

Intelligent Hybrid Multi-Cloud for the Modern Enterprise

Solution Overview

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Executive Summary

The cloud has become a mainstream option for managing IT operations that helps businesses reduce management overhead and focus on delivering new innovations. With multiple cloud services and features available today, businesses are increasingly adopting hybrid multi-cloud strategies that use a combination of on-premises resources and services from multiple public cloud providers. Because of the wide range of options available, it can be difficult for organizations to design and build hybrid multi-cloud environments that can effectively manage their IT services while optimizing costs, resource utilization and functionality.

Veritas provides enterprise data solutions that help you deliver IT services with maximum availability, resiliency and intelligence. Veritas has a long-standing history of providing innovative solutions for managing data both on-premises and in the cloud. The integration of Veritas high availability and resiliency, data protection and analytics solutions provides organizations with the foundation for building intelligent hybrid multi-cloud environments with several key benefits:

- Platform-agnostic availability management for applications and IT services.
- Resiliency and data protection that provides advanced recoverability for your applications across platforms.
- Real-time business insights that help optimize performance and operating costs for IT services.

This solution overview will discuss the Veritas strategy for designing and managing intelligent hybrid multi-cloud environments for any type of application or IT service. Veritas offers a unique integrated solution that ensures availability, protection and intelligence for IT services with the flexibility to run and optimize your business technology in any hybrid multi-cloud environment.

Solution Value

As a software-defined solution, Veritas provides a foundation that lets you build optimized hybrid multi-cloud environments. This foundation reduces the complexity associated with managing multiple different technologies and platforms as part of an overall IT strategy. With the flexibility to support nearly any deployment architecture, Veritas provides a platform for hybrid multi-cloud environments that offers application availability, data protection and operational intelligence to ensure IT services are highly available and optimized for hybrid multi-cloud deployment architectures.

Organizations often design and operate a hybrid multi-cloud environment using multiple independent tools and processes.

Veritas offers a unique integrated approach to hybrid multi-cloud operations that has several advantages:

- Flexibility to run applications on any platform with the agility to move applications between platforms to optimize costs and functionality.
- Automated availability management for complex, multi-tiered business applications.
- Intelligent analytics designed to help improve application performance, reduce costs and increase efficiency.
- Data protection that supports a broad range of applications and platforms with multi-cloud recoverability.

The software-defined approach to integrating Veritas data protection, analytics and application availability management solutions acts as the foundation for running your business technology with confidence in a hybrid multi-cloud model using a single, unified strategy.

Solution Overview

By integrating data protection, high availability (HA) and analytics technology, Veritas provides a single source of availability, protection and operational intelligence based on advanced integration between the following solutions:

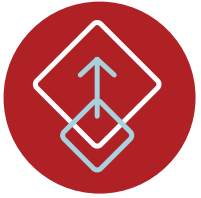


- **Veritas InfoScale™**—A software-defined optimization solution for mission-critical applications that abstracts applications from their underlying hardware and software resources. That abstraction enables enterprise-grade optimizations around business continuity, performance and infrastructure agility across physical, virtual and cloud environments. InfoScale provides advanced software-defined storage and availability management for mission-critical applications that need to be always-on. To learn more about InfoScale, visit the [Veritas website](#). 
- **Veritas NetBackup™**—Provides enterprise-level heterogeneous data protection for nearly any platform and application as well as cross-platform data protection functionality for a large variety of operating systems and applications. NetBackup uses a centralized management architecture that can be easily scaled to manage data protection for vast enterprise environments. NetBackup has advanced Automatic Image Replication (AIR) capability for replicating backup images between sites to maximize resiliency for backup data and backup services. The Veritas solution discussed here will also include information on how to use NetBackup to provide orchestrated system resiliency using the NetBackup Resiliency option that can be included in a NetBackup deployment architecture. As a best practice, it's important to have a full NetBackup enterprise data protection solution in addition to the resiliency solution provided by the NetBackup Resiliency option. This approach ensures you have backup and recovery services along with orchestrated resiliency and disaster recovery (DR) services for your IT applications and services in a hybrid multi-cloud model. To learn more about NetBackup, visit the [Veritas website](#). 
- **APTARE™ IT Analytics**—An IT analytics solution that provides advanced insights into storage, backup, compute and cloud infrastructures as a single platform designed to optimize IT operations, efficiency and costs in nearly any environment. APTARE enables holistic visibility into your data center operations by providing data-driven insights to optimize how resources are used, enabling cost accounting for resource utilization and reducing risks by ensuring IT resources are protected. APTARE analyzes data in both on-premises and cloud environments to determine appropriate cloud workloads, right-size resources before migration to the cloud and optimize infrastructure already using cloud resources, with a simple deployment architecture that makes it easy to use and operate with a minimal infrastructure footprint. To learn more about APTARE, visit the [Veritas website](#). 

Figure 1 shows an overview of how Veritas provides a complete foundation for running your business technology in a hybrid multi-cloud environment with integrated availability, protection and intelligence.

