



**RIPE NCC**  
RIPE NETWORK COORDINATION CENTRE

# Country View On Belarus

Christian Teuschel | 9 October 2017 | ENOG 14 Minsk

# Statistics



- Statistics are important
  - They help to shape informed business decisions, influence regulatory policies, etc.
- The RIPE NCC provides essential data sets
  - RIPE Database
  - Routing Information System (RIS: <http://ris.ripe.net>)
  - RIPE Atlas (<https://atlas.ripe.net>)
- Access to all data via RIPEstat
  - <https://stat.ripe.net>



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Open Data API for Internet related data  
35+ million daily requests  
Hardly any usage limitations





# Country View

Belarus and Regional Context

# Belarus and Regional Context



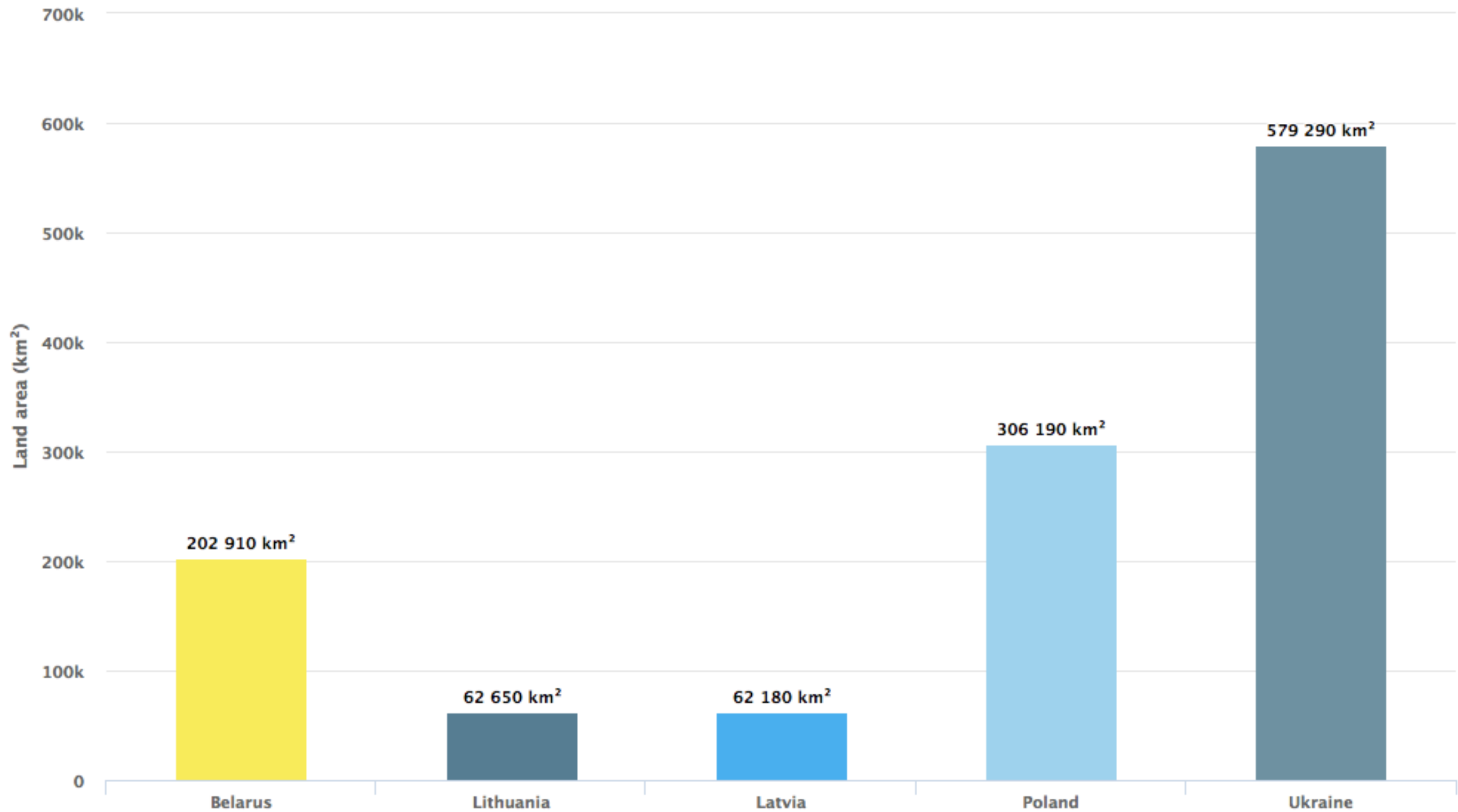
[https://www.amcharts.com/visited\\_countries/#BY,LV,LT,PL,UA](https://www.amcharts.com/visited_countries/#BY,LV,LT,PL,UA)

# Belarus and Regional Context



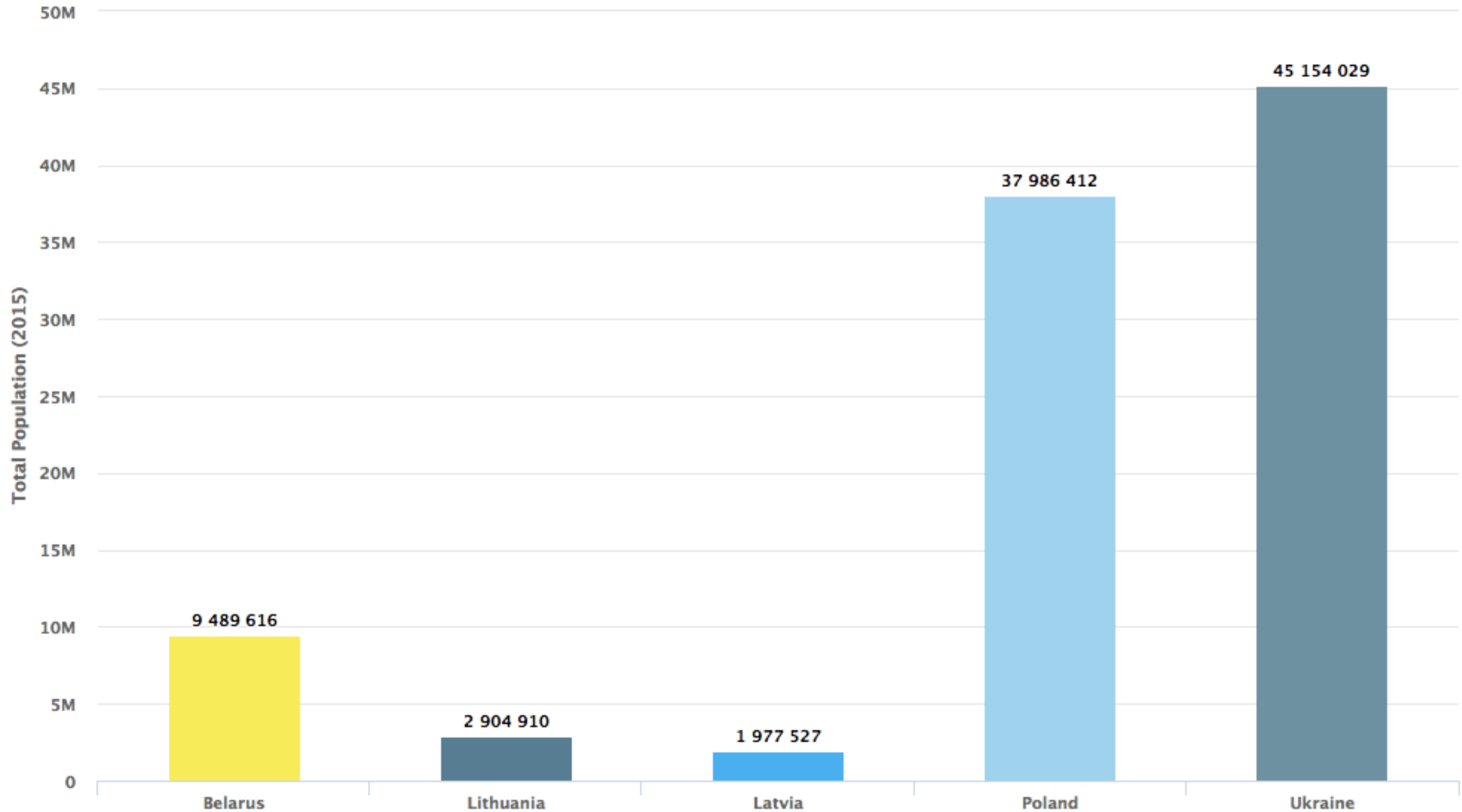
[https://www.amcharts.com/visited\\_countries/#BY,LV,LT,PL,UA](https://www.amcharts.com/visited_countries/#BY,LV,LT,PL,UA)

