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Citizen Identity Technical Definition

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Document Management

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Reviewers

This document must be reviewed by the following people:

Reviewer name	Title / Responsibility	Date	Version
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Approved by

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Melissa Ruscoe	Programme Head	09/05/18	0.7
Adam Lewis	Programme Director	09/05/18	0.7

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1 Introduction

1.1 Purpose of Document

This document summarises the Architecture for the NHS Digital Citizen Identity Platform – this supports other services when providing digital health and care services to members of the public, including those who do not strictly fit in to the term ‘citizen’. The document highlights the key requirements for the Citizen Identity solution which have been gathered through stakeholder engagement and articulates where these requirements impact the architecture.

The document will be refreshed as the solutions and architecture evolves.

1.2 Audience

The primary audiences for this document are:

- Citizen Identity Programme team
- NHS Digital – Digital Delivery Centre
- NHS England

1.3 Definitions

Where used in this document set, the keywords MUST, SHOULD and MAY are to be interpreted as follows:

- **MUST**: This word, or the terms "**REQUIRED**" or "**SHALL**", means that the definition is an absolute` requirement of the specification.
- **SHOULD**: This word, or the adjective "**RECOMMENDED**", means that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications **MUST** be understood and carefully weighed before choosing a different course.
- **MAY**: This word, or the adjective “**OPTIONAL**”, means that an item is truly optional. One implementer may choose to include the item because a particular implementation requires it or because the implementer feels that it enhances the implementation while another implementer may omit the same item. An implementation which does not include a particular option **MUST** be prepared to interoperate with another implementation which does include the option, though perhaps with reduced functionality. In the same vein an implementation which does include a particular option **MUST** be prepared to interoperate with another implementation which does not include the option (except, of course, for the feature the option provides).

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2 Problem Description

From the Citizen Identity Strategic Outline Case:

The NHS is already considered to be one of the most efficient Health Organisations in the world. But this efficiency is currently impacted by disparate care settings, lack of shared information between acute, primary and social care, and the use of paper records.

Furthermore, NHS England estimates that 50% of A&E attendees could be treated elsewhere. The Royal College of General Practitioners say 27% of patients that attend GP practice don't need to see a GP. The system is under immense pressure already at a time of an ageing population and the increasingly diverse and complex needs of patients.

In order to continue to provide a sustainable service, innovative new ways to treating patients is required, and for many this means a better use of information technology and digital services. The objective is to empower patients to self-care, take preventative measures if possible, and empower their carers to look after them.

The Empowering the Person domain are developing a number of digital tools and services that will put patients in charge of their own health and care, enabling patients to manage aspects of their own healthcare, to contribute to the care process and as such reduce pressure on front-line NHS services.

These digital tools and services often require an understanding of digital identity *as a pre-requisite* to patients being able to use the services, particularly; where people need others to act on their behalf through a digital channel; where user adoption needs to be simple and understandable; where sensitive information is accessed it needs to be protected; where personalised or contextual services need to be delivered.

However, apart from Patient Online, which is available only for GP services, the current processes for proving your identity in order to use these services, and the technology landscape of systems in the NHS are grossly inadequate to meet the challenges of this forthcoming digital transformation.

What we do know

We know that patients and carers find existing processes for proving who they are, are a barrier to receiving the care they need. In some cases, they may have to prove identity many times depending on the number of services they need to access. They are likely to have to do this in person, which may require them to take time off work or put in place childcare arrangements to attend a GP practice.

Despite presenting in person, people are often *unable to complete the process* because they are required to bring physical copies of identity documents, which they forget, or bring documents that are not considered trustworthy because they don't understand what they are being asked to do.

We know the care workers who work in the NHS and are currently required to help people get access to online services are already under pressure; that they do not have the time or expertise to validate identity documents as part of this process and are often deploying workarounds to get the job done.

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This in turn means the process of online service adoption and the security applied to services is hugely varied, resulting in inconsistent access to services, inconsistent experiences and inadequate security.

In short, patients are being failed as they are unable to get access to digital services when they want to in a manner that is convenient to them. Care workers are being failed as we are adding Identity Verification processes to their workload, and they are unable to deploy digital services that could alleviate those pressures quickly enough.

This programme aims to, in part, address these concerns by providing services that enable people to prove their identity once, in a manner that is convenient to them, and re-use this identity to access many services.

2.1 Stakeholders and their Concerns

The key stakeholder-defined future requirements for the Architecture are outlined below:

Category	Stakeholder and Stakeholder Needs Identified
Programme Benefits Realisation	• NHS Digital Programme – meet the defined objectives for the programme • GPs and practice staff – Reduce burden of managing patients' identities • Citizens/Public – Access digital services via a convenient and consistent sign-in process • NHS Bodies – Provide access to digital services • Third Parties – Provide access to digital services
Reuse (operational)	• Other NHS Organisations – A Platform of reusable Identity capabilities • Third-party suppliers – A Platform of reusable Identity capabilities
Operational	• NHS Digital - Minimise the cost and effort in managing the Citizen Identity Platform • NHS Digital - Extensible and Flexible platform to accommodate future change
IG and Security	• NHS Digital - Secure and consistent Identity management for individuals • NHS Bodies (identity providers and authentication hubs) – assurance of compliance with *Identity Verification and Authentication Standard for Health and Care* prior to on-boarding to the national service • Third Parties (identity providers and authentication hubs) – assurance of compliance with *Identity Verification and Authentication Standard for Health and Care* prior to on-boarding to the national service
Privacy	• NHS Digital - User consent for data sharing • NHS Digital - Reduce the data which users must share across bodies • PCAG – Data collected from citizens is proportionate and managed appropriately

