

Modernization in Healthcare:

Strategies for Transitioning from
Windows to AWS Cloud-Native
and Open-Source Solutions



- Solution Provider
- Managed Services Provider
- SaaS Services Competency
- DevOps Services Competency
- Security Services Competency
- Generative AI Services Competency
- L1 MSSP Services Competency
- Migration Services Competency
- Healthcare Services Competency
- Small & Medium Business Services Competency

In healthcare, the rapid evolution of technology demands greater efficiency, security, and accessibility for patient data. As an AWS Premier Tier Partner, RapidScale brings unparalleled expertise and a robust portfolio of services to help healthcare organizations leverage AWS's industry-leading technology. This partnership enhances our ability to deliver secure, scalable, and innovative solutions tailored to the unique needs of the healthcare sector.

AWS has pioneered innovation and modernization in healthcare, providing tools and services that make this transformation possible. For healthcare to grow beyond traditional IT and overcome the limitations of traditional data centers and Windows workloads, AWS has enabled organizations to overcome the challenges of modernization and deliver unmatched value and flexibility in their service offerings.



Healthcare organizations often hesitate to rapidly change their IT systems due to the reliance of staff and patients, making minimal upgrades seem less disruptive. Additionally, modernization efforts are often hindered by legacy data centers with complex rules, tech debt, and hardware limitations.

The Windows enterprise and tech stack itself has dictated the form and structure of the data center itself and application design and function, built on layer upon layer of Microsoft products and overhead. The tech skills of your staff, often focused on maintaining the current environment, make

it a significant challenge to find time for upskilling and familiarization with newer more modern architectures, methodologies, and practices.

How do we answer the challenge then? Open-source solutions and AWS cloud adoption offer the ability to modernize while maintaining existing infrastructure. The cloud serves as a tool for controlled disruption and change, enabling transformation while preserving service availability. Taking your Windows environment and transforming them into open-source or cloud enabled services can be seamless and transparent to your end users with planning, the appropriate strategy, and a little expert help where needed.

While there are numerous strategies for modernizing your workloads, this eBook will explore four strategies that will make your migration and modernization efforts successful. We will also discuss how to classify and organize your Windows workloads into manageable categories that will help you determine the best strategy for your workloads. Transitioning away from traditional Windows-based systems towards cloud-native and open-source solutions requires a significant investment in time, energy, and knowledge.

Challenges of Migration:

While the benefits of modernization are compelling, migrating from Windows to cloud-native and open-source solutions presents challenges for healthcare organizations, including interoperability with existing systems, legacy applications, database migrations, data transfer, and complex networking. Adopting a cloud mindset and modernizing your Windows applications can be overwhelming, and at times impossible to accomplish. However, RapidScale provides the necessary expertise and tools to navigate these challenges. Leveraging AWS's robust suite of migration and modernization tools, such as AWS Migration Hub and AWS Application Migration Service, we ensure a seamless transition to the cloud.

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Some healthcare applications built on Windows-based frameworks may not be readily compatible with cloud-native or open-source alternatives and will require extra planning, testing, and development to be able to be "cloud" deployable. Navigating these complexities requires significant experience and attention to detail. Understanding these challenges, organizations must carefully assess their application portfolios, develop migration strategies to minimize disruptions to clinical workflows and patient care, and develop processes and solutions that will enable change to occur. Experience is crucial for navigating this complex modernization journey.

Another major challenge involves addressing security and compliance concerns associated with Windows modernization and cloud adoption. Healthcare organizations must comply with stringent regulatory requirements such as the Health Insurance Portability and Accountability Act (HIPAA) to protect patient privacy and ensure the confidentiality and integrity of electronic health records. Therefore, migrating sensitive healthcare data to cloud environments requires robust security measures, including encryption both at-rest and in-transit, access controls, and audit trails, to mitigate the risk of data breaches and unauthorized access. Working with an experienced partner, like RapidScale, will allow you to plan and address operational security and efficiency and ensure optimal performance and cost-efficiency which are critical to your modernization success. We can deploy and configure advanced security features such as AWS Identity and Access Management (IAM), AWS Key Management Service (KMS), and AWS Shield, providing a comprehensive security framework for protecting sensitive healthcare data.

