Pipeline
Knowledge Is Power

Optimizing Application Performance on Large Branch Networks
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In today's global economy, it's not uncommon to find organizations struggling to share enterprise applications with hundreds of branch offices and mobile workers across the world. As a result, corporate WANs are now playing an ever more important role in providing remote branches and mobile workers with fast access to critical business applications. Optimizing the performance of applications over the WAN has become a critical issue and top priority for most IT departments.

Managing WAN application traffic flow in organizations with a limited number of offices can be demanding. Yet, some businesses have hundreds or thousands of offices that must share and manage information over the network. These organizations-- such as those in the banking, insurance and travel industries -- must optimize application performance using a more strategic approach.

One issue that many large organizations grapple with is that applications used within the company may be very different (e.g. transactional trades, reservations, payment authorizations, email – even music broadcasts). Thus, network teams are often confronted with a massively complex environment: dozens of applications, thousands of sites and tens of thousands of workstations.

This complexity means that a huge number of situations can occur in the network, each one very different from the next. As a result, the slightest incidents with centrally located servers may cause enormous repercussions at branch offices, including a complete failure of network services. Interestingly, these problems are very similar to those experienced by network operators and managed service suppliers, which must consider many different networks.

These large organization challenges are compounded by the great size and complexity of meshed networks, coupled with the characteristically small size of the central IT team and the fact that small office sites often can't justify having dedicated equipment at them. In addition, these organizations are challenged to deliver a good quality of experience to the mobile workers to ensure their productivity. In such cases, network managers have often wondered out loud whether properly managing applications on a large branch network is possible or just a fantasy.

For example, consider office flow matrices. Despite the general movement toward

server consolidation of different applications, branches often exchange information with other sites. For example, some branches host applications from server centers or provide load-balanced access to regional offices. Yet, in some instances, corresponding sites can differ from one branch to the next (the Boston branch and the San Francisco branch may not be in contact with the same regional office and therefore receive different information). This situation translates to "some-to-many flows" where a small number of sites communicate with a subgroup of offices. To guarantee application performance, this partial meshing needs to be taken into account by the company's optimization system. This system should automatically determine the groups covering central branches and be capable of managing situations where there is competition between the different flows.

Today, responsibility for this intricate application performance delivery is falling more and more on the shoulders of network professionals. To manage this wide range of day-to-day situations, these individuals need to be armed with tools and methods that allow them to get information, make decisions, and rapidly apply them.

Network managers need three ingredients to optimize large branch office applications successfully:

- an overall view (applications, traffic matrices, network performance, and applications)
- the ability to guarantee the performance of critical applications at all times
- the jurisdiction to act locally in case of any incident (alarms, local analyses of flows)

In addition, network managers need to manage their budgets and supply high-level information to management, or even to their internal customers.

Traditional network traffic tools offer management rules and traffic monitoring for each site, but they soon surpass their limits because the configuration becomes too complex due to the multitude of possible situations. In these cases, managing change can become a real nightmare. Network managers can't manage what they can't see and measure. Without real-time visibility into end user response times and traffic flows, it's impossible to manage and optimize application performance. Too

often, network managers have no way of knowing how well their organization or service provider is meeting its performance targets.

Other solutions have also emerged in recent years such as WAN optimization controllers (WOCs), which address application performance hurdles in selected portions of the network. Some enterprises have tactically deployed WOCs at sites that exhibit poor end-user experiences for networked business applications. While this opportunistic approach has great advantages because of the immediate relief it provides, not all networks are compatible with such a tactical approach to application performance.

For example, most very large international organizations cannot deploy WOCs on their networks. There are four key reasons why:

1. **Inefficiency.** On large networks, these tools very often do not improve performance. Modern networks have meshed topologies that WAN Optimization Controllers cannot handle properly.
2. **High investment costs.** Even if the technology tends to be more affordable, these tools still cost many times more than the cost of a branch router.
3. **High management costs.** WOCs are high-tech devices that need to be configured individually. The configuration of each device needs to be consistent with the others and yet, all devices must reflect local requirements.
4. **Inability to Scale.** WOCs are able to enhance application performance on ten or twenty sites. Very few are able to scale benefits to hundreds or thousands of sites.

The good news is that a new generation of WOCs can cooperate with each other as part of a global WAN optimization system. These systems are more aptly suited for large organizations with a plethora of branch offices. WAN optimization systems offer a more global top-down approach that offer possibilities that are particularly adapted to the problems discussed above. There are four key reasons why:

1. **Efficiency.** WAN optimization systems address application performance problems globally. They not only reduce the response times of business applications but also guarantee consistent response times regardless of network topology and occurrences on the network.
2. **Minimal investment costs.** The components within WAN optimization systems cooperate with each other so that they can serve the need of all branch offices without requiring a device at each site
3. **Low management costs.** Network managers configure WAN optimization systems globally using application performance objectives. Devices do not need to be configured individually. WAN optimization systems dynamically compute and apply the perfect configurations based on powerful and intelligent algorithms that ensure perfect settings, even when the network, applications, users or site characteristics are evolving.
4. **Scalability.** WAN optimization systems were designed and built for large networks from the very beginning. They are able to scale to the largest networks without any risks in efficiency and reliability.

IT can no longer manage large branch networks without taking into account the critical applications on them. Network managers must take a different approach to optimize branch offices and mobile workers. The strategy needs to start with the

application's perspective and the associated performance requirements to manage the entire network. Some of these newer solutions serve as "application SLAs." These application SLAs can be used as an objective not only to manage end-user flows such as optimization and acceleration, but also to analyze the results like measurement and support of strategic decisions. Such systems are intelligent enough and able to understand all local traffic situations at all times and enable managers to make decisions in an autonomous way in line with objectives.

These days, most large, multi-office enterprises want network availability 24x7 and trouble-free access to networked applications. To meet these needs, companies require application traffic and performance management solutions that have kept pace with the technology. It also requires a shift in strategy to focus more on application performance and less on bandwidth and infrastructure. Managing large branch office networks is challenging. Yet with the new breed of WAN Optimization Systems that simply and automatically manage WAN application traffic, successful management of the enterprise WAN is well within the reach of most large organizations.

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