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Figure 1 – Summary of Stakeholders and their concerns

From the Citizen Identity Programme Strategic Outline Case, a useful summary of the needs is set out below:

The NHS now urgently needs to address the following shortcomings in the existing services arrangements:

- **There is no consistency in how patients prove their identity**[1] or how people enable others to act on their behalf when accessing digital services today
    - Many of the processes used are a burden on patients, who may have to travel or perform ID verification on a per-service basis
- **There is no online mechanism for Identity Verification** available to the NHS today
- **Care workers and other NHS staff are not trained to validate ID documents**
    - The current processes do not adequately prove identity
    - Identity Verification could be performed outside the NHS front-line if a suitable process was defined, supported with appropriate technology or service providers.
- **The end-user experience of accessing digital services is poor**, because registration and log-on is different for each service, and cannot be re-used
- **There is a significant variation of the level of security and privacy** applied to different services – some services have been deemed unsafe by the Care Quality Commission (CQC).
- **Service adoption is slow due to each service having to implement their own arrangements** for Identity Verification - meaning a lot of duplication of effort in delivery of those services and slow user adoption (due to the barrier of having to go through ID verification or registration each time they want to access a new service).

[1] Referred to as “Identity Verification”

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2.2 List of Issues/Scenarios to be addressed

The key scenarios for the Citizen Identity Platform, which the Architecture must support, are outlined below:

High-Level Scenario	Architecture Implications
User proves who they are, so that they may access a digital service	Drives many of the functions available within the platform including registration, identity verification and federation with the digital service Data must be stored within the platform, including identifiers, credentials and contact information
User manages their account	Further functions within the platform around self-service
Identity solution changes over time	Flexibility and evolution of the platform itself Capabilities to draw in new providers of identity functions, including third-parties

2.3 Compliance with PCAG principles

The Privacy and Consumer Advisory Group is an independent forum that advises the government on how to provide trusted and secure means of accessing public services.[2] PCAG has published Identity Assurance Principles to support identity assurance services and to ensure that users have control over access to their identifying information when interacting with Government online services. The focus is on control and consent.

As these principles are published by a nationally recognised body that advises the Government, there is a clear benefit for the NHS Citizen Identity processes to overtly respond to and comply with them. The programme will ensure that these principles are met, through assuring compliance with the *Identity Verification and Authentication Standard for Health and Care.*

	Principle	Met / Comments
1	USER CONTROL "I can exercise control over identity assurance activities affecting me and these can only take place if I consent or approve them."	Met. Identity registration and use will only be initiated by the user.
2	TRANSPARENCY "Identity assurance can only take place in ways I understand and when I am fully informed."	Met. A full audit trail to be provided to the user.
3	MULTIPLICITY "I can use and choose as many different identifiers or identity providers as I want to."	Research required to confirm whether multiplicity is valid and required in a health context balanced against

[2] https://www.gov.uk/government/groups/privacy-and-consumer-advisory-group

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		potential clinical risk of multiple identities.
4	DATA MINIMISATION "My interactions only use the minimum data necessary to meet my needs."	Met. Identity information only held where necessary.
5	DATA QUALITY "I choose when to update my records."	Only within the context of the identity element of the record – rather than the health record itself.
6	SERVICE USER ACCESS AND PORTABILITY "I have to be provided with copies of all of my data on request; I can move / remove my data whenever I want."	Met, data will be removed unless required for legal purposes.
7	CERTIFICATION "I can have confidence in the Identity Assurance Service because all the participants have to be certified against common governance requirements."	Will be met - Needs further investigation dependent on the solutions being developed – the standard will not proscribe the solution.
8	DISPUTE RESOLUTION "If I have a dispute, I can go to an independent Third Party for a resolution."	Existing NHS dispute resolution mechanisms are already in place and will be used.
9	EXCEPTIONAL CIRCUMSTANCES "Any exception has to be approved by Parliament and is subject to independent scrutiny."	Existing healthcare and data protection laws are deemed sufficient and further parliamentary scrutiny is deemed unnecessary for access to health records.

Figure 2: Alignment to PCAG Principles

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3 High-Level Objectives

The high-level objectives of the Citizen Identity Programme are presented in the Strategic Outline Programme Case, repeated here:

1. **Improve patient uptake and adoption of online health and care services** - by making service adoption for patients simple by providing patients with a consistent way of accessing multiple digital health and care service, e.g. creating a single account and providing a common log on experience and providing a way of proving who you are online
2. **Ensure patient information is protected to a consistent level** - through provision of a trusted process and supporting technical services for verifying identity to a consistent level that meets defined standards, including identity validation and document checking, ensuring data security and online safety to users [Compliance with *Identity Verification and Authentication Standard for Health and Care* by NHS Digital and connecting organisations]
3. **Improve efficiency and reduce costs, and time to market of online health and care services** - by providing an identification/verification service that can be re-used so that service providers don't have to deliver identity services themselves
4. **Reduce burden on health and care front line** - by providing capabilities that enable patients to be registered and verified for access to digital services without having to present themselves physically at a health service location. This supports greater access to digital services which allow them to self-manage their health and also access to personalised online health and care services.
5. **Enable improved decision making, and ability to self-care** – by providing the facility for a patient to enable a carer to access digital services on their behalf, and therefore actively participate in managing their health conditions.
6. **Enable effectiveness and efficiency of future service implementation** - standards and guidance on identity assurance, including technical standards for Identity Verification and how health and care service providers delivering digital services to patients and citizens can make use of strategic solutions

The architecture for the Citizen Identity solution must support these objectives.

