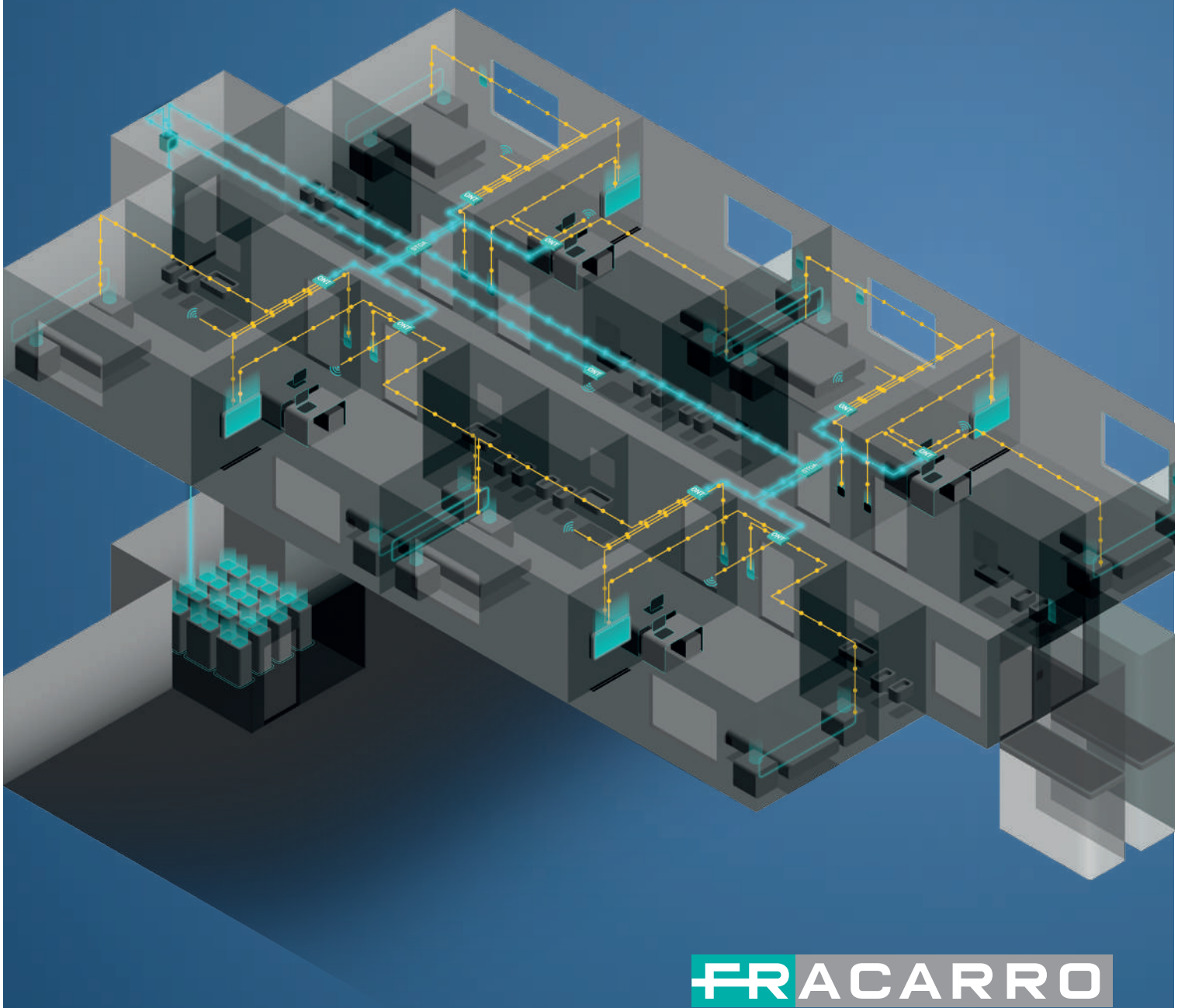
GPON SOLUTIONS

Gigabit Passive Optical Network

Technology
Advantages
System structure
Professional services



FRACARRO

Introduction to GPON Networks

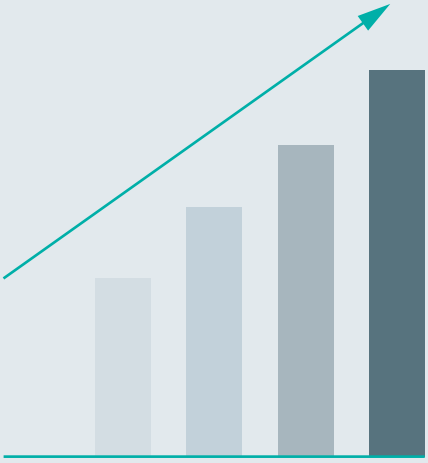
TECHNOLOGY

The continuous **demand for connectivity** and **service distribution over IP networks** has made it essential to adopt a technology capable of meeting the ever-increasing bandwidth requirements, both today and in the future.

