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Storage Consolidation Testing and Validation

Ensuring a successful storage consolidation project with storage performance validation

Introduction

Consolidation projects are typically initiated in order to lower IT costs and improve overall IT operational efficiency. They often are the result of a significant internal reorganization or merger and acquisition activity.

The trend to data center consolidation has been enabled by both server consolidation and storage consolidation. Although consolidation of servers and storage can substantially increase the efficient use of resources, it may also result in complex configurations of data, networks, applications, and virtual servers that need to support highly unpredictable workloads. Risk is usually increased, especially when it comes to performance.

Further, the changing mix of applications and evolving data management requirements are driving major changes in storage requirements. IT managers are demanding storage solutions that allow them to deploy complementary tiers of networked storage systems optimized to meet specific requirements for performance, capacity, reliability, and cost. Consolidating older, expensive tier 1 storage systems into newer, more cost-effective lower tiered storage is another strategy often employed in consolidation projects.

Challenges

Accurately sizing all infrastructure components in the consolidated

data center has been more of an art than a science. Understanding the performance and workload characteristics of virtualized applications is difficult to assess, often leading to major performance issues occurring at peak times due to resource contention between the resources.

Consolidated storage inevitably includes new network infrastructures to support the greater I/O demands. While these networks are potentially beneficial from a performance perspective, transitioning to higher speeds creates real challenges for storage architects in balancing performance with cost.
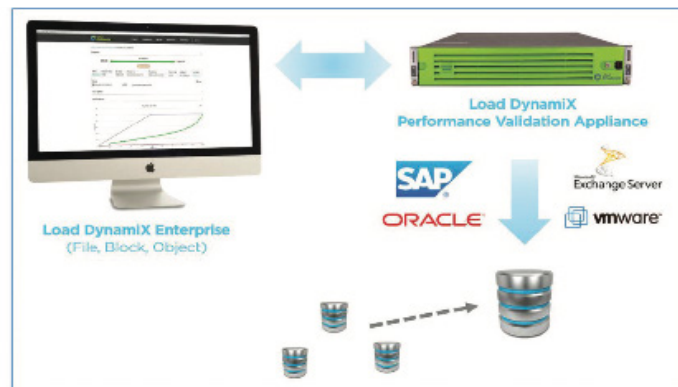

Figure 1: Storage Load Testing Deployment

How Storage Load Testing can help with storage infrastructure consolidation

Storage Load Testing is uniquely positioned to properly test and validate consolidated storage platforms with a high degree of accuracy. Storage Load Testing provides a combined software and hardware solution for storage workload modeling and performance validation. The product suite empowers IT organizations to mitigate performance risk with consolidation initiatives. With

the ability to accurately emulate real-world application workload behavior, Storage Load Testing enables storage engineers and architects to make intelligent sizing and deployment decisions. Our recommended best practices include:

Performance Testing Best Practice

Storage Load Testing enables storage engineers and architects to compare storage system performance using not just an arbitrary industry benchmark, but accurate workload simulations that realistically resemble their production environments. The tests are easily and fully (100%) repeatable over time, so accurate, "apples to apples" comparisons can be done.

Storage Load Testing develops a workload model that allows you to accurately simulate how well the proposed applications will perform when run on a consolidated system—at the scale you expect to see in production— with the network protocol you are moving to. There is no need to rely on vendor claims, best guesses, or freeware benchmarking tools that simply don't represent your environment.

Tiering and Configuration Optimization Best Practice

What is the right mix of HDDs vs. SSDs in your data center? How do you determine if traditional hard drive-based storage is most appropriate for your workloads versus hybrids or all flash arrays? With the flurry of new technologies (SSDs, object storage, caching/tiering, dedup/compression) promising faster, cheaper and better storage solutions, it's hard not to get caught up in the hype. And how can vendors make such claims about their technology without knowing how the technology will perform in your specific environment with your consolidated workloads?
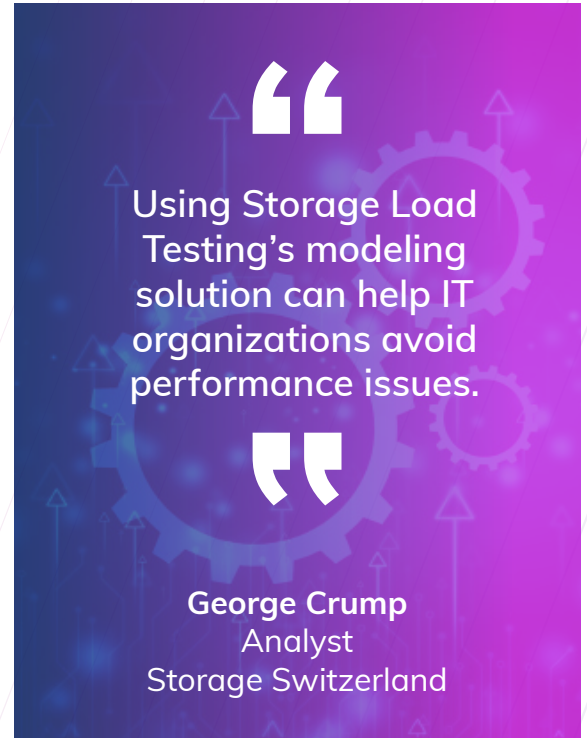
With Storage Load Testing, you determine the optimal storage price/performance configuration by varying dozens of settings like read/write ratio, random/sequential ratio, number of clients, block/file size, compression/dedupe and queue depth. And on the array, vary media type, caching, and other variables, such as the effect of replication and backup. Know your optimal configuration and available headroom before you consolidate. You can determine the optimal number of consolidated workloads that the new centralized storage system can adequately support without over-provisioning or underprovisioning the storage infrastructure.

Pre-production Validation Best Practice

The process of validating storage configurations prior to production cutover has become much more challenging with the increase in storage scale, complexity, and new technologies such as virtualization. Testing and validating storage infrastructure can be extremely complex, often involving hundreds (or more) of interconnected servers, as well as switches and storage arrays. The risk of new deployments missing key SLAs

is increasing as the complexity and scale of the storage infrastructure grows. Beyond just the components, validating storage infrastructure requires tracking thousands of access paths in real time. In a SAN with only a few dozen servers, tens of thousands of paths must be validated to ensure performance.

Storage Load Testing helps you to develop a workload model that allows you to accurately simulate how well the target storage systems will perform in your datacenter based on a variety of real-world testing scenarios, prior to going live. You enable faster deployments with less risk.

> " Using Storage Load Testing's modeling solution can help IT organizations avoid performance issues. "
>
> **George Crump**
> Analyst
> Storage Switzerland

Summary

Proactive, pre-deployment testing enables high consolidation rates without impacting performance as demands change. It eliminates the risk associated with consolidation by enabling delivery of and adherence

to SLAs. Changes in demand and performance can

now be detected long before users are impacted. With Storage Load Testing' "what if" performance modeling capabilities, storage architects can provide extremely accurate performance forecasts by using actual historical data and applying configuration changes to that data. Running reports that show latency and throughput enable the comparison and recommendation of other options that balance utilization and result in faster and less risky consolidation.

The benefits of consolidation are well understood and Storage Load Testing can accelerate and de-risk your consolidation initiative by providing best practices around storage consolidation with an advanced testing and validation solution.

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