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4 Environment and Process Models

4.1 Current Process Description

Current identity verification and management processes within the NHS, relating to citizens, are not consistent or efficient. The largest process sits within the Patient Online Programme – whilst this sets some minimum standards for identity verification, the process does not necessarily scale across other contexts without extra burden upon GP Practices. There are also inconsistencies in how Identities are verified and governed.

4.2 Future Process Description

There are a number of outline areas where the introduction of a Citizen Identity solution will introduce new processes and business capabilities, as well as impact various existing processes and capabilities.

These changes are:

- Make user ‘sign-in’ available via the NHS Digital Citizen Identity Platform
- User profiles, summarising the Identity Assurance associated with a person, maintained by the NHS Digital Citizen Identity Platform
- Technical Integration available such that Applications/Services can utilise the NHS Digital Citizen Identity Platform ‘sign-in’
- Identity verification – online user journey
- Identity verification – offline user journey
- Identity verification – online-to-offline user journey

Development of the Citizen Identity solution to support these new processes will be undertaken using an Agile methodology and hence is envisaged to occur in phases.

4.3 Information Flow

Figure 3 below shows the key information flows to be supported by the Citizen Identity Solution.

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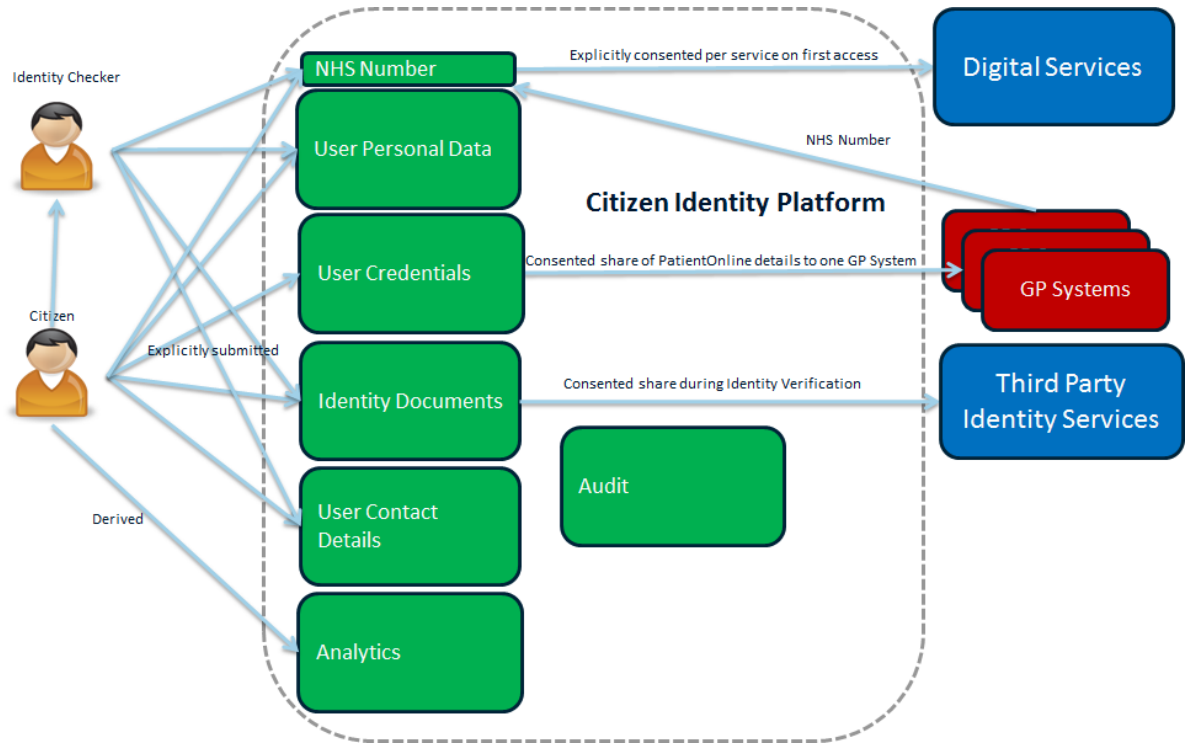

Figure 3 – Key Logical Information Flows – a summary Privacy View

The Platform captures a range of data types:

- NHS Number
- User Personal Data such as name, Date of Birth
- User Credentials – password, device identifiers
- Identity Documents – as images and/or document identifiers
- User Contact Details – email address and/or mobile phone number
- Analytics – which pages within the Identity Platform all users visited and when
- Audit – Who made changes to data items, when and under what context

The above shows the main flows, the key points being:

- The above data items are captured directly from the individual, in some cases
- In other cases, the data is provided by an authorised user, 'Identity Checker'
- Identity Documents and/or identifiers may be cross referenced against external third-parties and other government departments, as part of Identity Proofing and document validation
- If the user provides their GP System 'linkage' and/or other GP System credentials, then these may be sent to the relevant GP System for validation and verification
- The NHS Number will be provided to the Digital Service which the user is requesting to access

4.4 Participating Organisations

The following data items will be collected from:

- Citizens applying for their Identity to be verified

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- Any NHS or non-NHS provider, organisation, company, or authority that provides identity services for individuals accessing online health or care services

In accordance with the process for onboarding Organisations which meet the Identity Standard, or parts thereof.

4.5 The Data that will be Collected

From the DPIA, the following data is collected and processed by the Platform.

