APTARE

Enabling Storage Services in Virtualized Cloud Environments

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Executive Summary

Many enterprise organizations are adopting both private and public clouds in the hopes of leveraging their promises for a more dynamic, agile company that can quickly respond to demanding customer requirements and changing market needs. Driving this initiative is the desire to more efficiently manage the applications and infrastructure hosted within the data center. Through optimization and efficiency, the enterprise can lower costs while enhancing the quality and quantity of IT services to the public and private consumer.

Traditional IT services hosted in the cloud include productivity applications including customer resource management (CRM), sales force automation, and help desk. However, the ever-expanding list of regulatory and compliance requirements, coupled with the explosion of storage capacity growth, have created a need to incorporate storage and backup management as a cloud service.

As organizations continue to evolve their environments and deploy highly virtualized cloud infrastructures, data center optimization management that is easy to deploy, provides a multi-tenant architecture, is heterogeneous and offers end-to-end visibility of the technology stack will be increasingly critical.

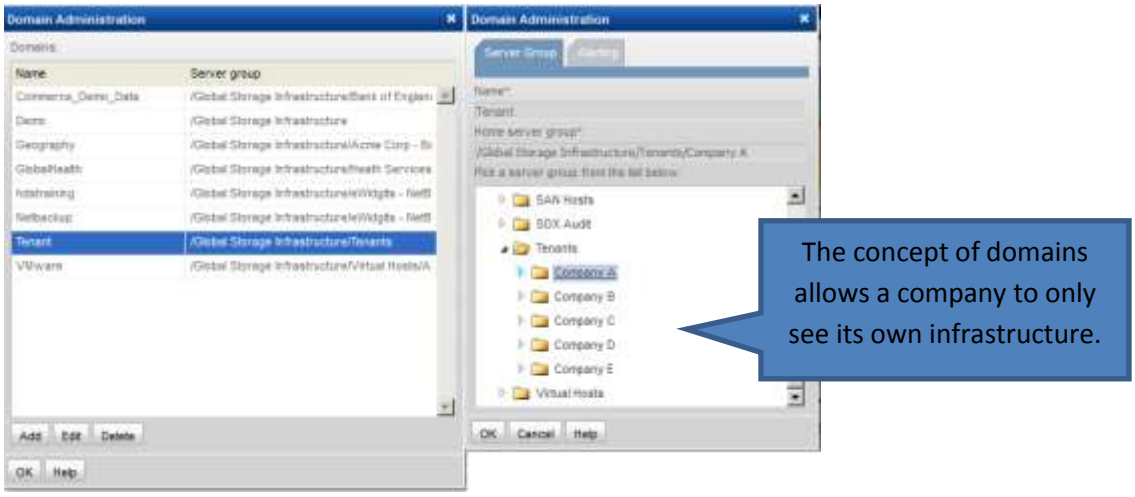
APTARE StorageConsole was designed for the delivery of storage and backup management services through the public and private cloud. APTARE provides the ability to enhance your service portfolio to include data center optimization services, such as:

- Capacity Planning
- Chargeback
- Service Level Management
- Infrastructure Visibility including Virtual Environments

1. Multi-Tenant Architecture

APTARE StorageConsole was developed for the cloud and contains various mechanisms for segregating assets and infrastructure. Each user, company, application owner, etc. can be separated from other users of the portal.

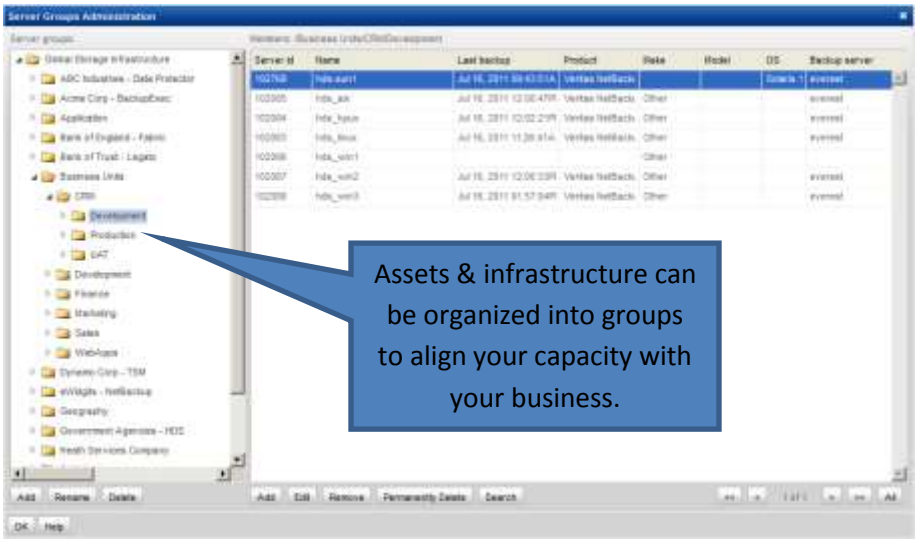
This segregation concept, known as *domains*, allows the Managed Services Provider (MSP) to deliver IT services to their clients through a public cloud platform. The infrastructure of each company (or tenant) can be organized as if they were the only user of the portal.



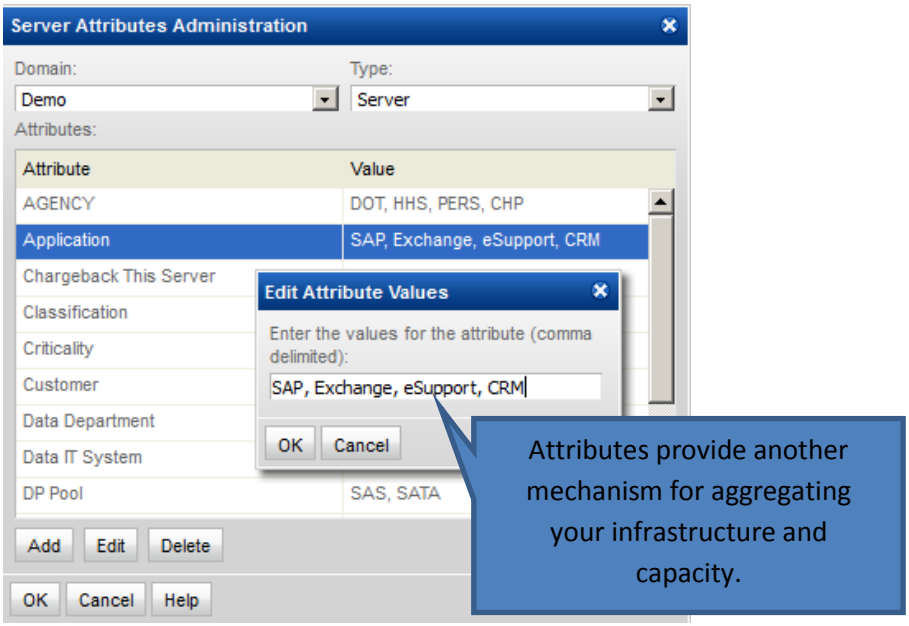
2. Server Groups, Attributes, and Aggregation