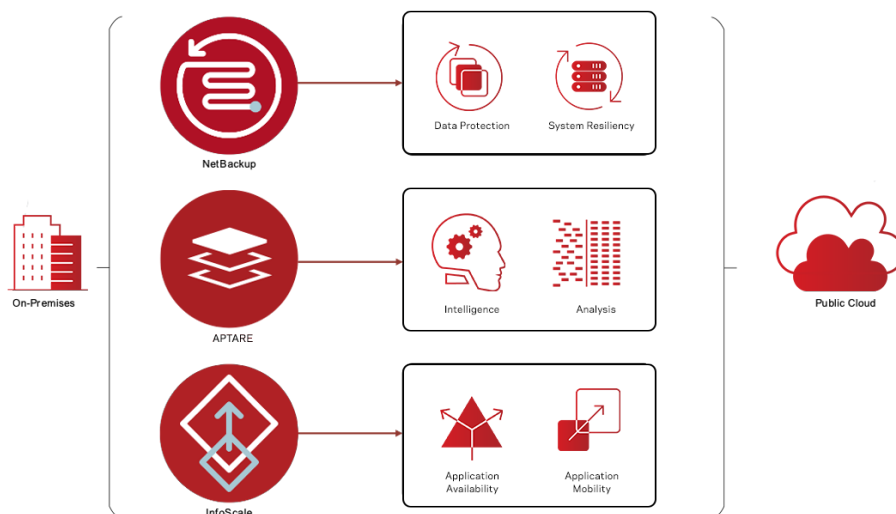


Figure 1. An example of the Veritas intelligent hybrid multi-cloud strategy.

Availability

Providing application and IT service-level availability in hybrid multi-cloud environments can be a significant challenge. Multiple factors can affect operational readiness and you need to consider all of them to properly architect an operational model that meets your business requirements. Creating an effective operational model requires an enterprise-grade foundation on which your applications and IT services can run, with intelligent resource management that has visibility into both the infrastructure and application layers—regardless of how or where they're deployed. In a hybrid multi-cloud strategy, you need both flexibility and agility to:

- Use the best platforms and services available to manage and run your IT services.
- Avoid being locked in or burdened with complex and expensive migrations in the event your strategy changes and you need to adapt your applications to run on other platforms.

Veritas provides a solution that enables optimized application availability and mobility. This solution lets you move your applications and IT services between platforms easily so you can use the platform that offers the best technology for your application and business requirements. Plus, you can do so without having to undergo a complex and expensive migration process that can result in increased costs, manual processes, user errors and application downtime.

Veritas gives you the architectural freedom to ensure your IT services are running on the platform best suited to their business purpose. This approach helps your business innovate faster and provide the best user experience possible, using the most optimized platform available.

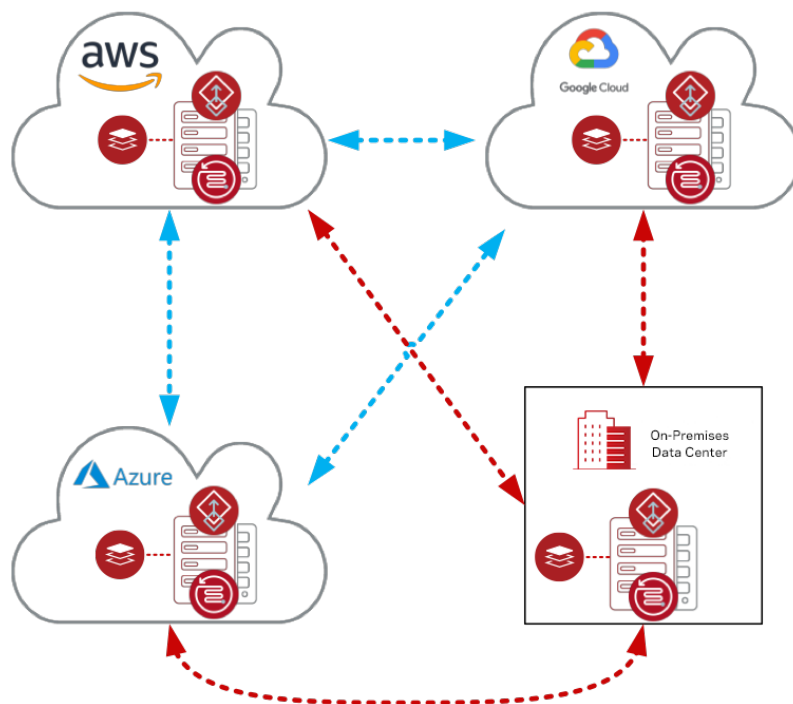


Figure 2. Ensuring application availability in a hybrid multi-cloud architecture.

Managing Availability for Any Application

It's important to understand that not all applications and IT services are created equal. There are typically several different applications within an organization that all serve a particular purpose. Some applications may provide critical business services while others may be acting in a business support capacity and aren't as critical to ongoing operations. Regardless of whether an application is mission-critical or has a lower impact on your business, you need to have a reliable application availability strategy in place to ensure your business technology meets your service-level agreements (SLAs) and user expectations and can operate efficiently in a hybrid multi-cloud model (see Figure 2).

Mission-Critical Applications

InfoScale eliminates planned and unplanned downtime by clustering critical applications and the resources they require. It does so for applications and infrastructure on nearly any platform—on-premises, in the cloud or in a hybrid multi-cloud environment. With intelligent kernel-level application monitoring that acts immediately in the event of a system fault, InfoScale can ensure fully automated application HA and a near-zero recovery point objective (RPO) and recovery time objective (RTO) if a failover is needed. InfoScale also dynamically monitors available unused system capacity in terms of CPU, memory and swap space to understand which systems have the most available resources. It can then make dynamic decisions and failover applications to the systems best suited to take over application execution with maximum performance, which helps provide the best user experience.

