Cognia – successful migration and scalable Mendix Application on AWS

About Cognia

Cognia resulted from the merger of two nonprofit education improvement organizations, AdvancED and Measured Progress. Each institution brought to the new organization a long history of thought leadership, research, advocacy, and service to teachers, leaders, and learners. The legacy of the work of Cognia began in 1895 with the rich history of accreditation and school improvement and the role as an industry leader in assessment spanned nearly 40 years.

Today, Cognia as a global non-profit is the largest community of education professionals in the world, serving 36,000 institutions across 90 countries and supporting nearly 18 million students and 800,000 educators every day. Cognia's services include accreditation and certification, assessment, and professional services.

Scaling up and down on demand

Cognia hosts their client engagement portal in the Mendix cloud. Recently, they had a requirement to host this portal in their own public cloud account, while also leveraging the Mendix low code application development platform.

Mendix also supports public cloud providers such as AWS, in addition to Mendix Cloud. Cognia approached EPI-USE to implement Mendix for private cloud (AWS) for their application. Since the application will be deployed in Cognia's own AWS account, they will have granular control over it. At the same time, the frontend and application development platforms can continue to use the current Mendix framework.

Providing Mendix for private cloud (AWS)

Granular control over Cognia's AWS account

Development platforms using Mendix framework

> "Our usage has significant seasonal peaks with over 10,000 simultaneous users and we needed a scalable solution using the Mendix framework."
>
> Nicolas deKanter, Senior Product Manager

A successful migration and bespoke, scalable solution

To address Cognia's requirement, EPI-USE Services for AWS designed a highly-available AWS infrastructure. It had the ability to scale up resources on demand to accommodate many concurrent users, and achieve optimum performance in peak periods. The infrastructure was also designed to scale down to minimum resources automatically during low-demand periods, thus optimizing costs while improving the application's performance.

EPI-USE Services for AWS migrated the application to the AWS cloud and deployed it on the AWS-managed Kubernetes cluster, EKS. Amazon EKS is a fully-managed service that allows hosting Kubernetes on AWS while also handling the Kubernetes control plane. This simplifies the deployment, management, and scaling of containerized applications.

Instead of relying on the cluster autoscaler, using Karpenter helped improve the Cognia application availability and cluster efficiency by rapidly launching right-sized compute resources in response to changing application load. Karpenter offers more flexibility, and is well-suited for clusters with workloads that encounter periods of high, spiky demand, or have diverse compute requirements. When installed in the application cluster, Karpenter observes the aggregate resource requests of unscheduled pods and makes decisions to launch new nodes and terminate them to reduce scheduling latencies and infrastructure costs. Karpenter does this by observing events within the Kubernetes cluster and then sending commands to the underlying cloud provider's compute service, such as Amazon EC2.

Also, coupling Karpenter with horizontal pod autoscaling further improved the scaling process by deploying more pods with an increase in the workload. The Kubernetes Horizontal Pod Autoscaler automatically scales the number of pods in a deployment, replication controller, or replica set, based on that resource's CPU utilization. This helps the application to scale up to meet increased demand or scale down when resources are not needed.

To determine the appropriate infrastructure budget, EPI-USE Services for AWS conducted a load test using automated scripts to simulate actual traffic and assess the application's ability to scale up or down on demand. By analyzing the results, we determined the required resources to handle specific numbers of concurrent users, including the appropriate node type and costs for various traffic needs.

EPI-USE Services for AWS designed a solution for Cognia that achieved many benefits for the client:

- A highly-available AWS infrastructure
- The ability to scale resources on demand
- Achieving optimum performance in peak periods.

"EPI-USE Services for AWS designed a cost-effective and sustainable solution that could scale up or down quickly and efficiently, according to demand, and achieve optimum performance."

Douglas Potts, Vice President, Software Engineering

AWS Elastic Kubernetes Service (AWS EKS): Minimizing management overhead with AWS

Karpenter: Fast and efficient scaling of resources using AWS open-source technologies, along with the support of the Kubernetes Horizontal Pod Autoscaler

Terraform: Automating infrastructure deployment and Mendix configuration, reducing the need for manual intervention and ensuring a more streamlined and efficient process

AWS Migration: Mendix to AWS Migration and 24/7 support with Managed Services

The EPI-USE and Mendix Partnership

EPI-USE Rapid Application Development (RAD) specializes in crafting cutting-edge business applications that elevate the experiences of employees, clients, constituents, and vendors. Powered by our esteemed partner Mendix and their industry-leading low-code technology, we seamlessly bridge the divide between ERP systems and other enterprise technologies. Our approach prioritizes tailoring workflows to align with the unique needs of businesses, eliminating the need for process adaptation to fit technology. Through our Agile methodology, we bring together client subject matter experts and technology practitioners to nurture ideas into fully-fledged, modernized applications. Whether our mission is to empower clients to independently harness technology or enhance their capabilities to deliver solutions, EPI-USE RAD is equipped for your success.

About EPI-USE Services and AWS

EPI-USE Services for AWS offers robust and scalable hosting solutions, based on AWS. As a Next-Gen Managed Services Provider (MSP) we provide managed services and consulting services for AWS, including assessment, development, migration, management, and optimization, allowing our clients to focus on their core business. By providing a flexible cloud migration methodology, we tailor our migrations to each client's unique requirements. This allows any business to move from traditional server environments to AWS quickly and efficiently, with little to no impact on existing environments.

To learn more about how we can help your business, contact info-aws@epiuse.com or visit epiuse.com/aws-services.

groupelephant.com is a largely employee-owned group of companies, nonprofits and impact investment organizations, with a strong global presence. The Group is characterized by a primary strategic imperative in terms of which it goes 'Beyond Corporate Purpose' in its day-to-day activities.