EPLEXITY

Modernize your .NET workloads on AWS

Faster migration with less risk

CXOS

Strategically invest for the long-term

The cloud has upended the way organizations build applications and manage IT costs. By shifting the management of infrastructure to cloud service providers, enterprises take advantage of continuous availability, superior performance, and auto-scalability at a fraction of the cost. These organizations can invest more resources into building better products and services that drive the business forward, giving them a competitive edge.

If you are still managing an on-premises data center, the end of support for Windows Server 2008 and SQL Server 2008 provides a great opportunity to rethink your approach to technology investments. Legacy applications are expensive to manage and maintain. Over time, the value they bring to the business diminishes. Without Microsoft support you are at greater security risk, and you may be out of compliance with government privacy and data regulations. Regulations such as the Health Insurance Portability and Accountability Act (HIPAA), Payment Card Industry Data Security Standard (PCI DSS), the Sarbanes–Oxley Act of 2002 (SOX), the Dodd–Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank), the California Consumer Privacy Act (CCPA), and the General Data Protection Regulations (GDPR), among others, require companies to run on supported platforms. Failure to comply can be costly and damaging to your brand.
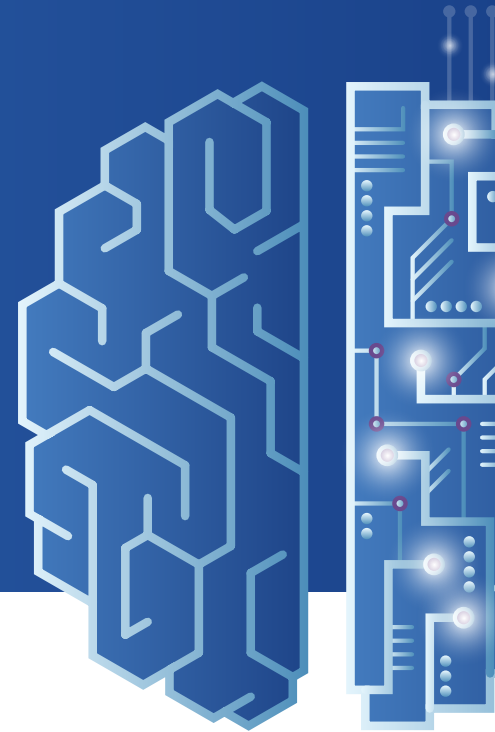
In July of 2019, Microsoft ended extended support for SQL Server 2008 and 2008 R2. Support for Windows Server 2008 ended in January 2020. Once support ends Microsoft no longer commits to fixing bugs, resolving performance issues, or addressing security issues.

Now is a good time to plan your move to the cloud.

Reduce your total cost of ownership

As you think about how you will address end of support for Windows Server 2008 and SQL Server 2008, you may feel pressure to decide quickly. But it's important to plan for the long term as you consider your options:

1

Migrate your workloads to the cloud by rehosting SQL Server and Windows Server (often referred to as "lift and shift")

This is the fastest way to get your applications in the cloud. You can reallocate many of your resources from infrastructure management to other business initiatives and reduce your costs significantly. However, you will still pay expensive licensing fees, and this approach won't address compliance and security issues.

2

Modernize your database and migrate apps to the latest version of Windows Server in the cloud

Modernize your database to an open source option like PostgreSQL and eliminate your SQL Server licensing fees. Amazon Web Services (AWS) End-of-Support Migration Program for Windows Server can help you move your legacy applications to the latest version of Windows Server without any code changes. With this option, you will still pay for Windows Server licenses.

3

Modernize your database and .NET applications and migrate to the cloud

If you want to take advantage of modern engineering techniques like microservices and containers or access cloud-based services such as artificial intelligence, data analytics, or the Internet of Things (IoT), you'll want to modernize your database and your apps. Plus, you'll reduce your operational burden and costs significantly. This will take some planning and time, but with the right partner, it may not be as hard as you think.

Future-proof your business with app modernization

There are pros and cons to each of your end of support options, but only app and database modernization and a migration to AWS gives you access to the kind of innovation that will allow you to compete in today's fast-paced economy. Buying a new Windows Server and SQL Server is expensive. You can reduce some of those costs by migrating to AWS while continuing to host on Windows Server and SQL Server, but you will still pay big licensing fees. Ultimately, you can't truly unlock the benefits of the cloud without removing your dependency on underlying infrastructure.
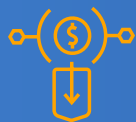
Lower cost of ownership

By modernizing and migrating your workloads to the cloud, you eliminate large, upfront infrastructure investments and reduce your licensing fees. Because cloud service providers, like AWS, offer elastic consumption models, you only pay for the capacity you use.

