VERITAS

Veritas InfoScale in the Cloud

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

White Paper | August 2022

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 clouds[1]. While cloud services have many benefits, the cloud is a shared responsibility model, and it is your responsibility to ensure that your mission-critical IT services are highly available and resilient when running in the cloud.

Veritas InfoScale 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 migrations[1], InfoScale can 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**: Ensure that your applications are highly available with near-instantaneous automated recovery that minimizes the impact of cloud provider disruptions and outages. InfoScale 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**: InfoScale enables software-defined high-performance shared storage, using native cloud storage services with intelligent data management that can maintain application data on the fastest storage services. This improves application performance and maximizes cloud resources, while helping to reduce costs and complexity.
- **Mobility**: Avoid vendor lock-in by enabling applications to run in a highly available configuration in cloud environments. InfoScale allows you to easily move your applications within public cloud and hybrid cloud architectures. InfoScale also provides automated cloud migration from on-premises systems and between different cloud providers.

This solution brief will provide an overview of how InfoScale works in cloud environments. InfoScale 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.

InfoScale Solution Value

InfoScale has several unique features that offer significant value to organizations looking to improve application performance and reduce costs by maximizing flexibility of architecture, without being locked in to 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. InfoScale is designed to integrate with cloud infrastructure to provide availability, resiliency, and high-performance storage for your IT services.

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

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

InfoScale has customized cloud agents for mission-critical applications that ensure your IT services have the highest possible uptime in the cloud. InfoScale can also intelligently manage HADR for cloud, hybrid-cloud, and multi-cloud environments as a fully automated process. There are several key benefits InfoScale 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. InfoScale'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. InfoScale can 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. InfoScale'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**: InfoScale supports a near-zero RTO/RPO for mission-critical applications 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.

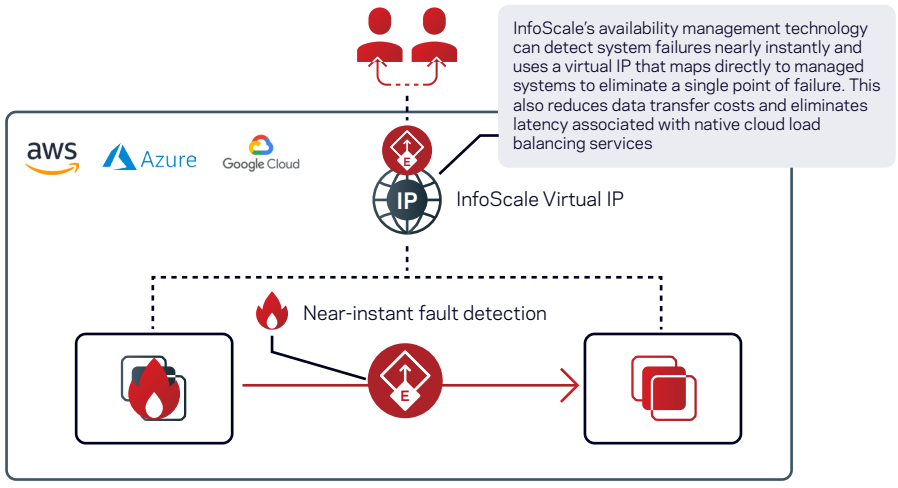
InfoScale's enterprise HADR capability for cloud environments also includes an integrated feature allowing application tiers to be grouped together in a way that represents the entire business service that the application provides. This is known as a Virtual Business Service (VBS). A VBS represents a 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.

InfoScale 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. InfoScale's application-aware clustering and high-availability services ensure your applications are always online. If an application goes offline, InfoScale 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. InfoScale ensures that your applications are highly available within cloud, hybrid-cloud, and multi-cloud environments.



InfoScale 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. InfoScale clustering can 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.

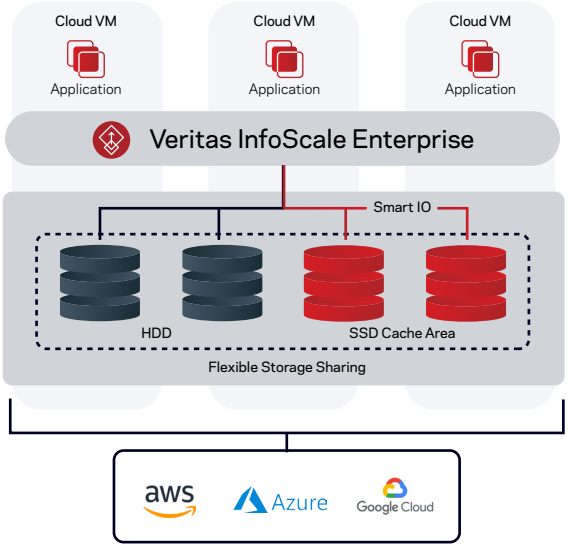
InfoScale supports several private and public cloud providers and can be used in cloud environments to provide full HADR capability that is not achievable with cloud native tools. Using InfoScale in the cloud gives you the best:

