AN INFLUXDATA CASE STUDY

WP Engine Deploys Global Monitoring and Alerting Solution Using InfluxDB

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Observability Platform Increased Infrastructure Performance While Requiring Less Human Intervention

Company in brief

WP Engine offers website hosting, performance tools, and intelligence for WordPress customers. The WP Engine platform provides brands the solutions they need to create remarkable sites and apps on WordPress that drive their business forward faster. It hosts over 1.5 million websites, serving over 175,000 customers in more than 150 different countries, and processes 5.2 billion requests per day. In total, WP Engine's footprint comprises about 8 percent of the entire web.

Case overview

WP Engine experienced a system outage for nearly 24 hours in August 2019. During this outage WP Engine's Zabbix monitoring system went down because it had a single point of failure. WP Engine developers had already begun the search for a more reliable replacement but this was the final straw for Zabbix. After evaluating several options, WP Engine developers chose a solution including InfluxDB, and in the process transformed a monitoring solution into a true observability solution. The new observability system increased the number of metrics the company collected, provided redundancy, reduced the number of alerts generated by the system, and triggered autonomous tasks, reducing the amount of human intervention required to manage the WP Engine platform as a whole.

Technologies used: Amazon SNS, GitOps, Grafana, InfluxDB Enterprise, InfluxDB OSS, Kapacitor, Kubernetes, PagerDuty, Slack, Telegraf.

The business challenge

The WP Engine platform experienced an outage in August 2019, and the company's site reliability engineers (SREs) had no visibility into the issues. WP Engine ran the largest known Zabbix deployment with over 15,000 hosts on a single server, but that single server was also a single point of failure. So, when that server went down, so too did WP Engine's platform visibility.

The WP Engine team needed a reliable monitoring system that enabled them to respond to issues before they affected users. To achieve this, they needed a system with built-in redundancy and the ability to scale with the company's needs.

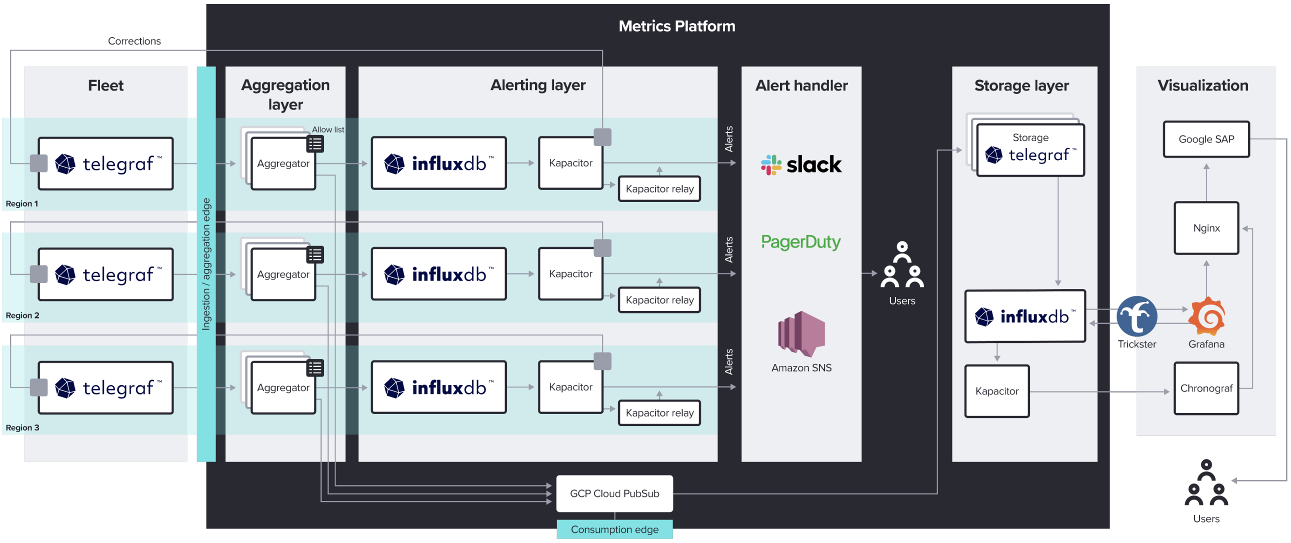
The technical challenge

Because the WP Engine platform caters to such a large user base, the new observability solution had to be able to handle several key metrics. Its Zabbix system monitoring was at its limit, which led to compromised visibility, and made it impossible to increase alert granularity because of the sheer number of hosts and metrics being monitored. The more WP Engine developers tried to stretch the system's capabilities, the more downtime they experienced. As a result, they had to reduce the granularity of their data to keep the system operational. Even at this limited capacity, the system still served 250,000 queries per minute and generated 3TB of log data per day and an alert every six minutes. This created a lot of human cognitive overhead.

