Strengthening Cloud Operations and Email Reliability

Overview

Crystal Crops (Modern Papers and Nexus Crop Science Pvt Ltd.) is one of the market leaders in India's agrochemical sector, specializing in the manufacturing, formulation, and distribution of a wide range of products including insecticides, fungicides, and herbicides. With decades of experience, the company has built a reputation for quality and innovation. Their reliance on technology to manage manufacturing, supply chain, and marketing operations means that the stability, security, and efficiency of their IT infrastructure are fundamental to their continued success and market leadership.

Challenges

Crystal Crops's existing AWS infrastructure was facing several critical issues that exposed the business to operational risks, security vulnerabilities, and unnecessary costs.

Lack of Proactive Monitoring

The environment lacked a continuous monitoring solution. System issues were only discovered reactively, typically after a service had failed and impacted users, leading to extended downtime and disruption to business processes.

Deployment and Security Hurdles

An issue with EBS volume encryption prevented the successful launch of new servers from existing Amazon Machine Images (AMIs). This blocked deployments and updates. Concurrently, a lack of a consistent patch management process left servers vulnerable to known security exploits.

Application Performance Bottlenecks

The email functionality within their applications was unreliable and slow, likely due to default service limits on mail-sending capabilities from EC2, which hampered business communication and workflow automation.

No Automated Backup Policy

Critical business systems running on Amazon EC2 instances were not being backed up in a systematic or automated manner. This created a significant risk of data loss in the event of accidental deletion, hardware failure, or a security incident.

### Sub-Optimal Resource Utilization

A review of the server fleet indicated that many EC2 instances were not optimized for their workloads. This over-provisioning resulted in performance that was adequate but incurred significantly higher costs than necessary.

Proud to be part of.

Solution Proposed

A multi-faceted solution was implemented to create a more secure, resilient, and cost-effective infrastructure.

- **Continuous Monitoring and Alerting:** AWS CloudWatch was configured to provide comprehensive, real-time monitoring of all critical EC2 instances. Custom dashboards were created to visualize key performance metrics (CPU, Memory, Disk I/O). CloudWatch Alarms were set up to proactively send notifications via Amazon SNS to the operations team whenever performance thresholds were breached, enabling a proactive response to potential issues.

- **Automated Backup and Recovery:** An automated backup plan was configured for all critical EC2 instances. This involved creating scheduled snapshots of the attached EBS volumes and ensuring they were stored within the same region for rapid recovery.

- **Security and Compliance Enhancement:** AWS CloudTrail enabled across the account to log all API activity, creating a detailed audit trail for security analysis and compliance verification. To resolve the EBS encryption issue, a technical workaround was performed: the encrypted volume was detached, a new unencrypted was created from it, and a new AMI was generated, successfully unblocking the deployment pipeline.

- **Server Rightsizing:** An analysis was conducted using performance data from CloudWatch to identify over-provisioned EC2 instances. A detailed report was provided to Crystal Crops with specific recommendations for right-sizing each server to a more appropriate instance type, balancing performance with cost.

- **Email Service Optimization:** The mail-sending limitations were addressed by increasing the message-per-second limit for the account, which involved coordinating a service limit increase request with AWS support to ensure reliable email delivery for their applications.

Architectural Layout
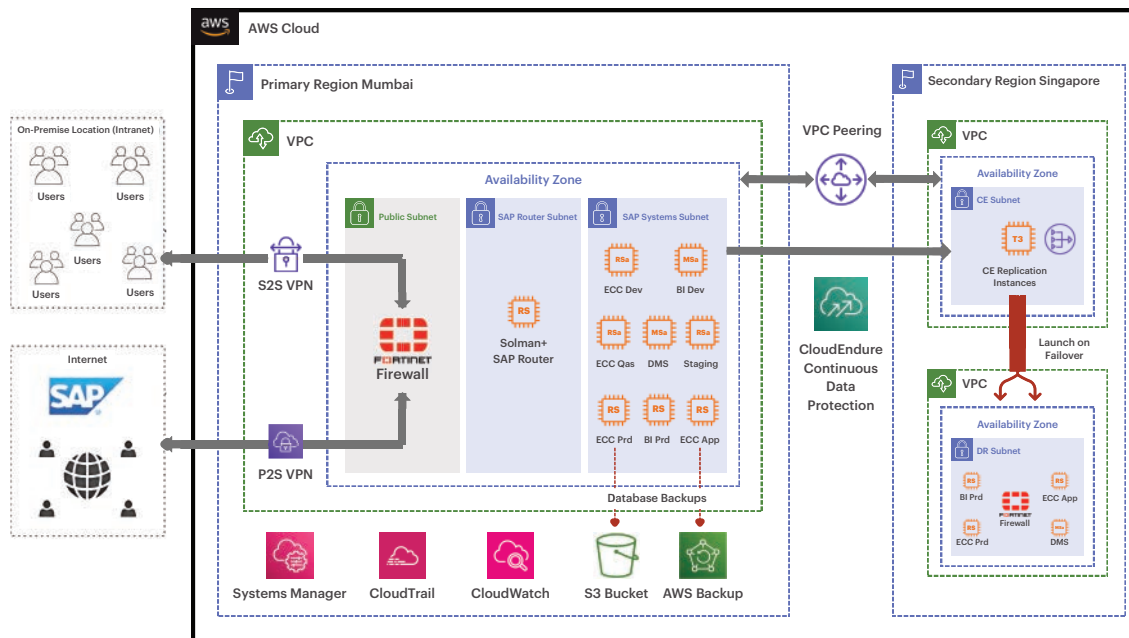
Tech Stack

KMS   S3 Bucket   CloudWatch   CloudTrail   Systems Manager   AWS Backup

Proud to be part of.

Business Impact

The strategic improvements to the AWS environment resulted in a more robust and efficient platform that directly supports Crystal Crops's business objectives.

Improved Operational Resilience

The implementation of automated backups and proactive CloudWatch alarms drastically reduced the risk of data loss and minimized the Mean Time To Resolution (MTTR) for system issues, leading to higher availability of core business applications.

Enhanced Security and Compliance

With CloudTrail providing a complete audit log and a clear path forward for patch management, Crystal Crops's security posture was significantly improved. Resolving the EBS encryption issue has also strengthened data handling protocols.

Cost Optimization

The server optimization recommendations provided a clear roadmap for reducing infrastructure costs without compromising performance, allowing for the reallocation of budget to other strategic initiatives.

Increased Performance and Visibility

Right-sized instances and resolved email bottlenecks led to better application performance. The CloudWatch dashboards provided Crystal Crops with unprecedented visibility into the health and usage of their infrastructure.

Founded in 1975, Motherson Group is an industry leader and one of the world's largest manufacturers of components for ther automotive and transport industries. The group's diversified portfolio makes it a complete solutions provider across the globe. Motherson Group serves its customers with a wide array of products and services through multiple business divisions including wiring harness, vision systems, modules and polymer, technology & software, aerospace, health & medical, logistics, retail and metal products. Motherson Technology Services is a global technology company that offers a consulting-led approach with an integrated portfolio of industry leading solutions that encompass the entire enterprise value chain. Our technology-driven products and services are built on two decades of innovation, with a future focused management philosophy, a strong culture of invention and co-innovation, and a relentless focus on customer-centricity. A CMMI Level 5 company, we have delivered best-in-class services to 430+ clients in 43+ global locations across all continents. We are a business division of Motherson Group, one of the largest manufacturers of components for the automotive and transport industries worldwide with 1,90,000 employees across the globe.