Aligning capacity and infrastructure with the organizational structure is fundamental to business-level reporting. APTARE provides several methods for defining groups for report aggregation.

- Server Groups: Provide the ability to organize your infrastructure into logical groups. One of the advantages of this method is that you can define a hierarchy for drilldown from high-level entities to more granular groupings.



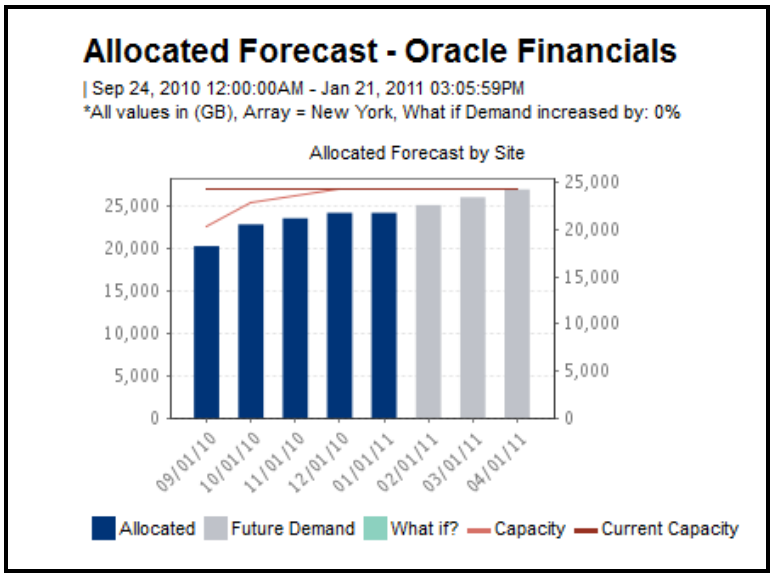
- Attributes: Provide the ability to tag an object with a free-form value that can be used to aggregate data into groups. Some common examples include: application, business unit, line of business, cost center, and environment.



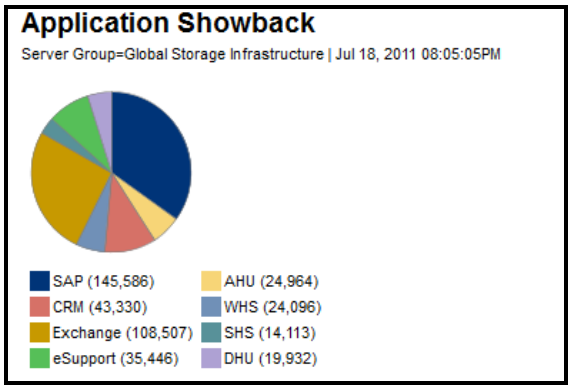
Both options provide a mechanism for aggregating data and provide users the ability to track business entities as opposed to individual infrastructure components.

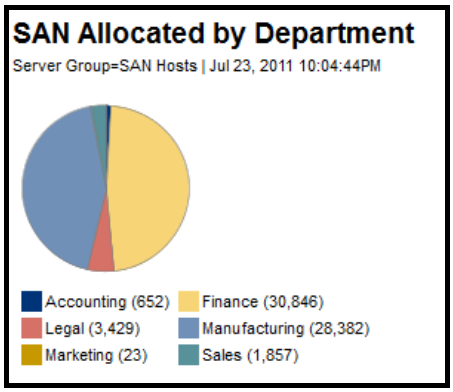
3. Capacity Planning as a Service

APTARE provides visibility into your storage environment and illustrates how your capacity has been allocated and utilized within your organization. Allowing an application owner to visualize how much capacity is currently in use, and predicting future consumption based upon historical trends equips users with the information necessary to make intelligent procurement decisions. Integrating this service into your cloud portfolio will enable near real-time management of application capacity without having to resort to time-consuming statistics collection and report creation. Since the information is dynamically updated, you can be confident that you're making decisions based upon accurate and current information.

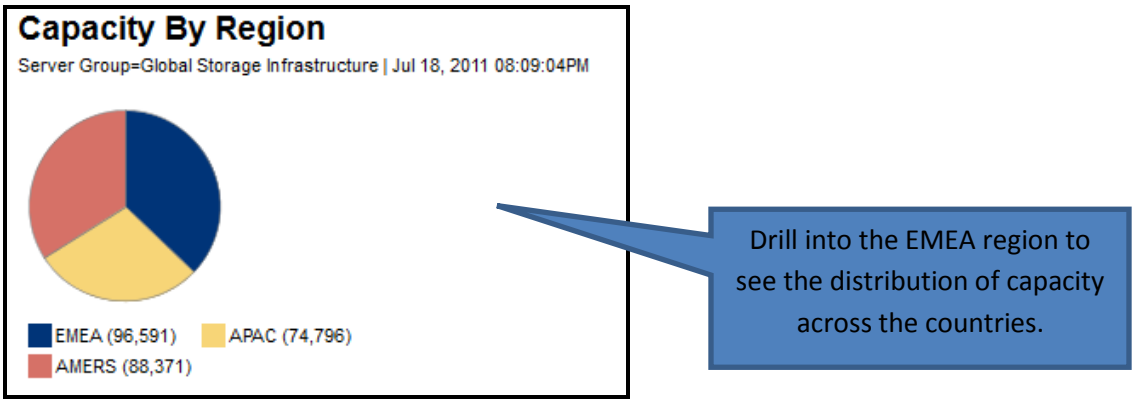


For those who have the responsibility of managing multiple applications, business units, and regions, APTARE has the flexibility to organize your infrastructure to reflect your organizational structure. This enables executive management to visualize their assets from a high-level view.

