4 Economic Benefits

Of Hosted Private Cloud

From resource rightsizing and flezible scaling, here's why private cloud hosting is a winning infrastrructure alternative.

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Adoption of cloud-based architectures continues to grow at a rapid pace and most organizaions have already shifted at least some workloads to the cloud. For those who haven't, the question isn't if they will move some or all on-prem workloads off-premises, but rather when and how.

Introduction

It's complicated but achievable

As the cloud computing market matures, vendors expand feature sets, and competition leads to near-parity performance, selecting the most effective solution for a given use case is more complicated than a simple binary decision. At a high level, organizations have the options of public or hosted private cloud architectures, with a hybrid, multi-cloud strategy being the optimal approach for many projects.

There is no one-size fits all

We recognize that there is no one-size-fits-all solution, and throughout this eBook, we will take a pragmatic approach to defining the scenarios where hosted private cloud makes sense from an economic perspective and how organizations can identify use cases where a hosted private cloud can add the most value to their business.

Bottom line: The needs of a specifica application should drive the business decision to deploy new workloads or existing on-premises workloads in the cloud. Additional takeaways stemming from that ideal include:

- Many economic benefits obtainable in the public cloud are also obtainable in a hosted private cloud

- Steady-state and always-on workloads are ideal candidates for hosted private cloud deployment

- Rightsizing a solution allows for the most efficient allocation of resources and optimal application performance

What is Hosted Private Cloud?

In a Hosted Private Cloud model, the service provider dedicates cloud computing resources to a single client of organization that is either logically isolated (multi-tenant) or physically isolated (single tenant) from other users.

Compute resources are reserved and dedicated for that customer alone. A prototypical hosted private cloud partner will provide the underlying infrastructure and technology (bare metal servers, networking, sotrage, facilities, power, cooling), hypervisor for virtualization, and a variety of optional management and security solutions.
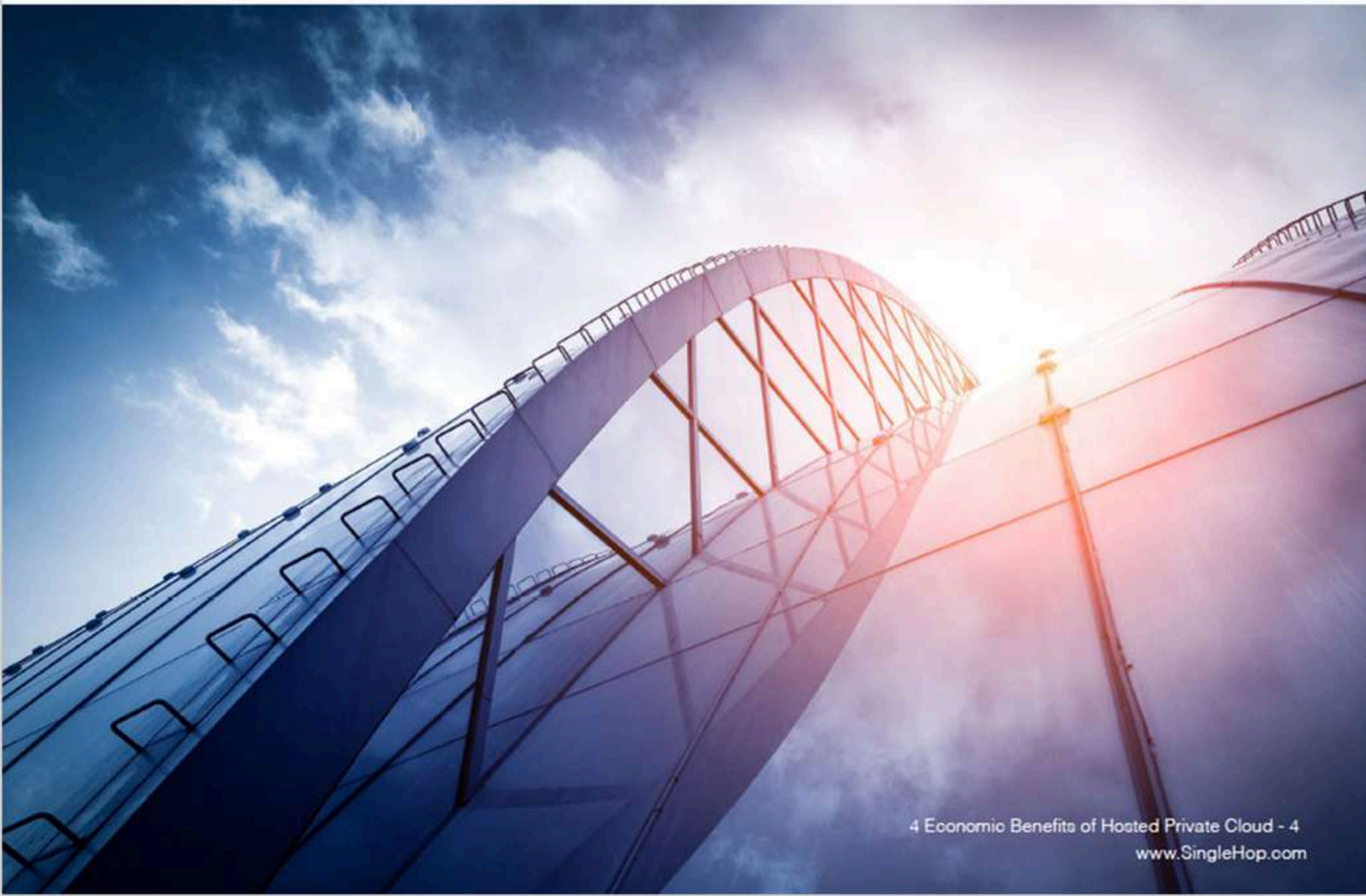
What is a Hosted Private Cloud?