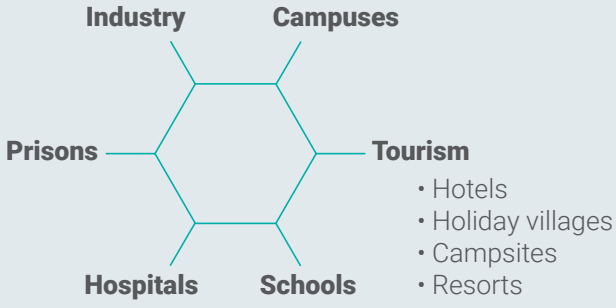
The **GPON (Gigabit Passive Optical Network) solution**, also employed by telecom providers at a metropolitan level and implemented using 9/125 single-mode passive fibre optics, is the answer to these needs.

Thanks to its **point-to-multipoint structure**, it is ideal for **business and hospitality applications** (such as hotels, holiday villages, campsites, or resorts), as well as in the tertiary sector, providing connectivity and supporting services such as WiFi, IPTV, CCTV, and VoIP.

The available **bandwidth** is **particularly high**: 2.5 Gbit/s downstream and 1.25 Gbit/s upstream, with the capability to manage 10 Gbit/s (XG-PON), 40 Gbit/s, and beyond.

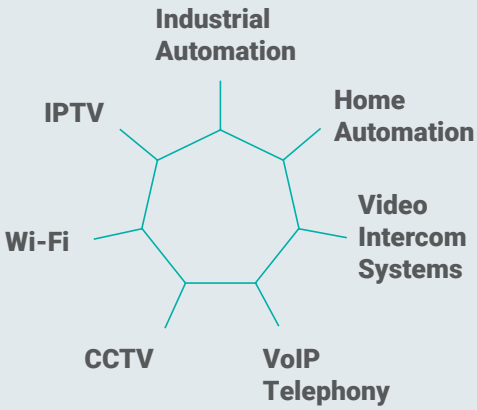


Fields of Application



- Hotels
- Holiday villages
- Campsites
- Resorts

Distributed IP Services



System Architecture

The **Fracarro GPON solution** integrates and distributes systems and services based on the **IP protocol**. For this reason, the infrastructure consists of active devices capable of managing the connection of various servers, controllers and network logic.

ROUTER
For network logic management

SERVER and CONTROLLER
For distributed services within the infrastructure

CENTRAL HUB/SWITCH
Manages the connection of servers and controllers

OLT - Optical Line Termination
Manages GPON network traffic

PON - Passive Optical Network
Boxes, splitters, single-mode fibre, etc.

ONT - Optical Network Termination
Converts the signal from fibre optic to ethernet

