

## IM&T Strategy 2013-16

### Appendix B - Underlying Architecture

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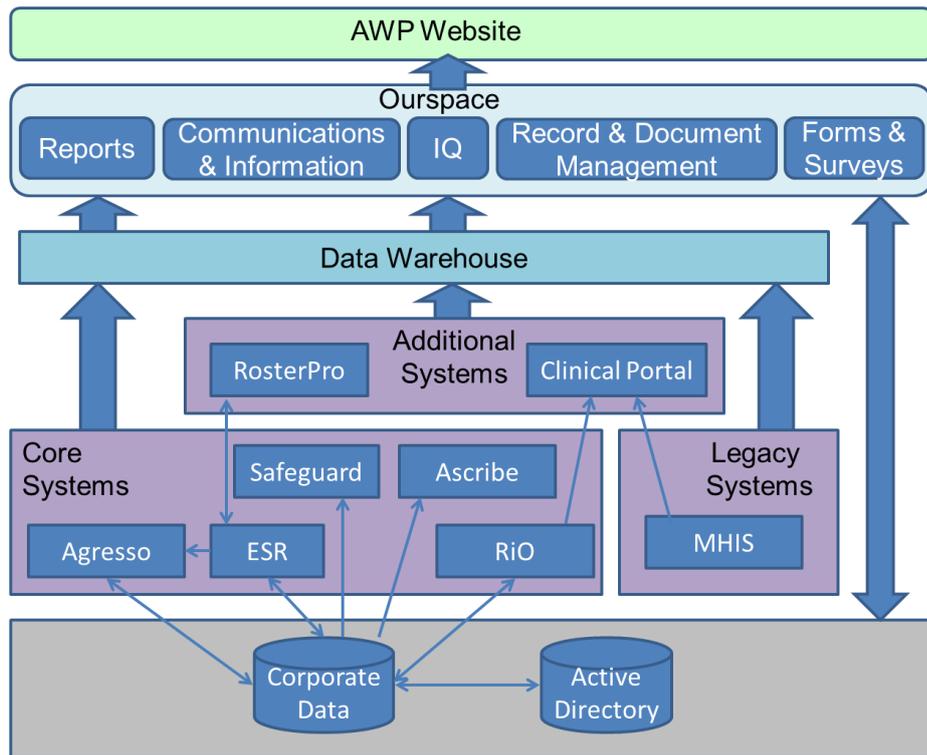
**1. Information Systems Architecture**

- 1.1. The vision for IM&T will require the implementation of an Information Systems Architecture that will:
  - Collect, securely, core information through ergonomic processes, workflows, and systems
  - Seamlessly integrate information across systems and functions and interoperate with our partner’s systems.
  - Collate core information, presenting key management and clinical data with clarity
  - Enhance knowledge sharing and collaboration though inventive use of technology.
  
- 1.2. The information systems requirements for the next three years have been considered in three main areas; clinical, corporate and back office systems. These will require a mix of replacement, upgrading and development in addition to the further integration of core systems and data and the much wider development of the information repository to cover all aspects of Trust business. The ability for all staff to interrogate and actively use this information gathered from operational systems is a key development for this strategy.
  
- 1.3. In addition the capability for the systems to Interoperate, interface and message with both internal and external partner systems is key.

**1.4. Technical Implementation**

- 1.5. To achieve this the key elements of the system infrastructure to be developed are shown in the diagram below, which is a simplified version showing a limited number of systems to demonstrate the principles.

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## 2. Clinical Systems

2.1. Holding and accessing information about service users and their interactions with clinical teams is critical to providing safe and effective care and supporting many other aspects of Trust business. The information systems and processes used must be robust, fit for purpose and flexible to accommodate changing circumstances and enable the Trust to exploit the opportunities to use systems to transform the way that services are provided.

