

Veritas Alta Application Resiliency in the Cloud

Ensuring application high availability, disaster recovery, performance, and mobility in a cloud shared responsibility model.

Executive Summary

Cloud services have transformed the IT landscape and have become mainstream alternatives to hosting IT infrastructure in traditional data centers. With several private and public cloud options available, 78 percent of organizations now have workloads deployed in multiple clouds¹. While public cloud platforms have many benefits, universally, cloud service providers have imposed a shared responsibility model, which compels users to ensure their mission critical IT services are highly available and resilient, regardless of any uptime guarantee published by the Cloud Service Provider (CSP).

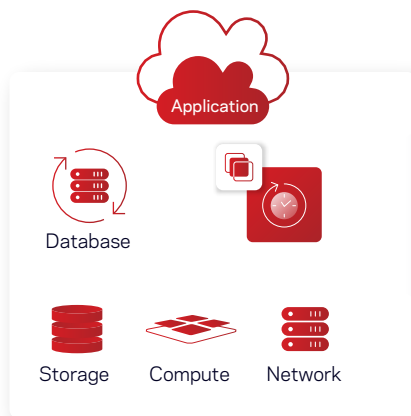
Veritas Alta™ Application Resiliency provides enterprise-class software-defined storage management, application-aware high availability, and disaster recovery (HADR) for your applications running in cloud, hybrid-cloud, and multi-cloud environments. With 83 percent of organizations using manual processes for cloud migrations¹, Veritas Alta Application Resiliency can also automate the migration process and enable you to run your business technology in the cloud with several advanced features focused on three key principles:

- **Availability:** Provides application resiliency, ensuring that your applications are highly available with near-instantaneous automated recovery that minimizes the impact of cloud provider disruptions and outages. Veritas Alta Application Resiliency delivers advanced availability management, which helps reduce latency and cloud data transfer costs, and can integrate directly with applications to improve uptime compared to native cloud services.
- **Performance:** Veritas Alta Application Resiliency delivers a low-latency, software defined storage platform, designed to ensure the maximum performance of cloud-based workloads. By coupling the intelligent data management of Veritas Alta Application Resiliency with the nearly limitless capacity of cloud storage volumes, users can maximize not only their resource utilization but maintain a cost-effective and scalable primary storage architecture.
- **Mobility:** Avoid vendor lock-in by decoupling your critical applications and services from their underlying cloud infrastructure. Veritas Alta Application Resiliency provides the most flexible and widely supported HA and DR architectures for workloads running both in the cloud as well as automating the migration from on-premises data centers.

This solution brief will provide an overview of how Veritas Alta Application Resiliency enables organizations to combine the High Availability and Disaster Recovery (HADR) requirements of IT applications with highly performant and scalable software-defined storage to achieve maximum application uptime and performance in cloud, hybrid-cloud, and multi-cloud environments.

Veritas Alta Application Resiliency Solution Value

Veritas Alta Application Resiliency has several unique features that offer significant value to organizations looking to not only improve application performance and reduce cost, but maximize their architectural flexibility, all while avoiding lock-in with a specific technology. Creating cloud environments capable of supporting your most mission-critical applications involves several challenges that cannot be resolved with cloud native tools or services. Veritas Alta Application Resiliency is designed to integrate with cloud infrastructure to provide availability, resiliency, and high-performance storage for your IT services.



	Cloud	Veritas Alta Application Resiliency
Application	✗	✓
Storage	—	✓
Networking	—	✓
Compute	—	✓
Recovery Method	Manual	Automated
Response Time	Depends	Seconds

✓ High availability monitoring & automated recovery — Basic infrastructure monitoring & resiliency ✗ No native high availability or DR

Veritas Alta Application Resiliency has customized cloud agents for mission-critical applications that ensure your IT services have the highest possible uptime in the cloud. It can also intelligently manage HADR for cloud, hybrid-cloud, and multi-cloud environments as a fully automated process. There are several key benefits it provides in the cloud:

