NETWORK PERFORMANCE

AT THE HEART OF THE E-BUSINESS ECONOMY

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ENTERPRISE MANAGEMENT
ASSOCIATES

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Introduction

Since e-business services are by definition networked services, managing network performance is more critical than ever. Throwing bandwidth at the problem won't deliver insight or safety from dramatic changes in localized traffic usage, especially as voice and video applications become more prevalent. Bandwidth is blind; it cannot proactively shed insight into the dynamics of any service.

The e-business economy is driving change both in IT and business practices. Most dramatic is their mutual dependencies. Failures in the performance of the networked infrastructure can cost billions of dollars once the full set of interdependencies of impact is understood.

Some of the other changes include an accelerated time for decision making, a compression of geographical presence into "cyberspace," and the requirements for applications, systems and network performance management to evolve beyond islands of discipline towards more integrated "infrastructure" management. However, the current environment is one of rapid innovation with often more desperate than effective measures for control.

Network performance solutions that span protocols and device types, and that leverage the network for inclusive insight into systems, application and user behavior, will be of tremendous value as both enterprises and service providers seek more sophisticated service guarantees. Selecting strong network performance solutions, however, requires a recognition of the need to judiciously match complementary solutions, as well as a broader map of the performance tradeoffs across the e-business food chain.

The Network-centricity of E-business Infrastructure

The Internet and e-business is a very different model from a network management perspective than traditional data centers with peripheral desktops or even peripheral LANs. E-business must transpire over geographically dispersed communities in which back-end Intranet support systems and WAN dependencies multiply the possibility of failure. This can hardly be overstated and is often overlooked from the IT perspective. With e-commerce, buyers can be interest groups that exist, effectively, only on the Internet. Moreover, businesses will

depend on e-services from a variety of marketing and content providers that are themselves geographically dispersed. All of these things live, in reality, "*on the network*." E-commerce and e-business services that strive to support a market infrastructure for specialized communities must be prepared to be network sensitive, or perish.

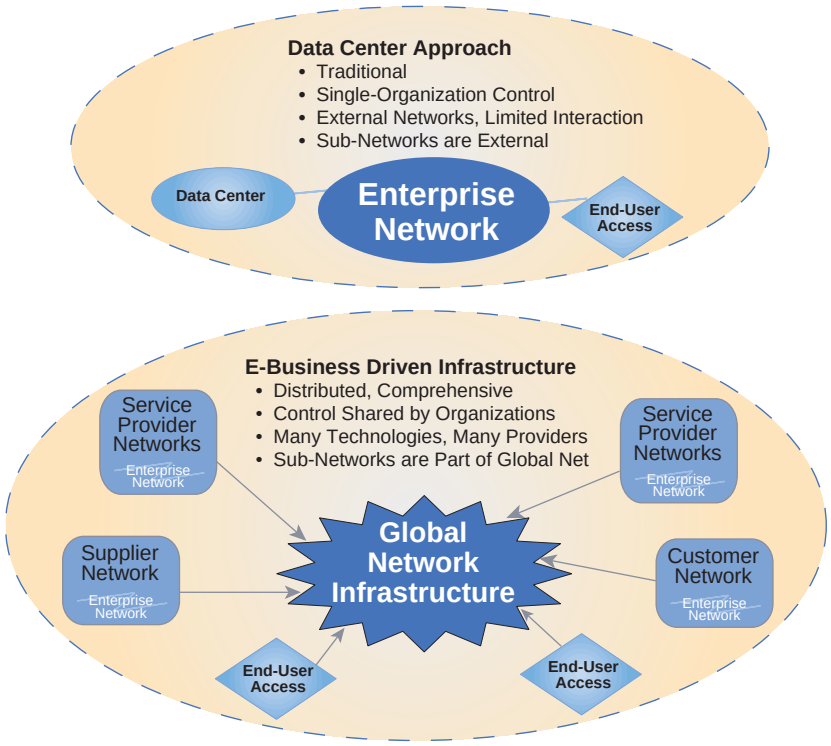

FIGURE 1. The network-centric nature of IT infrastructure in the e-business economy

As this figure suggests, organizations – whether enterprises or service providers – that default to old models of management in the new economy will not stay competitive. They must move beyond element management towards more central control. This means growing beyond isolated disciplines in which network, systems and application specialists – or service providers – turn to finger pointing when problems occur. Management software organizations, and management software tools, will increasingly be expected to bridge disciplines. From the network management perspective, this means leveraging the network to inform on systems and applications within the Intranet and across the Internet. The network, after all, touches everything.

The Impact of E-business on Management Disciplines

The importance of managing the e-business infrastructure from the perspectives of network and systems performance and availability can hardly be overstated. E-business is serving as a catalyst for performance and availability management, which must step up to new requirements for all environments where IT and business performance are inextricably linked. The e-business economy depends not only on web-based transactions, but also upon other supporting services including ERP, CRM and database applications – all of which are increasingly dependent on networked delivery.

