

# **IT Solutions Technician**

**Level 3 Apprenticeship**

**End-point Assessment Plan**

**IT Solutions Technician**  
**End-point Assessment Plan**

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## 1. INTRODUCTION AND OVERVIEW

This plan sets out the requirements for end-point assessment (EPA) for the IT Solutions Apprenticeship Standard. It is written for end-point assessment organisations, training providers and employers who need to know how end-point assessment for this apprenticeship must operate.

Full-time apprentices will typically spend 18 months on-programme working towards the apprenticeship Standard, with a minimum of 20% off-the-job training.

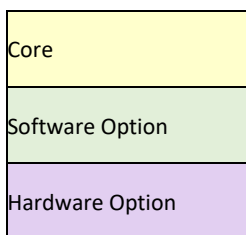
End-point assessment should only start once the employer is satisfied that the apprentice is consistently working at or above the level set out in the Standard; that the pre-requisite gateway requirements for end-point assessment have been met; and that they can be evidenced to an end-point assessment organisation.

The EPA must be completed within an EPA period lasting a maximum of 3 months, beginning when the apprentice has met the EPA gateway requirements.

End-point assessment must be conducted by an organisation approved to offer end-point assessment services against this Standard, as selected by the employer, from the Education & Skills Funding Agency's Register of End-Point Assessment Organisations.

End-point assessment tests all the knowledge, skills and behaviours on the Standard.

The IT Solutions Technician is a core and options standard. All apprentices must take the assessment of the core content and then either the software option content or the hardware option content. Throughout this plan this is illustrated as follows:



The end-point assessment is based on two distinct assessment methods, which can be taken in any order.

- Knowledge Test – comprised of four Knowledge Units each based on multiple-choice questions – assessing underpinning knowledge and understanding as defined in Table 1.
- a Project and Interview – comprised of two parts: a project giving the apprentice the opportunity to undertake a business-related project away from the day to day workplace, followed by a structured interview with an independent assessor - assessing the knowledge, skills and behaviours (as defined in Table 1) demonstrated in the project as well as drawing on those demonstrated in their portfolio.

Both of these methods must be passed for the apprenticeship to be passed.

The Knowledge Test is pass/fail (where each of the four units has to be passed to achieve a pass).

The Project and Interview is pass/fail/merit and distinction

The overall apprenticeship is pass/fail/merit and distinction

The end-point assessor will determine the overall apprenticeship grade of fail, pass, merit or distinction see Annex 2 for details of grading.

The approach is described in detail in the rest of the plan.

## **2. THE END-POINT ASSESSMENT GATEWAY**

The employer, in consultation with the training provider, will determine, when the apprentice is ready for end-point assessment. This will include

- confirmation that Level 2 maths and English have been achieved, before or during the apprenticeship;
- confirmation that the employer believes that the apprentice is ready for end-point assessment as they have demonstrated the application of all the knowledge, skills and behaviours on the Standard; and
- confirmation that the apprentice has produced a portfolio.

### The Portfolio

The portfolio must be submitted to the EPAO once the apprentice meets the gateway requirements and before selecting the Project.

The portfolio presents evidence from real-work projects and is used to inform the interview (as part of the synoptic test). It is produced towards the end of the apprenticeship and before the Gateway. It contains evidence from projects that have been completed, usually towards the end of the apprenticeship. It will showcase their very best work, enabling them to demonstrate in the interview how they have applied the knowledge, skills and behaviours (linked to the Project and Interview – see Table 1) in a real-work environment to achieve real-work objectives. The portfolio is not evidence that the learning has taken place, but is evidence that the apprentice has applied all of the knowledge, skills and behaviours in the Standard being assessed by the Project and Interview.

The evidence contained in the portfolio will comprise evidence from the work place which, taken together, cover all the knowledge, skills and behaviours being assessed by the Project and Interview (see Table 1).

Employers, with support from the training provider, will assist the apprentice to assemble their portfolio to ensure that the portfolio is complete, and has been done to a satisfactory standard.

The portfolio can be in any format, as long as it can be uploaded electronically to the chosen EPAO. It must include

- a list of contents and a map of contents against the required knowledge, skills and behaviours;

- a brief introduction/commentary by the apprentice, produced towards the end of their apprenticeship and highlighting, where appropriate, anything they would do differently;
- evidence from real work projects/pieces of work which between them illustrate the KSBs that will be discussed in the interview as defined in Table 1;
- a one to two- page testimonial from the employer, relating particularly to behaviours shown in the workplace that are being tested by the Project and Interview defined in Table 1;
- a signed statement from the employer and training provider confirming this as being the apprentice's own work and confirming that, in their view, the work demonstrates competence against the Standard; and
- a signed statement from the apprentices confirming this as their own work.

Evidence can be submitted in a variety of appropriate and authentic formats, for example.

- Text, graphics, presentations, spreadsheets, project plans;
- The product itself;
- Job sheets, case studies, screen dumps, links;
- Photographs;
- Audio; or
- Video.

Note: where the evidence of the real work cannot be submitted for security or confidentiality reasons then other evidence to demonstrate this real work may be submitted.

The evidence can be supplemented with the following

- Performance reports;
- Expert witness testimony; and
- Customer feedback.

Note that reflective accounts or self-evaluation by the apprentice cannot be included as evidence.

**\* The Knowledge Test and the Project and Interview can be done in any order.**

### 3. END POINT ASSESSMENT METHODS

#### Overview of End-Point Assessment Methods

The following table sets out what is assessed through each of the two distinct assessment methods, and the grade that can be achieved in each method.

Assessment Method	Areas Assessed	Assessed by	Possible Grades
Knowledge Test	The apprentice undertakes four on-line tests against the defined knowledge statements (as set out in Table 1)	Electronic marking and assessment by an EPAO on the Register of End-Point Assessment Organisation	Fail Pass
Project and Interview	The apprentice undertakes a pre-defined project to assess against the defined set of knowledge, skills and behaviours (as set out in Table 1). The project is undertaken in a controlled environment.  An independent assessor then interviews the apprentice to assess how they have applied the knowledge, skills and behaviours (as set out in Table 1) in the project and to explore how these have been demonstrated in the workplace based on a discussion of the evidence presented in the portfolio.	Independent assessor from the same end-point assessment organisation	Fail Pass Merit Distinction

End-point assessment organisations must make reasonable adjustments to these assessment methods as required.