- **Availability**: While public cloud infrastructure is designed to provide excellent availability and durability for compute and storage systems, InfoScale is focused on the applications that run on top of this infrastructure. InfoScale'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. InfoScale'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 InfoScale, 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. InfoScale 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. InfoScale storage is designed to provide maximum storage performance and resiliency for applications that have higher availability requirements. InfoScale storage 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.



InfoScale Flexible Storage Sharing (FSS) 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 InfoScale shared storage in the cloud is ideal for enterprise applications, as it can decrease your storage costs and improve your application performance and resiliency. InfoScale storage 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

InfoScale manages fault tolerance for your data, and can be configured as shared storage within an availability zone and across zones and regions. With InfoScale, you also get a sub-minute RTO, as you do not have to detach and reattach storage volumes in the event of a failure. InfoScale 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

InfoScale can significantly improve the performance and efficiency of the underlying cloud native storage services with FSS, and an intelligent data caching feature called SmartIO. InfoScale Storage 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 InfoScale 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. InfoScale'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. InfoScale 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.

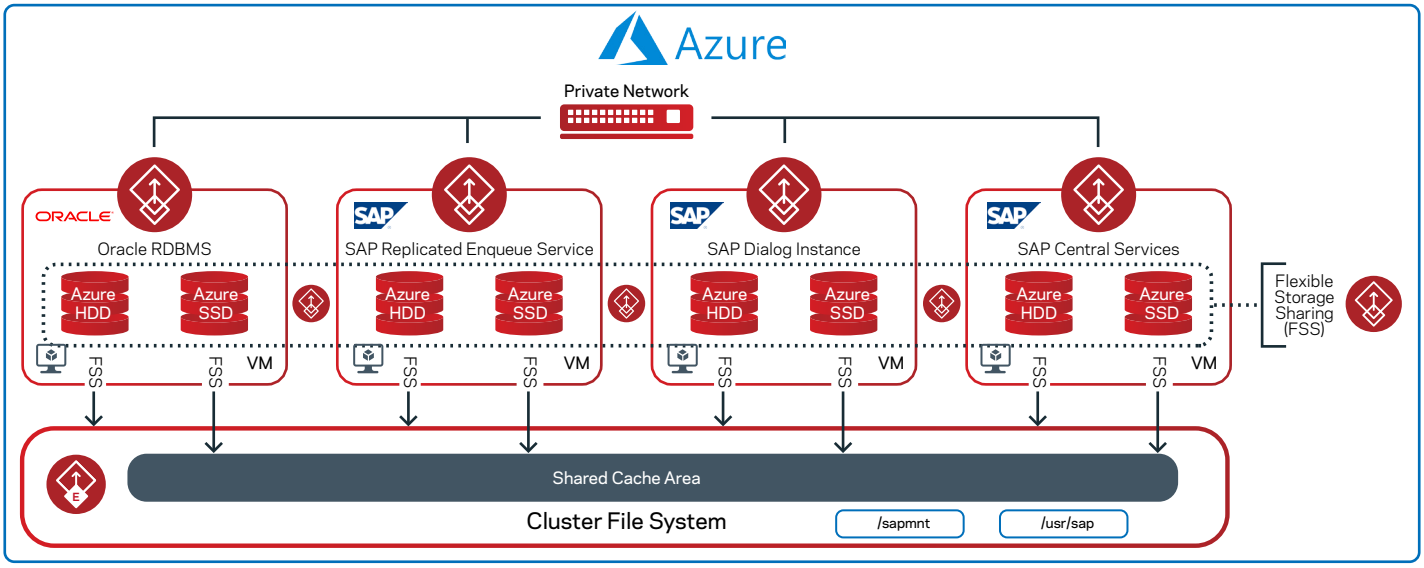


Figure 4. SAP S4/HANA running on InfoScale shared storage in Microsoft Azure

Combining Enterprise Storage and High Availability in the Cloud

InfoScale's combination of HADR and cloud storage management features provide the enterprise functionality needed to confidently run a tier-1 application in a public cloud environment. With InfoScale, 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 InfoScale 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.

