



euro-IX

Internet Exchange Points

2020 Report

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About Euro-IX

The European Internet Exchange Association was established on June 28, 2001, in Amsterdam, The Netherlands. Since this date, the European Internet Exchange Association (Euro-IX) has operated under the responsibility of an Association according to Dutch law. Euro-IX has been set-up as a non-profit association.

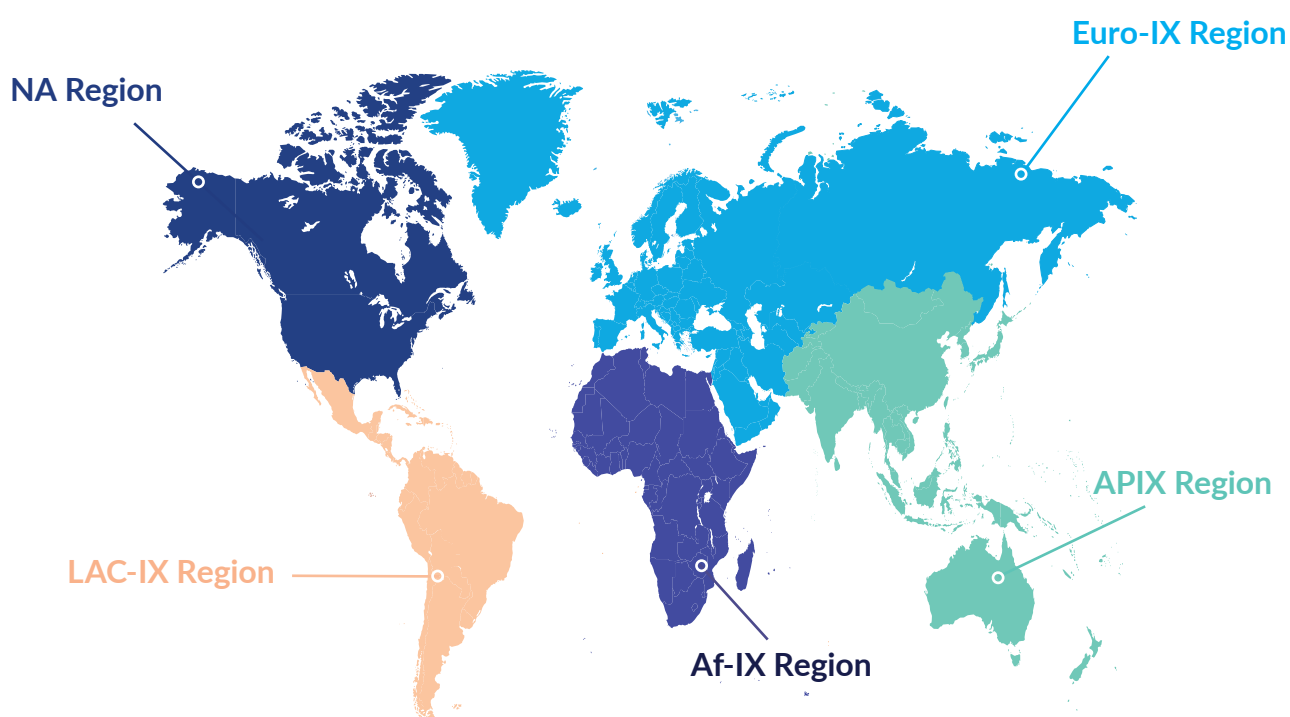
Euro-IX brings together the Internet community with the aim to share ideas and experiences and coordinate technical standards, develop common procedures and publish statistics and other useful information. To compile this report on IXPs, we used data from the Internet Exchange Point Database (IXPDB) - <https://ixpdb.euro-ix.net/en/>

The IXPDB is an authoritative, comprehensive, public source of data related to IXPs. It collects data directly from IXPs through a recurring automated process. It also integrates data from third-party sources in order to provide a comprehensive and corroborated view of the global interconnection landscape. For example, it highlights networks that have not reported they are in PeeringDB and shows which IXPs are MANRS compliant. The combined data can be viewed, analyzed, and exported through this web-based interface and an API.

In 2020, Euro-IX counted 72 Members and 11 Patrons from the IXP-related equipment-vendor and colocation sectors of the community.

The 72 member IXPs are from 50 countries and the affiliations are as follows:

- Standard Members: 42 IXPs from 29 countries
- Associate Members: 8 IXPs from 5 countries (Brazil, Japan, Saudi Arabia, UK and USA)
- Remote Members: 22 IXPs from 21 countries, including 14 IXPs from Europe (Albania, Armenia, Bosnia and Herzegovina, Bulgaria, Finland, Iceland, Italy, Macedonia, Russia, Sweden and UK), 6 from the Af-IX region (Angola, Congo, Kenya, Nigeria, South Africa), 3 IXPs from the APIX region (Australia, Sri Lanka and Serbia) and 2 IXPs from the LAC-IX region (Costa Rica and Curacao).



1. Introduction

1.1 Foreword

This report has been compiled by the European Internet Exchange Association (Euro-IX) to give an overview of the current status of IXP deployment in Europe including:

- The number of Internet Exchange Points (IXPs) currently operating in Europe
- Related statistics and trends that are appearing in the European IXP market and a general global view
- The evolution over the last couple of years

1.2 Notes on this report

- Not all IXPs make their traffic statistics publicly available and no attempts at estimates were made where true figures were not presented.
- All information has been gathered on a best effort basis and relies on the information that is provided by individual IXPs. Therefore all information contained in this report is only as accurate as the information that has been published by these IXPs. If you are planning to base your decision on the information contained in this report, we strongly advise to check the information against up-to-date data.
- Not all IXPs measure their peak traffic using the same periodic average. While the majority of IXPs choose to take samples every five minutes, some have chosen to take these samples more or less frequently.
- A best effort was made to list all known operational IXPs in Europe. However we may be unaware of the existence of some IXPs and thus they do not appear in the list (Appendix 1). We welcome any information about IXPs missing from this report.
- Some IXPs that were listed in the 2018/19 report have not been included in the 2020 one due to the fact that either no contact could be made with them to verify if they are still operational, they have no working website or we have received information that they are no longer operational.

1.3 Internet Exchange Point (IXP)

Euro-IX has accepted the Internet Exchange Federations (IX-F) definition of an IXP being;

“A network facility that enables the interconnection and exchange of Internet traffic between more than two independent Autonomous Systems. An IXP provides interconnection only for Autonomous Systems. An IXP does not require the Internet traffic passing between any pair of participating Autonomous Systems to pass through any third Autonomous System, nor does it alter or otherwise interfere with such traffic.”

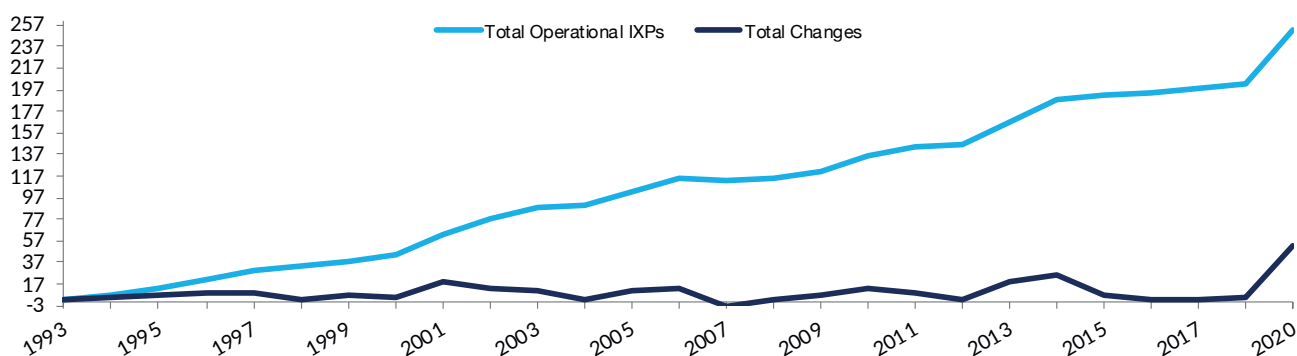
2. IXPs in Europe

2.1 Number of operational IXPs in Europe

» IXP Growth in Europe over 10 years

The number of operational IXPs in Europe has increased by 87.5% over the past 10 years, going from 136 in 2010, to 255 in 2020. 2020 saw significant growth for IXPs, partially due to the number of IXPs added to the IXPDB, indicating better reporting of active IXPs.

Note: The growth of 52 IXPs in 2020 includes both newly established IXPs but also IXPs that were only identified by Euro-IX in 2020 (Source: IXPDB)



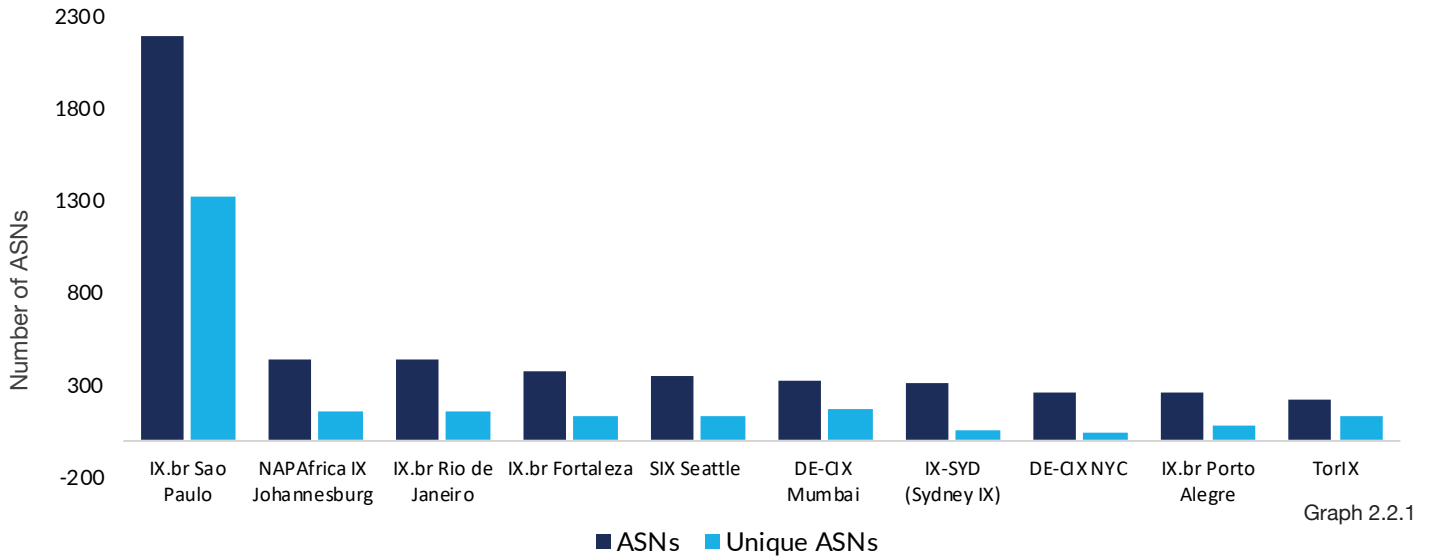
Graph 2.1.1

YEAR	IXPS STARTED	IXPS CLOSED OR INACTIVE	GROWTH	OPERATIONAL
2010	18	4	14	136
2011	8	0	8	144
2012	2	0	2	146
2013	22	2	20	166
2014	37	16	21	187
2015	17	11	6	193
2016	44	12	32	225
2017	5	2	3	198
2018	7	2	5	203
2019	21	2	19	224
2020	59	7	52	255

Table 2.1.1

2.2 Number of connected parties globally - Top 10 by IXP (excluding Europe)

- » The data below show the top 10 IXPs by connected parties globally. More complete data can be found in the [IXPDB](#).