WP Engine's team did not simply want to replace the Zabbix system, they wanted to improve it and make it scalable to grow with the company's needs. They wanted something that could handle a global, multi-region platform, that was extendable, that could take advantage of automated tasks, and would provide flexibility for incorporating other data sources and machine learning solutions.

The solution

WP Engine considered a turnkey solution in Datadog, but it was cost prohibitive. Instead, WP Engine's developers created a multi-layered metrics platform to address all these needs with InfluxDB as the central time series platform. With this approach, if one region goes down, the whole system does not go down with it. WP Engine has 15,000 hosts spread among a range of services and cloud providers. WP Engine considered Fluentd for data collection in this layer, but went with Telegraf because it is much less resource-intensive and has a large plugin library so it's possible to collect a wider variety of data. WP Engine collects metrics like CPU and memory utilization at both the server and container level, server response time, disk utilization, and more.



The WP Engine metrics platform stack

For each region, Telegraf sends this data to an aggregation layer, which runs on Kubernetes. This layer cleans and filters out the data they do not want to keep in the data pipeline. WP Engine uses GitOps for deployments in the aggregation layer, giving developers flexibility when updating the type or number of aggregators running or updating filter settings.

From the aggregation layer, the data moves to the alerting layer. Here, WP Engine runs an instance of InfluxDB OSS and Kapacitor. To reduce the amount of data kept in Kapacitor memory, WP Engine sends all of the data via InfluxDB OSS to Kapacitor and relies both on stream and batch alerting for Kapacitor. Alerts get sent to a variety of endpoints, such as Slack, PagerDuty, and Amazon SNS.

The number and frequency of alerts was an issue for WP Engine developers, so they also use Kapacitor to trigger automated tasks. Kapacitor sends a connection to a special agent running in the fleet layer, which initiates the command. For instance, if a virtual machine needs to be restarted, Kapacitor can automatically trigger that task. WP Engine built in re-try logic and redundancy, so if the re-start task exceeds the maximum number of tries, a human receives an alert.

From the aggregation layer metrics also route through Google Pub/Sub, which in turn sends data to multiple storage locations, including a six-node cluster of InfluxDB Enterprise. Data stays in Pub/Sub for a day in case an outage occurs in the storage layer. That way, no data gets lost. To keep Pub/Sub costs down, WP Engine uses Telegraf to compress the data sent to Pub/Sub. The observability team also created a pull request in Telegraf to get access to the uncompressed data.

Finally, WP Engine uses the metrics stored in InfluxDB Enterprise for a variety of visualization tasks, using Chronograf and Grafana.

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> *We are looking to solve one of the major problems in our system — our support and production engineering team was being interrupted with lots of alerts that could be easily solved with no human intervention. So instead of sending those alerts to humans, we captured them in a Kapacitor relay and sent those signals to VMs to correct automatically.*
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> **Nadeem Syed,** Principal Software Engineer - Observability, WP Engine

Results

WP Engine created a solution that meets its current needs and has the capability to grow along with the company. The company eliminated single points of failure where possible, invested in interconnectivity and redundancy with InfluxDB Enterprise. The WP Engine metrics platform ingests twenty times more metrics than the old system (as much as 25MB of metrics every second), handles 5 million data series, and stores that data in two places, instead of just one. The new system reduced alerting frequently to once every 15 minutes now, delivering more than 2x improvement in human cognitive overhead. Contributing to this is better auto remediation because fewer noisy alerts fall to humans to deal with.

What's next

This system serves internal WP Engine users, but the company is exploring options for exposing relevant data to customers. Additionally, WP Engine developers are looking into converting Kapacitor tasks to InfluxDB tasks.

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.