

HSCN Buying Guide

For new and existing customers

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Information and technology
for better health and care

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Document Purpose

This document intends to provide useful information to new and existing customers considering buying a new HSCN Connection. The HSCN website contains supporting information and is available at <https://digital.nhs.uk/health-social-care-network>.

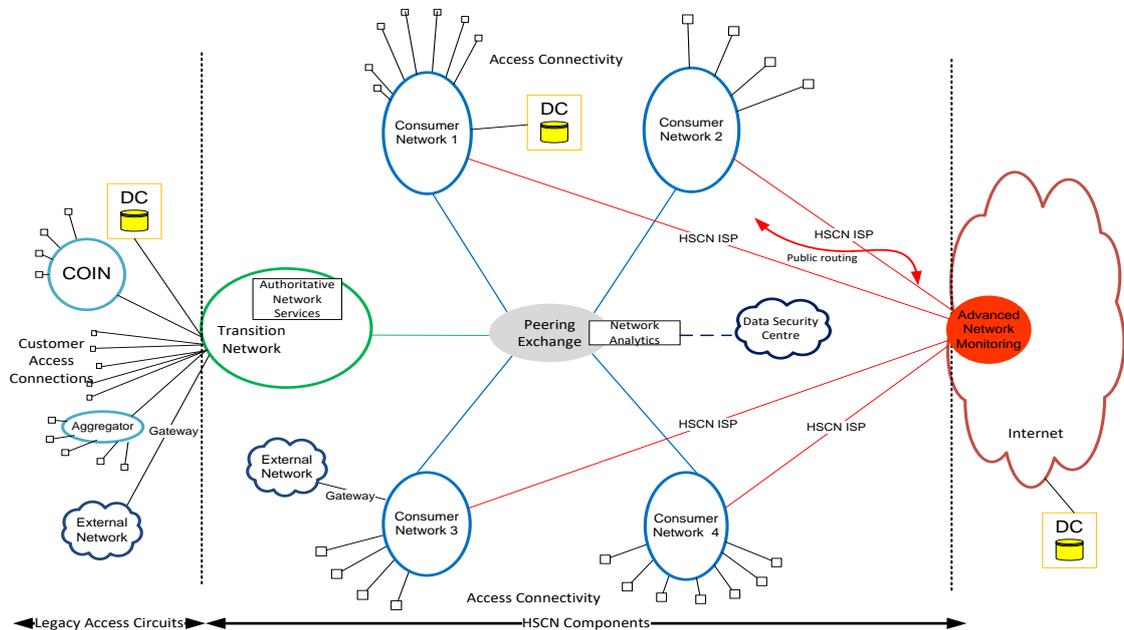
HSCN Overview

The Health and Social Care Network (HSCN) is the new national network for the NHS, the successor to the N3 network that has been in operation since 2004. The network enables health and social care providers to access and exchange information reliably, efficiently and conveniently.

HSCN is a standards-based network that means health and social care organisations can buy cost effective connectivity from a choice of suppliers (known as HSCN Consumer Network Service Providers (CN-SPs) within a competitive marketplace and in collaboration with other health and social care organisations.

In order to become an HSCN CN-SP, suppliers must demonstrate adherence to the HSCN Obligations Framework, which is a set of standards that ensure the effective delivery and operation of the HSCN to a consistent standard.

The following diagram shows the transition state HSCN solution. Further information is available in the 'HSCN Solution Overview' available on the HSCN Website.



Why do we need HSCN?

- Successor to N3
 - The N3 contract ceased on 31 March 2017 and successor services are required to support the requirements of a modern and integrated health and social care system.
- Improved Integration and Sharing
 - Health and social care organisations need to share information and services electronically in order to provide coherent, joined up services to the public.
 - HSCN will provide the underlying network arrangements that will enable all organisations involved in the provision of health and care to share information with one another and to access local and national health applications and systems reliably and efficiently, regardless of their network supplier.
 - HSCN enables NHS organisations to collaborate with non-NHS social care organisations on the procurement and operation of shared, place-based, data networks.
- Reduced Costs
 - Multiple competing suppliers deliver HSCN to a defined set of industry-aligned standards; therefore, network connectivity should cost less than it did under the N3 arrangements.
- Enhanced Security
 - HSCN has enhanced, centrally managed security capabilities to increase protection against escalating cyber threats and ensure high levels of network reliability and availability, in addition to each organisation's local security.
- Reliability and simplicity
 - HSCN provides highly reliable, highly available private network connectivity as well as security enhanced Internet connectivity, over the same infrastructure.
 - New arrangements for authorising organisations to connect to HSCN (via the HSCN Connection Agreement) are also simpler than they were under N3
- Technology and Innovation
 - HSCN standards enable a broad range of suppliers to offer network services that use the latest technology and innovation.

