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**AIOps Essentials**

# How AIOps and Intelligent Automation Fuel Autonomous Remediation



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## Executive Summary

Within the course of a few years, the environments that IT teams are tasked with managing have seen unprecedented change—and the evolution only appears to be accelerating. At the same time, the tolerance for failures and poor performance continues to shrink. To contend with these realities, these teams need artificial intelligence for IT operations (AIOps) solutions. This white paper offers a detailed look at why the need for these solutions is so urgent, and it spells out the specific requirements an effective AIOps platform needs to address in order to deliver maximum value.

## Introduction: The Heightened Demands, and How Traditional Approaches are Falling Short

For today's IT teams, the demands, and the stakes, continue to escalate. Businesses are counting on IT to deliver on a number of competing, critical objectives:

- Delivering digital services to users and customers that power the business.
- Pursuing strategic digital transformation initiatives, while retaining control over costs.
- Ensuring that business services offer users optimized performance, reliability, and experiences.

Teams are contending with an 88% increase in processed metrics, events, and alerts.

While all these demands only get more urgent, they are also getting more difficult to address. That's because the environments being managed continue to grow more complex and dynamic. Now, environments are composed of a hybrid mix of legacy on-premises infrastructure, modern container- and microservices-based platforms, multiple cloud services, and more. While all these advanced approaches present the business with a number of advantages, including enhanced agility and flexibility, they also introduce a great deal of operational complexity.

The net result of today's complex, hybrid IT landscape is growth. This includes growth in the number of incidents and service requests as well as growth in the volume, variety, and velocity of operational data that has to be managed. In fact, reports indicate teams are contending with an 88% increase in processed metrics, events, and alerts.<sup>1</sup>

72% of IT teams rely on up to nine different IT monitoring tools.

The problem is that far too many teams are ill equipped to contend with this growth. Why? Too many teams rely on a disjointed, diverse mix of tools that have accumulated over time.

For monitoring, teams have employed specific tools to track a distinct set of technologies, infrastructure layers, and so on. Further, as more technologies get added to the environment, more monitoring tools continue to follow. For example, one survey found 72% of IT teams rely on up to nine different IT

<sup>1</sup> Digital Enterprise Journal, "Modernizing IT Operations for Digital Economy," December 2016, [https://www.slideshare.net/dej\\_io/modernizing-it-operations-for-digital-economy](https://www.slideshare.net/dej_io/modernizing-it-operations-for-digital-economy)

monitoring tools to support modern applications.<sup>2</sup> However, even as more tools continue to get added, teams still lack what they really need: a unified view of all their services, environments, and technology domains.

A similar scenario has arisen with respect to automation. In most cases, automation has been used in an isolated fashion, often to relieve a specific pain point, within a specific domain. Various cloud providers, legacy vendors, and open source tools offer automation capabilities, for example. However, these tools typically only apply to a single cloud service or technology domain. Fundamentally, these tools lack capabilities for integration with neighboring tools and environments. As a result, teams lack the ability to manage orchestration in a unified fashion across environments, for example from cloud to on-premises or across a hybrid cloud environment.

Another common problem is that teams lack enterprise-level governance and security. Specific teams control specific domains, but it remains difficult to ensure policies are consistently enforced across the enterprise. With these approaches, it is hard to understand and account for the ecosystem in which a specific process resides, or how interrelated elements will work together. Ultimately, these disjointed efforts mean disparate systems are not synchronized or coordinated, causing delays, inefficiencies, laborious reporting efforts, and a host of other issues, which can all serve to exacerbate the complexity problems plaguing these teams.

As a result, businesses are being stifled by these realities:

- Operational teams spend too much time and effort resolving issues. Now, for example, mean time to repair takes 4.5 hours on average.<sup>3</sup>
- Customers experience poor service levels, which can impose a penalty on near-term revenues and long-term customer satisfaction.
- Users contend with lengthy outages, stifling staff productivity and efficiency.
- Business users continue to grow more dissatisfied, which increases the likelihood that business units will adopt shadow IT approaches.
- Service desk teams continue to contend with increasing volumes of incidents, and more incidents need to be escalated to senior personnel, which results in proliferating workloads and costs.

Enterprises are losing  
\$21.8 million per year  
due to downtime.

