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EMC RecoverPoint and VMware — Managing Data Replication and Recovery the Easy Way

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Management Summary

You have probably watched an action movie, detective show, or courtroom drama where a tough character asked someone, "Do you want to do this the easy way or the hard way?" The character might have been trying to get someone to talk or do something he wanted. Implied in that question is a choice – not of whether to comply – but whether voluntarily or after some unpleasant pressure.

In *VMware* virtualized server environments, *EMC RecoverPoint* now gives users a choice to manage data replication and disaster recovery the easy way or the hard way. In this case, the statement is not a threat, but an opportunity, because IT administrators are already doing it the hard way. Disaster recovery is an important and necessary IT capability because business operations are so dependent on IT systems. Administrators in VMware environments typically use manual procedures and makeshift spreadsheets to discover and visualize the mappings between virtual machines and replicated physical LUNs. This approach is haphazard and time-consuming. Furthermore, while VMware *vCenter Site Recovery Manager* automates failover to a recovery site quite smoothly, failback to the original protected site is still a manual process involving many steps. An easier approach would be very welcome in enterprise data centers.

EMC RecoverPoint is a versatile network-based platform for data replication and disaster recovery. RecoverPoint combines continuous data protection (CDP) for recovery to any previous point in time with synchronous and asynchronous local and remote replication for operational and disaster recovery. It is a solution suitable for a variety of applications and environments.

Previously, RecoverPoint had established integration with VMware virtual server environments by dynamically monitoring and mapping relationships between virtual machines and replicated physical LUNs. With the latest release of RecoverPoint, failback after data recovery in VMware virtual server environments became easier because RecoverPoint now has a vCenter plug-in for automated failback of virtual machines that are managed with VMware Site Recovery Manager. Additionally, write throughput has been increased by utilizing multiple RecoverPoint appliances for high performance, distributed consistency groups.

The latest release is scheduled for general availability in March 2010. Read on for details about how RecoverPoint facilitates data protection and disaster recovery in VMware environments – *the easy way*.

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RecoverPoint for Data Replication and Disaster Recovery

EMC RecoverPoint is a network-based solution for data replication and disaster recovery. This

versatile platform combines a variety of technologies, most notably remote replication and recovery to any previous point in time. Salient features include the following.

- **Continuous data protection (CDP)** – Journals write data chronologically for recovery to any previous point in time at the local site. This allows data centers to recover quickly and precisely from logical errors like database corruption and viruses.
- **Continuous remote replication (CRR)** – Replicates block-level data to a remote site for disaster recovery. It offers remote synchronous and asynchronous replication with the ability to switch dynamically between synchronous and asynchronous modes to maintain production application performance during periods of high network utilization. The recovery image can be the most recent data or any previous point in time.
- **Concurrent local remote replication (CLR)** – Supports both local and remote replication for the same data. This configuration combines fast local recoveries with remote failover in the event of a disaster.
- **Heterogeneous support** – Supports heterogeneous storage systems, network equipment, and server operating systems for applications in a wide variety of scenarios, including different configurations at source and target sites. This stands in contrast to host- and storage-based replication technologies that tend to be limited to specific operating systems or storage models.
- **Application-consistent bookmarks** – By default, RecoverPoint creates crash-consistent replicas by preserving write-order fidelity. In addition, it integrates with specific applications to create periodic application-consistent bookmarks (e.g., Microsoft VSS). Related LUNs can be arranged into consistency groups to ensure application data is treated consistently as a whole.
- **WAN bandwidth reduction** – Employs data compression and other optimization techniques to reduce bandwidth by five to ten times. This feature saves money and maintains better performance over WAN connections.
- **Splitters in host, network, or storage array** – Since RecoverPoint resides out of band in the storage network, it requires splitter software that duplicates a stream of writes (in order to protect the data). Customers have a choice of deploying splitters on the host server, on Brocade or Cisco network switches, or in an EMC *CLARiiON* storage array.
- **VMware integration** – Dramatically simplifies management in virtual server environments through integration with VMware *vCenter Server* and *Site Recovery Manager* (SRM).

All features are included in the base price of the product. In the latest version, RecoverPoint 3.3 expands its capabilities with VMware integration and improves scalability for large enterprise environments.

VMware Integration and Enhancements

The adoption of VMware in enterprise data centers continues unabated. This popular technology provides significant benefits in physical server consolidation, cost reductions and ease and flexibility of virtual machine deployment. VMware has developed the vCenter product family to automate and manage these virtual server environments. It includes SRM for automating recovery to a secondary site. SRM creates disaster recovery plans, tests the recovery process non-disruptively, generates reports, and automates the failover process. This saves an enormous amount of time and risk in disaster recovery.

SRM is a management tool that does not perform data replication itself. It relies on third-party replication products that have been integrated with it, of which EMC RecoverPoint is one. However, RecoverPoint goes further than standard SRM integration products by adding several very useful management capabilities.

Mapping Virtual Machines to Replicated LUNs

A major challenge for administrators has been the lack of automatic, real-time visibility into which virtual machines and datastores are mapped to which replicated physical LUNs. Previously administrators had to export configuration data from SRM and their replication solutions, load it into a spreadsheet, and manually sort and discover the correlations. This is a time-consuming task and the correlations are only valid at that point in time. If new virtual machines

Case in Point — QualityTech Deploys Managed Service for Disaster Recovery on RecoverPoint

Quality Technology Services (QualityTech), headquartered in Suwanee, Georgia, is a full-service technology infrastructure company that provides managed services, data center services, media services and professional services to businesses. It owns and operates more than two million square feet of data center space from coast to coast. QualityTech provides colocation space with "power, ping, and pipe" as well as managed services for networking, servers, storage, backup and data protection, and applications. From an enterprise perspective, managed services allow them to avoid large IT infrastructure investments, pay as they go, and retain the flexibility to upgrade or discontinue services as their needs change.

