice, please see *Assessment and Quality Assurance for Open and Distance Learning* (SQA, February 2001 — publication code A1030).

Candidates with disabilities and/or additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* (www.sqa.org.uk).

General information for candidates

Unit title: Network Server Operating System

This is a 2-credit Unit at Level 7 intended for candidates undertaking a Computing or IT-related qualification who require an understanding of Network Server Operating Systems. It is designed to develop an understanding of the issues involved in installing and administering a desktop operating system. On completion of the Unit you should be able to:

- Manage and maintain physical and logical devices
- Manage users, computers and groups.
- Manage and maintain access to resources
- Manage and maintain a server environment
- Manage and implement disaster recovery

In the first part of the course, you will study managing and maintaining physical and logical devices, including managing hard disk subsystems, monitoring server hardware, optimising server disk performance, installing and configuring server hardware devices

The second section covers managing users, computers and groups, including managing user profiles, creating and managing and troubleshooting user and computer accounts, and creating and managing groups

The third section covers managing and maintaining access to resources, including configuring access to shared folders, troubleshooting terminal services and configuring file system permissions.

The fourth section covers managing and maintaining a server environment, including monitoring and analyse events and system performance, managing software updates and site licensing, managing servers remotely, monitoring file and print servers, monitoring and optimising application performance and managing a web server.

The final section covers managing and implementing disaster recovery, performing system recovery for a server, managing backup procedures, recovering from server hardware failure, restoring backup data and scheduling backup jobs.

There will be one or more closed-book restricted-response assessments covering all outcomes. You will be presented with a total of 40 questions and expected to answer 70% of these correctly. You will also be expected to keep a logbook recording the practical tasks you have carried out during the Unit. You must satisfy the requirements for these assessments in order to achieve the Unit.

This Unit may assist you in preparing for Microsoft examination 70-290: Managing and Maintaining a Microsoft Windows Server 2003 Environment. Vendor certifications can change rapidly and you should check the current details at www.microsoft.com/traincert to ensure that all objectives have been covered. This examination contributes towards the Microsoft Certified Systems Administrator (MCSA) and Microsoft Certified Systems Engineer (MCSE) awards.