



Private Cloud Options



Part 6 of 8 – Application Hosting and Cloud Strategy



This is part 6 of an introductory series of documents intended to assist your organisation in defining your Application Hosting and Cloud Strategy. Your organisation may already have such a strategy, in which case these documents will hopefully confirm you are on the right track or they may identify challenges your organisation faces.

Private Cloud Options

This section explores the options for a Private Cloud deployment. Private Cloud can deliver against some of the benefits identified above and is therefore preferred over a traditional environment that typically stops at the virtualisation layer.

Two key inter-related questions have been considered:

- Build on the existing technology stack or switch to alternative technology stack?
- Create a new Private Cloud environment separate from a traditional legacy environment or maintain legacy environment on a stack that allows both orchestrated “cloud like” deployment and traditional virtual deployment?

An assumption across all options is that the applications cannot remain on an unsupported platform and therefore the legacy environment either needs to be upgraded or replaced and applications migrated off the old environment.

Existing or New Technology Stacks

The diagram below shows the broad options alongside traditional and Public Cloud “stacks” for existing or new technology stacks.

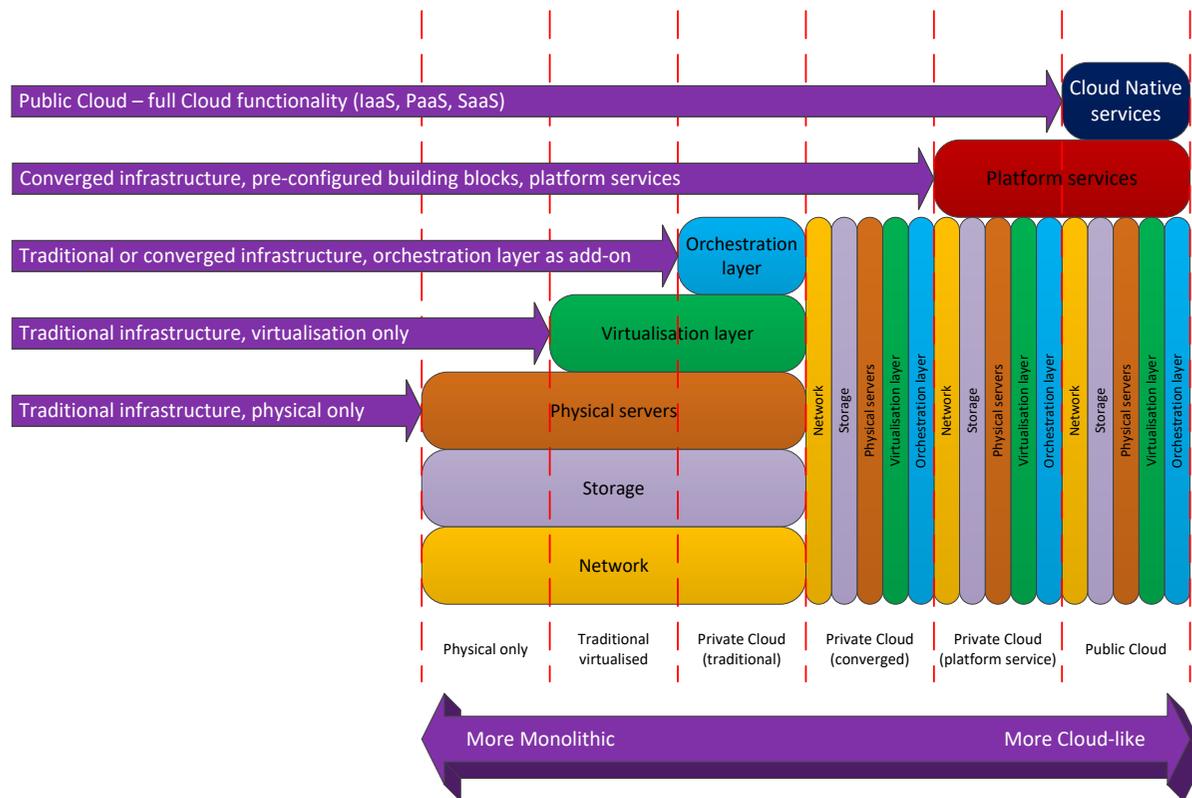


Figure 1 - Comparison of traditional and new technology stacks

Different platforms offer different levels of “cloud like” experience, in most cases these platforms operate at the IaaS level with little or no PaaS services (therefore not suitable for Cloud Native solutions & limited IaaS/PaaS solutions). In all cases there is not the range and scale of PaaS services available in the Public Cloud. The maturity of orchestration functionality that allows ease of movement between Private and Public cloud is another variable. The table below illustrates at a very high level the extent to which the benefits can be leveraged against each of the above “stacks”.

