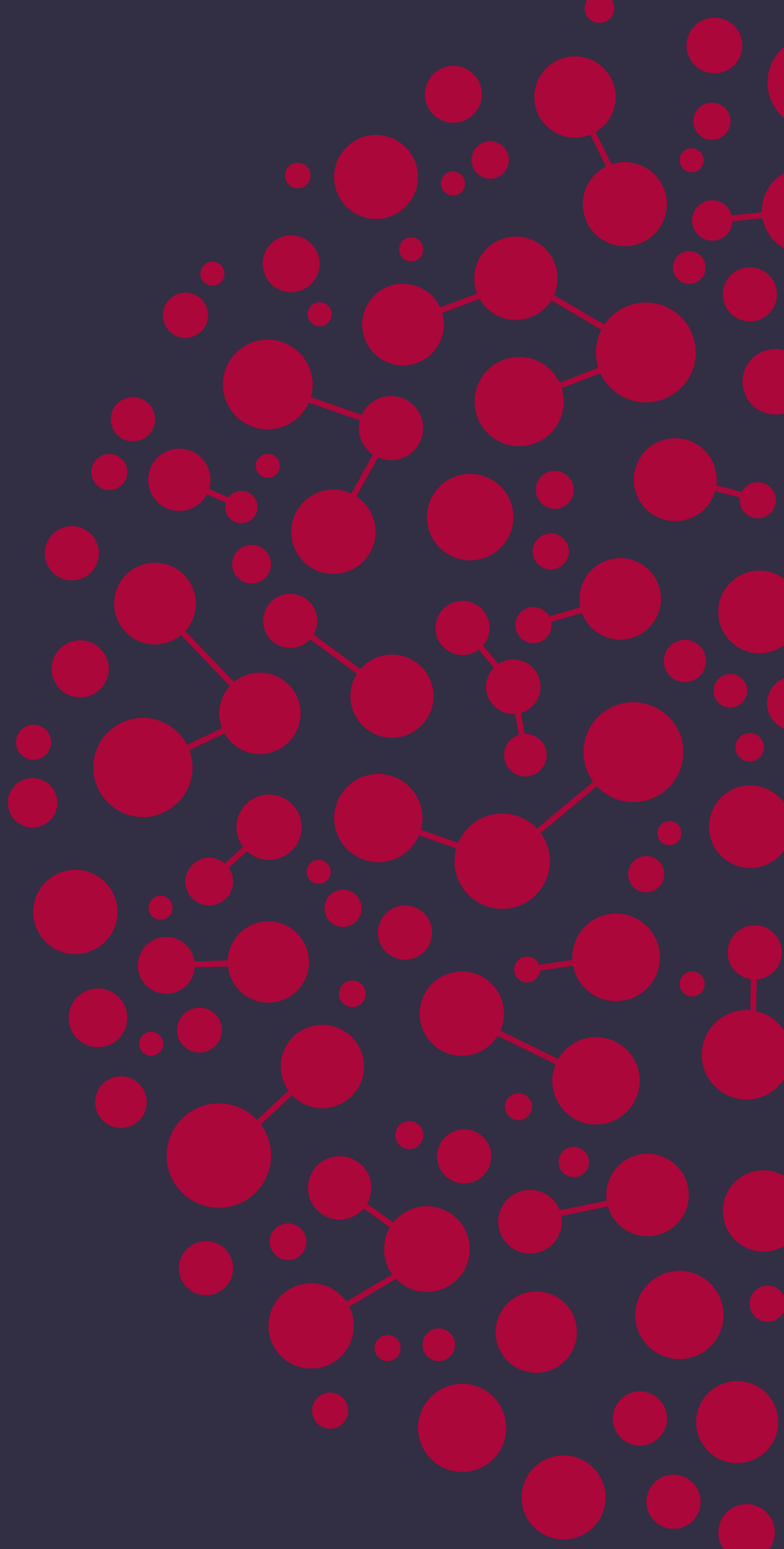# NAMEX
ROMA INTERNET EXCHANGE POINT

annual
report
2022

Community is the key —— May 2023

«Rome is becoming an indispensable and strategic hub, not only for Southern Italy, but for the entire Mediterranean.»

Maurizio Goretti Namex CEO

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Namex at glance

Namex - Roma IXP, is a not for profit, neutral exchange and interconnection point between national and international Internet service providers (ISPs) and content providers.

Namex was founded in 1995 as a neutral access point inside an academic institution (CASPUR, now CINECA). It was really the first attempt at creating an infrastructure that could optimize interconnection and reduce costs for the Internet providers, in a world where the Internet was still a niche known to a few enthusiasts and researchers.

