

Cloud Strategy 2024 – 28

1 Executive Summary

The Cloud Strategy 2024 – 28 presents a comprehensive ICT hosting strategy and cloud adoption plan for the council, aimed at leveraging modern cloud computing services to support the Digital Strategy, significantly enhance operational efficiency, reduce operational costs, and elevate service delivery to residents, customers, and communities.

Central to this strategy is a transition from traditional, largely ‘on premise’ ICT infrastructure, to a cloud-first approach over the next five years. This transition is not only about technology, but also aligns with DCC’s broader ambition and strategic objectives, ensuring that DCC’s digital transformation resonates with its commitment to community service.

The Cloud Strategy has been developed to support the Council Plan 2024/25, and the Council Plan for the following four years FYs 2025/26 to FY 2029/30. The current council plan’s ambition is described as:

- Resilient, healthy and safe communities.
- High performing, value for money and resident focused services.
- Effective early help for individuals and communities.
- A prosperous and green Derbyshire

Before embarking on the journey of cloud adoption, the council commissioned Socitm Advisory, and Shaping Cloud, to conduct a thorough assessment of its current ICT infrastructure and related operational capabilities, and commissioned a strategy, roadmap, and investment case in order to give DCC clear direction based on evidence and analysis.

In developing the Cloud Strategy, key stakeholders within the council have been engaged, to understand the unique challenges and opportunities that lie ahead. This strategy outlines an analysis of the current hosting environment, sets out the collaboratively developed future state, and details the strategic investments and implementation steps required to achieve this vision.

While prioritising data security, compliance, and robust disaster recovery, the plan also addresses potential challenges, from integrating legacy systems to upskilling the workforce, ensuring a smooth and effective transition to a cloud-centric environment.

Key findings and recommendations:

- **Strategic Transformation:** Transition to a cloud-first approach is integral to DCC's broader strategy of high performing, value for money and resident focused services.
- **Cost-Effective Modernisation:** The Total Cost of Ownership (TCO) analysis underscores the long-term financial benefits and efficiencies of moving to a cloud model, balancing initial investments with future savings.
- **Sustainability at the Forefront:** Emphasising sustainable practices in cloud adoption aligns with the council's commitment to environmental responsibility.
- **Efficiency and Innovation:** Modernisation through cloud technology is a pathway to enhanced operational efficiency and opens doors for innovative service delivery.
- **Risk Management:** Prioritising risk mitigation in cloud adoption enhances data security and ensures compliance, aligning with DCC's risk management framework including corporate risk mitigation strategies, emergency response, and information governance.
- **Historical Underinvestment:** Any investment must reflect the considerable workload and system inefficiencies stemming from the lack of investment in the last decade – whether continuing as-is or implementing the recommended roadmap.
- **Internal Skills Maturity and External Expertise:** There is a low cloud skills maturity level amongst current colleagues, which means that the council will continue to need external expertise to augment its internal capability while continuing to develop internal competencies.
- **Strategic Investment vs. Tactical Replacement:** It is imperative to invest wisely, with the current budget constraints, in moving towards a modern digital platform vs. re-investing in a legacy infrastructure that continues to constrain service delivery.

Adopting this strategy will enable DCC to continue to develop, within the context of devolution; having the digital capabilities to transform, to inform, and to drive collective endeavours.

The Cloud Strategy supports the council's overall Digital Strategy, and connects to a separate ICT Strategy, an ICT Transformation Programme and a Target Operating Model (TOM), which together describe the service necessary to achieve the ambition of the Digital Strategy. The Cloud Strategy has been developed to address the specific technology challenges facing the council at present, and to transform the ICT service into a digital transformation partner for the wider council, which will be able to support the delivery of the Cloud Strategy.

As Derbyshire County Council stands at a pivotal juncture, the initiation of this cloud-first hosting strategy is not just an opportunity but a necessity for the future, which will not only meet the challenges of today, but pave the way for a more efficient, sustainable, and innovative future for DCC.