Benefit	Characteristics	Private Cloud Stack Type			
		Traditional Virtualised	Orchestration Layer on Virtualisation	Hyper-converged	Azure Stack
Increased Agility	Automated deployment, IaaS as code, service catalogue	Red	Green	Green	Green
Consumption based delivery	Reporting tools, increased utilisation	Red	Yellow	Yellow	Green
Elasticity	Ability to scale up and scale down rapidly and automatically, environment no longer sized for peak workloads	Red	Yellow	Yellow	Green
TCO and OpEx smoothing	Hardware lifecycle management (CapEx), drive out efficiency savings, reduce up front costs	Red	Red	Yellow	Yellow
Innovation and Currency	OS & platform lifecycle management	Red	Red	Red	Yellow
Sustainability	Tech stack might be more efficient but still deployed in our data centre (PUE)	Red	Red	Yellow	Yellow
Accessibility	On-premise, so behind traditional DMZ etc	Red	Red	Red	Red
Visible and contractual SLAs	On-premise, so not consuming “a service”	Red	Red	Red	Red
Portability	Ability to move between Public and Private Clouds, and between Public Cloud providers	Red	Yellow	Yellow	Yellow

Hyperconverged stacks have combined virtualised compute, storage and network that are all software defined on hardware that is converged onto a single stackable unit. Considerations:

- Now available from a number of vendors and can be considered a mainstream technology;
- Cheaper to run due to ease of deployment & manageability and reduction in support overhead¹ (skills, FTEs etc);
- Modular and scalable;
- Some vendors offer support for multiple hypervisors so there is flexibility at the virtualisation layer to use any of the leading technologies (VMWare, Microsoft Hyper-V, Citrix XenServer, KVM).

¹ This will rely on the support contract with new “tower providers” having the flexibility to allow your organisation to derive support cost savings based on technology stack changes.

Hardware costs may be slightly lower than non-converged equivalents but the main cost savings for a hyperconverged stack are in the running costs due to converged management and skills requirement.

Separate or Shared

There are constraints in the current application estate that would make automated/orchestrated deployment into a Private Cloud environment challenging. Containerisation platforms may present some opportunities to mitigate some of the constraints by wrapping legacy applications and running them on modern platforms. In some cases however deployment directly at the virtualisation layer may be the only option. This may limit some of the technology stack options if a shared environment is considered as not all will have the capability to allow both automated/orchestrated deployment and direct virtual machine deployment.

A shared platform means that one environment will need to be maintained which will reduce support overhead (monitoring, patching, skills, upgrade cycles etc) and reduce overall costs (licencing, hardware etc).

The purpose of keeping these environments separated would be to allow clean and fully automated deployment into the Private Cloud from day one, this would allow all Private Cloud features to be leveraged for everything deployed on that platform. This opens up opportunities to sweat the legacy environment further and keep it on a separate lifecycle but ultimately this environment will need to be refreshed.

Conclusion

The below table highlights the key pros and cons for each key question.

New stack	Existing Stack
<p>Pros:</p> <ul style="list-style-type: none">• Opportunity to drive down cost• Opportunity to simplify support• Opportunity to modernise to the next generation of platforms• Opportunity to consider options for edge computing	<p>Pros</p> <ul style="list-style-type: none">• Capability to support already exists in service providers• Simple migration• Less or no risk of compatibility conflicts

Cons: <ul style="list-style-type: none"> • Overhead of technology evaluation • More complex migration & testing (assuming different hypervisor) • New skills to support • Risk of compatibility conflicts 	Cons <ul style="list-style-type: none"> • Missed opportunities to reduce costs, modernise and simplify
Shared Private Cloud & legacy environment	Separate Private Cloud & legacy environments
Pros <ul style="list-style-type: none"> • Lower cost, only 1 environment to purchase and maintain • Simpler support 	Pros <ul style="list-style-type: none"> • Could move to a more feature rich platform for Private Cloud
Cons <ul style="list-style-type: none"> • May limit platform options 	Cons <ul style="list-style-type: none"> • Overhead of 2 environments to support • Overhead of 2 replacement cycles

Considering generic CTO principles of “reduce costs” and “reduce the number of moving parts”:

- Maintaining two separate environments adds complexity and cost so a combined environment would be preferred;
- The opportunity to investigate alternative stacks that could further simplify and drive out cost savings should be taken.

The extent to which having a combined environment constrains our Private Cloud options is not yet quantifiable, this is however a common problem so it is envisaged that vendors will have mechanisms for accommodating both in most cases. Legacy application containerisation may also provide a viable option for some legacy applications.