Since then, Namex has grown signfiicantly and today it counts over 200 connected networks, becoming one of Italy's leading internet exchange points (IXPs). Located in Rome, Bari and Napoli, Namex provides a crucial link in the country's digital infrastructure, facilitating the exchange of internet traffic between different content and access providers.

The Namex consortium also counts many local ISPs operating

The Namex Team

in Italy, particularly in the South of the country. The purpose of Namex is to provide a neutral platform on which local and international operators can benefit from the interconnection services provided by the Consortium, improving the Internet infrastructure of Southern Italy.

Namex has established itself as a strategic point of presence for all ISPs operating in Italy, and it is now a point of reference for all the operators which need to provide high-quality service throughout the country.

Community is the key

——— **Renato Brunetti** Namex President

It is my great pleasure to reflect on another successful year for our Consortium. During 2022, we wanted to concretely strengthen our role as a member-based consortium.

One of our key achievements this year has been our expansion into new regions, consolidating Namex Bari and opening a new regional IXP in Naples. We have successfully leveraged our collective expertise to explore new opportunities and establish a stronger presence in the Southern regions, which are often the most suffering from the digital divide.

In today's digital age, access to the internet is crucial for individuals, businesses, and governments. ISPs play a critical role in providing internet connectivity but face challenges in expanding their services and infrastructure.

IXPs, like Namex, are essential in facilitating the interconnection between different ISPs and content providers. They provide a neutral and efficient infrastructure that reduces the cost and complexity of internet traffic exchange. By peering at an IXP, ISPs can avoid costly long-haul transit and improve their customers' service quality.

In particular, the opening of regional IXPs is particularly important for a community of

«In today's digital age, access to the internet is crucial for individuals, businesses, and governments.»

small-sized and local providers, as well as for large content providers. The opening of edge IXPs in fact results in faster connectivity and

«By serving as a human and infrastructural aggregator, Namex helps its members to mitigate the impact of rising energy costs by sharing resources and expertise.»

therefore it can help to improve the quality of service delivered to the end customers. In this sense, a regional exchange is a vital point for the strengthening and further development of a local community.

Another example is the ongoing energy crisis, caused by geopolitical difficulty and uncertainty, which has strained many businesses, impacting also on Namex members. Despite the challenges, Namex was able to absorb the impact of rising energy costs during 2022. Unfortunately, energy costs are one of our largest operating expenses, and they significantly impact Namex financials.

Nonetheless, a community-based IXP like Namex plays an even more crucial role in these difficult times. By serving as a human and infrastructural aggregator, Namex

helps its members to mitigate the impact of rising energy costs by sharing resources and expertise.

As we look to the future, I am confident that our sense of community will only continue to grow. Namex will continue its tireless work as a human and infrastructural aggregator, seeking new ways to safeguard its members' interests. By promoting the growth of IXPs, we can contribute to developing a more robust and resilient internet infrastructure, which can benefit the entire digital ecosystem.

«Despite the challenges, Namex was able to absorb the impact of rising energy costs during 2022. Unfortunately, energy costs are one of our largest operating expenses, and they significantly impact Namex financials.»

The new Italian ecosystem and the role of Rome

—— **Maurizio Goretti** Namex CEO

Rome has been growing quite fast in the last few years. Compared to 2018, Namex has more than tripled its connected networks, and for a member-based Consortium this is surely a crucial asset.

Indeed, because of the community-centered nature of Namex, we have not been growing alone. The growth in demand for interconnection in the city has gone hand in hand with the growth in demand for new datacenters.

During 2022, several operators made major investments in the city. Four major datacenters are under construction and some of them are expected to be fully operational by the end of 2023.

The growth trend of Namex and the city suggests that Rome is becoming an indispensable and strategic hub, not only for Southern Italy, but for the entire Mediterranean. In fact, in addition to the new datacenters, two new submarine cables currently being deployed will land in Rome:

Unitirreno (Unidata) and BlueMed (Sparkle). Submarine cable routes have traditionally been landing in other points (such as Marseille), touching some points within the Southern Mediterranean (such as Sicily). The most recent geopolitical tensions have been rising again the issue of diversifying routes and landing stations for such critical infrastructures and Rome is becoming strategic in this context.

