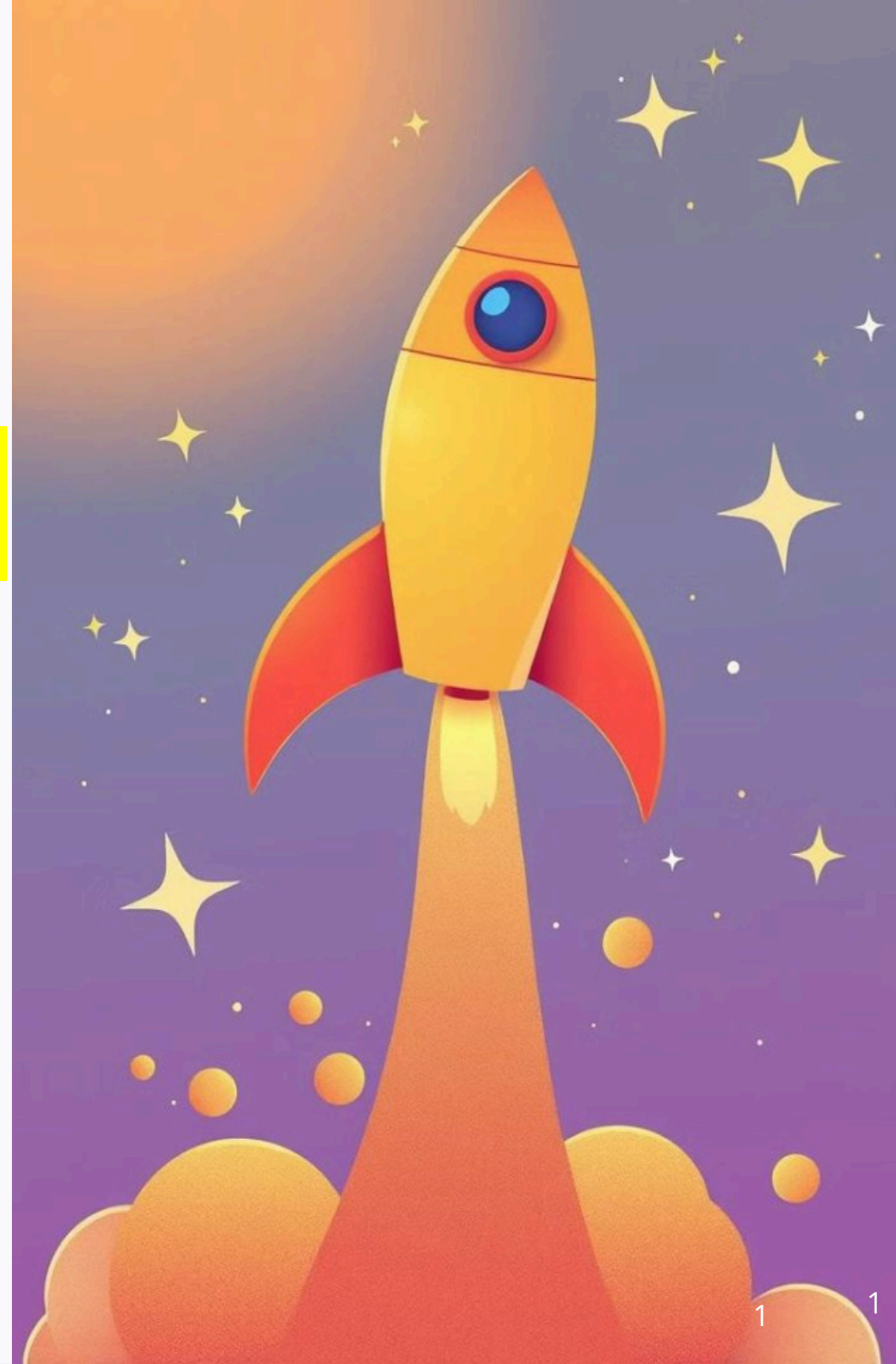




School Readiness Mission: Case Study

Founded to drive Early Childhood Development (ECD) in India. Our client uses technology to connect Anganwadi workers and parents through engaging content and policy advocacy.

- Reach: 2.5 million children at just \$1.50 per child annually.
- Impact: 70% of children achieving school readiness, surpassing the 50% national average.
- Goal: Expand their educational programs securely and efficiently with scalable technology.



The Challenges: Scaling for Growth and Ensuring Security

1

1. Complex Monitoring Needs

Limited insights into pod resource utilization hindering efficient allocation.

