

# Revolutionizing Storage Management for SQL Server Environments

## Changing Mindsets about Database Storage with Tintri SQL Integrated Storage

The relational database is the engine that drives most important business decisions and powers almost all electronic transactions in today's modern enterprise. Most end-users have come to expect databases to execute operations with high efficiency and zero delays. Yet most database administrators (DBAs) probably wonder why their jobs still rely on tedious operations from the previous century. Many of these activities are related to storage infrastructure, which in many ways hasn't evolved to complement the capabilities of databases like Microsoft SQL Server. DBAs have long come to expect that storage will create bottlenecks, cause user complaints, require storage expertise to troubleshoot, manage and scale, and will generally make their lives more difficult.

The inability to easily understand and cost-effectively manage storage to meet required database performance, growth and uptime requirements can result in a range of inefficiencies – from time-consuming troubleshooting and tuning to costly overprovisioning of storage resources and IT staff. The lack of database-level visibility and control further complicates matters by making it more difficult to determine where issues originate, when resources should be allocated and how quality of service can be maintained or adjusted across all databases in the environment – without spending a lot on storage and network headroom “just in case”.

Organizations need a smarter infrastructure solution that supports today's demanding database and application environments, simplifies the lives of DBAs and infrastructure teams, and also delivers positive bottom line results.

## Purpose-built Intelligent Infrastructure for SQL Server Databases

Tintri SQL Integrated Storage is a non-disruptive, agent-less storage technology that integrates directly with SQL Server databases and is used with Tintri VMstore Intelligent Infrastructure systems. It leverages patented, proven VM-integrated Tintri technology and applies those benefits to SQL Server environments. The result is a database-centric, database-integrated approach that simplifies and automates storage management to drive efficiencies, empower DBAs, and provide consistent performance – in short, delivering an outstanding database experience for all SQL Server stakeholders.

Tintri SQL Integrated Storage uniquely offers database-level granularity in the context of visibility, analytics, performance and capacity management, data protection, cloning, and more. This granular approach, combined with ML-driven intelligence, is how Tintri SQL Integrated Storage stands apart from every other storage offering. It's also why it represents a game-changing evolution from the cumbersome world of LUNs, volumes, RAID groups and other legacy storage constructs and associated tasks.

Tintri SQL Integrated Storage enables VMstore systems to support SQL Server databases running on virtual or physical servers – or a combination of both. This flexibility enables organizations to apply the benefits of this solution across a broader set of enterprise applications.

## Drive Efficiencies with Intelligent Insights and Architectural Simplicity

Tintri SQL Integrated Storage improves operational efficiency with a combination of broad end-to-end visibility and granular database-level insights. DBAs can gain actionable information about each and every SQL Server database instance in the infrastructure from a single view. In fact, SQL Integrated Storage presents information in a simple, standardized manner that enables DBAs, storage and infrastructure administrators, application owners and IT generalists

## Tintri SQL Integrated Storage Advantages

- End-to-end visibility and actionable insights across entire SQL Server database infrastructure
- Per-database insight, data protection, cloning and recovery to improve control and efficiency
- Real-time and predictive analytics for fast issue resolution and accurate resource planning
- Predictable, self-optimized performance for all SQL Server databases
- Self-service capabilities that empower DBAs as well as storage admins and IT generalists
- Instant, zero-stun snapshots and clones for cost-efficient data protection and DevOps
- Dedicated database copy for each developer to optimize development workflows
- Offloading of resource-intensive activities to avoid impact on production databases

## Application Development Benefits

- Save time and storage space for non-production systems
- Provide each developer with an individual copy of the database
- Eliminate loss of development hours due to shared database resources
- Refresh databases in non-production environments within seconds
- Reduce support overhead with self-service capabilities

alike to quickly understand it. For example, any of the above IT team members can easily cut through the noise and immediately identify database outliers by name across the IT stack to proactively address hotspots before users are impacted. There's no need to spend hours trying to locate the offending database(s), which may reside in a LUN that contains many other databases. Such LUN or volume-based scenarios, common with standard infrastructure, inevitably cause delays to resolution and potentially mask other issues. The ability to pinpoint the root cause of latency in seconds and view real-time performance and capacity metrics for any SQL database and database file enables organizations to avoid lengthy investigations, take prompt action and mitigate productivity slowdowns.

Real-time insights are complemented by advanced predictive analytics that leverage 3 years of historical database storage trends and advanced machine learning capabilities that give staff the ability to accurately plan resources and budgets 18 months in advance. This ensures that organizations buy storage only when needed and eliminates the cost of overprovisioned, wasted resources.

The unique Tintri VMstore design also provides additional means of reducing storage resource requirements and management complexity. By enabling a single storage pool to support thousands of databases, Tintri SQL Integrated Storage helps enterprises avoid setting up and managing – and consequently overprovisioning – numerous LUNs and volumes typically associated with standard database storage.

## Empower DBAs with Autonomous Operations and Self-Service

Tintri SQL Integrated Storage is the only storage solution that enables self-service capabilities for DBAs. Its database-centric approach and ML-driven task automation eliminate the need for deep storage expertise and can reduce administrative overhead by up to 95%. Tintri SQL Integrated Storage ensures that Tintri VMstore systems are self-optimized for SQL Server, which means there's no need to spend time

configuring and tuning storage for databases; it's done autonomously and continuously. Streamlined, effortless processes enable snapshot copies and database clones to be created instantly for data protection and DevOps environments, respectively. Both snapshots and clones can be created with zero performance impact (zero stun), using zero storage space. Databases can also be recovered from snapshot copies instantly, and individually, while clones can be used to refresh test environments in seconds as opposed to hours. DBAs can now be more independent and productive, and IT can eliminate helpdesk tickets that are usually required to address performance complaints and grow LUNs and volumes. And both storage and database experts can focus their time where it counts – on strategic activities that advance the business.

## Improve User Experience with Predictable Performance

Predictable performance is a key attribute that is increasingly expected by users. That's why IT staff usually aren't congratulated when application performance is acceptable, but they are quickly blamed when expectations aren't met. Unlike traditional storage, Tintri SQL Integrated Storage ensures consistent, predictable performance by isolating each database from "noisy" workloads and other databases that might be processing disruptive queries. A database running the heaviest I/O loads in the data center can be placed alongside any other database without requiring initial or subsequent storage configurations. All databases will perform flawlessly with Tintri SQL Integrated Storage. By dynamically and autonomously adjusting resources as I/O requirements change, performance and QoS are maintained without overprovisioning or administrator intervention – each database always gets the exact resources it requires. To keep production databases unaffected, Tintri SQL Integrated Storage can also offload resource-intensive activities to other SQL Servers instances, including integrity checks, maintenance, reporting and copy-only backups.

Experience Different! For more information about how you can turbo-charge your data center with Tintri SQL Integrated Storage, please visit us at: [www.tintri.com/sql](http://www.tintri.com/sql)