- ▶ Control Tower Service Control Policies
- ▶ Role-based access control (RBAC) using AWS IAM
- ▶ Multi-factor authentication (MFA)
- ▶ Strong password policies



Benefits of Modernization:

The primary benefit of modernization is improved service quality for your organization, patients, and healthcare providers. Outdated architectures are prone to failure, hindering the delivery of efficient information systems, analytics, and collaboration.

Despite the challenges, modernizing IT infrastructure by transitioning to cloud-native and open-source solutions offers numerous benefits that can positively impact your IT

organization, patient care, and healthcare delivery in toto. One significant advantage is improved accessibility and collaboration among healthcare providers and patients. Cloud-native solutions enable healthcare professionals to access patient data securely from any location, facilitating real-time collaboration, telemedicine consultations, and remote patient monitoring.



Moreover, cloud-native and open-source solutions enhance data analytics capabilities, enabling healthcare organizations to derive valuable insights from large datasets for predictive analytics, population health management, and personalized patient care. By leveraging advanced analytics tools and machine learning algorithms, healthcare providers can identify trends, detect anomalies, and predict adverse health events, leading to proactive interventions and improved patient outcomes.

Modernizing your IT infrastructure will reduce the total cost of ownership (TCO) for healthcare organizations by eliminating upfront capital expenditures on hardware and software licenses. The reduction or elimination of "tech debt", or the on-going costs to maintain systems in an operational

state. Cloud-native solutions offer a pay-as-you-go model, enabling healthcare organizations to scale resources based on demand and optimize operational costs while maintaining high levels of performance and reliability.

And lastly, and probably one of the biggest benefits of modernization, automation. Automation is a game-changer, reducing errors, scaling on demand, and revolutionizing how healthcare IT services are delivered. The ability to deploy code, infrastructure, and services on-demand and without human intervention, means better more resilient services and applications which leads to better patient outcomes and satisfaction.

The Power of Partnership: RapidScale and AWS in Healthcare

Modernizing healthcare IT infrastructure brings numerous benefits, from enhanced security to improved patient outcomes. As an AWS Premier Tier Partner, RapidScale leverages AWS's industry-leading cloud technology to offer unparalleled solutions tailored for healthcare.

Together, RapidScale and AWS deliver a powerful combination of capabilities:

Comprehensive Compliance and Security:

With AWS's robust compliance capabilities, including HIPAA, HITRUST, and GDPR, and RapidScale's expertise, we ensure your healthcare data is safeguarded to the highest standards.

Advanced Analytics and Machine Learning:

By utilizing AWS services like Amazon SageMaker, Amazon Bedrock, and AWS HealthLake, RapidScale enables healthcare providers to derive valuable insights from their data, enhancing patient care and outcomes.

Seamless Migration and Modernization:

Our joint expertise simplifies the migration process, using tools like AWS Migration Hub and AWS Application Migration Service to ensure a smooth transition to the cloud, minimizing disruptions and maximizing efficiency.

24/7/365 Cloud Operations Support:

RapidScale's round-the-clock support, combined with AWS's resilient infrastructure, ensures your cloud solutions run smoothly and efficiently, providing peace of mind.

Assessment and Planning:

Modernizing your IT infrastructure can be a complex undertaking, but a well-defined plan can help ensure a smooth and successful transition. This section will guide you through the assessment and planning process, providing a step-by-step approach to understanding your applications, classifying them for migration, and developing a detailed strategy.

It's also important to classify your applications into some basic modernization & migration categories. A good rule of thumb for classifying your applications is by simply looking at functionality. Functionality usually falls into one of several categories:

1. **Internal or external:** Is this something you use as an internal application or would a customer access? Separate networks, VPCs, Subnets, and VLANs
2. **Support or business:** Does this application support an internal function, something like a back-office application or file and print? Or is it an application that your users use to drive or operate your business?

You can then further classify into sub-categories such as Internal-Support or Internal-Business, External Support or External Business. The idea is to group your applications into manageable chunks of infrastructure. There are typically whole swaths of applications that can be eliminated, or removed, from consideration allowing you to focus on the ones that have the potential to be modernized. After having your applications categorized you can then begin to strategize and assess each application in detail.

Begin by conducting a thorough assessment of your current Windows workloads. Identify which applications and services are candidates for migration, considering factors such as compatibility, dependencies, and business criticality. Develop a detailed migration plan that outlines goals, timelines, resource requirements, and potential risks.

