AROONA POL

PRODUCT BROCHURE

Passive Optical LAN renovation without fiber recabling

Facilitate POL adoption over exisiting multimode fiber cabling infrastructure

cailabs

SHAPING THE LIGHT

AROONA POL

PASSIVE OPTICAL LAN

How to lower fiber cabling CAPEX?

-40% to -60 %

CAPEX and OPEX savings
compared to traditional LANs

Passive Optical LAN is an attractive, long-term LAN architecture that outperforms traditional Ethernet LAN in capacity, installation and operational cost, energy savings, infrastructure footprint and security. It benefits from the Gigabit Passive Optical Network (GPON) technology for access networks and brings fiber-speed connections to the desktop.

... but backbone/vertical fiber recabling may be deterrent to POL adoption

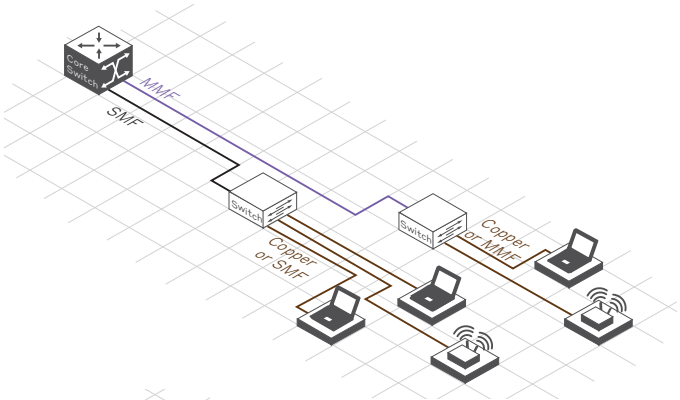
Cabling expenses represent 30 to 50 % of POL installation costs. Such initial investment may act as a strong disincentive, especially for renovating and upgrading an existing network. Not being able to reuse the existing cabling infrastructure is an obstacle when it comes to POL adoption.

Up to 75 %

of campus backbone and
distribution fiber links are MMFs,
incompatible with GPON equipment

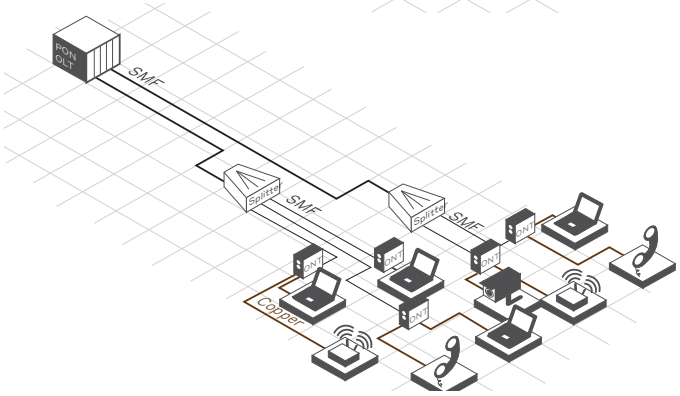
Traditional Ethernet LAN

Backbone and ditribution links between core and edge switches are still largely in multimode fiber (MMF).



Passive Optical LAN

Using GPON equipment requires that singlemode fibers (SMFs) are used to link the OLT to the ONTs.

