SRE Automation Case Study

Stock Exchange Trading Platform

Industry Context

A national stock exchange runs a **high-frequency trading (HFT) platform**.
Peak traffic occurs during:

- Market open (9:00–9:30 AM)
- Major announcements
- Sudden buy/sell surges

They must ensure:

- Millisecond latency
- Zero downtime during trading hours
- Fast recovery
- Automated reliability operations

Case Study Scenario

ExchangeX, a major stock exchange, operates a trading engine that processes **50 million transactions/day**.

Current Challenges

1. **Manual deployment approval**, leading to delays.
2. **Frequent CPU spikes** on matching engine (buy/ sell) nodes.
3. **Order processing queue delays**, not detected until traders complain.
4. **Manual rollbacks** that take 20–30 minutes.
5. **Incidents are manually triaged**, slowing MTTR.
6. **Inconsistent logs**, making root-cause analysis difficult.

Business Goals

- Achieve **99.99% availability** during trading hours.
- Reduce **MTTR from 25 minutes to <5 minutes**.
- Automate **scaling, deployment, rollbacks**, and **incident detection**.
- Reduce **manual operations by 70%** within 3 months.

Questions

Q1. What SRE Automation should be introduced to reduce manual deployment delays?

Q2. How can auto-scaling be implemented for a trading engine that cannot go down?

Q3. What automation can detect order queue delays before traders report issues?

Q4. How can automated rollbacks be implemented for critical trading services?

Q5. What SRE automation can reduce MTTR during high-severity incidents?

Q6. What logging and monitoring automation strategy would best fit a stock exchange platform?

Q7. How can SREs use resiliency testing safely in a financial trading system?

Q8. What error budget policies should be set for a 99.99% SLA trading system?