



Enterprise Mobility Technology



India

MTAP Technologies Auto-Resolves 70% of Infrastructure Issues with iOPEX's Claude Code-Accelerated Automation

MTAP Technologies set out to strengthen the reliability of Safetrax, its always-on employee transport management platform, by **introducing intelligent monitoring and automated remediation across hundreds of production servers**. Working with iOPEX, the company moved from reactive infrastructure monitoring toward a self-healing operating model that resolves routine issues before they affect enterprise users.

Highlights

- Safetrax required scalable monitoring across **hundreds of production servers** and **more than 40 interconnected, uptime-critical services** supporting enterprise transport operations.
- iOPEX used **Claude Code** to build a layered SRE framework comprising monitoring agents, fixing agents, database diagnostics, service watchdogs, automated backups, and contextual alerting.
- The production system now **auto-resolves 70% of infrastructure issues** without human intervention and automatically identifies **95% of slow database queries**.

Business Challenge

MTAP Technologies' **Safetrax** platform supports employee transportation operations for enterprise customers. Its production ecosystem extends beyond the core Java and MongoDB application to include a Node.js and React interface, driver and employee applications, GPS ingestion servers, SMS and OTP services, IVRs, geofencing, speed and violation monitoring, dashcam alerts, live video streaming, third-party integrations, report emailers, and automated calling services.

Together, this **environment comprises more than 40 services, customized for individual clients and deployed across hundreds of production servers**.

Every service plays a direct role in transportation operations. A stalled GPS feed can reduce visibility into vehicle movement. An SMS or OTP failure can prevent users from accessing trip information. A slowdown in the core application can affect transport coordinators, employees, and drivers.

MTAP was working toward a site reliability engineering target of **99.999% availability**. At this scale, relying primarily on engineers to watch dashboards, interpret alerts, diagnose incidents, and apply corrective actions would not provide the speed or consistency required.

The operating model needed to evolve in three important ways:

- From periodic checks to continuous service-level monitoring
- From alert generation to diagnosis and automated remediation
- From engineer-dependent recovery to repeatable, policy-driven action

MTAP therefore engaged iOPEX to build an intelligent monitoring and self-healing capability that could continuously assess the Safetrax production environment, resolve common infrastructure issues automatically, and give engineers actionable context when human attention was required.

iOPEX Solution

iOPEX developed a layered **monitoring and auto-remediation framework for Safetrax, using Claude Code** to accelerate the design and development of every monitoring script and operational agent.

The engagement followed a closed-loop SRE model:

Detect → Analyze → Remediate → Verify

Instead of stopping after an alert was raised, the framework was designed to determine what had happened, apply an approved corrective action, and verify that the affected service had recovered.

Continuous Health Monitoring

iOPEX built automated health-monitoring scripts that continuously evaluate application and service health across Safetrax's production estate.

The monitoring agents assess more than whether a process is technically running. Service-level watchdogs verify whether critical functions are completing their intended business activity, including:

- GPS data ingestion
- SMS and OTP delivery
- IVR activation
- Report emailer execution
- Application responsiveness
- Supporting service availability

This approach distinguishes a functioning process from a functioning service.

Self-Healing Fixing Agents

When a monitoring agent detects a recognized failure condition, it invokes a fixing agent rather than only sending an alert.

Based on encoded operational rules, the fixing agents can:

- Restart affected applications
- Terminate long-running or stuck processes
- Optimize swap utilization
- Address excessive memory consumption
- Stabilize running services
- Verify recovery after remediation

This converts frequently occurring infrastructure issues into **repeatable automated responses** while retaining human involvement for unfamiliar or higher-risk incidents.

Intelligent MongoDB Monitoring

iOPEX developed a dedicated database monitoring agent for **MongoDB**.

The agent interprets profiling logs, identifies slow queries and resource pressure, and provides administrators with possible corrective action. This replaces raw database alerts with **pre-diagnosed operational guidance**.

By attaching likely causes and recommended actions, the framework reduces the effort required to move from detection to resolution.

Web Server Connection Management

An **Apache monitoring agent** was introduced to track active connections and identify stale or unused sessions.

