Data Center and Disaster Recovery on AWS

CASE STUDY

Tata Steel Utilities and Infrastructure Limited

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About Tata Steel Utilities and Infrastructure Services Limited

Tata Steel Utilities and Infrastructure Services Limited (Formerly, Jamshedpur Utilities and Services Company Limited - JUSCO) is India's only comprehensive urban infrastructure service provider. The company was carved out of Tata Steel, from its Town Services Division in 2004.

JUSCO, a Tata Enterprise has five areas of business - Engineering Procurement and Construction, Power Service Division, Integrated Township Management, Operation & Maintenance, and Real Estate. JUSCO's footprint at present is widely spread across 5 states in India.

Executive Summary

JUSCO has a mix of SAP Application ECC 6.0, IS-Utilities (IS-U) running on Windows 2008 OS with Oracle database and non-SAP Application Vidushi running on Windows OS with MS SQL DB setup in their data centre within their manufacturing facility. Both SAP ECC IS-U and Vidushi Application Infrastructures were reaching technological obsolescence. To meet their Business needs, JUSCO was planning a revamp of its supporting infrastructure for the SAP and non-SAP applications.

JUSCO wanted to explore and evaluate the cloud Infrastructure option, for hosting its SAP workload, take advantage of the robust, highly scalable, agile benefits and minimize the Infra management burden. For business continuity, the SAP application and the business processes it supports, should remain available and accessible without any interruption, despite man-made or natural disasters. It should serve its intended function seamlessly.

Challenges with On-Premises Hosting Solution

Frequent power shutdown which affects their production system.	Presence of only tape backups and in case of any failure, the restoration time can be long.	Limitations on users - collaboration, connectivity, and accessibility.
Data Security concerns and ambiguity around who is responsible for Data security.	High CAPEX in setting up additional hardware for business expansions and growth.	

Solution Proposed

After exploring all the available options, JUSCO chose Sify Technologies Limited (Sify) as its partner to implement Cloud solution for entire DC-DR Infrastructure and provide managed services for the implemented Infrastructure.
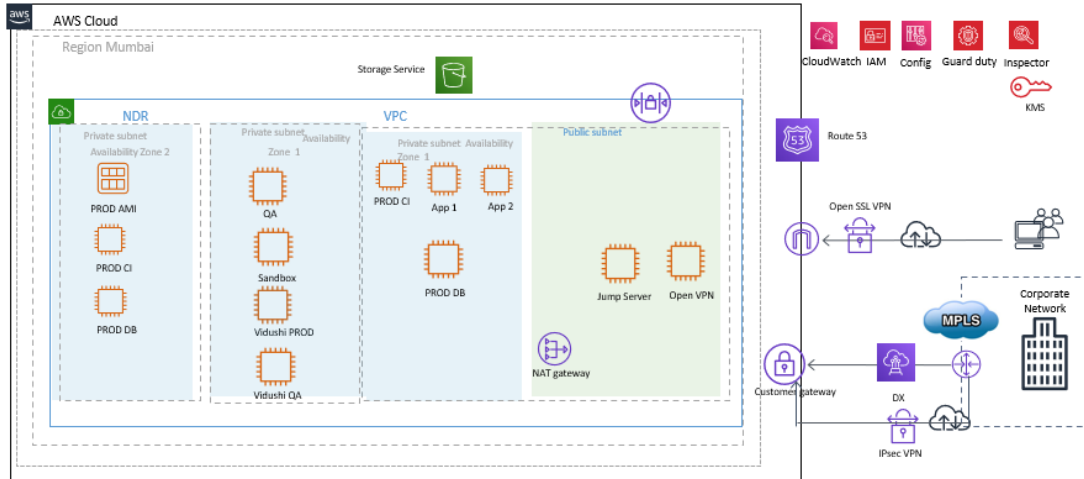
Sify had proposed to setup the entire DC and DR (in different Availability zone) on AWS cloud for their SAP landscape setup with low OpEx instead of CapEx. JUSCO's internal team has performed migration from on-premises source SAP landscape (ECC ISU on Windows 2008 OS with Oracle 10.2.2 DB) to AWS cloud target landscape (ECC 6.0 on Oracle Linux with Oracle 12c DB) with the technical assistance from Sify's experienced team.