What is assessed in each assessment method

The following table shows each statement in the Standard; shows which assessment method(s) test it; and which of the grading criteria (see section 7 and Annex 2) it contributes to.

**Table 1: KSBs to be assessed in each assessment method**

KSB Reference	Requirements from the Standard	Assessed in the Knowledge Test  The Test is made up of four Knowledge Units (KU)	Assessed in the Project and Interview
<b>CORE Technical Skills</b>			
S1	Applies a professional methodology or framework in their work tasks.		Y  Project and Interview
S2	Executes appropriate due diligence, including formal testing or validation		Y  Project and Interview
S3	Applies a range of technical IT skills, including: accessing remote systems; file manipulation; file editing, changing system or application settings; system administration; setting up and upgrading components (infrastructure or software);		Y  Project and Interview
S4	Operates in line with organisational polices, standards, legislation, security requirements, professional ethics, privacy and confidentiality; and understands escalation policies.		Y  Interview
S5	Creates and maintains documentation in accordance with best practice, organisational guidance and legislation.		Y  Interview
S6	Identifies appropriate technical solutions using both logical and creative thinking.		Y  Project and Interview
S7	Diagnoses and understands client requirements and problems using sound analytical and problem-solving skills		Y  Interview
S8	Communicates effectively in a variety of situations including formal and informally both within their team and externally.		Y  Interview

S9	Operates securely across all their areas of responsibility, in line with organisational guidance and legislation		Y Project and Interview
<b>CORE Knowledge and Understanding</b>			
K1	Understands the stages within the overall solution lifecycle.	Y KU1	
K2	Understands the main principals, features, differences and benefits of Waterfall and Agile type methodologies and the function of service management frameworks.	Y KU1	
K3	Understands the aims and benefits of DevOps approaches; including the benefits of automation, the ideas behind continuous improvement and monitoring	Y KU1	
K4	Understands the principles of Solution Architecture including the importance of re-use.	Y KU1	Y Project and Interview
K5	Understands why testing is necessary, the need for both functional and non-functional testing, the different types of testing available, including unit testing, integration testing, user acceptance testing and performance testing.	Y KU1	Y Project and Interview
K6	Understands planning and delivery within their role and how this contributes to the wider team and the organisation.		Y Project and Interview
K7	Understands how the end-user context influences the solution.		Y Project and Interview
K8	Understands the key features of, and where to find, organisational requirements in relation to policies, standards, legislation, professional ethics, privacy and confidentiality.	Y KU4	
K9	Understands the main legislation, policies and standards that apply to IT solutions.	Y KU4	
K10	Understands the concepts of networking including the ISO (International Organisation for Standardisation) and TCP/IP (Transmission Control Protocol/Internet Protocol) network stacks, Ethernet LANs (Local Area Networks), IP addressing,	Y KU2	



	Port numbers, DNS (Domain Name System), DHCP (Dynamic Host Configuration Protocol), and the principals of routing between LANs and WANs (Wide Area Networks).		
K11	Understands the different types of network devices, routers and network switches, their relationship to the stack model and the use of firewalls.	Y KU2	
K12	Understands the main components within an IT Solution including how hardware and software components work together	Y KU2	
K13	Understands the main components of a computer system and their purpose, including servers, end-user computers, and mobile devices (both physical and virtual), user interfaces, CPUs, storage and connectivity.	Y KU2	
K14	Understands the purpose of an Operating System.	Y KU2	
K15	Understands the concepts of Cloud, Cloud Services and storage.	Y KU2	
K16	Understands how their work contributes to business performance, continuity and resilience.	Y KU4	Y Interview
K17	Understands the main trends in emerging technologies – including the Internet of Things (IoT), artificial intelligence, and automation - and the potential implications for digital activities.	Y KU2	
K18	Understands the necessary numerical skills including Binary and Hexadecimal.	Y KU2	
K19	Understands why cyber security is essential as part of the delivery of any solution	Y KU4	
K20	Understands the importance of working securely and the main classifications of types of threats and common mitigation practices.	Y KU4	
K21	Understands the meaning of risk in the context of security and can explain the relationship between levels of risk, impact, and designed level of protection in IT Solutions.	Y KU4	

K22	Understands the role of configuration management and version control systems and when they should be used.	Y KU2	
K23	Understands the concepts of virtualisation.	Y KU2	
K24	Understands the use of different platforms (including web, mobile, or desktop applications).	Y KU2	
K25	Understands the concepts of relational databases, non-relational structured and unstructured databases.	Y KU2	
K26	Understands the concepts of solutions development to a given set of requirements, including the use of standard approaches for web and cloud-based solutions.		Y Project and Interview
K27	Understands the benefits of and requirements for vendor support including commercial cloud offerings	Y KU2	
<b>CORE Behaviours</b>			
B1	Works professionally and independently, taking responsibility and initiative as appropriate		Y Interview
B2	Demonstrates standard business courtesies and professional ethics in how they work		Y Interview
B3	Demonstrates a productive and organised approach to their work		Y Project and Interview
B4	Works effectively with customers, clients and users.		Y Interview
<b>Option 1 Software Technical Skills</b>			
S10	Works at any stage of the software solution lifecycle.		Y Project and Interview
S11	Undertakes maintenance of a range of contemporary or legacy software solutions to required levels of service.		Y Project and Interview
S12	Installs and configures software system components including virtualised components where appropriate.		Y Project and Interview

