



## Wholesale Market

## IP OVER FTTO

Flexible Internet access and TIM's  
Autonomous System



# IP OVER FTTO

IP over FTTO is the simple, cost-effective and flexible solution that allows Operators to offer their Business Customers access to TIM's Public Internet and/or Autonomous System. It does so via a dedicated single-fibre connection and transport over the packet network to the TIM IP backbone entry node.

The available speed is up to 1 Gbps.

## Service features

<b>Speed</b>  <b>DOWNSTREAM AND UPSTREAM</b> <ul style="list-style-type: none"><li>• Peak bandwidth up to 1 GBPS</li><li>• Different Minimum Guaranteed Bandwidths</li><li>• Symmetrical Service</li></ul>	<b>Delivery SLAs</b> <ul style="list-style-type: none"><li>• 60 calendar days</li></ul>	<b>Assurance Blocking failure recovery time:</b> <ul style="list-style-type: none"><li>• 8 calendar hours</li></ul>
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## Who is it for?

The service is for business end customers who want access to TIM's internet and Autonomous System with speeds of up to 1 Gbps at a very competitive price.

## IP OVER FTTO Service Description

The service allows you to connect the Operator's Autonomous System (hereinafter also 'AS') with that of TIM and, if required, allow access to the public Internet, by configuring a BGP session:

- on a specific router of the TIM network called Route Server;
- on the Operator's router: configuration on this device, owned and operated by the Customer, is the latter's responsibility.

If the Operator does not have its own AS but is, in any case, assigned a set of public IP addresses, it can request the announcement of this set (LIR) through the TIM AS (AS 3269).

Finally, if the Operator does not have its own AS and is not assigned public IP addresses, it may request up to four IP addresses belonging to TIM's Autonomous System and consistent with TIM's current addressing policies.

The Operator may request an additional eight IP addresses for a fee; such additional IP addresses will not be consecutive. In this second case, the IP configuration between the Operator Router and the TIM Router will be done by static routing.

TIM will evaluate further requests for additional IP addresses.



# IP OVER FTTO

## Transport infrastructure

The transport infrastructure is shown in the following figure:

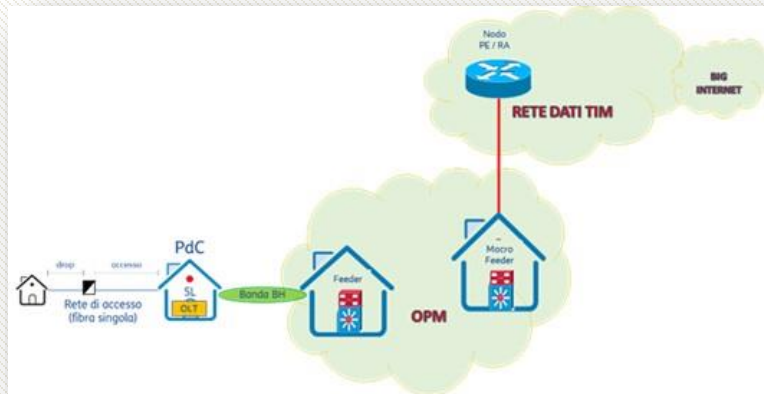


Figure 1: Service transport infrastructure diagram

The access component on the End Customer-side consists of:

- Operator-side port on L2 switch device on which the single fibre connection service is configured
- between the End Customer's premises and TIM's network and 1 Gbps optical interfaces with transmission solutions defined by TIM by project and transparent to the Operator.

The device at the End Customer's premises is connected to TIM's network using a single-fibre fibre-optic carrier, which is connected to a dedicated 1 Gbps port of the OLT (Optical Line Termination) device present at the local exchange at the End Customer's premises.

The specific L2 switch device model and equipment is decided on a case-by-case basis, depending on the bandwidth capacity required for the Connection.

## Profiles

The following profiles are envisaged:

- **IP over FTTO profile up to 1 Gbps:**  
Symmetrical Peak Bandwidth (BP) of 1 Gbps.  
Different sizes of symmetrical Minimum Guaranteed Bandwidth (MGB) are available.
- **IP over FTTO profile up to 100 Mbps:**  
Symmetrical Peak Bandwidth (PB) of 100 Gbps.  
Different sizes of symmetrical Minimum Guaranteed Bandwidth (MGB) are available.



# IP OVER FTTO

TIM configures the MGB required by the Operator for the connection on the traffic transport route from the End Customer's premises to the entry node on its backbone so that each service's transmission capacity is based on the chosen Profile and MGB. Specifically, traffic is assigned a Class of Service of two or four depending on whether its instantaneously controlled speed is less than / equal to or greater than the MGB, respectively.

It follows that it is still possible to use the transmission capacity to PB in shared mode for IP over FTTO profiles up to 100 Mbps and up to 1 Gbps.

For each connection underlying the service, a virtual private network (VLAN) is configured between the L2 switch device located at the Operator's/Customer's premises and the optical line terminal (OLT) on the TIM network of certification in a way that is transparent to the Operator. This means that its configuration does not influence the configurations of the latter's devices.

## Protocols

The delivery to the Operator/End Customer's premises, carried out with an Ethernet L2 Switch, associates a VLAN with the Operator's traffic on a port basis and must necessarily be untagged and IP type. Any BPDUs (Bridge Protocol Data Units) of L2 control protocols will be discarded by termination.

All IPP/DSCP (Differentiated Services Code Point) values of the Operator's traffic will be accepted, but they will not be used in any way to differentiate the priority of network traffic. The received IPP field will also be marked as 0, which is standard behaviour for TIM Internet access services.

Maximum MTU sendable on End Customer-side: 1500 Bytes.

## Prices

The price of the IP over FTTO service is divided into a contribution and a monthly fee depending on the chosen profile and minimum guaranteed bandwidth.

## Regulatory Conditions

The service is for:

- Operators with an individual license or a general authorisation for telecommunications networks and services for public use which existed before the entry into force of Italian Legislative Decree no. 259 of 1 August, 2003, containing the 'Electronic Communications Code' (referred to in Article 38 of the Code), as last amended by Italian Legislative Decree no. 259 of 28 May, 2012. 70.
- Companies with a general authorisation for electronic communications networks and services pursuant to Art. 25 of Italian Legislative Decree no. 259 of 1 August 2003, as last amended by Italian Legislative Decree no. 70 of 28 May 2012.





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**TIM SPA**

Registered Office: Via Gaetano Negri, n.1 - 20123 Milano  
Sub-Office and General Management: Corso d'Italia, n. 41 - 00198 Roma  
Certified email box (PEC): [telecomitalia@pec.telecomitalia.it](mailto:telecomitalia@pec.telecomitalia.it)

Tax Code/VAT no. and Milan Company Register no.: 00488410010  
Entry in the Register of Producers of Electrical and Electronic  
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