# Land Area



Source: <http://worldbank.org>

# Population



Source: <http://worldbank.org>

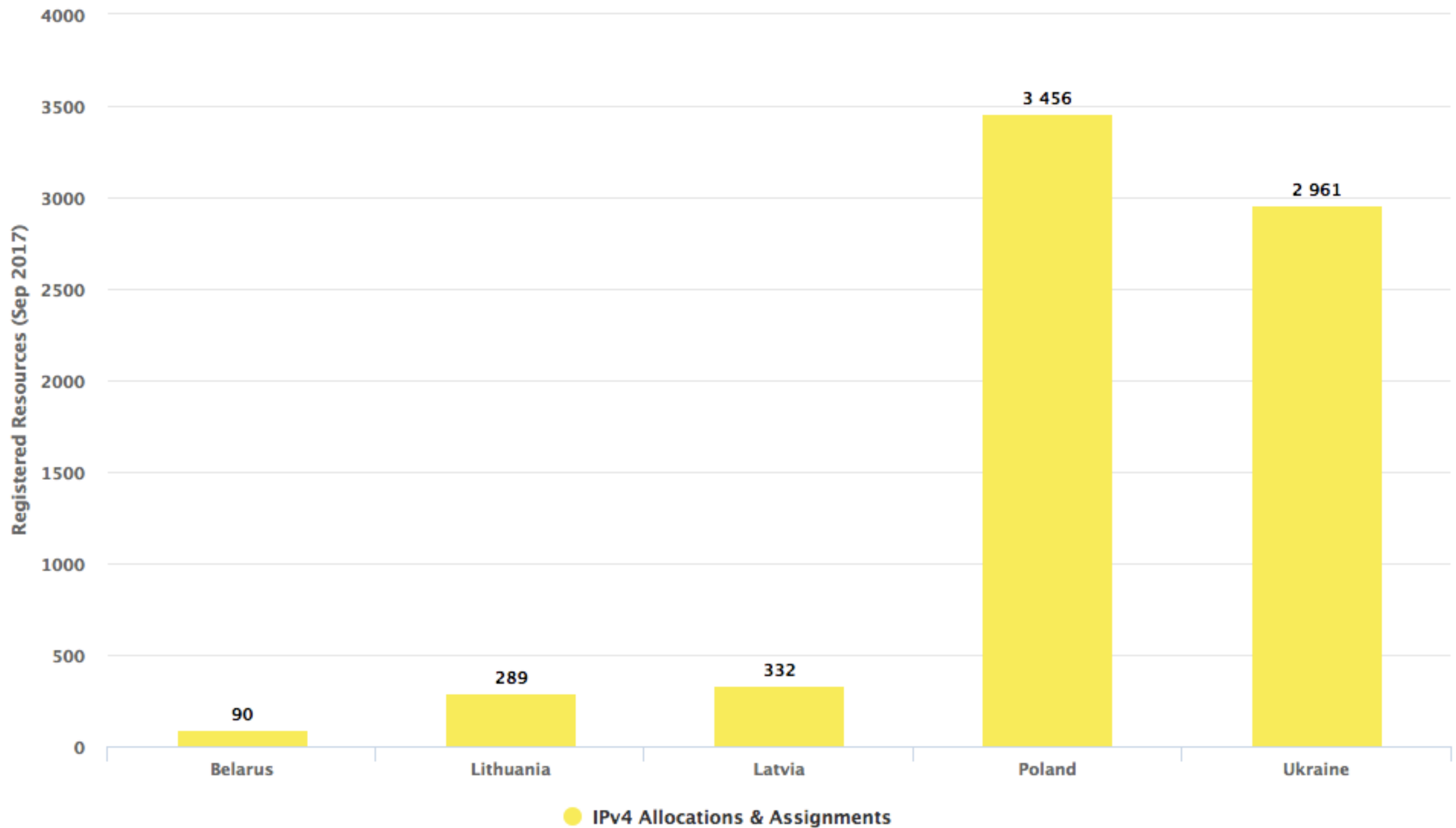




# IPv4 Depletion

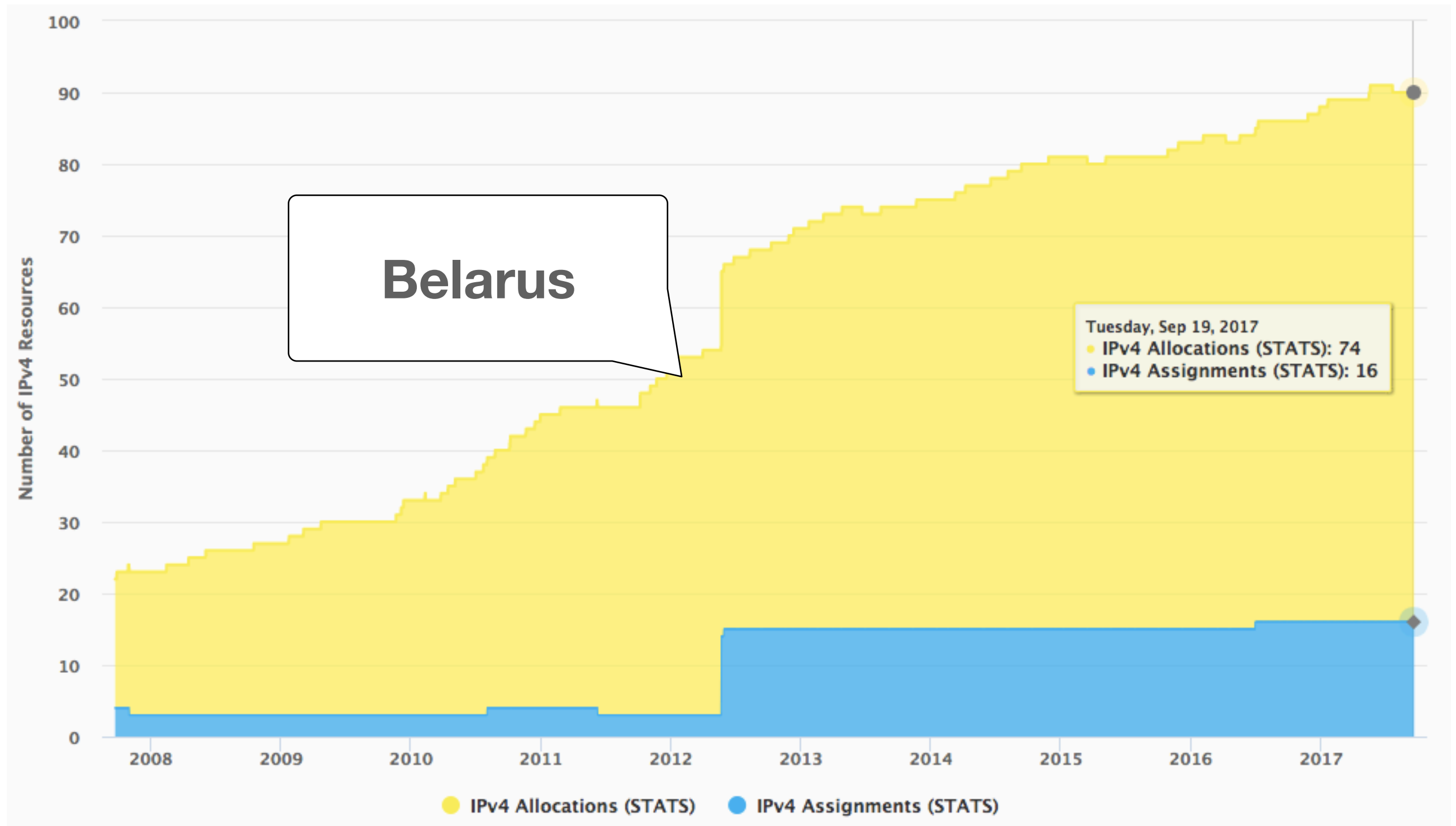
Belarus and Regional Context

# Registered IPv4 Resources



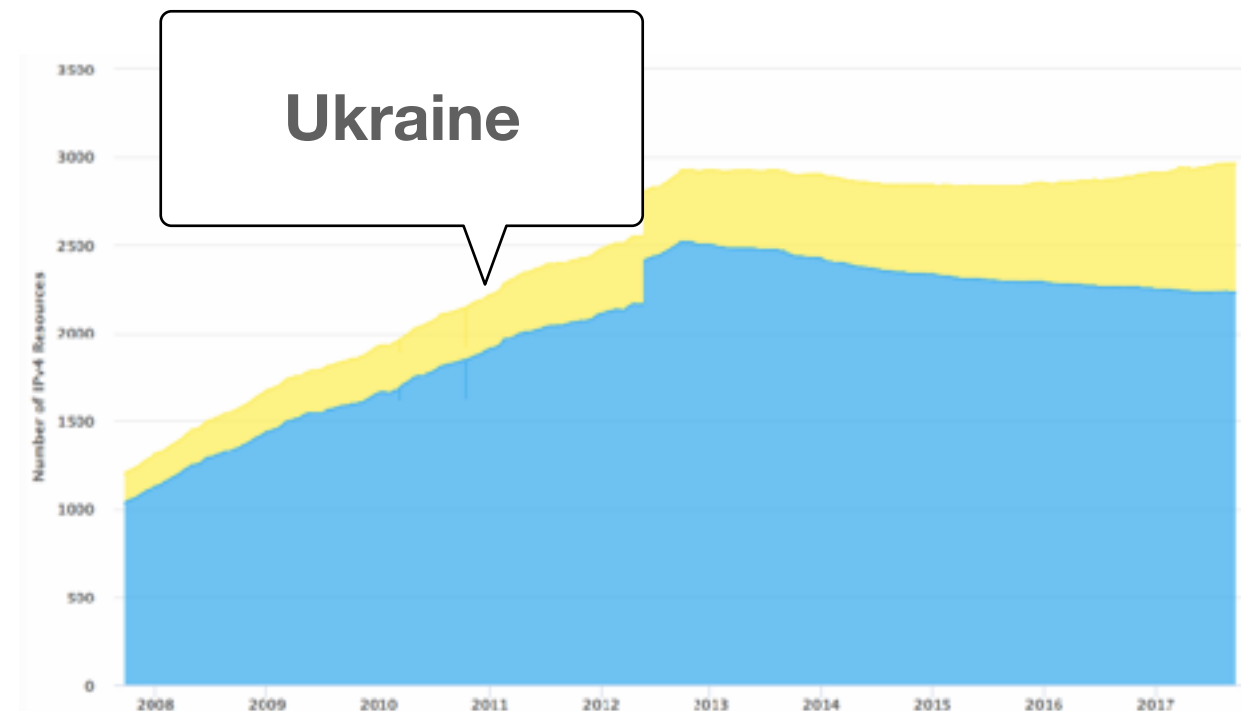
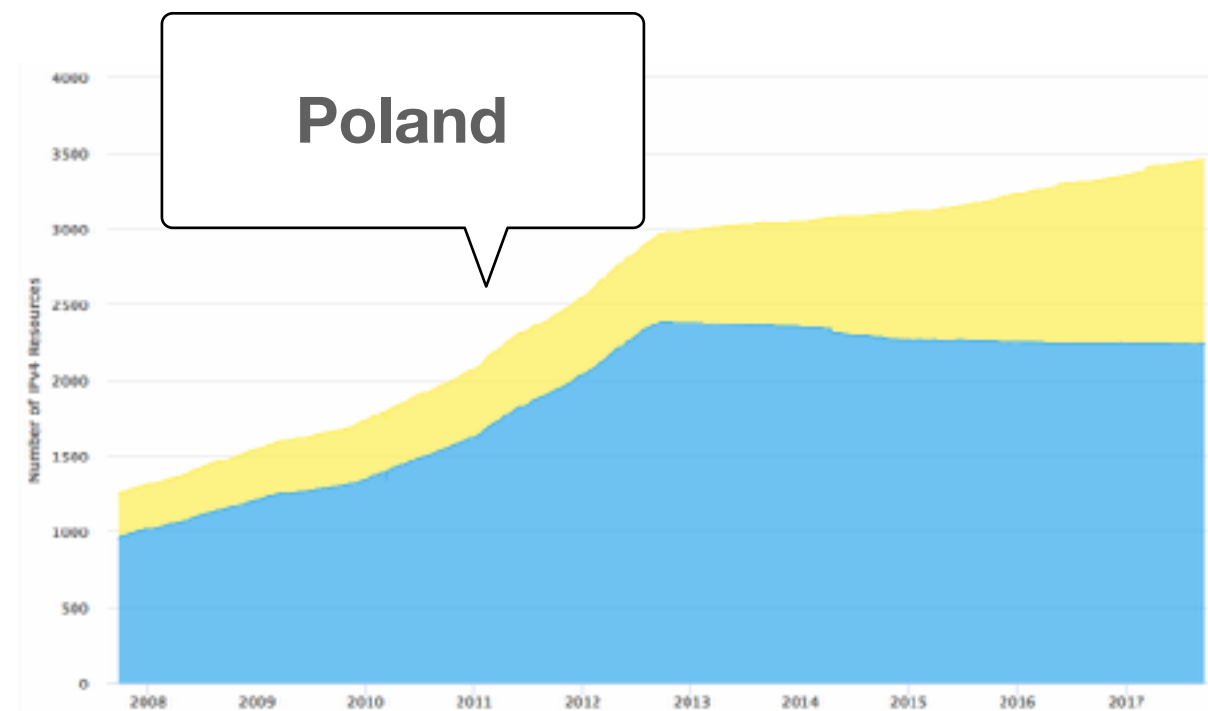
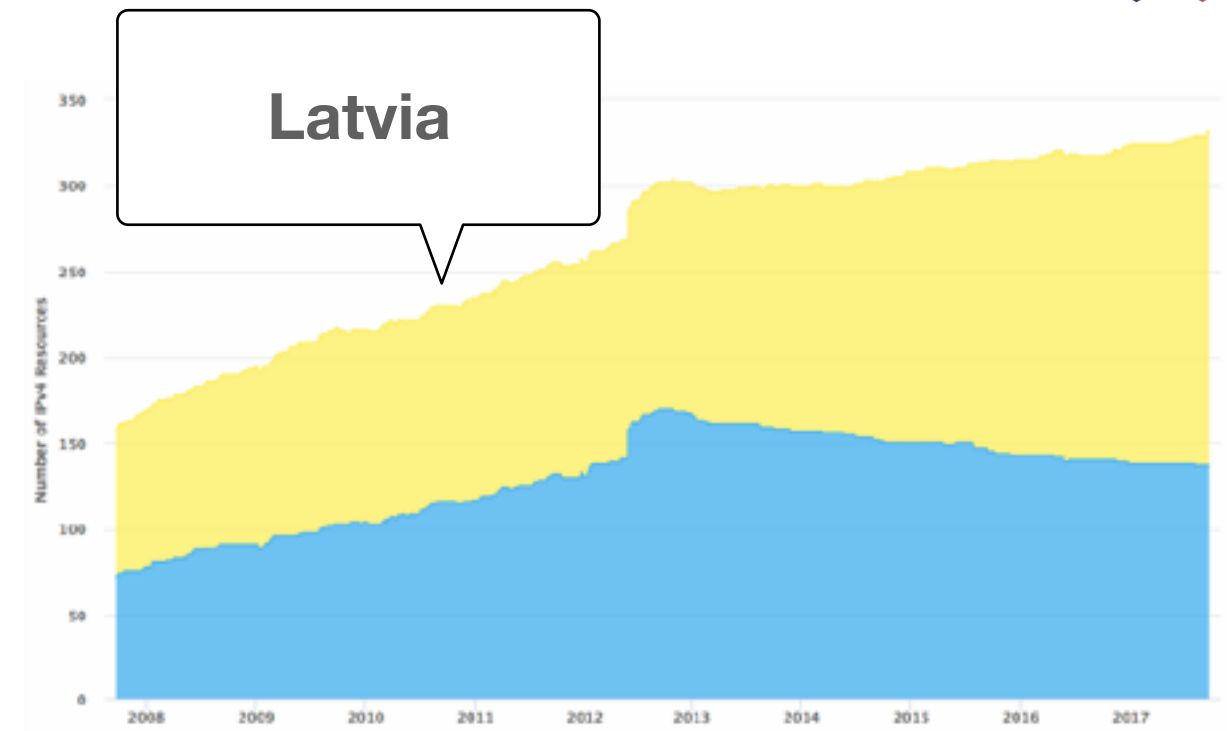
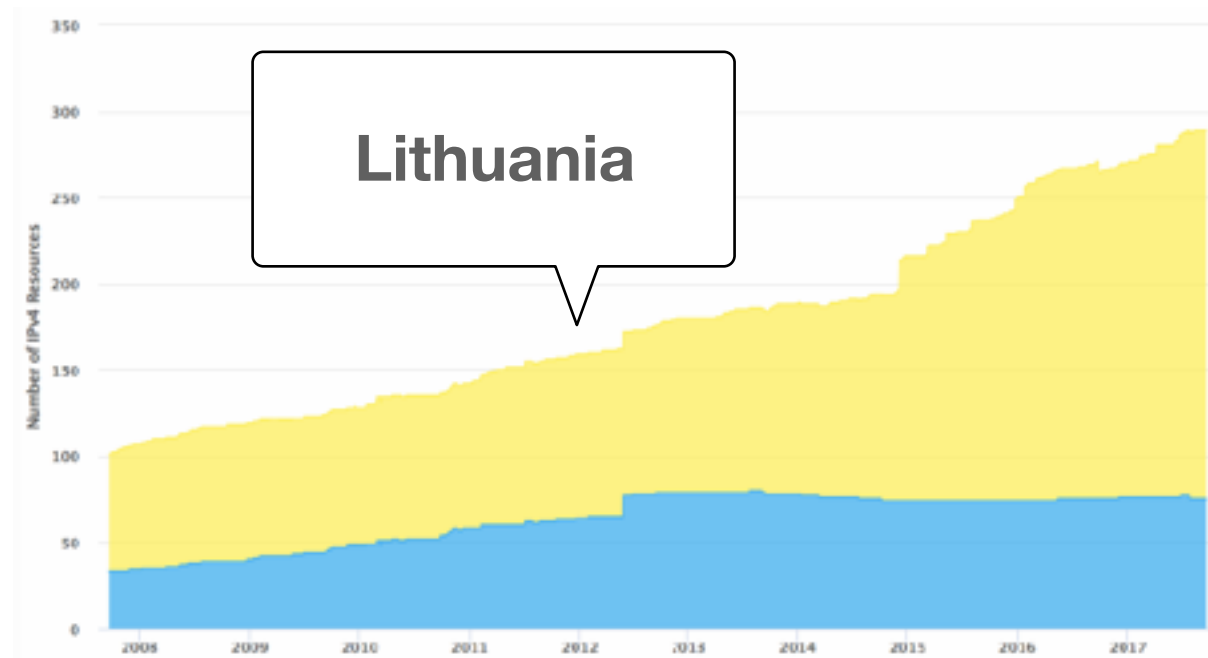
Source: <https://stat.ripe.net>