S13	Writes or maintains simple scripts or code.		Y Project and Interview
S14	Can search and manipulate different types of data, including both structured and unstructured		Y Project and Interview
<b>Option 1 Software Knowledge and Understanding</b>			
K28	Understands the principles of Solution Architecture as applied to software.	Y KU3	
K29	Understands why there is a need to follow good coding practices and have good coding standards.	Y KU3	
K30	Understands the main categories of computer languages and the main features and benefits of each.	Y KU3	
K31	Understands how to implement software solutions including simple programming to a given a set of requirements and how to connect code to data sources.	Y KU3	Y Project and Interview
K32	Understands the purpose and usage of document mark-up languages including XML (extensible mark-up language) and html (hypertext mark-up language).	Y KU3	
K33	Understands the use of relational databases, including tables, views, joins and indexes.	Y KU3	
K34	Understands the use of Big Data Environments for storage and analysis of non-relational structured and unstructured data and the purpose of database normalization - organising the attributes and relations of a relational database to reduce data redundancy and improve data integrity.	Y KU3	
K35	Understands how to develop, test and implement code following a logical approach.	Y KU3	Y Interview
<b>Option 2- Hardware Technical Skills</b>			
S15	Works at any stage of the hardware solution lifecycle		Y Project and Interview
S16	Undertakes maintenance of a range of contemporary or legacy hardware solutions to required levels of service.		Y Project and Interview

S17	Installs and configures basic hardware system components, networks and devices (including servers, end-user computers, and mobile devices, whether physical or virtual) as required		Y Project and Interview
S18	Demonstrates safe application of the concepts of Electro Static Discharge (ESD) and meets appropriate health and safety standards when working with hardware		Y Project and Interview
<b>Option 2 Hardware Knowledge and Understanding</b>			
K36	Understands the principles of Solution Architecture as applied to hardware.	Y KU3	
K37	Understands the advantages and disadvantages of different types of hardware configurations.	Y KU3	
K38	Understands a range of cabling and connectivity.	Y KU3	
K39	Understands the concepts of standard builds.	Y KU3	
K40	Understands the concepts of mobile data, Bluetooth, 3G, 4G and Wi-Fi and the security implications of such solutions.	Y KU3	
K41	Understands different types of storage including locally attached, SAN (storage area network) and networked, and the concepts of RAID (Redundant Array of Independent Discs) and knowledge of RAID levels.	Y KU3	
K42	Understands requirements when working with electro static sensitive equipment (including personal grounding devices) and when working in a server room and/or data centre and/or handling equipment.	Y KU3	
K43	Understands how to install, configure and test hardware components, networks and devices – including servers, end-user computers and mobile devices.	Y KU3	Y Project and Interview
K44	Understands the need to follow a logical approach and how to ensure connectivity within solutions.		Y Interview

The definition of the terms used in the Standard is given in Annex 1 and the grade descriptors are given in Annex 2.

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End-point assessment organisations should use Table 1 as the basis for a checklist for assessors to use in preparing for the interview, to ensure that the right knowledge, skills and behaviours are covered in the interview and to record where sufficient evidence has been demonstrated for each statement.

#### 4. THE KNOWLEDGE TEST

The Knowledge Test enables a consistent assessment of an apprentice's underpinning knowledge and understanding.

End-point assessment organisations will develop five discrete, standalone, on-line, multiple-choice test-units, in the following four areas (with a software option and a hardware option) for the third area.

**Table 2: Specification for the Knowledge Units**

Name of Knowledge Unit	No of Questions	Time (mins)	Minimum Bank of questions	Pass rate
Knowledge Unit 1 (KU1) Methodologies and Principles (core)	20	30	80	65% or above
Knowledge Unit 2 (KU2) Core Technical IT Knowledge (core)	40	60	100	65% or above
Knowledge Unit 3 (KU3) Software Option (option 1)	40	60	100	65% or above
Knowledge Unit 3 (KU3) Hardware Option (option 2)	40	60	100	65% or above
Knowledge Unit 4 (KU4) Security and Legislation – (core)	20	30	80	65% or above

The knowledge statements from the standard for each of these Knowledge Units are given in Table 1. EPAOs must use this to draft the bank of questions, from which the selection of questions is generated for apprentices, as shown above.

Each Unit will have a set number of knowledge-based multiple-choice questions (see Table 2 above), with four options to choose from, where only one is correct. Each correct question will score 1 points, any missing or incorrect answers will score 0 points.

End-point Assessment Organisations must ensure that apprentices complete each of the four Units in a quiet, controlled, “closed-book” environment, away from their day-to-day work and other distractions. There must be an “invigilator” present to ensure there is no collaboration between apprentices – with the maximum ratio of apprentices to invigilators being 20:1.

The apprentices will have a set number of minutes, as shown in the Table 2 above, to complete each Unit, and each Unit will close down after that period. Apprentices can take the Units in any order over a five working-day period. All the tests are electronic unless reasonable adjustments are required.

All tests are marked electronically by the EPAO. Results are provided at the end of each test.

EPAOs must develop a question bank of sufficient size for each Knowledge Unit to prevent predictability and review them regularly (and at least once a year) to ensure they, and the specifications they contain, are fit for purpose. The minimum number of questions is set out in Table 2. Questions should be developed through the quality assurance and validation processes of the end-point assessment organisation. Questions must address the content as set out in Table 1.

All four units of the knowledge test must be passed for the Test to be passed.

## **5. THE PROJECT AND INTERVIEW**

The Project and Interview is in two parts – the project and the interview.

### **The Project**

The project is key to consistency and comparability of the end-point assessment. The project is designed to assess apprentices in a consistent way, irrespective of their particular workplace and their particular role within their company.

End-point assessment organisations will develop a bank of business-related projects to adequately reflect different business situations. Each of these projects will present a typical business task, appropriate for an SME, an IT business, a large corporate or a non-IT business. All of the projects will be comparable in terms of content and complexity; it is the context within which the knowledge, skills and behaviours must be demonstrated that will vary. Each project will have a short summary from which the employer and apprentice can select the most appropriate project for the apprentice, based on their job role.