3

3. Inconsistent CI/CD Processes

Deployment failures due to version control issues, slowing updates and delivery cycles.

5

5. RBAC Misconfigurations

Incorrectly configured RBAC policies risking unauthorized access to sensitive data.

2

2. Container Image Optimization

Large, unoptimized container images slowing deployments and increasing costs.

4

4. Scaling and Cost Management

Inefficient scaling policies leading to over-provisioning and underutilization of resources.

6

6. Multi-Tenant Security Risks

Lack of proper isolation measures in multi-tenant clusters, increasing the risk of attacks.



Why AWS? A Comprehensive Cloud Platform for Growth

Scalability

EKS and Karpenter enabled dynamic scaling to accommodate annual growth of 50%.

Security

Integrated solutions like GuardDuty and Security Hub ensured compliance with regulations.

Reliability

A globally distributed architecture guaranteed 99.9% uptime for uninterrupted access to learning resources.

Cost Efficiency

Hybrid scaling using Spot and On-Demand Instances significantly reduced operational expenses.

Partnering with NlineAxis



Kubernetes Expertise

NlineAxis delivered advanced configurations for security and optimization.



AWS Partnership

Certified AWS professionals ensured seamless deployment and ongoing support.



Custom Solutions

Tailored multi-tenant and CI/CD workflows aligned with Rocket Learning's objectives.



Cost Optimization

Leveraged advanced scaling mechanisms and minimal image builds to reduce costs.





Partner Solution

Kubernetes Optimization

Prometheus with Kube-State-Metrics for detailed tracking of resource utilization.

1

CI/CD Process Enhancement

Streamlined CI/CD pipeline using AWS CodePipeline and CodeBuild, integrating automated rollback mechanisms.

3

Security Enhancements

Enforced least-privilege RBAC policies to restrict access, introducing security contexts to prevent privilege escalation.

5

Container Image Optimization

Thorough image audits to remove unnecessary dependencies, switching to Alpine Linux and multi-stage builds.

2

Node Scaling with Karpenter

Dynamically adjusted scaling policies using Spot Instances to optimize costs, defining resource requests and limits.

4

Key AWS Services

S3

Object storage for static assets and backups.

EC2

Worker nodes in private subnets for processing tasks.

RDS (MySQL)

Secure, reliable database management for data integrity.

GuardDuty

Proactive threat detection and security monitoring.

CloudWatch

Performance monitoring and alerting.

Lambda

Serverless compute for backend processing or automation.

API Gateway

Manages API requests (connects Lambda to clients).

ECR

Stores Docker images.