Deliver customer value faster

The cloud makes it much easier to adopt modern development practices like DevOps, microservices, and continuous integration and continuous deployment (CI/CD). Once you modernize your apps, you can deliver high quality code faster.

Reduce risk

When you run your own on-premises infrastructure, you may fall short of critical security and compliance standards. AWS is architected to the be the most secure cloud computing environment with support for 89 security and compliance standards.

Rapidly scale to meet demand

When you build your apps with containerized microservices and host them in the cloud, it's much easier to scale up and down to accommodate fluctuations in traffic and demand.

Access innovative technology

Once you've modernized your apps, you can take advantage of emerging technologies, like machine learning, data analytics, and artificial intelligence. AWS offers innovative services that you only pay for as you use them.

! An experienced partner can help

The benefits of workload modernization are substantial, but that doesn't mean it's easy. Cloud computing requires a different set of skills than traditional on-premise IT. Refactoring your apps takes time. If you're ready to modernize, but the cloud feels out of reach, Eplexity can get you up and running on AWS quickly and efficiently.

AWS is the best cloud for your .NET apps

AWS has over ten years of experience running Windows workloads in the cloud, longer than any other cloud provider. When you migrate your apps to AWS, you'll get the following benefits.

More operational experience

AWS has unmatched experience, maturity, reliability, security, and performance that you can depend upon for your most important applications. For over 13 years, AWS has been delivering cloud services to millions of customers around the world running a wide variety of use cases.

Greater reliability

AWS has the best global infrastructure for running workloads that require high availability with 66 Availability Zones (AZ) across 21 Regions. The AWS Region/AZ model has been recognized by industry analysts as the recommended approach for running enterprise applications that require high availability.

Most functionality

AWS has significantly more services, and more features within those services, than any other cloud provider—form infrastructure technologies like compute, storage, and database—to emerging technologies, such as machine learning and artificial intelligence, data lakes and analytics, and the Internet of Things.

More security capabilities

AWS offers 210 security, compliance, and governance services and key features which is about 40 more than the next largest cloud provider. AWS also supports 89 security standards and compliance certifications including PCI-DSS, HIPAA/HITECH, FedRAMP, GDPR, FIPS 140-2, and NIST 800-171.

Support for familiar .NET tools

AWS provides all the familiar tooling and integrations .NET developers expect, enabling you to leverage the most innovative cloud with a short learning curve:

▶ Full support for .NET applications and Windows workloads

▶ The latest release of .NET Framework and .NET Core

▶ Deep integration with Visual Studio and Visual Studio Team Services

▶ A range of resources and tools to build modern .NET serverless solutions

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! When compared to the next largest cloud provider, AWS offers:

▶ **2x more regions with multiple availability zones**
▶ **5x more services offering encryption**
▶ **89 security standards and compliance certifications**
▶ **7x fewer downtime hours in 2018**

   https://aws.amazon.com/sql/

Migrate faster, with less risk

Eplexity is an AWS Advanced Plus Partner helping companies establish their cloud foundation, modernize using cloud native tools, and run and operate their AWS workloads. Eplexity architects and engineers are experts in AWS and Microsoft technologies. If you are interested in modernizing your Microsoft workloads as part of your AWS migration strategy, Eplexity's CXOS platform lowers the cost, reduces the time to market, and removes the complexity associated with moving to AWS.

CXOS

AWS application pattern library

The backbone of the CXOS platform is a catalog of pre-established, production-ready, best practice AWS architectures.

Application patterns are workload specific patterns that are engineered to AWS Well Architected Framework[1] standards. Each pattern is proven through hundreds of successful AWS projects utilizing infrastructure-as-code, site-reliability, and security industry best practices.

The patterns also optimize workloads post-deployment by meeting AWS Well Architected standards that ensure workloads are secure, high-performing, resilient, and efficient.

The CXOS Mission Control dashboard is automatically enabled when you deploy your Microsoft workload via the CXOS pattern library, providing the necessary monitoring and 24/7 proactive service management that support the five Well Architected pillars:

▶ Operational Excellence
▶ Security
▶ Reliability
▶ Performance Efficiency
▶ Cost Optimization

How it works

There are three primary phases of work associated with refactoring your database and .NET applications and migrating them to AWS:

▶ Modernize SQL Server
▶ Containerize application services with Kubernetes
▶ Establish CI/CD for code management

Each phase is supported through deployment by a CXOS application pattern and post-deployment by CXOS 24/7 Mission Control.

[1] https://aws.amazon.com/architecture/well-architected/

Modernize SQL Server

A significant portion of the cost of running Microsoft workloads is the licensing fees. And most of your licensing costs are driven by SQL Server. If your organization requires enterprise level features, such as scalability and high performance, it can get expensive quickly.