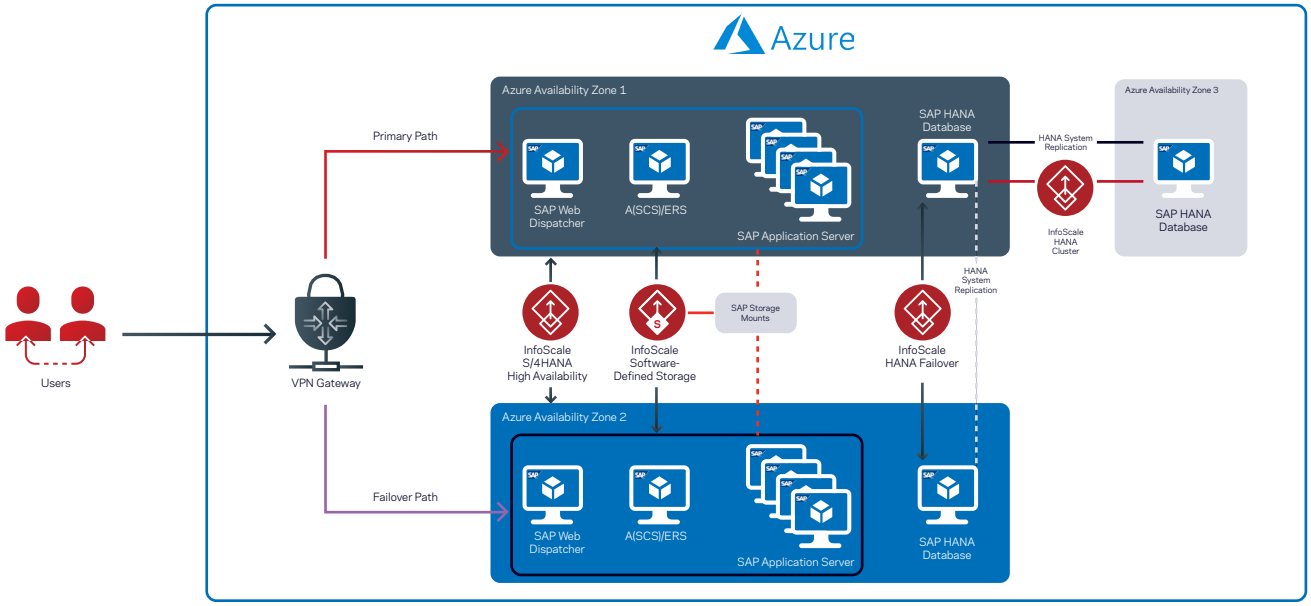


Figure 5. SAP S4/HANA with InfoScale storage and high availability across Azure availability zones

InfoScale 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).

InfoScale 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 InfoScale in public cloud environments can be found in the following documents:

- InfoScale for High Performance Applications in the Cloud
- InfoScale for SAP NetWeaver in AWS
- InfoScale for NetWeaver in Azure
- InfoScale for HANA in AWS
- InfoScale for Oracle in AWS
- InfoScale in Microsoft Azure
- InfoScale Deployment in Microsoft Azure using Solution Templates
- Intelligent Hybrid Multi-Cloud for the Modern Enterprise

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. InfoScale 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. InfoScale manages the application components on-premises and in the cloud, and VVR manages the data replication between on-premises and cloud data volumes.