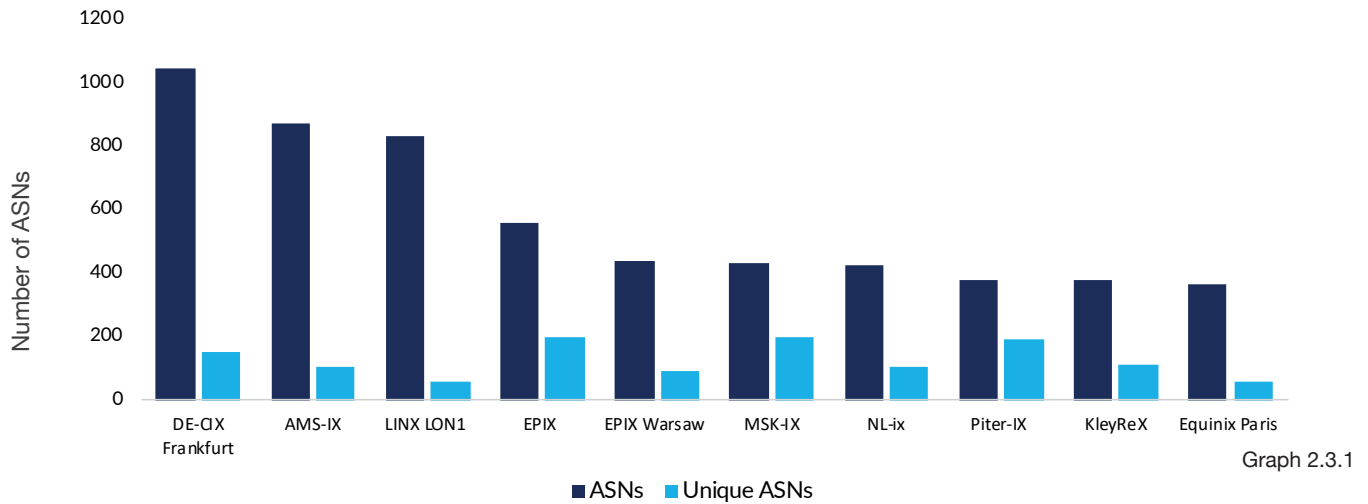
This data shows the total listed ASNs, and unique ASNs globally. The highest participants' distribution is from IX.br - São Paulo, Brazil, with 2203 ASNs, followed by NAPAfrica with 443 ASNs connected. If you see that an IXP is missing, please speak to us or the IXP to get their data included.

	IXP	Number of listed ASN	Number of unique ASNs
1	IX.br São Paulo	2203	1323
2	NAPAfrica IX Johannesburg	443	158
3	IX.br Rio de Janeiro	438	158
4	IX.br Fortaleza	374	125
5	SIX Seattle	344	126
6	DE-CIX Mumbai	322	172
7	IX-SYD (Sydney IX)	307	58
8	DE-CIX NYC	256	45
9	IX.br Porto Alegre	255	85
10	TorIX	224	129

Table 2.2.1

2.3 Number of connected parties in Europe - Top 10 by IXP

- » The data below shows the top 10 IXPs by connected parties in Europe. More complete data can be found in the [IXPDB](#).



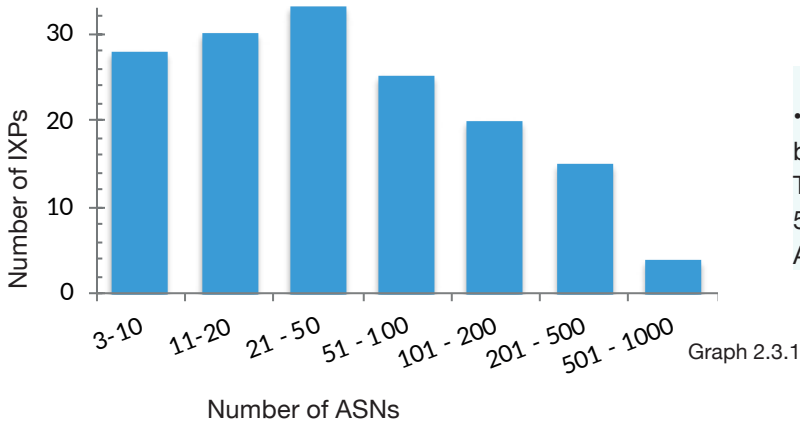
The data here shows the total listed ASNs, and unique ASNs in the Euro-IX region at the end of 2020. We see DE-CIX Frankfurt leading the top ten with 1043 ASNs, followed by AMS-IX with 870 ASNs. However, it's interesting to see the IXP with the most unique ASNs is EPIX based in Poland, followed by MSK-IX and Piter-IX, both based in Russia.

	IXP	Number of listed ASN	Number of unique ASNs
1	DE-CIX Frankfurt	1043	149
2	AMS-IX	870	105
3	LINX LON1	827	60
4	EPIX	556	199
5	EPIX Warsaw	436	93
6	MSK-IX	431	198
7	NL-ix	422	101
8	Piter-IX	377	189
9	KleyReX	373	113
10	Equinix Paris	366	57

Table 2.3.1

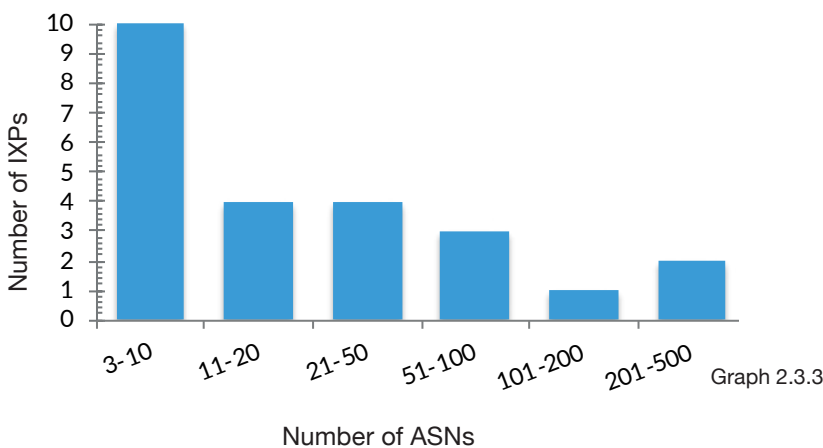
2.4 Number of connected parties globally

» Euro-IX Region



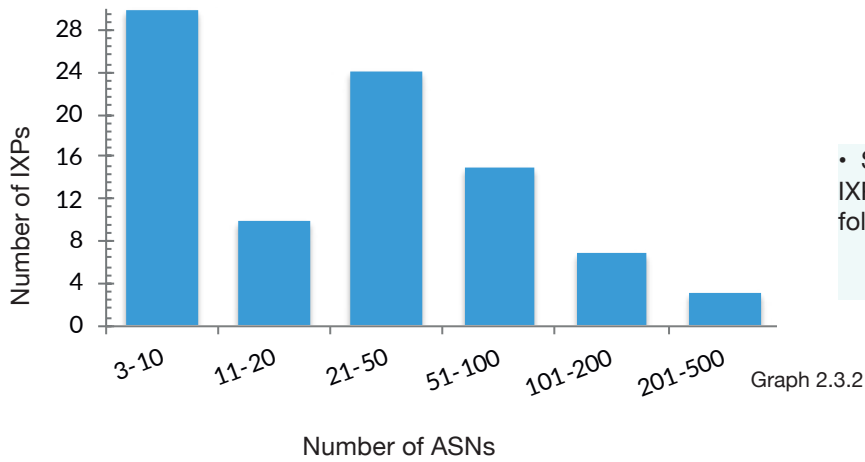
- In Europe, we see the majority of IXPs have between 21-50 ASNs connected. There has been natural growth with IXPs with 51- 100 ASNs, in contrast to IXPs with 101-200 ASNs, which has dropped slightly this year.

» Af-IX Region



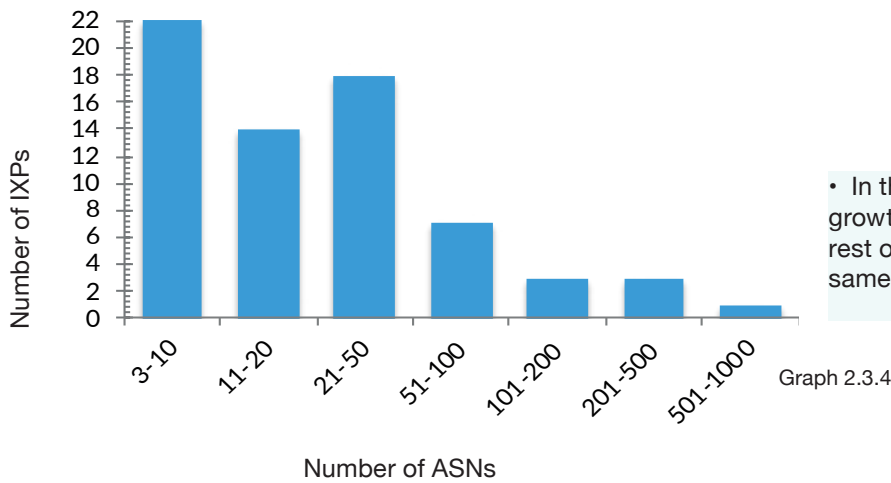
- In Africa, we see the largest majority of IXPs have a range between 3-10, which is not surprising with the number of new IXPs being formed over the last few years. We expect growth in the next category over the next year.

» APIX Region



• Similarly, in Asia we also see the majority of IXPs had a range of 21-50 ASNs connected, followed by a range of 21-50.

» LAC-IX Region



• In the LAC region, there was significant growth in the 1-10 category in 2020, whilst the rest of the categories remained relatively the same as the previous year.

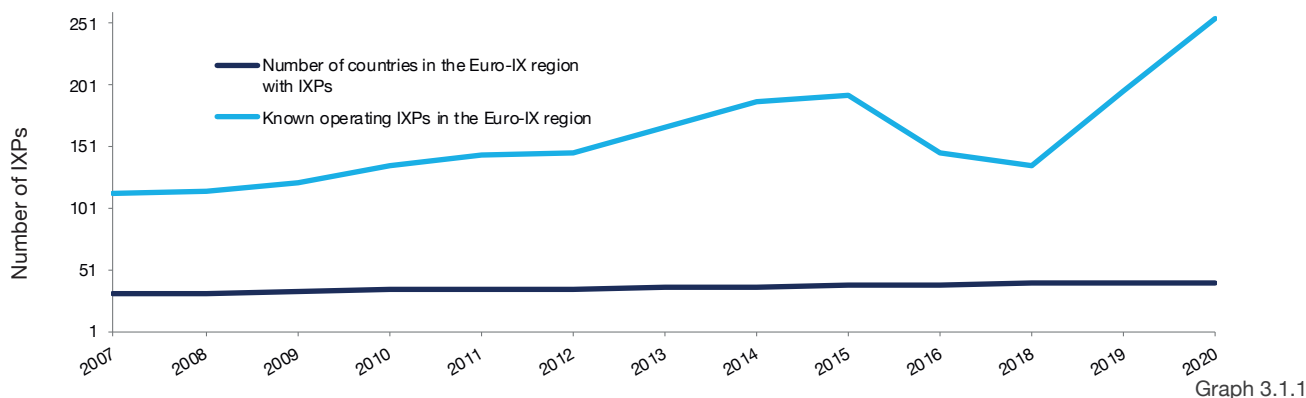
3. Global Traffic Statistics

3.1 Traffic Statistics in Europe

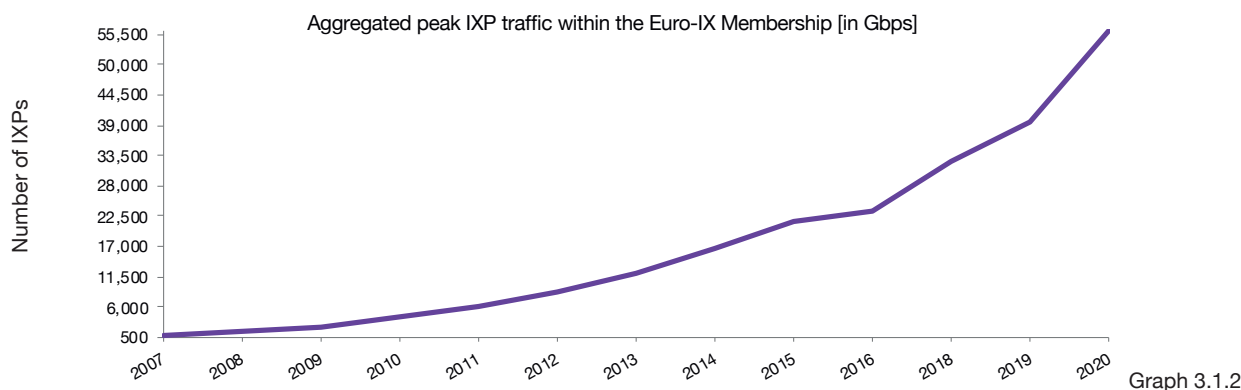
» Traffic growth over 10 years among Euro-IX membership

