Service Intelligent™ Architecture for Wireline Networks

Deliver the advanced, bundled services customers want – profitably.

Lucent's unique vision for Service Intelligent™ Architecture helps service providers optimize existing networks by reusing their embedded infrastructure and selectively adding systems when and where they're needed to offer new services. This approach helps generate profitable, new revenues. At the same time, it lowers capital and operational expenses and simplifies network operations.

This white paper addresses:

- Overcoming the challenges facing service providers today
- The benefits of Lucent's Service Intelligent™ Architecture
- Opportunities for serving enterprise customers
- The layers and strategic areas of focus of Service Intelligent™ Architecture

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Abstract

The communications marketplace has undergone dramatic changes recently, resulting in an extremely challenging environment for service providers. Many start-up companies have faltered because of huge debt burdens. While incumbents have regained market share, they are facing tight profit margins. At the same time, they need to create new revenue streams and reduce costs to enhance their bottom lines.

Wireline and wireless subscribers are demanding a wide array of innovative services at reasonable prices, as well as traditional voice services at lower prices. Also at issue is the dilemma of data traffic growing more rapidly than data revenues. Service providers face a difficult business problem—how to deliver the services customers want while becoming more profitable.

As the only network solutions company focused exclusively on the success of service providers, Lucent Technologies has leveraged its experience and wide-ranging skills in the areas of R&D, networking solutions, and customer service and support to develop Service Intelligent™ Architecture—a vision for an integrated, flexible, service-rich network, and a strategy for carriers to manage and evolve their networks to increase profitability. This paper provides an overview of Lucent's Service Intelligent™ Architecture for wireline networks and the corresponding benefits for service providers and their customers.

Introduction

In today's challenging economy, businesses of all types are intently focused on lowering costs while trying to increase revenues and profits by boosting sales to existing subscribers and attracting new ones. The telecommunications market has been particularly affected, and service providers face unprecedented challenges. They must create innovative offerings for enterprises and consumers, continue delivering the highest quality service, hold down capital and operational expense, and simplify operations.

Conventional wisdom in the communications industry suggests that deploying new services nearly always calls for substantial, additional investments. It is especially difficult to get new, profitable services to market quickly because network complexity can drive up operating costs and slow down the development process. These conditions demand a different network approach that delivers immediate tangible benefits.

Lucent's Service Intelligent™ Architecture enables carriers to intelligently reuse network assets to tap the strengths of existing infrastructures, and seamlessly transform them into networks that can offer unique, customized experiences for businesses and end users. At the same time, Service Intelligent™ Architecture eases the financial burden on capital budgets for service providers: investments become incremental, instead of monumental.

The market for enterprise customers is highly competitive. The convergence of voice and data services has attracted many networking competitors. Deregulation has resulted in more participants in the industry, many of which seek to portray incumbent firms simply as providers of commodity voice transport.

Service Intelligent™ Architecture allows service providers to create new value for lucrative enterprise customers, leading to increased revenues, higher margins and deepened relationships. While enterprises want to hold down communications costs, their primary goals are to increase their own profitability and customer satisfaction. A service provider whose network can dynamically and reliably deliver new services or applications that support these goals will give enterprises the confidence to outsource larger portions of their IT budgets.

Those service providers will have moved significantly beyond providing so-called "commodity" services, to easily and rapidly creating customized offerings that meet enterprise customers' unique and changing requirements and let them concentrate on their core businesses. Service intelligence in a carrier's network lets enterprises keep control without having to do everything in-house. For the service provider, a network with Service Intelligent™ Architecture lets it widely deliver "mass-customizable" services to a broad range of enterprises with unique needs.

Enterprises know their businesses best, and service providers know more about communications and networking. Service Intelligent™ Architecture helps create stronger, more strategic partnerships between service providers and enterprise customers by holding down costs and improving business results for both.

As service intelligence becomes integrated throughout the network, a service provider can market a new wave of innovative, customized services and applications to other customers, including small and medium-sized businesses, small office/home office (SOHO) customers, and even consumers.

Lucent takes the vision of a flexible network to a new level where it recognizes individual users—regardless of how, when or where they access the network—and dynamically allocates the resources they require. Features like simple, self-directed provisioning are not only cost effective, but also flexible enough to let service providers roll out new services on a trial basis and scale them up rapidly. It's all part of Lucent's Service Intelligent™ Architecture vision.

"The advantages of Service Intelligent™ Architecture are especially important for service providers' relationships with enterprise customers. The classic '80/20' rule of business suggests that 80% of a firm's revenue comes from 20% of its customers, and in the case of service providers, those key customers generating the majority of revenue are enterprises."

