



Aspire Systems' cloud maturity assessment uncovers \$1 million in annual savings for top US cybersecurity firm





Challenges

- High costs due to sub-optimal resource utilization
- Poor performance due to complex EKS clusters
- Database performance issues
- Inefficient tool usage
- Reliance on time-consuming manual processes
- Security challenges due to IAM issues
- Connectivity issues
- Data security concerns
- Occasional spikes in incoming traffic need to be checked

Solution

- Aspire's cloud maturity assessment – Auditing the client's current cloud environment and providing remediation

About the Customer

The customer is a global leader in online protection with headquarters in California. The computer security software firm offers data center, cloud defense, threat intelligence network, and cybersecurity solutions, as well as data and endpoint protection, risk, compliance, and security information management services. The client serves education, enterprises, governments, and consumer clients worldwide.



The Need

The customer wanted to optimize their AWS environment, but faced roadblocks when it came to getting the project off the ground. They approached Aspire seeking cloud optimization consulting services. Our cloud maturity assessment, which involves a thorough study of the client's AWS accounts, covering infrastructure, databases and DevOps. The assessment brought to light the following business challenges:

- 1. Cost Challenges:** CloudWatch costs were relatively high, especially in log ingestion. These cost would increase by 2% to 5% every month. Computing instances required optimization as did the management of unused storage volumes. High network costs, complex EKS clusters and RDS instances, and poor resource utilization added to the overall cloud costs, with RDS costs alone rising by 1.5% every month.



Results

- Total annual cost savings of 21% or \$1.07 million
- 15% drop in log ingestion costs
- Storage costs reduced by 7% per month
- 6% reduction in networking costs
- 2% monthly reduction in RDS costs
- 9% improvement in resource utilization, enhancing performance
- Significant performance improvement with database query optimization and upgraded systems
- Streamlined development process and increased operational efficiency with enhanced Jenkins workflow
- Enhanced scalability and elasticity
- Streamlined workflows and tool usage
- Strengthened security practices
- Significant time saved with automated DB patching

2. Performance Challenges: Complex EKS clusters posed performance challenges such as increased latency, resource contention, scaling inefficiencies, and intricate troubleshooting. Outdated systems and inefficient deployment processes also contributed to increased latency, deployment delays, and overall application sluggishness. Computing resources needed to be aligned dynamically with varying workloads to prevent bottlenecks and improve efficiency. The customer needed to enhance data retrieval processes, reduce query execution times, and improve the responsiveness of applications. Manual database patching also affected availability in addition to being time consuming. Database operations were affected by bottlenecks and resource shortages, thereby affecting overall system performance.

3. Efficiency Challenges: The client needed to streamline workflows and make them consistent while improving tool usage. Poor visibility into costs contributed to higher bills while manual storage management led to inefficient storage. Resource tagging and DB patching needed to be automated for time efficiency. Data transfers and configurations needed improved monitoring to reduce networking costs. Manual snapshots were taking a toll on memory and cloud costs.

4. Security Challenges: The utilization of a public schema in database management raised data security concerns, potentially leading to unauthorized access, data leakage, and schema design issues that necessitate careful review and corrective measures. Usage of certain connectivity solutions posed security challenges. The customer's identity and access management needed to be reviewed and adjusted.



Aspire's Solution

The cloud maturity assessment didn't stop at merely identifying problem areas. Aspire's certified experts, based on their decades of experience, best-practices-driven guidelines, and grasp of latest tools, provided solutions to optimize the client's AWS environment. They implemented measures for AWS optimization and recommended further changes, adopting a three-pronged approach:

INFRASTRUCTURE

- 1. CloudWatch evaluation:** The team evaluated CloudWatch usage to identify contributors to high costs, focusing on log ingestion. They also explored CloudWatch Logs Insights for optimized log queries and set up log retention policies for efficient log storage.
- 2. Compute instance analysis:** Experts conducted a comprehensive analysis of computing instances for optimization opportunities and rightsized instances based on actual usage for cost and performance benefits. They also made use of AWS Compute Optimizer for recommended instance types.
- 3. Storage Management:** Unused storage volumes were identified and deleted to free up resources. Storage volume sizes were reviewed and adjusted based on data requirements and automated policies were implemented for efficient storage management.
- 4. Security and Access Controls:** A thorough review was conducted to ensure the environment was in line with AWS IAM best practices. Access controls were evaluated and adjusted to restrict unnecessary access. The team also addressed deprecated runtime environments and updated them to supported versions.



Further recommendations

In response to the identified challenges, the team put forth a series of recommendations. They suggested maintaining a discerning approach to connectivity solutions usage and optimizing networking costs by suggesting a review of data transfer and configurations. Recommendations included ensuring adherence to best practices for network peering and proposing a thorough review and update of resource tagging policies for consistency. For simplified management, they suggested the use of AWS Resource Groups and the automation of resource tagging for ongoing consistency. The team recommended exploring AWS CloudWatch features for comprehensive monitoring and the potential implementation of custom metrics and alarms for proactive issue identification, with regular reviews and refinements of monitoring dashboards.

