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TIER IV datacenter

Whitepaper



The ABC of Private Clouds

A viable option or another cloud gimmick?

Although many organizations have adopted the cloud and are reaping the benefits of a cloud computing platform, there are still concerns with the handling of sensitive information on a public cloud platform. For such organizations an alternate option is available, and it means having their own private cloud.

Private cloud presents a new and an innovative approach to organizing and managing information technology resources and services. Private cloud is a new concept that focuses on IT resources forming a flexible pool that organizations can draw upon precisely when and as needed instead of filling predefined and limited roles.

Imagine a scenario where your organization could rapidly access and analyze information and make decisions? Innovate and launch new business capabilities faster? Scale business operations up or down as needed? Tap into new information and expertise - both inside the company and in the marketplace - on demand? And do all this while safeguarding sensitive information and other business assets? Private cloud offers you this and much more adding up to genuine business agility.

What is a 'Private Cloud' anyway?

The private cloud offers an opportunity to a business enterprise to create a virtualized IT architecture on its own terms with the internet as a backbone for facilitation. The applications reside on the organization's hardware, within its network along with the data. The IT infrastructure is distributed across the enterprise LANs and WANs. A private cloud offers the same benefits as that of a public cloud - cost reduction, asset utilization, information availability, rapid deployment of new services, and business agility - sans the

security risks. In the future as the need may be, a private cloud can also serve as a gateway to the public cloud, enabling a business to make use of the growing array of services available on a public cloud, while keeping business-critical information systems 'inside' the private cloud.

IDC, a premier IT research firm, views private cloud computing as maturation of the evolution of the IT datacenter, and sees virtualization as the necessary stepping stone to the private cloud environment. While public cloud computing raises issues of reliability, data security, system protection, compliance and governance, none of these concerns are as prominent with the private cloud.

The main benefits of having a private cloud infrastructure are as follows:

Control

A private cloud infrastructure provides an organization with total control of the cloud services. An in-house information technology (IT) department will be able to handle every aspect of the administration.

Location

A private cloud is located in a nearby facility, making it practical for the IT team to go on-site and resolve problems and issues as they arise.

Security

The organization with a private cloud has the flexibility and freedom to establish its own security policies i.e., the organization decides on the level of security for each area of the cloud platform.

Hosted Private Cloud

Hosted private cloud is another form of private cloud where the infrastructure is hosted at the provider's location rather than at the organization's own premises.

In a hosted private cloud, physical infrastructure is provisioned and dedicated to a single customer that ensures no sharing of data, applications, user credentials, or other sensitive information. This dedicated infrastructure is secured in state of the art datacenters and is often locked within a cage, further limiting physical access to a select few individuals. Hosted private clouds have all the benefits of shared clouds that are typically associated with cloud computing. Hosted private clouds also have many additional benefits, mostly in the areas of enhanced security, privacy, control, and configurability.