Data Categories [*Information relating to the individual's*]	**Yes**	**N/A**	**Justifications** *[there must be justification for collecting the data items. Consider which items you could remove, without compromising the needs of the project]*
Personal Data			
Name	Yes		Names will be collected for all users, so we can accurately match them to their record, they will either input their NHS numbers or give us further demographic details. Surnames will also be captured and stored against the users profile (via a PDS trace if NHS Number is known) as there is a technical requirement and this also allows for a smoother user journey, when a user attempts to access GP services (or moving GP and then trying to access new GP services). Services which connect with the NHS Platform may also allow delegated access, for example: if a mother is able to access her child's medical records, she may want to grant access to the father. In terms of the process of delegated access, the programme is currently in discovery and working to understand and define this process.
Address	Yes		The address is only collected if the user is unable to provide their NHS Number, for the purpose of identification via the NHS NHS Citizen Identity Service and matching the correct individual to a record via PDS. Address will be captured via the Online and Offline NHS Citizen Identity Service user journeys.

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Postcode	Yes		The postcode is only collected if the user is unable to provide their NHS Number, for the purpose of identification via the Citizen Identity Service and matching the correct individual to a record via PDS. Postcode will be captured via the Online and Offline NHS Citizen Identity Service user journeys.
DOB	Yes		The DOB will be collected for all users, so we can accurately match them to their record, they will either input their NHS numbers or give us further demographic details. DOB will also be captured and stored against the users profile (via a PDS trace if NHS Number is known) as there is a technical requirement and this also allows for a smoother user journey, when a user attempts to access GP services (or moving GP and then trying to access new GP services).
Age	Yes		NHS Citizen Identity Service – This can be derived from the form of ID provided by patient/delegated individual, hoever we will not explicitly request their age. Therefore, age will be captured via the Online and Offline NHS Citizen Identity Service user journeys.
Sex	Yes		NHS Citizen Identity Service – This can be derived from the form of ID provided by patient/delegated individual, however we will not explicitly request their sex. Therefore sex will be captured via the Online and Offline NHS Citizen Identity Service user journeys.
Marital Status		N/A	
Gender		N/A	
Living Habits		N/A	
Professional Training / Awards		N/A	
Income / Financial / Tax Situation		N/A	
Email Address	Yes		An email address will be captured for the below: NHS Platform - Email address will be captured from the offline face to face facial comparison

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			process (this is when a patient/delegated individual, may visit a GP to have their identify verified). Email address is being captured, so they can receive a link which binds their verified identity to their email address. This will allow them to continue the process of accessing/signing into the service they wish to access online. NHS Account – If a patient/delegated individual wishes to access certain services connected to the NHS Platform, they will be requested to make a NHS Account. The patient/delegated individual will be requested to input their email address, to create a set of credentials that allow access to their account or service they wish to access. Email will be captured via the Online and Offline NHS Citizen Identity Service user journeys.
Physical Description		N/A	
Home Phone Number	Yes		A code could be sent to the patient's home phone number for 2FA, as a security measure for their NHS Account. Home phone number will be captured via the Online user journey of NHS Citizen Identity Service.
Online Identifier e.g. IP Address/Event Logs	Yes		Audit/Event logs will be generated and may contain IP addresses. These may be stored by Security Ops who utilise information for fraud investigations. Audit/Event logs will be captured via the Online user journey of NHS Citizen Identity Service.
Website Cookies	Yes		These will be for functional use and analytical purposes. Website cookies will be captured via the Online

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			user journey of NHS Citizen Identity Service.
Mobile Phone / Device No	Yes		A code could be sent to the patient's mobile phone number for 2FA, as a security measure for their NHS Account. Mobile phone number will be captured via the Online user journey of NHS Citizen Identity Service.
Device Mobile Phone / Device IMEI No		N/A	
Location Data (Travel / GPS / GSM Data)		N/A	
Device MAC Address (Wireless Network Interface)		N/A	
Sensitive Personal Data			
General Identifier e.g. NHS Number	Yes		The NHS number will be utilised to match against PDS to authenticate and match the individual to a record. NHS Number will also be sent to the specific service which the patient will be accessing, once the citizen has successfully authenticated themselves. NHS Number will be captured via the Online user journey of NHS Citizen Identity Service. There may be services which have an existing general identifier for their users and would like to onboard with the NHS Platform. These users will have satisfied satisfactory identity checks to be presented a general identifier and therefore will be allowed to use it to access a service and features which have been clinically authorised immediately, for example users with a Linkage Key (these are generated by GP system suppliers, once a user has visited their practice with the required ID documents).

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			If a user is not registered for a Linkage Key, the individual service will complete identity verification with the NHS platform and then a Linkage Key will be generated for the user. The Linkage Key will then be stored against the user's profile, so whenever the user logs into access a service requiring linkage keys we will be able to pass them to a service.
Sexual Life / Orientation		N/A	
Family / Lifestyle / Social Circumstance		N/A	
Offences Committed / Alleged to have Committed		N/A	
Criminal Proceedings / Outcomes / Sentence		N/A	
Education / Professional Training		N/A	
Employment / Career History		N/A	
Financial Affairs		N/A	
Religion or Other Beliefs		N/A	
Trade Union membership		N/A	
Racial / Ethnic Origin		N/A	
Biometric Data (Fingerprints / Facial Recognition)	Yes		Video Selfie, Driving Licence and Passport will be processed for identification purposes. Driving Licence and Passport will be captured via the Online and Offline NHS Citizen Identity Service user journeys. Video Selfie will be captured via the Online NHS Citizen Identity Service user journeys.
Genetic Data		N/A	
Other Data			
Audit Data	Yes		Audit is essential to record the actions performed by whom and when - these enables investigations and accountability for access to

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			data Audit data will be captured via the Online and Offline NHS Citizen Identity Service user journeys.
Analytics	Yes		Analytics provides data that can measure the performance and success of the or service against KPIs Analytics data will be captured via the Online and Offline NHS Citizen Identity Service user journeys.

