EnerNOC uses Continuous APM to Manage Complex Distributed SOA Environments

Case Study – Production/Lifecycle - EnerNOC

dynaTrace software

Company
EnerNOC, Inc. (NASD: ENOC)

Industry
Green Tech/Demand Response

Location
United States

Challenge
24x7 code-level visibility into a complex, SOA-based environment to Improve performance and proactively identify issues in the application lifecycle

Application Environment
Distributed J2EE / LoadRunner

Requirements
Manage application performance in production environment to:

- → Monitor Application Performance with real-time 24x7 transaction coverage and capture
- → Code-level visibility for fast root-cause determination
- → Capture data on an ongoing basis to proactively spot performance issues early in the lifecycle before they become expensive problems
- → Integrate with LoadRunner

Solution
dynaTrace Production, Test and Development Editions enable EnerNOC to quickly trace performance issues down to their root cause to:

- → Reduce Mean time to repair of performance issues by upwards of 95%
- → Monitor and Diagnose their network 24/7 in production
- → Identify such issues earlier in the lifecycle, reducing operating costs
- → Improve application performance, leading to operational efficiency gains
- → Achieve a 2x ROI (on a low-six-figure investment) in a few months

ENERNOC Get More From Energy

EnerNOC is a leading developer and provider of clean and intelligent energy solutions to utilities and electric power grid operators, as well as commercial, institutional, and industrial customers. EnerNOC's technology-enabled demand response and energy management solutions help optimize the balance of electric supply and demand. The Company uses its Network Operations Center, or NOC, to remotely manage and reduce electricity consumption across a network of commercial, institutional, and industrial customer sites and make demand response capacity and energy available to utilities and grid operators on demand.

Challenge: America's energy grid is nearly a century old, and the electrical power industry faces enormous challenges to keep pace with the increasing demand for electricity. Utilities need to build plant and transmission lines to meet peaks in demand, but those peaks are infrequent – an estimated 10% of North America's electrical infrastructure has been constructed to meet peaks in electricity demand occurring less than 1% of the time. EnerNOC understands this supply-demand inefficiency intimately, and the genius of their model lays in realizing that you don't always need to generate more supply to maintain balance between supply and demand.

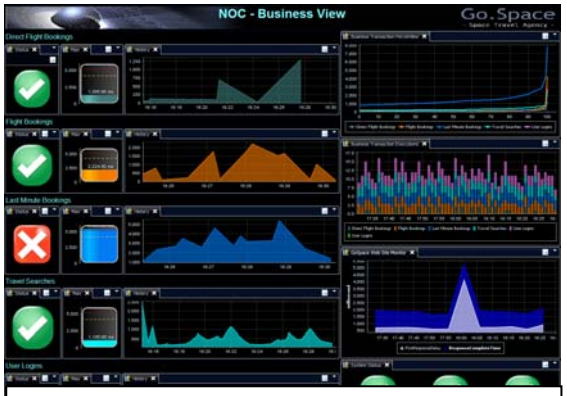

Figure 1: Operations Dashboard view

As simple as that sounds, however, the ability accurately and reliability manage demand is an extraordinary technological challenge. EnerNOC has gateways at over 3,000 customer sites across North America that monitor site usage 24/7. During periods of peak usage, EnerNOC technology automatically powers down lights and other discretionary load based on pre-defined rules, reducing stress on the grid. In this way, EnerNOC customers not only can reduce costs, but are actually paid simply by agreeing to be on standby for grid events. Customers receive additional payments from EnerNOC based on actual energy reductions during an event.

As EnerNOC scaled to over 3,000 customer sites, it realized that it needed greater visibility in diagnosing performance issues in its distributed network earlier in the production lifecycle. EnerNOC first created a mirror-image of its production environment in staging in order to perform load tests and simulate large volumes of data streams, devices and simultaneous users in a very large distributed environment. They then turned to dynaTrace during these tests in staging to identify a number of issues early on, well before they could escalate into something more critical.

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"The earlier we can isolate performance issues in our application lifecycle, the less expensive it is for us to solve them."

"With dynaTrace we've been able to reduce that problem determination time by 90-95%. Where before determining the root-cause of a performance issue might have taken weeks or months, or if it was something really hard it might have never happened; with dynaTrace it's literally down to a couple minutes on the production system."

"... we have a happier team of developers, they're more productive, and when they hand off the code to our QA team, they now have less bugs to deal with so we're obviously seeing an improvement in our QA cycle time."

"...we're seeing that the performance of the application has improved... now they can respond much quicker to these events because the application is that much faster. We can actually manage events more efficiently, with fewer NOC operators."

"We have made a low six-figure investment in the dynaTrace product, and we believe we've gotten a 2x return on that to date."

Solution: After experiencing success in QA and staging, EnerNOC took the next logical step: Deploying dynaTrace into their 24/7 production environment. They found that dynaTrace's lightweight agents provided unprecedented visibility into their production system, with minimal overhead. Now, each of the servers monitoring EnerNOC's customers' sites is monitored by a dynaTrace agent, providing deep diagnostics that give EnerNOC the same visibility into the issues created by peaks in demand on its software as it has with the peaks in their customers' energy usage. They also licensed dynaTrace for each of its developers to find issues as early as possible.

Results: "In January this year we significantly expanded our production architecture, and made it more service-oriented," said Jim Nichols, EnerNOC's senior Performance Engineer. "As we did that, it was really a no-brainer to expand the dynaTrace deployment to monitor all of those new services we added in the production environment."

One of the main benefits EnerNOC has found from this deployment is the visibility dynaTrace gives them into production. "We have a very complex technical solution, and to be able to understand and isolate performance bottlenecks is very difficult and time-consuming to solve," said Nichols. "The earlier we can isolate performance issues in our application lifecycle, the less expensive it is for us to solve them."

That visibility enabled EnerNOC to improve performance by drastically reducing their mean-time-to-repair. "With dynaTrace we've been able to reduce that problem determination time by 90-95%," said Nichols. "Where before determining the root-cause of a performance issue might have taken weeks or months, or if it was something really complex, it might have never happened; with dynaTrace it's literally down to a couple of minutes on the production system."

"If there's a problem we're able to go into the run-time system and see exactly why it was slow, store that exact PurePath of what exactly happened and send that off to a developer for them to take a closer look at," Nichols added. "Having that PurePath capturing what was going on when the response time was slow, being able to capture that and send it to a developer really reduces the time it takes for them to go in and actually repair the problem."

This drastic reduction in root-cause determination has enabled EnerNOC to significantly reduce its costs. "We've seen dynaTrace impact our operating costs in a couple of different ways," said Terry Sick, EnerNOC's VP of Product Development and Engineering. "We're seeing significant improvement in our developers' time spent on actually developing application features and functionality and less time on trying to track down performance issues. Our developers have more time to develop enhanced application features."

Figure 2: Systems Architect Dashboard view

"Software developers love to develop features and functionality and spend less time fixing bugs," Sick continued, "so we have a happier team of developers, they're more productive, and when they hand off the code to our QA team, they now have less bugs to deal with so we're obviously seeing an improvement in our QA cycle time."

Improved application performance has led to efficiency gains in EnerNOC operations. "From a user's perspective, we're seeing that the performance of the application has improved to the point where we needed X number of NOC operators to manage a demand-response event, whereby now they can respond much quicker to these events because the application is that much faster," Sick said. "We can actually manage events more efficiently, with fewer NOC operators."

These reductions in operating costs have generated a significant ROI in a few months. "We have made a low six-figure investment in the dynaTrace product," Sick concluded, "and we believe we've gotten a 2x return on that to date."