# Apparent Networks' AppCritical: Handling the New Management Realities for Application Services over Converged Networks

An ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) White Paper
Prepared for Apparent Networks

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IT Management Research, Industry Analysis, and Consulting

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## Introduction

As IT evolves towards a more significant business role, the need for more effective problem solving and diagnostics as they impact IT services has also become more and more paramount. This report looks at key industry trends as the market is evolving to support Networked Application Management (NAM)—both in terms of increased requirements for business alignment and new technologies.

This report then discusses Apparent Networks' AppCritical solution, which provides an easy, unrestricted deployment across any network while giving network operations staff and application owners an end-to-end, unbroken view of their networking infrastructure from the perspective of the applications that operate on it. AppCritical addresses all elements that comprise paths from applications to the end users that access them, including detailed visibility into the cloud of the service provider network for an end-to-end view of application performance over the network. AppCritical uniquely views network performance from the application perspective to help isolate problems between the network and the application, including data, voice and video traffic before they impact end-user performance.

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## Market Context

Businesses with IT elements that have no clear accountability, across the organization, for how their operations and actions impact the organization as a whole are competitively challenged. This issue is not limited to any particular company size or industry sector. It crosses all boundaries and has a huge impact on both economic trends and business competitiveness. Some of the key business impacts worth mentioning are:

- Commercial businesses have the option to begin leveraging all of their IT capabilities to best position themselves to enhance productivity, achieve new revenue targets, reach new buyers and partners, and even create new business practices by leveraging their IT infrastructure and its services. For those larger organizations, they may also transform into a more service provider-like use of their IT infrastructure—especially within industries such as healthcare and financial services, which are increasingly dependent on centralized IT expertise to support new modes of business operations.
- In the government ranks, government IT departments are regularly increasing their service offerings for their own Federal, state, and local agencies as well as for open public access to data sources that have traditionally been paper-based and closed to open access. Additionally, these same governmental agencies are opening up their efforts to share and exchange information across agency lines to reduce their individual process and service efforts.
- As managed services become increasingly more commodity driven, service providers (SPs) are regularly facing an uphill battle against steeper and broader competition from local, national, and worldwide forces. Cable companies and carriers are all vying for hearts and dollars from the same customer base—one that is increasingly demanding of the services they are receiving from SPs, and that will often jump ship

given the ever increasing options for moving their accounts elsewhere. SPs also have to become more varied and application centric in their service offerings, which in turn places extreme pressure on managing their networks more cohesively to fully support the delivery of application and other high level business services.

There are multiple factors impacting these trends and pressures. The first factor, which jumps to the forefront, is the growth in quantity and variety of new IT-based services. These services include Web Services, Web 2.0, Software as a Service (SaaS), Voice over Internet Protocol (VoIP) and IP Telephony, video and expanded use of wireless. The volume and heterogeneity of new services that depend increasingly on IP network transport as their delivery method is enough to put network managers in all sectors in a state of alert. Enterprise Management Associates (EMA) research shows that most enterprise, public sector and service provider organizations expect to provide a wide range of application services for their constituencies.

A second key factor involving new trends is centered on new and expanded application technologies. These include applications that are designed from the ground up, such as Web 2.0 technology, and Web Service applications based on Service Oriented Architectures (SOAs) that allow for business models and application design to be more tightly interwoven to better express the practices and procedures used by businesses. In recent EMA research, 40% of network planners expect the move to SOA-based Web Services to impact their performance requirements significantly in the near term (within one year).

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The negative impact to network infrastructure occurs when implementing these new application architectures as they become increasingly geographically dispersed. Network reliability pressures and network-aware application capabilities will force aggressive changes in networks and application management across the industry. The key emphasis to the future of network management will be in the areas of network and application performance and reliability. Network performance baselines and milestones are a *must have* for network administrators along with a thorough understanding of how reliable their network is at any given time.

