



MANAGING the **HYBRID** and **MULTI-CLOUD** FUTURE

Nine Ways to Manage the Hybrid and Multi-Cloud Future:

From Databases to Clouds



Best Practices Series

When cloud computing first appeared on the scene, it was a point-to-point proposition: Users subscribed to a service for a specific function—whether it was a developer seeking compute power, a sales manager seeking customer contact capabilities, or a team leader seeking a collaboration platform.

Now, things are more complicated. Clouds are built upon clouds, which interface with other clouds, resulting in what is essentially a cloud fabric extending across enterprises. At the same time, legacy or on-premise systems haven't gone away, and continue to expand. It's up to data managers to decide where standard databases end and the cloud begins, and ensure the

accessibility and proper governance of information assets across an increasingly complex environment.

It's notable that cloud has become a mainstream environment for data managers. Half of the database managers participating in a recent survey conducted by Unisphere Research, a division of Information Today, Inc., indicated they are regular cloud users, and a sizable portion are committing most of the data to be managed to cloud providers.

While cloud is seen as the go-to environment for modernizing IT strategies and managing ever-increasing volumes of data, it also presents a bewildering array of

options. Respondents to the Unisphere survey agree that hybrid is an overall architectural solution for their applications—75% prefer a hybrid cloud architecture that includes both on-premise and public cloud components. In addition, they expect the transition to a hybrid cloud scenario to be seamless. Among those respondents employing a premium virtualization architecture and considering a hybrid cloud architecture, more than two-thirds expect all the features that have been available to them on-premise to be fully available in the cloud as well.

There has been some confusion in the market over the differences between hybrid and multi-cloud implementations.

While *cloud* is seen as the go-to *environment* for modernizing IT strategies and managing ever-increasing volumes of data, it also presents a *bewildering* array of options.

Both involve working with more than a single platform, but that's where the similarities end. Multi-cloud approaches involve employing two or more providers to support specific workloads, while hybrid cloud approaches combine public cloud services with on-premise systems—traditional and private cloud environments—in an integrated manner. Multi-cloud is about choice, while hybrid is about seamless delivery.

Either way, enterprises will be running hybrid clouds in conjunction with multi-cloud services, providing advantages to data environments, as well as challenges. The good news is that cloud vendors are constantly adding tools and features that assist data managers in growing and monitoring their environments and remediating issues. Nonetheless, cloud vendors cannot address the organizational issues that arise as data is moved across many different platforms. Here are nine points to consider in preparing for the hybrid and multi-cloud world:

1. DOCUMENT HOW CLOUD APPLICATIONS ARE BEING USED WITHIN THE ENTERPRISE.

Data may not necessarily be passed from on-premise to cloud services, but may be transmitted from cloud to cloud. This has implications for data governance and security, especially as many cloud services are being contracted outside the purview of IT or data managers. It's important to understand which cloud services are being adopted for key functions. In addition, end users need to be educated on the impact on data governance.

2. AVOID COMPLEXITY AS MUCH AS POSSIBLE.

Moving to multi-cloud and hybrid cloud environments means having differing layers of cloud within the enterprise. It is important to understand

who is paying for and using these cloud services, and whether there are duplications or new silos as a result. Look for instances of cloud services that are being purchased, but are never or rarely used.

3. HOLD CLOUD PROVIDERS ACCOUNTABLE.

Many external cloud agreements absolve cloud providers from data breaches or losses. Data managers need to insist on accountability for vulnerabilities that occur on the provider side. They must understand what controls and safeguards are in place, and what happens to the data when the contract is changed or ended.

4. STANDARDIZE AS MUCH AS POSSIBLE.

The various components of cloud offerings—including storage, virtual machines, and data formats—should be aligned across the enterprise. Data managers need to focus on a cloud architectural approach that enables users and developers to quickly connect to the data sources they need for the business.

5. ACCELERATE DATA AGGREGATION.

Data within multiple and hybrid environments should flow freely, without obstacles. Data integration takes on a new urgency. Data should be stored in environments that are rapidly accessible to all cloud or on-premise services.

6. ENHANCE DATA GOVERNANCE ACROSS CONSOLIDATED PLATFORMS.

The viability and security of data should be consistent across all cloud services. Cloud providers need to be active in this process, offering policy engines and compliance tools. At the same time, enterprises need to exercise

due diligence in ensuring the security of their data, regardless of where it resides.

7. DRIVE GREATER SELF-SERVICE THROUGH ADVANCED ANALYTICS.

Lines of business are more responsive to customers when self-service applications are available that enable business users to rapidly conduct analyses from datasets. The power of these self-service capabilities can be greatly enhanced when they connect to aggregated data environments that draw capabilities and resources from all pertinent sources.

