

Alcatel-Lucent 735x ISAM FTTB Product Portfolio



Enabling Triple Play Services





The delivery of premium video services — be it IPTV or over-the-top (OTT) video — produces nearly an order of magnitude increase in bandwidth demands. As a result, service providers have been looking at deep fiber deployments: some operators deploy DSLAMs in cabinets or in buildings to shorten the copper loops, enabling them to deliver the required high bitrates over VDSL2 or ADSL2plus; others remove the copper loop altogether and connect subscribers with Fiber to the Home. Alcatel-Lucent’s strategy for more than the past two years has been “Fiber to the most Economical Point”. Our strategy and this ISAM product portfolio recognize that operators will deploy a mix of CO, FTTN, FTTC, FTTB, and FTTH technologies to serve their subscribers with very high speed broadband services in the most cost-effective way.



The Alcatel-Lucent 735x ISAM FTTB Product Family is the newest addition to the ISAM family, and gives service providers the flexibility and scalability necessary for the successful delivery of triple play services. By allowing operators to deploy DSLAM equipment closer to the subscriber — typically in building, curb, or cabinet deployments — the Alcatel-Lucent 735x ISAM FTTB Product Family enables cost-effective delivery of triple play services. Besides the standard Ethernet and GPON aggregation technologies, the 735x family also supports the unique Distributed DSLAM concept, which allows operators to manage small DSLAMs as remote linecards of a central host, resulting in low aggregation CAPEX and low OPEX.

Brokering the new world of triple play

Video has become a key agent of change. Service providers are being forced to innovate by offering competitively differentiated services and by exploring new business models based on targeted advertising, e-commerce integration, and revenue sharing with application and content providers. While services such as these are boosting ARPU (average revenue per user), they are also placing unprecedented stress on the traditional high-speed Internet infrastructure.

Consider these facts: end users downloaded 100 billion Internet video clips in 2007; by 2011, streaming video content will increase from 0.3 Exabytes (EBs) to 10 EB. What's more, analysts are predicting 55 million IPTV subscribers in three years time. Just as significant, Youtube currently accounts for 10 percent of all Internet traffic, while over-the-top streaming comprises 20 percent. All of this, coupled with the fact that the top four user generated content (UGC) providers — Youtube, Google, Yahoo, and MSN — with a combined audience of 94 million, is driving service providers to provide not only the required bandwidth but also the necessary quality of experience (QoE) that their end users want and expect.

To meet this challenge — to provide the scalability and quality that these video applications require — service providers need to determine the best strategy to meet escalating bandwidth requirements. Among other things, they need to identify the most economical point for fiber deployment, while also leveraging their existing copper assets. Put somewhat differently, they need to find a cost-effective solution capable of assuring the QoE required to deliver triple play services in both high and low density areas. The good news is that, in combination with Alcatel-Lucent ISAM portfolio, the Alcatel-Lucent 735x FTTB ISAM Product Family is letting service providers extend the triple play offer to all subscribers in order to achieve 100-percent coverage.



Leveraging the ISAM family advantage






As part of the Alcatel-Lucent ISAM portfolio, the 735x Intelligent Services Access Manager (ISAM) Fiber to the Building (FTTB) Product Family plays a critical role in extending coverage for premium services to all subscribers. This is made possible with a family of small DSLAMs — also known as remotes — which can be placed in cabinets, buildings, or at the curb. The net result is that service providers shorten the copper loop, thus enabling high bitrates over VDSL2 or ADSL2plus.

Together with the CO/FTTN products of the ISAM portfolio, the Alcatel-Lucent 735x FTTB Product Family lets operators build a flexible architecture — quickly and cost-effectively — with a highly targeted triple play offer. Whether they choose CO, FTTN, FTTB/C, FTTH or a combination of these, service providers are able to take advantage of the ISAM family's wide ranging portfolio — designed to deliver fiber to the most economical point.

As members of the ISAM portfolio, the Alcatel-Lucent 735x ISAM Product Family also provides the same service intelligence on any line or any box, shares a common network management, and enjoys the same environmental and electromagnetic hardening. The remotes, which support the Distributed DSLAM concept, even use the same linecards as the 7302 and 7330, resulting in reduced OPEX with easier software upgrades, better aggregation, faster training, and simplified qualification cycles and stock management.