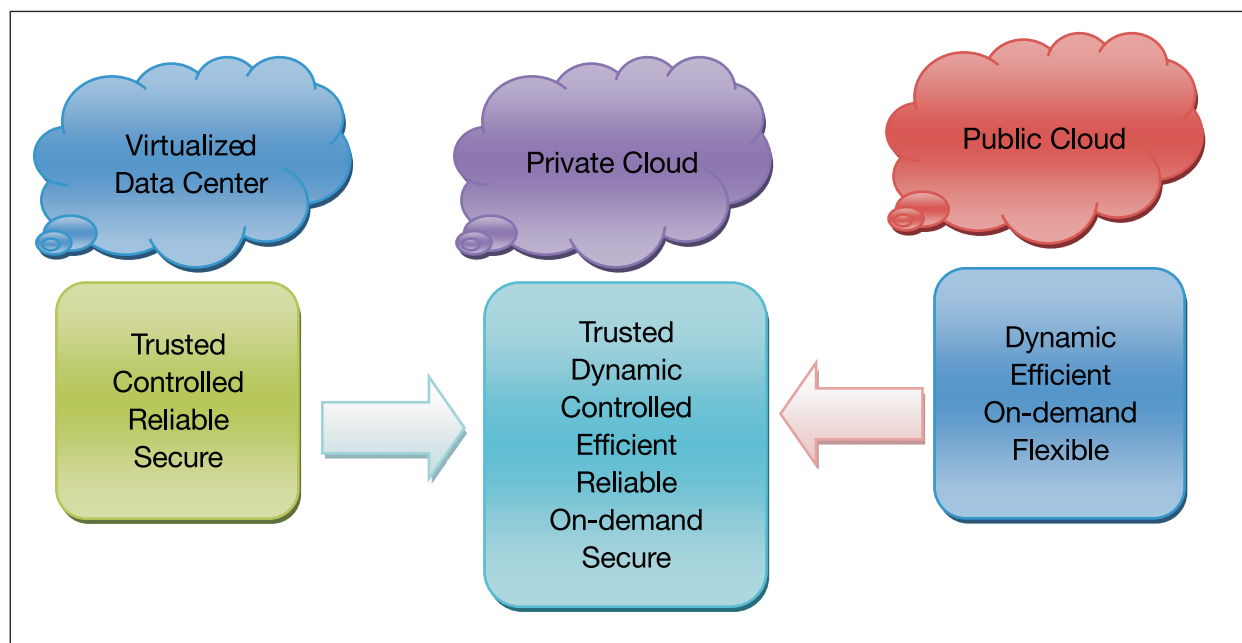
Virtualization

The flexibility and agility of a well-managed virtual system eliminates the roadblocks of the 'racking and stacking' physical systems, providing the basis for rapid elasticity and resource pooling.

Cloud Service Management

By providing a set of business focused and policy-driven services, this delivers the on-demand self-service and measurement that rounds out the essential characteristics of a private cloud.

A critical and indispensable component of a private cloud is the Service Catalog,



The building blocks of a Private Cloud

Infrastructure Automation, Virtualization, and Service Management are fundamental building blocks for Private Cloud.

IT Automation

Automation of even complex processes for deployment and management allows network-accessible IT components (servers, applications, storage, networks, etc.) to be rapidly deployed and repurposed, as required.

providing a menu of standard cloud service offerings and a self-service 'storefront' for IT. The Service Catalog provides visibility into IT's offerings for the enterprise - what services are being offered, what costs are associated with a given service level, and the ability to provision that service or retire it as needed.

Key elements of a Private Cloud infrastructure

The key elements of a private cloud include the following:

- **Self-service portals:** access to a Web-based system that enables on-demand consumption of IT services;
- **Policy-based controls:** rules, policies and other mechanisms that govern the terms and conditions of IT resource consumption;
- **Standardized hardware:** servers and other hardware resources that are under the centralized control of the IT supply chain and lifecycle;
- **Automated deployment and maintenance:** software and other management tools that eliminate manual administration as well as reduce cost and variability of IT resource maintenance;
- **Targeted independence:** the ability to move services dynamically between internal and external deployment environments based on price, performance or policy; and
- **Elasticity:** the ability to provision, de-provision, and scale resources up and down on demand.

Another key element of a private cloud is automating server management and maintenance - as well as management of other resources, including networks, and storage.

Cloud characteristics and advantages

The resources in a cloud have three essential characteristics:

Pooled

All the resources in the cloud are organized and managed as a common shared pool. Pooling usually begins with servers and storage and then come data and applications. Common methods for structuring, connecting, and accessing the resources are used for pooling.

Virtualized

All the resources in the pool are packaged in electronic 'shipping containers.' Each

contains not only the resource itself, but also the business rules governing its access, use, and management.

Networked

All these modular resources are accessible over a network using standard interfaces. In more technical terms, they are available as "Web services."