### 2.2. *RiO Clinical System*

2.3. The Trust is currently using RiO, the national NPfIT system, as its electronic mental health clinical information system. During 2013-14 there will be a major update to the system known as Release 2 which will provide access to further functionality. This includes electronic prescribing, orders and results and RiO-2-RiO, a method for sharing information between mental health trusts. The extent of deployment will depend on the decision on the replacement system and timing of deployment at the end of the contract during 2014-15.

### 2.4. *Clinical Portal*

2.5. The trust has developed a clinical portal to enable viewing of RiO clinical information from the data warehouse for resilience purposes. This is and will continue to be, enhanced to supplement areas where RiO fails to meet the Trust's needs.

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**2.6. *MHIS Legacy System***

2.7. The Trust has used MaraCIS as its corporate service user system for over 10 years and has a large amount of historical data held within it. In the move to RiO much of this core data has been migrated to populate the new database. However as MHIS was never a complete electronic clinical record, with the paper health & social care record remaining as the comprehensive record, the requirement to maintain the system has declined and only a subset of data needs to be retained within the data warehouse and accessible via the clinical portal.

**2.8. *Primary Care IAPT System***

2.9. The Trust currently uses the Mayden Health IAPTUS system to support its primary care IAPT services, and will continue to push for improvements to the functionality to better meet the requirements of the service.

**2.10. *Care Clusters & PBR***

2.11. The in-house developed CAST system is used for HoNOS recording and care cluster allocation. This will be further updated to include SDAS and secure requirements and any further enhancements required to support the introduction of payment by results as required.

**2.12. *Choose and Book/Easy Access***

2.13. The Trust has implemented Choose and Book for one small service, enabling the link with RiO for direct booking. This is available for further roll-out to other services as required to enable GPs to check our Directory of Service and to make electronic referrals and bookings to triage functions or assessment clinics as appropriate.

**2.14. *Pharmacy Systems***

2.15. The Ascribe system is currently used by the in-house pharmacy service with a planned development to integrate the system with a manufacturing robot for the production of dosset boxes as part of the Pharmacy hub project. The system is also currently being piloted for eprescribing although this will need to be reviewed in the light of the chosen replacement clinical system.

2.16. A previous version of the system is also used within the SDAS SBU to provide batch prescription printing. It is anticipated that with the move to commissioners providing SDAS systems, for all services involved within an area, the use of ascribe will not be required in the future and the system will not be migrated to a new version.

**2.17. *Electronic Transmission of Prescriptions***

2.18. Electronic transmission of GP prescriptions to the community pharmacy is available from GP systems. It is anticipated that this facility may be

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extended to mental health in later releases allowing FP10s to be electronically transmitted.

**2.19. Picture Archiving Communications Systems (PACS)**

2.20. There is no requirement to implement PACS (electronic X-rays) within the Trust during the lifetime of this strategy. However electronic access to other Trusts PACS systems, used under SLA for access to results and images, could be made accessible via N3.

**3. Corporate Systems**

3.1. The Trust has developed two key corporate information systems; Ourspace and the Data Warehouse, that together provide the core Information Knowledge base for the Trust. These systems will be further developed over the life of the strategy and provide the basis for further areas of knowledgebase developments.

**3.2. Ourspace**

3.3. Ourspace, the AWP SharePoint Intranet, that provides knowledge management and communications is now routinely used by staff at all levels and now holds much of the core information of the Trust including the Trust’s policy library and procedural documents. Future developments will include the move to SharePoint 2013 and expanding the types of information that can be shared by provision of secure areas where additional materials can be made available to restricted target groups. In addition further developments to integrate it more closely with Microsoft Office for more formal records management, introducing discussion forums and blogs and further developing its use as a delivery mechanism for intelligence will be required.

**3.4. Data Warehouse**

3.5. The Trust’s Data warehouse has been developed to hold data from the RiO, MHIS and CAST systems providing the data for integrated performance reporting on our clinical information. This has been delivered through the Performance Point system built into Ourspace providing access to this information through a user friendly interface that can “drill down” to underlying data. The data warehouse will be further developed to incorporate data from the other Trust systems, such as ESR and Safeguard to provide an integrated repository for all business information.

