

Cisco IT Methods

How Cisco Simplifies Application Monitoring

Introduction

Insights into individual online transactions and user experiences are critical to today's digital business activity. In the past, obtaining this deep visibility was difficult because of complex websites, distributed applications, and dependencies across IT domains. Troubleshooting application or transaction problems was time-consuming and often required manual analysis to identify the root cause. And this troubleshooting typically was an after-the-fact reaction to a reported problem, with limited visibility into problems in real-time.

Helping IT departments address these challenges was one factor behind the decision by Cisco to acquire AppDynamics, Inc. in early 2017.

Solution

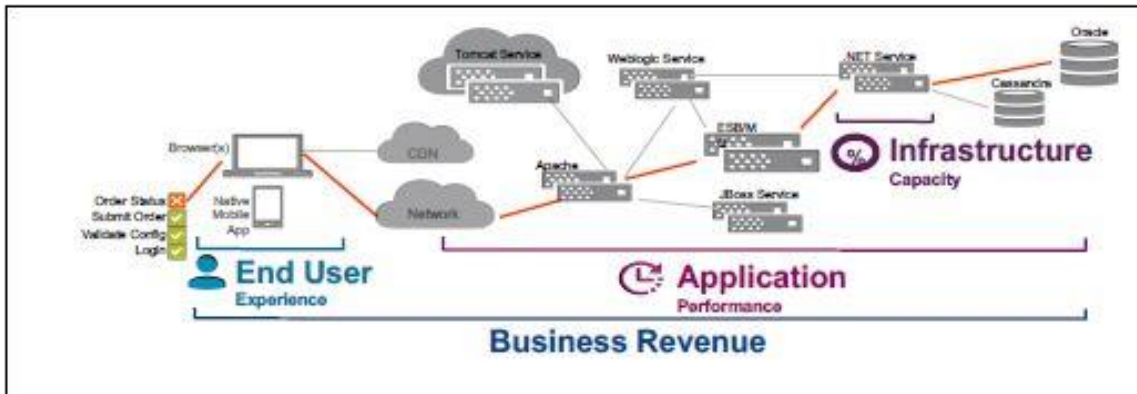
Prior to the acquisition announcement, Cisco IT had chosen the AppDynamics Application Performance Management and End-User Monitoring products to gain end-to-end visibility into business-critical applications. Today, data and analytics from AppDynamics help us improve application performance and user experience on multiple Cisco® websites, including Cisco.com.

As of early 2017, our use of AppDynamics covers a broad range of IT services and transaction types, including:

- Quotes and configuration for customer product and service subscription orders
- Customer returns and support cases
- Supply chain inventory, logistics, fulfillment, and forecasting
- Corporate human resources, procurement, legal, and finance applications

As shown in Figure 1, AppDynamics collects data about a transaction from the user to application to infrastructure. This data produces several key metrics and insights for application monitoring such as an application flow map, business transaction response times, and traffic load and errors. For user experience, AppDynamics data presents response time trends and statistics on usage factors such as browser and device types.

Figure 1. Example Business Transaction Flow Analyzed by Cisco IT Monitoring as a Service



Four Cisco IT development groups illustrate the value of AppDynamics for improving the performance and experience of our business applications.

Web content publishing. Cisco.com and other Cisco corporate websites provide essential information and resources to our customers, employees, partners, and suppliers. To publish and manage the content on these sites, we use a content management system (CMS) that is implemented with multiple instances and considered to be a top-priority application.

For the Cisco IT Operations team, AppDynamics offers automated alerts for server utilization and system performance that identify problems before they affect content authors and website users. Previously, the team relied primarily on user reports to identify problems with CMS operation.

“With AppDynamics, we gained better control of the CMS deployment and could improve its availability and stability,” says Eldho Syriac, architect, Cisco IT. “The proactive alerts allowed us to cut the time to identify a problem’s root cause from 48 hours to two hours and avoid 12 application incidents in just one month. For our internal business users, the CMS now delivers higher performance so it doesn’t take a long time to develop content and they can have confidence it will be posted on time.”

