

# 'A Journey To The Cloud': How ACC helped RBL Bank extend their data center to the AWS cloud

## Summary

RBL Bank in its vision to become a dominant force in the Banking and Financial Services sector knew data-driven decisions are not just critical but they are the future. They understood how data can grow exponentially and infrastructure to support this growth can be cost-effectively procured on the public cloud. Equipped with this knowledge, they embarked on a journey to the AWS Cloud.

## About RBL Bank

RBL Bank is one of India's fastest growing private sector banks with an expanding presence across the country. The Bank offers specialized services under six business verticals namely: Corporate & Institutional Banking, Commercial Banking, Branch & Business Banking, Retail Assets and Treasury and Financial Markets Operations. It currently services over 9.63 million customers through a network of 429 branches; 1,365 business correspondent branches (of which 260 banking outlets) and 412 ATMs spread across 28 Indian states and Union Territories.

## Challenge

RBL Bank's objective was to create an extension of their existing data center to move their Microsoft Workloads to the cloud. The challenges they were facing with an on-premises data center were:

1. Inability to scale with demand. They wanted to be able to scale with demand without having to worry managing the infrastructure. The applications that were initially short listed were expected to grow and needed upgraded infrastructure to support that growth. Scalability was a challenge RBL Bank faced with their existing infrastructure
2. Inability to quickly deploy infrastructure when needed. Quick turnaround time was very important for RBL Bank's future plans and that was something they struggled with at their data center.
3. Cost was at the center of their decisions and they wanted to be able to scale with demand yet keep the costs of scalability down.
4. Enhanced security for the existing as well as new applications but with much lesser infrastructure complexity. With growing security concerns, RBL Bank wanted to ensure their valuable enterprise information is not vulnerable to security risks.
5. Quick recovery from failures. Downtimes faced in the existing infrastructure at RBL Bank's on-premise data center took longer to recover. Identifying and analyzing the problem and then fixing it needed to be done much faster. Being a crucial business objective in terms of cost and loss of data, this challenge had to be addressed as a priority.

## **Why AWS and Why ACC?**

Initial analysis of the migration challenge, led RBL Bank to identify workloads that mostly had open-source components. After researching various public cloud providers, RBL Bank's management knew, for open-source workloads, AWS is the right cloud platform.

ACC had several successful migrations from the Banking and Financial Services sector under its belt. Being an AWS Financial Services Competency partner, ACC became a preferred choice of recommendation from AWS as well.

RBL Bank knew they were in good hands. It was a no-brainer decision for them to join hands with ACC and this decision continues to serve them well.

## **Solution**

At first, we did a Migration Readiness Assessment to review RBL Bank's readiness from AWS Cloud Adoption Framework's perspective. This assessment gave a clear picture on what to migrate as well as justified a business case and the total cost of ownership (TCO) for migration. This report along with architectural designs and decisions were shared with RBL Bank. Next, was to identify the applications and its risks and pre-requisites. Results from interviews with application owners and relevant stakeholders along with existing application documentation and were used for application discovery. Network traffic monitoring scripts were used to identify dependencies and traffic sources and destinations. AWS Direct Connect setup, License evaluation, Application and Security Team approval, CloudEndure installation and the core team formation followed next.

A total of 40 applications were identified for migration. A solution was designed and was to be implemented in two phases. Phase one or the Mobilize phase was 10 applications migrated in 10 days and depending on this success, Phase Two or the Migration phase, was to migrate the remaining 30 applications in 30 days. This was to ensure productivity and quality of work, meet business challenges and mitigate risks of project failing. This solution offered seamless migration of RBL Bank's Microsoft Workloads to the AWS Cloud.

In Phase one of the solution, 10 applications of various migration complexities were migrated to the AWS Cloud. This meant a total of 39 servers in the web, application and database tiers spread across RBL Bank's UAT and PROD accounts. In both UAT and PROD, for application servers, CloudEndure was leveraged. For database servers, we majorly used AWS Database Migration Service (DMS). In some cases where DMS could not be leveraged, a manual migration was done. A total of 28 web and application servers, of which 70% followed the Rehost (lift-and-shift) migration strategy while the remaining 30% of the servers were migrated using the Replatform (lift-tinker-and-shift) migration strategy. Similarly, 100% of the 11 database servers were migrated using the Replatform migration strategy where they were moved from Microsoft SQL Server 2008 R2 Standard to Microsoft SQL Server 2016.

