The Power and Payback of Unified IT Monitoring

An ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) White Paper
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Executive Summary

Today’s IT leaders are faced with a seemingly intractable problem. On the one hand, they are pressured to support new technologies and innovations, such as client mobility and cloud services. At the same time, the growing use of agile development techniques and the move towards an “app economy” are accelerating the rate of new, business-critical application deployments. And all the while, expectations are continuously rising for higher availability and faster performance across hybrid physical/virtual/cloud infrastructures. One important path to success involves bringing together infrastructure, application, and service level visibility via a technique known as “unified IT monitoring.” This ENTERPRISE MANAGEMENT ASSOCIATES’ (EMA™) white paper examines why unified IT monitoring is an important enabling technology for both enterprises and management service providers, including both the organizational and strategic impacts as well as the business case surrounding it. It goes further to examine CA Unified Infrastructure Management as an example of unified IT monitoring, and reviews three case studies where the solution has been deployed for active use in a unified manner.

The Drive to Unify Enterprise IT Monitoring

As Information Technology (IT) has evolved and become an entrenched part of business and organizational processes, ensuring that all of IT’s parts, pieces, and elements are playing their intended roles on a reliable basis has become increasingly mission-critical. Much as a living organism’s viability is based on the need for multiple interrelated systems to work together smoothly, the applications that underpin business processes rely on multiple interrelated technologies in order to deliver desired end results. Within IT, this means that infrastructure—networks, systems, and storage, both physical and virtual—must be available and functioning as needed in order for higher level functions (applications and services) to be successful. And unlike a living organism, IT must contend with a constantly changing mix of technologies, such as the recent rise in endpoint mobility, cloud services, and the application economy.

So how do we ensure that everything is functioning as intended, across an increasingly diverse and virtualized infrastructure? And how do we make sure that the applications are healthy at the same time? The simple and well-known answer is that IT Operations must monitor the infrastructure and applications to make sure each element that is needed is indeed up and running (available) and is achieving necessary functional capacity (performing). But that’s where the simplicity ends. While the basic concepts of understanding performance and availability are similar across infrastructure and application components, the methods of how to gain such an understanding range widely.

The historical approach to comprehensive monitoring has been to build or buy a series of monitoring tools, technologies, and practices, each centered upon a specific major technology area or “domain,” such as networks, servers, storage, databases, or applications. While this strategy has allowed IT to gain tremendous availability and performance insights within each domain, it leaves a fractured, incomplete understanding of how all of the domains are (or are not) working together to successfully deliver the end goal of supporting business processes with acceptable levels of service quality.

A better path is needed—one that allows and embeds the ability to integrate all of the monitoring techniques and data into a single common system. A living organism is a system of systems, and when we check up on its health, we assess all of those systems and how they come together to impact the
overall health of the organism. In a like manner, a complete IT monitoring approach incorporates insights into all of the composite domains and components so that the overall health and viability of IT can be understood at all times.

**Strategies for Integrating Monitoring**

There are three primary ways to accomplish comprehensive, integrated monitoring. The first is to rigorously define operational practices and domain-specific monitoring tool configurations in ways that align data representation and relative systems priorities. In essence, this is a manual correlation approach simply seeking to complement existing domain-specific monitoring tools with human intelligence. As a result, it is intensive in terms of human resources required and also slow to recognize and respond to incidents and issues due to human processing speeds. Yet despite these limitations, this approach can be viable in small organizational settings, where the overall complexity of the IT infrastructure and applications is very low.

An alternative approach involves buying or building a “manager of managers” system that automatically and programmatically collects management data from multiple underlying domain-specific management tools, bringing it together for correlation and analysis. Such a system can indeed provide a centralized view across all infrastructure and applications, with common consoles and reporting. But it is also a very expensive proposition, both in terms of cost to acquire and deploy the technology as well as in terms of ongoing administrative costs of keeping such systems up to date when underlying monitored technologies, monitoring systems, integration interfaces, and cross-domain relationships change. Again, despite these limitations, the manager-of-managers approach is viable, particularly for very large managed environments where human (and capital) resources are sufficiently rich.

