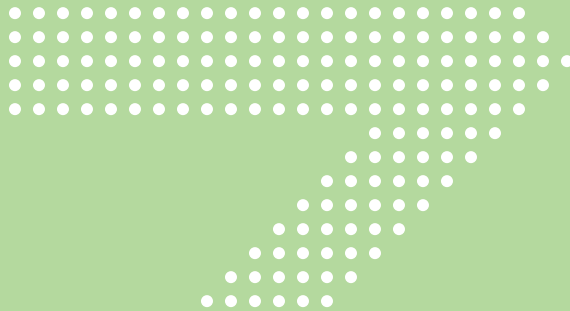# Alcatel-Lucent
7342 Intelligent Service Access Manager (ISAM) Fiber to the User (FTTU)

Alcatel·Lucent

The Alcatel-Lucent 7342 ISAM FTTU enables IP converged triple play services by offering maximum bandwidth and QoS over fiber access. Its FSAN standards compliant GPON implementation is unmatched in features — 2.5 Gb/s bandwidth, 20 km reach, ONT Management and Control Interface (OMCI), and the most robust QoS for triple play services. The Alcatel-Lucent 7342 ISAM FTTU integrates smoothly with legacy voice and RF video networks, and allows you to grow new service revenue and offer true gigabit download speeds. With the Alcatel-Lucent 7342 ISAM FTTU, your can decrease OPEX for technical and service representatives, and reduce churn with attractive service bundles, increasing ARPU and decreasing subscriber acquisition cost.

Optical Broadband from the Broadband Leader

The Alcatel-Lucent 7342 Intelligent Services Access Manager (ISAM) Fiber to the User (FTTU) system provides you with a 21st-century platform for bundled services and offers a wide range of network applications, including fiber access to residential and business subscribers, as well as subscribers in multiple dwelling or tenant units (MDU/MTU). With the Alcatel-Lucent 7342 ISAM FTTU, you gain a long-term strategic advantage over your competition. You can offer any service mix with increased reliability and performance, while significantly lowering operational costs.

The Alcatel-Lucent 7342 ISAM FTTU system offers a GPON solution with unparalleled scalability, port density, and performance.

The Alcatel-Lucent 7342 ISAM FTTU uses Full Service Access Network (FSAN) standards compliant gigabit passive optical network (GPON) technology to multiplex any mix of voice, video or data in the central office (CO) onto a single fiber that is terminated at the subscriber's premises. Each PON line supports 2.5 Gb/s downstream and 1.2 Gb/s upstream. In addition to GPON performance, PON lines can be extended up to 20 km with 32 subscribers per PON, or up to 64 subscribers per PON for shorter distances.

As the foundation of a cost-effective all-IP optical access network, the Alcatel-Lucent 7342 ISAM FTTU system supports next-generation voice, data, and video services over IP using Ethernet interfaces while maintaining robust support for legacy services, such as plain old telephone service (POTS) and radio frequency (RF) video.

The Alcatel-Lucent 7342 system uses Alcatel-Lucent's ISAM technology for intelligent IP-based access, enabling reuse of network deployment models and management systems.
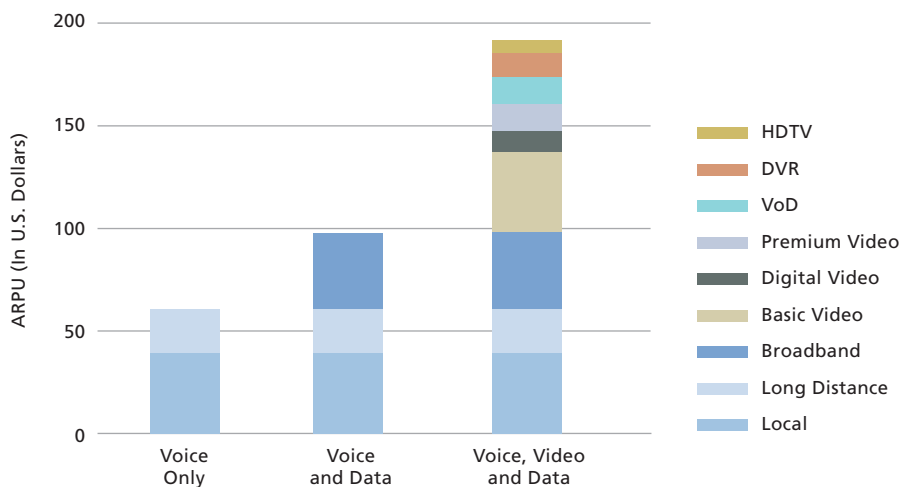
Alcatel-Lucent 7342 ISAM FTTU   3

