



# *Benefits of Peering*

*Fiber Telecom Winery Tour – Catania 5 April 2022*



*Darwin Costa @DE-CIX*





WHOLESALE

Winery  
Tour

thank you

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DE CIX

# Who am I?

- Joined DE-CIX April 2019
- Before I was part of the team who **built SACS (South Atlantic Cable System)**
- @DE-CIX I look over **South Europe – mainly Portugal, Africa & LATAM Strategy**
- On **volunteer** basis I work for: **PeeringDB, AFRINIC, AONOG, ngPIF & AfPIF**
- Happy to **discuss any general peering / BGP / IXP / routeserver** questions



# Agenda

- DE-CIX Global Overview
- IXPs in Italy and traffic analyzes
- Benefits of Peering
- Closing Remarks
- Q&A



# Introduction to DE-CIX

- Operates Internet Exchanges (IXs or IXPs) in various metro markets in Europe, the Middle East, North America, and India
- Provides interconnection services such as **peering**: the **settlement-free exchange of Internet traffic**
- Serves and connects more than **2000 networks worldwide** (all kinds of Internet service providers, carriers and network operators)
- Strictly **carrier and data center-neutral**
- **Owned by the eco association**, Europe's largest non-profit association for the Internet industry



# DE-CIX is the largest carrier & data center neutral interconnection ecosystem in the world

Facts & figures  
as of April 2022

33

internet exchanges

86+

Tbit capacity

500+

data centers

2,500+

connected networks



## North America (x5)

Chicago, Dallas, New York, Phoenix, Richmond

## EMEA (x20)

Athens, Barcelona, Berlin, Copenhagen, Dubai, Dusseldorf, Esbjerg, Frankfurt, Hamburg, Helsinki, Istanbul, Kristiansand, Leipzig, Lisbon, Madrid, Marseille, Munich, Oslo, Palermo, Ruhr region

## Asia Pacific (x8)

Brunei, Chennai, Delhi, Kuala Lumpur, Kolkata, Johor Bahru, Mumbai, Singapore

# ...and the largest neutral interconnection ecosystem in South Europe



Facts & figures  
as of April 2022



**5 IXs** | **400+** Networks | **17** Data centers | **Multiple services** Cloud, direct & remote interconnect



# Reaching network and Cloud partner-rich DE-CIX ecosystem

## 1 Peering eXchange

### North America (5 IXs)

Chicago	24 ASNs
Dallas	123 ASNs
New York	262 ASNs
Phoenix	live March
Richmond	23 ASNs

### EMEA (20 IXs)

Athens	17 ASNs
Barcelona	32 ASNs
Berlin	142 ASNs
Copenhagen	live 2022
Dusseldorf	272 ASNs
Dubai	84 ASNs
Esbjerg	live 2022
Frankfurt	1,083 ASNs
Hamburg	223 ASNs
Helsinki	live 2022
Istanbul	40 ASNs
Kristiansand	live 2022
Leipzig	live 2022
Lisbon	53 ASNs
Madrid	226 ASNs
Marseille	116 ASNs
Munich	221 ASNs
Oslo	live 2022
Palermo	24 ASNs
Ruhr region	3 ASNs

## 2 Cloud eXchange

### 50+ Cloud Service Providers

(local and global players)



Microsoft Azure



Google Cloud



Alibaba Cloud

SAP

ORACLE  
CLOUD

IBM Cloud

epsilon

StormWall™

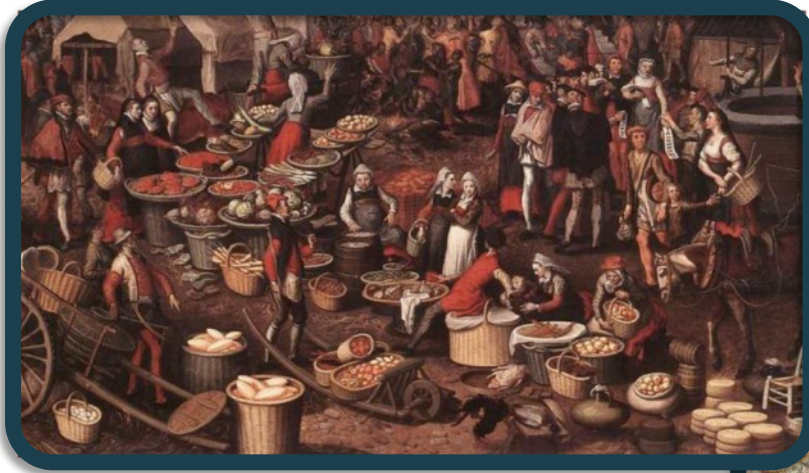
TELXIUS  
Enabling Communication

More...

