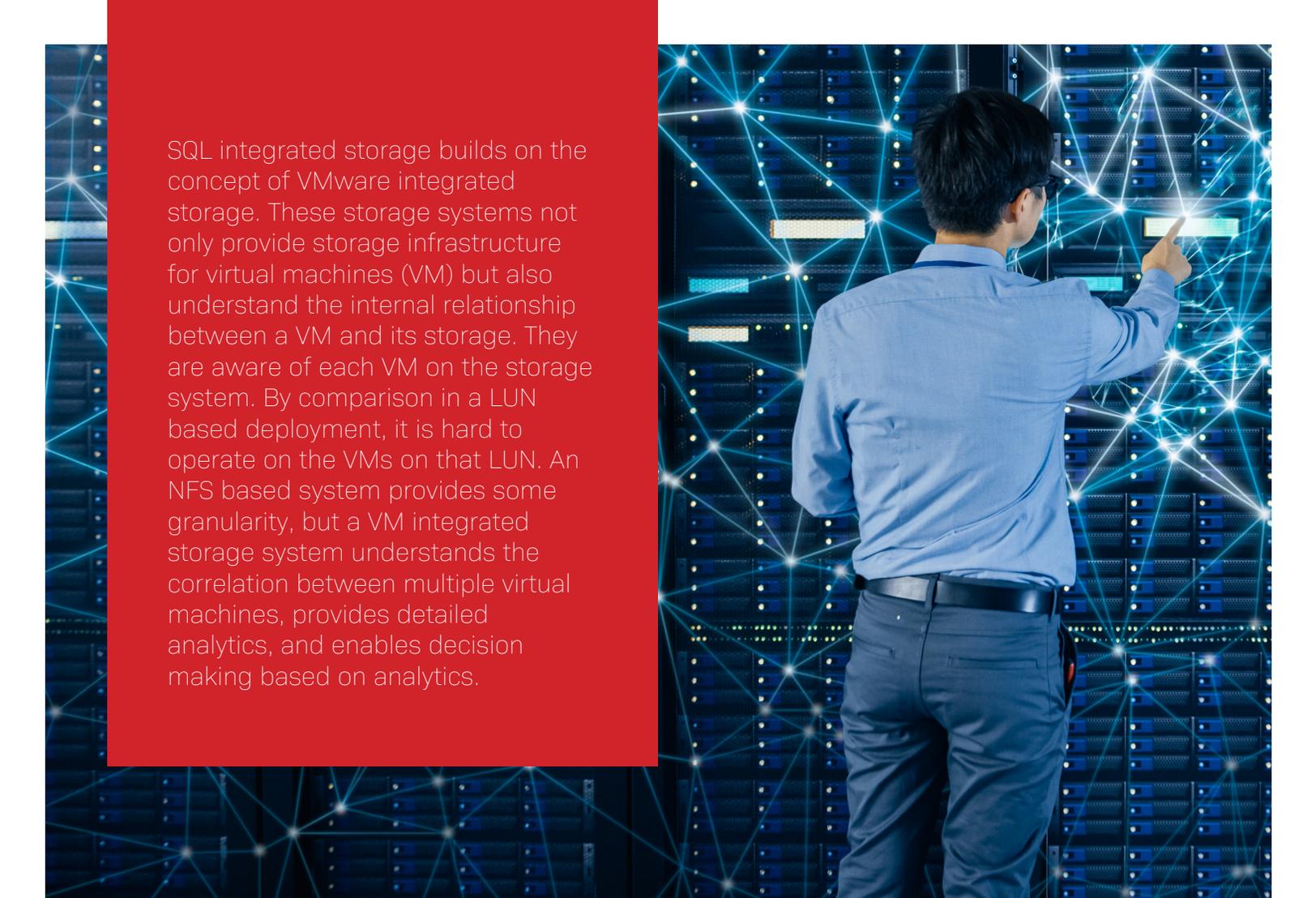


# TINTRI INTRODUCES SQL INTEGRATED STORAGE





SQL integrated storage builds on the concept of VMware integrated storage. These storage systems not only provide storage infrastructure for virtual machines (VM) but also understand the internal relationship between a VM and its storage. They are aware of each VM on the storage system. By comparison in a LUN based deployment, it is hard to operate on the VMs on that LUN. An NFS based system provides some granularity, but a VM integrated storage system understands the correlation between multiple virtual machines, provides detailed analytics, and enables decision making based on analytics.

## WHAT IS SQL INTEGRATED STORAGE?

A SQL database is, essentially, a collection of files with associated metadata, managed by a relational database management system. SQL integrated storage provides similar capabilities to SQL databases, from a storage context, as VMware integrated storage does for VMs. In other words, the storage system is SQL aware, meaning that it understands the files associated with a particular database and provides insight and analytics into those files.

SQL integrated storage provides storage administrators and database administrators with the ability to understand precisely how storage is interacting with their databases. With integrated storage, storage administrators can fine-tune storage performance, predict and prevent performance problems, and improve database protection for specific databases on the storage system.