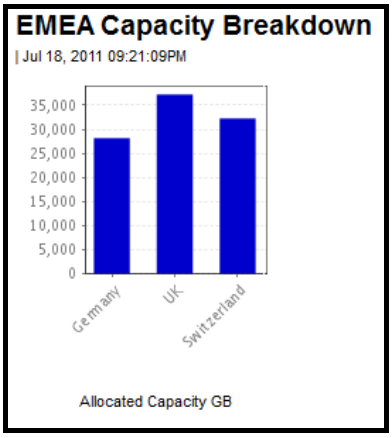




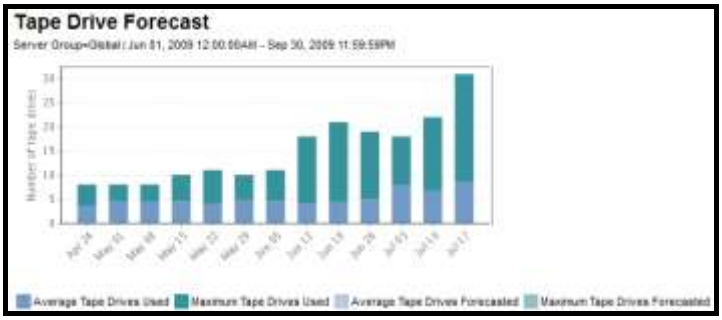
ATPARE StorageConsole allows your users to organize their assets and infrastructure into dashboards that include the information that's pertinent to their job functions. In addition, you can build reporting hierarchies that allow additional granularity through drilldown functionality.



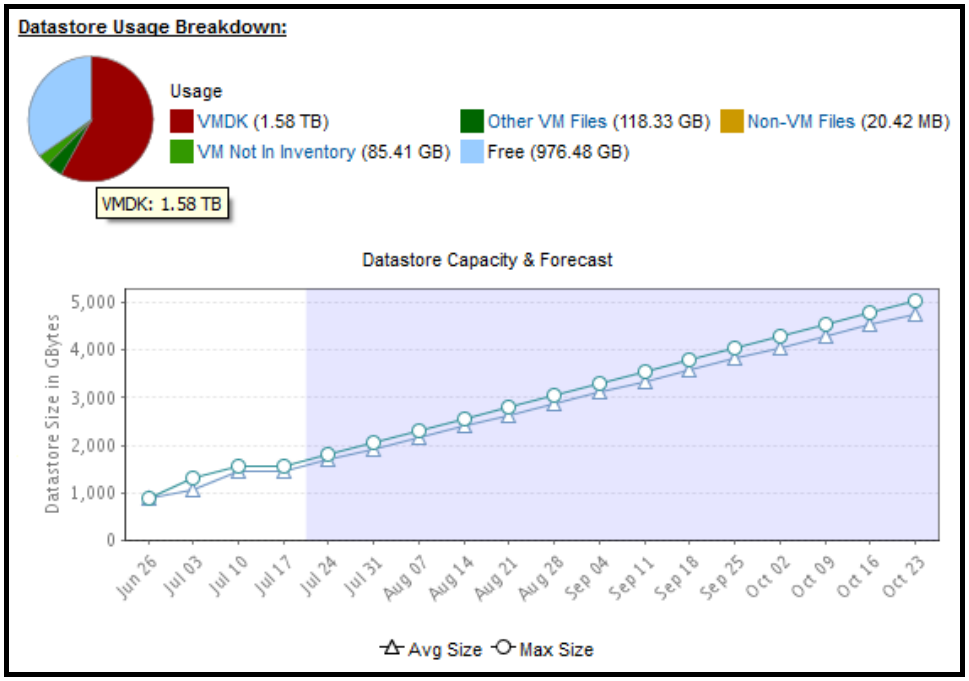
By drilling into an individual region, you can identify the distribution of capacity for the countries within that region. Furthermore, you can create deep hierarchies to visualize more granular information. These features assist you in aligning your capacity with your organizational structure.



APTARE also can extend your capacity planning service to include backup, virtualization, and fabric infrastructure. Through trending and forecasting, APTARE can provide the information necessary to understand what resources are currently available and what resources will be available based upon current consumption. The following examples focus on tape drive and tape media availability:



The final example illustrates the current capacity breakdown for a VMware datastore and forecasts future capacity requirements based upon historical usage.



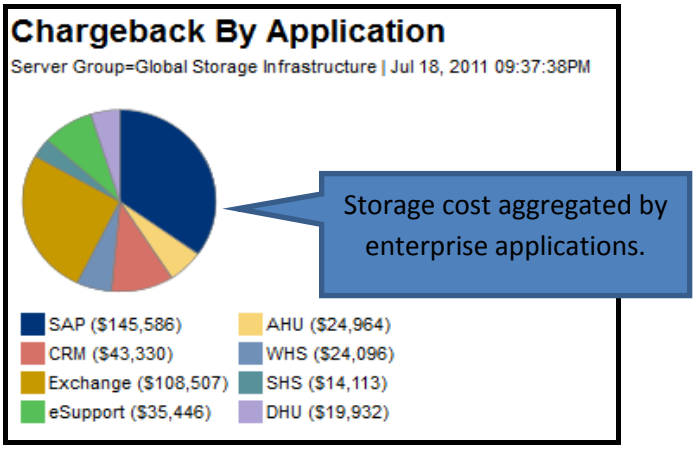
4. Chargeback as a Service

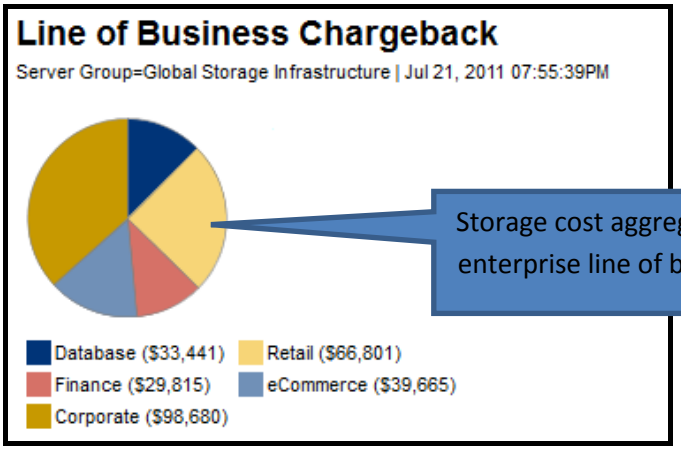
IT budget optimization is an important aspect of managing infrastructure. Recent trends suggest that storage-related costs have been steadily increasing, as a percentage of IT budgets. Chargeback has been used successfully to recoup costs and change the behavior of consumers who often consider storage to be an infinite resource.