2 Strategic Context

The Cloud Strategy details the development of a cloud-first hosting approach, encompassing a thorough assessment of the current state of DCC's ICT infrastructure, operational capabilities, and software applications. This assessment highlights the significant backlog of work due to a decade-long lack of investment in the application estate, and the need for a hardware refresh due to past underinvestment. It also brings to light the challenges of limited resources and a perception of the ICT team as an impediment in project delivery. These insights are critical in shaping a strategy that not only addresses current gaps, but also paves the way for a more efficient and sustainable future.

The Cloud Strategy articulates a vision for the Future State, tailored to enable DCC to accomplish its strategic objectives. Following the assessments and strategic recommendations, the strategy lays out a detailed roadmap, serving as a practical guide to transition from the current state to a more advanced, cloud-centric infrastructure. The strategy concludes by describing the actions required to realise the transformative potential of the cloud-first hosting strategy.

Background

It is important to understand how ICT has changed, and continues to change for DCC as an organisation, its workforce, its partners, residents and communities which use its services. It's only when we look back over this evolution that we can appreciate the progression of technology in various stages.

Early Technology replacing manual processes – In the initial stage, early technologies like word processors and calculators replaced manual processes, making tasks more efficient and less labour-intensive. These tools aimed to simplify and automate specific functions, enabling individuals to perform their jobs with greater ease and speed.

Early ICT initiatives were innovative for their time and targeted specific functions, contributing to increased efficiency in certain areas. For example, the introduction of the Police National Computer in 1974 replaced manual card index systems.

Development of Early Business Applications - Early business applications emerged to automate existing business processes, enhancing efficiency without fundamentally changing the established operating model. These applications were often small and bespoke, tailored to specific business needs, and marked the beginning of data accumulation within organisations.

With increasing complexity, ICT services expanded to manage systems and data storage across various service delivery areas. This was predominantly done 'on-premise', with each organisation having its own ICT team to handle emerging technologies. The need for on-premise teams was widespread, reflecting the growing reliance on technology for day-to-day operations.

Evolution of Internet Connectivity – The evolution of connectivity through the internet allowed for the networking of applications and data, both within organisations and between them. This stage facilitated improved communication, collaboration, and information sharing, leading to more integrated business processes.

As networking and data accumulation grew, cloud computing and data storage emerged as alternatives to on-premise solutions. This shift allowed organisations to hold data externally, and ICT services could be provided remotely. Cloud adoption has accelerated, with the expectation that it will become the norm for ICT service delivery, except in cases where information security or service delivery requirements make it impractical.

Acceleration and Increasing Complexity of Business Applications - The complexity of business applications has increased, reaching a point where certain applications, such as Mosiac and Microsoft Office, became predominant. Internal, bespoke applications face challenges at this point, since they have to either adapt to connect with the predominant applications or be retired. Adaption then has to keep pace with the upgrading of the predominant applications, with the potential for increased cost.

The evolution of cloud computing offers advantages, especially in outsourcing technical competence. Service delivery organisations no longer need to maintain ICT teams covering the full range of technical skills. Cloud providers manage the technical aspects of running systems, allowing organisations to focus on user-end support and effective contract management.

Cloud adoption brings increased disaster recovery and resilience, since both data and operating systems are not confined to single 'on-premise' systems. Commercial providers manage the entire ICT infrastructure, making it easier for organisations to keep pace with technology improvements. Cloud providers invest in and maintain the necessary skills, serving multiple customers more cost-effectively than each organisation managing its own infrastructure, with its own team.

Accelerated Acquisition and Storage of Data - The progression of applications also includes a substantial increase in the acquisition and storage of data, across a wide range of activities within the organisation. This data accumulation has become a valuable asset supporting service delivery and has commercial value, mirroring the practices of commercial providers who use data sets for strategic planning.

Overall Implications - The progression described above underscores a trend towards automation, connectivity, and data-driven decision-making. The accumulation of data becomes a key resource, both for enhancing service delivery within the council and potentially having commercial value. As technology evolves, the council faces the challenge of adapting or replacing internal applications to align with predominant and more complex solutions.

