Welsh Government

ICT Strategy 2016-2021

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1. Foreword

Established by the Government of Wales Act 2006, the Welsh Government is the devolved Government for Wales. It develops and implements policies, makes decisions and ensures delivery in respect of the areas devolved to us and proposes and makes Welsh laws and subordinate legislation. It is elected by the people of Wales to deliver a programme for Government.

The Welsh Government is headed by the First Minister of Wales with the Cabinet as the main decision making body.

The Welsh Government Civil Service supports the Welsh Government. We have a work force of 5,500 people, who work in out office across Wales and further afield.

ICT background

The ICT systems that support the Welsh Government have developed and grown since the earliest days of devolution. The ICT has been delivered through a variety of contractual arrangements. The current Merlin framework was introduced as a 10 year framework in 2004. It aimed to deliver Business Change capability alongside a sustainable service model and involved three main suppliers, Siemens Information Systems, Cap Gemini and PA Consulting.

In 2014 the framework was extended for a further 5 years with key changes. First the external partnership was with ATOS and Cap Gemini, in addition the contract was reframed to enable transition away from the services provided during the contract lifetime, including moves of key services toward cloud based technologies which were emergent in 2014.

During the period of the Merlin contract, substantial centralisation has occurred – previously there were many servers and systems operating in different offices throughout the Welsh Government estate, supported by different groups and individuals. The vast majority of these systems have been centralised and are supported under common and documented arrangements. They have also been made “Cloud Ready” in anticipation of the advent of cloud services for government. The user experience has also substantially improved, with the use of thin client technology enabling a common desktop for users.

The federated nature of government business has led to different business units undertaking diverse business functions supported by multiple applications. Therefore, the complexity of unifying our infrastructure onto a single platform and migrating to a new ICT vendor would previously have been significant. However, with the advances in technology, and the accreditation of Cloud Services to securely host government data, many of these complexities have been reduced. This, in co-ordination with the end of the Merlin contract in 2019 provides a convincing argument for change. In parallel, austerity and the likelihood of further budget reductions for Welsh Government would mean a move to a less expensive ICT Service model in terms of both capital and revenue would be beneficial. This, however will bring challenges in terms of how we fund ICT as the requirement for Capital funding diminishes and revenue funding increases, a challenge which many in the Public Sector will face.

This strategy details the ICT Roadmap for this new organisation for the next five years, aligning our organisation with wider Public Sector strategies, developing our internal capabilities and removing our dependence on the Merlin contract for ICT Service.

Strategy documents should be living and breathing documents, rather than filed away and forgotten about, or produced as a means to tick a box; this document should serve to inform and reassure the business that ICT will meet its needs over the coming years, and provide direction to those working on ICT enabled projects.

As business drivers or political focus changes, this document should be updated, re-circulated and agreed, in order to provide a contextual direction at any given time.

1.1 Vision

This strategy will equip the Welsh Government with a modern, flexible infrastructure that will support the organisation and its users, enabling us to fulfil our functions over the next five years and beyond. The ICT marketplace has changed substantially over the last few years, as has UK government policy regarding ICT; this strategy reflects those changes, embracing cloud technologies which will help us move away from on-site infrastructure and aim to allow our users to access systems anytime, from anywhere. This document also details our migration away from physical infrastructure and our current ICT arrangements (provided under the contract known as Merlin).
This migration and strategy has been informed by gaining a better understanding of our users and their ICT needs going forward, which will enable us to provide a performant, resilient infrastructure, to help our staff be the best they can be.

Another key principle of this strategy, is to provide internal ICT provision. This means that we will look after our ICT ourselves and in order to do this we need to make sure we have the skills, capability and capacity to do so – the roadmap for achieving this is detailed herein. The outcome of this, will be that we have WG staff providing ICT support to WG users which means a greater understanding of business priorities when dealing with ICT issues. It also means more, good quality jobs for people in Wales.
In keeping with the Wellbeing of Future Generations Act, we will continue to embrace digital communications – using collaborative tools to enable staff to better interact with each other regardless of location and reducing the need for travel and face to face meetings.

We will also further enable our Flexible Working approach, by providing our staff with faster, more modern and more flexible equipment to allow them to access ICT on the move where necessary whilst retaining appropriate security controls safeguarding our data and systems.

Finally, but most importantly - this strategy must meet the needs of the business to deliver Ministerial priorities and the Programme of Government, therefore it must be reviewed by colleagues from different functions across the organisation on a regular basis, to ensure that as the shape, function and direction of the business changes, ICT will continue to adapt to support it.

2. Executive Summary

2.1 Strategy Priorities

The ICT Strategy's main aims are:

- To enable WG to meet its current and future priorities
- To enable and encourage flexible working patterns
- To provide a better experience and level of customer care for all users
- To migrate to modern, more cost efficient and environmentally friendly technologies and devices
- To provide a secure, resilient infrastructure platform which we can build upon in the future

In order to achieve these aims, there are five main work streams as illustrated and described below:

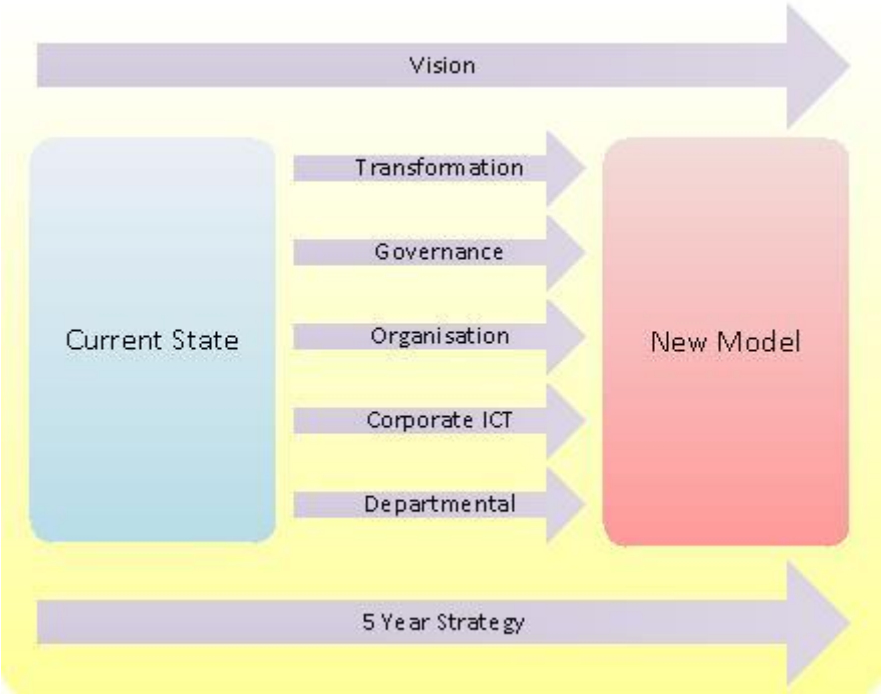


Figure 1 - ICT Vision

Transformation – This is the move from physical systems and from externally provided ICT, to cloud based systems and internally provisioned ICT

Governance – The introduction of new governance around ICT, both from a project and a day-to-day running perspective

Organisation – The development of the WG capability and capacity needed to run the ICT service post 2019, built upon the foundations of the existing ICT Team.

Corporate ICT – Once our new platforms are provisioned we need to look at the main, critical applications we use across the organisation and re-evaluate how suitable they are going forward

Departmental – For our applications used in specific areas of the business, we need to understand the likely future requirements and ensure they are accommodated within the strategy.

These work streams are detailed from Section 4 onward.

2.2 ICT Strategic Principles

The following Strategic Principles have been agreed by representatives from across the organisation, via the Solution Design Authority and presented to Operations Committee.

Figure 2 - Welsh Government ICT Strategic Principles

2.3 Purpose

The ICT Strategy will provide the roadmap, direction and guidance for ICT developments within Welsh Government for the next 5 years. The document will be periodically reviewed and updated in order to maintain it's context and relevance.

3. Context

3.1 Overview

The Welsh Government is at a transitional point in time with regard to its ICT Infrastructure; its framework agreement, known as Merlin, which has provided ICT Services to the organisation for over a decade is due to expire in January 2019. Consequently, the Welsh Government needs to put in place successive arrangements to ensure not only continuity of service, but to also provide greater capability to meet the demands of an increasingly digital world. The emergence of Cloud technologies and the portability and security of modern devices also means that ICT can now underpin our aspirations with regard to the agility of our staff and flexible working more widely.