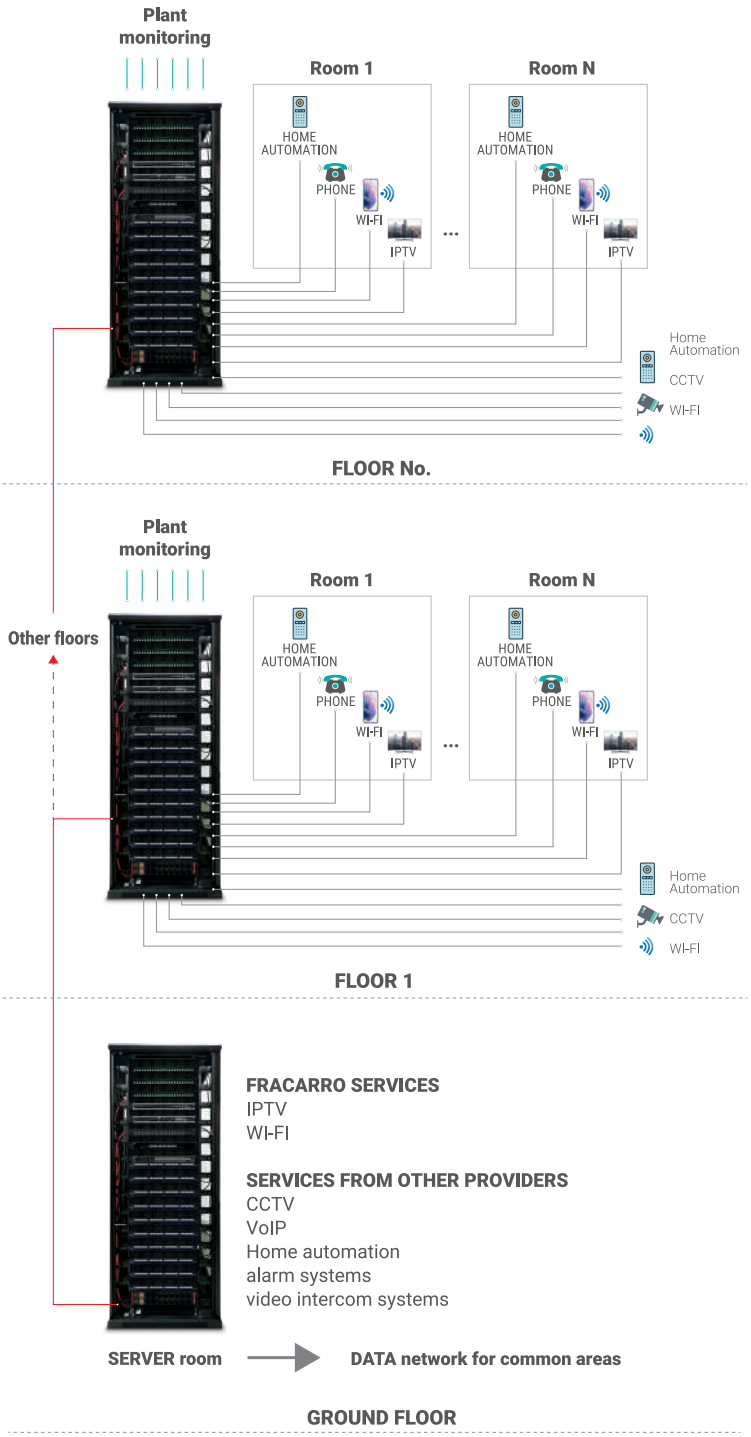
SERVICE DISTRIBUTION
In rooms, apartments, offices, and technical areas

