



5 CLOUD ENABLEMENT STORIES

FROM THE ISV FRONTLINES

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Cloud as Force Multiplier

VIEW FROM THE CLOUDS

In rare quiet times, CIOs dream of a cloud-native nirvana of Everything-as-a-Service (XaaS), where automation, on-demand access, and extensibility free up IT to focus on innovation. The reality is that, for most organizations, cloud enablement is achieved one project at a time – whether it's refactoring applications, migrating from on-premise IT to public cloud or, for a majority of enterprises today, adopting a multi-cloud or hybrid cloud model.


The challenge for ISVs, however, is to design products to work within and across whatever cloud environments their clients may be using, planning or implementing. This adds time, complexity and cost across the development pipeline – unless they move workloads to the cloud providers best equipped to handle specific product requirements. Does this mean most ISVs will be going hybrid cloud? As the case studies will show, it depends...

Hybrid, Multi-cloud or All In?


By 2021, more than 90% of enterprises will adopt multi-cloud strategies.^[3] However, multi-cloud architectures add complexity. Each platform has its own rules for operations and management, making it harder to share data, optimize utilization and reduce costs without investing in a cloud management system (CMS). A traditional hybrid framework with standardized policies and strong interconnectivity could bridge the gaps, but it requires a complex, constantly changing map of APIs and custom integrations.

Modern Hybrid Cloud


Instead of connecting multiple computing environments, modern teams are abstracting applications into containers and microservices, creating an interconnected, OS-consistent environment where apps can be moved from one environment to another – and DevOps can take the lead in achieving cloud-native speeds and extensibility.



Multi-cloud allows an organization to run all its workloads on different clouds (38% in public and 41% in private clouds) using different providers.^[1]



Hybrid cloud enables operators to leverage a mix of on-premises systems (or private clouds) and public cloud services, with some form of integration or orchestration between them. ^[1]



98% of businesses will switch to the multiple-hybrid cloud by 2021. ^[2]



CLOUD SCENARIOS FROM THE REAL WORLD

One way of assessing cloud-enabling tools and technologies is by examining a variety of approaches and configurations – from cloud adoption, to hybrid cloud, to cloud-native development and containerization.

I. Cloud Migration of Hosted Compliance Solution Using Partial Refactoring and Azure

A leader in Food and Quality Assurance (FSQA) Management Solutions had relied on a multi-tenant legacy application hosted by Windstream. But, as the volume of business increased, they experienced performance, scalability and deployment issues. They urgently needed the modernization power and agility of the cloud, but they also needed configuration-level changes to retain the equivalent of on-premise procedures, such as backups, security checks and patches. At the same time, they needed to educate and prepare a customer base that did not welcome change, so they had to move quickly.

SOLUTION

- Re-architected the application for the cloud and migrated its components and data from Windstream (hosted solution) to Azure (cloud) to maximize scalability
- Used Azure's BizTalk services, blob storage and perpetual licenses reduced costs
- Re-designed workflows to benefit from Azure Cloud Services such as Azure Storage, Cloud services, CDN, Azure SQL etc.
- Performed Web and App Services VM migration by Lift and Shift

RESULT

- Reduced production downtime with Azure's monitoring tools
- Reduced licensing and infrastructure maintenance costs by 50%
- Achieved 80% growth in recurring revenue over 12 months
- Improved supply chain efficiencies by 25%
- Increased customer base by 20%
- Increased customer satisfaction by 2X

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II. Legacy Desktop-Based Software Transformation to SaaS Platform with Hybrid Cloud Enablement Using AWS

This mortgage origination giant works with thousands of lenders, processing 50,000-plus loan applications every month. Their desktop-based Loan Origination Application relied on a client server architecture, which prevented important data like quotes, credit score checks, etc. from being delivered until the next day. The result was revenue loss and poor customer satisfaction. In addition to these stressors, they had scalability and maintenance issues, and an 'unfriendly' user interface.

SOLUTION

- Re-architected the desktop application into a web-based SaaS application; implemented new front and back-end modules
- Built web services APIs that allowed multiple client apps to leverage back-end loan processing information
- Incorporated proper encryption and security access controls
- Integrated existing functionality with UI and AngularJS to make code base more efficient and maintainable

RESULT

- Achieved seamless scalability on AWS through partial cloud refactoring
- Improved monitoring with AWS services resulted in 65% reduction in MTTR for incidents
- Ensured seamless data movement between on-premise and on cloud through hybrid cloud deployment for cloud enablement
- Enabled lenders, service providers, and ISVs to easily build their custom loan applications and deploy on cloud
- Accelerated mortgage processing speed while reducing costs by improving collaboration and visibility across various stakeholders Xoriant

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III. Cloud-Native Infrastructure Development with a Scalable, Serverless AWS-Based Architecture

A provider of a real-time, deep learning platform for network threat protection had a tall order. They needed a cloud-native, SaaS-driven infrastructure to streamline tenant provisioning via a data pipeline capable of handling 65GB+ data per tenant/per day, 7PB+ per year. Additionally, they needed a cost-effective, cloud-based, multitenant data acquisition mechanism that could scale to handle thousands of network traffic messages per second, and a reporting dashboard that could capture and display the data in near real-time, enabling security teams to analyze threats and take immediate action.