Some important items to note:

- Windows OS version
- Installed service packs and patches
- Installed applications
- Database connections
- Resource usage (CPU, memory, storage)
- File shares and permissions
- Application details (binaries, version, dependencies)
- Networking (internal/external connections)
- Configuration (IIS, API, .NET, Active Directory, DNS)

The more information you gather during this phase the easier it will be to plan and modernize your application and migrate it into one of several different options. Documentation, diagramming, and due diligence are key to a successful modernization effort.

Once you have a good understanding of your application and its dependencies you can begin to group your applications into what we would consider a workload. A workload may consist of multiple servers, file and data storage components, enterprise level service dependencies (such as DNS or Active Directory), and any internal or external networking requirements required for your application to run as intended.

Once you have a clearly defined workload you can then begin planning your modernization efforts and moving it into cloud-native or open-source alternatives. Begin by looking at each of the components that your application is comprised of. Your application will contain several layers or "tiers". In a three-tier web application, for example, you will have a web server, an application server, and a database. Very generally speaking you will have some variation of a component that presents an interface to a user, a component that processes or does the work, and a component that stores some type of data, such as a database. By breaking down your applications components you can begin to strategize about how to replicate or transform each layer. We will discuss a standard web application, for example in this e-book to illustrate the different methodologies, strategies, and thought processes you will need to modernize your Windows applications.

When modernizing an application, we typically look at the following four strategies:

1. Containerization
2. Open-source alternatives
3. Cloud native
4. Replatforming or refactoring

1. Containerization:

When looking at your application consider containerizing Windows applications, web sites, and web applications using technologies such as Docker or Kubernetes. Containerization allows for easier deployment, scalability, and portability across different environments. Tools like Docker Desktop for Windows and Windows Server containers can help facilitate this process. The Amazon Elastic Container Service or "ECS" can run your containerized workloads and is even a great choice for maintaining and packaging your legacy applications without having to maintain a host of Windows servers. Containers also offer a great solution for hosting your web sites and applications and offer the benefit of greater reliability and scalability.



2. Leverage Open-Source Alternatives:

Explore open-source alternatives to proprietary Microsoft technologies. For example, consider migrating from SQL Server to PostgreSQL or MySQL for databases, or from Microsoft IIS to Apache or Nginx for web servers. Evaluate the features, performance, and compatibility of open-source solutions to ensure they meet your requirements.

3. Cloud Native Migration:

AWS provides tailored solutions for moving your Windows virtual machines into Amazon EC2 which can help you eliminate the high cost of hypervisor licensing such as VMWare. Look at cloud storage options like S3, Elastic File Storage or "EFS", or FSx to consolidate or eliminate your file servers. Leverage cloud-native services like Amazon Relational Database Service (RDS) for managed database solutions. Migrate your MS-SQL servers to Amazon Aurora to eliminate SQL licensing requirements. Cloud native solutions offer flexibility in eliminating or supplanting your Windows workloads and remove the costly overhead in managing fleets of Windows servers.

4. Re-platforming and Re-factoring:

Depending on the complexity and requirements of your Windows workloads, you may need to re-platform or re-factor certain applications for compatibility with open source or cloud-native environments. This could involve modernizing legacy applications, optimizing performance, or integrating with cloud-native services. Consider using tools and frameworks like .NET rather than .NET Framework (I know, confusing...) for application development or migrating to microservices architecture for improved scalability and agility.

In Conclusion:

The transition from Windows to cloud-native and open-source solutions represents a strategic imperative for healthcare organizations seeking to modernize their IT infrastructure, improve patient care, and drive innovation. While the migration journey presents challenges, the benefits of enhanced agility, scalability, security, and collaboration far outweigh the initial hurdles. By embracing cloud-native and open-source principles, healthcare organizations can leverage technology to transform healthcare delivery, empower patients, and achieve better health outcomes for all.

How to Get Started with RapidScale

No matter where you are on your modernization journey, [RapidScale](#), an [AWS Premier Tier Partner](#), can help you quickly achieve your goals. From reinventing customer experiences and creating innovative new applications to massively improving productivity, our certified AWS experts offer comprehensive support and tailored solutions to optimize your cloud environment.

Whether you are looking to define a use case, create a roadmap, build a prototype, or implement a production-quality solution, RapidScale has a suite of services tailored specifically to accelerate your goals. With 24/7/365 support, top-tier security, and cost management strategies, we ensure your cloud infrastructure is efficient, reliable, and maximizes your AWS investment.

Trust RapidScale to drive your business growth and jumpstart your modernization initiatives today.

