

Triple Play Service Delivery Architecture



Transform networks to realize profitable, mass market delivery of blended voice, video and data services, providing a superior experience — anytime, anywhere.



The increase in demand for new bandwidth intensive triple play services like IPTV, video on demand, enhanced high-speed Internet, blended IP multimedia services and voice over IP (VoIP) represent a significant revenue growth opportunity for operators. Triple play services require a network that is scalable to deliver these services to the mass market; reliable, to provide the optimal quality of experience for the subscriber; and flexible, to adapt to service changes and new service opportunities. The Alcatel-Lucent Triple Play Service Delivery Architecture (TPSDA) is designed to allow you to quickly and efficiently respond to changes in bandwidth demands and service needs ensuring that you can meet the requirements of a triple play world now and into the future.



Delivering Profitable Triple Play Services to the Mass Market

Adding new triple play services to the service bundle has compelled many operators to rethink their network infrastructures. Traditional IP networks were designed for best-effort, high-speed Internet services and applications. While best-effort service works well for non-real-time data transfers like e-mail, delivering profitable triple play services that include real-time applications such as streaming video and voice services to the mass market will require a more scalable, reliable and quality of service enabled network foundation. IPTV service providers need

additional service capacity improvements due to the competitive requirements for multi-room and high definition service. Only a next generation network will enable cost effective service delivery while guaranteeing the quality of experience (QoE) subscribers are expecting.

The Alcatel-Lucent TPSDA meets all triple play requirements and provides you with a comprehensive network solution that will transform your business for triple play services now and into the future.