Differences Between On-Premise

From a hardware and hypervisor standpoint, hosted private clouds are highly similar to on-premises private clouds (in which the organization using the cloud is also owns and operates the underlying infrastrucutre at their facilities), but there are a number of differences that can make a hosted private cloud solution a compelling option for many use cases. Generally speaking, hosted private clouds offer significantly greater flexibility and scalability due to the fact the client is not constrained by the hardware they purchased at the start of a project or the resources and lead-time required to spin up a new application to support the business. Similarly, by removing the infrastructure acquisition and maintenance burden from an organization, hosted solutions allow the client to focus on core business activities rather than time-consuming procurement, troubleshooting, and break/fix activities that come with owning hardware.

Differences Between Public Cloud

The next logical comparison to a hosted private cloud solution is public cloud providers like Amazon Web Services (AWS) and Microsoft Azure. Thre are some applications where these hyperscale environment will outshine hosted private clouds, particularly with highly burstable workloads or applications that only need to be online for a set amount of time per day. However, there are many more applications where the best benefits of the public cloud aren't leveraged or required. In those scenarios, deploying a solution in the public cloud may lead to more waste due to over-provisioning compared to a hosted private cloud solution. Additionally, organizations comfortable with hypervisors like VMware's ESXi and Microsoft's Hyper-V may find that a hosted private cloud using these platforms and tools results in more productivity and transparency.

What is a Hosted Private Cloud?

Choosing a Hosted Private Cloud

In addition to financial and productivity benefits, application characteristics and regulatory requirements are also key elements of the use case that typically drives enterprises to choose a hosted private cloud. Applications that consume a predictable amount of resources (or those with steady-state, always-on workloads) can be rightsized in a hosted private cloud, as opposed to paying a premium for public cloud instances that are highly scalable but may not maximize the use of the compute and storage resources you are paying for.

Businesses must also choose the type of hosted private cloud to be used — either Virtual Private Cloud (VPC) or Dedicated Private Clouds (DPC).

VPCs are multi-tenant, logically isolated cloud computing environments. Use cases where VPCs make sense include applications that have significant variable computing resource usage, do not require physical isolation of data for security purposes, or smaller deployments that cannot justify dedicated hardware.

DPCs are fully isolated, single tenant hardware nodes dedicated to one client, providing an on-premises experience coupled with the benefits of the cloud. DPCs offer dedicated compute and firewall resources to the client and the ability to access the underlying hypervisor. Some hosted service providers will also integrate compute hardware clients have pre-qualified into a hosted private cloud. This is a significant value-add for organizations hesitant to outsoource their data center due to strict hardware requirements. Other common workloads suited for DPCs include those that require compliance (PCI DSS, HIPAA, Sarbanes-Oxley, etc.), those that utilize enough resources to justify dedicated hardware, or those where a client would like visibility or control at the hypervisor level.