Finally, the third approach focuses directly on merging the domain-specific monitoring systems themselves. This technique eliminates the data integration problem by replacing multiple domain-specific monitoring systems with a single cross-domain alternative that is capable of understanding how to monitor all technology types. EMA describes such an approach as “unified IT monitoring.” Unified IT monitoring systems provide much the same automated cross-domain correlated consoles and reporting capabilities of a manager of managers, but eliminate the capital and administrative costs of deploying and maintaining multiple management tools.

**Why Unify Monitoring Now?**

While human and capital cost are indeed drivers, there are other significant reasons for embracing a unified monitoring approach. Over the past several years, EMA has been following and documenting the rising awareness and importance of higher-level IT objectives combined with organizational shifts designed to meet those goals. For instance, recent EMA research\(^1\) revealed majority awareness of the importance of application performance, end-user experience, and service quality within enterprise networking teams—typically the last to join the party when it comes to service orientation. In fact, service quality was called out as growing in importance by a full two-thirds of organizations studied.

In parallel, a rising number of organizations are re-aligning their teams into a single, converged, cross-domain operations center model. Within that same study, EMA found such approaches, while most common among mid-sized organizations, are now embraced by 40% of IT shops overall. This percentage has increased by a factor of two from similar measures five years ago, and this type of approach has

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shifted steadily from being a strategy employed primarily by large organizations embracing IT Service Management (ITSM) initiatives to one that represents a practical path to service orientation for small and mid-sized organizations.

In order for IT organizations to achieve service quality awareness and facilitate integrated operations, monitoring tools and technologies must do their part by helping operators start with the broad view and then get to the information that matters to them most as efficiently as possible. While any of the three integration strategies discussed above will help with this, the one that represents the most viable and effective answer for most organizations is unified IT monitoring.

**Business Value of Unified IT Monitoring**

While unified IT monitoring can certainly help with the organizational and aspirational aspects of service-aware integrated monitoring, no management technology solution can be embraced without also understanding the commercial/cost side of the equation. In order to warrant making the shift, a clear business case must be evident, one that is sufficiently compelling to balance out both the hard monetary costs of transition and the soft costs of any disruption that might occur. And importantly, since unified IT monitoring will be used to bring together what are typically independent functional areas, it requires bringing together cost factor assessments across multiple viewpoints and constituents.

Key to understanding the business case for unified IT monitoring is recognizing the reach of such solutions and the scope of potential value, both to the IT operations team as well as to the supported business organization. Business case models for unified monitoring will commonly be comprised of multiple elements, spanning reduced operational cost and complexity as well as improved resilience and readiness of the IT infrastructure. Following are highlights of each major area of savings that should be considered.

**Improved Visibility – Reducing MTTR**

The first and most common objective of moving to unified IT monitoring is to take advantage of the inherently integrated/correlated viewpoint such solutions offer to deliver operational insights that reduce the time required to move from recognition to diagnosis to correction when a problem or incident occurs. Whether the problem is with infrastructure or application element health or degrading response times affecting customer experience or end-user productivity, Mean Time to Repair/Restore (MTTR) is a common metric used to track the average time that IT takes to correct such issues. By reducing MTTR, disruptions in availability or performance of IT systems are dealt with more expeditiously, resulting in lower impact to the supported organization via shorter loss of access and/or reduced loss of productivity. Unified IT monitoring systems help to shorten MTTR by bringing monitoring data across multiple technologies together in one place so that operators can rapidly recognize the current state of all related, interdependent components as well as any recent events that may reflect the source of the issue.

The business value of reduced MTTR will vary depending on the organization. Start by quantifying the cost of an hour of downtime for your most critical applications. A pro-rated equivalent can be calculated to reflect performance degradations as well, if they measurably impact productivity. MTTR improvement rates experienced by those deploying unified IT monitoring can then be used to calculate the potential savings at hand.
Improved Coverage – Extending MTBF

Failures and degradations within IT are sometimes swift and sudden, resulting from unanticipated loss of function somewhere within the infrastructure or application. In those situations, your best answer is to react as efficiently as possible, as described above. But another, and perhaps greater, opportunity exists to avoid service-impacting incidents entirely in cases where early indicators begin to pop up that can be dealt with on a proactive basis. This means recognizing potential failures or the early signs of degradations that will eventually impact user experience and taking preventative measures before problems become noticeable to users and customers. Fully informed capacity planning is relevant here too. Doing this right means making progress on extending another common metric—Mean Time Between Failures (MTBF). By extending MTBF, business productivity can again be protected.