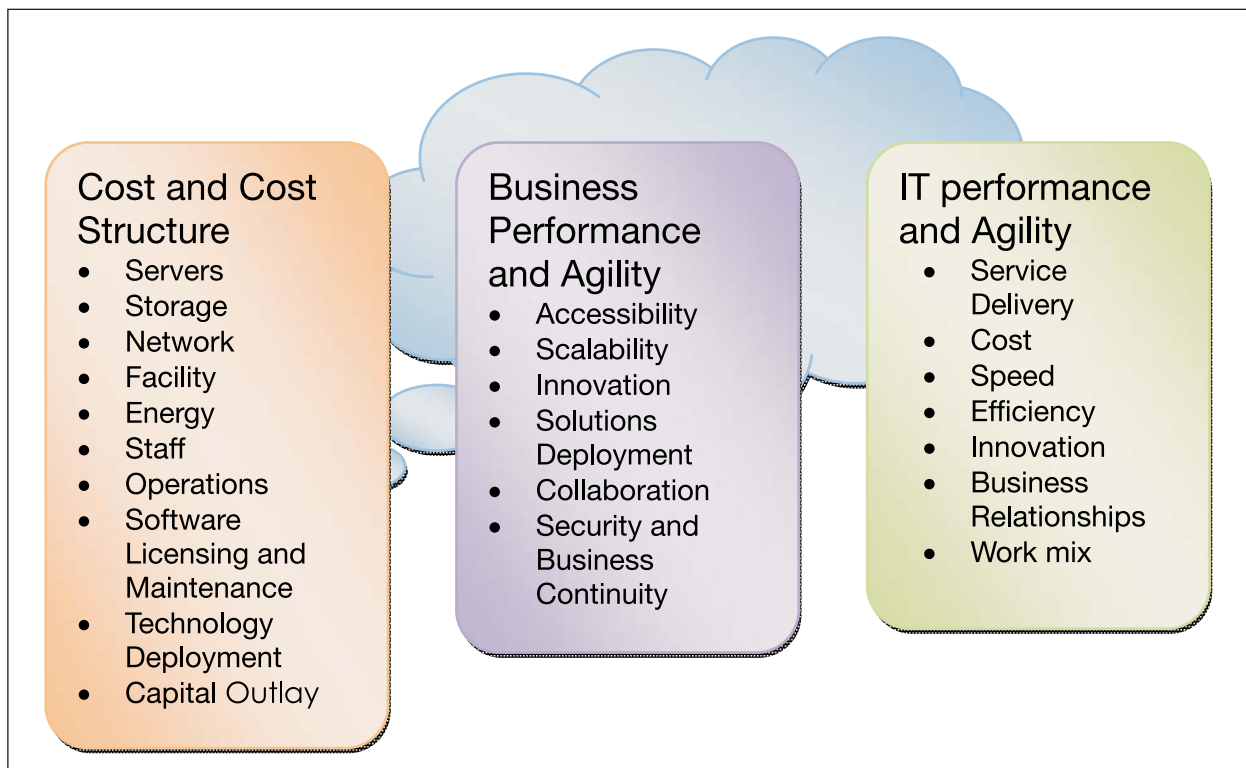
Cloud computing changes the way in which the technology resources are consumed by the business. As the activity in a cloud is measured and metered, customers who avail of cloud-based services are charged on a pay-per-use basis. This gives enhanced visibility to the customer as they can measure their actual usage levels and thus can understand how much they have been charged. Through the cloud resources can be made available on an on-demand model, often via self provisioning as per the customer's requirements. The cloud enables well-defined services, simple interfaces, and automated provisioning so that the customers can find and use services on their own or with minimal intervention and assistance from IT staff.

With a private cloud, one can change the unit of consumption itself. Instead of consuming and being charged for basic technology resources (e.g., servers, CPU cycles, gigabytes of storage, and bandwidth), business people and processes can consume relevant and easy-to-understand business services (e.g., business transactions, e-mail, and information analyses).

Cost and Cost Structure

This includes not only direct cost reduction, but also cost avoidance and improving cost structure. Through consolidation of hardware and virtualization of the digital assets, organizations can reduce their short term

Benefits of the cloud approach



costs. This leads to an overall reduction of 40% in data center costs, including a 30 percent reduction in power consumption and cooling costs. Virtualization enables organizations to resize the data center closer to average capacity. Accordingly when the need arises, resources can be automatically channeled to the most important business activities.

By pooling and centrally managing assets, a private cloud delivers economies of scale, better resource utilization, reductions in capital outlay, ongoing operational efficiencies, and the conversion of fixed costs to variable.

