

SQL Server HA and DR:

A Simple Strategy for Realizing Dramatic Cost Savings

by Joseph D'Antoni



SIOS

Significant savings in both SQL licensing and SAN TCO.

As companies become increasingly reliant on SQL Server to run their critical business operations, their tolerance for application downtime soon approaches zero. However, with the licensing changes that were introduced in SQL Server 2012, the cost of providing high availability (HA) and disaster recovery (DR) protection to prevent downtime and data loss has risen sharply. This licensing cost adds to the already high cost of buying, implementing, and maintaining a SAN-based cluster, making SQL Server total cost of ownership (TCO) one of the most expensive items in the IT budget.

#SANLess clusters can save \$800,000+ and improve HA and DR protection.

This paper discusses the SQL Server 2012 licensing changes and their impact on HA and DR strategies. It concludes that a #SANLess cluster can eliminate the need for upgrading to SQL Server Enterprise Edition by providing complete HA and DR protection with SQL Server Standard Edition saving \$74,096 in a 16 core, 2-node cluster (see Table 1). Furthermore, by eliminating the need for a SAN (see Table 2), a #SANLess cluster can save as much as \$735,944, together **saving more than \$800,000.**

Table 1. Comparison of Software Costs For Two Node SQL Server Cluster

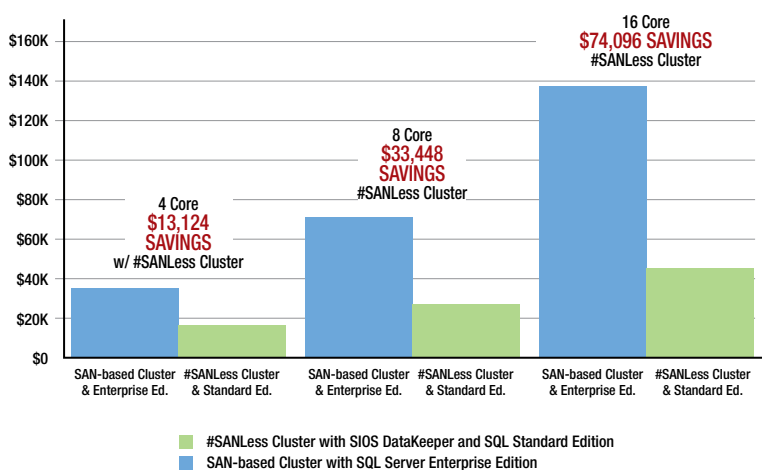
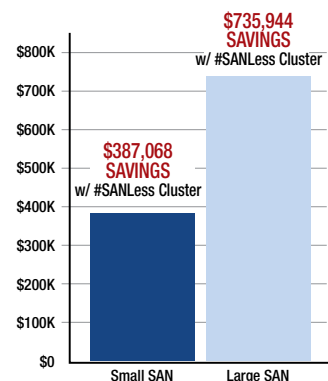


Table 2. Five Year SAN TCO



SQL licensing costs have nearly doubled.

The licensing changes that were introduced in SQL Server 2012 not only increase the cost of SQL Server Enterprise Edition licenses, but also require you to purchase Enterprise Edition for several key features that are important for HA and DR, such as the AlwaysOn Availability Groups feature.

SQL Server licensing by cores drives up cost.

In the past, you could license SQL Server Enterprise Edition either by sockets, or by server (with client access licenses for each user). With the introduction of SQL Server 2012 you can only license Enterprise Edition by cores. As a result, **the cost of SQL Server licensing has nearly doubled** for the most common server configurations. Before 2012, a license for two sockets would have cost approximately **\$54,000** (list) — today the same server (assuming the common six-core processor) costs **\$82,488**. These licensing costs dramatically increase as you move to larger servers.