Considerations for DCC - Given the progression described, the council needs to evaluate its existing applications to see how well they can seamlessly integrate with

predominant systems. Emphasis on data governance, security, and privacy is crucial, especially with the increased accumulation of valuable data. Continuous adaptation and innovation will be necessary, to stay aligned with technological advancements and evolving business needs. The migration from on-premise solutions to cloud computing represents a strategic shift, offering greater flexibility, efficiency, and resilience for ICT support services, in alignment with the evolving landscape of technology adoption.

Understanding this historical context helps to inform decisions for the future technology strategy, ensuring it aligns with both current and anticipated trends in technology and data management. The evolution of ICT described above has several implications for the council, explained below.

Continuous Technological Development - The evolution described is ongoing, and technological development will continue. Councils need to remain agile and open to adopting new technologies to deliver services as effectively and efficiently as possible. Continuous investment in technology and regular updates will be necessary to make the best use of emerging opportunities.

Fundamental Change in Service Design - There is a fundamental shift in how service delivery organisations such as councils should view technology. It is not just an efficiency add-on, but an integral part of service design. The need is to design service delivery around the optimal use of available technology, rather than viewing technology as only a tool to make existing processes more efficient.

Automation and Optimisation - The evolution implies a move towards automation and optimisation of service delivery processes. For instance, automating connections between the council's key systems can lead to streamlined processes and optimised team structures. Opportunities exist for revenue savings within and beyond the ICT service, as service delivery models become more efficient and automated.

Cultural Shift in Operations - The evolving ICT landscape brings about a cultural shift in the way the organisation operates, as described in the Digital Strategy. The traditional model of manual processes and standalone systems is replaced by a more interconnected and automated approach. This shift requires a change in the organisational culture, where adaptability, collaboration, and a digital mindset become crucial. This will require a holistic approach to technology adoption, ensuring that systems are interconnected and aligned with the overall organisational goals.

Service Delivery Model Change - The evolution of ICT significantly changes the service delivery model. It's not just about adopting technology; it's about reimagining how services are delivered to leverage the full potential of available technology, and moving towards best-practice approaches that have already been successful across local government. This shift may lead to a more efficient allocation of resources, improved service delivery, and cost savings in the long term.

Importance of Leadership and Stakeholder Engagement - The successful adoption of these changes requires strong leadership and engagement with stakeholders. Clear communication about the benefits and an evolving ICT estate is

crucial to gaining support. The change management strategies will be aligned to the central Portfolio Management Office (PMO) frameworks to ease the transition, and ensure that all change projects are aligned with the new service delivery model, alongside the people strategy when considering core competencies and cultural change .

In summary, the evolution of ICT has broad implications for the council, encompassing technological advancements, service design, automation, cultural change, connectivity challenges, funding changes and a shift in the overall service delivery model. Embracing these changes strategically can position DCC for continued efficiency, innovation, and responsiveness to evolving service delivery needs and demands.

3 Current State Assessment

This Current State Summary provides an overview of the existing landscape, identifying the key areas that the cloud strategy aims to improve and transform.

The data gathering process involved a series of face-to-face discovery sessions with key stakeholders, deployment of data analysis tools across the network and gathering of artefacts such as technical documentation, asset lists and service descriptions. Finance, procurement, service, project, programme and strategy information was also collected for analysis.

Key findings from this assessment:

Challenge	Impact
Increased data security and privacy risk due to reliance on legacy systems	<ul style="list-style-type: none"> Physical hardware is nearing its end of life and will become at risk of both hardware failure, and cyber threats. Aging in-house created applications are written in old code bases, which do not adhere to current best practices. Vendor supplied applications are often out of support and/or are on an old version. Inflexible nature of old ICT infrastructure means that the organisation is unable to meet demands in service areas for development and improvement. Intrusion detection and prevention tooling used on-premises is difficult to maintain, which could lead to a slower incident response.
Lack of data and application integration	<ul style="list-style-type: none"> Lack of data sharing or integration between systems prevents departments from accessing the information they need, despite the data being available. A lack of application interoperability with other systems limits the ability to respond and adapt to business needs, which hampers agility. There is sometimes a lack of trust between departments and ICT teams around access to, and the gathering of, relevant data causing blame to be passed between teams. Data is being distributed across different applications with limited integration, which reduces the ability to generate reports, hindering data-driven decision making. Lack of unified data governance across the ICT estate can lead to data being less controlled and more susceptible to loss. Legal and regulatory risks exist by being unable to share or report on data in a compliant manner. Inability to integrate data hinders the council's opportunities for growth and innovation.
Resource constraints	<ul style="list-style-type: none"> ICT skills gaps across the workforce exacerbated by staff turnover.