How to Approach Cloud Infrastructure Planning

Launching a new infrastructure project? Follow these steps and ask the right questions.

ASSESSMENT STAGE

1. **Drivers & Goals** —A prerequisite to rightsizing an application is understanding the bigger picture. What business problem is the project intended to solve? Are there specific KPIs for the project?

2. **Application Assessment** —Is the application CPU Heavy or RAM heavy? What are its availability requirements?

3. **Capacity Needs** —How much storage will the application require?

4. **Performance Requirements** —Does the application have specific IOPS targets or latency requirements?

5. **Growth & Scaling Expectations** —Plan to purchase for the immediate term through rightsizing the environment (see more on pg. 7) and create a plan to scale as needed.

6. **Compliance & Security Needs** —Does stored or processed data fall under common regulatory bodies like PCI DSS or HIPAA? What other security measures are needed to protect your application and mission-critical data?

7. **Management Capabilities** —Self-managed, co-managed or fully-managed? How much of the support burder can your team handle? Can your team handle the support burden as efficiently as the service provider? Is a co-managed approach the right balance of operational transparency and time investment?

SOLUTION & DESIGN STAGE

1. **Pick the Right Platform Based on Application Needs** —Steady-state applications that run 24/7/365 are good candidates for hosted private cloud deployment. Applications that need "hyper scale" due to frequent traffic spikes, or simply function better in pay-per-use model, may be best suited in a public cloud.

2. **Architecture & Design** —Keeping in mind all resource, performance, security and availability requirements, it's time to design your environment.

3. **Goal Evaluation** —Will the environment achieve short term and long term goals? Is there a practical and sustainable plan to scale up if needed? How will KPIs be measured over the short and long term?

4 Economic Benefits of Hosted Private Cloud

Hosted private cloud environments can offer organizations currently running applications on-premises significant benefits in the form of economies of scale and flexibility in infrastructure investment.

When selecting a cloud environment for an application or data center, both the economic and operational aspects of a solution should be considered, as the latter invariably impacts the former over the course of a project. The economic and operational benefits of a hosted private cloud typically lie in the following areas:

- **Solution Design (Benefit 1)** - Hosted private clouds allow resources to be **rightsized**, minimizing waste and solving a 1:1 app to instance problem often found in public cloud deployments.

- **Solution Agility (Benefit 2)** - A predictable, month-to-month payment model allows for a **just-in-time** approach to your cloud deployments, offering flexibility for special projects or scalability for planned growth.

- **Solution Management (Benefits 3 & 4)** - Economies of scale offer organizations **access to services** (security, disaster recovery, and network services) that may be too costly otherwise. Additionally, managed services allow IT teams to focus on tasks and projects that **move the business forward** as opposed to simply "keeping the lights on."

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Benefit 1: Rightsizing Enables Optimal Utilization

Underutilization of on-premise, baremetal servers is commonplace despite the progress made through virtualization. Resource utilization in the public cloud is also much less than ideal. Recent surveys estimate that typical waste ranges 30-45 percent. For applications with consistent, predictable workloads, there is no sound business justification for this level of inefficiency and it is one of the key areas a hosted private cloud can cut fat from an IT budget.

To understand the potential for cost-savings and resource optimization using private cloud, it is helpful to first understand why the problem exists in other environments. One of the major contributing factors to oversizing in the public cloud is the instance-based pricing model offered by public cloud vendors. Instance-based pricing refers to the pricing model in which a client selects instances from a list of predefined options (usually sorted by CPU, RAM, and storage) and pays a discounted rate (relative to a pay-as-you-go hourly rate) to reserve the compute power of those instances for a specific duration. In AWS, this is called Reserved Instances.

