Next Generation Higher National Unit Specification

Managing a Web Server (SCQF level 8)

Unit code: J7E7 48

SCQF level: 8 (16 SCQF credit points)

Valid from: session 2023–24

Prototype unit specification for use in pilot delivery only (version 1.0) June 2023

This unit specification provides detailed information about the unit to ensure consistent and transparent assessment year on year.

This unit specification is for teachers and lecturers and contains all the mandatory information required to deliver and assess the unit.

This edition: June 2023 (version 1.0)

Unit purpose

This unit provides learners with the knowledge and skills they need to install, configure and maintain a web server. They also learn about the additional elements required for web servers to provide dynamic capabilities.

This is a specialist unit, primarily aimed at those working in a technical support role. It is also suitable for those in a technical web development role who require a better understanding and appreciation of the complexities associated with web servers.

We recommend that learners have a basic knowledge of and competence in manipulating files and directories, using the command-line interface, creating simple web pages and basic IP addressing.

Learners may progress to more advanced units in server technology or web design and development at SCQF level 8 and above.

Unit outcomes

Learners who complete this unit can:

1   analyse the requirements for running a web server
2   install and configure a web server
3   perform web server maintenance
4   implement web server security

Evidence requirements

Learners must provide knowledge evidence and product evidence.

Outcome 1

Learners produce a report. They must analyse:

♦   operating system requirements
♦   additional features
♦   security issues

Learners have approximately 150 words for each bullet point (500 words in total).

Learners must also analyse two topics of their choice from the remaining topics in the 'Knowledge and skills' section. They have approximately 100 words for each topic (200 words in total).

Outcome 2

Learners produce product evidence of:

♦   an installed and configured web server
♦   the incorporation of additional features that support web database functionality and server-side scripting
♦   the incorporation of per-user web directory functionality for system users

Outcome 3

Learners produce product evidence that shows they can:

♦   locate log files on a web server
♦   interpret the information from log files and use it to manage the server
♦   maintain web directory structures in both the document root and the per-user web directories
♦   implement name-based virtual hosting, naming to IP mappings, and server aliasing
♦   manipulate server directives and manage port information
♦   back up the server and websites

Outcome 4

Learners produce product evidence that shows they can:

♦ apply appropriate permissions to files and folders contained in the server environment

♦ password-protect directories and particular locations in the server

♦ secure web page transfers by implementing server certificates, secure sockets layer (SSL) and hypertext transfer protocol secure (HTTPS) technologies

Knowledge and skills

The following table shows the knowledge and skills covered by the unit outcomes:

Knowledge	Skills
Learners should understand: ♦ web server hardware requirements ♦ web server operating systems ♦ web server configuration ♦ database integration ♦ scripting languages ♦ multi-site hosting ♦ web server security ♦ security protocols: SSL; transport layer security (TLS); HTTPS ♦ document and server root location ♦ server log files ♦ server information and statistics ♦ web server directory structures and protection ♦ name-based virtual hosting ♦ server backup and schedules ♦ server certification for security	Learners can: ♦ identify hardware requirements ♦ determine operating system requirements ♦ identify configuration options ♦ identify database integration options ♦ identify appropriate scripting languages ♦ identify additional features ♦ determine multi-site hosting capabilities ♦ identify security issues ♦ install a web server ♦ manipulate core configuration files ♦ identify document and server root locations ♦ implement additional server features ♦ identify and manipulate server log files ♦ analyse server information and statistics ♦ maintain directory structures ♦ implement name-based virtual hosting ♦ perform server backups ♦ apply appropriate file and folder permissions ♦ password-protect directories ♦ generate server certificates ♦ enable SSL ♦ implement HTTPS

Meta-skills

Throughout this unit, learners develop meta-skills to enhance their employability in the software development sector.

Self-management

This meta-skill includes:

♦ focusing: sorting and maintaining documentation throughout development in a logical and efficient manner; attention to detail to ensure error-free configuration of a web server, considering all aspects of user requirements

♦ adapting: critically reflecting on personal skills development; evaluation of user experience; self-learning to develop wider skills and extend development beyond the minimum requirements in unit content

♦ initiative: independent thinking to establish user requirements and design solutions; installing a web server that meets client requirements; self-motivation and time management

Social intelligence

This meta-skill includes:

♦ communicating: receiving information to establish the user requirements and ensure an understanding of the brief; giving information during web server design, installation, and testing to confirm understanding of requirements

♦ feeling: storytelling through the creation of technical documentation; providing a walk-through and detail of the system

Innovation

This meta-skill includes:

♦ creativity: using imagination to provide a solution that meets the needs of the client; idea generation and thinking about problem areas and how to provide a solution; visualising the complete web server application platform solution

♦ sense-making: analysis; seeing the bigger picture

♦ critical thinking: logical thinking to ensure a coherent approach and to meet requirements

Delivery of unit

We recommend that the order for delivery of this unit should be as follows:

Outcome 1 should be delivered first, introducing learners to the theoretical aspects associated with installing a web server.