Introducing the Alcatel-Lucent 735x ISAM FTTB product family members

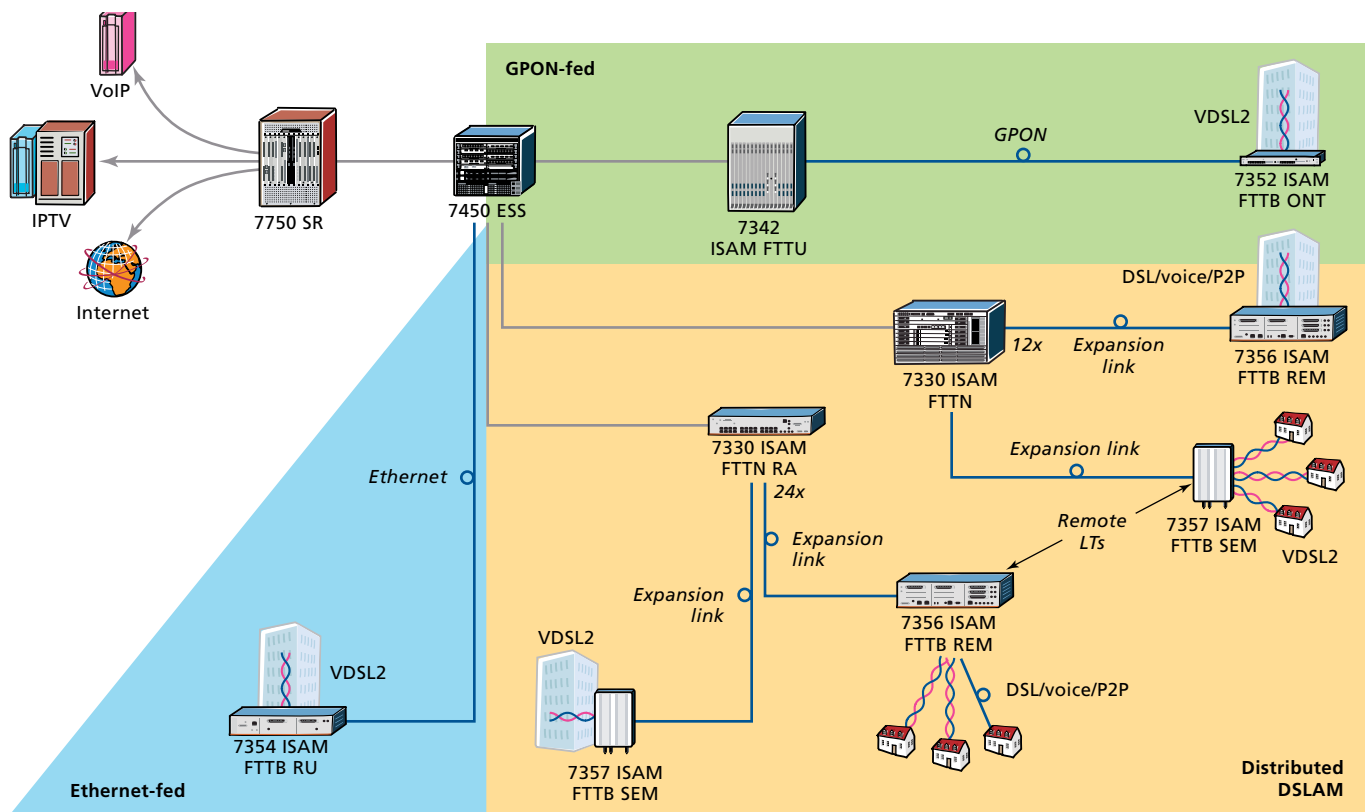
With the Alcatel-Lucent 735x ISAM Product Family, service providers have a broad choice of densities, aggregation technologies, and deployment models capable of bringing fiber to the most economical point. Moreover, the variety of form factors lets service providers maximize their customer base with a full triple play offer.

