



AN INFLUXDATA CASE STUDY

# SAP Uses InfluxDB to Monitor Performance Testing Infrastructure in Real-Time

Telegraf and InfluxDB collect, store, and process critical performance testing data



## Company in brief

SAP is the market leader in enterprise application software, helping companies of all sizes and in all industries run at their best: SAP customers generate 87% of total global commerce. Its machine learning, Internet of Things (IoT), and advanced analytics technologies help turn customers' businesses into intelligent enterprises. Its end-to-end suite of applications and services enables our customers to operate profitably, adapt continuously, and make a difference.

## The business challenge

SAP wanted a one-click, end-to-end performance monitoring framework based on open-source technologies. Because SAP engineers ran a wide range of tests using large-scale infrastructure, they needed a solution to monitor that infrastructure to ensure tests ran according to plan. This framework needed to support both single and multiple load generator scenarios, and real time performance results visualization. The company intended to use this framework for performance qualification for five of its core stack products and microservices. As a result, it needed to be able to collect performance data from multiple sources, including JMeter, infrastructure, and log files. Utilizing open-source technologies as much as possible in the creation of this system meant SAP could get the same testing and performance results that they could get with something like HP LoadRunner, but at a fraction of the cost. Having such a framework at its disposal, SAP could also modify it to work with different technologies with minimal investments of time and effort.

## Case overview

Performance engineers at SAP sought to build an end-to-end performance testing framework that catered to the needs of large-scale infrastructure monitoring. SAP built its new solution with open-source technologies, including InfluxDB as the time series database. The testing framework uses Telegraf to collect data, and InfluxDB to store and process data from infrastructure systems in real-time. The resultant framework streamlined application testing and eliminated data and transaction loss during automation or performance test execution.

### Technologies Used:

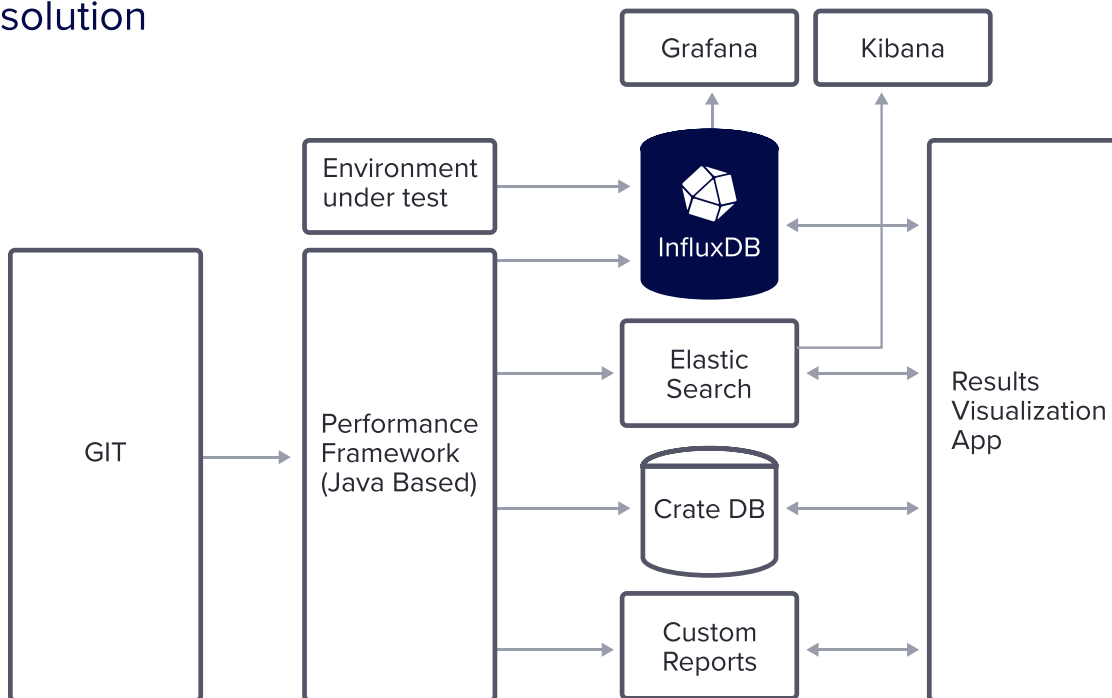
Flux, Grafana, InfluxDB, JMeter, Telegraf

## The technical challenge

SAP has a large testing infrastructure, including around 200 servers and a range of related systems. This infrastructure needs to be able to meet the demands of any test that SAP developers can throw at it. Performance tests can run as quickly as a few minutes or for many consecutive days. If something went wrong with a test, SAP developers needed to be sure that the failure was a result of the test and not due to overwhelmed infrastructure.