Outcomes 2, 3 and 4 should ideally be delivered in order, starting with installation, then progressing to configuration of the server, implementing additional features, and server management, then finishing with the addition of security features. By that stage, learners should have a fully functional, scalable and secure web server application platform.

The time required varies depending on the previous experience of individual learners. Based on 80 hours delivery and assessment time, we suggest the following distribution:

Outcome 1 — Analyse the requirements for running a web server
(15 hours)

Outcome 2 — Install and configure a web server
(30 hours)

Outcome 3 — Perform web server maintenance
(20 hours)

Outcome 4 — Implement web server security
(15 hours)

Professional recognition

There is no professional recognition for this group award.

Additional guidance

The guidance in this section is not mandatory.

Content and context for this unit

You should provide learners with a broad knowledge base in how to prepare for, install, maintain and secure a web server platform, along with the conceptual understanding of how web servers function.

Outcome 1 introduces learners to the factors that they must consider when preparing for the installation of a web server. It focuses on operating system considerations, the features that are available to web servers, and security considerations when running a web server.

Outcomes 2, 3 and 4 focus on the practical aspects of installing and configuring a web server, including implementing additional features, server maintenance and security.

We recommend that you deliver the unit in a Microsoft context using an internet information server (IIS) or Apache under a Linux context. Learners implement any popular and secure web server application platforms such as Linux, Apache, MySQL and PHP (LAMP).

Approaches to assessment

You should assess outcome 1 through a written report of approximately 500 words. A suggested approach is to have learners analyse the requirements for setting up a website. Their report should consist of approximately 500 words, 300 of which should be based on:

♦ operating system requirements
♦ additional server features
♦ security issues

Learners can choose two topics from the remaining topics in the 'Knowledge and skills' section. They have approximately 100 words for each topic (200 words in total).

Product evidence can be generated through practical assignments and tasks. Learners may demonstrate their knowledge and skills by installing, configuring and maintaining a dynamic web server environment, as well as implementing additional features for security.

It is suggested that you adopt a holistic approach to generating the product evidence by providing a case study or project of sufficient complexity to produce evidence for the skills statements. Learners must produce their evidence individually and without assistance.

An example project would require learners to install and configure the web server and implement additional features. They could install the server using pre-packaged binary (executable) files or download and install the server directly from the internet. In the latter case a Debian/Ubuntu or Fedora Linux-based operating system would be suitable.

Learners should know the location of web directories (document root) and configuration files to maintain the server effectively.

The following additional features should be implemented:

♦ integration with an appropriate database and scripting language, to provide dynamic web page features
♦ per-user web directory features, for system users to serve web pages from their own profile (/home) directories

To demonstrate maintenance of the server, learners must locate and interpret server log files. They should maintain websites and/or content management systems using information in web directories and per user web directories.

Learners should implement name-based virtual hosting to demonstrate hosting multiple websites using one IP address, and back up server files and directories.

They must demonstrate adding security features to the server such as file and folder permissions and methods to password protect directories. They must implement SSL on the server, generate server (self-signed) certificates and use HTTPS to secure server web pages.

Equality and inclusion

This unit is designed to be as fair and as accessible as possible with no unnecessary barriers to learning or assessment.

You should take into account the needs of individual learners when planning learning experiences, selecting assessment methods or considering alternative evidence.

Guidance on assessment arrangements for disabled learners and/or those with additional support needs is available on the assessment arrangements web page: www.sqa.org.uk/assessmentarrangements.

Information for learners

Managing a Web Server (SCQF level 8)

This information explains:

♦ what the unit is about

♦ what you should know or be able to do before you start

♦ what you need to do during the unit

♦ opportunities for further learning and employment

Unit information

This unit provides you with the knowledge and skills you need to install, configure and maintain a web server, as well as the additional elements required for web servers to provide dynamic capabilities while remaining secure.

This is a specialist unit, primarily aimed at those working in a technical support role. It is also suitable for those in a technical web development role who require a better understanding and appreciation of the complexities associated with web servers.

You gain knowledge of the theoretical aspects of web servers, as well as acquiring hands-on skills in installing, configuring and maintaining a web server. Before starting the unit, you should have basic knowledge of and competence in manipulating files and directories, using the command-line interface, creating simple web pages, and basic internet protocol (IP) addressing.

You create, install, manage and secure web servers. Throughout the unit, most of your time is spent on practical activities to install and configure a web server and implement additional features. You then implement name-based virtual hosting, interpret server monitoring data and secure the web server against intrusion.

Part of your assessment is of your knowledge and understanding, but most of your assessment evidence is from the practical activities described above.

Throughout the unit, you develop meta-skills covering self-management, social intelligence and innovation.

On completion of the unit, you may progress to more advanced units in server technology or web design and development at SCQF level 8 and above.

Administrative information

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Superclass: CB

History of changes

Version	Description of change	Date

Note: please check [SQA's website](#) to ensure you are using the most up-to-date version of this document.