



Integrated IP DSL Solution

Lower Your Infrastructure Costs and Improve Your Bottom Line

The deployment of high-speed broadband access networks today comes with the expectation of delivering profitable services over those connections. Leveraging IP (Internet Protocol) transport and services in your network can increase the number of revenue-generating services for your customers while at the same time lowering infrastructure costs. This a double-edged sword to use to your advantage in the battle to blacken the bottom line. The access networks of tomorrow will require multiple revenue streams from each broadband connection and the convenience of one-stop shopping to maintain customer loyalty.

In the move to the converged network paradigm, the growth potential for delivering new services over old infrastructure is great. IDC forecasts IP Services to be a \$25 billion service provider opportunity by 2004. And 84% of large enterprises are expected to utilize VPNs by 2005 (Infonetics Network Technology Adoption Forecast, 2001). Not to mention the delivery of bandwidth intensive video services such as broadcast TV or entertainment on demand. Such services are expected to achieve a growth rate of over 300% per year through 2003, followed by 100% growth through 2005 (Cahners In-Stat Group).

Lucent Technologies has the solutions to successfully deploy the Digital Subscriber Line (DSL) access networks of tomorrow. These solutions cut the cost of building out networks and make it easier for carriers to provide new IP services to subscribers.



The Lucent IP DSL solution is based on the high-capacity Stinger DSL access concentrator.

Deliver New Services Quickly and Cost-Effectively



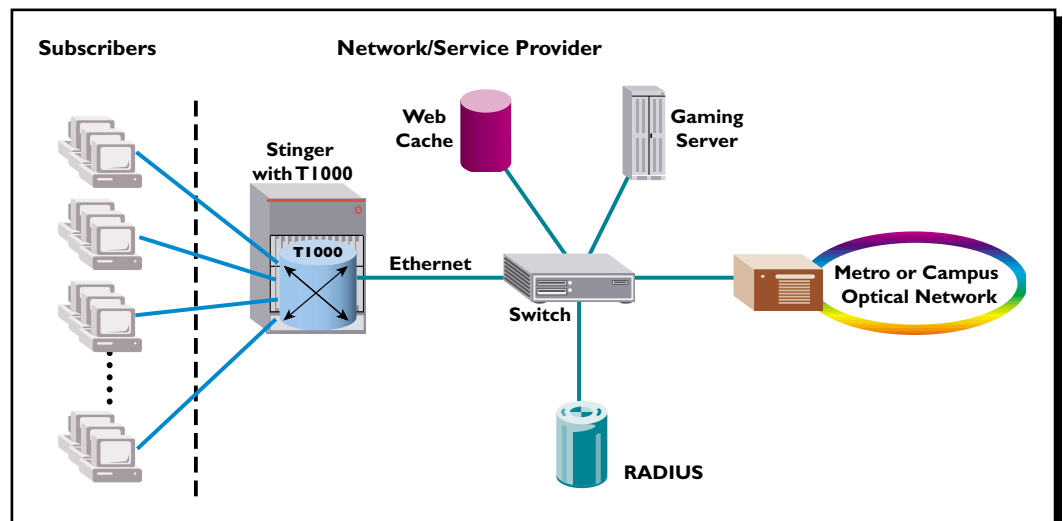
The Stinger LS with modular design for flexibility and scalability.

The Lucent integrated IP DSL solution is based on the Stinger® DSL access concentrator and utilizes the new T1000 IP services module. This carrier-class architecture enables deployment of DSL directly in IP or Asynchronous Transfer Mode (ATM) networks, or a combination of both (see Figure 1). This is a distinct advantage over typical DSL access systems designed only for ATM networks. The build out of IP networks can be significantly less complex and costly than developing ATM infrastructure. Deploying DSL into an IP infrastructure can be a distinct advantage in newly developed or newly serviced areas. Integrated IP capability therefore enables carriers to deliver broadband access to more customers more quickly and at lower costs than previously possible.