	<ul style="list-style-type: none"> • Legacy systems are reliant on knowledge of those systems to maintain them. As the systems become older so do the staff, increasing the risk of losing knowledge with specific team members, and placing systems at risk. • ICT staff are distributed across departments with a lack of centralisation in decision making and strategic ICT direction, leading to siloed buying for single use cases. • The operating model across the organisation for ICT architecture, security, development, maintenance and governance does not currently allow for the innovation, strategic planning and execution which ICT requires. • While improvements are in progress, ICT are still assigned projects to implement on behalf of departments, but have not had the resources to deliver them, which sometimes results in the ICT team being seen as a blocker.
<p>Budget constraints</p>	<ul style="list-style-type: none"> • Lack of prioritising ICT in budget making decisions, and not realising the knock-on implications impacting upon security, privacy and overall operations in an emergency situation. • The council have been unable to make informed decisions on budget allocation, due to not having a comprehensive view of service costs and the value that technology offers. • The service areas do not know how or if technology can solve their problems, or address their requirements, leading to budget being invested elsewhere or in solutions that could have had lower cost alternatives if an effective ICT Service was involved in the decision making.

The Current State Assessment provides a clear picture of where DCC stands in terms of ICT infrastructure and operations. It highlights the challenges and opportunities that the Cloud Strategy aims to address. By understanding the current state, the council can make informed decisions on how best to leverage cloud technologies to achieve its goals of modernisation, innovation, consolidation, value and benefits, cost reduction, and risk reduction.

4 Cloud Vision

The vision and goals for the Cloud Strategy are aligned with the broader context of the organisation. Currently, like many councils, DCC is navigating through a landscape marked by budget constraints, stemming from external economic pressures. This backdrop makes it imperative that every ICT investment not only aligns with, but actively contributes to the council's overall ambition..

Technology, in this context, is more than a facilitator of operational efficiency; it is a tool for realising broader organisational transformation. The promise of technology in driving process and decision-making efficiency has been a long-standing narrative, with varying degrees of fulfilment. However, the technological landscape has matured significantly. Today's technology offers an advanced, accessible set of tools that can automate, analyse, and inform business practices in very effective ways. This evolution presents an opportunity for DCC to achieve transformative efficiencies across its operations, aligning with budgetary objectives. The Cloud Strategy is about leveraging technology to make DCC a more agile, informed, and efficient organisation.

The resultant overarching vision for this work is to:

Transform DCC's ICT infrastructure into a secure, scalable, and agile system, which leverages cloud technology to benefit DCC and support the delivery of its ambition and strategic objectives.

High-level Objectives

- **Modernisation:** Transitioning to cloud computing is a critical step in modernising our ICT infrastructure. It will provide the foundation for more advanced, scalable, and agile services.
- **Innovation:** By embracing cloud technologies, doors open to new possibilities, encouraging innovative solutions to traditional problems and enhancing service delivery.
- **Consolidation:** The cloud strategy aims to streamline the ICT assets and services, reducing complexity and creating a more cohesive and efficient ICT environment.
- **Value & Benefits:** The adoption of cloud services will be evaluated not just on cost but also on the value and benefits it brings to the council and its constituents, such as improved service delivery and accessibility.
- **Cost Reduction:** A key objective is to achieve more for less by moving to a cloud model that offers scalability and eliminates the need for heavy upfront investments in infrastructure.
- **Risk Reduction:** Managing and mitigating risks is central to the cloud strategy. By employing cloud services, the aim is to enhance data security, ensure compliance, and improve disaster recovery capabilities.
- **Flexibility:** A key goal of the strategy is to help DCC become independent from County Hall by eliminating the need for datacentre hosting. This will allow the council to use the County Hall site for other purposes or sell it.