**3.6. Business Intelligence**

3.7. The Trust has been rapidly developing its performance management framework and has recognised the importance of this information being provided as a dynamic real-time tool. This approach has now been underpinned by the Data Warehouse and Ourspace infrastructure providing access to performance reporting through “ReportZone”. This will be further developed to cover other business areas though their own equivalent portals.

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**3.8. Clinical Intelligence**

3.9. The intention is to further develop the Data Warehouse and Ourspace technologies to further develop a “Clinical Dashboard” with access to all types of data from the Trust’s clinical systems to give staff, teams and managers easy access to a range of clinical indicators and information that will enable them to research, analyse and understand the care provided, highlighting areas for investigation and improvement.

**3.10. Market Intelligence**

3.11. A major development needed to support the Trusts move to Foundation status is gaining access to information related to competitors for marketing and service development purposes. This would include access to national data for comparison purposes and also gaining a better understanding of the health market in our operating area. The Trust will investigate the options for obtaining and interrogating these types of information.

**3.12. AWP Internet site**

3.13. The AWP web site was designed to provide useful information about the Trust and its services and about mental health conditions for a target audience of current and potential service users, their carers, family and friends and current and potential staff. When the Trust achieves foundation status, the web site will increase in importance as a marketing and information tool for potential referrers and as an information source for members and governors. In addition, it is essential that the web site is effective for users from a range of disadvantaged groups.

3.14. The website’s management, format and content will be reviewed and proposals for its redevelopment considered including the use of SharePoint technology to enable integration with Ourspace to provide it with both an internal and external view. Further areas of development could include online booking and interaction facilities.

**3.15. Records Management**

3.16. The Trusts Records Management Strategy identifies the requirement for a structured electronic document management system with a specification that is flexible enough to manage documents produced by the Trust in all three types of information assets produced and relied upon by the trust, i.e. Staff Records, Service User Health and Social Care Records, and Management (corporate information assets) Records and specifically, to replace the unstructured and unmanaged network shares residing on file servers.

3.17. The strategy is to store all patient based information electronically within RiO. Similarly staff information will be held electronically within ESR. However historic paper information and any paper based information that cannot be stored will require a solution. For staff paper records the Windip solution is being used to supplement ESR. For historic service user records a solution now needs to be investigated to provide a cost effective

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solution to minimise the amount of real estate used for records storage and retrieval. For corporate information assets (business records) the intention is to further develop the use of Ourspace as the Electronic Records Management system for the Trust.

**3.18. Library systems**

3.19. Library services have changed considerably in recent years with the internet providing the means to access services which were traditionally provided in a physical library (such as reference materials and catalogues) from the workplace or home. In addition the Library Service uses a shared South West NHS Library System (SWIMS) which supports all library functions such as book issues and returns and user self-help. As this service is low cost and the system is well-liked, easy to use and has all required functionality, there are currently no plans to change it.

**3.20. Board and Committee system**

3.21. The Trust has introduced the BoardPad system for the management and distribution of Board Papers to provide a paperless environment. This will be rolled out to further support committees and some corporate management meetings.

**4. Back Office Systems**

4.1. The Trust has a number of business functions which use information systems to support their operations. The strategic development principles for these are similar to those for patient systems i.e. using systems to facilitate quicker access to information Trust-wide and exchanging information with other authorised systems.

**4.2. Finance Systems**

4.3. The Trust has recently implemented the Unit4 Agresso finance system to replace the CedAr eFinance system and Asset 4000 capital system. The Trust also uses the Trojan patients' monies system the PSCAL system for reference costs. The Trust's financial systems now need to reflect the development of PbR and the costing requirements in an FT regime.

