Unified Network Management

The Key to Operational Efficiency

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Executive Summary

As the world of IT converges, within the data center, within networking technologies, between voice and data, and in more ways to come, it is also appropriate to examine how management tools and technologies can be converged in order to best meet the needs of IT planning and operations. Within the scope of network management, this means adopting products that integrate or unify management capabilities, features, and functions. Though many network management product choices may sound similar on paper, there are distinct differences that should be understood. This ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) white paper examines how a unified approach can both improve operational efficiency and lower total cost of ownership (TCO). The unified solution offered by Entuity is used as an example, along with some real-world testimonials of how the Entuity solution has been deployed within live production environments.

Achieving Operational Efficiency in Converging Environments

The phenomenon of convergence manifests itself in many ways within IT organizations today. From a technology perspective, the infrastructure is converging, driven by virtualization technologies and the steady march towards IP as the transport for both human-to-human and machine-to-machine communications. For example:

- Voice, video, and applications all traverse the same network, creating new contention for shared resources along with diverse delivery and quality requirements.

- Datacenter architecture complexity, recently multiplied by new virtualization techniques, is driving a surging interest in converged infrastructure solutions that combine compute, network, and storage into "datacenter in a box" offerings, removing both deployment and long-term administrative hurdles.

- The datacenter network itself is converging, with the emergence of flat switching architectures and single, unified compute and storage fabrics.

- Transitioning IT infrastructure from hardware-centric to virtual sets of "on demand" resources, the true objective behind cloud computing, is causing a converging focus on applications and services.

At the same time, operations teams are also converging. EMA research has tracked a steady increase over the past five to six years in the percentage of enterprises that claim to have established cross-domain, service-oriented operations teams—an approach nearing mainstream status. Such techniques are particularly prevalent within organizations that have either embraced external cloud services or are undergoing internal transitions to a cloud-oriented operating model.

> Convergence and complexity in the managed environment is driving a reassessment of network management tooling and practices.

Driven by these macro- and micro-scale changes, networking professionals continue to voice a strong preference for integration within their network management solutions. EMA research published in mid-2014 noted that the majority of respondents preferred fully integrated multifunction platforms to those that are loosely integrated or "best of breed."

The overriding issue at hand is the increasingly critical role the network plays in converged and service-oriented IT operations. There simply is no time for downtime, nor any sort of extended performance degradation. This is driving organizations to realize that in order to achieve operational efficiency

they either have to throw more and more resources at monitoring and fixing their networks, or they have to reevaluate their approach to leveraging network management tools and technology. Historical approaches of having a kitbag full of each engineer's favorite tools is no longer appropriate, efficient, nor effective.

Total Cost of Ownership and Operations for Network Management

Another important parallel consideration involves the business costs associated with historically traditional multi-tool, piecemeal approaches to network management. Having to keep many tools up-to-date across individual product release cycles and in synch with current devices under management adds measurable administrative resource time. Needing to train engineers, managers, and operators to understand and navigate multiple user interfaces raises learning curves and depresses the likelihood that any individual tool is fully understood or utilized. And because each tool will have its own data repository, sharing of data between tools is typically done manually (time consuming and inaccurate), with the help of outside professional services (expensive to deploy and maintain) or not at all (leaves gaps in visibility). Very simply put, more tools are more work and more overhead, creating budgetary demands that bloat maintenance spending to the detriment of new investments. Unified network management solutions can represent a real alternative.

Technical Demands for Unified Network Management

What does "unified network management" mean, and how does it differ from integrated management approaches? In short, while the ends are very much the same, the means to those ends are different. An integrated management approach presumes installation and deployment of multiple independent, individual management products, which are then knitted together, typically via APIs or a middleware bus. Integrations may be "loose," which commonly means that data is passed ad hoc between products and sometimes the products can even cross-launch each other in context. Alternatively, integration levels may be described as "tight," where data definitions are shared and user consoles and dashboards may also be directly interleaved. Either type of integration brings the advantage of sharing data and workflow, but the downsides of initial cost (sometimes as much or more than the tools themselves!) and architectural "brittleness," meaning that if any one tool changes, interface breakage may occur, and so the whole architecture must be re-verified and retested. Brittleness often results in network management teams being frozen - unable to upgrade tools for fear of disrupting work processes - and thus unable to access valuable new features and functionalities coming from new product releases.

