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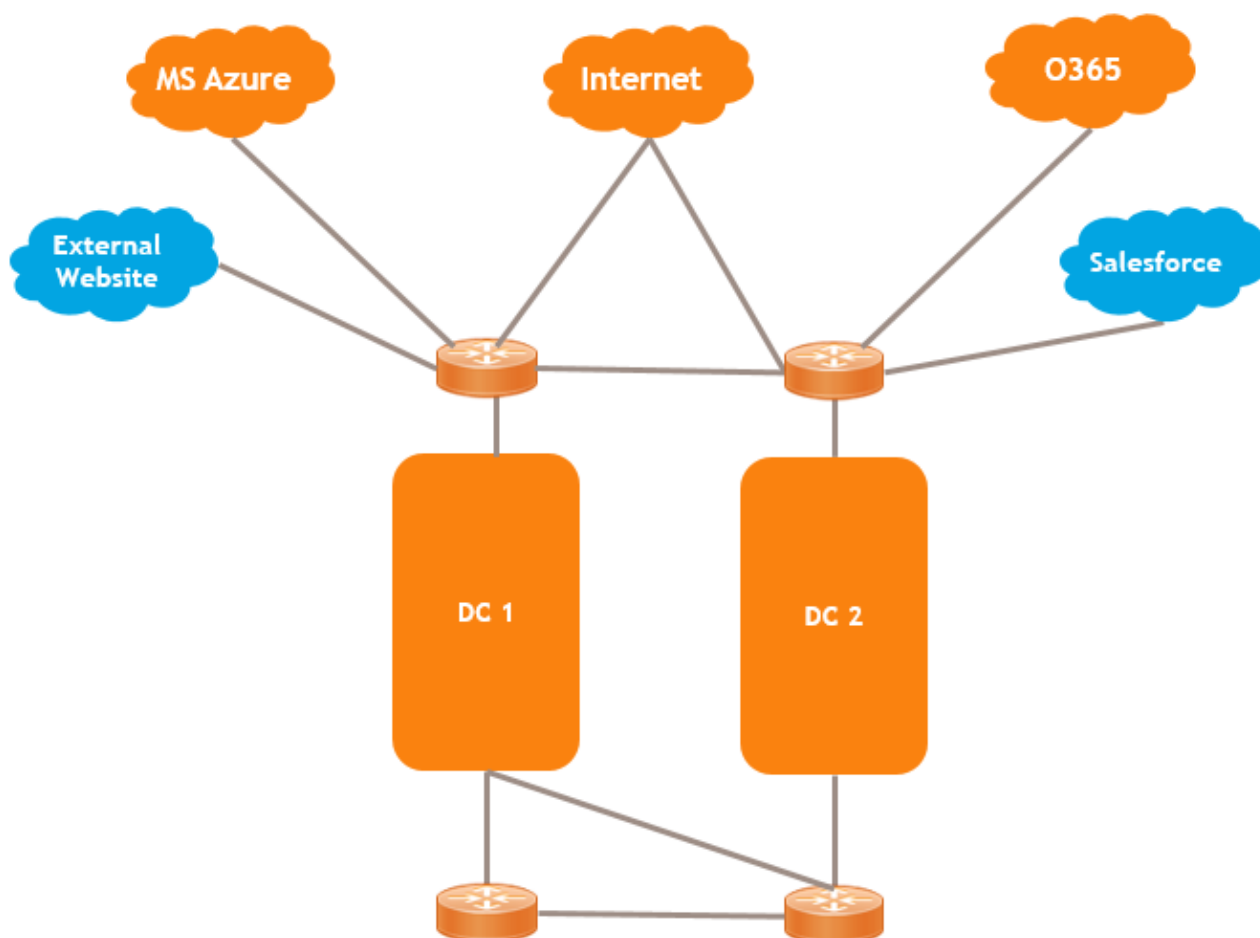
CITIPOWER, POWERCOR & UNITED ENERGY

IT Hosting Strategy

November 2019

Contents

1	Executive Summary	4
2	Introduction	7
	Scope and Approach	8
3	Current State	9
	Current Hosting.....	9
	Current Datacentres – CitiPower, Powercor	10
	Current Datacentres – United Energy	11
	Application Groups	12
4	Vision and Principles	14
	4.1 Constraints.....	16
5	Options & Recommendations	17
	Hosting Scenarios.....	17
	Hosting Scenario Evaluation	23
6	Future State.....	24
	Target State – CitiPower, Powercor	24
	Target State – United Energy	25



	Datacentre		Cloud	
				Establishing Cloud Services 25
				Migration 27
Appendix A				Cloud Hosting Types 30
Appendix B				Cloud ADOPTION 31

Regulatory Reset Period 2021- 2026

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1 Executive Summary

BDO Australia was engaged as part of CitiPower, Powercor & United Energy's Regulatory Reset Project to formulate a cloud based IT Hosting Strategy. This strategy reviews and presents potential changes to the current on premise IT hosting model that could be undertaken during the next regulatory reset period (2021-2026). Currently, CitiPower, Powercor & United Energy have a traditional (data centre) hosting model not dissimilar to other companies within the power industry.

Vendor roadmaps and the prevalence of cloud hosting are driving significant change and challenging the relevance of maintaining the traditional private hosting model. CitiPower, Powercor & United Energy are cloud aware companies, and have begun to introduce cloud native applications such as Click, Salesforce (in CitiPower/Powercor) and O365 for email (in United Energy only). Further adoption of a hybrid cloud strategy presents CitiPower, Powercor & United Energy with a more flexible financial position, by allowing movement of funds from capex to opex and creating a controlled infrastructure spend. The operational position will also be improved by introducing flexible, scalable and dynamic hosting to deliver critical business services.

This report is based heavily on deploying an "Infrastructure as a Service" (IaaS) compared to Top 7 application list provided by CitiPower, Powercor & United Energy (excluding o365 Email & SharePoint which is a SaaS provided solution). This application list represents the Critical Applications which currently utilise the largest IT Infrastructure footprint (includes SAP ERP, SAP BW, Itron, Email, File shares & Oracle fusion). The report presents the comparative cost and opportunity for CitiPower, Powercor & United Energy if it takes a measured approach to cloud services, whilst still meeting its vision and strategic goals for IT hosting. IaaS hosting offers virtualised resources owned and hosted by a service provider and offered to customers on-demand.

Over time, IaaS hosted services or applications will most likely migrate to "Software as a Service" (SaaS) or "Platform as a Service" (PaaS) solutions whereby a vendor manages varying levels of the system and infrastructure (e.g. all upgrades, patches and day to day operations) and CitiPower, Powercor & United Energy interact with and curate the data. Ongoing review and potential adoption of cloud hosting platforms will allow the business to scale at will, delivering an agile and stable delivery platform, increased capacity and performance as needed, or immediate savings when scaling back a service. Delivering longer term savings to customers cannot be achieved in the current on premise hosting model, as storage requirements cannot be easily scaled.

By consultation and review, BDO Australia and CitiPower, Powercor & United Energy staff created a scenario based approach to look at a cloud based IT hosting model. The team used a nominated set of applications (referred to as the Top 7 for CitiPower, Powercor), known regulatory reset budgets, then worked with Microsoft teams both local and the global CKH team to create a detailed IaaS (Infrastructure as a Service) cost model.

Three models were created for CitiPower, Powercor & United Energy;

1.1.1 Scenario 1 - Steady State (Baseline)

Steady state acknowledges that cloud based migrations may occur in an ad hoc fashion during the 2021-2026 regulatory reset period, but it continues to reflect and retain on premise as the default hosting platform. This scenario also continues to work with a capex heavy investment strategy year on year already presented to the regulator by CitiPower, Powercor & United Energy. There would be a reduced ability to adapt to new and changing technologies increasing risk as vendors move to alternate delivery methods.