Subsequent phases of delivery will further impact the logical information flow, and potentially the data collected. This document (and DPIA) will be updated accordingly.

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5 Actors and their Roles and Responsibilities

5.1 Human Actors and Roles

The existing human roles described in the table below will interact with the Citizen Identity Platform.

Role	Actor
Citizen	Any member of the general public (not just citizens) within England
Identity Checker	A specific individual, authorised to verify citizen identities. In the initial phases (for Private Beta), this will be limited to a shortlist of NHS staff
Digital Delivery Centre Operations Staff	NHS Digital staff operating the platform

5.2 System Actors and Roles

The table below summarises the computer actors and roles.

Role	Role Description	Actor
Digital Services	These are health and/or care applications and tools – in this context, they require the citizen or patient to sign-in/login	Applications/tools provided by NHS Digital, other NHS and private sector organisations
GP Systems	These are systems procured by GP Practices. They provide current Identity Verification and Management within Primary Care	GP Systems provided by GP Systems of Choice framework (GPSoC)
Identity Providers	These are Identity Services which can provide all, or part-aspects of Identity Verification, Authentication and Sign-in capabilities	This could include services such as GOV.UK Verify and associated providers. There are also other Government departments that fit into this role.
Identity Verification Services	These are Identity Services which can provide all, or part-aspects of Identity Verification capabilities	This could include services such as GOV.UK Verify and associated providers. There are also other Government departments that fit into this role.

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6 Resulting Architecture Model

6.1 Constraints

The following have been identified as constraints on the Architecture Model for the Citizen Identity Solution:

- Technology selection must reflect the operational capabilities of NHS Digital
- The Citizen Identity Programme, and to a certain extent, NHS Digital, has limited control over user uptake and usage of the Citizen Identity Platform. The Architecture Model for the Citizen Identity Platform must therefore be flexible and scalable to deal with rapid fluctuations in service utilisation with no impact to end users

6.2 Requirements

Requirements captured here are relevant to the component architecture view of the Citizen Identity Platform. Requirements relevant to other architecture views (such as technology architecture) are managed with the Citizen Identity Architecture Repository:

- The architecture must support multiple Digital Services, providing a consistent user and technical interface
- The architecture must support multiple solutions for Identity Verification as well as a number of Identity Providers for user authentication
- The architecture should abstract from the Digital Service the detailed mechanism of Identity Verification which the user has been routed through – Information Hiding
- The architecture must support the changing landscape of Identity types and approaches, such that the service can take advantage of new solutions and technologies
- The architecture must adhere to existing standards for Identity Federation (sharing Identity within defined rules on trust and interoperability)
- The architecture must be capable of flexing to user and service volumes on a day-to-day basis – Scalability
- The architecture should support the general move towards ‘thin technologies’ such as microservices and ‘serverless’ operations

6.3 Design Principles

The key Architecture and Design principles based on experience from Care Identity Service (CIS) and previous NHS Digital programmes are included in the table below:

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Priority	Principle	Implications/What this means in the design
1	Design for security	Assurance that the Service and Platform complies with the Identity Verification and Authentication Standard for Health and Care. Assurance that parties submitting verified identities to the service comply with the Identity Verification and Authentication Standard for Health and Care (on-boarding process).
2	Design for operational simplicity and efficiency	Automated testing at unit and acceptance level Automated build 'Thin' technologies - serverless where possible, containerised where not
3	Flexible functionality via simple designs and loose-coupling (without extra-engineering)	Interfaces between components should be standards-based wherever possible Interfaces between components should be simple to implement and extend later We don't code/implement for future unknowns and "maybe's"
4	Provide interfaces to the 'outside' using open standards	Stay within published standards - extend only where permitted by the standard
5	Design for Scalability	Use technologies which are simple to scale and manage - serverless, or containerised Scale horizontally where possible Allow the underlying platform to manage scale rather than our own additional tooling State needs to be carefully managed and designed out where possible
6	Choose technologies to support rapid delivery	Choose products and technologies that support rapid procurement (none if possible) Choose technologies which we have skills to deliver in
7	Platform Portability	Avoid decisions which unnecessarily lock the architecture into specific platform providers

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Alignment with wider NHS Digital Principles, Policies and Standards will be ensured through the NHS Digital governance processes.

In addition, the principles included in the GDS Service Design Manual will be adopted for the Citizen Identity Platform solution.

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7 Component Architecture View

Figure 4 shows the component architecture view for the Citizen Identity solution following the first phase of development.

