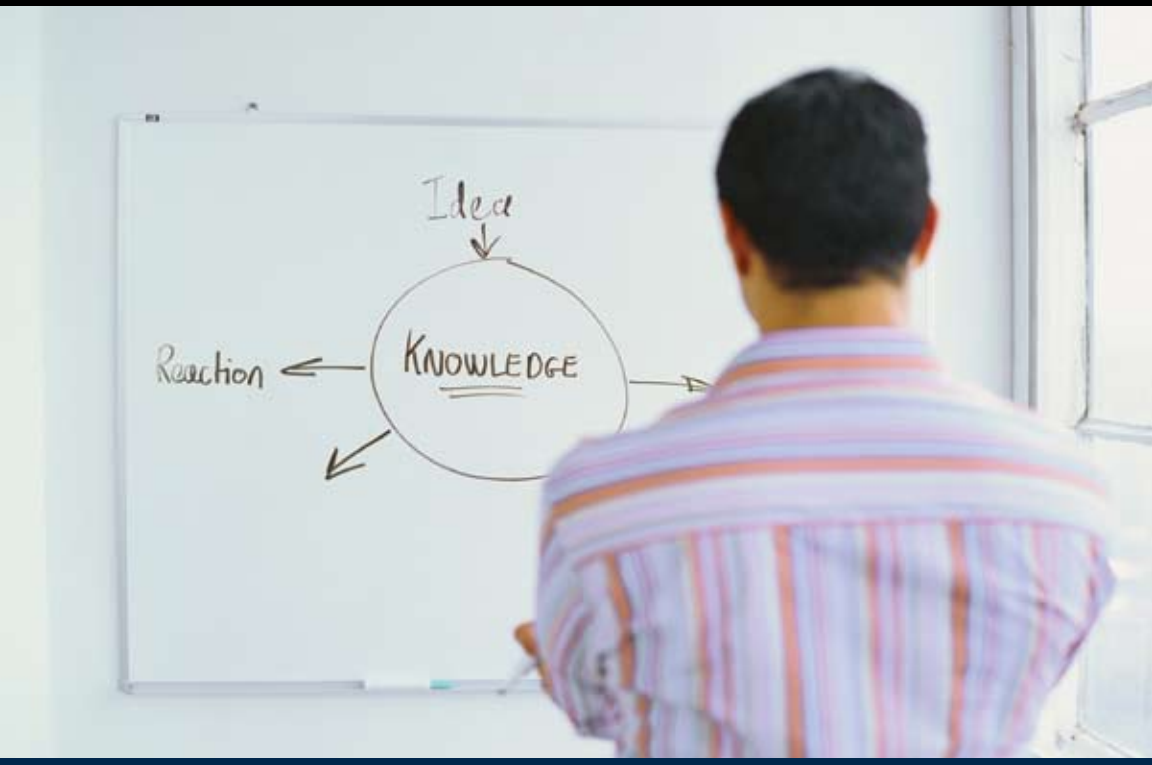
A NET TRUTH REPORT

by Jim Metzler

SURVIVING THE IT TRANSFORMATION:

CRITICAL STRATEGIES EVERY NETWORK MANAGER NEEDS



NETSCOUT®

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Always a demanding profession, network and application management is growing ever more important as application performance becomes one of Information Technology's central concerns. The reason for this shift is easy to discern: senior business managers don't particularly value the network itself, which they view as just another utility, like electricity. These managers do value the applications that they use to run their business. Thus, when reviewing the IT budget in terms of business relevance, application performance—which governs the ability of employees to get their jobs done—is a critical metric.

Cognizant of this fact, leading edge IT organizations are transforming how they define their role. In particular, until recently it was common to have an IT organization be comprised of an application development function and an infrastructure function. Now leading edge IT organizations are evolving to where they are comprised of an application development function and an application delivery function. This is not a subtle transformation. Whereas the typical IT infrastructure function was comprised of myriad technologies that were managed as individual stove-pipes based on metrics that were relevant for that particular technology, the application delivery function is managed holistically with metrics that are intended to ensure acceptable application performance.