PostgreSQL with Amazon Relational Database Service (RDS) offers the same performance, high availability, and transactional consistency as SQL Server without the big licensing fees. An open source database like PostgreSQL is interoperable and can be run on Linux and Windows and with any operating system, giving you greater flexibility.

Your Eplexity DevOps team performs the following steps to modernize your database:

1 **Schema compatibility assessment.** Use the AWS Schema Conversion Tool to understand the level of work required to migrate from SQL Server to RDS PostgreSQL. Then run the AWS Schema Conversion Tool against storage objects to:

➤ Assess the schema in target source Microsoft SQL and compatibility with PostgreSQL

➤ Assess the triggers in target source Microsoft SQL and compatibility with PostgreSQL

➤ Assess the database constraints in target source MS SQL and compatibility with PostgreSQL

➤ Assess the indexes in target source Microsoft SQL and compatibility with PostgreSQL

Run the AWS Schema Conversion Tool against code objects to:

➤ Assess the stored procedures in target source Microsoft SQL and compatibility with PostgreSQL

➤ Assess the views in target source Microsoft SQL and compatibility with PostgreSQL

➤ Assess the scalar functions in target source Microsoft SQL and compatibility with PostgreSQL

2 **Convert from SQL Server to PostgreSQL database.** Size CPU and memory requirements and define replication and backup specifications. Design the new RDS to those specifications. Create the new PostgreSQL database and run the AWS Schema Conversion Tool to convert code objects and storage objects from SQL server to PostgreSQL. Any code or storage objects that aren't automatically converted will be changed manually. Thoroughly test the schema in the new da`tabase.

3 **Migrate data from the SQL Server to the new database.** Use AWS Database Migration Service (DMS) to migrate data from the old database to the new PostgreSQL database. The service is quick and secure, and the source database remains fully operational during the migration. Once the data is migrated, set up the DMS using SQL Server as the source and the new PostgreSQL as the target, then create a DMS replication on an Amazon Elastic Compute Cloud (EC2). DMS makes it fast and simple to migrate the data. Testing is a critical component of this phase.

4 **Code conversion.** Assess all the locations where data access objects (DAO) and direct Java Database Connectivity (JDBC) are used for access to SQL Server. The focus of the code conversion is to support these new open source databases within Microsoft's Entity framework (.NET framework or .NET core), ADO.net or LINQ to SQL. (JDBC).

5 **Create unit tests** to test functional code connection to PostgreSQL.

Containerize your apps with Kubernetes

By breaking your applications into microservices and containerizing them, you can deliver features at a higher velocity and be more responsive to customer demand. Containers eliminate dependencies on underlying infrastructure, so you can easily port them from developer machines to test environments to production environments without the usual configuration issues.

Removing the dependency on underlying servers lets you move to an immutable infrastructure. This comes with a lot of benefits. Teams are more productive when they don't have to troubleshoot configuration issues. And, you can more easily implement a CI/CD pipeline to automate much of the integration, testing, and deployment steps.

AWS Elastic Kubernetes Services (EKS) is a fully managed Kubernetes service that makes it easier to run containerized apps at scale. AWS Fargate is a serverless platform for EKS that removes the need to provision and manage servers.

Your Eplexity DevOps team performs the following steps to containerize your apps with Kubernetes:

1 **Assess** .NET conversion to .NET Core for compatibility.

2 **Convert** .NET to .NET Core. Address any dependencies that cannot be migrated to .NET Core.

3 **Containerize** Windows apps.

4 **Store** container images in AWS Elastic Container Registry. AWS Elastic Container Registry is fully managed, so you don't need to operate and manage the underlying infrastructure. Container images are highly available and accessible. AWS Elastic Container Registry transfers your images over HTTPs and encrypts them at rest, keeping them secure.

5 **Migrate** to AWS. You have several options when you migrate your containerized apps to AWS.

   a You can host them on a Windows OS EC2 and use EKS or run the EKS pods on AWS Fargate. Since you don't have to worry about managing servers, this option offers the least amount of operational complexity.

   b Host Windows OS EC2 using EKS. If you want more control over compute for your clusters, this is a good option.