Conventional **ETHERNET** Network

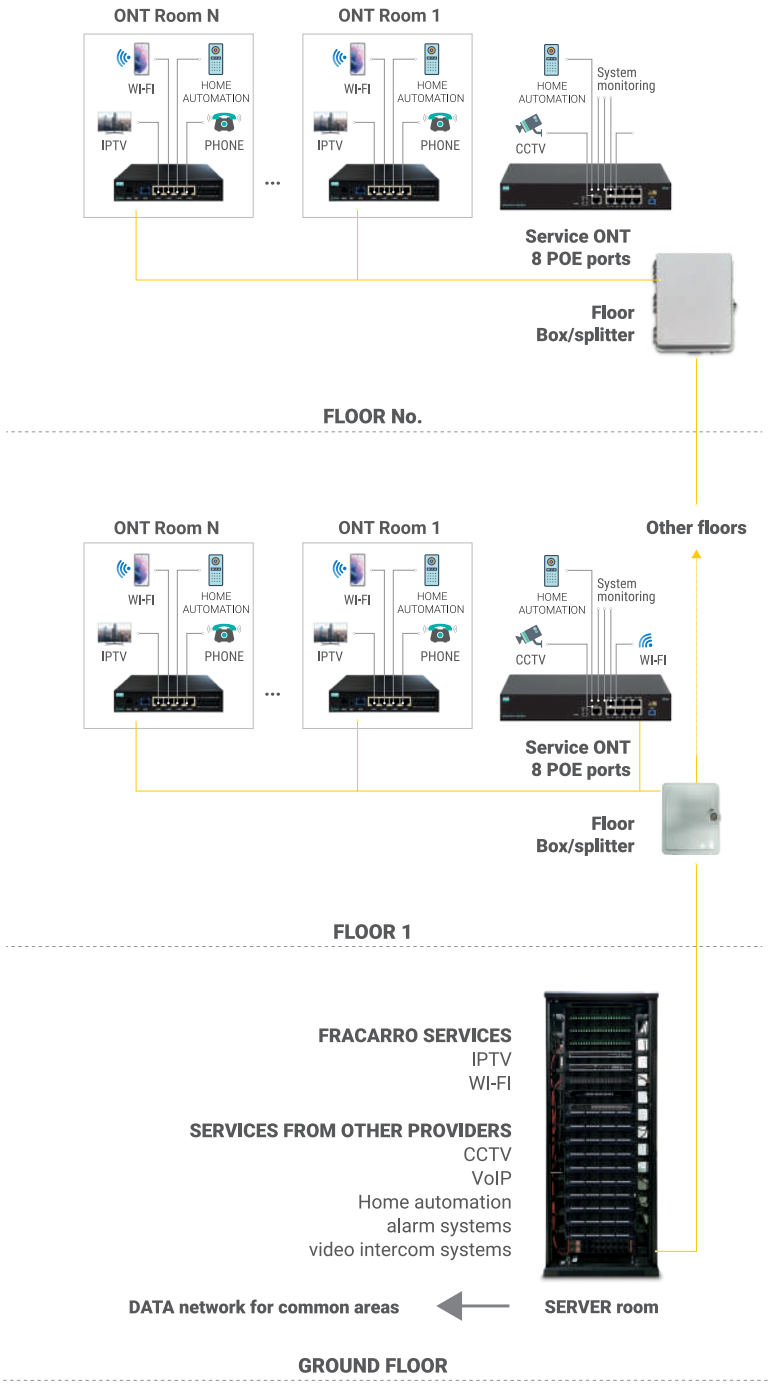
Conventional System:

- A dedicated technical room and a rack on each floor
- Active switches on each floor
- UPS lines
- Cooling system
- Cable trays sized according to cable volume
- Planned installation work schedule
- Long installation times

Less Reliable System: A switch malfunction can result in service disruption for all rooms and offices on the floor.



GPON network



GPON-Based System:

- A single rack in the server room
- Small-sized passive box/splitters per floor
- Elimination of technical rooms on each floor
- Reduction of copper cabling
- Reduction of labour costs
- Shorter installation time

More Reliable System: Any ONT malfunction only affects a single room or office, ensuring minimal disruption.

Advantages of the GPON Solution

The Fracarro GPON solution enables the creation of next-generation IP systems, offering significant advantages in terms of innovation and security.

Future-Proof Infrastructure

The GPON system is open to technological advancements, as the fibre optic network can always support new services. Choosing a GPON system means a long-lasting installation, free from concerns about obsolescence, ensuring that your investment is preserved for many years.

Simplification

Thanks to its point-to-multipoint structure, the GPON system streamlines installations, providing significant savings in terms of space, materials, time, and installation costs:

- No floor or area racks are required, eliminating the need for dedicated technical rooms.
- As a passive network, no active devices are needed on floors or in specific zones, reducing power consumption, eliminating the need for dedicated UPS lines, and improving system reliability since passive components are not prone to malfunctions.
- No cooling systems are required, leading to lower energy consumption.
- A reduced quantity of materials is needed (copper, conduits, pipes, etc.).
- Installation times are shorter.
- Labour costs are reduced.

Scalability
The GPON solution seamlessly adapts to the real needs of the customer. New services can be implemented at any time, thanks to the high bandwidth capacity of single-mode fibre and the continuous technological advancements of active devices.

Signal Immunity
The use of fibre optics ensures perfect immunity to electromagnetic interference and other disturbances, significantly enhancing system efficiency and reliability.