Fortunately, the management tools available to IT professionals are improving, making much more information available in a far more timely fashion and hence easing the burden of the transformation. Unfortunately, it's hard to keep up with all the new tools and capabilities. Those who don't keep up run the risk of seeing their career choices dwindle, while IT managers who adapt to and properly leverage these new offerings will find themselves increasingly valued as part of the business team. This white paper examines the changing landscape of network and application management and the impact of the new tools and information sources that are available to you, and suggests some steps you can take to keep your career going strong.

CHAPTER 1

CHANGING LANDSCAPE AHEAD

IN THE PAST, MOST IT ORGANIZATIONS HAD LITTLE FOCUS ON APPLICATION PERFORMANCE MANAGEMENT. INSTEAD, THEY CONCENTRATED MOSTLY ON SUPPLYING SUFFICIENT BANDWIDTH ON THE ASSUMPTION THAT THE LACK OF BANDWIDTH WAS THE MAJOR DETERMINANT TO APPLICATION PERFORMANCE. IN PART, THIS FOCUS WAS FORCED ON THEM BY THE LIMITATIONS OF THEIR MANAGEMENT TOOLS. IN PARTICULAR, THEY COULDN'T MANAGE WHAT THEY COULDN'T MEASURE, AND BANDWIDTH IS BOTH EASY TO MONITOR AND REQUIRES RELATIVELY FEW MANAGEMENT TOUCHPOINTS (LOCATIONS WHERE DATA IS OBTAINED AND/OR CONTROL EXERCISED).

But in order to support the transformation to an application delivery function, that strategy (actually, that lack of strategy) no longer suffices, due in part to a number of changes that makes bandwidth somewhat less of a critical factor relative to application performance. These changes include the decentralization of employees, the consolidation of IT resources, the emergence of more complex traffic patterns, the growing impact of the WAN due to the adoption of Service-Oriented Architectures (SOA) and Web services. All of these require measurements that are harder to obtain (e.g., actual application response time) and that are needed from more locations. And, as shown in Figure 1, the importance of managing application performance is growing.

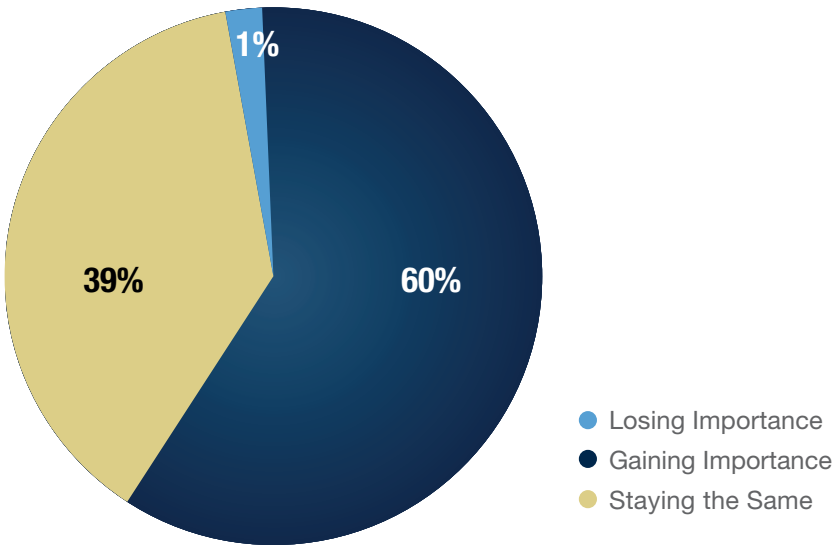

Figure 1: In a recent survey, 60% of the survey respondents said that managing application performance was gaining in importance in their organization.[1]

[1] *Eliminating the Roadblocks To Effectively Managing Application Performance, Jim Metzler, BCR, January 2007*