Given all these challenges and obstacles, enterprises are contending with costly outages. In fact, one report revealed that enterprises are losing \$21.8 million per year due to downtime.<sup>4</sup> What's worse is that it doesn't take outages for poor service levels to hurt the business. Today, the reality is that slow has become the new down. For example, 53% of mobile applications are abandoned if they take longer than three seconds to load.<sup>5</sup>

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2 CA, "The Top 5 Reasons You Need AIOps," <https://www.ca.com/content/dam/ca/us/files/ebook/top-five-reasons-you-need-aiops.pdf>

3 IDG, "IDG Quick Pulse: State of IT Operations and Analytics," February 2018, <https://www.ca.com/content/dam/ca/us/files/industry-analyst-report/idg-quick-pulse-state-of-it-operations-and-analytics.pdf>

4 David Gewirtz, ZDNet, "The astonishing hidden and personal costs of IT downtime (and how predictive analytics might help)," May 2017, <https://www.zdnet.com/article/the-astonishing-hidden-and-personal-costs-of-it-downtime-and-how-predictive-analytics-might-help/>

5 Shaun Anderson, "How Fast Should A Website Load in 2018?," March 2018, <https://www.hobo-web.co.uk/your-website-design-should-load-in-4-seconds/>

## Requirements: A Combination of AIOps and Intelligent Automation

The only way teams will be able to effectively combat the challenges outlined above is to leverage a combination of AIOps and intelligent automation. The following sections examine each of these requirements in more detail.

### AIOps: Establish unified, cross-domain intelligence

To realize maximum value, IT teams need AIOps platforms that address the following requirements:

- **Establish a comprehensive data lake.** Teams need an AIOps platform that can ingest structured and unstructured data from IT performance monitoring tools and combine it in a unified data lake. To deliver maximum value, the platform should be able to ingest the broadest range of data types, from the broadest range of sources. This should include support for data from third-party sources ranging from mainframes to cloud environments, and for metric, alarm, log, topology, text, and API data.
- **Employ intelligent correlation.** Once data is aggregated, it's essential that it can be correlated and ultimately mapped to what matters most: the services that power the business. With these capabilities, issues can be mapped to services, which is vital in giving staff the context for most intelligently prioritizing their troubleshooting and remediation efforts.
- **Establish predictive identification of potential risks.** It's vital that an AIOps platform leverage machine-learning-based insights to detect abnormal behaviors and predict potential issues.
- **Automate root cause analysis.** To meaningfully enhance service levels, teams need targeted, machine-learning-driven insights that power fast, automated root cause analysis. Given the complex, dynamic, and interrelated nature of today's environments, teams need an AIOps platform that can automate root cause analysis across all the organization's services and domains. It's also vital that the platform can consume data and correlate intelligence from multiple architectural layers.

### Enterprise-wide automation

Operational teams need a single, unified, and intelligent orchestration layer that provides an enterprise-wide view of all processes and tools. With these robust orchestration capabilities, teams can gain visibility and control of enterprise processes, from end to end.

#### Orchestration of runbooks

IT teams need platforms that offer complete support for employing runbook orchestration. Within operations teams, runbooks represent an approach for documenting key IT processes. This can include IT's support of business processes, such as nightly book closing or invoicing. In addition, it can include IT-focused efforts like backup routines or disaster recovery plans.

Effective runbooks document all the steps needed to execute processes, schedule them efficiently, solve problems that arise, and escalate issues. While basic orchestration tools integrate capabilities for managing incidents, changes, provisioning, and operations, this only scratches the surface in terms of what's required. Today, teams need true IT process automation in order to realize the greatest business value.

They need automation that can address the following requirements:

- Integrate a broad range of systems so end-to-end automation can be instituted.
- Reduce or even eliminate a lot of the manual efforts required to fulfill routine, commonly recurring tasks.
- Take preventative actions before problems arise, or before they grow more difficult to manage.

- Conduct real-time analysis of processes underway in order to offer the visibility that enable staff to prioritize automated workflows based on financial impact. For example, if not possible to execute all processes, staff should be able to deprioritize the processes with the least critical SLAs, and so ensure that the most business-critical tasks get completed.

### Closed-loop automation

In most organizations today, the service desk is the central point of control for managing incidents. When an issue arises, service desk technicians take the lead on identifying resources, creating service tickets, and so on. Then, tickets tend to be managed by IT personnel, who'll investigate the issue. Through this effort, they may need to create more tickets or escalate an issue to a more senior resource.

By contrast, teams need to establish automation that can respond to triggers and take action needed to resolve the issue. With advanced solutions, teams can establish closed-loop processes that automate ticket generation, resolution workflows, ticket updates based on the automated activities conducted, and the closing of tickets when issues are resolved.

### Roll-back capabilities

It is also important to ensure automated processes can be rolled back, so, for example, if a runbook encounters an error during an application update, it can automatically roll back the environment to the prior, properly functioning state.