Revenue, brand loyalty, partner relationships and business productivity all depend on IT performance metrics to a degree that would have been unimaginable just a few years ago. Moreover, the time in which decisions can and must me made is being shortened through an e-business dynamic in which search engines are making purchasing decisions, marketing data is real-time, and partner performance can be mapped to strategic partner supply chains through the same software and services. These and other trends are elevating expectations for network and systems performance both within the enterprise and across the service provider community.

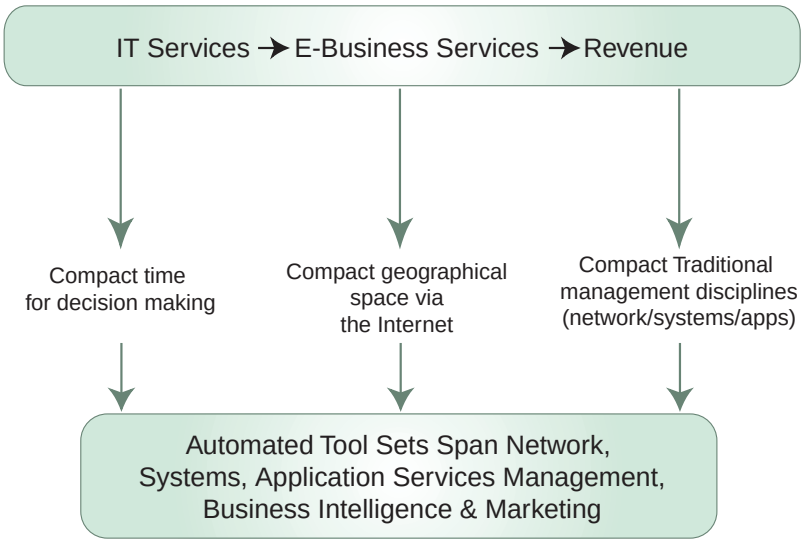

FIGURE 2. Compacted time for decision making — and affect on management software tool sets

It should be kept in mind that increasingly, just as network, systems and application management are becoming a continuum – so are performance and availability management. The two mutually inform each other – as device failures can cause performance slow downs and congestion can eventually go beyond brown-outs to induce network failure. Conversely, good performance monitoring and measurement can proactively prevent saturations that can lead to network outages.

The publicized cost of outages can be dramatic, and yet the real costs are often in excess of published numbers. This has to do with the interdependencies of e-business services across the network. Networked interdependencies escalate the cost of outages in the e-business economy – both within intranets, certainly, but the most dramatic examples come from Internet failures.

One example occurred with the ten-day outage of a major telecommunications provider, MCI, in 1999. Published costs focused on rebates to customers and approached $29 million dollars. One of the affected ISPs (Cove Internet of Copperas Cove, Texas) modeled its own outage, where customer credits and rebates amounted to one percent. While this doesn't sound like a lot, the same percentage would mean that MCI could have lost nearly $2.9 billion, including loss of new business and customer defections.

Interdependencies make the effects of infrastructure performance issues even greater. A single customer, the Chicago Board of Trade, lost in the vicinity of $500 million in financial trading. Hundreds of dependent ISPs suffered their own financial losses, or worse, went out of business. When brand loyalty depends on performance and changing partners or providers is easy, e-business consumers do not wait for excuses. On the other hand, the interdependencies of IT-centric commerce escalate network performance problems to new levels.

This is not an environment where any business or service provider can afford to be reactive. Good network performance and availability management could have saved the day, or at least shortened the time to solution – saving billions of dollars of combined losses.

E-commerce and B2B Performance Management Requirements

Performance management solutions for e-commerce and B2B e-business face some different requirements. Strong performance monitoring with an eye to real-time control and troubleshooting is essential for e-commerce, where traffic is highly irregular and unpredictable. Planning is also important because peak periods need to be defined and trended, rather than just trusting to overprovisioning. *Bandwidth may be getting cheaper, but it is also blind.* The erratic effects of e-commerce can be such that blind overprovisioning leaves providers susceptible to radical shifts in usage due to new services and new bandwidth-intensive applications in a narrow segment of the network. Throwing bandwidth at the networked delivery of e-business services is both costly and dangerous. With the growth of video and voice data streaming it will become even more risky.

Performance management for B2B is also critical, but takes a somewhat different form. Here, analysis and trending for consistent performance guarantees with an eye to business-to-business SLA's becomes more dominant. B2B e-business is somewhat more predictable than e-commerce, but partner dependencies will increasingly require consistent guarantees of service. This is all-the-more true because business partners over the Internet live in what is becoming a glass house where real performance metrics can become public information. For instance, portals already exist today – such as those provided through Manage.com — in which a business can gauge the performance metrics of not only partners in its own supply chain, but also the performance metrics of its competitors. With this information, the vendor may choose, just as readily, to improve his or her IT performance, insist on improved partner performance, or choose to switch partners.