Projects will balance the need to 1) be specific to ensure consistency and comparability and 2) be sufficiently flexible to enable apprentices to apply the approaches they use in their role.

Definitions are given in Annex 1.

Apprentices will do either the hardware project or the software project, depending on which Option they take during their apprenticeship.

The Software Project will require a solution to be developed to address an organisation requirement including

- Identifying appropriate technical solutions;
- diagnosing and understanding client requirements;
- installing and configuring software system components;
- writing simple script or code, and connecting code to data sources.

The Hardware Project will require a solution to be developed to address an organisation requirement and which enables the apprentice to demonstrate

- identifying appropriate technical solutions;
- diagnosing and understanding client requirements;
- installing and configuring basic hardware system components, networks and devices;
- testing hardware components, networks and devices.

Each Project will require the Apprentice

- to apply a methodology;
- to demonstrate their understanding of solution architecture by producing a contextual logical and a contextual physical diagram of what they are going to do;
- to define the acceptance criteria for their solution based on the business requirements;
- to design and build the solution; and
- to test and refine the solution (the total solution and the elements within it).

Each project will set out the business requirements (which must lend themselves to the grading criteria, giving scope for apprentices to exceed the pass requirements).

Each project will enable the following to be demonstrated

- the application of the knowledge, skills and behaviours (as set out in Table 1 and listed below) to meet the project outcomes; and
- the differentiation of performance in line with the grading criteria (see Annex 2).

There are two outputs from the project:

- The Project Output - the solution that the apprentice has produced to meet the project requirements. the technical solution to meet the client's needs
  - for the Software Development Project this will be installed and configured software system components and a script or code which is connected to the data source see Annex 2 (Coding p31)
  - for the Hardware Project this will be installed and configured hardware system components and testing results of components, network and devices
- A Project Rationale – which requires the apprentices to describe how they have applied the relevant knowledge (see Table 1) such as why and how they have completed the project in the way that they have, the options they have considered, the decisions they have made and the reasons behind them, the assumptions they have made and the consequences of those assumptions, and anything they would do differently with hindsight. The project rationale should be 1,000 words (+/- 10% at the discretion of the apprentice). This should be accompanied by supporting

evidence – whether photos, videos, images, screenshots or diagrams.

The project also requires

- a signed statement from the Invigilator to confirm it is the apprentices own work and has been completed under controlled conditions, and
- a signed statement from the apprentice to confirm it is the apprentice's own work.

End-point assessment organisations will test and trial the projects with small groups of apprentices, employers and training providers. This will ensure they are valid, reliable and comparable to the other projects, before being implemented. EPAOs will develop a bank of projects to prevent predictability and review them regularly (and at least once a year) to ensure that they, and the specifications they contain are fit for purpose. End-point assessment organisations will monitor projects over time to ensure comparability and continuing relevance.

Each project will be designed to take 20 hours to complete. Apprentices will complete their project off-the- job, so that they are away from the day-to-day pressures of work and in a 'controlled' environment. Apprentices have 20 hours to complete the project and produce the project rationale.

Each project will have a detailed brief and instructions for the apprentice – and this will not be opened until the first morning of the first day in which the project is carried out.

Each project will specify what systems, tools and platforms will be required to complete the task.

The project will specify what has to be uploaded and to where on completion of the project – and this must include the Project, the Project Rationale and the two signed statements.

#### The controlled environment

The EPAO is responsible for ensuring an appropriate controlled environment (which could be the employer or training provider premises or another suitable venue), which must:

- be a quiet room, away from the normal working environment, usually at the training provider or employer's premises;
- have a dedicated work station;
- be away from disruptions;
- provide access to all required equipment, tools, systems – as required for the Test they are doing; and
- have very reliable Internet access.

The EPAO will ensure that there is an invigilator who is responsible for managing the controlled environment, and with no role in supporting the project. This person is responsible for resolving any technical issues with the equipment that arising during the Test. Where only one apprentice is taking the project, then this person needs to be contactable but not present the whole time. There may be others taking the same test – but they must be two meters apart, at separate workstations and with their own set of instructions and resources. When more than one person is taking the project in the same place,

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the invigilator must be present the whole time to ensure that there is no collaboration between apprentices. This person is also responsible for confirming that the apprentice has backed up their work at the end of each day.

The apprentice must ensure that the project output and the project rationale are uploaded on completion, and the Invigilator will check that this has happened. The end-point assessment organisation will inform the independent assessor once the project and project rationale has been uploaded.

### **The Interview**

The Interview is the second part of the Project and Interview. It is key to the authenticity and validity of the assessment decision. The Interview is undertaken by the independent assessor who will also make the grading decision. The Interview can be conducted either face-to-face or online. The Interview is one to one – although a second independent assessor may be present for moderation or training purposes and/or when reasonable adjustments are required.

The Interview will take place following the completion of the project and after the independent assessor has reviewed the project and the portfolio. The apprentice will have at least seven working days' notice.

The Interview should give the apprentice the best possible opportunity to get the best possible result. The purpose of the Interview is to gather sufficient evidence, primarily by discussing the work undertaken in the project and submitted in the portfolio, against the knowledge, skills and behaviours set out in Table 1. The independent assessor can then determine whether the minimum standards have been achieved or not and whether they have been significantly exceeded to inform the decision about the grade to be awarded (see grading criteria in Annex 2).

The independent assessor must put the apprentice at their ease and give the apprentice the opportunity to do their very best. The assessor should ask open, competence-based questions to encourage the apprentice to illustrate the application of the knowledge, skills and behaviours defined in Table 1 as they talk about the work they undertaken in the project and submitted in the portfolio. The Interview is a structured, technical discussion between the apprentice and their independent assessor. The Interview is NOT a test of their interview skills.

The Interview is informed by the project and the portfolio, but the apprentice may also refer to other work the apprentice has undertaken. Both the independent assessor and the apprentice will have access to the project outputs and the portfolio before and during the interview.

