Achieving Agile IT Operations with Unified Infrastructure Monitoring

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Executive Summary

Enterprise IT organizations are often organized into subgroups of technology specialists responsible for managing a particular domain in the organization, such as servers, networks, storage, virtualization, or applications. This siloed approach to IT operations is a natural outgrowth of the specialization of administrators who are equipped with narrowly focused management tools. As long as these administrators continue to live in their management silos, infrastructure operations will be slow to respond to change, and operational workflows will be slow and choppy. This status quo may have been acceptable a decade ago, but many enterprises have found that business conditions can no longer abide. Enterprises need to streamline IT operations to support a more agile approach to delivering new services and revenue-generating applications. The essential ingredient in achieving this aim is an infrastructure management toolset that breaks down silos and unifies monitoring and workflows. The time has come for unified infrastructure monitoring tools.

This paper explores the macro trends that are generating a need for unified monitoring tools. It identifies the business drivers for adopting such tools, including the key considerations for earning a return on investment. Finally, the paper examines CA Technologies' Unified Infrastructure Management (UIM) solution as an example of a monitoring architecture that supports the needs of an agile enterprise. The paper especially examines CA's most recent iterations of UIM and how they are advancing both the networking monitoring capabilities of the architecture and the overall usability of the product.

Unified IT Monitoring Leads to Better Service Quality and Agile Operations

IT infrastructure comprises several independent technology elements, including networks, servers, storage, virtualization software, and applications. Each of these domains requires a distinct set of specialized skills to deploy, maintain, and operate it. Naturally, siloed teams of IT administrators have emerged to manage these infrastructure elements, and each team has adopted its own toolset for monitoring and managing its respective technology domain.

Siloed management tools typically result in a fragmented approach to data center operations with no holistic, end-to-end view of the data center. When a critical application fails, administrators from each group will rely on their separate management tools to troubleshoot the issue. If the tools report back that all is well with their technology stack, the administrators will point the finger elsewhere. The problem with this approach is that the root causes of application performance and availability issues often lie hidden in between management domains. Without an end-to-end management view, the operations team has to go hunting for the problem using time-consuming ad hoc processes. The fragmented management model leads to a data center operation that lacks agility and is slower to resolve service quality problems.

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Unified infrastructure management and monitoring tools offer an alternative to this fractured IT operations landscape. Unified infrastructure monitoring is a central architecture for managing all components of IT Infrastructure, including the physical and the virtual elements. It focuses particularly on unifying systems and network monitoring as administrators of these two areas of infrastructure are often at odds over whose domain is responsible for a given service interruption. A unified infrastructure monitoring tool not only gives a complete picture of the state of IT infrastructure and the services it delivers. It also delivers a shared view, a common data set that all the administrative domains of the data center can view together.

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This unified management environment streamlines operations and makes the IT organization much more agile and responsive to change. For instance, enterprises with a siloed management architecture will have to configure and tune each individual tool whenever a new system or application is introduced to the infrastructure. With a unified monitoring architecture, IT operations can adapt much faster to these changes.

Agile IT Operations Requires Unified Visibility & Architecture

In a business environment dominated by the hype of mobility, big data, and the Internet of Things, the typical enterprise wants to turn its IT organization into a competitive differentiator. Businesses want infrastructure that can rapidly deliver new applications and services with superior service quality. In fact, ENTERPRISE MANAGEMENT ASSOCIATES (EMA) research has found that 66% of IT organizations have started emphasizing overall service quality as a key measure of success, more so than end-user experience, application performance, and internal service-level agreements (SLAs). (See "Managing Networks in the Age of Cloud, SDN, and Big Data: Network Management Megatrends 2014", May 2014.) To accomplish this, many enterprises will need to abandon the siloed approach to IT operations.

Unified infrastructure monitoring gives data center operations teams the centralized management view they need to focus on service quality and agility. When the networking team, the server team, the storage team, and the applications team are all working within the same management console with the same end-to-end data set, they are able to work more cooperatively and efficiently.

