

open labs

# RFO

RF  
video  
extender

Reach farther,  
spend less

extend your RF Overlay coverage  
with a low cost solution



# Innovative & low cost



## Reach more clients

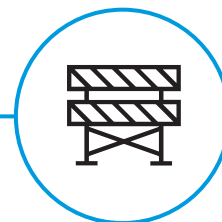
Television has an undeniable relevance in modern society. Operators that provide TV services compete every day for new customers. With the traditional solutions, extending the service coverage will require substantial investment. RFO is the ideal solution for expanding TV signal coverage to new geographical areas, while reducing CAPEX and OPEX costs and ensuring the quality of service.

### Traditional TV transport



With the fiber network massification and availability the transport of TV signals is currently deployed using fiber optics.

### Current limitations



In analog transmission over fiber scenarios the increase of the distance degrades the signal quality. Changes in the TV channel plan imply headend reconfiguration in IP transmission scenarios.

# Business benefits

- Reduce CAPEX and OPEX - compared with the traditional solution:  
Reduced investment on remote headend equipment, simplified management, low power consumption (50 watts) and reduced footprint (1RU).
- Provide flexibility:  
Agnostic to different video standards and signal formats and transparent to TV channel plan changes.
- Ensure system's reliability:  
Signal processing based in robust HW scheme and transmission redundancy and protection.
- Simplify the operation:  
Plug and play solution and no configuration required.



RFO

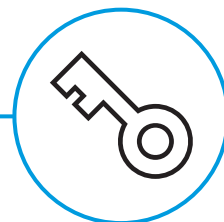
Unique, flexible and affordable  
Ideal solution to extend the transport of TV signals over optical fiber

## Challenge

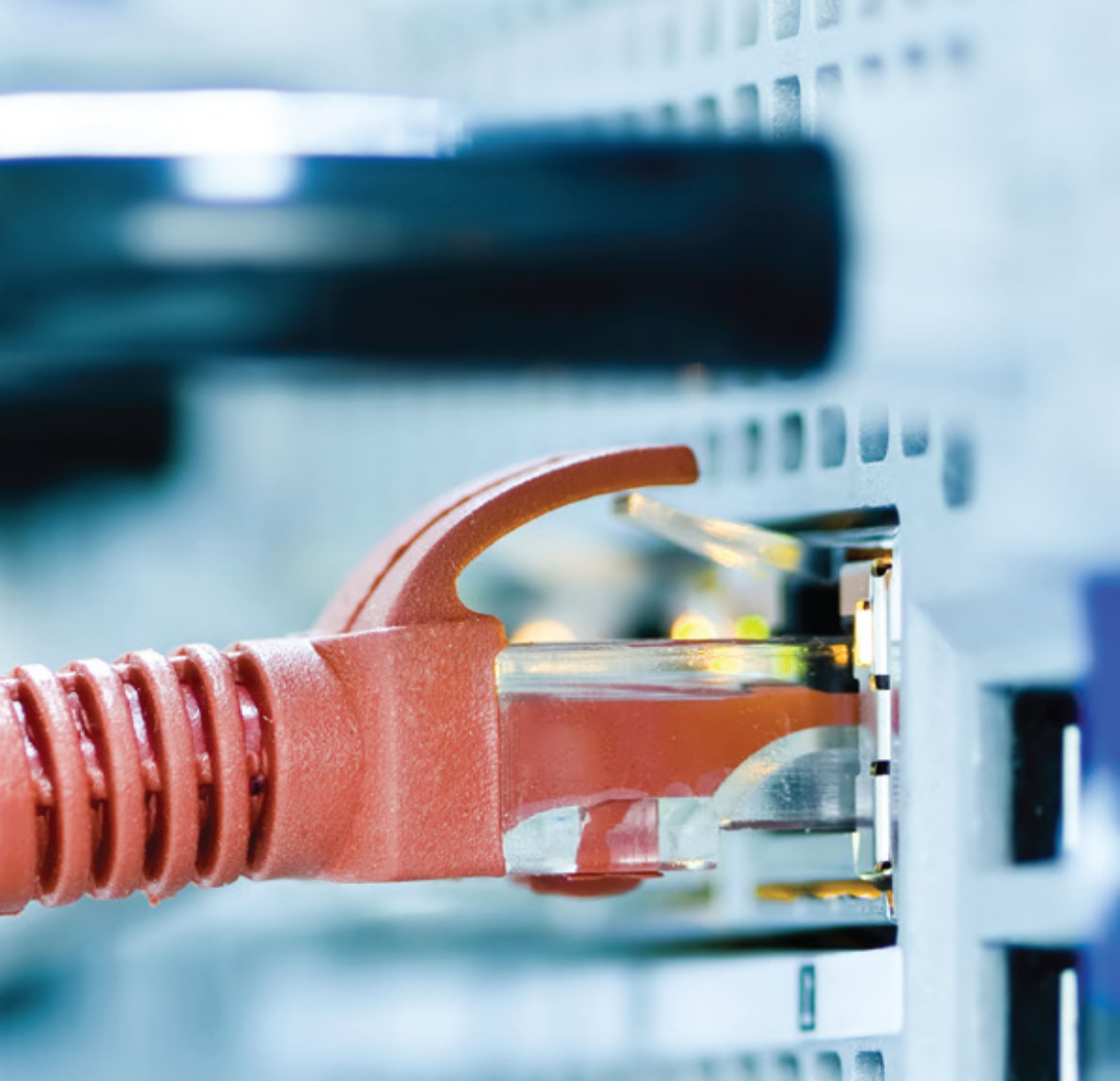


How do we transport the TV signal over optical fiber across long distances without signal degradation and at the same time reducing costs?