Furthermore, the team suggested an evaluation and enhancement of data backup strategies, including periodic testing of data recovery processes for effectiveness. Cost-effective storage options, such as Glacier for backups, were recommended. They also advised staying updated on AWS best practices and new features, suggesting the utilization of AWS Trusted Advisor for personalized recommendations. Additionally, the team recommended conducting regular reviews for both cost and performance to ensure ongoing optimization.

DEVOPS

- 1. Code Reliability Measures:** The team fortified code reliability with the implementation of unit testing and thorough test coverage in adherence to industry best practices.
- 2. Automation in CI/CD Workflow:** Experts seamlessly integrated automation test cases into the CI/CD workflow, adjusting the build based on test case execution outcomes.
- 3. Cross-Environment Monitoring:** The team expanded insights into system performance by introducing monitoring across diverse environments.



- 4. System Optimization:** Experts implemented comprehensive measures, including capacity planning, scalability assessments, and performance testing, to ensure the system's resilience.
- 5. Bottleneck Identification and Streamlining:** The team identified and streamlined bottlenecks, applying optimization techniques for enhanced overall performance.
- 6. Secure Service Discovery with Service Mesh:** Experts deployed a service mesh to ensure secure service discovery, leveraging mutual TLS (MTLS) for an added layer of security.
- 7. Dynamic Build Agents in GitHub Actions:** The team introduced dynamic build agents within GitHub Actions, providing flexibility in managing the build process.
- 8. Effective Cardinality:** Experts optimized resource utilization by ensuring effective cardinality in the monitoring component.
- 9. Real-Time Visualization of Service Communication Traces:** The team implemented techniques for the real-time visualization of service-to-service communication traces, offering valuable insights into system interactions.

Further recommendations

To tackle the identified challenges, the team proposed several solutions, such as implementing docker image signature verification using DCT to bolster security measures. Another recommendation was to establish network policies in each namespace, regulating and controlling network communication. The team also suggested isolating applications into different namespaces based on their type, enhancing both organization and security. Continuous monitoring and alert configurations across all environments were advised for proactive issue identification. Additionally, the team proposed a comprehensive review and update of roles and role bindings in the EKS cluster to strengthen access controls and security measures.



DATABASE

1. **Resize RDS Instance:** The team dynamically adjusted the size of the RDS instance, leveraging CloudWatch metrics to ensure that resources are allocated optimally, aligning with the actual demands of the database.
2. **Parameter Tuning:** For better query response, default parameter values were tailored, fine-tuning the database configuration to achieve improved overall performance and responsiveness.
3. **Schema Restructuring:** The team ended usage of public schema and introduced specific schemas to fulfill particular purposes, fortifying security measures and enhancing the organization within the database.
4. **Index Cleanup:** Experts identified and eliminated unused indexes within the databases, orchestrating a cleanup operation aimed at optimizing memory usage and concurrently reducing operational costs.
5. **Snapshot Management:** Streamlining snapshot management, the team systematically removed manual snapshots that were deemed surplus, contributing to heightened cost efficiency without compromising data integrity.



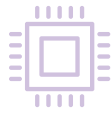
- 6. Multi-AZ Configuration Removal:** In a strategic move to economize, the team eliminated the Multi-AZ configuration from associated accounts in non-prod environments, achieving significant cost savings while maintaining essential functionality.
- 7. Backup and Recovery Optimization:** Ensuring a robust backup and recovery strategy for all databases, the team fine-tuned the frequency of these processes based on the criticality of each database, striking a balance between data protection and operational efficiency.

Further recommendations

The team of experts recommended implementing the following solutions to enhance system efficiency and security. Firstly, they proposed building automated scripts for starting and stopping non-production instances, streamlining operational processes and minimizing resource usage during idle periods. To optimize costs, the team suggested tuning long-running queries and establishing a periodic review process for ongoing efficiency. Additionally, in the interest of data security, the experts recommend the implementation of SSL/TLS encryption, ensuring a secure communication layer for sensitive information. Lastly, to improve database response, the team advocates for the implementation of indexing strategies at both the table and child partition levels, enhancing overall query performance.



Technology Snapshot



Cloud - AWS

Tools:

- » Prometheus & Grafana
- » GitHub Actions
- » Instana
- » Harness
- » Rancher
- » TeamCity
- » Terragrunt
- » Languages: Python, go, NodeJS



Aspire Systems is a global technology services firm serving as a trusted technology partner for our customers. We work with some of the world's most innovative enterprises and independent software vendors, helping them leverage technology and outsourcing in our specific areas of expertise. Our core philosophy of "Attention. Always." communicates our belief in lavishing care and attention on our customer and employees.

For more info contact: info@aspresys.com or visit www.aspiresys.com

USA

+ 1 630 368 0970

SINGAPORE

+65 3163 3050

INDIA

+91 44 6740 4000

BELGIUM

+ 32 3 204 1942

NETHERLANDS

+ 31 (0)30 800 92 16

POLAND

+48 58 732 77 71

MEXICO

+52 222 980 0115