Accionlabs

Accion AI SRE Agent Accelerator

Transforming Reliability with AI-Driven Observability & Automation

Developed by: **Accion DevOps COE**

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Challenges in Modern SRE

Challenges

Increasing Complexity	❖Rapid growth of microservices ❖Multi-cloud computing environment ❖Less information on deployment visibility ❖Missing KPI's for K8s Multi Clusters
Manuel SRE	❖Traditional SRE Engineering - ❖High Manual Intervention ❖Reactive Firefighting Mode , ❖Alert Fatigue
Scalability	❖Difficulty in scaling traditional SRE practice ❖Difficulty in scaling large datasets across ❖For large k8 cluster , with large number of pods, Metrics and log analytics is quite challenging
Application and Infra Management	❖Tough to manage & monitor apps and infra in K8s ❖Need for Predictive observability ❖Need for Automation in operations
Inadequate Process & Governance	❖Limited governance & missing policy enforcement ❖Inadequate Review Process ❖Limited SCM integration

Accion's Solutions – AI SRE AGENT Platform

- ✓ **Anomaly detection (AI/ML driven),** intelligent insights , and Logs Correlation
- ✓ **Automates incident response** & runbook generation and Troubleshooting
- ✓ **Predictive Scaling**, Auto-Remediation
- ✓ **Supports Golden Signals** & SLO-based monitoring , SLI analysis, SLO adjustments
- ✓ Generic, extensible accelerator leveraging OpenTelemetry
- ✓ **Plugin-based** integration for any telemetry source
- ✓ **Native support for Prometheus, Grafana Loki**, and AWS services, Planned extensions to **Datadog, Splunk, CloudWatch**, etc

Business Value

50–70% reduction in monitoring time

30–40% lower operational costs

100% Improvement in operational efficiency

SRE Spends more time on incident prevention(Days to Hours)

Improved System Reliability and Reduced downtime

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Anomaly Deduction

What is an Anomaly? : **Deviation from normal or expected behaviour in a system**

Types of Anomaly in Kubernetes

Type	Description
Metric Anomalies	Sudden spikes/drops in CPU, memory, pod restarts, etc.
Log Anomalies	Repeated error messages, unusual log volume, or out-of-pattern log content
Event Anomalies	Unexpected resource creation, deletion, crash loops
Behavioural Anomalies	Changes in pod scaling patterns, failed health checks, node behaviour shifts
Network Anomalies	Latency, packet loss, unusual traffic volume

How is Anomaly Detection Useful to an SRE Agent?

- Detects issues **before impact** through proactive monitoring
- Reduces **manual triage and alert fatigue**
- Prioritizes alerts based on **severity and context**
- Speeds up **Root Cause Analysis (RCA)** by correlating across logs/metrics
- Enables **auto-remediation triggers** for common issues

AI SRE AGENT Core Functional Capabilities

(DevOps, DevSecOps, SRE)

Functions	Feature	Status
Observability	**Anomaly Detection**	**Completed**
Observability	Log Correlation	In progress
Incident Management	Runbook Guidance Alert Prioritization	In progress
SLO Feedback Loop	SLI analysis, SLO adjustments – In progress	In Progress
Self-Healing	Predictive Scaling, Auto-Remediation - Pending	Pending
Environment	**Kubernetes Cluster , Azure - Completed, Grafana, Prometheus**	**Completed**
Environment	AWS , GCP , OCI , VMS , Datadog, New relic, Sumo logic etc.	Pending