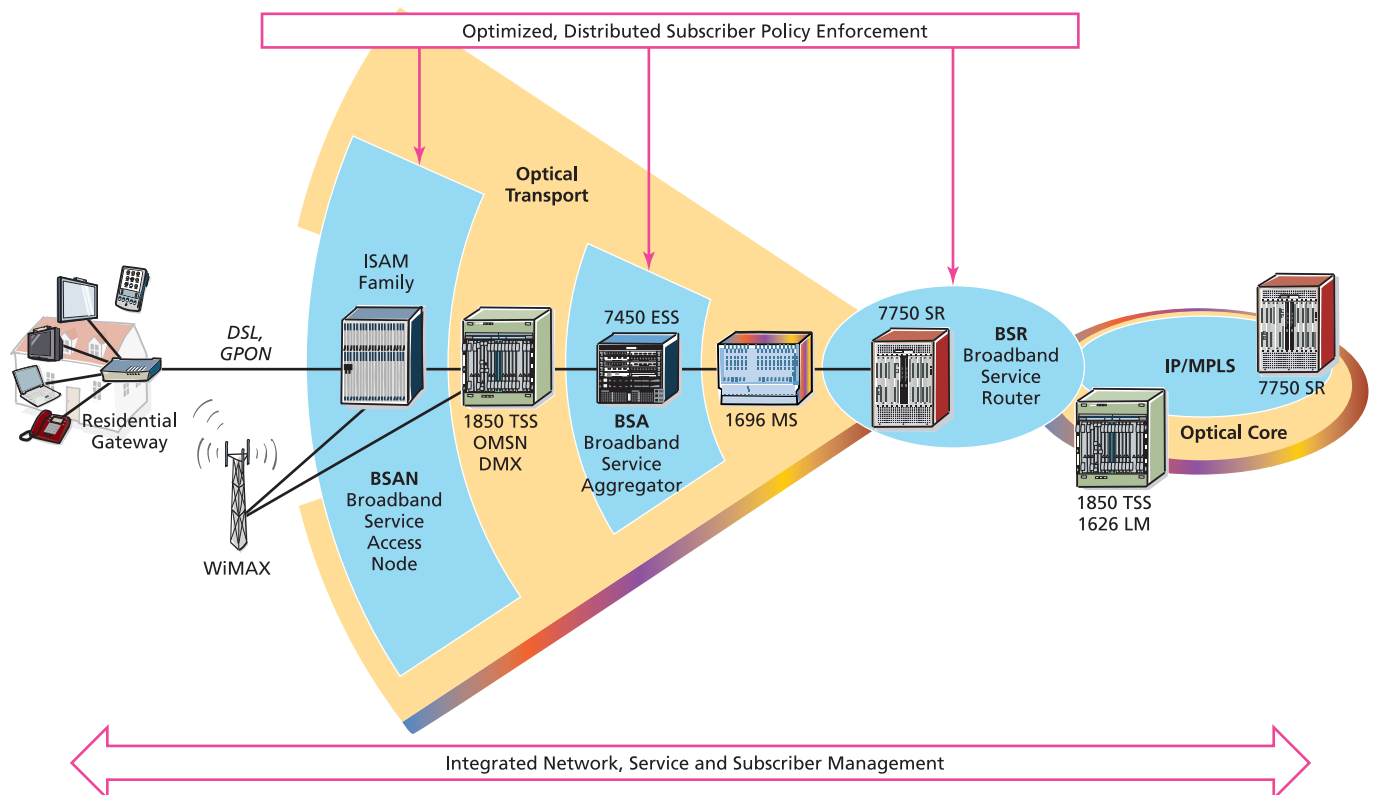
Transform Your Network with TPSDA

With more than 40 deployments worldwide, the Alcatel-Lucent TPSDA is a proven IP-based network reference architecture specifically designed to address the scalability, reliability and flexibility challenges you face in the delivery of quality voice, video and data services to your customers. The TPSDA enables you to engage strategically in the IP transformation process with a purpose-built, next generation network foundation that leverages access, optics, Carrier-Ethernet and IP technologies and couples them with robust management and security capabilities to deliver a seamless user experience (Figure 1).

The Alcatel-Lucent TPSDA is based on a comprehensive product portfolio specifically developed to meet the requirements for a next generation triple play infrastructure (see Table 1). It addresses the fundamental challenges of optimizing performance and cost with distributed functionality, allowing each device to optimize its role in the network to meet individual service needs. This distribution is balanced by central administration and control capabilities to guarantee superior QoE end-to-end, in a cost-effective manner.

Optimized for any delivery method (copper, fiber or wireless), the TPSDA portfolio is built to simultaneously ensure the delivery of today's profitable services and provide the flexibility for future service growth and innovation.

Figure 1. The Alcatel-Lucent Triple Play Service Delivery Architecture



“As triple-play service bundles are still in the early stages of deployment, service providers are making critical investments in network infrastructure to prepare for long-term growth in subscriber demand...[Alcatel-Lucent] demonstrates its operational experience from early TPSDA deployments by developing important new product capabilities that will help its expanding customer base meet subscriber demand and improve the user experience.”

YANKEE GROUP

Table 1. TPSDA Components

ICON	ROLE
 RG	Residential Gateways (RGs): RGs are the demarcation devices between the home network and the operator network. They combine a broadband access termination function with an integrated router and firewall, voice over IP (VoIP) gateway and wireless LAN access capabilities. RGs enable the connecting of home computers, TV set-top boxes, and existing POTS/ISDN “black phones,” as well as IP “hard phones” and IP “soft phones.”
 BSAN	Broadband Service Access Node (BSAN): BSAN refers to a new generation of access devices that leverages the economies and versatility of IP/Ethernet switching and employs DSL technologies and FTTx technologies (such as Gigabit passive optical networking (GPON)) to create deep fiber access networks. The TPSDA includes IP layer functions to optimize the quality, security and cost-effectiveness of the overall architecture. The Alcatel-Lucent Intelligent Services Access Manager (ISAM) portfolio is designed to support the role of the BSAN.
 BSA	Broadband Service Aggregator (BSA): The BSA is a new type of network element that combines the strengths of Ethernet and MPLS technologies to enable virtual private LAN services (VPLS). The BSA supports subscriber access control functions and optimizes quality and efficiency in IP service transport over Ethernet for both IP unicast and multicast traffic. The BSA has IP service awareness and support functions. The Alcatel-Lucent 7450 Ethernet Service Switch is designed to support the role of the BSA.
 BSR	Broadband Service Router (BSR): The BSR acts as the converged IP service edge and performs IP routing functions. The BSR uses a unified mode of operation based on IP over Ethernet and DHCP to deliver services and obtain IP addresses on behalf of the subscriber or user device. The BSA and BSR work together as a virtual node that functionally replaces the BRAS and associated ATM-based aggregation nodes in legacy IP service infrastructures. The Alcatel-Lucent 7750 Service Router is designed to support the role of the BSR.
 OPTICAL TRANSPORT	Optical Transport: Data-aware multiservice provisioning platforms and wavelength division multiplexing (WDM) platforms aggregate multiple services to cost-effectively connect the BSA with the BSAN and enable a smooth evolution to all packet transport. The Alcatel-Lucent OMSN and DMX are SDH and SONET multiservice provisioning platforms while the 1850 TSS is a hybrid packet/TDM/WDM transport service switch. The Alcatel-Lucent 1696 MS and 1626 LM are metro and core WDM transport platforms.