# Registered IPv4 Resources



Source: <https://stat.ripe.net>

# Registered IPv4 Resources

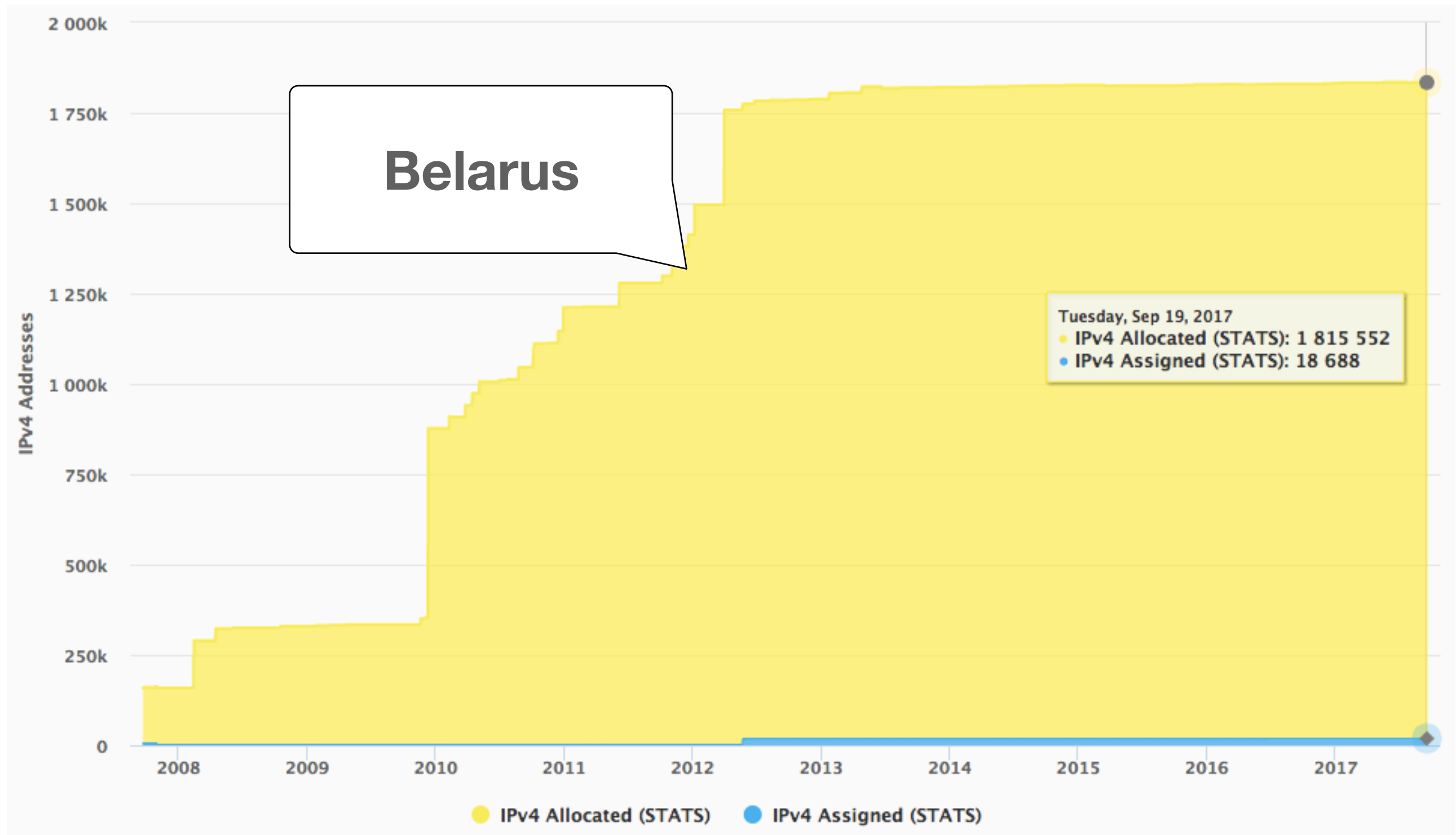


● IPv4 Allocations (STATS)

● IPv4 Assignments (STATS)