The business value of extending MTBF is also dependent on the organization. It can be calculated using a technique similar to MTTR, based on the average cost of downtime/degradation and the improvement rate from real life deployments.

Improved Tooling Costs

Central to the concept of unified IT monitoring is reducing the number of monitoring tools that must be deployed in order to keep tabs on IT environments. Each tool brings its own license and training costs, as well as the ongoing cost of support, maintenance, and administration. In some cases, maintenance and support subscriptions can represent significant financial commitments, far outpacing initial acquisition and deployment costs.

The amount of savings here depends on the number and type of tools that can be replaced via a unified IT monitoring solution. Recent EMA research\(^2\) has found that within the networking area alone, 54% of organizations use six or more tools to support operations activities, 29% use ten or more, and 10% use at least twenty! While not all of these tools will be fully replaced by unified monitoring, most organizations will find that there will be clear opportunities to consolidate. And with each consolidation, savings in support, licensing (particularly in subscription models), training, and dedicated administration can be used to drive the business case for unified IT monitoring.

Improved Readiness

The final area of business value is often the most difficult to calculate directly, but it is nonetheless important to include in considerations. If anything is certain in IT, it is that new applications and technologies will be coming, each one promising advantages but also representing risks during rollout and adoption. All too often, such projects are delayed either because the production environment is not ready/able to support the new initiative or because problems not caught during pre-deployment or pilot testing begin to manifest themselves during full-scale production rollout. Such delays may result in direct cost to the organization, such as missed deadlines/commitments to external partners or customers, or they may simply delay the capture of expected savings or new revenue streams.

With a unified IT monitoring system in place, two key advantages can be gained in this area. First, with MTBF extended and MTTR reduced as described above, the risk of failure due to infrastructure readiness can be significantly reduced. This may be quantifiable, particularly if contractual penalties arise due to lack of successful delivery. The second advantage is in faster recognition of issues during new initiative rollouts so that corrective actions and adjustments can be invoked in a more timely

\(^2\) Ibid
manner. In fact, a unified monitoring system is likely to deliver a much more conclusive set of feedback during pilot rollouts since impacts and performance can be recognized across all technologies simultaneously rather than on a piece-by-piece basis.

Quantifying the business value of improved readiness is highly dependent upon individual organizational projects and objectives but can be very real for those that have contractual commitments and closely tracked business cases for deployment of new IT capabilities.

The CA Unified Infrastructure Management Approach

An excellent example of a unified monitoring approach can be found in the CA Unified Infrastructure Management (UIM) solution offered by CA Technologies. CA Unified Infrastructure Management has been designed from the ground up as a truly unified availability, performance, and SLA monitoring solution that can incorporate and support virtually any form of IT infrastructure, spanning networks, servers, storage, databases, and security systems, including those in physical or virtual form. The solution goes further to support direct testing of applications, by monitoring both application components and processes as well as sample transactions. Application awareness is also supported via support for NetFlow, and specific features have been added for integrated monitoring of external cloud environments, including Amazon AWS, Google Apps, Rackspace, and more. Deeper Data Center Infrastructure Monitoring (DCIM) is also included, adding operational awareness of power usage and efficiency. Finally, the solution can be extended to monitor virtually any system or element that has some form of communications interface, whether standards-based or purely proprietary.

The CA Unified Infrastructure Management solution is built using a highly scalable, distributed publish-and-subscribe communications bus architecture, which allows a single server to support tens of thousands of managed elements. The back-end database supports enterprise-class platforms such as Oracle, MS SQL, and MySQL. And the front-end consoles, dashboards, and reports have been designed with full multi-tenancy in mind so that they can be tuned to show only those elements and data that pertain to a particular user role or to (in the case of management services providers) any individual client’s managed domain.

