

The Road to Successful Application Delivery



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Introduction

In a couple of previous IT Impact Briefs, I commented on how important I feel it is that the people who plan and manage the IT infrastructure develop a greater awareness of the applications that the infrastructure supports. Based on that belief, I spent most of the later part of 2006 researching application delivery both from the perspective of the impediments, as well as the successful steps that IT organizations are taking to improve their ability to ensure acceptable application performance. The result of that research is an in-depth report, *The Handbook of Application Delivery* that is available at www.netscout.com. This IT Impact Brief will provide a brief summary of some of the key issues discussed in that report.

Re-Defining Application Delivery

As many of you know, over the last year I have conducted extensive market research into the challenges associated with application delivery based on surveys and interviews utilizing both the NetScout and the Webtorials communities. One of the most significant results uncovered by that market research is the dramatic lack of success IT organizations have relative to managing application performance. In particular, I recently asked 345 IT professionals the following question: "If the performance of one of your company's key applications is beginning to degrade, who is the most likely to notice it first - the IT organization or the end user?" Seventy three percent of the survey respondents indicated that it was the end user.



One of the conclusions that I drew upon completing the market research is that IT organizations have two primary functions: applications development and applications delivery. Applications development involves a variety of tasks including developing new software, acquiring software from a third party, integrating software modules and maintaining software. Applications delivery involves any task required to ensure a secure, cost effective and acceptable level of application performance.

The stumbling block is that while most IT organizations have a formalized approach to application development, few have a formalized approach to application delivery. The vast majority of IT organizations, for example, are not organized in a way that even acknowledges the role of application delivery. In particular, most IT organizations are organized around individual technologies such as LANs, WANs, databases, storage, security, etc. More importantly, most IT organizations have not implemented the processes that are necessary to cross technology and organizational boundaries and support an effective application delivery function.

I believe that the goal of an application delivery function is to minimize the occurrence of application performance issues and to both identify and quickly resolve issues when they do occur. It is important to note that most times when an industry trade magazine uses the phrase application delivery, they are referring to just network and application optimization - functions such as caching, compression and protocol acceleration. Network and application optimization is important. However, achieving the goal stated above requires a broader perspective on the factors that impact the ability of the IT organization to assure acceptable application performance.

The Report develops a framework for application delivery that IT organizations can customize for use in their environment. The framework is comprised of four primary components: Planning, Network and Application Optimization, Management, and Control. Some overlap exists in the framework, as a number of common IT processes are part of multiple components. This includes processes such as discovery (what applications are running on the network and how are they being used), baselining, visibility and reporting.

The Application Environment

As outlined in The Report, there are many aspects of the application environment that complicate the task of application delivery. Some of these aspects include:

The Application Development Process

In the typical application development environment, the focus is on delivering the promised software functionality on time and with relatively few bugs or security vulnerabilities. This lack of emphasis on how well an application will run over the WAN often results in the deployment of chatty applications. Chatty applications are applications in which a given transaction requires tens or possibly hundreds of round trips, a.k.a., application turns. The *November 2006 IT Impact Brief* referred to chatty applications as being WAN vicious.

The Breadth of Applications

The *August 2006 IT Impact Brief* discussed how widespread network misuse is. In that brief, network misuse referred to malicious applications such as spyware or recreational applications like YouTube or Internet radio. Successful application delivery requires that IT organizations are able to identify the applications running on the network and are also able to ensure the acceptable performance of the applications relevant to the business while controlling or eliminating applications that are not relevant.

Application Complexity

Beginning with the deployment of client-server applications, most IT organizations have adopted a distributed architecture for applications development that is often referred to as an n-tier architecture. The typical three-tier application, for example, is comprised of a Web browser, an application server(s) and a database server(s). The information flow in a three-tier application is from the Web browser to the application server(s) and to the database, and then back again over the Internet using standard protocols such as HTTP or HTTPS. Since the application server(s) and the database servers are typically in the same data center, the only impact of the WAN on the performance of a three-tier application is that it impacts the traffic flow between the Web browser and the application server(s).

In a Web services-based application, the Web services that comprise the application typically run on servers that are housed within multiple data centers. As a result, the WAN impacts multiple traffic flows and hence has a greater overall impact on the performance of a Web services-based application than it does on the performance of an n-tier application.

Webification of Applications

The phrase Webification of Applications refers to the growing movement to implement Web-based user interfaces and to utilize chatty Web-specific protocols such as HTTP, HTML, XML and SOAP. Similar to the definition of a chatty application, a protocol is referred to as being chatty if it requires tens, if not hundreds, of turns for a single transaction.

In addition, XML is a dense protocol. That means communications based on XML consume more IT resources (i.e., WAN bandwidth, CPU cycles) than communications that are not based on XML.

Data Center Consolidation and Single Hosting

Many companies are reducing the number of data centers they support worldwide. HP, for example, recently announced it was reducing the number of data centers it supports from 85 down to six. This increases the distance between remote users and the applications they need to access. Many companies are also adopting a single-hosting model whereby users from all over the globe transit the WAN to access an application that the company hosts in just one of its data centers. One of the effects of data center consolidation and single hosting is that it results in additional WAN latency for remote users.

Changing Application Delivery Model

The 80/20 rule in place until a few years ago stated that 80% of a company's employees were in a headquarters facility and accessed an application over a high-speed, low latency LAN. The new 80/20 rule states that 80% of a company's employees access applications over a relatively low-speed, high latency WAN.

I don't believe that any of the factors that complicate application delivery are going away any time soon. To the contrary, I expect that the impact of these factors will only increase in time.

¹ Hewlett-Packard picks Austin for two data centers
<http://www.statesman.com/business/content/business/stories/other/05/18hp.html>

Conclusion

In a tongue in cheek manner, I can say that conceptually application delivery is not that difficult. To be successful with application delivery, all that an IT organization must do is:

- Have a deep understanding of the volatile environment that is the organization's applications, servers, users and networks.
- Implement the appropriate techniques to optimize the performance of the network, the servers, and the application.
- Measure everything and automate as much as possible.
- Develop control over the desktop as well as control over what traffic can enter the network and how that traffic is routed through the network.

As demonstrated in The Report, however, the devil is definitely in the details.

The next IT Impact Brief will examine some of the management challenges associated with application delivery.

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