Angus Council Technology Roadmap 2018-2020

Contents

Background

Angus Council is on a journey to deliver a more digitally capable council, as described in the digital strategy and delivered through the change programme. This includes internal efficiency and operational capability as well as easy to use and streamlined on-line services to customers.

This roadmap is a business enabler driven by council objectives as outlined in the Council plan and Digital Strategy. To deliver these we have reviewed our current position and mapped out what technology is required now and going forward, and have provided a planned strategy to ensure that we can maintain and advance each of the necessary components required to provide the platform for improving services.

This document describes cloud.

Key Drivers

There are a number of factors that are driving the need to have a clear understanding of how our technical infrastructure will evolve over the longer term;

- Budget constraints mean that we need to consider how to get most out of the technology that we have, sweating assets where possible, while ensuring that future contracts and new services are cost effective and evaluated on a total cost of ownership basis
- All aspects of this roadmap must be based on demonstrable business benefit expressed either as a cost reduction or an increase in services as required by the business or the end customer
- Reduction in staff resources means that technology must be used better to streamline our internal processes, automating tasks and transferring data automatically between systems where possible
- The workforce strategy promotes a more agile approach to working, which has an impact on the type of technology that is required to support council officers. This includes the patterns of where, how and when technology will be used and demands for greater service resilience
- Customer expectation is that access to data and council services should be as simple as any other company or utility, with services that are available at their convenience, easy to use and quick to process
- Information is a primary resource for Angus council's daily business and Cyber security threats are ongoing and relentless. Legislative changes require us to ensure information confidentiality, integrity, and availability and technical controls form a part of this defence of information assets.
- The IT industry itself is changing at an ever greater pace, and it is important that the roadmap is flexible and reviewed regularly to take into account new opportunities as well as understand where we will be forced to review and upgrade existing capability

Common Goals

Although there is diversity in the types of technology required to deliver a complete digital service to staff and customers, there are some common goals covered in the digital strategy that will be aimed for.

- We will reduce technical complexity where possible, allowing for simpler operation, management and integration between components
- We will offer the range of devices that staff need to be productive, while ensuring that we get best value from all the hardware that we do buy
- Our preference will be to push services and infrastructure into the cloud, taking advantage of the flexibility and lower support requirements that this offers
- We will deliver a more predictable profile of IT expenditure, where infrastructure and service costs are known and can be budgeted for appropriately
- We will work towards no single points of failure (SPOFs) in our infrastructure for critical services, and where these exist we will identify acceptable risk mitigation.
- We will ensure that all services are designed end-to-end to be secure, whether internally provisioned or hosted in the cloud
- We will work with partners to reduce costs and improve service delivery. In collaboration with PKC and Dundee, as part of the Tayside collaborative, we will share knowledge and support resource, bridge skills gaps, standardise product sets and undertake joint procurements.
- We will ensure that our IT resources remain skilled and capable of shifting from infrastructure support to an architectural and commissioning role facilitating a culture of innovation and customer focus.