**4.4. HR Systems**

4.5. The Trust implemented the national Electronic Staff Record System (ESR) which provides our integrated HR and Payroll system. The Trust has partly implemented the recruitment module and much work has been undertaken to ensure the HR information is the aligned with the Trust's organisational structure. Collection of business expenses is managed through a separate web based hosted solution from COA which feeds into ESR for payment through a standard interface. The use of the available self service functionality needs to be investigated. When the Trust achieves foundation status there is the opportunity to move away from ESR and potentially use the Agresso system instead. This would be dependant on the

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costs/benefits of each option which will be informed by the central contract negotiations for ESR when the contract expires in 2014

- 4.6. Training records are currently held on a Managed Learning Environment MLE purchased on behalf of local Trusts by the AGW Workforce Confederation. It is anticipated that when equivalent functionality becomes available within the learning module of ESR an evaluation would be undertaken to decide which would better meet the Trust's requirements. The MLE is also a delivery mechanism for eLearning modules and these will be further developed and rolled out to provide an efficient and cost effective training mechanism. This is being supplemented by the new Tribal system procured by the strategic Health Authority which is currently being implemented in the south West.
- 4.7. The Trust currently uses the HMT Roster Pro system to support staff rostering on in-patient wards. Unsocial hours data is fed into ESR through a standard interface and development of this to feed other data into the system is envisaged. The intention is to produce integrated information e.g. sickness absence. As the Trust has recently brought its bank staff management in-house Roster Pro is also being used as a Bank Staff Management System. As there are shortfalls in functionality it is anticipated that this system will need replacement during the life-time of this strategy.
- 4.8. HR service delivery has recently been redesigned and in support of this two new systems have been developed in-house, the Sickness Absence Support System and the HR case management system. It is anticipated that The Sickness system will require replacement to a self-service function or through implementing ESR self-service.
- 4.9. The People Directorate have purchased the Inspire system to support the appraisal processes within the Trust and enable talent management. This system has been piloted and a decision on further roll-out is awaited.
- 4.10. The Medical & Strategy Directorate have recently implemented a new system to support the revalidation and appraisal of medical staff.

### **4.11. *Establishment Data & Workflow Systems***

- 4.12. Corporate reference data that is required by all systems, and is key to using web based forms for workflow and interfacing, requires a central system that can alert the other systems that use the data to any changes. ESR is currently the lead system for organisation structure but it does not hold the superset of people using Trust systems and processes e.g. social services staff, students etc. Therefore a new Establishment database will need to be developed to keep track of the changing teams and people within them enabling all other systems to be kept in alignment. It should also provide the data to allow more targeted communications with different groups of staff.

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**4.13. Quality and Safety Systems**

- 4.14. The NCAS Directorate use the Ulysses Safeguard system to record incidents, complaints and patient advice and liaison services (PALS). Further developments to more widely use the system include Subject access requests, freedom of information, risk and a customer Service web module.
- 4.15. The first iteration of the new, in-house developed Information for Quality System, IQ, has recently been implemented for monitoring seven domains of quality in teams and wards. This will be further developed and enhanced to meet the changing requirements and particularly to interface with the establishment system to keep teams relevant and up to date.
- 4.16. The Meridian system has been implemented to support the collection of information on the patient experience and is being used for the Friends and Family Test.

**4.17. Clinical Audit and Research & Development Systems**

- 4.18. The Clinical Audit Department and the R&D Strategic Business Unit both require the ability to analyse clinical data and this facility is currently provided by the SPSS statistical package. With the introduction of RiO and the increase in available clinical data provided by the implementation of electronic records further consideration will be need to be given to how this can be appropriately accessed and analysed for these two important areas that support improvement in practice. This is likely to require further developments of the Trust's Data warehouse.

**4.19. Corporate Communications Systems**

- 4.20. The Communications Team has identified a requirement for a Trust wide Customer Relationship Management (CRM) system to track external communication and feedback from key stakeholders to enable knowledge and information sharing.

**4.21. EFM Systems**

- 4.22. The Estates Department currently use excel and access to manage their site data. This will need to be investigated to understand how it can be integrated with the other corporate data elements and in particular the Establishment Database for site information. Also there is a requirement to make available to LDUs and other corporate departments site plans, drawing and information.
- 4.23. An in-house PFI maintenance monitoring system and a patient transport system has been implemented
- 4.24. The service is also considering introducing a central monitoring system for utility meters etc. which could also be used to enable centralised building access to improve site security.