The average number of IXPs we collected data from was 56. These include Euro-IX members and “sub-members”, i.e. other IXPs or PoPs operated by our members in Europe, such as LINX Manchester, Netnod Gothenburg etc.

Note: the aggregated peak traffic volume is determined by collecting publicly available traffic statistics from Euro-IX Member IXPs. The data was captured during 12-month periods, from January to December each year, and varied from one month to the other depending on the data available. Please refer to section 1.2 for details on how traffic data is collected.



Graph 3.1.1



Graph 3.1.2

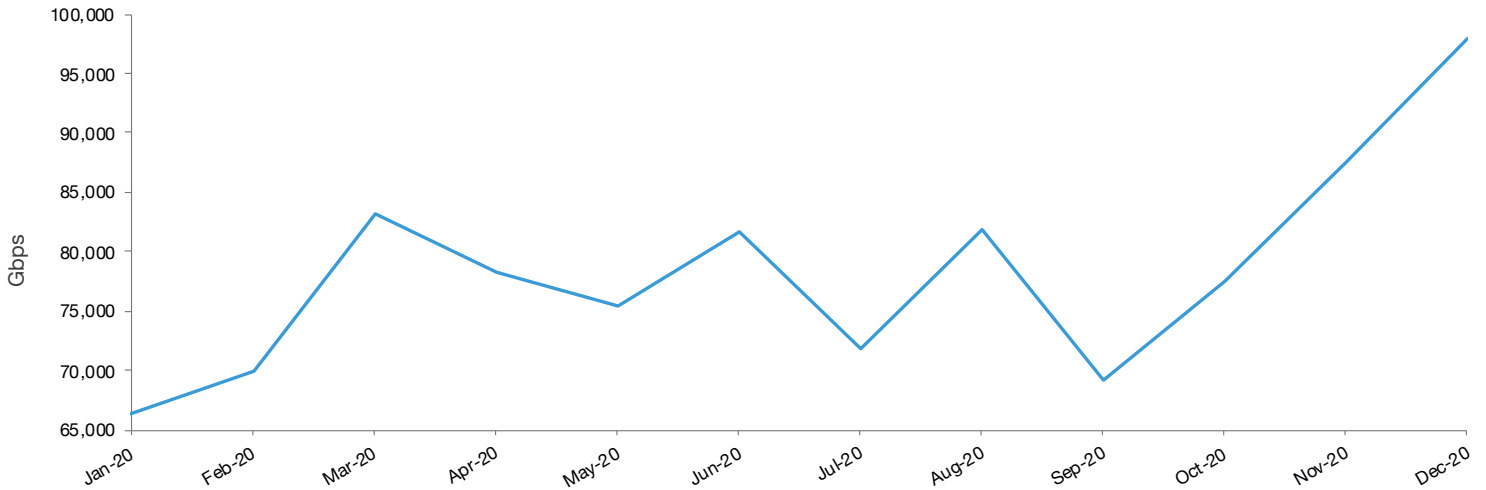
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Known operating IXPs in Europe	136	144	146	166	188	193	225	198	203	224	255
Number of countries in Europe with IXPs	35	35	38	43	48	48	49	49	42	40	40
Average number of IXPs we collected traffic data from in 2020	42	44	43	45	54	55	58	54	57	56	56
Average aggregated peak traffic per year within Euro-IX membership (in Gbps)	4,140	6,080	7,629	10,515	13,877	18,765	23,192	26,136	27,117	34,342	45,325
Maximum aggregated peak traffic per year within the Euro-IX membership (in Gbps)	5,085	7,072	9,099	11,903	16,169	21,469	27,198	30,987	30,009	39,609	56,172

Table 3.1.1

3.2 Global Traffic Statistics

» Total Aggregated Global Traffic Statistics (in Gbps)

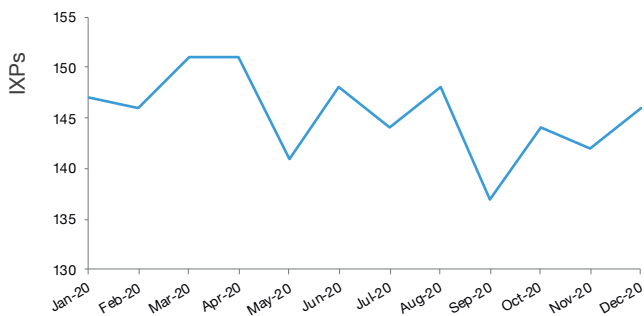
These charts show general trends based on reported data. Not all IXPs report data or use the same measurement intervals. These charts should be used to understand trends in data flows and not to place boundaries on total traffic passing through IXP infrastructure.



Graph 3.2.1

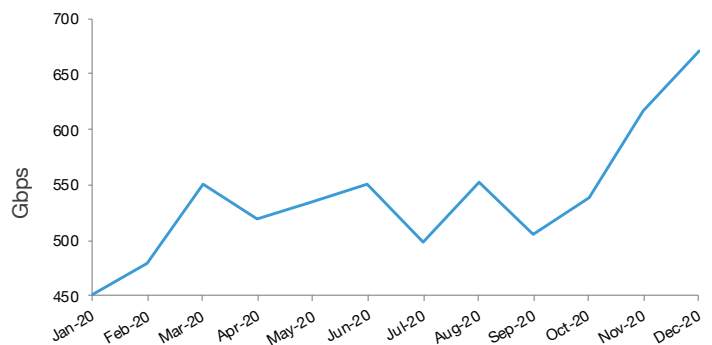
The average peak per IXP increased from 66,368 Gbps in January to 97,875 in December, with many peaks and troughs, which can be attributed to the “lockdown” and “relaxing of lockdown” measures around the world.

» Number of IXPs monitored worldwide



Graph 3.2.2

» Average Peak traffic per IXP (in Gbps)



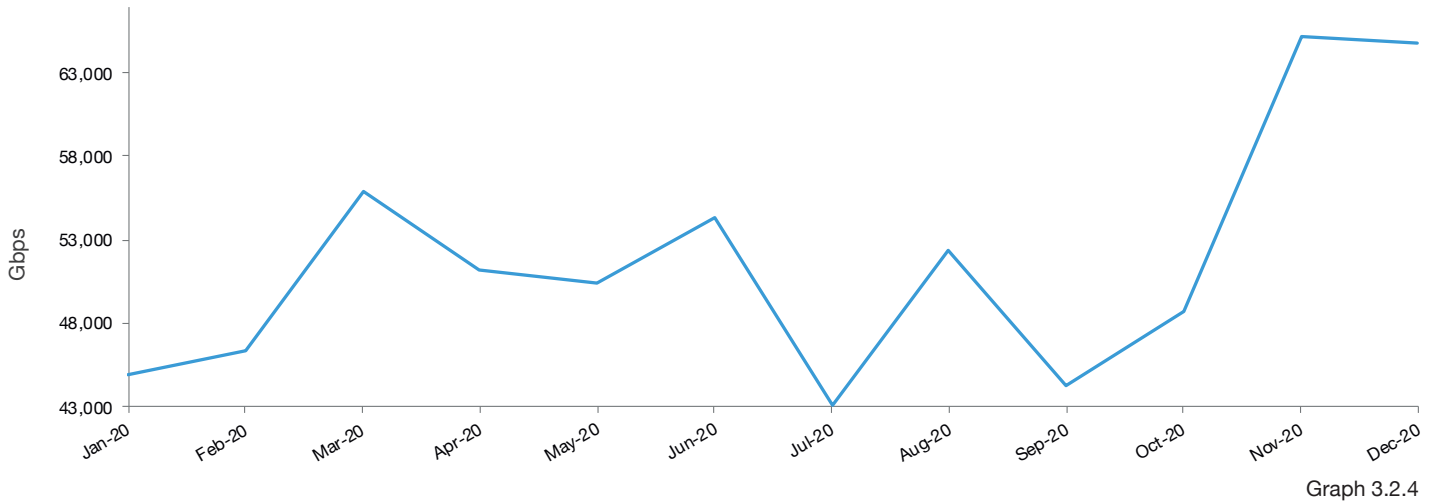
Graph 3.2.3

The number of IXPs monitored fluctuated throughout the year, starting with 147 in January, decreasing to 137 in September, before going back up to 146 in December. The drop in data collected in September, can partially be explained by the temporary decrease of IXPs monitored (with some IXP data unavailable at the time).

The average peak traffic per IXP increased with 49%, going from 451 Gbps to 670 Gbps. The traffic peaks in this region ranged from 22 Mbps and 7,800 Gbps in January and from 25 Mbps in January to 10,181 Tbps in December.

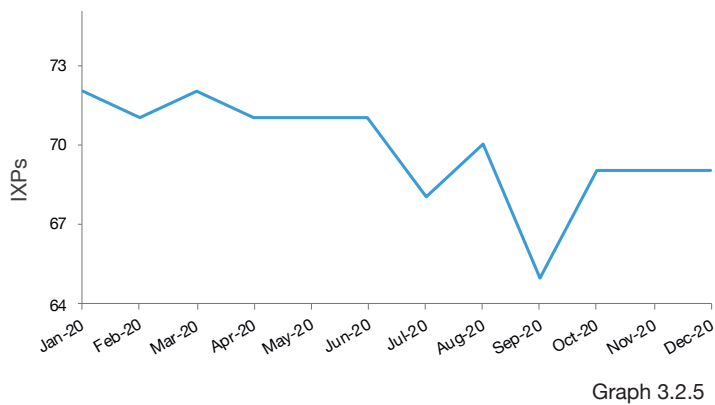
The averages shown above are therefore not representative for most of the Exchanges and the IXP community remains very diverse.