ALCATEL-LUCENT 735x ISAM FTTB PRODUCT FAMILY	ROLE AND FUNCTION
 <p data-bbox="421 804 695 825">Alcatel-Lucent 7352 ISAM FTTB ONT</p>	<p data-bbox="834 709 1473 825">The Alcatel-Lucent 7352 Intelligent Services Access Manager (ISAM) Fiber to the Building (FTTB) optical network terminal (ONT) is a compact GPON-fed 24p VDSL2 remote for the Alcatel-Lucent ISAM 7342 FTTU. It allows operators to deliver very high speed services using small DSLAMs (remotes) deployed close to subscribers — either in cabinets or in buildings.</p>
 <p data-bbox="421 1003 695 1024">Alcatel-Lucent 7354 ISAM FTTB RU</p>	<p data-bbox="834 934 1457 1029">The Alcatel-Lucent 7354 ISAM FTTB RU is an Ethernet-fed 24p VDSL2 remote with 30a profile support and ADSL backward compatibility, using GE Ethernet uplinks for easy integration in Ethernet aggregation networks. It is ideal for service providers involved in a gradual fiber migration.</p>
 <p data-bbox="421 1255 695 1276">Alcatel-Lucent 7356 ISAM FTTB REM</p>	<p data-bbox="834 1138 1481 1276">The Alcatel-Lucent 7356 ISAM FTTB REM is a 48p/96p mini MSAN with 2 LT slots and 1 or 2 splitter slots, hosted from the Alcatel-Lucent 7330 ISAM FTTN or Alcatel-Lucent 7330 ISAM Remote Aggregator (RA). It is managed as a remote linecard of a 7330 host, resulting in lower aggregation CAPEX, lower OPEX, and faster roll-out. The 7356 ISAM FTTB REM accepts ISAM line cards, including the VDSL2, multi-ADSL, point-to-point Ethernet, and voice boards.</p>
 <p data-bbox="440 1591 679 1612">Alcatel-Lucent 7357 ISAM FTTB SEM</p>	<p data-bbox="834 1434 1481 1549">The Alcatel-Lucent 7357 ISAM FTTB SEM is a 48p sealed VDSL2 remote hosted from the Alcatel-Lucent 7330 ISAM FTTN or Alcatel-Lucent 7330 ISAM Remote Aggregator (RA). It is designed for flexible large-scale outdoor FTTB deployments, with passive cooling and remote powering. It is managed as a remote linecard of a 7330 host, resulting in lower aggregation CAPEX, lower OPEX, and faster roll-out.</p>
 <p data-bbox="440 1822 679 1843">Alcatel-Lucent 7330 ISAM RA</p>	<p data-bbox="834 1707 1449 1843">The Alcatel-Lucent 735x FTTB portfolio is launched together with the Alcatel-Lucent 7330 ISAM Remote Aggregator, which offers cost-effective aggregation for hosted remotes (7356 REM and 7357 SEM), and for mixed hosted Ethernet-fed remote deployments. The Alcatel-Lucent 7330 ISAM RA reduces aggregation CAPEX by reducing the number of ports required on the metro aggregation network nodes.</p>

Unique advantages of the Alcatel-Lucent 735x ISAM FTTB family

With the 735x ISAM FTTB Product Family's *unique* advantages, in combination with other members of the ISAM family, service providers can deliver on any FTTX deployment model with reduced CAPEX and OPEX. They are also positioned to capture new revenue from over-the-top application content providers looking to assure their customers of superior QoE.

Figure 1. Alcatel-Lucent 735x ISAM FTTB product family – GPON, Ethernet and distributed DSLAMs





Distributed DSLAMs – 24x fewer nodes to manage

The 735x FTTB product family not only supports the standard fiber and Ethernet aggregation technologies, it also offers the unique “Distributed DSLAMs” concept. With this approach to aggregation, the Alcatel-Lucent 7330 Remote Aggregator serves as a host for remote REMs and SEMs. As a result, the number of nodes in a remote deployment is reduced by a factor of 24x. This is because the remotes are managed, not as individual nodes, but as remote host linecards. This brings three advantages:

- *Low aggregation CAPEX* — The number of costly aggregation ports in the Ethernet MAN is reduced by the same factor of 24x.
- *Cheaper and faster operations* — Alarm management, software upgrades, and system configuration and maintenance are reduced by the same factor, reducing required staff and maintenance duration.
- *Faster roll-out* — Using the same line cards across the ISAM family not only means that the same service can be offered, but also results in faster qualification, easier training, simpler stock management, and faster feature availability roll-outs.

Virtual ONT – Consolidated management of copper and fiber users

By incorporating the Virtual ONT concept, the Alcatel-Lucent 7352 ISAM FTTB ONT lets service providers manage QoS for fiber and copper users in precisely the same way. Each VDSL copper user has the same QoS management as FTTH/GPON users, and is treated, in effect, as if each is a fiber user (i.e., with the same type of GPON T-CONTs mechanism). As a consequence, service providers enjoy significantly reduced OPEX.

