

CASE STUDY

CODELATTICE MASTER PILOT

Seamless Disaster Recovery leveraging AWS Cloud



We are managing AWS for one of the largest Low-Cost Airlines in the Middle East and North Africa. They fly over 170 destinations with 56 aircraft. They offer reliability and value for money for air travel across their network in 50 countries. The priority is to provide the best possible connections to the passengers at suitable timings. The airline carries more than 12 million passengers yearly, which is approximately 23 tickets per minute.

The Problem Statement

The Airlines website is the company's primary entry point to its e-commerce. It is used by millions of visitors every year to reserve flights and checks flight status information. Because of the critical nature of the site, the airline needs to ensure high uptime. They have a setup of 6 servers to cater to the normal traffic managed by the elastic load balancer. They approached Codelattice for their Server maintenance and Disaster Recovery (DR) to ensure business continuity.

On-Premise to Cloud & Cross Region Disaster Recovery

Due to common hardware and software failures, human errors, and natural phenomena, disasters are inevitable, but IT infrastructure loss shouldn't be. Codelattice provided a DR solution leveraging AWS Cloud infrastructure managed from multiple availability zones with cross-region backups. The solution devised included Multi-zone standby servers in AWS, AMI backup of each instance and Multi-zone RDS instances. Backup of application & database is routed to S3 buckets. There is a setup of On-Premise DR backup AWS instances and DB.

Multi-zone standbys - Active-Active Configuration

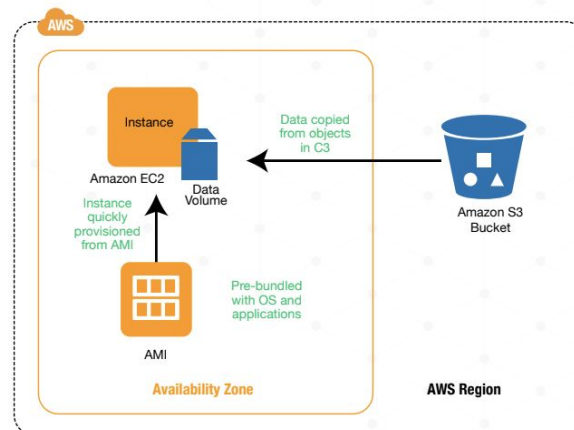
The airline's website is very critical for the company to ensure their business continuity. A multi-site solution is configured in AWS as well as on the existing on-site infrastructure, in an active-active configuration. When a resource becomes unavailable, the DNS Route 53 can detect that it's unhealthy and stop including it when responding to queries. Exploited the weighted routing mechanism in Route 53 to route production traffic to different sites that deliver the same application or service. In an on-site disaster situation, the DNS weighting can be adjusted and send all traffic to the AWS servers. To reduce the cost further, we maintained an active backup in the DR region with minimal server configuration which scales up automatically during any downtime in the main site. It takes less than 20 minutes for the DR region to be fully functional and capable of handling the full load.

Backup & Restore - Multi-tier Backups

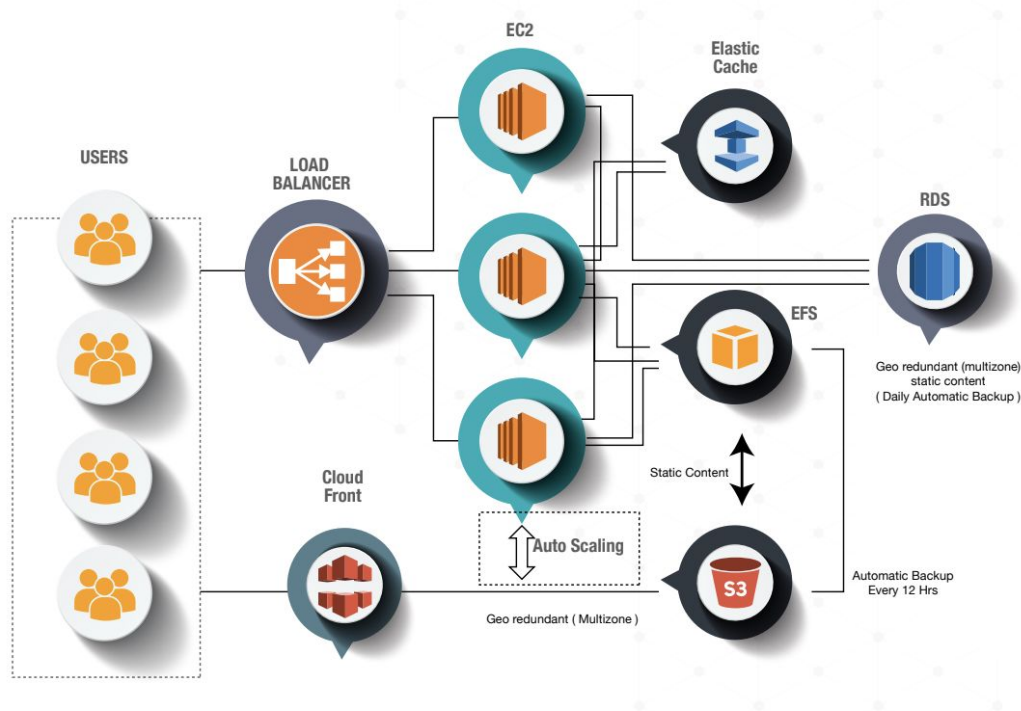
While Amazon RDS provides a highly available Multi-AZ configuration, it can't protect from every possibility, such as a natural disaster, a malicious actor, or logical corruption of a database. To maintain business continuity, it is important to design and test a DR plan. The Solution devised runs automated periodic incremental backups to S3 buckets with retention policy for a set number of days. The applications are stored in a redundant network file system - Amazon EFS. The application snapshot is configured as Amazon Machine Image (AMI) and stored in S3 buckets. AWS Storage Gateway is used to enable snapshots of on-premises data volumes to transparently copy into Amazon S3.

