The Performance Management Mandate

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Introduction

Over the last several years the role of IT has changed. A few years ago, IT was generally regarded both as a utility and as a cost to be minimized. While managing cost is still important to virtually all IT organizations, IT is in the process of assuming much more of a strategic business role. For example, IT is now looked on as a key player in myriad strategic initiatives such as enabling business process re-engineering and supporting compliance with government regulations. In many instances, IT is leading these initiatives. For example, many IT organizations are deploying technologies the goal of which is to improve employee productivity through more effective collaboration.

Just as IT is changing to become more business relevant, network management also needs to change and be able to demonstrate business value. For example, network management has historically focused primarily on fault and event management. The thrust of fault end event management is on the availability of the network infrastructure. While this is clearly important, it is difficult to be perceived as providing business value based just on ensuring the availability of the network. That follows because availability is a no-win situation. In particular, the network organization does not get any credit for providing a highly available network because the organization's senior management expects the network to be available. Analogously, because the organization's senior management expects the network to be available, the network organization does loose creditability when the network is not available.

As IT organizations change to become more business relevant, they are paying more attention to application delivery. This is the classic good news/bad news situation. The good news is that network organizations now have the opportunity to show business value by demonstrating how they ensure that the company's key business applications exhibit acceptable performance. The bad news is that ensuring acceptable application performance is extremely difficult. This newsletter will discuss some of the factors that make application delivery so difficult and will suggest an approach that IT organizations can take to be successful with this critical activity.

The Challenge of Application Delivery

Today in the vast majority of instances in which the performance of an application is degrading the degradation is noticed first by the end user and not by the IT organization. IT organizations will not be regarded as successful if this situation continues. The goal of application delivery is to reverse this situation. In particular, the goal of application delivery is to minimize the occurrence of application performance issues and to both identify and quickly resolve issues when they occur – preferably before the end user notices it.

Some of the factors that make application delivery so difficult are:

- IP Networks are very dynamic, with changes made on a frequent basis.

WAN Characteristic	WAN Optimization Techniques
Insufficient Bandwidth	Data Reduction: Data Compression Differencing Caching
High Latency	Protocol Acceleration: TCP HTTP CIFS NFS MAPI Request Prediction Response Spoofing
Packet Loss	Congestion Control Forward Error Correction (FEC)

- Some applications such as VoIP require very stringent network parameters.
- The performance of distributed applications (i.e., 2-tier, 3-tier, 4-tier applications) is significantly impacted by the performance of the WAN.
- During the design and development of an application there is typically at most a moderate emphasis on how well that application will run over a WAN.
- A large percentage of IT organizations are in the process of taking servers and storage out of branch offices and placing them in centralized data centers.
- Many companies are reducing the number of data centers they support worldwide.
- The majority of employees no longer reside in a headquarters facility.

As a result of these factors, the vast majority of employees access applications over a relatively low speed, high latency WAN. That fact combined with the dynamic nature of IT and the stringent demands of many applications often results in less than satisfactory application performance. In addition, the fact that many applications are chatty [1] means that adding additional bandwidth will often not improve application performance.

In order to successfully meet these challenges, IT organizations need to redesign their approach to managing the IT infrastructure. This new approach must focus on ensuring the acceptable performance of applications. It is neither realistic nor desirous to expect that IT organizations will be able to implement a new approach to managing the IT infrastructure overnight. Rather, what is needed is an evolutionary approach. One aspect of this evolutionary approach is that IT organizations should begin to deploy the appropriate instrumentation that will allow them over time to gather the information that is required to successfully manage application performance. Other aspects of this evolutionary approach are detailed in the following section.

Successful Application Delivery

Because successful application delivery is so demanding, IT organizations will not be successful with a narrowly defined solution. Rather, IT organizations must approach application delivery in a broad, holistic fashion

[1] Chatty applications require tens or hundreds of application turns for a single transaction.

that is comprised of four key activities. These activities are described below. It is important to realize that these activities are overlapping. For example, in some cases the same management tool that is used to plan the deployment of a new application can also be used to manage and troubleshoot the environment once the application has been deployed. In other cases, different tools are used. These tools, however, share the same information about the network.

Planning: Application performance is too important to the business and to the IT organization to proceed with an approach that is predicated on making changes and hoping that everything is acceptable. What is needed is an approach that allows the IT organization to model the change before it occurs. This approach enables IT organizations to understand in advance the impact of a change such as deploying a new application or modifying the network infrastructure.

Optimization: One of the primary components of optimization is to improve the performance of applications that are delivered to branch offices over a WAN. As demonstrated in Table 1, there are myriad techniques that are designed to mitigate the negative impact that the WAN has on application performance.

Management: As noted, in the vast majority of instances in which the performance of an application is degrading the end user notices the degradation before the IT organization does. In order to reverse this situation, IT organizations need visibility into network and application behavior issues so that these issues can be identified before they impact the user. In order to be successful, IT organizations need to understand more than just the performance of an application is beginning to degrade. They also need to understand what component of the network, if any, is the cause of that degradation.

A key component of understanding the impact of the network on application performance is based using intelligent information from rich instrumentation to create a baseline of network performance. The purpose of the baseline is to quantify what is normal network performance. Once this has been established, network management tools can monitor the actual network performance, compare the actual performance to the baseline and hence identify abnormal situations. These abnormal situations could be the result of a network problem, a security attack, or both.

Control: As noted, applications such as VoIP require very stringent network parameters. In particular, VoIP requires very low levels of delay, jitter and packet loss. Given the dynamic nature of IP networks, these stringent network parameters cannot be guaranteed without implementing Quality of Service (QoS). QoS refers to the ability of the network to provide preferential treatment to selected traffic classes.

QoS alone, however, is not sufficient. What is also needed is the ability to measure bandwidth quality on a granular basis so that IT organizations can fine-tune bandwidth requirements to achieve the appropriate application performance.

Summary and Conclusions

Application Delivery is a good news bad news situation. Part of the good news is that ensuring acceptable application performance helps a company to achieve its goals. The rest of the good news is that ensuring acceptable application performance is good for the careers of IT professionals. That follows because ensuring acceptable application performance is something that senior managers care about.

The bad news is that ensuring acceptable application performance is difficult. As such, IT organizations will not reap the benefits of successful application delivery with a simplistic approach. Rather, what is needed is an approach that includes planning, optimization, management, and control.

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About Kubernan™

Kubernan™, a joint venture of industry veterans Steven Taylor and Jim Metzler, is devoted to performing in-depth analysis and research in focused areas such as Metro Ethernet and MPLS, as well as in areas that cross the traditional functional boundaries of IT, such as Unified Communications and Application Delivery.

Kubernan's focus is on providing actionable insight through custom research with a forward looking viewpoint. Through reports that examine industry dynamics from both a demand and a supply perspective, the firm educates the marketplace both on emerging trends and the role that IT products, services and processes play in responding to those trends.

Kubernan is the Greek root word for *helmsman* as well as the phrases to guide and to steer. As such, the name Kubernan reflects our mission of guiding the innovative development and usage of IT products and services.

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