SYNDESIS

MOVING BROADBAND
UP THE VALUE CHAIN:

Growing Margins with Differentiated Service Offerings

The future of Broadband is not merely high-speed Internet access.

THE BROADBAND BUSINESS IMPERATIVE

For service providers around the globe, the pressure is on. While revenue from traditional voice services still accounts for a significant portion of carrier income, that revenue is steadily shrinking due to increased competition associated with deregulation and the prevalence of wireless substitution. The recent U.S. Federal Communications Commission (FCC) ruling on wireline-to-wireless number portability will only deepen this trend for U.S. providers.

Meanwhile, traditional or 'basic' broadband services are not doing enough to offset these service provider revenue declines. In the case of DSL-based services, competitive flat-rate prices often cannot cover the capital investment and operating, regulatory, and third party expenses required to deliver and maintain basic broadband access. North American incumbent providers are losing on average $2—$4 a month per subscriber on DSL. One incumbent local exchange carrier (ILEC) estimated that it needs between 3.5 to 4 million subscribers to make its DSL service business model work.[1] As of year-end 2003, that ILEC had just over 2 million DSL subscribers.

With Cable Multiple Systems Operators (MSOs) now targeting the voice-data-video 'Triple Play' in broadband services, incumbent service providers must look beyond basic Internet access, beyond the delivery of 'fat pipes', to stave off the

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competition, to achieve sustainable broadband profitability and to increase average revenue per user (ARPU) or – more importantly – average margin per user (AMPU). According to a recent Arthur D. Little (ADL) report, access fees accounted for approximately 90% of revenue earned from broadband users in 2002, while services like premium content represented just 3%.[2]

If service providers want to realize broadband's potential, they need to shake these numbers up. They need to move broadband services up the value chain.

With next generation network infrastructure largely in place and high-speed access penetration growing, now the broadband challenge is offering value-added services that leverage existing and emerging broadband access technologies – whether xDSL, fibre-to-the-anything (FTTx), Metro or Gigabit Ethernet (GigE), or even Wi-Fi or WiMAX innovations. The future of broadband is not merely Internet access. It's premium mass market consumer services such as ultra highspeed internet, online gaming, streaming audio, and broadcast high definition and interactive TV. It's business offerings such as video conferencing on-demand (VoD); Voice over IP (VoIP), Voice over DSL (VoDSL) or Voice over Broadband (VoBB) for IP Centrex or IP PBX connectivity; E-learning and application hosting. It's on-demand and pay-per-use services that attract new customers, expand markets and – perhaps more importantly – open new revenue streams for current subscribers, with relatively minimal incremental costs to the service provider.

Some of these value-added services are available today; others are well on their way. In the last 6 to 9 months PCCW (Hong Kong), France Telecom, and Italy's FastWeb SpA all announced TV programming over DSL. Telecom Italia is not far behind, saying it will do the same in 2004. SBC and other North American incumbent service providers have announced online gaming partnerships or offered special-event video broadcasts. Incumbent providers across Europe have teamed with broadband equipment manufacturers to offer their subscribers streaming audio and video gear, and the premium services that go with them.

However, for most service providers, the missing piece in the value-added broadband service puzzle remains cost-efficient operations to support the rapid introduction, profitable volume deployment and ongoing maintenance of these dynamic value-added service offerings and the quality of service (QoS) requirements that go along with them.

SERVICE DELIVERY CHALLENGES: A CLOSER LOOK AT DSL

To-date, most DSL-based service – what we'll call first generation or basic DSL – has been sold as best-effort, high-speed Internet access suitable for Web surfing, email and file downloads. For consumers, these flat-rate offerings are a step above dial-up service. For businesses, they are a cheaper alternative to private lines. Because many service providers initially

viewed DSL as an 'extension' of the existing infrastructure and service catalog, they applied traditional (i.e. PSTN) operations support system (OSS) concepts to DSL service fulfillment, employing a variety of pre-provisioning models (both network and service) to engineer the network and keep pace with demand for basic broadband access. Accordingly, equipment configurations adhere to templates, simplifying new device deployment. Physical and logical circuits, often from the DSLAM to the ISP/Core, are laid in advance of customer orders to minimize provisioning effort. Bandwidth is largely pre-allocated. Cross connects and service elements are in place as soon as equipment is commissioned. QoS is managed in the form of over-subscription factors.

Some service providers turned to automated, commercial – off – the - shelf (COTS) provisioning solutions for their DSL offerings. But, given the general static cookie cutter nature of first generation DSL services, a majority of providers relied on the pre-provisioning model. For basic DSL service, this has proven a viable delivery strategy for many service providers since most offer very few 'flavors' of basic service (thus virtually all subscribers are identical). Once in place, basic access service usually requires few, if any, changes as evidenced during DSL's initial rapid growth phase, when providers experienced much less churn than they do today.