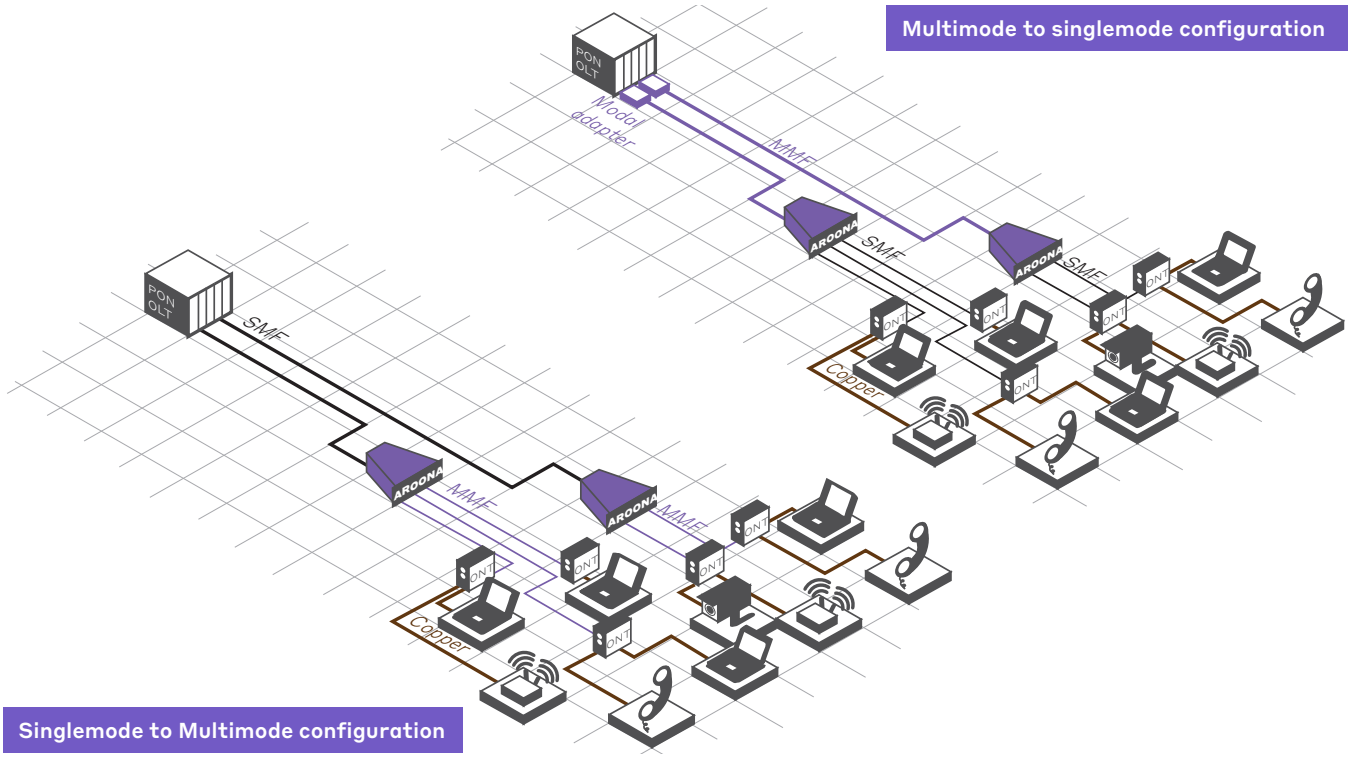


AROONA POL

Retrofitting old infrastructure for POL

Adapting backbone or distribution MMF and SMF

AROONA-POL allows POL implementation to make use of existing MMF links. It replaces an **optical splitter in the distribution frame** and **avoids complex recabling** across campuses and inside buildings.



Benefits of AROONA-POL

- **Compatibility:**
  AROONA-POL input is compatible with **any LAN MMF** (OM1, OM2, OM3, OM4, OM5) which can be **directly plugged into the OLT**. AROONA-POL makes **the existing MMFs pluggable to new SMFs.**
- **Simplicity:**
  AROONA-POL eases the deployment of POL: **no need to recable the backbone or distribution links** in SMF. **Avoid all risks and disruption** due to fiber redeployment. AROONA-POL adapts MMFs to SMFs by simple replacement of an optical splitter.
- **Cost:**
  Limit the cost of POL deployment by removing the exorbitant investment of fiber roll-out. AROONA-POL **is up to 10 times less expensive** than fiber recabling, and **eliminates all hidden costs** (project management, authorization, down-time, etc.)

Up to x 10 less expensive

than SMF recabling in complex cases requiring new cable trench

AROONA POL

How does it work?

MMF is not directly compatible with singlemode operation

If singlemode and multimode fibers are directly connected through standard connectors or by splicing with low control, the unique spatial mode (LP_{01}) from the SMF can divide several spatial modes of the MMF. This results in:

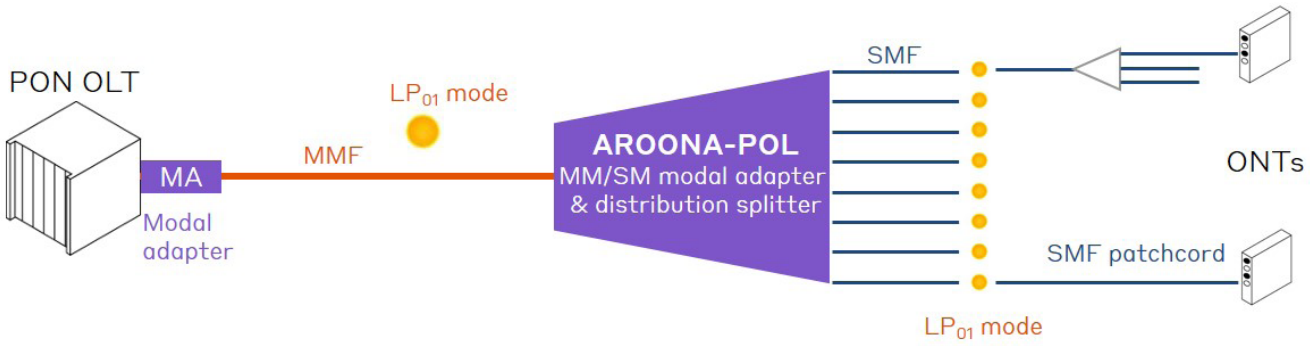
- modal dispersion, limiting the reach for a given data rate
- multi-path interferences, creating power fluctuations (up to 12 dB)

These phenomena strongly deteriorate the signal.

