



# NETWORK ENGINEER

## Details of standard

### Occupation summary

This occupation is found in large 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 digital 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 consultancies offer support to clients on a contract basis.

For example, a Network Engineer may work within a network of hotels to ensure that the booking system functionality and performance is maintained and customer access to courtesy systems such as Wi-Fi are managed appropriately for performance.

In a large infrastructure project, a Network Engineer may work in a team to ensure that significant project milestones are reached in delivering network services both within the project and by servicing the project teams with reliable network capability to enable them to deliver that project successfully.

Large communications organisations use Network Engineers to service world-leading global networks at the cutting edge - adapting and evolving with changes to new technologies to give customers the very best digital experience from delivering major communications installations to monitoring nationwide networks.

The demand for people who can manage, build, maintain virtual and physical networks is increasing. This is because of technological developments such as, 5G and Cloud. The broad purpose of the occupation is to install computer networks, maintain them, and offer technical support to users where necessary.

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 and infrastructure.

Network Engineers deal with both hardware and software issues. They are a key part of putting things right quickly when networks fail, and they communicate problems that they have identified with network integrity or performance rapidly to ensure service is resumed and downtime minimised. Network Engineers help customers both technical and non-technical to install computer 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 interacts with management within organisations, team members, staff, clients, customers, and suppliers. They may interact 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.

The work of a Network Engineer is office-based, although they may need to work across different sites depending on the size of the organisation and their network. When working as a consultant a Network Engineer may spend a lot of time at clients' offices and on large installations, which may mean spending time away from home or their usual work base.

### Typical job titles include:

Desk based engineer

Dynamic network engineer

Field based engineer

Infrastructure engineer

Network administrator

Network architect

Network engineer

Systems engineer

### Occupation duties

DUTY	KSBS
<b>Duty 1</b> Install, configure, and test appropriate network components or devices securely to well-defined specifications whether physical or virtual	K2 K4 K9 K10 K11 K12 K13 K14 K15 K16 K17 K18 K19 K20  S1 S2 S4 S18  B1 B2 B6
<b>Duty 2</b> Acquire and analyse network performance data to monitor network activity	K1 K3 K4 K6 K14 K15 K17 K19  S3 S5  B1 B2 B6
<b>Duty 3</b> Optimise and maintain the performance of network systems or services in line with well-defined specification whether physical or virtual	K2 K3 K4 K6 K9 K10 K11 K12 K13 K14 K15 K16 K17 K18  S11 S12  B1 B2 B6
<b>Duty 4</b> 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 K20 K21  S6  B1 B2 B3 B4 B6 B8
<b>Duty 5</b> Undertake upgrades to a network including physical or virtual systems	K1 K2 K3 K4 K5 K6 K7 K8 K9 K10 K11 K12 K13 K14 K15 K16 K17 K18 K19 K20 K21  S20  B1
<b>Duty 6</b> Interpret written requirements and technical specifications in relation to delivery of network systems and services	K2 K5 K6 K7 K14 K16 K21  S10  B2 B4 B6
<b>Duty 7</b> Maintain accurate logical records in line within organisational policy when carrying out network tasks	K1 K14 K15 K21  S9 S13  B2 B3 B5

<b>Duty 8</b> Use operational data to manage weekly work schedule in an efficient and cost effective way	K5 K6 S17 B1 B2 B4 B5 B6
<b>Duty 9</b> Consider the impact and risks when implementing network changes in line with work activities and escalating as required by organisational policies	K1 K4 K5 K6 K7 K16 K19 K21 S8 S19 B2 B4 B8
<b>Duty 10</b> Communicate technical network requirements effectively and professionally with a range of stakeholders ensuring stakeholder relationships are maintained	K5 K6 K16 S7 S16 B4 B5 B8
<b>Duty 11</b> Practice continuous self-learning to keep up to date with technological developments to enhance relevant skills and take responsibility for own professional development	K5 K6 K16 B1 B7
<b>Duty 12</b> Incorporate considerations of the requirements of the wider digital context in which they operate to ensure that network engineering activities are carried out effectively	K1 K5 K6 K7 K16 S14 B1 B2 B3 B4 B6
<b>Duty 13</b> 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 S15 B1 B2 B3 B4
<b>Duty 14</b> Deliver and manage a high quality service under pressure	K6 K7 K21 S6 S7 S13 S14 S16 S19 B4 B5 B6 B8