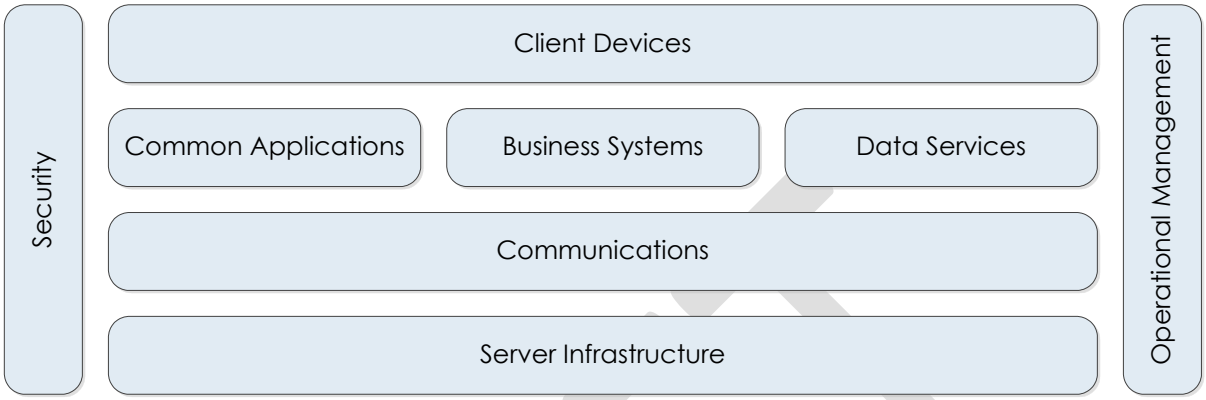
Scope

This document concentrates on infrastructure and services delivered to the corporate business services, and does not directly include services delivered to schools or partners such as the NHS or Angus Alive. However, it is by design that the communications and infrastructure aspects are currently shared with some of these areas at a physical level, so the roadmap does take this into account. For example, communications architecture is planned to deliver both corporate and Education strategies, delivering capacity and resilience for all services. See the Schools Digital Strategy (http://www.angus.gov.uk/sites/angus-cms/files/2017-10/Report%20187_Digital%20Strategy_Appendix.pdf) for more information on schools service requirements around clients and application/data services.

As service delivery models are reviewed and technical deployments change, it is important that the council understands the scope and audience of updated IT services. This is documented in the Service Catalogue, which will be reviewed and re-published as we deliver new and upgraded capability. This will also define which services are delivered to the different user groups and the expected levels of service attached to each.

Components

This diagram gives a high level overview of how the different hardware, software and services that make up our IT infrastructure can be represented. Each section has a distinct set of components and related plans which adhere to the general goals.



Client Devices

This area includes any physical device that a user might use to consume services can be classed as a client device, including;

- Mobile phones
- Tablets
- Laptops
- Desktop PCs
- Chromebooks
- Wyse (Citrix) terminals

To progress this we will;

1. Agree a suitable range of devices that can be offered for each of the agreed Angus agile work styles, to ensure that the form of device is appropriate to the function and that employees and managers do not have to make IT choices themselves. We will limit the number of options for each types of device to ensure that we can deliver cost effective, reliable and proven devices that can deliver the applications employees need to do their job.
2. Manage the purchase, implementation and upgrade of devices, ensuring that we get the best use out of devices that we have whilst ensuring that they are still reliable and have suitable support arrangements available. This will involve an audit of all hardware, a defined replacement policy and programme of replacement, and the necessary budget processes to deliver this and manage costs.

3. Investigate options that would allow staff to use their own devices to connect to and use council services. While this may present difficulties in ensuring that devices are compatible and capable of running our services (and could result in substantial support requirements), there is an opportunity to reduce our hardware estate and related budget if we do not have to purchase devices for staff.

Common Applications

Desktop services includes applications and services consumed by the physical device and the core productivity capabilities that all users need to use on a daily basis. These include applications such as Office, e-mail, and Lync. This does not include business systems.

To progress this we will;

1. Migrate these services and the related data into the cloud where possible. This will offer a 24/7 service available from outside the council's infrastructure, and will reduce the IT overhead in managing internal servers and data storage. In addition, modern cloud-based versions of products (such as Office) are useable across a wide range of device types, making them suitable for agile and mobile workers. By moving to cloud services we will have the latest features as these applications are regularly updated, and will also eliminate future projects that incur capital costs and major design/implementation effort to upgrade internal infrastructure.
2. Upgrade and enhance Citrix desktop services to ensure that low cost Chromebooks and Wyse devices can continue to be used, giving users the Windows desktop experience necessary for running Windows client applications. This will also include managing the introduction of new applications into the Citrix environment (where deemed suitable), as well as applying the regular updates that are necessary to retain our PSN compliance.

Business Systems

Service-specific business systems are not mapped out in the IT roadmap, as priorities and timescales for developing these is largely driven by the owning business area. However, these systems are dependent on a number of technological components and it is expected that the business systems will follow the general goals outlined above and that vendors will increasingly encourage councils to hosted or cloud based solutions.

The One Council Approach to Applications project, which is part of the change programme, will take these systems into account when identifying risks or opportunities to consolidate systems or seek upgrades or replacements. This project will also commence work on an application roadmap which is essential to improving the quality of the services provided.