Accommodating Massive Growth

A key challenge is to build an infrastructure that is optimized for today's offering and that can scale for future subscriber and service growth. The TPSDA addresses multi-dimensional scaling needs on an end-to-end basis. It alleviates scaling issues for bandwidth-intensive services and allows you to better optimize the network for future service innovations by distributing the functionality and intelligence between the nodes in the network. This provides the opportunity to "right-size" your investment over time to optimize capital expenditure investments as your network evolves.

BANDWIDTH SCALING

To support video services, the architecture must be optimized for sustained high bandwidth demand, and it must scale cost effectively from a basic broadcast TV service offering to a mass-market uptake of video on demand (VoD) and Internet video.

The TPSDA incorporates the flexibility to optimize for broadcast TV service now, and still scale bandwidth levels to support a full unicast model such as VoD at high concurrency levels.

Broadcast TV is optimized by replicating the video channels in the network as close as possible to the viewer. This increases the efficiency of the network by reducing the bandwidth and fiber requirements for delivering broadcast channels to the subscriber.

As video services mature, a higher percentage of unicast traffic will flow into the network, creating a greater bandwidth demand. The TPSDA can efficiently scale to offer the required capacity and enables geographic distribution of video content servers to minimize the transport cost of video traffic. The first mile provides high bandwidth capacity with the use of fiber in the access network and new technologies like VDSL2 and GPON. The aggregation network can be scaled to hundreds of Gigabit Ethernet ports per node, supported by an underlying optical infrastructure that allows incremental growth of the network up to Terabit/s capacity per optical fiber.

SERVICE PRIORITIZATION AND CONTROL

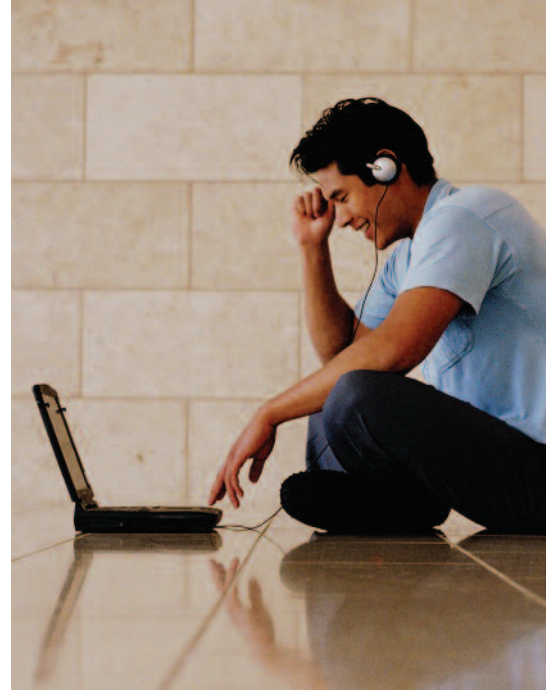
End users do not have the same expectations for all services. VoIP, broadcast TV, VoD and high-speed Internet traffic have different quality of service (QoS) and bandwidth demands and must be treated accordingly. The TPSDA allows you to allocate a bandwidth budget and/or priority to each subscriber and each service category, which enables you to provide premium quality services to end users in a cost-optimized way. The TPSDA supports this capability by distributing policy enforcement functions, such as traffic management, filtering and accounting functions, in the end-to-end service path.