The overall architecture of SAP's testing framework contains several different clusters that each play a unique role in the testing process. The solution needs to be able to detect infrastructure issues, and address testing failures and retry logic. The primary framework is Java-based and relies on Apache JMeter. To monitor infrastructure performance, SAP engineers needed a time series database to see what was happening in real-time. Nicknamed the TIG stack, the SAP team built a monitoring cluster that utilizes Telegraf, InfluxDB, and Grafana.

## The solution

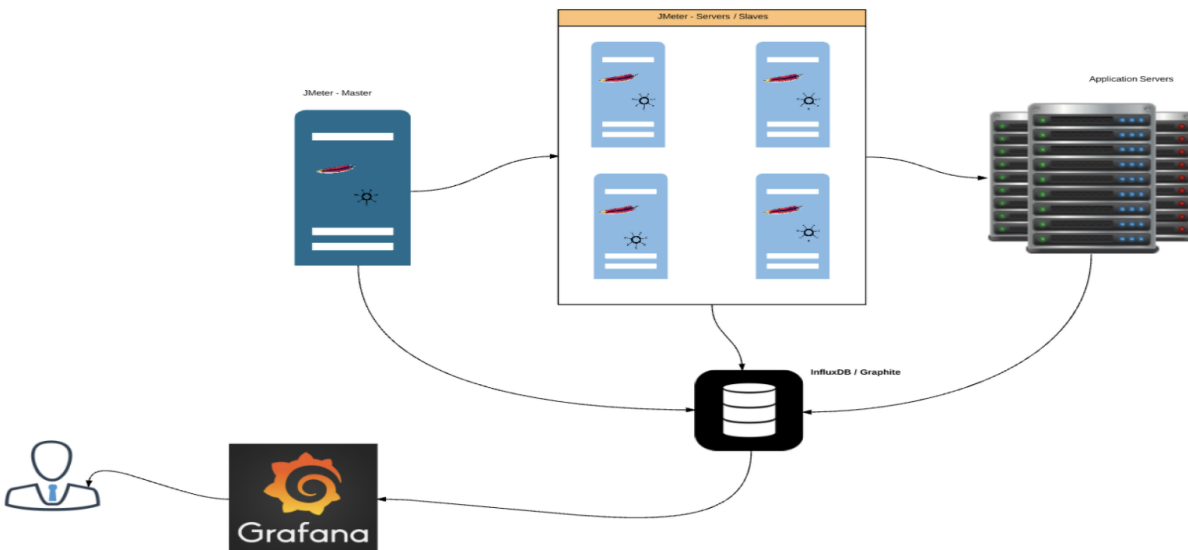


Real-time monitoring with the TIG cluster starts with a primary JMeter node and a group of secondary nodes on different load generators. The primary node randomly connects to any one or more of the secondary nodes, where it begins to execute the test. The primary node also connects to InfluxDB, which collects performance test data from the testing infrastructure. This includes metrics like minimum and maximum response times, total number of requests, total number of failed requests, throughput rates, and more.

The secondary node connects to the application servers, and both secondary node and application servers send data to an InfluxDB instance.

SAP uses Telegraf as a server monitoring agent for the application servers. These Telegraf agents collect system and application metrics, such as cpu and memory usage, storage capacity, and network connectivity, from the application servers and send that data to an InfluxDB instance.

Once in InfluxDB, SAP uses Flux to process the raw data and generate aggregations. The processed data then gets sent to Grafana dashboards for visualization.



## Results

Using this JMeter-based load testing framework, SAP eliminated 100% of data and transaction loss during automation or performance test execution. The TIG stack allows SAP engineers to see these results in real-time.

This solution streamlined SAP's testing workflows by reducing the amount of effort and the number of man-hours necessary for completing the execution of performance and automation tests. Users can easily replay data from completed tests, which reduces the need to duplicate tests and enhances overall testing efficiency. The data collected also acts as a highly accurate model for metrics generation, allowing testers to compare baseline and comparison test builds without any data mismatches.

## What's next

The SAP team developed this framework for internal use, but noted that as an open source model, anyone can adopt this particular performance testing framework to any cloud infrastructure and adjust it to work with different technologies with very minimal changes.

## 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](https://influxdata.com) and follow us [@InfluxDB](https://twitter.com/InfluxDB).



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