Some routes were reinforced with new cables from the Balkans to Italy (Ex-Trans Adriatic Express and Islalink Ionian) and a new one was announced (Medusa) from Italy to Spain. European traffic will have the opportunity to shift to move further south and the new routes from east to west can give Italy, and Rome, new opportunities. 2Africa cable can reinforce the status of Italy as an important
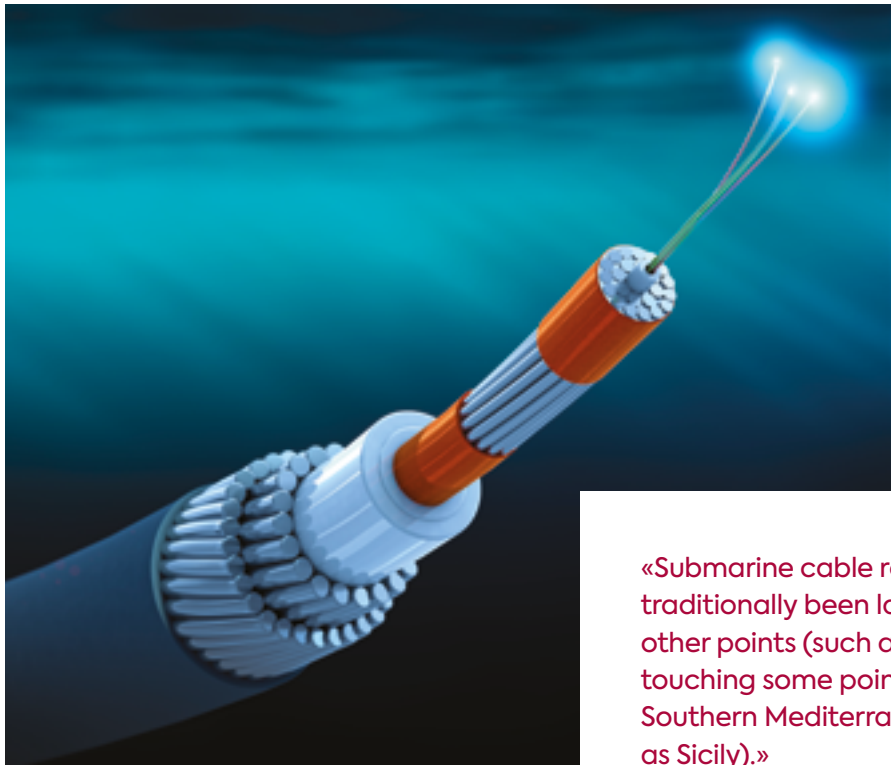
«Submarine cable routes have traditionally been landing in other points (such as Marseille), touching some points within the Southern Mediterranean (such as Sicily).»

European gateway for African traffic. The interconnection of the Internet is shifting from concentration to an edge distribution. This means that the growth of the Roman infrastructure has to be accompanied by investments that allows reaching also regions other than Rome. This is why we decided to open another regional IXP in Naples this year, Namex Napoli. There are several advantages to having a local IXP, especially in densely populated area such as Naples:

1. Lower latency; as it reduces distance between operators and final users
2. Increased network resilience; a regional IXP provides an alternative route for traffic in case of network disruptions or

outages.
3. Local content development: A regional IXP can help to promote the development of local content, as it provides a more efficient and cost-effective way for local content providers to distribute their content to users in the region.

For these reasons, we will keep working on the development of our infrastructure, supporting the needs of all the network operators and trying to play a key role in in the development of our community.

«The growth trend of Namex and the city suggests that Rome is becoming an indispensable and strategic hub, not only for Southern Italy, but for the entire Mediterranean. In fact, in addition to the new datacenters, two new submarine cables currently being deployed will land in Rome: Unitirreno (Unidata) and BlueMed (Sparkle).»

There is more than Peering

—— **Flavio Luciani** Namex CTO

Once upon a time, IXPs were simple creatures. When the World Wide Web became popular in the 90s, network operators needed to optimize traffic exchange and reduce transit costs.

The main aspect of peering was improving interconnections between network operators to lower latencies, costs and dependency on the ex-incumbents. Interconnects brought a huge value to the European ecosystem and helped to create a competitive market, make the Internet more resilient and it also helped innovation.

The Internet had a clear hierarchy then, with large players at the top of the infrastructure. In this context, interconnection at a neutral location, such as IXPs, helped lower costs and created more competition within the market since it allowed Internet Providers to propose lower prices to their end users. In a nutshell, peering was intended as a mutual benefit among network operators.

Nonetheless, by the mid-2000s, Internet use became massive and new players emerged.

Content that used to be on single servers began to be distributed with CDNs. The rapid traffic growth, however, moved the deployment of CDNs inside the ISPs, slowing down internet exchange growth.

In recent years, we have observed a similar mechanism with OTTs, especially those providing live-streaming content. When the traffic grows fast, content needs to be deployed within ISPs, especially in local providers, so that the capillarity of the distribution is ensured. The absolute novelty is that CDN caches are now starting to be present also within long-tail network operators, which was uncommon during the past decade.