1.1.2 Scenario 2 - Measured Approach - Top 7 Applications and 5% Non-Critical Application Migrations

The measured approach connects on premise datacentres to external cloud offerings and takes proactive steps to shift hosting to a IaaS platform. This implementation of a hybrid cloud requires a smaller scale up-front spend on infrastructure and uses a cloud first approach to hosting. Scenario 2 will see a significant use of cloud by hosting all SAP applications on Microsoft Azure and a move to O365 for Email, SharePoint and Network File Shares. Itron IEE & MTS migrations would be aligned to new vendor roadmap which is expected around 2023. In addition, 5% of NC (non-critical) applications and infrastructure would migrate to the cloud in this scenario (IaaS only).

1.1.3 Scenario 3 - Aggressive Approach - Top 7 Applications and 10% Non-Critical Application Migrations

A strategy of more aggressively transitioning adopting cloud would see CitiPower, Powercor & United Energy undertake migrations scheduled in Scenario 2 but increasing NC (non-critical) applications migrations to 10% year on year. This scenario continues the hybrid cloud hosting strategy with applications, services and connectivity working seamlessly between external cloud providers and on premise datacentres. Adopting this scenario would require CitiPower, Powercor & United Energy to have a high level of internal maturity in cloud adoption and understanding of its application compatibility with cloud based platforms.

1.1.4 Scenario Costs

Cost Models are modelled from baseline regulatory reset information supplied by CitiPower, Powercor & United Energy. Scenario 1 shows the submission funding request for IT Infrastructure as the starting point, Scenario 2 cost model shows the expected capex and opex adjustment by migrating Top 7 and 5% NC Apps to Microsoft Azure (IaaS) and O365 (SaaS), Scenario 3 cost model shows the expected capex and opex adjustment by migrating Top 7 and 10% NC Apps to Microsoft Azure (IaaS) and O365 (SaaS).

1.1.5 Benefits & Recommendation

Of the three IT Hosting scenarios represented, two were based around a hybrid cloud model whilst one reflects continuing with the current approach for IT hosting during the regulatory period 2021-2026.

Benefits for considering a hybrid cloud approach are:

- ▶ Improved agility and adaptability to business needs
- ▶ Reduced risk of applications changing beyond the hosting platforms' ability to support
- ▶ Provision of agile and scalable hosting platforms as needs change
- ▶ Allow incremental non-capital intensive capacity growth
- ▶ Provide greater ability to manage peak demands aligned to business needs.

The benefits for CitiPower, Powercor & United Energy adopting Scenario 2 - Measured Approach, for its new IT Hosting Strategy are:

- ▶ Incremental calculated moves to cloud, providing compatible platforms for both legacy and new applications
- ▶ Reduce infrastructure footprint in all CitiPower, Powercor & United Energy datacentres
- ▶ Incremental capacity growth via cloud on-demand for capacity
- ▶ Refresh reduced infrastructure footprint at next reset and less ongoing capital expenditure requirements.
- ▶ Cloud first approach for new and ongoing delivery of IT hosting.

Together, BDO Australia and CitiPower, Powercor & United Energy staff agreed that Scenario 2 (Measured Approach - Top 7 Applications and 5% Non-Critical Application Migrations) reflected the best value and most achievable option for an alternate IT Hosting strategy during the next regulatory reset period. BDO Australia recommends that CitiPower, Powercor & United Energy should continue to take a measured approach to all new cloud services.

2 Introduction

BDO was approached by CitiPower, Powercor & United Energy to complete a cloud based IT Hosting Strategy to assist with cost modelling the 2021 - 2026 AER Regulatory Reset period. A major outcome for this engagement was to create a future strategy with a defensible cost model for CitiPower, Powercor & United Energy IT requirements over the next regulatory reset period. No business case component was completed as part of this engagement.

BDO worked with CitiPower, Powercor & United Energy to create an IT Hosting Strategy, with the following objectives in mind:

- ▶ Reduce operational risk
- ▶ Increase flexibility and agility to efficiently respond to changing business needs and enable CitiPower, Powercor & United Energy to take advantage of future technologies as they become available
- ▶ Offset expenditure and increase the business value from IT infrastructure and application services over the next regulatory reset period

BDO worked with Microsoft exclusively during this engagement for comparative pricing and utilisation of proposed services. This was primarily to leverage the global agreement and direction of the parent company CKI Holdings, which enables CitiPower, Powercor & United Energy to utilise discounts available to the greater group of companies. Also, at the time of engagement, previous work had been completed with Microsoft around SAP and O365.

CitiPower, Powercor & United Energy have already commenced the journey towards a more flexible hosting environment. Examples of previous implementations of cloud based technologies and software include Salesforce and Click at CitiPower Powercor, and O365 at United Energy. These decisions have not only removed the requirement for additional on premise storage and server resources, but has also enabled a shift of ongoing maintenance and upgrade tasks to the respective providers, resulting in more timely upgrades and reduced IT degradation risk for the business.

The Hosting Strategy builds upon these initial cloud application migrations and assesses the IT hosting (IaaS) environments required to enable CitiPower, Powercor & United Energy to meet future operational objectives.

Scope and Approach

The scope included a review of hosting platforms, current application roadmaps within the business and options available for future hosting.

2.1.1 Phase 1 - Confirm Current State

Through workshops and engagement with key stakeholders, the application hosting platforms were reviewed and documented to support a baseline understanding of hosting usage.

2.1.2 Phase 2 - Market Scan and Roadmap Alignment

Roadmaps were based on known vendor roadmaps. Where no clear roadmap existed, estimations were made and alignment occurred with internal product owner stakeholders.

2.1.3 Phase 3 - Options Assessment and Recommendation

Three hosting scenarios were developed and agreed in consultation with the business. The modelling focused on Microsoft Azure Services as the cloud provider of choice. Costing supplied via CKH global Microsoft team.

2.1.4 Phase 4 - IT Hosting Scenario and Roadmap

High level roadmaps containing the proposed application migration timeframes were completed. Final IT Hosting costs were completed in line with the three hosting scenarios. Scenario 2 was chosen as it provided the best value, most achievable proposition within the next regulatory reset period and represented optimum returned benefit to customer.

3 Current State

Current Hosting

The current hosting model for CitiPower, Powercor & United Energy is predominantly deployed on premise via owned data centres and co-location datacentre facilities. The technology utilised on premise is largely based on VMWare, Oracle, HDS & ZFS Storage, Oracle Solaris, Red Hat, Microsoft and Cisco technologies. There have been continued ongoing purchases for the current hosting environment, including storage and compute resource expansion, driven by usage and business growth.

CitiPower, Powercor & United Energy currently maintains one external and one internal datacentres:

