MCP Dev Summit Mumbai

MCP-Powered Ops

Red Hat Kubernetes MCP & Grafana MCP for Mission-Critical Applications

MTTR Reduction

45 Minutes
Previous State

<4 Minutes
Using AI-Assisted Operations

The Person Behind the Terminal

$ whoami

rishi@motorola:~

```
rishi@macbook:~$ cat profile.json

Name          : Rishi Nikhilesh
Designation   : Manager, Software Engineering @ Motorola
                Solutions
Experience    : Engineering Manager and Strategic Technology
                Leader with 12+ years of experience driving
                large-scale digital transformation, cloud
                modernization, AI-enabled innovation, and
                operational excellence across global
                enterprises. Proven ability to bridge
                technology, business strategy, and people lea
                dership to deliver measurable organizational
                impact. Passionate about creating people-
                centric environments where innovation, owner-
                ship, and continuous growth thrive.
Skills        : [Human first, AI next]
```

The Person Behind the Terminal

$ whoami

sayantan@motorola:~

```
sayantan@macbook:~$ cat profile.json

Name          : Sayantan Karmakar
Designation   : Platform DevOps Engineer 2 @ Motorola
                Solutions
Experience    : 8+ years of experience in Platform
                Engineering, architecting robust CI/CD
                pipelines, automating IaC, and managing
                large-scale Kubernetes clusters.
Certifications : [Golden Kubestronaut, RHCSA, AWS-SAA,
                Terraform Certified Associate, OCI,
                NCA-AIIO]
```

🎭 The Blueprint: What We're Unlocking Today

🚨 Act I: The 45-Minute Nightmare

- **Race Against Time:** The Chaos of Public Safety Emergencies
- **The Intelligence Chasm:** Trapped in the Maze of Tool Sprawl

🌐 Act II: Enter the Universal Interface

- **API Extinction:** The Death of Custom Enterprise Integration
- **The MCP Breakthrough:** Standardizing the Language of AI Agents

🧠 Act III: Training the AI SRE Expert

- **Telemetry Sight:** Giving LLMs "Eyes" Inside Kubernetes & Grafana
- **The Production Blueprint:** Architecting the AWS Bedrock Backbone

✨ Act IV: The 30-Second Correlation "Magic"

- **Multi-Vector Fusion:** Merging Metrics, Logs, and Events Instantly
- **The Safe Switch:** The Guardrail Keeping Humans in Ultimate Control

🚀 Act V: The 4-Minute Resolution & Beyond

- **The 90% Drop:** Crushing MTTR from Hours to Minutes
- **Knowledge Unlocked:** Democratizing Expertise for the Autonomous Era

Why This Matters: Every Minute Counts

A Fire Emergency Doesn't Wait for an Incident Bridge

Motorola Mission-Critical Environment

Overview of systems:

- Emergency Dispatch
- Command Center
- Video Management
- Analytics
- Communication Services

Infrastructure:

- OpenShift Clusters
- Grafana
- Prometheus
- AI Operations

The Traditional Incident Response Problem

Manual, fragmented workflows across siloed tools.


SRE
Manual investigation for 45 minutes.
SRE
< 4 Minutes MTTR with AI-Assisted Ops.

Challenges We Faced

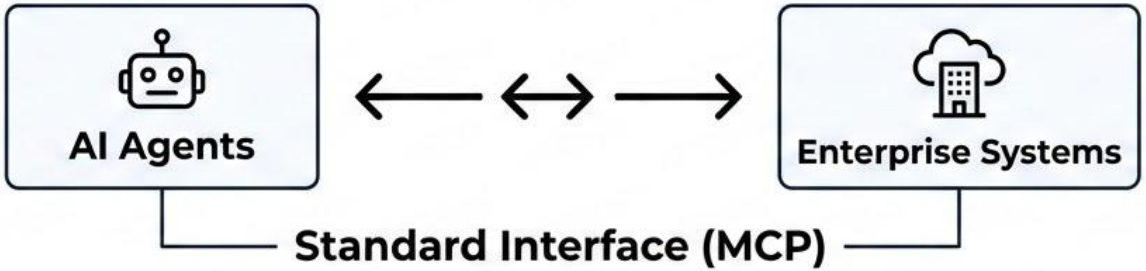
Operational Pain Points

Challenges We Faced

What Is MCP?

