

NHSBT Board
November 2018

ICT Infrastructure Programme

1. Status – Official

2. Executive Summary

Over the past four years a number of improvements have been made to stabilise and protect NHSBT's core IT systems and infrastructure. NHSBT's physical IT infrastructure, however, was last replaced in full in 2013 with an intended life of five years. This hardware, which supports both NHSBT's desktop and file systems and a number of core systems such as Pulse, will be seven years old in February 2020.

In addition, NHSBT's current data centre hosting contract with SCC has also been extended until February 2020, the maximum number of extensions permitted under the contract now having been executed. It is now necessary to replace the hardware and procure new data centre hosting arrangements.

As well as replacing the central infrastructure, there are a number of local ICT infrastructure services which require renewal over the next 18 months and refreshes are also due for the Windows 10 desktop. There is therefore a substantial programme of ICT infrastructure work required over the next 18 months which will place considerable demands on NHSBT's ICT teams.

3. Action Requested

The Board is asked to:

- **Note the substantial ICT infrastructure programme requirements for the upcoming 18 months; and**
- **Note the approach being taken to define the data centre hosting strategy and review of approaches to its delivery.**

4. Purpose of the paper

The purpose of the paper is to:

- 4.1 Inform the NHSBT Board of the substantial ICT infrastructure programmes which are required over the next 18 months and the significant commitment of internal ICT resources that this will require.
- 4.2 Inform the Board of the approach being taken to define a new infrastructure hosting strategy.

5. Background

5.1. Over the past four years a number of improvements have been made to stabilise and protect NHSBT's core IT systems and infrastructure. These include:

- Moving all existing services from NHSBT owned data centres to a secure, resilient co-location offering at SCC
- Replacing both the wide area network and local area networks at almost all NHSBT sites, providing increased bandwidth and greater resilience
- Renewing the wifi capability at all NHSBT locations with a simpler, faster service
- Upgrading the Oracle database services used by Organ Donation and Transplantation to ensure that they remain supported during the transition to the ODT Hub
- Moving from a Windows 2003 desktop infrastructure to Windows 2016 across the entire organisation
- Migrating email services from Exchange 2007 to Exchange Online under Office 365, thereby opening up the capabilities of Office 365 and supporting a 'work anywhere' approach
- Moving initially from a Blackberry and basic Nokia mobile provision to Windows Phone, and subsequently to Android and supported Apple devices, to enable more flexible working for many members of staff
- Implementing new firewalls to protect NHSBT's information with a managed service to provide threat intelligence and rapid response to incidents.
- Upgrading the middleware and front end servers for Pulse, as well as the Hematos clients, to supported versions of Windows

5.2. NHSBT's physical IT infrastructure, however, was last replaced in full in 2013 with an intended life of five years. The useful life of that equipment has been extended to seven years through the use of a comprehensive hardware support contract with HP. Extending that contract beyond 7 years is likely to incur prohibitive costs and it is deemed unwise to extend the use of the hardware so far beyond its intended life. This hardware, which supports both NHSBT's desktop and file systems and a number of core systems such as Pulse, will be seven years old in February 2020.

5.3. In addition, NHSBT's current data centre hosting contract with SCC has also been extended until February 2020, the maximum number of extensions permitted under the contract now having been executed.

5.4. As such it is now necessary to replace the hardware and procure new data centre hosting arrangements. It is preferable for these two requirements to be managed together so that the new hardware can be ordered and built in whatever new data centres are procured. This will also enable NHSBT to continue to run services in the existing SCC data

centres and migrate to the new hardware using a phased approach, subject to the constraints of each system.

- 5.5. As well as the central data centre infrastructure, NHSBT has a number of IT hardware services hosted locally at different NHSBT premises. These provide support for local requirements such as the Contronics environmental monitoring system and provide a local data store for those systems requiring it. A project is already underway to renew these 'site servers' with updated hardware.
- 5.6. While the network services have been upgraded at most locations under the Vodafone networks contract, the local area network at Filton was excluded from the upgrade at the time of contracting since most of the equipment was new and well under five years old. As our largest site it is now necessary to upgrade this equipment to bring it into line with the services provided elsewhere.
- 5.7. There are also a number of 'key machines' at each NHSBT site which are provided to support specialist equipment such as test analysers. These machines were last replaced three years ago and, given the specialist nature of the services they provide, were excluded from the desktop upgrade project. It is now necessary to replace these machines again and to bring them into line with the rest of the desktop provision.
- 5.8. Lastly, while NHSBT's desktop is now much more up to date and runs on Windows 10 and Windows Server 2016, Microsoft has continued to push out improvements to these operating systems. The most recent Windows 10 upgrades have been substantial and represents a considerable refresh of the operating system. NHSBT's desktop devices will need to be recalled in order to apply this upgrade which is a considerable undertaking.