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**4.25. Hotel and Site Services Systems**

- 4.26. The Trust no longer uses the Maximiser cleaning monitoring system and is currently implementing the C4C system for PLACE assessments. The use of additional modules to support other facilities requirements will be investigated.
- 4.27. The Trust has implemented a room booking system at some of its PFI sites which is being upgraded. As part of the migration to NHSmail it will be rolled out to all sites to replace Outlook based room booking and also support booking for hot-desking. The system should also be able to support the booking of additional services such as catering and equipment and will provide costing information for invoicing or recharging.

**4.28. FT Membership Database**

- 4.29. A FT membership database was been purchased and implemented to support the Trust in its preparation for FT status, recruitment, retention and communication with its members - currently standing at over 16,000. In the third year of the contract for the membership database it will be reviewed to scope future business and customer relationship needs, agreeing procurement specifications accordingly.

**4.30. Digital Dictation and Speech Recognition systems**

- 4.31. The Trust currently uses the Phillips SpeechExec system for digital dictation but this is now end of life and requires replacement. The Trust now requires a new system that can support mobile technologies such as smartphones apps to integrate digital dictation and workflow as part of its mobile strategy. In addition the new system should provide the capability to use speech recognition to further streamline administration functions.

**4.32. Text Messaging systems**

- 4.33. The Trust has identified the potential benefits to be gained from reminding service users about their appointment thus reducing “Did Not Attends”. This requires a technical system solution as part of the interoperability infrastructure to provide reminders for appointment on RiO via SMS text messaging or email. This technology could also be developed for wider use such as communicating with staff, job applicants and members.

**4.34. IS&T support systems**

- 4.35. The IT Department has implemented the LANdesk workflow system to manage IT service incidents through the helpdesk. Further modules will be implemented covering problem management, configuration and release management. Password reset software will be introduced to minimise the time staff are unable to access their accounts and self service will provide direct access to updates on their support calls without having to telephone the helpdesk.

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- 4.36. With the change to the software licensing arrangements in the NHS from central to local management the SNOW software asset management tool will need to be fully implemented to ensure the trust maximises its licence use to minimise costs.

## 5. Supporting Technical Architecture

- 5.1. The vision for IM&T will require the implementation of a Technical Architecture to enable the principles outlined in the Strategy of:
- Information systems, infrastructure and data centres being resilient, available 24x7, and appropriately supported.
  - Every member of staff having access to an appropriate internet connected device wherever they need to access information.
  - All Trust systems being securely accessible via the Internet
  - Secure core networking available on all Trust sites connected by N3 to the national NHS infrastructure network with sufficient capacity for business purposes.
  - A secondary internet accessible network, utilising Wi-Fi technology, supporting wider business uses, that can securely access the primary core network for systems access.
  - Networks capable of supporting integrated voice, video and data.
  - Making use of national NHS systems and services where they are cost-effective and fit for purpose
  - Systems capable of being technically linked and able to exchange data and messages, through both electronic messaging and shared data input.
  - Adopting a standardised approach ensuring compliance with both legal and NHS requirements
  - Continued replacement of systems and technology at the end of their expected lifecycle to ensure they remain fit for purpose..

### 5.2. Wide Area Networking

- 5.3. Network infrastructure is the glue that binds all the IT components together. With the rise of the Internet as a common delivery method for networking the traditional use of Wide Area Networks (WAN) to link sites to the core systems is changing. The Trust has moved to a “cloud” based environment through the development of a secure primary network where internal systems are hosted and access is provided through to the NHS national infrastructure and systems. This will be supported by increasing the use of a secondary network across all sites providing managed access to the internet allowing wider use of internet technologies such as

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videoconferencing, Webex, web cams and eLearning without compromising Information system security.