5 Technology Roadmap Vision

The proposed approach to transition has been set out into two phases giving a high-level set of activities to complete against a phased timescale.

The roadmap is split into the following phases:

- Phase 1 - Risk mitigation and application migration in years 1 and 2
- Phase 2 - Application Modernisation in years 3 and 4

The approach involves operating in a mixed environment, utilising both on-site data centres and cloud services, until the end of the third year (2026) for business applications. After this point, aiming to fully transition to cloud-based operations by 2028.

Key areas of focus include:

- Implementing a dependable Disaster Recovery (DR) solution for the ICT infrastructure.
- Transferring applications to:
 - Software as a Service (SaaS) solutions, including Office 365.
 - Platform as a Service (PaaS) options, such as web applications.
 - Azure Virtual Machines as an Infrastructure as a Service (IaaS).
- Upgrading operational tools, moving from on-premises services to cloud-native technologies.

Phase 1: Risk Mitigation and application migration

The first phase covering years 1 and 2 within the roadmap focuses on mitigating key risks which were identified during the current state analysis, as well the stabilisation and readiness of the Azure platform for the migration of applications, as set out in the application assessment.

What we will do:

- Procure hardware to replace the current high-risk compute and storage systems, to reduce risk until migration to cloud.
- Implement Azure Site Recovery to provide robust and reliable disaster recovery.
- Migrate NetApp vault data to Azure Cool Storage.
- Migration of applications:
 - Review the existing landing zone and make any amendments needed.
 - Review and update InfoSec policies.
 - Ensure that any licencing amendments needed to support Azure.
 - Migrate 148 of the 492 unique servers – lift and shift (Rehost to IaaS) over years 1 & 2.
- Make the best use of new or existing Reserved Instance capacity, ensuring DCC are obtaining the best value for money.

- Set up the monitoring, governance and amendments to business process, policy and requirements needed.
- Begin modernising the operational toolset by:
 - Moving from Solar Winds to Azure Monitor.
 - Adopting Azure Sentinel as a new SIEM.
 - Transitioning from SCCM to Intune.
 - Migrating WSUS to Azure Update Manager.
- Prepare for SaaS adoption in year one:
 - Implementing contract changes, additions or extensions (by Procurement and/or Legal) as required.
 - Moving to a SaaS-first approach for all new application procurements, supported by procurement and architecture governance processes to ensure it is implemented.
 - Making the technical changes required ready to start moving the first applications to SaaS in year two.
- Prepare for PaaS adoption in year two by:
 - Building skills in cloud native technologies.
 - Setting up development best practices and principles.
 - Planning architectural and technical changes needed ready for the adoption of PaaS in year three. (e.g. upgrading to new code version, redesigning data models and associated reporting)

Phase 2: Application Modernisation

At the end of year three (2027) the remaining 195 servers on premise will have been retired, replaced or addressed by DCC's other initiatives. This will reduce the dependencies on the County Hall datacentre, so that when the council exit, it is a much smaller project where the only remaining services to be decommissioned are telephony, DCC's facilities and network management.

To enable all business services to exit the datacentre in 2027, DCC need to review contract end dates, consider alternative solutions (managed service/SaaS) and create plans that align with the application migration timeline to minimise the residual costs from running the datacentre with minimal business benefits, due to low utilisation.

What we will do:

- Complete SaaS migration and mature SaaS processes for 3rd parties so that monitoring and management is scalable and effective.
- Complete data migration to Microsoft OneDrive and Teams for departmental shares, maximising the use of the council's M365 licencing for data storage.
- Migrate the first PaaS applications and start building out the PaaS platform alongside the supporting DevOps, SecOps and ITOps processes and practices.
- Move from a primarily IaaS based architecture to adopting cloud native services.