The TPSDA supports hierarchical QoS in which VoIP has the highest priority, then video services, followed by the various quality grades of high-speed Internet traffic. Unused bandwidth dedicated to a higher order service class will automatically become available for lower classes of service, thus optimizing resource utilization. When a higher priority service class needs more bandwidth than budgeted, it can pre-empt bandwidth of lower priority services to optimize revenue.

To make sure the proper bandwidth is allocated to each user, the TPSDA features a centralized service and subscriber management system that enforces control over network resources. This enables subscriber access to the network and ensures users receive the appropriate QoS, based on the applications they are using.

Providing a Superior Quality of Experience

The foundation for a successful triple play offering is to ensure a flawless user experience by enabling people to do what they want — watch, play, talk, listen — whenever they want. When it comes to video and audio services, end users have very high expectations and very low tolerance for anything but a positive experience. Assuring a superior QoE to the end user is not just a matter of bandwidth. The TPSDA includes the functionalities and provides the tools to help you ensure customer satisfaction and loyalty.



NON-STOP SERVICE DELIVERY

The Alcatel-Lucent TPSDA provides a highly available infrastructure foundation. One of its foremost differentiators is its ability to deliver non-stop routing and non-stop services by reducing the risk of service outages due to node or link failure.

The underlying TPSDA products meet and exceed the most stringent reliability demands of operators, with hardware and software architectures designed for maximum uptime. All Alcatel-Lucent platforms in the TPSDA are fully redundant platforms with no single point of failure. At the network level, rapid protection and restoration mechanisms are implemented at the photonic, Ethernet and IP layer providing a sub-50 millisecond recovery time. The TPSDA also enables a dual homing of the access node to the aggregation network with zero impact to end users and their services in the event of the access link or aggregation node failing.

ASSURED & OPTIMIZED IP VIDEO DELIVERY

TPSDA provides a foundation for IPTV operators to deliver superior video quality, with greater personalization and interactivity. The enhancements to TPSDA have multiple benefits that include:

- a more cost-effective and flexible platform for high bandwidth services such as HDTV
- an improved user experience — with immediate channel changing and more reliable TV service
- the ability to insert into TV programs advertisements that are targeted to specific communities or localities, in turn enabling the development of a new TV advertising business model

The enhancements add application layer intelligence to the TPSDA network elements enabling them to cache, store, stream and splice video content as well as to characterize application layer content. As a result, the triple play operator is able to deliver a better TV experience, reduce costs, and also improve the ability to monetize the service.

CONGESTION AVOIDANCE

The Alcatel-Lucent TPSDA provides a comprehensive approach to capacity planning and congestion avoidance to meet the service quality, availability and cost objectives. Service admission control, a mechanism that verifies capacity in the network to allow user requests, complements other quality assurance mechanisms to preserve service sessions in progress. The objective is to preserve service sessions in progress against the risk of quality degradation due to network overload. Alcatel-Lucent TPSDA supports both multicast service admission control (i.e., for broadcast TV) and unicast service admission control (e.g., for VoD and streaming IP multimedia).

Alcatel-Lucent deploys a centralized broadband policy server to support unified subscriber management and service delivery control for triple play. The policy-based authentication, authorization and accounting, and service admission control functions are tightly integrated and centrally administered to close the loop between demand and supply based on the subscriber's service profile and network resource availability.

CONTENT AND CUSTOMER SECURITY

Network security and content protection are key concerns of customers, who want their personal network protected, and content owners, who need assurances that their content is securely delivered and protected against piracy and unauthorized replication. To respond to security threats, the TPSDA includes comprehensive, built-in security mechanisms and authentication processes to prevent theft of service and denial of service attacks, while also protecting digital rights.

SERVICE QUALITY ASSURANCE

A resilient, scalable and secure architecture, combined with a congestion avoidance mechanism, contribute to increasing the probability that end users receive the QoE they are expecting. However, the only way you can be sure your end users' QoE is satisfactory is by actually monitoring it.

The Alcatel-Lucent TPSDA combines monitoring and troubleshooting tools to collect usage and performance data coming from the entire service delivery path to verify and assure that services are being delivered at the required quality. Management tools enable you to diagnose potential problems prior to performance degradation, so you can take proactive actions such as rightsizing capacity at perceived congestion points. With this information, you can respond to increased demand, proactively remedy potential quality issues and isolate faults in the end-to-end network, from the home to the service source.