The Alcatel-Lucent ISAM technology is also designed for wire-speed performance with cost-effective Ethernet switching and enhanced Layer 2/Layer 3 functions. The Alcatel-Lucent 7342 ISAM FTTU combines ISAM performance with a comprehensive integrated solution for fiber access. With this technology, you have the flexibility to deliver RF video, IPTV, data, legacy and next generation voice – as well as backhaul 2G, 3G and WiMAX radio access, all on one platform. Just as important, the Alcatel-Lucent 7342 ISAM FTTU is managed by the same systems used for all Alcatel-Lucent access products: the Alcatel-Lucent 5526 Access Management System (AMS) in ANSI markets, or the Alcatel-Lucent 5523 ADSL Work Station (AWS) in ETSI markets.
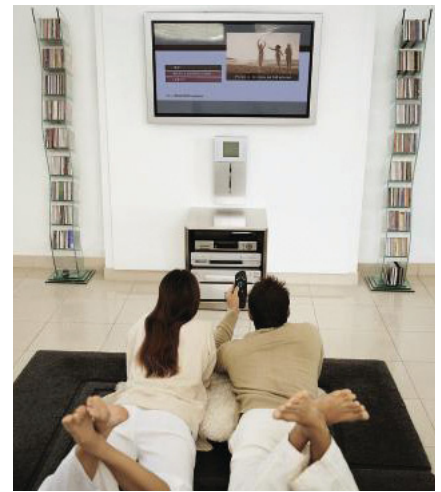
Increase Service Revenue

Gaining a competitive edge often means offering more services to increase revenue and reduce churn; however, your existing access network is probably not designed to deliver a full suite of services. The Alcatel-Lucent 7342 ISAM FTTU is a strategic access platform that enables delivery of these and future services. Offering a complete suite of voice, data, and video can dramatically increase your top-line revenue as shown in Figure 1.

Figure 1. Incremental Revenue from FTTU


Source: *The Yankee Group*, 2004

Lower Operational Costs

Increasing revenue from new services is only part of the value offered by the Alcatel-Lucent 7342 ISAM FTTU solution. Service providers are beginning to document the operational savings achieved with optical access networks. By using passive elements, the fiber-based Alcatel-Lucent 7342 ISAM FTTU solution delivers cost savings that can result in between 40 and 60 percent lower labor expenses compared with using existing copper networks. These savings are achieved in reduced subscriber contact associated with service orders, trouble reporting, outside plant operations, CO operations, and network operations. As shown in Figure 2, financial analysts see the opportunity to reduce longer term operating expenses with capital investment in FTTU.

The high degree of integration and the passive nature of the outside plant used in the Alcatel-Lucent 7342 ISAM FTTU solution greatly simplify network operations. Your service provisioning can be largely automated because the network is designed to support a spectrum of services from day one, which is not the case in today's copper networks. Services can be initiated and terminated by your subscribers, saving labor costs that can be used for other aspects of customer care, such as improving customer loyalty. In addition, because multiple services are provided via a single network, customer care can be much more effective and offer more up-selling opportunities. This also decreases your churn, cutting back on marketing costs for individual services and order generation.

Figure 2. Incremental EBITDA from FTTU Build

- Retained 9%
- HSD 28%
- Op. Exp. Savings 45%
- Video 18%
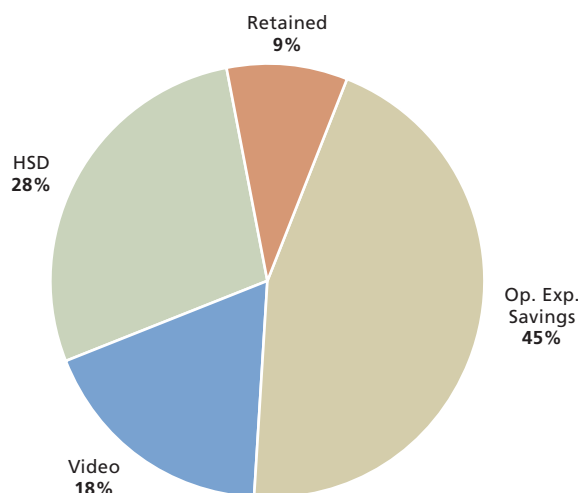
Source: ARMIS database and Bernstein Analysis

A Scalable Full-Service Solution

With the Alcatel-Lucent 7342 ISAM FTTU system, you also get the best-in-class solution for deployment of GPON-compliant full service access networks. The system is the result of years of R&D going back to the mid-1990s. Indeed, Alcatel-Lucent is a leader in PON technology development and has been instrumental in the work of the FSAN Group and the standardization of optical access by the ITU-T.