AROONA-POL controls mode coupling between SMF and MMF

AROONA-POL simultaneously manages the spatial modes upstream and downstream operation between singlemode fibers and multimode fibers.

For MM to SM version, in downstream, the modal adapter converts the fundamental mode from the OLT into the LP_{01} mode of the backbone MMF and AROONA-POL converts the mode from MMF to SMF and splits the signal into the distribution SMFs. Upstream, it is the opposite, AROONA-POL converts the SMFs mode from ONTs, recombines the signals into the backbone MMF and the modal adapter converts the signals from MMF to singlemode OLT.



As far as the SM to MM version is concerned, the principle remains the same. Downstream, AROONA-POL splits the SMF signal from OLT and converts it to the LP_{01} distribution mode for MMFs. Upstream, AROONA-POL adapts modes from MMF and recombines the signals in the backbone SMF.

AROONA POL

Technical specifications

PARAMETER	VALUE					
POL Type (OLT to ONT)	SMF to MMF			MMF to SMF		
Splitting ratio	2 x 8	2 x 16	2 x 32	2 x 8	2 x 16	2 x 32
Minimum insertion loss (dB)*	9	12	***	10	13	16
Maximum insertion loss (dB)*	13.2	16.7		12.2	15.7	19.2
Uniformity (dB)	2.4	2.8		1.8	2.2	2.6
Input fiber type	SMF 9/125 µm			MMF (62.5/125 µm or 50/125 µm)		
Input connector type	LC/UPC			Fiber to splice to existing MMF (+ modal adapter to splice on MMF at OLT side)		
Input connector return loss (dB)	50			55 (SC/APC connector at front panel)		
Output fiber type	MMF 50/125 µm			SMF 9/125 µm		
Output connector type	LC/UPC			SC/APC		
Output connector return loss (dB)	20			55		
Maximum input power (dBm)	23					
Operating wavelength (nm)	1260-1625					
Splitter directivity (dB)	55					
Operating temperature (°C)**	-5 ; +40 long term @ 5% to 85% humidity -5 ; +50 short term @ 5% to 90% humidity					
Storage temperature (°C)	-25 ; +55 (ETSI EN 300 019-1-1 Class 1.2 Storage)					
Package	19'' 1U rack (43mm x 480mm x 250mm)					
Transportation tolerance	ETSI EN 300 019-1-2 Class 2.2					

* Intrinsic equipment loss; measurable with SMF patchcord on both sides
** Humidity is non condensing
*** SMF to MMF 2x32 splitting version not recommended. Optical budget potentially impacted by power fluctuations due to poor quality of field connectors

cailabs
SHAPING THE LIGHT

Harness the full potential of optical fibers

Cailabs is a leading provider of innovative solutions designed to increase the capacity of optical fibers.

We develop and manufacture a large range of light-shaping components based on our patented, efficient and flexible Multi-Plane Light Conversion (MPLC) technology.

Worldwide telecommunication manufacturers and providers, such as Nokia, Cisco, Huawei, KDDI and Tellabs represent a few of our trusted clients who have used our products to upgrade today's network infrastructure and create the networks of tomorrow.

At Cailabs, we help you make the most of your optical fibers.

What our partners say about AROONA-POL

> The new Tellabs® FlexSym™ Singlemode to Multimode Splitters are built using technology from Cailabs.
> *« We have both commercial and federal government customers that can now move forward with Passive Optical LAN retrofits because this singlemode to multimode splitter allows them to leverage existing multimode fiber cabling inside their building, which substantially lowers the total cost of their network upgrade. The net result is they cost-effectively update their network to Tellabs OLAN, which gives them better security, has software defined LAN functions today and stands ready to support 10G speeds when and where needed.»*

Jim Norrod
Tellabs President & CEO

> *« AROONA-POL avoids the risks and costs of recabling with new cables. I am highly satisfied with the product provided by Cailabs on our client's premises.»*

Xavier Laureaux
IBM Network Architect

Cailabs is a member of APOLAN.
AROONA-POL is the APOLAN Innovation Platinum Winner for the 2016 APOLAN Awards.

cailabs

SHAPING THE LIGHT

CAILABS

38 boulevard Albert 1er
35200 Rennes, France

www.cailabs.com
aroona@cailabs.com

@CAILabs