With the help of the AWS Landing Zone, RBL Bank had already got separate AWS accounts for development, testing and production environments. We leveraged the AWS Identity and Access Management (IAM) service and created groups, users, roles and policies granting only the required least privileges in accordance with AWS' Security best practices. Additionally, AWS CloudTrail was enabled for governance, compliance and auditing of the AWS accounts.

RBL Bank's Microsoft Workloads migration was achieved through a CloudEndure setup. We ensured their network architecture on the AWS cloud had the same micro segmentation as their data center. To address their challenges of quick recovery from downtimes and enhanced security, we distributed the architecture across multiple availability zones as well as placed all of the critical resources in private subnets with no access to the public Internet. Internal Load Balancers were used for resources in the private subnet. Internet-facing applications were placed behind an Internet-facing Load Balancer that was equipped with a TLS 1.2 encrypted SSL certificate, managed by the AWS Certificate Manager. For Disaster Recovery, an active environment in a standby state was created and hosted in a separated availability zone. DR drills were planned and conducted to test business continuity.

AWS Auto Scaling was used for some applications to ensure the underlying resources scale effortlessly with demand and without the hassle of having to manage the hardware. This AWS service tackled RBL Bank's challenge of scalability and quick turnaround time in infrastructure deployment. Downtimes and cutover varied depending on the applications. 70% of the applications were in use during office hours so downtimes were planned at night. For databases that needed to be online most of the time, a Flash-cut migration was planned. After schema conversion, data replication using AWS DMS, source and target databases were synced and kept ready for a seamless DNS switch. A one hour downtime was needed and this ensured the database came back online quickly.

Phase one was completed in 10 days and this early success was a good enough indicator for RBL Bank to authorize us to move ahead with phase two or the Migration phase. Phase two was the migration of 30 applications, both critical and non critical in 30 days. This was a total of 98 servers in the web, application and database tiers spread across RBL Bank's UAT and PROD accounts. All of 64 web and application servers were migrated using the Rehost (lift-and-shift) migration strategy. From the total 34 database servers, 75% followed the Rehost migration strategy while the remaining 25% of the database servers were migrated using the Replatform migration strategy. With this, phase two and RBL Bank's migration to the AWS cloud was completed seamlessly as well as on schedule.

## **Service Used**

Several AWS services were used in this successful migration. AWS Schema Conversion Tool, AWS IAM, AWS CloudTrail, Amazon VPC, AWS Certificate Manager, Elastic Load Balancing, AWS Auto Scaling were some of the services used. However, CloudEndure, AWS Database Migration Service, Amazon RDS and Amazon EC2 stood as the heroes of this mission.

## **Timeline**

Phase one of the project started on 15<sup>th</sup> July 2019 and completed on 25<sup>th</sup> July 2019. Phase two of the project started on 15<sup>th</sup> Sep 2019 and completed on 15<sup>th</sup> Oct 2019

## **Results and Benefits**

This migration not only proved to RBL Bank that an on-premise data center can be seamlessly integrated into the AWS Cloud but also addressed every challenge they had with their existing infrastructure. Virtual machines, mission critical applications, open-source applications and Active Directory were sent to the AWS cloud to accomplish the goal of RBL Bank's 'data center extension.'

Our solution ensured that RBL Bank got scalability and ease of infrastructure deployment. Procurement cycle time of 6-8 week was reduced down to minutes and hours.

Cost being an important metric was optimized with the pay-as-you-go model on the AWS Cloud. Our on-going support to RBL Bank ensures that they are always on the right pricing plan, their storage costs are minimized as well as their resources are right-sized for maximum utilization. RBL Bank was aware of the cost associated with physical space, electricity and maintenance of their on-premises Data Center. They did not have a mechanism to accurately allocate, rent, electricity and manpower cost workload wise hence we could not quantify the savings. However, due to automations and the reliability of AWS hardware, RBL Bank could reduce the cost of manpower needed to support the infrastructure.

Finally a disaster recovery drill was planned to test failover and to ensure that RBL Bank's architecture is fault tolerant. An RTO of 2 hours and an RPO of 12 hours were met as per RBL Bank's business objective.

## **About ACC**

Applied Cloud Computing (ACC) is an advanced AWS consulting partner. ACC accelerates end-to-end cloud adoption with the best implementation services, software and processes available. ACC's comprehensive framework for cloud adoption and dedicated software development capabilities help clients achieve business results faster, no matter where they are in their cloud transformation.