The agent can terminate unnecessary connections and optimize the connection pool **before worker exhaustion affects application availability**.

Cron Job Governance

Safetrax relies on scheduled processes to execute operational activities at frequent intervals.

The **crontab agent** verifies that these services are functioning correctly, tracks operational output such as calls and SMS activity, and ensures that minute-level jobs complete **within seconds**.

It also prevents duplicate jobs from executing simultaneously, reducing the risk of repeated transactions, overlapping workloads, and unnecessary resource consumption.

Automated Backup Management

iOPEX implemented a multi-layered database backup cycle comprising:

- Weekly full backups
- Daily incremental backups
- Hourly backups

The backup agent executes and verifies these activities without routine human involvement, strengthening MTAP's **business continuity and recovery posture**.

Proactive Infrastructure Hygiene

Additional agents were developed to address common infrastructure risks before they could become production incidents.

These included:

- Disk utilization monitoring
- Automated log rotation and cleanup
- CPU and load-spike detection
- Memory and swap optimization
- Stale-process identification
- Service-level responsiveness checks

During load spikes, the system captures the processes and queries responsible for the event. This preserves useful **forensic context** for subsequent analysis and preventive action

Context-Rich Alerting

When human intervention is needed, administrators receive more than a threshold notification.

Alerts are enriched with:

- The affected service
- The detected condition
- The likely cause
- The action already applied, where applicable
- A suggested corrective action

This enables administrators to begin with diagnosis and operational context already available rather than starting an investigation from a generic alert.

Claude Code-Accelerated Engineering

Claude Code supported iOPEX engineers throughout the development of the monitoring and remediation framework.

It was used to:

- Design the detect-analyze-remediate-verify agent logic
- Encode safe restart and process-termination procedures
- Develop and iterate monitoring scripts
- Define memory and swap optimization actions
- Extend automation coverage as new production patterns emerged
- Interpret MongoDB profiling output

The agents and scripts are now **live in production**, with coverage continuing to expand as part of the ongoing SRE and infrastructure support engagement.

The Result

The self-healing framework has shifted Safetrax infrastructure operations from alert-led response toward automated incident prevention and remediation.

70% of Infrastructure Issues Auto-Resolved

The system automatically resolves 70% of identified infrastructure issues without human intervention.

Common conditions such as stale connections, swap pressure, CPU spikes, excessive RAM utilization, and stuck processes can now be detected and corrected by the agents.

This reduces repetitive operational work while helping engineers concentrate on complex incidents and platform improvements.

95% of Slow Queries Automatically Identified

The MongoDB monitoring agent automatically identifies 95% of slow queries.

Administrators receive the diagnosis with a suggested fix, reducing the effort required to interpret profiling data and isolate the source of database performance issues.

Faster Detection-to-Resolution

Recognized issues can be remediated before they develop into visible service disruptions or client escalations.

By combining continuous monitoring, automatic diagnosis, corrective action, and recovery verification, MTAP has shortened the path from infrastructure anomaly to service restoration.

More Reliable Scheduled Operations

Every minute-level cron job completes within seconds, with controls preventing duplicate job execution.

This supports dependable execution of the recurring processes that underpin Safetrax's transport operations.

Automated Business Continuity Controls

Weekly full, daily incremental, and hourly backups are executed and verified automatically.

The untouched backup cycle strengthens operational resilience without adding recurring administrative effort.