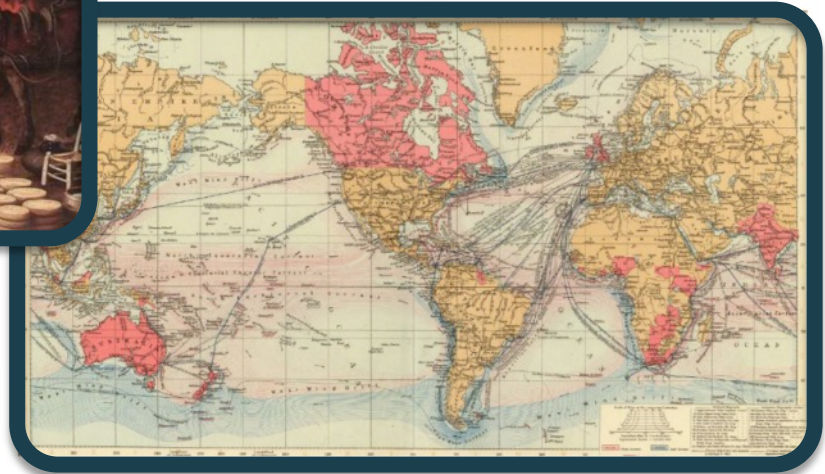


# Connecting people and ideas

The village square



Global Trading Routes



# Connecting people and ideas

The digital marketplace



Internet traffic flows





# *What is needed to support this development?*



create a local  
hub for peering



attract  
international  
content, by  
offering a central  
point of entry



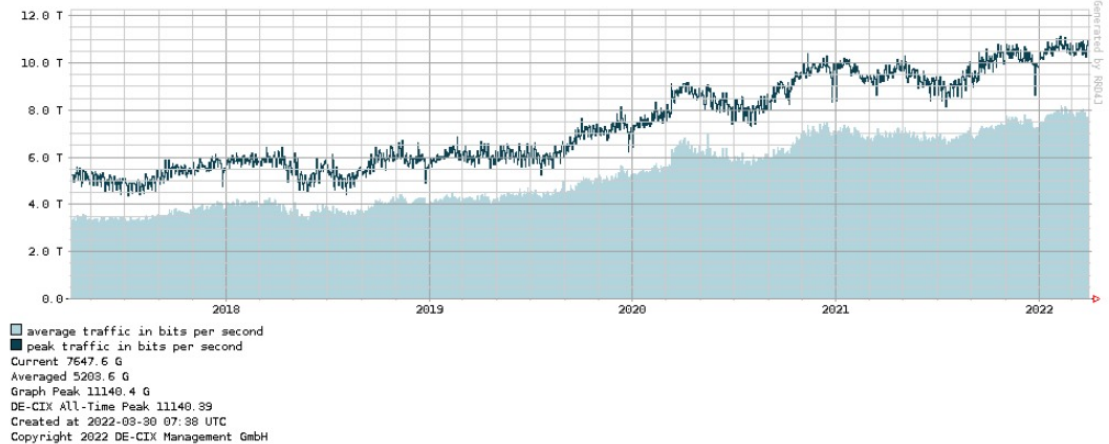
attract neighboring  
countries to peer  
locally



# DE-CIX Frankfurt

- Established in 1995
- 1000+ ASNs connected
- 11+ Tbps of peak traffic
- 800+ 10GE ports & 200+ 100G ports connected

## 5-year graph

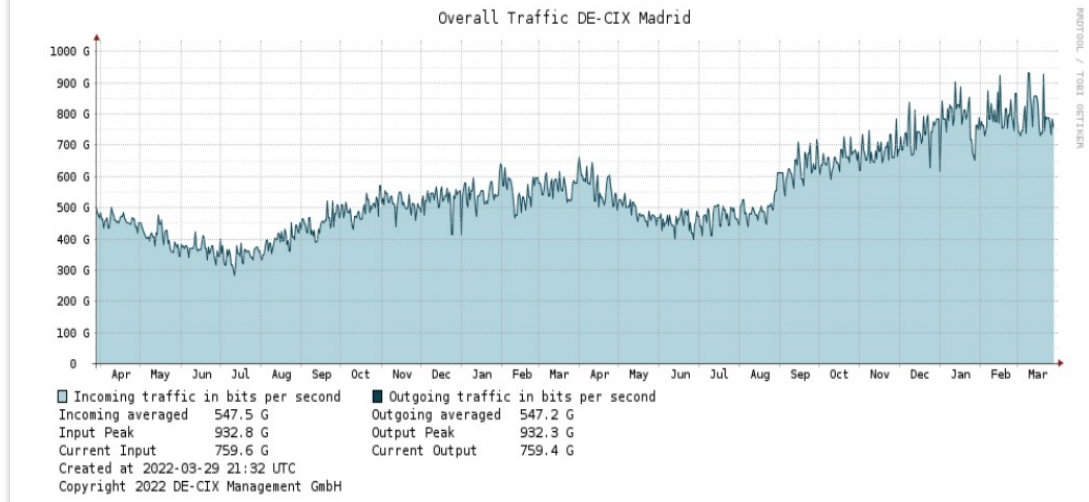


# DE-CIX Madrid

- Established in 2016
- 200+ ASNs connected
- 900+ Gbit/s peak traffic
- One of the **fastest growing Internet exchange in the world**