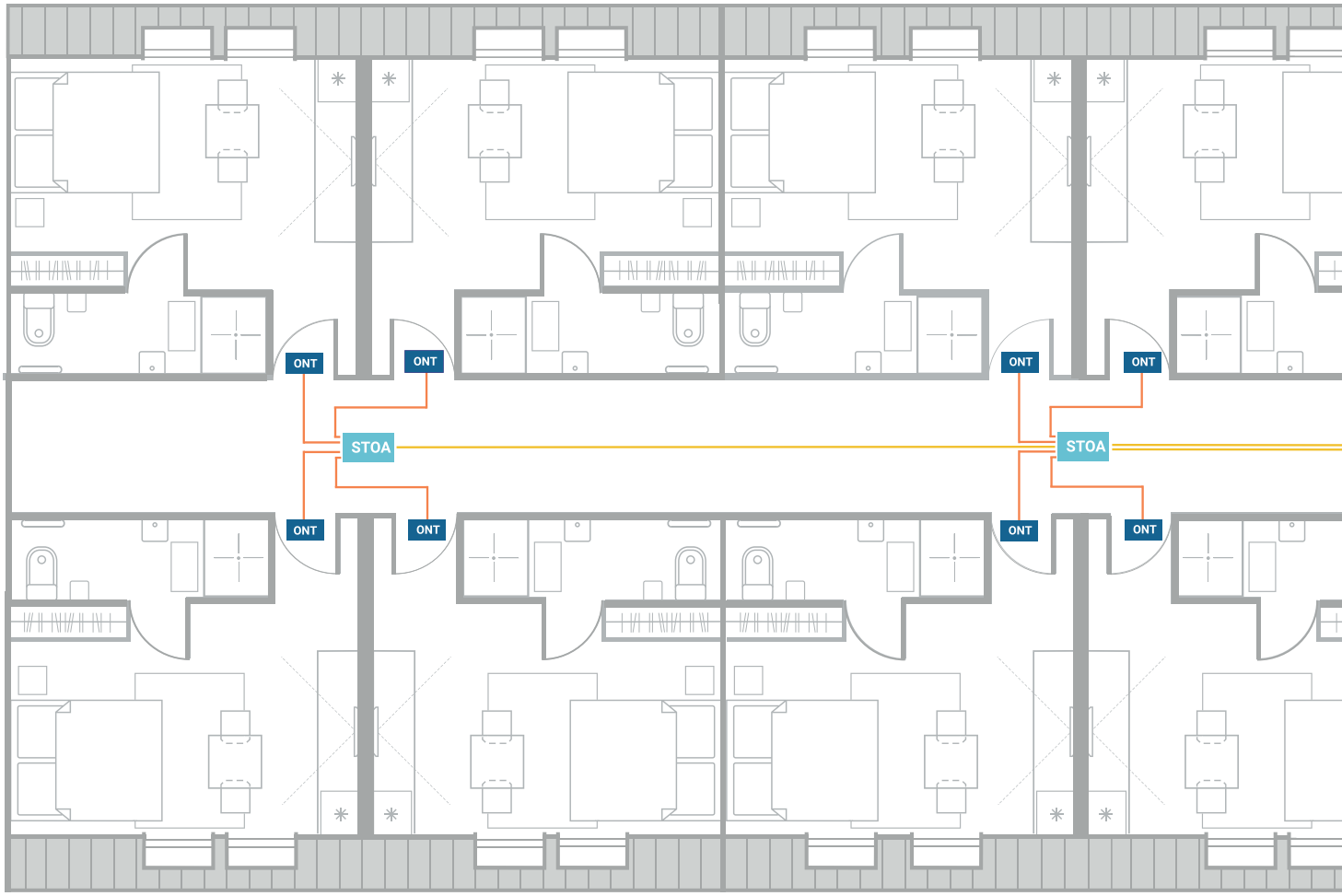
Protection Against Lightning and Surges
Due to the nature of fibre optic distribution, GPON systems help protect active equipment from damage caused by adverse weather conditions.

Extended Distribution Range
GPON technology dramatically increases the distance between ONT devices and the server room, reaching up to 20 km, far exceeding the 90-metre limitation of copper-based connections.

Reliability and Performance
The GPON solution offers a highly efficient and cost-effective approach by utilising next-generation systems that optimise connectivity and service distribution.

Security
GPON systems ensure data protection through dynamic bandwidth management and encrypted traffic, guaranteeing secure and reliable communications.