The third influencing factor on today's IT market space is the need for organizations to reach ever broadening markets and customers. Organizations have found they need to expand to broader geographical markets, sometimes moving to a worldwide presence. To reach those broader markets and customer bases, organizations are finding it necessary to accelerate their business partnerships activities and to bolster their supply-chain dynamics, which are increasingly geographically dispersed. Of course, supporting a worldwide level of growth also impacts the network and adds size and complexity to most networks.

Organizations are expanding their use of branch offices to support their growth efforts. The range of branch office requirements can be seen below in a balanced sample of respondents that spans small and large businesses, public sector service providers and organizations. As Figure 1 shows, these organizations are primarily clustered at two extremes, 34.3% of those responding having more than 100 branch offices and 32.4%

having less than 10 branch offices. Collectively, the middle ground area represents an additional third, 28.5%, with those organizations having between 10 and 100 branch offices. This all suggests that organizations are highly dependent on dealing with multiple network spans and ever expanding geographical coverage.

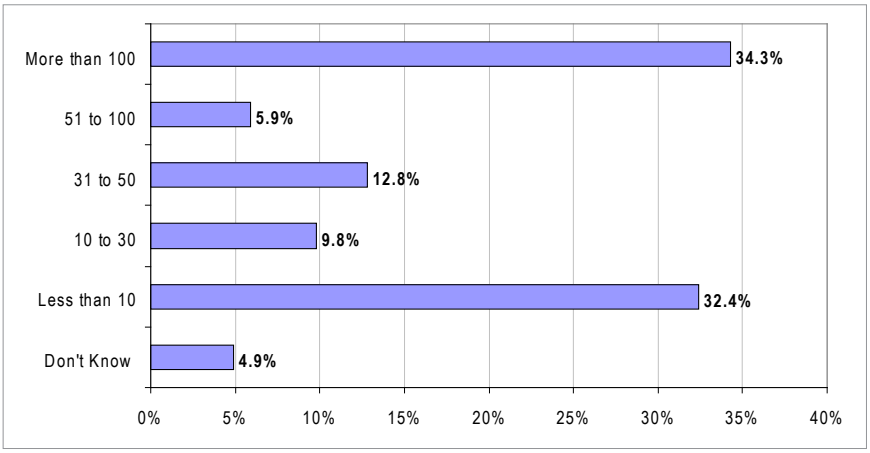


Figure 1: Branch offices are proliferating creating opportunities to reach new customers and work differently, but also places strain upon the network (EMA "Network Change and Configuration Management" August, 2007)

With the growth and the assimilation of new architectures comes a need for new processes and procedures to support the significant investments in dialogue, documentation and planning that go hand in hand with growth and expansion. Whenever an organization expands its operations into diverse geographical areas, it can expect to encounter some amount of cultural clash. The assimilation of diverse cultures typically occurs slowly and painfully within IT groups, just as it does within the broader societies that these IT organizations inhabit.

## Monitoring Service Performance in a Changing IT and Business Environment

Requirements for performance management systems capable of addressing both network and application complexities have emerged over the last five to ten years as one of the most dramatic bellwethers of change within IT. Some of the more salient factors are indicated below:

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- IT infrastructure is becoming more complex and heterogeneous. Research ranging from late-2006 and throughout 2007 has substantiated that network complexity is growing in parallel with application complexity as a growing number of transport technologies are often in play across a single organization, led not surprisingly by Ethernet and IP, followed by VPN and optical fiber. VLANs and wireless are presented as a strong second tier of technologies. Figure 2 illustrates which network transport technologies survey respondents already have incorporated into their network infrastructures. The graph shows how many of the 150 respondents were incorporating which type of transport technology into their infrastructure.