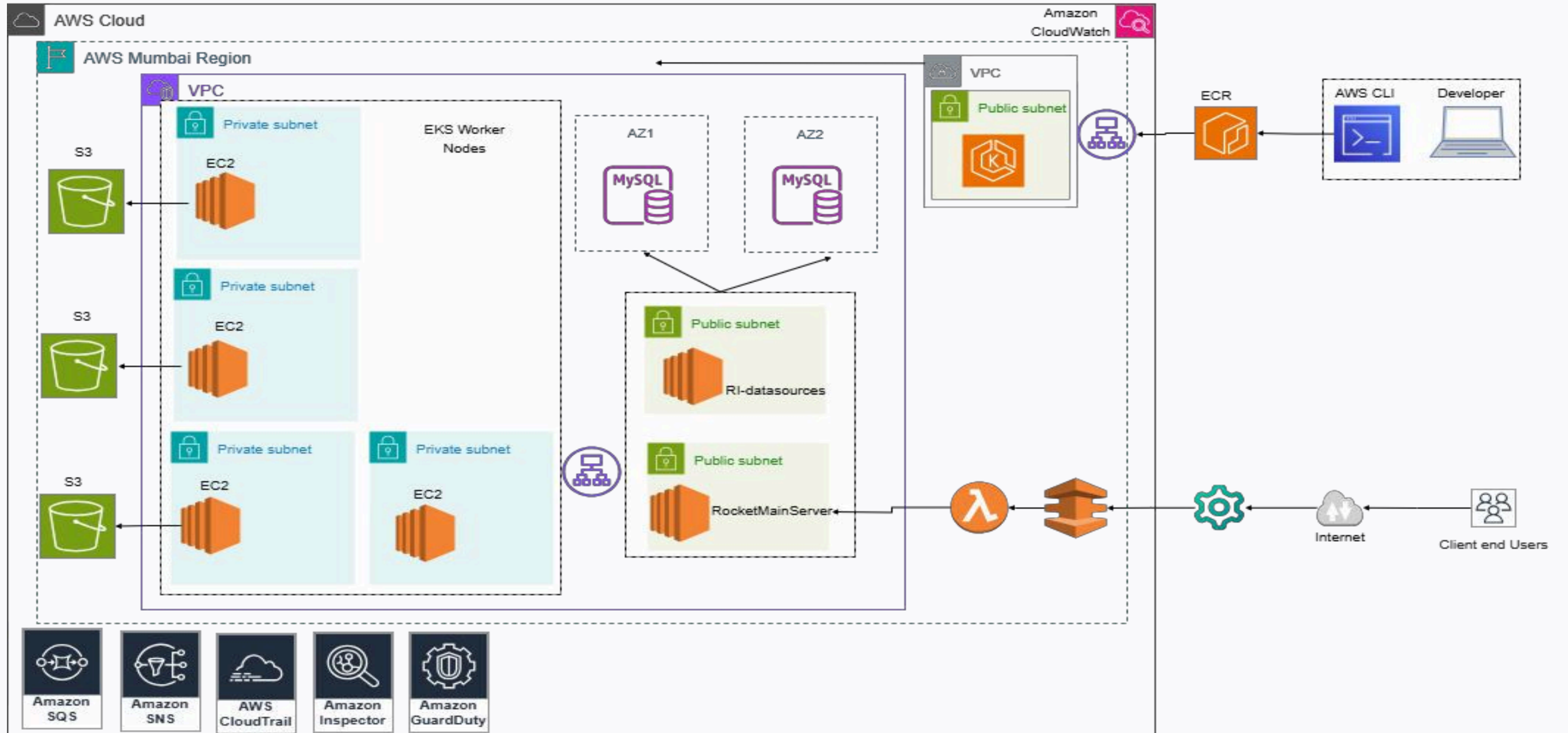
SNS

Sends notifications and alerts.

SQS

Manages asynchronous message queues.

Architecture Diagram



Results and Benefits

99.99%

Uptime

Achieving 99.9% uptime ensured uninterrupted access to educational services for Anganwadi workers and parents, maximizing the impact of the program and minimizing disruption to the learning process. This high level of availability is critical for delivering consistent and reliable educational resources to children in need.

30%

Downtime Reduction

Through proactive monitoring and efficient troubleshooting, we reduced downtime by 30%. This significant improvement is a direct result of implementing robust monitoring systems that identified and resolved issues quickly, minimizing interruptions and ensuring the smooth operation of the digital learning platform.

20%

Cost Saving

By implementing improved scaling strategies and optimizing resource utilization, we achieved a 20% reduction in operational costs. This cost efficiency allows for greater sustainability of the program and frees up resources to further enhance the quality and reach of the digital learning platform.



Key metrics Include and Next Steps

100%

Improved Metrics Evaluation

Custom dashboards tracked pod consumption, leading to efficient resource management and cost optimization.

99.9%

Streamlined CI/CD

Accelerated, reliable deployments with automated rollbacks, minimizing downtime and ensuring operational stability.

50%

Optimized Docker Images

Faster builds and deployments with reduced storage usage, supported by continuous vulnerability checks.

20%

Efficient Node Scaling

Fine-tuned scaling policies enhanced resource allocation and responsiveness, reducing operational costs.

Next Step

The solution delivered a secure, efficient infrastructure with enhanced operational processes. Metrics tracking, Docker optimization, and CI/CD enhancements improved cost efficiency and deployment speed. Security measures, including RBAC improvements and privilege escalation protection, ensured robust system security, supporting sustained performance and growth. NlineAxis continues to be a trusted partner, enabling Rocket Learning to achieve their ambitious goals and scale their impact even further.



Nlineaxis: A Trusted AWS Partner

NlineAxis is a leading provider of AWS Managed Services, Staff Augmentation, and Salesforce Solutions, empowering businesses to thrive in the cloud era. Their comprehensive expertise ensures seamless cloud migration, robust security, and optimized cloud infrastructure for clients worldwide.



Cloud Expertise

Core5 possesses extensive experience in cloud technologies, enabling us to provide comprehensive solutions for various business needs.



Security and Compliance

Core5 prioritizes security and compliance, ensuring that our solutions meet the highest industry standards.



Infrastructure Optimization

Core5 specializes in optimizing AWS infrastructure, reducing costs, enhancing performance, and ensuring high availability.



Managed Services

Core5 provides managed services to support our clients' cloud infrastructure, freeing them to focus on their core business operations.