- **Availability:** Eliminate single points of failure and latency in cloud native services that can negatively affect your end user's experience. Veritas Alta Application Resiliency's intelligent application clustering provides more advanced application availability than cloud provider load balancing services, and can respond to application failures in cloud environments instantly. It can also failover an IT service to other zones, regions, or even other cloud providers, and on-premises data centers.
- **Performance:** Easily configure high-performance shared storage in cloud networks using native cloud block storage services. Veritas Alta Application Resiliency's intelligent data caching process keeps frequently accessed data on cloud instance ephemeral SSD's, which are used in conjunction with direct-attached cloud block storage services for maximum performance in the cloud, while reducing operating costs
- **Resiliency:** Veritas Alta Application Resiliency supports a near-zero RTO/RPO for mission-critical application data, and can move data between clouds and on-premises datacenters with zero data loss. Integrated fencing and I/O shipping technologies protect your data from hardware and software failures in the underlying cloud infrastructure, and provide more secure and reliable storage than NFS-based cloud services.
- **Mobility:** Easily manage hybrid-cloud and multi-cloud environments with support for migration and full HADR architectures that eliminate service provider lock-in and help mitigate the effects of cloud service outages.

Veritas Alta Application Resiliency's enterprise HADR capability for cloud environments also includes an integrated feature allowing application tiers to be grouped together in a way that represents the entire business service that the application provides. This is known as a Virtual Business Service (VBS). A VBS represents a multi-tier application as a single consolidated entity. Using VBS, you can completely automate the recovery or migration of a complex multi-tier application in cloud, hybrid-cloud, and multi-cloud environments—which helps eliminate downtime.

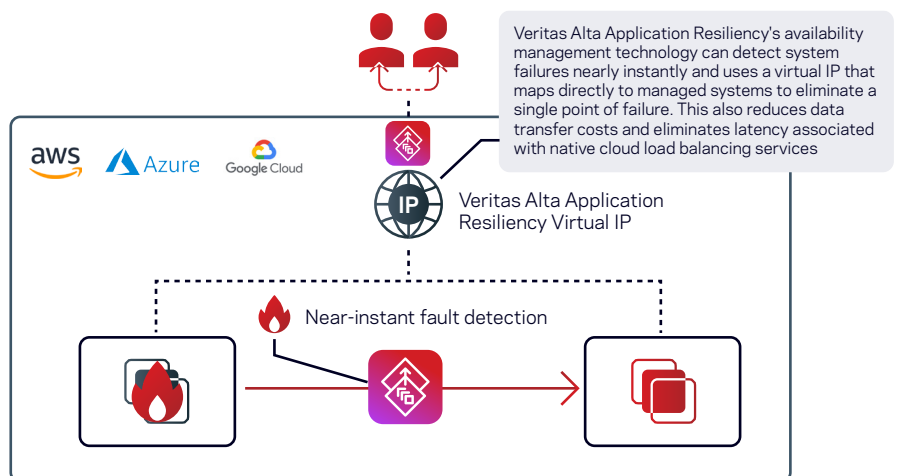
Veritas Alta Application Resiliency in Cloud Environments

HADR in the Cloud

Since the cloud shared responsibility model leaves application HADR to the end user, it is critical for organizations to have a proven enterprise-grade solution to manage application uptime in the cloud. Veritas Alta Application Resiliency's application-aware clustering and high-availability services ensure your applications are always online. If an application goes offline, Veritas Alta Application Resiliency can bring the application back online or move your application to a different system, so it stays online.

Tools such as Pacemaker can be used within the cloud, but they can be complex to manage and typically only work within a single environment, which does not allow for application failover to different clouds or on-prem data centers. Veritas Alta Application Resiliency ensures that your applications are highly available within cloud, hybrid-cloud, and multi-cloud environments.

Veritas Alta Application Resiliency can also help you improve application performance and reduce costs associated with cloud-based load balancing services that can lead to additional data transfer costs, are typically a single



point of failure, and add latency that can negatively affect your end user experience with longer application response times. It can also provide more advanced availability management for your applications than native cloud load balancing services, and it can be configured to provide application availability that spans cloud services. This allows you to run your IT services using the most highly available hybrid-cloud and multi-cloud architectures, which significantly reduces application downtime in the event of a cloud provider outage.

