



How to Get Full Value out of Your Cloud Migration

INDUSTRY PERSPECTIVE

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Executive Summary

Moving databases and workloads to the cloud is no longer a seriously debated topic in the private sector, as it is now considered standard operating procedure. Companies in competitive industries are accelerating the process of untethering on-premises assets to advance productivity and efficiency and to gain a competitive edge. The goal is to move assets to the cloud quickly and in a way that maximizes benefits.

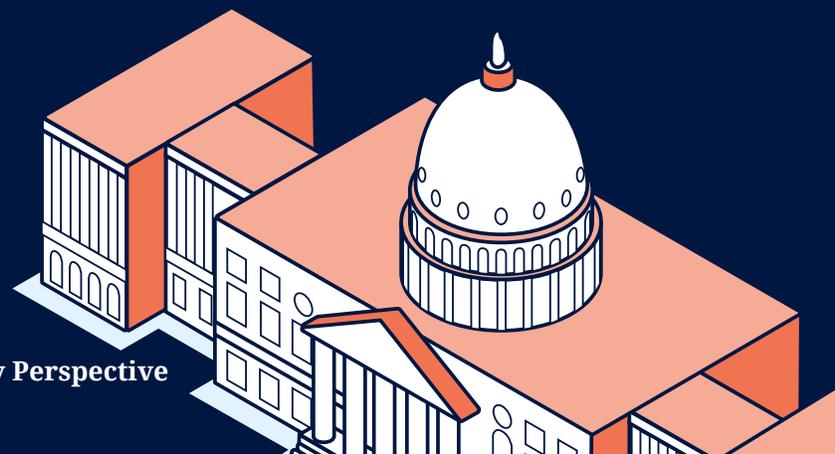
Federal agencies aren't quite there. Despite the government's years-long exhortations encouraging the migration of workloads to the cloud and the consolidation of more than 10,000 federal databases, several factors have impeded progress and contributed to a latency in federal enterprise modernization. Among the culprits are inadequate IT budgets, overreliance on "lift-and-shift" migrations and single-cloud solutions, legacy systems that siphon off critical funds, security concerns and inadequate in-house expertise.

Now, a triad of advanced technologies, federal policies and the expansion of remote work in the coronavirus era are driving agencies to surmount challenges to cloud adoptions — and to gain operational efficiencies and benefits that, until now, were out of reach. Yet challenges remain.

"The really critical workloads — mission-critical workloads — are still running on premises, which makes it difficult for agencies to really utilize the value of the cloud," said Ashish Gandotra, Master Principal Sales Architect at Oracle.

For federal agencies, successfully executing the next phase of cloud adoption is critical to continued mission attainment. Proper migration of databases saves money, improves performance, speeds operations, reduces latency and enhances predictability, while also simplifying implementations, integrations and migrations.

With so much on the line, well-managed agencies will push harder for smarter migrations that yield maximum benefits. GovLoop, Oracle and Affigent, a turnkey IT solutions provider and leading Oracle partner for more than a decade, created this report to explore the common obstacles to successful cloud migration — and proven strategies for overcoming them.



Cloud Migration: A Reality Check

To get the most out of the cloud's capabilities, agencies must anticipate challenges that could undermine the benefits of leaving on-prem environments.

Rearchitecting

Moving on-premises applications to the cloud often requires rearchitecting applications to make workloads compatible with cloud-native services. Those modifications require an understanding of applications' performance needs, cloud capabilities, business needs, connectivity and integration requirements.

"These mission-critical business applications don't run in silos," Gandotra said. "They are integrated with multiple other customer applications and business applications, so when you plan to take such applications to the cloud, you need to think through those integrations and data exchange costs."

"Rearchitecting on-premises applications for the cloud, you have to understand what your needs are on-prem, how you transform them to cloud services and how you build those technologies together," he added. "Do not do a 'big bang' approach."

Security

In an era of omnipresent cyberthreats, security is a pervasive concern that paralyzes organizations and keeps sensitive workloads on premises. You must have confidence that you can manage and control data migrated beyond the traditional security perimeter.

A cloud solution with security baked in can allay security concerns. Before bringing a database into cloud storage, ask the cloud solution provider if it will reside in a private subnet with no connectivity to the internet. The securest solutions, whether on-prem or in the cloud, are those that comply with the most rigorous security frameworks, such as the Federal Risk and Authorization Management Program.

Unanticipated Costs

To avoid overpaying for cloud services, agencies must understand how providers charge for different types of workloads. On-premises workloads that have stable costs unaffected by the number of databases and applications built will have different costs in the cloud. Moving workloads in and out of the cloud can increase costs. Over time, these costs add up to hundreds of thousands of dollars for large enterprises migrating to the cloud and building hybrid or multi-cloud solutions.

"Some vendors are making it very complicated for the customers," Gandotra said.