InfoScale has multiple agents and integration points developed specifically to support HA and storage management for public cloud services. InfoScale's agents for Amazon Web Services (AWS), Microsoft Azure and Google Cloud Platform integrate directly with your applications and their associated cloud infrastructure to ensure your applications are highly available in a hybrid multi-cloud operating model. InfoScale also manages heterogeneous data replication that optimizes data transfer. You can configure replication to move data between on-premises sites, on-premises to the cloud, between cloud zones and regions or between different cloud providers. This feature provides the best possible application availability and DR strategy by protecting your applications and data against local and cloud service provider outages (see Figure 3).

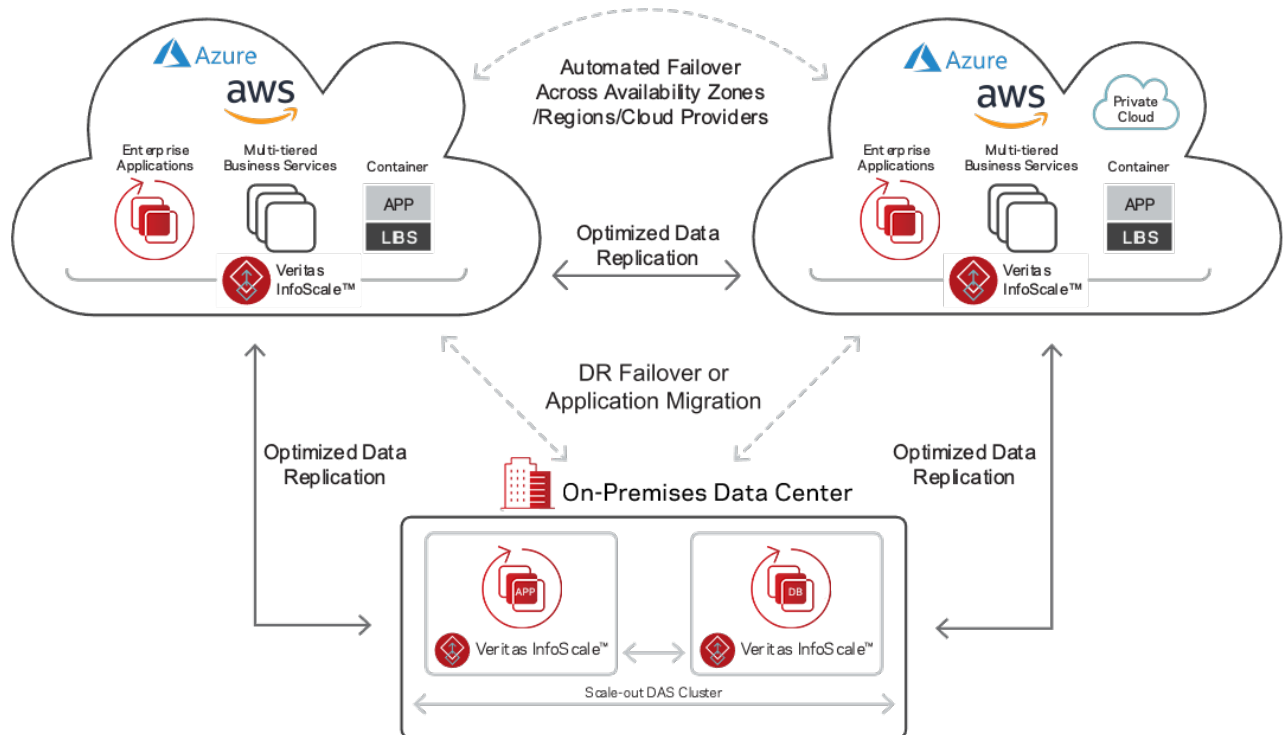


Figure 3. An example of platform-independent application availability using Veritas InfoScale.

Middle-Impact Applications

The NetBackup Resiliency solution enables a resilient hybrid multi-cloud deployment architecture that can manage and orchestrate the system resiliency process and data replication between sites. The RPO for your systems can be as little as five minutes using NetBackup Resiliency's integrated replication capability. In a migration or failover operation, NetBackup Resiliency automates the full process, including DNS updates, network mappings between sites and starting entire applications at the alternate site (see Figure 4). When using the cloud as a resiliency target, cloud resources are brought online on demand, only when needed.