Veritas Alta Application Resiliency supports several private and public cloud providers and can be used in cloud environments to provide full HADR capability that is not achievable with cloud native tools. Using Veritas Alta Application Resiliency in the cloud gives you the best:

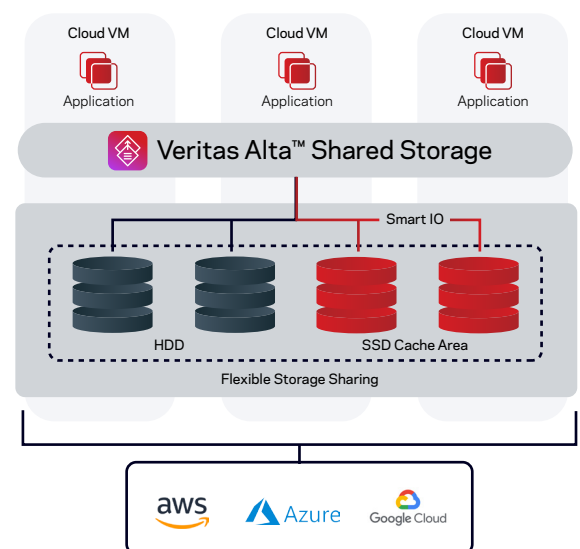
- **Availability:** While public cloud infrastructure is designed to provide excellent availability and durability for compute and storage systems, Veritas Alta Application Resiliency is focused on the applications that run on top of this infrastructure. Veritas Alta Application Resiliency's cloud agents are developed specifically for cloud services and can manage cloud compute, network, and storage resources required for both your infrastructure and application to be online in the cloud. In addition it's instant fault detection ensures that action is taken instantly in the event of an application failure.
- **Flexibility:** Use a single solution to manage availability for your entire environment where your applications can be deployed in a highly available configuration spanning cloud zones, regions, and even various cloud service providers. You can also create highly available hybrid-cloud configurations between on-premises and cloud environments.
- **Optimization:** Customized cloud agents integrate with native cloud monitoring and reporting tools to provide increased operational visibility into your application running in the cloud. This helps optimize your cloud resources and reduce cloud service operating costs.

With Veritas Alta Application Resiliency, applications can be replicated to other public and private cloud environments. Operations such as migrating from physical UNIX systems on-premises to Linux systems in the cloud are supported and can be done with minimal configuration. It also enables you to extract your data from the cloud to either bring data back on-premises, or to move data to another cloud provider. This gives end users the architectural flexibility required to implement a multi-cloud strategy without requiring multiple tools or professional services to manage data transfer between different cloud providers.

Shared Storage in the Cloud

In many cloud environments, NFS is used to provide shared storage for multi-system applications that require parallel access to their data. However, NFS has several drawbacks and is often not suitable for enterprise applications. As part of Veritas Alta Application Resiliency, Veritas Alta Shared Storage is designed to provide maximum storage performance and resiliency for applications that have higher availability requirements. It also eliminates security concerns that arise with NFS storage, which is inherently less secure and is visible by default to all systems across the network, which can expose your data to unauthorized users who may be able to gain access to your cloud environment.

Veritas Alta Shared Storage includes Flexible Storage Sharing (FSS) that allows you to use cloud-native block storage services such as AWS EBS and Azure managed disk to create secure, enterprise grade shared storage that can be used within an application cluster. Using Veritas Alta Shared Storage in the cloud is ideal for enterprise applications, as it can decrease your storage costs and improve your application performance and resiliency. It also provides data portability that enables you to easily move your applications and data between cloud zones and regions, and even to other cloud services or back on-prem if you want to or run your IT services in a multi-cloud or hybrid-cloud model. This gives you flexibility to run your IT services using the architecture that best suits your needs, without being locked into any cloud service or provider.



Resiliency

Veritas Alta Shared Storage manages fault tolerance for your data, and can be configured as shared storage within an availability zone and across zones and regions. With Veritas Alta Shared Storage, you also get a sub-minute RTO, as you do not have to detach and reattach storage volumes in the event of a failure. It also features advanced data fencing, ensuring that your data is protected in the event of a system or network failure within an application cluster—commonly known as a split-brain scenario.

Performance and Scalability

Veritas Alta Shared Storage can significantly improve the performance and efficiency of the underlying cloud native storage services with FSS, and an intelligent data caching feature called SmartIO. It also provides enterprise functionality for cloud environments beyond what is available with native cloud services. This offers some key benefits:

- **Performance:** While public cloud infrastructure offers higher performance storage options, there are limitations at the system level that minimize overall performance (IOPS). With Veritas Alta Shared Storage's SmartIO intelligent caching, application reads can be served from faster volumes using SSD storage, while writes can be served from a less expensive storage tier. This significantly improves application performance with minimal additional cost. Veritas Alta Shared Storage's SmartTier can also transparently move data between cloud SSD and HDD storage depending on I/O activity, which helps reduce your cloud storage costs.
- **Scalability:** With FSS, you can create the resilient shared storage volumes needed to horizontally scale enterprise applications using public cloud infrastructure. Veritas Alta Shared Storage also enables granular resource scaling. When an application needs additional resources, either compute or storage, they can be scaled dynamically and independently to help reduce costs while benefiting from on-demand usability of cloud resources.