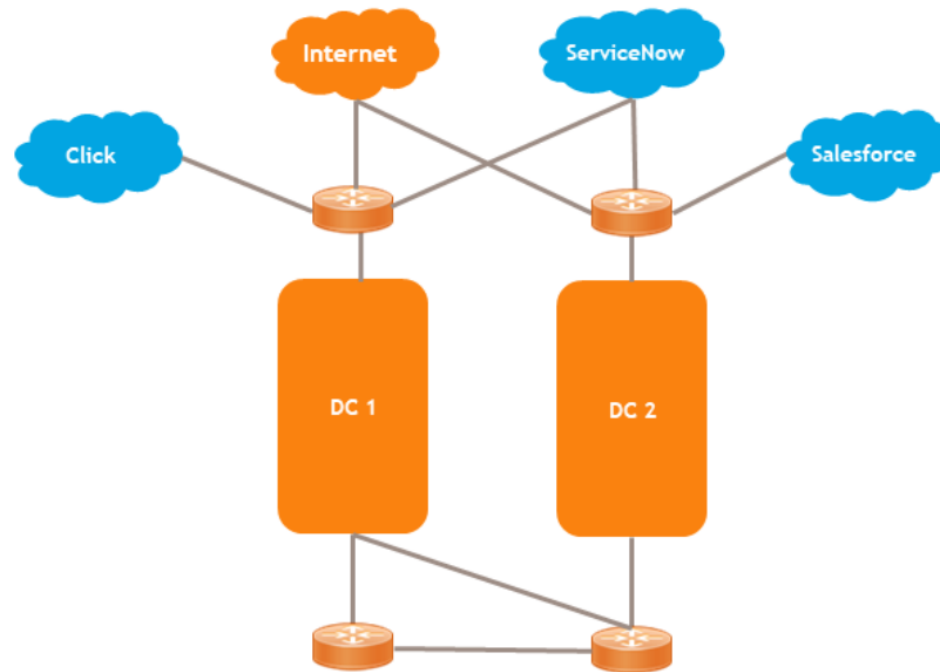
- ▶ Equinex (Co-Location Facility) - CitiPower, Powercor
- ▶ Market St. (On Premise Facility) - CitiPower, Powercor
- ▶ Mitcham (Vocus Co-Location Facility) - United Energy
- ▶ Pinewood (On Premise Facility) - United Energy

Applications residing in the current datacentre framework are deployed across both the business's respective datacentres. This deployment is based on an active/active service delivery model with replication between datacentres to meet reliability and availability requirements. The infrastructure is sized to ensure that in the absence of either datacentre the other can deliver the full capacity of required business services. Whilst this meets primary business objectives of system reliability and availability, this type of deployment requires capacity to be replicated and maintained for both production and BCP/DR sites.

Physical hosting within CitiPower, Powercor & United Energy will continue to change with the shifting requirements of the business and driven by IT market and vendor application delivery methods. As mentioned prior, CitiPower, Powercor & United Energy are actively introducing cloud services, this is a calculated and measured approach which will continue into the 2021-2026 regulatory reset period.

Current Datacentres - CitiPower, Powercor

Characterised by a large datacentre presence hosting physical IT infrastructure, the current hosting platform is distributed from two metropolitan datacentres. Ongoing capacity growth has continued during the current reset period, and it is expected with the acquisition of United Energy that certain datacentres and computer rooms will close which in turn may see expansions within the CitiPower, Powercor & United Energy group's primary datacentres. This may lead to increases in capital investment, operational (co-location hosting) cost and other inefficiencies such as the creation of additional support overheads via third party providers like CGI and Di-Data. During this current reset period (2016-2020), there have been discrete moves to the cloud. Introduction of SaaS applications such as Salesforce, ServiceNow and Click have expanded the hosting model (Cloud apps pictured below are indicative only, for full list, please refer to Appendix):

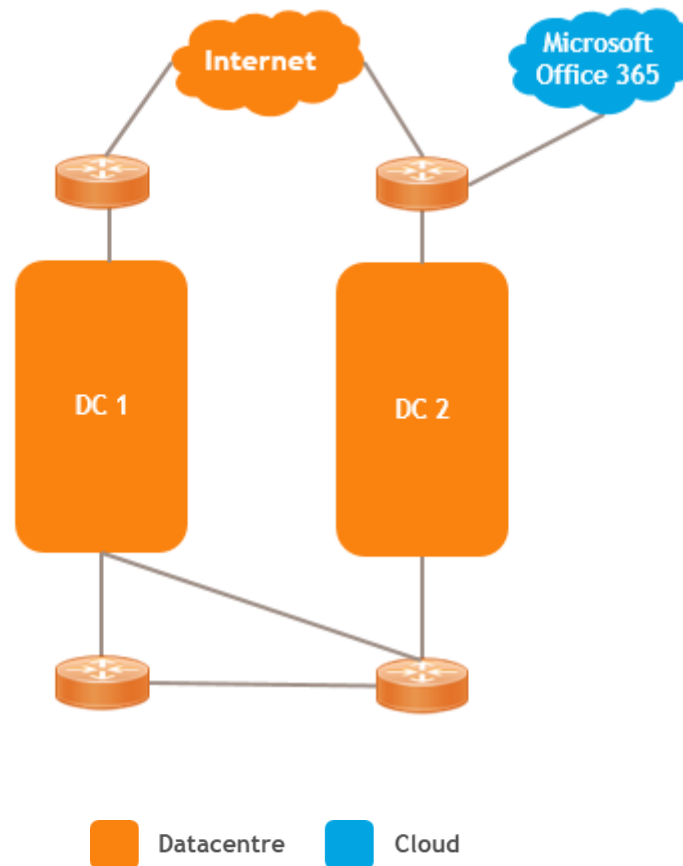




Current Datacentres - United Energy

Characterised by a large datacentre presence hosting physical IT infrastructure, the current hosting platform is distributed from two metropolitan datacentres.

During this current reset period (2016-2020), there have been discrete moves to the cloud. Introduction of SaaS applications such as O365 have expanded the hosting model:



Application Groups

The applications that use the hosting environment were categorised into two groups - Top 7 (Critical Applications) and Non-Critical Applications.

3.1.1 Top 7 (CP/PAL)

The Top 7 applications consists of:

- ▶ SAP BW / Hana
- ▶ SAP ERP
- ▶ Itron IEE
- ▶ Itron MTS
- ▶ Email / SharePoint
- ▶ Network Drives (User & File Shares)
- ▶ Oracle Fusion (USB).

3.1.2 Top 6 (UE)

The Top 6 applications consists of:

- ▶ SAP
- ▶ Itron IEE
- ▶ Itron MTS
- ▶ Cognos
- ▶ Network Drives (User & File Shares)
- ▶ Web Methods

3.1.3 Non-Critical Applications

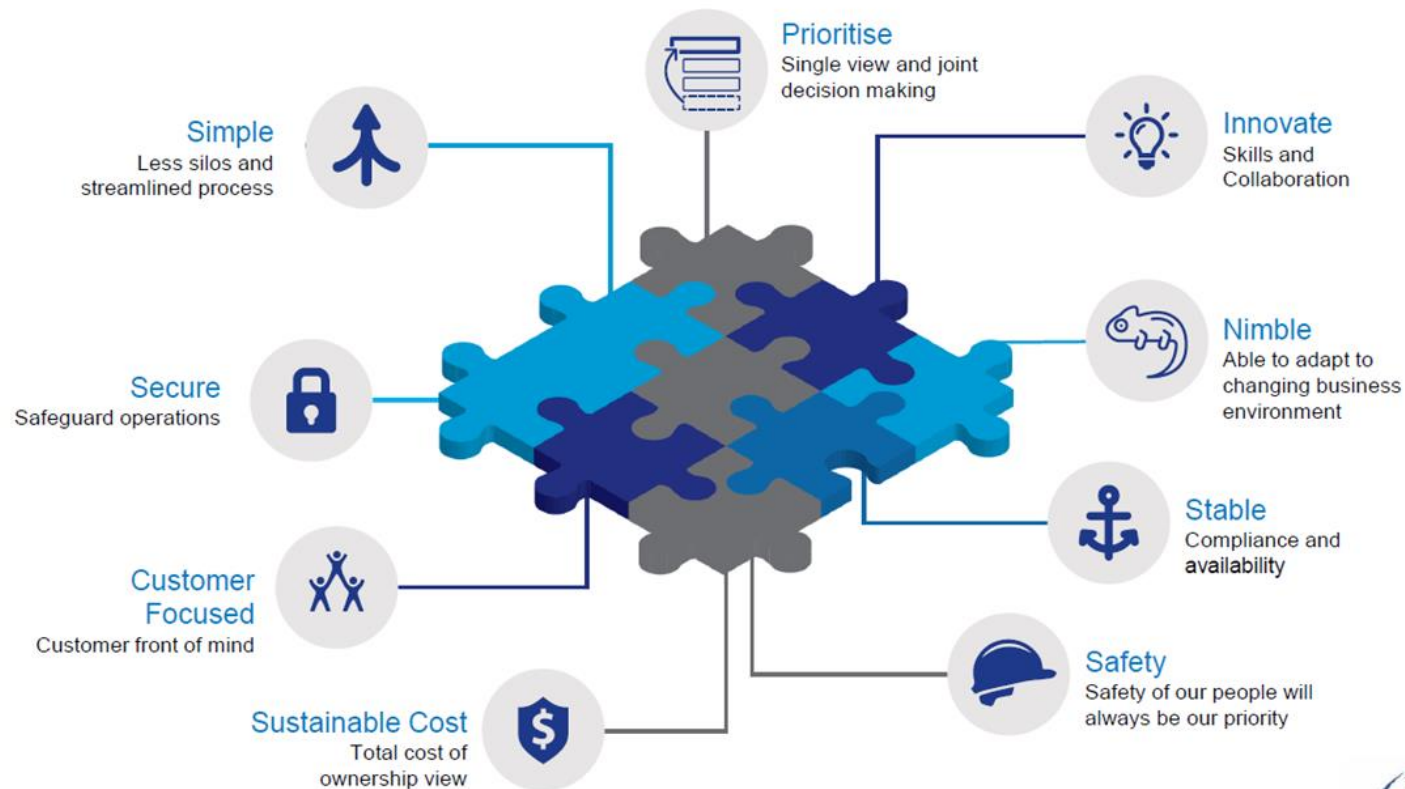
Non-Critical applications represent the known remaining (excluding Top 7 / Top 6) services and applications being hosted on premise storage and service infrastructure. These applications still play a very important part at CitiPower, Powercor & United Energy, providing foundation or supporting functions to the organisation. They were also the applications that had utilised little in the way of server and storage infrastructure. In this engagement, assumptions were made to application grouping and the complexity of migration.