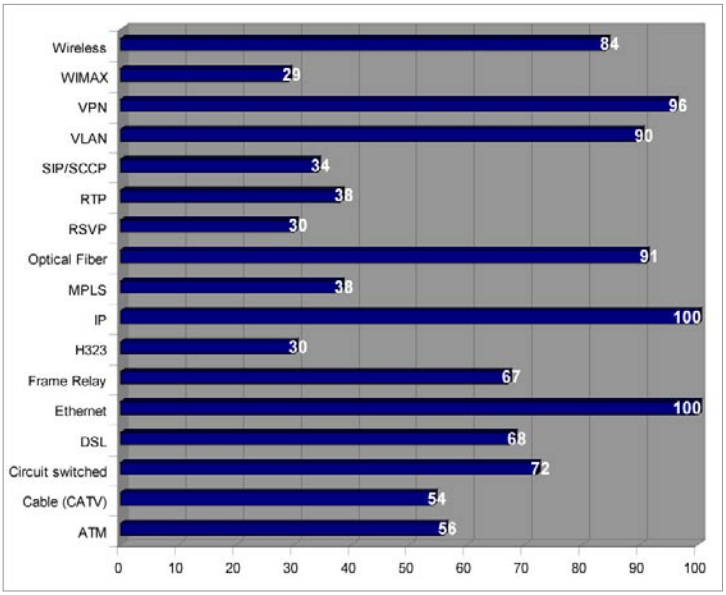


Figure 2: Growth in Infrastructure Complexity
(EMA data from "Network Change and Configuration Management" August 2007)

*Executive decision makers need to understand the complexities associated with their networks to optimally plan their competitive strategies.*

- Growth in the types of services is creating a greater density of volume over the network, coupled with denser number of devices to support these services. Added device density alone—which in many cases is orders-of-magnitude greater than just five or ten years ago—means greater challenges for managing the performance of applications over the network. Not only are understanding density increases at the network administration level important, but also at the upper echelons of business management. Executive decision makers need to understand the complexities associated with their networks to optimally plan their competitive strategies.

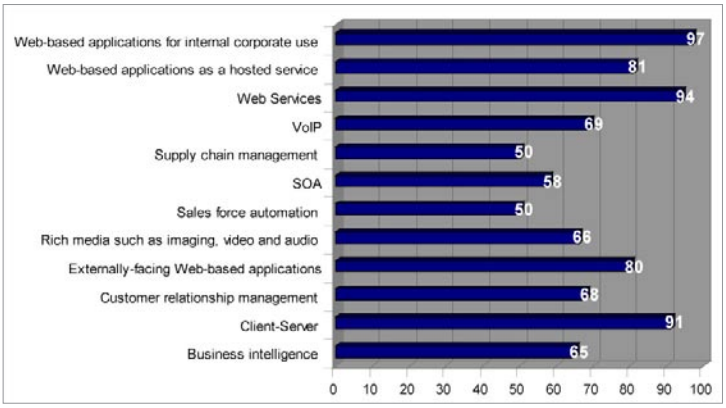


Figure 3: Growth in application complexity as it impacts service delivery over the network
(EMA research data, Q3, 2007 research)

- Greater frequencies of change to network device configuration, including the growing pervasiveness of patch updates, is a significant shift from ten years ago and a potentially disruptive factor in an already complex and challenging networked

universe. Once again, this added level of complexity—this time from change—places unique requirements for dynamic accountability in managing the performance of applications over the network.

- Security threats and compliance requirements combine to place added dependencies on managing service performance with accuracy and accountability.
- The rising interest in best practices and more effective cross-domain collaboration is yet another factor that is changing the game in managing networked application performance. There is a growing commitment to follow best practices around the industry, especially in areas that have heavily adopted the IT Infrastructure Library (ITIL). ITIL and other best practice initiatives have helped many IT organizations to bridge political and cultural divides by providing a departure point for common process models and common terminologies for communicating common problems. ITIL has also focused squarely on customer and business alignment, as well as on managing change effectively, as central to almost all IT concerns. ITIL V3's notion of Service Level Management (SLM) is new (introduced in May 2007), and will put new demands on IT. But it will help IT to move one step closer in support of a more robust, service-provider like model in support of business-to-IT interdependencies.

