Microsoft

With a move to the cloud, IT operations team redesigns the infrastructure monitoring model

Overview

In the past, the Manageability Platforms team within Microsoft Core Services and Engineering (CSEO) maintained a centralized monitoring environment for all internal business apps. However, that model had to evolve as business app teams began moving from dedicated servers to virtual machines (VMs) hosted on Microsoft Azure, over which the centralized team had little visibility or control. To support that move to the cloud, the Manageability Platforms team drove all of its internal customers to a decentralized, self-service monitoring model, with each business app team now monitoring its own solutions. That journey, while difficult, has led to increased monitoring agility and relevance, better visibility into end-to-end service health, increased innovation and DevOps alignment, and improved costs. And with business app teams now empowered to monitor their own infrastructure and apps, the Manageability Platforms team can think more strategically and focus on other aspects of enterprise manageability, such as security patching, inventory, and compliance.

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The Team

The Manageability Platforms team is part of Microsoft Core Services and Engineering (CSEO)—formerly called Microsoft IT. The centralized, global team is responsible for network and cloud manageability tools and platforms. Its responsibilities include security patch compliance and monitoring, performance management of network infrastructure, data collection for device inventory and configuration management, and inventory and distribution of software. These enterprise services are consumed by internal Microsoft business groups.

The Challenge

Up through 2017, the Manageability Platforms team maintained a centralized monitoring and alerting environment for the infrastructure upon which all internal business apps ran, encompassing some 16,000 servers. Based on Microsoft System Center Operations Manager (SCOM) at the time, the entire environment was firmly rooted in the traditional IT model, with a centralized team providing a self-contained service that business app teams consumed. The centralized IT team designed and maintained all the infrastructure, while the Manageability Platforms team (a part of that centralized organization) monitored its health, configured all alerts and notifications, maintained all reports and dashboards, and

handled most trouble tickets. Development teams for internal business apps operated almost entirely outside this domain, occasionally helping resolve issues when assistance was needed.

This centralized approach had to evolve as Microsoft began moving its internal systems and apps from dedicated servers to virtual machines (VMs) hosted on Microsoft Azure, upon which 90 percent of all Microsoft IT infrastructure now runs. "**The move to Azure** redefined the relationship between business app teams and us," says Dana Baxter, a Principal Service Engineer on the Manageability Platforms team. "They started creating their own virtual servers in the cloud, which were beyond our reach. They owned the Azure subscriptions and administered the VMs, yet we were supposed to manage them. It literally broke how we worked, including our accountability model, and we had to redesign our support services to accommodate the new self-service cloud model."

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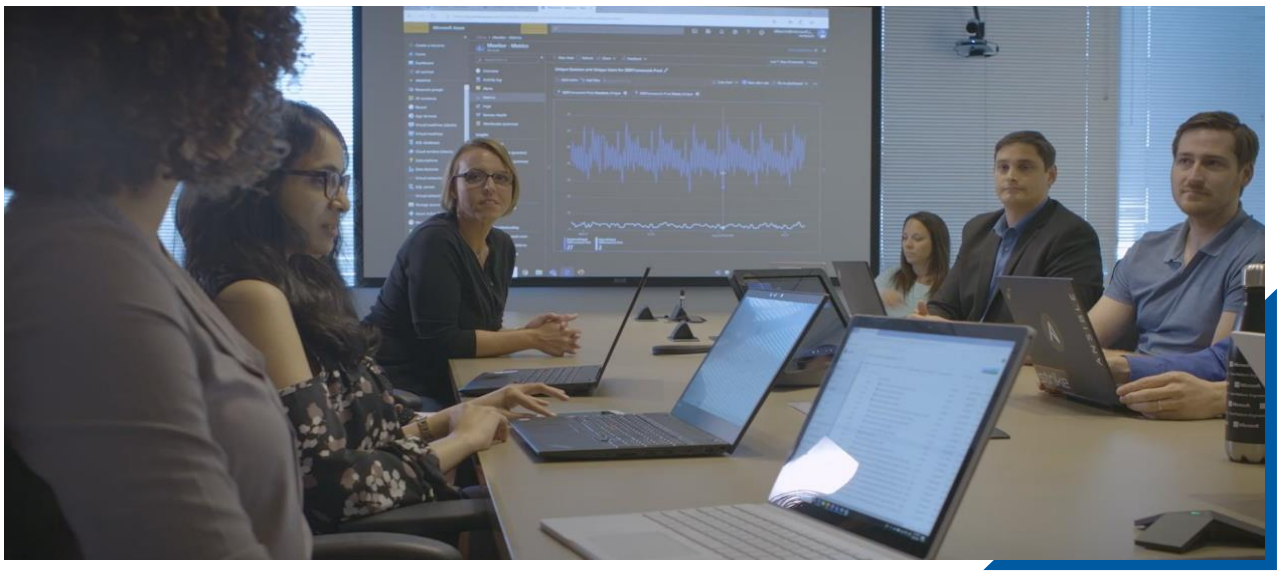
To complicate matters, at the same time all this was happening, the legacy monitoring environment was showing its age. Over the years, often in response to a single, isolated incident, new alerts had constantly been added—yet rarely removed. "Our monitoring environment had become a garbage dump of old alerts, with hundreds of false alarms each month as well as a whole bunch of legacy alerts that were never triggered," recalls Baxter. "The primary reason for all this was that, at the time, making changes was just too hard, with too little reward. Due to the scale of the environment and our change management processes, to make broad changes, it required a lot of time and effort to coordinate with business app teams and our support engineers. As a result, we focused on larger-impact projects while smaller maintenance projects, though important, remained unprioritized."