By comparison, Oracle Cloud "is very simple," he said. "When moving your workload from your on-prem environment to Oracle Cloud, you will not find any hidden costs. It's very simple billing that is clear and open to the customer." Oracle is also the only vendor that gives customers the first 10 terabytes of egress every month free of charge and additional savings for using Oracle FastConnect.

Best Practices in Cloud Migration

The success — or failure — of cloud migrations often hinges on four key factors: **performance, cost, implementation and security**. At the operational level, maximizing the benefits of cloud migrations is often a matter of applying best practices.

Performance

The first principle of successful cloud migration is understanding workloads. A process of discovery is critical to ascertain what's running on-prem and what they require. Only then can an agency look to the cloud and determine an appropriate business solution. Does "lift and shift" make sense, or would the latest cloud-native technology be a better fit? Would another cloud achieve similar performance?

Oracle offers a cloud service that runs databases in a storage layer to reduce the input/output (I/O) footprint. By bringing algorithms to data, obviating the need to move large blocks of information and performing operations in storage, the configuration delivers a high-performance database without increasing costs. Conversely, it's easier to control outlays without sacrificing performance.

"You may get performance in another cloud, but with additional cost because you have to run a lot more compute to get the same performance," Gandotra said. "And with single-purpose databases, you end up storing and moving your data between multiple systems, causing a slow response." With Oracle's converged database and cloud solutions such as Autonomous Database, customers can run mixed workloads such as data warehouses, online transaction processing, JavaScript Object Notation and structured and unstructured data within the same ecosystem

without needing to move data among systems. Additionally, they can move algorithms to data, thus providing a faster response at a lower cost.

Cost

Hidden charges incurred when moving workloads to the cloud can dramatically increase overall outlays, even when upfront costs are relatively straightforward. One such area that's vulnerable to cost creep is egress charges — fees cloud providers charge for data used vs. data stored.

A database running in the cloud that has no discernible I/O cost will be more efficient relative to I/O storage than a database in a traditional cloud configuration. Moving data in and out of databases costs money.

Some cloud providers who bill on a per-gigabyte basis begin charging clients as soon as cloud services begin. Oracle begins charging when customers reach 10 terabytes per month.

"With [other providers], agencies would have to keep multiple copies of data, incurring yet another cost," Gandotra said. "You would have to integrate, and that's another cost. You have to secure them separately, and that's another cost. You need to have the resources to understand all the different technologies, and that's another cost. All these soft and hard costs add up and make your solution even more complex."

Of course, cost and performance are closely related.

"If you do not understand your workload, if you do not understand your performance needs, your cost is going to be way higher than it would be compared to on-premise," Gandotra said.

“Oracle cloud has a very simple to understand cost structure, and we offer a very consistent global experience, both in price and performance. It doesn’t matter which region you deploy your service, cost and performance will be consistent. With Oracle’s flexible instances, customers can build their solution just how they need it with no waste. They can choose the specific number of cores and memory required without having to fit into predefined shapes.”

Implementation

Rather than rearchitect applications for the cloud, agencies can opt for a cloud infrastructure that supports the “lift and shift” of applications and workloads to new off-premises environments. Oracle Cloud Infrastructure (OCI) runs applications as they have run on-prem. By eliminating the rearchitecting phase of cloud migration, agencies can flatten the learning curve and sidestep potential costs and risks. OCI also provides a suite of tools to further automate and smooth the process.

An advantage of moving workloads to the cloud is autonomous databases, which are cloud databases that use machine learning (ML) to automate multiple functions, such as database tuning, security, backups, updates and other routine management tasks. Unlike conventional databases, autonomous databases perform these tasks without human intervention.

Building an autonomous database in Oracle Cloud can be done in less than a minute. That’s no more than 60 seconds to create a converged database to run any workload. “You don’t have to manage it. You don’t have to maintain it. You don’t have to build a backup of it. You don’t have any operational overhead. It’s the world’s first and only self-driving, self-securing and self-repairing database, which gives users access to all data models and types within a single converged database,” Gandotra said.

Furthermore, the solution comes with tools for developers, database administrators and data scientists. “With this one service, ease of implementation, cost, performance and security blow away every other service and every other cloud provider,” he said.

Security

Security measures’ effectiveness varies, even among cloud service providers that have met stringent security requirements for doing business with the government. Take encryption for example. Not all solutions encrypt data to the Federal Information Processing Standards 140-2 level, at rest and in motion. Agencies should look for cloud solutions that have a defense-in-depth strategy that delivers core-to-edge protection and shields all data traffic.

“Oracle offers security by design, with always-on encryption that protects customer data at rest and on wire with full customer isolation from other tenants and Oracle’s staff,” Gandotra said. “The best practice is to understand both the cloud provider’s responsibility and understand your responsibility. Cloud makes the enterprise more secure because a lot of security controls have already been implemented. Above all security functions and controls, only Oracle offers end-to-end [service-level agreements] covering performance, availability and manageability of services, which is a must for any mission-critical business application.”