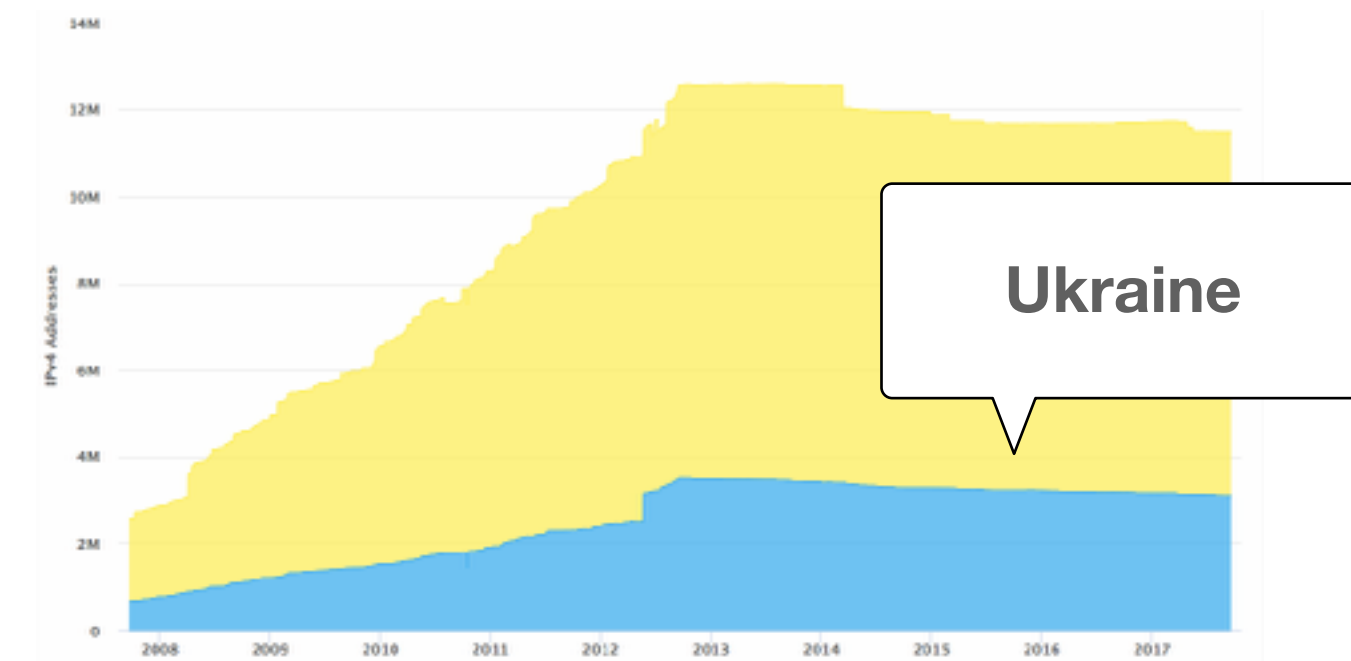
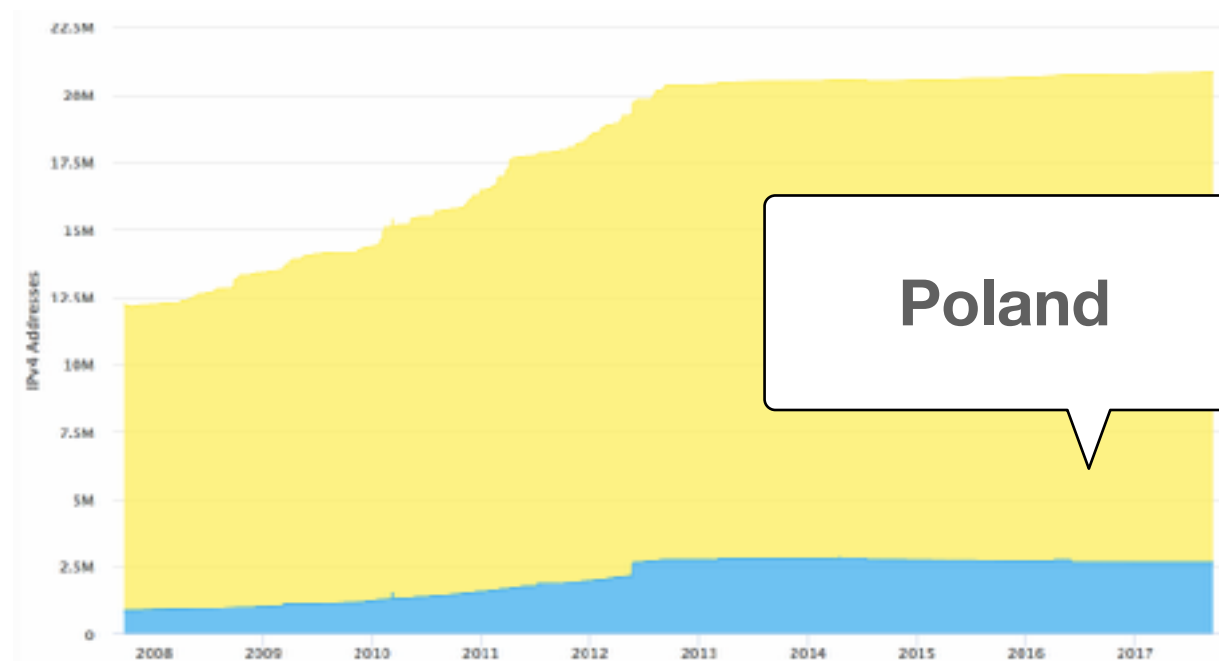
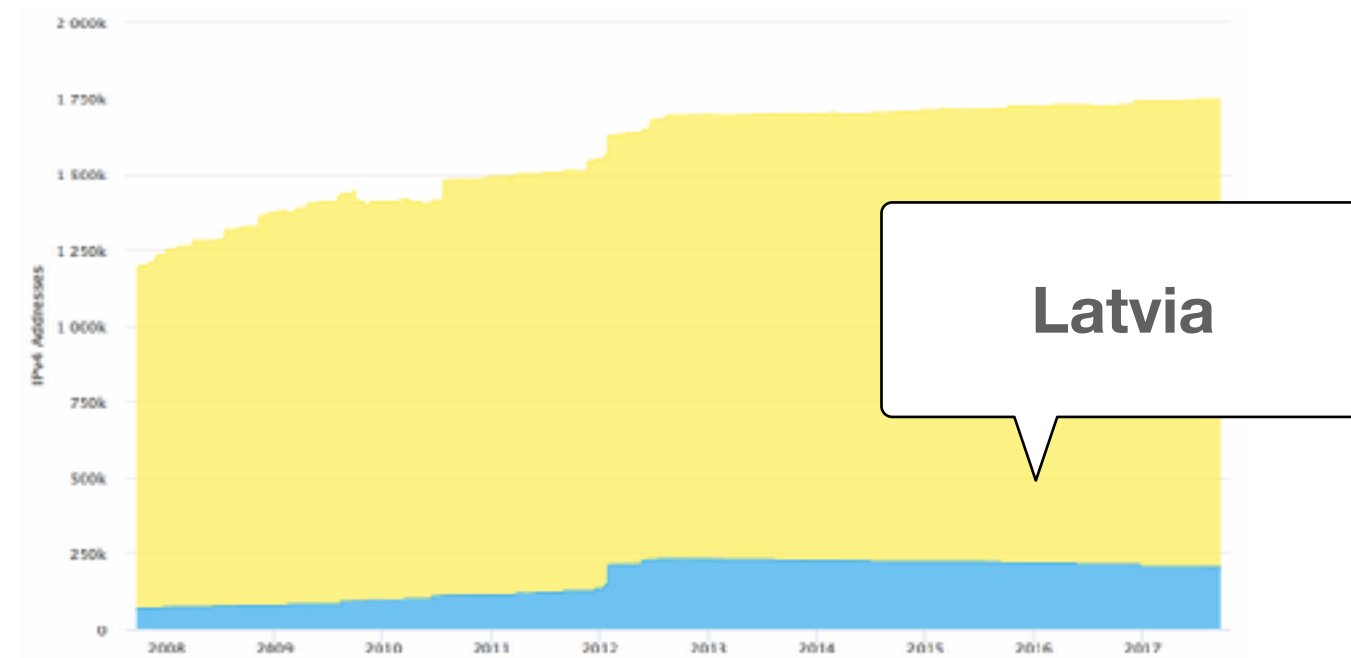
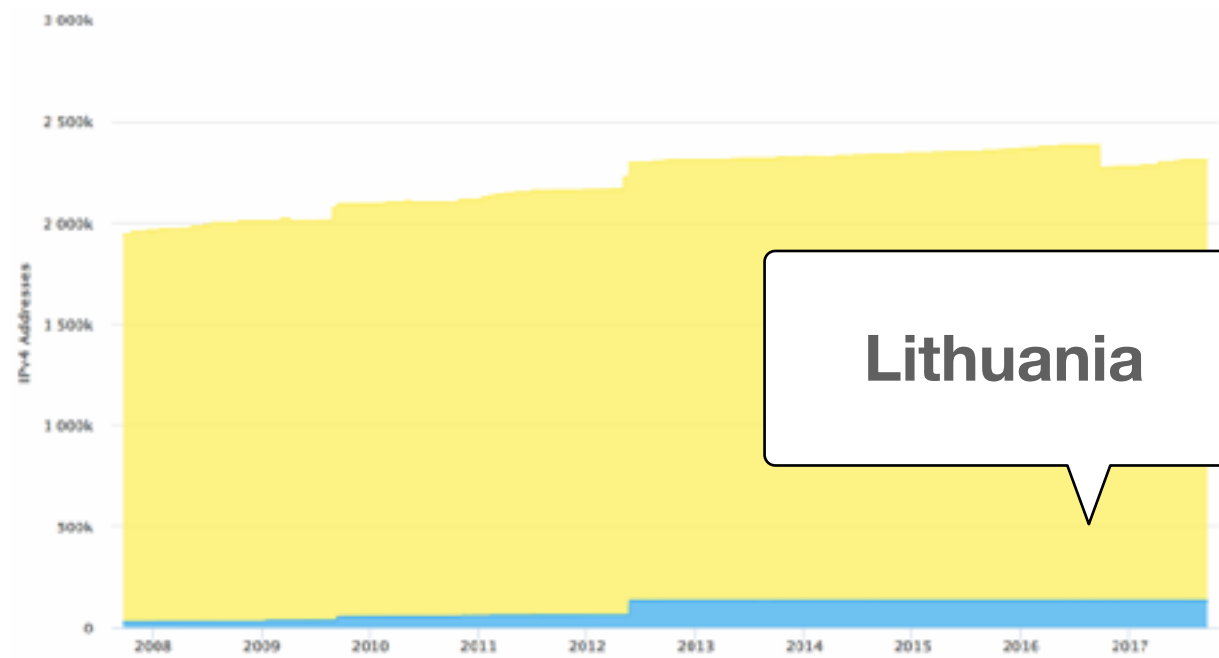
Source: <https://stat.ripe.net>

# Registered IPv4 Space



Source: <https://stat.ripe.net>

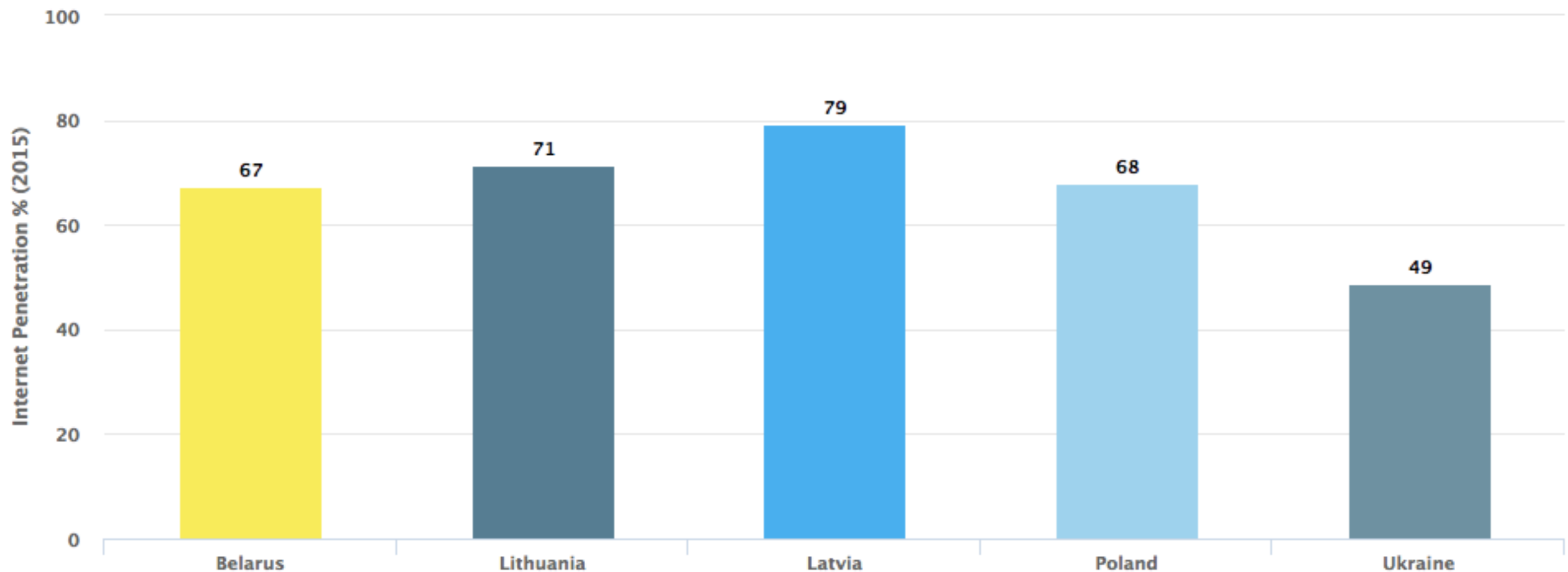
# Registered IPv4 Space



● IPv4 Allocations (STATS) ● IPv4 Assignments (STATS)

