Whitepaper

SUSE Cloud Solutions

Hybrid Cloud—Overcoming the Challenges and Unlocking the Potential

Executive Summary

Cloud computing has matured to where it has become an indispensable part of the modern IT landscape and a crucial component in the IT strategies of most enterprise organizations. While it is clear that all forms of cloud computing are on an accelerated growth curve, hybrid cloud is particularly in the spotlight.

The factors driving the trend toward a hybrid cloud strategy are no secret. Organizations are facing continued pressure to improve business agility, deliver more innovation and increase productivity, while also working on tight budgets or even reduced costs. For many IT professionals, hybrid cloud holds the key to successfully balancing these often conflicting demands and is a vital step on the pathway to digital transformation.

However, since the IT industry has been talking about hybrid cloud for almost a decade, you might be asking whether it is time the talk turned into reality. And that is where things start to get complicated because "hybrid cloud" is easier said than done.

As an introduction to the topic, this paper focuses on three factors that make hybrid cloud difficult to implement and how IT decision makers can address these challenges in order to unlock the full potential of hybrid cloud.

Difficulty Number 1: Hybrid Cloud Is an Elusive Concept

Although hybrid cloud has received a great deal of media attention and vendor focus, it remains a concept that has proved somewhat elusive and difficult to define. Different interpretations for what constitutes a hybrid cloud solution are frequently bandied around without a clear explanation of exactly what is meant or how it will be delivered. Despite—or because of—this level of ambiguity, research suggests 74 percent of IT decision-makers in North America and Europe already define their cloud strategy as hybrid.[1]

To illustrate the difficulty, here are a few examples of what many think of as "hybrid cloud":

- **Public cloud combined with existing on-premise (non-cloud) infrastructure.** *Many organizations find it advantageous to combine one or more public cloud platforms with their existing traditional data center environment. This enables the organizations to add the flexibility, elasticity, functionality or cost advantages of a cloud solution, while retaining and maximizing their existing non-cloud IT investments and assets.*

  Strictly speaking, this might be more accurately defined as a hybrid infrastructure rather than a hybrid cloud solution. However, the benefits delivered by this approach are perfectly valid for many businesses.
- **Multi-cloud.** *Many IT professionals use "multi-cloud" interchangeably with hybrid cloud, but there are subtle differences. In practice, over 80 percent of organizations have already adopted a multi-cloud approach.[2] Multi-cloud means using a number of different public or private cloud platforms independently for different applications and different use cases.*

  This makes perfect sense. An organization's cloud usage is likely to have evolved over time. The organization may

1 *Source: Forrester Data Global Business Technographics Infrastructure Survey, 2017*
2 *Source: RightScale 2018 State of the Cloud Report*

have chosen the specific cloud platform best suited to each individual workload when it was ready to be deployed or migrated. Alternatively, the number of cloud platforms being used might be influenced by geography or impacted by corporate acquisitions. However, each of these cloud platforms is being managed and used separately.

- **Genuine hybrid cloud.** *A true hybrid cloud involves more than simply using a hybrid infrastructure or adopting a multi-cloud approach. It involves combining two or more cloud platforms, usually a mix of public and private clouds, into a single cloud entity where access to resources can be consolidated and controlled through a single management environment.*

  With this kind of hybrid cloud model, data and applications can be seamlessly moved from one cloud to another or a single application can span multiple clouds. The NIST definition also includes cloud bursting capabilities and load balancing between clouds.[3] *The end goal is to achieve optimal performance, efficiency, economy and customer experience across the enterprise.*

Defining Your Own Hybrid Cloud Strategy

Clearly, a level of confusion around what constitutes a genuine hybrid cloud including hybrid infrastructure and multi-cloud approaches under the hybrid cloud umbrella is present with many IT professionals, customer and vendors. However, this doesn't mean that adopting any of these options is necessarily less valid or valuable to your business. Each of the options can be used to build an effective and sophisticated platform, depending on the needs of your organization.

The critical factor is making sure that hybrid cloud works for your organization. No two businesses are alike. Similarly, there is no reason why any two hybrid cloud strategies should be identical either. You can define what hybrid cloud means within the context of your business or organization.

Here are some of the key questions that need to be answered:

- *Why are you pursuing a hybrid cloud strategy?*
- *What must it deliver in order to meet your business goals?*
- *Which workloads, applications, systems and infrastructure will it need to support?*
- *How will the systems and solutions that run on the platform be architected?*
- *How much flexibility and agility will it need so that you are ready to respond to future change and challenges?*

These are important considerations. The right hybrid cloud strategy—one that is appropriate and tailored to the requirements of your business—will help deliver the next level of productivity, agility and customer experience needed for success in today's digital economy.