Business performance and agility

Private cloud can enable all technology-dependent business processes of an organization to operate more efficiently, with faster cycle time and at a lower cost. Benefits include:

- Expanded access to information and

- applications
- Rapid scaling of business operations up and down
- Rapid business innovation
- Rapid deployment of new business capabilities
- Expanded coordination and collaboration
- Better compliance, security, and continuity

IT performance and agility

With a private cloud, IT can collaborate and innovate better, develop and deploy applications faster, and provision technology and services more efficiently and flexibly. The work mix changes dramatically. Less time and effort are spent for commodity activities in the data center as the virtualized environment is more automated and dynamically self-adjusting, thus, increasing the amount of time and effort needed for business innovation and improvement projects. In addition to meeting individual business

Private Clouds vs. Public Clouds

THE distinction between public and private clouds is based on whether the IT resources are shared between many distinct organizations (a public cloud) or dedicated to a single organization (a private cloud). Private clouds can be external to your company's data center, such as Amazon's Virtual Private Cloud service, which securely walls off a section of its public cloud infrastructure for a unique customer. Compared with traditional virtualized data centers, both private and public clouds benefit from automated management (to save on manual labor) and homogenous hardware (for lower cost and more flexibility).

needs as they arise, IT is much better able to look across the computing environment and optimize its performance and cost on behalf of the business at large.

The roadmap to the Private Cloud

A private cloud helps an organization to organize and manage the technology better. Before embarking on this journey carefully evaluate what you want to achieve through a Private Cloud, is it:

- Consolidating servers, storage, networks, and other technology resources
- Virtualizing technology resources, including information and applications
- Organizing and provisioning IT offerings as business services
- Structuring and managing IT as a shared services organization
- Automating technology resource and security management
- Building standard interfaces with compatible service providers

- Making effective use of selected public cloud services

A private cloud roadmap can be the means of integrating all the above mentioned activities and enhancing their business benefits.

Private cloud represents a more productive way for technology services to be provided, consumed, and managed. For example, technology assets may be defined and packaged differently, through methods like metadata management and virtualization. IT's work may be structured and provisioned differently, as a catalog of business services. Business people may consume many services differently, using a self-service browser interface, and pay for them differently, if a pay-by-use method is implemented for selected services. And IT and the business can manage the technology environment and its services differently, with greater transparency into business performance and value.

Key issues to be looked at before starting your journey to Private Cloud

Following considerations must be evaluated before embarking on a journey to the private cloud:

Review IT infrastructure complexity

Organizations can derive the value of IT from three basic factors. These are:

- the business specific applications and data that are used to run their operation;
- the business process improvements that can be implemented more effectively through using IT; and
- the information and insights that can be gained from the data the organisation retains.

IT infrastructure of most organisations is

unnecessarily complex. This is because of many varied business decisions taken over the years, with little thought given to their effect impact on the organization's overall IT infrastructure. Complexity of IT infrastructure leads to deployment of a vast amount of internal resources and increased costs whilst delivering very little real business benefit. What more, it limits performance, scalability and particularly agility, reducing the ability to implement change quickly to meet the changing business requirements. All these issues can be addressed through cloud computing.

It has been observed that organisations that optimize their infrastructure through concepts such as resource pooling, virtualization and dynamic provisioning can improve operational performance and realize significant savings. By optimizing their infrastructure, they can then easily create a private cloud. A private cloud offers flexible capacity, together with scalability, flexibility and resilience, and can provide applications to users wherever they are. The use of private cloud, rather than public cloud, enables organisations to maintain a higher level of control and conserve their existing investment and develop support and management skills. In future, should the need arise to move to an external service provider, they can do so without any hassles.

Application delivery

The ubiquity of the Internet has led to cloud computing. Internet provides the standard interface for cloud: the browser. Not all applications yet run natively in a browser but most are heading that way. Studies indicate that every mainstream commercial application can be published to a Web portal and accessed through a browser. Except where specific device drivers are required that negate the

The Private Cloud Model

The following elements comprise a private cloud computing, or Infrastructure as a Service, model.

Virtualization

By virtualizing physical resources, then placing a management layer on top, applications, servers and other resources can be dynamically moved, managed and offered up to end users.

Multi-tenancy

Multiple end users share the same resources (hardware, applications, etc.). Multi-tenancy enables the centralization of infrastructure where resources can be priced at lower cost.

Self-service

Customers can request and provision cloud resources as they need them.

Automation

Automated processes ensure timely service delivery to customers.

Dynamic, on-demand scalability

Computing resources can be dynamically increased or decreased based on user demand.