Oftentimes, clients simply do not realize how much waste is occurring with their public cloud resources. Other times, the expense is justified based on the ability to scale near instantly in the cloud. That argument may certainly be valid for select use cases; however, the reality is most apps simply don't require that amount of headroom. An application using 30-40 percent of the resources allocated to it 24/7/365 isn't efficiently servce in this model.

vmware®

Familiarity Factor: Learning AWS vs. Leveraging VMware/vCenter

IT teams familiar with running their own on-premises data centers are likely well versed in VMware and comfortable with vCenter, ESXi, and other VMware technologies. Organizations that prefer their teams to be cerfitifed on the platforms they leverage will find that while AWS certifications are thorough and cover the material well.

SingleHop Hosted Private Clouds that use vCenter for provisioning will prove familiar to IT teams with VMware experience and allow businesses to leverage the technical knowledge that already exists within their organization, empowering them to hit the ground running with their hosted cloud deployments.

System Parity — SingleHop Private Cloud vs. AWS

|	SINGLEHOP	AWS
Hypervisor	VMware	Xen
Storage	Nimble SAN	EBS/S3/Glacier
Portal	vCloud/vCenter	AWS Management Console
Virtual Machine	vApp/Virtual Machine	EC2
Load Balancer	F5	Elastic Load
Backup	Veeam	Glacier Archival

4 Economic Benefits of Hosted Private Cloud

The core of the problem is analagous to the challenges organizations faced with resource over-allocation in dedicated servers 15 years ago. When one server was a little too small for an application, the next size up was significantly oversized leading to significant under-utilization. The same problem is now occurring with isntances in the public cloud replacing physical servers. Incrememntal increases in the size of instances can lead to the potential significant unnecessary billing increases and waste.

To conceptualize the issue with "t-shirt" instance sizes, consider the price increase between an AWS EC2 t2.large instance and the next incrememntal size up, the t2.xlarge. As of this writing, assuming a standard 1-year term for a reserved instance that is paid upfront, the cost of the t2.xlarge is just over double that of the t2.large ($1102 vs. $549). For an application that is just slightly underserved on a t2.large (2 vCPUs, 8 GiB RAM) paying double to run it on a t2.xlarge (4 vCPUs, 16 GiB RAM) is not the best allocation of resources. Scaling this scenario out to an organization's entire portfolio of applications, it is easy to see where IT budgets run into problems.

Hosted private clouds address this challenge by using a resource pool pricing model that shifts the paradigm from one based on 1:1 app to server instance logic to one more conductive to resource optimization. In a resource pool pricing model, cost is still related to the amount of compute resources reserved by the client, but providers are able to rightsize environments to minimize waste and keep resource utilization in a more desirable range. For most steady-state applications, near 70 percent utilization is ideal.