System architecture



CORRIDOR

- 9/125 Singlemode fibre
- Room optical patch cord 5/10/20m
- **BOX** floor splitter
- **STOA** serving rooms
- TECHNICAL **ONT** 8 PoE ports

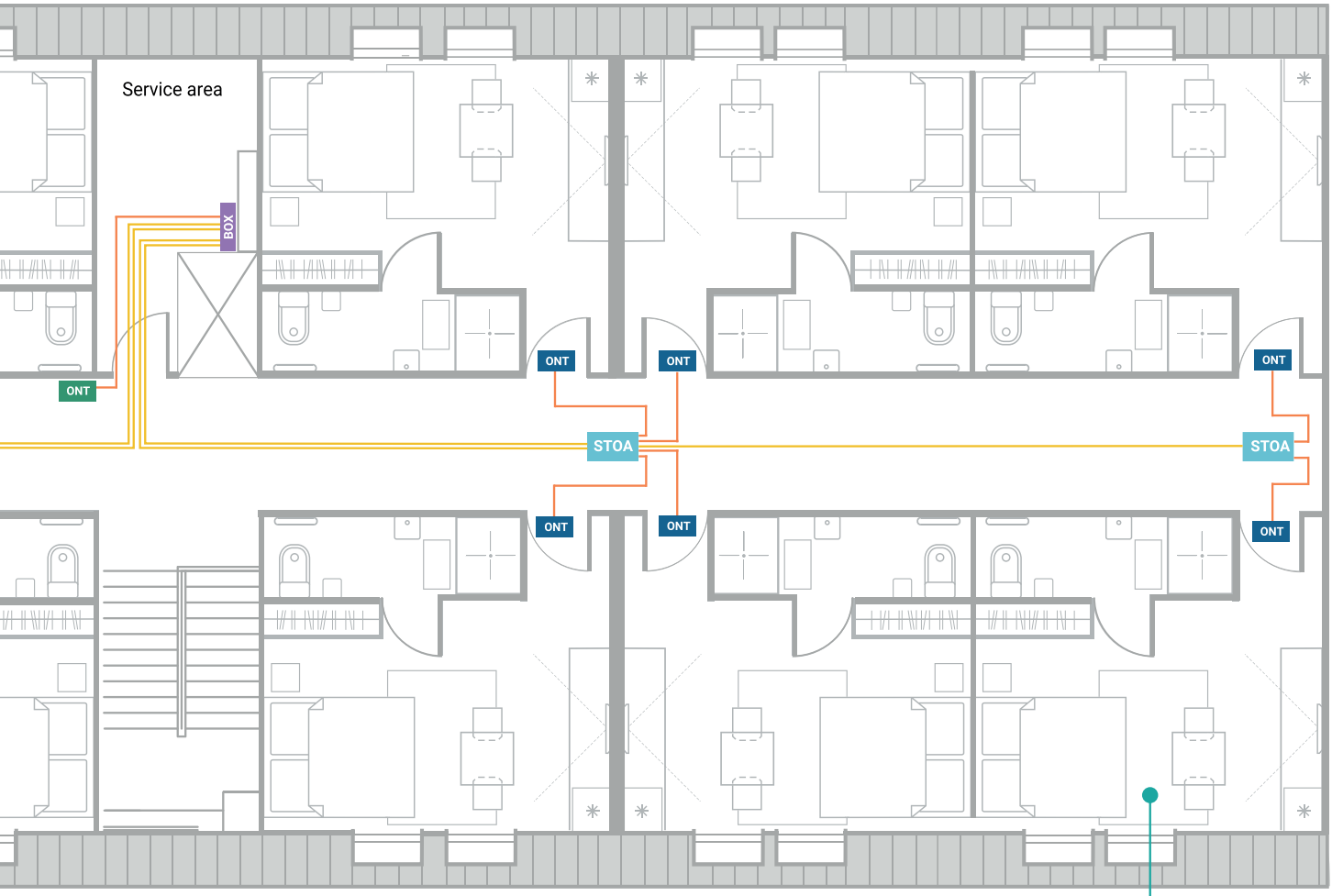
ROOM

- Patch cord CAT.6 or higher
- Copper cable CAT.6 or higher
- 4/8 ports **ONT** for room services
- RJ45 IPTV and telephone user point
- WI-FI
- Home Automation