## 2-year chart

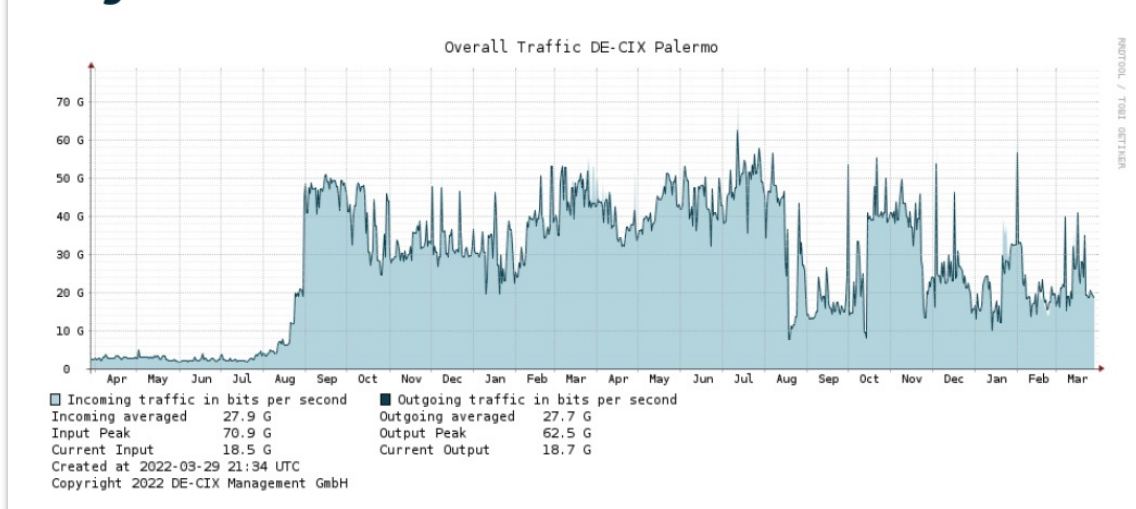




# DE-CIX Palermo 1/2

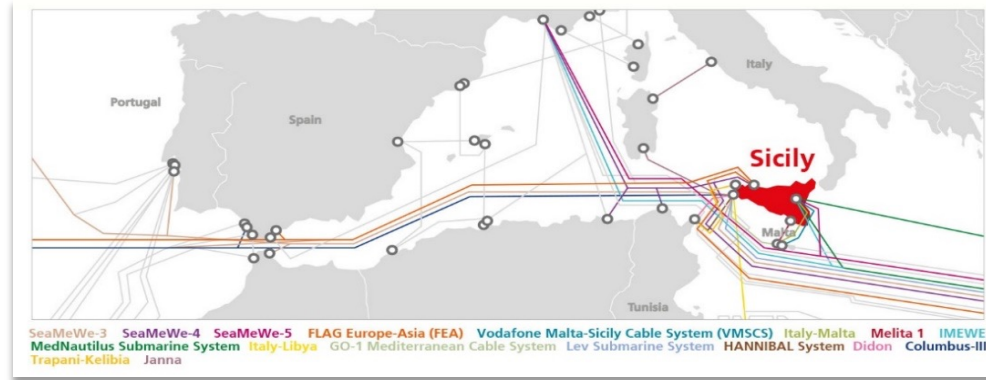
- Established in 2015
- 22+ ASNs connected
- 70.9 Gbit/s peak traffic
- Just 5-15ms from North Africa, offering access and the lowest latency path to African, Middle Eastern, and Asian markets via multiple and diverse submarine cable systems.

