



WE DO CONNECTIONS

# Consorzio TOP-IX Interconnection Services Service Description

DATE 23.03.2021

REV. 2021.04

# Service Description

<b>1. Introduction</b>	<b>4</b>
<b>2. TOP-IX Backbone Architecture</b>	<b>5</b>
2.1 TOP-IX Platform Access Nodes	5
2.2 Interconnection To The Platform	7
2.3 Interface And Physical Access Standards	8
<b>3. Services And Access Port</b>	<b>9</b>
3.1 Peering Service	10
3.1.1 Access Mode	10
3.1.2 Access Requirements	11
3.1.3 Route Servers	12
3.1.4 Peering Agreements	12
3.1.5 Ancillary Services	12
3.2 Marketplace Services	13
3.2.1 Access Mode	13
3.2.2 Access Requirements	13
3.2.3 Ancillary Services	14
3.3 Transport Services	14
3.3.1 Service Access Modes	15
3.3.2 Service Access Requirements	15
3.3.3 Ancillary Services	15
3.4 Reselling Services	15
3.5 Remote Peering To Partner Ixps	16
<b>4. Service Provisioning Process</b>	<b>17</b>
4.1 Provisioning	17
4.2 Management	17
4.3 Maintenance	18
4.4 Operational Communications	18
<b>5. Quality Statements</b>	<b>19</b>
5.1 Provisioning	19
5.2 Management	19
5.3 Maintenance	19
5.3.1 Availability	19
5.3.2 Recovery Time	20
5.4 Performance Monitoring	20

5.5 Access To Traffic Statistics ..... 20

## 1. INTRODUCTION

Interconnection services offered by Consorzio TOP-IX to consortium Members and Partners are based on the use of a geographically distributed transmission infrastructure (or platform) across North-West of Italy, and designed to allow the following types of connections:

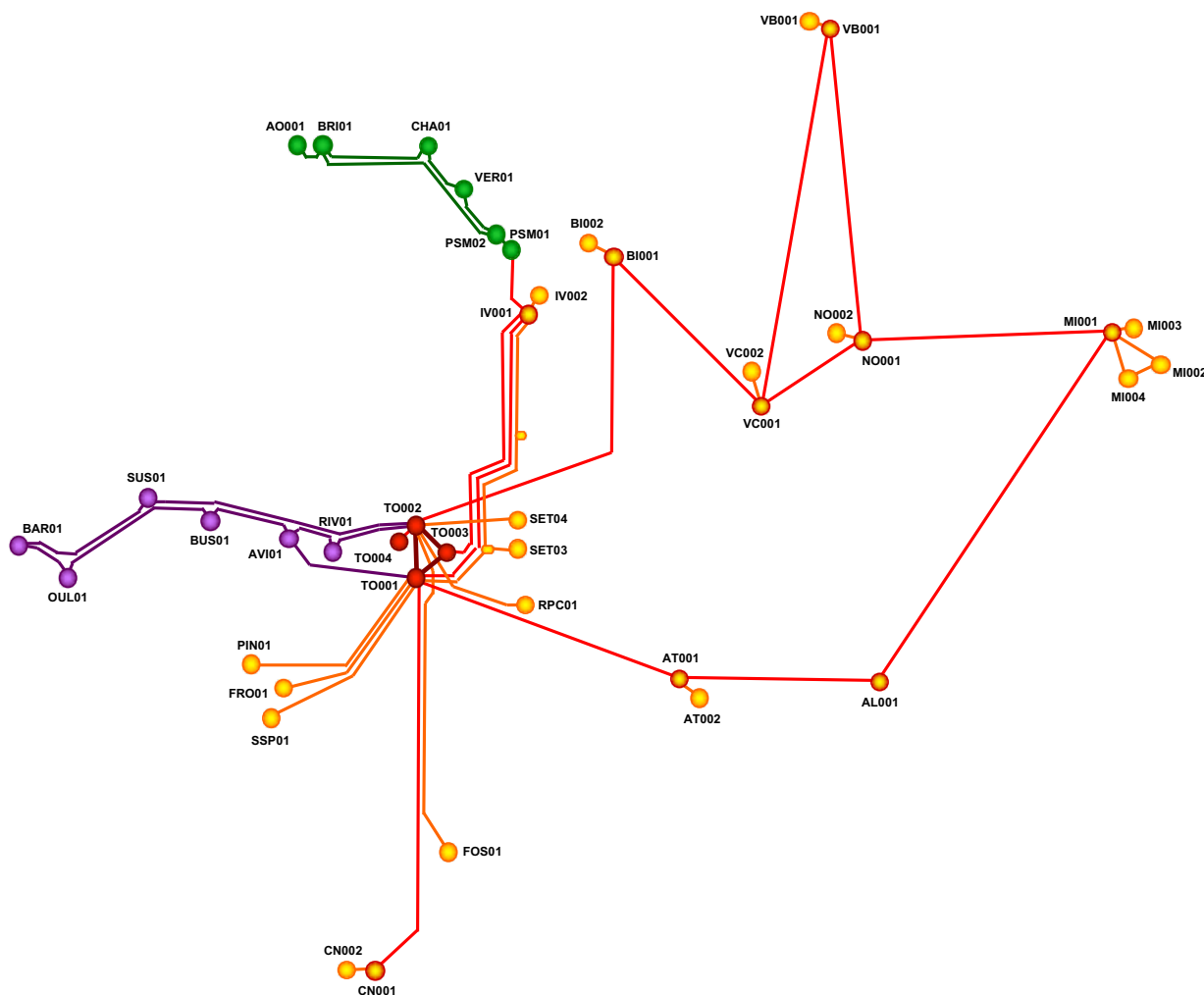
- **Peering** connections using BGP protocol to implement mutual visibility sessions between the Autonomous System of Members and Partners connected to the platform.
- **Marketplace** designed to allow the sale of interconnection services (e.g. IP Transit, Cloud, remote Ethernet, etc.) between Members and Partners connected to the platform.
- **Transit** designed to implement point-to-point or multipoint connections for private services (e.g. backhauling) for Members and Partners connected to the platform.