Although network and service pre-provisioning certainly brings additional overhead (e.g. the cost of manually reconfiguring systems end-to-end to support 'exception services', the under-utilization of certain network resources due to 'standardized' configurations that don't accommodate varying traffic patterns, etc.), these costs were generally considered acceptable given pre-provisioning's ability to keep service fulfillment times relatively short.

As carriers look to a new generation of value-added broadband services, however, they must re-examine the service fulfillment strategies that have served well for basic DSL. Can these strategies stand the test of more dynamic service offerings that leverage much of the same access infrastructure? The introduction of value-added, on-demand and pay-per-use services such as Voice Telephony, Live Audio, Tele-networking, HiDefTV, Live Video, Video Telephony, and Online Gaming means that exception services will become the norm. One-size will no longer fit all subscribers nor all applications all the time.

With the emerging generation of broadband services, quality of service and class of service (QoS/CoS) requirements will be much more stringent and much more varied. Service changes may be frequent (e.g. to accommodate fluctuating bandwidth requirements), and in many cases services will be of limited duration (e.g. the time it takes to view a concert) while time-to-service will be critical. Meanwhile, requirements for new network features will likely increase as service catalogs expand and technology life cycles contract. Service providers are also hoping that the number of service orders will grow as individual subscribers take advantage of multiple service offerings.

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Dynamic Services Demand Dynamic Service Provisioning

With its array of premium content and interactive applications, the new world of DSL (indeed the new world of broadband at large) brings with it a host of service provisioning requirements that extend beyond many carriers' existing, static service delivery models. Relying on manual intervention or batch automation to handle the new 'exception majority' is not economically feasible. Nor is extending in-house one size fits all pre-provisioning solutions to meet the demands of next generation broadband services and the underlying network technology.

To realize the potential of next generation broadband-enabled services, providers need to evolve to a more dynamic service provisioning strategy – one which enables them to take full advantage of both existing feature-rich networks and emerging network technologies; one which can speed the rollout and delivery of value-added services and keep pace with their frequently changing service level requirements; and one which tightly contains operations costs, leveraging existing provisioning strategies while providing an alternative to 'throw manpower at it' expansion (and exception) strategies.

By leveraging the efficiencies of existing network pre-provisioning models (e.g. pre-configuration of physical network elements such as access devices, line cards, provider access points, etc.) while transforming the *service* provisioning performed on top of these elements, providers can redefine DSL's economics,

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SYNDESIS: A PARTNER IN EVOLUTION

Refined and proven in Tier 1 production deployments, Syndesis' award-winning broadband fulfillment solutions provide the flexible design, adaptable provisioning capabilities, and extensive network, topology and domain intelligence required by the new generation of value-added broadband services.

Proven Solutions to Differentiate Broadband

Syndesis' broadband fulfillment solutions make the introduction and management of value-added services not just economically feasible, but economically compelling. With Syndesis, service providers can rapidly and cost-effectively define, deliver and maintain differentiated broadband services and the infrastructure that supports them because the solutions:

> Centralize and automate service provisioning and activation across access and transport portions of multi-vendor, multi-technology networks, speeding time-to-service

> Dynamically manage QoS and CoS end-to-end to accommodate on-demand service changes and requests

> Ensure provisioning and activation accuracy with an up-to-date model of

the provider's network and services, significantly shrinking fallout rates

> Leverage bi-directional APIs to facilitate customer self-care and flow-through order processing, from order entry to billing activation

> Remove order desk/entry from the complexity of underlying services, technologies, and network equipment to streamline fulfillment and speed new service introduction

> Facilitate the recovery of lost or stranded assets, the correction of inaccurate subscriber billing, and the propagation of accurate network and service inventory throughout the OSS

> Automate the most frequently encountered broadband service migration and redistribution functions across a variety of architectures and topologies

> Provide the scalability and reliability necessary in an expanding and competitive marketplace

Service providers have instituted various provisioning models to handle first generation broadband services. They're relying on an assortment of network topologies and architectures to deliver those services. And they have a broad range of plans for new technology introduction to support service catalog expansion.

Whatever the operations starting point and whatever the network plans, Syndesis eases the migration to more dynamic service delivery models. Syndesis supports both pre-provisioned and dynamically managed network and service elements, in any combination, and provides the most extensive off-the-shelf support for evolving broadband architectures and service topologies. Syndesis' expansive library of network Equipment Modules – paired with the products' inherent service, technology, and equipment abstractions – means that new vendors, new equipment or features, and new service topologies can be introduced transparently, without affecting higher level functions such as order entry or provisioning.