8. UPGRADE APPROACHES TO DISASTER RECOVERY AND BUSINESS CONTINUITY.

While cloud services themselves ease the backup and recovery process for applications and data, this can be a more difficult undertaking in hybrid and multi-cloud environments. At the same time, multi-cloud services help enterprises assure continuity, with highly available backups.

9. MONITOR AND MEASURE.

Keeping track of usage across disparate environments is another challenge that data managers face. A key aspect of hybrid and multi-cloud management is tracking resource consumption and spending. Cloud providers should provide access and tools for metering and monitoring cloud adoption, providing transparency to enterprises.

Hybrid and multi-cloud environments are becoming commonplace, and they require entirely new ways of thinking about data management. With this change, data management, to a large extent, becomes a shared endeavor—but data governance and security is still the ultimate responsibility of the enterprise. ■

—Joe McKendrick

Managing the Hybrid and Multi-Cloud Future



Just when we thought that IT and cloud terminology couldn't get any more confusing, a new term was coined to seemingly simplify it all: hybrid cloud.

MODERN IT IS HYBRID IT

As is often the case, one cloud doesn't fit all, and over the past few years, IT teams around the globe have realized that working with a combination of both worlds is a solution that works well. Combining the capabilities of various public clouds (aka multi-cloud) with on-premises private clouds (aka hybrid cloud) enables organisations to tailor their technology environments to their business needs more effectively.

In fact, many predicted in 2019 that hybrid cloud would be the future (as opposed to multi-cloud) and it is increasingly looking that way.

At [Continuent](#), we always look at the customer first, which translates into our consulting approach: "no customer is the same." And where no customer is the same, no solution is the same either.

That calls for hybrid ... as well as multi-cloud solutions.

[Continuent, the MySQL Availability Company](#), has witnessed the rise of Open Source and Cloud Computing since 2004 and been at the forefront of the market need for platform-agnostic, highly available, globally scaling, clustered MySQL databases that is driving businesses to the cloud today.



We provide [solutions for continuous operations](#), enabling business-critical MySQL applications to run on a global scale with zero downtime, with our Continuent Tungsten suite of database clustering and data replication products.

In other words, we provide geo-distributed MySQL high availability on-premises, in hybrid-cloud, and in multi-cloud environments, which enables our customers to respond cost-effectively to their business-critical needs.

USE CASE: COMPOSITE HYBRID-CLOUD CLUSTER TOPOLOGIES

Take our customer, a global SaaS provider for e-signature services, who used to run MySQL master/slave clusters, initially using native MySQL replication and later Tungsten Clustering, on a hosted platform at Rackspace. After migrating to the cloud, they are currently running Tungsten Clustering (with 200+ MySQL instances) parallel in AWS and Azure.

Their challenge was to find a continuously available solution for their SaaS customers, and do the migration from on-premises to the cloud without downtime.

That is exactly what they found with [Continuent Tungsten](#).

One of the most unique differences that Continuent has to offer compared to other MySQL high-availability alternatives is the ability to simultaneously run and manage database clusters on-premises and in the various clouds, providing a unified, single pane view management layer for all database nodes and clusters.

This allows customers to deploy hybrid-cloud MySQL clusters for continuous operations and migration purposes, and prevents the lock-in to any specific cloud vendor.

More importantly, it gives significant negotiation power on the compute instances prices with a realistic threat to take the workloads elsewhere.

Our use case SaaS customer started with on-premises deployments at Rackspace and now runs simultaneously both at AWS and Azure.

CONTINUENT TUNGSTEN CLUSTERING—CLOUD BENEFITS

[Tungsten Clustering](#) is the complete and proven clustering software solution for high-availability, disaster recovery and global scaling for MySQL, MariaDB and Percona Server databases. It comes with a range of benefits, including the following for the cloud:

- Hybrid Cloud MySQL and Multi-Cloud MySQL
- Deploy in the cloud, VM and bare-metal environments
- Mix-and-match on-premises, private and public clouds (incl. Amazon AWS, Google Cloud and Microsoft Azure)
- Easy, seamless migration from cloud to cloud to avoid vendor lock-in in any specific cloud provider
- Continuous operations—withstand node, data center, zone or cloud region failures or outages
- Conduct zero downtime maintenance operations
- Single pane view management, all clusters across the clouds



Continuent customers are leading SaaS, e-commerce, financial services, gaming and telco companies who rely on MySQL and Continuent to cost-effectively safeguard billions of dollars annual revenue. They include Adobe, Carfax, CoreLogic, F-Secure, Garmin, Marketo, Modernizing Medicine, Motorola, RingCentral, Riot Games, VMware and Vonage.

Continuent's database experts offer the industry's best 24/7 MySQL support services to ensure continuous client operations. ■