Elevating Network Performance Management

Businesses looking to integrate e-business requirements efficiently, and service providers looking to ensure service delivery while at the same time growing beyond commodity bandwidth suppliers, need to invest in a suite of solutions for performance management. Depending on the breadth of the e-business service, various categories apply, all of which are complementary. These include but are not limited to:

- Web–transaction performance
- System/server performance
- Client-side desktop performance
- Database performance
- ERP application performance
- CRM application performance
- Network performance

The value of this last item cannot be underestimated for two reasons. First, as has been shown, e-business is a networked phenomenon, and network performance issues can profoundly impact e-business financials. Secondly, since the network touches almost every piece of the e-business equation – web servers, applications and even third-party services – network performance software holds the potential to be a first window on the full e-business dynamic. Network performance management may not only offer strong indicators about the network itself, but also about many distributed resources

Given these factors, it is important to define a profile for effective network performance management solutions in the new economy. These parameters affect both product requirements and process requirements for the control and provision of both enterprise and service provider infrastructure:

- Provide insight into patterned behavior of the network in all its components: LANs, WANs, ATM, frame relay, and global IP nets.
- Troubleshoot real-time problems in geographically dispersed communities in conjunction with event management solutions to help pinpoint failure and resolve problems with minimal impact.
- Proactively monitor problems that surface in congestion patterns before they actually cause an outage, and before they significantly degrade performance.
- Provide insight not only into how the network is performing (layers two and three), but leverage network performance in-

formation to help clarify issues in systems and application delivery.

- Provide insight into how network services are being used – who is using them, where they're being used, and how and when they're impacting the network infrastructure. For service providers, this means gaining control of monitoring their customers. For enterprises, it will mean taking charge of the networked delivery for critical business applications.
- Provide support for related management solutions in performance management, change management, problem management, accounting and billing and service-level and business-process management.
- Do all of these things with a maximum of automation, flexibility and ease-of-use. Ease of use and deployment will not only help in gaining more effective performance control for critical, business services – they will also help to minimize the impact of IT churn by requiring a less dedicated, specialized skill base.

While there is nothing specific to e-business in any of these bullets, it is safe to say that e-business is an accelerator for all of them. That's because e-business is serving as a catalyst, some might say an "irritant," driving requirements for more automated and integrated sources of management data. In a sense, e-business is driving the same kinds of requirements that apply to service-level management in terms of holistic rather than fragmented performance control.

Choices in Network Performance Management

Between the enterprise businesses and the various service providers (niche providers for e-services, Application Service Providers (ASPs), Internet Service Providers (ISPs), Network Service Providers (NSPs,) systems integrators and others) who play to the e-business opportunity, there are a wide variety of choices to manage networked performance. These include a range of choices that can be confusing, and often distracting from making effective buying decisions. The technologies and the environments both tend to obscure each other and get in the way of clarity in focus for selection and deployment. The result is that most businesses under-invest in management software,

making buying decisions in which complementary solutions are nevertheless competing against each other, while they end up purchasing duplicative solutions that reside side-by-side.

The choices should be viewed in multiple levels. There are many point solutions for performance management, including many developed by specific networking device vendors – including those from heavyweights such as Cisco and Lucent. There are other point solutions targeted at monitoring and trending specific transmission environments (ATM, frame relay, VLAN switching) – many of which are, again, from network device manufacturers. There are a growing variety of network-centric application monitoring solutions, such as Pegasus from Ganymede, employing various approaches. One type of approach is *"observed"* (in which, for instance, an application response is viewed as it occurs at the end-user's desktop. Another is "*synthetic transactional*," in which an artificial application transaction is "recreated" across the network at specific intervals.

RMON, RMON2 and SMON solutions are other examples that look at application performance in a network context through "conversations" across network segments. Moreover, they can also address transport performance metrics, such as ATM and frame relay. The NetMetrix Performance Center is a good example of rich RMON-based centralized performance control. The Netmetrix Performance Center is particularly interesting because of its breadth in terms of harnessing performance information to provide a foundation for management disciplines including billing, accounting and service simulation, as well as synergies with fault management and QoS.

Making the Investment

Businesses and service providers seeking a realistic foundation for performance control should spend time looking at the market to find the right mix of solutions to fit their specific environment – from a heritage, skills and business perspective. However, while attention is often drawn to niche solutions such as web-server performance, or back-end data center management solutions, buyers should not overlook the critical foundation for performance control in e-business that can only be supplied by broad, cohesive solutions with strong network roots.

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