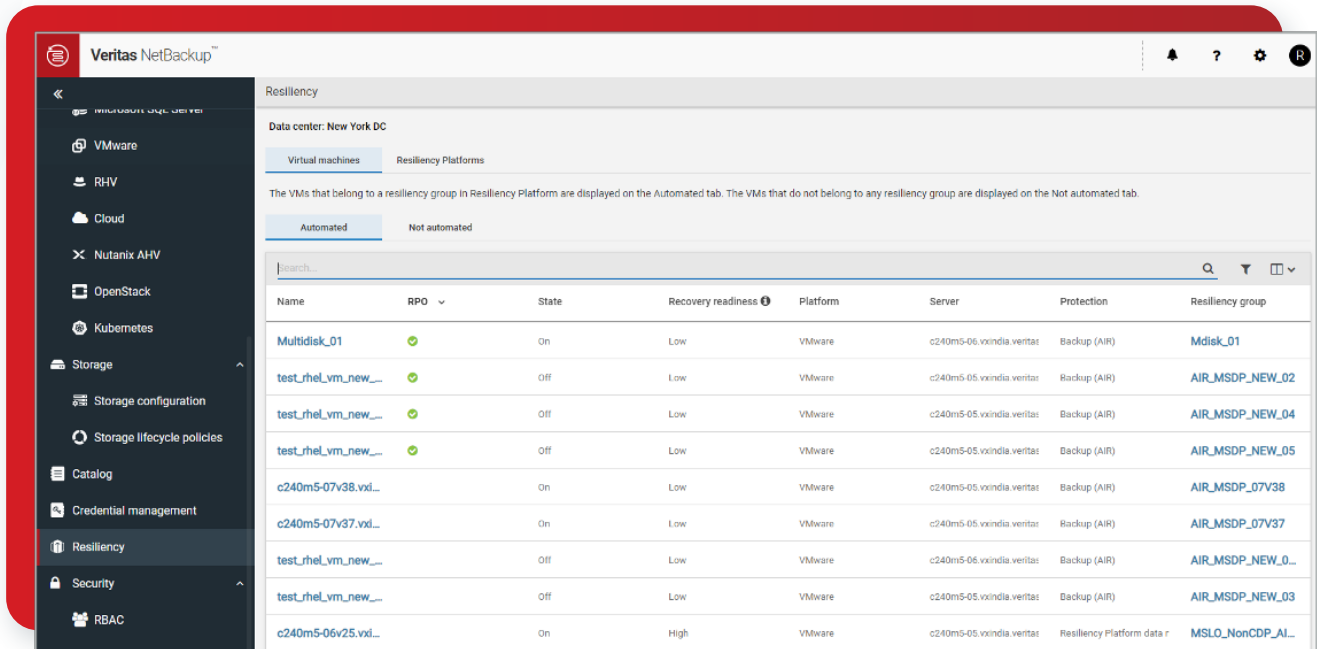


Figure 4. Automated system resiliency managed by NetBackup Resiliency.

Lower-Impact Applications

Applications with less-demanding uptime requirements may not require real-time replication and can benefit from using a more cost-effective way to meet less-demanding SLAs. NetBackup Resiliency can make lower-impact applications available and resilient by automating the recovery of system backup images. This is a fully orchestrated process that offers a near-zero RTO using the Instant Access option to bring a system online almost instantly using a backup image. When you need to recover several systems or an entire IT service as a single operation, the process can be entirely automated instead of having to manage multiple restore operations, which can be complex and time-consuming.

Lower-impact applications can often benefit from insights that help reduce infrastructure costs, particularly when it comes to storage and compute resources. APTARE can provide detailed analysis and reports on resource utilization and can offer recommendations for how to reduce your infrastructure footprint without impacting operations.

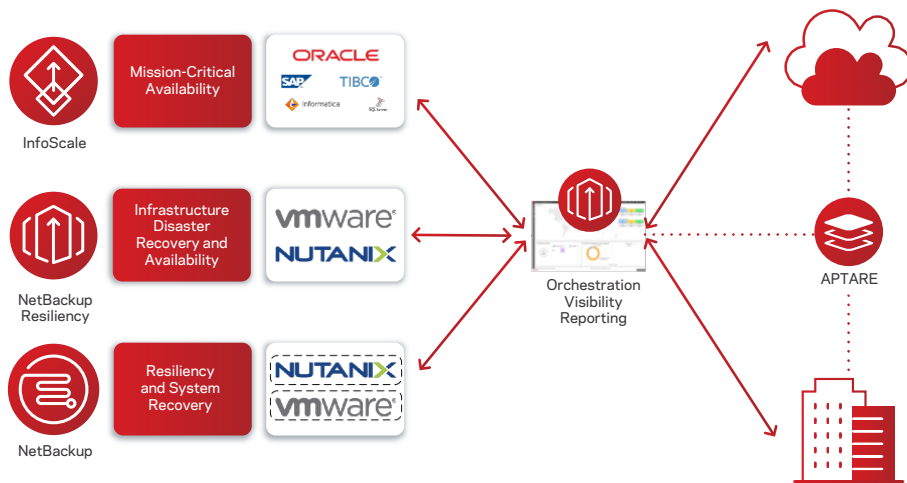


Figure 5. Ensuring availability for any type of application in a hybrid multi-cloud model with Virtual Business Services.

Service-Level Management

In a hybrid multi-cloud environment, managing your IT services can be complex, with multiple tiers and dependencies that work together to provide availability and resiliency for the overall IT business service.

The Virtual Business Services (VBS) feature is unique in the market. It lets you manage HA and DR for multi-tiered applications as a single consolidated entity, even when there are different system types, RPOs and RTOs for individual application tiers. Using VBS, you can completely automate the recovery or migration of a complex multi-tier application and the business service it provides.

VBS manages dependencies between application tiers as well as the order in which the applications and their components are brought online in a start operation and taken offline in a stop operation. VBS is aware of the overall business service provided by the application tiers and can take the appropriate action in the event of a failure to restore the entire service, delivering faster recovery and minimal downtime, with no manual intervention.

Figure 5 gives an example of how a VBS can manage multi-tier applications as a single logical business service.