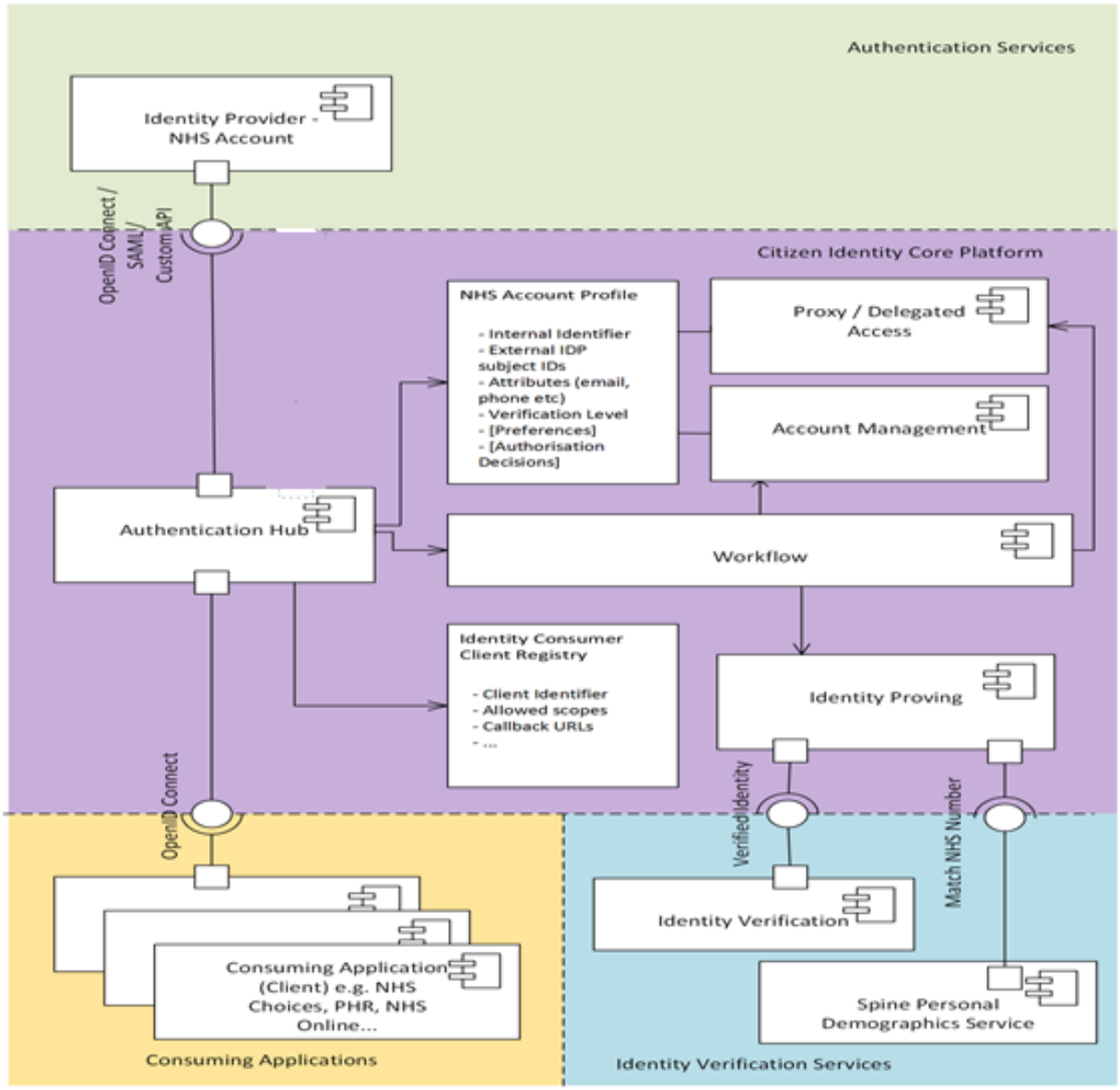

Figure 4 – Citizen Identity Logical Components

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8 Technology Architecture View

The technology architecture view encompasses two main perspectives; the software platform on which the service will be developed and run, and the infrastructure platform on which the service will be delivered.

8.1 Software Architecture

At a high level the software architecture employed to deliver the service will broadly conform to a standard web-based tiered architecture. This type of architecture layering is well understood and there are many individual software options available which have proven implementations meeting the non-functional performance, availability, and security requirements of the Citizen Identity service.