As it stands, a substantial portion of our physical infrastructure (servers, SANs, network equipment) is approaching being out of warranty or beyond "end of life". This means that in order to safeguard ongoing service, a substantial capital investment is required. Indeed, with physical infrastructure, this capital investment cycle is an ongoing feature of ICT. The option now available to organisations such as ourselves is to move our systems into the Cloud. Whilst clearly there are transition costs involved in moving any ICT infrastructure, the lower costs of Cloud based services mean that savings will be realised in a fairly short term after the move. Further to this, Cloud services do not need ongoing capital investment cycles for server and datacentre infrastructure, as the Cloud vendor reinvests in their overall infrastructure as necessary, meaning that our servers are continually kept up to date. Resilience of Cloud systems is also considerably greater than the resilience we could afford to purchase as a single entity; the premise of Cloud is that the benefits of scale of hosting multiple organisations within the same datacentre (although entirely segregated) can more affordably provide enhanced capability to deliver ongoing service even during substantial infrastructure failures. The availability of these services from the Cloud, are typically supported by a financially backed SLA (Service Level Agreement), which means that in the instance of outage, which is typically less frequent than with standard infrastructure, then WG would be refunded monies in line with the scale of the service and the duration of the outage.

In line with a number of public sector bodies such as Northern Ireland Executive, Natural Resources Wales, Companies House and DVLA), Welsh Government will provide its own ICT service as a replacement, utilising SME vendors for 3rd line support as well.

This involves the augmentation of the current ICT Team (currently responsible for managing the Merlin BAU (Business As Usual) contract) to create a fully fledged ICT Service and project delivery capability. This enhanced capability will require a combination of up-skilling of existing staff, recruitment of new staff, apprenticeship and graduate schemes and some potential TUPE on contract end – resulting in an increased headcount.

As services will be migrated from Merlin to WG ICT gradually during the period up to the contract end point, this enhanced capability will also need to be grown in a gradual fashion, to ensure readiness for the services as they are transitioned to the responsibility if the WG.

One of the primary focusses of the Future ICT Replacement programme is to ensure Business Continuity throughout this transition period, ensuring that the organisation can continue to function at least as effectively, regardless of systems being moved to the Cloud, or services being transitioned to WG.

This document will also cover WG's ICT Strategy at the end of the Merlin contract, and will detail how we will best leverage our new Cloud based infrastructure for the benefit of the organisation, Wales' citizens and other stakeholders.

It is recognised that ICT exists to serve the business need, consequently it is imperative that ICT is represented at the highest level within the organisation; every single task we undertake as a government is underpinned by ICT therefore we must recognise its importance.

We will also ensure we aim to meet the needs of all our users from within central ICT regardless of their location or any additional assistance software or equipment they require. Due to the security requirements of the GSi (Government Secure Intranet), mobility of staff ICT has been limited. The new roadmap will enable much greater mobility of staff and will provide the ability to use modern devices such as tablets and smartphones virtually anywhere.

We will aim to ensure that we comply with the Welsh Language Act, and the new Welsh Language Standards in the choices we make regarding our systems and infrastructure.

3.2 Challenges

The Welsh Government needs to prepare for the end of the Merlin contract in 2019 and to achieve ongoing service it needs to develop its own ICT capability. In the meantime, a transition programme has been set up which will move the majority of WG's applications to the Cloud, and in doing so reduce complexity and total cost of ownership. As applications are transitioned from legacy physical infrastructure to the Cloud, responsibility for their ongoing service will transfer to the new WG ICT team. This means that between now and contract end, their will be a gradual glide path downward of services taken care of via the Merlin contract.

It is anticipated that due to the reduced total cost of ownership of Cloud, that savings will be made which can be re-invested in providing better customer service to staff.

Long term contracts do not typically deliver optimal levels of innovation, value for money or change. A factor of this is evident in that we are bound to use legacy waterfall based methodologies, which often make new innovative style developments not possible as there is no provision within the Merlin contract for small AGILE based developments. Consequently, it could be viewed that the flexibility and adaptiveness of the current WG systems has been limited over the past few years. We have also been constrained by the GSi (Government Secure Intranet) CoCo (Code of Connection) as this has robust rules regarding our connectivity to external services and our internal controls. Moving away from this model whilst providing us with greater opportunities to innovate and to share date more widely with external stakeholders, also presents challenges in terms of cyber security and ensuring our sensitive data is protected appropriately. It is important therefore that WG develops additional capability in the area of cyber security in order to leverage the benefits of greater flexibility, safely.

3.3 Well-being of Future Generations Act

In 2015, the Welsh government introduced the Well-being of Future Generations Act. The Act will ensure public bodies think more about long term outcomes and impacts, work better with people and communities and each other, look to prevent problems and take a more joined-up approach.

It expects public bodies in Wales will:

- work together better
- involve people reflecting the diversity of our communities
- look to the long term as well as focusing on now
- take action to try and stop problems getting worse - or even stop them happening in the first place.

With this is mind, this Strategy in particular aims to produce a low carbon, sustainable ICT estate which meets the meets of all its users. Our move toward cloud technologies means we can move away from the need to have our own physical datacentres, and share facilities with many other organisations, benefitting from the much larger scale and much more modern cooling and power

technologies. In the workplace itself, the use of modern devices will enable both flexible and collaborative working, allowing conferencing from the desktop, better working from home and overall, a reduced need for travel.

3.4 User Application Delivery

3.4.1 Current Situation

Over the last decade, WG has invested substantially in the Citrix platform which is able to deliver Windows based desktops to a variety of devices. The "computing" is undertaken on the Citrix servers themselves within the datacentre, and the consuming device can therefore be very low cost and very low in power consumption. An additional benefit is that the majority of network traffic is between the Citrix Servers and WG's other application servers which are within the same datacentre. In a traditional Rich Client model (where users have a normal PC on their desktop), traffic is between the client (i.e. the desktop) and the application servers themselves, which can mean larger network capacity is needed and also users may notice greater latency (slow response times) when accessing applications, particularly from remote sites. Having a standardized Citrix based desktop also means that users can easily log in to any thin client device located across the estate, as they are identical and do not hold any user information, which has enabled a much more flexible working method to be adopted and a simple deployment of hot-desking capability across the estate.

Historically, using rich clients would have inhibited this capability, as a user's profile would have need to have been copied to the client machine, which can result in storage issues as multiple client profiles could end up residing on a machine. The other issue this causes, is where users' profiles become large, as this can have a substantial network impact particularly at times when many users are logging on (i.e. between 8am and 9 am).

To contrast, Citrix deployments require a large amount of server power in the datacentre – each Citrix server in WG is capable of hosting between 40 and 50 user desktops at any given moment, meaning that well over 100 Citrix servers would be required to service the WG's user base – and that is before any resilience is factored in. These servers need to be replaced on a 5-7 year cycle which requires substantial capital investment, as well as ongoing maintenance throughout the period.

In WG, the adoption of Citrix has meant that "Thin Client" devices have been most widely used across the estate, which has allowed a broadly standardised desktop to be delivered to all users across the estate. Additionally "Citrix Receiver" technology is used to provide remote access to users from laptops and iPad devices. This technology essentially turns a Rich Client device temporarily into a thin client device, meaning no data is stored locally and WG security requirements can be upheld regardless of the consuming device.

It should be noted, that some of the estate's assisted users are unable to use thin client devices, as their assistance software does not function very well with Citrix. As a consequence, we have a number of users who remain on rich client devices.

Whilst WG has benefitted substantially from the standardization of the desktop, technology has moved on substantially since its introduction, as has user expectation regarding devices. Similarly, Cloud based technologies have emerged, and in this context we need to review the user delivery

model within WG, ensuring we can meet modern requirements of mobility and flexibility, whilst not losing the benefits of our Citrix investment over the last few years. It is also critical that we provide the same level of service for all our users across the estate, regardless of their assistive technology requirements.

3.4.2 Future Strategy

Citrix will continue to be used for much of the migration phase and the desktop will remain the same, meaning that initially users will not notice the application servers being moved into the Cloud as the user experience will be almost identical. In most instances, as servers are being replaced with new Cloud based virtual machines, users should instead notice an uplift in performance as the new servers will be replacing, in some instances, servers that are beyond end of life out of support, with brand new hardware. As more applications are moved into the cloud and the Citrix infrastructure ages, we will in tandem start to rollout traditional Rich Client PC's to desktop users. Citrix will however continue to be used for supporting our BYOD (Bring Your Own Device) service called Stratus. Indeed, as we roll out Rich Clients to users and the Citrix requirement diminishes, we will move Citrix servers to support Stratus, to provide a better service for our BYOD users. Over time, once the physical infrastructure is at end of life, we will move the Stratus Service into our cloud-based datacentre. We will monitor ongoing the use of Stratus, in order to determine its lifespan within the organisation; if users generally prefer using a WG Tablet, then Stratus can be phased out over time.