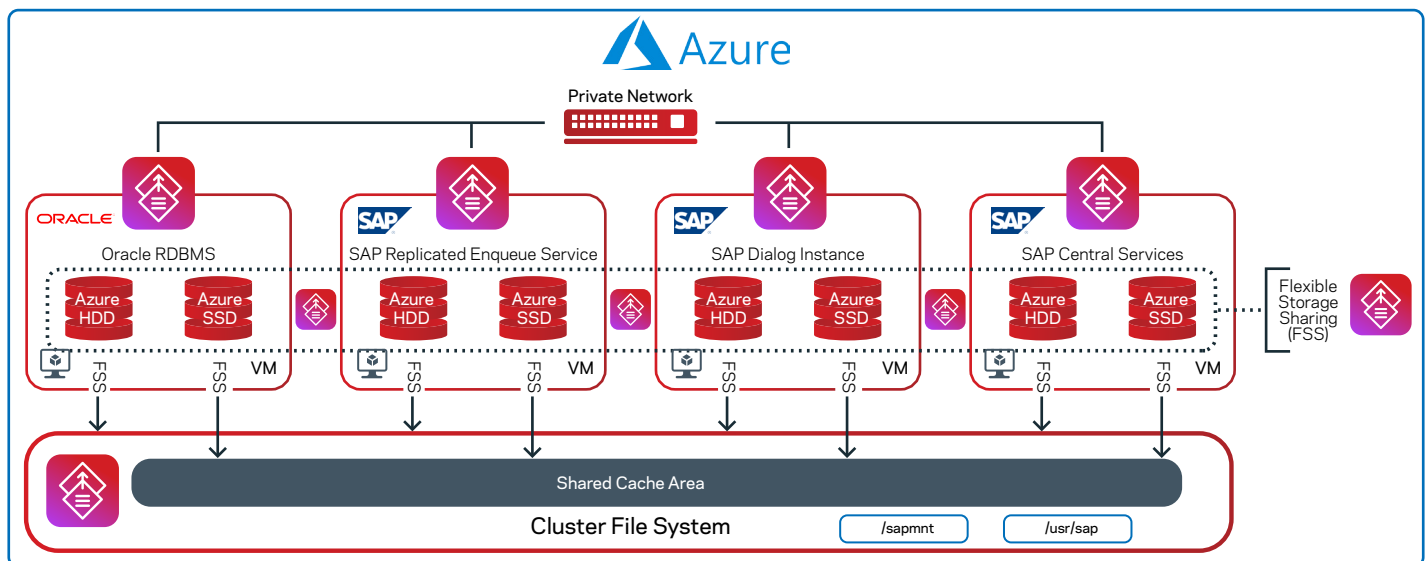


Figure 4. SAP S4/HANA running on Veritas Alta Shared Storage in Microsoft Azure

Combining Enterprise Storage and High Availability in the Cloud

Veritas Alta Application Resiliency's HADR and cloud storage management features provide the enterprise functionality needed to confidently run a tier-1 application in a public cloud environment. With Veritas Alta Application Resiliency, you have the tools needed to manage your high priority applications in the cloud:

- ✓ Application integration for near instant fault detection with fully automated failover and migration
- ✓ Highly performant, resilient, and secure block-level shared storage using cloud native infrastructure
- ✓ Flexibility to architect your applications to run in any cloud, hybrid-cloud, or multi-cloud architecture

Figure 4 shows an example of how Veritas Alta Application Resiliency provides high availability and software-defined shared storage services for SAP S4/HANA in Microsoft Azure, with a highly available configuration that spans multiple availability zones.

