

AmCham Bulgaria Hackathon 2026

RingCentral Case 2

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BUSINESS CASE

Early Detection of Production Performance Degradation



ASSIGNMENT CONTENT

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Modern production systems generate large volumes of telemetry data: metrics, logs, traces, and service health indicators. However, performance degradations are often detected only after they already impact users or business metrics. The task is to design a solution that **detects early signs of system degradation before it becomes a critical incident**.

In many real-world systems, degradations start gradually - for example:

- increasing API response time
- slow growth in error rate
- growing queue sizes
- memory or CPU leaks
- database latency spikes

ASSIGNMENT CONTENT

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These signals often appear **minutes or even hours before a real outage or customer impact**, but they are difficult to detect automatically among large volumes of monitoring data.

The challenge: Design and prototype a system that can:

1. Analyze production telemetry data (metrics/logs).
2. Detect anomalies or degradation patterns **before they trigger standard alerts**. At least 10 minutes after abnormal behavior started
3. Provide early warning signals to engineers.
4. Reduce the time to detect incidents and improve system reliability.

MENTOR



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TECHNICAL REQUIREMENTS

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The proposed solution should meet the following requirements:

- **Early degradation detection**

The system should identify abnormal system behavior or degradation patterns **before they cause visible incidents or service outages.**

- **Telemetry data analysis**

The solution should process system telemetry such as **metrics, logs, or traces** and analyze trends, anomalies, or unusual patterns.

TECHNICAL REQUIREMENTS

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- **Alerting or visualization**

The system should provide **clear signals for engineers**, such as alerts, notifications, or dashboards indicating potential degradation.

- **Scalability and extensibility**

The solution should be designed in a way that allows it to be **extended to multiple services or large volumes of monitoring data**.

SKILLS TO BE DEVELOPED

1/2

Participants will develop practical skills in:

- **Observability and production monitoring**
Understanding how modern systems are monitored using metrics, logs, and traces.
- **Data analysis and anomaly detection**
Analyzing telemetry data to identify unusual patterns, trends, and system degradation signals.
- **Artificial Intelligence and Machine Learning applications**
Applying AI/ML techniques for anomaly detection, prediction of system issues, or intelligent alerting.

SKILLS TO BE DEVELOPED

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- **Distributed systems reliability**

Learning how to improve system stability by detecting issues early.

- **Data visualization and engineering tools**

Building dashboards, alerts, or analytical tools to support engineering teams.

- **Team collaboration and rapid prototyping**

Working in teams to design and deliver a working prototype within a limited time.