Source: <https://stat.ripe.net>

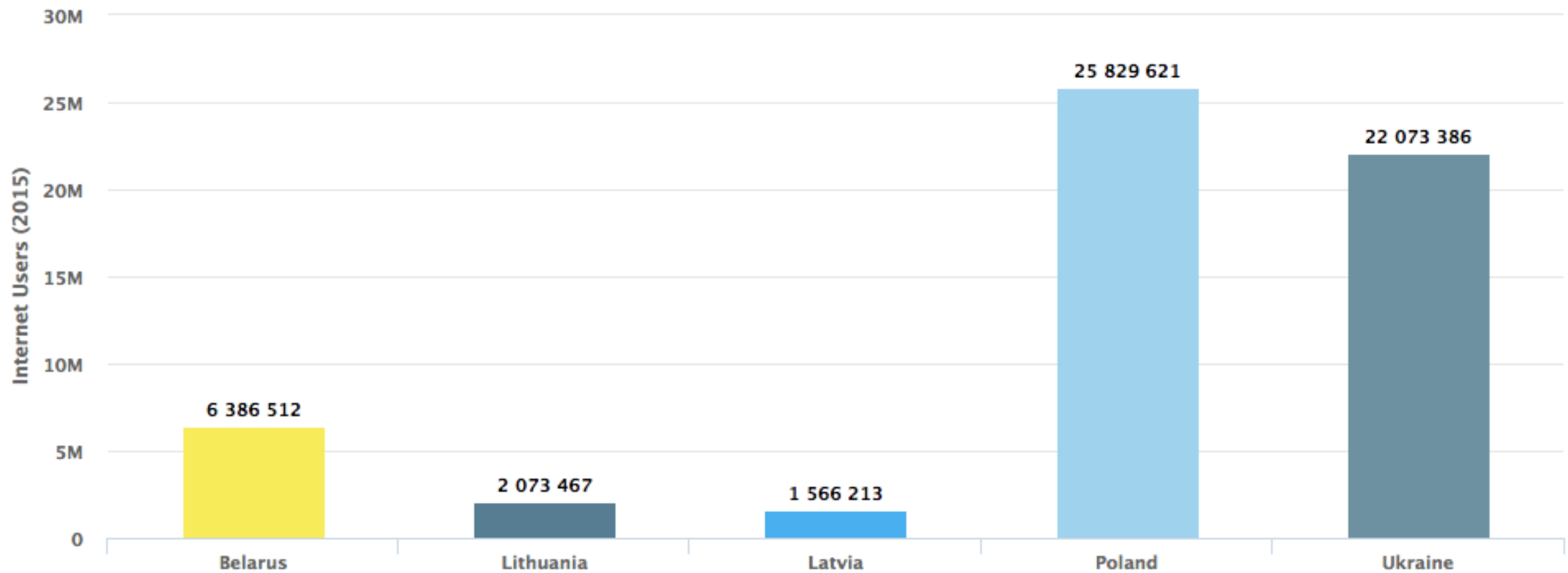
# Internet Penetration



combine with population →

Source: <http://worldbank.org>

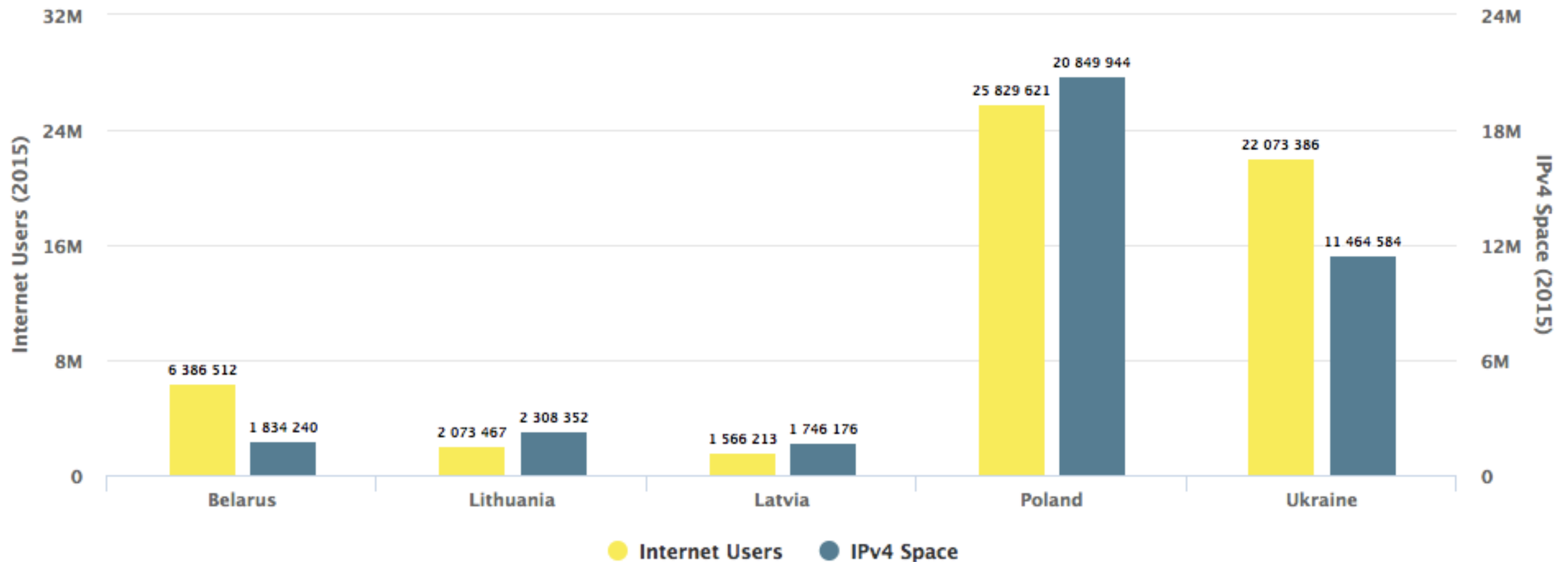
# Internet Users



Source: <http://worldbank.org>

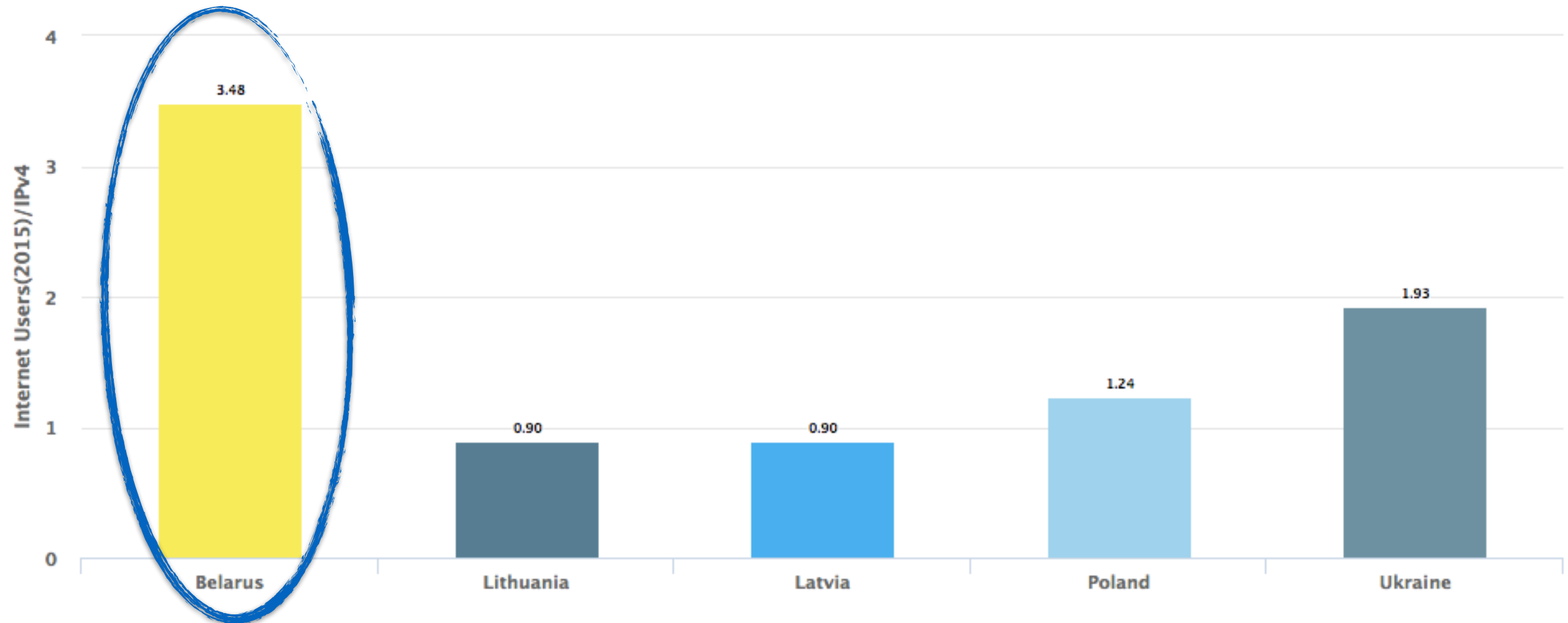


# Internet Users and IPv4 Space



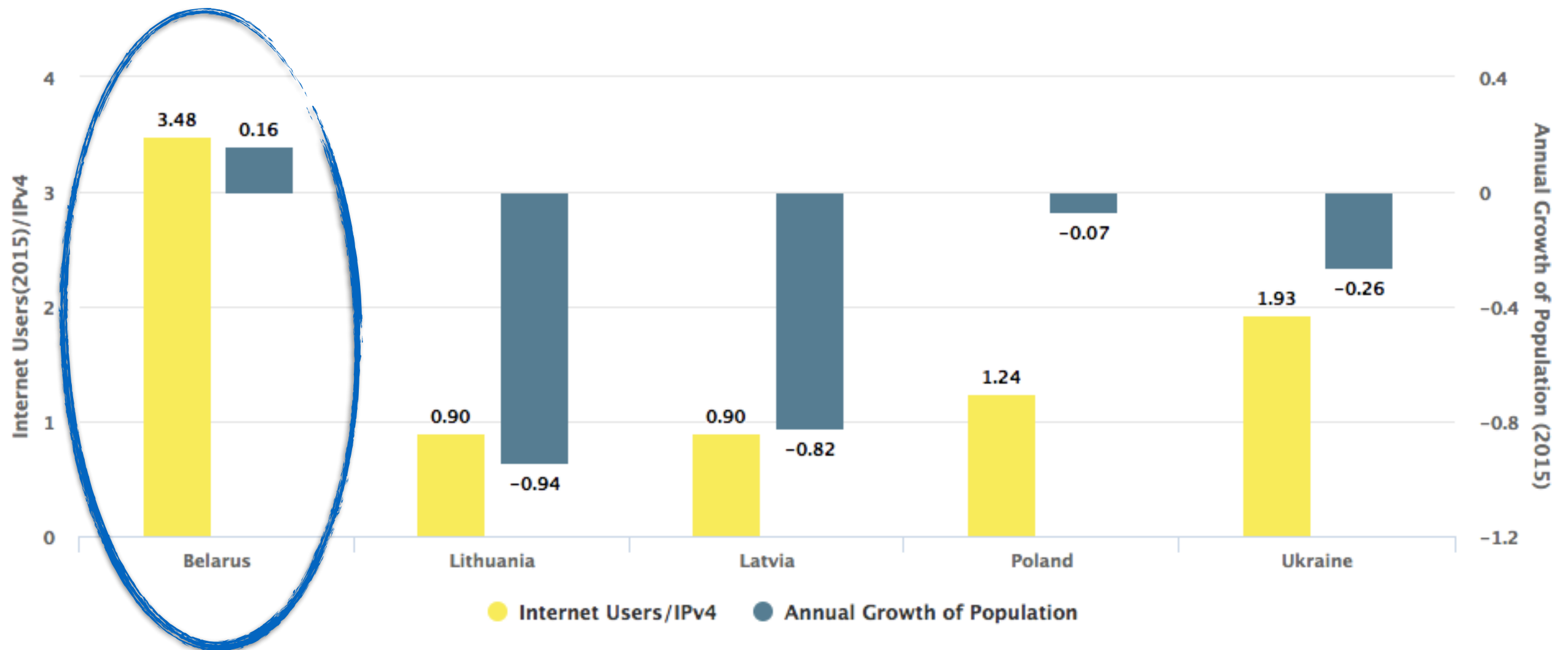
Source: <http://worldbank.org>  
& <https://stat.ripe.net>

# Internet Users/IPv4 Address



Source: <http://worldbank.org>  
& <https://stat.ripe.net>

