

# **MIX REPORT**

## **2015**



# HAPPY 15° BIRTHDAY MIX!



## Introduction from the President



I believe that in a few years, looking back on the history of this period, we will realize that 2015 was "the year of change."

It certainly has been an important year. Not so much - or rather not only - for what happened, but for the different overall climate and for MIX's different approach to its ongoing challenges.

Starting from the end, I would like to recall that in the leaflet presenting the "Salotto del MIX" last November, I teased that I expected that by

2020, 50% of Italians will have to have Internet access over optical fibre, and said that if this did not happen, we should all do something else - something much less technical. It seems that all the conditions are now met for us to bridge the gap we have from OECD countries in terms of average Internet access speed, and not only. Many businesses, especially in the Milan area, are betting on the rapid growth of services and content, and are getting ready to make available Data Centres whose size and capacity will be at par with those of the main European countries.

**.... To set in motion a virtuous circle, MIX took the initiative, along with a group of prestigious consortium partners and has finally founded the "Open Hub Med" consortium (OHM).**

MIX is there. We are enhancing our Caldera campus and we are ready to invest in the various sites where we see the opportunity for similar initiatives, characterized by neutrality and openness to all parties. This has always been our mission: to be the catalyst that facilitates the creation of a sustainable ecosystem for the Internet industry.

In some cases, this is not enough. For example, in the case of the mass of submarine cables that reach Sicily (and partly also Apulia), there was all the potential to develop an open and competitive market for telecommunications services and DCs, actively involving Italy in the growth of Internet traffic - and of related services and content - in the regions bordering on the Mediterranean, but for several years nothing materialized and Marseille became the interchange centre.

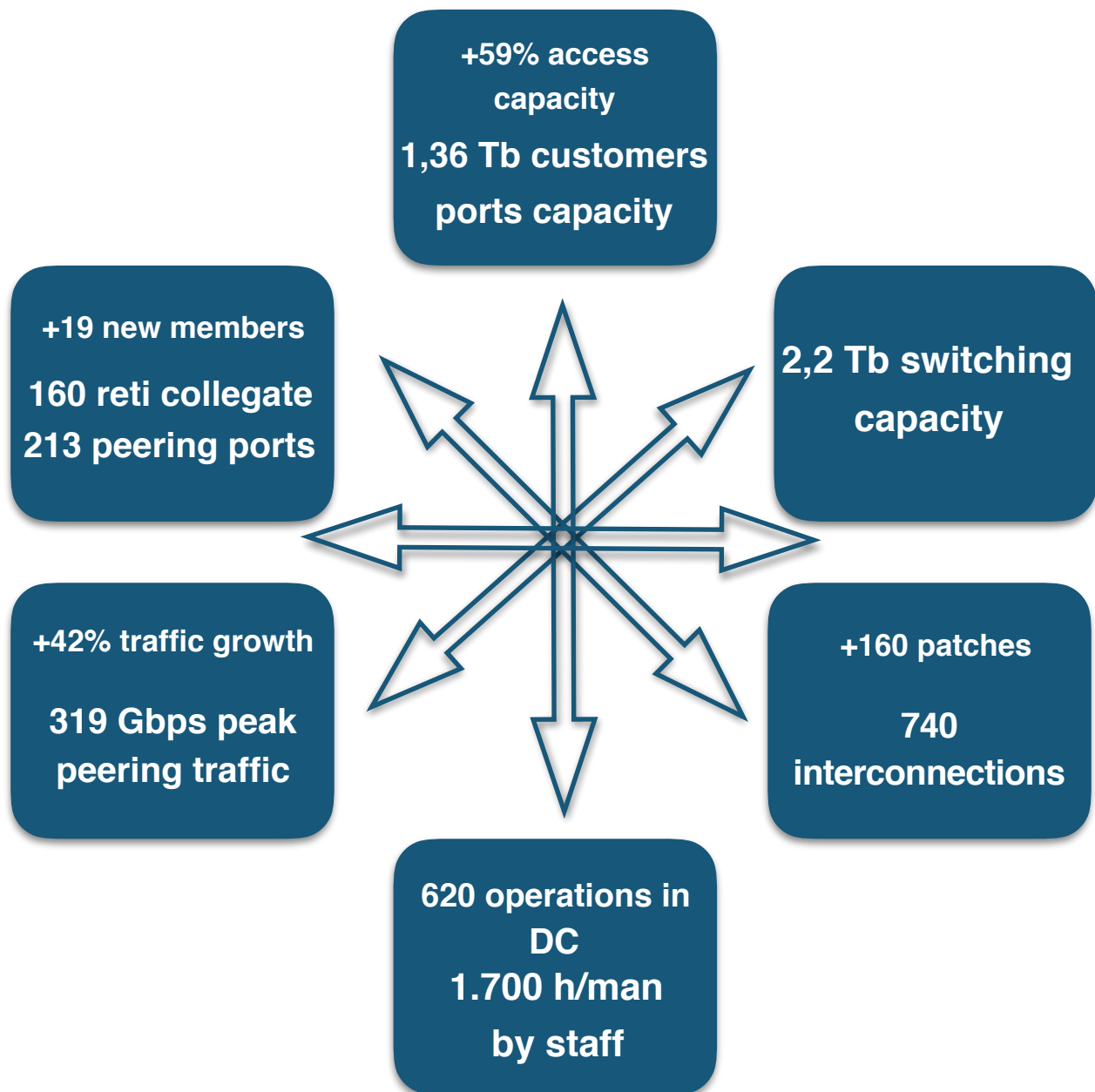
To set in motion a virtuous circle, MIX took the initiative, along with a group of prestigious consortium partners and has finally founded the "Open Hub Med" consortium (OHM). Although the project has just started, it is already at the forefront and has attracted the attention of many potential customers. In the future, we will hear a lot more about OHM; meanwhile, we have shown that "We can do it", overcoming the scepticism of those who didn't believe it could be done and those who prefer to keep the advantage of privileged positions based on the *status quo*.

Lastly, we must remember that the MIX "family" is growing, and it could not be otherwise, with all the initiatives that we are deploying on all fronts. I don't want to be accused of paternalism, by using the term "family", but in this case, even without speaking of how close together the team of MIX works every day, during 2015, the "family" really grew: Monica, who has been with MIX since day 1, has been on maternity leave for Matthias, who everyone here feels a bit their nephew.

Finally, I want to greet the newcomers: Raffaella Carenzi (Secretary General) and Barbara Mori (External Relations) who were hired during 2015.

**JOY MARINO**

# 2015@MIX in few words



## WHY TO CONNECT TO MIX

- MIX links national and international networks for a total amount of traffic handled of **320 Gbps (as of December 2015)**.
- Over **150,000** IP network prefixes are announced on MIX;
- It continues to grow: **19 new IP networks** connected in 2015 and nearly **100 Gbps of traffic more than in the previous year (+ 41%)**
- It hosts **I-root, K-root and J-root** name servers on its own network and many **ccTLDs** and **TLD DNSs**, for direct peering.
- It allows direct peering with the 160 connected operators, of which 70% can be reached within a single direct session using the **route-servers** provided by MIX.
- It offers its own DC spaces for network equipment of operators and carriers, where over **40 Carriers** provide interconnection, transit and transport services
- **It manages the entire service chain with its own staff**, from the co-location of equipment to their interconnection on the peering devices, providing **24/7/365** support.
- It provides highly secure reliable, low-cost **Meet-Me-Room** services
- It offers many different methods of local and remote connection, suitable for any technical requirement
- It provides, for its members, custom monitoring tools and statistics developed in-house
- It ensures high levels of physical and logical security for the data rooms and for the switching platform.