In these rightsized hosted private cloud environments, workloads are run across a server cluster made up of a series of virtual mahcines (VMs) and new servers are added only when capacity across all resources is consumed. By rightsizing a hosted private cloud environment to meet the needs of its applications, SingleHop found that businesses can save 40 to 70 percent on their cloud deployments in internal studies.
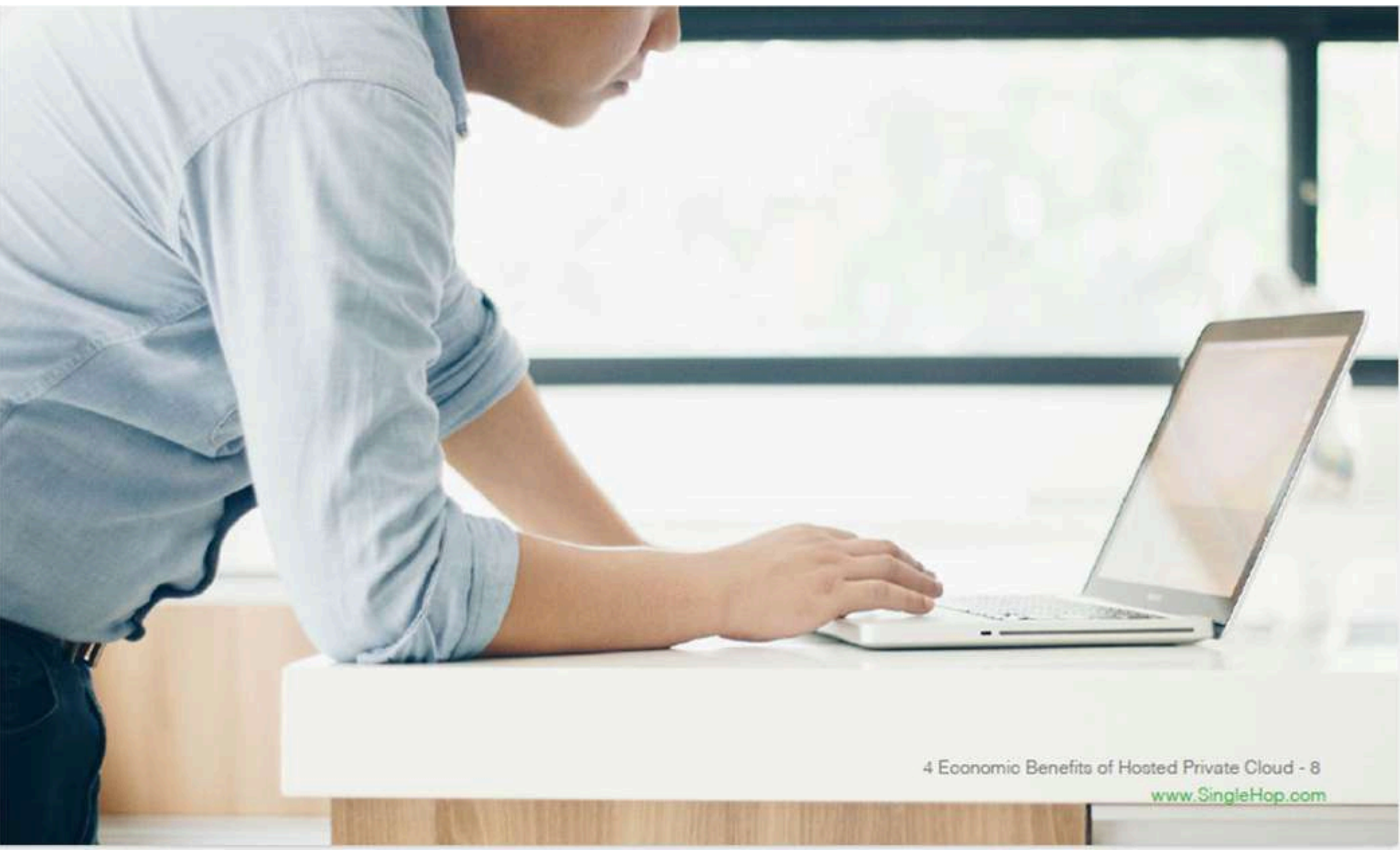
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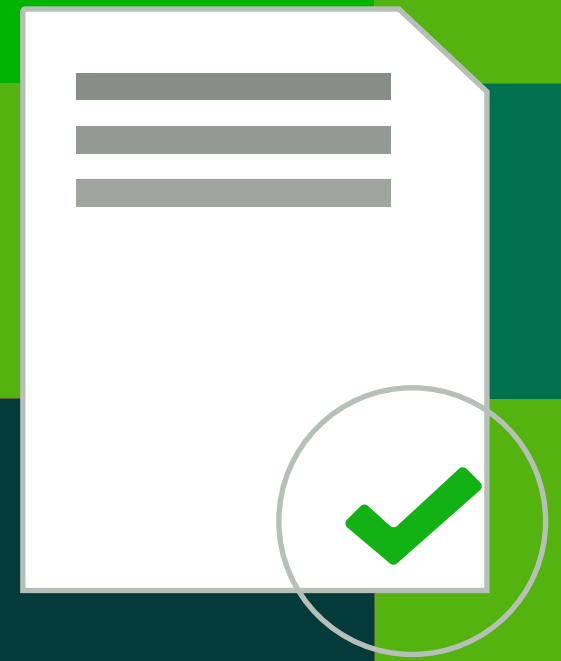
Benefit 2: Just-in-Time Deployment and Flexibility for Special Projects