Principles	Your organisation will not create multiple environments for legacy and Private Cloud, preferring instead to create a single “stack” that can support both.
	When changes to any on-premise application are planned, migration of that application to the Public or Private Cloud will be considered alongside and if the uplift in effort is not significantly increased then the application should be re-platformed.
Roadmap Items	Conduct a technology evaluation of Private Cloud options.
	Investigate containerisation technology alongside Private Cloud options as a means to decrease the number of applications that are deployed in a less than optimal way on the new Private Cloud environment.
IT Organisation Implications	Agree, at the earliest opportunity, on a mechanism with new service tower providers to drive out cost based on technology consolidation or technology change.

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www.rheinberry.com

info@rheinberry.com

Application Migration

This section covers the approach to moving current on-premise applications onto the new Private Cloud and potential re-platforming to Public Cloud.

Ideally application migration should be based on detailed application roadmaps which are business driven and based on providing applications that are functionally fit for purpose, supportable and meet availability and performance requirements. Roadmaps do not exist for all applications currently and this has led to many applications lapsing out of any formal lifecycle management which in turn leads to a high level of obsolescence at the infrastructure layer. Infrastructure projects that have focused purely on infrastructure components have historically hit problems as the application layer and the compatibility/testing requirements have been considered out of scope.

Where the level of Infrastructure obsolescence in your organisation's environment cannot be sustained then upgrades such as the following must be introduced:

- Operating System;
- Additional physical to virtual migration based on physical server asset replacement;
- Potential introduction of new Hypervisor as part of new Private Cloud technology stack;
- Database version upgrades to remain within supported versions.

Each of these will require application re-testing and in some cases, may require application layer upgrades to ensure compatibility.

Containerisation may provide an alternative way to manage legacy applications on the modern Private or Public Cloud environments as well as improving security, availability and fast provisioning. This is not expected to be a "silver bullet" but may increase the number of applications that can be remediated.

Cloud Financing

The investment associated with the refresh activities are considerable and therefore offer good opportunities for redirection into the cloud platform.

The migration of applications and services to the cloud will allow your organisation to take advantage of technologies such as multi-tenancy and thin-provisioning that lower the total capacity of infrastructure required. This should allow your organisation to lower the overall expenditure on IT even though the OpEx investment will increase.

The CapEx and OpEx investment required for the implementation of Application Hosting and Cloud Strategy is dependent on 2 main points:

- CapEx reduction will not occur smoothly year on year, reductions will be in line with asset replacement and will rely on scaling down at each iteration;
- OpEx increase will be more gradual as applications are opportunistically migrated, in reality this may go in waves as there may be external catalysts that cause peaks of activity in application replacement (e.g. preparing for new financial regulation).

In terms of overall total cost of ownership, there are a number of key variables which influence whether a reduction is achievable and over what period:

- The extent to which current legacy applications can be migrated (technically) and the relative up-front cost of doing the migration;
- The extent to which existing services can be scaled down, consolidated or made to run on shared platforms once migrated to the cloud;
- The extent to which elasticity can be exploited;
- The extent to which mature SaaS or PaaS services could replace existing applications;
- The extent to which decommissioning legacy environments will lead directly to OpEx cost savings with outsourced suppliers;
- The resource cost saving associated with maintaining the CapEx cycle (re-justifying and planning & executing asset replacement programmes);
- The improvements in controlling costs through good day to day management of cloud services;
- The extent to which current practice over-specifies or over-provisions capacity for infrastructure platforms;
- The extent to which replacement on-premise infrastructure components can be scaled back when they need replacing;
- The extent to which implementing a DevOps approach to Cloud Native solutions drives down overall costs of deployment.

Rheinberry specialises in assisting IT leaders in organisations with complex environments to successfully plan and deliver IT change across their organisation. We provide our clients what they really need, costs representing good value, flexible ways of working with proven IT professionals and most importantly successful Project and Programme outcomes.

To do this we have combined the proven methods, professionalism and structure of traditional IT consulting practice with the experience, pragmatism and independence of IT freelancers, interims and contractors, to create a new 'hybrid consulting' model. Our approach and working style is very much 'client-side', we collaborate and engage deeply with stakeholders and we strive for long term relationships. We believe in small teams of highly skilled experts with not only the right experience but also those that have worked together previously and know each-other's strengths and working styles that collectively deliver quicker than a team that has not worked together previously.

www.rheinberry.com

info@rheinberry.com

Rheinberry Ltd

International House
24 Holborn Viaduct
London
EC4A 4AN
United Kingdom

+44 (0)20 3000 2660

Rheinberry Ltd 2018

www.rheinberry.com

info@rheinberry.com