## 2-year chart

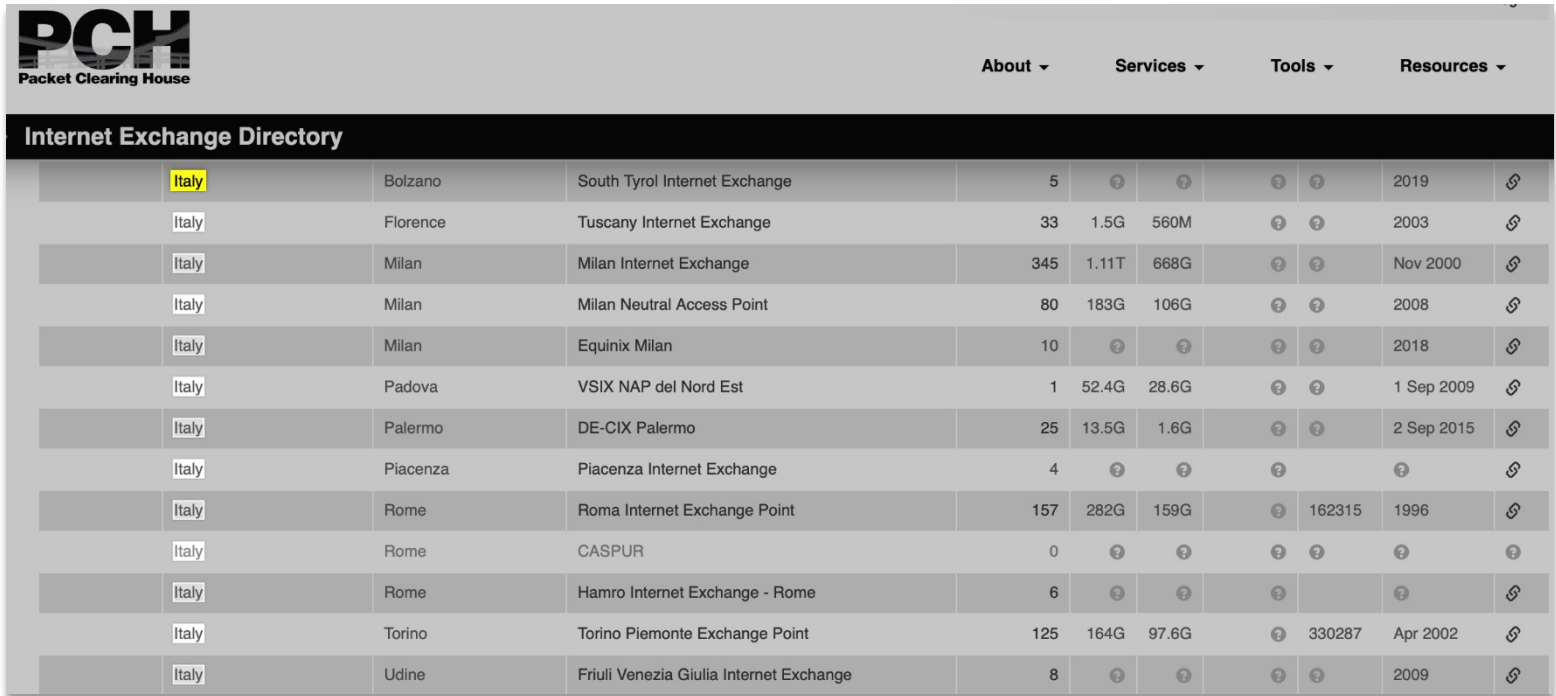


## DE-CIX Palermo 2/2

- Situated just 5-15ms from North Africa, offering access & the **lowest latency path to African, Middle Eastern and Asian markets** via multiple & diverse submarine cable systems
- Located at the **carrier-neutral Sicily Hub, TI Sparkle's data center** in Palermo
- **19 subsea cables** are landing in Sicily (e.g. SEMEWE5, IMEWE; DIDON, and others..)



# 13 IXPs in Italy



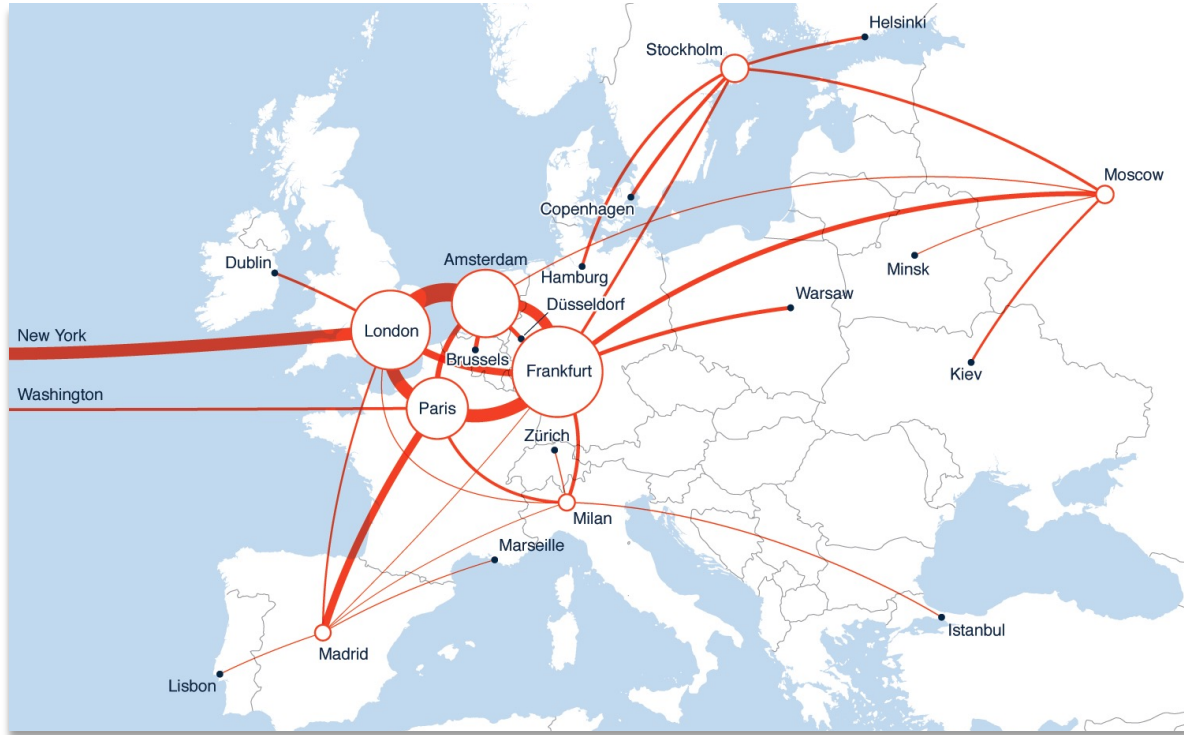
The screenshot shows the PCH (Packet Clearing House) website's Internet Exchange Directory. The page header includes the PCH logo and navigation menus for About, Services, Tools, and Resources. The directory table lists 13 IXPs in Italy, with columns for Country, Location, Name, ASes, and various metrics. The 'Italy' filter is highlighted in the first column.