The Interview will last 90 minutes (+10% at the discretion of the independent assessor to provide scope for an apprentice to demonstrate their full abilities). Whether the interview is conducted face-to-face or on-line, the apprentice and the independent assessor must be in a quiet room, away from disruptions or distractions.

### Preparation for the Interview

The Project (which is assessed and contributes to the grading) and the Portfolio are reviewed by the independent

assessor who can then determine the relevant interview questions. Whilst all of the knowledge, skills and behaviours set out in Table 1 must be explored at the interview, the assessor will determine those particular knowledge, skills and behaviours they need to probe in more depth in order to elicit sufficient evidence against the grading criteria set out in Annex 2. This is particularly important where the initial review suggests that the evidence may be at a grade boundary.

End-point assessment organisations will produce a structured brief for the independent assessor to support the interview and a bank of typical questions from which the assessor can select the most appropriate. The bank of open questions will reflect what questions might be required to differentiate competence in potential pass/fail, pass/merit and merit/distinction situations. This will ensure a consistent and comprehensive approach. The independent assessor will select the relevant questions, typically 15, based on their review of the Project and the Portfolio. In addition, the independent assessor may ask follow up questions or prompts to elicit further information or more in-depth replies to each question.

#### After the Interview

The main points from the Interview, and the conclusions, will be documented within 48 hours of the Interview being completed. The grading decision will be taken within five days of this. The Interview will be recorded for internal and external moderation purposes. All documentation and evidence should be retained securely for six years.

## 6. GRADING

The **Knowledge Test** is fail or pass. Each of the four units has to be passed for the Test to be passed as below

Fail	Pass
<65%	65% or above

The **Project and Interview** is fail, pass, merit or distinction. Each of the pass criteria in Annex 2 has to be passed for the Project and Interview to be passed. An apprentice will fail the Project and Interview if he/she has not met all of the pass criteria in Annex 2.

If an apprentice has passed the Project and Interview, the assessor can then assess whether or not they have demonstrated sufficient evidence for a merit or a distinction see Annex 2.

The requirements for a Merit include a consideration of KSBs under three themes, as shown below

Theme	Description of theme
<b>The What</b>	Those KSBs that define <i>what</i> the apprentice must be able to do.
<b>The How</b>	Those KSBs that define <i>the way</i> in which the work has to be done.
<b>The With</b>	Those KSBs that define <i>the personal and interpersonal qualities</i> that must be

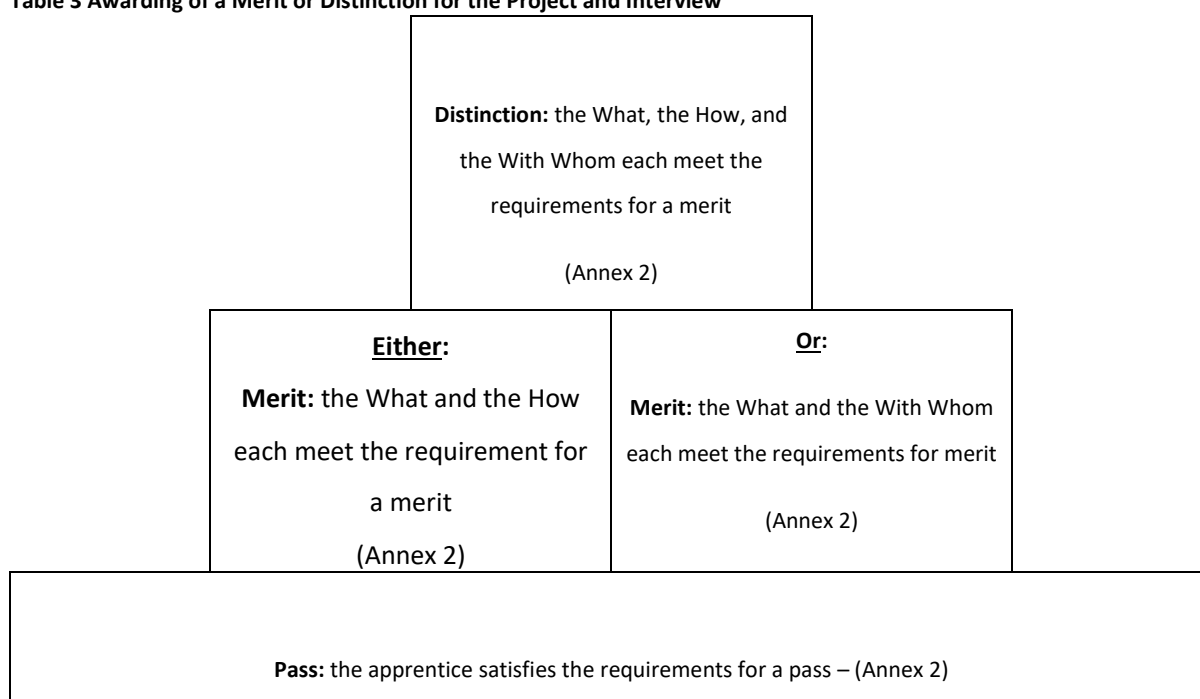
<b>Whom</b>	brought to internal and external relationships.
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A **Merit** is achieved if the apprentice satisfies the merit requirements for What they have done – *and* satisfies the merit requirements for *either of the other* two themes. A Merit is **not** achieved if the apprentice satisfies the merit requirement for only the How and the With Whom.

A **Distinction** can only be achieved if the merit requirements are achieved for *each of the three* themes

The requirements for a merit are set out in Annex 2. This is illustrated in Table 3, below

**Table 3 Awarding of a Merit or Distinction for the Project and Interview**



The overall grade is then determined as follows:

Knowledge Test	Project and Interview	Overall Apprenticeship Grade
Pass	Pass	Pass
Pass	Merit	Merit
Pass	Distinction	Distinction
Fail	Any result	Fail
Pass	Fail	Fail

Where the assessor is unsure of the grade to be awarded, the assessor may seek advice from the EPAO.

