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AN INFLUXDATA CASE STUDY

Volvo Uses InfluxDB to Build Custom DevOps Monitoring Tools

VOLVO

DECEMBER 2021 (REVISION 1)

Data-Driven Approach To Monitoring Improves Issue Resolution And Reduces Production Delays And Stoppages

Company in brief

Volvo Cars is a Swedish automotive manufacturer of luxury vehicles headquartered in Torslanda in Gothenburg, Sweden. The company manufactures and markets sport utility vehicles, station wagons, hatchbacks, sedans, and compact executive sedans.

Case overview

Volvo had a DevOps monitoring solution in place for over fifteen years. That solution became outdated and failed to provide information that developers wanted or needed. When IT issues began to affect the production floor, it became clear that something needed to change. Volvo's DevOps Enablement team used InfluxDB and Grafana to create new dashboards and tools that provided actionable intelligence. Now, instead of reacting to existing issues, Volvo developers can proactively detect issues and resolve them faster, avoiding production delays or stoppages.

The business challenge

Volvo's DevOps Enablement team functions as in-house metrics as a service provider for developers across the company. The team faced several challenges when it came to devops monitoring. One was an ineffective legacy monitoring solution. Operating for over fifteen years, the legacy system technically monitored 99.8% of Volvo's IT components. Simply having data does not make a company data-driven. Despite this seemingly extensive coverage, the system had an outdated design and failed to produce actionable data that developers wanted or needed.

Technologies Used: InfluxDB, Grafana, Kafka, Telegraf

With thresholds set incorrectly and team members neglecting to fix them, Volvo developers had no way to understand when an issue reached a critical level before it was too late. The company experienced a growing number of IT-related incidents and problems, some of which went so far as to affect production operations on the factory floor. If production comes to a standstill in a manufacturing operation, that is a major problem.

Not only was the technical side of the legacy solution a challenge for the DevOps Enablement team, but so, too, was the personnel aspect of it. There was one small team that had access to all the data that the system generated. It was this team's responsibility to relay critical information to the right people at the right time. This lack of transparency was another area that needed addressing.

The DevOps Enablement team wanted to provide a centralized repo that developers from across the company could access and use to track their own metrics. The Enablement team sought to provide the infrastructure and tools that allowed developers to set their own thresholds and manage changing needs without having to look for external solutions.