The new licensing also requires you to purchase Software Assurance (SA), the Microsoft upgrade and support program, to be eligible for key features that most customers need. SA can add **25% to annual recurring costs**, based on your total number of licenses. SA is required for features such as:

- **Cold DR licensing** — Allows you to create a standby site for DR purposes without purchasing an additional license.
- **License mobility** — Allows licenses to float from one physical machine to another, a necessity for virtual server environments.
- **License upgrades** — Enables you to upgrade from SQL Server Standard Edition to Enterprise Edition, without repurchasing the base license.



SIOS

HA and DR protection with SQL Standard Edition falls short.

HA protection for SQL Server is typically provided by the SQL Server Failover Cluster Instances (FCI) feature that is integrated with Microsoft WSFC, and available in all editions of Windows Server, starting with Windows Server 2012. However, the HA features in SQL Standard Edition have drawbacks that cause many companies to opt for Enterprise Edition.

For example, **Database Mirroring** (High Safety Mode – Synchronous Replication) has been marked for deprecation in SQL Server 2012, giving it a limited future. Database Mirroring Mode in SQL Server Standard Edition also requires labor-intensive manual maintenance of SQL Server Agent jobs and SQL Server logins across all involved nodes. Another drawback is that **High Safety Mode** slows performance on the primary server, making it poorly suited for mirroring data over long distances or over higher latency connections.

Storage array-based replication is complex and expensive for DR.

Traditionally, WSFC could not be used for DR because of its dependence on shared storage, which cannot span multiple sites without an impractically expensive configuration. While storage array-based replication can be used for multisite protection, it requires a shared storage array (SAN or NAS) in the primary site and a second identical array that processes the data and manages the replication process. This option is expensive and it locks you into a single vendor for both arrays. It may also require the purchase of additional software from the storage area network (SAN) vendor.



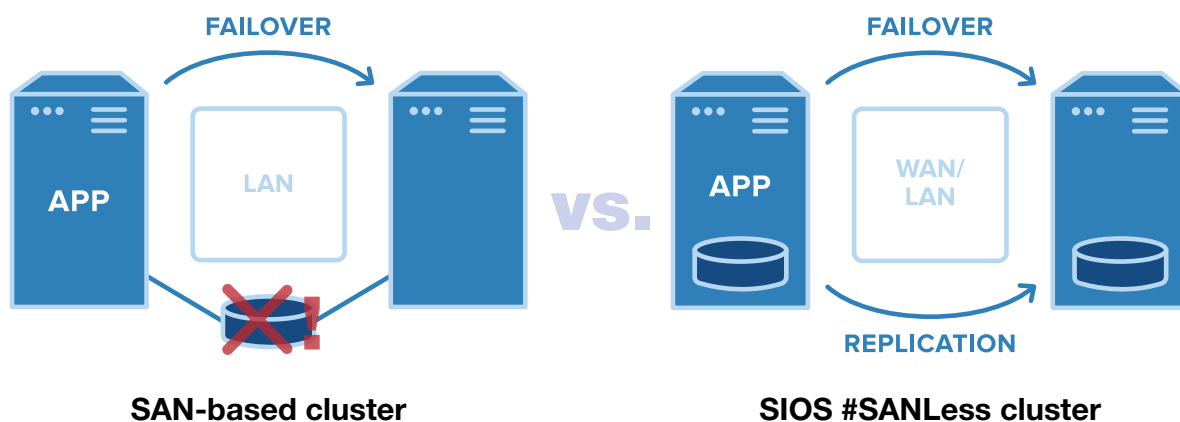
SIOS

You don't need Enterprise Edition or SAN hardware.

The easiest and most cost-efficient strategy for delivering HA and DR in a SQL Server environment is to create a **#SANLess cluster** by adding SIOS DataKeeper™ Cluster Edition software to a SQL Server WSFC configuration. These clusters use host-based, block-level replication to synchronize local storage in primary and standby servers, **enabling the use of SQL Server Standard Edition software licenses and eliminating the cost of expensive SAN hardware.** You can manage the replication and recovery process exclusively at the host operating system level and get the same “geo-cluster” functionality as array-based storage with significantly more **configuration flexibility.** #SANLess clusters allow you to replicate locally, remotely, into the cloud and between SAN and #SANLess clusters.