## WHAT'S MIX

MIX is the leading Italy-based Internet Exchange Point (**IXP**) and among the most significant and active at European level. It has grown constantly since 2000, the year of its founding.

MIX provides over 160 (as at 31 December 2015) connected IP networks ( "**Autonomous Systems**" - AS) a highly reliable connection platform that allows IP traffic exchange of the many internet providers through agreements and direct one-to-one relationships ("**Peering**").

The advantages of direct interconnection on MIX compared to the transit of traffic flows through the networks of many other operators (transit providers) are clear:

- reduction of infrastructure costs
- performance improvement
- easier network management, thanks to the direct control of traffic flows;
- reduction of latency: by bringing together the networks, and keeping local traffic local, the length of the data paths is shortened and the need to use international backbones is reduced.

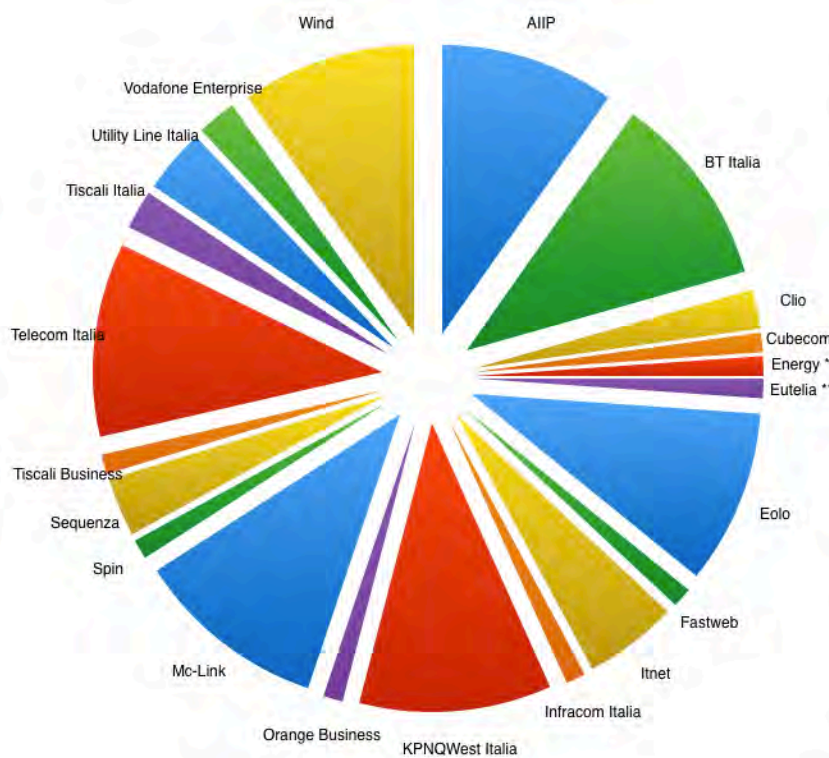
The presence of IXPs at global level is fairly consolidated, although in Europe, since peering is historically a much more developed phenomenon, there is a higher incidence. Since the first months after its inception, MIX has actively participated in the development of IXPs in Europe, participating in the foundation of the world's largest association of IXPs (Euro-IX).

## MIX HISTORY

MIX was founded in 2000 with the objective to improve and develop the infrastructure of Internet in Italy, facilitating the intercommunication between different European Internet operators.

It strategically set up its operational headquarters in the Via Caldera technological campus in Milan, where the backbones of the most significant national and international telecommunications operators that work in Italy come together. The Campus, which covers about 45.000 m2, includes the largest Data Centres in the area, which are independent of each other, both electrically and physically.

The **corporate structure** of MIX consists of 21 companies that hold shares of capital that range from 1.10% to 10.85%