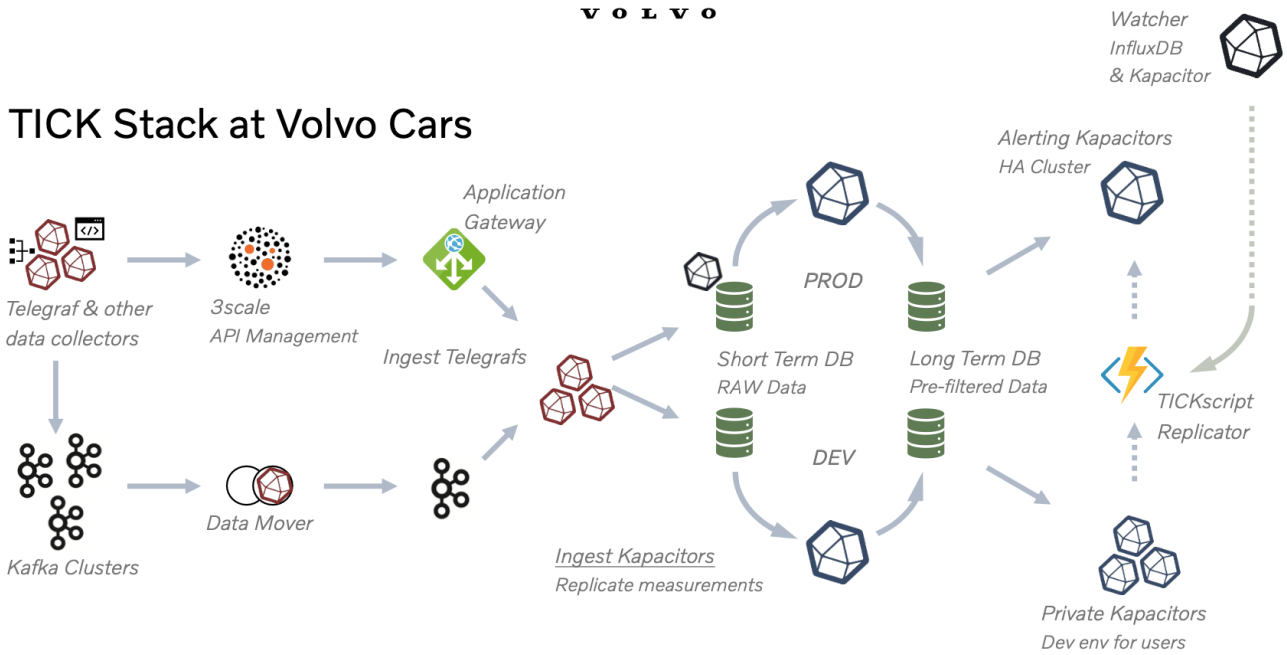
The technical challenge

To better understand the problem, the DevOps Enablement team created a Grafana dashboard that visualized the state of all of Volvo's servers.

As the image above confirmed, a lot of issues existed. But simply knowing the state of things in this manner did not fix the problem. The team struggled to figure out where to start to address these issues. The process of determining where the issues were and how to solve them required a lot of time and effort.

As the number of issues multiplied, the time-to-resolution lag meant that problematic items got worse before the team could start to triage them. This created a circular pattern of reactive response. The DevOps Enablement team knew that something needed to change.

The solution



Volvo's DevOps team created an entirely new monitoring system with InfluxDB at the core. This system uses Telegraf and other custom scripts to ingest data. They use 3scale primarily for application management and integration, and Kafka for telemetry data.

Regardless of the route, the data hits the Telegraf ingest instances, which replicate the data in both the development and production clusters. This is a key point because having identical data in both locations allows the Volvo team to better develop and configure TICKscripts. Developers can test changes in the dev environment on the same data that is in the production environment and see how those updates would affect it.

Each cluster has two databases, a short-term database for raw data and a long-term database for clean data. From there, the team set up two Kapacitor clusters for notifications. Again, one operates in production while the other is for development. They configured these clusters so that changes in the dev environment can be quickly pushed to the production environment. Developers simply need to change the meta information on the script in development and the TICKscript Replicator picks up those changes and pushes them to production.

> *“We decided, from a monitoring perspective, that we are … going with a best of breed setup. So, we put the best tools in place, like InfluxDB for metrics monitoring.”*

Daniel Putz, DevOps Enablement, Volvo

Results

As the Volvo team designed this new system, they had three goals for it: they wanted it to offer transparency, to provide the ability to self-serve, and to foster a mindset that embraced a data- driven approach to IT management.

One of the first things the DevOps Enablement team did was to use the data from this new solution to feed a Grafana service. This puts all the system alerts in one place. Then they granted broad access to the dashboard. Instead of having a small group with all the information, the new setup created previously unavailable transparency by easily giving everyone access to all the system's data.

Teams also can maintain the alerting scripts that are most relevant to them by modifying thresholds and other configurations in the new, modern system. Teams can have their own private Kapacitor clusters that connect to the main database clusters. When they make changes to the alerting scripts in their private cluster, they simply create a pull request. Someone on the DevOps team reviews the request, primarily to make sure the script change formats the data properly, and once approved a series of automated processes commit the change to the production environment. The entire process takes only a few minutes after approval, so that team can start collecting and visualizing that data in near-real time. This process provides self-service to teams within Volvo.

With greater control over monitoring thresholds and alerting, the entire diagnostic and resolution process improved. Once properly configured in the new system, many of the issues that appeared in the old system simply disappeared. Having reduced much of the alerting noise, teams at Volvo can diagnose issues faster and resolve them quicker. Now, when an alert turns yellow or red, teams immediately know that they need to act and have a better understanding of why issues occur and, therefore, how to resolve them.

Implementing this new system demonstrated the power and value that monitoring data brings to Volvo, and how it can have a positive impact on the bottom line. By giving developers within the company the tools to monitor and manage their IT systems, the DevOps Enablement team helped create a new mindset within the company that embraced the data-driven approach to monitoring.

About InfluxData

InfluxData is the creator of InfluxDB, the leading time series platform. We empower developers and organizations, such as Cisco, IBM, Lego, Siemens, and Tesla, to build transformative IoT, analytics and monitoring applications. Our technology is purpose-built to handle the massive volumes of time-stamped data produced by sensors, applications and computer infrastructure. Easy to start and scale, InfluxDB gives developers time to focus on the features and functionalities that give their apps a competitive edge. InfluxData is headquartered in San Francisco, with a workforce distributed throughout the U.S. and across Europe. For more information, visit influxdata.com and follow us @InfluxDB.