Recovery Process

Backup process of Application and DB into S3 buckets



Solution Architecture



DevOps & Deployment

CI/CD Pipeline - Automate & Deploy

Codelattice provisioned CI/CD pipeline for the application resources in a safe, repeatable manner, allowing the developers to build and rebuild their infrastructure and applications, without having to perform manual actions or write custom scripts. The DevOps solution adopted by Codelattice takes care of determining the right operations to perform when managing your stack, orchestrating them in the most efficient way, and rolls back changes automatically if errors are detected.

Infrastructure as Code - Create reproducible infrastructure

Codifying your infrastructure allows you to treat your infrastructure as just code. The details of the infrastructure are codified into a configuration file. The configuration files allow the infrastructure to be elastically created, modified and destroyed. This provides a single source of truth for all your resources and helps you to standardize infrastructure components used across your organization,

enabling configuration compliance and faster troubleshooting. The database infrastructure was codified with Terraforms. AWS CloudFormation is used for one-click network and vpc configuration. Infrastructure as code gives you the luxury of version-controlling the network, and it allows for seamless network duplication for on-demand development and staging environments.

Codelattice AWS Crew

Codelattice is a born cloud company established in 2009. The team has extensive experience in implementing and managing cloud solutions. They have undertaken several mission-critical projects with a proven track record. Codelattice engineers are AWS certified and located in different geographical time zones. This makes round the clock support more effective.

Watch over and Guard

Optimize and Monitor using AWS Cloud Watch

Codelattice employed AWS CloudWatch to provide data and actionable insights to monitor applications, respond to system-wide performance changes, optimize resource utilization, and get a unified view of operational health. Amazon CloudWatch Events detect and react to changes for AWS Health. Then, based on the rules created, CloudWatch Events invokes one or more target actions. Depending on the type of event, it captures information and notifies the DevOps engineers to take the required action.

The Maintenance Imperative

Preemptive maintenance checklist is followed religiously to ensure the AWS resource availability and performance. Here is a glimpse -

EC2 Daily Checks	RDS Daily Checks
Disc Usage check	Disc usage check
CPU Utilization History	CPU Utilization History
Memory Utilization History	Memory Utilization History
Check Network status	Database Connections
Check All Services	Backup File Checks
Backup File Checks	
Check and Clear the logs	
Check EFS File system	
Check Elastic Beanstalk	
EC2 Weekly Checks	RDS Weekly Checks
Remove old/unwanted backups	Remove old/unwanted backups
Check Backup Tasks in Task Scheduler	Check Backup Tasks in Task Scheduler

Mock Drills

Mock drills are conducted once in a month to check the reaction of the server and the team. If at any point, a discrepancy is noted during the process, the remedies are taken quickly. Proactive drills have helped to patch several security vulnerabilities and optimize resource utilization.

Seamless Disaster Recovery

Leveraging AWS, Codelattice built a much reliable and faster Disaster Recovery solution. While the standby servers in different regions ensure business continuity, the impacted server recovery happens in less than 20 minutes (RTO). This is a remarkable achievement in terms of resilience and business continuity. The Codelattice solution ensured a 99.9% uptime, reliability, scalability, and flexibility without significantly increasing the costs. Also, we are able to maintain the application server as stateless as possible without any local storage. So far the solution has stood the test of time.

Thank You

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Codelattice is a technology solution provider established in 2009. We are a team of 200+ technocrats spanning across 8 countries. We help our clients to Activate, Elevate and Accelerate their endeavours. Guided by a decade of experience, Codelattice offers customizable Digital Solutions, off the shelf Software Products and bespoke IT Services. By partnering with industry pioneers such as Google Cloud, GoDaddy & AWS we provide the imperative digital edge.

We Make You Digitally Immortal[®]