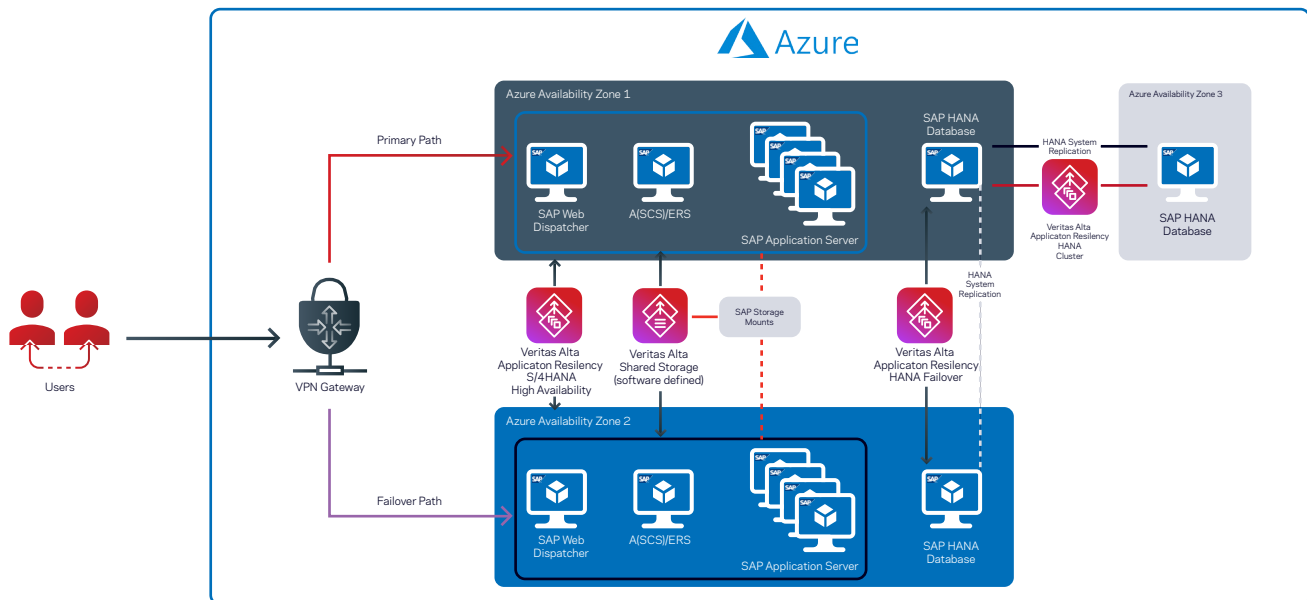


Figure 5. SAP S4/HANA with Veritas Alta Application Resiliency across Azure availability zones

Veritas Alta Application Resiliency has solution templates available in public cloud marketplaces to simplify the purchasing and deployment experience. Solution templates are available in the AWS Marketplace (AWS CloudFormation Template), the Azure Marketplace (Azure ARM Template), and the Google Cloud Platform Marketplace (Deployment Manager Template).

Veritas Alta Application Resiliency offers flexible configuration options and is a certified HADR solution for tier 1 applications, such as SAP and Oracle, that run in public cloud environments. More information on using Veritas Alta Application Resiliency in public cloud environments can be found in the following documents:

- [High Performance Applications in the Cloud](#)
- [High Availability and Disaster Recovery Solutions for SAP NetWeaver on AWS](#)
- [High Availability and Disaster Recovery Solutions for SAP HANA on Microsoft Azure](#)
- [High Availability and Disaster Recovery for SAP NetWeaver in Microsoft Azure](#)
- [Oracle High Availability Configuration in AWS Cloud](#)
- [Alta Application Resiliency in Microsoft Azure](#)
- [Alta Application Resiliency Deployment in Microsoft Azure using Solution Templates](#)
- [Application Resiliency for Multi-Cloud Deployments](#)

Hybrid Cloud

Managing storage and high availability for environments that consist of on-premises and public cloud infrastructure can be challenging and may require multiple point tools. Veritas Alta Application Resiliency can fully support a hybrid approach to public cloud consumption, offering bi-directional HADR and storage management between on-premises environments and the supported public cloud providers. Veritas Alta Application Resiliency manages the application components on-premises and in the cloud, and also manages the data replication between on-premises and cloud data volumes.

With the agnostic approach to operating systems and platforms, Veritas Alta Application Resiliency is well suited for deployment in hybrid-cloud HADR configurations and can be tailored to support varying RPO and RTO requirements. It can also support hybrid-cloud HADR configurations with multiple cloud providers, enabling a resilient and performant hybrid cloud strategy.