Website traffic loads. The Global Support Experience team uses AppDynamics to track selected factors about website traffic loads. For example, data on the number of website cache calls gives early warning of potential problems such as longer response and transaction times. The monitoring service helps the team analyze trends in traffic load patterns and obtain visibility of transactions as they are transferred from one server to another within the Cisco IT infrastructure. This team also uses AppDynamics tools as part of their development and test activity to identify and resolve defects in application code. “Our goal is to get an early alert of problems so we can remediate them quickly and keep them from becoming a business-impacting issue,” says Ravi Patnala, operations engineer, Cisco IT.

Automated software license activation. The Licensing Applications team is responsible for managing the on-premises software license activation and provisioning when a Cisco customer purchases a hardware or software product. Given the complexity of the activation task and the diverse mix of products, the team needs the ability to monitor many aspects of the transaction. Previously, the team obtained limited reports about application performance based on processing log data or using tools specific to a particular application stack.

“Now, we can see a map of all the connected components in a license activation transaction, with information across all of the IT services involved, even after the fact” says Naveen Uttamsingh, architect, Cisco IT. “Also, the ability to test transaction flows in a nonproduction environment helps us quickly solve problems as they happen in the production systems.”

Website search services. The Enterprise Search Services team maintains a single capability to serve nearly 15 million search queries per month across more than 45 Cisco websites and applications. The team previously used an external, synthetic-agent tool to measure latency for delivering search results. However, this tool was installed only in a small number of fixed locations, so it could not provide a complete view of the search experience for users worldwide. “The application monitoring service gives us data on the experience of users regardless of location, which is useful for making sure we deliver fast response to user search queries around the globe,” says Rohit Poduval, product owner for OneSearch, Cisco IT.

Additionally, the search service makes use of hundreds of Java virtual machines (JVMs) across a large number of hosts, which creates large log files and metrics data per JVM. “The huge volume of log and metrics data makes troubleshooting JVM problems very difficult,” says Sujith Joseph, architect for enterprise search, Cisco IT. “Additionally, when Java virtual machines or hosts have performance problems, it has an immediate impact on search performance, so we want to receive alerts and resolve the problem as quickly as possible and the monitoring service helps us do that.”

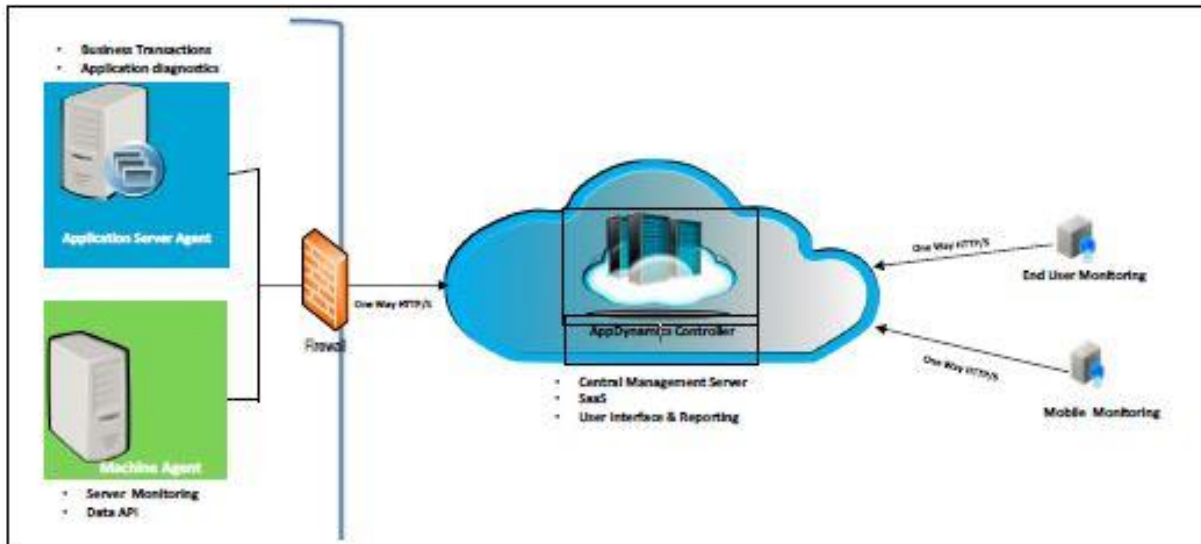
Another important factor for this team is the performance level of the monitoring service itself. “One of the most valuable benefits of the monitoring service process is the lightweight way it integrates with the network traffic so it doesn’t degrade performance and search query response times,” says Raashid Mehasanewala, service owner for findability solutions, Cisco IT. “Other products can have a bigger impact on search performance, which would be noticeable to users.”