Layered Intelligence

Service Intelligent™ Architecture leverages a carrier's existing network and capabilities, embedding intelligence or service "awareness" throughout the network. Instead of relegating intelligence to the edges of the network with "dumb" boxes at the core, Service Intelligence™ enables intelligent connections in and between the three primary network layers—the Network Transport layer, the Service Control layer and the Application layer.

Providing open interfaces allows for in-house and third party innovation, helping service providers to dynamically allocate resources to support new services. It also delivers these services over a set of highly reliable network elements that scale as carriers deploy a growing number of offerings.

The three primary layers in the Lucent Service Intelligent™ Architecture perform specific yet integrated functions. The Network Transport layer is the "network highway," moving traffic onto and across the network in a fast, efficient and reliable manner. This layer consists of the Core, Access and Metropolitan area (Metro) networks.

The Service Control layer assembles the right resources for users, such as telephony end points and VPNs. It serves as a traffic director, deciding how to best respond to requests, apply resources, and mediate the network to meet customer needs. The layer accomplishes this via intelligent signal requests for resources, for management of telephony endpoints, and the creation of network communities of interest, or VPNs.

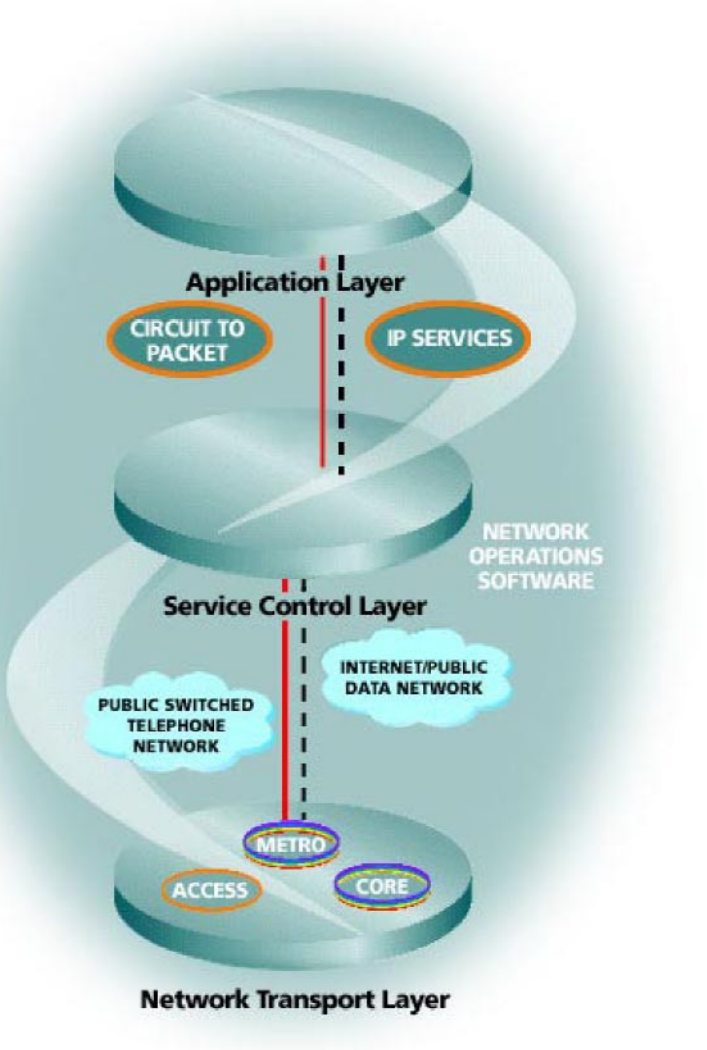
The Application layer provides the open interfaces that enable the in-house and third party innovation referenced above for a plethora of new voice and data applications, including customer self-provisioning.

Making networks more intelligent, efficient and reactive ensures that the layers work in harmony within the entire infrastructure. Service Intelligent™ Architecture makes service providers more agile, enabling them to rapidly prototype different service combinations tailored to different market segments. They can define new applications and services in the policy system, deploy them, scale them and have them follow end users, whatever their access technology and wherever they may be. This is analogous to a "virtual assembly line" on a massive scale.

