How AIOps from Broadcom Addresses Top NPM Usability Complaints

AN ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) WHITE PAPER
PREPARED FOR BROADCOM
BY SHAMUS MCGILLICUDDY
SEPTEMBER 2019

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EXECUTIVE SUMMARY

This white paper examines how enterprises are applying AIOps technology to network performance management (NPM) tools to make their networks more reliable and secure. Based on Enterprise Management Associates (EMA) research, this paper explores how enterprises should leverage emerging AIOps technologies to enhance their NPM toolsets. The paper also looks at how the combined AIOps and NPM solution, Broadcom's AIOps for Networks, meets the present and future requirements enterprises have or will have for their AIOps-driven NPM tools.

AIOPS EMPOWERS DIGITAL NETWORK PERFORMANCE MANAGEMENT

Modern enterprises expect the network to be a platform for digital transformation, but before that can happen, network operations must address some persistent problems. The two most pressing challenges to network operations teams today are the lack of end-to-end network visibility and the lack of skilled networking staff.

In other words, network managers need tools that can give them total visibility into the network, and those tools must have embedded intelligence that allows lower-skilled administrators to manage complex issues. EMA research has determined that network performance management (NPM) tools that leverage AIOps technology can help network teams address these requirements.[1]

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Today's Network Team is Struggling

Unfortunately, network operations teams are struggling. The typical network team devotes 75% of its week to fixing problems, which leaves it with no more than 25% of its time devoted to strategic projects for the business. Also, the average network team detects only 61% of network problems before end users complain. Thus, 39% of the time, service problems are only addressed after users are impacted, a situation that nearly guarantees loss of productivity, revenue, or brand reputation.[2]

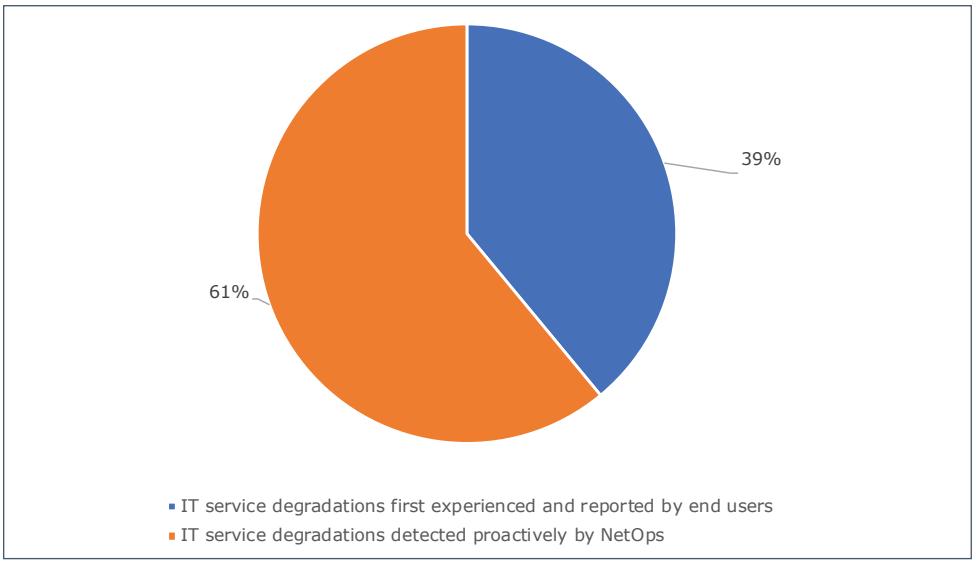

Figure 1. NetOps teams rely on end users to discover 39% of IT service problems.

1 Unless otherwise noted, all data cited in this paper was originally published in the EMA research report, "Network Performance Management for Today's Digital Enterprise," May 2019.
2 EMA, "Network Management Megatrends 2018: Exploring NetSecOps Convergence, Network Automation, and Cloud Networking," April 2018.

NPM tool fragmentation is partially to blame for these struggles. The typical enterprise has three to six NPM tools installed, and 13% have eight or more. Network managers will struggle to establish an end-to-end view of the network when they have to correlate insights across so many individual tools. They will also struggle to define workflows and processes across these tools, which limits the opportunities for lesser-skilled administrators to contribute to operations.

92%

of IT operations teams are interested in using embedded AIOps capabilities in their NPM tools.