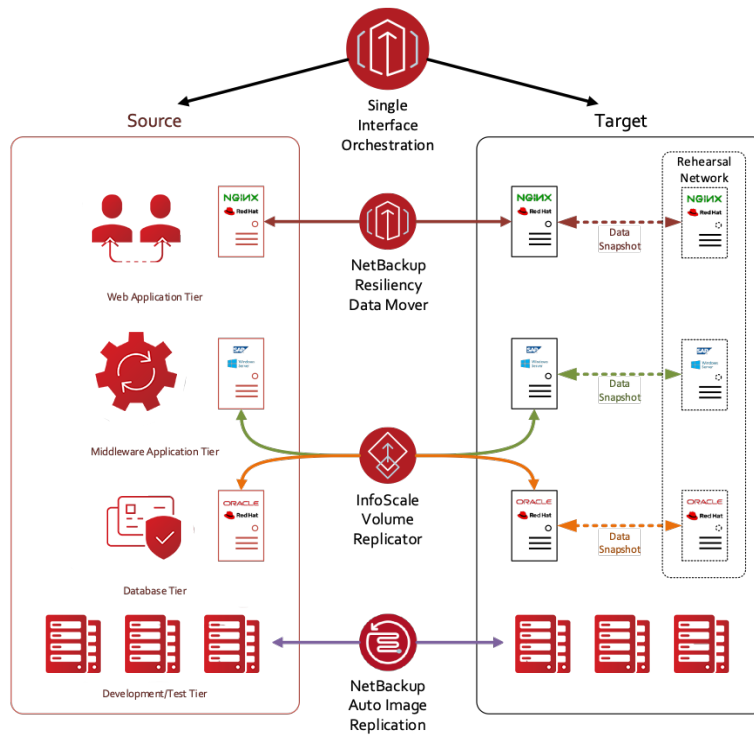


Figure 6. VBS with DR rehearsal.

Protection

Improving application and system resiliency can be one of the most significant benefits of a hybrid multi-cloud strategy. Leveraging multiple platforms within a single deployment model protects your IT services against individual cloud provider outages and reduces the likelihood of downtime and data loss.

Veritas provides an enterprise-wide solution to help you manage application and system resiliency in hybrid multi-cloud environments with several customizable options for making systems resilient, including automated recovery from system backups. Veritas offers several unique data protection features such as cloud recovery from on-premises system backups, recovery between clouds and an advanced rehearsal option that lets you test a resiliency plan to ensure it will work as expected in the event of an outage or service disruption (see Figure 6).

Data Protection

In modern, fast-changing hybrid multi-cloud environments, organizations need a new approach to data protection to ensure all applications are protected without limiting their recovery options. NetBackup reduces complexity, scales with growth and creates a foundation for multi-cloud data management that provides broad platform support for hybrid multi-cloud architectures. NetBackup provides advanced data protection for hybrid multi-cloud environments with a focus on:

- Cloud storage—NetBackup ensures workloads are fully protected with optimized data transfer to cloud storage, encryption, network throttling and metering to monitor data transfers. Cloud-agnostic granular recoverability provides the architectural freedom needed in a hybrid multi-cloud model.
- Scalability—With the ability to support large, multi-petabyte data footprints, NetBackup provides enterprise-level scalability with unlimited retention. Integrated data immutability features protect data against corruption and ransomware attacks.
- Workload support—NetBackup provides data protection for an industry-leading range of workloads, including SaaS applications, commercial and custom applications, relational and NoSQL databases and big data solutions—on-premises, in the cloud and in hybrid multi-cloud environments.

Cloud Recovery

Recovering on-premises system backups in the cloud can be a cost-effective, reliable option for recovering systems using cloud resources only as they're needed. Veritas provides an innovative cloud recovery option that lets you recover on-premises system backups in the cloud. You can manage the restore of NetBackup images into the cloud without having to deploy or manage a full complement of NetBackup infrastructure in the cloud environment (see Figure 7). This option gives you the flexibility of cloud-based infrastructure that can be provisioned on demand and used only when it's needed. Cloud recovery of backup images enables a cost-effective hybrid resiliency strategy and is also an excellent option for cloud migration using existing backup images with minimal resources required.