## KSBs

### Knowledge

**K1:** the causes and consequences of network and IT infrastructure failures

**K2:** the architecture of typical IT systems, including hardware, OS, server, virtualisation, voice, cloud and applications

**K3:** the techniques for systems performance and optimisation

**K4:** diagnostic techniques and tools to interrogate and gather information regarding systems performance

**K5:** organizational procedures to deal with recording information effectively and in line with protocols

**K6:** Service Level Agreements (SLAs) and their application to delivering network engineering activities in line with contractual obligations and customer service

**K7:** their role in Business Continuity and Disaster Recovery

**K8:** the purposes and uses of ports and protocols

**K9:** devices, applications, protocols and services at their appropriate OSI and, or, TCP or IP layers

**K10:** the concepts and characteristics of routing and switching

**K11:** the characteristics of network topologies, types and technologies

**K12:** wireless technologies and configurations

**K13:** cloud concepts and their purposes

**K14:** functions of network services

**K15:** the different types of network maintenance

**K16:** how current legislation relates to or impacts occupation

**K17:** troubleshooting methodologies for network and IT infrastructure

**K18:** how to integrate a server into a network

**K19:** the types of security threats to networks and IT infrastructure assets

**K20:** how to use tools to automate network tasks

**K21:** approaches to change management

## Skills

**S1:** apply the appropriate tools and techniques when securely operating and testing networks

**S2:** install and configure the elements required to maintain and manage a secure network

**S3:** implement techniques to monitor and record systems performance in line with defined specifications

**S4:** maintain security and performance of the system against known and standard threats

**S5:** apply the appropriate tools and techniques to identify systems performance issues

**S6:** apply the appropriate tools and techniques to gather information to troubleshoot issues and isolate, repair or escalate faults

**S7:** communicate outcomes of tasks and record in line with organisational procedures and SLAs including adherence to customer service standards

**S8:** upgrade, apply and test components to systems configurations ensuring that the system meets the organisation's requirements and minimises downtime. This should include backup processes

**S9:** record task details whether face-to-face, remote or in writing in line with organisational requirements

**S10:** interpret information received from a manager, customer or technical specialist and accurately implement the defined requirements

**S11:** monitor, identify and implement required maintenance procedures

**S12:** implement techniques to optimise systems performance in line with defined specifications

**S13:** organise and prioritise clients or stakeholders' requests in line with SLAs and organization processes

**S14:** 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 in appropriate language considering accessibility and diversity implications

**S15:** operate securely and apply the appropriate process, policies and legislation within their business responsibilities

**S16:** communicate with a range of stakeholders taking into consideration the organisations cultural awareness and technical ability

**S17:** apply the appropriate level of responsibility when planning and prioritising work tasks

**S18:** apply the relevant numerical skills (Binary, dotted decimal notation) required to meet the defined specifications

**S19:** ensure compliance of network engineering outputs with change management processes

**S20:** select the appropriate tools and comply with organisation policies and processes when upgrading systems

## Behaviours

**B1:** work independently and demonstrate initiative being resourceful when faced with a problem and taking responsibility for solving problems within their own remit

**B2:** work securely within the business

**B3:** work within the goals, vision and values of the organisation

**B4:** take a wider view of the strategic objectives of the tasks or projects they are working on including the implications for accessibility by users and diversity

**B5:** works to meet or exceed customers' requirements and expectations

**B6:** Identifies issues quickly, investigates and solves complex problems and applies appropriate solutions. Ensures the true root cause of any problem is found and a solution is identified which prevents recurrence

**B7:** Committed to continued professional development in order to ensure growth in professional skill and knowledge

**B8:** 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.

## Professional recognition

This standard aligns with the following professional recognition:

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

## Additional details

### Occupational Level:

4

### Duration (months):

30

### Review

This apprenticeship standard will be reviewed after three years

## Version log

VERSION	CHANGE DETAIL	EARLIEST START DATE	LATEST START DATE	LATEST END DATE
1.2	Standard, funding band and end-point assessment plan revised	01/06/2021	Not set	Not set
1.1	The funding band for this standard has been reviewed as part of the apprenticeship funding band review. The new funding band is £17000	04/03/2019	31/05/2021	Not set
1.0	Retired	12/11/2014	03/03/2019	Not set