Both public and private clouds offer organizations a means to purchase compute resources in a much more efficient manner than trafitional, CapEx investment in on-premises infrastructure. The standard IT purchasing process for a new project or rollout to be deployed on-premises usually consists of a vetting process where the current infrastructure is qualified and protected against future state requirements. New infrastructure is purchased based on expected growth and requirement changes over the next 3-5 years.
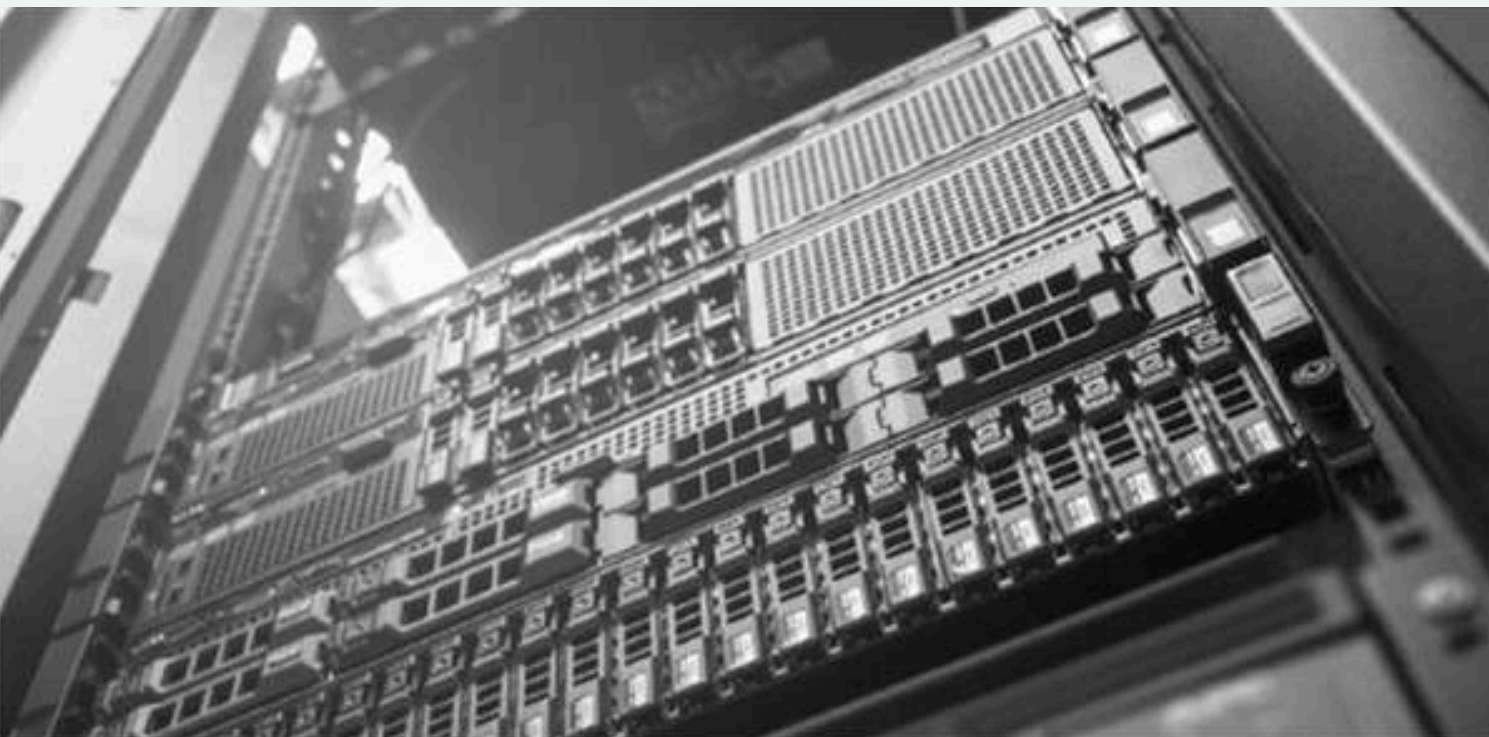
The problem with this model is that it requires IT teams to forecast compute and storage needs to accurately enough to optimize resource utilization over the long-term. Generally, one of two problems arises — either the organization over sizes the infrastructure (leading to waste in expenditures not only on compute resources, but also power and cooling) or fins that they need to purchase additional infrastructure after underestimating growth projections.