Model Context Protocol

MCP provides a **standard interface** between:



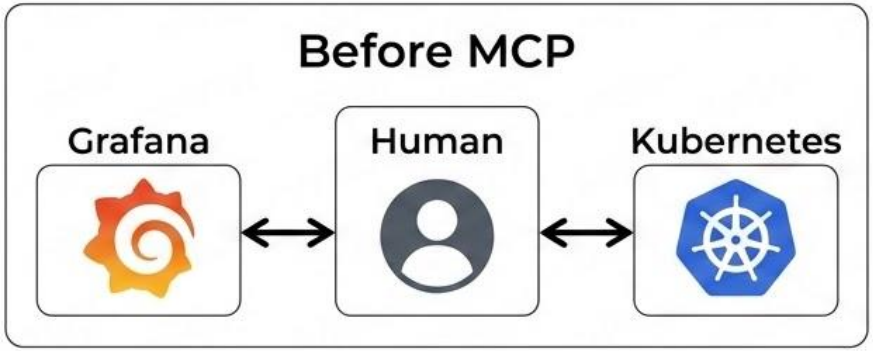
Key Benefits

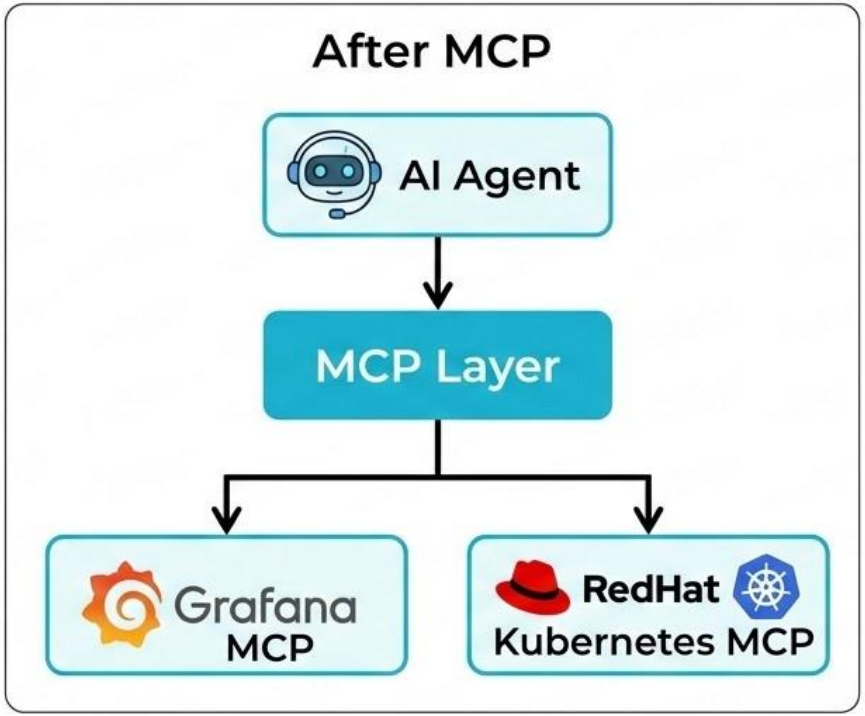
- **Tool interoperability:**
- **Standardized context:**
- **Reusable integrations:**
- **Agent orchestration:**

Why MCP Instead of Custom Integrations?