» Traffic in the Euro-IX Region

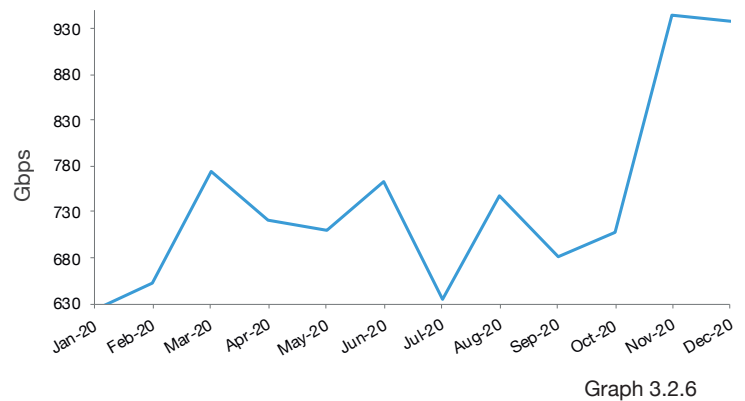


In the Euro-IX region, the average peak per IXP increased from 44,912 Gbps in January to 64,737 Gbps in December. The peaks and troughs generally follow the same pattern as that in the global traffic, except traffic seemed to hold steady nearing the end of 2020.

» Number of IXPs monitored in the Euro-IX region



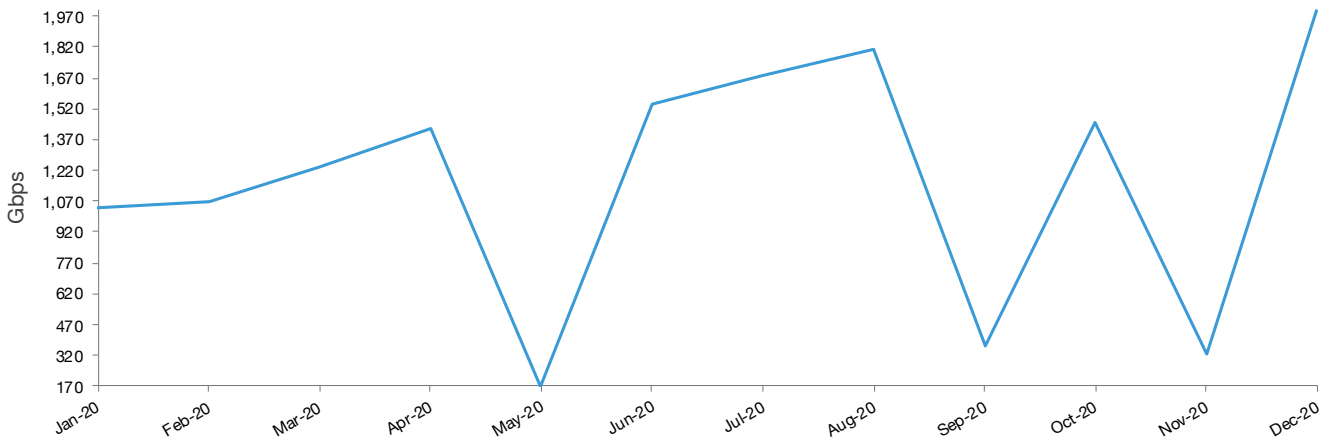
» Average Peak traffic per IXP (in Gbps)



The number of IXPs monitored throughout the year varied between 72 in January, slightly decreasing to 69 in December. The average peak traffic per IXP increased with 50%, going from 624 Gbps to 938 Gbps. The traffic peaks in this region ranged from 31 Mbps to 3,500 Tbps in January and 77 Mbps to 10,181 Tbps in December.

The 4 largest IXPs in terms of traffic in this region are DE-CIX in Frankfurt, AMS-IX in Amsterdam, LINX in London and MSK-IX in Moscow, which are the only ones where the traffic peaks above 3 Tbps each month.

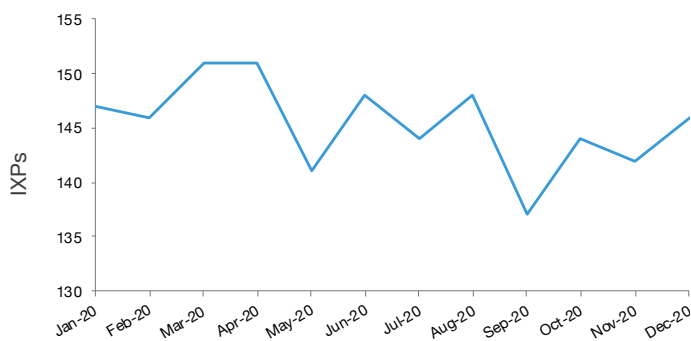
» Total Aggregated Traffic in the Af-IX Region (in Gbps)



Graph 3.2.7

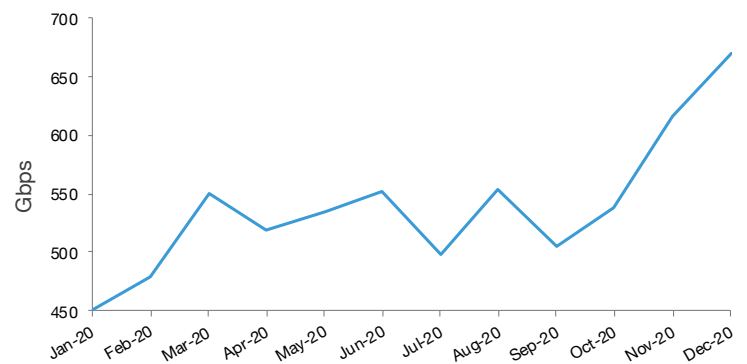
In the Af-IX region, the average peak per IXP increased from 1,034 Gbps in January to 1,556 Gbps in December. Although there was some fluctuation throughout the year, the traffic seemed to steadily increase from September to the end of the year. The sudden drop in May, September and November can partially be explained by the temporary decrease of IXPs monitored during those months (with some IXP data unavailable at the time).

» Number of IXPs monitored in the Af-IX region



Graph 3.2.8

» Average Peak traffic per IXP (in Gbps)

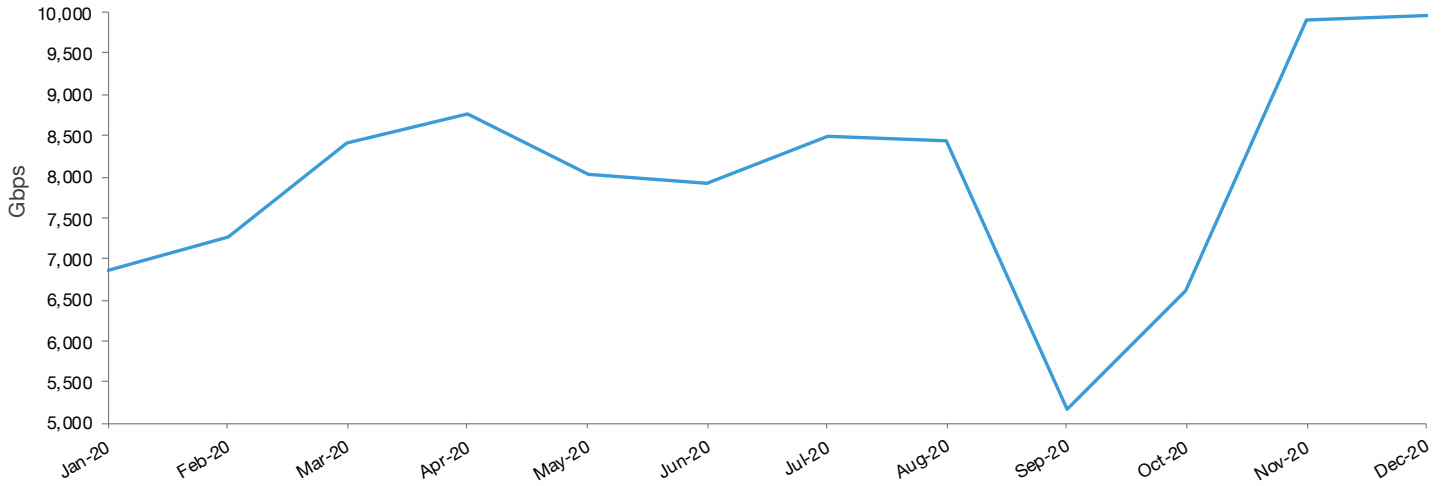


Graph 3.2.9

The average peak traffic per IXP increased with 69%, going from 148 Gbps to 250 Gbps. The traffic peaks in this region ranged from 3.7 Gbps and 978 Gbps in January and from 25 Mbps in January to 1,556 Gbps in December.

The largest IXP in terms of traffic is NapAfrica (Johannesburg, Durban and Cape Town), now peaking above 1 Tbps each month.

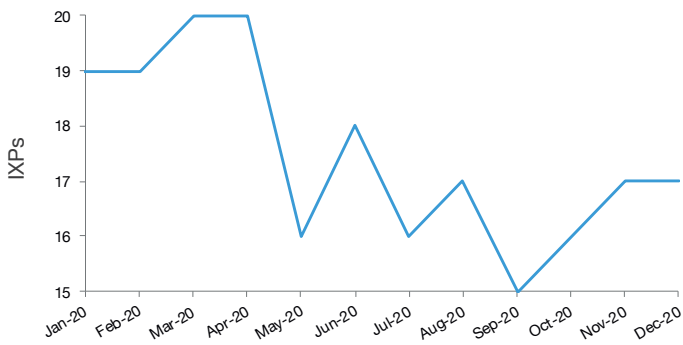
» Total Aggregated Traffic in the APIX Region (in Gbps)



Graph 3.2.10

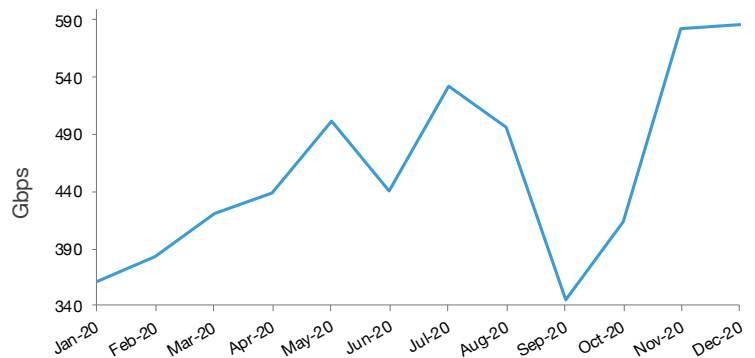
In the APIX region, the average peak per IXP increased from 6,870 Gbps in January to 9,963 Gbps in December. These numbers are based on data collected from 19 IXPs on average, over public peering LAN. The sudden drop in September can be explained by the temporary decrease of IXPs monitored during that month (with some IXP data unavailable at the time).