3.4.3 Infrastructure Impact of Moving from Citrix to Rich

As rich clients are rolled out across the estate, there will be an impact upon the infrastructure required to support the user base; whilst Citrix diminishes, we will need to implement a service to store a user's profile (all their desktop settings and any specific files or applications) to ensure that when they log in to a different machine, they will have the same experience. The adoption of this methodology (known as "roaming profiles") means that when a user logs into a new machine, their profile is downloaded from a central service onto the local device. This means that as well as there being a storage requirement in the datacentre to hold these roaming profiles there is also a network impact upon logon; if many users logon in a similar timeframe this could potentially impact upon network performance, particularly in remote sites where bandwidth may be limited. Whilst technology has greatly improved in this area, particularly in the efficiency of the delivery of the user's profile and the increase in our network, we will still need to implement a number of constraints in order to ensure that the storage used in a user's profile is minimised – this is also in line with our record keeping policy, as all corporate information ought to be stored within iShare, or the relevant business application.

3.5 User Types

A substantial study was undertaken of how individuals within the organisation work in order to categorise our user types. This categorisation will allow us to provide users with a standardised ICT offering. These user types are detailed in Appendix C – User Types.

3.6 User Packages

This section shows the mapping between the user types defined in Appendix C – User Types and describes the ICT packages aligned to each type. A hardware policy will be developed which further describes this in due course

Table 1 - User Packages

User Type	Thin Client or PC	Power PC	Laptop or Tablet	Smartphone	Stratus
Office Worker	✓				
Office-Home Worker			✓		-
Home Worker	✓				-
Office-mobile Worker			✓	✓	-
Mobile worker			✓	✓	-
Technologist		✓		✓	-
On Call			✓	✓	-
VIP			✓		-

The proposed user offerings contain the following devices:

Desktop device

A thin client or traditional rich client – the functionality of both is the same from the user's perspective; however it has substantial implications in terms of infrastructure. As any user will be able to log in to any device (regardless of thin or rich) then this will continue to promote the Flexible Working initiative.

Tablet Device or Lightweight laptop

A modern tablet device with keyboard or lightweight laptop. This will replace the traditional laptops that have been provided to staff. Large screen sizes, better chipsets and ergonomic keyboards means there is no difference in functionality between tablets or lightweight laptops and traditional laptops, whilst the former options offer a much more lightweight solution with greater connectivity and better battery life.

Smartphone

Our existing stock of Blackberrys will be replaced with Smartphones which will be integrated with Office 365. These devices offer much greater functionality than our legacy Blackberry devices, whilst retaining appropriate levels of security.

Exception device

Where a tablet or lightweight laptop device is deemed unsuitable (for example if a user of Assistance software requires additional peripherals or a user requires high performance computing) then a device will be issued that meets the user's needs. This will be dealt with on a case-by-case basis.

Apple iMac desktops are also in use on the estate and will continue to be supported.

3.7 Operating System Strategy

A virtualized Windows 7 desktop is currently delivered to thin client users across the organisation via Citrix. Laptop devices are also Windows 7 and there are a number of Apple iPads and Apple Macintosh PC's running various versions of iOS.

Going forward, when new devices are issued they will be using Windows 10, with an Enterprise build – this includes thin client replacements, tablets, smartphones and any laptops we need to issue.

3.8 Software Strategy

As a preference, Microsoft technologies will continue to be used at the operating system and server level. As well as providing industry standard capability, this option also provides us with the most standard migration path to cloud. It should also be noted that Microsoft Azure supports the use of many open source software packages and operating systems which can be considered for new projects in the future.

User Software packages will be reviewed during the course of the next five years, and all critical applications will be assessed for their strategic compatibility.

3.9 Datacentre Strategy

The Welsh Government currently operates two main datacentres, known as DC2 and DC3.

DC2 is located in the basement of a property rented by the Home Office in Newport Road, and DC3 is a hall within the Mitel datacentre in Caldicot. Additionally, Welsh Government also has servers in a number of datarooms within office locations throughout Wales.

Moving forward, it is the intention to reduce the number of physical datacentres and datarooms we use. With this in mind, WG's strategic datacentres have been identified as DC3 and MS Azure which will be known as DC4 (one being physical, the other being Cloud-based). We will also require some capacity in DC1 (the data room within CP1). It is expected that all non-strategic data-rooms will be wound down over time, until they contain communications and management servers only.

DC3 will be our primary repository for legacy HF systems, which cannot be migrated to the Cloud, as well as some management and communications servers. DC4 will be our primary repository for data and applications.

3.10 Application Strategy

Over the next five years, the process we will undertake with regard to our application set, is to Migrate, Evaluate and Consolidate.

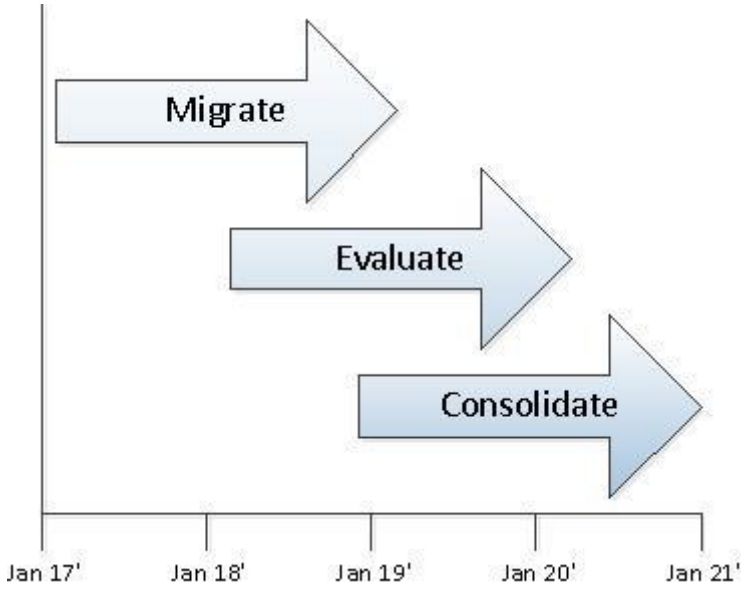


Figure 3 - Application Strategy

1. **Migrate** – As described later in this document, during the Transformation period, applications will be moved to the cloud in their current state, with as little change as possible, in order to achieve the timeframe.
2. **Evaluate** – Once an application has been moved to the cloud we need to evaluate its strategic context for the organisation, in line with the principles in this document. A strategic forum will look at each application in turn, along with the business area using the application and look for opportunities enabled by the new infrastructure.
3. **Consolidate** – In this phase, where beneficial to the organisation, we will refresh, re-platform or retire applications identified during the evaluation period.

3.11 Supplier Strategy

In line with the emergence of the NPS, the way we purchase ICT has begun to change; Instead of procuring mainly through the Merlin contract, WG now increasingly uses the NPS categories that are available.

The key procurement principles we will apply are

1. Making sure that we comply with the Wales Procurement Policy Statement.
2. Embedding the requirements of the Well Being of Future Generations Act to deliver measurable, sustainable outcomes.
3. Ensuring that our procurements support the development and investment in the economy in Wales, creating jobs and encourage Welsh suppliers to bid.

3.12 Telephony

At time of writing, the Unified Comms project is about to role out VOIP telephony which will replace traditional PBX telephony across the Welsh Government estate. As well as increases in call quality, the cost of telephony across the estate reduces substantially as internal calls are routed across WG LAN and WAN infrastructure, rather than public telephone networks. As we move forward with delivery of this strategy and the Unified Comms project, this will be further complemented by instant messaging, collaborative tools and video and audio conferencing from the desktop. All of these features will be available to all users across all sites, thus reducing the need for travel to and from meetings and reducing the requirement for costly video conferencing infrastructure.

3.13 Print Strategy

At time of writing, printers used across the estate are purchased rather than leased, which means that periodically we have to invest in new printers as they become unreliable and out of warranty.

If users have a printer issue, then they contact the main Service Desk on 5555. Atos will attempt to fix the issue, if it is not hardware related. Hardware issues are passed to the printer vendor which is typically Hewlett Packard. Consumables such as toner cartridges and paper are purchased centrally in Welsh Government.

As we migrate to managing our own ICT Service, we must also begin to manage the print capability for users. In order to do this, WG will consider over the next two years, the most suitable option for doing so, which may include a managed print solution.

3.14 Assisted Users

Our Strategic Principles state we will “Address the needs of our disabled service users when developing and delivering our products and services”. What this means in practice is that we will ensure the needs of all our users are met by the ICT Service we provide. In order to do this we will, through the governance mechanisms described later in the document, ensure that all new systems and any substantial changes to systems are co-ordinated with the Disability and Awareness Support group (DAAS). The new WG ICT Service will also have a specific function catering for users of

assistive software and ensuring we are able to provide suitable assistive products to all our users where required. To make this manageable, a standardized suite of products will be made available by consultation with DAAS and kept up to date to ensure they remain in support from the vendor.

WG will also consider making operating system based accessibility tools such as Magnifier and Narrator available as part of the standard package available to all staff.