Lower your RTO and RPO.

#SANLess clusters use highly efficient block level replication and data compression technology that is transparent to both the application and the operating system, enabling them to deliver disaster protection with extremely low recovery point and recovery time objectives (RPO, RTO).



A closer look at SQL software licensing costs.

Let's compare the costs of providing high availability and disaster protection for SQL Server using a traditional SAN-based cluster to the cost of using a #SANLess cluster.

#SANLess clusters save up to \$74,096 in software licensing costs alone.

SQL Server Licensing: Table 3 on page 6 shows a side-by-side comparison of software licensing costs for a traditional cluster using SQL Server Enterprise Edition versus a #SANLess cluster using SQL Server Standard Edition with SIOS DataKeeper™ Cluster Edition software. Costs are calculated for comparable two-node clusters with four, eight, and sixteen cores. Software Assurance licensing costs are also included.

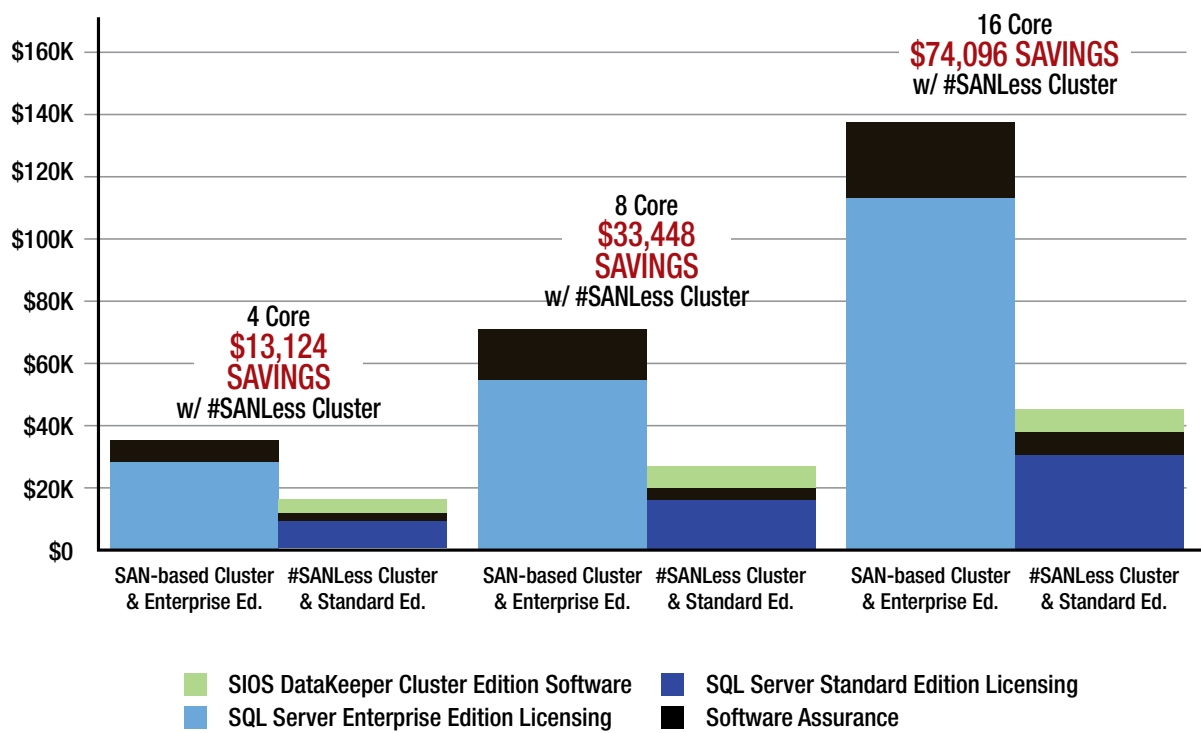
As shown, the #SANLess cluster with SIOS DataKeeper Cluster Edition **saves \$13,124** in a four-core cluster, **saves \$33,448** in an eight-core cluster and **saves \$74,096** in a 16-core cluster configuration. These savings factor in the purchase of SIOS DataKeeper to create a #SANLess cluster licensed by node. When used in multiple SQL Server environments, #SANLess clusters can **save several hundred thousand dollars** in software licenses.