Any relation between connecting entities is carried out directly between the relevant involved parties without any technical or financial involvement by TOP-IX. TOP-IX is solely responsible for providing the configuration on the platform required by Members.

## 2. TOP-IX BACKBONE ARCHITECTURE

The interconnection platform managed by TOP-IX operates at Level 2 (Ethernet). It is characterized by a high level of reliability and availability thanks to the redundant architecture of the local physical platforms building the network nodes and their interconnecting backbones.

As shown in Figure 1, the platform currently covers all the main cities in Piedmont and Valle d'Aosta regions, as well as the metropolitan Milan metropolitan area.



*Figure 1 - TOP-IX network platform*

### 2.1 TOP-IX PLATFORM ACCESS NODES

Depending on the specific features of local platforms and interconnecting backbones, four types of node can be identified. Each node differs in terms of its level of reliability, robustness and performance.

**CORE:** robust, reliable and high-performance platforms nodes comprising composed by redundant equipment. The backbones links connecting the nodes to the rest of the platform have a meshed topology with physically diverse routes, with a speed of no less than Nx10Gbps.

**BACKBONE:** reliable and high-performance platforms nodes. The backbones links connecting the nodes to the rest of the platform have a meshed topology with physically and/or logically diverse routes, with a speed of no less than 10Gbps

**EDGE:** reliable and high-performance platforms nodes. The backbones links connecting the nodes to the rest of the platform have a meshed topology with diverse routes on selected nodes, with a speed no less than 10Gbps

**REMOTE ACCESS:** access nodes with a passive, single way xWDM interconnection technology. These nodes are designed to house backbone, point-to-point radio devices for traffic backhauling.

## CORE NODES

TO001 TORINO Corso Unione Sovietica 216 (CSI Piemonte)

TO002TORINO Centro Piero della Francesca Corso Svizzera 185 (It.Gate) MI001 MILANO Via Caldera 21 Palazzina D (Irideos)

## BACKBONE NODES

AL001 ALESSANDRIA Lungo Tanaro Magenta 7/a (Municipality of Alessandria) AT001 ASTI Viale Pilone 103 (Municipality of Asti)

BI001 BIELLA Via Quintino Sella, 12 (Province of Biella) MI002 MILANO Via Savona 125 (Equinix ML2)

MI004 MILANO Via Monzoro, 101-105 Cornaredo (Data4)

NO001 NOVARA Viale Manzoni, 26 (Municipality of Novara)

VB001VERBANIA Via dell'Industria, 29/1 (Tecnoparco / Province of Verbania)

VC001 VERCELLI Via San Cristoforo, 3 (Province of Vercelli)

## EDGE NODES

TO003TORINO Environment Park Via Livorno 60 (Colt Technology Services) MI003 MILANO Via Caldera 21 (Caldera21 - CDLAN)

CN001CUNEO Corso Soleri 2 (Province of Cuneo) IV001 IVREA Strada Torino 50 (City of Torino)

FOS01FOSSANO Strada Torino 164/166 (Unione del Fossanese)

PSM01PONT SAINT MARTIN Viale Carlo Viola 76 (Aosta Valley regional government offices / Engineering)