4. Strategic Workstream 1 - Transformation

4.1 Transformation

4.1.1 Aims and Principles

The aims of the Merlin Replacement programme are:

1. To provide WG with its own ICT capability to service users
2. To migrate off legacy infrastructure and move toward the Cloud as swiftly as possible to achieve maximum cost savings, whilst providing minimum disruption to users and stakeholders
3. To review systems for appropriateness as they are migrated to determine
    a. Ongoing relevance to the organisation
    b. Whether the solution can be retired
    c. Business Ownership of the solution
4. To provide WG with a capability to service online users in a cost effective, convenient manner
5. To ensure that WG is self sufficient to provide and develop its own service

4.2 Internal ICT Capability

4.2.1 Current Arrangements

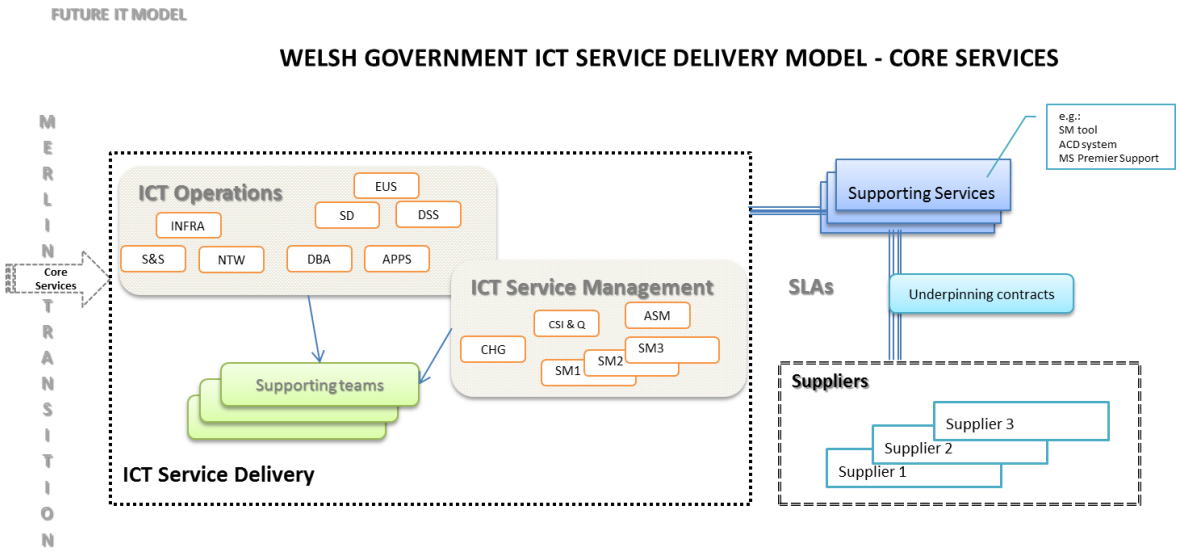
Currently the WG ICT is outsourced through the Merlin contract which is due to end in January 2019. As part of this arrangement, the services supported by Atos range from Service Desk and Infrastructure services to managing assets and application support.

The Merlin contract and Atos's service performance is managed by a small ICT team internal to WG, whose role is to control and audit the vendor's performance and drive improvements accordingly. In addition to the service management role the WG ICT team is fulfilling, the team also has a small operational team looking after services that are outside Merlin scope such as Stratus and some other non-GSI systems.

4.2.2 Support Strategy

Our Strategy is that in January 2019, WG will have a fully functioning ITIL aligned ICT service, which will provide the functions that until that point have been delivered by ATOS. In order to achieve this, we will need to gradually build capability throughout the course of the migration; i.e. when infrastructure is built or applications moved to the Cloud, WG will need to have the capabilities ready to support them.

To be able to support these services, WG's focus needs to be on building resources with the right skill sets, provisioning and development of the tools required and designing the IT processes. This will build the foundations of a mature ICT organisation, which will efficiently deliver good customer service to our organisation.



Key building blocks to the WG ICT Service Delivery :

- Fit for purpose IT Service Management tool : high level of integration, rich in capability
- Robust and mature service management processes
- Well established governance and communication framework
- Well defined organisational structure : roles & responsibilities , skills mapping
- Well controlled Supplier Management

Figure 4 - ICT Service Delivery Model

4.2.3 Migration Timeframes

The transition programme's primary aims are to provide a replacement service for the Merlin agreement which is scheduled to expire in January 2019. The two primary components to this are creating an ICT Support organisation and moving all the current core applications into a Cloud based environment in order to simplify support and simplify and refresh infrastructure prior to the end of the contract. The timelines for the programme are illustrated below:-

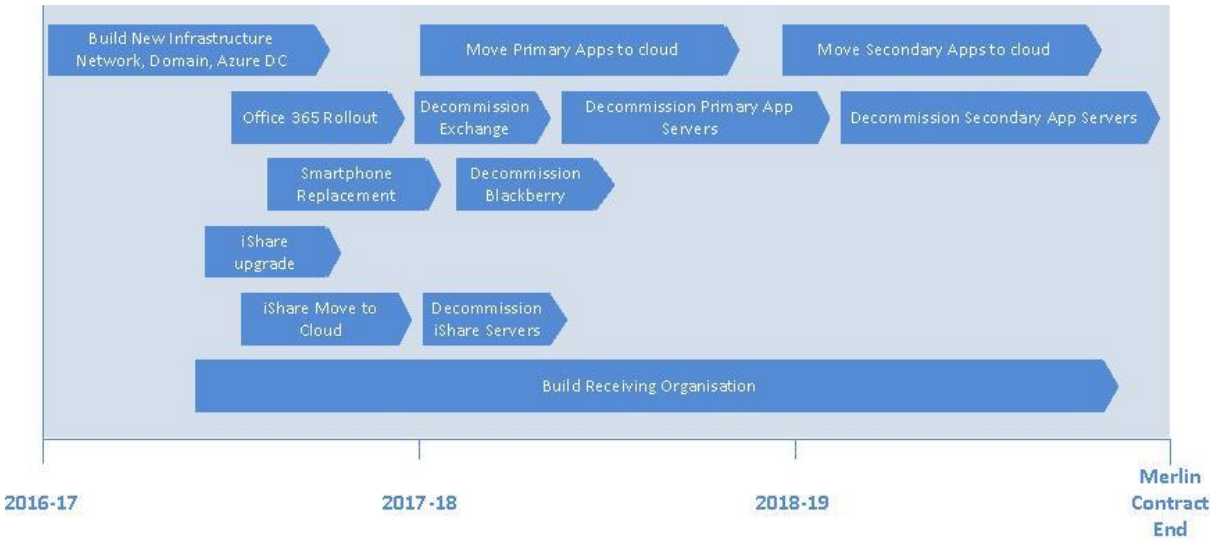


Figure 5 - Migration Timeline

4.3 Target Operating Model

The Welsh Government consists of many different business areas, each dealing with either ministerial deliverables or corporate functions. An operating model is a simplified view of how an organisation such as ours operates. With the transition of ICT provision from Merlin to an internal service, there are a number of changes required to the operating model from both a technical and a functional perspective.

The first diagram, overleaf illustrates the technical changes, showing how new infrastructure elements will be created, and legacy infrastructure migrated.