Deployment

Application teams currently use the Cisco IT monitoring service to support Java applications running in the Cisco Lightweight Application Environment. The service platform team provides an initial consultation to define and create the initial setup of monitoring policies and rules for alerts. When this initial environment is ready, the application teams are able to order the monitoring service from the Cisco eStore and take over ongoing policy management and changes. “Because the tools are available to us as a service, activating the monitoring capability is very simple and we don’t need to plan on a long lead time for setup,” says Prabhu Narayanan, manager, Cisco IT.

The AppDynamics agents are installed on Cisco Unified Computing System™ (Cisco UCS®) servers in the Cisco IT production environment. These agents send the log data and transaction traffic to the AppDynamics Controller, which is a cloud-based central repository and analytics engine that stores all performance data for reporting and analysis. To analyze transactions, agents are installed on the user’s browser or within the application accessed by the user. (Figure 2)

Figure 2. Implementation Design of AppDynamics Components in the Monitoring Service



Benefits

“The AppDynamics platform gives us early insights into application performance problems, which enables the Operations teams to take proactive remediation actions, thus avoiding business impact. It also gives the application teams and service owners real-time insights about the health of their application and business transactions,” says Yatin Wadhavkar, manager, Cisco IT. “These deep insights help the developers continually improve an application’s performance, which has a direct and positive impact on Cisco business performance.”

Supports increased speed and ease for conducting business. We have experienced a 10 times increase in the speed of detecting and identifying the root cause of application performance problems. Operations teams have seen 15 percent fewer problem cases initiated by application users because they are able to proactively remediate the issue based on the early warnings sent by the AppDynamics tools.

Simplifies the user experience for application services. With the ability to view individual transactions in detail, application teams can identify and resolve difficult aspects of the user experience. Business owners also obtain real-time visibility into the health and performance of their customer transactions. The insightful data that the AppDynamics tools provide reduces the fault domain to a very narrow area of the infrastructure. The IT Operations teams need to engage only a few individuals to resolve the problem instead of the multiple number of teams that would otherwise be required to triage the issue. This scope not only reduces the time to problem resolution and improves productivity, it also makes a fourfold improvement in the ease of working with IT.

Improves application performance and quality. The ability for application teams to resolve problems proactively means fewer support cases. And because application teams can detect and solve code issues earlier in the development cycle, this helps increase the quality of the code and leads to fewer problems when the code is released in the production environment.

Helps to avoid costs for application troubleshooting. Improved fault isolation has helped us avoid an estimated 30 percent of application troubleshooting costs by making it easy to identify the right team quickly to work on the root cause, remediate the situation, and restore services.

Lessons Learned

Cisco IT offers the following lessons for developing a similar application monitoring service.

Show the value of adoption. Application teams may view the monitoring service as just another tool, which will lead to slow adoption. Proving and showcasing the valuable information and capabilities available helps application developers understand the difference and benefits of the monitoring service.

Make the service easy to consume. Three activities help with this strategy:

- Package the monitoring tools into a self-service, automated platform.
- Automate the rollout of the AppDynamics agents via a process that integrates into your continuous delivery framework.
- Create a “train the trainer” plan to develop awareness and educate application teams about using the monitoring service.

Fine-tune the application health rules. Modifying the rules to eliminate unnecessary alerts avoids inundating the support queue and creating an associated risk for losing awareness of critical events.

Automate corrective actions. Plan to automate the actions triggered by the monitoring insights delivered by the application layer. This automation is very powerful for improving application performance now and paves the way for achieving autonomous operations in the future.

For More Information

Learn more about Cisco's acquisition of AppDynamics: <https://www.cisco.com>

To read additional Cisco IT case studies on a variety of business solutions, visit Cisco on Cisco: Inside Cisco IT <https://www.cisco.com/go/ciscoit>

Note

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