STOA: Apartment Termination Box

BOX

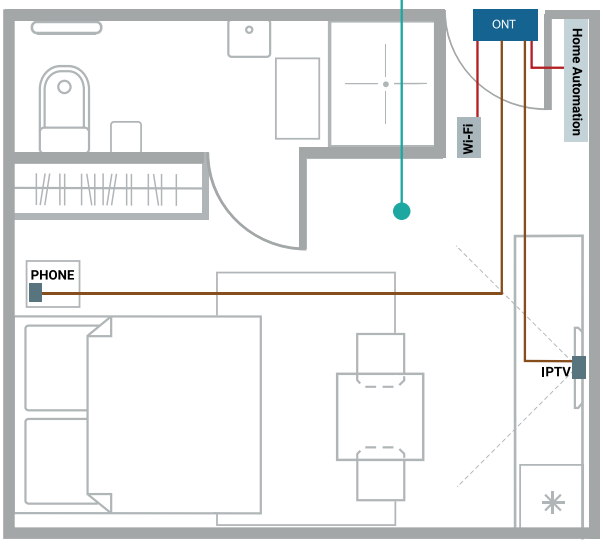
STOA



OPTICAL PATCH CORD

ONT

TECHNICAL ONT



Passive optical infrastructure

The Fracarro offering for passive GPON infrastructure includes a comprehensive range of high-quality solutions, constantly updated and easy to install.

INDOOR SOLUTIONS



Fibre Optics
- Optical fibre
- Optical patch panels
- Optical boxes
- Splitters
- Optical fibres in various sizes, compliant with CPR regulations
- Optical patch cords, adapters, etc.
- Equipment for fibre handling: fusion splicers, testers, etc.

Conventional Networks
- Rack cabinets
- Patch panels
- Termination boxes
- Category 6, 6a cables, compliant with CPR regulations
- Patch cords and connectors for different cable categories
- Crimping tools, testers, etc.

OUTDOOR SOLUTIONS – PROJECT-BASED

- Street cabinets
- Splice closures
- Ducts, microducts, multiducts
- Optical fibres in various sizes
- Fibre blowing machines

Installations with Passive Equipment
With Fracarro's passive products, it is possible to implement solutions tailored to various architectural and environmental requirements: from vertical installations for hotels, offices, and the tertiary sector in general, to horizontal installations for villages, campsites, resorts, and industrial facilities. All solutions comply with the relevant industry regulations.

Active GPON devices

For every connectivity requirement, **Fracarro** provides all the **active devices** needed to implement various types of GPON networks, such as FTTR (Fibre To The Room) or FTTD (Fibre To The Desk), ensuring the seamless distribution of multiple services.

CENTRAL SYSTEMS – OLT

Designed to manage networks up to 20 km in length, each GPON central system is supplied to meet the specific requirements of each project, both in terms of size and reliability.
From compact OLTs with 1, 4, or 8 PON ports for smaller installations up to modular systems capable of handling an increasing number of ONTs, Fracarro offers scalable and adaptable solutions for any network infrastructure.

OLTG-1P2G1S

code 287787

The Optical Line Terminal (OLT) for small networks features. One integrated PON port, 2 GE uplink ports, 1 SFP+ 10GE port and an integrated power supply.

NEW

OLTG-1P2G1SW

code 287858

The Optical Line Terminal (OLT) for small networks up to 30 ONTs features one PON port, 2 GE uplink ports, 1 SFP+ 10GE port and an integrated power supply.

NEW

OLTG-2P2G1SW

code 287857

The Optical Line Terminal (OLT) for medium networks up to 60 ONTs features two PON ports, 2 GE uplink ports, 1 SFP+ 10GE port and an integrated power supply.

OLTG-4P4GC2S

code 287791

The Optical Line Terminal (OLT) for medium-sized networks features. Four PON ports, uplink with 4 GE/SFP combo ports and 2 SFP+ 10GE ports, and dual power supply included.

OLTG-8P4GC2S

code 287792

The Optical Line Terminal (OLT) for medium to large networks features. Eight PON ports, uplink with 2 GE ports, 2 SFP ports, and 4 SFP+ 10GE ports, with dual power supply included.

Active GPON devices

SFP MODULES - SMALL FORM FACTOR PLUGGABLE

The Fracarro range includes the **GPON SFP module**, essential for managing data traffic on a single PON port, and the **10-Gigabit SFP module**, designed for interconnecting central network devices.

NEW

SFP 1G LC SM

code 287555

SFP 1GE module for uplink or trunk connections between switches.

SFP 10G LC SM

code 287761

SFP+ 10GE module for uplink or trunk connections between switches.