	# of Apps
Low Complexity	31
Medium Complexity	35
High Complexity	55
Total	121

4 Vision and Principles

CitiPower, Powercor & United Energy have defined a vision statement and created a key set of principles upon which they guide decisions. We have considered this when evaluating the IT hosting strategy.

The principles of our model are balanced



IT Principle	Description	How Hosting Strategy supports IT Principle
Prioritise	▶ Single view and joint decision making	▶ Targets the highest priority systems for Cloud migration based on which will provide the greatest benefit
Innovate	▶ Skills and Collaboration	▶ Hybrid cloud brings scalability, allows for quicker innovation
Nimble	▶ Able to adapt to changing business environment	▶ Hybrid cloud allows for agile scale up and scale down capability
Stable	▶ Compliance and Availability	▶ Ensuring correct levels of service availability are matched to business criticality and required regulatory compliance
Safety	▶ Safety of our people will always be our priority	▶ Responsive hosting promotes robust data security, compliance and disaster recovery protection, which protects our people as well as our IT assets
Sustainable Cost	▶ Total Cost of Ownership	▶ IT hosting decisions are made pragmatically, and are as cost effective as possible
Customer Focused	▶ Customer front of mind	▶ IT hosting will reflect the needs of customers both internal and external
Secure	▶ Safeguard Operations.	▶ We will ensure ongoing application / data security compliance and disaster recovery protection are in place wherever IT is hosted
Simple	▶ Less silos and streamlined process.	▶ The Hosting Strategy promotes a coordinated approach to IT hosting and transition.

4.1 Constraints

Operating in a regulated environment, CitiPower, Powercor & United Energy is required to work within constraints. Along with the regulatory conditions, there are other operational and IT dependencies that the hosting environment must provide for.

The approach selected is expected to deliver internal compliance needs, as well as supporting CitiPower, Powercor & United Energy in:

Regulatory Compliance

- ▶ Critical Infrastructure- While this area of regulation continues to evolve,, some existing regulations already limit certain types of private and public cloud. A hybrid approach provides the option to continue to respond to regulatory changes.
- ▶ Geographic - Legal and regulation of consuming services only within Australian jurisdictions limit some options and in most cases, increase hosting costs e.g. Australian hosted versus United States hosted is more expensive.

Technical Agility

- ▶ Vendor offerings - Increasingly, applications are being offered only in cloud hosted by the vendor, or as models with private deployments, which attract higher costs
- ▶ Legacy applications can potentially not be compatible with cloud offerings (e.g. Solaris OS) or require significant re-architecture over time to operate within specific cloud offerings. While this is expected to change, a hybrid model with its inherent flexibility, would be potentially superior choice rather than being delivered directly from public and private cloud options. By definition Hybrid Cloud allows for the orchestration between on premise, private or public cloud environments, giving ultimate flexibility for businesses to consume services as and when they need them.
- ▶ High Availability (the concept or goal of ensuring your critical systems are always functioning) - Commercial offerings may not offer the level of availability required to meet business obligations.
- ▶ Security - Classification of information may not be suitable and/or security overheads may not be cost effective to hold in cloud
- ▶ Costs - Areas such as big data, Artificial Intelligence and the Internet of Things require specialist infrastructure which is cost prohibitive to privately acquire and own, making cloud options for specialist services more attractive.

5 Options & Recommendations

Hosting Scenarios

The following scenarios underwent detailed modelling against a nominated set of applications (referred to as the Top 7) and cost forecasts provided by the businesses' baseline scenario, versus IaaS hosting solutions provided by Microsoft. Of the three scenarios represented, two are based around a hybrid cloud implementation whilst one reflects continuing with the current approach for IT hosting during the regulatory period 2021 - 2026. Whilst the current approach (Scenario 1) has a cloud-first focus for new applications (where practical and compliant), it does not actively drive cloud transition within the Top 7 legacy applications to create a more balanced hybrid profile (Options 2 & 3).

The IT benefits for a hybrid cloud approach are:

- ▶ Improved agility and adaptability to business needs
- ▶ Reduced risk of applications changing beyond the hosting platforms' ability to support
- ▶ Provision of agile and scalable hosting platforms as needs change
- ▶ Allow incremental non-capital intensive capacity growth
- ▶ Provide greater ability to manage peak demands aligned to business needs.

5.1.1 Scenario 1 - Steady State

Scenario 1 - Steady state acknowledges that cloud based migrations may occur in an ad hoc fashion for new applications during the 2021-2026 regulatory reset period, but it continues to reflect and retain on premise as the default hosting platform for existing applications. This scenario also continues to work with a capex dominant investment strategy year on year. There would be a reduced ability to adapt to new and changing technologies increasing risk as vendors move to alternate delivery methods.

The characteristics are:

- ▶ Adopting cloud only where required e.g. driven by vendor roadmap(s)
- ▶ Connectivity included to allow use of cloud only where required
- ▶ Continue with two private datacentres
- ▶ Ongoing capital purchases for capacity growth
- ▶ Refresh infrastructure at next warranty expiration with like for like, continuing the on premise hosting approach.

Scenario 1 roadmap activities:

- ▶ 2021 to 2026 - Implementation of cloud connectivity and transition of applications
- ▶ 2021 to 2026 - Continued purchase and implement replacement infrastructure (like for like)
- ▶ 2022 to 2026 - Investigation of a hybrid cloud hosting platform, whilst continuing with an on premise hosting approach
- ▶ 2024 to 2026 - Consideration of hosting strategy for future regulatory reset periods.

5.1.1.1 Scenario 1 - Cloud Usage Profile**5.1.2 Scenario 2 - Measured Approach - Top 7 Applications and 5% Non-Critical Application Migrations**

The measured approach connects on premise datacentres to external cloud offerings and takes proactive steps to shift hosting to a IaaS platform. This implementation of a hybrid cloud requires a smaller scale up-front spend on infrastructure and uses a cloud first approach to hosting. Scenario 2 will see a significant use of cloud by hosting all SAP applications on Microsoft Azure and a move to O365 for Email, SharePoint and Network File Shares. Itron IEE & MTS migrations would be aligned to new vendor roadmap which is expected around 2023.