» Number of IXPs monitored in the APIX region



Graph 3.2.11

» Average Peak traffic per IXP (in Gbps)

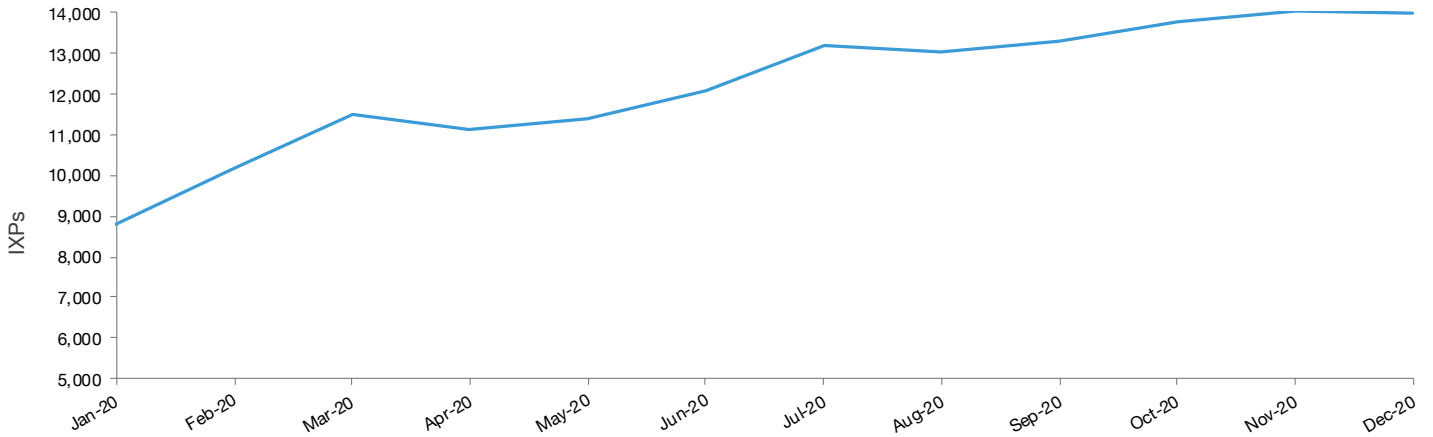


Graph 3.2.12

The number of IXPs monitored throughout the year varied between 19 in January, slightly decreasing to 17 in December. The average peak traffic per IXP increased with 62%, going from 362 Gbps to 586 Gbps. The traffic peaks in this region ranged from 6.5 Gbps to 1,996 Gbps in January and 35 Gbps to 2,770 Gbps in December.

The 3 largest IXPs in terms of traffic in this region are JPNAP, JPIX and Hong Kong IX.

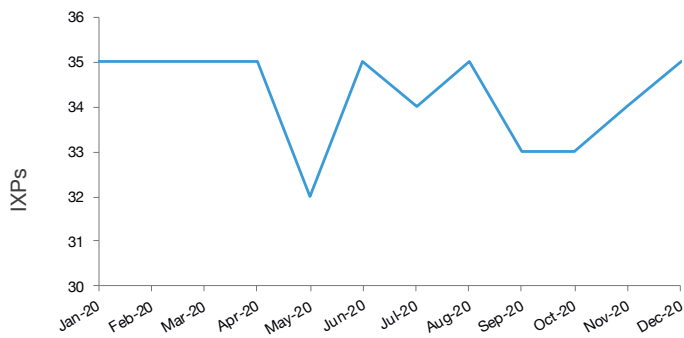
» Total Aggregated Traffic in the LAC-IX Region (in Gbps)



Graph 3.2.13

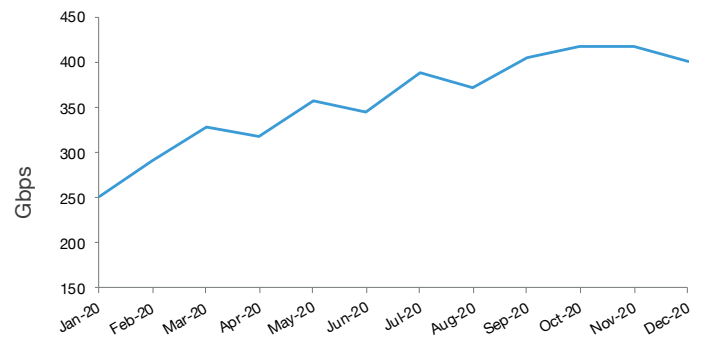
In the LAC-IX region, the average peak per IXP increased from 8,807 Gbps in January to 13,993 Gbps in December. Unlike in the other regions, there was no sudden decrease of traffic occurring in the year. The traffic has been growing steadily with slight drops in April and August.

» Number of IXPs monitored in the LAC-IX region



Graph 3.2.14

» Average Peak traffic per IXP (in Gbps)

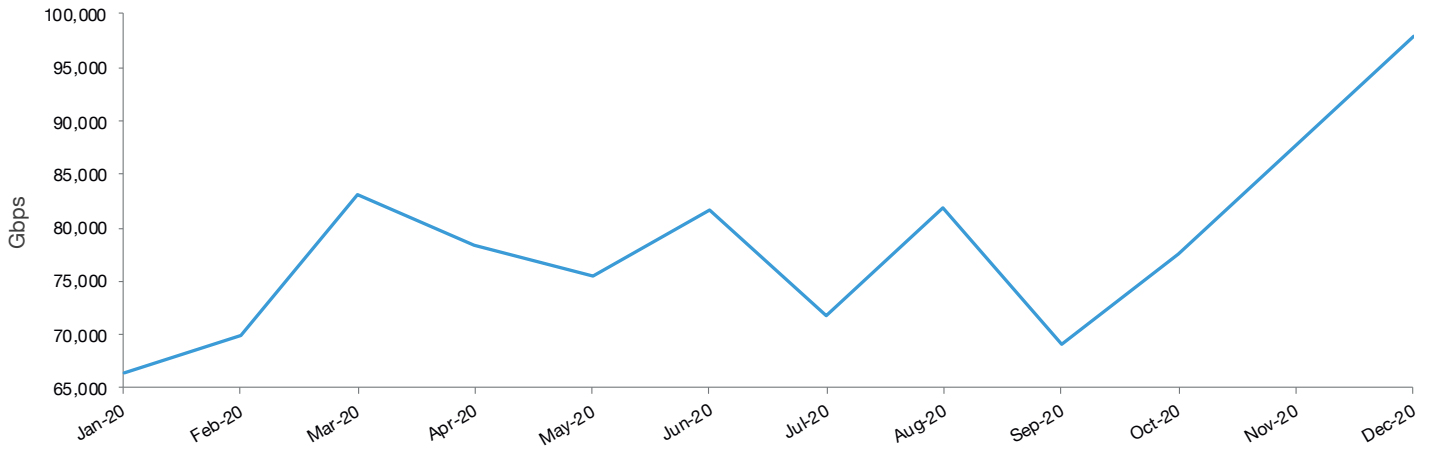


Graph 3.2.15

The number of IXPs monitored throughout the year varied between 35 in January, slightly decreasing to 32 in May and going back up to 35 in December. The average peak traffic per IXP increased with 98%, going from 252 Gbps to 400 Gbps. The traffic peaks in this region ranged from 31 Mbps to 3,500 Tbps in January and 1,08 Gbps to 10,065 Gbps in December.

The largest IXP in terms of traffic in this region is IX.br (São Paulo), where the traffic peaks above 7 Tbps each month. IX.br (São Paulo) and DE-CIX Frankfurt have the most data throughput worldwide.

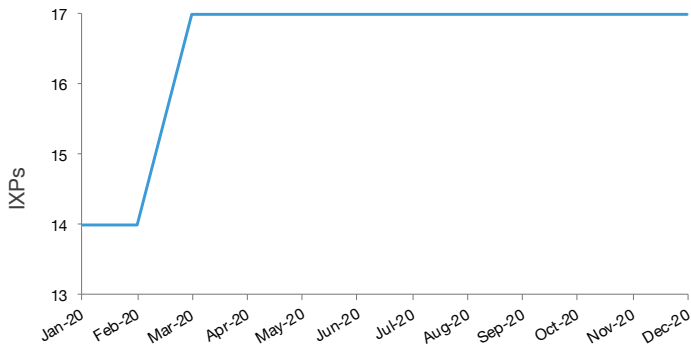
» Total Aggregated Traffic in the North America Region (in Gbps)



Graph 3.2.16

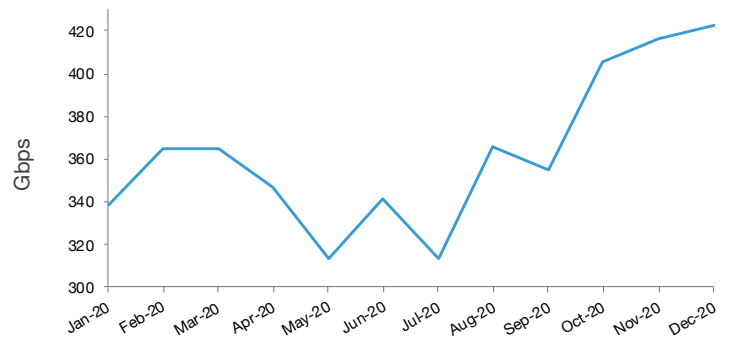
In the North America (NA) region, the average peak per IXP increased from 4,745 Gbps in January to 7,182 in December. The NA region experienced fluctuations similar to the other regions, with traffic steadily increasing from September to the end of the year.

» Number of IXPs monitored in the NA region



Graph 3.2.17

» Average Peak traffic per IXP (in Gbps)



Graph 3.2.18

The number of IXPs we collect data from went from 14 in January to 17 in December. The average peak traffic per IXP increased with 24%, going from 339 Gbps to 422 Gbps. The traffic peaks in this region ranged from 43 Mbps to 1,300 Tbps in January and 1.45 Gbps to 1,810 Tbps in December.

The largest IXPs in this region are SIX in Seattle, Telx Atlanta (both showing a traffic peaking above 1 Tbps each month), and NYIIX in New York and Torix in Toronto, with a steadily increasing monthly peak.

3.3 Traffic Statistics - Top 10

» The tables show the top 10 IXPs and countries in the world with the highest traffic. More complete data can be found in the [IXPDB](#).

» IXPs with the most traffic in Europe

	IXP	Maximum in Gbps
1	DE-CIX Frankfurt	10,385
2	AMS-IX	9,820
3	LINX LON1	4,920
4	MSK-IX	4,674
5	NL-IX	4,470
6	DATA-IX	3,849
7	GigaNET	2,300
8	Peering.cz	2,100
9	DTEL-IX	2,002
10	Netnod Stockholm	1,980

Table 3.3.1

» Countries with the most IXP traffic in Europe

	Country	Aggregated Traffic Peaks (in Gbps)
1	The Netherlands	14,290
2	Germany	12,792
3	Russian Federation	8,990
4	United Kingdom	6,481
5	Ukraine	5,103
6	Czech Republic	3,600
7	Sweden	2,136
8	Italy	1,880
9	France	1,750
10	Poland	1,433

Table 3.3.2

» IXPs with the most traffic worldwide (excluding Europe)

