The Challenge: Complex, Costly SAP Landscape Management

As SAP landscapes grow to support more and more business-critical applications, the job of maintaining those landscapes becomes increasingly complex. The process of keeping SAP software and related database and operating system software up to date, managing data migrations and business process changes, and backing up and protecting data along the way has become a business process in itself. In addition, today's server and storage resources exist in silos, which can lead to low utilization, inefficiency, and lack of ability to respond quickly to changing business needs.

The Solution: Secure Multi-Tenancy for SAP

Virtualization at all layers—servers, storage, and network—is at the heart of addressing these challenges. It provides new and much more efficient ways of operating and growing your SAP landscapes, while at the same time offering an evolutionary path to take advantage of cloud computing.

NetApp, Cisco, and VMware have collaborated to integrate an innovative service-oriented infrastructure that includes all server, storage, networking hardware, and software components to support secure multi-tenancy (SMT) in the cloud. With the Cisco® Unified Computing System (UCS), the joint solution opens up the combined potential of server, network, and storage I/O virtualization through a top-down approach that fuses traditionally separate infrastructure silos into a single holistic computing platform with high virtualization performance. The joint solution also supports sharing, reuse, and dynamic resource allocation for extending these capabilities to SAP landscapes.

Solution Highlights

- A single unified virtualized architecture from NetApp, Cisco, and VMware
- Isolation and security for multi-tenant SAP® environments
- Multi-tenancy with NetApp MultiStore
- Storage security and isolation for SAP landscapes
- Seamless migration of SAP landscapes with NetApp Data Motion
- Highly available data mobility with minimal disruption of SAP services
- Integrated SAP lifecycle tasks
- SAP-consistent serverless backup and recovery and rapid, space-efficient SAP system copies
- SAP Adaptive Computing
  - Virtualized SAP software, decoupled from operating system and hosts
The secure multi-tenancy for SAP solution enables SAP customers to reduce costs by running a shared, virtualized infrastructure while helping to maintain secure separation of their different environments when required. They can also create fast, space-efficient, fully isolated repair systems that can help them address logical errors in a very flexible way that can save time and money.

Key features of the SMT model include an efficient, high-availability infrastructure with elastic scalability across all layers; integrated SAP application data protection; advanced automation of tasks such as SAP system copy creation; integration of SAP Adaptive Computing; and the ability to migrate both SAP applications and data transparently across the infrastructure.

SECURE SAP LANDSCAPES
A shared virtual infrastructure requires securely isolating the resources of different tenants, clients, business units, or departments while still delivering promised service levels. The secure multi-tenancy solution from Cisco, NetApp, and VMware offers the current industry's first end-to-end SMT solution for virtual SAP environments. This solution keeps different SAP landscapes separated at the storage system level by using NetApp® MultiStore® software. MultiStore offers multiple isolated logical partitions on a single cost-effective Ethernet-based storage system so that tenants can share storage without compromising privacy. The result is a secure, virtualized storage solution with optimal storage utilization.

In addition, NetApp Data Motion™ offers the ability to migrate entire SAP landscapes independently and transparently between storage systems to balance load, expand storage capacity, and refresh technology with minimal disruption.

BACKUP AND RECOVERY IN MINUTES
In shared, virtualized environments, traditional backup approaches driven by the server layer are not practical. To optimize server utilization for application loads, it is important to remove the backup tasks from the server layer down to the storage layer with efficient storage-based backup automation.

With SAP-integrated NetApp SnapManager® products, you can create SAP database backups in minutes by using NetApp Snapshot™ technology. SnapManager products can also control the restore process, which takes just a few minutes.

SnapManager products can also integrate with NetApp Protection Manager to extend Snapshot based backups to an end-to-end disk-to-disk backup solution without the need for tape backups. Protection Manager and NetApp SnapVault® transfer the Snapshot based backups from the primary to a secondary storage system by moving only changes at the block level. In this way, SnapVault can help minimize the load on primary and secondary storage as well as on the backup network. This can also reduce the amount of disk space required for each backup to typically less than 5% of the database size for each daily full backup. Protection Manager can further simplify the backup process by using protection policies to automate SnapVault transfers between storage systems.

FAST, SPACE-EFFICIENT SAP SYSTEM COPIES
A typical SAP customer environment today consists of different SAP Business Suite and SAP NetWeaver® components. Processes such as testing application patches, running performance and data integrity tests, and providing user training environments all require several copies of SAP components. During these processes, the copies must be refreshed, often on a weekly or monthly basis. The creation of an SAP system copy
normally takes several days, and many of the steps involved in creating the copy are manual, so they consume valuable IT staff time.

NetApp SnapManager products can make it easy to create SAP system copies on demand, in a few minutes, and with minimal impact on the source system. Because the data is not copied but is referenced in place, the amount of storage required is limited to only data that is changed at the source and the target system. This significantly decreases the disk space required for SAP system copies.

Secure multi-tenancy solution for SAP enables cloning of individual SAP systems or complete SAP landscapes and separation of each clone securely from its source. This makes it possible to run the cloned systems with the same security identifiers (SIDs) as the source and to eliminate any SAP-specific postprocessing.

**ON-DEMAND SAP REPAIR SYSTEMS**

A specific use case in SAP environments is to use an SAP system copy as a repair system to recover from logical errors without having to restore and recover the entire SAP production system. NetApp SnapManager products enable you to clone a backup of the production system and attach it to another host to analyze the error and then test corrective procedures or export the required data out of the repair system and into the production system. This makes it possible to resolve the logical error with little or no impact on the production system, no data loss, and no inconsistencies in the SAP landscape. Because the creation of the repair system takes very little time and storage resources, it’s possible to test corrections multiple times before performing them on the live production system.

Secure multi-tenancy for SAP provides secure separation of SAP systems so that you can start the repair system immediately without having to do any SAP-specific postprocessing.

**SAP ADAPTIVE COMPUTING**

The ability to combine server and storage virtualization with application virtualization offers additional advantages. With SAP Adaptive Computing concept and the Adaptive Computing Controller, you can easily move SAP systems from one virtual machine to another or even to a physical server. The Adaptive Computing Controller supports starting, stopping, and relocating SAP systems as manual, scheduled, or mass operations. NetApp MultiStore, together with NetApp Data Motion, provides data mobility at the storage level. This can make it easy to move SAP systems, for example, to higher-performance storage and servers when operations require greater throughput. For example, you can migrate an SAP HR system to a higher-performance environment to run payroll twice a month.

The combination of NetApp cloning technology, “golden images” of operating systems, and virtualized applications with SAP Adaptive Computing allows fast provisioning of operating systems for new servers or virtual machines and simplified patching of operating systems. This functionality also simplifies the physical replacement of server hardware. NetApp MultiStore and Data Motion extend this functionality by enabling seamless data migration from one storage system to another.
THE ADVANTAGES OF SECURE MULTI-TENANCY FOR SAP

The combination of application, server, network, and storage virtualization provides many advantages in managing existing SAP environments and provisioning new ones. Secure multi-tenancy offers separation of environments on all layers of the solution stack. It also makes it possible to simplify and fully automate SAP application lifecycle management tasks, such as backup and the creation of SAP system copies. The system uses SAP-integrated NetApp SnapManager products and efficient storage-based technologies to automate backup and recovery tasks as well as to clone SAP systems and landscapes.

The secure multi-tenancy for SAP solution enables SAP customers to reduce costs by helping customers to run a shared, virtualized infrastructure while maintaining secure separation of their different environments when required. They can also create fast, space-efficient, fully isolated repair systems that can help them address logical errors in a very flexible way that can save time and money.


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