# Internet Users/IPv4 Address



Source: <http://worldbank.org>  
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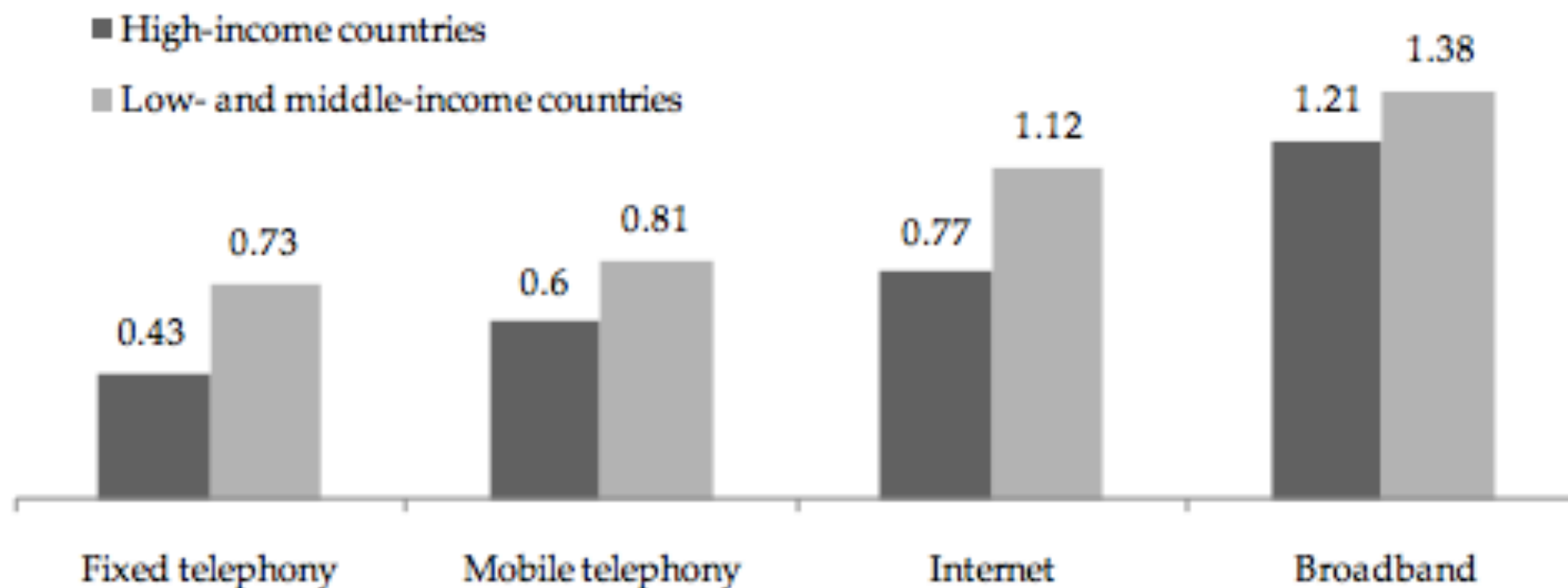
# **Internet and Economy**

Belarus and Regional Context

# Internet and Economy

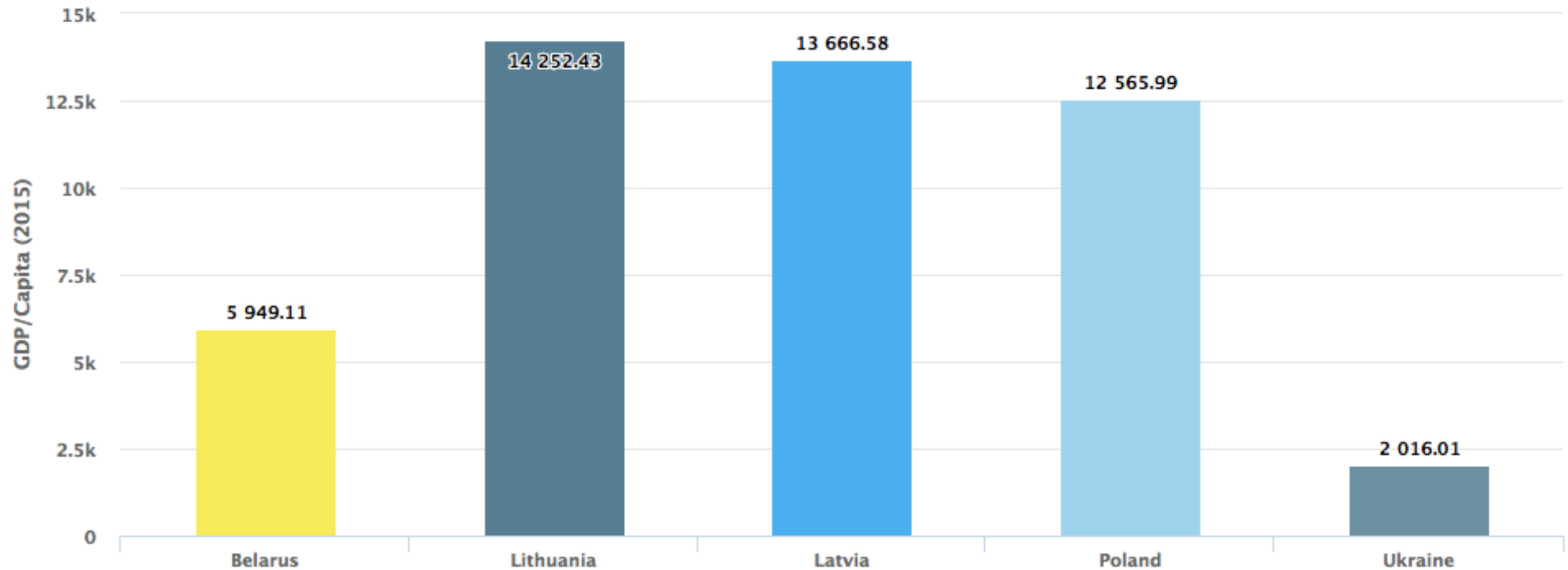


- Study in 2010 by World Bank “Building Broadband: Strategies and Policies for the Developing World”



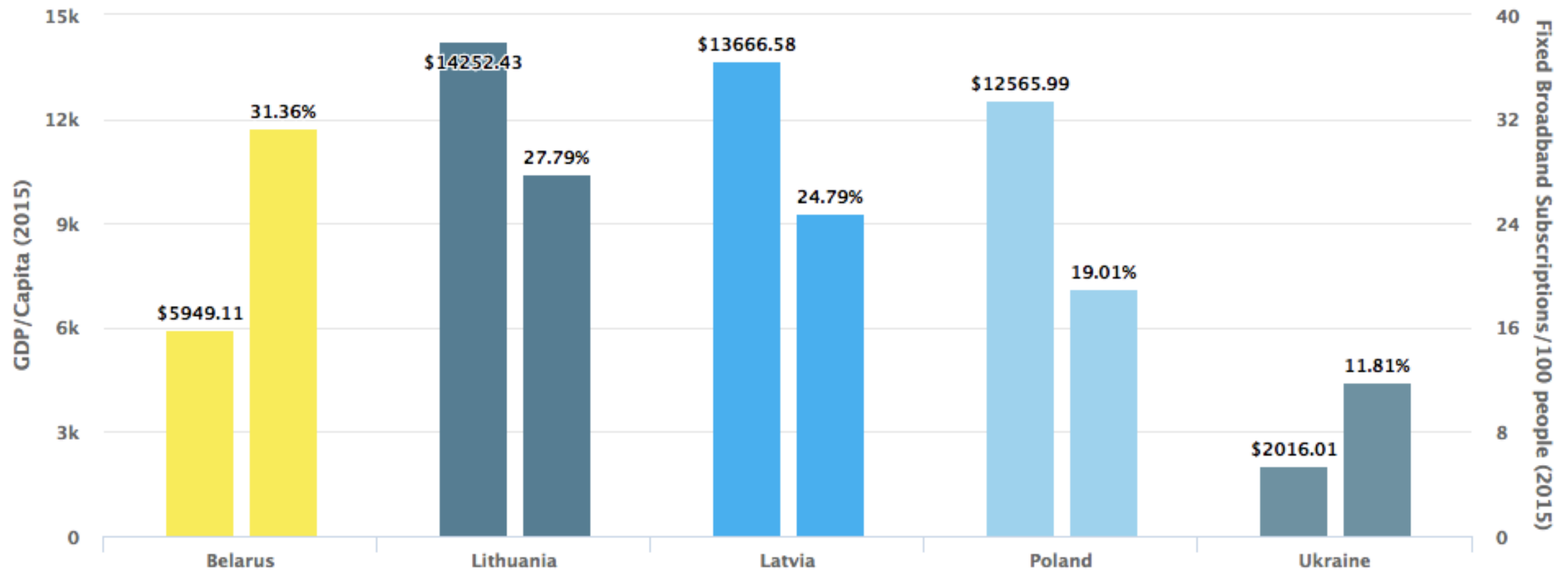
*Figure 1: Growth impact of telecommunications  
(GDP percentage point increase due to 10 percentage-point increase in penetration)*

