

# DATABASE PERFORMANCE ADVANCES IT MODERNIZATION

The right tools and strategies can streamline database management and facilitate new technology adoption.

**G**OVERNMENT AGENCIES FACE considerable challenges as they undertake the transformative activities required under the Modernizing Government Technology Act. Those challenges include managing an IT infrastructure that consists of multiple platforms, a mix of old and new systems, and resources located both on-premises and in the cloud. That level of complexity has forced the need to better monitor databases.

In addition, database management can play a central role in meeting the Federal IT Acquisition Reform Act goal of enhancing transparency and improving risk management in IT investments.<sup>1</sup>

Traditional operational monitoring—simply “keeping the lights on” in the existing database environment—is no longer sufficient to satisfy the evolving and increasingly important monitoring requirements for mission-critical databases. Furthermore, the American Technology Council’s draft report on federal IT modernization recommends incorporating database assessments into the testing regimen for agencies’ high-value assets.<sup>2</sup>

“Whether it’s continuous integration or deployment, database monitoring solutions must be able to adapt,” says Amit Parikh, senior consultant, information systems at Quest. “We need to take operational monitoring further so we can analyze workloads and identify changes in performance and the resources that will be affected when changes come through from the development side.”

New tools and strategies are making it easier for agencies to manage those complex, multi-platform environments. However, Parikh says any tool introduced into an IT environment should provide a standardized approach to monitoring the performance of a broad range of platforms. “That results in consistently high database performance and consistently high availability.”

Part of that approach includes offering a global view of all database services across all platforms to help facilitate deep dives into the data and remediate with the help of built-in intelligence. “Your monitoring system should have the ability to store and maintain a rich set of historical data and offer robust reporting, workload analysis, and easy integration,” says Parikh. “All these things should be consistent across the broad range of platforms you are monitoring,

with the goal of moving away from a siloed approach.”

Database replication tools can also help agencies integrate diverse data sources and maintain high availability in environments that can’t tolerate downtime. “Replicating between different types of databases, and then encrypting and compressing data traffic over the network, helps agencies use the latest technologies to share data internally and externally without jeopardizing the security of the data,” says Susan Wong, a principal systems consultant at Quest.



<sup>1</sup> <https://www.congress.gov/113/plaws/publ291/P LAW-113publ291.pdf#page=148%5D>

<sup>2</sup> <https://itmodernization.cio.gov/report/preface>

## Shine a Light on Performance

Quest's tools can help government agencies at all levels meet the mandates by taking advantage of new technologies and platforms while avoiding a negative impact on mission-critical applications. The company's Foglight is designed for cross-platform, consistent performance monitoring and management of cloud environments, hypervisors, virtual machines, and storage. Specifically, it helps agency IT staff with the following functions.

■ **Enhanced analysis and remediation.** Foglight makes it easier for agencies to manage complex environments by offering a single view of all their platforms. Its built-in intelligence capability not only shows the relevant metric and whether it has crossed a certain threshold, but also offers advice to step administrators through remediation, such as configuring parameters, making tunable changes to a database, or altering the underlying structure of the data.

■ **Identify and learn from trends.** Storing historical information about agency databases and other resources will reveal activity trends. "Foglight will quickly register what the high and low levels are for any given environment, so if your processor or memory consumption rises, Foglight will tell you if it's falling within the normal range of activity so you don't have to overreact to that metric," says Parikh. "Adaptive baselines help you understand what's normal, help you predict what's going to happen down the road and help you anticipate growth."

■ **Improve the user experience.** Agencies can zero in on critical transactions over short or long periods to determine whether their resources are running optimally. They can also identify users who would be most affected by performance loss in a particular area, which can help with the overall user experience.

■ **Protect mission-critical applications.** Foglight can compare an existing production environment on an older platform with a newer version in a pre-production environment. It compares configuration parameters and workloads on both sides and helps determine whether the new environment will be able to handle the workload with the same level of success as the older platform. That approach can reduce the amount of downtime and eliminate the impact on mission-critical applications during the transition to a new or upgraded database or other platform.

## Replicate Success

Quest's SharePlex uses real-time database replication for on-premises, cloud, or hybrid environments. The approach helps agencies:

■ **Maintain high availability.** Instead of having downtime during maintenance or upgrades, agencies can point users to a near-real-time copy of the database so they can continue

working. Their transactions will be integrated into the source database as soon as it comes back online.

■ **Improve performance.** Agencies can move batch processes to a separate near-real-time instance tuned specifically for that purpose. Whether the goal is reporting or analytics, those processes will run more efficiently, and the transactional database won't have to compete for resources.

■ **Migrate to new platforms with zero downtime and failback capability.** The technology can facilitate migrations to the cloud, another type of database, or a new database location without any downtime. "Normally, you'd have to shut down the database, make a point-in-time copy, put it over on the target, and wait until that target comes up to start working there," says Wong. "With SharePlex, users can still be working on that production instance while the point-in-time copy is being made and moved." In addition, before users are moved to a new platform, SharePlex's failback capability can start replication in the reverse direction so that anything users do on the new platform also updates the old one. Users can be moved back to the up-to-date original database if there is a problem with the new platform.

■ **Enhance their auditing capabilities.** Another configuration in SharePlex gives agencies information about every transaction that's hitting the database, which lets them run analytics and gain insight about what's happening in the database. The data—which includes userid, timestamp, type of transaction, and before and after values—is captured on a separate instance so running analytics will not affect the production database.

Comprehensive database management is an integral component of IT modernization efforts, and it has the added benefit of helping agencies operate more efficiently and securely. "Having multiple checks and balances for IT systems improves the odds that those seeking to penetrate an organization will not have the ability to compromise every system collecting trace metrics, which include data at rest or in flight and performance baselines," says Chris Roberts, solution architect at Quest.

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