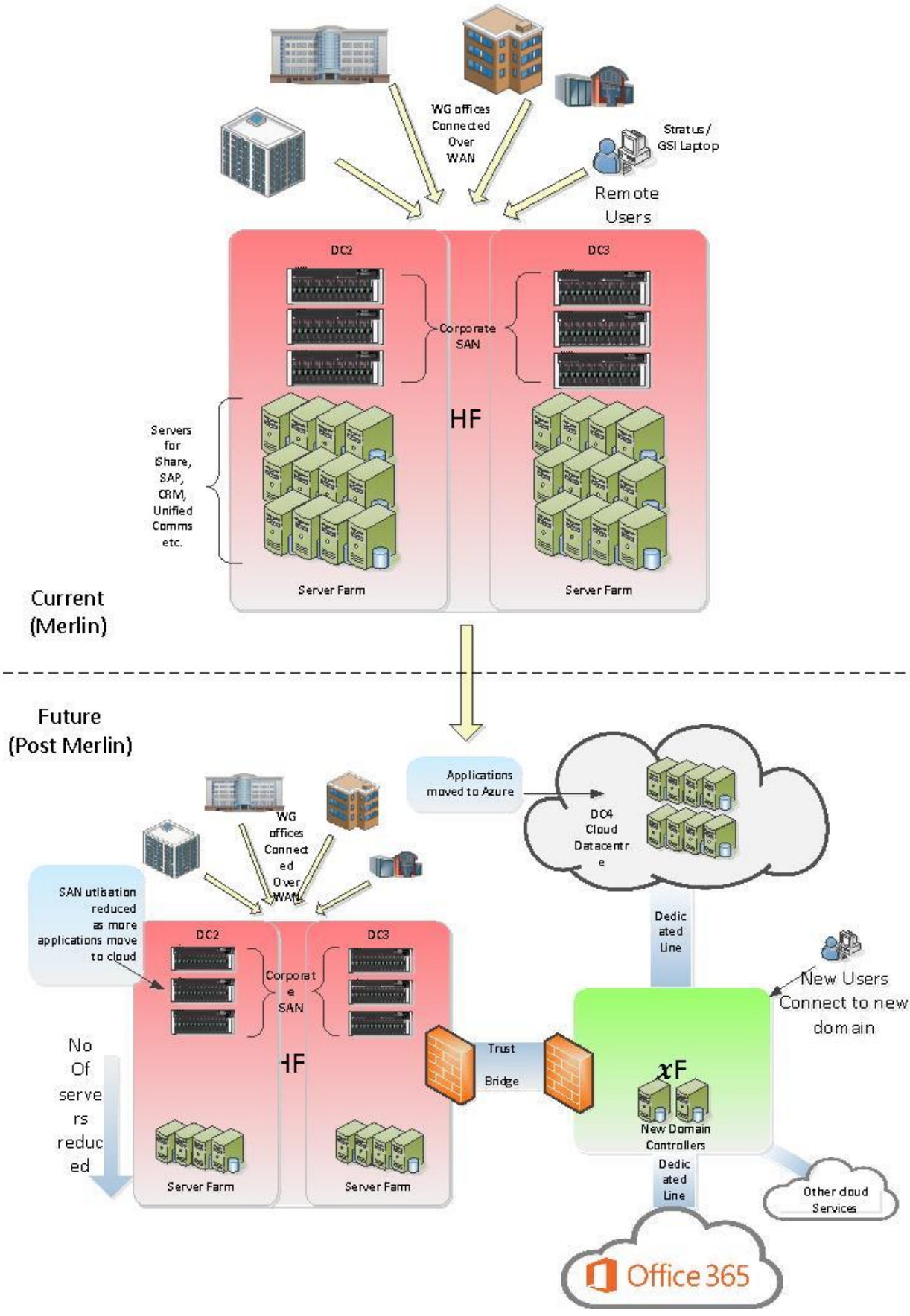


Figure 6 - Target Operating Model – Technical

Key Points

- **Creation of a new network domain**

  This new domain will be created to allow a new Welsh Government managed network infrastructure to be setup. During the migration phase this is critical, as it is allows a clear designation between Merlin managed and WG managed infrastructure and applications. Going forward, new WG users will be connected to this new domain, instead of the legacy HF domain. This new domain will be connected to the new Cloud based datacentre below. More importantly, it will have a "two way transitive trust" between itself and the legacy HF domain. This means that from a user perspective, applications can be consumed seamlessly from either the legacy network or the new network – indeed the user will not be able to tell the location of the service they are consuming.

  It is the aim to migrate all applications into the new Cloud datacentre, however it is known that there are some legacy systems which cannot be migrated (such as AS400 based applications), therefore the legacy network will become minimised until these applications are deprecated, at which point the HF network can be switched off - to note, this does not need to be co-terminus with the Merlin contract end as the infrastructure on the HF network is owned by WG.

- **Creation of a Cloud based datacentre**
  The new network will be connected to a Cloud-based datacentre, capable of providing IaaS (Infrastructure as a Service) and PaaS (Platform as a Service) capabilities – see Annex XX for definition of these. This datacentre will be the Microsoft datacentre based in Newport. This new capability will become the strategic hosting environment for all our applications where technically possible.

- **Rollout of Office 365 to all staff**
  Office 365 is one of the PaaS services we will consume from the Cloud based datacentre. It provides a Cloud based MS Exchange service which will provide all our email requirements, using the new @gov.wales email suffix, replacing the @wales.gsi.gov.uk suffix. Office 365 also provides the licensing model for MS Office (Word, Excel, Powerpoint etc) as well as licensing for Sharepoint, Skype for Business, Yammer and 1TB of Cloud storage per user.

- **Replacement of Blackberry service**
  The ageing Blackberry service will be decommissioned and superseded by a Smartphone capability that will be rolled out to current Blackberry users. These smartphones will be linked to the Office 365 service in the new Cloud datacentre.

- **Migration of applications to Cloud based datacentre**
  Throughout the migration period, our critical applications will be prioritised and moved into our new cloud datacentre.

5. Strategic Workstream 2 - Governance

5.1 Governance Procedures Overview

In March 2016, a new governance regime was established which comprises the following:

5.1.1 The Solution Design Authority (SDA)

A central authority which governs and reviews proposed solutions, ensuring they are chosen for reasons aligned with WG ICT Principles, and that they are implemented to WG standards, architectural models and change roadmap. The Solution Design Authority attendees are representatives from across the business thus ensuring a view across the organisation is achieved prior to approving a solution. Proposals are submitted to the SDA mailbox as required, and the group will meet regularly with the remit of authorising the proposals and of providing advice and guidance as appropriate.

5.1.2 Comprehensive Portfolio Management

The role of the Solution Leads will be extended into managing business solutions as a portfolio of applications and systems as part of the SDA. Solution Leads will also act as the gateway for Solution Designers within their Departments, providing advice and governance prior to solution proposals being submitted to the SDA.

5.1.3 Project Management Structures

Providing resource and completing work

The WG Project Management Office (PMO) will take input and demand from the SDA, for solution proposals that are approved and are to be completed by the ICT dept (rather than in the business areas themselves). Based on this demand, the PMO will provide resources to complete the work across:

- project managers
- business analysts
- ICT architects
- ICT engineering
- Test

The PMO will, based on internal resources available, produce a programme of projects that gives the organisation a timetable on ICT project delivery. Where the business need is great enough, the internal project resources may be bolstered flexibly, by assistance from third party organisations or the contract workforce to accelerate delivery.

Principles

The WG ICT PMO will remain aligned to the following principles

- **Only do it if it adds value** – we want to focus our efforts on creating tangible outputs, rather than process for its own sake.

- **Decisions when they're needed, at the right level** – we want the people closest to the subject matter to feel empowered to decide (within sensible guidelines) and not wait until governance checkpoints such as a project board to seek approval or endorsement
- **Don't slow down delivery** – *those asked to fill a management or assurance role on the project need to work at the same pace as the project team*

This means that we need to adopt newer, more flexible ways of completing work, that will use different techniques within the of the programme and project management toolbox. It may mean that each piece of work has the potential to be managed differently depending on:

- Whether it's critical and/or urgent
- Whether it's a high risk piece of work
- Whether it's an infrastructure or software related project

5.1.4 Programme and Project Governance

We will still use Programme and Project Boards (as advocated in 'waterfall' methods such as MSP and Prince II), to provide assurance and governance so that projects have the best chance of success. Where the project is being run more flexibly than a traditional waterfall method, such as agile methods like Scrum or Kanban, the project will still be expected to provide reports into whichever higher level project or programme is sits within.

5.1.5 Methodologies

Planning and Design

All programmes and projects will be supported to achieve a fast start on work, providing tangible deliverables as quickly as possible. Projects will be encouraged to perform 'just enough' design and 'just enough' planning before starting build and implementation. Techniques such as Progressive Elaboration and Rolling Wave can provide sensible alternatives to a large and drawn out planning and design processes.

Implementation

The Methodologies used by the WG ICT PMO will vary and be appropriate to the type of project being worked on:

- Infrastructure projects will more often than not be completed using waterfall methodologies, with clear gates between sequential parts of the lifecycle such as Requirements, Design, Build, Test and Deploy. Infrastructure projects will also be supported to try modern methods of agile infrastructure project delivery using Spiral approach, to assess whether speed and efficiency of delivery is improved, working in a different way.
- Software projects will be supported to use modern agile methodologies such as Scrum or Kanban.

5.2 ICT Asset Management

To support the device strategy and ongoing cost management, data protection and audit within WG, a full Centralised Asset Register (CAR) will be created and maintained by the ICT Team.

The Asset register will contain details of

- All devices owned by WG (including desktop, laptop, specialist, mobile)
- Details of to whom devices are allocated
- Details of any contracts for provision of internet connectivity
- Details of any contracts for provision of telephony (mobile and fixed)
- Details of support contracts for all devices (including user devices and infrastructure)
- Details of all software
- Details of software licenses including costs and expiry dates
- Details of all software support contracts including costs and expiry dates

5.3 ICT Financial Management

The current financial model in Welsh Government for ICT spend is diverse; some ongoing departmental ICT costs are paid for centrally whilst some are paid for within the department. All applications have an impact on infrastructure maintenance; however this is paid for within ICT, without contributions from departments. During the transformation period, Welsh Government will consider rationalising its approach to ICT spend across the organisation, to ensure a sustainable, transparent model is in place going forward.

ICT project spend is also departmental, however visibility of this has been much enhanced by the introduction of the Solution Design Authority. Mechanisms for better pipeline planning and orchestration across the estate will also be introduced.

Many organisations struggle to find the re-investment required to ensure that user devices are modern and kept up to date. Some organisation have introduced a model whereby user devices are effectively rented for an annual cost from the a central ICT function. This can help cover the costs of infrastructure support and can also provide a contribution toward refreshing this equipment on a 3, 4 or 5 year basis. This removes the need for large scale capital reinvestment and also large scale business change, as the refresh can be staggered across the orgranisation, thus making it incremental rather than “big bang”, This and other strategies will be considered for ongoing user device refresh approaches.