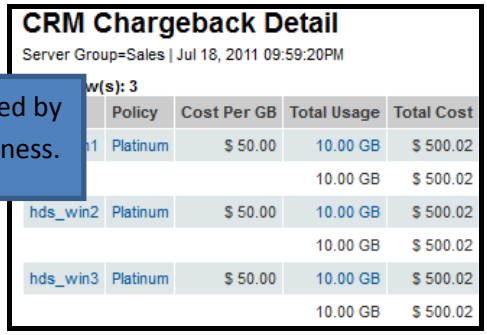
When implementing a chargeback strategy, it's imperative that your consumers have the ability to track their capacity growth and validate the billing process via an audit. APTARE provides this mechanism by generating capacity chargeback reports and identifying the infrastructure that comprises that cost. Providing your users the ability to audit the chargeback process through the cloud provides a self-service billing justification that makes this process more efficient and easier for your users to adopt.

4.1. Storage Chargeback

One of the most important aspects of a chargeback solution is the flexibility to support different chargeback models. In the storage space, companies need to determine whether to charge applications and business units based upon an allocation or utilization model. Since APTARE provides users visibility from the storage and host perspective, we can support either of these models.







4.2. Backup & Restore Chargeback

In the data backup domain, APTARE supports numerous methods of charging clients for backup and restore services. Some of the most common methods include: cost per tape, cost per gigabyte backed up, and cost per de-duplicated gigabyte backed up. Incorporating the ability to audit these services through the cloud minimizes the amount of administrative overhead and support required for delivery.

Oracle and Exchange Applications Chargeback Summary

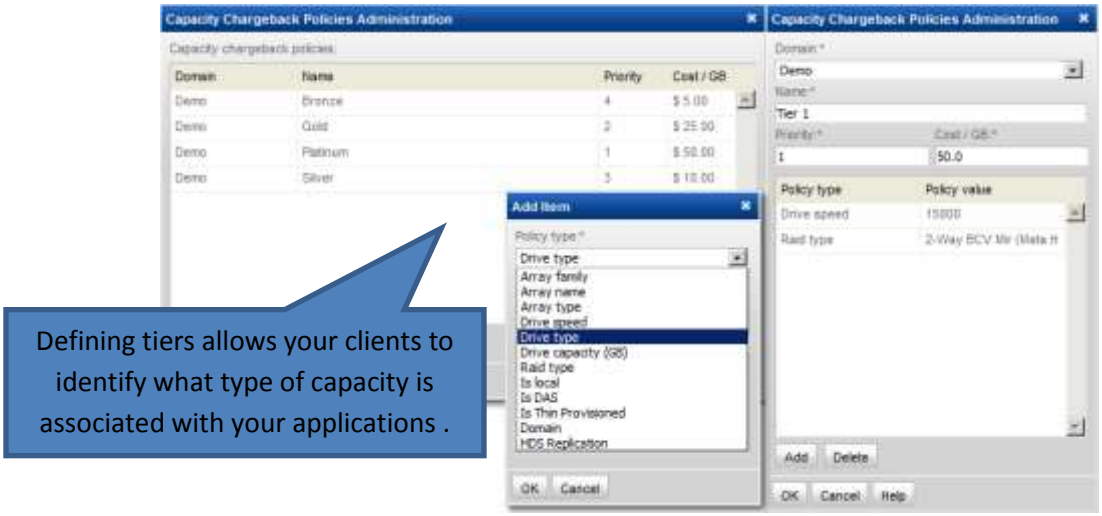
2 Server Groups | Jun 01, 2011 12:00:00AM - Jun 30, 2011 11:59:59PM

Total Clients: 2

Business Unit / Department	Backed Up GB	GB Usage Cost	Total Tape Cost	Total Dup (GB)	Total Cost
/Global Storage Infrastructure	2,546.44	$ 12,732.21	$ 875.00	0.00	$ 13,607.21
/Global Storage Infrastructure/eWidgits - NetBackup	13,712.20	$ 68,561.02	$ 10,880.00	0.00	$ 79,441.02