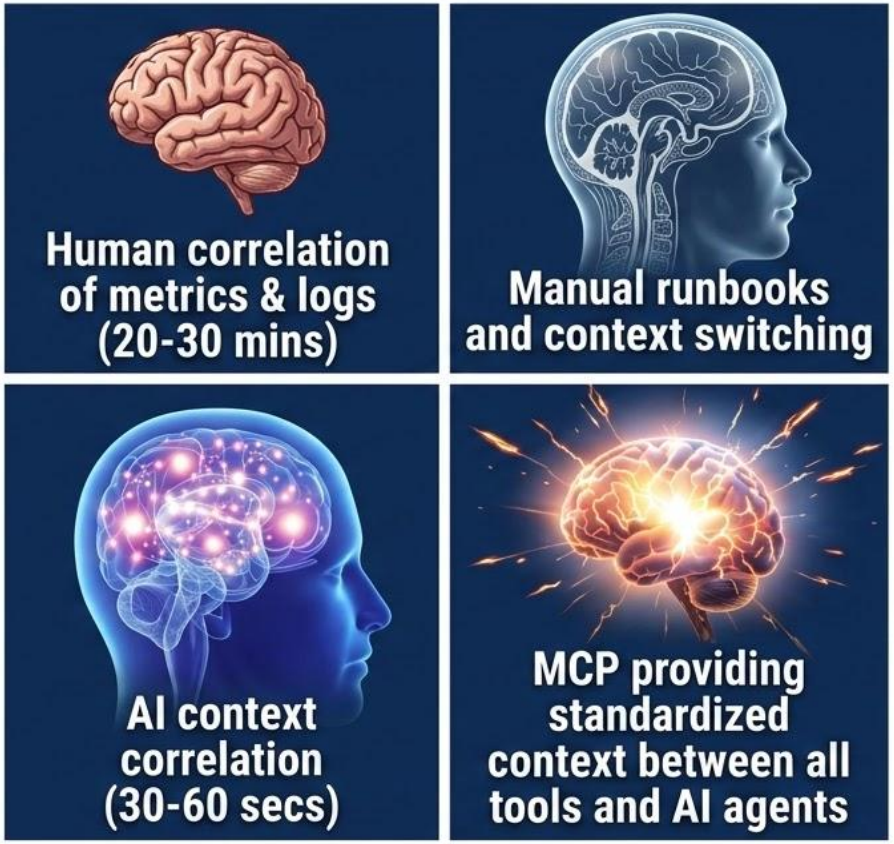
Traditional	MCP
Custom APIs	Standard Protocol
Point-to-point	Reusable
High Maintenance	Low Maintenance
Vendor-specific	Portable