Unified network management solutions, on the other hand, include a broad range of features and functionality within a single product footprint. Unified solutions are built on a uniform architecture that only needs to be installed once, and subsequently there is only one product to configure, upgrade, or patch when changes are needed. Such solutions can still offer modularity by means of license keys, allowing teams to only pay for the parts they choose and need, while

> Unified network management solutions include a broad range of features and functionality within a single package.

making extended capabilities essentially trivial to deploy. Further, there are no variations in levels of unification. All data is shared (by definition), consoles and reports are intrinsically common, and cross-functional tasks and features are already inherently linked.

A unified network management solution must be broad and deep enough to prevent the need for buying and deploying additional network management products just to get the job done. More specifically, a unified network management solution must be able to provide the following capabilities:

- **Multi-vendor management**: First and foremost, the solution must be capable of being used to manage network equipment from more than one supplier-vendor. Importantly, multi-vendor does not simply mean supporting industry standards – the solution must have validated extensions for vendor-specific management interfaces if it is to successfully deliver a fully functional alternative to vendor-specific management products. Generally, the broader the list of fully supported vendors, devices, and device firmware versions, the better.

- **Multi-function management**: In order to capture the value of unifying management rather than integrating, the solution must offer functionality that spans what would otherwise require multiple products. In the case of network management, this should include fault/availability, performance monitoring, and configuration management at a minimum.

- **Multi-domain management**: Networks exist to serve the purpose of interconnecting IT resources, and increasingly it becomes important to recognize not only the elements comprising the network, but also that which the network connects. Since the focus here is on network management and not server, storage, or desktop management, the required depth of management capabilities for attached components is less than it is for network devices, but of key importance is enabling network engineers and operators to quickly recognize how any particular portion of the network affects the way in which network-connected IT infrastructure is performing. This can include supporting facilities infrastructure, such as power, HVAC, and even physical access control security systems.

- **Support for cloud**: While network management tools and practices are only beginning to be applied to directly monitor or address external cloud resources, internal cloud transformations introduce multiple new (often virtualized) technologies that will most certainly need to be understood and managed. Most importantly, connected cloud services and direct support for virtual network elements, such as virtual switches and emerging overlay and underlay SDN (software defined networking) technologies must be recognized and accommodated, either with direct support or an active, committed roadmap.

- **Multi-dimensional management data**: One of the reasons that multiple management tools are deployed is to gather varied sets of management data. A unified network management system should incorporate as many types of available management data as possible, including traditional element SNMP data (traps and MIBs), log data, and flow data (such as NetFlow). Having all such types of data brought together in a single system vastly simplifies the challenge of correlation and provides the "360 degree" view capabilities that are often necessary for effective analyses.

- **Facilitated workflows**: Inherent in the unified approach, data and actions should be aligned in a way that allows networking pros to accomplish tasks and workflows in an optimal, efficient manner. The best unified management systems will also add specific task-oriented user interfaces, wizards, and dashboards, along with the ability to configure the system in ways that help to address the unique tasks existing within any particular managed environment.

- **Effective collaboration**: Finally, the operational intelligence gathered within a unified network management system can be of great value both for converged operations as well as to the broader organization, for proper diligence in planning and forecasting. Systems must be able to present management information in real-time consoles, flexible reports, as well as via API. Certified programmatic interfaces also represent the best means for connecting a unified network management system with other non-network management systems, such as applications management, systems management, help desk, service management, or even billing.

Besides these core functional capabilities, a unified network management approach must also possess a few essential architectural attributes. Most important here are the ability to scale gracefully, the ability to operate in a highly available and reliable manner, and the use of automation where ever appropriate and possible. Also important are intuitive user interface designs that shorten learning curves and promote use of the system across a broad audience, even beyond typical networking practitioners.

The Entuity Solution: A Unified Approach to Network Management

Entuity has long focused on solutions for network management that are quick to deploy, simple to use, and yet rich and deep in features and functions. This vision has led the company to build a network management solution that takes a truly unified approach, slashing administrative overhead while empowering networking pros to get their jobs done more efficiently and more effectively.