Beyond the cost benefits, the advantages to be derived from IP intelligence at the network edge from a network design perspective are many, including:

- Simplified subscriber (VC) management
- Reduced number of network elements
- Better utilization of WAN links via edge routing
- Improved network robustness with distributed routing
- Increased network security
- Decreased WAN load through traffic localization

Figure 1. IP Back Haul, Local Hosting



Direct 10/100 Ethernet network interfaces off Stinger can be utilized to support low cost IP infrastructure for back haul. In addition, value-added applications and services such as web caching and gaming can be easily co-located with the Stinger.

The New T1000 IP Services Module

The T1000 enables distributed subscriber management functionality directly in Stinger through the termination and aggregation of PVCs and PPP sessions. This broadband remote access server (BRAS) functionality substantially reduces the number of circuits that must be managed in the network—thus simplifying provisioning and lowering deployment costs (see Figure 2). The distribution of the BRAS function to the edge can also consolidate the number of devices in the overall network deployment.

In support of IP-based infrastructures, the Stinger IP DSL solution offers optional dual 10/100 Ethernet ports for connection to the carrier network. The two 10/100 Ethernet network interfaces each operate as independent router ports and provide an option to ATM network backhaul. The Ethernet ports can also be leveraged for use as a low cost means of hosting application services local to the Stinger. For pure ATM networks, the Ethernet networks need not be utilized in which case the T1000 operates as a one-armed router within Stinger.

The T1000 provides IP edge routing functionality to enable increased intelligence in handling broadband subscriber traffic, whether directed over ATM or IP networks. By analyzing, aggregating, and routing traffic at the point of entry into the access network, IP packets can be sent along optimal paths, potentially reducing network congestion. The distribution of routing functionality also improves the overall robustness of networks by lowering reliance on more costly, centralized routing devices.

Added Value at the Network Edge

The addition of IP intelligence at the network edge provides the means to add additional value before the traffic hits the carrier network. By use of RADIUS for user configuration, subscribers can be authenticated at the edge of the network, increasing security and decreasing backbone traffic. Optional VPN functionality supported by the Stinger IP DSL solution enables broadband wholesaling services to be deployed (see Figure 3). Secure environments and subscriber connections can be maintained to multiple service providers. Value add functionality such as business-class VPNs can be delivered with the solution in conjunction with the Lucent SpringTide® IP services platform.

Stinger IP DSL Solution

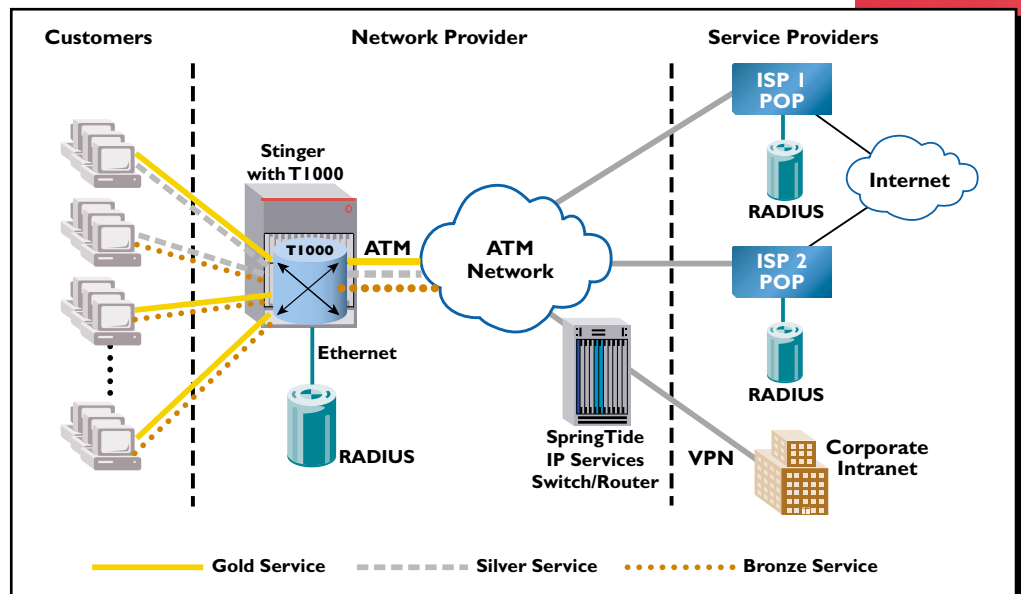
Key Applications:

- DSL Traffic Aggregation
- DSL Wholesaling
- IP Network Backhaul
- Local Application Hosting

Key Benefits:

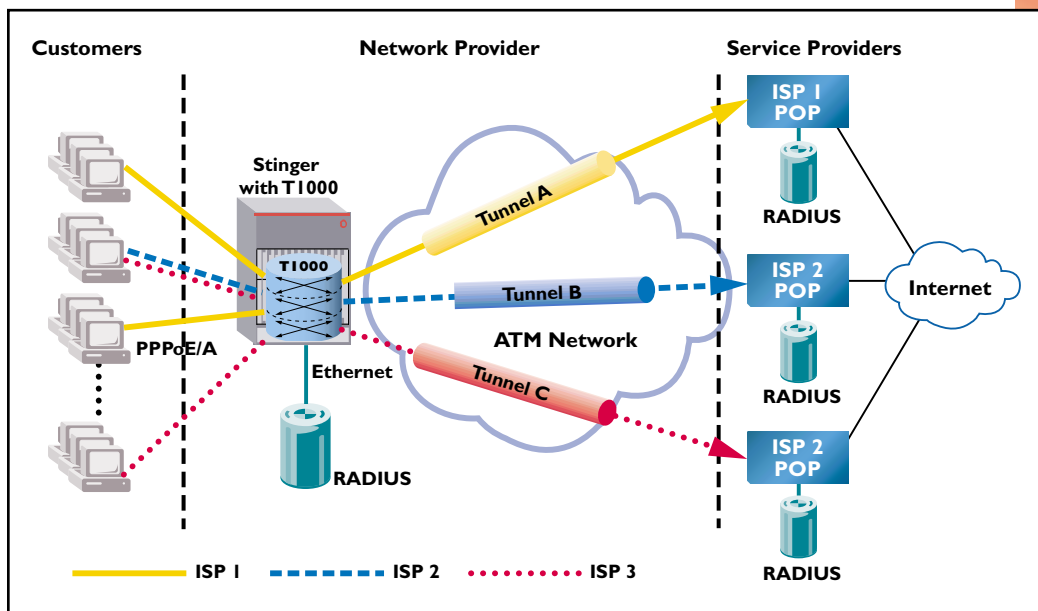
- Increased flexibility
- Cost effective—Saves money and time
- Leverages both IP and ATM networks
- Lower recurring backhaul costs
- Quick turn-up of revenue-generating Next Generation services

Figure 2. DSL Traffic Aggregation



DSL traffic is aggregated at the network edge by terminating subscriber sessions in the Stinger and combining the traffic from hundreds of users into a few, more easily manageable circuits. New subscribers map to pre-existing Virtual Circuits (VCs) through the network, thereby alleviating VC scalability issues and lowering provisioning costs.

Figure 3. DSL Wholesaling



In the wholesaling model, the network provider can aggregate subscribers to multiple service providers by way of dedicated VPN tunnels. Virtual routing provides separation of control and resources along the backbone network.

Integrated IP DSL Solution for Increased Flexibility

The new Lucent integrated IP DSL solution brings carriers to the leading edge in delivering broadband services in today's challenging marketplace. New options for infrastructure build out and advanced subscriber management provide carriers the ability to optimize the design of their DSL networks to fit their specific needs.

The integration of IP functionality at the network edge gives service providers much more flexibility than other ATM-only DSL solutions in the market today. The solution helps lower recurring backhaul costs by reducing or removing the reliance on an ATM network. Non-recurring costs may be lowered as well by reducing the number of elements that must be deployed, serviced and managed in the network.

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