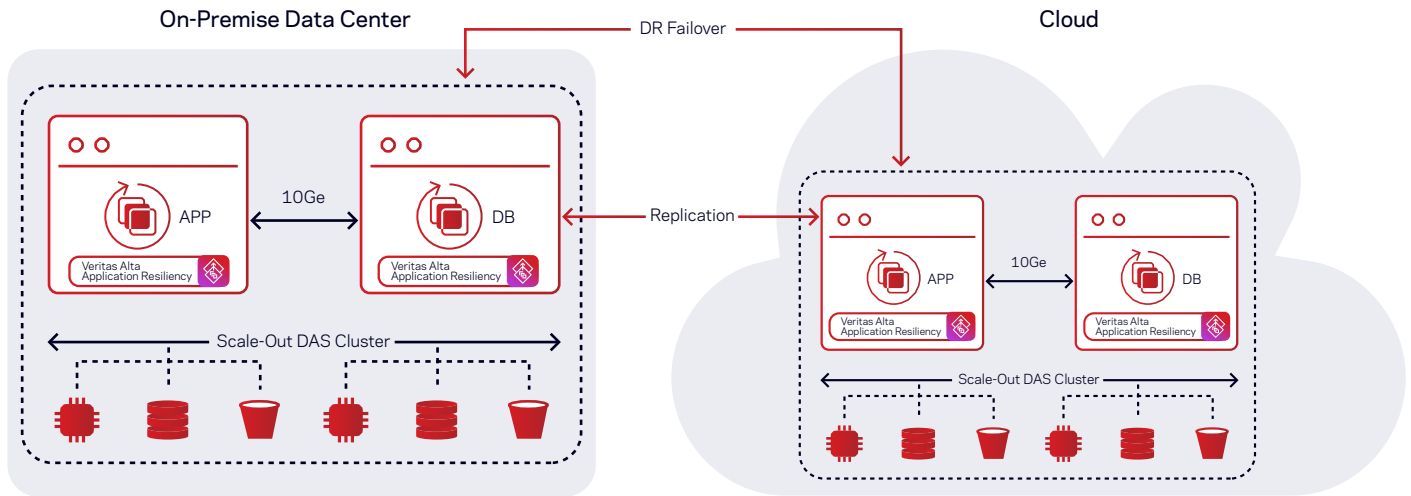


Figure 6. Veritas Alta Application Resiliency Hybrid Cloud Design Concept

Multi-Cloud

An organization interested in moving business-critical applications into the cloud to increase efficiency and reduce operational expenses may consider extending its reach into more than one public cloud. Public cloud services have limited options for providing HADR and enterprise storage for applications deployed in an IaaS model. In most cases, applications running in the cloud have the same RPO and RTO requirements as on-premises applications running in a clustered or other high availability configuration. Veritas Alta Application Resiliency offers the same benefits, functionality, and configuration options to provide HADR and storage management for applications in the cloud, with the added benefit to the application owners of providing data mobility between cloud providers. This helps eliminate being locked in to any specific cloud service provider and enables a high availability configuration that can protect against cloud provider outages.

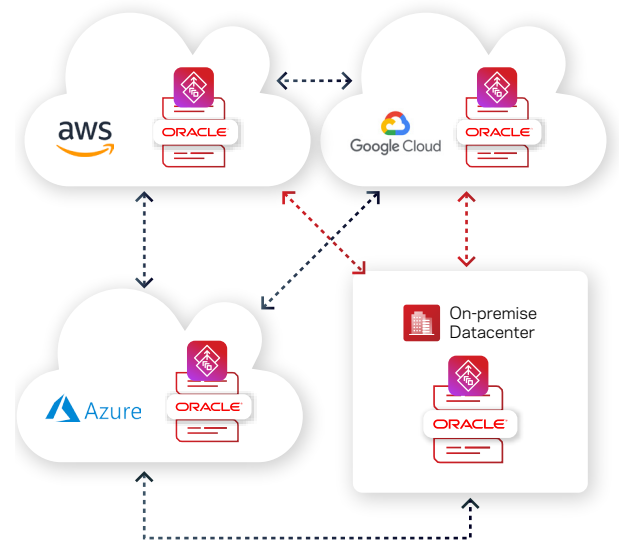


Figure 7. Veritas Alta Application Resiliency enables multi-cloud HADR

Veritas Alta Application Resiliency offers native replication functionality with the Volume Replicator feature that works in concert with application clustering to ensure the application state is preserved when an application is failed over between clouds. When a failover event occurs, Veritas Alta Application Resiliency initiates the application failover by unmounting the data volumes (if possible), switching over the application services to the target cluster, and restarting the application with the replicated data (shown in figure 7).