Many enterprises are striving to unify IT operations. EMA research found that 57% of enterprises now have cross-functional processes to orchestrate provisioning and management of storage, network, and server resources. (See "Obstacles and Priorities on the Journey to the Software-Defined Data Center," January 2014.) One example of how enterprises move to a more unified operational model is the software-defined data center (SDDC), an architecture that abstracts infrastructure and presents it to developers and line of business owners as a programmable set of resources. EMA research revealed that 49% of enterprises consider centralized management from a single control point to be one of the most critical aspects of an SDDC. Additionally, 34% of enterprises said a lack of such centralized control was a key pain point caused by silos within an IT organization.

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Business Drivers for Unified Infrastructure Monitoring

While a unified infrastructure monitoring architecture makes logical sense to many IT decision-makers, they still need to make the business case for the technology since such tools can represent a substantial financial investment and realignment of personnel. Thus, it is essential to understand the potential returns on investment from this technology. There are two overriding payoffs from unified monitoring. First, it can reduce operational overhead. Second, it makes an IT organization more responsive to the needs of the business.

Unified Monitoring Streamlines IT Operations

Unified monitoring reduces operational costs and complexity in an enterprise data center in a number of ways. With broad visibility into servers, storage, networks, and applications, administrators can draw logical connections between these technology areas and see how they interact with each other. As the different infrastructure resources work together to deliver a service, administrators can see where these different resources are misaligned. They might identify that an application isn't properly coded for a networked environment, or they may find that the network policies for one application are conflicting with those of another, leading to service interruptions. With a shared data set, data center operations can spend less time pointing fingers and shorten their mean time to repair.

When the operations team has access to this unified view into the entire infrastructure stack, it also detects problems more quickly. The data center can suddenly adopt a more active monitoring posture, detecting problems before users complain. For instance, a network tends to be self-healing, which can obscure a problem. If a link goes down, the network usually routes around the failure. The link failure might look relatively benign to a siloed networking team: the network is still up and running, and no one is complaining about a service interruption. So the network administrators make the link repair a low priority. However, if that link failure affects the performance of a financial application that only receives heavy use at the end of the quarter, then the finance team might be in for a nasty surprise when the end of the quarter arrives and the network can't handle the jump in application traffic. A unified monitoring architecture will connect the dots earlier and anticipate such a problem.

The final operational benefit of a unified infrastructure monitoring tool is the consolidation of monitoring platforms. Administrative teams will probably hold onto some of their siloed legacy tools. But they will need fewer of them. Given that each monitoring tool requires maintenance, administrative training, and occasional upgrades, a fractured toolset can be expensive.

Unified Visibility & Architecture Makes IT More Responsive to the Business

Beyond improved operations, unified monitoring offers the added benefit of agility in an IT organization. The end-to-end monitoring approach makes the IT organization more responsive to the needs of line of business managers. In today's business environment, enterprises recognize that time-to-market is a critical factor to the success and profitability of a new service. Consequently, an IT organization must be able to support new services rapidly and effectively. Unified infrastructure monitoring can support these goals by simplifying the process of deploying and debugging new applications and services on the infrastructure. The process of rolling out new applications in a data center can involve months of debugging and tuning infrastructure to ensure performance, reliability, scalability, and security. A siloed IT operations team with a fractured monitoring toolset will be slower to support new services. However, a data center operations team with an end-to-end unified monitoring architecture will have better visibility into how the infrastructure is supporting new applications. It will also be equipped with the visibility and knowledge needed to fine-tune the infrastructure for the successful, rapid delivery of services.

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> Unified infrastructure monitoring makes IT more responsive to the business by simplifying the process of deploying and debugging new applications and services on the infrastructure.

DevOps, the practice of aligning application developers with IT operations for rapid deployment and iterations of new applications and services, has risen in importance within IT organizations. Enterprises are realigning their data centers around DevOps practices to support the rapid deployment of new applications and services. According to EMA research, 70% of enterprises have initiatives in place to enable developers to take better advantage of data center infrastructure (See "Obstacles and Priorities on the Journey to the Software-Defined Data Center," January 2014.) IT organizations will increasingly enable programmability of data center infrastructure to support agile IT operations. To ensure that this programmability is successful, enterprises will need the full-stack visibility of unified infrastructure monitoring.