## Solution



Digitalizing the RF TV signal will make it more robust to distortions and interferences allowing higher transmission ranges.



## Key differentiators

- CAPEX and OPEX reduction;
- Installation simplicity;
- Agnostic to different format, and video signals standards;
- Reduced energy consumption;
- Reduced size;
- Simplified network architecture;
- High level of quality and signal integrity.



Reduced investment  
Extended coverage

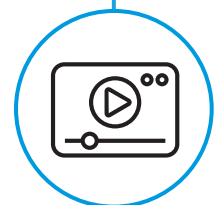
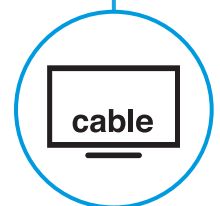


Lower complexity  
Higher efficiency



Less equipment  
More savings

Who benefits from it?



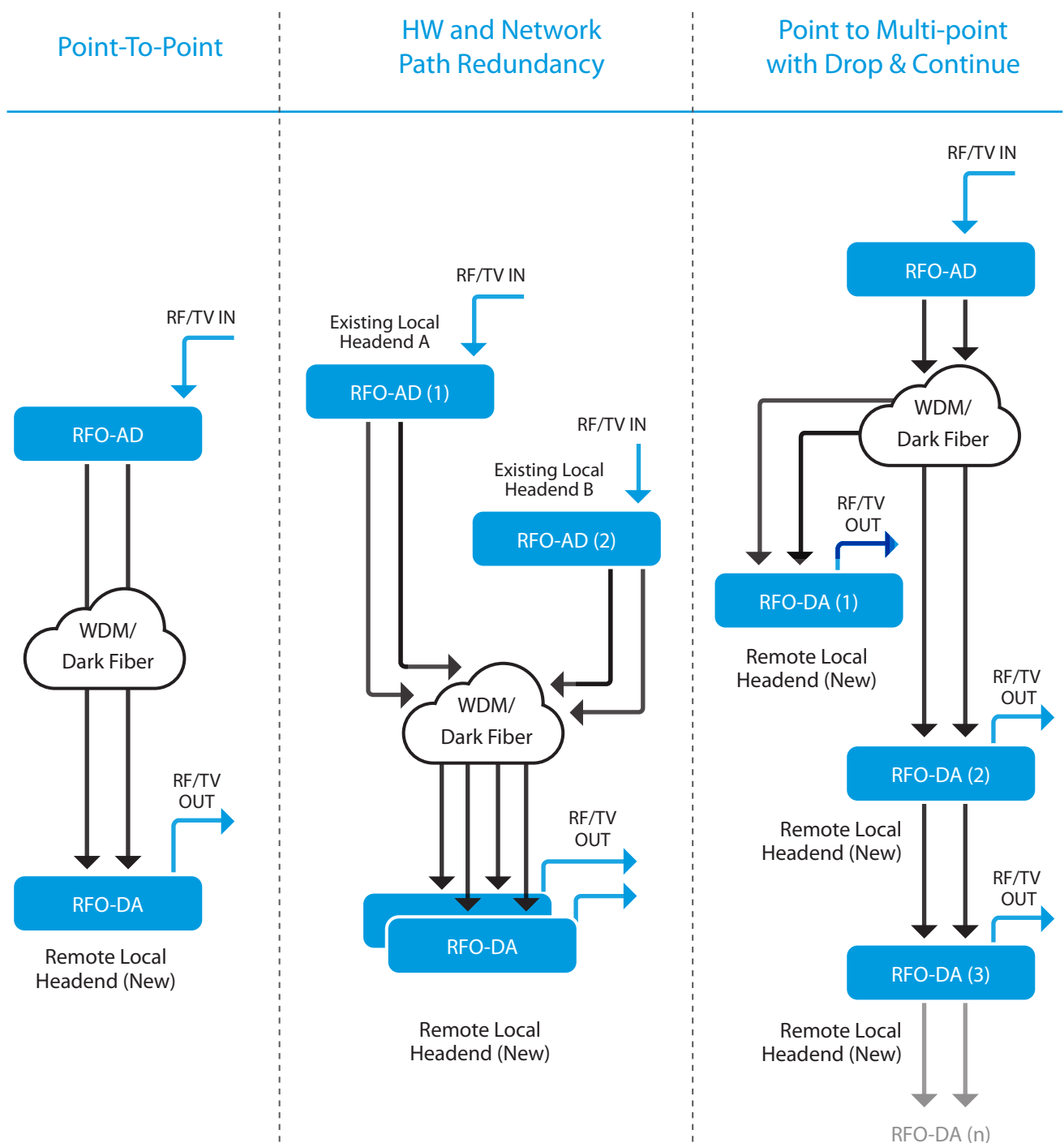
Tv Operators

Enabling new operator business models

# The architecture

The solution is composed by two sub-systems performing complementary functions, RFO-AD and RFO-DA, both interconnected by an optical network. RFO-AD receives a video channel bouquet signal and converts it into a digital format so that it can be transported over long distances without losses. On the other hand, RFO-DA receives the digital signal and recovers it into the original format while keeping the signal quality and integrity.