Appeals on grading decisions should be investigated and resolved through the End-Point Assessment Organisation's formal and documented processes, and records of such appeals should be retained.

#### **7. RESITS AND RETAKES**

Apprentices who fail one or more assessment method can be offered the opportunity to take a re-sit/re-take. A re-sit does not require further learning, whereas a re-take does. The apprentice's employer will decide whether or not a re-sit/re-take is an appropriate course of action. Apprentices should have a supportive action plan to prepare for the re-sit/re-take.

Re-sits/re-takes must not be offered to apprentices wishing to achieve a higher grade than pass.

Both assessment methods must be successfully passed within a three month period of each other; otherwise the entire EPA must be re-sat/re-taken.

There are no restrictions on the grade awarded in the case of a re-sit/re-take.

EPAOs must ensure that apprentices complete a different Knowledge Test and Project when taking a re-sit/re-take.

#### **8. PROFESSIONAL BODY RECOGNITION**

This apprenticeship is recognised for entry onto the BCS, The Chartered Institute for IT, Register of IT Technicians confirming level 3 professional competence. Those completing the apprenticeship can apply for registration.

#### **9. INTERNAL QUALITY ASSURANCE**

Any organisation interested in delivering the assessment service must be on the ESFA register of end-point assessment organisations and will, therefore, be able to demonstrate a range of capabilities including

- access to technical expertise and experience in designing and delivering tests/exams to give consistent, reliable and valid results;
- assessors with in depth and up to date occupational knowledge and understanding, and credibility within the sector;
- the ability to develop relevant, valid and robust tools and materials to deliver these assessments;
- a track record in delivering assessments;
- employer responsiveness and effective customer service processes;
- effective induction and training for everyone involved in assessment;
- effective leadership and management arrangements;
- robust quality assurance and quality control procedures, consistently applied; and

- impartial internal moderation of assessment decisions.

EPAO's internal quality assurance procedures should include

- a minimum of 50% of new assessors grading decisions being moderated, reducing to a minimum of 10% as that assessor's proficiency increases and risks decline;
- a minimum of six-monthly internal standardisation meetings with assessors – with each assessor participating in a standardisation meeting every six-months;
- carry out moderation and reviews on a risk basis, with sampling evidence to support this, that demonstrates full coverage across assessors and locations and over time. These should focus on comparability, fairness and grading results. The sampling should also take in to account the different Training Provider and Employers. All evidence should form the basis of training and standardisation required.

End-point assessment organisations are responsible for developing the assessment tools, materials and supporting materials, including documented criteria for the use of each assessment tool. These tools should be trialed and tested before implementation. Independent assessors should be provided with supporting information to help ensure that all end-point assessments are made consistently and against the specification.

End-point assessment organisations will have systems to recruit, induct and train independent assessors with the skills and experience required to assess against this Standard (whether as employees or sub-contractors). It is the responsibility of each end-point assessment organisation to ensure that those delivering end-point assessments have the necessary skills and industry knowledge to make reliable judgments and to confirm that they are entirely independent from the training provider and the employer for every apprentice that they assess.

All registered independent assessors must be competent in this occupation, in terms of

- at least three years, relevant, in-depth and broad experience of working in this occupation;
- recent and relevant industry expertise at a level equivalent to or higher than the level of the IT Solutions Technician standard within the last two years
- the possession of practical and up to date knowledge, gained within the last two years, of the application of current working practices, infrastructure, tools and technologies appropriate to this occupation and of relevance to the sector/size of business in which they will be carrying out assessments.

Note that in the case of the Software option, independent assessors must understand the different outputs likely depending on the complexity of the programming language the apprentice has used.

End-point assessment organisations must also ensure that all assessors are

- able to interview apprentices and communicate appropriately with apprentices
- have an understanding of apprenticeships
- have an understanding of what an apprentice should be able to do in their role and at the level of the apprenticeship.

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In addition, end-point assessment organisations must run induction programmes for all independent assessors to ensure they can demonstrate working knowledge of the apprenticeship Standard, the end-point assessment process and the grading criteria. They must be fully trained and approved for use of the assessment tools and be trained in the consistent application of the grading criteria. Independent assessors will be trained in the art of interviewing and reaching consistent judgment. They must attend standardisation meetings, at least annually, to ensure and maintain consistency of assessment decisions.

Anyone who undertakes end-point assessment must be held on a register by the end-point assessment organisation. The register must confirm that each individual undertaking end-point assessment has satisfied these criteria and that evidence has been checked through, for example a combination of

- Interviews
- Qualifications
- CPD evidence
- Employment History
- Professional registration
- Testimonials
- Assessment

End-point assessment organisations should have robust internal quality assurance and verification processes to ensure that the quality, consistency and validity of assessments are maintained. This should include mechanisms to ensure that employers and training providers understand their responsibilities in relation to invigilation and controlled environments. They should have a Lead Assessor, or someone responsible for the quality of assessment decisions.

## **10. EXTERNAL QUALITY ASSURANCE**

The external quality assurance will be an employer-led model carried out by NSAR (the National Skills Academy for Rail), on behalf of the Digital Apprenticeship Quality Board.

## **11. AFFORDABILITY**

The following factors should ensure the EPA is affordable:

- the use of on-line and virtual assessment,
- the potential use of employer premises, or other premises, rather than the need for dedicated assessment centres

## **12. VOLUMES**

It is expected that there will be approx. 1,000 starts per annum once it is fully established.

## **Annex 1**

### **DEFINITIONS**

**The following define some of the key terms that are used in the standard.**

#### Definitions for Methodologies and Service Frameworks

“Solution Delivery Lifecycle” - a high level description of the stages (activities) needed in the delivery of any IT solution, named as follows: Planning; Analysis; Design; Implementation; Maintenance. Note that this should not be confused with various descriptions of “Software Development Lifecycle” or “Systems Delivery Lifecycle” on the Internet which is generally descriptions of a waterfall based methodology. It is defined in this standard to give consistency of naming.

“Testing” is used with its widest meaning of the word, “Validation” or “Verification” are alternatives.

