

AIOps in telecommunications: Where to begin – and where to go next

Introduction

Harnessing the power of artificial intelligence to enable new levels of speed, insight, and automation, AIOps is transforming the way technology operations are managed at organizations of all kinds. The AIOps revolution comes at a critical time for telecommunications businesses, as operators face new pressures around quality, cost, and scale resulting from the move to 5G, the emergence of new business and operational models, and rising customer expectations. That's especially true in an increasingly software-defined world. As network and IT technologies converge, it makes sense to use common management tools and operational processes across both domains—and to put the artificial and machine learning innovations pioneered on the IT side to work for the network. But while there's certainly tremendous potential for AIOps to drive value, it's not entirely clear to many operators how best to proceed. Which tactical use cases are most practical as a starting point? What technologies and capabilities are needed to put AIOps into action?

In this white paper, we'll talk about where to begin your AIOps journey and what you'll need to move forward.

Why AIOps matters for telecommunications – and where organizations stand today

Traditionally, network operations and IT have been separate worlds for telecommunications companies, each

with its own technologies and processes—OSS/BSS and eTOM for the network, ITIL for IT. There was neither a need nor an opportunity to share common technologies across both environments. But this is quickly changing, as networks become increasingly software-defined and operators make greater use of cloud-first/cloud-native technologies. As this convergence proceeds, operators are recognizing the value of a single management layer spanning traditional IT and network domains to allow both network fault management and IT monitoring through a single toolset. Similarly, as operators seek to leverage the full scalability and cost benefits of cloud, IT capacity management has become increasingly relevant to ensure effective support for the cloud resources supporting key network functions or infrastructure.

In this context, the emergence of AIOps as a foundation of modern IT operations has critical significance for network operators. As modern technology grows more complex, fast-paced, and dynamic, it becomes difficult or impossible for operations teams to keep up using traditional methods. With AIOps, operations teams can use big data, machine learning, and analytics to identify patterns in monitoring, capacity, and automation data across their complex technology infrastructure. Based on this insight, they can work more quickly and effectively to improve the speed, quality, and cost-efficiency of service delivery. That's as true for an operator's network environment as it is for the IT environment.

AIOps continues an evolution in operations that began 20 years ago, when teams focused largely on offline records-keeping, toward increasingly automated processes. At a high level, this journey began with observability, proceeded to actionability, and is now culminating in closed-loop automation. The solutions used to implement AIOps fall along similar lines.

- At the **observability** stage, an AIOps system will analyze complex data sets to identify patterns in monitoring, capacity, and automation data across hybrid on-premises and multi-cloud environments.
- At the **actionability** stage, the solution provides insights that guide immediate actions to drive out cost, fix problems more quickly, and improve quality.
- At the **closed-loop automation** stage, AI and machine learning make it possible to predict, find, and fix problems without human intervention, often before they impact service quality, and to improve quality across a modern software-defined networking (SDN) environment.

Some operators have made more progress than others in this evolution, but for many, a practical question remains: what do we really need to automate, and do we really need AIOps to do so? It's important to remember that the goal isn't to use artificial intelligence for its own sake. Any AIOps initiative should be tied to key strategic and operational

objectives. Today, that means addressing priorities shared by most telecommunications businesses: driving out cost, saving time, and improving quality.

Key challenges facing today's telecommunications operators

In a time of rapid transformation, operators are straining to keep up with the operational implications of new innovations, business requirements, and customer demands. In particular, they face difficult challenges around:

- **Cost** – New investments in 5G, combined with margin pressures in the mature markets they serve, make it imperative to lower costs in the operations space.
- **Scale** – The highly complex and distributed nature of 5G, edge computing, and other innovations make it unfeasible to scale operations and support functions linearly. Simply put, there just aren't enough staff hours available to meet the demand. In that sense, the scale challenge is also a time challenge.
- **Quality** – As customer experience becomes a key competitive differentiator, operators must ensure that their services are reliable, responsive, and up to the standards of demanding consumer and enterprise customers.
- **Technology convergence** – Decades-old industry technology infrastructure is being rapidly reshaped by cloud, virtualization, and containerization to meet the demands of a new era. To be successful, this technological transformation calls for an operational transformation as well.

In the next section, we'll look at tactical AIOps automation for use cases that offer a practical, high-value starting point for AIOps.

What to focus on first

For operators, the implementation of AIOps can involve somewhat familiar solutions. Many of the tools used to enable AIOps are also used for IT-related activities such as service management and operations management, and have been adopted by many telecommunications companies to support their own IT departments. In fact, this experience can help guide operators as they seek to achieve their own objectives around cost, time, and quality. With a single AIOps platform spanning both IT and networks, operators can:

- Deliver near-term operational quality improvements through automated correlation and root cause analysis of faults that may span applications and network elements
- Improve quality of service by using AI-based correlation of IT and network data to predict future issues
- Improve the optimization of cloud resources across hybrid and public clouds
- Automate the closed-looped remediation of common faults

With these capabilities, operators can use tactical automation to address key strategic priorities around cost, time, and quality.