Undoubtedly, live streaming has been a crucial game changer. However, the

«IXPs have came a long way since their genesis, and they have evolved from simple optimization points to critical components of the Internet's infrastructure, improving its reliability and efficiency.»

current context is quite complex and entails multiplying different actors that need to interconnect with access providers. In other words, we are moving from a system where ISPs look for interconnections with other ISPs and content providers to a telco industry with diverse stakeholders. CDNs, cloud, gaming, Enterprise, and cybersecurity are just a few examples of the diversity of the new community.

Therefore, the future role of IXPs would be much more than simple "peering points." First and foremost, the new interconnection model must be based on decentralization, pandering to the need for different network operators to be closer to end users. Namex has already started evolving its model by opening new regional IXPs, such as Namex Bari and Namex Naples. Nonetheless, the new model will also require decentralizing the services offered to meet the growing

demand for local interconnection.

Then, for IXPs, there will be more than peering in the future, as they will be facilitators for the mutual exchange of traffic and services. This may lead to creating an interconnection system that is densely distributed throughout the territory and can provide mixed services on the whole national territory.

IXPs have came a long way since their genesis, and they have evolved from simple optimization points to critical components of the Internet's infrastructure, improving its reliability and efficiency. As the Internet continues to grow, Namex will need to continue to adapt, providing new services and features to meet the needs of its members.

«Undoubtedly, live streaming has been a crucial game changer. However, the current context is quite complex and entails multiplying different actors that need to interconnect with access providers.»

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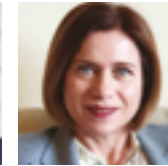*(Cineca)*
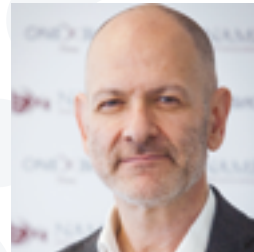
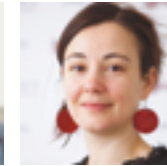**Antonio Soldati**
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Luciano Talarico
(BALENO)

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Massimo Carboni
(GARR)

Francesca Cuomo
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Florence Lavroff
(Google)

Francesco Ferreri
(Namex)

Flavio Luciani
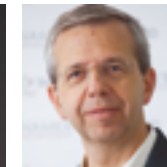*(NamexI)*

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Federico Tito Moretti
(TIM)

Luca Rea
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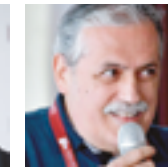
Tiziano Tofoni
(Reiss Romoli)

Giuseppe Di Battista
(Roma3 University)

The Namex Team

Maurizio Goretti
CEO

Flavio Luciani
Chief Technology Officer

Francesco Ferreri
Chief Engineering Officer

Marco Tocci
Facility Manager

Andrea Spadi
Facility Manager
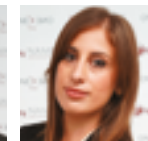
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Administration

Ettore Palmieri
Administration

Luca Davoli
Membership Development and Marketing

Riccardo Zavatta
Senior Account Manager

Alessandra Festa
Communication and Events

Leonardo Sanna
Digital Media Specialist

Innocenzo Genna
Public policy consultant

2022 results at-a-glance

New members in 2022

At the end of 2022, the total number of members of Namex is **209** operators. Below is the list of the 24 that became members during the last year:

+24%

REVENUE
4,7 MLN EURO
+24% compared to 2021

+18%

AS 2022
209 ASNs
24 new ASNs joined in 2022, +15% compared to 2021 EOY, 24 new members and 3 remote aggregations

+50%

PUBLIC PEERING TRAFFIC
434 GBPS
average daily peak,+50% compared to 2021

8Route	www.glpr.biz	AS34428
Alfa Bit Omega	www.alfacom.it	AS208354
Arcolink	www.arcolink.it	AS51333
AS5398	as5398.com	AS5398
Devdata	www.devdata.it	AS211152
Enel Energia	www.enel.it	AS202098
Entraincittà	www.ipernetadsl.it	AS203485
Fibreconnect	www.fibreconnect.it	AS49991
Fowhe	www.fowhe.com	AS60443
Hal Service	www.halservice.it	AS44092
Iliad	www.iliad.it	AS29447
Intendo	www.tlcweb.it	AS34691
IP Telecom	www.twsitalia.com	AS29449
Lo Conte Wifi	www.twsitalia.com	AS206732
Mibura	mibura.com	AS400696
Neofiber	neofiber.it	AS205358
Progeform	www.ermes.biz	AS206961
Radware	www.radware.com	AS198949
Rai Way	www.raiway.it	AS209902
RETN	www.retn.net	AS9002
TechDigital	www.techdigital.it	AS199536
Tecno General	www.tecnogeneral.it	AS203591
WIBI	www.wibi.it	AS209003
Wifimultimedia	www.wifimm.it	AS206947