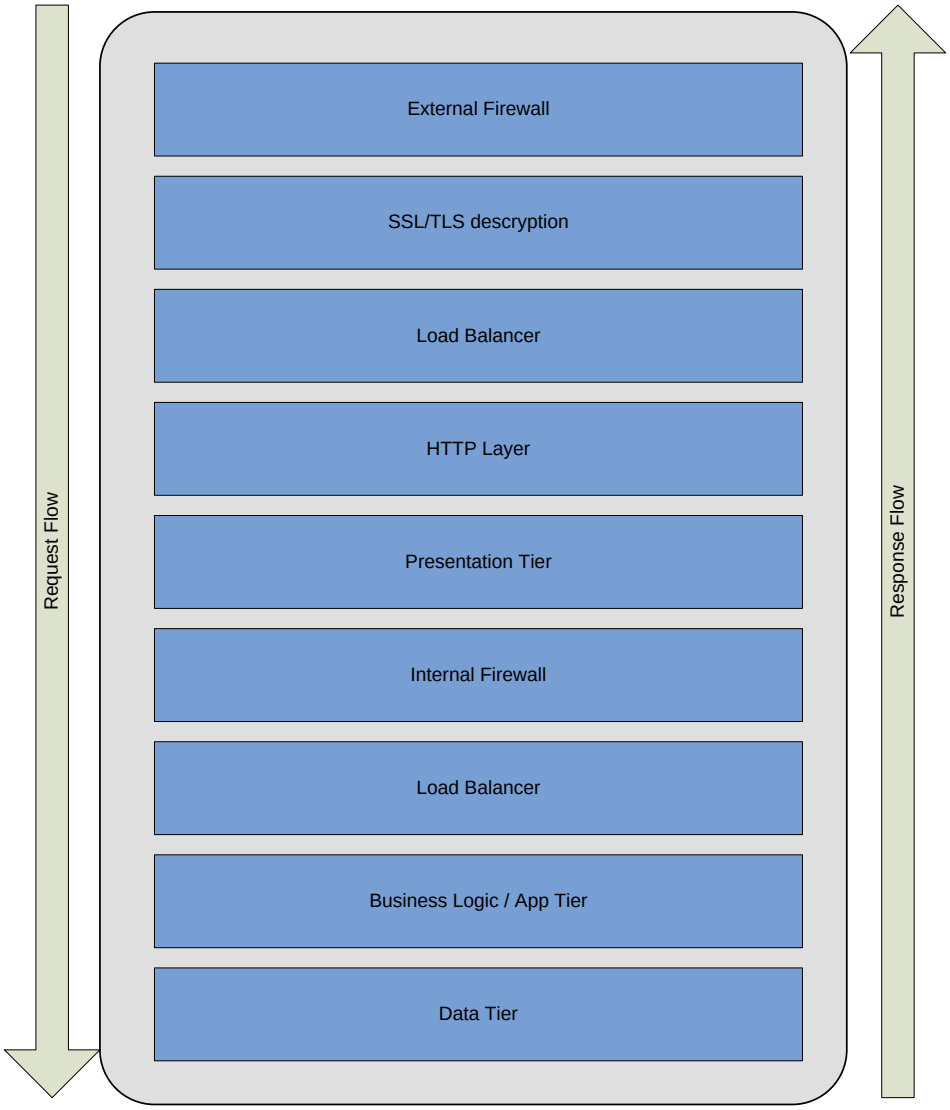

Figure 5 - Simplified tiered web architecture

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The software architecture is concerned with the HTTP, Presentation, Business Logic and Data tiers. The firewall, SSL/TLS decryption and load balancing components are considered within the Infrastructure view.

There is an anticipated set of technologies that will be implemented within the service, these are shown in the figure below.

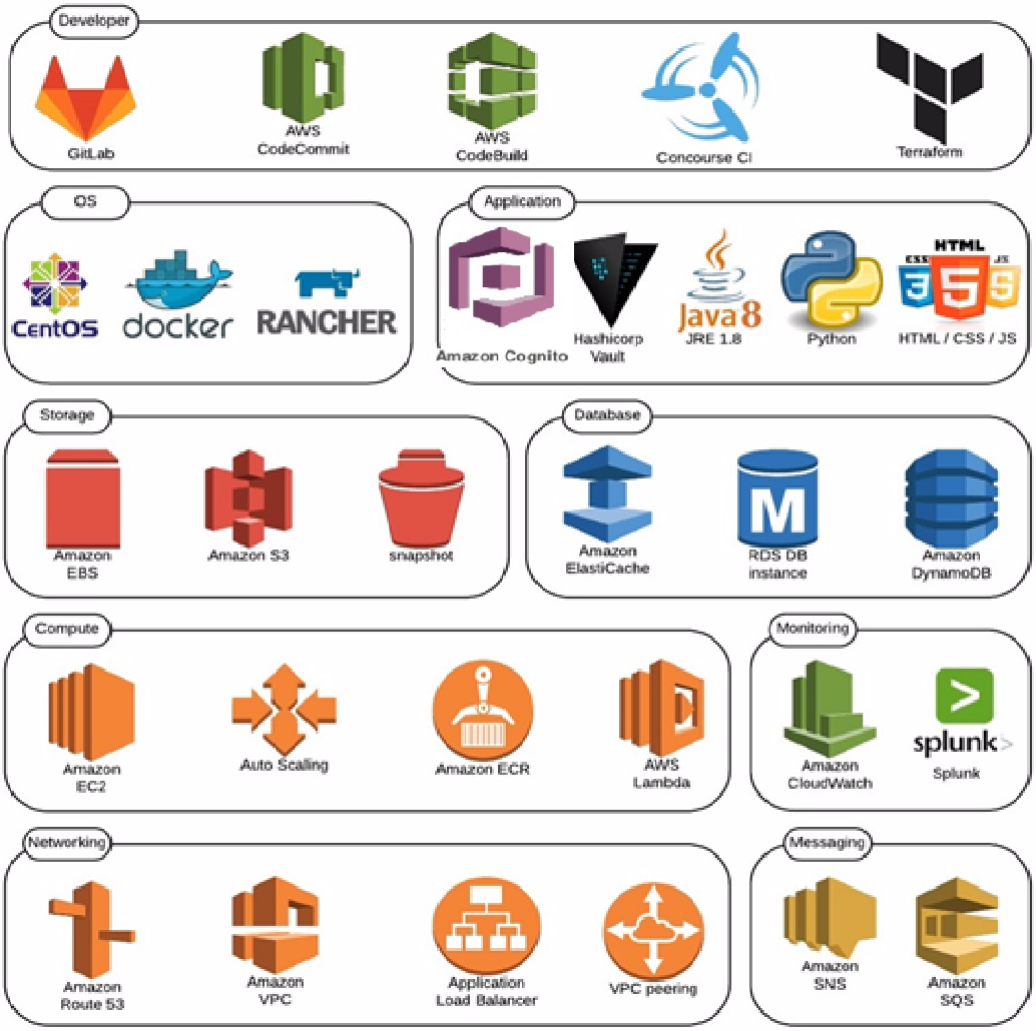

Figure 6: Current View of Technologies – will evolve during the life of the service

8.2 Infrastructure Architecture

The Citizen Identity solution will be deployed on Infrastructure-as-a-Service - up to and including the operating system. Cloud services such as Amazon Web Services fit the general need in terms of flexibility, availability and scalability. This aligns with the NHS Digital principle of 'Internet First' for public/patient-facing services. The infrastructure will also minimise the use of the HSCN network.

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8.2.1 Network Architecture

A summary of the network is shown below – fundamentally, the design makes use of the 'flat' nature of the cloud. The Citizen Identity Platform is effectively given its own virtual network, private from other customers using the same cloud.

Access to the Platform is via the Internet – this aligns with the 'Internet First' principle across new NHS Digital services.