Cost – By gathering and analyzing data from across the network environment, AIOps can give operators a clear understanding of the resources being used to support specific services and technologies, as well as their associated costs. Looking forward, AIOps can also model and predict the resources and capacity that will be required by current and proposed services and technologies in the future. By using this information to guide planning, operators can optimize usage to keep costs as low as possible—especially in a more software-defined world where

resources can be scaled and reconfigured quickly and frictionlessly. For example, the relative cost-efficiency of on-premises and cloud resources can be used to generate automated recommendations for sizing so operators can lower spending without the risk of impaired quality. Cloud migration initiatives can be informed by comparing the cost and performance available under different options, as well as the savings and performance impact of consolidating or decommissioning existing resources.

Time – As the network environment grows more complex and software-defined, with more technologies to monitor, more data to interpret, and more decisions to be made, operations teams struggle to perform their tasks in a timely manner. Forced to make sense of a vast sea of information in real time on their own, teams often end up one step behind, reacting to problems rather than being able to prevent them. With AIOps, data gathering and analysis can be performed automatically so that staffers receive the right data, at the right time, with actionable recommendations. With this understanding, they can make timely decisions to ensure that services will have the right resources at the right capacity to ensure high quality, discover opportunities to reduce cost, find and fix potential problems, and keep the entire environment secure, auditable, and in compliance. In some cases, decisions can become entirely autonomous, allowing teams to allocate their full attention to areas where human expertise is essential.

Quality – For operators, ensuring quality across a rapidly transforming environment is both business-critical and tremendously difficult. Often, the first notification of a service failure or degradation comes from an irate customer, by which time the damage to the company's business has already begun. By using machine learning and anomaly detection to identify and analyze application and infrastructure

problems, AIOps enables operations teams to address performance problems quickly before they impact customers. At the closed-loop automation stage, the system can even resolve issues automatically, without the need for human intervention. As the network transforms towards a more software-centric model, AIOps can detect constraints in underlying compute and storage before they cause performance slowdowns or failures, driving greater elasticity in delivery and can help forecast future demands to meet traffic changes.

Building your AIOps toolbox

To address the use cases above while building a foundation of AIOps capability and expertise, operators will need core functionality including open data access, machine learning, and automation.

Open data access

To support an AIOps strategy, operations teams need to be able to consume huge volumes of historical and streaming data across multiple technologies and systems. An AIOps solution should support monitoring for services distributed across cloud, container, and at the edge, and provide a unified data view across different layers and types of technology. As traditional IT and network domains start to converge, teams should be able to correlate data across services powered by different elements of the environment. This makes it possible to perform automated impact analysis to determine the downstream effects of issues or failures, and in turn to prioritize remediation so that issues with the greatest potential business impact can be addressed first.

Machine learning

Machine learning makes it possible for an AIOps solution not only to identify and correlate patterns in data more quickly than a human expert could, but also to adjust and optimize the

algorithms used by analytics so they become more accurate over time. The system can learn the characteristic behaviors of normal operating conditions; adjust these baselines dynamically to reflect normal shifts in behavior, such as higher usage during peak periods in customer demand; and flag anomalies for attention before potential problems grow. When a problem does arise, machine learning can enable fault clustering to see whether multiple problems share the same root cause.

AIOps and automation

The insights delivered by machine learning and analytics can power automation to save time and reduce cost. An AIOps solution can provide functionality for high-value use cases such as automated event remediation, closed-loop compliance processes, and event-driven automation. Intelligent ticketing can be particularly valuable, generating service tickets automatically based on automated anomaly detection, then routing tickets optimally to the expert best able to fix the problem—or fixing the problem automatically. As a result, operators can manage a growing number of assets without increasing labor costs, free staff for more valuable activities, and deliver better quality for customers.

AIOps in the real world

The potential impact of AIOps for telecommunications businesses can be seen in the experiences of a major operator serving the European market. The company needed to deliver event and service impact management across a network encompassing more than 60,000 mobile and fixed network sites. Following its implementation of AIOps, the operator can now correlate network, application, and infrastructure data to automatically identify the impact of detected faults across 5,000 customer services. Automated analytics identify anomalies in the network environment, correlate complex log

data, and identify the probable root causes of issues. Automated event consolidation reduces event noise and false positives, allowing operations teams to focus and resolve critical issues more quickly. As a result, the operator has:

- Reduced false alarms by 90 percent
- Reduced resolution time for common faults by 75 percent
- Reduced troubleshooting and remediation effort by up to three hours

Conclusion

The creation and adoption of a comprehensive set of Open APIs that continue to evolve and mature is a key foundational step. Enabling the practical decoupling of systems of engagement from systems of record especially in brownfield environments requires API orchestration and adaptive data mastering across the potentially many systems of record that may be involved. The ODA reference implementation, as illustrated in the BOS catalyst and now being taken forward in the just announced ODA Component Accelerator project, outlines the path towards achieving a step change in operational costs through standardized and fully automated component lifecycle management. The extension of this to an ODA ecosystem in which external application components may participate as first class ODA citizens offers the clearest roadmap yet for radical transformation.

Speaker bio

Ian Russ is the EMEA Chief Architect within BMC Software's Office of the CTO. With over 10+ years at BMC spanning multiple roles, Ian has worked extensively with major communication service providers and currently focuses on areas of new innovation for BMC where he leads the development of the telecoms vertical.