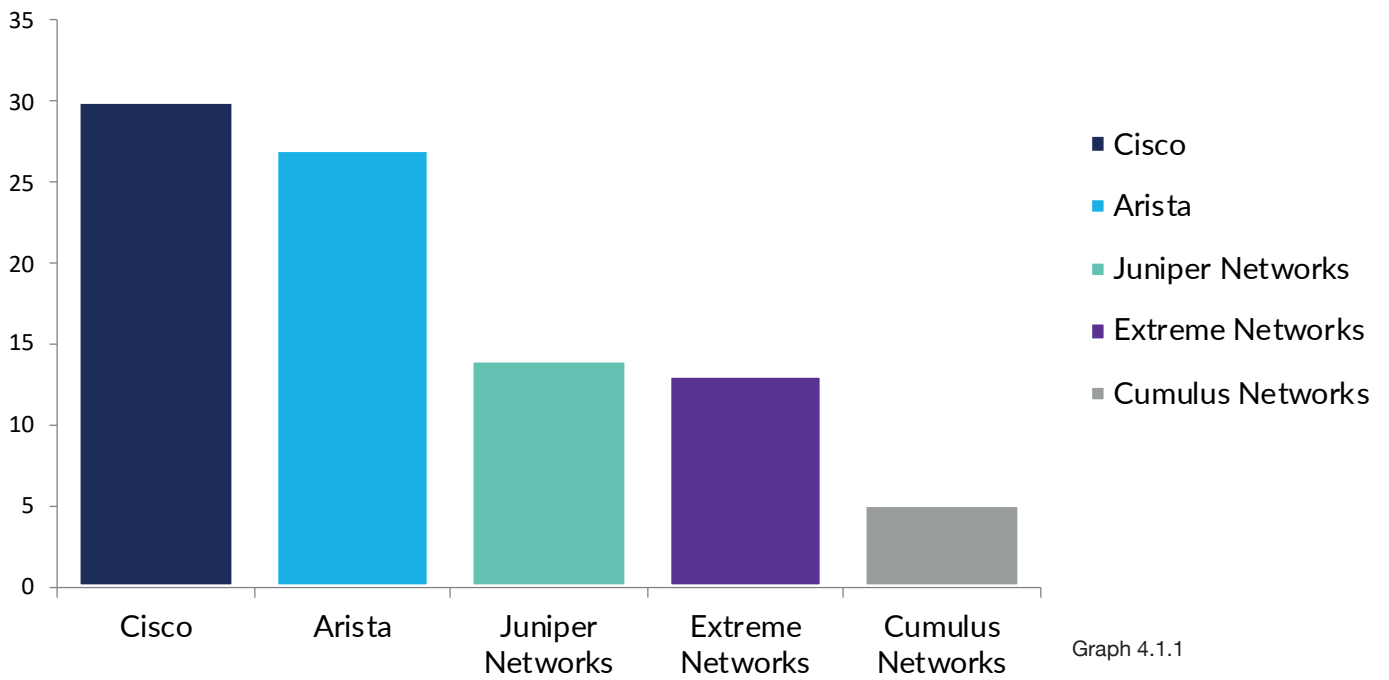
	IXP	Maximum in Gbps
1	IX.br	13,047
2	JPNAP Tokyo I	2,800
3	IX.br Rio de Janeiro	1,890
4	SIX - Seattle	1,850
5	HKIX	1,840
6	NAPAfrica	1,556
7	JPIX Tokyo	1,530
8	TLEX Atlanta	1,290
9	TORIX	1,166
10	IX.br Fortaleza	1,021

Table 3.3.3

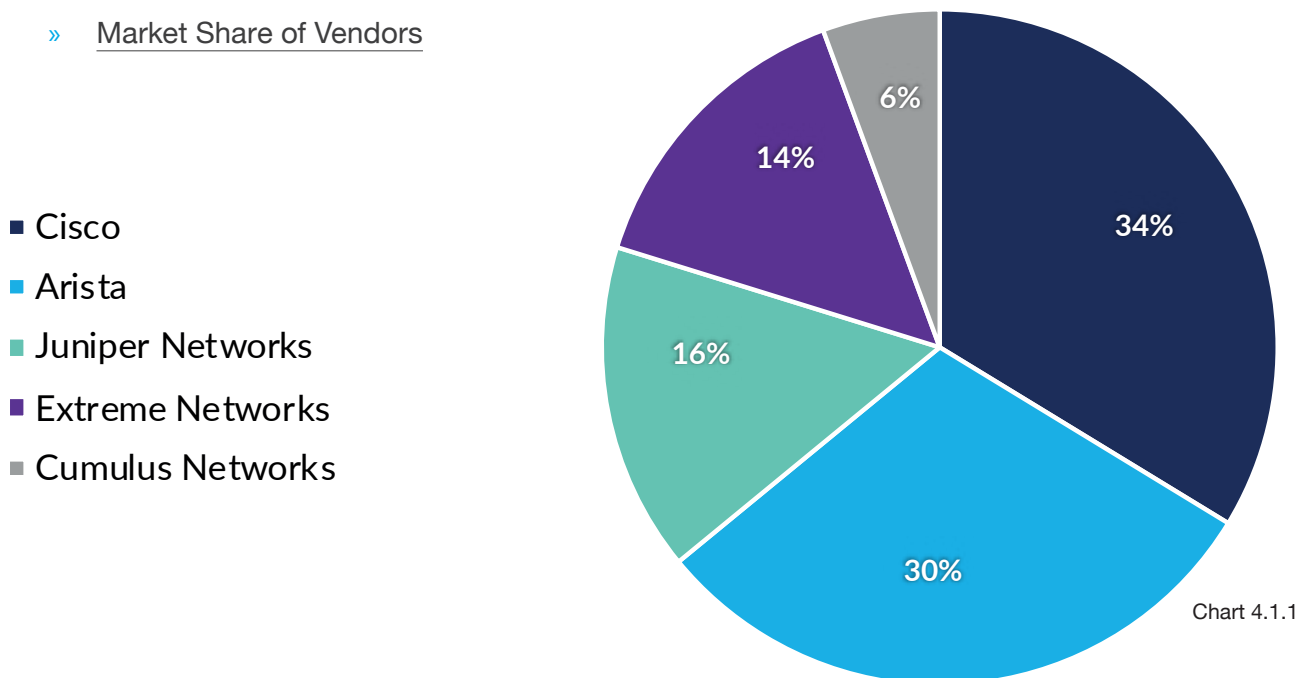
4. IXP Switching Platform Technology

4.1 Switches in use at IXPs

» Number of switches in use in 2020 - *Data source: IXPDB

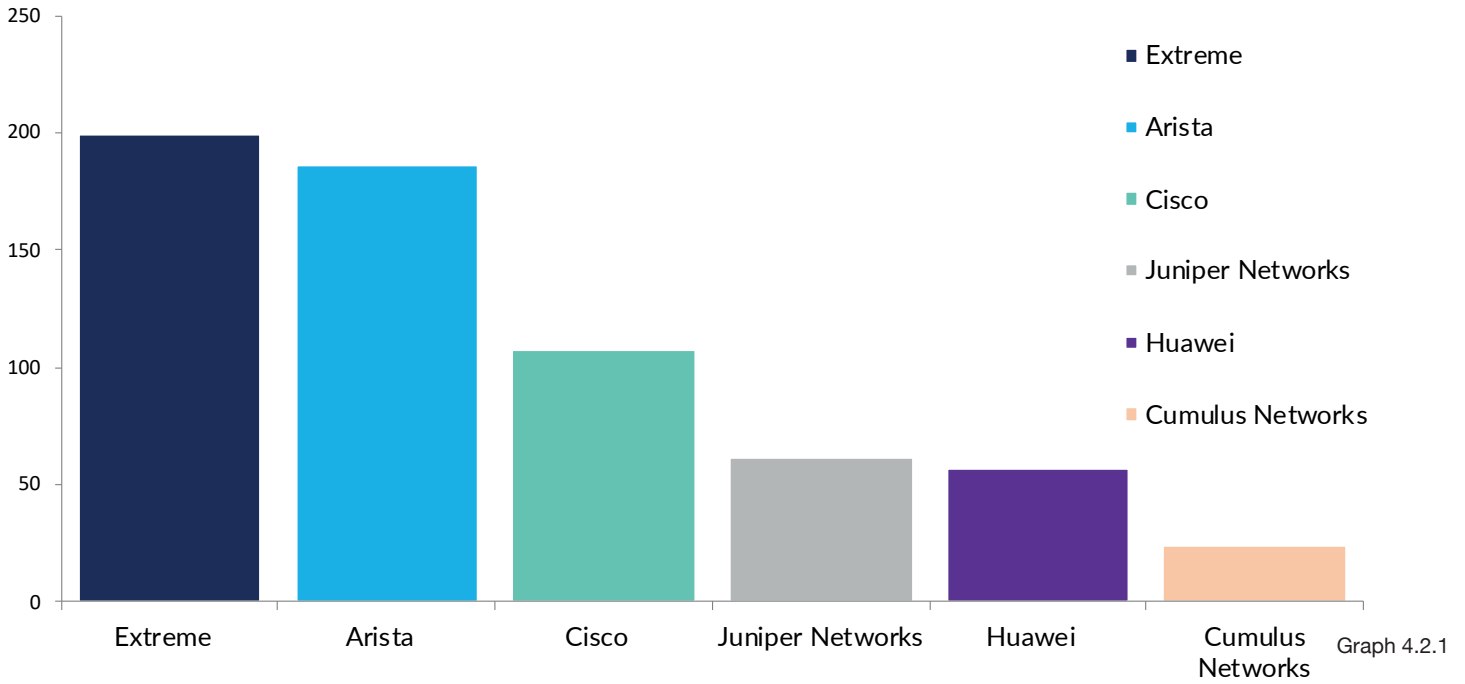


» Market Share of Vendors

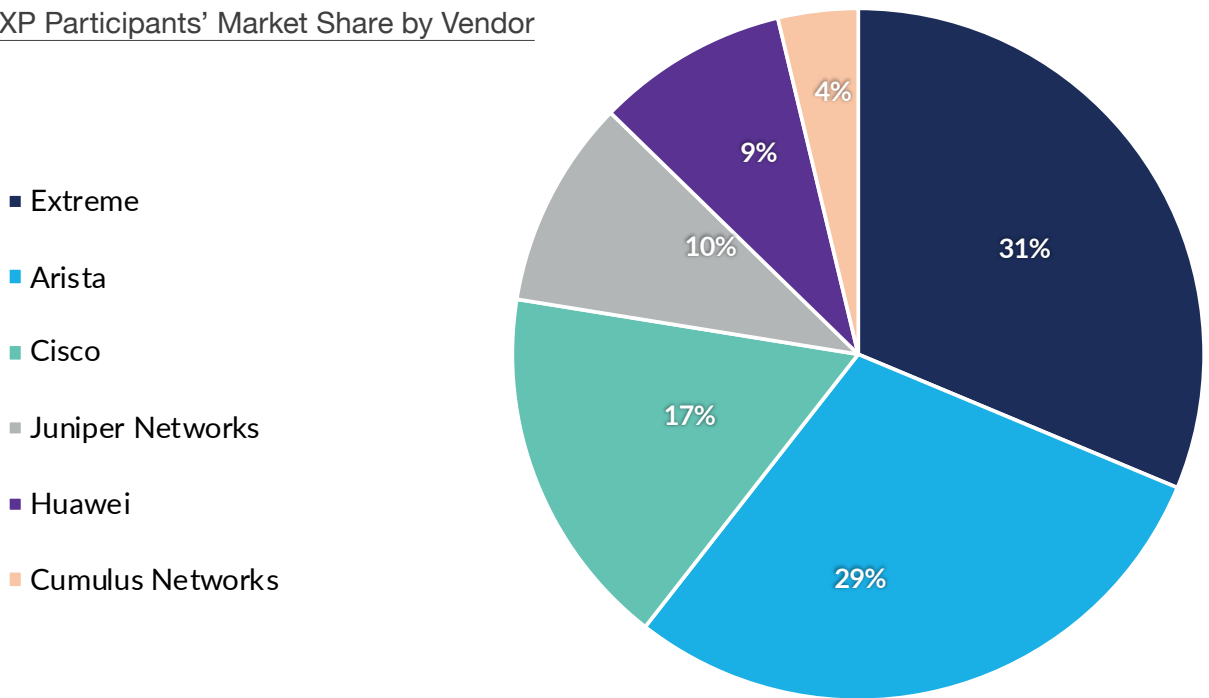


4.2 Network Peering Hardware

» Hardware used at the IXP participants - *Data source: IXPDB



» IXP Participants' Market Share by Vendor



6. Further information

6.1 Resources

IXPDB - The data in the IXPDB is automatically updated from JSON feeds supplied directly by the IXPs. The data, in addition to member lists and location information, also includes details of hardware used at IXPs.

We thank all sponsors of the IXPDB, Euro-IX Members and Patrons. We additionally thank all European IXPs, and especially those that provide publicly available information.

6.2 Contact

We welcome all forms of feedback and suggestions concerning this report and will do our best to answer any further requests for information.