Following analysis, it was determined that Oracle Fusion (USB) would not be suitable for a cloud migration spanning the 2021-26 period, this application would most likely have a similar cloud native application created and the USB service would be deprecated. By 2026, it is assumed that the Top 7 applications would be fully cloud hosted with 25% of supporting applications also being cloud based.

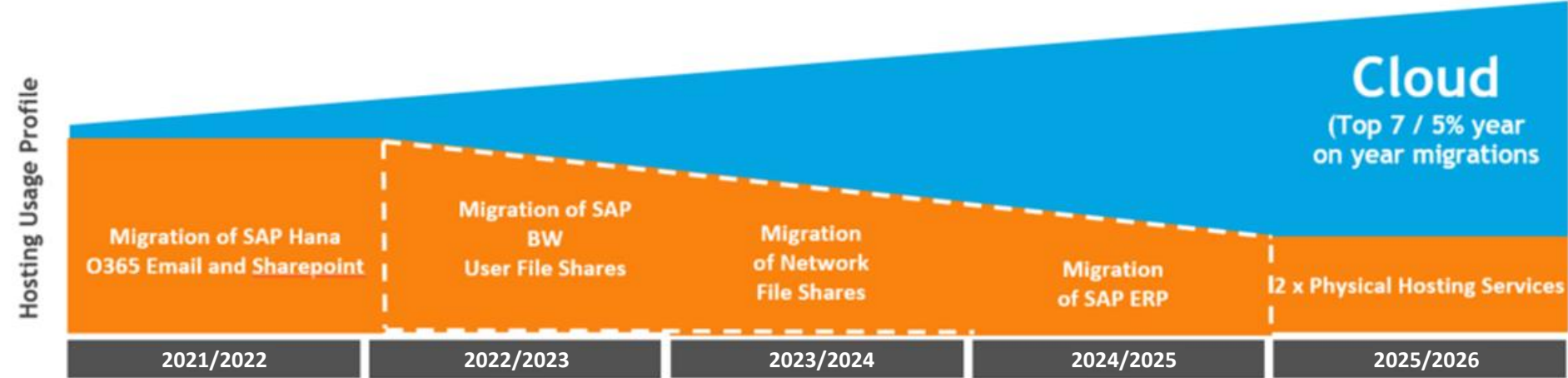
The characteristics are:

- ▶ Incremental calculated moves to cloud, providing compatible platforms for both legacy and new applications
- ▶ Reduce infrastructure footprint in all CitiPower, Powercor & United Energy datacentres
- ▶ Incremental capacity growth via cloud on-demand for capacity
- ▶ Refresh reduced infrastructure footprint at next reset
- ▶ Cloud first approach for new and ongoing delivery of IT hosting.

Scenario 2 roadmap activities:

- ▶ 2021/22 - Migration of Email, SharePoint to O365
- ▶ 2021/22 - SAP Hana migration to Microsoft Azure
- ▶ 2022/23 - User shares migrating into OneDrive (O365)
- ▶ 2022/23 - SAP BW migration to Microsoft Azure
- ▶ 2023/24 - Itron Migrations to cloud service
- ▶ 2023/24 - Potential remaining network file shares migrate in cloud service
- ▶ 2023/24 - Replacement cloud aware middleware platform goes live.
- ▶ 2025/26 - SAP ERP migrates to Microsoft Azure
- ▶ 2021 - 2026 - 5% of all NC Applications migrated to cloud year on year (25% migrated by 2026)
- ▶ 2021 - 2026 - Re-architect and transition applications aligned to any change in hosting platforms
- ▶ 2021 - 2026 - Refresh and implement reduced infrastructure footprint for two datacentres
- ▶ 2021 - 2026 - Operation of hybrid cloud hosting platforms, utilising cloud when appropriate.

5.1.2.1 Scenario 2 - Cloud Usage Profile



5.1.3 Scenario 3 - Aggressive Approach - Top 7 Applications and 10% Non-Critical Application Migrations

A strategy of more aggressively transitioning to cloud would see CitiPower, Powercor & United Energy undertake migrations scheduled in Scenario 2 but increasing NC (non-critical) applications migrations to 10% year on year. This scenario continues the hybrid cloud hosting strategy with applications, services and connectivity working seamlessly between external cloud providers and on premise datacentres. Adopting this scenario carries some additional risk, as it requires CitiPower, Powercor & United Energy to continue developing a high level of internal maturity in cloud adoption and understanding of its application compatibility with cloud based platforms.

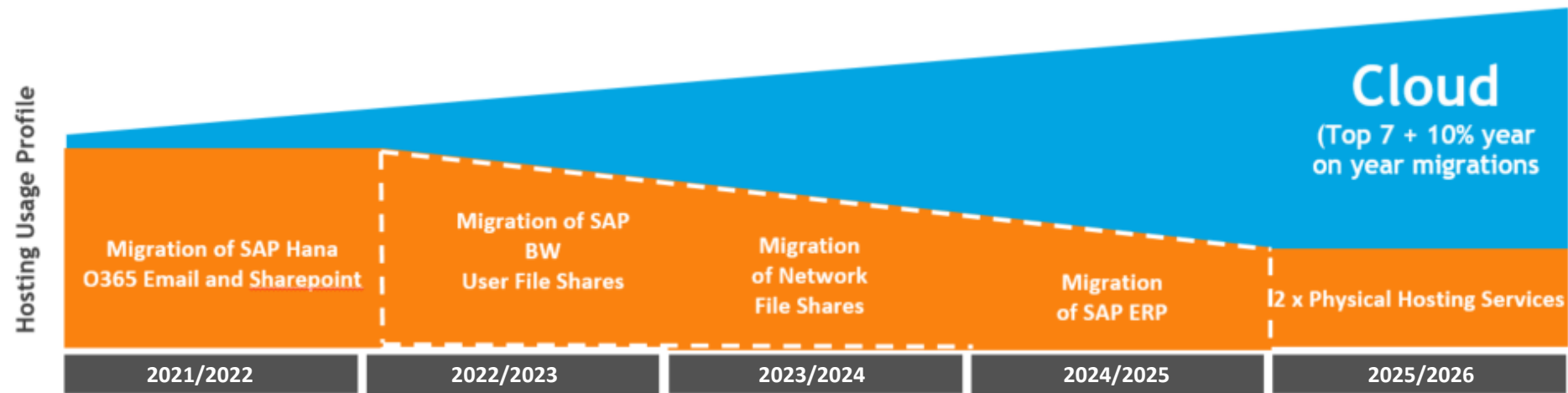
The characteristics are:

- ▶ Scenario 3 follows the same characteristics of Scenario 2, but it doubles the percentage of NC applications migrating to cloud
- ▶ Incremental calculated moves to cloud, providing compatible platforms for both legacy and new applications
- ▶ Reduce infrastructure footprint in all CitiPower, Powercor & United Energy datacentres
- ▶ Incremental capacity growth via cloud on-demand for capacity
- ▶ Refresh reduced infrastructure footprint at next reset
- ▶ Cloud first approach for new and ongoing delivery of IT hosting.

Scenario 3 roadmap activities:

- ▶ 2021 - 2026 Roadmap activities are the same for Top 7 applications
- ▶ 2021 - 2026 Increase to 10% year on year of NC (non-critical) application migrations
- ▶ 2021 - 2026 - Re-architect and transition applications aligned to any change in hosting platforms
- ▶ 2021 - 2026 - Refresh and implement reduced infrastructure footprint for two datacentres
- ▶ 2021 - 2026 - Operation of hybrid cloud hosting platforms, utilising cloud when appropriate.