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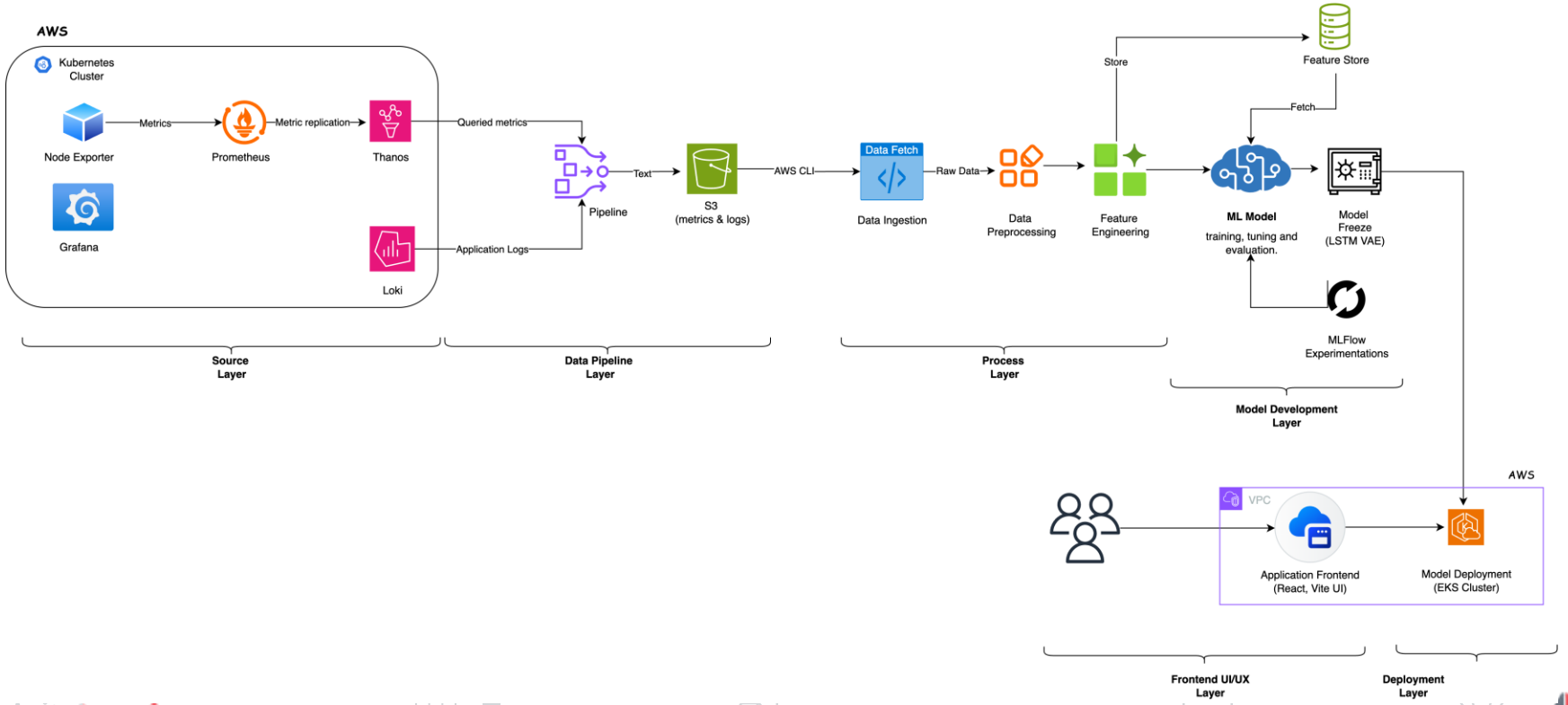
AI SRE Agent - Architecture Diagram



AI Model Performance

- Model comparison charts based on roughly **30,000 data points** collected over a 30-hour period—from 09:00:03 on July 23, 2025, to 14:00:04 on July 24, 2025.

Model Name	Type	Suitable Data	Performance Matrix (Training Time,Peak Memory)	Score/Accuracy Silhouette Score , Calinski-Harabasz , Davies-Bouldin	Observations
Isolation Forest	Unsupervised		12.1226s, 8.2119MB	0.626 ,878.151 ,2.882	It achieves the highest performance among the selected machine learning models but struggles to handle non-stationary data.
DBSCAN	Unsupervised		1.7363s, 5.5MB	0.603 ,1088.29, 2.282	The executon of the DBSCAN is of the order O(N^2) , so the performance detoriates with more samples
One-Class SVM	Unsupervised		0.3109s, 2.35MB	0.656,308.75,2.927	Shows very poor performance , due to very dynamic and non-stationary dataset
LSTM VAE	Unsupervised		342.36s, 72.35 MB	0.8540,18249.72 ,0.1689	The model achieves the highest score among all models and easily handles non-stationary data, thereby providing consistent performance across different time periods, but the model suffers from high sensitivity.

Let’s see the Demo

TEAM

- **DEVOPS COE – SRE TEAM**
  - Mahendiran Madhaiyan (Architect)
  - Mohit Pundir (Dev)
  - Dheeraj M (AI developer, Intent)
  - Kishore MC (Cloud and Data)
  - Surender (Cloud)
  - Nishanth (Lead)
  - JP Sheety (PM)

THANKS

Proposed Solution 'SRE AI Agent' Platform

- Enhance SRE team's observability using AI/ML for **anomaly detection** and **intelligent insights.**
- Automate incident response and runbook generation.
- Support golden signals (**Latency, Traffic, Errors, Saturation**) and SLOs.
- Enable continuous learning and adaptability to new observability platforms.
- Offer a configurable, **Plugin based integration** framework for new telemetry sources

- The AI SRE Agent is a ***generic***, ***extensible*** **accelerator** leveraging **Open Telemetry** principles to improve observability, resilience, and automation in Site Reliability Engineering (SRE).
- It begins with native support for Prometheus, Grafana Loki, and AWS services, with planned extensions to Datadog, Splunk, CloudWatch, etc.
- It features a **plugin-based** integration framework that supports easy onboarding of new telemetry sources and inference backends.