The Euro-IX Secretariat
secretariat@euro-ix.net

Appendix 1

List of known IXPs in Europe

Note: * indicates Euro-IX Member / ** indicates IXPs operated by our Members

ECONOMY	# OF IXPS	CITY	FULL NAME OF IXP	ACRONYM
Albania	1			
		Tirana	Albanian Neutral Internet Exchange	ANIX*
Armenia	1			
		Yerevan	Armenia Internet Exchange	ARMIX*
Austria	5			
		Graz	Grazer Internet Exchange	GraX
		Klagenfurt	Alpes Adria Internet Exchange	AAIX
		Vienna	Community Internet Exchange - Vienna	Community-IX Vienna
		Vienna	Equinix Internet Exchange - Vienna	Equinix Vienna**
		Vienna	Vienna Internet eXchange	VIX*
Belarus	1			
		Minsk	Belarus National Internet Exchange Point	BY-IX
Belgium	2			
		Brussels	Belgian National Internet Exchange	BNIX*
		Waasmunster	Belgium Internet Exchange	BelgiumIX
Bosnia and Herzegovina	1			
		Sarajevo	Bosnia and Herzegovina Internet Exchange	BHNIX*
Bulgaria	5			
		Sofia	Balkan Internet Exchange	Balkan-IX
		Sofia	Bulgarian Internet Exchange	BIX.BG*
		Sofia	Sofia Internet Exchange	IX-SOF
		Sofia	NetIX	NetIX*
		Sofia	T-CIX	T-CIX
Croatia	1			
		Zagreb	Croatian Internet eXchange	CIX*
Cyprus	1			
		Nicosia	Cyprus Internet Exchange	CyIX
Czech Republic	3			
		Brno	Brno Internet Exchange Point	BR-IX
		Prague	Neutral Internet eXchange of Czech Republic	NIX.CZ*
		Prague	Peering.cz	Peering.cz*
Denmark	3			
		Copenhagen	Danish Internet eXchange point	DIX*
		Copenhagen	Netnod - Copenhagen	Netnod - Copenhagen**
		Copenhagen	Stockholm Internet Exchange - Copenhagen	STHIX Copenhagen**
Estonia	4			
		Riga	PITER-IX	PITER-IX Riga
		Tallinn	Tallinn Governmental Internet Exchange	RTIX
		Tallinn	Tallinn Internet eXchange	TIX Tallinn
		Tallinn	Tallinn Internet Exchange	TLLIX

Finland		7	
	Espoo	Finnish Communication and Internet Exchange	FICIX - Espoo**
	Espoo	Global Internet Exchange - Helsinki	Global-IX - Espoo
	Helsinki	Finnish Communication and Internet Exchange	FICIX - Helsinki*
	Oulu	Finnish Communication and Internet Exchange	FICIX - Oulu**
	Helsinki	Global Internet Exchange - Helsinki	Global-IX - Helsinki
	Tampere	Tampere Region Exchange	TREX*
	Tuusula	Securebit AG	SBIX TUU
France		14	
	Béarn	BéarnIX	BéarnIX
	Clermont Ferrand	AuvernIX	AuvernIX
	Grenoble	Grenoble Internet Exchange Point	GrenobIX**
	Lille	Lille Internet Exchange	Lillix
	Lyon	Lyon Global Internet Exchange	LyonIX**
	Marseille	France Internet Exchange - Marseille	France-IX Marseille**
	Marseille	Deutscher Commercial Internet Exchange	DE-CIX Marseille**
	Nantes	OuestelX	OustelX
	Paris	Equinix Internet Exchange - Paris	Equinix Paris**
	Paris	French National Internet Exchange IPv6	FNIX6
	Paris	France Internet Exchange	France-IX*
	Paris	Service for French Internet eXchange	SFINX*
	Rennes	Breizh-IX	Breizh-IX
	Toulouse	GIX de la grande region Toulousaine	TOUIX*
Germany		21	
	Berlin	Berlin Commercial Internet Exchange	BCIX*
	Berlin	Europen Commercial Internet Exchange - Berlin	ECIX Berlin*
	Berlin	Community-IX	Community-IX
	Bremen	Bremen Internet Exchange	BREM-IX
	Dortmund	Dortmund Internet Exchange	DO-IX*
	Düsseldorf	Deutscher Commercial Internet Exchange	DE-CIX Düsseldorf**
	Düsseldorf	European Commercial Internet Exchange - Dusseldorf	ECIX Dusseldorf**
	Düsseldorf	Local Internet Exchange	LocIX Düsseldorf
	Düsseldorf	OpenCarrier e.G. Member IX Dusseldorf	OCIX Düsseldorf
	Düsseldorf	Securebit AG	SBIX DUS
	Frankfurt	Deutscher Commercial Internet Exchange	DE-CIX Frankfurt*
	Frankfurt	European Commercial Internet Exchange - Frankfurt	ECIX Frankfurt**
	Frankfurt	Equinix Internet Exchange - Frankfurt	Equinix Frankfurt**
	Frankfurt	Local Internet Exchange	LocIX Frankfurt
	Hamburg	Deutscher Commercial Internet Exchange	DE-CIX Hamburg**
	Hamburg	Europen Commercial Internet Exchange - Hamburg	ECIX Hamburg**
	Karlsruhe	Baden-Württemberg Internet Exchange Karlsruhe	BW-IX
	Munich	Deutscher Commercial Internet Exchange	DE-CIX Munich**
	Munich	Europen Commercial Internet Exchange - Munich	ECIX Munich**
	Nuernberg	Nuernberger Internet eXchange	N-IX
	Stuttgart	Stuttgarter Internet eXchange	S-IX
Greece		2	
	Athens	Greek Internet Exchange	GR-IX*
	Athens	(South East Europe Cloud & Interconnection Exchange	SEECIX
	Thessaloniki	Greek Internet Exchange	GR-IX Thessaloniki**

	Thessaloniki	Thessaloniki neutral Internet Exchange Point	THESS-IX
Hungary	1		
	Budapest	Budapest Internet eXchange	BIX*
Iceland	1		
	Reykjavik	Reykjavik Internet Exchange	RIX*
Iran	1		
	Tehran	Tehran Internet Exchange	Tehran-IX
Ireland	3		
	Cork	Internet Neutral EXchange	INEX Cork**
	Dublin	Internet Neutral EXchange	INEX*
	Dublin	Equinix Internet Exchange - Dublin	Equinix Dublin**
Israel	1		
	Tel-Aviv	Israeli Internet eXchange	IIX - Tel Aviv
Italy	10		
	Florence	Tuscany Internet eXchange	TIX Tuscany*
	Milan	Equinix Internet Exchange - Milan	Equinix Milan**
	Milan	Milan Neutral Access Point	MiNAP
	Milan	Milan Internet eXchange	MIX-IT*
	Padova	VSIX Nap del Nord Est	VSIX*
	Palermo	Deutscher Commercial Internet Exchange - Palermo	DE-CIX Palermo**
	Piacenza	Piacenza Internet Exchange	PCIX
	Rome	Nautilus Mediterranean Exchange Point	NaMeX*
	Torino	Torino Piemonte Exchange Point	TOP-IX*
	Udine	Friuli Venezia Giulia Internet eXchange	FVG-IX*
Kazakhstan	2		
	Almaty	Kazakhstan Traffic Exchange	KAZ-IX
	Semey	KazNIX Exchange Point	KazNIX
Kosovo	1		
	Prishtinë	Kosovo Internet Exchange Point	KOSIX*
Latvia	3		
	Riga	Latvian Internet eXchange	LIX - Latvia
	Riga	Moscow Internet Exchange - Riga	MSK-IX Riga**
	Riga	Santa Monica Internet Local Exchange	SMILE
Lebanon	2		
	Beirut	Advanced Internet eXchange	A-IX
	Beirut	Beirut Internet Exchange	Beirut-IX*
Liechtenstein	2		
	Balzers	Securebit AG	VIXP
	Eschen	Rheintal IX Internet Exchange	Rheintal IX
Lithuania	3		
	Vilnius	Baltic Internet Exchange	BALT-IX
	Vilnius	Lietuvos Interneto paslaugų tiekėjų apsikeitimo mazgu	LIPTAM
	Vilnius	Lithuania Internet Exchange	Litix
Luxembourg	1		
	Luxembourg	Luxembourg Commercial Internet Exchange	LU-CIX*
North Macedonia	1		
	Skopje	Faculty of Computer Science and Engineering	IXP.mk
Moldova, Republic of	1		
	Chisinau	Internet eXchange Moldova	MD-IX
Netherlands	14		
	Amsterdam	Amsterdam Internet Exchange	AMS-IX*

	Amsterdam	Asteroid Amsterdam IX	Asteroid*
	Amsterdam	Equinix Internet Exchange - Amstedam	Equinix Amsterdam**
	Amsterdam	Global Internet Exchange - Amsterdam	Global-IX Amsterdam**
	Dronten	Speed Internet Exchange	SPEEDIX
	Emmen	Zuid Oost Drentse Internet eXchange	ZOD-IX
	Enschede	Nederlands-Duitse Internet Exchange	NDIX
	Groningen	Groningen Internet Exchange	GN-IX
	Leeuwarden	Friese Internet Exchange	FR-IX
	Rotterdam	Rotterdam Internet Exchange	R-iX
	The Hague	Data Facilities Internet Exchange	DF-IX
	The Hague	LayerSwitch Internet Exchange	LSIX
	The Hague	Neutral Internet Exchange	NL-ix*
		Local Internet Exchange	LocIX Netherlands
Norway	7		
	Bergen	Bergen Internet Exchange	BIX**
	Oslo	Free Internet eXchange Oslo	FIXO
	Oslo	Norwegian Internet eXchange	NIX*
	Oslo	Norwegian Internet eXchange	NIX2**
	Stavanger	Stavanger Internet Exchange	SIX - Stavanger
	Tromsø	Tromsø Internet Exchange	TIX
	Trondheim	Trondheim Internet Exchange	TRDIX**
Palestinian Territory, Occupied	1		
	Ramallah	Palestine Internet Exchange Point	PIX Palestine
Poland	12		
	Gdansk	Gdansk Internet eXchange	GIX Gdansk
	Gdynia	APLIX.PL	APLIX
	Katowice	E-Poludnie Internet Exchange - Katowice	EPIX Katowice
	Krakow	Cracow Internet Exchange	CIX KR
	Lodz	Lodz Telecommunication Node	IX.LODZ.PL
	Lodz	Lodz Internet Exchange	LIX - Poland
	Poznan	Poznan Internet Exchange	PIX
	Warsaw	KIX - Poland	KIX - Poland
	Warsaw	Equinix Internet Exchange - Warsaw	Equinix Warsaw **
	Warsaw	Orange Polska Internet Exchange	TPIX*
	Warsaw	Warsaw Internet eXchange	WIX - Poland
	Warsaw	E-Poludnie Internet Exchange - Warszawa	EPIX Warszawa
Portugal	3		
	Lisbon	Deutscher Commercial Internet Exchange - Lisbon	DE-CIX Lisbon**
	Lisbon	GIGABit Portuguese Internet eXchange	GigaPix*
	Lisbon	Equinix Internet Exchange - Lisbon	Equinix Lisbon**
Romania	6		
	Bucharest	Balcan-IX Internet Exchange	BALCAN-IX
	Bucharest	InterLAN IX	InterLAN*
	Buscharest	Romanian Commercial Internet Echange	RO-CIX
	Bucharest	Romanian Internet eXchange	RoNIX
	Constanta	Tomis Internet Exchange	Tomix
	Targoviste	LNK Internet Exchange	LNK-IX
Russian Federation	29		
	Barnaul	SFO-IX	SFO-IX
	Chelyabinsk	Chelyabinsk Peering Point	CHEL-PP
	Ekaterinburg	Moscow Internet Exchange - Ekaterinburg	MSK-IX Ekaterinburg**
	Kazan	Moscow Internet Exchange - Kazan	MSK-IX Kazan**
	Khabarovsk	DataIX - Khabarovsk	DataIX - Khabarovsk
	Krasnodar	South Russia IX	Sea-IX