IT organizations can also be more responsive to the needs of the business by anticipating problems and solving them before they disrupt services. Too many IT operations teams spend the majority of their time reacting to service interruptions and too little time on new business initiatives. A unified infrastructure monitoring architecture can turn the tables on this reactive posture. If it has enough analytical intelligence, it can use the data it collects to predict problems and warn IT operations, who can then take proactive steps to remediate infrastructure problems before they disrupt the business.

The CA UIM Approach

CA Unified Infrastructure Management (CA UIM, formerly CA Nimsoft Monitor) is a multi-domain, multi-vendor-supporting solution that monitors servers, networks, applications, databases, storage systems, user experience, public cloud, and private cloud. CA's strategic approach with its UIM product is a hyper-focus on ease of use, with an intuitive interface that simplifies the user experience across all administrative domains. CA also emphasizes the importance of maintaining a holistic and unified approach to infrastructure performance management. Finally, CA focuses on providing comprehensive analytics to differentiate UIM from other monitoring products.

A Scalable and Extensible Architecture

The CA UIM architecture has a single back-end message bus that allows for the simple integration of new monitoring capabilities. The message bus and its application programming interfaces (APIs) serve as an abstraction layer and a publish-and-subscribe interchange where monitoring components within UIM can exchange information with each other and with the core system.

Many competing vendors develop monitoring capabilities as standalone applications, with their own databases, application servers, and web servers. These vendors have to build individual connectors among the individual applications in their architecture to provide a unified management platform. CA UIM's single bus architecture removes the need for standalone applications. New monitoring capabilities are added to the product natively. The message bus component also guarantees a consistent look and feel across the different monitoring capabilities of CA UIM.

The second component of the CA UIM architecture is the hub, software that connects UIM's visibility architectural components—including dashboards, reports, and the alarm server—to the message bus. On the data acquisition side, the CA UIM robot component collects and shares information on a particular device managed by UIM. Each robot has multiple associated probes that provide visibility into the individual components on a managed device.

This streamlined architecture also enables a highly scalable monitoring solution with broad vendor and device coverage. CA UIM can scale from 100 to more than 100,000 devices. And it supports more than 140 devices and platforms out of the box, with the ability for users to self-certify new devices as needed. CA has focused especially on expanding this scalability and depth of coverage within UIM's network monitoring capabilities.
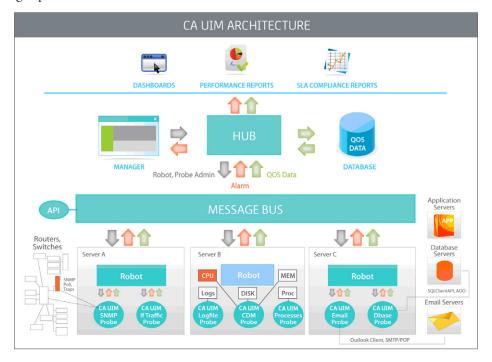

Figure 1. CA UIM Architecture

CA UIM is designed for use by a cross-functional data center operations team. It offers role-based monitoring views tailored to the devices and software managed by each administrative specialty in the data center. It also provides visibility across silos so that the operations team can monitor for overall service assurance. By giving everyone access to the same data set, CA UIM breaks down organizational silos. The legacy IT workflow practice of handing off events and tickets from one administrative domain to another is erased. What emerges in its place is a more efficient system where networking, server, storage, and application specialists work together as an integrated team with a common management tool.

CA UIM Evolves to Support the Agile Enterprise

CA has focused its recent engineering efforts on enhancing UIM's ability to support an agile data center operations team, with particular emphasis on advancing the network monitoring capabilities of the architecture, analytics and increasing the product's overall usability.

Over the past year, for instance, UIM's Simple Network Management Protocol (SNMP) collector has been enhanced by leveraging CA's powerful eHealth library. It now supports thousands of device types and hundreds of vendors. It also offers a self-certification function, where users can now certify a device not already supported by UIM. This capability delivers same-day support for new devices, and users no longer need to wait for CA engineers to certify devices for them.