- 5.4. Although the Trust upgraded the bandwidth to its sites as part of the move to COIN based WAN, the requirement to increasingly use more video communications will require further investment to further increase the size of the network links to support this.

### **5.5. Network Resilience**

- 5.6. The Trust sets standards for network infrastructure to ensure a high level of resilience. This includes such measures as flood cabling, triangulation of building interconnects, standards for IT equipment rooms and monitoring arrangements. Although there are many new or refurbished buildings that meet these standards there are some strategic sites that do not. The Trust will as part of its estates strategy bring all its estate up to these standards over the three year period.

### **5.7. Local Area Networking**

- 5.8. The Local Area Networking (LAN) has to date been based on CAT5 hardwired cabling. This is still the most resilient and fastest technology for connecting devices to the network. However the changing requirement to move to more mobile working requires the provision of wireless networking on sites to allow mobile devices to connect seamlessly as they enter a Trust building. Wireless technology would also provide a route for service users and others to access the internet without using the primary secure network. Trust sites identified as long term within the estates strategy will therefore be Wi-Fi enabled.

### **5.9. Mobile & Wireless Networking**

- 5.10. The Trust runs community based services that cover a wide geographic area. These services need to be able to operate flexibly with individuals not tied to Trust bases in order to access information. Following a successful pilot and roll-out the Trust will continue to provide real-time mobile access through utilising 3G, 4G and Wi-Fi technologies for offsite use.

### **5.11. Server Infrastructure**

- 5.12. The Trust's strategy is to utilise a "private cloud" virtualised server infrastructure environment supported by Storage Area Network (SAN) technology. This provides better flexibility to rapidly respond to changing system requirements while also improving business continuity and reducing carbon emissions.
- 5.13. Applications are hosted on a Citrix environment which also provides full integrated desktop access. This provides a secure method of accessing systems anywhere on the Internet and will be further developed for Virtual Desktop Infrastructure (VDI) deployment.

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- 5.14. Single sign on to all Trust systems will be investigated. This may potentially be based on the smartcard technology used for Connecting for Health systems.

**5.15. Systems Development Infrastructure**

- 5.16. The Trust's strategy continues to require the capability to develop applications and integrate systems this will be based on web based technologies based on Microsoft products e.g. ASP, .Net and SQL server.
- 5.17. The requirement for interoperability will need investment in appropriate technologies and systems to enable interfacing, messaging and the development of integrated apps.

**5.18. Desktop Infrastructure**

- 5.19. The Trust's policy for desktop infrastructure replacement to ensure end user equipment is kept up-to-date is currently five years. This will includes the flexibility to change these devices to meet the changing needs of the service e.g. through replacing PCs with mobile devices. This will support the Trust's service redesign programme enabling different working patterns such as mobile and home working. A range of mobile solutions will be developed to enable access to the Trust network from anywhere with internet connectivity from a variety of devices e.g. smart phones and tablets.
- 5.20. The Trust will need to keep its desktop infrastructure up to date but this will, in time, move from being based on physical PCs to a totally virtual desktop. Although any change in desktop infrastructure will be dependant on meeting the NPfIT warranted environment until the end of contract in 2015.

**5.21. Desktop Software**

- 5.22. The Trust currently uses Microsoft Office 2010 as its office automation product. As the Trust has a software assurance contract with Microsoft the move to Office 2013 will be planned once it is part of the warranted environment. This will support the further expansion of SharePoint as the document management system for corporate records.

**5.23. Voice Services**

- 5.24. The Trust will continue to implement its Trust wide Voice over IP OpenScope telephone system to all its sites. Once the system is fully implemented and NHSmail2 is in place full unified communications functionality will be deployed and mobile phones will be integrated into the system. This could be through the use of OpenScope unified communications or Microsoft Lync technology both of which are licenced for use.

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**5.25. Video Services**

5.26. Following on from its investment in videoconferencing facilities the Trust will develop a solution for the use of webcam technology for device to device video access including the requirements for communicating externally with service users e.g. through the use of Skype.