Case Study

In 2018, the Treasury Department decided that its on-prem, enterprisewide human resources (HR) management system was bound for the cloud. The legacy platform, HR Connect, had become unacceptably slow, inflexible and costly.

HR Connect enables and supports personnel actions – hiring, promotions, separations, transfers and updates to emergency contact information – across 36 civilian and Defense Department agencies.

By shrinking the system’s large data center footprint, Treasury projected reductions in operational resources and costs, while increasing security and performance. Before moving forward, however, the agency had to choose a solution that would deliver high performance, scalability and security, along with lower, more predictable costs.

Treasury chose OCI’s hybrid cloud model, which made it possible to easily migrate HR Connect’s customized applications to the new service. The migrated workloads went live in 2020, and soon after, Treasury saved millions of dollars, according to Mary Colville, Senior Director of Civilian Sales at Affigent.

“It reduced a lot of the downtime that they were having,” Colville said.

The Oracle Toolbox

Oracle solves government’s IT challenges using secure, enterprise-class solutions, from cloud computing to databases. Key offerings include:

 Exa-Series hardware platforms – hyperconverged and software-defined infrastructure solutions

 Application development – Oracle’s Java and traditional language development environments, which provide industry-leading performance and developer services in affordable packages

 Infrastructure-as-a-Service (IaaS) – secure, reliable, high-performance, enterprise-class infrastructure

 Platform-as-a-Service (PaaS) – Oracle’s most popular enterprise software solution, which delivers fast, secure deployment and scaling of development and production environments

 Database-as-a-Service – dedicated Oracle Database Cloud offerings with end-to-end security

 Oracle Cloud@Customer – hybrid cloud hardware that brings Oracle Cloud into customer data centers

 Oracle Managed Cloud Services – Oracle’s secure, hosted cloud solutions, which are fully staffed and dedicated to customer requirements in Oracle’s managed data centers

 Oracle Cloud services – assisting with all phases of cloud adoption, from architecture and design to migrations

How Affigent and Oracle Can Help

Affigent helps customers get to the cloud. For most agencies, the path leads to a hybrid cloud environment. Often, the impetus for moving workloads off-premises includes reducing costs, typically lowering egress charges; ease of integration; simplified migrations and implementations; and more robust, multilayered security.

Affigent delivers Oracle Cloud and engineered systems on the General Services Administration Schedule. Among its advantages, Oracle has developed a singular part number that covers a set of Oracle PaaS and IAAS cloud offerings based on a unit price of \$1, called a Universal Credit, that can be purchased in a block that is sized to the customers' environments, goals and requirements. The block amount, which cannot exceed cost value, represents a maximum spending figure. This arrangement allows customers to monitor spending and shift from one product set to another without modifying orders.

Put another way, customers of Oracle Cloud have greater procurement flexibility.

"If you want to run your operations in a cloud with the highest performance and lowest cost, we can provide you that in Oracle Cloud," Gandotra said.

Conclusion

Federal agencies have migrated workloads to the cloud for years, yet many of them have resisted moving their most critical workloads to off-premises locations. Despite the allure of the cloud's benefits – greater efficiencies, cost savings, flexibility and improved performance – concerns about cybersecurity have prevented agencies from diving into the deep end.

Until now. Advances in cloud and multi-cloud solutions make them faster, more efficient and securer. Agencies are taking notice.

When done correctly, moving workloads to the cloud advances innovation, scalability, availability and reliability, end to end. The right cloud solution supports emerging technologies, such as artificial intelligence, ML, blockchain, human interfaces and advanced security.

For agencies focused on mission attainment, that means faster and more predictable performance, better pricing and security and enhanced compatibility for enterprise workloads.



About Affigent

Affigent is a turnkey IT solutions provider dedicated to helping agencies modernize their IT infrastructure while simultaneously improving security and delivering mission-serving solutions faster and at a lower cost. As a wholly owned subsidiary of Akima, an Alaska Native Corporation, Affigent offers customers the flexibility and agility of working with a small business, while also receiving support from a global enterprise with decades of experience working with the federal government.

In 2020, Washington Technology ranked the Akima portfolio of companies #39 amongst the top 100 government contractors. Affigent has core capabilities in cloud computing, cybersecurity, enterprise IT, network operations and application development. To learn more about Affigent, visit www.affigent.com.



About GovLoop

GovLoop's mission is to inspire public sector professionals by serving as the knowledge network for government. GovLoop connects more than 300,000 members, fostering cross-government collaboration, solving common problems and advancing government careers. GovLoop is headquartered in Washington, D.C., with a team of dedicated professionals who share a commitment to the public sector.

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