Alcatel-Lucent Smart DSL – Unprecedented line stability

Line stability is crucial for IPTV and streaming video, because each technology is highly sensitive to errors. Anything less than superior quality will meet with subscribers’ complaints. To meet this challenge, the Alcatel-Lucent 7354 ISAM FTTB RU, the 7356 ISAM FTTB REM, and the 7357 ISAM FTTB SEM are designed to take advantage of Alcatel-Lucent’s Smart DSL, an innovative technology, which significantly increases DSL line stability. Compared to the standard technique of increasing the noise margin, which often leads to much lost bandwidth, Alcatel-Lucent Smart DSL stabilizes lines at as much as 30 percent higher bit rates.

Smallest MSAN on the market – Reduced footprint and multiservice access

The Alcatel-Lucent 735x Product Family also boasts the smallest Multi-service Access Node (MSAN) available today. As such, the Alcatel-Lucent 7356 ISAM FTTB REM is ideal for service providers rolling out Very High Speed broadband services from remote deployments with a smooth migration for existing ADSL and voice customers. Its support for the P2P Ethernet line card also provides a path toward mixed DSL/fiber deployments from the cabinet, and also offers voice termination. For ease of deployment, training, and stocking, the FTTB family’s DSL, fiber, splitter and voice cards are the same ones as those being used in the CO/FTTN members of the ISAM portfolio.

More about the 735x FTTB family members



The Alcatel-Lucent 7352 ISAM FTTB ONT is ideal for service providers pursuing an FTTB strategy or a combination of FTTH and FTTB. Typically such service providers are deploying FTTH to single-dwelling units, but for economical and time-to-market reasons they want to re-use existing in-building copper in multi-dwelling units. With the Alcatel-Lucent 7352 FTTB ONT's Virtual ONT concept, the QoS for FTTB subscribers can be managed in the same way as for FTTH fiber-connected users. This FTTB model completely complies with the FSAN GPON standards.

Up to 100 Mb/s – 24p VDSL2, 30a and 17a profiles

Flexible FTTB/FTTH mix – Serve FTTB/FTTH subscribers from the same fiber, line card or shelf

Smallest box on the market – 19" form factor, 1RU

Indoor/outdoor – EMC and industrial temperature hardened (-40°C to +65°C)

Virtual ONT – Same QoS management for FTTB as for FTTH subscribers



The Alcatel-Lucent 7354 ISAM FTTB RU is designed for service providers involved in gradual fiber migration. Instead of deploying fiber to the home, many service providers are choosing to re-use the existing copper pairs where available, and to deploy VDSL2 service from the cabinet or FTTB deployments. In this respect, the Alcatel-Lucent 7354 ISAM FTTB RU is ideal for both Tier 1 and smaller operators. It provides a compact Ethernet-fed ISAM DSLAM for FTTB or cabinet deployments, and is an ideal complement to existing (CO) ISAM deployments, offering the same management and service intelligence as other members of the ISAM family. For smaller operators, the Alcatel-Lucent 7354 ISAM FTTB RU provides the lowest barrier to high-speed VDSL2 deployments with 30a profile support and standard Ethernet uplink, while still offering Alcatel-Lucent's expertise in carrier-grade DSL products.

Up to 100 Mb/s – 24p VDSL2, 30a/17a/12b/12a, backwards ADSL/ADSL2+ compatible

Low barrier for VDSL2 rollout – Plug 'n' Play Ethernet-fed VDSL2 remote

Carrier-grade pizza box – ISAM management and service intelligence

Indoor/outdoor – EMC and industrial temperature hardened (-40°C to +65°C)

Smart DSL – Stabilize DSL lines at up to 30 percent higher rate than traditional way



The **Alcatel-Lucent 7356 ISAM FTTB REM** has been especially designed for service providers rolling out Very High Speed Broadband services using VDSL2 or ADSL2+ from remote deployments, with a smooth migration for existing ADSL and voice customers. The Distributed DSLAM concept makes the Alcatel-Lucent 7356 ISAM FTTB REM particularly well suited for large-scale deployments and for the extension of an existing ISAM deployment to FTTB/FTTN remotes. Support for P2P Ethernet line card provides a path towards mixed DSL/fiber deployments from the cabinet. The 7356 ISAM FTTB REM accepts two ISAM line cards (VDSL2, multi-ADSL, P2P Ethernet, and voice), and one or two ISAM splitter boards.