SIOS

Save with SQL Server Standard Edition.

Table 3. Comparison of Software Costs For Two Node SQL Server Cluster



SIOS

Eliminate SAN hardware TCO.

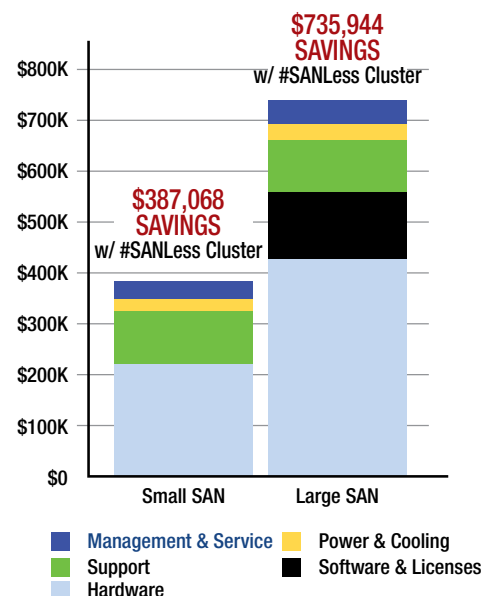
According to a recent ESG Lab Report¹, the five-year TCO for a SAN can range from approximately **\$387,068** to **\$735,944**, for mid-tier storage arrays. A #SANLess cluster with comparable performance eliminates this cost entirely. Combined with the software license savings described earlier, **DataKeeper software can save customers more than \$800,000 dollars in five-year TCO.**

SAN savings are shown in Table 4, which compares the TCO of two use cases: a small SAN for organizations requiring 112 TB of storage and a large SAN for organizations requiring 218 TB of storage. SAN TCO includes hardware, support, power, cooling and labor. SAN software is not required in the small SAN model used.

Eliminate specialized SAN labor expenses.

Note that a #SANLess cluster saves significant labor costs. A typical SAN requires dedicated support from both the vendor, and either a full time employee, or a consultant on retainer to perform maintenance and troubleshoot performance, whereas, a #SANLess cluster uses standard server hardware, low-cost, easy-to-configure, local storage and WSFC. It also provides an intuitive configuration wizard and a management console that makes it easy to use and easy to own.

Table 4. Five Year SAN TCO



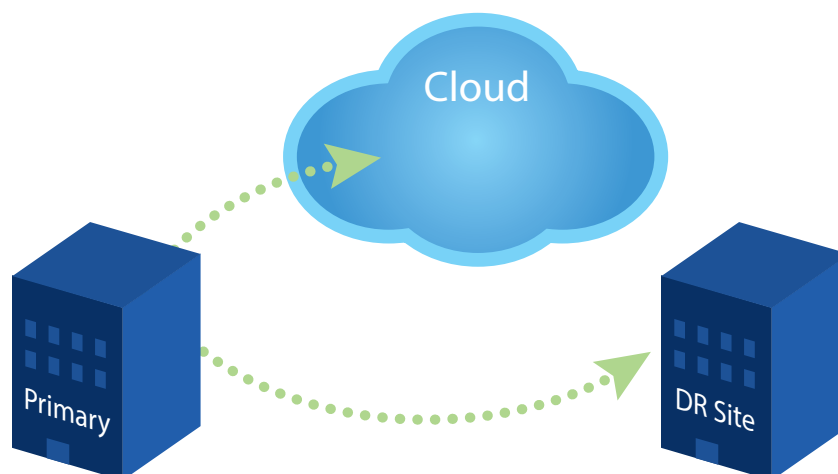
SIOS

Add configuration flexibility.