## How IT Teams and the Business Benefit

By leveraging platforms that deliver advanced AIOps and intelligent, enterprise-wide automation capabilities, IT teams can realize a number of benefits:

- **Enhanced business efficiency and productivity.** By employing closed-loop automation, teams can do much more with far less, while maximizing consistency. These capabilities enable more efficient, centralized audit and control of critical IT processes. With these capabilities, IT teams, and the broader business, can more effectively monitor and manage their critical processes and workflows and ensure desired outcomes are more consistently achieved. Businesses can establish the automation that fuels new digital services and business models, and boosts competitive position.
- **Speed issue resolution and enhance service levels.** With AIOps and intelligent automation, teams can move from reactive approaches to proactive service optimization. Teams can establish SLAs and real-time monitoring of processes, and gain the predictive capabilities they need to identify potential SLA violations before they occur. Further, they can respond to these risks more quickly and effectively. Through closed-loop automation, teams can both reduce manual efforts, and speed mean time to recovery. Further, these tools can help teams significantly reduce the number of trouble tickets that get generated. Harnessing a complex event processing engine—including predictive analytics and pattern-matching tools—teams can identify recurring issues and establish policies that proactively eliminate these issues from arising in the future.
- **Boost agility and flexibility.** By leveraging central, cross-organization orchestration capabilities, teams can respond more quickly to changing requirements, technologies, and objectives. As teams move to a new cloud service or development paradigm, they won't have to start over with a different orchestration platform. With tools-agnostic orchestration, teams can employ a consistent orchestration approach, while minimizing migration challenges and accelerating their digital transformation.

## How Broadcom Can Help

Today, IT teams can leverage the AIOps and intelligent automation capabilities they need—with DX AIOps, a leading solution from Broadcom. DX AIOps helps users solve complex IT problems—including performance, capacity, and configuration issues—before they have an impact on the business. This solution combines the power of innovative AI, machine learning, and intelligent automation.

Broadcom is the only vendor in the market to deliver a solution that combines application, infrastructure, and network monitoring; machine learning analytics; and intelligent, automated service orchestration. The following sections offer more detail on the solution's key capabilities.

### AIOps

This solution normalizes, correlates, and analyzes the rapidly increasing volume and variety of IT operational data across the entire digital delivery chain. This solution enables customers to deliver superior user experiences, while speeding innovation and increasing IT efficiency. The solution offers these advanced capabilities:

- **Full-stack observability.** DX AIOps integrates capabilities for monitoring digital experience, application performance, infrastructures, and networks, delivering unprecedented levels of visibility across the entire digital delivery chain. With DX AIOps, teams can monitor the entire stack with a single solution, minimizing the war-room meetings and finger-pointing associated with tool sprawl. Only DX AIOps cross-correlates every component in the IT stack, including the user experience, the application, and the underlying infrastructure, revealing how everything in the environment is connected.
- **Comprehensive, contextual operational intelligence.** The solution ingests data from a wide range of tools and combines it in a single, resilient data lake. The solution can ingest structured and unstructured data; data from a wide range of third-party sources, from mainframe to cloud environments; and a wide range of data types, including metric, alarm, log, topology, text, and API data.
- **Vendor-agnostic integrations.** Customers can more quickly and easily stream metric, event, log, and topology data to and from any third-party monitoring, management, analytics, and visualization tools. The solution offers support for AppDynamics, Chef, Dynatrace, Elastic, IBM®, Puppet, ServiceNow, SolarWinds, Splunk, Tableau, and more.
- **Proactive closed-loop remediation.** The platform offers predictive analytics to help solve complex IT problems, including in such areas as performance and capacity. With the platform, configuration issues can be detected proactively—before they have an impact on users—and remediated automatically.

### Intelligent, enterprise-wide, end-to-end automation

With this solution, teams can reduce complexity, while maximizing agility. This platform enables teams to leverage consistent models and orchestration approaches, while aggressively pursuing their digital transformation initiatives. The platform offers these capabilities:

- **Unified, consistent control.** With this solution, teams can leverage a single platform that can scale across disparate cloud models and technology domains. The solution integrates with ITSM tools, orchestration tools, applications, operating systems, databases, CMDBs, web services, cloud solutions, open source tools, and more.
- **Model-based GUI.** This platform features powerful, intuitive visualization, offering capabilities for modeling and mapping communications and dependencies between different systems. This graphical visualization enables non-technical staff to view and understand their environments.

- **Repeatable process model.** With this platform, teams can establish process models in a unified fashion, and uniformly apply them to their evolving requirements. For example, teams can set up rules that enable automated instantiation of cloud services to perform specific tasks, and apply these rules to multiple cloud provider environments.

## Conclusion

For today's IT teams, the reality is that manual, reactive approaches don't cut it any more. To meet all their pressing, urgent imperatives, teams need to leverage advanced AIOps and automation platforms. Now, with DX AIOps and the Automic One Automation Platform, organizations can gain the capabilities they need to optimize their dynamic, hybrid IT environments, and the critical digital services running in them. These platforms offer comprehensive coverage, predictive insights, and intelligent automation. With these offerings, organizations can boost staff productivity, maximize agility, and optimize service levels. To learn more, be sure to review our **AIOps and intelligent automation solutions product brief**.

### 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](http://www.broadcom.com).

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