Your end users can also undertake their own troubleshooting operations using a dedicated self-care application that will guide them through the different steps required to resolve problems.

Alcatel-Lucent Motive® home device management and customer support solutions facilitate and automate various operational processes including device installation, service activation, customer support and troubleshooting operations.



Ultimate Flexibility

“Launching HD TV secures SaskTel’s position as an IPTV pioneer. With [Alcatel-Lucent’s] Triple Play solutions, we are confident that HD is one of many innovative entertainment services that we will continue delivering to our customers.”

SASKTEL

The TPSDA supports any combination of home gateway, access technology, aggregation network, authentication protocol, connectivity model, subscriber management and policy enforcement to cater to the specifics of any triple play service rollout around the world. This “any mode of operation” model provides you with maximum flexibility to build a triple play network tailored to your market.

With the Alcatel-Lucent TPSDA, the required intelligence can be activated in each part of the network according to the optimal cost and function set you need. TPSDA is a highly flexible, multiservice architecture that allows you to rapidly develop and roll out innovative services without requiring a complete re-architecting of your existing services or the deployment of new equipment. As services continue to grow, and users become more and more sophisticated, a blending of services will be a natural evolution and network requirement. IP multimedia subsystem (IMS) is a key enabler of the blending of triple play services. The TPSDA is an IMS-ready architecture that can grow and evolve with your service mix.



FROM THE GRACEFUL MIGRATION OF LEGACY SERVICES TO NETWORK CONVERGENCE

The TPSDA can be deployed alongside your legacy infrastructure to enable you to support the introduction of IPTV services, cap investments in legacy voice and data service infrastructures, and support the evolution to NGN/IMS and enhanced Internet services. Legacy voice and high-speed Internet service offerings are typically migrated to the TPSDA at the time a subscriber signs up for an IPTV/triple play service bundle. In addition TPSDA provides a foundation for converged mobile and Wireline networks for streamlined introduction of new converged services, easier application enablement and efficient infrastructures for service and content delivery.

From an expense and investment perspective, the costs of rolling out a new infrastructure that is able to address the introduction of IPTV can be balanced against the need to upgrade the installed base to address continuing growth in high-speed Internet and the additional capacity required for next generation services.

“By offering innovative triple play and IPTV services to our customers while driving down the operational costs of the company, Wind is strengthening its competitive position in the Italian marketplace. Our partnership with [Alcatel-Lucent] is a significant element of our ongoing network transformation strategy to IP-based technologies.”