The Alcatel-Lucent 7342 ISAM FTTU platform has throughput capacity and operational enhancements unmatched by competitors. In addition to using Alcatel-Lucent's market-leading GPON technology, this platform leverages Alcatel-Lucent's leadership position in DSL and next-generation DLC in two key ways:

- The 7342 ISAM FTTU uses the same Layer2/Layer3 technology as the industry-leading ISAM platform for IP DSLAM

- The 7342 ISAM FTTU uses the same management system (5526 Access Management System [AMS] in the ANSI markets or 5523 ADSL Work Station [AWS] in the ETSI markets) as the Alcatel-Lucent ISAM and Litespan platforms

Access Platform for a Competitive Edge

The Alcatel-Lucent 7342 ISAM FTTU platform provides you with unmatched, scalable bandwidth using GPON technology for video, voice, legacy and high-speed data services. Your services are delivered using a single fiber with receive-and-transmit wavelengths multiplexed together — along with an optional wavelength for downstream RF video. FTTU enables you to deliver high-revenue, next-generation services today – cost-effectively and efficiently.

Figure 3 illustrates the elements of a complete Alcatel-Lucent 7342 ISAM FTTU end-to-end solution. The solution includes a packet optical line terminal (P-OLT), located in the CO, that terminates PON interfaces connected to many outlying ONTs. The Alcatel-Lucent FTTU solution includes four different types of ONTs: Indoor ONTs (ONT I-Series) for single family homes; Outdoor ONTs (ONT O-Series) for single family homes and Small Office Home Offices (SOHOs); Business ONTs (ONT B-Series); and Low Profile Multiple Dwelling/Tenant ONTs for up to 12 living units or small businesses (LP-MDU-ONTs).
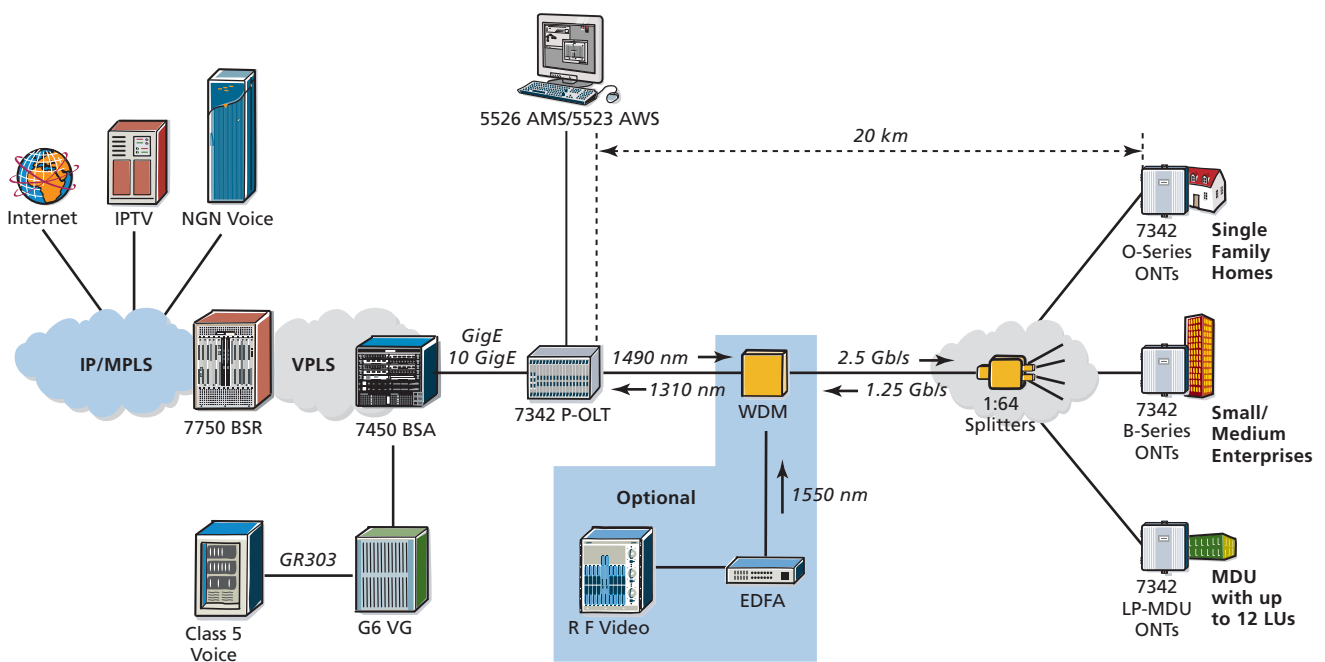
The Alcatel-Lucent 7342 ISAM FTTU solution supports longer reach from the CO to the subscriber — up to 20 kilometers (12.4 miles). Each fiber terminated at the P-OLT
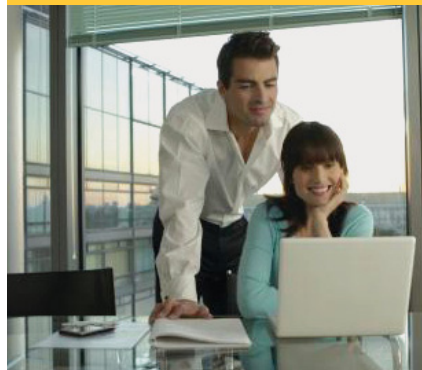
in the CO can be split using optical splitters, which enables the 7342 to serve up to 64 ONTs located at outlying subscriber sites. The Alcatel-Lucent 7342 FTTU performs service differentiation and traffic flow prioritization in the ONT and P-OLT. The solution grooms voice traffic and forwards it to the PSTN voice gateway — the GenBand G6 using GigE interfaces. Data traffic is groomed and forwarded to a broadband service aggregator (BSA)