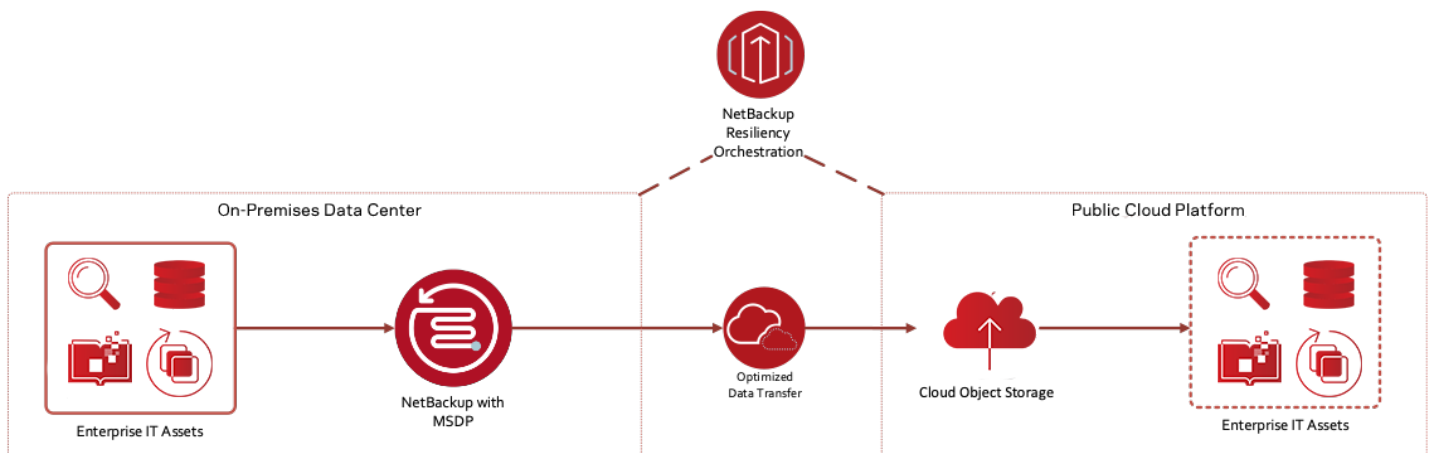


Figure 7. Automated cloud recovery using NetBackup images.

Multi-Cloud Resiliency

In a hybrid multi-cloud model, application and system resiliency can be difficult to implement and often involves multiple independent solutions that are designed to work with specific technology. Veritas offers an agnostic approach to multi-cloud resiliency that helps ensure data integrity and recoverability across any cloud. With a unified solution, Veritas provides:

- Resiliency and DR with real-time replication that can provide a low RPO and RTO for applications and systems. Effectively managing resiliency between on-premises data centers and the cloud and between different cloud service providers protects against platform outages and service disruptions.

- Flexible recoverability that lets you back up and recover applications and systems running in a public cloud service, with the ability to recover them in a different cloud service, if required.
- Useful insights into your resource and capacity utilization to help reduce the infrastructure footprint required to make applications and systems resilient. APTARE helps optimize costs and improve resiliency in the cloud by providing real-time information on system and storage utilization and recommending how to optimize resources.

Resiliency with Confidence

Veritas offers a DR Rehearsal option that lets you test a resiliency or recovery operation for any application prior to execution, regardless of how it's protected, with no impact on production services. You can manage and run a simulated failover test on an isolated, non-production network segment to ensure systems at the secondary site are working properly prior to a full failover event. This simulation uses snapshots of production data that are then attached to temporarily provisioned systems used for testing purposes. Clean up of the rehearsal environment when it's no longer needed is fully managed and automated.

The DR Rehearsal feature has flexible configuration options and can be used for a single system or for an entire VBS. Figure 5 shows an example of how the integrated Veritas solution can orchestrate a DR rehearsal for a multi-tiered application.

Operational Visibility and Reporting

A key advantage that Veritas delivers for hybrid multi-cloud environments is the ability to visualize the resiliency and operational status for all your applications in a single view, regardless of where they're running. The resiliency console is a centralized interface that shows resiliency and availability status and information for all protected applications and systems. The console also provides a map view that shows the physical locations of the protected applications and systems, giving you full insight into multi-site geographically dispersed resiliency. The APTARE portal provides a centralized view of the operational status of your resources with unlimited data retention that enables you to understand and predict trends and usage patterns (see Figure 8).

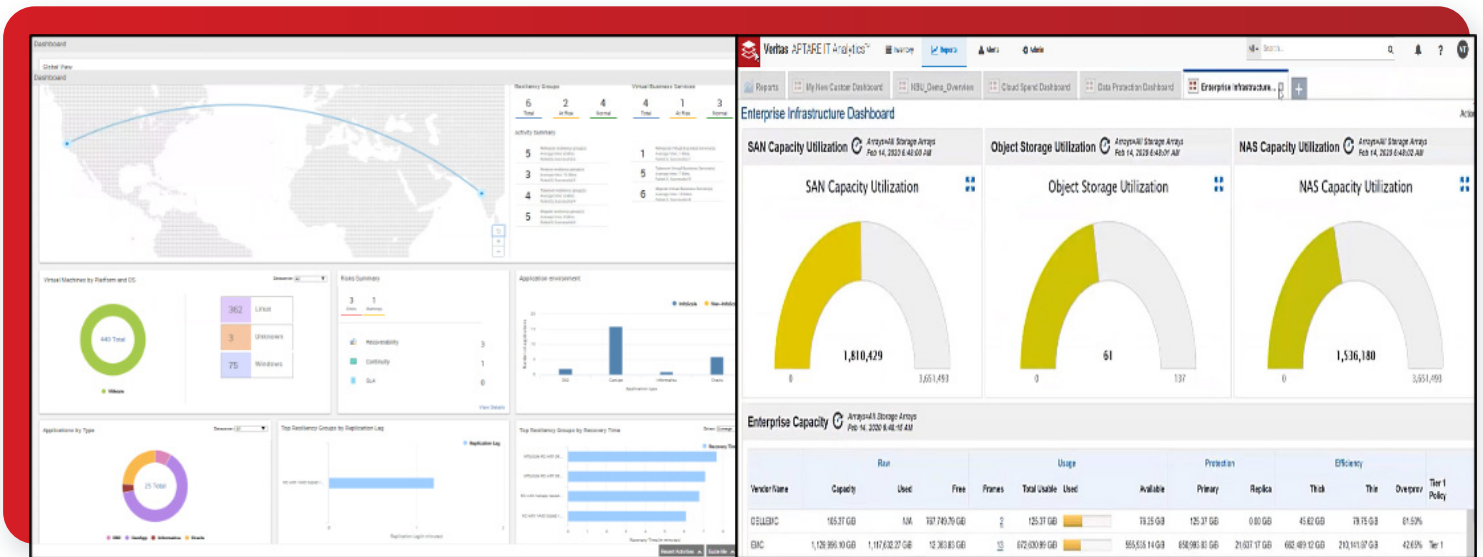


Figure 8. Simplified operational visibility and insights with the APTARE portal.