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

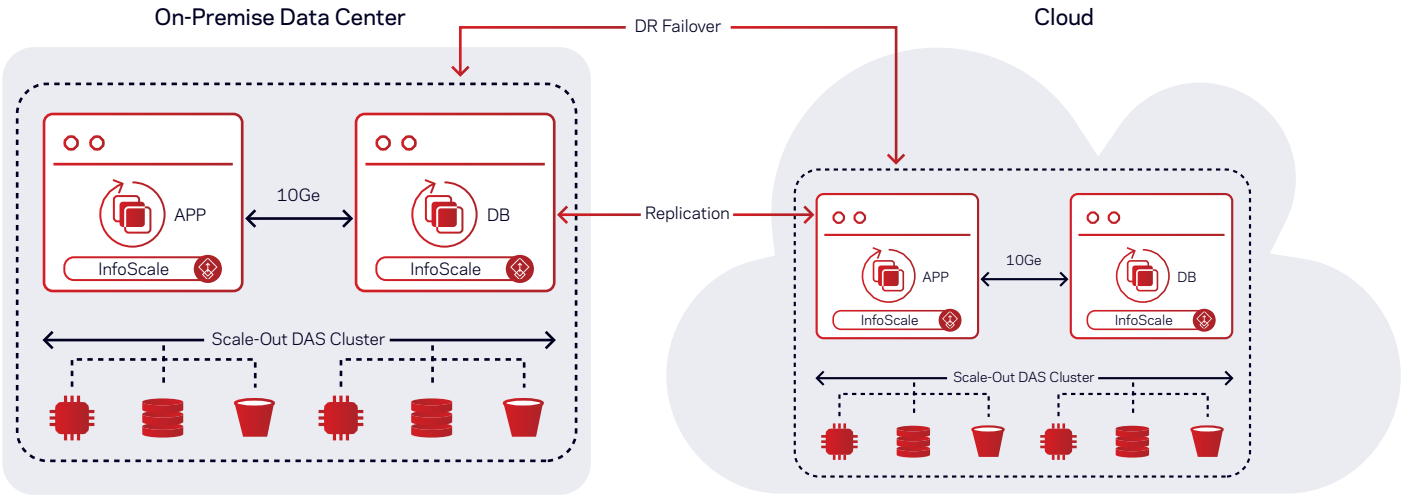


Figure 6. InfoScale Hybrid Cloud Design Concept

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. InfoScale 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.

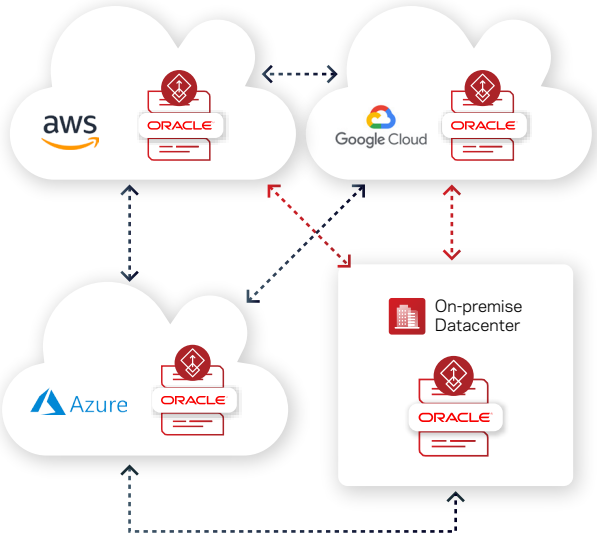


Figure 7. InfoScale enables multi-cloud HADR

InfoScale offers native replication functionality with the Volume Replicator feature that works in concert with InfoScale application clustering to ensure the application state is preserved when an application is failed over between clouds. When a failover event occurs, InfoScale 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).