	Krasnoyarsk	Krasnoyarsk Internet Exchange	SIBIR-IX
	Moscow	Dataline Internet Exchange	DatalineIX
	Moscow	DatalX - Moscow	DatalX - Moscow
	Moscow	MPIX	MPIX
	Moscow	Moscow Internet Exchange	MSK-IX*
	Moscow	PIETER-IX Moscow	PIETER-IX Moscow
	Nizhny Novgorod	IX of Nizhny Novgorod	NNOV-IX
	Novosibirsk	DatalX - Novosibirsk	DatalX - Novosibirsk
	Novosibirsk	Moscow Internet Exchange - Novosibirsk	MSK-IX Novosibirsk**
	Omsk	OMSK-IX	OMSK-IX
	Rostov on Don	Moscow Internet Exchange - Rostov on Don	MSK-IX Rostov-on-Don**
	Samara	Moscow Internet Exchange - Samara	MSK-IX - Samara**
	St.Petersburg	DatalX - St Petersburg	DatalX - St. Petersburg
	St.Petersburg	Global Internet Exchange	Global-IX
	St.Petersburg	PIRIX Internet Exchange	PIRIX
	St.Petersburg	Moscow Internet Exchange - St. Petersburg	MSK-IX - St. Petersburg**
	St.Petersburg	PIETER-IX St.-Petersburg	PIETER-IX St.-Petersburg
	Simferopol	Crimea-IX	Crimea-IX
	Stavropol	Moscow Internet Exchange - Stavropol	MSK-IX - Stavropol**
	Ufa	DatalX - Ufa	DatalX - Ufa
	Ulyanovsk	Ulyanovsk Internet Exchange	ULN-IX
	Vladivostok	Moscow Internet Exchange - Vladivostok	MSK-IX - Vladivostok**
	Yaroslavl	Yaroslavl Internet Exchange	YAR-IX
Saudi Arabia	1		
	Riyadh	Saudi Arabia Internet Exchange	SAIX*
Serbia	1		
	Belgrade	Serbian Open eXchange	SOX*
Slovakia	3		
	Bratislava	Slovak Internet eXchange - Bratislava	SIX - Bratislava
	Bratislava	Neutral Internet eXchange of Slovakia	NIX.SK**
	Kosice	Slovak Internet eXchange - Kosice	SIX - Kosice
Slovenia	1		
	Ljubljana	Slovenian Internet Exchange	SIX*
Spain	5		
	Barcelona	Catalunya Neutral Internet Exchange	CATNIX*
	Barcelona	Equinix Internet Exchange - Barcelona	Equinix Barcelona**
	Madrid	Espana Internet Exchange	ESPANIX*
	Madrid	Deutscher Commercial Internet Exchange	DE-CIX Madrid**
	Madrid	Equinix Internet Exchange - Madrid	Equinix Madrid**
Sweden	14		
	Gothenburg	Gothenburg Internet Exchange	GIX
	Gothenburg	Internet Exchange i Sverige - Gothenburg	Netnod - Gothenburg**
	Gothenburg	Stockholm Internet Exchange	STHIX - Gothenburg**
	Lulea	Internet Exchange i Sverige - Lulea	Netnod - Lulea**
	Malmoe	Internet eXchange point of the Oresund Region	IXOR
	Stockholm	Global Internet Exchange - Stockholm	Global-IX - Stockholm
	Stockholm	Internet Exchange i Sverige - Stockholm	Netnod - Stockholm*
	Stockholm	SOLIX	SOLIX - Stockholm
	Stockholm	Stockholm Internet Exchange	STHIX*
	Stockholm	Equinix Internet Exchange - Stockholm	Equinix Stockholm**
	Sundsvall	Internet Exchange i Sverige - Sundsvall	Netnod - Sundsvall**
	Sundsvall	Stockholm Internet Exchange - Sundsvall	STHIX - Sundsvall**
	Umea	Stockholm Internet Exchange- Umea	STHIX - Umea**

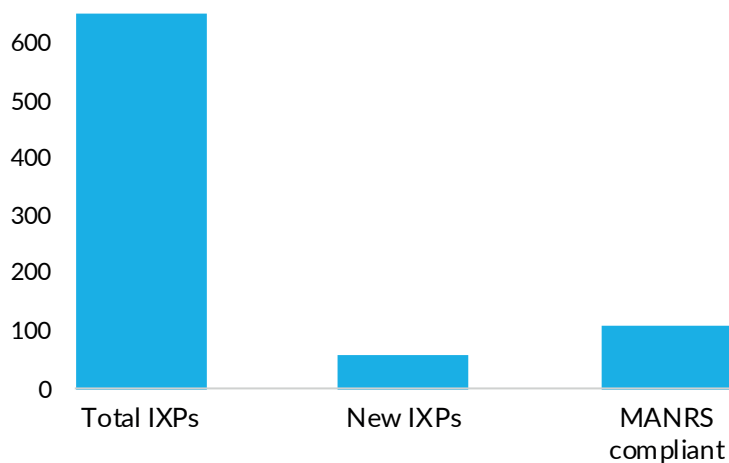
	Umea	NorrNod	NorrNod
Switzerland	8		
	Geneva	CERN Internet eXchange Point	CIXP*
	Lousanne	RomandIX	RomandIX
	Zurich	4B42 Internet Exchange Point	4IXP
	Zurich	CH-IX	CH-IX
	Zurich	Equinix Internet Exchange - Zurich	Equinix Zurich*
	Zurich	Swiss Internet Exchange	SwissIX*
	Zurich	Securebit AG	SBIX
	Zurich	Community-IX.ch	Community-IX ch
Turkey	2		
	Istanbul	Deutscher Commercial Internet Exchange	DE-CIX Istanbul**
	Istanbul	Turkish internet eXchange	TR-IX
Ukraine	5		
	Donetsk	Donetsk Internet Exchange	DN-IX
	Kiev	Digital Telecom Internet Exchange	DTEL-IX
	Kiev	Giganet	Giganet
	Kiev	Ukrainian Internet Exchange	UA-IX
	Odessa	Odessa Traffic Exchange Network	Od-IX
United Arab Emirates	2		
	Abu Dhabi	SmartHub Internet Exchange	SH IX
	Dubai	United Arab Emirates Internet Exchange	UAE-IX*
United Kingdom	11		
	Bradford	Bradford Internet Exchange	BFD-IX
	Cardiff	LINX Wales	LINX Wales**
	Edinburgh	LINX Scotland	LINX Scotland**
	Leeds	IXLeeds	IXLeeds*
	Liverpool	Liverpool Internet Exchange	IX Liverpool
	London	Equinix Internet Exchange - London	Equinix London**
	London	London Internet Exchange	LINX*
	London	London Network Access Point	LONAP*
	Manchester	Equinix Internet Exchange - Manchester	Equinix Manchester**
	Manchester	LINX Manchester	LINX Manchester**
	Newcastle	Newcastle Internet Exchange	NCL-IX

Appendix 2

» IXPs who are MANRS Compliant in the IXPDB

Mutually Agreed Norms for Routing Security (MANRS) is a global initiative, supported by the Internet Society, that provides crucial fixes to reduce the most common routing threats.

In 2020, there were 109 IXPs who were MANRS in the IXPDB.



IXPB Data	
Total IXPs	651
New IXPs added in 2020	59
MANRS Compliant IXPs	109



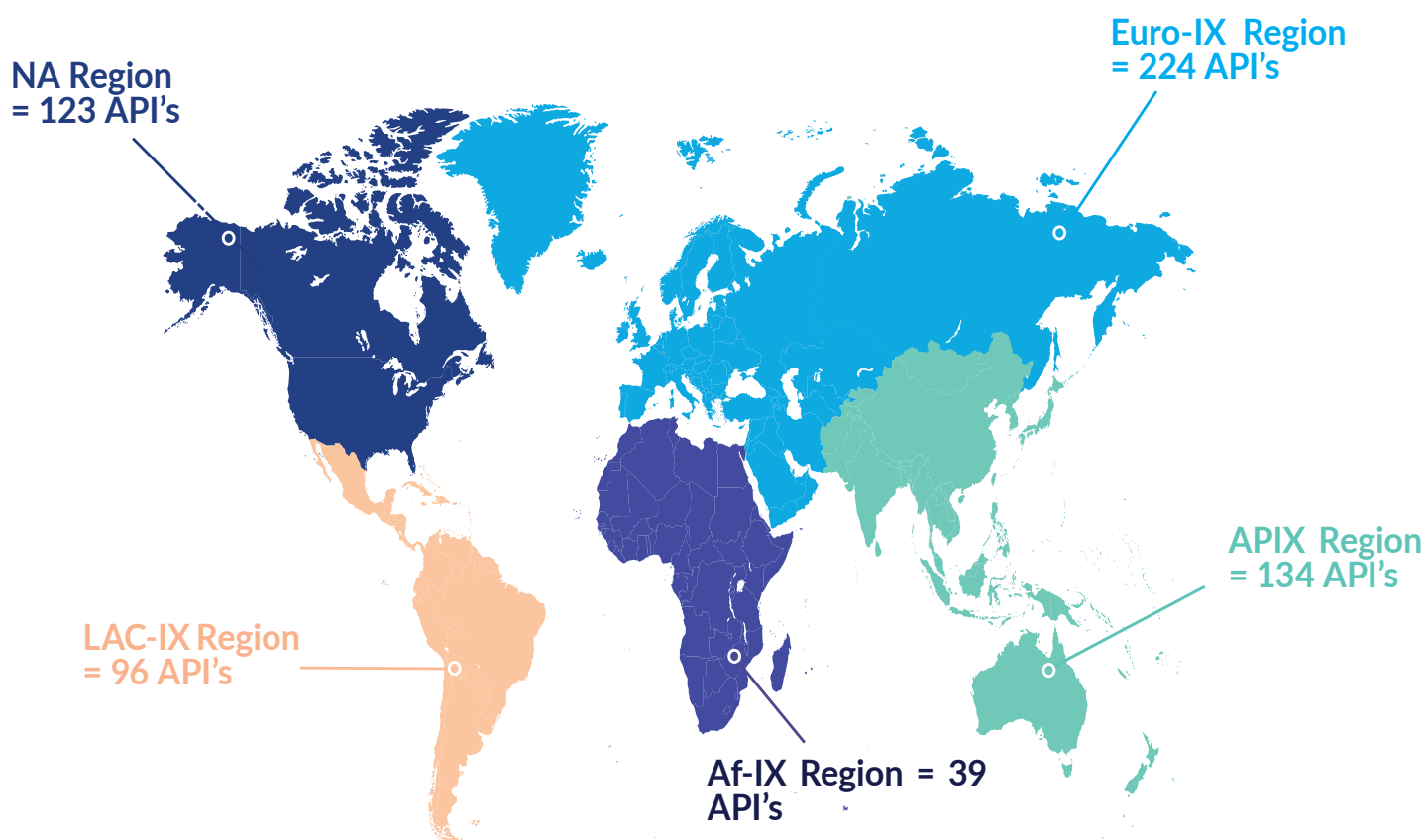
MANRS

Learn more about the [MANRS Program](#)

Appendix 3

IXP API exports in the IXPDB

» There were 256 API's in the IXPDB at the end of 2020



Note: IXPDB sponsors in 2020