VER01 VERRES Via Luigi Barone (Aosta Valley regional government offices / Polytechnic of Torino)

CHA01CHATILLON Via Tornafol (Aosta Valley regional government offices / CVA)

BRI01 BRISOGNE Località Ile Blonde, 5 (Aosta Valley regional government offices / INVA)

AO001AOSTA Via Laboratori Vittime col Du Mont 24 (Aosta Valley regional government offices)

RIV01 RIVOLI A32 motorway, Galleria "La Perosa" (SITAF)

AVI01 AVIGLIANA A32 motorway, Toll Booth (SITAF)

BUS01BUSSOLENO A32 motorway, Galleria "Prapontin" (SITAF) SUS01SUSA A32 motorway, Autoporto di Susa (SITAF)

OUL01OULX A32 motorway, SS335 intersection (SITAF)

BAR01BARDONECCHIA A32 motorway (SITAF)

## REMOTE ACCESS NODES

AT002 ASTI Piazza Catena 3 (Municipality of Asti) (single path connection to AT001 node)

BI002 BIELLA Via Fratelli Rosselli 2 (IIS “Sella”)

(single path connection to BI001 node)

CN002 CUNEO Corso Alcide de Gasperi 40 (Provveditorato)

(single path connection to CN001)

NO002 NOVARA Via San Bernardino da Siena 10 (IIS “Nervi”)

(single path connection to NO001 node)

SSP01 SAN SECONDO DI PINEROLO Via Repubblica 1 TOP-IX (Scuola Secondaria “F. Brignone”)

(single path connection to TO001 node)

VB002 VERBANIA Via dell’Industria, 29/1 (Tecnoparco / Provincia di Verbania)

(single path connection to VB001 node)

VC002 VERCELLI Piazza Risorgimento 12 (CCIAA)

(single path connection to VC001 node)

SET03 SETTIMO TORINESE - Via Santa Cristina, 3 (Municipality of Settimo Torinese / Hospital)

(single path connection to TO001 node)

SET04 SETTIMO TORINESE - Piazza Freidano (Municipality of Settimo Torinese / Traliccio)

(single path connection to TO002 node)

PSM02 PONT SAINT MARTIN Viale Carlo Viola 76 (Aosta Valley regional government offices / Pépinière)

(single path connection to PSM01 node)

RPC01 RIVA PRESSO CHIERI - Via Andriano 12 (former Embraco industrial area) (single path connection to TO002 node)

PIN01 PINASCA - Via Pola 2-6 (Municipality of Pinasca) (single path connection to TO001 node)

FRO01 FROSSASCO - Via Rinaldo Asvisio 2 (Municipality of Frossasco) (single path connection to TO001 node)

## 2.2 INTERCONNECTION TO THE PLATFORM

The choice of the access node and the connection speed are at the discretion of the individual user who may also choose whether to:

- implement a direct remote interconnection from its own premises to the TOP-IX node while keeping the network equipment at its own premises;
- exploit the housing location at the TOP-IX node to host the network equipment.

The service demarcation point is located at layer 2 physical port made available to TOP-IX Member on the network node chosen by the Members. The Member is responsible for any physical cross connect needed from the physical access port on the TOP-IX network device to its own network infrastructure or to its equipment hosted in the node.

In selected locations, TOP-IX offers a housing service in the amount of three rack units per Member in shared spaces (200 Watt max), dedicated exclusively to host network transmission equipment (the installation of equipment such as servers, storage, etc. is not permitted). The service is to be considered included in the interconnection service fees paid by the Member in the same site.

The housing service is available in the following TOP-IX locations: AL001, AT001, BI001, NO001, VB001, VC001, CN001, IV001, FOS01, RIV01, AVI01, BUS01, SUS01, OUL01, BAR01, AT002, BI002, IV002, NO002, SSP01, VB002, VC002, SET03, SET04, RPC01, PIN01, FRO01.

The housing service is fully normed in the term of service document available on TOP-IX website.

Any additional space and/or housing services in other TOP-IX nodes must be requested as an ad-hoc service to TOP-IX or must be directly requested to the owner of the housing location.

In-site cross-connect between equipment from different consortium Members must be requested to TOP-IX and are managed directly by TOP-IX staff.