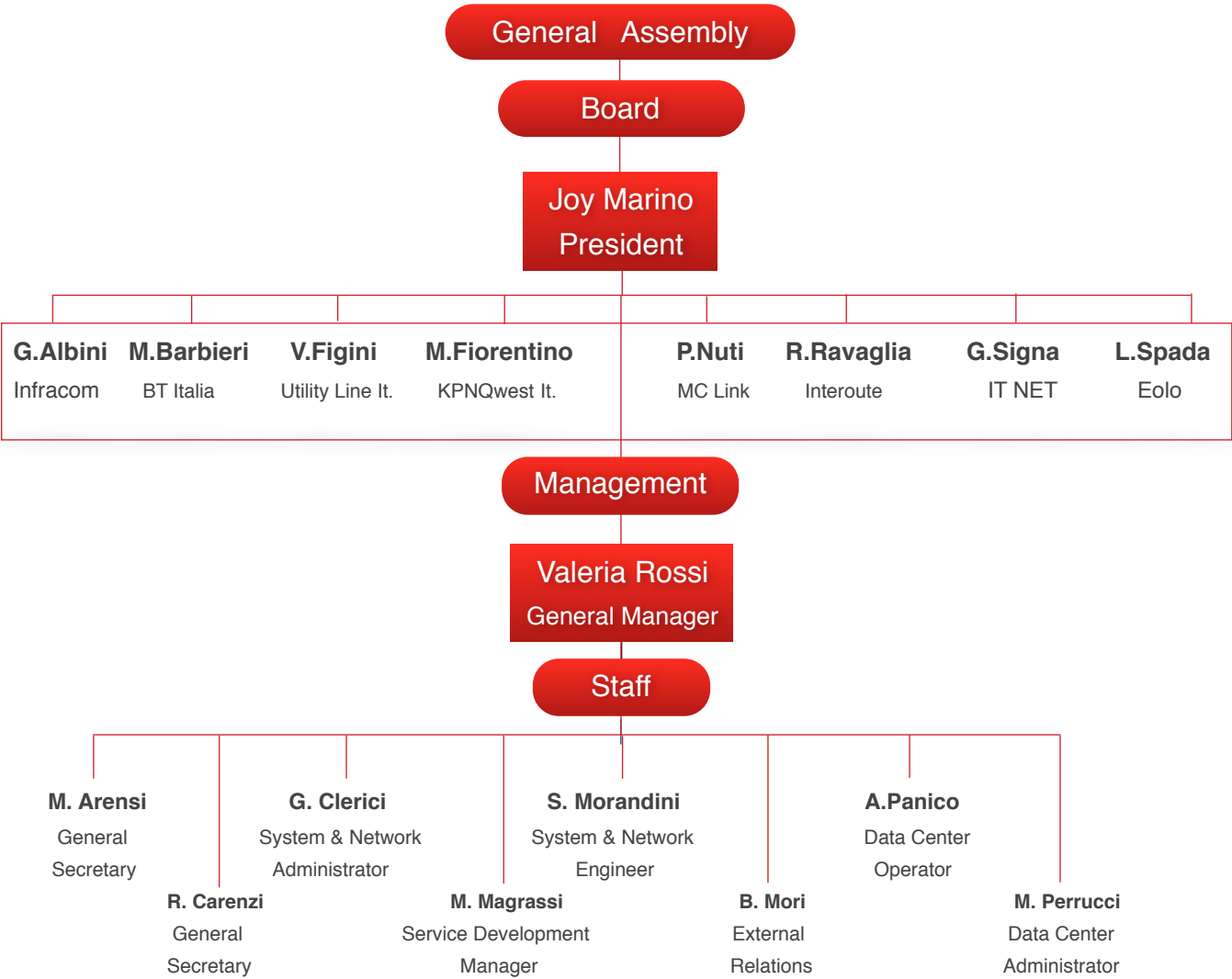


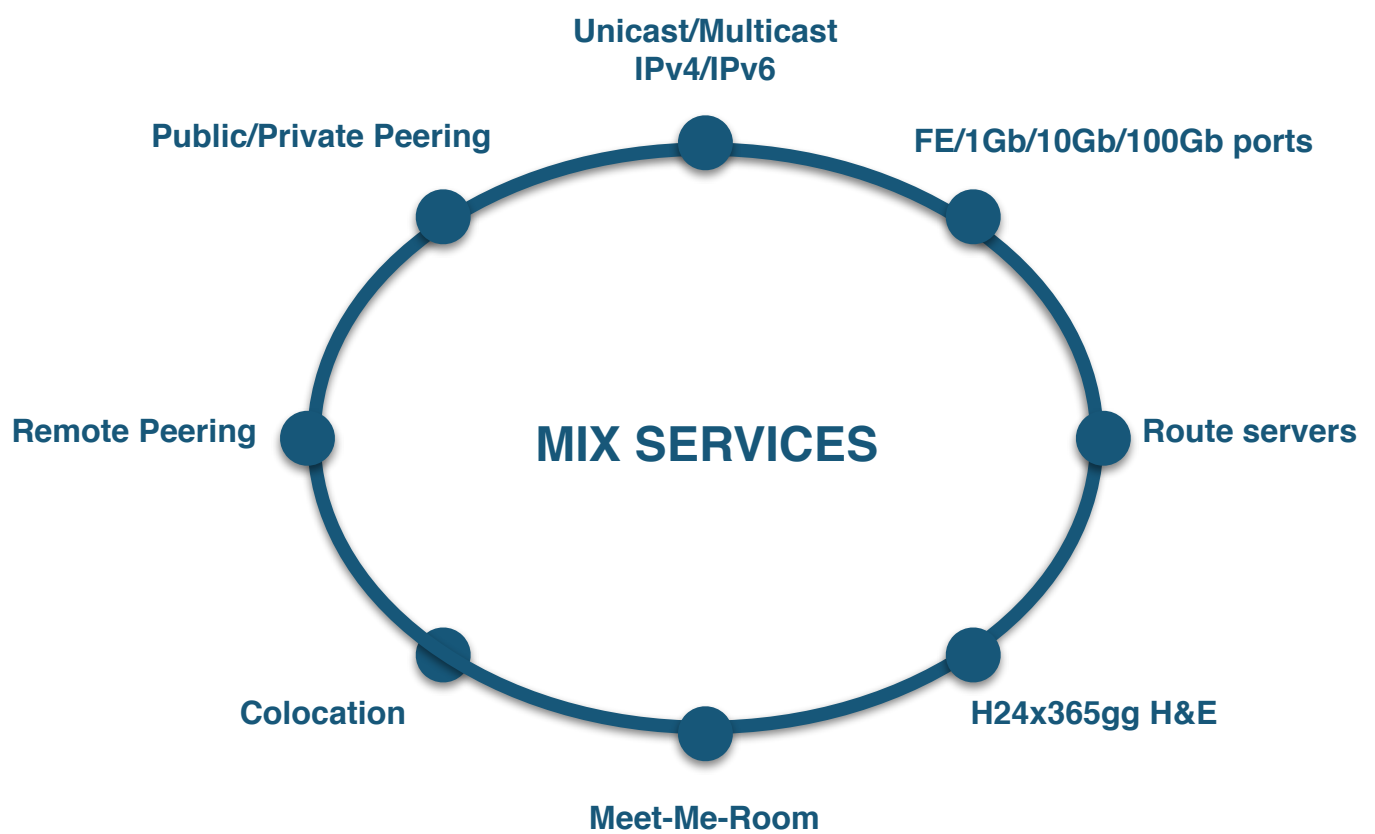
	%
<b>AIIP</b>	9,75
<b>BT Italia</b>	10,85
<b>Clio</b>	2,20
<b>Cubecom</b>	1,10
<b>Energy *</b>	1,10
<b>Eolo</b>	9,75
<b>Eutelia **</b>	1,10
<b>Fastweb</b>	1,10
<b>Infracom Italia</b>	1,10
<b>Itnet</b>	5,25
<b>KPNQWest Italia</b>	10,75
<b>Mc-Link</b>	10,75
<b>Orange Business</b>	1,10
<b>Sequenza</b>	3,30
<b>Spin</b>	1,10
<b>Telecom Italia</b>	10,85
<b>Tiscali Business</b>	1,10
<b>Tiscali Italia</b>	2,20
<b>Utility Line Italia</b>	3,60
<b>Vodafone Enterprise</b>	2,20
<b>Wind</b>	9,75

\* in liquidazione

\*\* in Amministrazione Straordinaria

# PEOPLE AND ORGANIZATION





## CERTIFICATIONS



MIX is the **second European IX** to have been awarded the **Open-IX OIX-1 certification, the most important certification** for Internet exchange points: it sets the service levels and network engineering standards that constitute the best practices for interconnection services of IXPs.

Open-IX has been developed in the United States, with the approval and support of the managers of the largest Internet Exchanges worldwide, of Global Carriers and Over the Top Operators to promote the development of technical and operational standards that could be useful to DCs and IXPs whose operations are crucial for the proper operation of the global Internet.

## ISO 27001

MIX embarked on its ISO 27001 certification process, the certification recognized at a global level that specifies the set of activities related to the security of data, information, and more generally to the management of risks and possible vulnerabilities that may have an impact on services. With this certification, MIX aims to adopt standardized processes to ensure the security of its operations.