ISAM VDSL2 LT – Up to 70 Mb/s – 48p VDSL2, all 8/12/17 profiles, backwards ADSL/ADSL2+ compatible

Smallest MSAN on the market – ISAM LTs – DSL, voice and P2P Ethernet; clock synchronization over fiber

Distributed DSLAM – Low OPEX/aggregation CAPEX, full feature parity with CO/FTTN

Indoor/outdoor – EMC and industrial temperature hardened (-40°C to +70°C)

Smart DSL – Stabilize lines at up to 30 percent higher rate than the traditional way

The **Alcatel-Lucent 7357 ISAM FTTB SEM** meets the challenges of service providers deploying Very High Speed Broadband services using VDSL2 from outdoor remote deployments. It is weatherproof and hardened for outdoor deployments (wall/pole mounted), which is extremely cost-effective and allows for a faster-time-to-market because operators do not have to build cabinets or negotiate building access with landlords. It's also optimized for residential deployments being absolutely silent (thanks to passive cooling), with a small footprint. In addition, the unique hosted concept makes the Alcatel-Lucent FTTB SEM particularly well-suited for large-scale deployments and for extension of an existing ISAM deployment to FTTB/FTTC remotes. The Alcatel-Lucent 7357 ISAM FTTB SEM is an ideal complement for cabinet deployments, allowing operators to reach 100 percent coverage in a cost-effective way.

ISAM VDSL2 LT – Up to 70 Mb/s – 48 p VDSL2, all/12/17 profiles, backwards ADSL/ADSL2+ compatible

Fast rollout – 100 percent coverage – remote power, passive cooling; no cabinets required

Distributed DSLAM – Low OPEX/aggregation CAPEX; full feature parity with CO/FTTN

Outdoor/residential areas – Absolutely silent; small footprint; weatherproof, +45 plus solar load

Smart DSL – Stabilize lines at up to 30 percent higher rate than traditional way



Table 1. Comparison of the Alcatel-Lucent 735x FTTB family features

735x ISAM FTTB PORTFOLIO	7352	7354	7356	7357
Type	GPON MDU ONT	Pizza Box	3-slot/4-slot shelf	Sealed remote
Uplink	GPON	2xGigE	Distributed DSLAM	
Aggregated on	7342 ISAM FTTU	Eth Switch	7330 FTTN (12p) or 7330 RA (24p)	
Max. DSL Subs	24	24	48-96	48
VDSL2 profiles	17a, 30a	12a/b, 17a, 30a	All 8/12/17 profiles	
Backwards ADSL comp	N	ADSL/ADSL2+	ADSL/ADSL2+	
Splitters	1RU splitter unit	Integrated	Splitter LT	Integrated
POTS/ISDN Termination	N	N	Y	N
Other line cards	N/A	N/A	m-ADSL, Eth, Voice	N/A
Access Mgmt System	Y	Y	Y	Y
Stacking	Optical (splitter)	4 units – 96 subs	N	N
Cooling	Active	Active	Active	Passive
Hardening and Sealing	Industrial	Industrial	Industrial	Industrial/Sealed
Outdoor deployments	Y (in cabinets)	Y (in cabinets)	Y (in cabinets)	Y (weatherproof)
Rack mount	ETSI and 19"	ETSI and 19"	ETSI and 19"	N/A
Height	1RU	1.5RU	2.5RU	N/A



Transforming the access network with the Alcatel-Lucent ISAM family

Triple play services are placing increasing demands on broadband access networks. To deliver the compelling combination of video, data and voice, service providers must transform their networks with the aim of achieving:

- An unsurpassed triple play user experience with a compelling service offering
- Cost-effective coverage of their entire subscriber base with a mix of deep fiber deployment models
- Cost-effective and scalable operations

The Alcatel-Lucent ISAM portfolio, in combination with the 735x ISAM FTTB Product family, has been specifically designed to meet these challenges. In fact, Alcatel-Lucent's ISAM portfolio is the industry's leading access portfolio, making Alcatel-Lucent the undisputed leader in DSL, IP DSLAMs, and VDSL. The 735x ISAM FTTB portfolio has been designed using Alcatel-Lucent's unmatched DSL expertise, resulting in truly carrier-grade compact DSLAMs.

Confident in Alcatel-Lucent's broadband access leadership, more than 180 operators worldwide are deploying the ISAM family.

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