Country	Location	Name	ASes	Other Metrics	Year	Link
Italy	Bolzano	South Tyrol Internet Exchange	5	?	2019	🔗
Italy	Florence	Tuscany Internet Exchange	33	1.5G 560M ? ?	2003	🔗
Italy	Milan	Milan Internet Exchange	345	1.11T 668G ? ?	Nov 2000	🔗
Italy	Milan	Milan Neutral Access Point	80	183G 106G ? ?	2008	🔗
Italy	Milan	Equinix Milan	10	? ? ? ?	2018	🔗
Italy	Padova	VSIX NAP del Nord Est	1	52.4G 28.6G ? ?	1 Sep 2009	🔗
Italy	Palermo	DE-CIX Palermo	25	13.5G 1.6G ? ?	2 Sep 2015	🔗
Italy	Piacenza	Piacenza Internet Exchange	4	? ? ?	?	🔗
Italy	Rome	Roma Internet Exchange Point	157	282G 159G ? 162315	1996	🔗
Italy	Rome	CASPUR	0	? ? ? ?	?	?
Italy	Rome	Hamro Internet Exchange - Rome	6	? ? ?	?	🔗
Italy	Torino	Torino Piemonte Exchange Point	125	164G 97.6G ? 330287	Apr 2002	🔗
Italy	Udine	Friuli Venezia Giulia Internet Exchange	8	? ? ? ?	2009	🔗

Source: <https://www.pch.net/ixp/dir>



# Traffic is pulled towards „the big four“



# Internet connectivity with Palermo



## The Med Hub

### Advantages:

- ✓ Reduce latency
- ✓ Regional traffic-exchange
- ✓ Low Roundtrip delay
- ✓ Less congestion
- ✓ Access to local/regional ecosystems

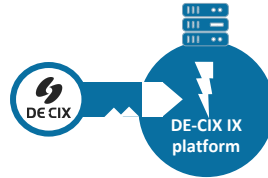


*Benefits of Peering and what we did different from others?*



# What did we do different?

## 1 access to DE-CIX IX platform



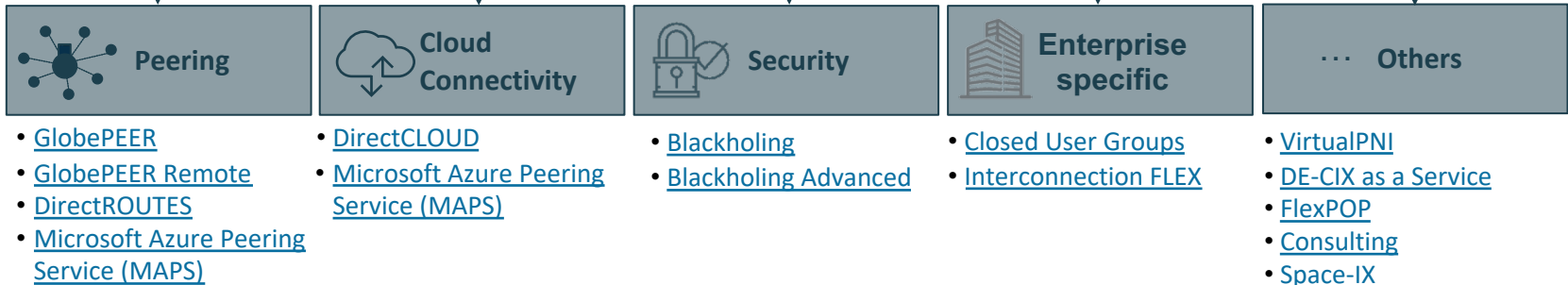
### Access:

- Physical connection to DE-CIX
- either a 10,100GE or a 400GE access

### Services:

- Delivered on top of 'Access' (cross connect, transport connection)
- GlobePEER, DirectCLOUD, VirtualPNI (VLAN Provisioning / 1 IP Address each)

## Multiple interconnection services across the same access





# What did we do different?

- We scaled the platform globally
- We added additional services into the IXP
- Security on the IX for the participants was improved by adding (RPKI on the Route Servers, DDOS mitigation, etc)
- Dedicated Peering Team to support our customers once they join the IX
- Asking our customers to work on their #MANRS and create ROAs for their prefixes

Go to: **Established** **Down**

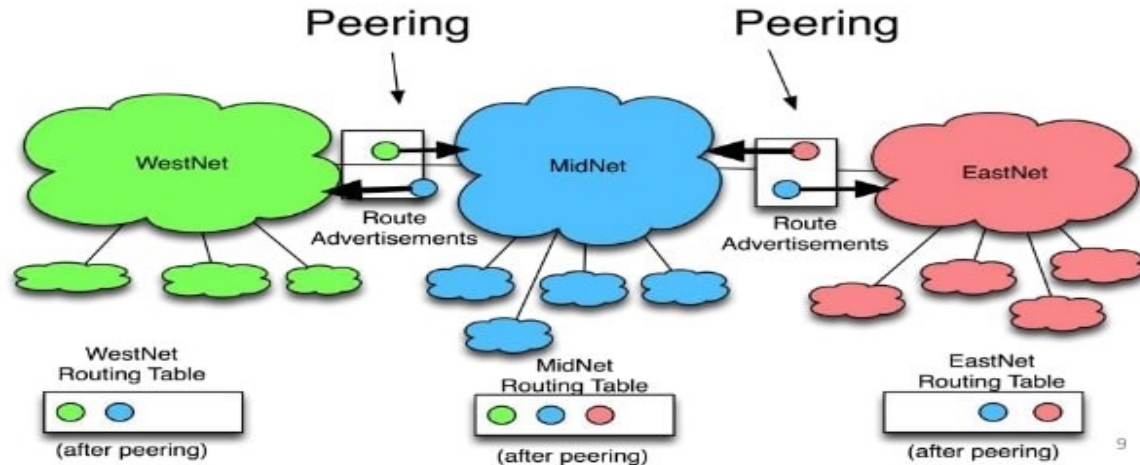
Received	Accepted	Filtered	Exported
68	68	0	103389
2	2	0	103455
1	1	0	103456
98299	91851	6448	11924