In addition, other change projects to deliver improved business processes will identify the need to consider the fitness for purpose of the specific business applications in terms of their capability to deliver digital services.

Data Services

Data services includes any of the IT infrastructure that supports the storage of data, including database servers, shared file folders, document management systems and GIS spatial data stores.

To progress this we will;

1. Reduce the need for shared file areas and data storage for e-mail and intranet services, allowing us to lower costs and administration required to support the infrastructure.
2. Promote existing document management systems and Office 365 for general shared document storage, while relying on business system functionality for case documents directly related to the services and their core processes.
3. Move backup and archiving to cloud solutions to reduce the need for internal backup infrastructure, saving on hardware storage, licensing costs and administration.

Server Infrastructure

Server Infrastructure includes all aspects of server and desktop hosting, primarily the physical and virtual servers in the data centre that deliver the services and applications

To progress this we will;

1. Audit existing physical server specifications to generate a comprehensive view of hardware capability and age. From this a replacement programme can be drawn up and costed to maintain the physical capacity required to support data, applications and services
2. Monitor virtual server processor, disk, I/O and memory to determine how close virtual specifications are to the actual running requirements. Rationalise server requirements, reducing where necessary to reduce physical server requirements
3. Plan and implement the migration of critical server workloads into the cloud, reducing internal cost, administration and support for infrastructure, and offering flexible options for availability, performance, resilience and backup/recovery.
4. Reduce the physical space requirements for the data centre and other server rooms as internal server capacity is migrated to the cloud

Communications

As IT infrastructure and services shift from internal ownership to external, the need for resilient network capability increases, to provide the access necessary to consume applications and data in the cloud. This is one of the most important factors in delivering cloud services as bandwidth requirements increase and patterns of network activity change, and is already identified as a major pre-requisite for delivering the early phase of cloud projects.

This section includes all aspects of the network and communications infrastructure that connects client devices, servers and attached storage. It also includes our secure internet hosting area (DMZ) as well as connectivity out to the internet for internal users accessing the internet.

To progress this we will;

1. Review WAN (Wide Area Network) provisioning, considering the required design, capacity and resilience. Take advantage of SWAN (Scotland Wide Area Network) opportunities where appropriate to upgrade network connections and reduce costs.
2. Review and upgrade Wi-fi provision where necessary throughout council offices, including public access where appropriate. This will offer the capacity and management to deliver current future agile working patterns as the reduced office estate adapts to cater for more users and drop-in spaces.
3. Investigate opportunities to deliver modern communications to hard to reach schools, and explore technical solutions that will enable business and communities to use the council network for their broadband services.
4. Invest in projects that increase the reach of high speed broadband in Angus.
5. Break out schools internet access at the schools to simplify corporate network configuration and offer the capacity and flexibility for schools to define separate networking options specific to their needs. Also ensure corporate capacity and resilience on internet access to meet future demands which will involve more cloud services.
6. Rationalise the DMZ configuration as services move out to the cloud, offering a simpler configuration which is easier to manage and secure.

Security

Security encompasses all aspects of IT infrastructure and services. This includes firewall and perimeter protection, anti-virus for client devices and servers, and malware protection. It also includes user authentication for access control, and physical encryption of mobile data storage (laptop disks, USB sticks) to protect in the case of loss or theft

To progress this we will;

1. Review user authentication requirements to offer cheaper and more flexible two-factor authentication where necessary, considering the use of mobile phones instead of physical tokens. Also investigate options to simplify password management by providing either SSO (Single Sign On) or a centralised authentication scheme.
2. Maintain existing malware and anti-virus protection on client devices and servers, with appropriate procedures to continue the distribution and application of updates and virus definitions.
3. Review and update firewall and web filtering services and related management procedures. Consider new technologies and capabilities to counter increasingly sophisticated threats, as well as the potential to use cloud or network services to reduce internal administration and management, and to block threats before they can reach internal networks.
4. Maintain and review MDM (Mobile Device Management) capability to ensure that corporate managed mobile devices are suitable protected, offering encryption and data separation. Part of this will include simplification of policies and consideration of putting management of mobile devices into the cloud.