At the core of the Entuity solution is a rapidly scalable federated architecture, allowing multiple independent Entuity servers to work as one. Each server has its own local database with data specific to the network segment under management but is also logically joined to all other Entuity servers, appearing as a single unified database for analysis and presentation purposes. Using a distributed approach provides better I/O performance and allows the solution to scale smoothly while also eliminating single point of failure concerns. Functional modules are all designed to connect into and leverage the common core data architecture, eliminating the need for the data translation, mapping, and correlation that would be required under a multi-product integrated approach. Features that have been directly implemented within this unified product strategy include discovery and inventory, topology and path mapping, performance monitoring, fault and event management, root cause analysis, configuration management, and a full complement of customizable dashboards and reports.

Entuity has demonstrated a long-term commitment to continuous improvement. Two recent examples are the added event management system (EMS) and integration with Entuity SurePath technology. The EMS provides a simple-to-use yet powerful means for managing large volumes of alerts and events, including the ability to specifically tune each type for severity, notifications, and automated actions that make sense for the specific context and needs of any managed environment. Entuity SurePath uses patent-pending algorithms to automatically discover the precise, exact path(s) that interconnect any two points anywhere on the network, with visibility down to layers 2 and 3. The ability to directly invoke SurePath from Entuity Network Management will further automate path visibility and integrate path details into the Entuity system. This will greatly accelerate troubleshooting of connectivity or performance issues, and improve ongoing application path monitoring, particularly in large distributed organizations.

Following is an assessment of how the Entuity solution matches up with requirements outlined above for unified network management:

- *Multi-vendor management*: The Entuity system was designed from the ground up to support mixed, multi-vendor environments and is commonly deployed in precisely such settings. Existing libraries support hundreds of manufacturers and thousands of devices. Additionally, the solution offers very fast adaptation/extension for new devices, new revisions, new models, etc. This especially applies to new or updated SNMP MIBs, which can be accommodated within a few hours either by the solution administrator or via Entuity support. EMA dialogue with Entuity solution users has validated this approach as effective.

- ***Multi-function management***: The Entuity solution provides capabilities that span all three primary network management functional areas - fault/availability management (including discovery and topology mapping), performance management (including both device monitoring and flow monitoring), and configuration monitoring.

- ***Multi-domain management***: The Entuity system is regularly used to monitor network-attached devices of a wide range of types, including physical servers, virtual servers, storage, environmental systems, and other IP-addressed elements of all types and kinds, even including devices such as digital security cameras. While the primary focus of the solution is completeness for managing networks, connected elements can be recognized for understanding topological placement and assisting with problem isolation.

- ***Support for cloud and virtualized platforms***: The Entuity solution has been extended to manage virtualized compute environments, including the virtual network elements within them. Entuity servers can be deployed as virtual machines on all major hypervisors.

- ***Multi-dimensional management data***: The Entuity solution gathers multiple types of management data, including SNMP polled data, SNMP traps, NetFlow, IP SLA, syslog and even configuration files. This gives network managers and operators the ability to look at issues through multiple lenses and viewpoints, all within the same management system.

- ***Facilitated workflows***: The unified nature of the Entuity solution eliminates the "swivel-chair" or "alt-tab" approach to management so often required when using multiple standalone or integrated products. Regardless of which functional task is at hand, networking pros can access the data they need from a single seamless set of dashboard and console views. Automated capabilities within the system, such as incremental discovery and root cause analysis, keep operators focused on what actions to take rather than trying to arbitrate between independent data sets.

- ***Effective collaboration***: The Entuity system goes beyond simply providing consoles and dashboards for the network operator. Also included are status views that can be customized to the needs of individual IT and non-IT constituents, as well as a full complement of flexible and extensible reports for sharing information across the organization. The system also provides programmatic interfaces for exporting any and all data and events into other management and reporting systems.

From a platform architecture perspective, the shift to supporting virtual machine hosting for Entuity servers makes deployment fast and easy. The user interface design regularly gets rave reviews from system users during EMA dialogues, in particular for its intuitive nature and the short time required for new users to achieve productive efficiency. The solution has also been integrated with a long list of complementary management systems that focus on deep management of systems, applications, and databases, such as the BMC TrueSight and Oracle Enterprise Manager, as well as service management systems such as BMC Remedy.