Resellers

Below is the list of Namex Resellers operators:

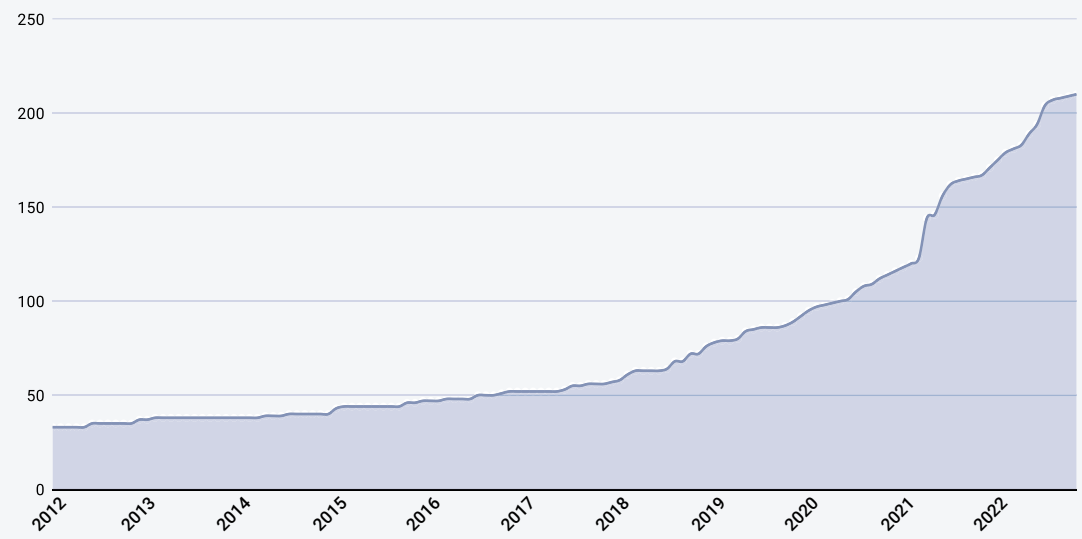| AS Reseller |
|---|
| Baleno |
| Convergenze |
| Fiber Telecom |
| Irideos |
| IT.Gate |
| Lepida |
| Retelit |
| Unidata |
| Warian |

Public peering

The volume of traffic exchanged on the peering platform reached an average daily peak value up to 434 Gbps with an increase of 50% compared to last year.
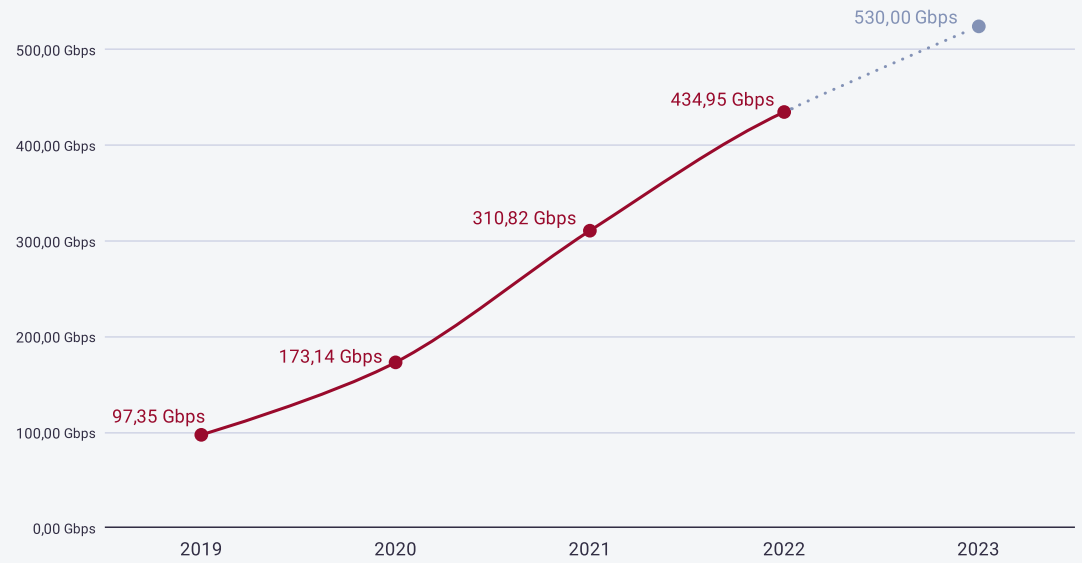
Connected Networks in the last 10 years

Financial statement

The final balance sheet of Namex for the year 2022 shows that the consortium kept growing, with an increased turnover of 24% YoY, confirming the previous years trend.