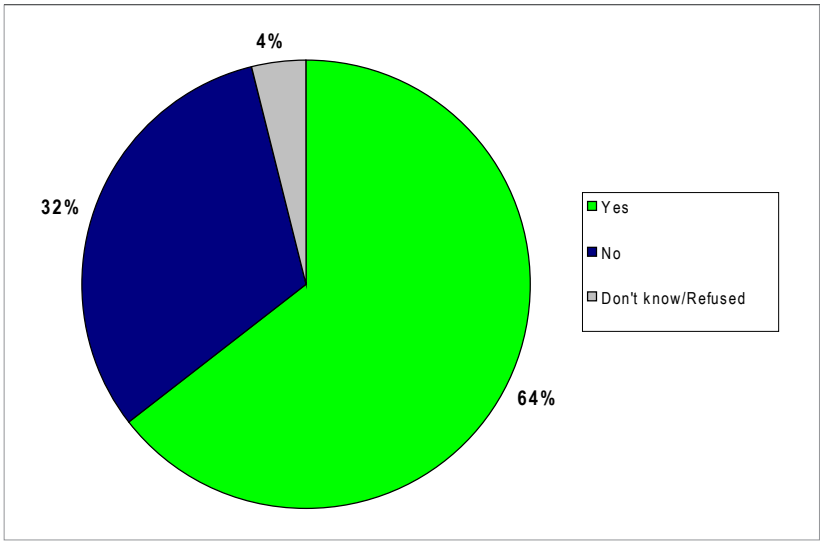


Figure 4: Organizational efforts to support better collaboration between the NOC and application managers show a striking commitment to improved collaboration across sectors (Managing Application Performance over the Network, EMA, Q4, 2006)

*By almost a two-to-one margin, enterprise customers regularly have to deal with end-user notification issues that are in turn causing help desk calls to escalate or call durations to extend beyond acceptable levels.*

- Nonetheless, many processes remain in the Stone Age, with largely reactive ways of working and responding to problems. By almost a two-to-one margin, enterprise customers regularly have to deal with end-user notification issues that are in turn causing help desk calls to escalate or call durations to extend beyond acceptable levels. While regular examination of server and device log files has long been a means of locating problematic issues, tools for quick and efficient log file manipulation are typically elusive for most enterprise customers.

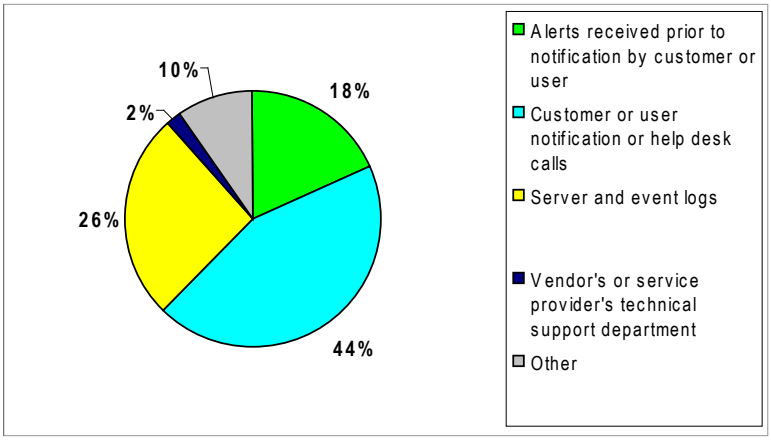


Figure 5: Process issues from problem diagnostics reveal a mistrust of monitoring tools and a reactive way of working (taken from EMA research data)

*The lack of effective end-to-end diagnostic capabilities is the number one network management issue facing half of today's enterprise customers.*

- Unmet needs are also striking, as solutions are often either too complex to use, or too narrow in scope to be useful. The lack of effective end-to-end diagnostic capabilities is the number one network management issue facing half of today's enterprise customers. Being able to prepare and operate proactively to prevent failures overall and reduce the impact of configuration related problems is a very close second. Today's network management tools must allow the enterprise customer to move into the preventative driver's seat while encouraging faith and trust in the tools themselves so that customers can begin to focus on effective operations rather than the traditional fire drill that has been standard operating procedure around the industry for far too long.

