Higher National Unit specification

General information for centres

Unit title: Web Server Platform

Unit code: F6BM 35

Unit purpose:

This Unit is intended to equip the candidate with the skills and knowledge needed to install and maintain a world wide web (www) server platform, including dynamic content service. It is anticipated that this will be of relevance to both specialists in supporting such technologies (technical support and network support) and web developers who support their own web servers. The candidates will develop hands on skills in installing, configuring and maintaining a web server and will gain knowledge about the theory of web server management.

On completion of this Unit the candidate should be able to:

1   Describe the software and hardware environment required to run a web service.
2   Install, configure and test web server software
3   Organise and manage a web server system.

Credit points and level: 2 HN credits at SCQF level 8: (16 SCQF credit points at SCQF level 8*)

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 is at the discretion of the centre. However, it is recommended that the candidate has some exposure to manipulating files and folders using an operating system and creation of basic web pages. If candidates do not have such skills, then opportunity to gain these skills must be provided.

Core Skills: There are no opportunities to develop Core Skills in this Unit.

General information for centres (cont)

Context for delivery: If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Assessment: Evidence is required that candidates have achieved all Outcomes. Outcome 1 will be assessed by multiple-choice questions testing knowledge and/or skills. Outcomes 2 and 3 will be assessed by practical exercises that test the candidate's knowledge and skills in installing, configuring, organising and maintaining a website.

Any assessment activity involving practical work should be carried out under supervised conditions sufficient to ensure the confidence in the authenticity of submissions.

Some of the Evidence Requirements may be produced using e-assessment. This may take the form of e-testing (for knowledge and understanding) and/or e-portfolios (for practical abilities). There is no requirement for you to seek prior approval if you wish to use e-assessment for either of these purposes so long as the normal standards for validity and reliability are observed. Please see the following SQA publications for further information on e-assessment: (1) *SQA Guidelines on Online Assessment for Further Education* (March 2003) and (2) *Assessment and Quality Assurance in Open and Distance Learning* (Feb. 2001).

If a centre is presenting Outcomes 1 on-line the following assessment methods, where appropriate, may be selected:

♦ Multiple-choice
♦ Drag and drop
♦ Multiple response
♦ Mix and match
♦ A combination of the above

It is expected that the questions will be of the multi-choice variety. Centres may consider the use of alternative questions types, particularly if using Computer Assisted Assessment approaches.

However, care should be taken that the questions are valid and at an appropriate level. The use of simple true/false question responses is unlikely to achieve this.

Higher National Unit specification: statement of standards

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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

Describe the software and hardware environment required to run a Web service

Knowledge and/or Skills

- Operating system in use
- Hardware requirements
- Storage space requirements for different types of website.
- Features provided by software package
- Configurability of software package
- Virtual Servers
- Web Server Logs
- Performance Implications
- Security Implications

Evidence Requirements

This Outcome is to be assessed by a 25 multiple-choice questions test sampling all of the above topics. The sampling must be balanced with questions drawn from all of the major topics. No single topic may have a disproportionate number of questions allocated. The pass mark for this assessment is 60%.

The question set presented must change on each assessment occasion. No more than 60% of questions may reappear in consecutive assessment occasions.

Assessment must be undertaken in supervised conditions and is closed book. A candidate should complete this assessment within one hour. Candidates may not bring to the assessment event any notes, textbooks, handouts or other material (calculators are not allowed).

Higher National Unit specification: statement of standards

Unit title: Web Server Platform

Assessment Guidelines

If a centre is presenting this assessment on-line the following assessment methods, where appropriate, may be selected:

♦ Multiple-choice
♦ Drag and drop
♦ Multiple response
♦ Mix and match
♦ A combination of the above

Outcome 2

Install, configure and test Web server software

Knowledge and/or Skills

♦ Install Web server software
♦ Install data storage system
♦ Install server side scripting system
♦ Devise appropriate file system arrangement and configure server to support the layout (Server Root, Document Root and Script Directories)
♦ Configure Address, Host name, Port address, timeout and maximum client values
♦ Create and configure Virtual web servers
♦ Create an area of a website only available to authenticated users
♦ Create an area on a website protected by a digital certificate and strong encryption mechanism