Access to HSCN is minimised and only where necessary – initially using the National Data Opt-out Platform for access to Spine only

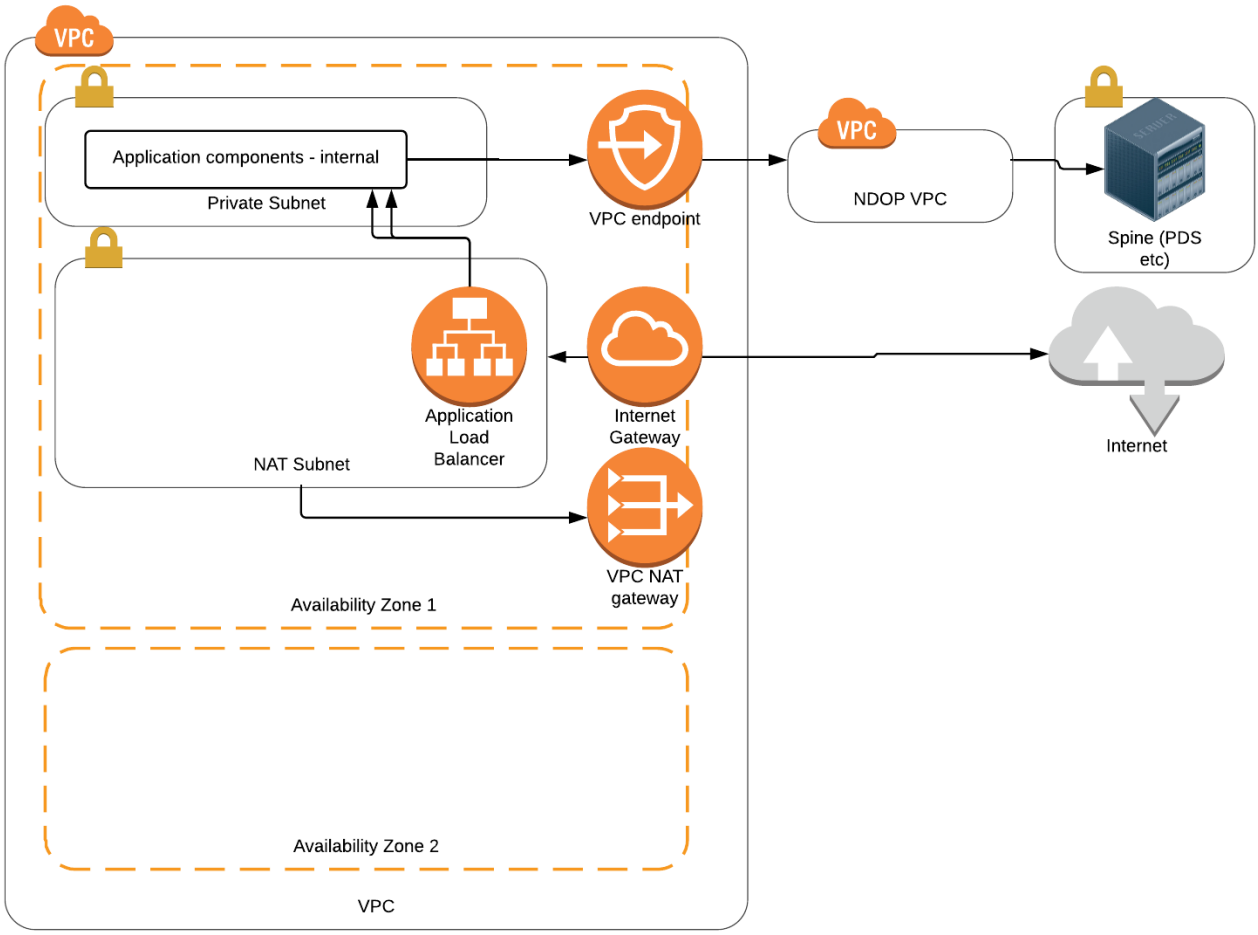

Figure 7: Current View of Networks, summarised

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9 Enterprise Architecture Alignment

9.1 Architecture Governance

Key capabilities of the Architecture will be captured within the 'NHS Digital EA Portal' capability cards. These capability cards are peer reviewed and published on the NHS Digital "EA Portal" website [https://enterprisearchitecture.digital.nhs.uk].

Citizen Identity Key Design Decisions are reviewed by the NHS Digital Technical Reference Group (TRG) using the appropriate forms as vehicles for describing the architecture, key decisions required from the group, and key architecture waivers.

Interoperability-related architecture items are discussed in the Interoperability Design Authority (IDA) group, and their recommendations are provided to the TRG.

The Enterprise Architecture Board (EAB) acts as a gateway for business cases. Once the related Key Design Decisions have been through a TRG review and waivers approved, the business case can proceed to TDIB for review.

Further details of the NHS Digital Architecture Governance Model and Architecture Principles can be found on the EA Portal.

9.2 Architecture Re-use

The NHS Digital Architecture Principles and NHS Digital's aim to support national NHS system live services through a common DevOps capability drive the need to ensure a level of consistency between national systems from a component perspective.

Component re-use is evaluated at multiple levels during the lifecycle of programme:

- Through the TRG – this group generally considers entire functional component re-use at a sub-system level.
- Through the IDA – this group generally considers component re-use from an interoperability and messaging perspective – for example promoting standards and patterns of integration which can be consistently applied across multiple systems
- Through peer-review of capability cards – this identifies overlaps and consistencies across programmes
- Through architect review meetings between programme architects – these meetings identify technical products and patterns which can be re-used across programmes. E.g. the pattern of integration with SDS is common between Spine II and e-RS.

Within Citizen Identity, a "Key Design Decision" document is produced to describe each key technical decision or product selected. These are captured within the NHS Digital Confluence. Part of the evaluation required in a Key Design Decision document is an evaluation of the re-use options within NHS Digital.

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Professor Stephen Powis

15th April 2019

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