using multiple GigE and 10 GigE interfaces. Traffic flow prioritization is performed at all interfaces using up to 8 queues for different service types. Traffic flow grooming is performed by using per service or per subscriber virtual LANs (VLANs) in the Alcatel-Lucent 7342 ISAM FTTU and virtual private LAN service (VPLS) instances in the BSA. The VPLS instances are terminated at the BSR, which is connected to the IP routed network.

Figure 3. Alcatel-Lucent 7342 ISAM FTTU in a Network

Alcatel-Lucent 7342 ISAM FTTU 7

For IPTV, the Alcatel-Lucent 7342 ISAM FTTU supports the Internet group management protocol (IGMP) proxy/snooping function within the P-OLT and ONT, permitting dynamic multicast of video channels. The GigE/10GigE interfaces at each P-OLT, the GPON interfaces, and the ONTs receive and forward IP video traffic using multicasting. In addition to IP video, the Alcatel-Lucent 7342 ISAM FTTU system includes an optional integrated RF overlay solution for video services. A video optical line terminal (V-OLT) is used to amplify the video signal using erbium-doped fiber amplifiers (EDFAs) for transmission downstream.

Service Access

With the Alcatel-Lucent 7342 ISAM FTTU solution, you can also deliver a full bundle of services — voice, data, and video — over a single fiber cable to any residential subscribers — for indoor or outdoor deployment — whether these subscribers are living in single family units (SFUs) or multi-dwelling units (MDUs). Moreover Alcatel-Lucent ONTs are compliant with ITU-T standards and managed through an ONT management and control interface (OMCI).

The Alcatel-Lucent 7342 ONT O-Series is designed to deliver triple play services to single-family home owners and Small Office Home Office owners that need a telco demarcation point outside the home or office. The ONT O-Series is a temperature-hardened unit ready for outdoor deployment with battery backup for lifeline services. The SFU versions of the O-Series include two or four POTS interfaces and one or two Ethernet or Gigabit Ethernet interfaces and one optional F connector for RF video. In addition, an optional MOCA (Multimedia over Coax Alliance) interface is included for Ethernet over existing coax home wiring.

A scalable architecture, full GPON standards compliance with unmatched performance, IP multiservice, and a common management system for all access networks make the Alcatel-Lucent 7342 ISAM FTTU your most cost-effective optical access solution on the market today.

The Alcatel-Lucent 7342 ONT I-Series is designed to deliver triple play services to single-family homes. I-Series ONTs can either be mounted inside the home or placed free-standing on a desk, and can be equipped with a battery backup for lifeline services. They include two POTS interfaces for voice, and up to two Ethernet or Gigabit Ethernet interfaces for high-speed data and one F connector for video.

The Alcatel-Lucent 7342 ONT-B Series is designed to deliver triple play services to businesses that need a telco demarcation point outside the business site. The B-Series ONTs are temperature-hardened and ready for outdoor deployment with battery backup. They include eight POTS interfaces for voice, and one Gigabit Ethernet interface, two DS1 or EI interfaces for TDM services, and one optional F connector for RF video.