In aggregate, Entuity has developed a product that qualifies as a truly unified network management solution. The system achieves the core requirements for such, and stands as a clear example of the unified architectural approach for integrating network management tools and technologies.

Real-world Experiences with Entuity Unified Management

Enterprise Management Associates (EMA) is in regular contact with practitioners who are actively using the Entuity solution, and recently checked in with two of them to gather perspectives on the value of Entuity's unified approach. Conversations evidenced benefits that should be specifically expected from using a unified system.

An IT tools architect for a large international pharmaceutical company has deployed the Entuity system to manage over 12,000 network devices across a global footprint. The implementation of Entuity Network Management was undertaken as part of a global IT consolidation project five years ago and one of the key objectives was to find a single network management solution to replace 4 to 5 disparate monitoring tools in use by what had been independent teams. Of greatest concern was replacing one well-known network management platform that had been in place for many years and had been heavily customized along the way, but the Entuity solution was able to meet that challenge with little difficulty. The ease of use and ease of implementation of the Entuity solution played a critical role in helping reach consolidation goals, since it facilitated adoption across multiple teams. The tool is primarily being used to handle event management through the monitoring of SNMP polled data and traps, and is now being used by over 100 operators and managers on a daily basis. Another important reason it was selected was the strong product integrations and company alliance with BMC, with direct advantage being realized from the integration with BMC Remedy for trouble ticketing as well as integrations with BMC capacity planning and configuration management tools.

> *"(Entuity) really helped us with our IT consolidation, because it was so easy to move to as a new platform."*
> *Tools Architect - Global Pharma*

A network administrator of a large international manufacturing company is using the Entuity solution to manage more than 2500 network devices across 300 locations worldwide. Initially installed many years ago but under-utilized, the solution has been getting much heavier use for the last two to three years. An eight-member team now uses the Entuity solution to provide 24 hour global monitoring coverage. The company faces a major challenge just keeping some regions on line since the backend infrastructure in some of the locations lack common amenities, like reliable electrical utilities. One of the main reasons for moving to the Entuity solution was to migrate towards a proactive (rather than reactive) monitoring approach specifically for this challenge.

> *"There is amazing power in the (Entuity) system."*
> *Network Administrator - Manufacturing*

Another ongoing challenge the company faced was the performance of recently deployed VoIP systems. Previously, VoIP had not been monitored, but performance issues mandated adding coverage. Entuity views and reports played a key role in proving that poor VoIP quality was due to a problem with the service provider, and not within their own network. Another "hidden gem" according to the administrator was the multiple branch perspective report. It is possible to take a snapshot of all the different remote branches and he knows instantly how each branch is performing. This allows operators to proactively monitor performance and gain insights into performance degradation over time. Yet another big benefit of the Entuity solution has been the ability to fine-tune incident handling in the event engine, via features allowing customization based on threshold and specific details/characteristics. This reduces the total volume of alerts and alarms, but more importantly allows the team to hone in on specific devices or connectivity that are behaving problematically.

EMA Perspective

As IT departments continue the long transformation process to virtual and hybrid infrastructures, one factor remains constant - operators need to know what is happening on their network, because without the network being up and performing well, nothing works. With the degree of complexity and rate of change rising continuously, rock solid network monitoring and management tools are essential. Network operators, engineers, and managers need all the help they can get and having a single up-to-date source of operational insights and intelligence is crucial to success. The key to operational efficiency means more automation and integrated management solutions, so that network managers and operators can focus on managing the network rather than managing the network management system. For technical, efficiency, and cost reasons, a unified approach makes overwhelming sense, and the Entuity Network Management system is a clear example of a feature rich, user-friendly unified solution that can grow gracefully with any organization while becoming a truly valuable asset in day-to-day operations.

About Entuity

Entuity is a leading independent provider of network management software for both large and small networks supporting enterprises worldwide. Entuity integrates all the requisite, contemporary network management functionality including automated, continual discovery of inventory and topology, configuration monitoring, advanced event management and root cause analysis, elemental performance, integrated application flow, and extensive reporting into a single operationally efficient solution.

For more information, please visit entuity.com or email info@entuity.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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