**5.27. Email Services**

5.28. The Trust uses Microsoft Exchange and Outlook for its corporate email system. This is currently in-house but is currently being migrated to NHSmail with a residual messaging exchange server remaining in house. The NHSmail contract ceases during 2013-14 and will be replaced by NHSmail2. It is anticipated that this will provide increased functionality and features and allow better integration with trust systems requiring messaging.

**5.29. Print Services**

5.30. The Trust has standardised on network printers as the RiO system does not have the capability to print on local PC connected printers. Therefore the remaining local printers will be phased out. This will be done in conjunction with a review of print services across the Trust to support the ambition of a “paperless NHS”. It will aim to replace the majority of printing with electronic methods and reduce the numbers of printers, replacing them with networked multifunction devices (i.e. photocopiers), ensuring there are appropriate facilities for production of print materials where still required.

**5.31. Data Centre Resilience**

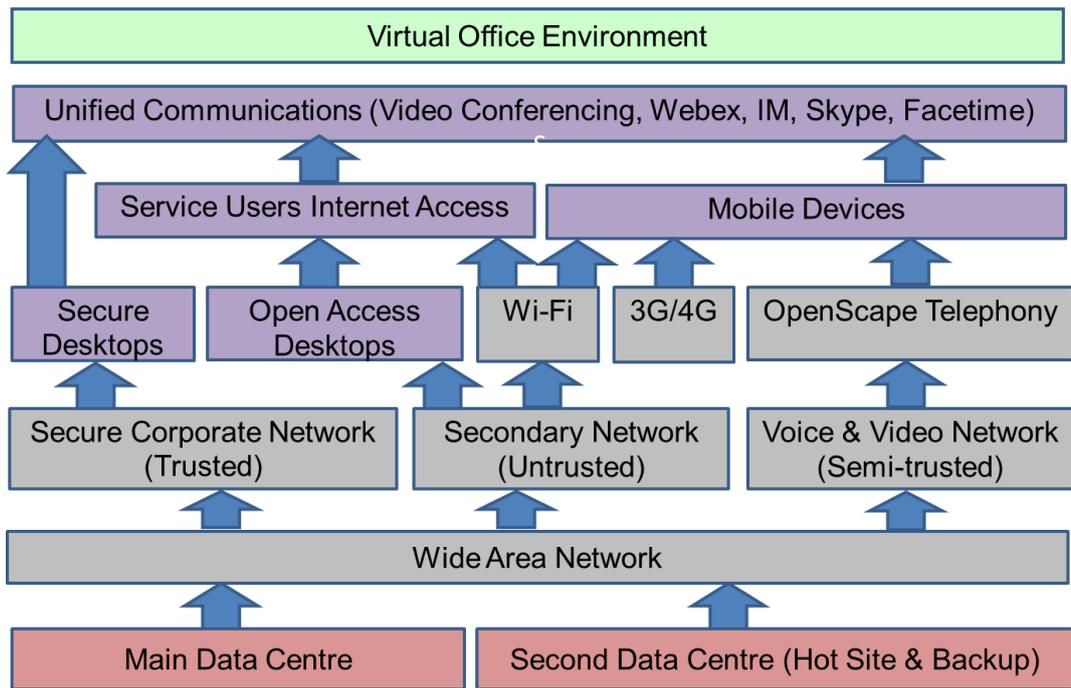
5.32. The Trust operates a primary data centre at Bath NHS House with a secondary “hot site” at Callington Road Hospital. The large scale technical developments over the last 5 years has taken these facilities to their limits in relation to space, power utilisation and cooling. The re-provision of the main data centre is now an urgent requirement to address resilience issues and ensure the environment is fit for purpose and capable of hosting critical clinical systems.

**5.33. Technical Implementation**

5.34. To build this new infrastructure it is recognised that the supporting projects have interdependencies that mean core elements will need to be put in place before the projects that bring the benefits can be implemented. This is demonstrated in the diagram below.

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IT Infrastructure Road Map



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