“Waterfall Methodology” - a traditional sequential methodology with the steps having the following names: Requirements; Design; Implementation; Testing; Maintenance.

“Agile Methodology” - a methodology where requirements and solutions evolve through the collaborative effort of self-organizing cross-functional teams. This includes methodologies such as SCRUM, KANBAN and others.

The scope of “Waterfall Methodology” and “Agile Methodology” includes their use in all types of IT solutions including hardware only based solutions as well as in applications and software development. This conforms to how these methodologies are used by industry leading organisations. Much of the reference material around methodologies come from software development and unfortunately older material on the internet often still reflects this.

“Service Management Framework” - ISO/IEC 20000. References to the Information Technology Infrastructure Library (ITIL), on which ISO/IEC 20000 is largely based must not be used because it is proprietary (owned since 2013 by the Cabinet Office and Capita).

Service Management Framework Key Processes – this includes Service Delivery Group processes consisting of “Capacity Management; Service Continuity & Availability Management; Service Reporting; Service Level Management; Information Security Management and Budgeting & Accounting for Services” plus the Resolution processes “Incident and service request management and problem management” plus the Control Processes “Configuration Management; Change Management; Release and Deployment Management”.

It should be noted that using a formal written methodology or framework in the apprentice’s work place is not mandated by this standard. The Apprentice is however expected to demonstrate working in a structured and professional manner and to understand the principles behind such formal methodologies and frameworks.

### Definitions for Networking

“OSI Network Stack” - the Open Systems Interconnection conceptual model ISO/IEC 7498-1.

“TCP/IP Network Stack” - the 4 layer DARPA model with its standard mapping onto the “Network Stack”.

All questions asked should be framed in terms of the “OSI Network Stack” unless they are specific to the “TCP/IP”.

All abbreviations such as “TCP/IP”, DHCP, DNS etc. will have their normal IT industry wide meanings.

### Definitions for Legislation

Key Legislation Affecting IT - includes the following

- Computer Misuse Act (1990) and any subsequent updates
- Copyright, Designs and Patents Act (1988) and any subsequent updates
- Data Protection Act (1998) (including the Data Protection Regulations (Regulation (EU) 2016/679)) and General Data Protection Regulation (GDPR) (Regulation (EU) 2016/679) and any subsequent updates



Annex 2: Grading Descriptors for Project and Interview			
Minimum Requirements to pass the Project and Interview  ↓	Grade Descriptors to exceed pass  ↓		
	<b>The What</b> Apply to: (S1, S2, S3, S9, K26) AND (S10, S11, S12) OR (S15, S16, S17) depending on the option taken	<b>The How</b> Apply to: S6, S7, K6, K7	<b>The With Whom</b> Apply to: B4
<b>CORE KNOWLEDGE SKILLS AND BEHAVIOURS</b>			
<b>Methodologies:</b> Applies the overall principles of the methodology / framework they are using in their own organisation and explains how the work tasks they have carried out conform to that methodology / framework. Explains the purpose of methodologies and frameworks and how this applies to their work, their team and their organisation, and explains the difference between a methodology and a framework. (S1,K5 and K6)	<b>Breadth – the range of tools and methods understood and applied</b>  Accurately applies and implements a wide range of tools and methods in a variety of different situations	<b>Responsibility – the scope of responsibility and level of accountability demonstrated in the apprentice’s work</b>  Autonomously undertakes work and uses discretion in identifying and resolving complex problems and assignments and determines when issues should be escalated	<b>Scope and appropriateness – the range of internal and external people and situations that the apprentice has engaged appropriately and effectively with</b>  Internally – works alone, 1:1, in a team and across the company with colleagues at all levels Externally – works with customers, suppliers and partners in a variety of situations
<b>Testing:</b> Undertakes testing (validation/verification) as appropriate to the methodology or framework they are using and to the particular solution they	<b>Depth – the level to which these tools and methods are understood</b>		

<p>are working; explains why testing (validation) is necessary at all stages of the Solution Delivery Lifecycle and applies testing appropriately to the framework they use in their work. (S2 and K5)</p>	<p><b>and applied</b></p>	<p>Works independently and takes ownership of responsibilities</p>	<p>Reads situations, adapts behaviours, and communicates appropriately for the situation and the audience</p>
<p><b>IT:</b> Autonomously carries out tasks in the following areas: accessing remote systems (logging in to the console of a remote system, using a tool such as TeamViewer, RDP, VNC, telnet, logmein); file manipulation (copy, delete, move, rename, change ownership and permissions, of both files and directories); file editing (use of a text file editor and functions such as search, global substitution, cut and paste); changing system or application settings (administrator level manipulation of operating system or hardware settings, such as environment variables, bios settings, registry settings or control panel setting); system administration (backup and restore operations, systems patching); and setting up and upgrading components whether infrastructure or software (installation of operating systems and/or applications and/or installation and/or configuration of hardware items. Explains the differences, including advantage/disadvantages between web vs installed clients; thin clients vs full functionality devices; and desktop virtualization vs</p>	<p>A sophisticated user – fully exploiting the functionality/capability of the tools and methods relevant at the point they are working at within the solutions development lifecycle. For example if they are working in an agile environment, using such tools as GitHub to communicate to relevant stakeholders.</p> <p><b>Complexity – Analyses and responds appropriately to inter-related and inter-dependent factors in the work</b></p>	<p><b>Initiative</b></p> <p>Solves the problem and explores creative or innovative options to find a solution that better meets customer needs, utilises more creative technology, such as IoT.</p> <p><b>Delivery Focus – the extent to which the apprentice has shown they can grasp the problem, identify solutions and make them happen to meet client needs</b></p> <p>Demonstrates project management skills, in defining problems, identifying solutions and making them happen and giving consideration to interdependencies between their work and others Demonstrates a disciplined approach to execution, harnessing resources effectively</p>	<p><b>Reliability – the extent to which they perform and behave professionally</b></p> <p>Consistently delivers, performs and behaves professionally. Manages and delivers against expectations. Proactively updates colleagues. Behaves in line with the highest values and business ethics</p> <p><b>A role model and exemplar to others</b></p> <p>Actively inspires and leads others, takes others with them, leads by example</p>