Progress Toward Five-Nines Availability

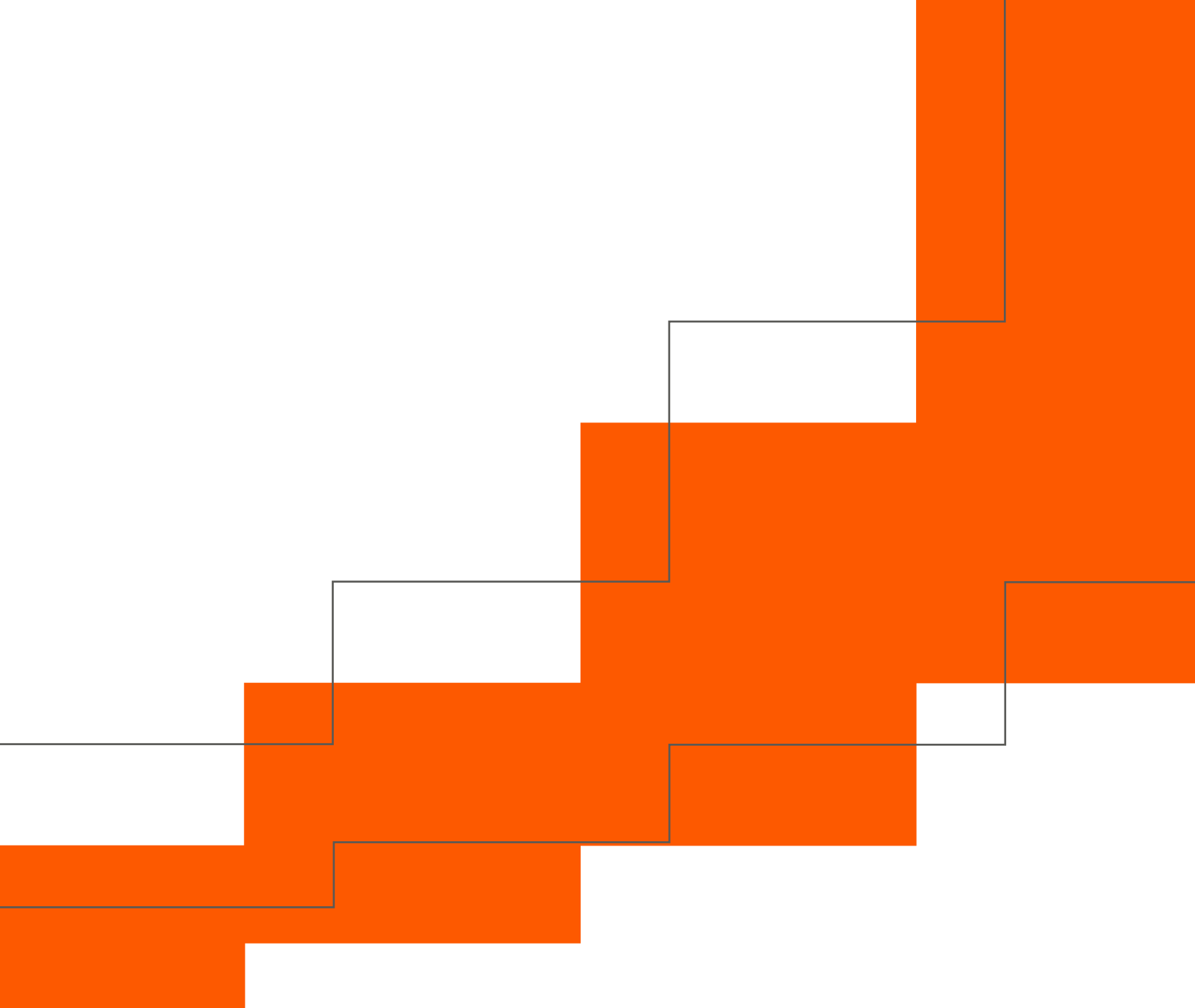
The framework supports MTAP's target of 99.999% availability across more than 40 services and hundreds of production servers.

Importantly, 99.999% is the availability objective supported by the solution—not a separately verified availability result.

Reduced Monitoring Effort

Engineers spend less time watching dashboards, responding to repetitive alarms, and diagnosing familiar infrastructure conditions.

The operating model is progressing toward MTAP's target of minimal-touch monitoring for routine detection and remediation, allowing engineers to redirect capacity toward reliability engineering and product development.



About iOPEX

iOPEX Technologies is a new-generation agentic AI and automation-led enterprise transformation partner headquartered in San Jose, California. At the intersection of enterprise operations, agentic AI, and intelligent automation, we deliver Intelligence as a Service. Over 70 global brands trust iOPEX as a strategic partner to turn AI into results that scale. We help clients accelerate enterprise transformation without endless consulting cycles by embedding intelligence directly into workflows. Learn more at www.iopex.com.

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