# Benefits of Peering?

## Internet Peering

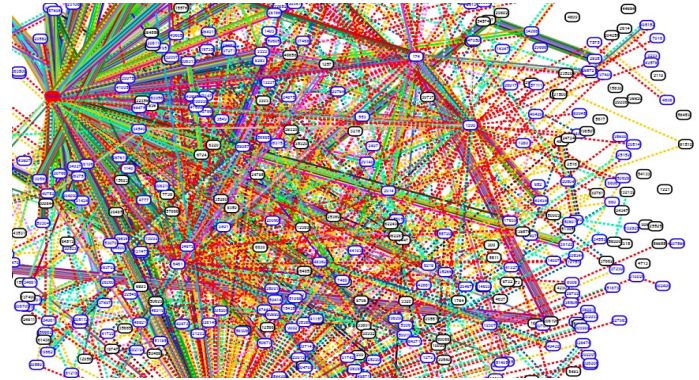
### 3 Key Points

1. Peering is not a transitive relationship
2. Peering is not a perfect substitute
3. Peering is typically settlement free



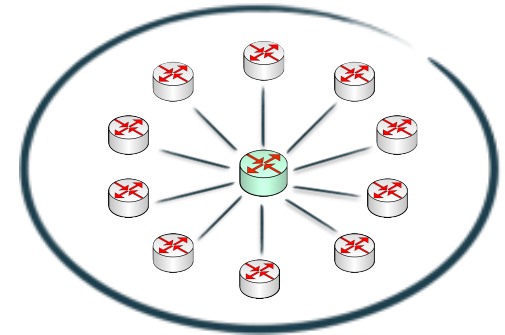
# Benefits of Peering?

- **Lowest latency path** by interconnecting with neighboring networks
- **More control over routing**
- **More flexibility** to route around congested paths to prevent packet loss
- **Redundancy**
  - If peering sessions fail, the transit services provide backup connectivity to the peer networks
  - If the transit connectivity fails, the peering connectivity is unaffected
- **Reduced network costs**
- **Enhanced end user Internet experience**
- **Marketing benefits**
  - A network diagram rich in interconnections is seen as proof of quality by customers



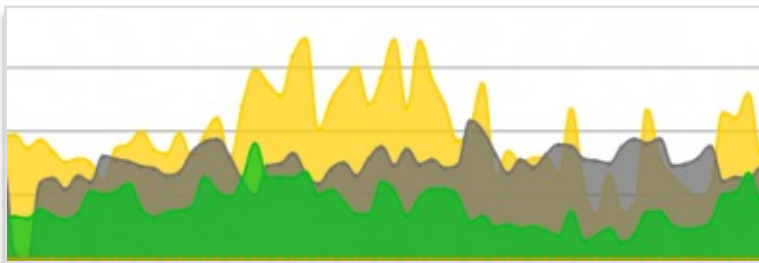
# Why using the route servers?

- **Simplify the setup** of peering / BGP sessions for as many peers as possible at a certain IXP
- with the **large amount of connected networks** at an IXP, managing all corresponding BGP sessions **can be a full time job.**
  - Changes will be required for every peer joining or leaving the IXP
- **with only 2x BGP route server sessions**, new peers will get (inter-)connected with almost all other peers at the IXP

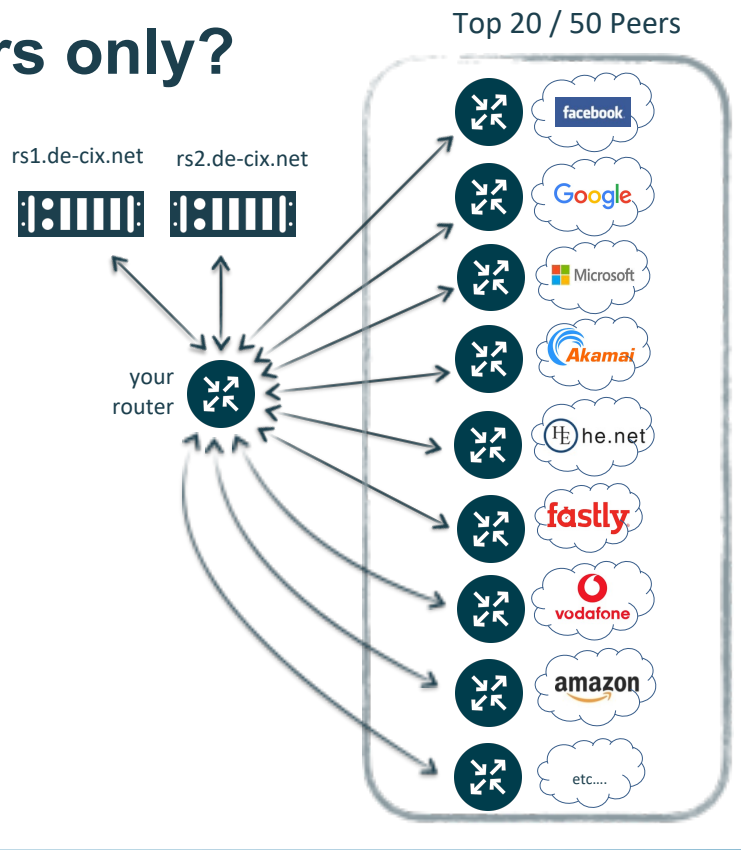


# Why to not use the route servers only?

- **Manage the most important peers manually!**
  - Create redundancy
  - Finer control / traffic engineering
  - In some cases you will receive even more prefixes over a direct session vs. the routeservers
- **Let the route servers handle the rest**



use the DE-CIX Service Insight System to further analyze your peering / traffic relations and discover any new important peers