AWS services used to setup entire DC-DR solution on AWS

Oracle 12c database on Amazon EC2 instance with SUSE Linux OS.	Amazon Elastic Block Store volumes used for EC2 storage for both application servers and database servers.	Amazon VPC configured with different private subnets for provisioning the Production environment, Dev., Quality & Sandbox environment, non-SAP systems environment, and DR environment.	Jump server, Open VPN and NAT Gateway hosted on the public subnet in the configured Amazon VPC. Whereas all the application and database servers hosted in private subnet.
AWS-DX circuit link built on L3 MPLS technology (Full Mesh topology) configured under existing MPLS VRF to enable direct seamless access to AWS Cloud from JUSCO HO & branch offices.	Users access to the servers using MPLS, Direct Connect and Open VPN.		DR setup configured in AWS with another AZ for SAP application along with Database.

SAP Applications

- ECC IS-U on Oracle Linux OS and Oracle DB.

Solution Description

Prepared necessary Landing zone to provision and deploy workloads. SAP Application platform launched in the AWS Asia-Pacific (Mumbai Region)	VPC CIDR range creation as given by JUSCO network team to ensure it does not have IP conflict.	Subnets NACLs and Security groups creation with only required PORTs (Incoming/Outgoing) permitted.	NAT gateway (single AZ) creation in Public Subnet which allow private subnet resources to initiate outbound traffic.
Jump server host creation on public subnet with Windows O/S if required for admin tasks.	S3 buckets creation to store static contents – as per need from SAP application.	DR setup configured in AWS with another AZ for SAP application along with database.	Complete setup of SAP Landscape on AWS platform in the SAP certified EC2 instances.
On completion of the setup, they are set in as RI mode.	The database replication between DC and DR is executed by native tool - Oracle data guard.	Application server's replication configured with native replication tool.	All monitoring activities performed using Enterprise tools like CA & ServiceNow.
CloudWatch monitoring enablement, alerts integration with SNS and enabling CW logs for details analysis.			

Security Considerations

Entire setup configured using private subnet and environments isolated with security groups naming convention & Tagging.	Subnets NACLs & Security groups implemented to restrict on certain ports between the servers.	Access to the AWS Infrastructure restricted to the specific IP's.	AWS Multi-Factor Authentication for privileged accounts, including options for hardware-based authenticators.
Using IAM, users and group restricted to access specific AWS resources as per the requirement.	The connectivity to the AWS Cloud is dedicated, private, and secured with stringent SLA.	CloudTrail enablement & store in specific S3 bucket with logs enabling & restricted access policy.	

Automations Implemented

Daily snapshots lifecycle automation and latest AMI build/create, maintain for restoration and new image creation (snapshot timings as given by ISWPL).	Auto-Scaling enabled to adjust compute resources automatically which optimize availability, cost, and maintain performance of applications hosted in AWS.	Ensure that environment is available during agreed hours, only using the scripts.
During DR failover, starting servers are automated using scripts.	Daily snapshot of the volumes & latest AMIs back-up lifecycle automation & sanity check.	

Cost Optimization

Server will be kept as On-Demand and 1 year no upfront RI. Dev, QA and Sandbox to be provisioned as On-Demand mode.	To ensure cost optimization of all Amazon EC2 Instances, Sify has automated to start/stop Amazon EC2 Instances by implementing scripts and Amazon EC2 Instances are resized based on the requirement.	Kept the DR servers in shutdown all the time. It will be switched on only in case of DR fail over. Hence, giving huge cost benefit to JUSCO since there are no active servers running during normal DC operation.

Project Timelines

- The project implementation of the entire DC & DR Infra on cloud took 3.5 months.

Customer Benefits

The standard SLA of EC2 instance is 99.5% and >95% of availability and uptime assurance for Managed Services.	Reliable connectivity in the form of client VPN during the DC operation.	Achieved more robust operational and performance excellence along with reduction in TCO.
Customer has a reliable DR solution in case of any failure in primary DC AZ.	They were able to achieve 2 hours of RTO and 15 mins RPO with lower cost.	

Customer Feedback

"Sify's customer- focused team helped us in achieving our cloud adoption strategy by moving SAP ECC IS-Utilities workload on to cloud with seamless DC-DR replication that exceeded our expectations in enabling the AWS Cloud solution with comprehensive Managed Services.

We thank Sify for all its right advisory and consultative approach at every step of this cloud transformation journey."

- Mr. Arun Mishra
Chief Manager – IT,
Tata Steel Utilities and Infrastructure Limited
(Formerly JUSCO)