6 Future State

The proposed solution of the strategic engagement is the culmination of many inputs from the current state phase and analysis during the future state phase.

The solution brings together the analysis of the current state environment, marketplace trends and innovative technology solutions to provide an easy-to-understand, tangible set of technical options and recommendations.

Based on the gathered information, we have analysed the current architecture and assets looking for opportunities to rationalise, consolidate and drive simplification of applications.

The application assessment is key in understanding the options available for each nominated application. Each application was assessed against the 6R's of cloud migration approaches (as detailed below), their complexity in terms of server numbers and connections, and their urgency to be moved into the Cloud as determined by DCC. A recommended target location was made for each application within the future state architecture and TCO model.

- **Rehost ("Lift and Shift"):** This involves moving applications or workloads to the cloud without modifying them. The physical infrastructure changes, but the virtual servers and applications remain the same. This is often seen as the quickest and simplest approach to cloud migration.
- **Re-platform/Refactor:** This is a moderated approach where some optimisations are made, to leverage cloud capabilities without making significant changes to the core architecture. For example, to alter the way an application interacts with a database to take advantage of cloud services.
- **Replace:** This involves moving from an existing application to a completely new cloud-native solution or replacing a legacy system with a SaaS (Software as a Service) product.
- **Rearchitect:** This is the most complex approach, where applications are significantly modified or entirely redesigned to be cloud-native. This allows for maximum use of cloud functionalities but requires substantial effort and investment.
- **Retire:** This involves identifying systems that are no longer useful or needed and decommissioning them. By doing this, focus can be on maintaining and improving assets that provide value.
- **Retain ("Revisit"):** This involves keeping certain applications or components in their current environment because they may not be ready for cloud migration or it's not cost-effective to move them. These applications might be revisited later for potential migration or retirement.

Overall application estate

DCC have 387 applications, which includes a mix of locally installed and server associated applications. Based on the output of the application assessment, below is

an overview showing the direction of travel for applications and the associated impact on the supporting infrastructure and DCC operations.

Work has already begun to decommission legacy applications and replace applications with SaaS, and by the end of year 3 adopting this Cloud Strategy we will have:

- 17% of the application estate will have been decommissioned, reducing the overall number of applications DCC need to manage.
- 28% of the applications will have been replaced with SaaS leaving DCC with minimal technical management overhead.
- 28% of the applications will be in Azure IaaS management or Azure PaaS, removing the need to manage physical infrastructure with additional opportunities for DCC to rationalise and consolidate these applications as described in 4.2.2 Consolidation Opportunities.
- 27% of applications either have no server association or need additional assessment (34 applications) and planning to develop an app strategy or make decisions about hosting platforms. Where possible these applications should be outsourced to SaaS or retired. The servers retained on-premises are primarily ICT applications, where they cannot be cloud hosted or retired, the strategy will recommend considering co-location to enable datacentre exit.

Applications Associated to Servers

A more detailed assessment was completed of the 179 applications associated to servers. A high-level overview of the assessment outcomes is summarised below:

- 72 applications will remain on-premise
- 85 applications will be re-hosted in Azure
- The remaining 22 applications, will need further work as part of the clean up activity

Some of the applications (34) do not have a migration plan or are not allocated to servers. Additional work is needed to identify what the applications are used for and to update the migration strategy.

It should also be noted that some applications may need to remain on-premise to ensure compliance with the council's Civil Contingencies Act responsibilities.

Consolidation Opportunities

When several applications with similar functions within the organisation can be streamlined into a single one, it cuts down on effort and saves costs across the entire lifecycle of the application (from acquiring it, setting it up, maintaining and supporting it, upgrading it, to retiring it).

In the DCC application estate, opportunities to combine and simplify services, aiming to lower expenses and simplify operations have been identified.