full client capability (S3 and K7).	Deals confidently and capably with a high level of interrelated and interdependent factors in their work	Drives solutions – with a clear goal focus and appropriate level of urgency	
<p><b>Solutions:</b> Identifies appropriate technical solutions, within the scope of their work, whether during resolution of an incident, or as part of their involvement in solution design. Applies analytical and problem solving skills to understand the client's needs and issues (where the client may be the end-user of the solution or the people who have commissioned the work). Explains and illustrates the fundamental purpose of a solution architecture (to break down a complex problem into a smaller set of solvable components) and applies this. Applies their understanding of the type of end users to influence the solution design (whether frequent use vs intermittent use vs occasional use, level of IT literacy, disability etc.). Explains the concepts of solutions development to a given set of requirements, including the use of standard applications for web and cloud based solutions. (S1 ,S6 , S7, K4, K7, K26)</p>			
<p><b>Communication:</b> Illustrates three occasions on which they have used verbal communication and three when using written communications, where these are non-trivial and varied (such as face-to-</p>			

<p>face vs remote, formal vs informal, use of different media,) to show the following:</p> <ul style="list-style-type: none"> <li>• Consideration of whether anything might disrupt the effectiveness of the communication (culture, past history etc.) and how to cope with this.</li> <li>• Sensitivity to the dynamics of the communication situation and the personalities involved.</li> <li>• Selecting the most appropriate method for the situation – recognising any limitations of the chosen method and the possible risk of miscommunication.</li> <li>• Taking into accounts possible barriers to communication such as different backgrounds (technical or cultural).</li> <li>• Expressing themselves clearly and succinctly and as appropriate to the audience.</li> <li>• Actively checking the other person/people understanding and modifying their communication as required.</li> </ul>			
<p><b>Security:</b> Operates securely across all their areas of responsibility and in line with organisation guidance</p>			

and legislation (S9)			
<p><b>Business:</b> Explains and illustrates how they work according to laid down policies and practices, including actions such as keeping usernames/passwords in a secure manner, ensuring that data is appropriately protected (for example by encryption of personal data), and obeying organisational, regulatory, or best practice and explains the documentation and policies used in their organisation and applies them appropriately and consistently. Explains how their work contributes to business performance, continuity and resilience, and illustrates the implications of this for what they do and how they do it (S4, S5 and K16)</p>			
<p><b>Professional Behaviours</b></p> <p>Carries out packets of work without supervision and without undue reference to others (B1)</p> <p>Applies standard business courtesies and business ethics (including confidentiality, bribery and corruption). (B2)</p> <p>Prioritises their own workflow to manage work they have been allocated, taking in to account organisational priorities and rules, with the aim of delivering the best service to their clients. B3)</p>			

<p>Develops effective and appropriate relationships with the groups / key individuals that they interface with in their role (their team members, customers, clients and stakeholders) (B4)</p>			
<p><b>AND EITHER:</b> <b>OPTION ONE: IT SOFTWARE SOLUTIONS</b></p>			
<p><b>Software Solution Cycle:</b> works as part of a team involved in the software solution cycle, within at least one stage of the Solution Delivery Lifecycle with a focus on software and shows an understanding of the different roles and the different stages. (S10)</p>			
<p><b>Maintenance and Support:</b> Undertakes a range of software maintenance and support activities – such as upgrading systems or applications, testing, data refresh, environmental refresh, dealing with problem tickets, using knowledge bases and documentation, promotion of code to production use, use of change control and version control systems and systems housekeeping, to meet client requirements appropriately. Installs and configures the operating systems and/or application for a non-trivial solution (one where the set of actions, if undertaken by an experienced practitioner would take more than half a day) to meet the clients’</p>			

<p>needs appropriately (S11 and S12)</p> <p><b>Coding:</b> Explains and applies the basic concepts and logic used by scripts and code including variables; variable assignment; conditionals (if..then..else) loops; (for, while, until) functions and sub-routine. Provides an example of script or code developed entirely by themselves, which contains 40 instructions or more, including comments. Explains how scripts/programs are developed and tested and how to connect code to data sources, such as files or databases. Illustrates and explains how they develop code, Including top down vs bottom up; debugging and use of Integrated Development Environments; (S13, K31, and K35)</p>			
<p><b>Data sources:</b> searches and manipulates different types of data sources, including structured and unstructured (S14)</p>			
<p><b>OR:</b> OPTION TWO : IT HARDWARE SOLUTIONS</p>			
<p><b>Hardware Solution Cycle:</b> works as part of a team involved in the hardware solution cycle within at least one stage of the Solution Delivery Lifecycle with a focus on hardware and shows an understanding of the different roles and the different stages. (S15)</p>			

<p><b>Maintenance and support:</b> Undertakes a range of hardware maintenance and support activities, including installation (commissioning or configuration of new servers, networks or other devices in either a traditional or virtualized environment); makes adjustments to hardware or system settings; backups/restores operations; systems maintenance; and patching of hardware of operation systems. Installs or removes at least one hardware component safely – for example installs a network switch, racked server, network connected disc pack, filtering appliance, firewall or adding or replacing a component within an enclosure (for example a new internal disc or I/O card. Or, in a virtualized environment: installs multiple servers and configures associated network(s) (S16 and S17)</p>			
<p><b>ESD:</b> Safely applies the concepts of Electro Static Discharge (ESD) whenever required and meets appropriate health and safety standards when working with hardware (S18)</p>			
<p><b>Installation:</b> Installs, configures and tests the listed hardware components for a non-trivial solution (one where the set of actions, if undertaken by an</p>			



experienced practitioner would take more than half a day) (K43) Explains the importance of logical approaches and provide an example of how this applies to ensuring connectivity (K44)			
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