Architecture Evolution

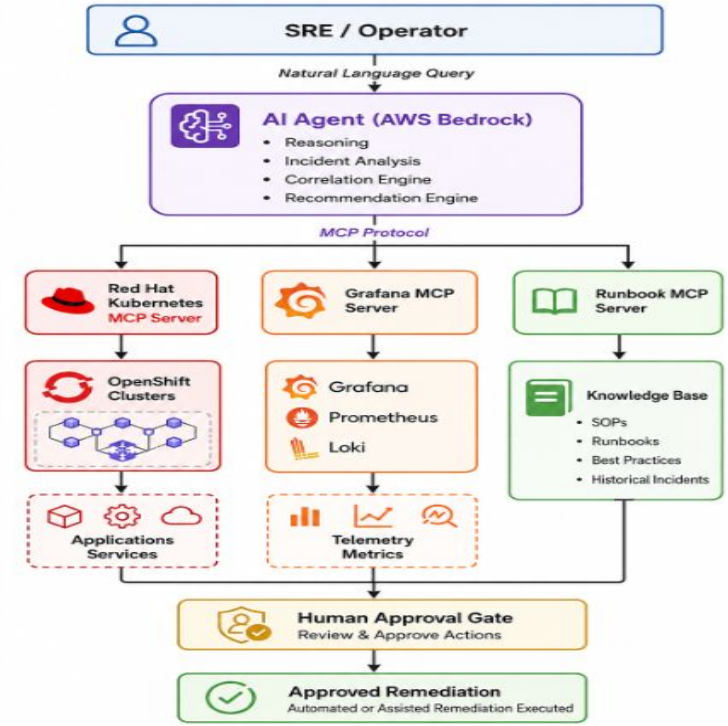




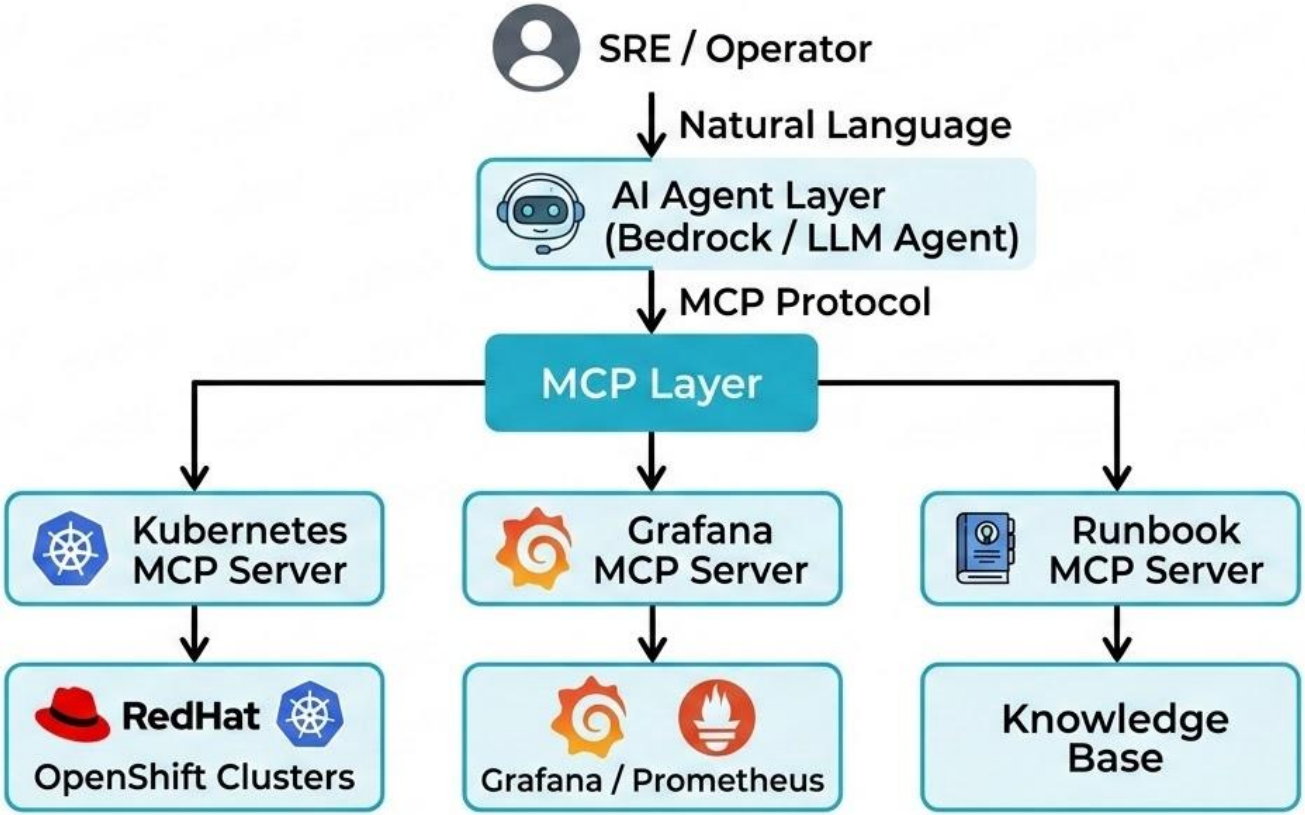
MCP: Standardized Context



End-to-End Architecture Overview



Production Architecture Overview



Deep Dive: Kubernetes MCP (Model Context Protocol)