5.1.3.1 Scenario 3 - Cloud Usage Profile












Hosting Scenario Evaluation

Taking into consideration CitiPower, Powercor & United Energy's current cloud posture, potential strategies each of the hosting scenarios were evaluated against three key areas. This was done to identify which was the most aligned approach and met the current and changing needs of CitiPower, Powercor & United Energy .. The evaluations were against:

- ▶ Alignment to Vision and Principles
- ▶ Alignment to Cost (where long term benefits exceed costs)
- ▶ Alignment to Risk

The results of the evaluation indicated that Scenario 2 is the preferred approach.

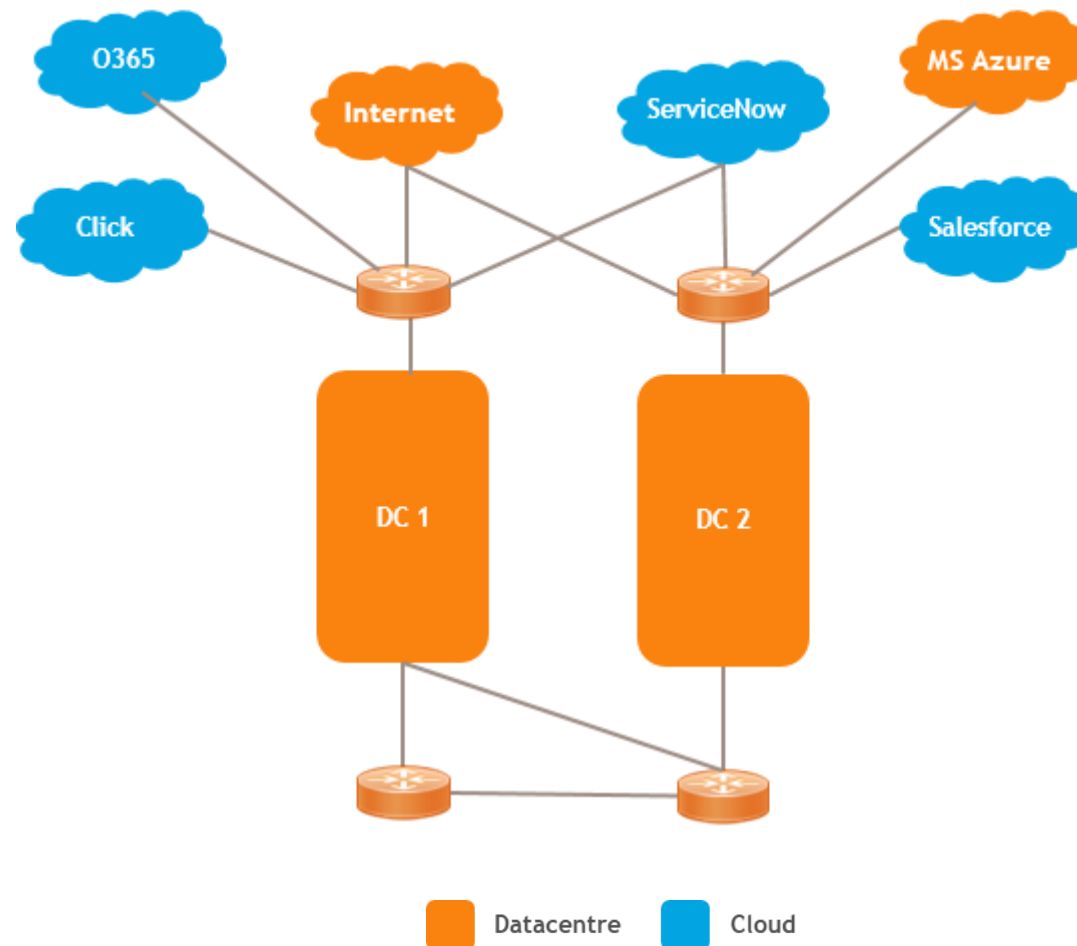
	Scenario 1	Scenario 2	Scenario 3
Alignment to vision and principles			
Alignment to Cost			
Alignment to Risk			

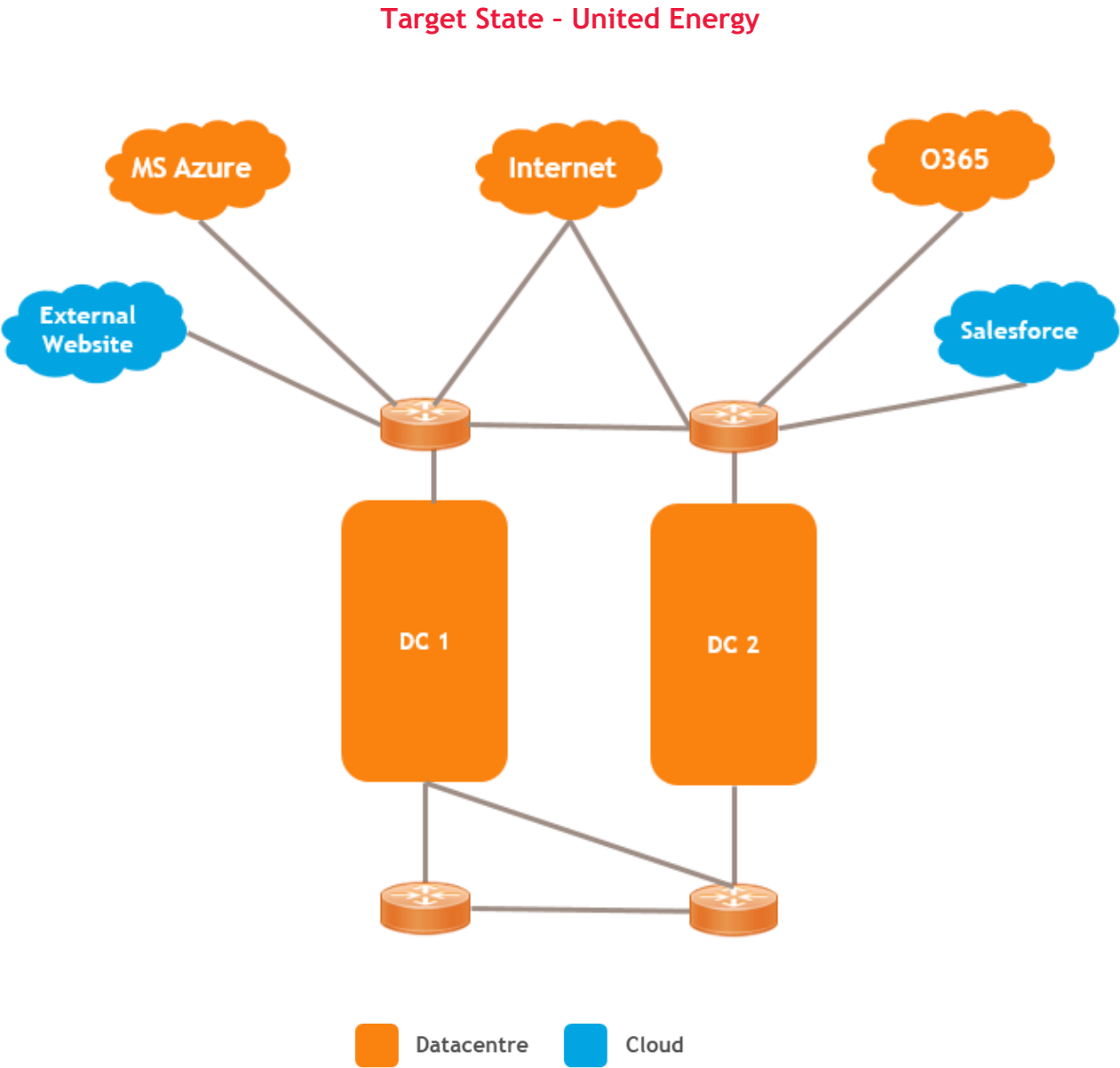
As this work was part of CitiPower, Powercor & United Energy's Regulatory Reset project the preferred scenario was tested to provide a net benefit back the customer.