Namex plans for 2023 are to keep reinvesting the surplus to

support its members, in order to compensate for the energy crisis and keep deveoping new technological solutions to foster the development of the Italian Internet community.

	2022 Final	2021 Final
Revenues	4.746.052	3.751.982
Costs	4.228.542	3.301.603
EBITDA	**517.510**	**450.379**
Credit Notes	–	–
Depreciation	166.985	131.574
Provisions Devaluation	4.659	5.788
EBIT	**345.866**	**313.017**
Financial income/(expense)	–	220
Extraordinary income	–	9.317
Extraordinary expense	32.759	5.414
Tax charges	89.956	105.489
FY PROFIT (LOSS)	**223.151**	**211.211**

Namex Bari

➜ bari.namex.it

Namex Bari is the first "edge" IXP created by Namex in the easternmost Italian region and is characterized by many local ISPs, National carriers, and submarine cable landing stations. Namex operates its neutral carrier DC in the city of Bari.
This year activities were more focused on the datacenter with emphasis on the commissioning of basic systems and related maintenance. In addition, a supervisory system was installed and partially completed for monitoring the DC itself. The fire detection system and intrusion detection system are nearing completion. By the end of 2022, 9 racks with a total of 12 connected networks have been set up, with Microsoft and Netflix that completed their installations in the first months of 2023:

• Unidata
• Fiber Telecom
• Convergenze
• Intendo
• Fastweb
• Meta
• Openfiber
• TIM
• WINDTRE

Also, at Namex Bari are already present three content providers with regional caches:

• Meta
• Microsoft
• Netflix

Namex Napoli

➡ napoli.namex.it

Naples is the Italian city with the highest population density in our country. This characteristic is paired with a quite high number of local ISPs providing services to the population and companies in the region. Furthermore, Naples is the largest city in Southern Italy. These reasons convinced Namex to open its second regional "edge" IXP, after the opening in Bari.
Following the path of Namex Bari, this second regional IXP wants to optimize regional traffic between local ISPs and content providers, as well as to be a carrier-neutral DC for national wholesalers and international carriers.

Namex signed in October 2022 a cooperation agreement with The Parthenope University for the use of a DC space located in the city center (Monte di Dio), close to TIM POP "Tupputi" and local POP GARR. The first inspection of the premises took place in the first days of November. The cluster dedicated to the peering service was prepared and resources requested from RIPE NCC to allocate an additional peering service.

End of January 2023, the installation of the cluster and physical fiber cabling between the various racks at Namex disposal has been realized.

ANIX
Albanian Neutral Internet eXchange
powered by Namex

«December 2022 also saw the Second ANIX Meeting, which took place in person in Tirana.»

Namex activities related to the management of ANIX, Albania's only neutral interchange point, continue. ANIX is hosted in the Data Center of RASH, the Albanian academic network.

During 2022, 6 local ISPs joined: Pronet, Nisatel, Keminet, Diginet, IBC Telecom, and FirstCom. The local connected ISPs became 18. However, it should be noted that some of the ISPs that had declared their adherence have not yet connected (MCN, Next-TV, Diginet and Nisatel). Thus, the actually active conncted networks are 14.

This increase in ISP presence was also aided by the activation at ANIX of a Netflix OCA cache, which occurred in late March 2022. Netflix does not directly face the peering LAN; the cache was installed on a LAN with Namex addresses, and cache traffic is announced on the peering LAN via Namex's AS (AS24796).

In 2022, the traffic increased considerably: the peak was about 3.5G in November 2021, after which it grew to around 7G in January 2022 and then stabilized between 20G and 25G, peaking at more than 26G in September 2022. This is a 650% increase in one year. "It can be said that almost all of the traffic, except for an estimated volume of around 1G of inter-ISP traffic, is from local ISPs' data exchange with Netflix and Facebook."

December 2022 also saw the "Second ANIX Meeting," which took place in person in Tirana. It was the first ANIX Meeting that took place in person, and the first physical meeting of Albanian network operators since ALNOG2 in 2018. There were 130 participants who attended in person (plus about 15 online). Seven companies joined as sponsors (Catchpoint, ISOC, RIPE NCC – gold, DHH, EXA Infra, Flexoptix – Silver, RETN – Bronze), and speakers were (in addition to Namex and RASH) from Telegeography, EXA Infra, and RIPE NCC.

The program was complemented by a panel consisting of local government, regulator and ISP representatives as well as two international players (HE and EXA Infra) focused on connectivity in Albania and its potential to become a gateway for Balkan Internet traffic.