Chargeback model

Users' resource consumption is measured and billed for by the IT department.

application being ported to a cloud service, applications can be centrally streamed from datacenters.

Flexibility, delivered through desktop and application virtualization will help an organisation meet several other key objectives that include application and service standardization; central control

and management of desktop; simplified and cheaper licensing; and most importantly the capability to deliver location independent flexible working.

Need for internal IT control

Effective use of any form of cloud requires that all the 'traditional' IT disciplines as defined by ITIL and other best practice frameworks should ideally be automated. If these are not already in place cloud computing will not provide the shortcut to delivering them. However, most organisations already have most of the required elements, which may just need to be re-architected or enhanced for cloud. These include:

- **On-demand self-service:** This can be provided through standard web portals, with packaged and streamed applications, services and complete desktops published through the portal. Access to these is linked to user authentication mechanisms that define which users will have access to what all applications and services. New users can be set up directly from the portal with appropriate security capabilities, and new services can be published and accessed on demand.
- **Resource pooling:** Most organizations have already implemented virtualization or are in the process of doing so. Virtualization provides the capability of resource pooling for servers, storage, desktops and more recently networks.
- **Rapid elasticity:** This is one of the key capabilities of virtualization; additional resources can be added quickly and easily as per specific needs. With a private or hybrid cloud servicing a defined set of users this is less of an issue.
- **Measured Service:** If organisations have effective Capacity Management and Service Level Management in place then two of the most important

requirements for moving to private cloud and eventually provider independent cloud are already met.

Service level

One of the primary benefits of the private cloud is cost effective delivery of high quality and guaranteed service levels that usually meet the requirements of an organisation. The first step in this direction is a review of the organization's business and IT alignment. This review is necessary to ensure that the organisation has accurately defined the service levels it requires for the key operational processes that IT supports, and has a full understanding of the cost, performance and availability implications of the requested service levels.

The second step is to ensure that best practice frameworks such as ITIL/ISO20000 for IT Service Delivery, ISO27000 for Information Security and BCI best practice for Business Continuity are refined and optimized to suit the requirements of your organisation.

Thirdly, private cloud infrastructure is by definition a fully resilient, virtualized environment that allows applications and services to be dynamically reassigned. If properly designed, implemented and managed, downtime from hardware failures should be non-existent.

Information security

For a private cloud every aspect can be audited against ISO27000 or PCI DSS best practice information security standards. Effective security processes can be embedded into the portal and the platform. One of the key advantages of using a private cloud to deliver a virtualized desktop environment is that no data ever leaves the datacenter unless the organization's security policy specifically allows mapping of local drives, USB

memory sticks or other external storage. Also, on private cloud, the existing user directory infrastructure can be reused whereas most public cloud services require this to be recreated from scratch.

Resilience and disaster recovery

Resilient hardware and disaster recovery processes should be an embedded and a fundamental part of the private cloud. The key elements to making failover fast, cost effective and efficient are virtualization of all elements and standardization. Virtualization makes automated, scripted failover and full service recovery between datacenters achievable in minutes, potentially seconds.

Effectively private cloud provides datacenter clustering. Standardization ensures that each datacenter is identical, allowing active/active and active/standby datacenter operation, with the added benefit that the organization can replicate its entire datacenter to any organisation that offers comparable facilities, saving