### 2.3 INTERFACE AND PHYSICAL ACCESS STANDARDS

TOP-IX platform have Ethernet access interfaces. The access speeds and standards are listed in the following table:

Node Type	Ethernet 1 Gbps	Ethernet 10 Gbps	Ethernet 100 Gbps
CORE	1000BASE-LH	10GBASE-LR	100GBASE-LR4
BACKBONE	1000BASE-LH	10GBASE-LR	-
EDGE	1000BASE-LH <sup>1</sup>	10GBASE-LR	-
REMOTE ACCESS	CWDM/DWDM <sup>2</sup>	DWDM <sup>2</sup>	-

In the case of different needs, TOP-IX can evaluate the use of other physical access standards on a project basis. The possibility of adopting a different standard depends on the capability and port availability of the node network equipment.

For multi-port links on the same node, it is possible to implement the link in LACP mode.

In case of Transport service port (therefore excluding Peering or Marketplace services) it is possible to request the setup of QinQ tunnel in order to allow the free use of a single VLAN tag by the end user.

The backbone does not implement any QoS (Quality of Service) management mechanisms.

---

1 On nodes VER01, CHA01, AO001, RIV01, AVI01, BUS01, SUS01, OUL01, BAR01 the actual access standard is 1000BASE-T

2 REMOTE ACCESS nodes do not have a local traffic exchange platform. In order to use the services offered at these nodes it is necessary to request a passive lambda interconnection (DWDM or CWDM depending on the node) towards the adjacent CORE/BACKBONE/EDGE node and a dedicated port on the latter. The lambda interconnection allows direct interconnection between the user equipment (installed in the REMOTE ACCESS node) and the dedicated port on the adjacent TOP-IX node. It is not allowed to use the lambda for different purposes, such as direct interconnection between the user devices located at the two ends of the link.



### 3. SERVICES AND ACCESS PORT

The TOP-IX platform allows the implementation of different types of services that can share the same access port when needed:

- **Peering:** Internet Exchange service in order to allow bilateral peering sessions (established between two different AS with direct BGP sessions) or multilateral peering sessions (i.e. established by an AS towards a set of AS through Route Servers);
- **Marketplace:** sale of interconnection services (IP Transit, Dedicated Cloud Access, Security, etc.);
- **Transport:** private point-to-point or multipoint interconnection of the TOP-IX platform for traffic backhauling, between ports of a single Member;
- **Reselling Standard:** access to TOP-IX platform services to remote users accessing through the reseller network infrastructure;
- **Reselling Advanced:** access to TOP-IX platform services to remote users accessing through the reseller network infrastructure, but with enhanced feature (VLAN mapping, rate limiting, etc.);
- **Remote Peering IXP Partner:** access to the peering platforms of other IXPs through the TOP-IX platform, depending on the Partnership of TOP-IX.

Depending on the services required, the ports are divided into four categories:

- **Peering ports:** ports reserved exclusively for peering services;
- **Marketplace ports:** ports reserved exclusively for Marketplace services<sup>3</sup>.
- **Transport ports:** ports reserved to all services (Peering, Marketplace, Transport and Reselling Standard);
- **Reselling Ports:** ports on which it is possible to request only Reselling Advanced services (which include delivery on a dedicated VLAN for each remote peer, rate limiting, etc.) (currently available only at TO002 node).
- Marketplace and Reselling ports can only be requested by service providers authorized by TOP-IX, after analysis of the technical requirements.

The following table defines the compatibility between service types and port types:

Service	Peering Port	Marketplace Port	Transport Port	Reselling Port
Peering	X	-	X	-

<sup>3</sup> Ports not included in the marketplace definition:

- all ports that collect traffic of wired networks in the availability of TOP-IX, even in the case where the traffic is propagated through electronic communication equipment owned by TOP-IX Member, Partners or any third party.
- - All ports that collect radio network traffic through passive infrastructure (supports, poles, pylons, etc.) made available by TOP-IX, even if the traffic is propagated through electronic communication equipment owned by TOP-IX Member or by third parties.

Marketplace	-	X <sup>4</sup>	X	-
Transport	-	-	X	-
Reselling Standard	X	-	X	-
Reselling Advanced	-	-	-	X
Remote Peering IXP Partner	X	-	X	-

The following table shows the connection speeds available for the different port types:

Port Speed	Peering Port	Marketplace Port	Transport Port	Reselling Port
100 Mbps	-	-	X <sup>5</sup>	-
1 Gbps	X	X	X	-
10 Gbps	X	X	X	X
100 Gbps	X	X	-	X

### 3.1 PEERING SERVICE

TOP-IX offers its Members and Partners access to the Layer 2 distributed platform of Internet Exchange in order to implement Internet peering agreements towards other Bodies/Organizations/Companies connected directly or indirectly to its platform.

The peering service can only be used to implement BGP sessions of mutual visibility between Consortium Members/Partners. It is prohibited to use TOP-IX public peering platform for other functionalities such as transport, transit sale, etc.