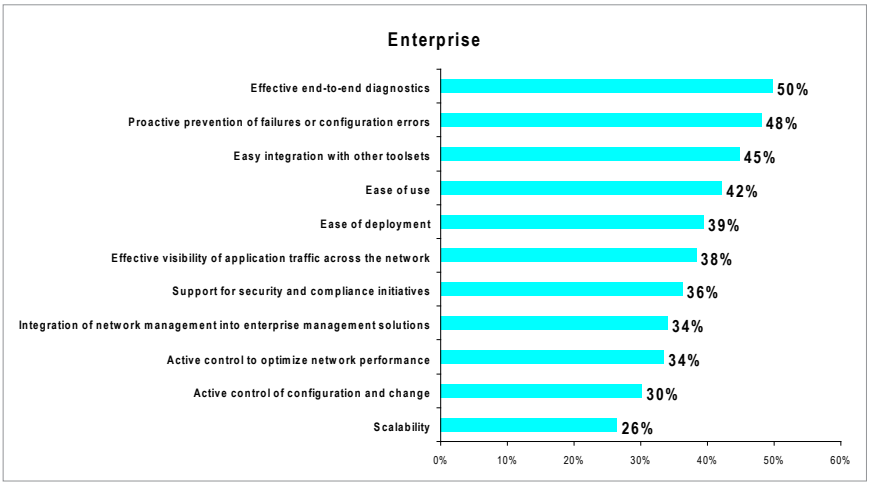


Figure 6: Unmet needs in network management (EMA data from summer, 2007)

## Growth in Networked Application Management Technologies and QoE

IT applications are becoming the heart of many businesses and central to their competitiveness. In addition, networked applications in all their flavors are reshaping how and where enterprises across virtually all verticals, government agencies, and even some service providers are doing business. Given this challenging situation, one that is placing more attention on network operations, many networking planners, engineers, managers and architects are looking to leverage more holistic and cohesive views of network-to-application performance, including Quality of Experience (QoE).

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The network is a part of the larger delivery system for QoE in which the only true metrics that matter ultimately reside within the flesh-and-blood experience of IT service consumers. Studies have shown that end users care more about degraded response times than intermittent availability issues. This has more to do with human psychology than network engineering. End users typically believe that a complete failure in availability will soon be remedied, whereas they feel isolated and unsure that any action will be taken if their response time is degraded. Moreover, degraded response times tend to persist far longer than most availability issues. So their perception really is reality in this case.

Yet response time can also be problematic in other ways. Average response times over a day, week or month may not be very meaningful as isolated data points. But collectively inconsistent response time metrics, even with faster overall averages, can be far more troublesome to rhythms in working and communicating than somewhat slower but more consistent service delivery. The dramatic fluctuations that alienate users can occur rapidly and intermittently. But with the right technology, these fluctuations may help to identify alienated users and provide insight on where the problems lie.

While effective response time metrics have rightly defined QoE from a purely technical perspective, there are a number of other concerns that should be at least highlighted here. These include, of course, basic availability—which itself can become complex when calculated as a sum of infrastructure components—as well as other metrics such as levels of security, appropriate accountability and costs. Other less quantitative but still important metrics, such as user empowerment in terms of service choice and flexibility, effective performance across tethered and mobile environments, and other open-ended issues reinforce the need for dialogue to understand the thinking and perceptions of the user base.

## Apparent Networks

Apparent Networks develops technologies and solutions that are focused on solving end-user experience- related problems, impacts on network responsiveness and the quality of operations, and the availability of business-critical applications. Apparent's solution provides awareness into the most critical network characteristics needed by network and applications teams to diagnose and address problems with today's burgeoning array of business-critical applications. Its products have been successfully deployed into large en-

terprises, managed service providers (MSPs) and tier-one technology vendors who all are looking to enhance their end-user quality of experience.