# PEERS@MIX

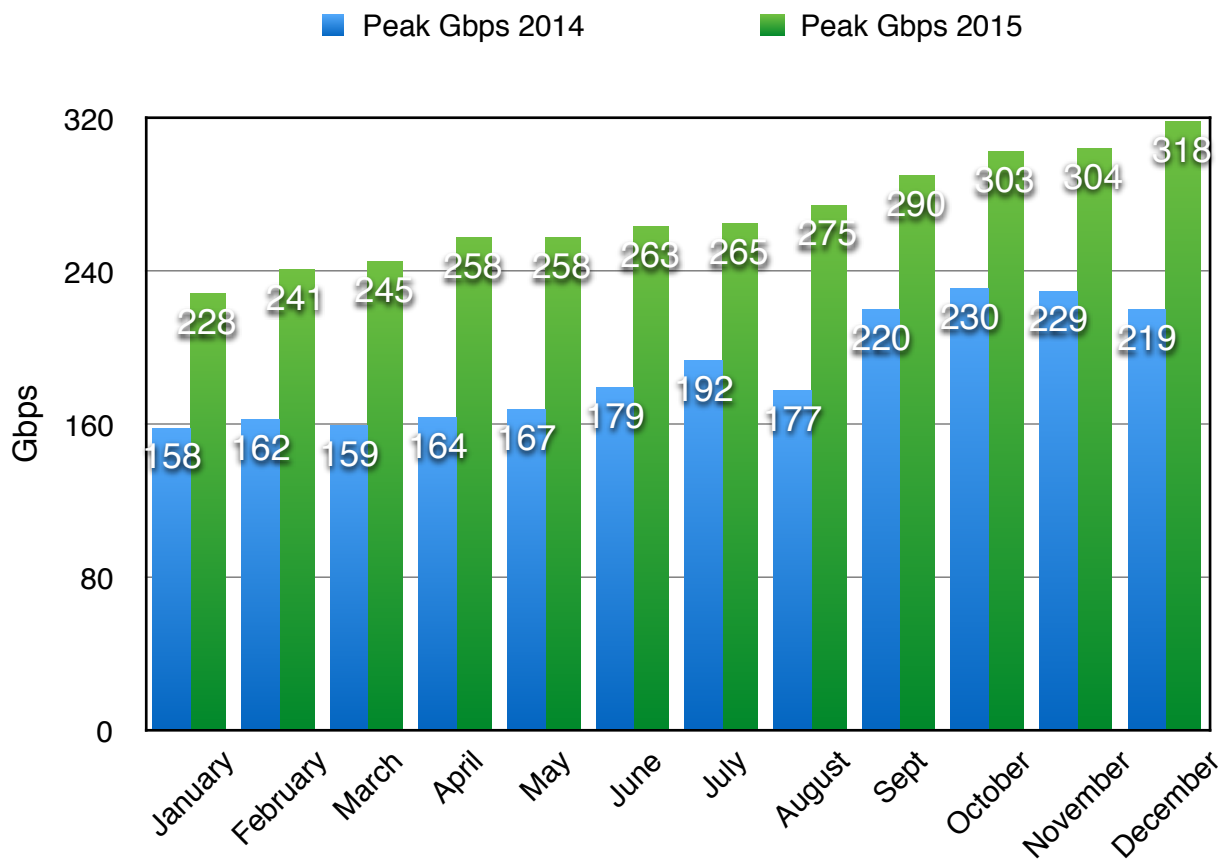
3P System	EasyConn	Internet One	Optima	Telecom Italia
Abilene	Easynet	Interoute	Orange	Sparkle
Acantho	EdgeCast	Interplanet	OVH	Telecom SM
Active Network	Elsyconn	Intred	Planetel	Telemar
AdalNetwork	Engineering	IPROUTE	Postecom	Telia Sonera
Afilias	Enter	IPTP	Progetto 8	Telnet
Akamai	ePress	Irpina Net	Qcom	Terra
Alfanews	Estracom	It.Net	RAI	Time-Net
Amazon	Etisalat	ITGate	Redder	Tiscali
AMT Services	Eurocall	IX Reach	Registro	Topnet
Aria	Facebook	Knipp	Retelit	Trentino Network
Aruba	Fastnet	KPNQwest	Retn	TTK
Asdasd	Fastweb	Leaseweb	RIOT GAMES	TWT
AT&T	Fibering	Leonet	Ris Project (RIPE)	Unidata
Atrato IP	FUB	Lepida	k.root-server	Uno Communication
Biesse Solution	Gandi	Level 3	ScanPlus	Utility Line IT
Brennercom	GARR	Limelight	Seeweb	j.root-server
BT Italia	GEANT	Lottomatica	Seflow	Verizon Italia
BT Italia / I.Net	Genesys	Mainsoft	Servereasy	Vodafone D2
CDLan	Globecorp	Mandarin	Sg.Gs	Vodafone
CDNetworks	Go Internet	Mc-Link	Siportal	VOIX
Cesena Net	GOLINE SA	Mediaset	SiriusTec	Omnitel
Clio	Google	Metrolink	SistemiHS	Webdiscount
Cloudflare	Goomobile	Microsoft	SOFTLAYER	Websense
CloudItalia	Grifonline	MYNETWAY	SpazioTempo	Welcome Italia
Cogent	H3G	NEMO	Stelkom	Wifiweb
COLT	Horizon	NETandWORK	Sky	Wind
Continent 8	Hurricane	Netflix	Spin	WispOne
Convergenze	ICT V.Umbra	Net Global	Stel	Wolnext
D.T.S.	ICTeam	NovaNetwork	Sunrise	Xmatica
Dada	IFOM	i.root-server	Swisscom	ZGelettronica
Deltaweb	Il Sole 24 Ore	Nexin	T.Net	
Digitel Italia	Infracom	Nexus	Tata	
DIR.org	Integrys.it	NGI	Telecity	
E4A	Intercom	Nice Blue	Telecom Italia	

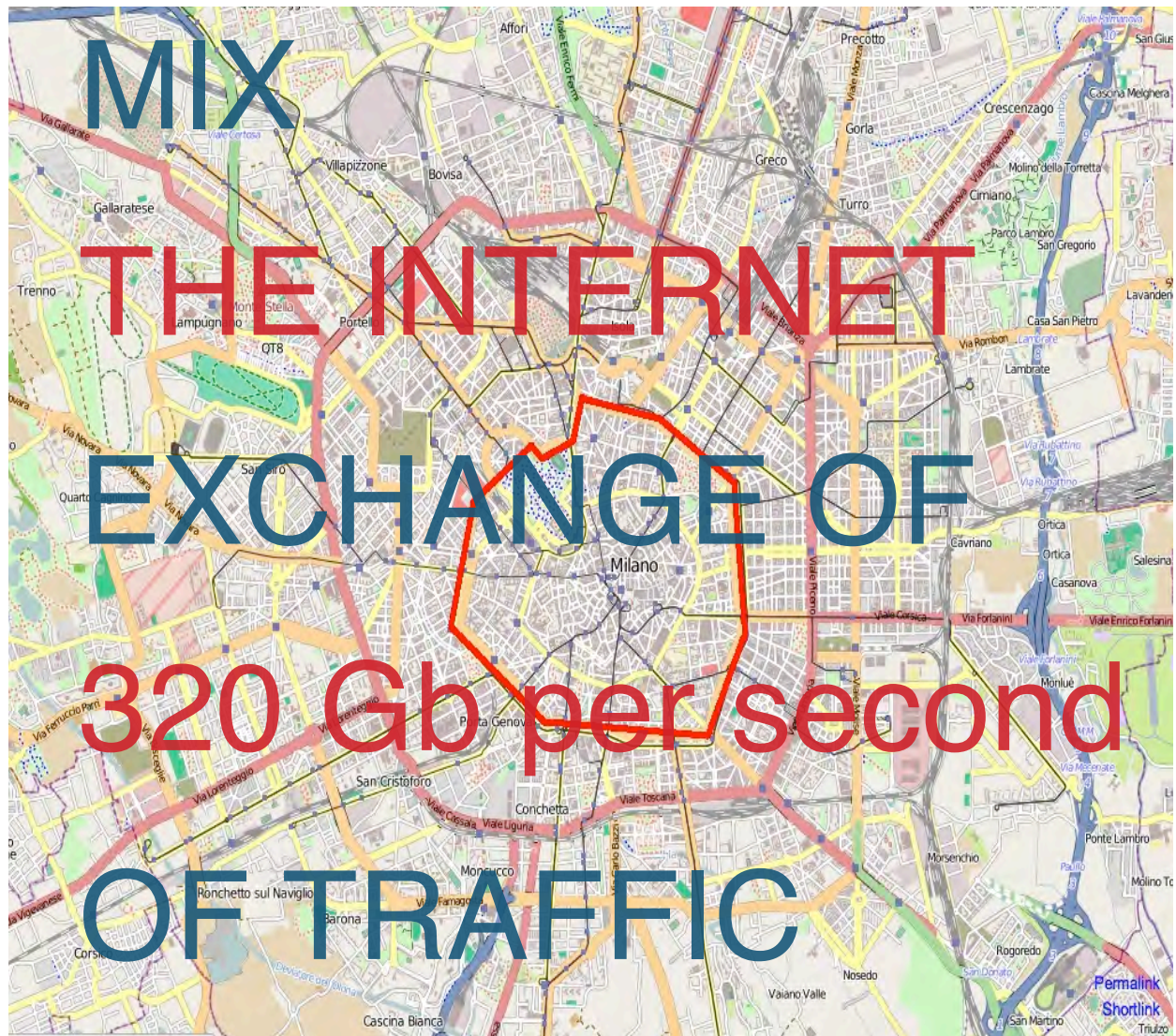
## **WHO CAN CONNECT TO MIX**

MIX is typically chosen by: **Internet Service Provider, Carriers, Content Providers, CDN, Broadcaster, Web Hosters, Research Networks, Public Administrations Networks, WISP, Web Providers ...**