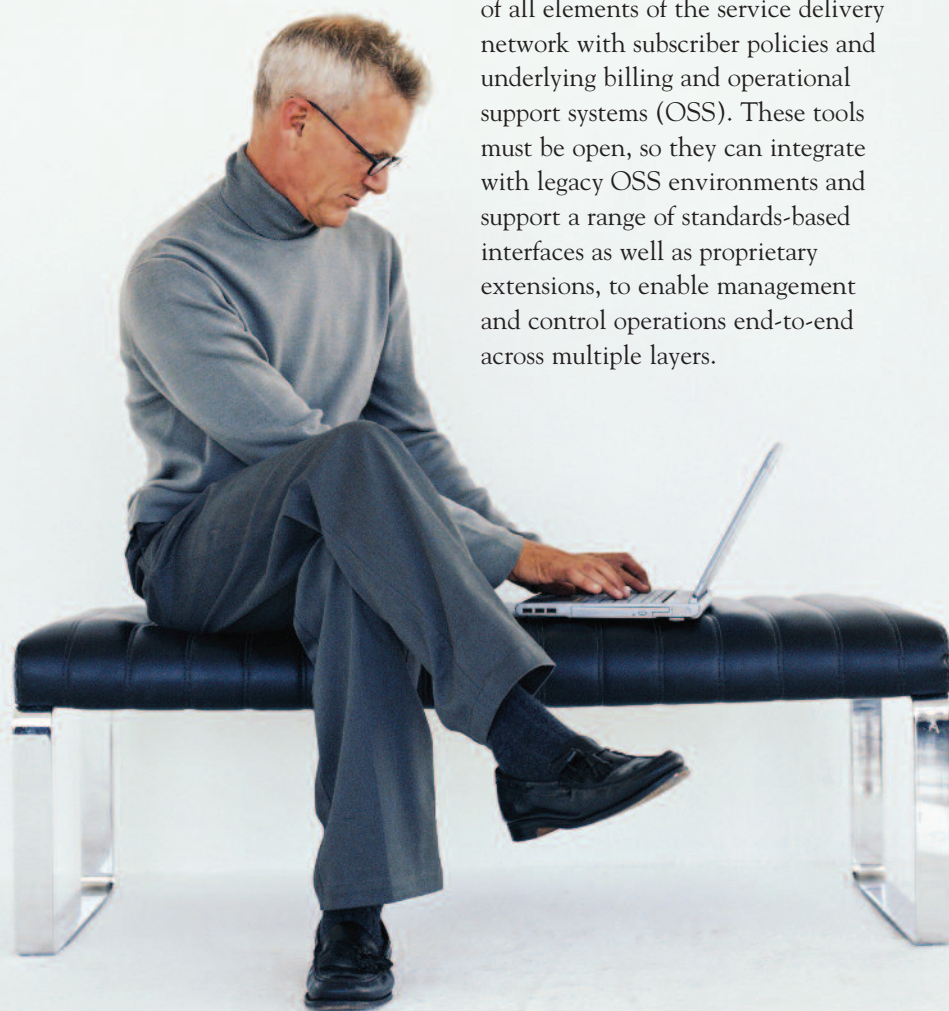
WIND

LOOKING AFTER THE BOTTOM LINE

Triple play network, operating costs need to be streamlined and expenditures must stay in line with revenue. In order to quickly and cost-effectively deliver new services, tools are necessary to orchestrate the interaction of all elements of the service delivery network with subscriber policies and underlying billing and operational support systems (OSS). These tools must be open, so they can integrate with legacy OSS environments and support a range of standards-based interfaces as well as proprietary extensions, to enable management and control operations end-to-end across multiple layers.

The TPSDA management tools facilitate the introduction of new services to ensure the network is up and running — and generating revenue — as quickly as possible. The highly flexible architecture is designed to allow you to “right-size” your service delivery architecture for specific demographic and market conditions. Services can be scaled up or down in line with demand, supporting a “pay-as-you-grow” model.

The Alcatel-Lucent team of experienced system experts are available to you every step of the way to minimize deployment risk and shorten time-to-market. Alcatel-Lucent provides a suite of professional services for the design, integration, deployment and management of the network in order to help you minimize the complexity of network transformation and migration, and reduce your overall total cost of ownership.



Why Alcatel-Lucent?



Alcatel-Lucent is uniquely qualified to help you transform your network to grow your triple play service offerings and ensure profit potential. As a proven partner in network transformation, Alcatel-Lucent provides you with:

UNPRECEDENTED LEADERSHIP >> An experienced leader in triple play solutions with 40 triple play network transformation deployments worldwide.

PROVEN PRODUCTS AND TECHNOLOGY >> A global wireline market leader, focused on innovation and growth, with market leadership positions in every segment.

- Leading DSL and GPON technology and platforms
- Superior WDM and multiservice optical transport platforms
- Innovative IP/MPLS platforms
- Industry leader in IPTV

MULTI-TECHNOLOGY NETWORK TRANSFORMATION EXPERTISE >> Solutions that are implemented and supported by one of the largest and most experienced global services teams, with partners from leading businesses in related fields.

REAL-WORLD INNOVATION >> Alcatel-Lucent plays an active and leading role in many key international standards bodies. Our strong research heritage, unique, patented multimedia innovations, and extensive IP video expertise enable our customers to deploy proven technology that lasts — maximizing their network investments.



“Our decision to launch a new triple play offer, once having our own network infrastructure, required the support of an experienced partner with extensive integration skills, innovative applications and best-of-breed portfolio of solutions. This is why we have selected [Alcatel-Lucent]. We have great expectations in this project, which will undoubtedly contribute to expand and consolidate Ya.com in a definite way as one of the main Telco operators in the Spanish market.”

YA.COM

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