# Gross Domestic Product (GDP)



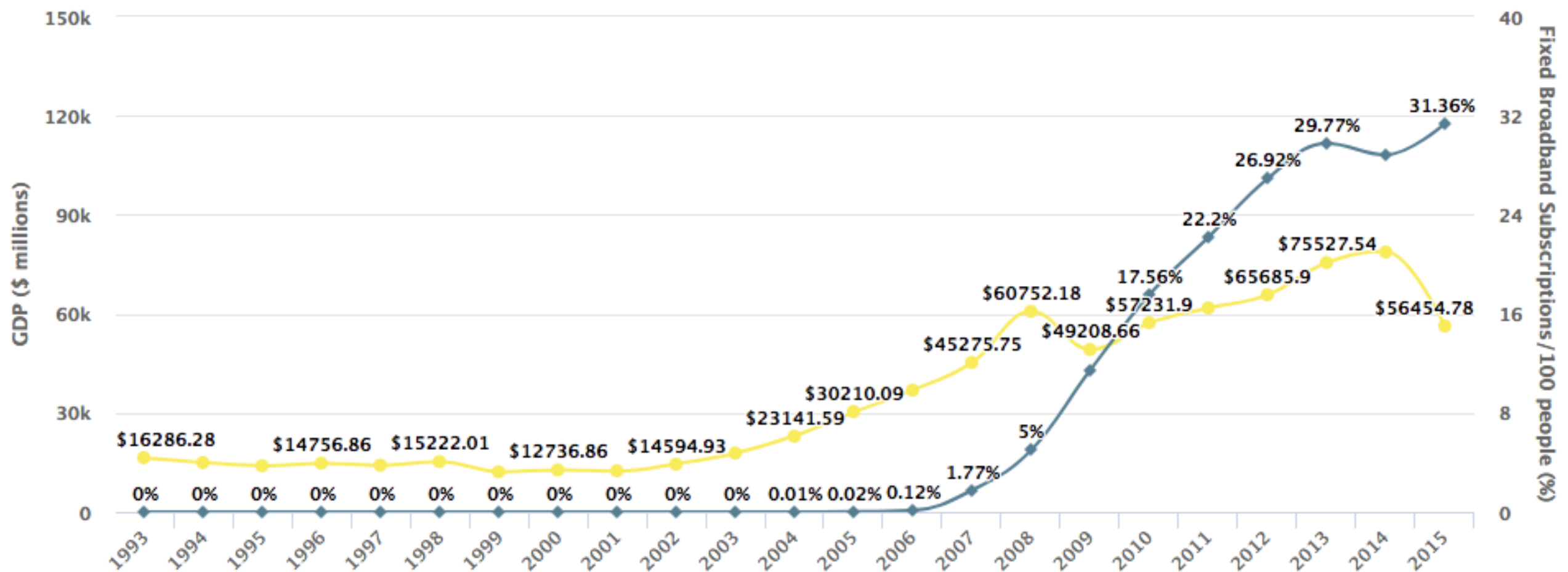
Source: <http://worldbank.org>

# Broadband Subscriptions and GDP



Source: <http://worldbank.org>

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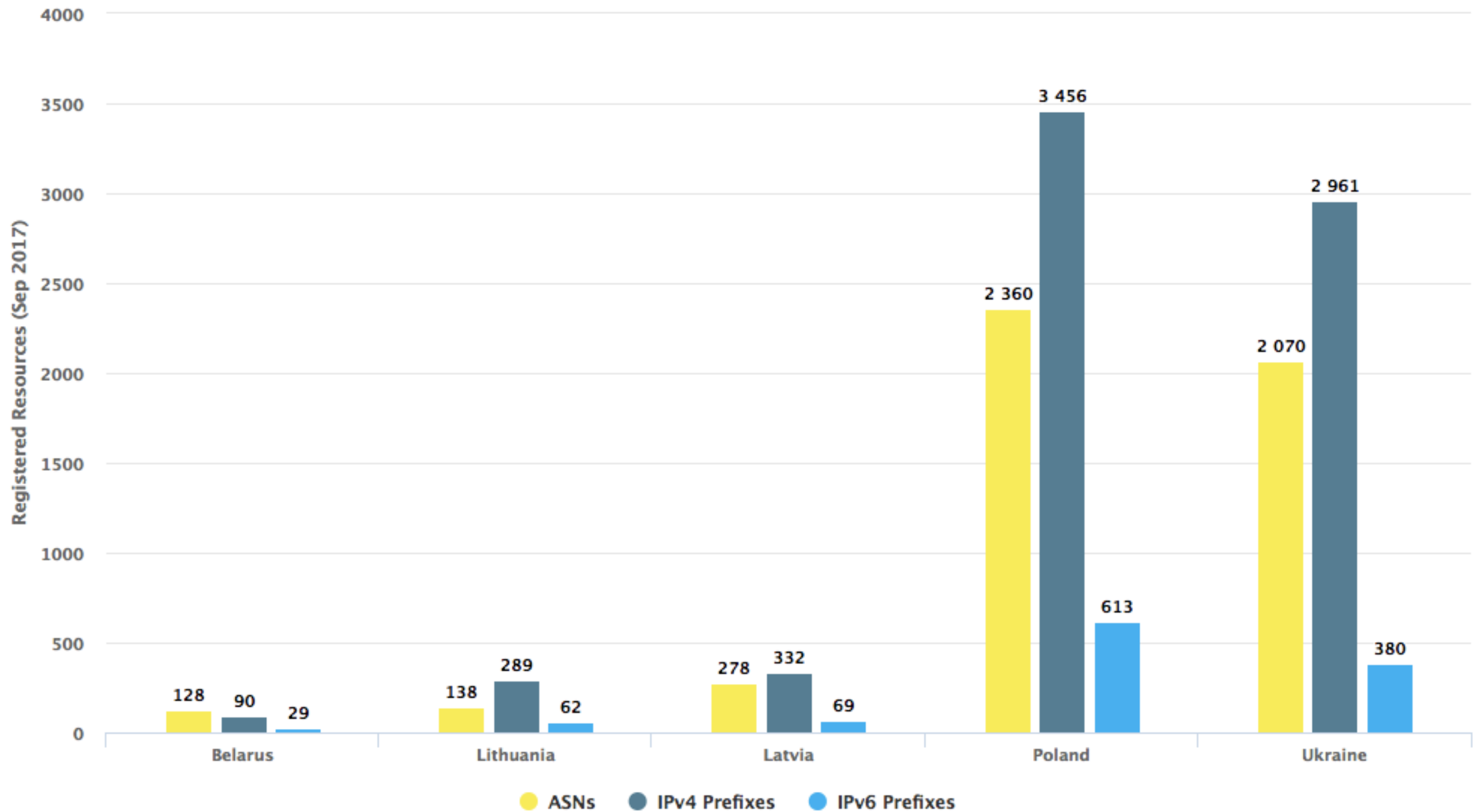