#SANLess clusters enable you to replicate locally, remotely, into the cloud, and between SAN and #SANLess clusters. You can configure a Local Failover Cluster or a Multisite Failover Cluster using SIOS DataKeeper to perform asynchronous replication (or synchronous if the distance between data centers is less than 100 kilometers) for DR. In either case, a single Windows Server Failover Cluster can be created for simplified management.

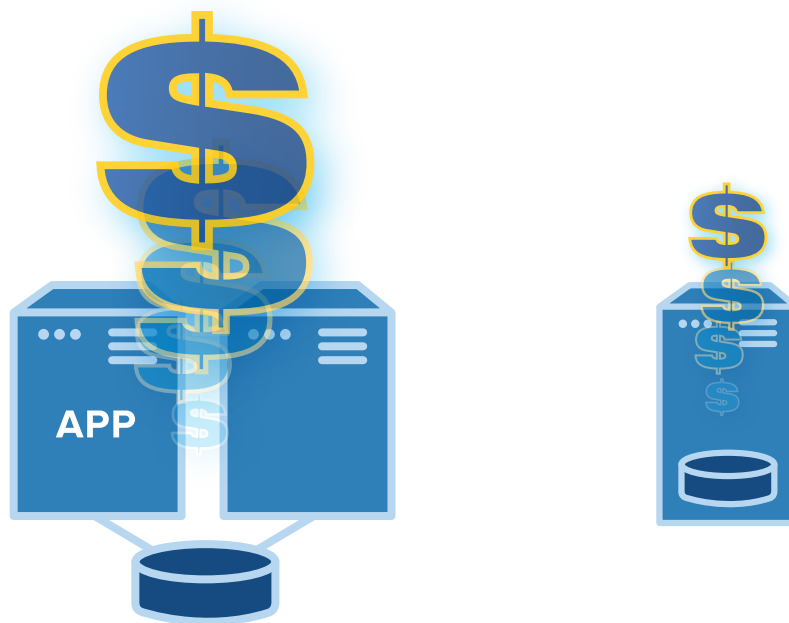
Three Nodes with SQL Server Standard Edition

One limitation of SQL Server Standard Edition is that a cluster cannot comprise more than two nodes. However, SIOS DataKeeper allows you to configure a third, unmounted node that is a replication target and not part of the WSFC. Using this approach, you can create highly cost-effective three-node configurations by deploying two nodes locally for HA, and a third node at a second, remote site to provide DR using only SQL Server Standard Edition. You only need one license of Microsoft SQL Server as long as the secondary replica is idle. If you plan to use the secondary server for snapshotting and reporting, an additional SQL Server Standard Edition license may be required. Consult your Microsoft sales representative for licensing information for a three-node cluster with SQL Server Standard Edition.



#SANLess clusters save hundreds of thousands of dollars.

With the introduction of core-based licensing in SQL Server 2012, and the deprecation of built-in disaster recovery features in the SQL Server Standard Edition, the cost of licensing has become a major concern for many organizations. This paper demonstrates that #SANLess clusters not only offer an easy, cost-effective alternative to traditional clusters, but they can also **save an enterprise data center hundreds of thousands of dollars**. #SANLess clusters also enable far more configuration flexibility than is possible in a SAN-based cluster environment, allowing enterprises to create a SQL Server environment that best meets their needs.



Notes:

¹ Kaufmann, Aviv, and Mike Leone, "Dell EqualLogic PS Series Storage and TCO Analysis," Enterprise Strategy Group Lab Report. January 2014. http://en.community.dell.com/techcenter/extras/m/white_papers/20438150/download.aspx



SIOS



Ready to Learn More

About protecting your applications with SIOS SAN or #SANLess cluster?

www.clustersyourway.com

© 2014 SIOS Technology Corp. All rights reserved. SIOS, SIOS Technology, SIOS DataKeeper and SIOS Protection Suite and associated logos are registered trademarks or trademarks of SIOS Technology Corp. and/or its affiliates in the United States and/or other countries. All other trademarks are the property of their respective owners.