Evidence Requirements

Evidence that the candidate has successfully completed the configuration will be in the form of a website containing annotated documentation. If the configuration was performed using a graphical user interface (GUI) tool, this will be in the form of annotated screen shots, if the configuration was performed using text based configuration (CLI) an annotated copy of the configuration file must be included. The annotation must be in the form of commentary, indicating:

♦ The name of the person performing the configuration
♦ The date that the configuration was completed
♦ The effect of the configuration
♦ A link to a screen shot of a successful test of the configuration

Higher National Unit specification: statement of standards (cont)

Unit title: Web Server Platform

Evidence must be included that indicates:

♦   Server side scripting language is correctly installed
♦   The file system arrangement (provide a files system listing rather than a screen shot)
♦   Operating system permissions have been correctly configured
♦   At least three virtual servers are configured
♦   Authenticated access only area is operated correctly (one test for an authenticated user, one for a user unable to supply credentials)
♦   Secure site has been correctly configured

If a centre uses software packages to include more than one install set, then the documentation must indicate this and must clearly indicate how the individual software packages can be installed.

Assessment Guidelines

Assessment will be open book and should be completed individually. Assessors must assure themselves of the authenticity of each candidate's submission.

Outcome 3

Organise and manage a Web server system

Knowledge and/or skills

♦   Install a dynamic content management system
♦   Customise the dynamic content management system
♦   Manage access by web 'spiders'
♦   Manage access by IP and/or domain
♦   Customize log file format
♦   Design a backup regime
♦   Backup the Web server

Evidence Requirements

Evidence that the candidate has successfully completed the task will be in the form of a website containing annotated documentation. If the configuration was performed using a graphical user interface tool (GUI), this will be in the form of annotated screen shots, if the configuration was performed using test based configuration(CLI) an annotated copy of the configuration file must be included. The annotation must be in the form of commentary, indicating:

♦   the name of the person performing the configuration
♦   the date that the configuration was completed
♦   the effect of the configuration
♦   a link to a screen shot of a successful test of the configuration

Higher National Unit specification: statement of standards (cont)

Unit title: Web Server Platform

Evidence must be included that indicates:

♦   A dynamic content system has been successfully installed. Examples of this type of system are CMS (Content management System) Blogging Package, Web based Bulletin Board or VLE (Virtual Learning Environment). To be appropriate for this task the software must use a data storage subsystem (such as a database) and a server side scripting language.
♦   Customised the system. There must be at least two aspects of customization applied, such as colour scheme and name of site.
♦   Web robots (or Spiders) are constrained to only visit parts of the site.
♦   At least one IP Range and one domain are not allowed access to the site.
♦   One customised log format has been created.
♦   The Web sever backup regime has been implemented, including a backup of the final configuration of the system and a backup of the content.

Assessment Guidelines

Assessment will be open book and should be completed individually. Assessors must assure themselves of the authenticity of each candidate's submission.

Administrative Information

Unit code: F6BM 35

Unit title: Web Server Platform

Superclass category: CB

Original date of publication: August 2008

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History of changes:

Version	Description of change	Date

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Higher National Unit specification: support notes

Unit title: Web Server Platform

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 80 hours.

Guidance on the content and context for this Unit

This Unit has been devised with the aim of making the candidate aware of the issues that surround installing, configuring, organising and maintaining a Web Server. The idea of the Unit is to instil into the candidate that there are many choices and decisions to be made before embarking down the road of running a web server. There is a wide range of server software, both in terms of performance and features which should be considered as part of Outcome 1, although particular attention should be paid to the products with the most significant market share.

The first Outcome also raises concerns about Web security. This section of the Outcome should bring to the attention of the candidate many of the key issues in security such as authentication of users, the access these users are afforded, digital certification and encryption.

