Standard in development
L4: Network engineer

Title of occupation
Network engineer

UOS reference number
ST0127

Core and options
No

Level of occupation
Level 4

Occupational maps data
Route: Digital
Pathway: Digital Support and Services
Cluster: Hardware, networks and infrastructure technician

Typical duration of apprenticeship
30 months

Target date for approval
06/11/2024

Resubmission
No

Would your proposed apprenticeship standard replace an existing framework?
No

Does professional recognition exist for the occupation?
Yes

Professional recognition
British Computer Society RITTech

Regulated occupation
Is this a statutory regulated occupation?
No

Occupation summary
This occupation is found in large, medium and small businesses, in all sectors, and within public, private, and voluntary organisations. Network engineers are a key occupation in most organisations which are increasingly dependent on their physical and virtual networks.

Organisations of all types are increasingly applying digital technologies across all their business functions to maximise productivity. Large organisations will have sophisticated complex systems whilst smaller organisations offer support to clients on a contract basis.

The demand for people who can manage, build, maintain on site, cloud and hybrid networks is increasing. This is because of technological developments such as, wireless and emerging technologies. The broad purpose of the occupation is to install networks, maintain them, and offer technical support to users where necessary.

Small organisations may require the network engineer to work alone or as part of a team to securely monitor performance, maintain functionality and troubleshoot virtual and or local area network or respective components, this may include Wi-Fi configuration.

Within a medium sized organisation, the network engineer will typically be part of a team but may work individually on network tasks to securely monitor, troubleshoot and maintain physically or remotely a local or wide area network infrastructure or components, this may include Wi-Fi configuration.

Within a large organisation the network engineer will typically be part of a team and may be involved physically or remotely in the use of the most up to date technologies and techniques whilst securely maintaining, troubleshooting, monitoring and changing complex networks, this may include Wi-Fi configuration.

A network engineer provides networks and systems to deliver the objectives of varied organisations. They will make sure that systems are working at optimum capacity and problem solve where they are not. To be able to do this effectively a network engineer must interpret technical information and understand organisational requirements and expectations. They support delivery of legislatively compliant solutions to challenges in network infrastructure.

Network engineers may deal with both hardware and software issues. They are a key part of putting things right quickly when networks fail, and they help troubleshoot and resolve identified problems and performance issues with network rapidly to ensure service is resumed and downtime minimised. Network engineers help customers both technical and non-technical to install networks, maintain them, and offer technical support to users where necessary.

Network engineers can be customer facing or internal. In their daily work, an employee in this occupation may interact with a wide variety of stakeholders, face to face or remotely by using a range of technologies. They may be working independently or collaboratively as part of a team. They will be aware of their organisational escalation routes and understand their role in their team.

Typical job titles
Dynamic network engineer Field engineer Field service engineer Infrastructure engineer Installation engineer Network administrator Network and cloud engineer Network architect Network engineer Systems engineer

Are there any statutory/regulatory or other typical entry requirements?
No

Occupation duties

Duty	KSBs
Duty 1 Install, configure, and test physical or virtual network components or devices securely to well-de fined specifications.	K2 K4 K9 K10 K11 K12 K13 K14 K15 K16 K17 K18 K19 K20 S1 S2 B1
Duty 2 Monitor and analyse network performance data.	K1 K3 K4 K6 K14 K15 K16 K17 K19 S3

Duty	KSBs
	B1
Duty 3 Optimise, upgrade and maintain the performance of physical or virtual network systems, services or components in line with well-defined specification.	K2 K3 K4 K6 K9 K10 K11 K12 K13 K14 K15 K16 K17 K18 S4 S7 B1
Duty 4 Investigate and problem solve to address technical performance issues in networks to return the network to successful operation and escalate as necessary.	K1 K2 K3 K4 K5 K6 K7 K8 K9 K10 K11 K12 K13 K14 K15 K16 K17 K19 S5 B1 B2 B5
Duty 5 Interpret written requirements and technical specifications in relation to delivery of network systems or services.	K2 K5 K6 K7 K14 K16 K21 S8 S11
Duty 6 Use operational data to deliver and manage weekly work schedule in an efficient and cost-effective way whilst maintaining a high quality service under pressure.	K1 K14 K15 K21 S9 S10 S13 B2 B3
Duty 7 Consider the impact and risks when implementing network changes and maintain accurate logical records in line within organisational policy.	K5 K6 K16 S12 B3 B5
Duty 8 Communicate technical network requirements effectively and professionally with a range of stakeholders.	K5 K6 K16 S6 S8 S11 B1 B4
Duty 9 Take responsibility for continuous self-learning to ensure that network engineering activities are carried out effectively.	K1 K5 K6 K7 K16 B1 B2
Duty 10 Ensure all network engineering activity complies with organisational policies, technical standards, Health and Safety legislation, data security requirements, professional ethics, privacy and confidentiality.	K5 K6 K16 K21 S10 S11 S12 S14 S15 B1 B2

KSBs
Knowledge

K1: Causes and consequences of network and IT infrastructure failures.