6. Strategic Workstream 3 – Organisation

6.1 Current Arrangements

Currently the WG ICT is outsourced through the Merlin contract which is due to end in January 2019. As part of this arrangement, the services supported by Atos range from Service Desk and Infrastructure services to managing assets and application support.

The Merlin contract and Atos's service performance is managed by a small ICT team internal to WG, whose role is to control and audit the vendor's performance and drive improvements accordingly. In addition to the service management role the WG ICT team is fulfilling, the team also has a small operational team looking after services that are outside Merlin scope such as Stratus and some other non-GSI systems.

6.2 Development of Internal Capability

As the diagram below shows, during the migration process, the vast majority of HF services will be transferred from Merlin control to Welsh Government control. Consequently, WG will need to develop the skills and capacity to maintain these services, continue to improve them and ensure that they meet the organisation's needs as required.

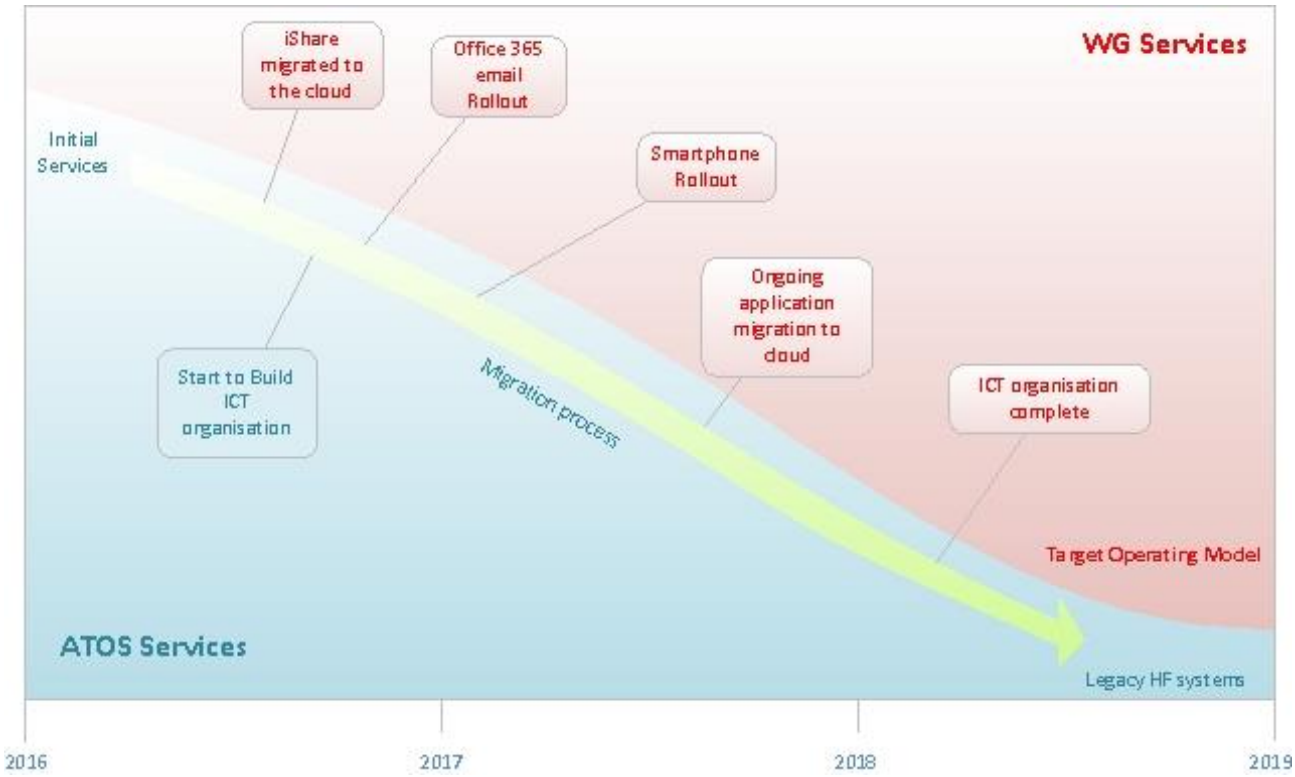


Figure 7 - Transition of Atos Services to WG

As noted, it will therefore be necessary during this period, to grow our ICT capability in terms of numbers (through internal transfers, external appointments and apprenticeships) and in terms of skillsets (through training courses, self learning and knowledge transfer). As well as growth, robust processes based on ITIL[1] and new ways of working will need to be introduced in order to provide a professional service desk facility as well as the other aspects required, such as service management, desktop, infrastructure and networks support. New software tools will also be required to undertake this service.

[1] **ITIL** is a best practice framework that has been drawn from both the public and private sectors internationally. It describes how IT resources should be organised to deliver business value, documenting the processes, functions and roles of IT Service Management (ITSM). It is considered to be best practice in government.

6.3 Support Strategy

Our Strategy is that in January 2019, WG will have a fully functioning ITIL aligned ICT service, which will provide the functions that until that point have been delivered by ATOS. In order to achieve this, we will need to gradually build capability throughout the course of the migration; i.e. when infrastructure is built or applications moved to the Cloud, WG will need to have the capabilities ready to support them.

To be able to support these services, WG's focus needs to be on building resources with the right skill sets, provisioning and development of the tools required and designing the IT processes. This will build the foundations of a mature ICT organisation, which will efficiently deliver good customer service to our organisation

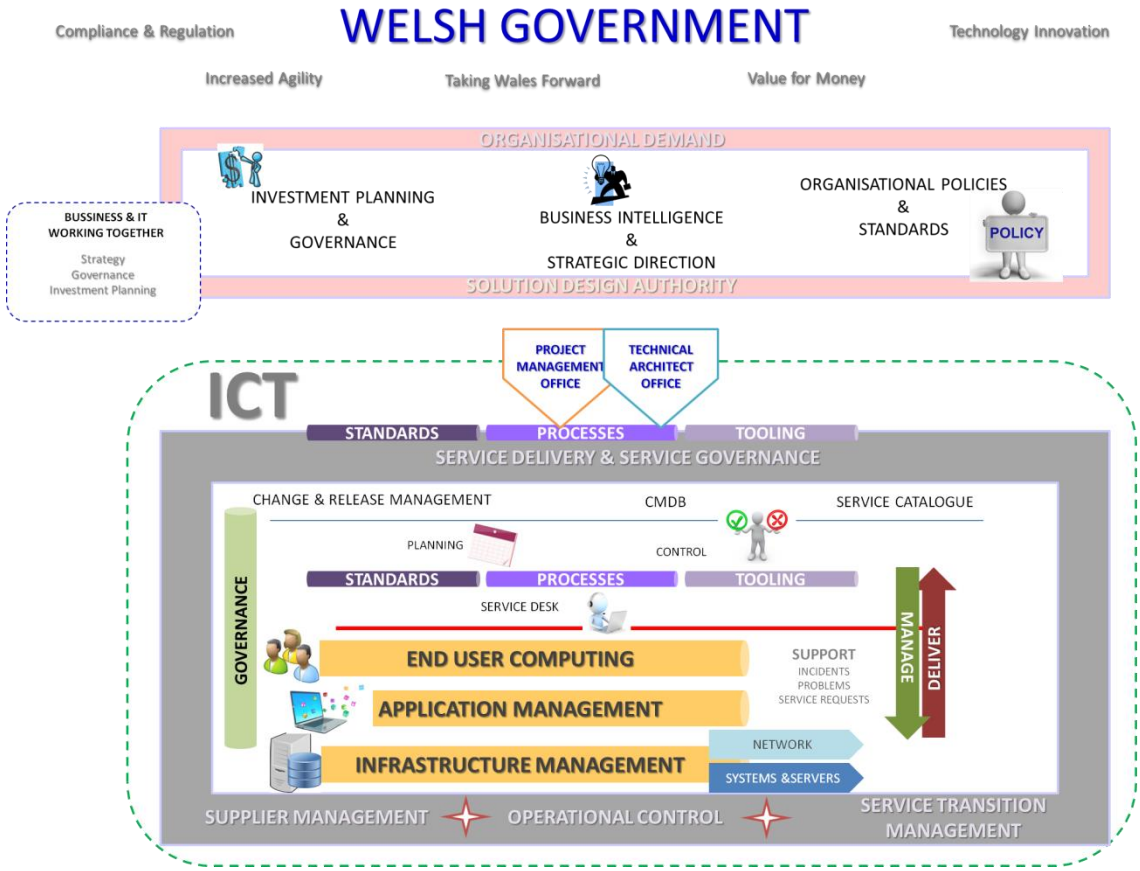


Figure 8 - Target Operating Model

In order to provide an ICT Service on conclusion of the Merlin contract in January 2019, WG will need to build a new team to replace the service currently provided by Atos.