   c Host Linux OS and use EKS to run pods on AWS Fargate. You eliminate Windows OS and maintain the least amount of management and operational complexity with this option.
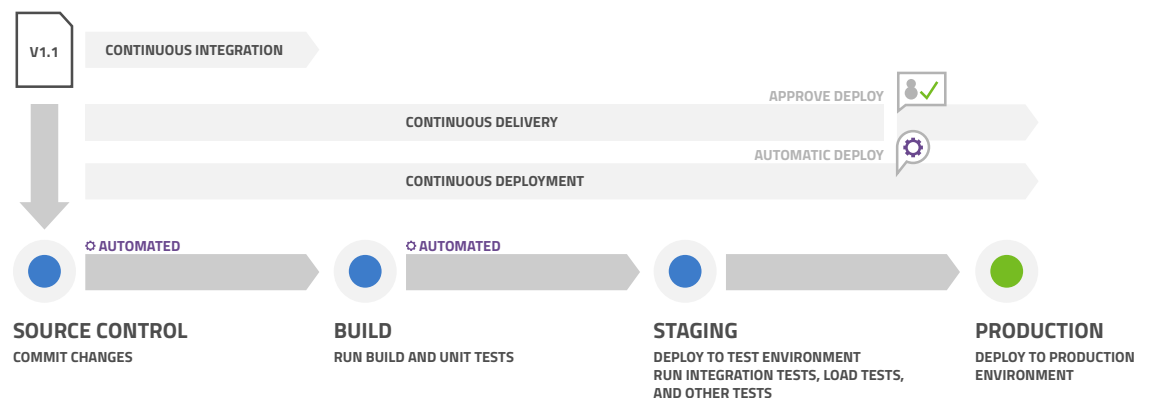
Set up CI/CD automation

CI/CD are important practices that will help you deliver code faster and more reliably. CI encourages teams to check in small code changes more frequently, so you can consistently and regularly validate changes. This drives better collaboration and higher quality code because it's easier to identify and address defects with smaller code packages.

CD provides a consistent and repeatable process for moving code through development and test environments. Ideally you automate as much as possible, including regression testing, performance testing, functionality testing, and security testing. You can even automate blue/green deployments or other deployment strategies.

Your Eplexity DevOps team performs the following steps to set up CI/CD automation:

1 **Set up your developer laptops** with Windows 10 and Visual Studio. You will also need Docker Containers and a central code repository like Github or AWS CodeCommit to check in completed code and manage versions.

2 **Set up AWS CodeBuild**, which is a fully managed build service that supports continuous integration. It compiles source code, runs tests, and produces software packages that are ready to deploy.

3 **Set up AWS CodeDeploy**, which is a fully managed service that supports continuous delivery. It automates deployments to minimize downtime.

4 **Set up triggers from AWS CodeCommit**, a fully managed source control service that hosts secure Git-based repositories, to begin the CodePipeline. Triggers send notifications or automatically run code whenever a change occurs in an AWS CodeCommit repository. CodePipeline is a fully managed continuous delivery service that helps you automate your release pipelines for fast and reliable application and infrastructure updates.

5 **Set up workflow** to include unit testing or functional testing.

V1.1 CONTINUOUS INTEGRATION

CONTINUOUS DELIVERY APPROVE DEPLOY

CONTINUOUS DEPLOYMENT AUTOMATIC DEPLOY

⟳ AUTOMATED ⟳ AUTOMATED

SOURCE CONTROL
COMMIT CHANGES

BUILD
RUN BUILD AND UNIT TESTS

STAGING
DEPLOY TO TEST ENVIRONMENT
RUN INTEGRATION TESTS, LOAD TESTS, AND OTHER TESTS

PRODUCTION
DEPLOY TO PRODUCTION ENVIRONMENT

EPLEXITY

A team you can count on

It's not over once your application patterns are deployed; you will need to continuously monitor and optimize your infrastructure to manage your costs and reduce your operational risk. The Eplexity team removes that burden with skilled AWS-certified engineers and site reliability engineering practices.

CXOS Mission Control

Once an application pattern is deployed through CXOS, Mission Control provides near real-time metric data and supports operations for each deployed pattern. You'll be able see site-reliability telemetry, security information, and simplified AWS budgets to project and optimize costs for each deployed application pattern.

You'll also receive 24/7/365 cloud managed services support from AWS-certified cloud technicians at the U.S. based Cloud Command Center (C3). Site reliability engineering ensures your deployed application patterns recover quickly from any service disruption. The team monitors utilization and automatically scales your systems up or down depending on need. They take care of security patching and OS upgrades, and you can count on Site Reliability Engineers to monitor and respond to security incidents.

CXOS DevOps Service Blocks

As you identify new initiatives and take on new projects, you can access DevOps resources to help you get them completed faster. You'll get a dedicated Service Delivery Manager to determine daily-to-weekly DevOps work requirements. Flexible contracts allow you to scale to fit your need. And SLAs give you the peace of mind that work will be completed on time.

Get a free licensing assessment

Wondering how much money you can save by modernizing your Microsoft workloads and migrating to AWS? Click the link below for a free Microsoft licensing review and evaluation of your modernization options.

GET STARTED TODAY

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CXOS