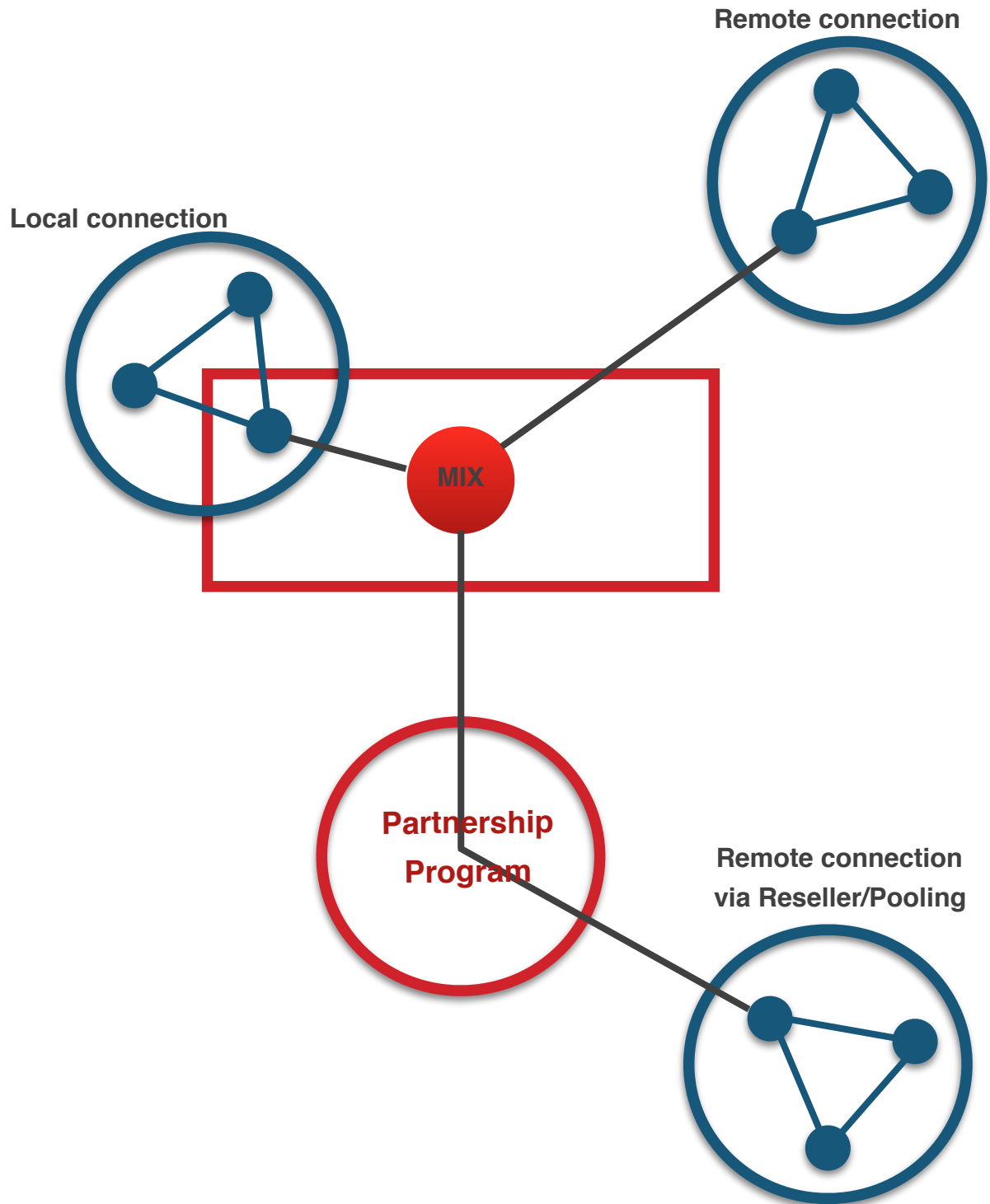
**MIX is available to any subject owing its own Autonomous System regularly released by a Public registry (Afrinic, Apnic, Arin, Lacnic, RIPE-NCC, ...)**

## 2015 PEERING TRAFFIC





## HOW TO CONNECT



## DIRECT INTERCONNECTION

### LOCAL CONNECTION

**Connection to the Peering switch through routers installed in MIX's DC or in DCs where there is a MIX PoP.**

If the router is installed in the DC of MIX, the link between routers and peering LANs is implemented by precabling provided by MIX.

If the router is installed in a DC where there is a MIX PoP, the wiring is provided by the supplier of the housing service.

In both cases, there is a direct technical and contractual relationship between MIX and the connected party.

### REMOTE CONNECTION

**Connection to the Peering switch through the router installed in DCs that are remote with respect to the MIX PoPs**

The connection between the remote router and the Peering LAN is implemented over optical fibre, terminated in one of the fibre-optic cabinets inside the MIX Data Centre and terminated by MIX on the peering equipment.

There is a direct technical and contractual relationship between MIX and the connected party.

## REMOTE INTERCONNECTION via MIX PARTNER

### CONNECTION via POOLING

**Connection to a Peering switch shared among multiple remote connected parties.**

Via a Pool, several networks can be connected to the Peering LAN, sharing the access circuit and port on MIX's switches. The Pool Registrar has a direct relationship with MIX for both the technical and contractual aspects related to all Pool Elements. The Pool Registrar is itself a part of the Pool.

### CONNECTION via RESELLER

**Connection to the Peering switch through a Reseller.**

The Reseller provides to the connected party the circuit and the port to connect to the Peering LAN. The Reseller can assign the port to a single connected party or share it among multiple parties, but cannot use it to carry out its own peering sessions (ports dedicated to the reselling service).

The technical and contractual relationship is between MIX and the Reseller, which is responsible for all administrative and non-administrative aspects concerning its customers.

## MIX INTERCONNECTION WORLD

### PUBLIC PEERING

This is the institutional service of every IXP in the world. The exchange of data takes place on a LAN that is shared by all the networks connected to MIX's switches. At MIX it is implemented on a primary LAN and can be provided, through simple configurations, on a back-up LAN.

### PUBLIC PEERING VIA ROUTE SERVER

The connection to the Peering LAN via **Route Server** makes it possible to configure a single BGP session, and to open peering sessions simultaneously with all the operators connected to it.

This service is particularly advantageous for those who have just connected not only because it makes it possible to exchange IP traffic with more than **100 peers on the RS**, but also because it makes it possible to reach the users of those operators who, due to their internal policy, prefer to manage a limited number of direct BGP sessions.

The Route Server service on the MIX LAN is fully redundant with a dual server on the primary Peering LAN and on the back-up Peering LAN and operates dual-stack IPv4 and IPv6.