The AIOps Opportunity

EMA has observed increased interest in applying AIOps technology to NPM tools. AIOps is shorthand for "Artificial Intelligence for IT Operations." EMA generally considers AIOps to be a set of technologies that use machine learning algorithms and other advanced heuristics to enhance the capabilities of IT operations management tools. AIOps capabilities can extract more insight from individual NPM tools, making them smarter and easier to use, with anomaly detection, natural language explanations of events, and suggestions for guided remediation. AIOps technology can also help correlate insights across multiple NPM tools.

EMA research found that 92% of IT operations teams are interested in using embedded AIOps capabilities in their NPM tools. More than one-quarter say such features are already critical to their use of NPM solutions. Operators of large networks are more likely to consider AIOps critical to NPM, suggesting that the technology helps them address scale and complexity. Furthermore, IT operations professionals identified AIOps as the third-most valuable technical function of an NPM tool. Only traffic volume analysis and traffic visualization were more important to them.

AIOps can do more than just enhance the value of individual NPM tools. EMA research has determined that AIOps is an effective means for correlating and integrating insights from multiple NPM tools. Most IT operations teams use two or more NPM tools, and they struggle to bring them together.

"[Correlation of NPM tools is] difficult to do because we have lots of manual processes and things are highly dynamic," a senior principal tools engineer with a large North American aeronautics enterprise told EMA. "We rely on the experience of the actual operational engineer and their knowledge. We attempted to use a manager of managers using CMDB integration, but that project went nowhere because we had to make sure our CMDB was up to date. It just shifted the manual processes burden to the person managing the CMDB."

IT operations teams vary in how they approach multi-tool correlation, including direct tool-to-tool integration, integration with a manager of managers, or integration with a service management platform. Nineteen percent of IT operations teams integrate tools with an AIOps platform to correlate insights across them. EMA research confirmed that companies that use AIOps are the most successful at correlating insights across multiple tools.

AIOps Use Cases for NPM

Based on research and interaction with the industry, EMA identified several essential use cases for applying AIOps to NPM technology. First, 28% of IT operations professionals identified automated traffic analysis as one of their most important uses of AIOps. This analysis helps network managers detect anomalies and suspicious activity. AIOps features can baseline network traffic patterns and highlight issues that fall outside those thresholds. Network managers can use this automated analysis to zero in on problems quickly, particularly potential security incidents that might initially present themselves as network performance problems.

Next, 26% of IT operations professionals selected automated root cause analysis of network trouble as a top AIOps use case. In this example, AIOps technology can correlate alarms, dependencies, topology, and other data collected and presented by NPM tools. AIOps technology can then automatically isolate a service problem, diagnose the root cause, and (in some cases) suggest possible fixes.

Automated capacity management (26%) was the third-most popular use case for AIOps and NPM. The technology can use predictive trend analysis to point to future capacity issues and alert network engineers with reports. For instance, a network manager might receive a report that traffic growth will saturate critical links within a couple months. This reduces the amount of manual calculations engineers must perform on their own, and it prevents them from being surprised by capacity challenges.

Finally, automated security remediation (26%) is the fourth-most popular use case for AIOps with NPM tools. In this example, a network manager might configure his tools to make automated changes to the network based on analytically derived security insights. For instance, an AIOps-driven NPM solution might detect an anomaly indicative of an infected host spreading malware laterally through the network. Integration with a network configuration management tool would allow the NPM tool to push a change into the network that isolates the infected host.

BROADCOM COMBINES NPM AND AIOPS

Broadcom (formerly CA Technologies) is a leading example of an NPM vendor that is enhancing its solutions with AIOps. Broadcom offers the DX NetOps platform. This NPM solution is an enterprise-class network fault management and NPM solution. It discovers and monitors digital infrastructure, cloud infrastructure, software-defined networks (SDN), and software-defined WAN (SD-WAN) infrastructure. It also monitors network flows and bandwidth utilization.

Enterprises can easily integrate DX NetOps with AIOps from Broadcom, an analytics stack that applies machine learning and advanced heuristics to DX NetOps data to support leading NPM use cases for AIOps. The combined solution is known as Broadcom's AIOps for Networks. AIOps from Broadcom can also integrate with other Broadcom IT operations management (ITOM) solutions and third-party ITOM solutions to provide cross-IT unified operations insights across NPM, application performance management, and more.