Consumer Network Service Providers (CN-SPs)

CN-SPs are network suppliers who demonstrate adherence to the HSCN Obligations Framework and are able to provide HSCN connectivity to health and social care organisations. A list of CN-SPs is available here: <https://digital.nhs.uk/health-social-care-network/suppliers>.

The HSCN Obligations Framework requires CN-SPs to provide connectivity services that are interoperable with all other CN-SPs and meet a UK Government assurance standard called CAS-T (CESG Assured Service Requirement for Telecommunications), which requires a

minimum availability of 99.95% for customer network services and ensures a range of mandatory controls from an international standard (ISO 27001) are in place.

Existing (N3) customers need to procure HSCN connectivity from a CN-SP, migrate to HSCN connectivity and terminate their legacy (N3) network connectivity at the earliest opportunity after successful migration.

CN-SPs are the primary point of contact for HSCN service provision and any HSCN related incidents.

Central Services

The HSCN programme has delivered the central infrastructure and services required to manage the safe and reliable operation of the multiple-supplier HSCN environment. The level of central services required may vary over time as the HSCN environment matures but NHS Digital will ensure sufficient capability exists to support business continuity, migration and early operation. These central HSCN services are:

Transition Network

From 31 March 2017, N3 network connectivity and existing contract arrangements moved onto the HSCN Transition Network. The Transition Network provides core network connectivity to provide service continuity until all existing (N3) customers have migrated to HSCN.

Peering Exchange

The Peering Exchange provides the highly available points of interconnection for the HSCN CN-SPs and the Transition Network. The Peering Exchanges are in London and Manchester – delivering access to many network providers. Network traffic traversing different CN-SP networks will utilise the nearest Peering Exchange.

The Peering Exchange operates active/active (meaning both data centres are in use at the same time, unless one data centre fails in which case traffic routes via the other data centre automatically) and is highly available within each location. The Peering Exchange will deliver the following performance levels:

- 99.999% availability
- 1 millisecond average latency
- 99.9% packet delivery

Cyber Security

HSCN significantly improves NHS Digital's ability to detect and prevent cyber security attacks over the NHS national network through two new capabilities:

- Network Analytics Service (NAS) monitors network flow metadata from HSCN to provide advanced threat detection and analytics. The NHS Digital Data Security Centre operates NAS to detect malicious activity on the network.
- Advanced Network Monitoring (ANM) monitors all Internet traffic from HSCN providing an advanced malware detection and prevention capability.

HSCN, like N3 is not a secure network; it is a private network with advanced security capabilities. Encryption and protection of patient and sensitive data occurs at the application layer, with the network infrastructure simply acting as a transport mechanism.

Service Coordinator

The Service Coordinator is the central NHS Digital service management capability that manages all providers that are involved in the delivery of HSCN. The primary purpose of the Service Coordinator is to:

- Provide BAU operational oversight of all HSCN providers;
- Perform performance monitoring of CNSPs; and
- Effectively co-ordinate the response to high severity operational issues involving CNSPs with Internal NHS Digital Functions and contracted service providers.

Technology Options

The majority of HSCN connectivity services use two networking technologies: Broadband and Ethernet. HSCN does not restrict CN-SPs to a particular technology; some CN-SPs may offer additional, innovative services such as wireless, satellite and remote access solutions.

Broadband

The three most common types of fixed-line broadband in the UK are ADSL, cable and fibre. Broadband services are typically asymmetric – meaning the download speed is not equal to the upload speed. Broadband services are distance sensitive – the bandwidth you receive will depend on the distance to the telephone exchange or street cabinet.

HSCN broadband services are available as consumer grade or business grade services. Consumer grade services are similar to the type of broadband service you receive at home, where business grade services may have enhanced capacity and support.

Broadband services are typically low cost as they are delivered over telephone lines, with the exception of FTTP (Fibre to the Premises), which may require additional installation charges if available in your area. To aid migration, it we recommend that customers opt for a new telephone line to be installed to enable testing of the new service before migrating.