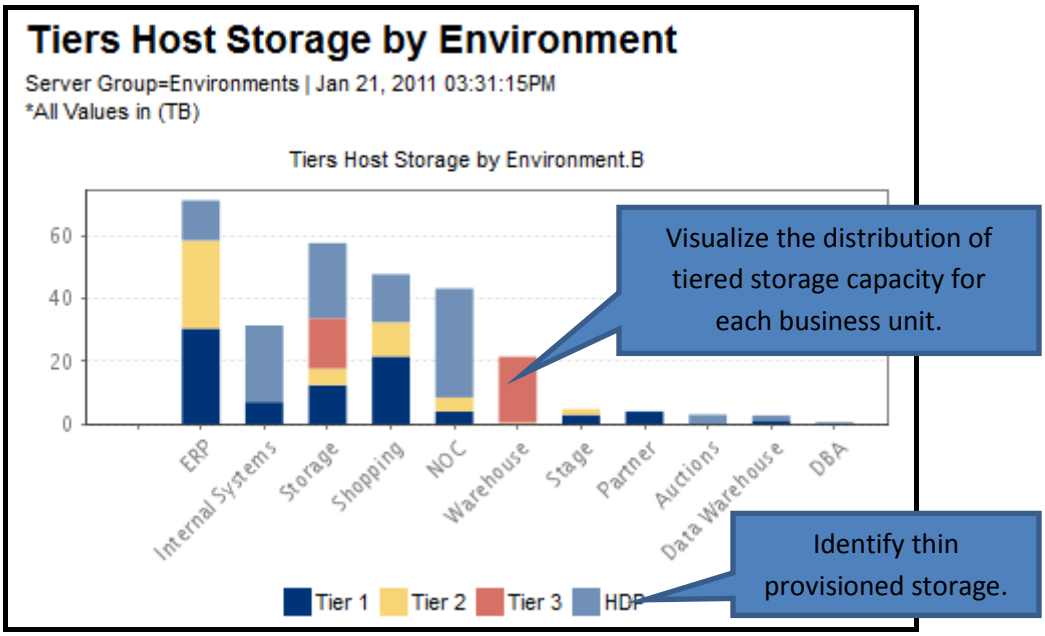
5. Storage Tiers

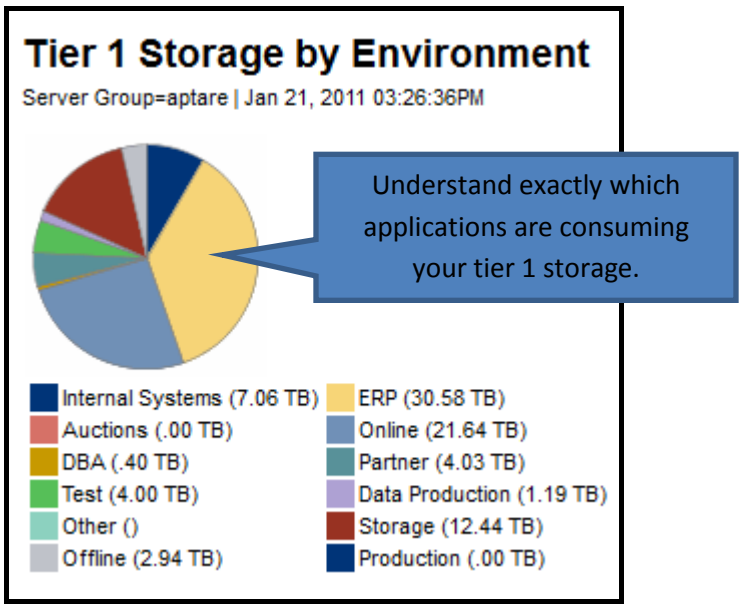
Incorporating the concept of storage tiers into your chargeback strategy will further enhance the quality of service you're providing to your users. Since storage costs are somewhat dependent upon the level of redundancy, performance, and capacity, it's essential for your clients to manage the tier of capacity their applications and business units are utilizing. This service lets your clients evaluate whether their applications are properly protected and/or whether non-critical data can be moved to a lower cost of storage.



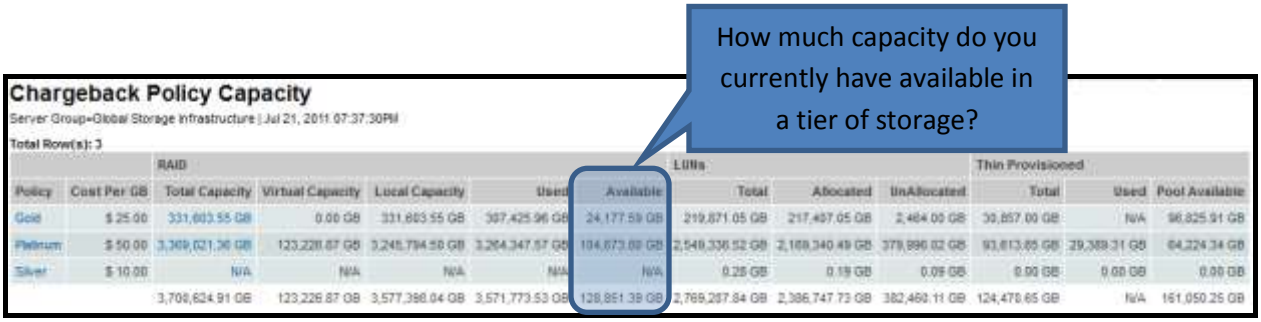
In addition to identifying what tier or capacity a particular application or business unit is consuming, APTARE also identifies when thin-provisioned storage is being leveraged. Utilizing

thin-provisioned LUNs adds an additional layer of abstraction that needs to be closely monitored to avoid a potential threat to application or system availability.



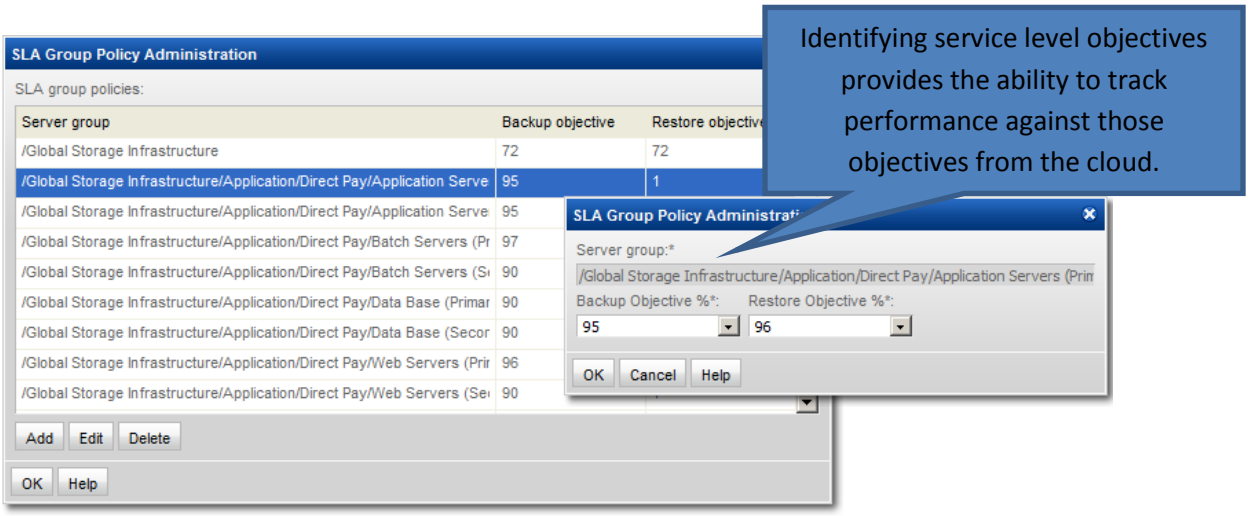


From a capacity management perspective, providing your clients the ability to identify how much capacity is available for a particular tier of storage assists with application capacity planning. In addition, understanding what costs are associated with a tier of storage provides more predictable and accurate project planning, as well as stronger business case justifications. Through the APTARE cloud, you can dynamically provide your users a near real-time view into available capacity and the costs associated with procuring it.