Key Capabilities

Pod Inspection

Pod Inspection
Inspect container state & labels

Deployment Status

Deployment Status
Check replicas, image versions, and readiness

Events & Health

Review cluster-wide events & Node status

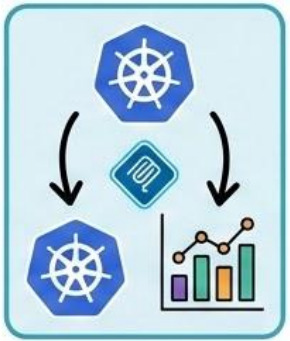
Resource Utilization

Monitor CPU/Memory across pods/nodes

Example Workflow

USER:
"Why is Dispatch Service API failing?"

Agent Retrieves:
1. Pod Status
2. Restart Count
3. Events



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Deep Dive: Grafana MCP

Key Capabilities

Query dashboards

Find and display specific dashboard panels

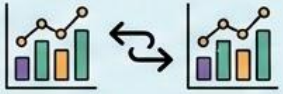
Metrics retrieval

Analyze real-time and historical performance metrics

Alert context

Provide context for firing alerts and recent incidents

Correlation analysis



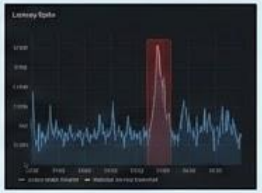
Cross-reference data points to identify relationships

Example Workflow

USER:
"Show latency spike for dispatch-api"

Agent Retrieves:

(1) Prometheus data for dispatch-api latency,
(2) Associated Grafana alert rules,
(3) Related service health dashboards



Latency Spike Detected

AI Agent Workflow

Incident Alert
Trigger event from monitoring system (e.g., Grafana, Sentry)

Agent Trigger
Automated activation based on pre-defined alert criteria

MCP Context Gathering
Retrieve system state via Model Context Protocol (e.g., K8s,

Correlation Analysis
Cross-reference data to identify dependencies and connections

Root Cause Identification
Pinpoint the likely source of the incident

Human Approval Request
Present findings and proposed resolution to an operator for review

Automated Action
Execute approved remedial steps (e.g., restart pod, scale deployment)

Human-In-The-Loop Design

Production Principle: Control and Oversight

An Agent acts within bounds; critical actions require a Human.

Critical Actions reericted

High-impact changes are blocked for autonomous execution.

Agent Boundaries: Critical Actions restricted

High-impact changes are blocked for autonomous execution.

Agent Capabilities:

scaling restarting deploying

Restricted Without Human Approval


Critical SRE Action:
scaling/restart/deploy
SRE
Wait for Human Approval Gate
Run it autonomously (NO!)

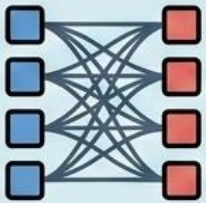
Incident Example #1: High Latency Alert

1. Symptoms

API latency > 5s

2. Agent Findings

- CPU saturation
- Pod restarts
- Memory pressure



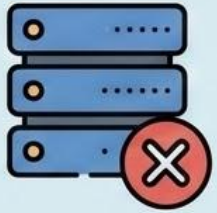
3. Correlation Analysis

Findings correlated to resource contention

4. Resolution

Approved action: Scale deployment

Incident Example #2: Node Failure

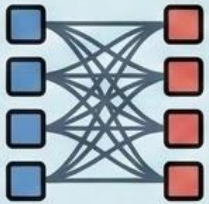


1. Symptoms

Node NotReady

2. Agent Findings

- Pod Evictions
- Traffic Increase



3. Correlation Analysis

Findings correlated to node saturation

4. Resolution

Approved action: Drain node and rebalance workloads

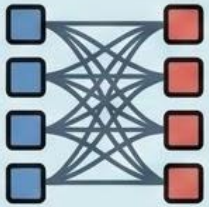
Natural Language Operations

1. Concept-based Query

- User Query Example: “Why is Dispatch API slow?”