# Local Preference Example

*An example you can follow (higher is better):*

1)	<b>Internal</b>	<b>= 999</b>
2)	Customer overweight	= 200
	<b>Customer default</b>	<b>= 190</b>
	Customer underweight	= 180
3)	Peering overweight	= 140
	<b>Peering default</b>	<b>= 130</b>
	Peering underweight	= 120
4)	<b>Transit default</b>	<b>= 100</b>
	Transit underweight	= 90

- 1. Internal routes are the most important ones, higher for this cases
- 2. Customer routes on the second place. That's normally where the revenue €€€ comes from
- 3. Peering routes are the third. Most of the cases peering it's better and cost efficient for networks when comparing to transit
- 4. Transit routes are the last ones and preferable with low weight

# Benefits of Peering in general

Peering in comparison to IP Transit has this advantages:

- **Lower and defined latency** to other peering members.
- **Less packet loss** to other peering members.
- **More throughput** (up to line rate) to other peering members.
- **Content or eyeballs** of peered networks are **much closer** than via transit.
- **AS paths are getting shorter.**
- **More revenue for members** who have bgp downstream customers.
- **Better user experience**, critical app's like VoIP and VPN does perform better.
- **More debugging possibilities.**
- **Direct human communication** with other networks which are peered.
- ... etc...

# Awesome developments 😊!



**NAMEX**  
ROMA IXP

**NameX\_IXP**  
@namex\_ixp

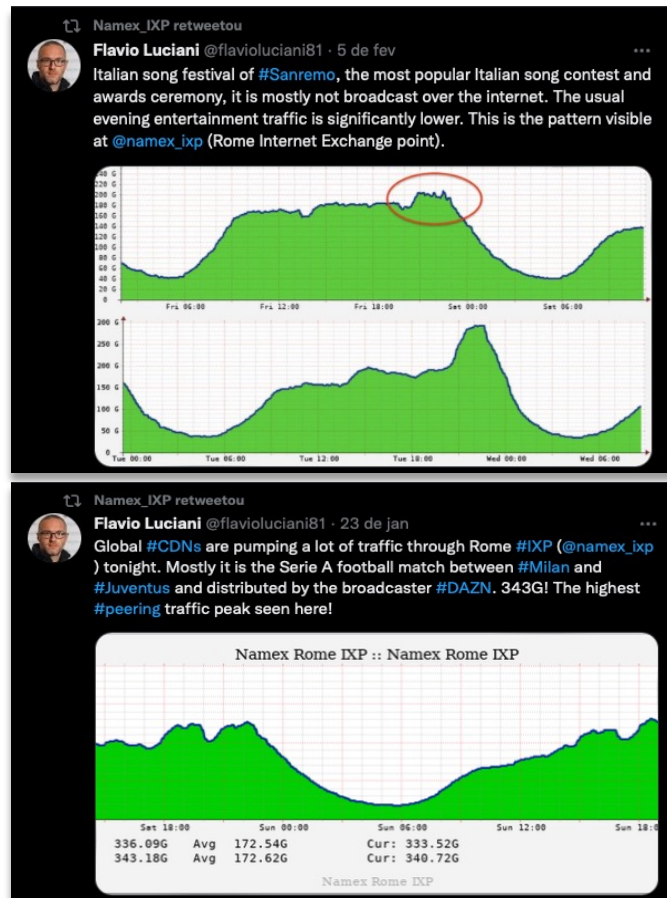
Rome Internet Exchange Point  
[Traduzir bio](#)

📍 Rome, Lazio 🌐 [namex.it](#) 📅 Ingressou em dezembro de 2010

382 Seguindo 1.020 Seguidores

Seguido por The Routing Table Podcast, LAC-IX e outros 37 que você segue

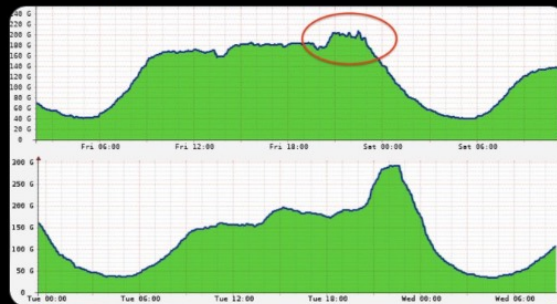
Tweets Tweets e respostas Mídia Curtidas



🔄 NameX\_IXP retweetou

**Flavio Luciani** @flavioluciani81 · 5 de fev

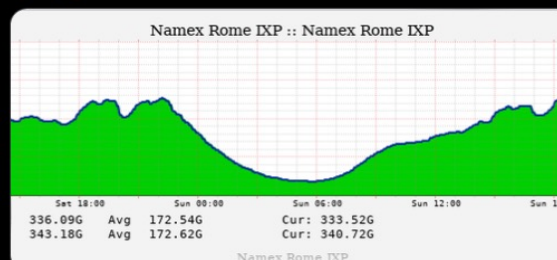
Italian song festival of **#Sanremo**, the most popular Italian song contest and awards ceremony, it is mostly not broadcast over the internet. The usual evening entertainment traffic is significantly lower. This is the pattern visible at **@namex\_ixp** (Rome Internet Exchange point).