Apparent Networks is the creator of AppCritical, its software-based network management application that provides a unique, comprehensive, real-time view into network functionality and its operational paths. AppCritical utilizes distinctive patent-protected technology for identifying and examining network behavior through synthetic application traffic, on-going non-intrusive monitoring and active diagnostics. AppCritical is principally used to guarantee superior network performance for business-critical network-based applications deployed across converged IP networks.

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To date, Apparent Networks has over 135 major customers constituting over 17,000 end users spanning large enterprise and MSP environments. Some of Apparent Network's more significant customers include ACS, Boeing, Nortel, Toshiba, 3Com, Cisco, Fujitsu, Siemens, IBM, Symantec, Bell, Hewlett-Packard, Network Appliance, TELUS and Electronic Arts. This lends credence to the acceptance of Apparent Networks' approach to solving the age old problem of managing network environments, but in a new way. It is the new problem of managing today's networks and applications with new demands that the age-old solutions and approaches simply cannot keep up with, unless they have the necessary tools and methodologies to properly address those needs.

Apparent Networks targeted its initial sales of AppCritical into the enterprise market and then expanded their market to include vendors of network-dependent applications. Many of these application vendors and MSPs initially used AppCritical to help optimize their networks and those of their customers to ensure that applications were running efficiently over the networks, and to reduce quality-related issues from the customer's point of view. Customers later expanded their use of AppCritical to regularly monitor, track, and diagnose application and service level issues that occur during the course of regular operations. This change in usage goes to show AppCritical' flexibility and versatility in taking on whatever the customer's environment has to throw at it.

## A Focus on Real-Time Monitoring with Active Diagnostics

Unlike traditional monitoring systems, AppCritical takes network management out of a device-centric auditing view and introduces an application path perspective that provides engineers with a course of action rather than just device status. Its holistic approach links network performance to the quality of the user experience for both data and voice applications. Functioning in real-time, its testing capabilities rapidly evaluate thousands of live paths for user-defined threshold violations. Without the involvement of the network engineer, AppCritical escalates testing until it identifies and diagnoses a problem and its location, or else dismisses it. This is critical in today's complex heterogeneous environments so network operations can focus on the source of performance problems and not sort through the countless, no-value alerts of traditional device-centric approaches.

AppCritical is as easy and convenient to install and set up as it is to use. It can be deployed within a few hours and it's typically ready to begin using in less than half a day.

AppCritical doesn't require the licensing, distribution or installation of any form of remote software agent or ownership of any network devices. Install it, deploy it, and you're done. Immediately thereafter, data is automatically collected from strategic points around the network. There's no more need to license and install software agents along key points of the infrastructure.

## Some Distinctive Features:

The following list of distinctive features serves to round out AppCritical's design point and advantages:

- Active Path Assessment – AppCritical's core, patented technologies provide precision packet-handling capabilities. It automatically transmits small, precisely timed packets through network paths using ICMP or UDP. As these small, synthetic packets traverse the network, they gain unique signatures for analysis by a statistical engine as their timing is distorted by delays, restrictions and limitations, all of which yield distinctive markers carried back by the packets. AppCritical analyzes these markers, creating a virtual image of the present state of network paths, and whether or not they meet requirements of network-dependent applications.
- Sequencers – Sequencers are small pieces of software placed at strategic network locations like data centers where they create packets and use them to conduct network path tests and collect real-time network performance data. Sequencer analysis requires no agents and no remotely deployable software on the end points to be measured.
- Network Intelligence System (NIS) – The NIS manages the Sequencers and controls all path analysis. It also analyzes data collected from Sequencers with identification, correlation and remediation analysis engines, and then presents results to the Operations Console. All data and analysis is stored in a relational database for historical reporting and auditing.
- Visibility into the service provider network – AppCritical is one of the very few network management solutions that provide visibility into the cloud of the service provider network, so enterprises and MSPs can monitor their entire application pathways regardless of who owns or controls the network devices that comprise those paths.
- Real-time, end-to-end monitoring – AppCritical can continuously monitor the capacity and quality of thousands of network paths in real time. AppCritical does not use traditional approaches like SNMP and RMON, which can be too cumbersome and restrictive to provide true real-time information in dynamic IP environments.