#### 3.1.1 ACCESS MODE

The peering service is available in the following three access modes:

- Direct access;
- Remote access;
- Access from Partner IXPs.

##### Direct Access

The direct access mode is used when the service user is directly connected to one or more ports active at nodes belonging to the TOP-IX platform.

##### Remote access

It is possible to access the public peering services offered by TOP-IX through a Partner (Reseller) chosen among those identified by TOP-IX. Resellers are Partners of TOP-IX who have signed a

<sup>4</sup> Marketplace services cannot be implemented between two Marketplace ports; at least one of the ports must be a Transport port

<sup>5</sup> 100 Mbps ports are provided on a 1 Gbps physical interface. The user is responsible for policing the traffic level to the contractual speed of 100 Mbps.

Reselling Agreement in order to provide third parties with remote access (remote peering) to the TOP-IX peering platform.

Any contractual relationship is directly managed by the user of the service and the Reseller. The extension of the peering service (Layer 2) between the platform of TOP-IX and that of the user of the service will be realized by the Reseller through its own network infrastructure.

#### Access from Partner IXPs

The public peering platform of TOP-IX is also available through the Internet Exchanges interconnected to TOP-IX platform (VSIX, Lyon-IX and France-IX).

Members of these IXPs may request access to TOP-IX public peering from their IXP. The Partner IXP extends the TOP-IX Layer2 peering LAN to its Member.

The service is to be considered as Best Effort, and not subjected to the Quality Statements.

### 3.1.2 ACCESS REQUIREMENTS

Access to the public peering service offered by TOP-IX must be carried out in full respect of the following constraints and requirements.

#### Physical Layer: (applicable only to direct access)

The physical interfaces of the equipment connected to the TOP-IX platform must respect the interconnection requirements defined in paragraph 2.3 (any exceptions must be agreed with and must be explicitly authorised by TOP-IX).

#### MAC level and VLAN:

All frames sent to the access ports of TOP-IX public peering platform must have the same source MAC address, associated with the IP assigned by TOP-IX.

Any MAC address change must be reported to the TOP-IX NOC, which will update the ingress filters associated to the access port.

Public peering agreements are carried out on a single public VLAN, they are free of charge and cannot implement transit services.

The protocols allowed are: IPv4 (Ethertype 0x0800), ARP (Ethertype 0x0806) and IPv6 (Ethertype 0x86dd).

ARP, ICMPv6 and unknown-unicast traffic is policed.

All control plane Layer2 protocols (STP, bridging protocols) as well as Router Advertisement/Router Solicitation (RA/RS) will be filtered out.

#### IP layer:

All Layer 3 interfaces connected to TOP-IX public peering platform have IPv4 and/or IPv6 addresses assigned by TOP-IX (the use of addresses other than those assigned is not permitted).

The service imposes the assignment of one IPv4/IPv6 for each interconnection port to the TOP-IX peering platform.

The service may be requested on a maximum of two interconnection ports to the TOP-IX platform for a maximum of two IPv4/IPv6 per Member.

Maximum MTU allowed is 1500 bytes.

Non-unicast packets are not allowed, with the exception of ARP and ICMPv6 Neighbor Advertisement/Solicitation (IPv4 multicast traffic is not allowed).

#### Routing:

Peering sessions established through TOP-IX public peering platform must use the BGP-4 protocol.

The AS numbers used in BGP sessions must be public and registered with a RIR (RIPE, etc.) in the name of the Member/Partner (the use of AS belonging to the reserved block for private use is not allowed).

Any IPv4/v6 address assigned by TOP-IX cannot be announced via BGP.

All routes announced in peering sessions must be registered with RIPE or any other public Routing Registry.

### **3.1.3 ROUTE SERVERS**

In order to facilitate and encourage public peering on its platform, TOP-IX provides a redundant Route Server service that automate the management of peering between Members and Partners.

The Route Server do not perform traffic routing, but deal exclusively with the redistribution of routes (learned via BGP protocol) between the Members of the platform. Using single BGP session with the Route Server is possible to receive the announcements generated by all the Autonomous Systems connected to the Route Server.

All information concerning the use of the Route Server systems are available at the address:

**<https://www.TOP-IX.org/it/ix/routeserver/>**

Given the importance of the role played by the Route Server function within the Internet Exchange service, the system is redundant; two BGP sessions toward two different and geographically diverse Route Servers must be configured for their correct use.

A Looking Glass service to verify the operation of the Route Server systems is available at the address:

**<https://lg.TOP-IX.org>**

The use of the TOP-IX Route Server systems is at the discretion of the individual Member, who may decide whether or not to use them.