Secure Sockets Layer in an e- commerce environment for the protection of sensitive data, ie credit card details, the various threats that a web server must endure and the security tools that are available from third parties in a bid to combat such security breaches.

Performance issues are also covered by this first Outcome. Performance issues that should be raised include: the replacement or upgrading of the web servers physical hardware, load balancing and the methods used to establish performance usage and statistics.

At the time of writing, a number of websites compare the performance of web servers, these may be useful to candidates wishing to research the topic.

Outcome 1 could detail the following topics:

♦ The role of the operating system in supporting the web server package in terms of multitasking support, security and features. Impact of other processes running on server.
♦ The hardware requirements of the web server package in addition to the operating system footprint, includes RAM, Storage space, network throughput and physical security.
♦ The storage space implications for the different types of website, from the low storage space requirement of a small static text only site to a large dynamic media rich site.
♦ The range of features offered by web server packages — from small fast low feature servers to large slow highly configurable packages, remote configuration options.
♦ The provision of virtual websites on one physical platform — advantages and disadvantages. The increasing use of running web servers in virtual machines — advantages and disadvantages.
♦ The use of web server logs to identify usage patterns, content issues, performance issues and security issues.
♦ The consequences of underspecified and overspecified web servers. The effect of changing server parameters on server performance, including adding hardware, changing configurations, server side caching, limiting number of clients. Performance monitoring systems.

Higher National Unit specification: support notes (cont)

Unit title: Web Server Platform

♦ Security concerns for web servers, including design of file layout, operating system file permissions, authenticated access (passwords etc) encryption to protect sensitive data (such as financial or personal data) digital certificates, controlling access based on domain name and/or IP address.

Outcomes 2 and 3 are practical based Outcomes, and should reinforce some of the theory introduced in Outcome 1.

Guidance on the delivery and assessment of this Unit

It is envisaged that Outcome 1 will be carried out first, giving the candidate a solid foundation to work from before tackling the practical assessments for Outcomes 2 and 3. It is intended that the candidate uses Outcome 1 to carry out background research of the software, hardware, security and performance issues involved when setting up a web server. The tutor should direct the candidate to research various areas but with the minimum of intervention. The material should provide plenty of scope for group or classroom discussion.

There are a number of options that may be used for the practical implementations, using either proprietary software or open source solutions.

Centres are advised that this Unit really requires two machines to be provided for each candidate, one a client machine for use in (remote) configuration, and one for the server itself. Centres may find it more convenient to supply one (or both) of these machines using virtual machine technology, but candidates may benefit from support when using such approaches. If using virtual machines, then the issues surrounding co-location could be explored more thoroughly.

Opportunities for developing Core Skills

There are no opportunities to develop Core Skills in this Unit.

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.

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**

General information for candidates

Unit title: Web Server Platform

This Unit is intended to develop knowledge and skills is setting up, securing and maintaining web servers, from specifying system capacity to running a dynamic content system.

This Unit is primarily targeted at those who expect to work in a support role, but it is also relevant to those who will work in a web development role. This Unit should provide you with an understanding and appreciation of the complexities of a web server/site. You will develop skills in installing, configuring, organising and maintaining a web server and will gain knowledge about the theory of web server management.

During the Unit you will learn how to specify and identify the equipment and resources required for setting up and maintaining a web server/site. You should also be provided with a good grounding in how to analyse the requirements of a customer and subsequently, how to install the hardware and software required to meet the customers' needs.

On completion of the Unit you should be able to:

♦   analyse and evaluate the requirements for setting up a new website
♦   install and configure Web server software implementing performance and security issues
♦   organise and maintain a website

Outcome 1 of the Unit covers the information required for you to make an informed selection based on the elements of security, performance and availability. You will, for example, evaluate hardware and software options, investigate web server/site features and deal with configuration, performance and security issues. In order to assess this you will be required to answer a number of questions in a closed-book assessment situation.

Outcomes 2 and 3 will introduce you to the skills required for installing, configuring, organising and maintaining web server software. You will also learn how to maintain the web server site based on the needs of the user and security issues.