Redundancy can be introduced using two different signal sources transmitted to the same remote node. RFO-DA can be used to cascade the TV signal along the network.



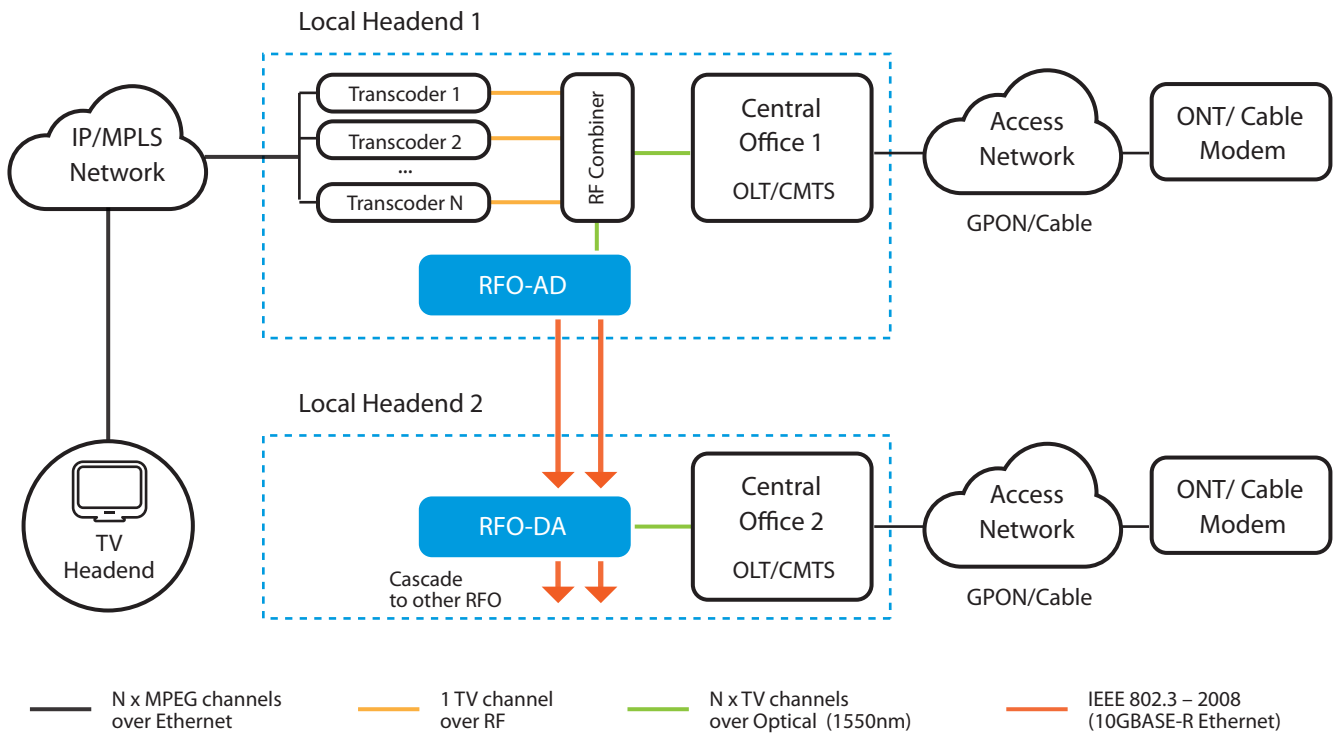
# Use cases

RFO is the right solution whether you have a GPON or Cable network.

RFO interconnects a Local Headend where the combined RF signal already exists (Local Headend 1 in the picture above) to a second Local Headend (Headend 2) with several perceived advantages:

- No need of having transcoders and RF combiner at the second Local Headend;
- The RFO D/A (receiver) can be used to cascade the same signal to another RFO D/A in a different location or to extend reach of the RF signal;
- Only two RFO equipments needed per link;
- No configuration and no adjustment needed of the RFO equipment;
- No need for operation procedures or additional equipment if there are changes on the number of channels or frequency allocation.





## “Overcoming the challenge”

Elsa Rebocho, Head of the Access Network Technologies Area, PT Portugal

## References

### Customer

- PT Portugal

### Motivation:

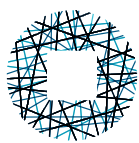
- Expansion of service in rural areas

### Application scenario:

- 16.000 real customers;
- Expansion to new low density areas;
- Replacing legacy headends in high density areas.

### Added value:

- End customer satisfaction;
- Capex savings;
- 10x less power consumption;
- 40x smaller footprint;
- Increased revenue.



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