6 Future State

Target State - CitiPower, Powercor

The future state selected is Scenario 2. There will be a reduction of hosting infrastructure in the datacentres to approx. 35% of current (2018) usage. By 2026 CitiPower, Powercor & United Energy will have adopted a strong cloud position capable of delivering against the established vision and principles as well as meeting regulatory needs.





Establishing Cloud Services

To include external cloud services in the IT hosting infrastructure there are a number of key activities that must be performed to prepare for operating the hosting environment. These activities must be undertaken in preparation for adopting Scenario 2.

6.1.1 Governance

Operating a larger hybrid cloud will require maturation of the current governance model. The new governance model must include new areas for control and reporting while remaining agile to deliver maximum benefits from cloud services.

The key activities which should be undertaken:

- ▶ Governance group - identify the stakeholders required to build an effective cloud governance model
- ▶ Policies - Create policies, cloud standards and processes to achieve effective governance
- ▶ Cloud vendor selection - define standards and application alignment criteria to select appropriate vendor
- ▶ Reporting Framework - define the reporting framework for the governance group and to executive management
- ▶ Implement - deploy cloud governance and corresponding areas to the business and establish into operations.

6.1.2 Network

Current network connectivity to cloud providers is limited and is unlikely to provide the necessary capacity and scalability for the hybrid cloud deployment. Moving forward dedicated connections will need to be established with cloud providers directly or via datacentre providers such as Equinix. An example of this express route with links to Microsoft cloud services. The connectivity must be scalable to allow CitiPower, Powercor & United Energy to grow over time and remain agile to meet hosting requirements. Outlined is the identified critical path for creating the cloud connectivity:

- ▶ Identify and select a cloud connection aggregator service
- ▶ Extend CitiPower, Powercor & United Energy datacentre connectivity to cloud aggregator
- ▶ Establish and deploy cloud network standards.

6.1.3 Security

Extending the security perimeter and establishing new standards for cloud deployed applications, will require a shift in the current deployment. Based on the current deployment and approach, a re-design will be required prior to establishing the selected cloud presence.

Key elements identified for this deployment to be achieved are:

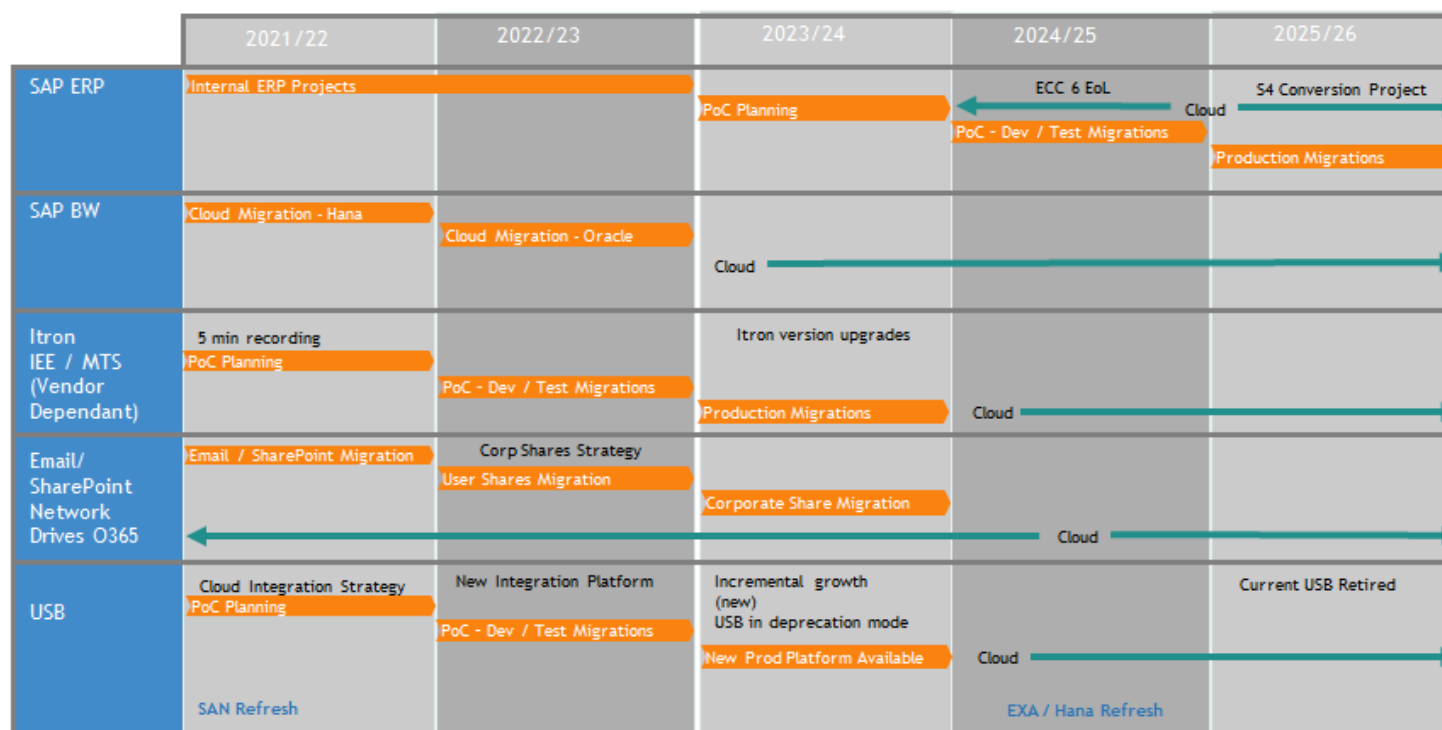
- ▶ Identify hybrid cloud security approach and standards
- ▶ Align standards with governance and networking standards
- ▶ Establish security presence across hybrid cloud.

Migration

6.1.4 Migration - Top 7 Roadmap

With over 70% of all on premise infrastructure resources being consumed by the Top 7, migration as described in the roadmap below, represents the largest opportunity for CitiPower, Powercor & United Energy to reduce capital infrastructure expenditure by converting to an operational spending model, in turn this deliver a high level of agility to the hosting environment. Exception for United Energy is the email migration to O365 which has already been completed.

2021 - 2026 Regulatory Reset - Top 7 Roadmap



6.1.5 Migration - Top 7 - Critical Applications

The nature of the critical applications means that these were assessed individually. As previously mentioned applications were selected as they represented the largest consumers of on premise infrastructure as well as being the most valuable to the organisation for day to day operations. The roadmap was created with

input from technical leads for each application as well as infrastructure personal from CitiPower, Powercor & United Energy. All applications were road mapped taking into consideration internal projects and future application strategies as well as the vendor's future roadmaps. CitiPower, Powercor & United Energy have a solid understanding of future direction but it must be noted that some application migrations will not be possible until 2023 - 2026 which represents the last years for the regulatory period.

During the Top 7 workshops it was determined that Oracle Fusion (USB) will remain a legacy platform during the next regulatory reset period. It is likely that a new cloud aware middleware system will be developed and placed into production around 2023, from that point new applications will be deployed to the new system and eventually Oracle Fusion (USB) would be retired post 2025.

6.1.6 Migration - Non-Critical Applications

The approach selected for non-critical applications (NC Apps) was to consider moves per year in percentages. Scenario 2 talks to 5% of NC Apps migrating year on year for the next regulatory reset period, whilst Scenario 3 doubles this migration rate to 10% year on year resulting in 50% of all NC Apps moving to cloud based infrastructure. It must be noted that accuracy is lost in using these types of percentages, however, it allows the strategy to adapt to the changing nature of the application landscape. As all migrations for NC Apps are targeted at IaaS, there is a large amount of flexibility to adapt which applications will migrate, and how, during the planning stages.