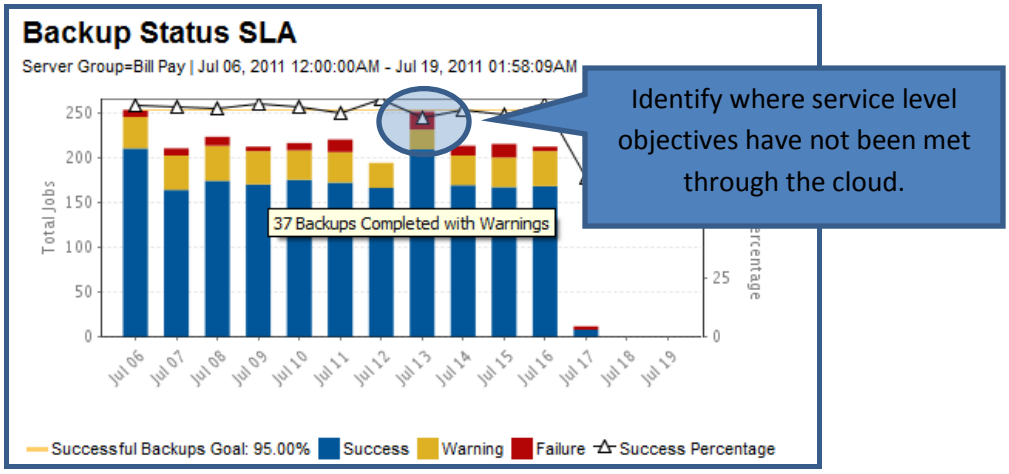


6. Service Level Management as a Service

Allowing users to verify whether service level agreements are being honored is a valuable service to include in your cloud portfolio. APTARE provides the ability to define service level objectives and track performance against those objectives for both backup and restore jobs.



Integrating service level monitoring into the cloud will increase the value of the services you're providing. Self-service monitoring eliminates the need for generating time-consuming manual reports in order to validate whether your company is meeting the objectives defined in their service level agreements.



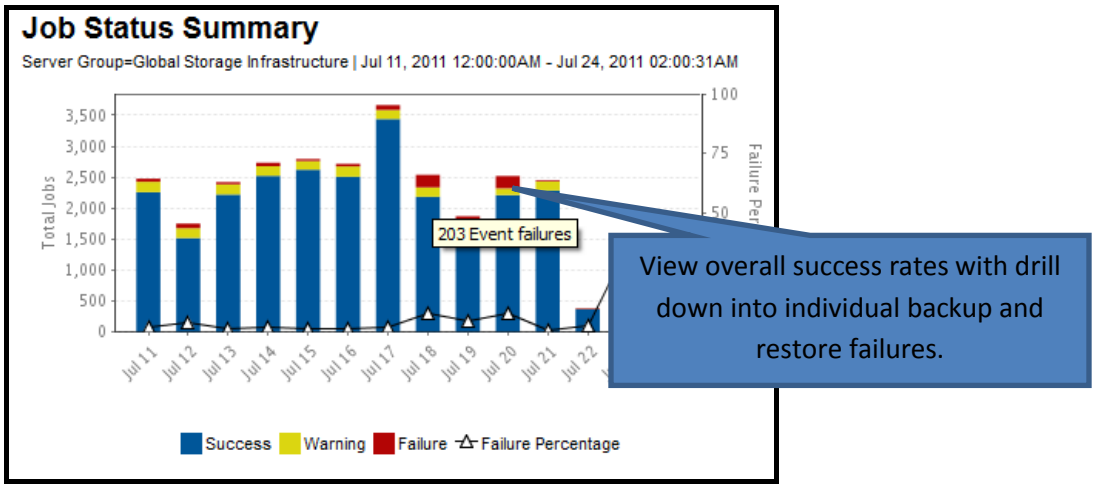
7. Infrastructure Visibility

In addition to providing high-level services like application capacity planning, APTARE allows your users to visualize infrastructure at a much more granular level. Detailed information about your storage and backup infrastructure can be accessed from within the APTARE cloud. Individual or groups of servers, switches, arrays, and database applications can be configured into pre-defined views and dashboards to track operational information.

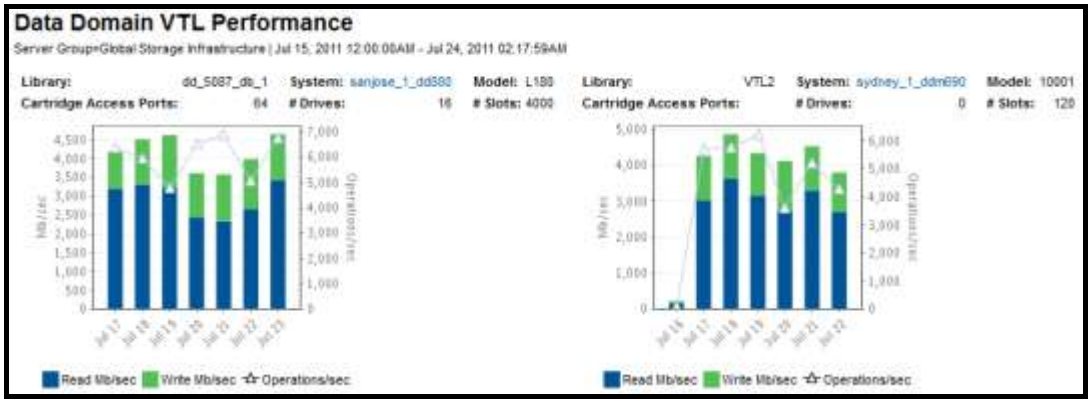
7.1. Backup Infrastructure

For a provider of backup and restore services, having the ability to verify that your clients' data has been protected is a powerful service to offer through the cloud. APTARE reports on all aspects of data protection and will provide your users invaluable information regarding whether they're compliant with standards and regulations.