CHAPTER 2

CONSIDERATIONS

FOR CHOOSING THE RIGHT PATH

THE TRANSFORMATION FROM AN IT INFRASTRUCTURE FUNCTION TO AN APPLICATION DELIVERY FUNCTION IS CHALLENGING IN LARGE PART BECAUSE ENSURING ACCEPTABLE APPLICATION PERFORMANCE CUTS ACROSS MULTIPLE TECHNOLOGICAL AND ORGANIZATIONAL BOUNDARIES. THE PROBLEM OF FINGER-POINTING AMONG VARIOUS TEAMS (APPLICATION, DATABASE, STORAGE, NETWORK, ETC.), AND ITS IMPACT ON MEAN TIME TO RESTORE (MTTR), IS TOO WELL KNOWN TO REQUIRE EXPLANATION HERE, EXCEPT TO NOTE THAT IT'S GETTING WORSE AS THE PRESSURE TO DELIVER ADEQUATE AND RELIABLE APPLICATION PERFORMANCE INCREASES.[2]

This pressure is also giving rise to a set of urgent challenges that IT professionals must deal with, both in their day-to-day activities and in their career planning. These include:

- *The demand for tighter linkage between the IT budget and business performance;*
- *The desire for a much richer view of IT service level performance;*
- *The need for more control over the complex mix of applications and the infrastructure that supports them;*
- *Dealing with the fact that today, it's the end user that most often first notices application performance degradation.*

[2]*For a brief discussion of the impact of finger pointing on the MTTR, please see When Apps Are Slow, Net Managers Are Wrong Until Proven Right, Network World, 7/03/07*

THE IT BUDGET AND BUSINESS PERFORMANCE—As noted, the senior business managers who either control or at least heavily influence the IT budget don't really care about the network infrastructure. In fact, technology in general is not of interest to these senior managers. When they think about IT, what they care about are the applications that they use to run their business units. To them, the performance of these applications is the primary justification for IT budget expenditures. Thus, as part of the transformation to an application delivery function, IT organizations must ensure that all management measurements relate to application performance in a way that senior business managers can understand.

IT SERVICE LEVELS—The challenge of measuring IT service levels is to understand how all the parts of the application delivery function support acceptable application performance. You don't want to try to explain jitter to a senior business manager, but you certainly want to be able to measure the impact of jitter when it causes a problem with a business application. What's required is a much richer view of the interactions and trade-offs between the performance of an application and various parts of the application delivery function. This includes the interplay between the performance of the application and factors such as bandwidth, latency, application design, and IT consolidation. Part of the goal is to position the IT organization to discover when application performance begins to degrade and to also be able to identify the likely cause of the degradation.

A COMPLEX MIX OF APPLICATIONS—The proliferation of new applications is making performance management more complex. We already mentioned the growth of SOAs and Web services as one aspect of this; VoIP and similar real-time or collaborative applications are another, and all of these pose particular challenges to network and application management. In addition, one of the side effects of the increasing distribution of the enterprise is an inevitable lessening of control over the applications that users place onto the network. So-called recreational applications, such as Internet radio, are examples of such applications that, while not malicious in intent, can nonetheless consume the bandwidth needed by business applications. In addition, the malicious effects of applications such as peer-to-peer file sharing (in terms of activity such as inappropriate content or copyright infringement), not to mention malware or spyware, can be even more detrimental. Compounding the problem is the penchant of these applications to use port 80 to evade detection and get through firewalls.[3]

END-USERS: JUDGE AND JURY—Perhaps the most pressing challenge for IT organizations as they transform the infrastructure function to become the application delivery function is that in the majority of businesses, application performance degradation is first noticed by end-users rather than by the NOC or other operational centers. This dooms IT to a predominantly reactive stance, which subtracts from the time available to perform sophisticated root cause analysis or deliver new capabilities that can help the company to become more competitive. Equally important is the fact that it certainly doesn't help one's career to be getting phone calls from the CIO that question the value of the investments that have been made in network and application management tools given that the first line of detection is the end users.