CA UIM also delivered a new streamlined visualization of SNMP and network flow data within the Unified Service Manager interface. With this interface, improved workflows are enabled as operators can quickly understand what hosts and traffic types are consuming bandwidth on critical network interfaces and circuits, all within a single screen.

On the analytics and usability side, CA has added dynamic thresholds and predictive analytics to its reporting and alerting features. In an effort to reduce the number of alarms that could be generated to only those that matter most, UIM can now inform users of the amount of time remaining before a key performance indicator (KPI) will cross over a threshold ("Time to threshold"), providing customers with an early warning system for potential customer impacting performance problems. An additional metric allows customers to set parameters as to how long a KPI should be over a threshold prior to generating an alert ("Time over threshold"), allowing IT to generate alarm conditions only for persistent issues when desired. And lastly, a new "Health Index" metric introduces an easy way for customers to quickly identify unhealthy IT infrastructure with a simplified 0 to 100 scale. As performance of infrastructure starts to degrade, either slowly or dramatically, the Health Index for that technology will drop, allowing IT operations to quickly focus on unhealthy items within the managed environment. This alternative approach highlights offending devices versus requiring an operator to manually interpret device health via individual alert tracking.

For reporting, new "Situations to Watch" reports have been introduced that reveal possible areas of trouble before they occur. "Top Ten" and "At a Glance" reports help direct administrators to areas of interest in the infrastructure.

UIM also gained additional monitoring visibility into Big Data operations with Hadoop and Cassandra monitoring probes, with MongoDB also under consideration. The product also gained updated public cloud visibility with an enhanced Amazon Web Services monitoring feature.

EMA Perspective

IT organizations that have been tasked with supporting an agile enterprise will find that siloed infrastructure management is untenable. These enterprises want to leverage their infrastructure investments to improve their competitiveness in an unforgiving business environment. This posture requires faster delivery of applications and services because time-to-market is increasingly a competitive differentiator. The DevOps movement—the integration of application development and infrastructure operations teams for rapid delivery of services over infrastructure—has emerged to satisfy this need for agile infrastructure. If IT operations teams are to deliver in this environment, they need to replace or augment their siloed management technology with a unified infrastructure management toolset. A siloed management approach focuses too much on the health of individual administrative domains when it should be focusing on overall service assurance. Agile enterprises need service assurance teams, not multiple administrative units pointing the blame elsewhere.

The business drivers for a unified infrastructure management approach are almost self-evident. By breaking down the divisions within a data center operations team, such a tool can provide broad, shared visibility to each specialist, removing the finger-pointing and leading to faster resolution of problems. When these groups work together using the same monitoring tool, they can adopt a more active monitoring posture, spotting problems before they affect overall service quality. And this single-platform approach leads to fewer tools to maintain, resulting in less overhead.

The softer payoff of such an approach arrives in the form of an IT organization that is more responsive to the business. As new revenue-generating applications are introduced, the unified monitoring tool's

ability to provide a service-quality view will streamline the deployment of those applications. The DevOps team will be able to debug applications and tune the infrastructure more rapidly.

CA Unified Infrastructure Management (UIM) is a leading solution that meets the needs of these agile DevOps enterprises. With a unique architectural approach, CA has delivered a scalable and highly integrated unified management platform with a powerful focus on the most essential parts of a modern data center: network monitoring and server monitoring. IT organizations have recognized that they need to break up operational silos if they are gong to support the agile enterprise. To achieve this, they need true end-to-end infrastructure monitoring platform with a unified architecture. Such platforms need to be easy to use and encourage collaboration across functional groups within IT. CA's latest UIM releases continue to demonstrate an innovative approach to breaking down organizational silos in order to help IT organizations support the needs of an agile enterprise.

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About CA Technologies

CA Technologies (NASDAQ:CA) creates software that fuels transformation for companies and enables them to seize the opportunities of the application economy. Software is at the heart of every business in every industry. From planning, to development, to management and security, CA is working with companies worldwide to change the way we live, transact, and communicate – across mobile, private and public cloud, distributed and mainframe environments. Learn more at www.ca.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 blogs.enterprisemanagement.com. You can also follow EMA on Twitter, Facebook or LinkedIn.

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