2. Actionable Intent Analysis

✅ User Query Example: ❌ “Show pods restarting in production.” ❌



3. Multi-Vector Context

- User Query Example: “What changed in last 30 minutes?”

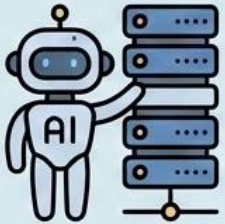
4. Accelerated Root Cause

✅ User Query Example: “Which node caused this alert?”

Natural Language Resolution: Automated Workflow

1. User Input Analysis

- User Query: “Why is API failing?”



2. Agent Analysis

- Agent Findings: CPU saturation detected

3. Action & Deployment

- Action: Scale deployment approved

Context Correlation Magic

1. Traditional Correlation

- Human correlation
- 20–30 mins ❌

MCP Agent Correlation

- Metric + Logs + Events
  30–60 seconds ✅

But, thankfully it is pre-recorded:

Let's see in action!!

Reliability Improvements

BEFORE

45 min

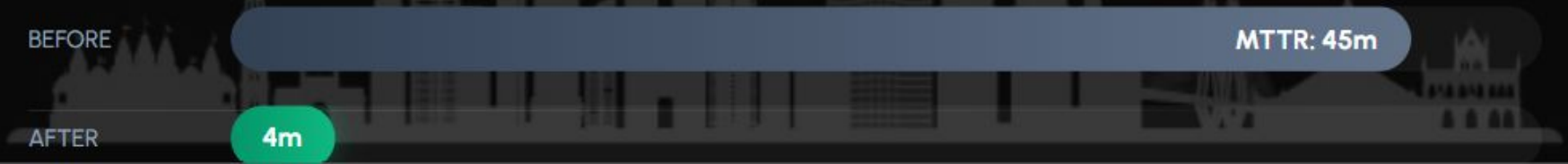
Manual Investigation

AFTER

↘ 91% Reduction

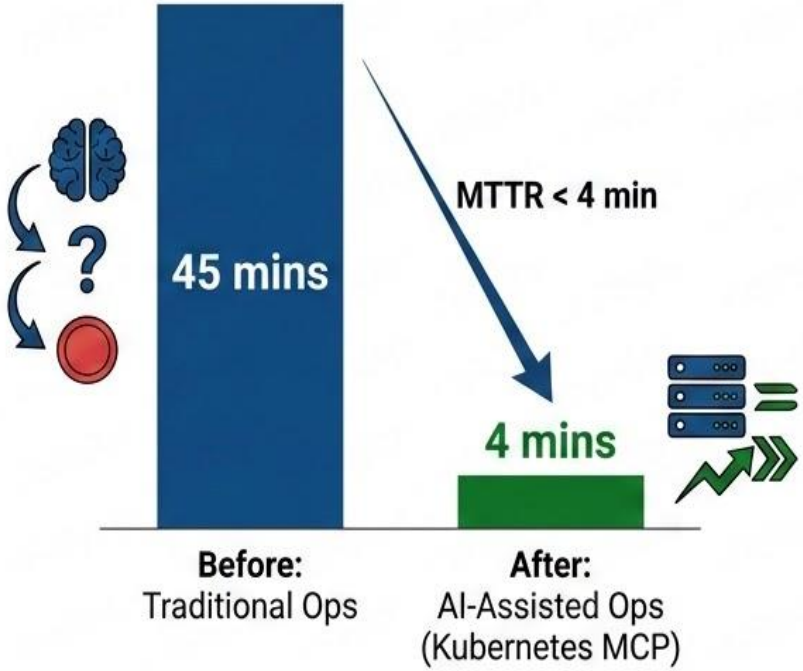
4 min

Automated Correlation



Operational Metrics

Mean Time To Recovery (MTTR) and Resolution Time Impact



Uptime Impact

Business Outcomes

Business Critical Availability

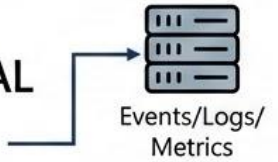
UPTIME TARGET ACHIEVED

Reduced Risk
Maximized Reliability

Operational Benefits

- FASTER RESPONSE TARGET TIMES

- LOWER OPERATIONAL RISK



- IMPROVED CUSTOMER TRUST


Traditional Ops
(45m MTTR, burnout)
SRE
AI-Powered Ops
(99.95% Uptime,
lower risk)
Traditional Ops
(45m MTTR,
higher risk)

Empowering Junior Engineers

Before

Junior engineers face high barriers to entry in complex cloud-native environments.

Need Senior SRE intervention

After

AI provides immediate operational intelligence:

- Context
- Runbooks
- Recommendations

KNOWLEDGE DEMOCRATIZATION


First month as a junior SRE...
...But the AI Agent gave me immediate context, runbooks, and recommendations!
Knowledge Democratization!

Security & Compliance

Role-Based Access Control

RBAC

Detailed Logs

Audit Trails

Conditional Checks

Approval Gates

Granular Permissions

Access Controls

Assume Zero Trust

Zero Trust

Lessons Learned / Key Takeaways

Build trust gradually

Foster confidence through incremental, reliable releases and feedback loops.

Keep humans in control