[3]For a brief discussion of the impact of the issues associated with port 80, please see How Do You Scan for What's on Port 80? Network World, September 18, 2007

CHAPTER 3

NEW CAPABILITIES

TO HELP YOU NAVIGATE

GIVEN THESE CHALLENGES, IT'S NO SURPRISE THAT NETWORK AND APPLICATION MANAGEMENT VENDORS ARE REALIZING THE NEED TO ENHANCE THEIR TRADITIONAL FOCUS ON FACTORS SUCH AS NETWORK AVAILABILITY AND BANDWIDTH UTILIZATION WITH A NEW FOCUS ON APPLICATION PERFORMANCE. THEY'RE ALSO RESPONDING TO THE CHANGING ROLE OF THE NETWORK ADMINISTRATOR, WHOSE FUNCTIONAL SCOPE IS EXPANDING INTO AREAS SUCH AS SECURITY, SYSTEMS MANAGEMENT, AND COMPLIANCE. AS A RESULT, NEW TOOLS AND MANAGEMENT CAPABILITIES ARE EMERGING AND THESE TOOLS AND CAPABILITIES ARE OF BENEFIT TO BOTH YOUR COMPANY AND TO YOUR CAREER.

These new tools provide a lot more information. High-speed data capture and intelligent data storage give you a more complete view of network and application performance over a wider range of time periods, from a real-time to a long-term historical view. The growing complexity that is associated with application delivery means that you need this complete view in order to be able to manage more intelligently. In addition, the available data is finer-grained and more highly correlated, giving you deeper insight into application complexities and the interplay between the network and the various technologies that support application delivery.

Some of the capabilities and aspects of these tools that you should be aware of as you plan your next management investments include *real-time enough* information; the ability to zero in on application performance rather than depending on a bottom-up approach, alarms and alerts based on real network behavior, better historical data, greater correlation of information, and better application discovery.

REAL-TIME ENOUGH INFORMATION—Information is now even more *real-time enough*. Not only is more information provided over shorter intervals, the information provided is much richer and provides much more intelligence about the underlying network and application performance. Past performance is much easier to interpret, current status information is immediately available and much more precise, and future performance can be predicted with much better visibility.

ZEROING IN ON PERFORMANCE—When they defined their role as part of the infrastructure, most IT managers estimated application performance using a bottom-up approach that focused on the devices and factors that might affect application performance. But too often, all the lights would be green and users would still be complaining. In order to support the transformation to an application delivery function, a new generation of network and application management solutions enables you to move away from this bottom-up approach and focus on what matters: application performance. This performance data, when integrated with the familiar device-level data, gives you a top-to-bottom, end-to-end view of what's going on—increasing your chance of detecting problems before the end-users do.

ALARMS FROM REAL NETWORK BEHAVIOR—One of the most irritating problems that network management has been dealing with for years is how to set performance alarms. Historically, IT managers had to choose between setting high thresholds and missing too many events that impacted users, or setting low thresholds and running themselves ragged keeping up with a flood of insignificant events. A new breed of solutions, however, models normal network behavior and correlates multiple metrics against this baseline. As a result, these solutions alert you to meaningful events and avoid overwhelming you with false alarms.

BETTER HISTORICAL DATA—At the same time that the new tools supply more real-time information, they've also become better at storing the masses of data that gets generated and making it available long term for forensics and planning. Having a rich set of historical data makes past performance much easier to interpret and gives you a very detailed view of how the network reacts to change. This enables much improved troubleshooting, capacity planning, budgeting, and network design, along with providing better insight as to what to expect when you add new applications or sites.

GREATER CORRELATION AND AUTOMATED ANALYTICS—As vendors add more and more capabilities to their tools, they are also offering more ways to correlate that data and automate finding the root cause of performance degradation. This delivers three major benefits:

1. *The ability to detect performance degradation before the user does;*
2. *The ability to quickly identify the likely causes of the problem; and therefore*
3. *The ability to fix it before it impacts end-user productivity.*

The bottom line is that these new capabilities can greatly reduce the MTTR associated with application performance problems, which has historically been significantly longer than the MTTR associated with network availability.