	Approx. # of Apps to migrate	% of Total classified non-critical apps
Low Complexity	31	26%
Medium Complexity	35	29%
High Complexity	55	45%

6.1.7 Final Recommendation

Together, BDO Australia and CitiPower, Powercor & United Energy staff agreed that Scenario 2 (Measured Approach - Top 7 Applications and 5% Non-Critical Application Migrations) reflected the best value and most achievable option for an alternate IT Hosting strategy during the next regulatory reset period.

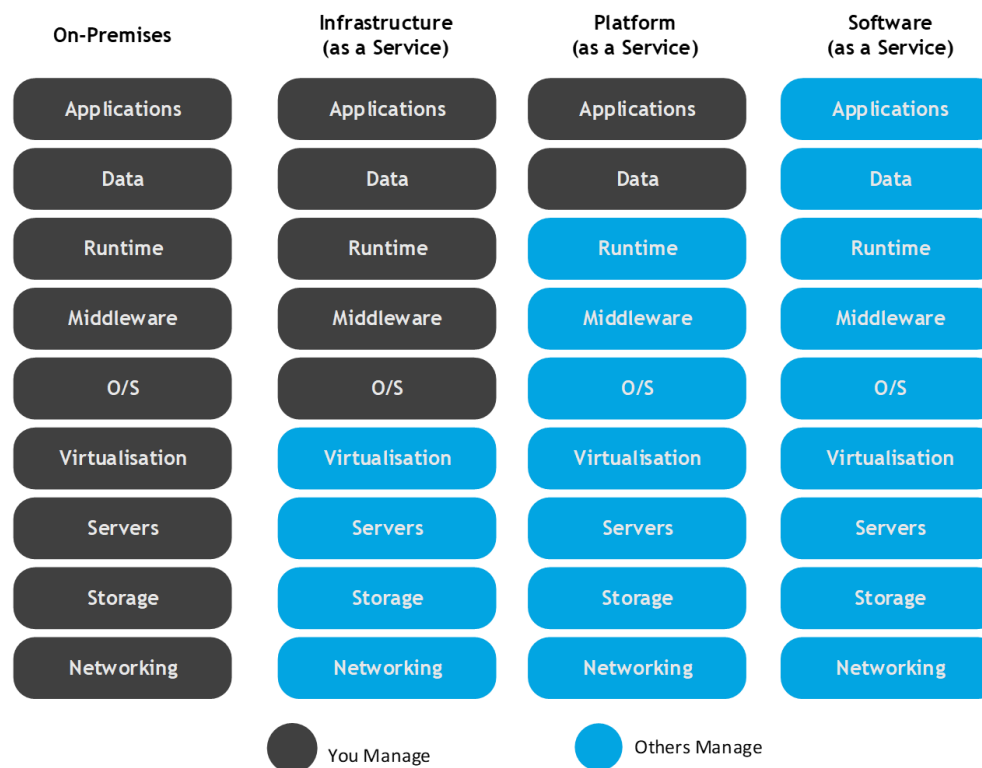
CitiPower, Powercor & United Energy are a cloud aware company, and have begun to introduce cloud native applications when applicable. Further adoption of a hybrid cloud strategy presents CitiPower, Powercor & United Energy with a more flexible financial position, by allowing movement of funds from capex to opex and creating greater controlled infrastructure expenditure. The operational position will also be improved by introducing flexible, scalable and dynamic hosting to deliver critical business services.

It is recommended that CitiPower, Powercor & United Energy review and plan for migration of Email, SharePoint and User File Shares to Microsoft's O365 platform. Strong consideration should also be given to investigation and implementation of a new cloud native middleware service, this will become critical as more cloud services are placed into production and need to communicate with on premise applications.

BDO Australia recommends that CitiPower, Powercor & United Energy should continue to take a measured approach to all new cloud services. The move to cloud should be thoroughly planned to ensure it meets the strategic vision and goals of CitiPower, Powercor & United Energy's IT Hosting strategy and continues to return benefits back to the customer.

Appendix A CLOUD HOSTING TYPES

External cloud hosting is generally broken down to three types shown here. Compared to On-premise (or colocation hosting, there are varying degrees of external management:



A.1.1 Infrastructure as a Service (IaaS)¹

¹ <https://www.gartner.com/it-glossary/infrastructure-as-a-service-iaas/>

A standardised, highly automated offering, where compute resources, complemented by storage and networking capabilities are owned and hosted by a service provider and offered to customer's on-demand. Customers are able to self-provision this infrastructure, using a Web-based graphical user interface that serves as an IT operations management console for the overall environment. API access to the infrastructure may also be offered as an option.

A.1.2 Platform as a Service (PaaS)²

Usually depicted in all-cloud diagrams between the SaaS layer above it and the IaaS layer below, is a broad collection of application infrastructure (middleware) services (including application platform, integration, business process management and database services).

A.1.3 Software as a Service (SaaS)³

Software that is owned, delivered and managed remotely by one or more providers. The provider delivers software based on one set of common code and data definitions that is consumed in a one-to-many model by all contracted customers at any time on a pay-for-use basis or as a subscription based on use metrics.

Appendix B CLOUD ADOPTION

Below lists the applications that CitiPower, Powercor & United Energy have already consumed from cloud providers. It shows the maturity of the technology IT team which will allow further expansion into cloud when needed;

Cloud Services			
Function	Product	CP/PAL	UE
Workforce	Click	X	
Web	SalesForce	X	
	TIS OCR	X	
SMS	IntelliMsg (SMS)	X	
Finance	Concur	X	
HR	SuccessFactors	X	
Map	Map Insights (AWS)	X	
Analytic	LV Map (AWS)	X	
Web	External Corporate Desktop website (AWS) – mobile and desktop sites being replace with single website on AWS	X	

² <https://www.gartner.com/it-glossary/platform-as-a-service-paBas/>

³ <https://www.gartner.com/it-glossary/software-as-a-service-saas/>

Web Mob	External Corporate Mobile website (SQUIZ)	X	
Finance	Hyperion	X	
SMO	ServiceNow	X	X
	Xmatters	X	
Collaboration	Office365	X	X
Doc	Livelink	X	
Finance	PwC Comply First Time	X	
Finance	OneSource - Corporate Tax	X	
	CCH - IntelliConnect	X	
	AustraClear	X	
Finance	Corporate Online - Westpac	X	
Finance	CBA CommBiz	X	X
Finance	ASB - New Zealand	X	
Finance	Quantate	X	
Finance	PBCS	X	
Finance	Orix	X	
Demand Response	Bidgley not FIRB compliant, working on a project to replace it		X
Web	UE Outage Channels (AWS) – in build		X
Web	UE External Corporate Website (Azure)		X
Finance	Blackline		X
Risk	Protecht	X	X
Finance	ADP		X
Finance	ATO Business Portal		X
Finance	CORPORATE ONLINE		X
	GRC Manager		X
Market	MSATS Production (Legacy)		X
	Reval		X
SMS	Whispir (SMS)	X	X
	Adobe Sign		X
Web	Supply Interruption Notification		
	AWS SNS (SMS)		X

Risk	Copperleaf	X	X
Asset Inspection	Click FSE	X	
Test Automation	HP ALM		X
Vegetation Mgmt	FMC Cloud	X	X
Demand Response	SMAC - Sensibo	X	
Facilities Mgmt	Urbanise	X	
Living Values	Redii (Red Ballon)	X	X
Content Publication	AirWhatch	X	X
Finance	PwC Purchase to Pay	X	X