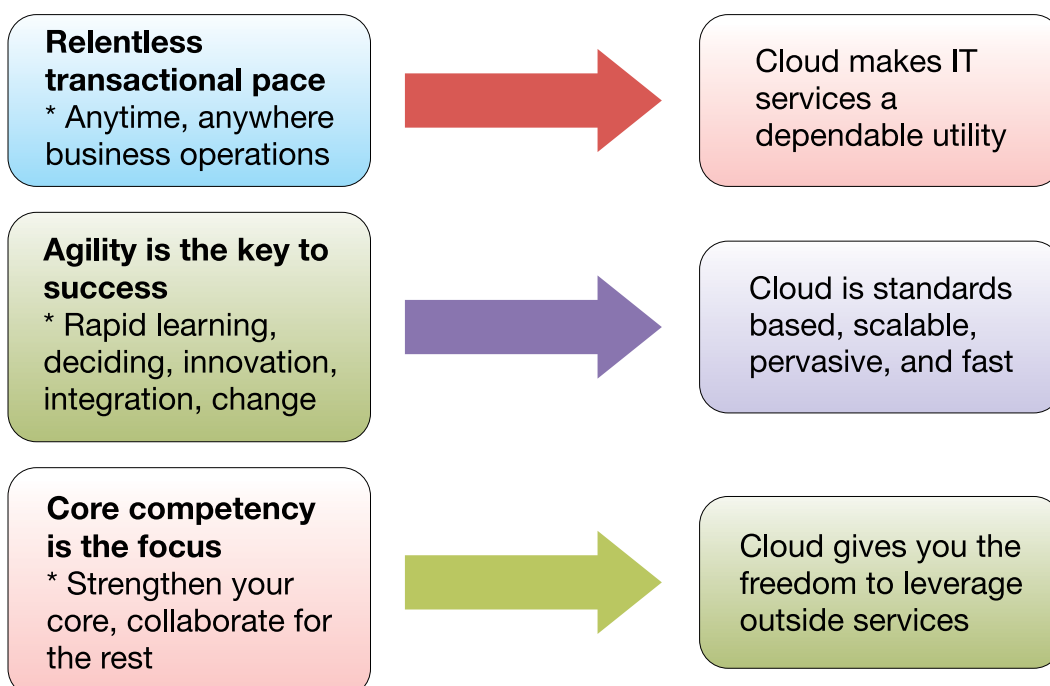
the investment cost and management overhead of running a separate disaster recovery environment.

How to get to private cloud

The steps most organisations will need to undertake to get to an initially private or hybrid clouds, and potentially public cloud in future, are as follows:

- Understand what services your business requires from your IT function. Define your Service Catalogue based on this.
- Review the required service levels needed for each of the defined services, include resilience and data security.
- Define and agree the services you want to provide internally and those that can be hosted or provided by a third party.
- Measure the current resources you require to deliver the internally provided services to the require service levels.
- Review your current infrastructure and look for all opportunities to simplify, rationalize and standardize what you

Key business drivers of Private Cloud



support and how you manage it.

- Virtualize every element you have not already done so where it is technically and commercially appropriate to do so; this includes desktops.
- Implement a common user portal where all users access all services whether provided internally or by a third party.
- Refine and improve your operational processes to take advantage of the new environment.
- Implement suitable internal charging mechanisms so all users/departments can understand the costs of the services they are using.
- Review cost of internal service provision against what commercial cloud providers can offer for the same level of service.
- Monitor every service provided whether in house delivered or externally to ensure it meets agreed service levels.

A unique offer from CtrlS: the on-demand Private Cloud

Although organizations are excited about using cloud technologies to bring in IT spend efficiency in the organization, they are still apprehensive about data security when migrating to the public cloud, but while Private clouds are really secure, they are also expensive. CtrlS offers a solution that cuts mid-way.

With CtrlS's on-demand Private cloud framework, organizations can now avail the benefits of a Private Cloud and also scale up and down as per need as you can in a Public Cloud solution. The costs too are scaled down without any significant

additional CAPEX or OPEX, making it an ideal solution for organizations who want the Private Cloud, yet also have the flexibility of scale and at costs that are definitely not prohibitive.

On-demand Private Cloud is a never-see-before concept and an extremely innovative framework that will bring cloud computing solutions close to organizations. It is also the ideal solution for small and mid-sized organizations who are eagerly considering a cloud solution, but with robust security features, provision to scale up or down and with costs that fit well into their budgets. On-demand Private Cloud offers the best of both Public and Private Clouds.

CtrlS believes that this is an opportunity for efficiency improvement, cost reduction, business agility, and customer satisfaction that no IT organization should pass up.

About CtrlS Datacenters Limited

With over 20,000 racks planned across India, CtrlS is the country's first and only certified Tier 4 datacenter and is offering cutting-edge DR solutions to over a 100 large enterprises across verticals. CtrlS has invested a lot of time and effort in creating a fault tolerant datacenter which can guarantee an uptime of 99.995%, the highest in datacenter industry. To know more about On-Demand Private Cloud, and our Cloud Computing solutions send us an email to mycloud@ctrls.in or visit www.CtrlS.in ■

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