### **3.1.4 PEERING AGREEMENTS**

The interaction between the Members takes place in peer-to-peer mode using the BGP-4 protocol (Border Gateway Protocol - version 4) or BGP-4+ (for the IPv6 protocol) without any technical or economic interference from TOP-IX.

A public VLAN is made available on which the interested Members can enter into peering agreements of mutual visibility (transit BGP sessions are excluded).

### **3.1.5 ANCILLARY SERVICES**

The service explained in the previous paragraphs also includes:

- One IPv4 and one IPv6 address belonging to the Autonomous System of TOP-IX (depending on the service required), used to implement peering interconnection agreements with other Members.
- Access to statistics related to the volume of traffic exchanged through the Member ports on TOP-IX platform;
- An operational mailing list service;
- Support for configuration updates on ports;
- Support for fault management and troubleshooting on TOP-IX platform affecting the Member service.

The services provided by TOP-IX do NOT include

- housing costs;
- cross connect costs;
- interconnection costs between the Member premises and the TOP-IX platform nodes;
- configuration of the Member equipment.

### **3.2 MARKETPLACE SERVICES**

The Marketplace services are dedicated to allow the sale of services (IP Transit, Dedicated Cloud Access, Ethernet, Security, etc.) between Members directly connected to the TOP-IX platform.

The service exclusively includes Layer 2 interconnection between the requesting party and another Member. The services provided on top of the Marketplace Service are subject to direct agreements between the two Members/Partners involved.

Marketplace services may only be requested between ports of two different Members directly connected to the TOP-IX platform. Marketplace services are not allowed between more than two Members.

#### **3.2.1 ACCESS MODE**

Marketplace services are only available in direct access mode to the TOP-IX platform.

#### **3.2.2 ACCESS REQUIREMENTS**

Access to the services must be made in full compliance with the following constraints and requirements.

##### Physical Layer:

The physical interfaces of the equipment connected to the TOP-IX platform shall comply with the interconnection requirements defined in section 2.3 (any exceptions must be agreed with and must be explicitly authorised by TOP-IX).

##### MAC level and VLAN:

A maximum of two MAC addresses per VLAN per interconnection port is allowed for Marketplace services.

Service agreements (IP Transit, Dedicated Cloud Access, etc.) are negotiated directly between Consortium Members/Partners without any interference from TOP-IX.

The protocols allowed are: IPv4 (Ethertype 0x0800), ARP (Ethertype 0x0806) and IPv6 (Ethertype 0x86dd).

ARP, ICMPv6 and unknown-unicast traffic is policed.

All control plane Layer2 protocols (STP, bridging protocols) as well as Router Advertisement/Router Solicitation (RA/RS) will be filtered out.

The use of spanning-tree protocols towards the TOP-IX platform is not allowed.

#### IP layer:

All Layer 3 interfaces connected to the platform and dedicated to Marketplace Services that impose the use of BGP sessions must use IPv4/IPv6 addresses assigned by TOP-IX (use of addresses other than those assigned is not permitted).

Maximum MTU allowed is 9000 bytes.

Non-unicast packets are not allowed with the exception of ARP and ICMPv6 Neighbor Advertisement/Solicitation (IPv4 multicast traffic is not allowed).

#### Routing:

Any IPv4/v6 address assigned by TOP-IX cannot be announced via BGP.

### **3.2.3 ANCILLARY SERVICES**

The service explained in the previous paragraphs also includes:

- One or more IPv4/IPv6 address and an IPv6 address belonging to the Autonomous System of TOP-IX (depending on the service required), used to implement peering interconnection agreements with other Members.
- One or more VLANs towards other Members/Partners of TOP-IX (each single VLAN may be propagated exclusively between two Members/Partners).
- Access to statistics related to the volume of traffic exchanged through the Member ports on TOP-IX platform;
- An operational mailing list service;
- Support for configuration updates on ports;
- Support for fault management and troubleshooting on TOP-IX platform affecting the Member service.

The services provided by TOP-IX do NOT include

- housing costs;
- cross connect costs;
- interconnection costs between the Member premises and the TOP-IX platform nodes;
- configuration of the Member equipment.

### **3.3 TRANSPORT SERVICES**

The Transport services allow the implementation of a Layer 2 transport between ports assigned to a single Member.

### **3.3.1 SERVICE ACCESS MODES**

Transport services are available exclusively in direct access mode to the TOP-IX platform and can be provided only on "Transport" type ports.

### **3.3.2 SERVICE ACCESS REQUIREMENTS**

Access to the services must be performed in full compliance with the following constraints and requirements.