It is based on the BIRD daemon, which over time has proven to be stable and has been adopted by many other IXPs.

### PRIVATE PEERING

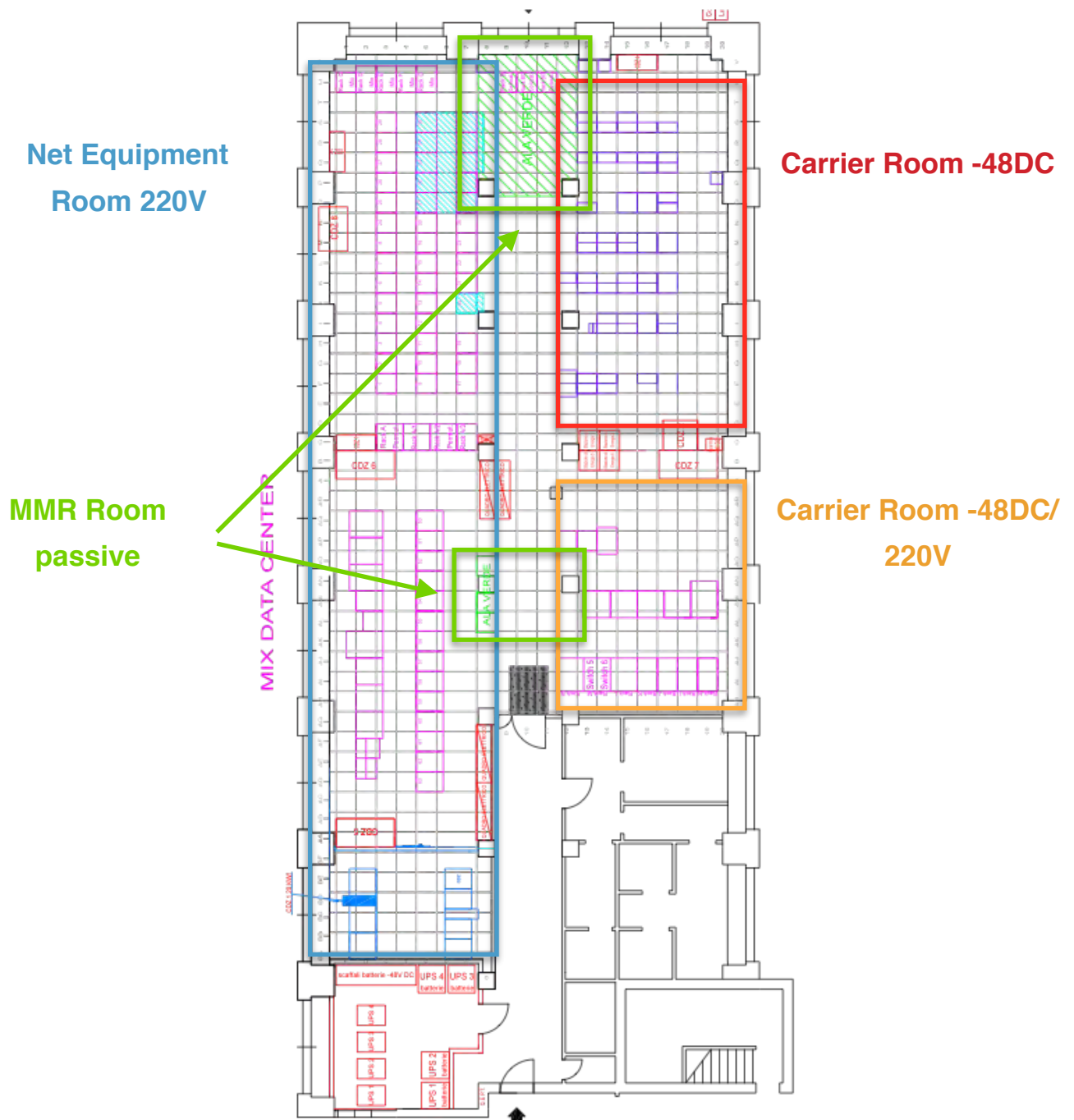
At MIX, Private Peering relationships can be set up both through **Private VLANs** configured on the switches and by using **Closed User Groups**, Private VLANs shared by groups of operators that need **to share a LAN** for routing specific traffic types and subject to the interests (SLA) of the group.

### MEET ME ROOM services

The coexistence of multiple ISPs and Carriers within the same area, has created satellite activities surrounding the Peering service, that include a range of other services available to connected operators, such as the sale and purchase of transit services, and opening dedicated peering and physical interconnections between networks. The growing amount of equipment installed in the Data Centre has gradually increased the demand for creating interconnections among them, by making MIX's DC evolve into a big **"Meet-Me-Room"**, which is currently the richest neutral/**carrier independent** one in Italy.



## MIX DATA CENTER AND CO-LOCATION SERVICES



MIX is the only European IX to have its own **carrier-independent** Data Centre, which guarantees the neutrality of its services.

MIX's DC houses the **core of the peering network** and is dedicated to housing the transmission and network equipment of its connected parties.

**It is entirely managed by MIX's staff, 24/7/365**, and this makes it possible to independently provide **services for operators from their arrival on campus to the peering port**.

It is fully redundant and equipped with a full range of alarm systems to guarantee the physical security and operation of the hosted equipment.

At the end of 2015 we began the **work** to extend **the installed capacity** which will be completed in Q1 of next year, equipping MIX with its own medium-voltage substation and power up to **1 MW**.

Later, **during 2016**, the space will be doubled, bringing the total area of the DC to **800 square meters**.

## 785 EQUIPMENT INSTALLED IN MIX DC

**ALA ROSSA -48DC**

**193**

**ALA ARANCIO -48DC/220V**

**91**

**ALA VERDE PASSIVE**

**62**

**ALA BLU 220V**

**439**

**ALA VERDE MMR**

**800 X-Connections**

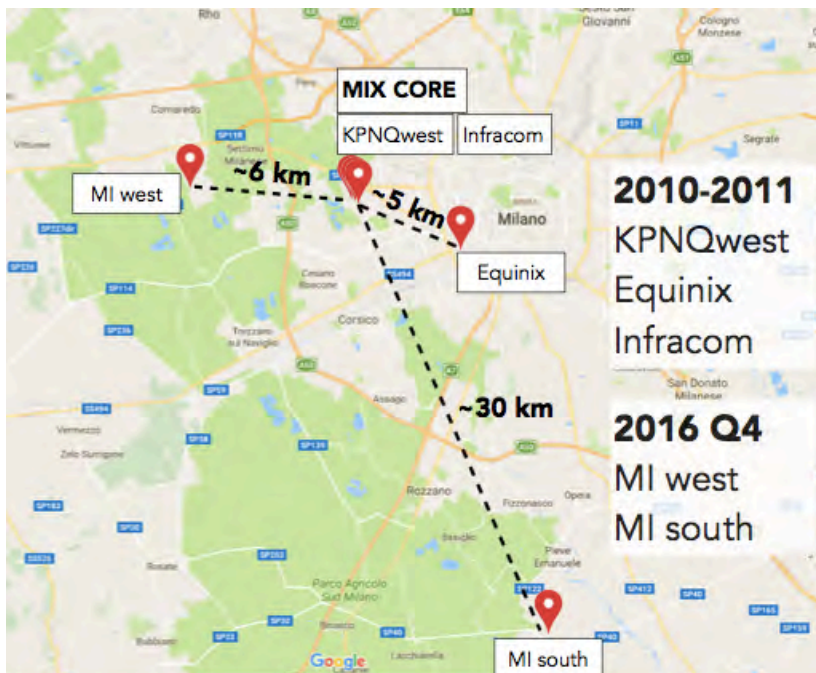
## MIX in MILAN



### Caldera Campus

MIX's core is located within the Via Caldera Technological Campus in Milan. The campus has evolved over the years and is now the area with the greatest concentration of Internet providers in Italy. It is populated by many DCs of many providers of co-location services, each independent of the other both physically and from the plant engineering point of view.