6. Proposal

- 6.1. Given the nature and criticality of NHSBT's functions, none of the above upgrades is optional. At the recent Transformation Programme Board prioritisation meetings each of them was assessed as a 'must do' project.
- 6.2. An early assessment of the effort required to complete these projects has highlighted that it is substantial and that, collectively, they have the potential to consume much of NHSBT's technical ICT resource for the next 12-18 months. This is particularly true of specialist engineering resources.
- 6.3. In the 2014 ICT Strategic Framework NHSBT adopted a three phased strategy in respect of its ICT infrastructure – to stabilise, protect and then migrate to cloud-hosted services. Cloud services place much of the burden of managing and maintaining infrastructure on the hosting provider rather than on the consumer – in this case NHSBT. While

NHSBT has had some success in migrating services to the cloud – such as DonorPath and the ODT Hub services in ODT and the Donor Portal in Blood collection, the closure of the Core Systems Modernisation programme leaves NHSBT with considerable on-premises infrastructure and no immediate path to its replacement.

- 6.4. In addition, in order to deliver the cloud-first approach of Core Systems Modernisation and the ODT Hub programmes, the ICT team was deliberately rebalanced in favour of cloud service architecture and engineering and away from infrastructure engineering. This rebalancing has resulted in NHSBT having fewer resources available for the kind of work now required.
- 6.5. In order to deliver these infrastructure projects effectively, it is proposed that they are grouped into three separate programmes of work. These are: Data Centre and Central Infrastructure Renewal; Local Infrastructure; and Desktop Refresh. This is to provide appropriate leadership and spans of control and more effective use of resources.
- 6.6. Each of these programmes will be led by a senior member of the ICT team with Andrew O'Connor taking on responsibility for the Data Centre and Central Infrastructure Renewal Programme. Leads are yet to be identified for the Local Infrastructure Programme and the Desktop Refresh programme pending completion of other projects.
- 6.7. The Local Infrastructure programme will consist of the following projects:
 - Completion of Wide Area Network upgrades - this is mostly complete with 10 sites outstanding.
 - Site Server Replacement - a project has been initiated with a Proof of Concept of new technology planned at Filton.
 - Telephony Replacement – this is underway with first STORM implementation planned imminently at ODT.
 - Filton LAN Replacement.
 - Key Machines Replacement.
- 6.8. The Desktop Refresh Programme will consist of:
 - Windows 10 Support Upgrade – moving to the new version of Windows 10, ideally through a managed service provision
 - Office 365 Contract Renewal
 - Domain Controller Upgrade – removing the final Windows 2003 domain controller and migrating services from it to Windows 2012
- 6.9. There are two further mandatory ICT projects which will be required over the same period. These are to upgrade the current Hematos platform so that the Hematos application used extensively in Diagnostic and Therapeutic Services remains under support; and a project to implement new strategic cyber security arrangements in light of the GBEST pilot

programme including new staff, an extension to the existing managed firewall service, and potentially additional security technology.

7. Data Centre and Central Infrastructure Renewal Strategy

7.1. By far the largest programme of work is the data centre infrastructure renewal which includes a range of services including the Pulse hardware replacement. The Pulse hardware replacement will be managed as a separate project within this overall programme.

7.2. At first sight it might seem that this programme of work is straightforward and requires simply a refresh of the existing hardware with more up-to-date alternatives. However, given the rapidly changing nature of technology and the availability today of very different types of hardware than were available seven years ago, there are a number of decisions that need to be taken including which hardware to buy, how much of it is required, where it should be hosted and whether new hardware is required for everything or some services can be migrated more easily to the cloud. It is also the case that different approaches to the programme may place more or less demands on NHSBT internal ICT resources.

7.3. As such, the first piece of work to be commissioned under this programme is a strategy development initiative which will seek to answer the following questions:

- Can a wholesale or partial move to a Public or Private Cloud platform be completed and within the timescales?
- Should NHSBT retain On-Premise (or Co-Location) hosting facilities?
- Is there a mix of Hosting and Cloud that represents a suitable technology solution for the next 5-years?
- What delivery options are available for the above choices to balance cost and people consumption in light of other competing priorities?
- How does this next move position NHSBT beyond any 5-year timetable?

7.4. A procurement exercise is underway to commission this work from a third party. They will be required to develop a strategy and roadmap, which will need to include a Decision Matrix that can be used to evaluate the benefits and challenges of each of the different options. This will also need to include the likely progress of other key programmes such as any new blood systems renewal/replacement programme which may dictate the need to keep a considerable number of specialised and legacy environments – even if running on newer Infrastructure.

7.5. The output of this work will be presented in an Outline Business Case which will seek approval to go to market and undertake a procurement to implement the recommendation of this strategy and approach to delivery. This will be followed by a Detailed Business Case to enact the

recommendation of the procurement exercise and to undertake delivery. It is anticipated that the Outline Business Case will be presented in March with the Detailed Business Case to follow in May/July 2019.

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