*By helping to eliminate the finger pointing and frustration between network operations and application owners, AppCritical can also strengthen the relationship between these groups.*

By helping to eliminate the finger pointing and frustration between network operations and application owners, AppCritical can also strengthen the relationship between these groups. With a common perspective of application and network performance, IT and business unit managers can collaborate more effectively on new business initiatives instead of fighting fires—and each other. IT service customers can sign up for higher service quality levels with confidence, and contribute better results to the corporation.

## EMA Perspective

Apparent Networks' AppCritical is the outgrowth of a well-tested design point that has the potential to reduce finger pointing and the time needed to isolate problems with service delivery across large, complex networks. It is both easy to deploy and scalable. Without a dependency on traditional network management protocols to perform its collection and monitoring operations, AppCritical can seek out relevant performance information on any network segment and provide status as to how data is operating across the network.

*AppCritical is able to combine functions more simply and cost effectively, and without administrative overhead while many of the large network platform vendors are still struggling with both of those aspects.*

AppCritical is able to combine functions more simply and cost effectively, and without administrative overhead, while many of the large network platform vendors are still struggling with both of those aspects. To attain product simplicity and ease of use and to provide a fast return on investment is a challenge for any vendor. Apparent Networks has nimbly managed to achieve all three objectives with its AppCritical product suite.

However, there is some room for growth. Apparent Networks has been candid in recognizing that effective visualization and reporting to support its broader, more enterprise-wide mission has been a weak spot, and EMA looks forward to seeing the fruits of its current focus around GUI customization, visualization and reporting. Another next step for Apparent is to make its application monitoring less generic and more targeted at individual applications. Currently AppCritical creates and analyzes synthetic packets that reflect actual application performance without having the inherent smarts to know the precise details of a specific application. The next evolutionary jump in AppCritical's advancement could be to allow it to support more detailed, specific application-aware insights over time.

And finally a third area where AppCritical could be improved is in the area of integration with third-party vendors and their product suites to offer a more complementary relationship. With AppCritical's ability to collect and process network data on practically everything imaginable, it only makes sense to expand the product's horizons and expand the product's integration and interoperability with other complementary network management products typically found in those same customer environments. By extending its partnerships and real-world integrations, Apparent Networks can provide a better value option for customers to easily say *yes* to purchase its product suite for use with existing network tools.

Still, AppCritical is one of the strongest offerings in IT infrastructure management—across any discipline and across the entire enterprise—that EMA has seen in a long time. This is a solid product with a firm market position, and the company has a clear and well thought out roadmap for enhancing its flagship product for a long time to come.

## About Apparent Networks

Apparent Networks develops and markets software that provides a unique approach to managing the performance of network-dependent applications. The Company's AppCritical solution measures and diagnoses live, converged networks with continuous real-time monitoring. It provides unbroken, end-to-end visibility into the critical performance characteristics of network resources needed for voice, video and data applications. AppCritical has been successfully deployed by large enterprises, managed service providers and tier-one technology vendors to assure end-user quality of experience. Customers include 3Com, Affiliated Computer Services, Boeing, Electronic Arts, Fujitsu, Hewlett-Packard, IBM, Network Appliance, Nortel, Polycom, Siemens, Symantec, TELUS, and Toshiba. For more information, visit www.apparentnetworks.com.

## About Enterprise Management Associates, Inc.

Founded in 1996, Enterprise Management Associates (EMA) is a leading industry analyst and consulting firm dedicated to the IT management market. The firm provides IT vendors and enterprise IT professionals with objective insight into the real-world business value of long-established and emerging technologies, ranging from security, storage and IT Service Management (ITSM) to the Configuration Management Database (CMDB), virtualization and service-oriented architecture (SOA). Even with its rapid growth, EMA has never lost sight of the client, and continues to offer personalized support and convenient access to its analysts. For more information on the firm's extensive library of IT management research, free online IT Management Solutions Center and IT consulting offerings, visit www.enterprisemanagement.com.

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