Understanding Service Intelligent™ Architecture

The Six Strategic Areas

- **Access:** Scales last mile/km on-ramp solutions to the Service Intelligent™ network.
- **Metro:** Bursts the metro networking bottleneck by efficiently unlocking capacity for services.
- **Core:** Provides more capacity, speed, reliability and flexibility in transporting services at lower operations expense, while evolving to all-optical core.
- **Network Operations:** Provides unified network management for end-to-end provisioning, monitoring, and fault management.
- **C2P™ Convergence:** Adds new service capabilities and efficiencies to PSTN through open packet technology, new service enhancement and cost reduction.
- **IP Services:** Delivers value-added, customized services, such as VPNs, Managed VPNs, Managed Security.



Service Intelligent™ Architecture

"Lucent understands how to help service providers transform the vision of 'service intelligence' into real world results, starting now. Lucent's Service Intelligent™ Architecture lets service providers creatively reuse their embedded infrastructure and selectively add to it to offer new revenue-generating services their customers want. This helps increase profits, lower capital and operational expenses and simplify network operations."

Service Intelligent™ Architecture in Action

Lucent's Service Intelligent™ Architecture is a holistic vision that encompasses a service provider's entire wireline network and focuses on the key elements essential for differentiating services and increasing profitability.

There are six strategic areas within the three layers that play integral roles in Service Intelligent™ Architecture for wireline networks.

Service Intelligent™ Access

One of Service Intelligent™ Architecture's key strengths is its ability to leverage existing and emerging access technologies, instantly recognizing end users, and automatically authenticating the type of network access method they're using.

As businesses and consumers move toward untethered data services, Service Intelligent™ Architecture will ensure that all users—from employees in traditional offices, to mobile professionals, to teleworkers—are connected reliably, flexibly and with the highest quality. They can be part of a single network, with each individual having access to the timely information and resources they need to enhance employee morale and boost productivity and profitability.

Service Intelligent™ Metro Optical Network

Most service providers have surplus bandwidth in their core networks. However, with escalating demands for increased bandwidth, some are beginning to experience the dilemma of fiber exhaust. Lucent helps solve this problem by using dense wave multiplexing technology to increase the bandwidth available on existing fibers, allowing service providers to deploy services when and where they're required.

Lucent can also help carriers package bandwidth in innovative ways. For example, service providers can offer Gigabit Ethernet services in metropolitan areas to allow firms with multiple locations to communicate as if they were in one location. Also, Service Intelligent™ Architecture can facilitate a disaster recovery plan that permits users to continuously back up critical data on the network, store it there, and instantly access it in the event that one or more locations are affected.

In addition to unlocking the required capacity in metropolitan areas, satisfying the growing need for geographic dispersal, and providing added service continuity, Gigabit Ethernet services easily and flexibly provide bandwidth on demand. This can enable ad hoc videoconferencing between locations, and an array of other innovative new services that can generate lucrative new revenue streams.

Service Intelligent™ Core Network

By making the optical core more intelligent and the entire network more aware of all the other network elements, Service Intelligent™ Architecture helps service providers bring new services to market faster and more cost effectively. Instead of tens or hundreds of provisioning steps, a network based on service intelligence requires as few as two—one at either end of the network. The network itself finds the path that satisfies the required optical transfer.

Lucent provides some of the highest capacity, long haul optical systems available today. Also, Lucent's multiservice core switching solutions offer graceful migration from Frame Relay and ATM to MPLS, allowing service providers to rapidly deploy emerging business-quality IP services. Lucent's vision of Service Intelligent™ Architecture significantly reduces costs with smaller footprints that decrease space requirements and allow less power consumption. In addition, this vision simplifies operations, increases flexibility and functionality and helps reduce operating and equipment costs and complexity.

Service Intelligent™ Operations Software

Up to 70% of a service provider's costs can be associated with operating and managing networks. Lucent provides a unified approach, cross-connecting Frame Relay and IP service switches, virtual routers and gateways, allowing service providers to manage all elements in a consistent, more efficient and cost-effective manner. Service providers also need to provision services, end-to-end, consistently; to manage the integrity of those services; and to communicate that integrity back to customers.

Network operations play a key role in distributing intelligence, and service intelligence is critical here too. Lucent's Service Intelligent™ Architecture follows an integrated, role-based model that matches the way networks are managed with a network-wide view that gives carriers total visibility into resource utilization, network integrity, and service quality. This approach requires less customer interaction because enterprises can do the provisioning via Web portals and interfaces. This powerful capability saves time and labor costs associated with implementing these simple tasks for both enterprise customers and service providers.

Service Intelligent™ C2P™ Convergence Solutions

Lucent understands the large investment service providers have made in the PSTN infrastructure. Lucent's Service Intelligent™ Architecture protects and leverages that investment by adding packet where and when it's needed, so further investments are clearly linked to market demand. Service intelligence provided by Lucent can reduce the cost of running networks with Internet Call Diversion (ICD), Packet Trunks and the Lucent Softswitch that provides open, programmable interfaces that let service providers rapidly create and deploy innovative services.