#### Physical Layer:

The physical interfaces of the equipment connected to the TOP-IX platform must comply with the interconnection requirements defined in paragraph 2.3 (any exceptions must be agreed with TOP-IX and must be explicitly authorised by the latter).

#### MAC level and VLAN:

The service is intended to allow connectivity between Layer 3 equipment of the requesting Consortium Member. A limit of maximum 20 MAC addresses per VLAN, per port is allowed.

The use of spanning-tree protocols towards the TOP-IX platform is not allowed.

### **3.3.3 ANCILLARY SERVICES**

The service explained in the previous paragraphs also includes:

- One or more VLANs to other ports of the Member/Partner using the transport service (VLANs used for the transport service may not be propagated to other Members/Partners).
- Access to statistics related to the volume of traffic exchanged through the Member ports on TOP-IX platform;
- An operational mailing list service;
- Support for configuration updates on ports;
- Support for fault management and troubleshooting on TOP-IX platform affecting the Member service.

The services provided by TOP-IX do NOT include

- housing costs;
- cross connect costs;
- interconnection costs between the Member premises and the TOP-IX platform nodes;
- configuration of the Member equipment.

## **3.4 RESELLING SERVICES**

These services are dedicated to TOP-IX Partners who have signed a Reselling Agreement in order to be able to offer third parties' access to TOP-IX public peering platform. Reselling services can be provided in Standard or Advanced mode.

### Standard Reselling

The Standard mode, currently available only for connections to the TOP-IX backbone at Core nodes (TO001, TO002, MI001, MI003, MI004), provides the service through direct access to the public peering VLAN of TOP-IX.

There is no VLAN translation or rate limiting system for the traffic, neither at port level nor at the level of individual third-party customers.

### Advanced Reselling

The Advanced mode, currently available only for connections to the TOP-IX backbone at the TO002 node, allow the interconnection through a dedicated platform that allows for advanced services - such as VLAN translation, per customer/VLAN rate limiting.

## **3.5 REMOTE PEERING TO PARTNER IXPS**

Through the TOP-IX platform it is possible to access the public peering platforms of Partner IXPs interconnected to TOP-IX platform.

It is possible to request access to the public peering services of the following IXPs:

- VSIX (Padua);
- LYON-IX (Lyon);
- FRANCE-IX (Paris).

The service offered by TOP-IX provides for the extension of the public peering VLAN of the Partner IXP to the requesting port.

The user is in charge for requesting to the Partner IXP IPv4/IPv6 addresses and the implementation of RSs peering sessions



## 4. SERVICE PROVISIONING PROCESS

The following sections describe the operational procedures and contact points for provisioning (port and service activation/capacity expansion/termination), management (changes in configurations) and maintenance processes (fault management and troubleshooting).

### 4.1 PROVISIONING

Requests related to activating/deactivating/modifying ports and/or services by Consortium Members/Partners should be made by filling in the form available from TOP-IX website

**<https://www.TOP-IX>**

under the Internet Exchange/Subscription and Fees section.

Request forms should be sent by e-mail to the following address:

**[amministrazione@TOP-IX.org](mailto:amministrazione@TOP-IX.org)**

During the request phase, the Member/Partner is required to indicate the technical person responsible for coordinating activities on behalf of the Member/Partner.

Requests will be carried out in the manner and timing foreseen in the "Quality Statements" section of this document.

In the case of requests involving contractual changes, please refer to TOP-IX website at <https://www.TOP-IX> (Internet Exchange/Subscription and Fees section) for current financial terms and conditions.

Requests for service activation and/or upgrade will not be carried out in case of pending or outstanding administrative case.

### 4.2 MANAGEMENT

The operations management service offered by TOP-IX includes the implementation of any configuration modifications requested by the Members/Partners that do not affect the service contract agreement, or require hardware/software updates to TOP-IX backbone platform.

Operations do not include actions involving activation of new ports, capacity changes, discontinuation of existing services - activities to be carried as described in the "Provisioning" section.

Requests to modify the configurations may be requested:

- by email to [networking@TOP-IX.org](mailto:networking@TOP-IX.org) (available only during normal business hours, from Monday to Friday, 9:00-13:00 and 14:00-18:00, public holidays excluded).

Requests involving this type of activity must be submitted with all the necessary technical information in order to implement changes correctly.

The minimum amount of information required in order to deal with the request is as follows:

- details of the technical staff in charge of coordinating the activity;
- detailed technical description of the request;
- any potential impact on other Members/Partners on the TOP-IX platform, and the staff contact of the latter.

This service is active Mondays to Fridays, 09:00-13:00 and 14:00-18:00 (public holidays excluded).