ANIX Connected Networks

Abissnet	abissnet.al	AS35047
Albanian Telecommunications Union	atu.al	AS198279
Diginet	–	AS6843
DNS-OARC-112	www.as112.net	AS112
Facebook	www.meta.com	AS63293
FirstCom	–	AS205244
Hurricane Electric	he.net	AS6939
IBC Telecom	–	AS57388
Isa.Net	isa.net.al	AS209240
ITirana	www.itirana.com	AS48265
Keminet	www.keminet.net	AS197706
Mobitel	mobitel.al	AS60471
Namex	www.namex.it	AS24796
Nisatel	nisatel.al	AS29328
Packet Clearing House AS3856	pch.net	AS3856
Packet Clearing House AS42	pch.net	AS42
PRONET	pronet.al	AS33924
Qendra Nderuniversitare e Sherbimeve dhe Rrjeti Telematik	www.rash.al	AS57961
Selcom	www.selcom.al	AS60352
Starnet Albania	www.starnet.al	AS60304
Tele.Co Albania	www.teleco-albania.al	AS199276
TiBO Communications	www.tibo.al	AS39611
Tring	www.tring.al	AS47394
Vodafone Albania	www.abcom.al	AS21183
Netflix Open Connect	openconnect.netflix.com/en_gb	visible behind AS24796

Tech focus

Quality of Service

Francesco Ferreri Namex Chief Engineering Officer

Assessing the quality of service provided by the peering platform has been a hotly-debated issue in the IXP community for years. Besides impacting commercial aspects, such as business continuity and commitment to SLAs, the ability to monitor the performance of the peering platform is a valuable tool to assess overall platform health and to foresee and prevent service degradation. While measuring the performance of a single-location peering point might look superfluous, it may not be trivial in the case an IXP is distributed across multiple geographical sites as latency and other performance-related indicators may be affected by data center interconnect (DCI) infrastructures performance as well.

A traditional approach
Before we start talking about "performance", we need to define some indicators for it and then devise a way to measure them in a reliable and repeatable way. A traditional approach is to use ICMP packets (ping) to determine the round trip time (RTT) between any two points at the edge of the platform. Widely available ping tools generally provide a set of statistics about RTT which include min/max/average values and standard deviation measured over a repeated series of probes. This may not be the most accurate tool since ICMP packets are not so representative of generic traffic passing through a peering platform, but we can assume it is a "baseline" measurement that can give us an initial, neutral assessment of overall performance. Most IXPs have been using a classical tool, *Smokeping*, to perform routine checks of peer reachability across the peering platform. *Smokeping* inserts data collected from periodic measurements into round-robin databases, these data can then be published into a visually pleasing form that provides instant feedback about a peer's health. Average response times are represented in color, surrounded by a smoky cloud (that's where the tool's name comes from!) that gives a hint about the dispersion of values from its average.
Despite being an easy off-the-shelf solution,

the usual Smokeping deployment has some drawbacks:
- it shows the "point of view" of a single probe that pings all the other routers in the platform;
- as it shows a logical view of the network, it hides information about where exactly each target is located;
- it relies on responses from hardware routers, which may choose not to prioritize ICMP traffic and thus provide inaccurate or heterogeneous results.

That's why we wanted to go a step further and adopt a more flexible approach that included the use of dedicated probes along with information about their location in space.

Introducing the IXPQoS framework

We devised the IXPQoS framework as a client-server system that includes:
- a set of hardware probes equipped with dedicated software and distributed at each geographical site hosting an edge node of the peering platform
- a central server that takes care of:
    1. distributing the operating configuration to each probe
    2. collecting and storing results from probes

The central server exposes its services to client probes by means of a RESTful API, at the current moment two services have been defined:
- Configuration repository: upon request, the server provides a client probe with a configuration set that includes information about:
    ° how many target probes are

registered with the system, along with their IP addresses;
    ° how to execute a probing session, which means the number and the rate of pings to perform against each target;

Result collection: after a client probe has performed its probing session, it posts the results to the server.
In its turn, the server stores the result in a time-series database (we chose InfluxDB as a backend) according to a format that includes information about the source and target probes associated with each measurement.
On the other hand, client software consists in a script that may be periodically run by a cronjob (every 5 minutes), and performs the following activities:
- Request the server for current configuration: list of active target probes and probe session specifications
- For each probe in the list:
    - Perform a probe session and collect results
    - Post results to the server for persistent storage

A probe session is performed by sending out a given number of ICMP packets toward each target. Response times are then collected and min/max/average and standard deviation values are computed out of the results, along with packet loss information (if any).