While a rigorous accounting of the full range of CA UIM features and capabilities is beyond the scope of this paper, the most visible evidence of the unified nature of the solution comes from examining sample dashboards and reports. For example, Figure 1 shows an integrated executive dashboard covering applications, servers, storage, and network status across multiple geographic regions, combined with non-IT business activity metrics and data feeds.
A common dashboard that might be used by an operations team is shown in Figure 2; it is sorted by elements that are exhibiting the most problematic status. This again shows CA Unified Infrastructure Management’s ability to bring together monitoring status of multiple IT domain types into a single, unified view to help IT operations teams recognize issues rapidly across a complex range of managed components.
For those seeking insights into how multiple systems are working together within a multi-tier web application, status and experience-affecting factors can be shown in an integrated application topology dashboard view, as shown in Figure 3. In this case, server, application, database, storage, and networking must all be working together in harmony for the end user to receive acceptable levels of experience.

Finally, the solution offers strong service level objective/agreement tracking via integrated QoS logging and thresholding. This capability allows for constant monitoring of Service Level Agreement (SLA) compliance by providing detailed reports, an example of which is shown in Figure 4.
Collectively, the CA Unified Infrastructure Management solution offers broad, comprehensive monitoring across complex, mixed IT infrastructures, applications, and services, delivered via an extensible, scalable, multi-tenant architecture. Further, non-IT data can be included within the same system so that business activity indicators can be aligned with the IT systems that support them. This allows the solution to be applied readily to both internal enterprise IT management and multi-client Management Services Provider (MSP) settings, delivering both operational and business intelligence in a unified manner.

**Experiences with CA Unified Infrastructure Management**

One of the best ways to assess how useful any technology can be is to learn from the experiences of those who have implemented that technology. While insights into actual value will always be somewhat specific to particular environmental conditions and needs, such illustrations can form a solid basis for setting expectations and estimating potential results for any organization. CA Unified Infrastructure Management has been deployed by hundreds of organizations worldwide, both in traditional enterprise settings as a solution used by IT operations teams and as the basis of service offerings by Management Services Providers (MSPs). Following are three case examples of specific experiences with the CA Unified Infrastructure Management solution.
Healthcare MSP

**Situation:** This organization specializes in providing outsourced IT monitoring services to healthcare provider organizations such as clinics, doctors’ offices, and hospitals. The MSP monitors all aspects of IT for their clients, including servers, networking, storage, and applications ranging from email to Electronic Medical Records (EMR) systems. The MSP is a full-service monitoring provider, meaning they enter into SLAs with clients on performance, responsiveness, and transaction times at the application layer.

**CA Unified Infrastructure Management Deployment:** The MSP chose CA Unified Infrastructure Management as its standard service platform due to the solution's flexibility and modularization. The solution has been deployed as a single CA Unified Infrastructure Management server with 25 hubs (software that sits inside the client firewall) for data collection. Currently, the system is used to monitor over 4,000 servers and related infrastructure, across all clients combined. Each of the MSP’s clients has a team assigned to it, and while each team uses CA Unified Infrastructure Management to track and understand client IT health and SLA compliance on an ongoing basis, the entire installation is administered and maintained by a single individual.

The team makes particular use of system resource and performance monitors, as well as process probes. The ability to track passed parameters as part of process invocation has been very handy in finding and revealing batch file issues. They have also found the logmon (log monitoring) probe to be particularly useful for tracking specific application messages and measures, as the probes are easy to configure and the application monitoring teams set them up and tune them on their own. Further, the logmon and E-mail Response probes have allowed the few remaining proprietary monitoring tools that must be used (often for specific individual turnkey systems) to be fully integrated so that CA Unified Infrastructure Management can function as a manager of managers.

**Key Findings:** The MSP has found particular benefits from three aspects of the CA Unified Infrastructure Management solution:

1. **Flexibility:** The prior system was far too rigid and difficult to adapt to changing needs and client environment variations. Now, the team can quickly add new systems, applications, and elements under management—even when no standards-based management interface is available. “People come to me and ask ‘How can I monitor this?’ and there are always options—and usually more than one,” said the administrator.