Most importantly, SQL integrated storage simplifies database storage management. In most cases, when the database team requests a storage administrator to deploy a database, they create multiple volumes, one for each database file type and each database is assigned its own set of LUNs. As a result, the number of LUNs that storage administrators need to manage increases exponentially with each additional database. With SQL integrated storage, organizations can use one volume not only for all databases and each database's group of files but also for the organization's entire virtual environment.



## INTRODUCING TINTRI SQL INTEGRATED STORAGE

Tintri SQL Integrated Storage is a new offering based upon the capabilities of VMstore storage systems and Tintri Global Center. It leverages the same technologies that Tintri created for virtual machine storage and applies them to databases. In addition to virtual SQL Server instances, Tintri SQL Integrated Storage can support physical, bare metal SQL Servers via an SMB mount, which has been available since Microsoft SQL Server 2012.

Tintri SQL Integrated Storage enables storage administrators supporting an SQL Server environment to use a single volume to support all databases as well as their virtual environment. Storage administrators no longer need to manage tickets requesting to extend or grow a LUN or datastore. Even though all databases are on a single volume, with the integration, both storage and database administrators can still “see” the various components of each database and file within that database. They can also see contextual relationships by the server, file share, and storage system. Quality of Service parameters can be set at the database level, ensuring that production, mission-critical databases get the performance they require.

The ability to have all databases on a single volume yet see into those databases means that both types of administrators can efficiently run reports as to top consumers of storage capacity or storage performance. They can also manage database sprawl. They can see the number of instances of each database and its copies.

The solution is also capacity efficient. SQL Integrated Storage provides deduplication and compression features to the database environment to make database storage and especially the storing of copies of databases more efficient. SQL Integrated Storage can even show the net impact of deleting a database copy. Showing the net impact of deleting a database is important when using deduplication and compression because the effect of removing a database copy may not be as dramatic, so showing the net impact is vital to free up disk capacity quickly.

Tintri SQL Integrated Storage also integrates with PowerShell or can use RESTful APIs so storage administrators can automate functions like provisioning, snapshots, and replication. Snapshots can be done per database and have different schedules on each. SQL Integrated Storage snapshots are zero stun, having no impact on the server hosting the database, and the database does not need to be put in backup mode. If full, stand-alone, copies of databases are required, the integration provides copy offload, which means copies are made independent of the database server and without utilizing network bandwidth.

The integration also means granular replication for disaster recovery. Organizations can make sure that they replicate only production copies of mission-critical databases to the disaster recovery site. They can also use different schedules for databases of varying criticality. The combination of granular snapshots and replication may remove the requirement of specialized SQL Server HA/DR tools.

Tintri Analytics provides detailed analytics of the environment and can trend up to three years of information about database storage resource utilization. It can provide an inventory of databases on the systems as well as report storage usage and growth during that time. Based on the three years of history, the system can provide capacity planning. The system can also provide the exact flow of data so that storage administrators can uncover hotspots in the configuration. Tintri's analytics capabilities may eliminate the need for a separate SRM tool and certainly should put an end to using an Excel spreadsheet for database storage management.

Most importantly, SQL integration enables the storage manager to delegate database storage management to the database team easily. With SQL Integrated Storage, DBAs don't need to be storage experts. It is easy to manage since DBAs don't need to create three to five LUNs per database. The environment is also easier to troubleshoot since performance metrics, like latency and IOPS, can be provided for the entire volume, all databases, or specific databases.



## STORAGESWISS TAKE

Storage for Databases is challenging to manage, and for the most part storage systems do very little to make database management easier. SQL Integrated Storage provides both types of administrators with the ability to dramatically reduce the time they spend managing storage, enabling them to instead focus on actual database management. Organizations looking to simplify their database storage management and lower costs through increased efficiency should take a serious look at the new SQL Integrated Storage by Tintri.



## THE FIRM

Storage Switzerland is the leading storage analyst firm focused on the emerging storage categories of memory-based storage (Flash), Big Data, virtualization, and cloud computing. The firm is widely recognized for its blogs, white papers and videos on current approaches such as all-flash arrays, deduplication, SSD's, software-defined storage, backup appliances and storage networking. The name "Storage Switzerland" indicates a pledge to provide neutral analysis of the storage marketplace, rather than focusing on a single vendor approach.



## THE PARTNER

Based in Silicon Valley, Tintri is a wholly owned subsidiary of DataDirect Networks (DDN), the data-at-scale powerhouse and world's largest privately held storage company. Tintri delivers unique outcomes in Enterprise data centers. Tintri's AI-enabled intelligent infrastructure learns your environment to drive automation. Analytical insights help you simplify and accelerate your operations and empower data-driven business insights. Thousands of Tintri customers have saved millions of management hours using Tintri. Choose differently, the choice is yours. Where will you invest your resources to increase the scale and value of your business?

Learn more about the Tintri portfolio of solutions at <https://www.tintri.com/products>.