Conclusions and future developments

Deployment of the IXPQoS system has enabled us to grasp a quick, standardized, and non-biased view of overall connectivity

status across the peering platform. While traditional Smokeping deployment (which we run embedded into IXP Manager statistics) can still give us useful information about each individual peer, a more generic and standardized approach is preferable to assess overall platform performance in a multi-site environment. Since the platform has a star architecture, with the main historical side at the center, the distribution of probes across the geographical nodes provides instant feedback about edge-to-edge performance between any two peripheral sites. Moreover, the retention of historical data gives us advice on possible service degradation or any unexpected modification in DCI performance.
So far we have devised the basic architecture and implemented the minimum number of services needed to run an operational measurement testbed.
We are thinking about expanding on this architecture by adding several features, including:
- Support for the management of planned maintenance activities, with temporary flagging of client probes as non-operational;
- Definition of a custom API for extracting data from the persistent database (data is currently read by direct interaction between external tools and InfluxDB);
- A monitoring, per-site threshold-based system to produce alerts and warnings.

IXPQos software is fully written in Python 3 and currently relies on the ping3 external package. We plan to release the code as open source as soon as it is fully consolidated.

School of Advanced Networking

→ school.namex.it

The Namex School of Advanced Networking was held again this year and was a great success among the Consortium members. The training offer proposed and approved by the Technical Committee was widely appreciated and the collaboration with Reiss Romoli has heightened the prestige of the courses offered.

The initiative proved to be an incentive especially for small ISPs that see Namex as a unifying center and as an active community in their area.

The following two tables summarize the courses offered and some key numbers on the initiative.

Course	editions	participants
BGP: from theory to practise	2	33
Introduction to Routing Multicast	1	18
Introduction to Network Automation	1	21
Introduction to Cybersecurity	1	20
IPv6: Intructions for use	1	20
DNS	1	21
Introduction to Python Language	1	18
Ripe Database	1	49

Students in total (2021)	Certifications*	Companies reached
142	103	83

(*) this is a total aggregate of the certification issued since the start of the School of Advanced Networking. Students can do the certification up to six months after the end of the course.

«The Namex School of Advanced Networking was held again this year and was a great success among the Consortium members.»

Namex Annual Meeting
#NAM2022

➜ nam2022.namex.it

The Namex Annual Meeting (NAM) 2022 was held in a hybrid format, after two years of completely virtual events.

The meeting brought together a large and diverse group of professionals from the telco industry. NAM provides a great opportunity to meet with all the decision makers of the Italian Internet community, to discuss the latest trends and developments of the sector.

The conference began with a keynote address from the Namex President, who highlighted the rising importance of Namex role within the Italian infrastructure. After that, we welcomed an update from the Ukrainian conflict, hosting a speech with an Ukranian ISP and presenting the Keep Ukraine Connected Project along with Jan Zorz.

The morning then continued with an intensive session on cybersecurity, which featured experts of the caliber of Roberto Baldoni and Corrado Giustozzi, two of the most prominent names on network security in Italy, taking turns on stage.

The conference then continued with an intense panel on the new IXPs, bringing together all the major Italian exchanges and discussing how the new interconnection model is moving to edge datacenters, at the network's periphery.

Last but not least was the panel that bore

«The meeting brought together a large and diverse group of professionals from the telco industry.»

the name of the event: "The game changers," which brought together C-levels from some of the key players in the profound transformation experienced by the Italian network during 2022, deeply impacted by the massive use of live streaming services.

Overall, the Namex Annual Meeting 2022 provided a platform for insightful discussions, knowledge sharing and business

development. The event consolidated the numbers from past editions, with 350 participants from more than 200 companies and over 600 attendees in live streaming.

Sealing the great importance of the event, the afternoon recorded 380 One-to-One meetings, confirming NAM as one of the leading Internet industry events in Italy.

Namex Supports

Namex supports some important initiatives within the Internet community and also some solidarity initiatives outside the telcos market.

Keep Ukraine Connected is an initiative aimed at supporting Ukrainain operators damaged by the ongoing conflict, so that the Internet infrastructure can be kept functioning.

FONDAZIONE
Telethon is an Italian non-profit organisation that support scientific research on rare genetic diseases.

Associazione Peter Pan Onlus
L'accoglienza del bambino onco-ematologico

Peter Pan is an Itlaian non-profit organisation that provides care for pediatric oncology patients and their families.

BIRD and **OpenBGPD** are the two software deployed on our Route Servers. Namex supports the developments of both software and strongly encourages software diversity.

IXP MANAGER

IXP Manager is our customer portal and we happy to support its development. It helps us with automations, and it enhance customer experience.