BETTER APPLICATION DISCOVERY—As discussed, most likely there are applications running on your network that don't belong there, and which can impact overall network and application performance. You can't do effective traffic management, no matter how good your tools are in other respects, unless you know what's running on the network. Market research indicates that over a third of IT organizations do not actively monitor their network for abuse such as online gambling.[4] The encouraging news is that the tools are finally available to identify these applications. However, it's also important to gain a high-level understanding of how key applications work and how they're being used. For instance, telling the VP of Sales that usage of the order entry system is up 20% over last year is the kind of knowledge that translates into increased credibility and more influence for network managers. It is also the kind of information available to IT organizations that focus on application delivery holistically and not just on stove-piped technologies.

[4] *Network Misuse Revisited, Jim Metzler, August 2006*

CHAPTER 4

NEXT STEPS
FOR IT PROFESSIONALS

SO WHAT STEPS SHOULD YOU TAKE TO ADJUST TO THIS TRANSFORMATION? KEEP IN MIND THAT APPLICATION PERFORMANCE MANAGEMENT HAS TO BECOME A KEY DISCIPLINE, NOT AN AD HOC PART OF YOUR JOB. AND PART OF ANY DISCIPLINE IS THE REALIZATION THAT LEARNING NEVER STOPS—YOU'LL NO SOONER HAVE GOTTEN A HANDLE ON THE DEMANDS OF AN SOA AND WEB SERVICES WHEN WEB 2.0 WILL COME ALONG AND CREATE AN ENTIRELY NEW SET OF DEMANDS.

Three things should be uppermost in your mind. First, the bottom line for an IT professional is credibility. Do your managers perceive you as one who delivers what you promise, so that they can trust that your budget requests will really serve business needs? Second, your credibility depends on effective problem solving, which requires the right tools applied the right way. And, third, as discussed earlier, you can improve your value to the business by knowing more about key applications and their patterns of usage and performance.

Some of the steps you must take, in light of the brief discussions above, include instrumenting the network so you get detailed information in a timely fashion, implementing automated analytics wherever possible, detecting problems before the users do, learning how to market your skills, and, most of all, evolving in step with the business and the technology.

- **INSTRUMENTING THE NETWORK**—As mentioned, vendors are delivering more highly functional tools. Your challenge is to find the right combination for your needs. Budgeting for network and application management involves tradeoffs, even with the most complete management suites. Depth vs. breadth of coverage, granularity of data vs. long-term storage and similar tradeoffs must influence your deliberation. First, decide what applications are most important to your organization and then, based on their characteristics, decide what information you need to effectively manage these applications.

- **AUTOMATED ANALYTICS**—To the largest extent possible, let your tools do the analysis. Your long-term value lies not in managing minute details but in using the skills and experience that no machine can match. Start by automating the routine aspects of management, and then focus your attention on performing sophisticated root-cause analysis for issues that impact the availability and performance of your network and your company's key applications. The task of automation isn't effortless, and no tool can substitute for the human judgment needed to determine which decisions should be automated, and which should not. You still have to understand the network and make the right choices up front, but a well implemented automation strategy can make a huge difference in terms of minimizing the number of daily fire drills and enabling network managers to continually add value.

- **DETECT IT BEFORE THE USER DOES**—This is a critical task, and it's why you must spend as much time as necessary to instrument and automate your network properly. Without proper marketing, the CIO won't remember all the times you caught a problem before the users were impacted. However, the CIO will painfully remember the times you didn't. Your goal is to minimize the latter, and good historical information from your tools helps you to achieve this goal.