2. **Ease of use:** “Everything is in plain English—we don’t have to try and figure out what an alarm means,” said the network administrator. This has been hugely helpful in rapid recognition of issues and also in troubleshooting, whether during initial triage or for understanding historical context and conditions surrounding an issue.

3. **Ease of administration/modularization:** Keeping the CA Unified Infrastructure Management system itself healthy and running has been very simple. Once the initial installation is complete, this takes very little time. Further, the system is extremely customizable, so each time a new client is added, the process of configuring and deploying monitoring services is fast. They simply drop a hub into the client’s DMZ, set up NAT (Network Address Translation), and are up and running.

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The system meets most all of its monitoring needs in a more efficient manner, resulting in 25% fewer service desk tickets.
Using CA Unified Infrastructure Management has allowed this MSP to realize one of its most important goals—signing up to application-level SLAs across multiple technology domains. And the results have been effective because the system meets most all of its monitoring needs in a more efficient manner, resulting in 25% fewer service desk tickets over time, on average. Things have gone so well that using the solution is now a mandatory policy—no alternatives or external monitoring tools are allowed unless they feed directly into CA Unified Infrastructure Management.

**Financial Services Provider**

**Situation:** This organization provides financial investment services, primarily in support of a network of over 6000 small, localized affiliate partners. The firm operates roughly 300 servers (most all of which are virtualized) across three datacenters, along with network equipment and storage systems. Its core business is hosting applications and suites for small financial and accounting firms that want to offer investment services and who access them remotely by secure Internet connections. In order to meet the expectations of affiliates, those applications must be available and performing around the clock.

**CA Unified Infrastructure Management Deployment:** The firm deployed CA Unified Infrastructure Management in June of 2013, replacing an outsourced monitoring service that was not providing sufficient coverage or depth of information. The initial purchase was cost-justified as delivering full ROI (Return On Investment) in two and a half years, just by switching from a recurring monthly monitoring expense to a depreciable capital software investment. CA Unified Infrastructure Management is now being used to track availability and performance across all of the company’s IT infrastructure, including servers, networks, storage, and applications. The same system keeps both production and dev/test/acceptance environments under constant surveillance.

Some of the most heavily used monitoring features include server cdm (CPU, disk, and memory), server processes, WAN connectivity between datacenters, Internet VPN connections, and application transactions via synthetic session replays. The logmon probe is also used to watch for key application errors as well as firewall activity and actions. The operations team has been integrated with the help desk team, all of whom use CA Unified Infrastructure Management to keep constant tabs on alarms, alerts, and problematic trends.

**Key Findings:** The financial services provider has found particular value in two essential areas:

1. **SLA tracking:** The organization makes regular use of the SLA tracking and reporting capabilities within CA Unified Infrastructure Management. While SLAs are only used for internal purposes at this time, they form the basis for operating IT as a service provider, both for internal users as well as for the firm’s affiliate network clients. This approach has helped to prioritize technology upgrades and investments based on business and customer service priorities. “SLA tracking is critical for us,” said the infrastructure manager. “It lets us tie our daily activities to what is important to our business and our customers.”

2. **Deep unified visibility:** The ability to bring all measurements, alerts, and events together into one place has paid significant dividends in terms of improving both responsiveness to incidents and overall systems and infrastructure stability over the long term. “We have definitely seen reduced failure rates because we now have the data that allows us to root out underlying, recurring causes,” said the infrastructure manager. “Stability has improved by leaps and bounds as a result of what we can do with CA Unified Infrastructure Management.”
While management leadership and vision have a lot to do with successful internal IT transformations, this financial services provider has found CA Unified Infrastructure Management to be a huge help in moving away from reactive, break-fix operations towards customer- and business-centered, service-oriented, proactive operations. The infrastructure manager was able to justify the move to CA Unified Infrastructure Management on the basis of direct cost savings, but the secondary benefits received in terms of IT stability and customer satisfaction have been equally, if not more, substantial.