This team will be built upon the current ICT Team, utilising the skills and expertise already in place, and complementing this with new team members and apprentices.

New process will be implemented in order to manage the service, along with ITIL standards and a Service Management Tool will be delivered to support the new processes.

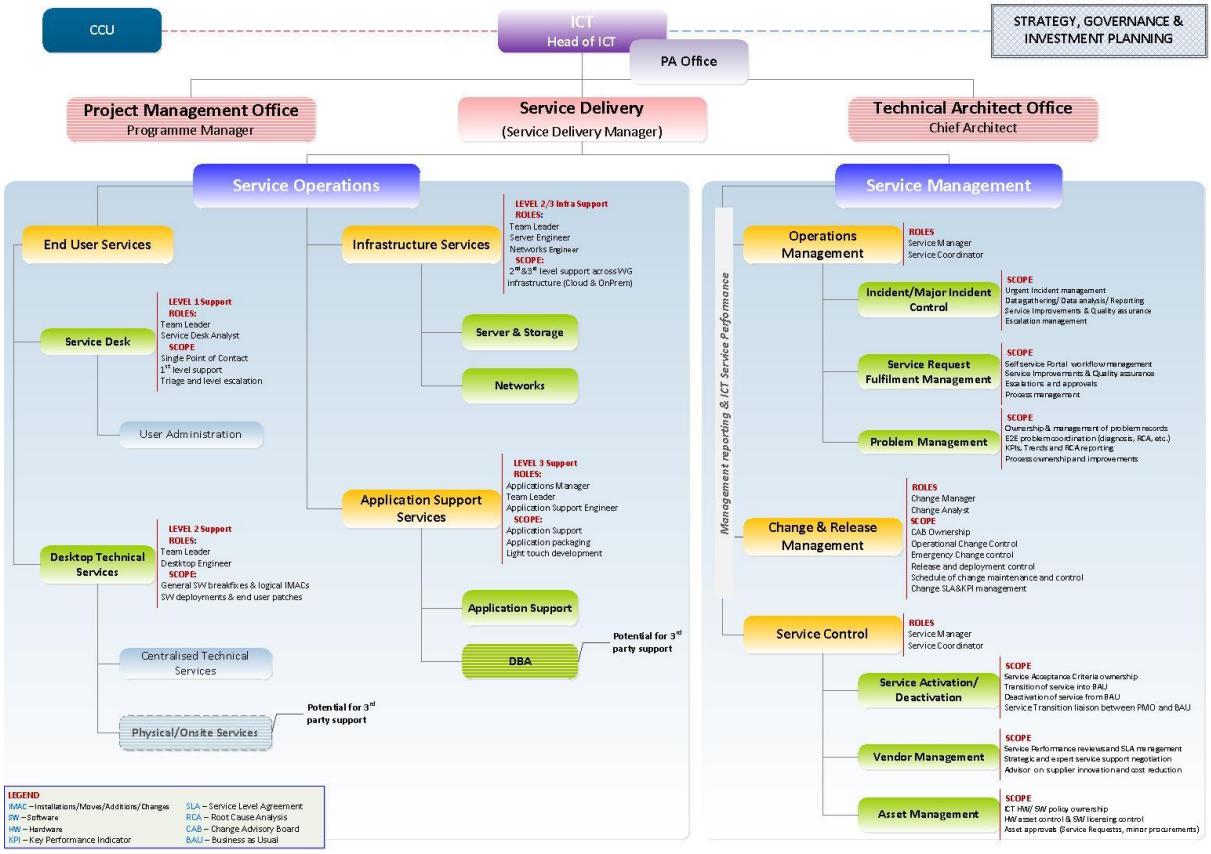


Figure 9 - Future ICT Team Functional Diagram

The diagram above illustrates how the service delivery model will look when WG delivers its own ICT services from January 2019.

The delivery of services in ICT requires two specific functions, firstly a Service Operations capability, with the scope of supporting end user services, the infrastructure and applications. The second capability is Service Management – this is the team that ensures a continuous high standard of ICT delivery, which includes change management, continuous process improvement, asset management, vendor management and service level management.

As shown, these two functions are assisted in their delivery by supporting teams, which will have specific expertise in technical and service management areas.

The BAU (Business as Usual) capability will adopt processes and policies designed by following the ITIL framework. This will help with providing for a service that is well structured, mature and measured and will facilitate better integration with business processes and policies.

7. Strategic Workstream 4 – Corporate ICT

7.1 Overview

Our Corporate ICT is the systems and applications that are used by most staff on a regular basis. This list includes applications such as:

- Microsoft Outlook
- iShare (our ERDMS system)
- Microsoft Office (Word, Excel, PowerPoint etc.)
- SAP
- Intranet
- Business Directory

Currently, Welsh Government has a number of applications which are used by most staff on a daily basis. Whilst the scope of the transformation stage is to undertake a "lift and shift" approach to migration, it is important that WG consider its strategic choice of Corporate platforms during the migration period as many of these applications were chosen some time ago, prior to the emergence of Cloud technologies. The replatforming of these applications into the cloud which will occur during the transition period, will potentially enable much smoother migration to other platforms as infrastructure, data and systems will be under Welsh Government control.

During Financial Years 2017-18 and 2018-19, Welsh Government will meet periodically to look at which systems need to be reconsidered in a strategic context, and whether migration could bring business and efficiency benefits to the organisation.

8. Strategic Workstream 5 – Departmental Business Systems

8.1 Overview

At time of writing, there are a number of separate ICT organisations within WG, which each support an application or suite of applications delivering a specific business function. Some of these ICT organisations are small and have a limited range of functions, whilst others offer the whole range of application development and support, and have their own infrastructure – such as WEFO and RDP. Most of these however are underpinned by some element of the Merlin contract.

During the Transition process, we will need to move the Departmental Business systems which are based on physical infrastructure into the cloud and it is anticipated this will be undertaken by the team responsible for maintaining and supporting the system currently in liaison with the Transformation team. For applications which are dependent upon support elements provided under Merlin, these requirements will need to be considered when creating WG's internal ICT Capability with timescales aligned accordingly, in order to ensure a seamless continuity of service.

During the migration phase, systems will be evaluated to ensure that opportunities to gain efficiencies during the replatforming process are taken. This may include migrating database applications to PaaS (platform as a service) rather than standalone implementations, or sharing cloud infrastructure already implemented for other WG systems.

As we move forward past the migration phase, Welsh Government will continue to move toward centralised ICT systems and services, in order to gain the benefits of scale and resilience that a larger team affords. Once Transformation is complete, WG will identify candidates for centralisation and establish a timeline for completion of this activity.

9. Appendix A : Glossary of Terms

Term	Definition
AGILE	A method of project management, used especially for software development, that is characterized by the division of tasks into short phases of work and frequent reassessment and adaptation of plans
Android	An open source operating system used predominantly in mobile phones and computers
BAU	Business As Usual – in this context referring to the say to day running of ICT Systems
BYOD	Bring Your Own Device – the concept of using one's own device for work purposes
CAR	Centralised Asset Register – a central log of all an organisations ICT related assets
CoCo	Code of Connection – the security and physical controls an organisation must meet in order to join a network
Citrix	Citrix are a software vendor, however in this context it is referring to their most ubiquitous software product which provides a managed desktop solution to users, by means of undertaking the computing in the datacentre. I.e. the actual desktop session is taking place on a server that could be some geographic distance from the user, and the users sees a representation of this activity on their thin client device.
Cloud	Cloud computing is a kind of Internet-based computing that provides shared processing resources and data to computers and other devices on demand
CP(1,2)	Cathays Park, buildings one and two
CRM	Customer Relationship Management
DAAS	Disability And Awareness Support group
DC(1,2,3,4)	Datacentre (1,2,3,4)
DVLA	Driver and Vehicle Licencing Agency
GDS	Government Digital Service – part of the Cabinet Office, which a focus on Digital Transformation and strategy
GSi	Government Secure Intranet is a United Kingdom government wide area network, whose main purpose is to enable connected organisations to communicate electronically and securely at low protective marking levels
HF	The network domain name of the current Welsh Government internal network
IaaS	Infrastructure as a Service is a form of cloud computing that provides virtualized computing resources over the Internet
ICT	Information Communication Technology
iOS	An operating system used for mobile devices manufactured by Apple Inc.
iShare	iShare is Welsh Government's branding for their electronic record and document management system, currently provided by Objective.
IT	Information Technology
ITIL	ITIL is a best practice framework that has been drawn from both the public and private sectors internationally. It describes how IT resources should be organised to deliver business value, documenting the processes, functions and roles of IT Service Management (ITSM). It is

