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The Road to IMS Success through Advanced OSS

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Many service providers and other players in the telecommunications industry are talking about IMS (IP Multimedia Subsystem) as if its success is already a foregone conclusion. It certainly may be the case. The IMS network architecture – if properly implemented – offers an answer to the demands of both consumers and providers. As our communications technology progresses, consumers have come to demand an increasingly varied and individualized set of services and content. They want to be able to access these services from any network in any location, and with the same QoS. In fact, QoS is becoming a particularly important requirement, as many of the new multimedia services are more sensitive to network performance and service degradation.

In addition to the consumers, service providers as well have a set of demands for which the current network structure and business model is insufficient. First and foremost, providers need a solution that will enable them to answer the consumer demands mentioned above. Providers are seeking to offer these services over a converged IP network, while moving beyond the current internet business model of a commoditized "bit pipe," and to provide real added value as a way of developing their end of the business.

In theory, IMS network architecture takes all of these demands into account. IMS will answer both consumer and provider demands to offer bundled multimedia services and rapid low-cost deployment of new services. At its core, IMS is based on a converged IP network, answering the demand for flexibility and cost control. IMS will provide consumers with the high-quality nomadic service they demand because it includes infrastructure with the potential to provide the same QoS while allowing consumers to gain access from any location or network. More importantly for service providers, IMS provides a framework in which they can move beyond the restrictive flat rating "bit pipe" business model and offer added value for increased profitability. With the benefits it has to offer on both ends of the market, IMS has the potential to become the widely accepted network standard in the near future.

However, providers need to be careful about the way they pursue the implementation of IMS. By incorrectly prioritizing the initial stages of rollout and moving forward without the proper OSS features, IMS profitability and market success may be jeopardized, or at the very least seriously set back. Many providers are planning to begin by devoting the bulk of their resources toward the billing and service provision mechanisms in order to quickly establish market share and the new business model, and then address Service Assurance and QoS in later stages. However, without consistently providing a high level of QoS and end-user experience, IMS will not achieve sustainable success. IMS standards do provide the infrastructure for end-to-end QoS, but this will just be wasted potential if it is neglected in the initial stages of rollout. In order to achieve the potential for IMS and ensure its adoption, service providers will need to include Service Assurance in their rollout strategy.

Service Assurance vendors will need to provide a solution with more advanced capabilities to help operators meet the challenges of ensuring QoS in an IMS environment. These challenges arise

from both the IMS architecture itself, as well as the market conditions surrounding it. Complex traffic patterns have become a source for service impact that was not present in traditional networks, where the leading sources for service deterioration have been network failures such as element malfunctions or fiber cuts. Demand for QoS itself will be higher and more sophisticated as an increasing variety of services and user classes are merged onto a single network. In addition, with the new billing schemes providers plan to implement, consumer demands for QoS will become stricter. To meet the consumers' expectations of IMS, providers must move beyond traditional fault management and accompany their rollout with an advanced, proactive Service Assurance solution.

An integral capability of any solution that aims to provide proactive service assurance over IMS networks is a service impact analysis. That is, when a potential fault is identified, its effects must be traced forward to analyze the effects it may have on various services or customers, in addition to working backwards to find the root-cause. The integration of different user classes (such as residential and business) into a single network has increased importance and complexity of SLA fulfillment. Under the legacy structure, these user classes typically accessed their respective services through separate networks. This had the drawback of replicating network structures and functions, but simplified management of their varying QoS needs. Efficiency is certainly improved by merging these uses onto a single network, but now network operators are faced with the task of distinguishing between a user at a free public hot spot, a residential user, and a CFO paying for a premium SLA. The capability to conduct this form of service impact analysis will allow an operator to take a more refined approach to QoS according to customer and service type, maximizing both the service quality and revenue potential that can be achieved over an IMS network.

Another necessary feature is a solution for an increased emphasis on monitoring traffic trends. The IMS structure allows consumers more flexibility regarding how and where they use the network. This added flexibility, combined with the increased bandwidth demands of certain services, increases the impact of traffic on overall network performance. In addition, one of the goals of IMS is to allow rapid rollout of additional services, which can result in further traffic-related performance faults that degrade the overall network performance. Service Assurance on IMS networks will have to cover traffic-related faults, in addition to traditional fault management that deals mostly with network failures. Furthermore, to maintain a proactive approach to QoS, historical data on past traffic patterns must be analyzed through advanced correlation techniques in order to anticipate traffic-related faults before their effects reach the end user.

An additional and essential OSS feature that enables a true proactive service assurance solution is bi-directional mediation. That is, the ability to communicate directly with the network and IMS control plane elements and issue commands to perform preventive and corrective actions automatically.   This capability, combined with the proactive analysis techniques already mentioned, will allow the OSS to monitor the network, services, and control plane, analyze all the available data, and perform necessary actions. In this manner, the OSS will be able to not only anticipate service degradation, but to actually take action to prevent it, as well. Furthermore, as a strong mediation enables a unified framework for network operation, providing a single network view (independently vendor and technology) and correlating the different layers composing the network (fiber, optical, VPLS, Ethernet, MLPS, IP), it is therefore a key component in realizing another IMS goal: the access agnostic network.

Providing QoS over IMS networks will require an advanced set of OSS features. On the whole, any OSS deployed over an IMS network must provide a unified and comprehensive network view in order to rationally manage the complexity resulting from the convergence and rapid service rollouts. Broader capabilities in fault management will be necessary in order to manage traffic patterns and congestion, in addition to traditional network faults. This broader scope of data analysis must then be utilized to anticipate effects on specific services and users, sometimes even before the root cause is identified. Finally, the OSS should have the capability to take action on these analyses, adjusting the network's bandwidth management to maintain QoS before the user experience is even affected.

The IMS network architecture has enormous potential to offer new benefits to the consumer and new revenue sources for network operators. However, if IMS is to succeed in the market and realize its potential for service providers, QoS must be a priority from day one. In addition to the changing network structure, the market around IMS will become more complex as well. Service providers will find themselves in competition with traditional competitors as well as with emerging content providers like Google, Yahoo, and Skype. With market conditions leading QoS to be one of the primary areas of competitive differentiation, combined with the increased range of competition, providers will need a particular set of OSS features in order to succeed. The OSS product suite should provide end-to-end proactive Service Assurance that includes not only performance monitoring, topology based root-cause correlation, and service impact analysis, but also automates problem resolution by sending commands to the network based on a predefined knowledge base. Making QoS a priority, and deploying the right OSS to provide it, will allow service providers to take advantage of new technologies and business models through IMS.