Type	Maximum Speed	Description
ADSL1	8Mbit/s	ADSL stands for Asymmetric Digital Subscriber Line and is the most commonly available type of broadband, delivered through the copper wires of a phone line. The broadband speeds via both types of ADSL will depend on the distance from your telephone exchange - the further away you are, the lower the speeds.
ADSL2+	24Mbit/s	
Cable	152Mbit/s	Cable networks use fibre optic and coaxial cables to deliver superfast broadband services - as well as TV and phone services - direct to premises. Typically, this is for home users.
FTTC	38Mbit/s or 76Mbit/s	Fibre-to-the-cabinet broadband involves fibre optic cables run from the telephone exchange to street cabinets before using standard copper telephone wires to connect to premises. Most fibre broadband connections in the UK are fibre-to-the-cabinet services.
FTTP	1Gbit/s	Fibre-to-the-premises broadband involves fibre optic cables running directly to your premises. It is faster than fibre-to-the-cabinet but currently only constitutes a minority of broadband connections.

Ethernet

Distance does not affect Ethernet services and services are typically symmetric – meaning the download speed is equal to the upload speed.

Ethernet services have two elements:

- Bearer – the physical cable delivering the service. Operating at 10Mbps, 100Mbps, 1Gbps or 10Gbps Ethernet.
- Committed Data Rate (CDR) – a logical limitation on the cable to provide the required amount of bandwidth.

These two elements define the service. For example, 200Mbps CDR on a 1Gbps bearer enable you to use 200Mbps of the available 1000Mbps. On some contracts, the supplier can logically upgrade the service by making a configuration change with no need to visit site or install any new equipment.

Ethernet services are typically more expensive and require the installation of dedicated cabling into your premises. This may require civil engineering such as digging up roads if fibre cabling is not already present on your premises. Permission may also be required from the landowner in the form of a Way Leave Agreement. Any excess works such as civil engineering will be as part of the supplier's survey, and may incur additional charges and time for installation.

Type	Maximum Speed	Description
10M Ethernet	10Mbps	Delivered over fibre optic cables or a number of copper cables bundled together. Suitable for a small site that requires synchronous connectivity. Typically no longer cost effective when compared to broadband or 100Mbps Ethernet alternatives.
100M Ethernet	100Mbit/s	Delivered over fibre optic cables. Suitable for medium sites that require synchronous connectivity. A 1Gbps service with a low committed data rate (CDR) may be a cost effective alternative and provide an option for future growth.
1G Ethernet	1Gbit/s	Delivered over fibre optic cables. Suitable for large sites that require synchronous connectivity. Medium bandwidth connections for large sites and regional data centres.
10G Ethernet	10Gbit/s	Services with a bandwidth greater than 1Gbps. High bandwidth connections to enterprise data centres and central services such as NHS Mail.

Alternatives

CN-SPs can now offer a full range of alternative networking technologies as part of HSCN including wireless technologies such as WiFi, 4G and satellite connections. The services offered by each CN-SP may differ.

Connectivity Requirements

Unlike N3, there is no standard catalogue for HSCN connectivity services. There are several different procurement options for HSCN services, all of which need defined customer requirements. CN-SPs can deliver any form of wired or wireless networking solution to meet your requirements. Further details on the procurement options for HSCN are available here: <https://digital.nhs.uk/health-social-care-network/new-to-hscn/procurement-options>.

We recommend a three-stage approach to assess your HSCN connectivity requirements:

1. Review current (N3) service and utilisation
2. Review your services that use N3 and will use HCSN
3. Estimate future use

You need to consider the cost of your connectivity requirements alongside your budget, including any central funding contribution that you may receive. We expect HSCN connectivity to be significantly more cost effective than equivalent connectivity previously provided under the N3 arrangements. As a result, you should be able to obtain more connectivity without paying more or obtain services equivalent to those you consumed under N3 for less.

Review Current Utilisation

BT can advise on the specification of your current N3 service and can provide monthly utilisation reporting through the High Speed Customer Reporting Tool (HSCR). You should contact the BT service desk or your local BT account team representative to request this information.

Identify any specific requirements that exist on your current network. Examples of these may be network elements specifically provisioned for high-bandwidth point-to-point applications (such as imaging) or clinical applications that are latency sensitive. Highlight any specific requirements as early as possible.