Broadcom is also integrating its AIOps solution with in-band network telemetry by leveraging Broadcom's TRIDENT 4 switch series silicon with its In-band Flow Analyzer (IFA) functionality. By integrating AIOps from Broadcom with TRIDENT 4, Broadcom is able to provide per-packet and flow data at millisecond intervals directly from switches and routers based on TRIDENT 4 chips. This will empower Broadcom's NPM and AIOps solution to provide flow latency monitoring with threshold-based alarms, packet path tracing with route change detection alarms, per-queue level flow counts and congestion events, and microburst detection and proactive congestion monitoring.

BROADCOM AIOPS FOR NETWORKS ADDRESSES TOP NPM USABILITY CHALLENGES

EMA research found that IT operations teams struggle most often with the following issues when using NPM tools:

1. Lack of real-time insights, providing mostly summaries of past events
2. Conflicting or inaccurate data
3. Too many individual dashboards or tabbed views (no big picture)
4. Lack of clearly defined workflows
5. Too many alarm storms

Broadcom's application of AIOps for Networks has the potential to address these usability problems.

Lack of Real-Time Insights

Broadcom's AIOps for Networks provides service-centric analytics by ingesting metrics, not just events or alarms. Thus, the analytically derived insights are based on live monitoring data instead of summaries of information. Network operations teams can click into the tool to find the underlying data if more granularity is needed.

Broadcom further addresses this issue of real-time insights by integrating AIOps for Networks with network infrastructure that uses Broadcom silicon for per-packet and flow latency analytics.

Conflicting or Inaccurate Data

Broadcom's solution identifies causal relationships between application and infrastructure data, components, and the alarms and events they generate. The solution ingests metrics, not just alarms or events. In AIOps, metrics are foundational to effective anomaly detection. Network managers don't have to set up thresholds. Broadcom's AIOps solution will correlate metrics and identify anomalies automatically.

Broadcom's AIOps for Networks uses a federated data management architecture and a rich meta-model of infrastructure and application environments. Its federated, interconnected data model is dynamic, responding to events and comparing them with a time-journaled, directed graph of attributed objects. This approach can help resolve data conflicts and identify inaccurate data.

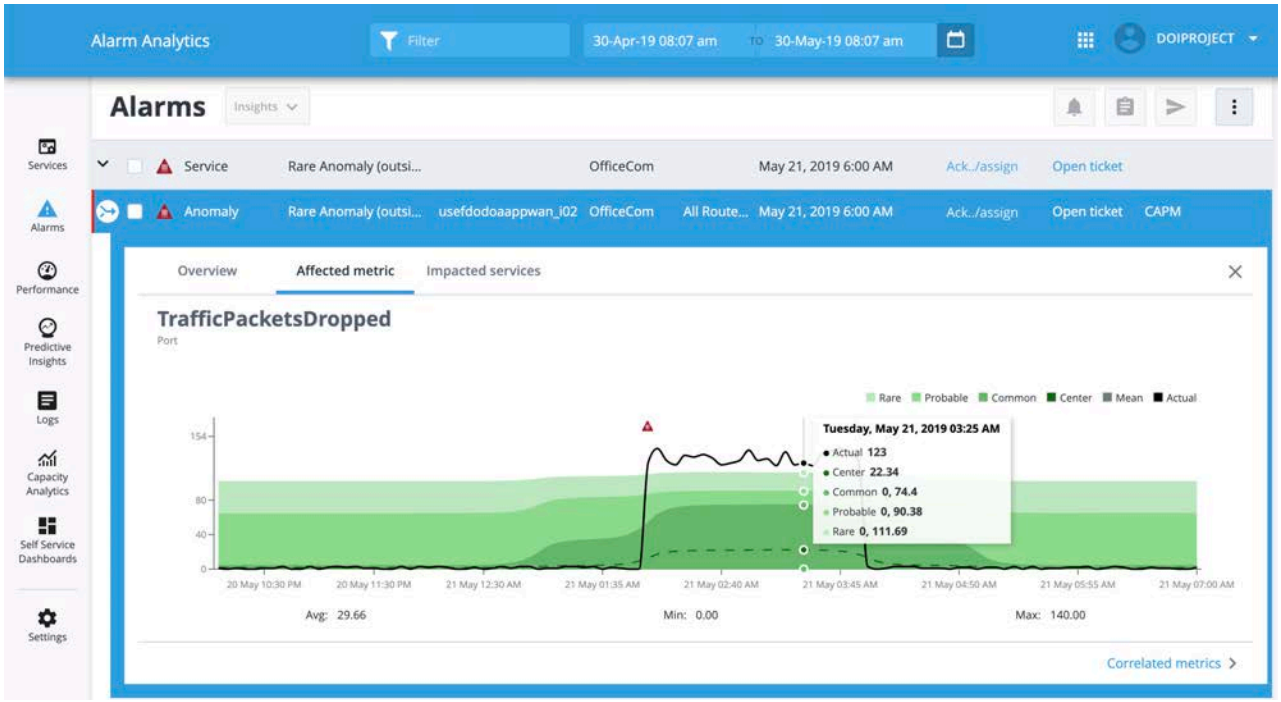

Figure 2. Broadcom's AIOps for Networks' alarm noise reduction and anomaly detection across disparate monitoring tools pinpoint the root cause of customer experience degradations for faster, Level 1 operations triage and automated remediation.

