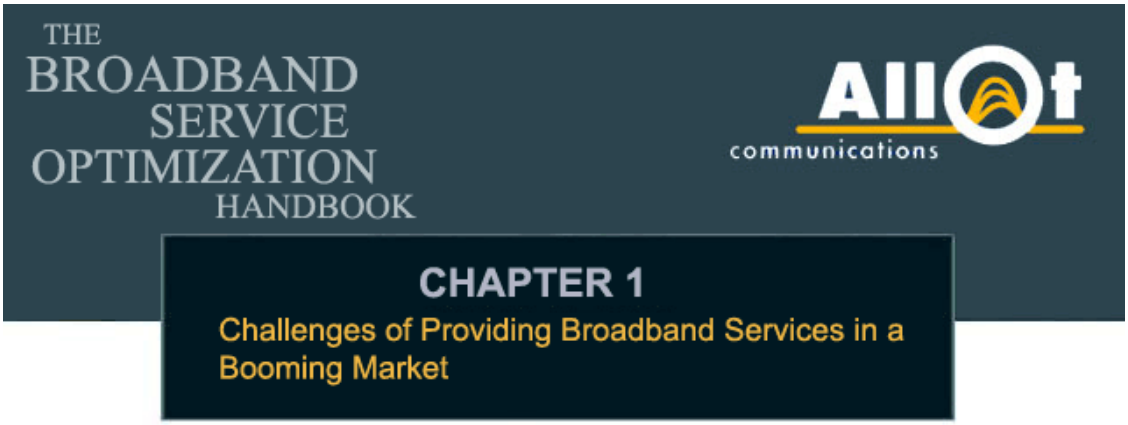


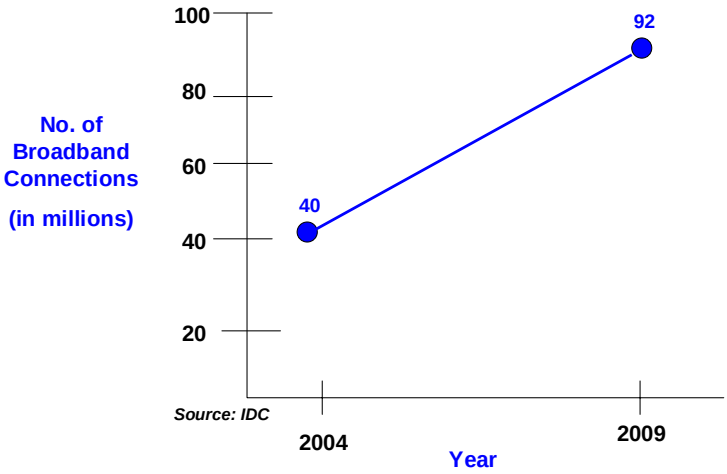
As the world's broadband subscriber base rapidly expands, service providers' customers are demanding greater network speeds and new services tailored to meet their specific needs. However, best-effort bandwidth provisioning alone cannot meet their latest requirements, which include performance guarantees for mission-critical data services, voice over IP (VoIP), conferencing, real-time and streaming media, gaming, and peer-to-peer (P2P) applications - services all sharing a common network.

Best-effort network systems restrict operators' ability to offer reliable and meaningful service-level agreements (SLAs). As a result, many service providers are struggling to differentiate themselves from their competitors, because the price-per-bit of pure network transport is plummeting toward commodity status. Rather, operators now require tools that provide them with the ***network control*** that will allow them to differentiated service plans and deliver consistently on the SLAs they promise their customers.

Service providers are feeling the dual-edged competitive heat to meet user demands and increase revenues at the same time. The key to their ongoing success lies in deploying innovative new services that address a variety of customer markets, while controlling costs and ensuring superior customer service. Currently, for example, some operators offer some IP SLAs, but lack a way to accurately measure whether they are consistently meeting them.

In Western Europe alone, broadband connections are expected to double by 2009 to 92 million. But service providers must be able and willing to deploy value-added, differentiated services to make that happen, according to worldwide researcher IDC (see Figure 1).

Figure 1. Broadband Growth & Opportunity in Western Europe



The uptake in broadband services in Western Europe is expected to more than double in the five-year period preceding 2009, according to IDC. However, services won't comprise just vanilla Internet access. Broadband will enable a "bouquet of IP services," says the researcher, which will include real-time services such as VoIP and IPTV.

This handbook educates those in service provider organizations about how to use intelligent management devices to gain detailed visibility into their networks so that they can deploy new services, offer iron-clad SLAs, control service provisioning costs, and manage ongoing operational expenses. The bottom-line: smarter networks make for smarter service provisioning and control.

Smarter Converged Networks

Predictions that subscribers would eventually turn to a single provider for telephone, entertainment, and Internet services are coming to pass. Today's converged voice-data-video networks transport applications with different behaviors and requirements onto a statistically multiplexed packet network. This approach is quite different from the circuit-switched networks of yesterday. Assigning a separate network for

separate applications or separate DS0 channels of a time-division multiplexed (TDM) circuit was used to support specific applications in a circuit-switched network environment. Applications did receive the bandwidth needed, but at the cost of letting expensive capacity frequently sit idle.

Sending traffic over a packet-switched network allows for bandwidth efficiency by having applications share pipes that maximize the use of all the available capacity. Lost in the tradeoff, however, has been the performance control afforded by having separate networks dedicated to supporting separate applications—at least, until the advent of intelligent traffic control systems. Without traffic control, poor application performance has typically resulted in the operator adding network capacity. This is a costly short-term fix at best, especially in light of certain bandwidth-hogging file-transfer and P2P applications, which are programmed to gobble up any available bandwidth.