Several years ago, QualityTech decided to develop a replication and disaster recovery service to offer its customers. The first step was to identify the right product platform for this new service. "We looked around the industry to see what products were available for building a shared replication platform," said Joe Hayes, Director of Storage for QualityTech. "The biggest issue for us is always how we can take hardware and share it across multiple customers to allow them the benefit of lower costs – by sharing infrastructure while maintaining security."

As a replication platform, Hayes and his team considered several storage-based, host-based, and network-based solutions before concluding that only EMC RecoverPoint met all of their requirements. First, RecoverPoint was scalable enough to support multiple customers simultaneously. As a network-based solution, it supported the variety of host operating systems and IBM and EMC storage arrays in their data centers. Its built-in data compression and Fibre Channel to IP conversion allowed them to avoid purchasing additional equipment for these functions. Hayes added, "EMC buying Kashya gave the product a little more credibility in the market as well." (The startup company Kashya originally developed the RecoverPoint product, and EMC acquired Kashya shortly after QualityTech began evaluating it.)

QualityTech installed its first RecoverPoint solution for an individual customer in 2007, and the following year it deployed RecoverPoint as a shared service for replication and disaster recovery. "Our team has been very excited about getting this product in place," he said. Its features and shared cost savings have given QualityTech an advantage over their main competition, and customers choosing to implement remote replication themselves. "Once we showed it to a couple of customers, they were just amazed. 'Wow, that's easy. We can do that? We can just test our failover without taking down the main production site?' Our customers are very excited to have those features."

Looking forward, the integration of RecoverPoint and VMware has paved the way for new services QualityTech plans to introduce in 2010 – namely, replication and disaster recovery in VMware virtual environments. "We're looking to use the RecoverPoint tools and VMware to add a whole range of products for customers," said Hayes. For instance, if customers wanted to avoid the cost of hot standby servers at the recovery site, QualityTech could provide virtual machines hosted on its own servers as failover targets. Replication in virtual environments enables a range of disaster recovery options spanning the entry level to the high end.

are created, existing virtual machines are moved, or storage configurations are altered, then virtual machines could reside unknowingly on un-replicated or insufficiently-replicated LUNs, thereby putting data at risk.

In RecoverPoint 3.2 (released in the fall of 2009), EMC enabled automatic discovery and mapping of virtual machines, datastores, consistency groups and their associated physical LUNs and replication status within the RecoverPoint GUI. RecoverPoint periodically polls the vCenter server for virtual machine configurations and correlates it with physical LUNs. Administrators can view mappings in real time and confirm the replication status of each virtual machine. RecoverPoint also alerts administrators automatically about replication breaks. This dynamic monitoring allows for detection and fast correction of any problems that may arise and ensures virtual machines are protected according to service level requirements. Moreover, it obviates manual, time-consuming tracking of the cor-

relations. To our knowledge, no other host-based or network-based replication solution offers this dynamic mapping capability.

Maintenance Mode for Point-in-Time Recovery

vCenter SRM currently supports failover to the most recent image at the recovery site. When using synchronous or asynchronous replication, this means the latest or nearly latest image of production data. However, if the problem is logical data corruption (as opposed to a system failure or natural disaster), you may want to recover to a previous point in time – before the corruption occurred. This is where the benefits of RecoverPoint's CDP architecture come into the picture.

Within the RecoverPoint GUI, administrators can toggle application protection between management by SRM and a "maintenance mode" for RecoverPoint management, thereby taking advantage of its CDP capabilities to recover to previous points in time at either the local or remote site. Again, this is useful for fast recovery from logical data corruption and for refreshing test and development environments.

Automated Failback

SRM automates failover to a remote site quite smoothly, but failback (i.e., returning to the original state) is still a tedious manual operation. SRM executes the dozens of steps involved in powering down local virtual machines, suspending replication, selecting the most recent data image, and registering and powering up virtual machines at the recovery site. But once the primary production site is repaired and ready to go back online, the failback process is still manual.

With the newest version of RecoverPoint, this is no longer the case. RecoverPoint now provides a vCenter plug-in that automates failback after an SRM failover. This allows vCenter to communicate directly with the RecoverPoint platform to perform the failback process automatically: powering down virtual machines, failing back replicated LUNs, reestablishing replication, registering and powering up virtual machines at the protected site – an automation of many manual steps. There is no need for the user to touch the RecoverPoint GUI, just press the button and the RecoverPoint vCenter plug-in does the rest.

The ability to automate both failover and failback saves labor, mitigates the risks involved in manual mistakes and misconfigurations, and speeds up the recovery process. As a result, disaster recovery is more robust and precise, which is important for business continuity in the event of a system failure or disaster.

Consistency Group Scalability

RecoverPoint 3.3 improves scalability by distributing a consistency group to up to four RecoverPoint appliances (RPA) instead of the previous limitation of one. Sharing the load across additional RPAs can increase the throughput for a consistency group by more than three times and enables RecoverPoint to support more demanding enterprise environments.

Conclusion

RecoverPoint is a powerful platform for data replication and disaster recovery in a wide variety of environments – and now especially for VMware virtualization. RecoverPoint goes beyond basic integration with Site Recovery Manager to provide capabilities like mapping virtual machines to physical LUNs and automated failback. It is ahead of competitors in this regard and is a strong fit for VMware deployments that need data protection and recovery to a failover site and/or to a previous point in time.

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