**MIX is connected by optical fibre with all the DCs of the campus**



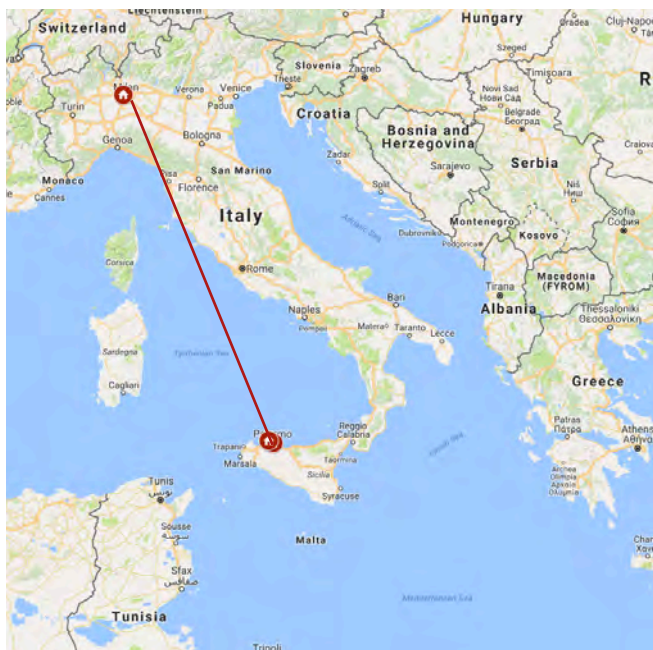
### Metropolitan Area

MIX has been present for a number of years with its own access PoPs and peering equipment within the DCs of KPNQwest Italia and Infracom, both located in the Caldera Campus.

In 2016, thanks to the arrival of major international players, Milan will evolve as the main telecommunications hub in Europe and will strategically set up totally redundant PoPs, connected in ring form with its core PoP.

**MIX's metropolitan network can finally be implemented.**

## MIX in ITALY



### Sicily + Milan a new ecosystem

Over the past years MIX has analysed and studied a broader project in order to provide value to all of Italy and to make it internationally competitive. The project aims to contribute to reduce the national transportation costs making Italy capable and attractive for transporting data via submarine cables from North Africa, the Middle East and the Far East. Back in 2013, as a first step, MIX installed its own PoP inside the CUC of the University of Palermo, under an agreement with the University and the GARR network. The project was then formalized in **November 2015, creating the Open HUB MED consortium** founded with major national and international players. Open HUB MED follows the logic implemented by the world's leading hubs, combining the ingredients that

have been shown elsewhere to contribute to their success: a **carrier-independent DC** with high reliability standards, suitable geographic location and **proximity to the landing points of submarine cables** to which easy and neutral paths will be created, and the presence with MIX of a **not-for-profit Internet Exchange**.

**MIX contributes to the project with its expertise and will make available to operators who will be in OHM, the peering LAN developed in Milan.**

## MIX in Europe

**MIX**, together with AMS-IX (Amsterdam), BPIX (Brussels), DE-CIX (Frankfurt), LINX (London), NETNOD (Stockholm) and VIX (Vienna), was **one of the founding members** of **Euro-IX**, the first and most active Internet Exchange association in the world, in which



MIX served on the board for the initial six years and to which it continues to contribute very actively. Started as a small group in order to share the experience and the market needs in different countries, as of the end of 2015 Euro-IX has 76 members who come from Europe, Brazil, Japan, India, the US, Australia and Africa. EUR-IX encouraged and supported the emergence of other regional associations (APIX, AF-IX and LAC-IX) and with them, in 2014 we founded **IX-F**, the IX Federation in the world that has the goal of creating a global community of IXPs, contributing to their development. **MIX treasures this close cooperation with the global excellence**, that supports its strategic choices with a global vision of the world of interconnections.

## Two Words from the GM

This year has once again been a year of great sowing and of reaping our first important results.

After the analysis we carried out last year, we have invested a lot of our time and resources to prepare the ground for MIX's infrastructure development at the metropolitan level in both the core of MIX and in other areas. We expect to see the results as early as next spring, as the power upgrade of MIX's Data Centres comes on line, increasing power availability to 1.2 MW. This will allow us to expand the DC

space, **making MIX's core fully redundant**. In the meantime, at the metropolitan level, new independent Data Centres are springing up, with high reliability standards, businesses with which we are setting up agreements to develop MIX in areas that are sufficiently distant from the core to become **geographically redundant points of our services**. Certainly, the greatest achievement of the past year was the formalization of the Open HUB MED Consortium, concluded after four years of work, contacts, analyses of market opportunities and economic analyses: a great step but more importantly, a great opportunity for Italy. In short, the new year is awaiting us with a lot already on the table, and for sure it won't be a boring year.

**First and foremost my thanks goes to our staff, numerically small but increasingly competent and passionate.**

This passion sets us apart and allows us to carry out many new projects that we believe will contribute to the development of the Network in Italy



**My thanks and best wishes for the hectic year ahead for the members of the Open HUB MED board:**

**Luca Beltramino, Simone Bonannini, Diego Bongiovanni, Gilberto Di Pietro, Pietro Pelizza, Giovanni Salerno, Luca Spada, Paolo Venturini**

**Il Presidente, Valeria**

**VALERIA ROSSI**

## MIX MEETINGS AND DISSEMINATION

### Salotto 2015 - THE NEXT 15 YEARS

After 15 years of business, MIX launches a challenge: **what will the telecommunications scenario look like, from now to 2030?** This is the leitmotif of our annual event held in November 2015 which was attended by over **230 people** (our record since the first event) from over 90 operators and companies with interests in the network world. In our usual format – a relaxed conversation with many voices – the discussion centred around broadband, digital-divide, technological and infrastructural developments, and involved very expert speakers.



### Salottino 2015 - Technicians at the table

In May nearly 40 people gathered in the new office of MIX for technical and design updates.

Thanks to:

Gianluca Mazzini of Lepida, Giacomo Bernardi (NGI/Eolo), Luca Sani (CNR), Valerio Luconi (UniPI), Marco D'Itri (Seeweb), Francesco Mazzola (T.Net)

#### Educational events

It started as a quiet activity a few years ago, at the request of a high school, just to explain to **students** how their smartphones work and how they are connected to social networks around the world. It was a major success and Simone of MIX continued to refine his presentation. The **astonished interest of students invites us to devote our time and resources** to setting up information activities about how the Network works, an essential tool for its sensible use. **This year we met with 150 high school students and for the first time, also with university students**, also offering them the opportunity to visit our data centres (thanks to Michele and Gianmarco, excellent guides to the MIX DC!).