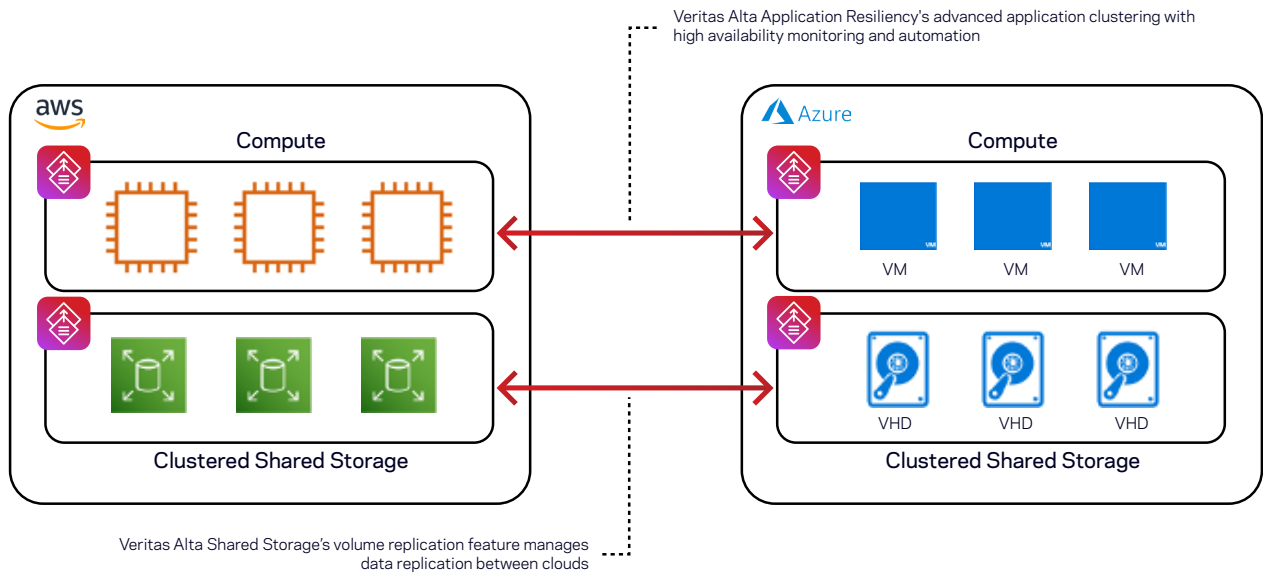


Figure 6. Veritas Alta Application Resiliency Hybrid Cloud Design Concept

Cloud Migration and Data Repatriation

There are several tools available for cloud migrations including those offered by most public cloud service providers. However, these tools are designed for migration purposes only and do not offer any additional benefit to customers beyond a one-time migration to the cloud.

Veritas Alta Application Resiliency can support the migration of nearly any application to the cloud as well as the ability to repatriate your applications to on-premises data centers if needed. It also provides several additional benefits compared to cloud provider migration tools:

- **Validation:** Using the Firedrill feature, Veritas Alta™ Application Resiliency allows you to test your applications in a non-production network segment in the cloud using temporarily provisioned cloud compute instances and snapshots of the production data volumes. This can be done on-demand using cloud resources, minimizing cost and operational overhead.
- **Usability:** In addition to managing the application migration to the cloud, Veritas Alta Application Resiliency also provides full bi-directional high availability for your applications once they are migrated to the cloud environment so they're ready for production as soon as they're migrated.
- **Failback:** With full bi-directional operations support for cloud, hybrid-cloud, and multi-cloud topologies, Veritas Alta Application Resiliency can move applications back on-premises for any reason once they are migrated, and online in the cloud environment.

Veritas Alta Application Resiliency enables cloud migrations for on-premises environments being migrated to the cloud—and for cloud-native environments being migrated within the cloud—to a different cloud service provider or to an on-premises data center.