- **MARKET YOUR VALUE**—One of the ironies of IT management is that the better you are at it, the less you're appreciated. Like the CIO, business managers only remember what you didn't do right. If you make all the problems go away, they're likely to conclude they don't need you. The answer, of course, is not to throw in a few emergencies from time to time to remind them of your value. Instead, network managers should learn to market their value and publicize their business value. One way to market your value is to establish a relationship with the lines of business and work with them to develop an agreed-upon cost of downtime. Then, when you quantify the improvements in uptime and mean time to resolution, your value is easily demonstrated. Another way to market your value is to publish a newsletter to let the rest of the business know what you're doing, and why network management is important. Put the issues that are important to you in a business perspective so line of business managers can understand them and become your ally.

CHAPTER 5

CHOOSE THE RIGHT PATH

MANAGING APPLICATION PERFORMANCE IS BECOMING INCREASINGLY IMPORTANT TO MOST ORGANIZATIONS AND, AS A RESULT, LEADING EDGE IT ORGANIZATIONS ARE TRANSFORMING THEIR INFRASTRUCTURE FUNCTION INTO AN APPLICATION DELIVERY FUNCTION. PART OF THE IMPACT OF THIS TRANSFORMATION ON YOU GOING FORWARD IS THAT YOUR CAREER DOES NOT LIE IN SCRAMBLING TO FIX THE PROBLEM OF THE DAY AND RESPONDING TO APPLICATION DEGRADATION ONLY ONCE THE ISSUE HAS BEEN IDENTIFIED BY END USERS. IN ORDER TO ADD THE GREATEST VALUE TO YOUR COMPANY AND TO SIMULTANEOUSLY ADVANCE YOUR CAREER, YOU NEED TO UNDERSTAND MORE ABOUT YOUR ORGANIZATION'S KEY BUSINESS APPLICATIONS, INCLUDING RESPONSE TIMES AND USAGE PATTERNS, AND FIND WAYS OF ENSURING THAT THE NETWORK DELIVERS THE RIGHT LEVEL OF PERFORMANCE GIVEN THE BUSINESS REQUIREMENTS. YOU NEED TO SEE ISSUES BEFORE THEY IMPACT USERS, BE ABLE TO EFFECTIVELY TROUBLESHOOT PROBLEMS, AND PLAN FOR IMPROVEMENTS IN NETWORK OPERATIONS. IN ORDER TO ACCOMPLISH THESE GOALS, IT ORGANIZATIONS MUST INTELLIGENTLY INSTRUMENT THEIR NETWORKS AND MUST HAVE TOOLS THAT CAN ANALYZE A GROWING VOLUME OF MANAGEMENT DATA.

Technology alone, however, is not sufficient. In order to be successful going forward, network managers also must do a better job of marketing the value that they provide. This includes developing relationships with the line of business managers. It also includes making sure that these managers are continually aware of how network management helps them to reach their goals.

JIM METZLER

Ashton, Metzler & Associates, President

Dr. Jim Metzler is widely recognized as an authority on both network technology and its business applications. Over the course of his 28 years in IT, Jim has assisted vendors in refining their product and service strategies, and helped enterprises evolve their network infrastructure. Jim has worked in many positions within the IT industry. This includes a compiler writer for a branch of the US intelligence community, creating software tools to design customer networks for a major IXC; serving as an Engineering Manager for high-speed data services for a major Telco; managing networks at two Fortune 500 companies; directing and performing market research at a major industry analyst firm; and running a consulting firm. Jim holds a Ph.D. in Numerical Analysis from Boston University.

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NetScout Systems, Inc. (NASDAQ: NTCT) has been the industry pacesetter for advanced network and service assurance solutions for over twenty years. NetScout's breakthrough technology solutions provide trusted, comprehensive real-time and historical performance intelligence, including advanced early warnings and rapid, definitive problem analysis. These capabilities are vital to IT operators who are accountable for reducing the Mean Time To Restore services. The world's largest enterprises, government agencies, and service providers depend upon NetScout's nGenius and Sniffer (formerly Network General) brands to assure service levels to their users by reducing or preventing disruptions and degradations. More information about NetScout is available at www.netscout.com.