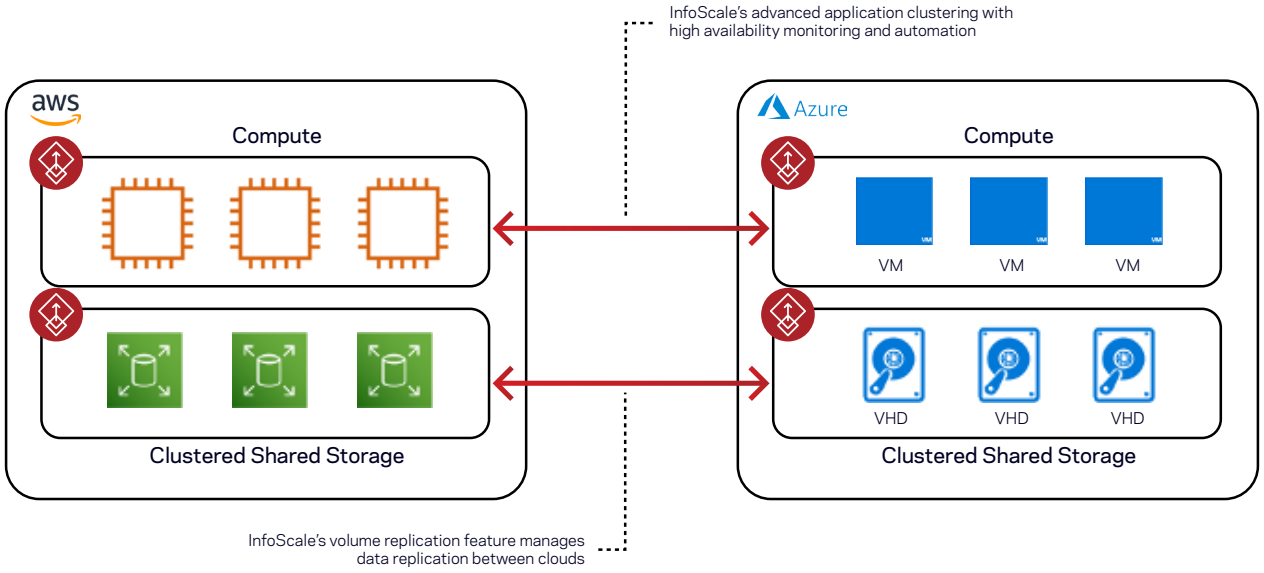


Figure 6. InfoScale Hybrid Cloud Design Concept

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.

InfoScale 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. InfoScale provides several additional benefits compared to cloud provider migration tools:

- **Validation**: Using the Firedrill feature, InfoScale 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, InfoScale 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, InfoScale can move applications back on-premises for any reason once they are migrated, and online in the cloud environment.

InfoScale 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.

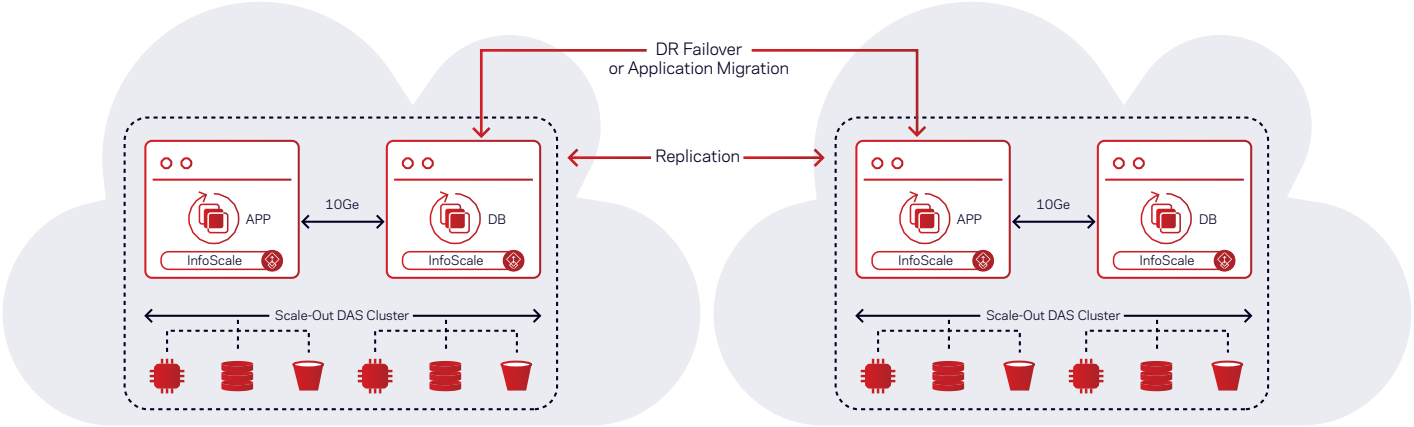


Figure 6. InfoScale Hybrid Cloud Design Concept

Conclusion

Ensuring that your applications provide a high-quality end user experience when running in the cloud is a must. InfoScale 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. InfoScale enables you to run your applications in the cloud with freedom of architecture and data portability across cloud, hybrid-cloud, and multi-cloud environments. With advanced enterprise features and functionality, InfoScale 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, InfoScale 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, InfoScale 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, InfoScale 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 global leader in data protection and availability. Over 80,000 customers—including 87 percent of the Fortune Global 500—rely on us to abstract IT complexity and simplify data management. The Veritas Enterprise Data Services Platform automates the protection and orchestrates the recovery of data everywhere it lives, ensures 24/7 availability of business-critical applications, and provides enterprises with the insights they need to comply with evolving data regulations. With a reputation for reliability at scale and a deployment model to fit any need, Veritas Enterprise Data Services Platform supports more than 800 different data sources, over 100 different operating systems, more than 1,400 storage targets, and more than 60 different cloud platforms. Learn more at www.veritas.com. Follow us on Twitter at @veritastechllc.

VERITAS

2625 Augustine Drive
Santa Clara, CA 95054
+1 (866) 837 4827
veritas.com

For global contact information visit:
veritas.com/company/contact

V1597 08/22