The Journey

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At first, the centralized IT team tried creating its own pool of Azure subscriptions for use by business app teams. "We tried a shared Azure experience, where we purchased subscriptions then divided them up," explains Baxter. "However, under that model, we were still a bottleneck to business app teams, who wanted the freedom to do things on their own—full administrator rights included. Remember all this was happening as the infrastructure-as-a-service model began to take off, with hosted VMs in the cloud—so a few years before today's platform-as-a-service era and modern Azure services."

In January 2017, with the churn and chaos surrounding the whole monitoring environment continuing to grow, the Manageability Platforms team decided to get out of the day-to-day monitoring business altogether. "We had a good relationship with the product group for Azure Monitor, the successor to SCOM, which we knew we would be moving to eventually," says Baxter. "There was enough feature set parity by that time that we felt confident flipping the switch—and telling all business app teams that 'you're going to have to start monitoring your own stuff in six months.'"

Needless to say, some business app teams were resistant and tried to push back, or at least ask for more time. Baxter had been down this road before, however, having led a similar effort to decentralize the administration of SQL Server, and knew it could be done. She also knew how to make it happen and had already been socializing the idea among Microsoft leadership teams, attending GM syncs and director reviews to help them understand the importance of the transition before announcing the six-month deadline. "Satya Nadella had been our new CEO for a few years by that time and had been pushing the company to move its own IT infrastructure onto Azure," says Baxter. "Leadership teams understood that such a move would let them take some credit for stepping-up and doing so in their own end-of-year reviews."

Baxter knew that instilling a culture change for infrastructure monitoring would require a focus on people, process, and technology. Before she could drive such a change, however, her team had to get its own house in order, and began cleaning up the existing mess of old alerts. "There were some core alerts that we knew were needed, plus a whole lot more custom alerts that had been created over the years as we dealt with unique situations," she explains.

"We reviewed each trouble ticket and what led it to be created, along with the severity and frequency of each alert to determine whether they were actually helping. By the time we finished, we had cut the number of alerts from about 100 to 15."

Those 15 alerts, in turn, formed the basis for the toolkit that Baxter's team created to help business app teams start monitoring their own infrastructure. "It came down to changing how they worked—that's the 'ops' part of DevOps," says Baxter. "When we told them they had to monitor their own infrastructure, a common response was 'we don't know how to do that.' The toolkit we gave them included automation and guidance to help them monitor their infrastructure in the same way that we had been doing it."

Decentralization of enterprise monitoring also required culture change on behalf of Baxter's team, which had to relinquish control over something it had owned for years. Fortunately, the toolkit enabled them to establish a baseline that would ensure both consistency and their ability to provide global oversight. "It gave us a vehicle for establishing some initial 'guardrails' that would help prevent business app teams from getting into trouble due to their newfound autonomy," says Baxter.