Having visibility into overall success rates of backups, restores, and snapshots, allows users to quickly evaluate the level of protection being provided through your service.

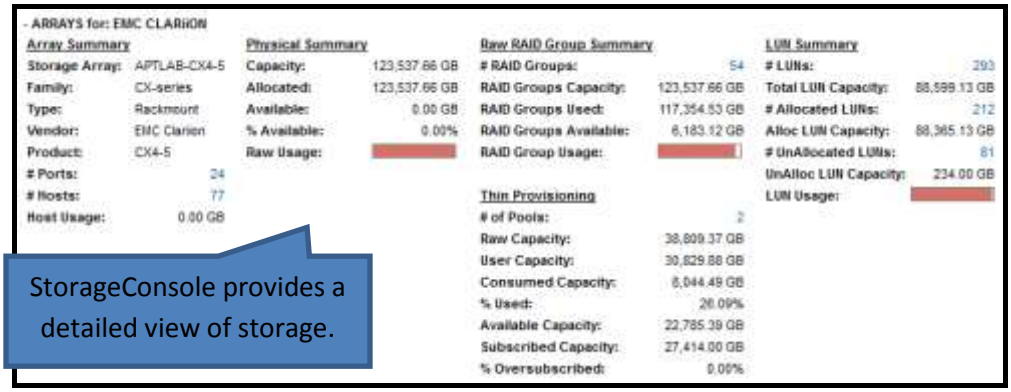


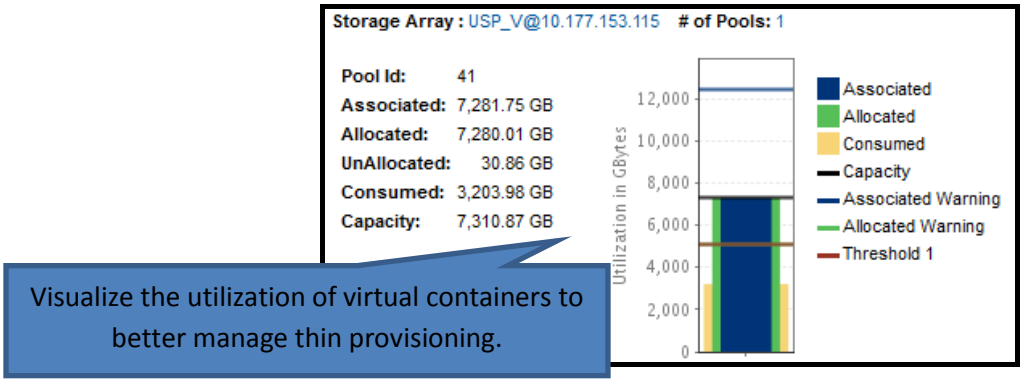
Some additional services you can provide through the cloud include visibility into physical and virtual tape libraries, de-duplication devices, media utilization and retention periods, and overall performance.



7.2. Storage Infrastructure

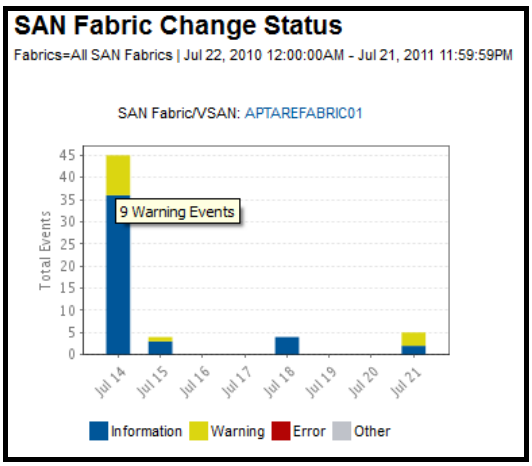
The level of complexity involved with storage management has been steadily increasing with the adoption of virtualization technologies, thin provisioning, and platform diversity. APTARE provides a simplified view by correlating host and application consumption with the backend SAN and NAS storage. It also identifies each layer of virtualization and clearly shows which physical devices comprise the virtual containers. For thin provisioning, we provide the information necessary to improve utilization without jeopardizing system availability. In short, APTARE provides end-to-end visibility and correlation of all of your storage infrastructure components.