Lucent continues to evolve the 5ESS® Switch to meet carriers' changing needs. Service Intelligent™ Architecture can help minimize the cost of ownership, increase capacity and density, lower power consumption and provide new network interfaces to support network evolution.

Circuit switches deliver a strong business case for traditional services, but the demand for multimedia services that can only be delivered via softswitch architecture is soaring. The Lucent Softswitch provides the bridge to deliver converged voice and enhanced data services quickly and profitably.

With service intelligence throughout the network, a carrier can migrate to packet while still generating revenue. Next generation voice services like IP Centrex, Virtual IP Call Centers, Voice over cable, and Unified Messaging can be delivered with high margins for subscriber growth and retention.

Service Intelligent™ IP Services

Nearly every industry study points out that the fastest growing opportunities lie in data services for businesses. Lucent's Service Intelligent™ Architecture helps service providers extend and enhance the portfolio they're offering today, creating significant new revenue-generating opportunities in the process.

For example, IP VPNs help service providers introduce bundled services to corporations, small and medium-sized businesses, SOHOs, and even consumers. These services include content creation, content management, intranet and extranet hosting and security services, as well as packet telephony services. Headquarters and branch office staff, mobile workers—all can have the access they require, when and where they need it, via IP services based on service intelligence.

To highlight another benefit of Lucent's Service Intelligent™ Architecture, service providers using Lucent virtual routers and directories can allow customers to provision services themselves. Clearly this provides significant benefits—including speed, flexibility and cost control—for carriers and their enterprise customers. Service providers can offer small business applications—such as accounting packages and upgradeable applications—over their networks, quickly and easily, creating additional value and generating greater revenue.

Market Opportunities

While it's difficult to predict the next "killer application," Lucent's Service Intelligent™ Architecture today supports Gigabit Ethernet in the metropolitan area, IP VPNs, and packet telephony services—all of which have strong market demand. The market for IP VPNs, for example, is expected to reach almost $24 billion by 2005, according to Cahners In-Stat Group[1]. IDC says the VoIP market will reach $23.7B by 2005.

1 "Telecom Service Revenues in the U.S and Worldwide—Changing the Mix" Cahners In-Stat Group, Sept. 2001

But that's only the beginning. Other areas include content management, storage area networking, bundled virus checking, firewall management and encryption management. Again, all are available today. Cahners predicts content hosting alone to be a $27.8 billion market opportunity by 2005.

In the consumer world, service intelligence helps service providers offer content, or even become a broker for that content. Many industry experts think video-on-demand and online gaming services tailored to individual consumers will generate high demand. The Yankee Group believes that the market for VOD will grow to $1.98 billion by year-end 2005. Some analysts believe that virtual reality gaming will ignite the consumer market. Others talk about the convergence of digital appliances in the entertainment center as a means of delivering new value added services. However the pendulum swings, the flexibility of Service Intelligent™ Architecture positions carriers to seize the most promising opportunities.

Conclusion

Service Intelligent™ Architecture is Lucent's vision for helping service providers optimize their networks and their profitability. It intelligently reuses service providers' existing network assets as they plan for future investments and deliver new, high revenue services to businesses and consumers today.

A service provider whose network can dynamically and reliably deliver new, individually customized services or applications will give enterprises the confidence to outsource increasingly larger portions of their IT budgets.

Service Intelligent™ Architecture helps service providers:

- Rapidly create and provision new services over highly reliable infrastructure
- Customize services on a massive scale, enabling enterprise outsourcing
- Manage networks and services more efficiently
- Provide lower-cost solutions that optimize existing infrastructure investment.

For service providers' customers, service intelligence from Lucent offers a rich set of easy-to-use services:

- High quality services, like IP VPNs, tailored to the needs of enterprises
- Services available wherever, whenever and however an individual connects
- Lower cost, less labor-intensive and strategically beneficial IT outsourcing alternatives that let enterprises focus on their core businesses
- Self-service for customer choice

In summary, Service Intelligent™ Architecture is Lucent's vision for integrated, flexible, service-rich and profitable service provider networks, and it is achieved (or delivered) through six strategic areas of the network:

- Access
- Metro
- Core
- Network Operations
- C2P™ Convergence
- IP Services

To learn more about our comprehensive portfolio, please contact your Lucent Technologies Sales Representative or visit our web site at www.lucent.com/sia.

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