The Alcatel-Lucent 7342 LP-MDU-ONTs are designed to provide services to residential subscribers in MDUs, such as apartment buildings or multi-tenant units such as business buildings. The ONT can connect up to 12 subscribers over telephone or Ethernet cables. Its low profile (3.844" x 17.43" x 12") design is ideal for installation in terminal rooms in a rack, closet, or outdoor cabinet. Two different versions of the LP-MDU-ONT can be used depending on the in-building cable interface required. The LP-MDU-V ONT provides VDSL2 interfaces over telephone wires and the LP-MDU-G ONT provides Gigabit Ethernet interfaces over Category 5/6 wires. Both versions include 24 POTS interfaces along with a coax interface with high launch power that you can use to distribute RF video.

The Alcatel-Lucent ONTs support Internet gateway message protocol (IGMP) snooping for Internet protocol television (IPTV) multicast, and ITU-T H.248/session initiation protocol (SIP) for voice loop emulation and softswitch-based voice services.
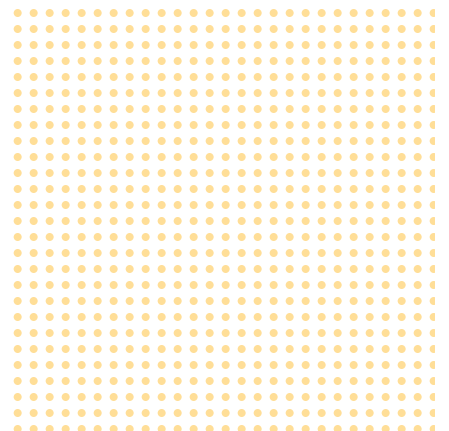
End-to-End Solution

The Alcatel-Lucent 7342 ISAM FTTU is part of a complete end-to-end solution for optical broadband from Alcatel-Lucent. Leveraging our leadership in broadband access, Alcatel-Lucent has developed a solution with a robust feature set ideal for mass deployment. It uses a cost-effective, standards-compliant passive optical network that revolutionizes your access network infrastructure. It gives you a long-term competitive edge and delivers a range of broadband services to subscribers over a single optical fiber.

THE ALCATEL-LUCENT FTTU PRODUCT SUITE CONSISTS OF THE FOLLOWING KEY COMPONENTS:

- Alcatel-Lucent 7342 Packet Optical Line Terminal (P-OLT)
- Alcatel-Lucent 7342 Indoor Optical Network Terminal (ONT I-Series)
- Alcatel-Lucent 7342 Outdoor Optical Network Terminal (ONT O-Series)
- Alcatel-Lucent 7342 Low Profile Multiple Dwelling Unit Optical Network Terminal (LP-MDU-ONT)
- Alcatel-Lucent 7342 Business Optical Network Terminal (ONT B-Series)
- Alcatel-Lucent 5526 Access Management System (AMS)
- Alcatel-Lucent 5523 ADSL Work Station (AWS)
- Alcatel-Lucent 5528 Web-Based Access Manager (WAM)
- Alcatel-Lucent FS3000 and FS5000 Platform
- Video Optical Line Terminal (V-OLT)
- Genband G6 Universal Media Gateways

21st Century Access from a Leader in Access

Optical technology has been successfully deployed within the network core to increase capacity. The access network — the "last mile" — has remained a bottleneck, limiting the deployment of new services. Demand for broadband services has resulted in DSL technologies being deployed on the existing copper-based access network to increase capacity. As you look to the future, you want optical technology in the last mile to provide the assurance that your networks will support your needs – both today and tomorrow.

As new homes and communities are built, or aged plants are refurbished, fiber access is becoming the preferred choice for build-out by traditional and alternative carriers alike. Your capital investment is more than justified by the long-term operational cost savings and increased revenues gained while leveraging an access network with virtually limitless capacity.

Alcatel-Lucent understands your access networks. Alcatel-Lucent understands fiber optics. An Alcatel-Lucent 7342 ISAM FTTU solution, the world's first standards-compliant GPON system, is sure to provide your network with years of profitable service.

Global Market and Technology Leadership

Alcatel-Lucent is the world leader in access systems for both digital subscriber line (DSL) and digital loop carrier (DLC) equipment. With over 25 years of access deployment experience and a demonstrated track record of successful broadband deployment, Alcatel-Lucent remains a proven choice for carrier-grade access solutions. Alcatel-Lucent has designed the 7342 ISAM FTTU system to provide a future-proof all-optical access solution to let you offer any service mix your subscribers demand while realizing the benefits of increased reliability and lower maintenance expenses.

Alcatel-Lucent has led the industry from technology innovation to standardization. It is a key member of the ITU-T and FSAN standards bodies and a major contributor to the GPON standards. Alcatel-Lucent's innovation and expertise demonstrate its commitment to providing you with a long-term strategic advantage in your access network — the access network for the next one-hundred years.

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