

Cloud Migration Success Story: Transitioning a FISMA High Enterprise System from Federal On-Premises Data Centers to AWS GovCloud

Company Overview:

A-TEK is a woman-owned small business having served a myriad of federal government agencies for nearly 30 years. During this time, A-TEK has consistently provided science and technology solutions that enable federal civilian, health, and national security missions. A-TEK evaluates the need, considers the complex, provides unique solutions, and consistently delivers mission success for our customers. A-TEK combines our expertise in science and technology to create powerful solutions to meet our customers' needs - we understand the challenges and deliver smart solutions with positive mission outcomes. A-TEK currently supports multiple engagements at the Food & Drug Administration (FDA). This case study describes our contributions to improving outcomes and our engagement which supports a public-facing portal providing SaaS / PaaS, Identify Management, and Application Development.

Challenges:

- **Scalability Issues:** FDA's on-premises infrastructure management relies on a lengthy process to provision additional resources to handle increasing user load and data volume, resulting in performance bottlenecks. Allocation of servers or virtual machines (VMs) usually takes weeks to accomplish.
- **High Maintenance Costs:** The U.S. Federal Government spends 80% of every IT dollar on Operations & Maintenance (O&M) costs. Similar to its Federal Agency Counterparts, the FDA is spending a significant portion of its budget on maintaining and upgrading aging IT infrastructure and applications. The footprint of the system included 8 physical servers and 64 VMs – a significant consumer of data center resources.
- **Limited Flexibility:** The existing on-prem infrastructure lacks the flexibility to quickly adapt to changing market demands and customer needs.
- **Dependencies:** The system had dependencies on 22 other partner systems. Each partner system had a unique set of stakeholders with their own priorities.

Solution:

A-TEK proposed the “Lift & Shift Plus” migration plan to FDA management to embark on a cloud migration journey to address these challenges. Based on details and comparison matrix provided the FDA management chose to migrate their on-premises infrastructure to the AWS GovCloud-based solution.

Migration Plan:

- **Assessment and Planning:** The team A-TEK conducted a thorough assessment of FDA's existing infrastructure and identified the AWS resources, dependent systems, need of on-prem connection from AWS and vice versa, security risks, network, and firewall requirement for migration to the AWS GovCloud FISMA High environment. We also established a migration team and defined the scope, goals, communication plan, and timeline for the project.
- **Data Migration:** Team A-TEK evaluated different options for migrating application data from on-prem database to AWS RDS including one time migration using the data pump export or leveraging AWS Data Migration Service (DMS) or combination of both. The application which was getting migrated is highly available critical system and cannot have long outage during the production migration. Upon careful evaluation of migration plan and total outage time allowed, team A-TEK began migrating data to AWS RDS using combination of data pump export/import and AWS DMS.
- **Application Migration:** A-TEK was awarded a task order to perform a “Lift & Shift Plus” migration to a FISMA High environment within the AWS GovCloud. In addition to the requirement to transition application resources to the cloud, our team managed the coordination of migration activities for 22 partner system interfaces. Each partner team required its own communication process, security system rules, and schedule

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to confirm connectivity of APIs, microservices, or direct data links. The team was also tasked with implementation of AWS OpenSearch into applications.

- **Testing and Validation:** Team A-TEK conducted rigorous testing to ensure that applications and data were functioning correctly in the cloud environment. This included load testing, security testing, and performance optimization.
- **Training and Skill Development:** A-TEK invested in training their IT staff to effectively manage and optimize cloud resources. They also implemented best practices for cloud security as per the FDA security requirements.
- **Deployment and Optimization:** After successfully evaluating the application migration to Dev, TEST and Pre-Production environments, the migration team deployed the applications and data to AWS production environment. Continuous monitoring and optimization were key to ensure cost-efficiency and performance.

Successful Outcomes:

- ✓ Reduced the total count of application and database servers to almost half. AWS EC2 resources are less expensive than data center VMs which resulted in a reduced overall cost of operating the system and a reduction in data center personnel support requirement.
- ✓ Implemented the cost-effective AWS S3 service to store unstructured data like product labels and marketing material. We eliminated the costs and dependency on FDA's OpenText / Documentum platform.
- ✓ Introduced and implemented AWS OpenSearch to provide keyword-based search and reduce code-base footprint and O&M costs. This was the first step in delivering on the "Cloud First" concept to building services and modularity in applications.
- ✓ Implemented enterprise applications in AWS environment along with addition of AWS S3, OpenSearch, and Lambda (serverless services) provided CIO's office with a tactical example of the implementation of FDA's Technology Modernization Action Plan (TMAP) goals.
- ✓ Utilized Relational Database Services (AWS RDS) as a database platform in AWS reduced O&M costs by eliminating the need to manage physical servers & clustered environments supporting Oracle Databases.
- ✓ As part of a "Plus" Service, during the migration, team A-TEK upgraded the Oracle database engine from 12c to 19c. What would have taken four weekends and 64 hours in the data center environment took a total of 16 hours.
- ✓ The addition of AWS CloudWatch monitoring provides an added layer of monitoring and complements existing SolarWinds and AppDynamics monitoring processes.
- ✓ Direct access of CM tools (Nexus repository) in AWS environment, reduces application deployment time during application releases. This has helped to further mature our Continuous CI/CD pipeline.
- ✓ The migration from data centers to AWS GovCloud was completed on time. As a result of efficiencies found during the project, the team completed all tasks at 17% under budget.

For more information contact:

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