Centralized reporting on system information and resiliency status is also easily accessible within a single console. You can include all the availability and resiliency information shown in the user interface in reports that can be downloaded and automatically distributed within an organization. Doing so helps eliminate operational complexity and increases confidence that your organization is well prepared for situations that are often unpredictable. You can schedule or run reports on demand for all protected applications. Business-level reports help prove compliance and service objectives while delivering confidence on the resilient state of the business to leaders.

Intelligence

Holistic real-time visibility into the status of your data and infrastructure is very important for effectively managing the availability and reliability of your IT services. APTARE enables you to better understand how resources are consumed both on-premises and in the cloud. This insight lets you quantify the costs and performance you're getting in a hybrid multi-cloud model so you can optimize your infrastructure and data footprint. It also ensures your IT services are protected and resilient by improving data reliability, anomaly detection, automated notifications and alerts.

Insights

Having a clear and complete picture of IT services resource utilization in a hybrid multi-cloud environment is challenging to many organizations due to multiple independent tools that are only designed to work with specific infrastructure or public cloud services. APTARE solves this problem by gathering and analyzing over 30,000 unique data points from storage, compute, backup and cloud resources in a single pane of glass solution that eliminates the need for multiple independent tools. This approach can provide significant benefits:

- **Infrastructure optimization**—Understand exactly how your data protection, storage and cloud infrastructure is being used. Expert, best-practices rules automatically run against your data to find areas of reclamation to increase utilization of existing infrastructure by up to 50 percent.
- **Usage optimization**—Enable cost accountability for on-premises and cloud resources based on detailed usage insights for any of the metrics collected. Allocate resources based on how they're being used, with the intelligence to account for changes in usage patterns.
- **Risk mitigation**—Ensure your critical data is protected. Compare all your physical and virtual hosts against your backup solution(s) to determine any possible risk and find any anomalies across all your data protection solutions. This process dramatically reduces or eliminates failed restore requests due to user errors or external attacks such as ransomware. To learn more about best practices and strategies to combat the threat of ransomware, [download this white paper](#).

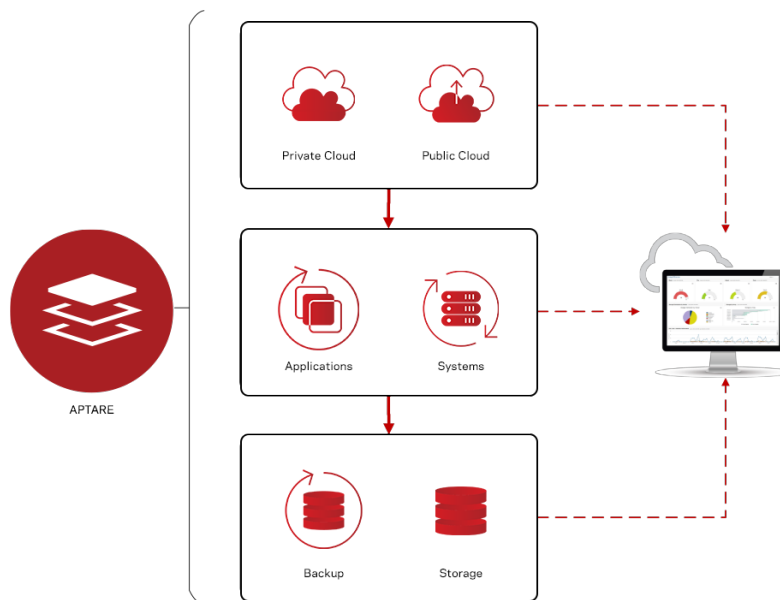


Figure 9. An overview of using APTARE IT Analytics for hybrid multi-cloud environments.

Visibility

Understanding how your IT resources are used is one of the most important factors in being able to effectively optimize your operations. APTARE IT Analytics provides consolidated visibility into complex, multi-vendor environments that lets you increase data reliability and reduce costs (see Figure 9). In hybrid multi-cloud environments, APTARE can provide visibility and analytics for multiple objects in public cloud services, which can help you understand and optimize several data points:

- Account information—Understand how resources are being used within your public cloud subscriptions and determine whether a particular cloud environment is providing the right features and benefits for a particular application or IT service.
- Usage information—Gain access to real-time data on system capacity and protection status with detailed information about cloud resource groups and any associated system, storage and network resources being used by your IT applications and services. You can use this information to improve application performance, optimize costs and to allow for chargeback within your organization based on actual usage data.
- Comprehensive reporting—The modern and interactive user interface gives you access to drag-and-drop report design and customization. You can access reports on demand or schedule them, with automated distribution to key stakeholders.

With full visibility into multiple data points—some of which can be unique to particular cloud operating environments—you can effectively architect your applications to take advantage of the cloud resources that are best able to deliver the services your applications require, regardless of which cloud provider is hosting the service. (See Figure 10.)