Operational Management

Running through all aspects of IT infrastructure and services is the need for the IT service to have the tools and procedures that allow us to manage the infrastructure and data.

To progress this we will;

1. Review the capability to deliver applications, support files and patches to client devices and servers remotely, to ensure that software is up-to-date. This includes agreeing downtime windows and regular patch schedules, and building the procedures to automate distribution, phase rollouts, and to back out problem updates where necessary.
2. Agree the most critical aspects of the infrastructure and implement pro-active monitoring on these components. As well as getting early note of potential problems areas this will also include implementing automated responses depending upon the types of error, timing and impact on users or other services. Outputs from this should also include better reporting of performance information including management summaries published to users.
3. Review the service desk application capabilities to ensure that the self-service capabilities are suitable for use across all device types, and that the processes offer the greatest opportunity for automation and streamlining.

4. Extend self-service capabilities for the IT service desk, to reduce avoidable contact and make it easier for users to raise incidents or request services. In addition we will build a better knowledge base of common problems and resolutions so that users will have to contact the service desk less.

Planned Projects

1. **Performance, Resilience & Capacity of Core Infrastructure**

These projects are designed to improve IT infrastructure and services by increasing capacity to reflect an immediate need, or to allow extra capability to be available to adapt to changes in officer working arrangements and different patterns of demand on services. In addition to ensuring capacity, they will offer resilience by ensuring that single points of failure are reduced to a minimum where practical, and are eliminated where the cost justifies the investment to reduce business disruption upon single failures.

Project Outline	**Timescale**	**Benefits**
Create resilient 1Gbps corporate network	Q2 2018	Ensure availability of core network Provide greater capacity to support agile work methods and greater
Create new radio infrastructure to improve core network links	Q2 2019	Increased resilience and capacity of internal network
Commission new wi-fi infrastructure and review office wi-fi network capability and product/supplier	Q4 2017 – Q4 2018	Increased coverage and capacity of wireless throughout offices
Install new network infrastructure to allow mobile devices in secondary schools to go direct to the internet	Q4 2017 – Q1 2019	Higher capacity network with less contention between users Divergence from the corporate network offers opportunities to consider different technology and services
Upgrade Netscaler load balancers for Citrix desktop provisioning	Q3 2018	Maintain resilience for Citrix desktop provisioning
Implement additional Moonshot chassis to support Citrix desktop and	Q2 2018	Offer increased functionality for Citrix

application requirements		desktops, including Windows 10 and more demanding applications Deliver capacity and future expansion to support changes in working and agility
Implement additional applications and desktops into Citrix environment	Q3 2018 - 2020	Reduce the need for desktop and laptop devices, allowing cheaper devices to be used which also require less configuration and maintenance
Replace all existing hypervisors and upgrade OS and support software to supported versions	2018	Maintain PSN compliance through supported server OS versions Deliver capacity required to host desktop services and applications
Enable resilience and replication across data and comms centre	2018	Provide additional network capacity and ensure availability of core services in the event of major data centre outage
Replace SAN hardware and disks for Compellent storage	Apr 2020	Reduced on-site data requirements and offer cost savings through reduction in data quotas

2. Cloud Migration of Data and Services

These projects cover the migration of servers, data and services from the current position where they are hosted within the Angus data centre, to a position where they are running in the cloud on external hosted environments. This reduces the hardware and software purchase cost, administration and support, and reliance on other internal infrastructure to deliver these services.