K2: The architecture, physical and virtual, of typical IT systems, including hardware, OS, server, virtualisation, voice and applications.

K3: The tools and techniques for optimising network performance.

K4: Diagnostic techniques and tools to interrogate and gather information regarding systems performance.

K5: Organisational policies and procedures to ensure accurate recording and management of information.

K6: Service Level Agreements SLAs, contractual obligations and customer service when delivering network engineering activities.

K7: Business continuity and disaster recovery and their role within in, including preservation of system configurations.

K8: The purposes and uses of sockets pair and protocols.

K9: Devices, applications, protocols and services at their respective Open Systems Interconnection or, Transmission Control Protocol or Internet Protocol models or layers.

K10: The concepts and characteristics of routing and switching.

K11: The characteristics of network topologies, types, technologies and network modelling and or diagrams

K12: Wireless networks technologies and configurations.

K13: concepts of cloud and cloud services.

K14: Functions of network services such as Domain Name System and Dynamic Host Configuration Protocol.

K15: Types of network maintenance.

K16: Current legislation and standards in the workplace and the impact on their role including sustainability.

K17: Troubleshooting methodologies and root cause analysis techniques for network issues.

K18: Approaches to integrate services into a network.

K19: Types of security threats to digital networks and risk mitigation.

K20: Approaches to network automation such as potential use of Artificial intelligence.

K21: Approaches to change management in a network environment.

Skills

S1: Apply tools and techniques when securely operating and testing networks.

S2: Install and or configure network components to maintain and manage a secure network.

S3: Implement tools and techniques to monitor identify analyse and record systems performance in line with defined specifications.

S4: Maintain security and performance of the system against known and standard threats.

S5: Apply tools and or techniques to gather information to troubleshoot issues and or isolate, repair or escalate faults.

S6: Communicate outcomes of tasks and record in line with organisational procedures and SLAs including adherence to customer service standards.

S7: Upgrade, apply and test components to systems configurations ensuring that the system meets the organisation's requirements and minimises downtime.

S8: Interpret information and or specifications received from a manager, customer or technical specialist and accurately implement the defined requirements.

S9: Implement techniques to optimise systems or component performance in line with defined specifications.

S10: Apply the level of responsibility when organising and prioritising work tasks, clients' or stakeholders' requests in line with SLAs and organisation processes.

S11: Explain their job role within the business context to stakeholders to enable a clear understanding on both sides of what their remit is and convey technical constraints.

S12: Operate securely, and apply process, policies and legislation within their business responsibilities.

S13: Apply the relevant numerical skills such as binary, dotted decimal notation required to meet the defined specifications.

S14: Ensure compliance of network engineering outputs with change management processes.

S15: Select tools and comply with organisation policies and processes when upgrading systems or hardware or software.

Behaviours

B1: Work independently and demonstrate initiative, being resourceful when faced with a problem and taking responsibility for solving complex problems within their own remit.

B2: Work within the goals, vision and values of the organisation.

B3: Works to meet or exceed customers' requirements and expectations.

B4: Committed to continued professional development in order to ensure growth in professional skill and knowledge.

B5: Work effectively under pressure showing resilience.

Qualifications
English and Maths
Apprentices without level 2 English and maths will need to achieve this level prior to taking the End-Point Assessment. For those with an education, health and care plan or a legacy statement, the apprenticeship's English and maths minimum requirement is Entry Level 3. A British Sign Language (BSL) qualification is an alternative to the English qualification for those whose primary language is BSL.

Does the apprenticeship need to include any mandated qualifications in addition to the above-mentioned English and maths qualifications?
No

Professional recognition
This standard aligns with the following professional recognition:

- BCS, The Chartered Institute for IT for Register of IT Technicians (RITTech) level 4

Consultation
Consultation was undertaken and details held on Cognito system

Progression Routes

Supporting uploads

Mandatory qualification uploads

Mandated degree evidence uploads

Professional body confirmation uploads

Involved employers
Hewlett Packard Enterprise company, TalkTalk, MOD, IBM, Accenture, BA, BT, Capgemini, Cisco, Fujitsu, HP, John Lewis, Lloyds, Microsoft, NCA, The Royal Signals, Telefonica, The Test Factory, Virgin Media, Visa, BCS - Chartered Institute of IT

Subject sector area
6.1 ICT practitioners