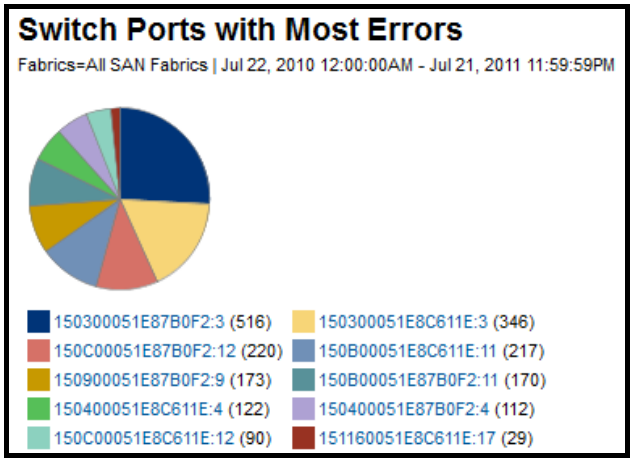


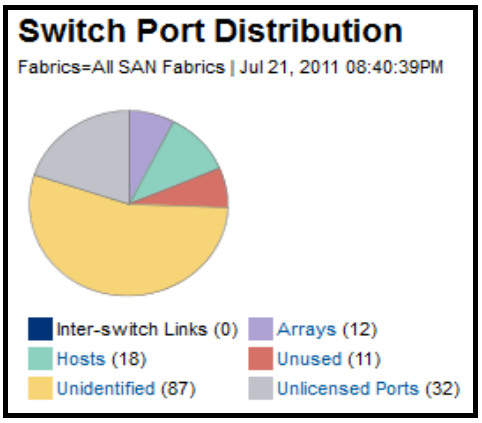


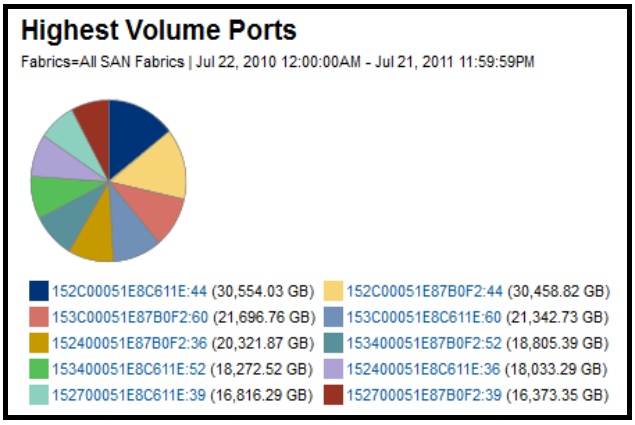
7.3. Fabric Infrastructure

APTARE lets your users track fabric utilization, errors, performance metrics, and changes on a near real-time basis. This service provides SAN administrators the ability to generate reports that identify hardware issues, firmware compliance incompatibility, and architecture flaws without having to interact with the actual hardware.



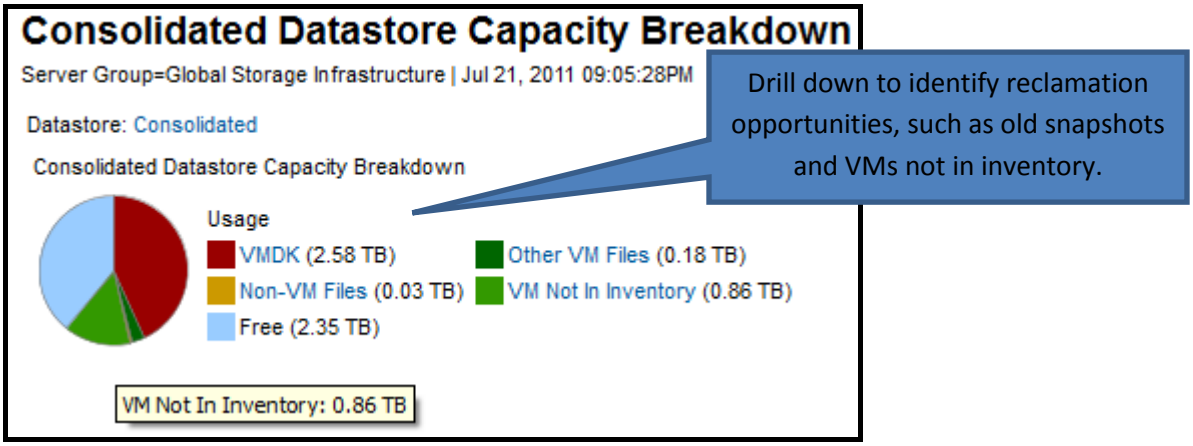


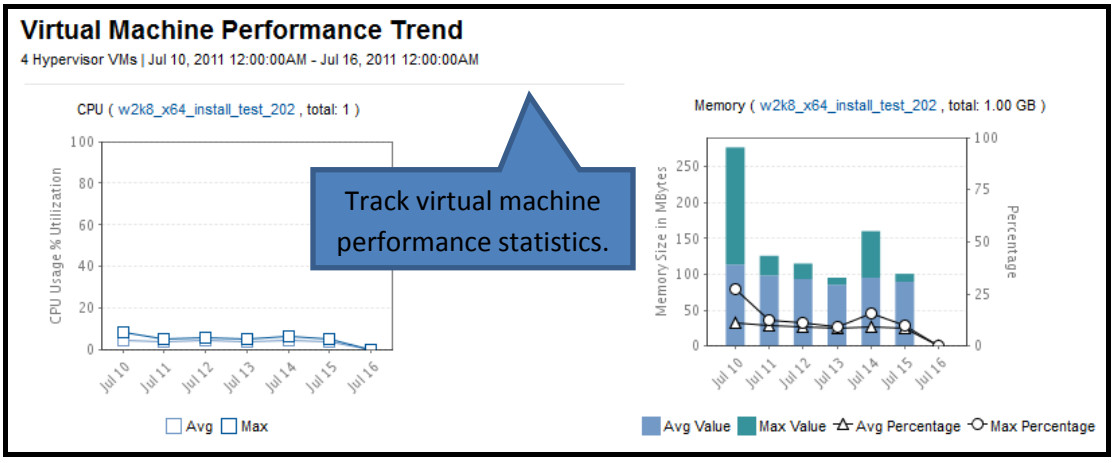


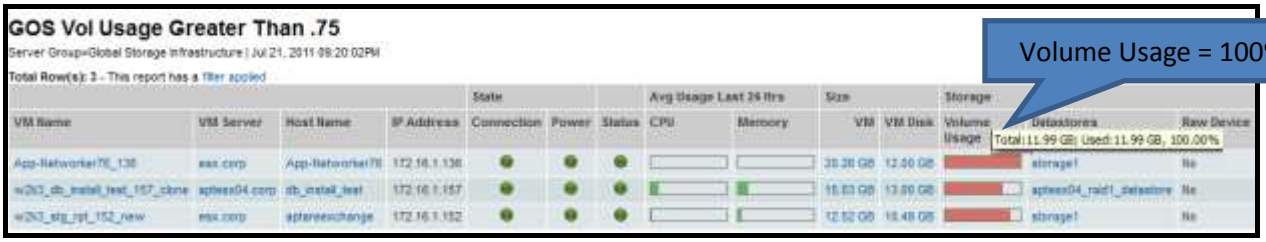


7.4. Virtual Infrastructure

APTARE provides similar visibility into your virtual environment allowing administrators the ability to optimize infrastructure by identifying reclamation opportunities, tracking performance statistics, and better understanding capacity consumption.







8. Conclusion

As companies continue to implement and develop their cloud computing capabilities, it's important to evaluate the services you intend to include in your portfolio. Incorporating a tool like APTARE into your cloud platform will provide a powerful inventory of services to assist your users with storage and backup management.

Delivering storage and data protection services through the cloud allows your users to optimize their infrastructure and more efficiently manage their applications and business units. This paper is intended to provide a glimpse of the value you can deliver with an APTARE StorageConsole solution. For additional information on how APTARE can assist you with your cloud initiatives, visit our web site www.aptare.com or contact APTARE Inc. at 866.927.8273