Project Outline	Timescale	Benefits
New telephony solution to deliver cloud-based system with improved functionality at lower cost	Q1 2018	Reduce costs for calls and future equipment through the use of headsets instead of handsets Reduced administration of internal equipment as a cloud service Less reliance on telephone numbers, which move with the person and offers greater agility
Audit of existing server hardware and replacement of physical servers out of warranty	On-going	Maintain physical server environment
Cost, design and migrate suitable cloud services for the non-hypervisor supported physical servers, based on prioritisation of business applications. Decommission of existing servers and rack space	Q3 2018 - 2020	Migrate internal server assets to reduce support and dependency on internal infrastructure for access Offer known and predictable costs based on usage
Investigate options for moving Citrix desktops to the cloud	2019 - 2020	Consider opportunities to reduce management and support required to sustain and upgrade the internal Citrix environment. Also offers a subscription type licensing model
Review of intranet requirements and implementation of new capability	Q2 2018 - 2019	More modern and capable environment to support the intranet information portal Deliver easier creation, publishing and viewing of employee information, accessible on any device type
Upgrade CommVault software and audit data to recommend what/how much can be archived. Migrate recommended data to the cloud on a phased approach based on bandwidth required and time to perform	2018 - 2019	More predictable costs for backup through per usage pricing
Migrate users and mailboxes onto Office 365, decommission internal Exchange 2010 environment	Q2 2018 – Q2 2019	Cloud-based e-mail hosting offering improved availability and capacity No internal server infrastructure required to purchase and support Modern e-mail interface and features

		for end users
Migrate users Office applications and data into Office 365	2019 - 2020	Reduce internal storage infrastructure requirements Take advantage of the latest version of Office applications, automatically remain up-to-date Offer new applications and opportunities for collaboration and sharing through other Office 365 applications
Migrate remaining SQL databases onto the cloud, dependant on the application strategy and business system	2018	Reduce internal reliance on SQL databases, offering greater availability and flexible provisioning and costing Eliminate the need to upgrade or patch internal server infrastructure to comply with PSN
Prioritise and migrate relevant virtual servers to the cloud, based on migration programme	2018 – 2020	Migrate internal server assets to reduce support and dependency on internal infrastructure for access Offer known and predictable costs based on usage
Migrate desktop OS to Windows 10	On-going	Deliver an updated Windows operating system for client devices that is fully supported and regularly patched for new features, fixes and security issues. Ensures PSN compliance for the desktop OS

3. Innovation & Development of Digital Capability

These projects cover research into new IT capability and development of new and improved services to support the business. It includes the upgrade of existing capability and migration to cloud, but also delivers the functionality required to deliver better digital services and good information management.

Project Outline	Timescale	Benefits
Identify publishing and hosting requirements for Angus Alive and schools. Reduce existing web hosting and decommission archive web site	2018	Remove legacy server infrastructure from the DMZ Deliver a hosting capability for future web sites that offers high availability, easy publishing and accessibility across different device types
Extension/Renewal of CSP customer portal capability used to deliver digital service forms and workflows	Q3 2019	Continued capability to develop and deploy digital services Review and consideration of opportunities offered through the CSP national framework and
Implementation of integration and process automation services to co-ordinate transactions and processes between business systems	2018	Delivers key capability that allows data and requests to be co-ordinated between systems and data stores, through a robust and flexible mechanism Provides capability to join services across business systems by automating application tasks
Implement contact centre system and web chat/bot technology to support digital services	2018 - 2019	Intelligent routing and resolution of service requests to reduce avoidable contact and increase self-service Consolidate contact sources and teams through improved contact centre capability Reduce cost to deliver digital services
Renewal of GIS intranet/internet capability and client editing/routing tools for spatial data	2019	Continued service of main user GIS toolset Opportunity to review requirements

4. Security & Legislative Compliance

These projects include areas where security products and services are required to ensure the protection of user identities, data and devices, and to allow us to protect against and respond to cyber-attacks.

Project Outline	Timescale	Benefits
Investigate options and implement better identity management to offer SSO (Single sign-on)	2018	Simplified login procedures for users through a single login Reduced administration for support staff to reset passwords for different systems
Replace physical based two-factor authentication with virtual cloud-based solution	Q2 2018	Removal of cost to purchase physical tokens Easier use and administration of two-factor authentication
Review internet logging and filtering capability	2019	Continued service with opportunities to consider new advances in threat detection and web content classification
Review anti-virus and malware protection capability	2020	Continued service with opportunities to consider new advances in threat detection and OS/application/data monitoring requirements
Review and update security requirements and procedures to maintain PCI and PSN accreditation	On-going	Continued service and connectivity with other government services Demonstrate good practice and reduce risk of technical security incidents