

NSB: Domain and cloud services

Online course specification

Target audience:

This course is designed for those who will be responsible for the management and maintenance of computer networks.

This course supports the attainment of some of the technical knowledge and understanding requirements of the following digital apprenticeships:

Infrastructure Technician, Unified Communications Troubleshooter, Network Engineer.

Course aim:

To introduce the role, benefits of, and facilities provided by, the various domain and cloud services that underpin the provision of business applications and the administration and management of the resources that those applications depend on.

Course level: Advanced

An explanation of PTT course levels is given at the end of this document

Pre-requisites:

An understanding of client server operation, the role of the different types of server in a corporate network, and methods of storing data. It is suggested that the PTT course “Network services” is studied before attempting this course.

Course structure:

The course consists of the following three modules:

1. Domain name system
2. Domain services
3. Cloud services

Module 1: Domain name system

Module aim: To describe the role and operation of the domain name system and the allocation of IP addresses to network attached devices.

After completing this module, a trainee will be able to:

- explain the role and structure of a fully qualified domain name with reference to the relationship between hostnames, sub-domains and domains.
- explain the operation of the domain name system (DNS) with reference to the role of root, top level domain, authoritative, and recursive DNS servers.
- describe the role of the various types of DNS record including A, AAAA, CNAME, NS, SOA, and SRV.
- explain the role and implementation of DNS delegation with reference to the concept of zones and the purpose of DNS glue records.
- explain the role of DNS server clusters with reference to the relationship between primary and secondary DNS servers and the purpose of zone transfers.
- explain the vulnerability of the domain name system to cache poisoning.

- describe methods of increasing the security of a network with reference to the separation of local and public DNS zones, the separation of recursive and authoritative server functions, and the use of a demilitarised zone (DMZ).
- describe the benefits of a combination of the dynamic host configuration protocol (DHCP) and dynamic DNS (DDNS)

Module 2: Domain services

Module aim: To describe the management of networked computers and the administration of computer facilities and network resources with emphasis on the services provided by Microsoft Active Directory.

After completing this module, a trainee will be able to:

- explain the benefits of the centralised management of user accounts, computers and networked resources.
- describe the role of a network administrator and compare the privileges of an administrator with those assigned to other network users.
- describe the role of a domain controller.
- define and compare the role of a domain, organisational unit, security group, and distribution group as applied to networks using Microsoft Active Directory.
- explain that the control of those in an organisational unit can be delegated by the administrator to a specific group of users.
- define the concept of an Active Directory object giving examples of the various types of object.
- define and compare user rights and resource permissions, giving examples of their use.
- define a security principal and explain that a user, computer and groups are security principals.
- explain the role of Active Directory group policy objects giving examples of the types of computer system behaviours, resource permissions and user rights they can control.
- explain the effect of inheritance, processing order and precedence as to which group policy objects take effect.
- explain how enforcement, blocking, security filtering and loopback can be used to modify which group policy objects are applied.
- explain how replication ensures that domain controllers in a domain hold the same information.
- describe the benefits of integrating the DNS function with those of a domain controller.

Module 3: Cloud services

Module aim: To describe the characteristics, facilities, applications and management of the various types of cloud service and the role and benefits of a software defined network in providing those services.

- describe the benefits and drawbacks of the use of cloud services.
- describe the role, benefits, and resources of a virtual machine.
- describe the role of a hypervisor in a software defined network.
- describe and compare the principles and applications of the various types of cloud storage including file hosting, block storage, and object storage.
- compare the facilities provided by Infrastructure as a Service (IAAS), Platform as a Service (PAAS) and Software as a Service (SAAS).

- describe the resources provided by a cloud service including virtual machines, storage, databases and applications.
- explain that multi-tenant cloud services allow different customers share access to cloud resources yet ensure complete separation between the activities and data of those customers.
- describe the administrative facilities provided by multi-tenancy cloud service providers that allow the control of access to cloud resources, tenancy and subscriptions.

Course access requirements:

To access the course, a computer running a browser such as Google Chrome, Safari etc is required. The computer should have Internet access. A screen resolution of at least 1024x768 is necessary.

Learning facilities:

This online course employs interactive simulations, hypertext links to an online glossary and multiple-choice question sessions to fully involve the trainee in the learning experience. Each module provides revision links to previously studied, relevant topics. A record of progress and level of achievement is recorded for each trainee. Once studied as a structured, assessed course, the content can be browsed for revision or reference.

PTT course levels:

PTT online courses are categorised by one of three levels according to the depth of treatment they provide:

1. Introductory:

PTT Introductory courses are designed for those with no previous experience or knowledge of digital technology. These courses provide an overview of telecommunications or discuss the fundamentals of electronic communications and ICT. The study of general science at secondary (high) school is a typical pre-requisite for PTT Introductory courses.

PTT Introductory courses are suitable for those joining the ICT sector particularly those in an apprenticeship programme.

2. Intermediate:

PTT Intermediate courses are designed for technicians and engineers requiring an understanding of a certain aspect of digital technology. Those planning to study an Intermediate course should understand the basic principles of computing or electronic communications.

The depth of treatment provided by Intermediate courses is typically equivalent to level 3 of a UK national vocational qualification (NVQ). PTT Intermediate courses can be used to support level 3 digital apprenticeships.

3. Advanced:

PTT Advanced courses are designed for those who require an in-depth treatment of a certain aspect of digital technology. Such courses are suitable for system designers as well as those who will be responsible for the maintenance of the system described in the course. Those planning to study a PTT Advanced course should have a background in ICT or telecommunications, and an understanding of the fundamentals and principles of the type digital technology system described in the course.

PTT Advanced courses can be used to support level 4 digital apprenticeships.

PTT
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