With all the necessary technology and processes in place, the remaining focus was on helping business app teams across the company start monitoring their own infrastructure. "We began to communicate and train like crazy, including broad communications, brown-bags, one on one training, and a little bit of hand-holding," says Baxter. "It wasn't easy; it took a lot of work to drive such a major culture change across the company. Support from our leadership team and setting timelines was key."

The Results

Redefined and optimized roles and responsibilities

The legacy infrastructure monitoring environment was decommissioned in July 2018. Today, business app teams across Microsoft are monitoring their own infrastructure, encompassing some 1,740 applications. The Manageability Platforms team is now "out of the day-to-day monitoring business," as Baxter puts it, and serves as a dynamic, distributed consultant instead of a self-contained service-provider—focused on continuously refining and improving both the monitoring environment itself and the guidance provided to the business app teams who use it.

"Looking back a few years, Azure was a big unknown to many people," says Baxter. "Today we're all really Azure-savvy and working cross-group, all in alignment. It was pretty difficult, and some parts were really painful, but teams across the company—including our own—are definitely better-off today."

Streamlined Processes

So just how have things improved? The transition to a democratized, self-service approach to enterprise monitoring and reporting has delivered several benefits, especially for business app teams. For example, in the past, working through old processes, it took days of coordination with the Manageability Platforms team to create new monitors and alerts. Today, business app teams can configure their own alerts in minutes, and can create their own reports and dashboards in just a few hours.

Consolidated, intuitive, and targeted reporting

In addition, the new environment gives the Manageability Platforms team a complete and consolidated view of its entire scope of responsibility and does the same for each of the company's business app teams. New reporting and dashboard tools that are enabled by Azure Monitor and take advantage of Power BI make it easy to view concise, targeted information about any part of the environment.

Efficiently configured monitoring environments

What's more, business app teams are now empowered to design a monitoring environment that's tailored to their specific needs and aligns with the way they're building and managing their apps. "Because business app teams are receiving the alerts from their apps and services, they're more motivated to not only fix any issues, but also to configure their monitoring environments as efficiently as possible," says Baxter.

Quicker fixes, better apps, amplified system performance

Self-service monitoring by business app teams also has led them to pay more attention to the information and alerts that are provided. In turn, this has led quicker fixes, better apps, and increased levels of system performance and efficiency. "In the past, a dedicated Insights team was required to ingest, warehouse, and deliver reports for measuring and managing faults, events, and performance," says Diego Baccino, Senior Software Engineering Manager in the in the Engineering Platforms and Insights group within Microsoft CSEO. "After we decentralized everything, our team was able to deprecate close to 500+ reports and data tables that were used by business app teams for this purpose. We shifted from having to ingest and warehouse all insights centrally to providing built-in templates as Power BI content packs, all while maintaining best practices for data interpretation and visualization."

Efficient processes give more time to innovate

The Manageability Platforms team is better-off too. It no longer needs to maintain a centralized monitoring infrastructure, which has freed the team's own engineers to focus on assisting business teams as needed. At the same time, the team is working on incorporating new Azure Monitor features into the environment—such as multi-resource metric alerts, which allow the creation of a single alert to monitor multiple virtual machines in a subscription. The team is also working toward incorporating Azure Policy into its standards and governance scenarios, as a means of enforcing compliance.

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"It used to be really hard to get people to take a risk and try new features—that's a lot easier now," says Baxter. "Today we're a smaller team, but those of us who are still here are no longer just a bunch of

SCOM experts; today we're a team of developers and engineers who are focused on broader enterprise scenarios and other aspects of manageability."

Increased standards of excellence

Along with a change in focus, the Manageability Platform team's measure of success has changed as well. "Our KPIs used to be all about alerts, trouble tickets, time to resolution, and so on," says Baxter. "Today they're around things like inventory, security patching, compliance, and other components of enterprise manageability. We still have problems to solve when it comes to other tools, but we know what we need to do and how to make it happen. It'll just be a matter of applying the same approach we used for enterprise monitoring to the next area we decide to tackle."

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