Furthermore, some IT teams prefer having plenty of room to grow. If compute resource utilization isn't a key performance inficator (KPI) the C-suite discusses, the resulting underutilization over the course of a project becomes a hidden cost, since technically, the project goes off as planned.

Flexibility for the Agile IT Department

The cloud addresses these issues by offering organizations the ability to purchase compute resources when they are needed — not all at once. With the ability to scale rapidly, organizations that leverage a cloud environment for their projects can be more confident in rightsizing the resources they purchase today, knowing that they can purchase as much as they need tomorrow should their requirements change. This shift from capital expenditures (CapEx) to operational expenditures (OpEx), allows organizations to more efficiently invest in compute resources and take what we call a "just-in-time" approach to deployments.

ASSESSMENT STAGE

The ability to deploy and scale on-demand (in minutes as opposed to hours, weeks or days) is a distinct advantage of the public cloud, but one that's only really needed for use cases like development and testing or highly unpredictable workloads.

Applications that are rightsized for hosted private clouds also benefit from this just-in-time approach to capacity planning and resource provisioning. When deploying applications in a hosted private cloud, businesses can confidently size for today knowing that they can scale tomorrow if needed.

By coupling a private cloud environment that is rightsized to meet the needs of the project with a just-in-time approach to investement in compute resources, organizations can maximize their ROI.

ASSESSMENT STAGE

The agility offered by just-in-time deployments possible in the cloud also provides the flexibility to run compute resources for special projects, or to cover seasonal increases in usage. Justifying the expense for on-premises hardware to run an application that will only be needed for a few months or less can be difficult. However, with a cloud-based deployment, businesses can pay for what they need for the duration of a project and eliminate the need to invest in resources that will not be used long term.

Generally speaking, experimental projects that will last only a matter of days or hours are likely best suited for the public cloud, while projects or deployments that will last a month or longer may be good candidates for a hosted private cloud solution.

Benefit 3: Expand Operational Capabilities

Economies of scale drive one of the most impactful value-adds of a hosted private cloud soluion. Customers can increase operational efficiencies and extend their capabilities by leveraging service provider facilities and by phasing out or consolidating on-premise data centers.

With a hosted private cloud, all of these infrastructure costs are rolled into the cost of the soultion and kept down due to the ability of the provider to invest at scale. For the best providers, this equates to fully redundant, energy-efficient Tier 3 facilities.

Moving beyond the infrastructure investment, managed hosted private cloud solutions can effectively deliver IT operations services that often go neglected or eat up significant time and capital when managed on-premises. Security and privacy are the top concerns that create hestitance about a migration to the cloud, but the best service providers prioritize security technologies, data integrity, and business continuity in a way that leads to an environment that is more secure than most on-premises installations.

Such benefits include network and application-level features like DDoS mitigation, intrusion detection systems, web application firewalls (WAFs), and OS hardening.

In addition to efficently addressing security, hosted private cloud providers can streamline the backup and disaster recovery process and offer SAN storage solutions, thereby minimizing the support burden and cost to clients.

veeAM

Hosted Private Cloud and Veeam Backups

Business continuity and data security are of paramount importance to most organizations. With a multitude of processes, compliance standards, and recovery requirements at play, understanding and implementing the right backup and recovery solution can be a daunting task for businesses migrating critical

Leveraging SingleHop's LEAP Control Panel with Veeam Availability Suite provides private cloud users with on-premise levels of control over backups while minimizing the support burden of maintaining an on-premises environment. Features of SingleHop's LEAP Control Panel with Veeam Availability Suite include:

- Self-service backups & restores
- Real-time alerting and reports
- Automatic account creation for VMware vCloud Director users
- Ability to search virtual machines and Windows guest files in current and archived backups
- Web-based recovery

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Benefit 4: The Human Capital Factor and Opportunity Costs

IT resources and staffing tradeoffs are inevitable. IT directors and CIOs must decide how to allocate their scarce human resources to the projects most likely to have a positive impact on business growth. When employees focus their work on one particular area, do the results exceed the expected gains of the projects they're not doing? In economics, this concept is called opportunity cost.

One of the most meaningful benefits offered via managed hosted private cloud solutions is reducing opportunity costs by removing the burder of routing ingrastructure and OS management from IT organizations' support queues.