Difficulty Number 2: Hybrid Cloud Is Complex

The hybrid cloud architecture is far from simple to implement and manage. If it was simple, most businesses would already have true hybrid clouds in place and cloud bursting workloads would be far more common.

Let's face it, even traditional IT is complicated enough. Many mid to large enterprises have a headache when it comes to tracking, managing and supporting the physical or virtual assets and infrastructures they have deployed, often in numerous datacenters and business locations, along with the workloads and applications running on them. Adding or migrating to a hybrid cloud environment is not going to miraculously make everything simpler. Quite the opposite.

Every IT infrastructure and organizational environment is unique. For that reason, a single cookie-cutter cloud solution that will cover every situation or every use case is not available. Moving to a hybrid cloud scenario may lead to an exponential increase in complexity for the following reasons:

- *Utilizing multiple cloud platforms will involve managing extra cloud components, features and functions, making integration, interoperability and monitoring a dilemma. Getting everything to play nicely together can be a time consuming and painful task.*
- *You will also be faced with using different application programming interfaces (APIs) and toolsets. Ideally, these will need to be consolidated into a single management plane.*
- *With over half of organizations feeling at risk of outgrowing their current security solutions,*[4] *hybrid cloud solutions are set to intensify those concerns. Managing security policies and requirements across multiple cloud platforms and boundaries can only make the whole exercise more intricate and demanding.*
- *There will be more cost points to track and manage. Understanding today's public cloud SKU options and pricing*

3 Source: The NIST Definition of Cloud Computing
4 Source: Threat Stack State of Security Budget in 2018 Report

is already tortuously complicated. Adding hybrid cloud into the mix is going to make negotiating, tracking and managing costs an even more convoluted exercise.

- *The number of technology and service partners you need to work with will increase. This will add to the challenges surrounding accountability and managing service level agreements (SLA).*

How to Address the Complexity Challenge

Firstly, realizing that when moving to a hybrid cloud strategy, not everything has to be done at once is important. You don't have to adopt an "all or nothing" approach.

Often, the most successful hybrid cloud projects have resulted from taking an "evolutionary" approach. This makes it easier to manage increasing complexity as it changes gradually over time. Adopting the more aggressive "revolutionary" method, where all the changes happen at once, will only compound the difficulties and increase the likelihood of failure.

This more evolutionary style allows hybrid cloud to be evaluated within the context of your current environment. It allows you to take advantages of business or technology inflection points to move more deeply into a hybrid environment at the most appropriate time. You will also be able to gradually develop the skills and organizational culture needed for a favorable outcome.

Selecting the most suitable hybrid cloud model, methodology and tools will also help simplify your hybrid journey. Here are some of the available choices:

- *One option is to use a set of common and consistent APIs that can be shared between the public and private cloud platforms in your hybrid solution. These common APIs serve as an abstraction layer for the underlying cloud services. Applications can then be developed using these APIs for deployment to either the private or public cloud environment, with the option of easily moving them between cloud platforms when required.*

  Eighty-two percent of OpenStack cloud users choose OpenStack because they value the ability to standardize on the same open platform and to share a set of common APIs across a global network of public and private clouds.[5] *However, the adoption of this shared API approach has been somewhat hampered by a lack of maturity or support for suitable cross-platform APIs for some other cloud platform options. The risk of vendor lock-in or the loss of some advanced API functionality has also been a concern. Many organizations prefer to take a more pragmatic approach by using one of the other alternative options to achieve a similar level of cloud abstraction.*
- *Hybrid cloud managers (HCMs) are available to provide an extra level of abstraction and to provide a unified console or dashboard for the cloud platforms, effectively masking the underlying cloud infrastructures and simplifying the use. These HCMs are often more cloud-focused rather than workload focused, proving particularly useful to infrastructure and operations professionals.*

  HCMs typically act as cloud brokers, providing a self-service portal and service catalog for the underlying clouds, while also handling the end-to-end orchestration processes. Designed to deliver preconfigured product offerings, HCMs aim to make it faster and easier to get access to cloud services, control usage, provide quota and cost management.
- *Application delivery solutions or PaaS (Platform as a Service) can also provide an added layer of abstraction for the underlying infrastructure in a hybrid cloud environment. These are workload-centric solutions designed to handle all the heavy lifting involved in developing, deploying and automating the life-cycle management for cloud-native containerized applications.*
- *SUSE® Cloud Application Platform is an excellent example of an application delivery solution based on the Cloud Foundry and Kubernetes open source projects. Kubernetes has matured to the point where it is supported as a container orchestration offering on all major public and private cloud platforms.*

  This means that an application delivery solution based on Cloud Foundry, using Kubernetes for orchestration and management can be used to develop cloud-native containerized applications and then deploy them on any platform within a hybrid cloud environment, ensuring seamless portability between the underlying cloud platforms as and when needed. This is commonly known as "develop once, deploy everywhere" or "write once, run anywhere". Using Kubernetes as a de-facto API abstraction layer in this manner is becoming increasingly popular.