Applications hosted on Infrastructure as a Service (IaaS) in Azure, rank as the second most maintenance-intensive among the four categories of management responsibility, which are On-Premise, IaaS, Platform as a Service (PaaS), and Software as a Service (SaaS). To improve this, there is a need for further consolidation and rationalisation, with a focus on maximising business value while minimising effort. This approach includes:

- **Business Applications:** Replace with SaaS where possible, and at the very least consolidate onto central, consistent technology PaaS platforms (such as SQL and Web Servers) to limit IaaS to that which is necessary from a software supplier support perspective.
- **ICT Infrastructure Applications and Services:** Transitioning these to Azure native platform services (such as Monitoring, Security and Configuration Management) or SaaS, thereby eliminating or vastly reducing the dependency on IaaS.
- **Legacy Websites:** Websites built on outdated code bases should be either restructured, and integrated into current web platforms or the proposed enterprise content management system, or they should be decommissioned.

Fewer applications to deliver similar digital capability should always be preferred, to keep architecture simple and easy to maintain and thus to keep costs and licensing low.

Hosting

In designing a solution architecture, the following technical hosting approaches were considered:

- On-Premise datacentres (Do nothing).
- Maximum use of Cloud (Max Cloud).
- Balance of On-Premise and Cloud (Hybrid Cloud).
- Co-location datacentre (Shared on-premise hosting).

Max Cloud was determined to be the best option for DCC for the following reasons:

- Improved resilience.
- Enhanced service delivery.
- Long-term cost benefit.
- Data-driven decision making.
- Sustainability and Environmental Impact.

To achieve the strategic recommendation for DCC to use Max Cloud as the chosen hosting option, the high-level steps to transition are in two phases (shown in Section 5):

- Phase 1 – Risk Mitigation and Application Migration over years 1 and 2.
- Phase 2 – Application Modernisation over years 3 to 5.

Cloud Hosting Platform

Microsoft Azure is recommended as the most appropriate hyper-scale cloud platform for DCC because of:

- Existing relationships between DCC and Microsoft.
- Having already procured Azure reserved instances, and an in-flight SAP migration project to Azure, means that core business data will already be in this location.
- Current Microsoft 365 and Windows licenses that can seamlessly integrate into the Microsoft Azure infrastructure, opening up opportunities for favourable pricing with Microsoft and a reduction in complexity.
- Ability to build on existing Microsoft and Azure skillsets within the organisation rather than start from new with another cloud provider.
- Its strong Government and Public Sector focus offering dedicated solutions and certifications with a deep understanding of the security and compliance requirements a government organisation faces.

Readiness Considerations

As part of the engagement with Shaping Cloud, we considered readiness for benefiting from cloud transformation in a number of areas. In order to ensure success with respect to wider strategic business aims, including the Digital Strategy, the council needs to consider these areas alongside the technical roadmap and projects.

- Organisational Readiness - In order to realise the fullest benefits from cloud and digital-first technologies, adoption of the technologies and mindset is needed across the council.
- A dedicated governance team for the project will ensure continued focus, pace, and mitigation of risks.
- New skills will be required by the ICT workforce as DCC adopt cloud, and become more digital in customer interactions, for example:
 - Azure Cloud Platform and Related Management.
 - Managed SQL Instances.
 - Application Service Plans.
 - Software-defined networking.
 - Architecting for Cloud - optimisation, scaling and secure by design.
 - Security in the Cloud using Azure Sentinel and Azure Monitor and Extended Security Updates subscriptions.
 - Backup and DR failover technologies including Commvault with Cloud, Azure Site Recovery and Azure Arc.
 - Utilising Intune and Azure Update Manager to support IT Operations and Governance.
- Deployment Acceleration –
 - Ensuring all deployments are executed using templates or automation scripts whenever possible.
 - Tools to support consistency and acceleration in deployment, e.g. pre-designed templates.

- Governance and Alignment - Derbyshire County Council's cloud strategy is not an isolated initiative. It must align with the broader ICT and PMO governance frameworks and Enterprise Architecture practice to ensure a cohesive, effective, and sustainable implementation. This section highlights the importance of integrating cloud adoption within the context of an enterprise architecture practice and aligning it with governance principles.

To adopt this cloud-first approach, and deliver this migration will require a team of experienced and skilled Azure experts including Architects, Administrators, Developers and security personnel. A lack of resource consistency creates sprawl, complexity and high management costs.