OLTG-SFP-C++

codice 287797

Compact, hot-swappable GPON SFP Class C++ module.

Active devices

ONT - PERIPHERAL DEVICES

Each Fracarro ONT receiver is designed to meet various connectivity needs, depending on the environment type, such as hotel rooms, common areas, offices, and technical rooms. Below are some available models:

ONTG-4GP-S

code 287788

PoE Optical Network Terminal (ONT) for data distribution over passive fibre optic infrastructure, equipped with 4 x 10/100/1000 GE PoE ports. Features advanced IPTV traffic management and multi-VLAN (tagged) support.

NEW

ONTG-4GP2F-S

code 287831

The **ONTG-4GP2F-S** optical receiver enhances the Fracarro ONT range, offering greater versatility for business applications.
It features 4 Gigabit PoE/PoE+ ports (IEEE802.3ah) for powering IP devices and 2 FXS ports for analogue phones.

Active devices

ONTG-8GP-M

code 287794

PoE Optical Network Terminal (ONT) for data distribution over passive fibre optic infrastructure, equipped with 4 x 10/100/1000 GE PoE ports. Features advanced IPTV traffic management and multi-VLAN (tagged) support.

ONTG-4G1FTW-H

code 287793

Optical Network Terminal (ONT) for data distribution over passive fibre optic infrastructure, featuring 4 x 10/100/1000 GE ports, 1 analogue telephone port (FXS RJ11), RF TV output, and a dual-band access point (WiFi 2.4/5GHz).

NEW

GPON RX TV ACT

code 287852

Passive Optical Network Terminal for digital TV signal distribution using the PON network. The receiver is equipped with an integrated WDM diplexer to separate the TV band from the data.

ETHERNET SWITCHES

Flexible, scalable, and high-performance, **Fracarro switches** are ideal for connecting multiple services such as servers, controllers, and for managing distributed data points. SFP ports allow for stacking or uplink connections with other switches in the same series.

In addition to **floor switches for backbone connections** (Series 7 at 1 Gbps and Series 8 at 10 Gbps), the range also includes the **Series 9** model, designed as a **central hub** for managing server, controller, and core network connections.

FSW-948C-6SFP+

code 287764

Layer 3 Core Switch with 48 x 10/100/1000 GE ports and 6 x SFP+ 10GE ports, featuring a 216 Gbps backplane, multicast support, and stackable design.

Fracarro, always by your side.

With **over 20 years of experience in fibre optics**, Fracarro is the ideal partner for the design, deployment, and management of GPON solutions. Our specialist technicians support professionals at every stage of the installation process, offering a comprehensive range of services.

RESOURCES FOR DESIGNERS

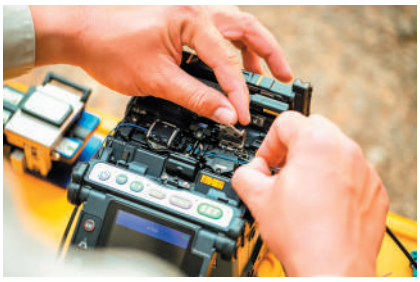
Fracarro supports design studios in developing data distribution solutions for all types of projects, providing the necessary technical and financial guidance for the preparation of bill of quantities.
Depending on the type of structure, required services, and project details (architectural and electrical), the Fracarro technical team defines the distribution aspects and sizes active equipment to deliver a comprehensive construction solution, including:

- Network logic design
- Material list
- Product technical datasheets
- Budget estimation

Fracarro's presence at an international level allows as to organize, through our partners, training and update courses on new technologies and related solutions.

FRACARRO NETWORKING SERVICES

Thanks to a network of dedicated professionals, Fracarro is able to remotely support designers and installers in the implementation of special systems.



Remote Support

Fracarro defines the IP plan, designing network architectures that enable secure and remote service distribution.
Each service is assigned a dedicated VLAN (Virtual LAN) and a network class, tailored to the number of devices and users.

During the operational phase, Fracarro remotely manages the configuration of routers/firewalls, switches, and GPON devices, ensuring the seamless integration of services such as IPTV, WiFi, VoIP, home automation, CCTV, and other smart systems.

Each stage of the installation is continuously monitored and remotely supported, allowing for real-time adjustments throughout the entire project.

Technical Support

The Fracarro support service is available to remotely assist with technical inquiries and provide maintenance for installed systems.

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