SOLUTION

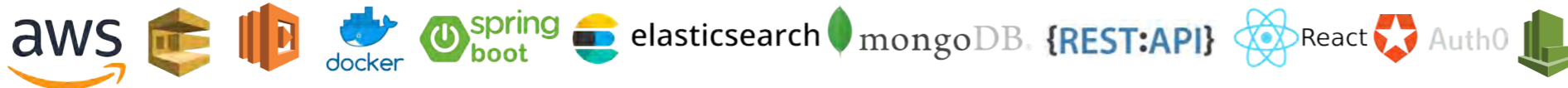
As part of solution architecture, the platform was broken down into multiple functional and non-functional areas. This modular approach enabled scalability, resilience and security by providing multiple availability zones with building blocks such as data ingestion, processing, query and storage layers with AWS Managed Services.

- Leveraged AWS services and technology stacks as best fit for this architecture
- Used DevOps for easy, automated deployment environments for QA, demos, pilots, etc.
- Streamlined provisioning for both shared and dedicated deployments using Terraform and Ansible
- Configured O365 and multi-tenancy support for real-time analysis of emails
- Implemented SQS and Lambda-based server-less implementation for robust and scalable message handling of network threat data
- Provided MongoDB Shards (EC2 based across AZ) as single source of truth and Managed Elasticsearch for storing aggregated data for querying
- Created real-time dashboards with ReactJS and report generation with AWS Managed Elasticsearch Services

RESULT

- Reduced infrastructure costs by 70% using multi-tenant provision with isolation at both logical and physical levels using shared MongoDB and Elasticsearch cluster
- Minimized Total Cost of Ownership (TCO) using serverless methods, coupled with AWS Managed Services such as Lambda and SQS
- Simple interface for users to take preventive actions to suppress threat progression
- End-to-end query latency of less than 5 seconds
- Accelerated customer base growth and onboarding with user-friendly UI on both shared and dedicated deployments

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IV. Containerization for High-Performing, Autoscaling Architecture Using Kubernetes

This leading financial services software company provides an automated, SaaS-based, ads-impression reconciliation platform for the digital advertising industry, handling 1.2 million records/day across 23 countries. However, legacy technology was preventing the system from scaling to handle record surges – severely impeding invoice generation and revenues.

SOLUTION

Docker and Kubernetes orchestration were employed to redesign the existing microservices architecture (NodeJS, EC2 VM and SQS queue) to provide the required autoscaling capabilities, as follows:

- Created docker images of each NodeJS microservice
- Deployed all microservices inside docker container
- Set up a Kubernetes cluster with master and worker nodes
- Set up elastic load balancer (ELB) for Kubernetes nodes
- All incoming requests come via Kubernetes worker node's ELB. Based on requests, K8s will scale the respective Pods (Horizontal Pod Autoscaler) up or down
- If there is no vacant place to deploy the Pod in K8s cluster, master node will send signal to AWS for autoscale up the EC2 instances according to auto scaling group
- If number of service requests goes down and sufficient memory is available in K8s cluster, master node will send signal to AWS for auto scale down the EC2 instances

RESULT

- 88% reduction in overall reconciliation processing time
- 80% reduction in Single REST API call response time
- 77% cost savings in AWS EC2 instances with decreased total deployment cost
- Replaced manual analysis with automated reporting
- Improved productivity with significant cost savings and benefits

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V. Containerization for Rapid Deployment Using Docker

This study is about a global leader in mobile interconnection and consumer engagement services and cloud service group of a Fortune 100 company. The chief architect had re-designed the primary application architecture, but needed help building containers and microservices to package the main components for cloud hosting, and to accelerate deployment of constantly changing scalability and functionality requirements.

SOLUTION

- Designed a new architecture employing 14 app-specific microservices and Docker EE (15+ containers) for faster startup and increased agility
- Created two layers of microservices – one for the Gateway and the other for Business Logic -- ensuring seamless integration of the application with Kafka, MongoDB Docker containers
- Developed front end web application as UI microservices, with Keycloak and LDAP role-based access management and dockerized Kafka on both UI and service layers

RESULT

- Accelerated deployment and configuration of cloud services
- Cloud-ready for future migration initiatives
- Improved process efficiency with microservices architecture
- Achieved rapid deployment and scalability goals

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CLOUD AS FORCE MULTIPLIER

The full value of cloud comes when you approach every cloud enablement project as part of a holistic strategy – developed and customized to meet your unique goals. Whether that entails standardization and automation through an open API model, agile development of cloud-native applications, or next-gen technologies to drive competitive advantage, the ever-expanding cloud universe can act as a force multiplier. May the force be with you!

References:

1. TechJury
2. Netgain
3. TechTarget



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