Prioritize human oversight and clear handoff protocols for automated tasks.

Use MCP standards

Adopt Model Context Protocol for secure, scalable integration and resource resource access.

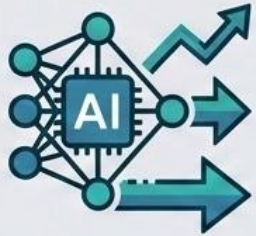
Focus on observability first

Invest early in monitoring, logging, and tracing capabilities for deep insights.

Future Roadmap / Next Steps

Multi-cluster Support

Enable cross-cluster visibility and resource management across diverse environments.

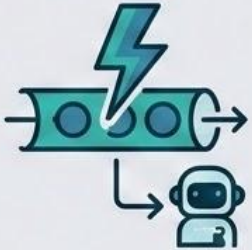


Predictive Operations

Leverage AI and historical data to forecast potential system issues before impact.

Autonomous Remediation

Implement self-correcting mechanisms for common runtime errors and drift.



Event-driven Agents

Deploy proactive, context-aware agents responding instantly to infrastructure events.

Lessons Learned / Key Takeaways

MCP is production ready

Foster confidence through incremental, reliable releases and feedback loops.

Human-in-the-loop remains critical

Prioritize human oversight and clear handoff protocols for automated tasks.

Kubernetes MCP + Grafana MCP create unified context

Adopt Model Context Protocol for secure, scalable integration and resource access.

MTTR dramatically reduced

Invest early in monitoring, logging, and tracing capabilities for deep insights.


END OF MY PRESENTATION
NOW CLAP!!!

Connect with us....

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Platform DevOps Engineer 2

Motorola Solutions

Rishi Nikhilesh

Manager, Software Engineering

Motorola Solutions

MCP Dev Summit Bengaluru

MCP Dev Summit Bangalore


THANK YOU FOR LISTENING
DO YOU HAVE ANY QUESTIONS?

IN LOVING MEMORY OF

Akshatha

JUNE 11, 2026

Today, we gather our hearts to celebrate a beautiful life that was lost to us far too soon. Though her physical presence is no longer beside us, the warmth of her smile, the grace of her spirit, and the kindness she brought into this world remain permanently etched in our memories.

> *"Those we love don't go away, they walk beside us every day. Unseen, unheard, but always near, still loved, still missed, and very dear."*
>
> — HELEN KELLER

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