The Broadband Service Optimization Handbook

By gaining greater insight into the behavior of specific applications, protocols, and subscribers, service providers can improve the quality of their customers' experience while avoiding investments in additional network capacity. Intelligent IP service optimization afforded by the monitoring and reporting capabilities of service optimization devices gives service providers visibility into their networks' application and protocol mix so they can see how applications are performing. From there, they can classify traffic and establish and enforce policies for how each traffic class should behave in order to optimize the performance of all user and application traffic.

Application Control and Subscriber Management — A Dynamic Duo

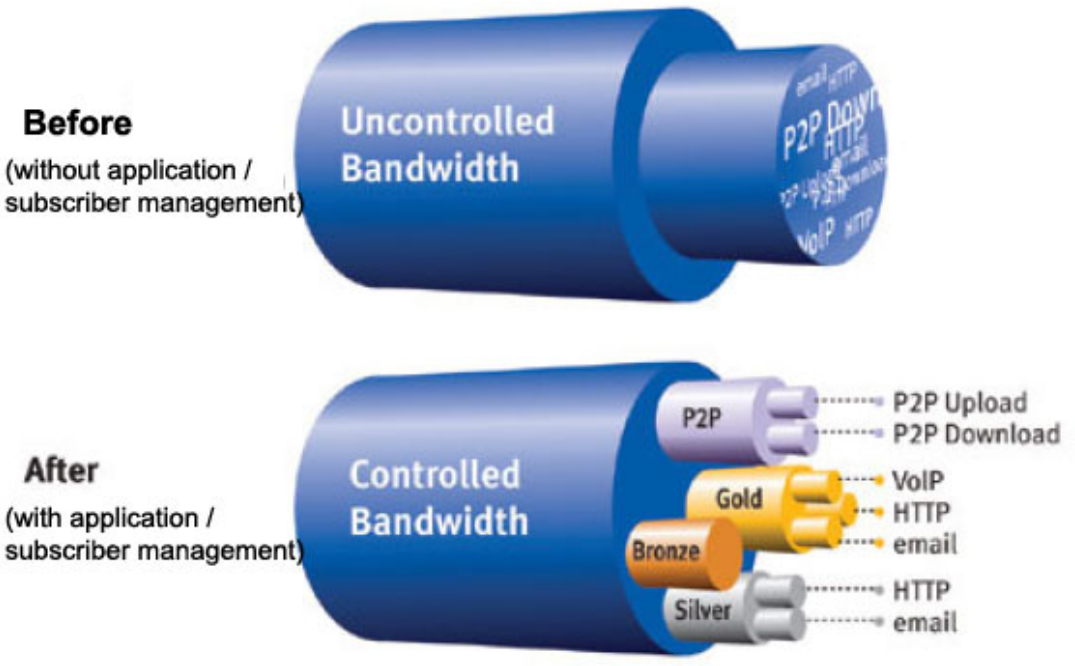
The earliest adopters of intelligent traffic management systems have been enterprises. Competition among business units, user groups, application types, and communications protocols, for example, necessitated the institution of priority protocols to manage the way each entity uses the enterprise network. That approach to controlling both traffic and subscriber behavior is now becoming the new model

for service providers struggling with customer demands for guaranteed bandwidth and application performance.

Application control refers to prioritizing, shaping, and managing the behavior of packets on the network for optimal performance. For example, business priority may be given to VoIP and streaming video, particularly when these services are competing with P2P applications or gaming. Application control starts with network monitoring and visualization, so that service providers know what traffic is on their networks, at what time, and which users are generating the traffic.

Service managment, by contrast, refers to controlling traffic behavior on a per-customer basis. Application traffic for individual subscribers is rate-limited and prevented from consuming bandwidth above a contracted service rate. Subscriber control allows for a variety of subscriber packages, priced at a various levels from basic to premium, including specialty packages for business subscribers.

Figure 2



Together, application control and subscriber management put the service provider back in charge of the network. Monitoring the network allows the service provider to determine how applications are behaving and to identify the culprits during periods of network congestion. That knowledge lets the service provider set and enforce new policies using protocols that reserve bandwidth for critical applications and services. As a result, providers can deliver scalable services with minimal performance degradation and avoid denial of service (DoS) to users.

Through the course of this handbook, you will see how application control and subscriber management allow service providers to:

- Improve their awareness of the applications and protocols riding their networks
- Deploy new tiered services
- Offer new application services
- Institute reliable SLAs
- Manage subscriber behavior more effectively
- Explore alternative pricing, such as usage-based billing and content charging
- Reduce customer churn
- Address accounting issues
- Improve average revenue per user (ARPU)

You will learn how each of these benefits can accrue through better control over the network.

Chapter Summary

The convergence of voice, data, and video technologies has placed unprecedented pressure on service providers to meet the increased broadband demands caused by bandwidth-hungry applications such as P2P and by the higher expectations of consumers for better service at lower prices.

The old model of adding bandwidth as the only option to meet increased demand is giving way to an approach that favors application control and subscriber management. The more service providers know about what is happening on the network, the better they are able to control the network. Application control prioritizes, shapes, and manages the behavior of packets on the network for optimal performance. Subscriber management lets the service provider profit from heavy-bandwidth users willing to pay premium rates for premium services, while ensuring that an individual customer cannot impede upon the SLAs of other customers.

The remaining part of this handbook examine how service providers can use network monitoring, application control and subscriber management to deliver differentiated competitive services and SLAs while improving subscriber ARPU.

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