🔄 NameX\_IXP retweetou

**Flavio Luciani** @flavioluciani81 · 23 de jan

Global **#CDNs** are pumping a lot of traffic through Rome **#IXP** (**@namex\_ixp**) tonight. Mostly it is the Serie A football match between **#Milan** and **#Juventus** and distributed by the broadcaster **#DAZN**. 343G! The highest **#peering** traffic peak seen here!



Set 18:00	Sun 00:00	Sun 06:00	Sun 12:00	Sun 18:00
336.09G	Avg 172.54G	Cur: 333.52G		
343.18G	Avg 172.62G	Cur: 340.72G		

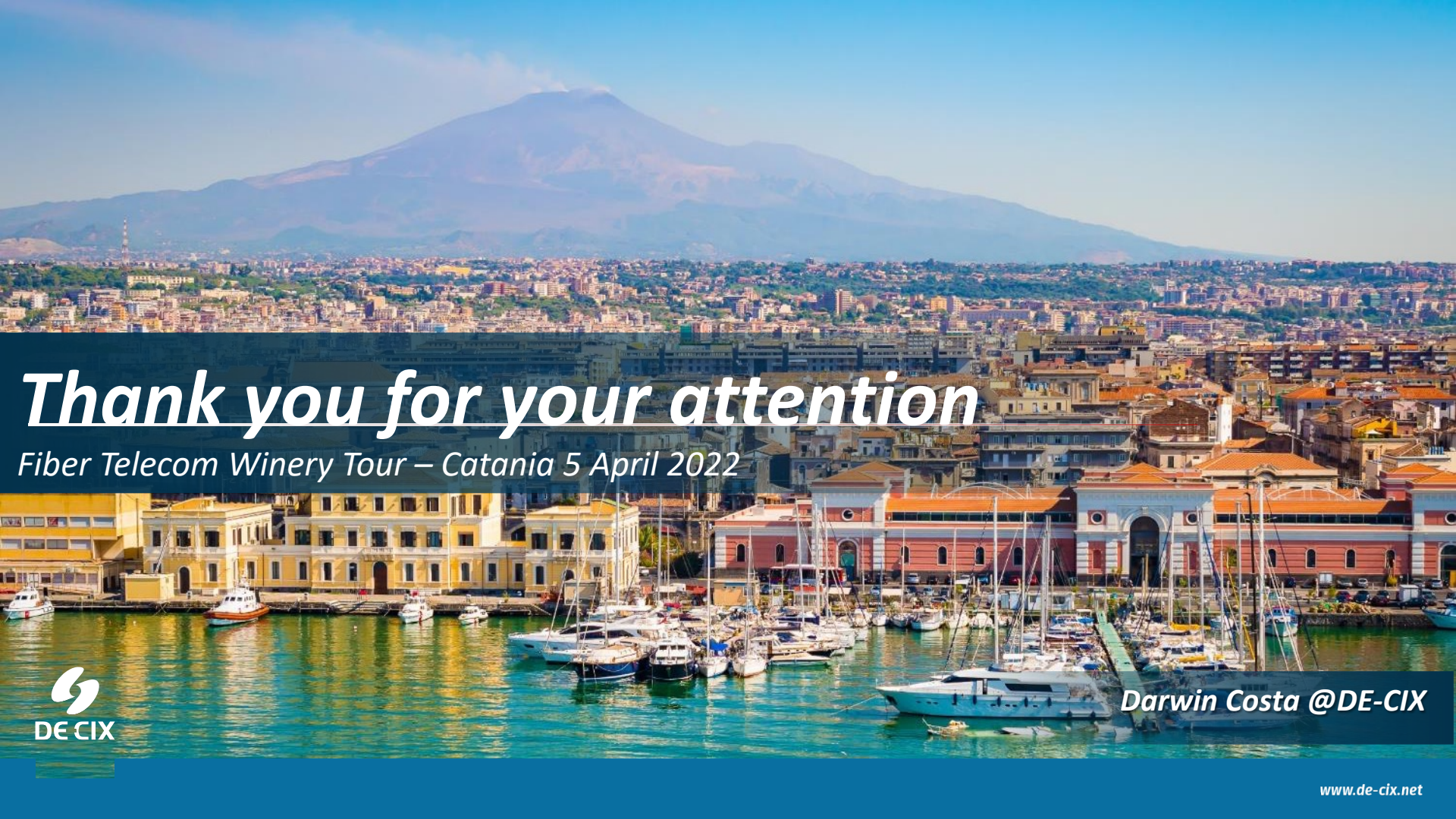
NameX Rome IXP

# Questions?



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# *Thank you for your attention*

*Fiber Telecom Winery Tour – Catania 5 April 2022*



**Darwin Costa @DE-CIX**