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Syndesis' Award-Winning Broadband Solutions

Provider Challenge/Benefit	Feature	Description
Fully leverage existing & emerging equipment, technologies, and provisioning strategies. Carefully orchestrate network and operations evolution.	Extensive broadband architecture and service topology support	Syndesis offers off-the-shelf support for providers' evolving broadband architectures and service topologies. For DSL, this includes any combination of Layer 2 PVC Architectures; VP Grooming Architectures; Pre-Provisioning; and Hybrid (VP and PVC) Architectures. All Syndesis solutions provide end-to-end service visibility.
	Support for pre-provisioning, dynamic provisioning, and hybrid provisioning models	In addition to dynamically provisioning end-to-end service connections, Syndesis® NetProvision™ also supports network topologies that include both pre-provisioned and dynamic elements, in any combination.
	Multi-vendor support; service-level vendor neutrality	Syndesis offers the broadest range of off-the-shelf equipment support. Because Syndesis solutions abstract the service layer from the specifics of network topologies, technologies, and equipment, providers can introduce new vendors, equipment or network service topologies transparently, without affecting order entry and provisioning functions.
	Automated large-scale service migrations	Syndesis® NetOptimizer™ automates bulk service migrations within multi-vendor, multi-layer networks, speeding equipment upgrades and replacements, as well as vendor displacements.
Reduce OpEx and increase ARPU through cost-effective, rapid delivery of differentiated services.	Integrated multi-layer service control	Syndesis automates service discovery, provisioning, activation, and migration across multi-layer networks. Integrating and automating Layer 1, 2, and 3 control enables providers to consolidate time-consuming manual or partially automated fulfillment processes and centralize end-to-end QoS control.
	Accurate Network & Service Model	Syndesis' upload and service discovery capabilities provide an accurate network model as the basis for NetProvision and NetOptimizer service provisioning operations, dramatically reducing fallout rates and speeding service delivery.
	Bi-directional Flow - through Interface & Open APIs	NetProvision features open APIs and a bi-directional flow -through interface to ease integration with 3rd party OSS/BSS and facilitate fully automated service delivery.
	Support for multiple connections per subscriber	NetProvision allows providers to assign multiple connections, each with its own service characteristics (e.g. QoS), to individual subscribers, enabling providers to create and manage multiple revenue sources per subscriber.
	Service Profiles	NetProvision supports the creation of service profiles, allowing providers to introduce new services with minimal effort and minimal impact on upper level OSS.
Make the Net work better. Improve network utilization and better control CapEx.	Data reconciliation & Discrepancy Reporting	Syndesis® NetDiscover™ enables broadband providers to recover stranded assets and isolate revenue leakage by reconciling a near real-time network database against billing and inventory systems.
	Automated service migrations and grooming operations	NetOptimizer manages and automates service migrations and grooming operations (e.g., performing PVC-to-SPVC migrations, re-homing DSLAMs, executing mass service upgrades, etc.) within tight maintenance windows, reducing strain on network resources and relieving areas of congestion or under utilization.
	Dynamic service provisioning	NetProvision's automated service provisioning enables painless evolution from often over-engineered, pre-provisioned networks to a more cost-effective service delivery models which allocate bandwidth and effect service changes dynamically, in support of on-demand service requests.

Completing the Package

Successful OSS projects depend on more than superior products and the latest technologies. They also depend on skilled people and mature processes. Syndesis offers both.

Our Global Services Team provides Syndesis customers and partners around the globe with the resources to successfully implement and operate carrier-class broadband service provisioning, reconciliation and network optimization solutions. Through an array of consulting, education and support offerings, Syndesis Global Services ensures that carriers enjoy improved productivity and efficiency, meet their evolving business and operational objectives, and convert their investment in Syndesis products into to continued measurable returns. By fostering carrier independence and flexibility, our Global Services team enables carriers to realize greater value not only from their Syndesis broadband solutions, but from their most important assets – their people and their networks.

REDEFINING BROADBAND ECONOMICS

With Syndesis as an integral part of their next-generation service fulfillment architectures, top-tier communications providers like Telecom Italia, Qwest, Swisscom and others are smoothing the migration to more dynamic delivery models while breathing new life into broadband business plans. They're increasing customer touch points (and revenue streams) with the rapid introduction of enhanced service offerings.

They're shrinking service delivery times and delivery costs while extending subscriber loyalty. They're gaining greater control over existing infrastructure while taking advantage of innovative technologies and new service capabilities.

With Syndesis OSS solutions, leading service providers are moving with confidence into the new world of broadband, redefining service fulfillment economics for the next generation in value-added broadband services.

Footnotes

[1] *Wall Street Journal*, 13 March 2003.

[2] "ISPs Face B'band Struggle" *Boardwatch* 13 November 2003. According to the ADL report, equipment sales and rentals accounted for the remaining 7% of broadband revenues in 2002. ADL's projections for 2003 show some increase in the percentage of content revenues, up to 7% from 3%.

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