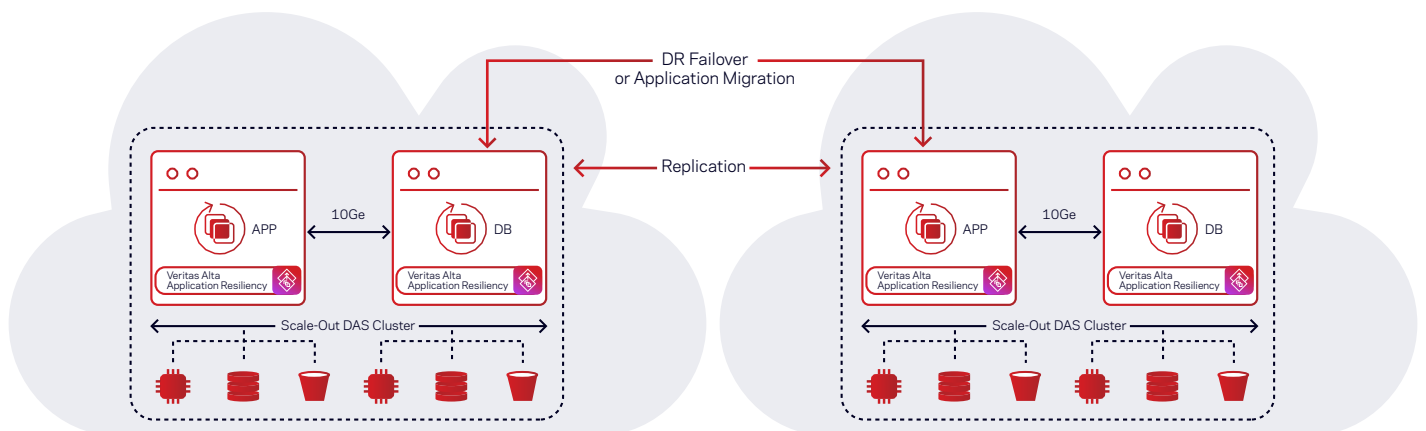


Figure 6. Veritas Alta Application Resiliency Hybrid Cloud Design Concept

Conclusion

Ensuring that your applications provide a high-quality end user experience when running in the cloud is a must. Veritas Alta Application Resiliency is designed to provide the application availability and portability needed with standard cloud shared responsibility models by optimizing native cloud services while adding the enterprise functionality needed to make your applications highly available in the cloud. It enables you to run your applications in the cloud with data portability across cloud, hybrid-cloud, and multi-cloud environments. With advanced enterprise features and functionality, it manages applications in the cloud with several key benefits:

- **Availability:** With instant application fault detection and the ability to manage several HADR configurations across cloud services, Veritas Alta Application Resiliency reduces costs in the cloud and enables hybrid and multi-cloud architectures that protect your IT services against cloud provider outages and disruptions.
- **Performance:** Maximize cloud resource utilization, reduce latency, improve application performance, and reduce cloud storage costs with intelligent storage and availability management that ensures your IT services are highly performant and resilient in the cloud.
- **Mobility:** Enterprise level HADR and storage management for any application that lets you seamlessly move applications and data between cloud providers as needed, so you can avoid being locked in to any specific cloud technology or service provider.

With cloud becoming an increasingly common platform for hosting IT infrastructure, Veritas Alta Application Resiliency is the ideal software-defined solution to help you reduce cloud costs and complexity while ensuring that your applications are highly available and resilient. Whether you're considering a cloud, hybrid-cloud, or multi-cloud architecture, Veritas Alta Application Resiliency provides enterprise functionality for your IT services that allows you to migrate and manage your business technology in the cloud with confidence.

1. <https://virtualizationreview.com/articles/2022/05/20/multicloud-report.aspx>

About Veritas

Veritas Technologies is a leader in multi-cloud data management. Over 80,000 customers—including 95 percent of the Fortune 100—rely on Veritas to help ensure the protection, recoverability, and compliance of their data. Veritas has a reputation for reliability at scale, which delivers the resilience its customers need against the disruptions threatened by cyberattacks, like ransomware. No other vendor is able to match the ability of Veritas to execute, with support for 800+ data sources, 100+ operating systems, 1,400+ storage targets, and 60+ clouds through a single, unified approach. Powered by Cloud Scale Technology, Veritas is delivering today on its strategy for Autonomous Data Management that reduces operational overhead while delivering greater value. Learn more at www.veritas.com. Follow us on Twitter at [@veritastechllc](https://twitter.com/veritastechllc).

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