	considered to be best practice in government.
LAN	Local Area Network
MS	Microsoft
NPS	National Procurement Service
OLA	An operational-level agreement (OLA) defines the interdependent relationships in support of a service-level agreement (SLA). The agreement describes the responsibilities of each internal support group toward other support groups, including the process and timeframe for delivery of their services.
PaaS	Platform as a service (PaaS) is a category of cloud computing services that provides a platform allowing customers to develop, run, and manage applications without the complexity of building and maintaining the infrastructure typically associated with developing and launching an app
PBX	Private Branch Exchange
PC	Personal Computer
PSBA	The PSBA network is a Welsh Government led collaborative national communications service that, in conjunction with other major Welsh public sector organisations, has created a national information & communications platform to enable greater efficiency and collaborative potential, helping to support the delivery of improved services for the people of Wales.
PSN	The Public Services Network (PSN) is the UK government's high-performance network, which helps public sector organisations work together, reduce duplication and share resources. It unified the provision of network infrastructure across the United Kingdom public sector into an interconnected "network of networks" to increase efficiency and reduce overall public expenditure.
RDP	Rural Development Programme
SAN	Storage Area Network – usually a device containing multiple hard disks, used for large scale digital storage
SAP	Systems Applications and Products
SDA	The Solution Design Authority is a Welsh Government forum which reviews all proposed ICT solutions across the organisation, to ensure strategic alignment and efficient use of resourcing.
SLA	A Service Level Agreement is a contract between a service provider (either internal or external) and the end user that defines the level of service expected from the service provider. SLAs are output-based in that their purpose is specifically to define what the customer will receive
SI	System Integrator – a large scale ICT Services Provider
SME	Small to Medium sized Enterprise
SQL	Structured Query Language
Stratus	Stratus is the Welsh Government home worker solution which is based on Citrix Receiver technology
TB	Terabyte – 1000 gigabytes.
TUPE	Transfer of Undertakings (Protection of Employment) Regulations 2006 - The TUPE Regulations preserve employees' terms and conditions when a business or undertaking, or part of one, is transferred to a new employer.
VoIP	Voice Over Internet Protocol
WAN	Wide Area Network

WEFO	Welsh European Funding Office
WG	The Welsh Government

10. Appendix B : Network Topology

10.1 Current Network Topology

The PSBA network is a Welsh Government led collaborative national communications service that, in conjunction with other major Welsh public sector organisations, has created a national information & communications platform to enable greater efficiency and collaborative potential, helping to support the delivery of improved services for the people of Wales.

The below diagram illustrates Welsh Governments high-level network topology

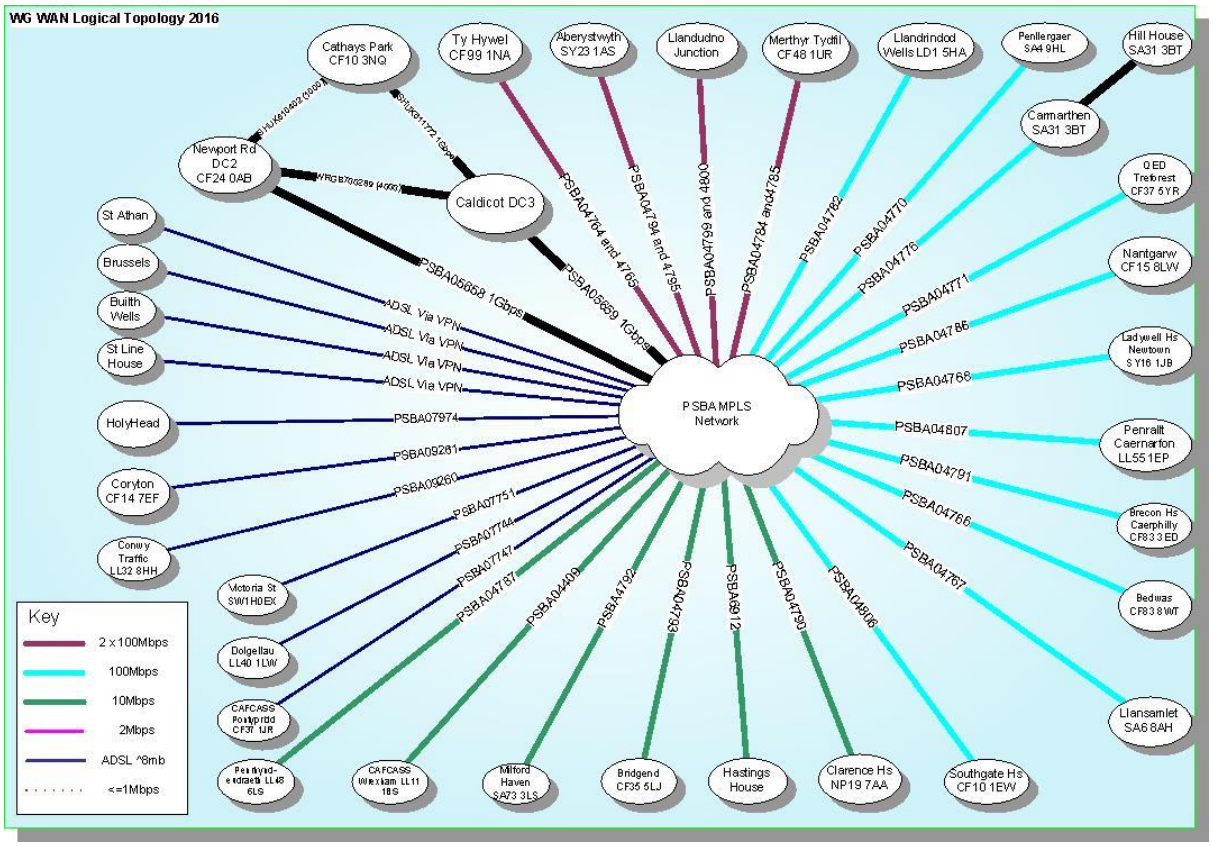


Figure 10 - Welsh Government Network Topology

As shown, the Public Sector Broadband Aggregation (PSBA) network is predominantly being utilised as the bearer for WG's networks with connectivity across Wales.

More detail on PSBA from http://www.psba.org.uk/index.aspx:

Conceived and delivered as a collaborative project with key stakeholders in Local Government and Health and Education, the network is now used by Unitary Authorities, Hospitals, General Practitioners, Universities, Further Education Colleges, Emergency Services, and a growing number of organisations funded by the public sector.

Connecting users since early 2008, the PSBA network delivers a wide range of communications services, supports voice, video and data traffic, and is currently delivering secure, fast and reliable communications to over 2000 (March 2010) public sector sites across Wales.

This unique and innovative public sector communications service, one of the first totally integrated Public Sector Networks (PSN) was conceived, designed, and built in Wales to meet the specific needs of the Welsh public sector.

11. Appendix C : User Types

Profile	Description
Office worker (working from one or more set office location at a fixed desk or hot-desk) (Fixed; Behind the Scenes; Front of house)	• Customers come to location (one or more locations) • Service is delivered at a specific place • Staff need to be in that location to deliver the service • Customer or non-customer facing • May require dedicated workstation and fixed telephone • Requires access to corporate systems May require access to specialist systems • Rarely work outside of office hours • Limited opportunity to work at home
Office-home worker (working from home and one or more set office location)	• Transactional/process/rules oriented • Desk based most of the time • Could be office or home based • Customer or non-customer facing • Requires access to corporate systems • May require access to specialist systems • Can work outside of office hours
Home worker (officially working from home all of the time)	• Output oriented • Non-customer facing • Requires mobile ICT equipment to access corporate systems to perform their role • May require access to specialist systems • No requirement to have fixed desk in a specific location • Can work outside of office hours
Office-mobile worker (working from the office and on the move regularly) (Office everywhere; Roaming)	• Output oriented • Spends time away from desk – at meetings or occasional home working • Keeps in touch with team by telephone and email • Specialists • Customer or non-customer facing • Likely to require access to specialist systems • Can work outside of office hours
Mobile worker (higher levels of mobility often with no fixed location) (Field; Out and About)	• Customer facing as part of investigations or fieldwork activities • Goes to customers and/or sites • Service is delivered to the customer at a specific location • Spends time away from the office or home base

	• Keeps in touch with team by telephone and email • Requires mobile ICT equipment to access corporate or specialist systems to perform their role • Without regular access to office facilities or mobile technology • Often have to access and capture information instantly • Can work outside of office hours • No requirement to have fixed desk in a specific location
Technologist (location variable, role specialist)	• Specialists • Could be office or home based • Customer or non-customer facing • Requires access to corporate and specialist systems to perform their role • Sophisticated IT users • Rarely work outside of office hours
On Call (working from one or more set office location at a fixed desk or hot-desk and mobile when required) (Always on)	• Could be office or home based • Often works on-call outside of office hours as required • Require access to corporate and specialist applications at all times • Highly responsive to all information received through multiple channels • Require good communications to others • Customer facing
VIP (Cabinet Secretaries, Counsel General)	• Requires access to corporate systems • Require good communications to others • Spends time away from the office or home base • Can work outside of office hours