Review Network Services

The first step to assessing your connectivity requirements is to determine the services that require HSCN connectivity. These services may include:

- central services such as SPINE, NHS Mail, SUS+, PACS, GPSOC
- regional services such as shared care records systems
- access to the Internet
- business application (overlay) services such as telephony and video conferencing

In addition to the services running over the network connection, you should consider the number of users operating at a site and the type of users these are. An example of user categorisation is included below:

Light User	Basic email and web browsing
Moderate User	Some file downloads, streaming video, voice and cloud based

	resources
Multimedia	Large file downloads, interactive web conferencing
Power User/Heavy	High bandwidth demand, intense Internet-based application use, multiple devices per user

Estimate Future Use

Your contract for HSCN connectivity may be on a multi-year term, so capacity requirement estimates need to factor in potential growth over the contract duration. Any major restructuring projects, changes to applications or increased use of cloud services may affect your requirements for network bandwidth.

Internet Access

Outbound Internet access from HSCN is an additional service that needs to be specified in your requirements. HSCN Internet is highly scalable, delivered by each CN-SP and routed through the HSCN cyber security capabilities – NAS and ANM.

Internet access requirements should also include your bandwidth requirements for accessing cloud-hosted services such as Office 365. Alternative connectivity options for cloud service providers may be available across HSCN.

CN-SPs will also be able to deliver inbound Internet access to locally hosted services. Please clearly state this in your requirements.

Service Specification

Four elements specify the network service. These will all have an impact on cost:

- Bandwidth – the volume of traffic you need to concurrently transmit over HCSN.
- Resilience – the level of tolerance provided to cater for failure of elements of the service.
- Additional Connectivity – VPNs between sites, private connections, user groups.
- Service Wrap – the level of service provided by the supplier.

Bandwidth

Consider the bandwidth requirement for your new HSCN connection against your current (N3) connection. Advances in technology mean that higher capacity services are now available at a lower cost. It may be possible to reduce the cost of HSCN further by moving to an alternative technology such as Broadband, which may now be able to offer equivalent or greater capacity than a legacy (N3) Ethernet service.

Consider future growth when specifying the bandwidth requirement for a service, which may influence the technology selected. Ethernet services can be variable to provide more or less bandwidth on relatively short notice.

Organisations recommended to replace any existing non-N3 Internet access services with HSCN Internet access and factor this into their bandwidth requirements. HSCN Internet access could be more cost effective and benefits from the central cyber security capabilities, ANM and NAS. CN-SPs can also provide inbound Internet access if required.

Resilience

The majority of N3 catalogue items provided a resilient service formed of two separate network circuits that provide backup connectivity should one circuit fail. Resilience is required where an organisation deems necessary based on their business/operational risk appetite. HSCN CN-SPs will also offer resilient services.

The main decision for customers on resilience is whether the backup circuit is equivalent to, or a lesser specification than the primary circuit. The two options are:

1. Backup equal to primary service – In the event of a failure there will be no difference in performance, but ongoing costs may be higher.
2. Backup is lesser specification to primary service – The backup service is a different technology (possibly wireless) or has a lower bandwidth than the primary service. The ongoing costs will be lower, but there could be a performance impact if the primary service fails.

In some areas of the country, it may not be possible to deliver fully resilient services – as there may only be a single connectivity route available – CN-SPs may propose alternative technologies such as wireless solutions.

Where resilience is critical to your business operations, take care to ensure that you specify a service that is fully diverse from your premises back to the local exchange. In some instances, circuits can use shared ducting into or under buildings, particularly on large sites. If this ducting is accidentally damaged it can result in both circuits failing and the site having no service. Your CN-SP should highlight if this risk is present for your services.

It may be possible to operate resilient services in an active/active manner – making use of the available bandwidth of both services under normal conditions, but utilising only a single service if one were to fail. Monitor capacity carefully in this scenario to ensure that the organisation can operate using a single service as utilisation increases over time.

Service Wrap

The HSCN Obligations Framework specifies the minimum standards that a CN-SP must meet for the HSCN connectivity services they deliver. Some customers may require a different level of service, which CN-SPs can deliver in excess of the minimum standard. Enhanced services levels will be likely to attract higher costs. Variable options include:

- Availability
- Service Desk hours
- Change Management service levels

The Obligations Framework minimum standards are available on the HSCN website here:

<https://digital.nhs.uk/health-social-care-network/suppliers>

Data Security

HSCN is a private network, designed as a reliable business resource to carry information, which is only available to certain organisations. This is very different from a 'secure' network.