All the above are elements are not specifically part of the Cloud Strategy; these will be included as part of other strategies such as the ICT Strategy, the Target Operating Model (TOM) and organisational changes that form part of the overall ICT Transformation Programme.

7 Measures of Success

This section provides an outline of the anticipated future state after the successful implementation of the recommendations set out in this strategy; painting a picture of how DCC's technology landscape will transform and the benefits it aims to achieve.

- Minimal services remaining in County Hall including telephony, networking and on-premise security.
- Azure Cloud hosting is used for all business applications alongside the existing SAP cloud environment with PaaS consolidation of technologies where appropriate.
- Cloud native operational tooling, backup and disaster recovery support all services across the DCC estate
- Production users access via the WAN and the County Hall datacentre ExpressRoute with DR via the ExpressRoute off the network providers' MPLS.

Outcomes by Year 5 (2029)

By year five we will have:

- Provided a reliable DR solution for the ICT estate in Azure, allowing for the decommissioning of the secondary datacentre at Shand House,
- An ICT landscape that is Cloud only and predominantly contains SaaS, PaaS and cloud native services with minimal IaaS, allowing the decommissioning of the primary datacentre at County Hall.
- A strong position to take advantage of data and AI tooling, with accessible and sharable data.
- Mitigated risks including hardware failure, on-premise flood risks and lack of ICT Governance.
- Adopted a cloud-first, SaaS first approach to procurement.
- Modernised operational tooling, applications and servers.
- Matured ITOps/DevOps/SecOps process and culture, supported by mature ICT Governance.
- Developed an Enterprise Architecture practice:
 - Taking a more business focused approach, bridging the gap between users and the ICT team.
 - Making more strategic procurement and technical decisions.
 - Reusing common components across the ICT estate.
 - Increasing consistency and standardisation of DCC's architecture through improved governance.

Networking

User access from sites to Azure will be via the County Hall datacentre using ExpressRoute with a 4 Gbps increase of bandwidth in year 3 to support user traffic, that should be monitored and adjusted as required to balance cost vs. performance.

Shand House will provide the DR route via ExpressRoute until it is decommissioned in year 1. After that, DR will need to be provided by the network provider through moving the Shand House ExpressRoute to the MPLS. This means there are no dependencies on DCC datacentres for the DR route to Azure.

It is recommended that a project is created to implement SD-WAN (it is not in scope of this work) that runs alongside the cloud roadmap.

8 Total Cost of Ownership (TCO)

The Total Cost of Ownership (TCO) analysis is a critical component of Derbyshire County Council's (DCC) cloud strategy, providing a comprehensive understanding of the financial implications associated with the transition to cloud computing.

Appendix A gives a summary outlining the key factors contributing to the TCO in the cloud environment, offering insights into both direct and indirect costs.

9 Glossary

Azure Reserved Instance: A type of virtual machine reservation in Azure for consistent virtual machine workloads, offering significant cost savings over pay-as-you-go pricing.

Cool-tier: In cloud storage, a 'cool' data tier is optimized for storing data that is infrequently accessed and stored for at least 30 days. It's more cost-effective for long-term storage, backup, and disaster recovery solutions.

Failover: The process of switching to a redundant or standby computer server, system, hardware component, or network upon the failure or abnormal termination of the previously active application, server, system, hardware component, or network.

Hypervisor: A form of computer software, firmware, or hardware that creates and runs virtual machines. It allows multiple operating systems to share a single hardware host.

Landing Zone: In cloud computing, a landing zone is a well-architected, multi-account cloud environment that's based on security and compliance best practices.

MPLS (Multiprotocol Label Switching): A routing technique in telecommunications networks that directs data from one node to the next based on short path labels rather than long network addresses.

NetApp Vault: A data storage and management service provided by NetApp, often used for secure data backup and recovery.

WAN (Wide Area Network): A telecommunications network that extends over a large geographic area for the purpose of computer networking. WANs often connect multiple smaller networks, such as local area networks (LANs) or metro area networks (MANs).