CASE STUDY

PatientPing brings teams together with real-time data and performance analysis

PatientPing is a nationwide care coordination platform that's reducing healthcare costs—and achieving explosive growth—by keeping medical professionals fully abreast of patients' treatment across facilities. Doctors, hospitals, emergency rooms, outpatient clinics, and other network providers get real-time admissions and discharge notifications, or Pings, whenever and wherever patients receive care. PatientPing also gives care providers immediate access to critical patient history. As a result, the company's ability to quickly and reliably manage vast quantities of complex data is of crucial importance to thousands of patient providers every day.

Building out a patient-centric platform to serve multi-layered healthcare networks across the U.S. is a huge job. PatientPing's engineers know the continued success of their groundbreaking application depends in large part on how effectively it interacts with their MySQL database.

HEADING OFF GROWING PAINS

Founded in 2013, PatientPing has expanded so rapidly that the engineering team has taken proactive steps to get ahead of potential database performance issues such as:

- Limited visibility. Legacy tools only provided snapshots of query/database performance. They didn't provide context to see how issues are interrelated or help forecast issues.
- Increased latency. Occasionally a set of queries might run slowly or hit the database frequently, causing application performance to suffer and end users to get frustrated.
- Lost resources. If left untreated, problematic queries can result in wasted CPU capacity, lost engineering team productivity, and system outages.

"MySQL Workbench is OK, but relying on it to monitor our database performance was like the old elephant joke: each blindfolded person who touches a different part thinks it's a different animal," said Heidi Schmidt, data engineer for PatientPing. "We needed a way to let our whole team see the complete picture at all times."

PATIENTPING

Sample Results

- Training program enabled **dozens of engineers, data scientists, and others** to use VividCortex (now SolarWinds Database Performance Monitor) to monitor database performance
- Identified underperforming queries and made improvements so those **queries run up to 10x faster**
- Found/fixed a problematic query pattern to achieve **double-digit reductions in memory use** and stabilize at a new sustainable level to reduce risk of outages

"PatientPing notified us that one of our patients had been discharged from an [skilled nursing facility]. She didn't have a stable home life or good social supports, and she was discharged without her inhalers. We immediately intervened, securing lost prescriptions, new housing, and community supports."

— Jane Mulligan
Nurse Case Manager at
PatientPing Customer Site

HOLISTIC VIEW EMPOWERS TEAM

To address this problem, VP of Engineering Ryan Scharer asked his team to find a tool that matched their values: "We empower developers to understand exactly how their code behaves in production, without being mediated through a special class of operators or DBAs, so they can take responsibility for the full lifecycle of their solution. We have such tools in place for monitoring application performance and hardware resources, but the database was essentially a black box. [SolarWinds® Database Performance Monitor (DPM)] solved this for us. Every team now has access to real-time data on how each of their queries is impacting the system, and they can tune their own code in response."

To accelerate adoption enterprise wide, Schmidt is coordinating a series of Power User Training courses for her PatientPing colleagues. "So far, three teams consisting of dozens of engineers are using [Database Performance Monitor], as well as data scientists and anyone else for whom database performance is of critical importance."

PREVENTATIVE CARE PAYS OFF

When PatientPing implemented DPM on its core systems, data engineers immediately saw several of their applications were dropping errors and key warning signs weren't being bubbled up within the ELK stack (Elasticsearch, Logstash, and Kibana). Bringing previously unknown errors into full view allowed the PatientPing team to detect anomalies and anticipate problems, so they could take preventative action. DPM helps streamline collaboration with developers by allowing the rest of the team to simply click "Copy Link," paste it to Slack, and have an efficient, data-driven conversation around query optimization.

The PatientPing team also began routinely triaging problematic queries—for instance, when one query hammers the database for an hour but another one only creates a tiny hiccup and doesn't affect overall performance. With DPM, engineers can easily see which queries have errors or are missing indexes and seriously impacting performance, so they can focus first on cleaning up those issues rather than wasting time or CPU capacity elsewhere.

By using Database Performance Monitor to uncover the individual queries not working as intended, the PatientPing team has made improvements enabling some of those queries to run up to 10x faster. In one case, the team discovered a query pattern was causing substantial memory loss every time it ran, so they refactored the code and reduced the frequency of the query pattern's use. As a result, the PatientPing app quickly achieved double-digit reductions in memory usage and stabilized at a new sustainable level, mitigating the risk of potential outages.

> *"VP of Engineering Ryan Scharer and Heidi Schmidt, data engineer, who says: "The bottom line here at PatientPing is supporting customers by optimizing every interaction between our app and database …We've been able to use [DPM] to… take proactive measures to keep our database healthy!"*
>
> — Heidi Schmidt
> Data engineer

EVENT MARKER TREATMENT

As PatientPing's developers go about checking their code, they say DPM's Event Marker capability is especially useful. By simply marking the DPM timeline when they deploy code or do a batch job—or when an unexpected issue occurs—they can easily see whether interactions between the database and the application were better or worse afterwards. The marker shows where the change may or may not have started. Then they can drill down into the Explain files and other details to discover the root cause of any problems.

"It's easy and it works. I'm happy to say the PatientPing team even took it a step farther with an innovation of our own," Schmidt said. "We set up our system to automatically monitor our event horizon by using Event Marker in combination with a shell script embedded in Java code or Python, putting them in place automatically."

By automating this key monitoring step, PatientPing has generated a new efficiency in the team's daily workflow, allowing developers to stay focused on writing code while also speeding up the discovery of any potential issues.

THE BOTTOM LINE

PatientPing, a proven leader in healthcare information technology, is now a leader in database performance monitoring. "The bottom line here at PatientPing is supporting our customers by optimizing every interaction between our app and database as well as mitigating potential risks," says Schmidt. "We've been able to use [DPM] to prove certain query patterns could cause the loss of a chunk of memory to the point that the database could potentially degrade. With greater visibility, we're able to take proactive measures to keep our database healthy!"

ABOUT SOLARWINDS

SolarWinds (NYSE:SWI) is a leading provider of powerful and affordable IT infrastructure management software. Our products give organizations worldwide, regardless of type, size, or IT infrastructure complexity, the power to monitor and manage the performance of their IT environments, whether on-prem, in the cloud, or in hybrid models. We continuously engage with all types of technology professionals—IT operations professionals, DevOps professionals, and managed service providers (MSPs)—to understand the challenges they face maintaining high-performing and highly available IT infrastructures. The insights we gain from engaging with them, in places like our THWACK online community, allow us to build products that solve well-understood IT management challenges in ways that technology professionals want them solved. This focus on the user and commitment to excellence in end-to-end hybrid IT performance management has established SolarWinds as a worldwide leader in network management software and MSP solutions. Learn more today at www.solarwinds.com.

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