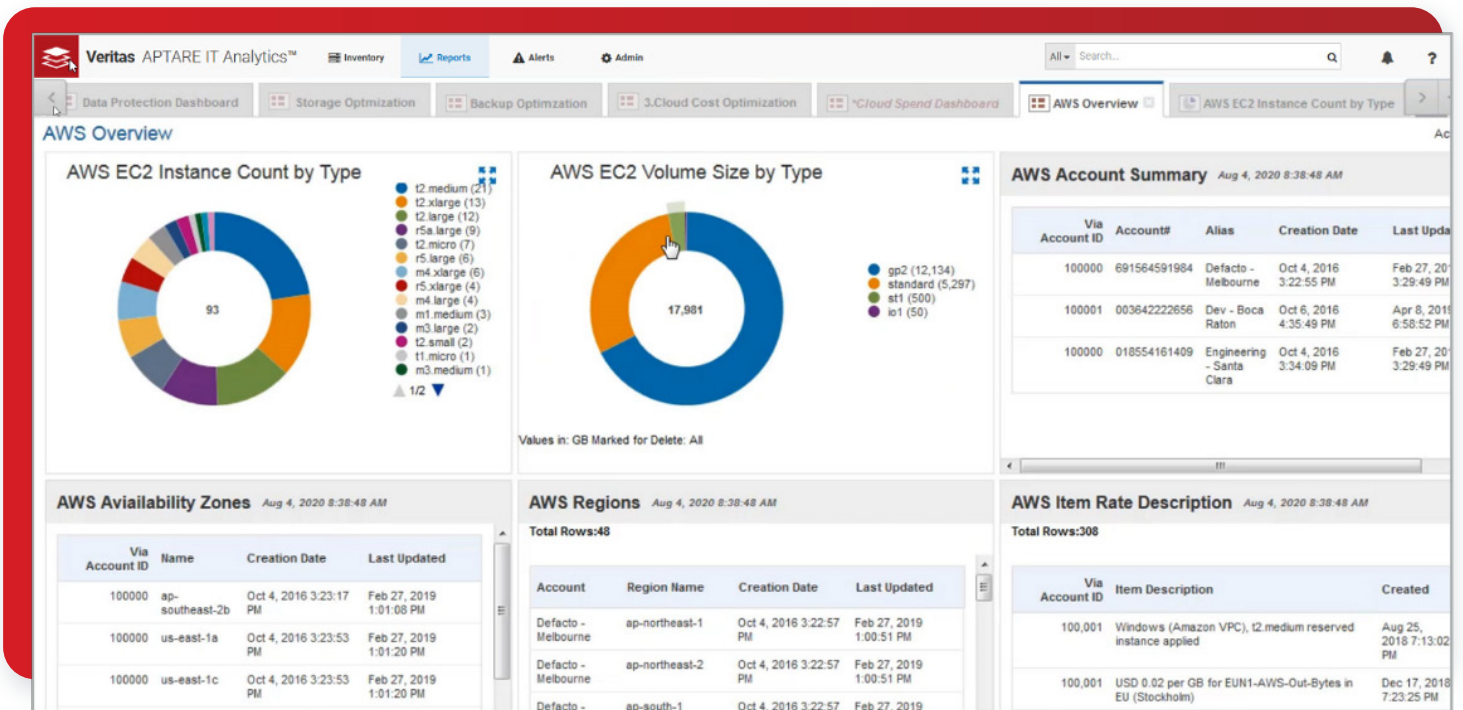


Figure 10. APTARE provides full visibility into cloud resource utilization.

Optimization

APTARE gives you the visibility needed to report on underused IT resources in real time, allowing you to allocate them in a way that optimizes your resource utilization and costs. You can identify the root cause of performance issues, identify storage tiers and opportunities to re-tier data and effectively implement chargebacks so business units understand their overall storage resource utilization and how to optimize it.

APTARE offers unlimited data retention to maximize identification of trends and usage patterns while maintaining the on-demand performance you need to gain insights into your hybrid multi-cloud environment in real time. APTARE provides a modern and intuitive user experience and is designed with a focused on:

- **Scalability**—Proven scale that can support the largest enterprises with thousands of systems and exabytes of storage. As a vendor-agnostic solution, APTARE gathers data points for nearly any type of system to give you a full range of insights into how to optimize resources.
- **Simplicity**—A single pane of glass solution for your entire organization that spans both on-premises and multi-cloud infrastructure.
- **Flexibility**—With easily provisioned customizations and an SDK that enables integration with other tools and services that can provide specific tailored insights, APTARE provides valuable information for personas ranging from operations teams up to C-level personnel.

Summary

In a market with multiple cloud service providers that offer similar features and functionality, implementing the best hybrid multi-cloud strategy that meets your business technology requirements can be a significant challenge. Organizations are often burdened with having to use multiple vendors and independent products to effectively manage hybrid multi-cloud deployments. Veritas solves this problem by providing a complete, software-defined foundation for hybrid multi-cloud architectures with integrated application availability, protection and intelligence. This unique approach provides several key benefits:

- Application availability for multi-cloud environments that ensures your business technology is highly available.
- Protection and resiliency for any application, with advanced options for multi-cloud recovery.
- Analytics and insights that help you optimize performance, resource utilization, costs and functionality.

Veritas delivers broad support for nearly any platform and infrastructure, with the intelligence and visibility needed to run your applications and IT services using the best technology available in the cloud today. This integrated Veritas solution is available in public cloud marketplaces and is designed to help you run your business with confidence in a hybrid multi-cloud environment.

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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](https://twitter.com/veritastechllc).

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