Too Many Dashboards – No Big Picture

Broadcom's AIOps for Networks has a "follow the red" approach to presenting its analysis. The solution performs application-centric root cause analysis across multiple topologies and applications, correlates insights to reduce noise, and makes a visual connection between the core event and the possible root cause. This approach should streamline mean time to repair.

Broadcom also uses unsupervised machine learning to identify anomalies and correlate alarms across ITOM solutions, allowing network operations teams to focus on the actual problem, rather than noise from dependent objects impacted by the root cause. Network operations teams do not need to click from one tabbed view to another to gather this insight. It is presented in a unified, intelligent way that shows the nature of a problem and how to address it.

Lack of Clearly Defined Workflows

AIOps for Networks from Broadcom enables contextual, automated remediation with user-defined workflows for fault management. Network operations teams can define monitoring and management policies that automatically execute appropriate remediation workflows against any root cause that the platform identifies. The underlying alarms will clear automatically after the system validates whether remediation was successful. This will help network teams that devote 75% of their week fixing problems become more efficient.

If the remediation workflow fails, the condition will continue to persist and will be reported by the failed workflow. Users can also apply automation to other processes like escalation, capacity, and configuration management.

Alarm Storms

AIOps for Networks provides "algorithmic noise reduction" via machine learning, according to Broadcom. Unsupervised machine learning can dynamically cluster Broadcom's monitoring and third-party alarms and identify relationships between them. The system then presents these clustered alarms as unified events, effectively removing noise that impedes fast triage.

Once the critical alerts are identified, Broadcom removes irrelevant information, helping improve the speed and accuracy of root cause analysis. This approach allows the network operations team to focus on the core issue of a service problem instead of sifting through hundreds of secondary, dependent alarms.

EMA PERSPECTIVE

Businesses are still in the early days of applying AIOps technology to NPM and ITOM tools in general. However, the early results are promising.

EMA research into enterprise NPM strategies found that AIOps can address multiple network operations challenges. AIOps can correlate insights across a fragmented NPM toolset. In fact, EMA research confirmed that AIOps may be the very best approach to correlating insights across multiple tools. It can also enhance the effectiveness of individual NPM tools with automated traffic analysis, automated root cause analysis, improved capacity management, and automated security remediation.

Broadcom has delivered a comprehensive approach with its AIOps for Networks solution. Driven by machine learning, this technology addresses many of the usability challenges of NPM that EMA research identified. EMA recommends that enterprises interested in applying AIOps to NPM technology should evaluate Broadcom's strategy.

Broadcom has delivered a comprehensive approach with its AIOps for Networks solution.

ABOUT BROADCOM

Broadcom Inc. (NASDAQ: AVGO) is a global technology leader that designs, develops, and supplies a broad range of semiconductor and infrastructure software solutions. Broadcom's category-leading product portfolio serves critical markets including data center, networking, enterprise software, broadband, wireless, storage, and industrial. Our solutions include data center networking and storage, enterprise and mainframe software focused on automation, monitoring and security, smartphone components, telecoms, and factory automation. For more information go to www.broadcom.com.

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Founded in 1996, Enterprise Management Associates® (EMA) is a leading industry analyst firm that provides deep insight across the full spectrum of IT and data management technologies. EMA analysts leverage a unique combination of practical experience, insight into industry best practices, and in-depth knowledge of current and planned vendor solutions to help EMA's clients achieve their goals. Learn more about EMA research, analysis, and consulting services for enterprise line of business users, IT professionals, and IT vendors at www.enterprisemanagement.com or blog.enterprisemanagement.com. You can also follow EMA on Twitter, Facebook, or LinkedIn.

Corporate Headquarters:
1995 North 57th Court, Suite 120
Boulder, CO 80301
Phone: +1 303.543.9500
Fax: +1 303.543.7687
www.enterprisemanagement.com

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