### 4.3 MAINTENANCE

Maintenance services offered by TOP-IX allow services to be restored in the event of TOP-IX platform malfunction.

Any faults or malfunction that interfere with the correct running of platform operations and, consequently the supply of services to Members/Partners, can be reported using the following methods:

- by email to [networking@TOP-IX.org](mailto:networking@TOP-IX.org) (available only during normal business hours, from Monday to Friday, 9: 00-13: 00 and 14: 00-18: 00, public holidays excluded);
- by telephone +39 011 0883150 (available 24/7/365).

The point of contact reported above are in use solely to report anomalies involving the TOP-IX platform. The contact numbers do not respond to issues regarding management activities (configuration modification, capacity expansion, etc.) or the Members/Partners network devices beyond the TOP-IX service demarcation point (Layer 2 port on TOP-IX node).

It is also necessary to supply all relevant information in order to facilitate initial remote fault troubleshooting:

- name of the Member/Partner affected by the fault or malfunction;
- details of the technical staff in charge of coordinating the activity;
- number of service demarcation points on the TOP-IX platform and related configuration;
- detailed description of the technical problem reported;
- any impact of the fault on other platform Members/Partners (if known).

Maintenance service coverage as described above is active 24/7 and 365 days/year.

### 4.4 OPERATIONAL COMMUNICATIONS

In addition to the above, the mailing list

**[operations@TOP-IX.org](mailto:operations@TOP-IX.org)**

is available to:

- communicate planned maintenance to the platform carried out by TOP-IX;
- report any malfunction or unexpected events that may impact on the services provided by TOP-IX.

The same mailing moderated by TOP-IX staff can be used by Members and Partners to:

- report activities and changes that can affect the public peering service on the platform (BGP update, changes, maintenance, etc).

## 5. QUALITY STATEMENTS

The Quality Statements described below - concerning the implementation, maintenance and management components of the services - are intended as TOP-IX objective to guarantee an adequate level of quality to the user of the platform.

TOP-IX will monitor the actual compliance with the defined target parameters, and in case of deviations from the defined target performance values will take the necessary action to ensure compliance.

### 5.1 PROVISIONING

Service activation time is subject to whether the type of port required is available on the platform and on the interested physical node device.

The following list describes the implementation times required following a request for the activities:

- port activation/capacity expansion requiring no hardware update: within 5 working days.
- port activation/capacity expansion requiring hardware update: to be defined (TOP-IX shall assess the actions required for platform expansion and will provide an estimated time of activation).
- port activation/capacity expansion on a custom project design: subjected to the project design and constraints.
- Access port discontinuation: within 3 working days.

### 5.2 MANAGEMENT

Configuration management is carried within 3 working days from the reception of the management request, providing that all details are correctly reported in the request.

### 5.3 MAINTENANCE

#### 5.3.1 AVAILABILITY

TOP-IX has set an annual minimum service availability target for each individual service port of 99.95%.

Actual availability for each individual port is calculated as follows:

$$Availability = \frac{Reference.period - \sum Downtime}{Reference.period}$$

Where:

Availability: The availability of the relative port, measured during the reference period.

Reference period: The reference period during which any downtime is measured, i.e. one year.

$\sum$  Downtime: The sum of all port downtime measured during the reference period.

Analysis does not include scheduled maintenance and platform update activities, which are carried out to improve performance and reliability.

These activities are managed on a per-project basis and planned in order to minimize any impact on services. Service users are notified in the following way:

- by e-mail with 10 working days' notice for activities with a significant impact on the services provided;
- by e-mail with 5 working days' notice for activities with a limited impact on the services provided.

### **5.3.2 RECOVERY TIME**

The target times set for service restoration in the event of a failure on the platform are:

- 10 hours from reporting the malfunction in 95% of cases;
- 24 hours from reporting the malfunction in 100% of cases.

### **5.4 PERFORMANCE MONITORING**

TOP-IX monitors traffic levels on its network platform in order to guarantee the network service levels and expand capacity when needed.

Platform monitoring is mainly focused on:

- backbone links, in order to ensure adequate capacity between service nodes;
- user service ports, in order to identify and notify user of possible access bottleneck and capacity upgrade.

The monitoring system provides the following web-based information:

- analysis of aggregated total traffic level on the TOP-IX platform (publicly available on TOP-IX website);
- analysis of traffic for each individual user port (privately available on the Members Area).

### **5.5 ACCESS TO TRAFFIC STATISTICS**

Access to information regarding allocated resources, active services, and traffic on the single ports is available to Members and Partners through the Members Area of the TOP-IX website, available at:

**<https://membersarea.TOP-IX.org>**