**Global MSP**

**Situation:** This global Management Services Provider (MSP) offers several classes of monitoring services, ranging from a light touch (all alarms are forwarded back to the client) up to and including full turnkey monitoring and management. Not long ago, a review of operations revealed that services were based on a wide range of monitoring tools, resulting in gaps (such as integrated VoIP monitoring) and inconsistencies from client to client and from region to region. A new initiative was undertaken to develop a center of excellence within the U.S. operations group to consolidate and standardize monitoring technology as a means to develop a consistent and fully capable services architecture.

**CA Unified Infrastructure Management Deployment:** CA Unified Infrastructure Management was chosen as the new, consolidated, unified monitoring services platform and is now being used to monitor over 15,000 client devices within the U.S. Roughly half of these are servers and the other half are network elements; however, databases, security devices, and storage are also being monitored, including both physical and virtual form factors. The solution has been deployed in a multi-tenant mode, with clients having direct access to their own CA Unified Infrastructure Management data views via the MSP’s customer portal.

**Key Findings:** The global MSP gets value from the CA Unified Infrastructure Management Solution in several areas:

1. **Breadth/flexibility of coverage:** While most of the MSP’s services tend to be focused on monitoring servers and network equipment, the ability to monitor other aspects of IT infrastructure is essential. “We have to be ready to monitor whatever our clients need help with,” said the MSP engineer. “With the CA Unified Infrastructure Management solution, we can easily build new probes for whatever we can’t get right out of the box.” (CA Unified Infrastructure Management “probes” are adapters that allow the system to collect metrics and data for monitoring services, applications, and infrastructure components.)

2. **Integration:** The MSP has integrated CA Unified Infrastructure Management with a third-party service desk/CMDB. “We’ve been able to take CI (Configuration Item) info from CA Unified Infrastructure Management and match that up with client data in the service desk so that actionable alerts automatically generate tickets that contain all the details we need for effective response and troubleshooting,” said the MSP engineer.

3. **Stability:** “The CA Unified Infrastructure Management system has been really reliable, operating at close to five nines of uptime,” said the MSP engineer. “And this is being done without a full and proper redundancy architecture—the product is just that solid.”
This global MSP needed to find a single, unified monitoring platform that would allow them to focus on adding value by applying internally-established best monitoring practices on behalf of all clients on a consistent basis, rather than trying to recreate and maintain those practices across multiple monitoring systems. CA Unified Infrastructure Management fit the bill in terms of breadth and flexibility and put them in position to proactively meet service expectations. “Our customers bank on us finding things early and handling them. If we miss an alarm, that’s a big issue,” said the MSP engineer. “CA Unified Infrastructure Management keeps us on top and in front of things—we don’t miss alarms anymore.”

EMA Perspective
Unified IT monitoring offers a wide range of benefits, from improved operational responsiveness to lower risk in rolling out new technologies and services. Further, these results can be operational as well as monetary. From a tactical perspective, unified monitoring offers the fastest path to integrating data across multiple technology domains so that a comprehensive view of infrastructure health and activity can be merged with an understanding of application performance and end-user experience. From a strategic perspective, unified monitoring paves the path for effective, integrated, cross-domain operations teaming and may be the only practical means for most organizations to realize true service level compliance monitoring and reporting.

The CA Unified Infrastructure Management solution is an excellent example of a unified monitoring approach, as evidenced by the three case studies reviewed here. All use the solution to combine deep monitoring across servers, networks, storage and more, and both MSPs and enterprise shops alike take full advantage of integral SLA monitoring. Further, the solution shows traction across several organization/deployment sizes and has received high remarks for resilience and flexibility/extensibility. Clearly, CA Unified Infrastructure Management is a solution that can meet the objectives of unified monitoring, delivering measurable value to adoptees.

About CA Technologies
CA Technologies (NASDAQ: CA) provides IT management solutions that help customers manage and secure complex IT environments to support agile business services. Organizations leverage CA Technologies software and SaaS solutions to accelerate innovation, transform infrastructure and secure data and identities, from the data center to the cloud. Learn more about CA Technologies at www.ca.com.
About Enterprise Management Associates, Inc.

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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