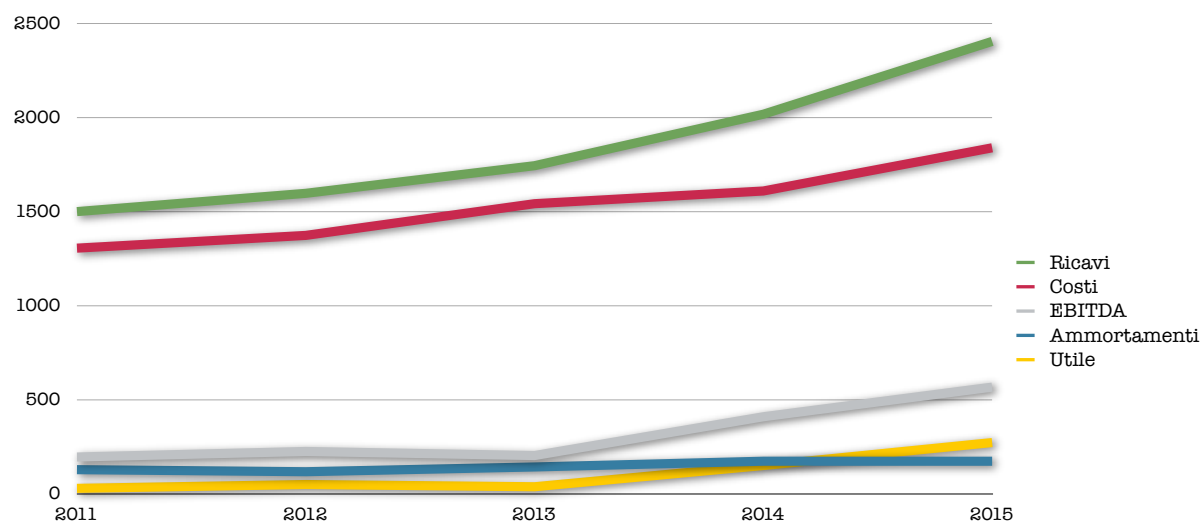
#### INTERNATIONAL EVENTS WHERE MIX PARTICIPATED

**NANOG63, San Antonio Texas**  
**Transport Network 2015, Moscow**  
**American Summit Interconnection, San Diego**  
**26° Euro-IX Forum, Marseille**  
**European Peering Forum, Madrid**  
**27° Euro-IX Forum, Berlin**  
**20° Anniversary of De-CIX, Frankfurt**

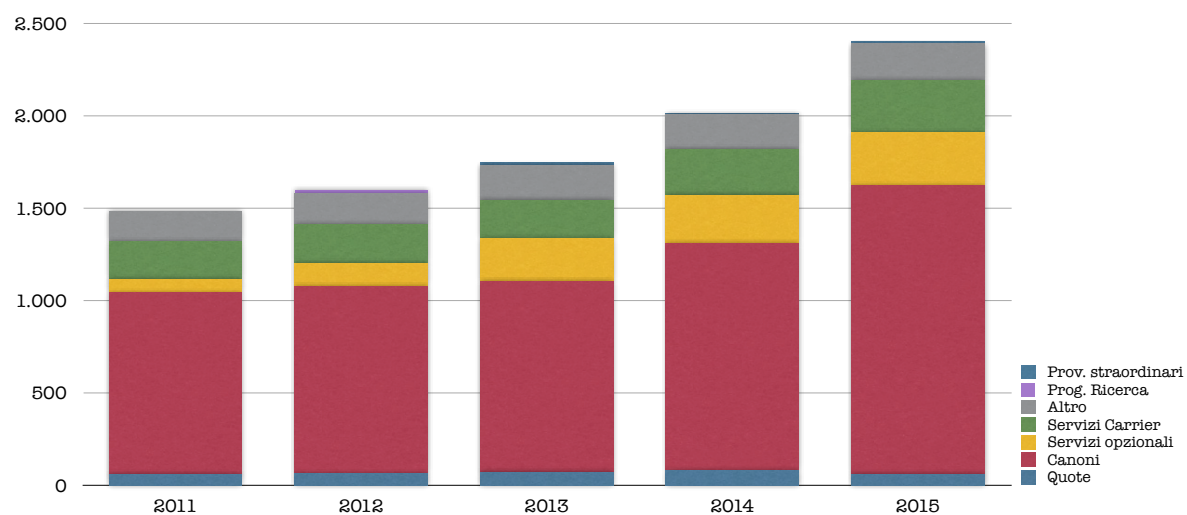
**SPONSOR OF CAPACITY MIDDLE EAST, Dubai**

## FINANCIAL

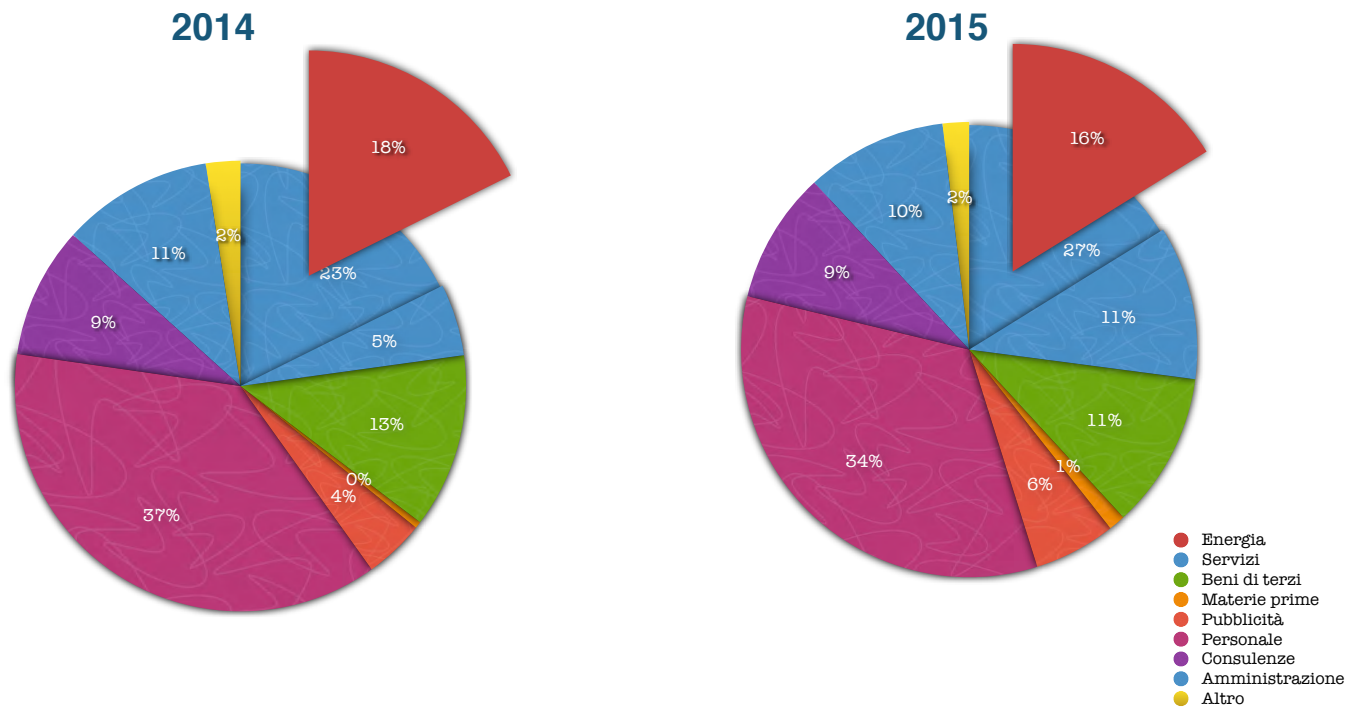
### Profit&Loss



### EARNINGS



## COSTS



## Investments and Depreciation

