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A Collaborative View of the Network Ensures a Successful End-user Experience

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Today, service providers face increasing demands to provide Internet messaging, business applications, and information services to mobile users while maintaining end-to-end service management capabilities. The challenge becomes one of not only ensuring adequate service, but also ensuring a happy coexistence of all critical networked applications. In order to achieve the highest level of service performance, it has become increasingly imperative for service providers to change the way they manage their networks.

While tackling the complexity of delivering new and innovative services for ever-more-sophisticated wireless devices and delivering a high level of service performance, the quality of experience (QoE) for the customer is key. The importance of providing the proper attention to customer management and customer satisfaction is fast becoming recognized as mission-critical. A satisfied customer today is defined as one who has received a service experience that matches the expectations, guarantees, and assurance they were offered at point of sale or contract signing. The reality is that if customers become dissatisfied through poor service quality or broken business continuity (coupled with a competitive market) it will not take long before churn and lost revenue become a reality.

However, while QoE is an important measure of a service's end-to-end performance from the user's perspective, other metrics are needed. There should be equal levels of emphasis put on infrastructure performance, as well as application performance. It is important for service providers to recognize the importance of moving toward a holistic service-centric model that has a collaborative view of the three critical elements: QoE, infrastructure performance, and application performance. Only then can successful end-to-end service performance become a reality, especially with the burgeoning growth of network traffic.

Trends in Network Traffic Growth

As service providers are painfully aware, it's not only the rapid growth in the number of devices available and in use by businesses and consumers that drives the need for deeper solutions when it comes to a higher level of network and service performance management and support, but it's also the explosion in the types of applications. Offering simple Internet access and bandwidth is no longer enough when other suppliers in the same market are providing bundled services that include broadband or cable TV—including access to downloadable movies and TV programs—VoIP telephone services, support for extensive mobile data services, and a wide range of other popular consumer applications. Statistics show that as of January, 2008, 93 percent of U.S. households that include families with children were equipped with a computer, and 66 percent of these have a broadband

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connection. Some 95 percent of these same households also own cell phones, used largely for voice and SMS (text). According to recent research, revenue from U.S. mobile services was expected to grow 45 percent during the 2008 calendar year. Over this same period, it's also predicted that revenue from worldwide mobile data services would eclipse that of fixed Internet access services.



Optimizing Growth; Application-level Monitoring

To deliver the growing demand of next-generation application services like VoIP and videoconferencing over a shared infrastructure, network managers must monitor performance at the network and server level, and also monitor performance and quality at the application level. It is important to note that solutions at the application level can be more difficult to achieve and are even more critical. Transmitting even crucial data across the network can look like a reasonably simple task compared to transmitting voice and video. If there is a delay or interruption of some kind in network traffic due to hardware problems or access congestion, transmission might be slowed but the information isn't lost. By contrast, new applications like video conferencing, streaming a song or movie, or making a VoIP call requires an unbroken flow of data. Any interruption or delay in service can result in image degradation, loss of audible or voice data, or dropped calls. And voice and video data is irretrievable, even though the connection might be restored quickly.

Determining the source of application flow problems—whether related to the network, application, or server—is a difficult challenge, especially given the explosive growth in the volume and types of applications running on today's networks. However, with a few basic steps and the right tools, network managers can not only support next-generation applications but also end the needle-in-the-haystack search when identifying the source of network- and application-related problems.

A focus on tools that offer visibility into application traffic, as well as network and service continuity, can deliver a convergent and holistic awareness that brings network, service, and application views together. Displaying the whole operational picture—and in real-time—is critical not only for keeping the network functioning and applications running smoothly, but also in achieving that all-important QoE and planning for future growth.

Preparing for Data, Voice, and Video on the IP Network

The success of staying ahead of the game in application performance begins with a well-executed planning stage – before any actual deployment or pilot. During this stage, the company must find out what applications are running over its networks. A typical large enterprise, for example, can run 1,000+ applications, many of which may be unknown and unauthorized.

Using deep packet inspection or NetFlow technologies, network managers can create an accurate inventory of applications and establish the capability to identify and proactively monitor business-critical applications. Doing so enables a network manager to understand which applications run on a network, traffic trends and patterns, where, when, and why latency occurs, and the quality of service (QoS) metrics associated with an application. The tools used must not only have the capability to identify applications and traffic patterns, but also classify applications by priority and criticality.



With a more-accurate picture of how the network is used, IT managers can then optimize the infrastructure prior to installing new services or applications. This might entail curtailing rogue activity or unauthorized network usage, adjusting traffic prioritization through router settings, or other QoS control mechanisms.

From Pilot to Production

The initial analysis and monitoring phase also provides a network baseline that will serve as a critical frame of reference once voice or video traffic is introduced. Network managers can use this baseline to ensure the quality of pre-existing applications throughout the change process.

Because VoIP creates a lot of traffic and can be more fragile than other services, network managers should put in place purpose-built monitoring tools that collect granular metrics needed to assure the quality of convergence technologies. In the case of VoIP, this means the ability to capture all call records, associated mean opinion score (MOS), and other voice-specific metrics that enable analysis of individual call problems in the context of overall bandwidth usage and call volume.

In summary

Best-of-breed monitoring tools should be put into place to enable the setting of performance thresholds so that most problems can be averted before end users call the help desk. These tools will accelerate problem resolution when issues arise, and provide engineers with the data to plan capacity as the use of voice and video grows. Companies that have postponed managing the applications in their networks should begin now to evaluate flow-monitoring technologies as a low-cost way to protect their application investment and ensure a positive end-user experience.