HSCN doesn't provide security to prevent loss, tampering, authenticity or inappropriate usage of the information it carries or the systems or services available through it.

This means that if patient data or personal data is transmitted across HSCN, then encryption must be used. It also means that if you provide systems or services over HSCN, it's your responsibility to secure them and to make decisions about who can access those systems or services.

The National Cyber Security Centre provides useful information on encryption and how to protect your data in transit: <https://www.ncsc.gov.uk/guidance/cloud-security-principle-1-data-transit-protection>

Please note, in the context of this information, that HSCN Suppliers are obliged to operate their networks in line with the requirements set out in the Communications-Electronics Security Group (CESG) Assured Services (Telecoms) [CAS(T)] scheme.

Installation Considerations

IP Addressing

Customers need to decide whether to retain their existing TN (N3) IP addressing, or request new IP addressing for migration. It is expected that most customers will initially retain their current IP addressing to minimise change during migration. More information is available in the HSCN IP Addressing Policy:

<https://digital.nhs.uk/health-social-care-network/IP-addressing-policy>

Service Installation

Depending on the service ordered, a CN-SP is highly likely to install new HSCN connectivity services in advance of migration and alongside to your existing (N3) connectivity. Your CN-SP will schedule migration to HSCN on a specific date. Your Cn-SP may also conduct a site survey to identify the installation location and access routes for cables. Parking, site access and supervision will need to be provided for survey and installation visits.

When your CN-SP confirms your installation and migration dates, they cannot be changed. If changes are required, or appointments missed then additional charges will apply. There may also be a significant delay in re-scheduling due to the volume of migrations occurring.

Equipment

Your CN-SP will need to install new network termination equipment to deliver your HSCN services. This equipment will require space and power for installation, potentially in close proximity to your existing (N3) services.

The CN-SP will supply details on the space and power requirements for the service you have ordered. You will need to meet these requirements prior to installation and the supplier may conduct a survey if necessary.

Your new HSCN equipment may be zero touch, or suitable for self-installation – particularly for Broadband services.

Once your existing (N3) services have ceased, you must arrange for appropriate disposal of the old equipment. BT will not recover the legacy N3 equipment.

You will need to provision and configure appropriate connectivity for the HSCN service into your local network – including any upgrades to local infrastructure that may be required to support higher speed services.

Wayleave & Access

If you are having a new service installed, or upgrading from an ADSL (telephone line based) to an Ethernet (fibre based) service, your CN-SP may need to install new cabling to your sites. If your site is owned or managed by someone else such as a landlord or leaseholder, Wayleave may need to be granted prior to any installation can occur.

Your CN-SP will advise on this following an installation site survey.

Migration Scheduling

For existing (legacy customers, your CN-SP will need to book a migration slot with the Transition Network Service Provider (TN-SP) to migrate legacy (N3) services to new HSCN services. Migration templates exist to streamline this process, the following templates are available:

- Standard – Mandatory for all migrations (per service). VPN migrations and IP address retentions can be added as options if required.
- Complex – Designed where N3 service assets are to be transferred to incoming CN-SP (by novation where applicable and allowable).
- Bespoke – Designed for CoIN, hosted voice and voice gateways migrations.

Migrations are scheduled to occur during working hours and additional installation charges may apply for out of hours installations or migrations. Migration plans will be produced jointly by the TN-SP and CN-SP for complex and bespoke activities. CN-SPs are responsible for ensuring the migration activities fit within their service implementation and testing plans that they agree with their Customers.

Service Migration

Prior to migration, your CN-SP will complete some basic commissioning tests for your new services. You may also wish to complete some additional local testing prior to migration.

During Service Migration, a contact will need to be available locally to work with the engineers from the TN-SP (for existing (N3) customers) and your CN-SP to migrate services. This person will need some technical understanding of the existing local network arrangements.

Before and after migration we recommend that testing is completed to ensure you can still access local and central services. NHS Digital can provide test scripts for pre- and post-migration testing for regional and national applications if required. Consumers will need to define their testing depending on the systems they use.

For existing (N3) customers, the majority of migrations will retain the existing network address. This simplifies the migration process as minimal changes should be required to local firewalls and no central application changes should be required.

More information on the migration process will be available from your NHS Digital RMM.

More Information

More information and contacts are available on the HSCN website:

<https://digital.nhs.uk/health-social-care-network>