5 *Source: 2018 OpenStack User Survey Report*

Difficulty Number 3: Hybrid Cloud Will Require Investment

Since its inception, cloud computing has been perceived as the go-to technology for cutting IT costs. However, given the increased sophistication and complexity involved, a hybrid cloud solution is unlikely to be the cheapest cloud option available.

So why do two-thirds of organizations expect their hybrid cloud usage and investment to continue growing?[6] The answer lies in the fact that a hybrid cloud is now recognized as the best model for delivering the agility, speed, responsiveness and innovation to satisfy rapidly changing customer demands, as well as the productivity, automation, performance and security needed by the business. Controlling costs will always be a factor, but a hybrid cloud solution is going to require some investment.

This means that the emphasis must shift from pure cost reduction to a return on investment (ROI) focus, by balancing customer experience and business outcomes with a well thought out and pragmatic business case.

Building a Business Case for Hybrid Cloud

How can you go about building a suitable business plan for hybrid cloud? Here are some things you may wish to consider:

- **Define your business objectives.** *This may seem as an obvious starting point. However, many cloud projects start with an executive edict to implement a hybrid cloud strategy. This does not count as a clearly defined objective. Understanding what the organization is trying to achieve and why is important. The objectives must be clearly understood in terms of business goals and customer experience outcomes.*
- **Take a workload-centric approach.** *Matching applications and workloads to appropriate cloud platforms and options is imperative. Some applications will be more suitable for deploying on a public cloud, while others are better off in a private cloud environment. Where workloads are spread across multiple clouds, which tiers or elements are best supported on each platform (public, private, on-premises or off-premises)? Bear in mind that not every application is suitable for every cloud option. Weigh up factors such as performance, elasticity, high availability, geography, security and data sovereignty or governance requirements. Which of your legacy workloads might need to be migrated and to which cloud platform?*
- **Do your research and planning.** *How will the hybrid cloud infrastructure be built, integrated and managed? How will the applications be architected to take advantage of the hybrid cloud and where will the workload components be hosted? Will they operate in virtual machines or containers? How will you manage portability or bursting between cloud infrastructures? How much will it cost to migrate away from specific cloud elements, should the need arise?*
- **How much will it cost?** *What are the true costs of moving to your chosen cloud architecture? Make sure to include all compute, storage, networking, software stack, tools and support cost elements for each cloud platform. What are the administration, operations, lifecycle management and data transfer costs?*

  Research conducted by SUSE shows that 94 percent of organizations recognize the importance of enhancing hybrid cloud skills.[6] With that in mind, will there be additional recruitment or skills training costs?

Are there hidden costs that need to be accounted for?

- **What do things cost today?** *This may not be as easy to define as you might think. Make sure you include all the cost elements for a realistic comparison, such as CAPEX and OPEX, staffing, maintenance and support components, facilities and energy costs.*
- **Get buy-in from all stakeholders.** *Put together a comprehensive list of all the project stakeholders. Create realistic plans and expectations and communicate them to all stakeholders, including executives, business leaders, influencers, vendors and service partners. Building the right team from the outset and maintaining their support throughout the project will be a critical factor to ensure success.*
- **Start small, but think big and move fast.** *As already mentioned, it is often better to take an evolutionary approach rather than a revolutionary one. Define small sub-project elements that allow for the delivery of success in increments with quick, measurable wins. This is often better than aiming for a single, mammoth revolutionary project that will take a long time to complete—or may never deliver results.*

6 *Source: SDI, Containers and DevOps—Cloud Adoption Trends Driving IT Transformation*

- **Build in monitoring and cost governance.** *Delivering a hybrid cloud will not be a one-off exercise in most cases. Customer expectations and technology options will continue to change rapidly. This means that the business contract must be flexible and constantly revisited. Cloud adoption, budgets, costs and spending will need to be closely monitored and managed. Have a separate ROI plan for each workload. The hybrid cloud architecture and workload deployments will need to be regularly reevaluated and adjusted. Any hidden costs will also need to be identified and managed.*

7 *Source: IDG 2018 Cloud Computing Survey*

Conclusion

There is little doubt that cloud computing is set to continue its impressive growth trajectory. Some reports suggest that more than a third of all IT departments are now under pressure to migrate all their applications to the cloud.[7]

As cloud technology continues to mature and with more and more IT decision makers focused on digital or IT transformation, hybrid cloud has clearly emerged as a top priority for the majority of organizations. Even though an exact definition may remain somewhat obscure for many customers and vendors, a well-executed hybrid cloud strategy could well be the difference between seeing your business fly, just about get by, or eventually wither and die.

Additional contact information and office locations:
www.suse.com

www.suse.com