# IPv6

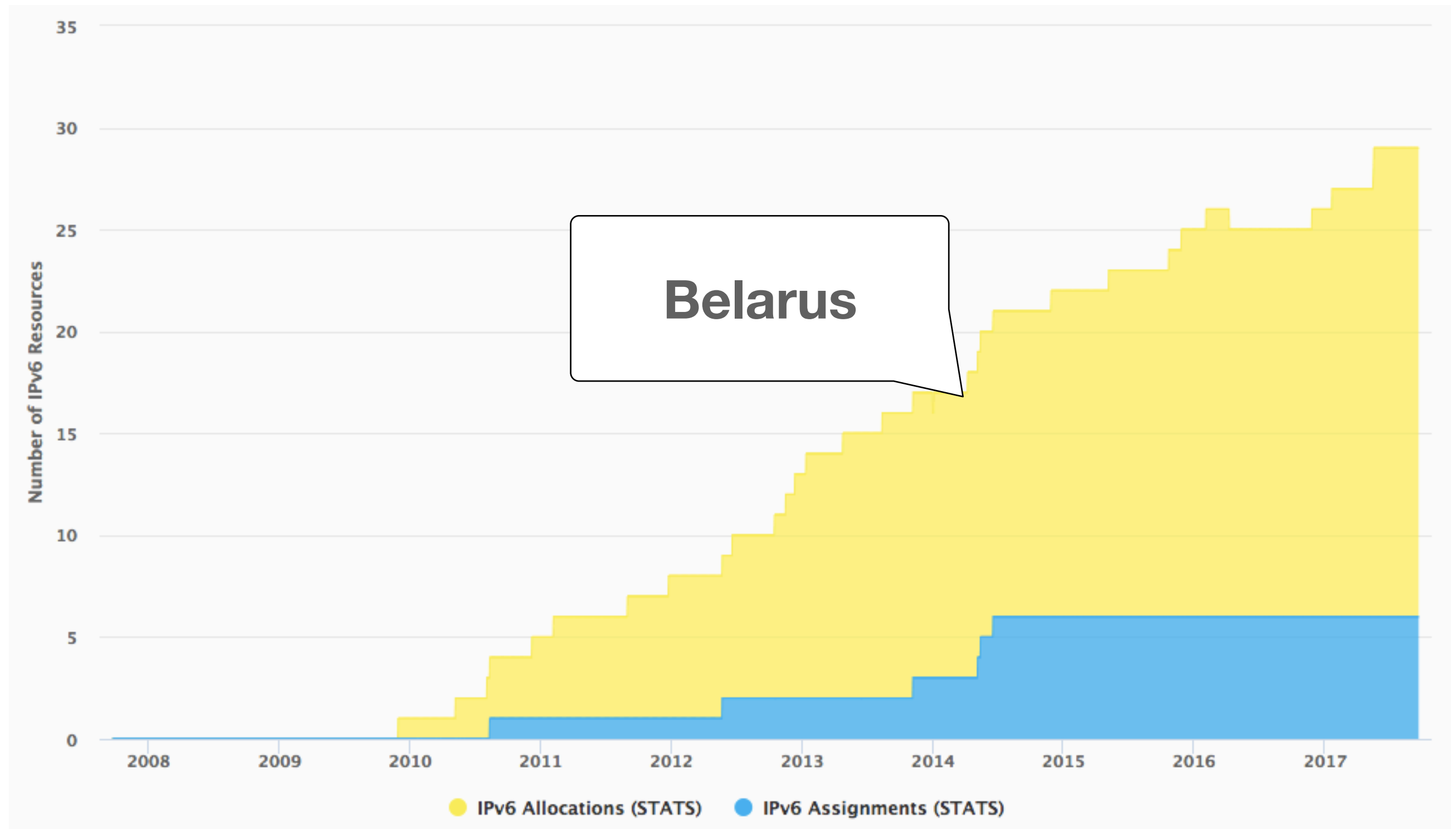
Belarus and Regional Context

# Registered Resources



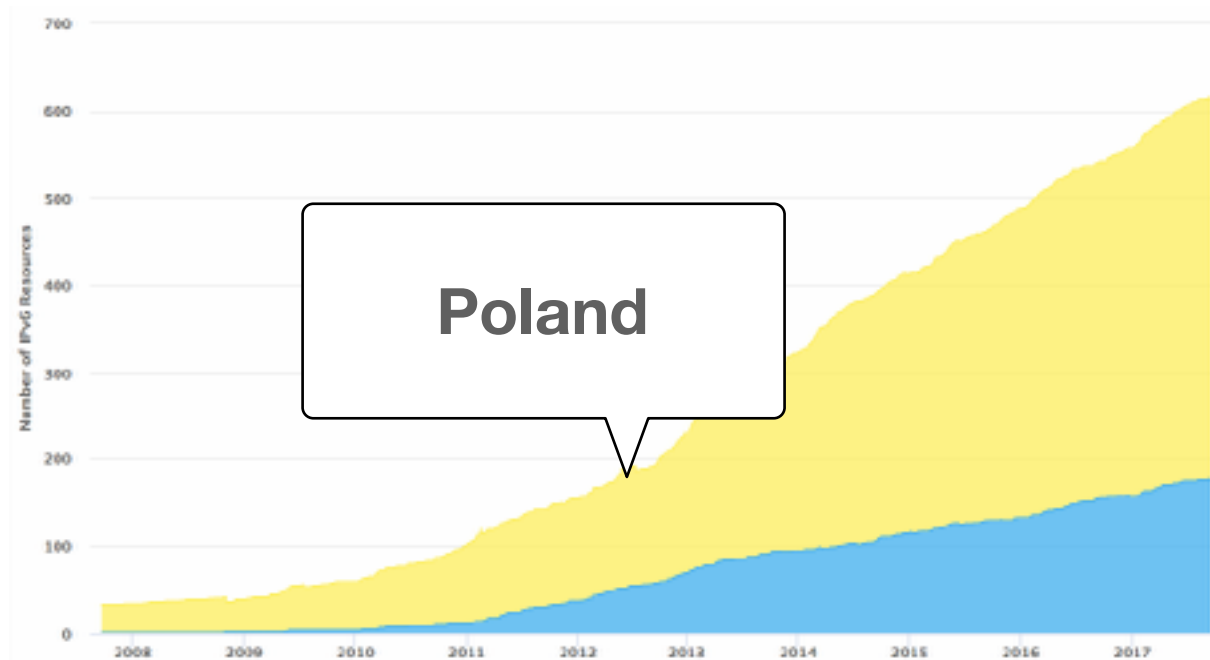
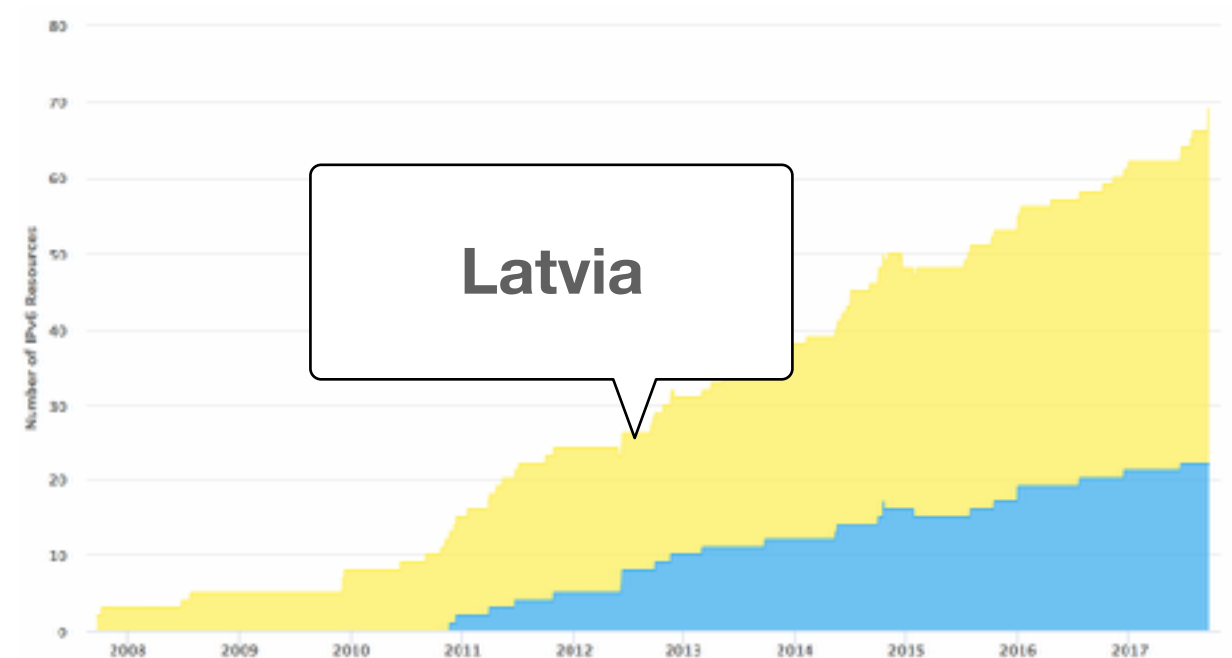
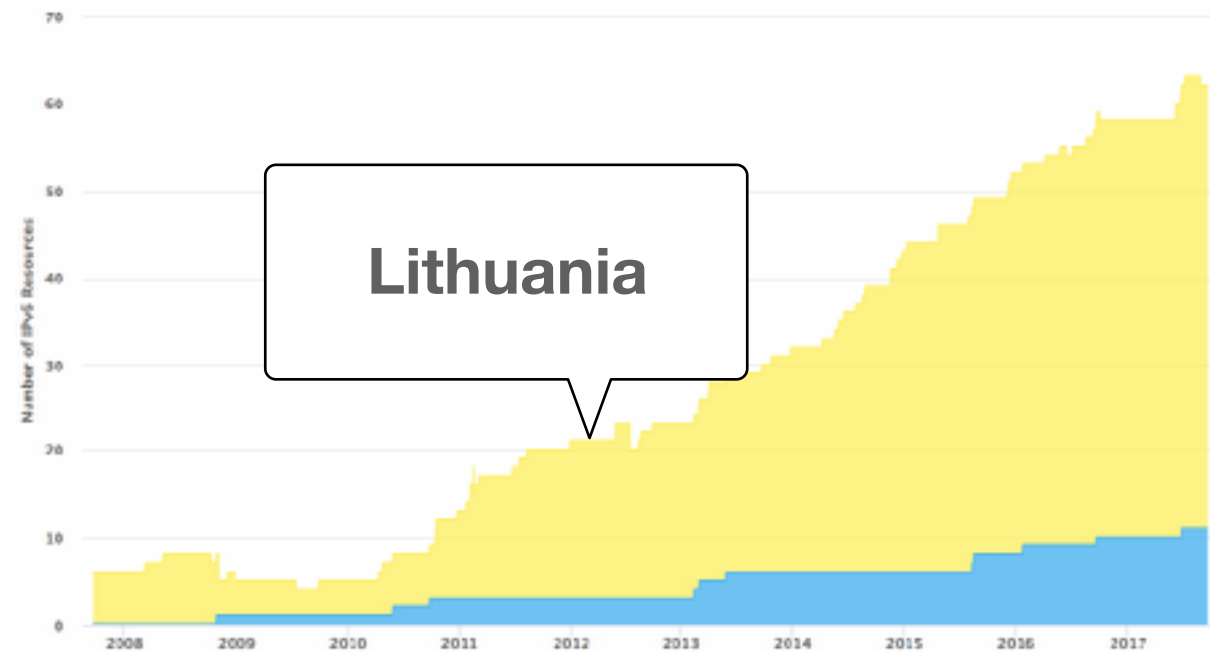
Source: <https://stat.ripe.net>

# IPv6 Resources



Source: <https://stat.ripe.net>

# Registered IPv6 Resources

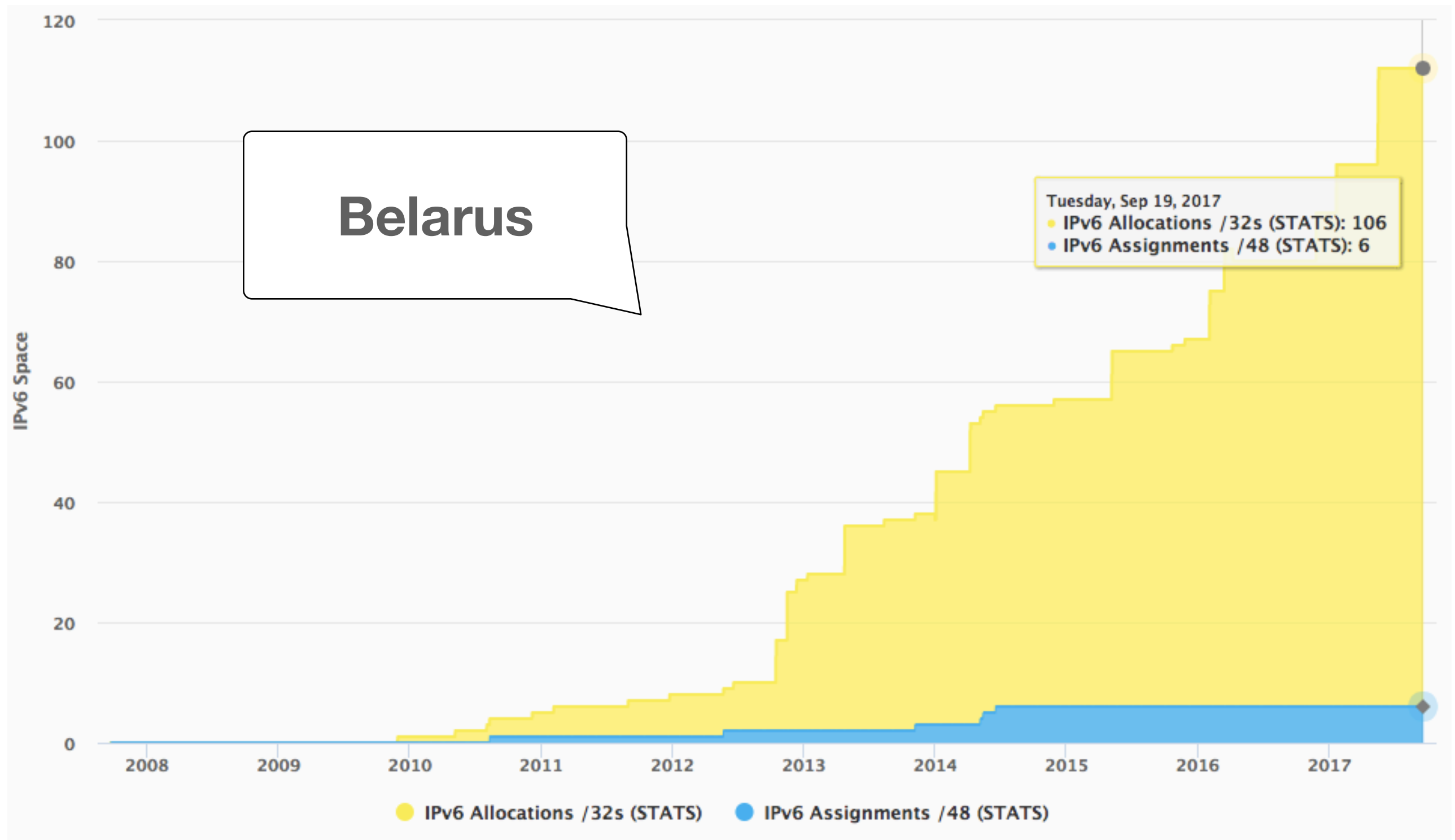


● IPv4 Allocations (STATS)

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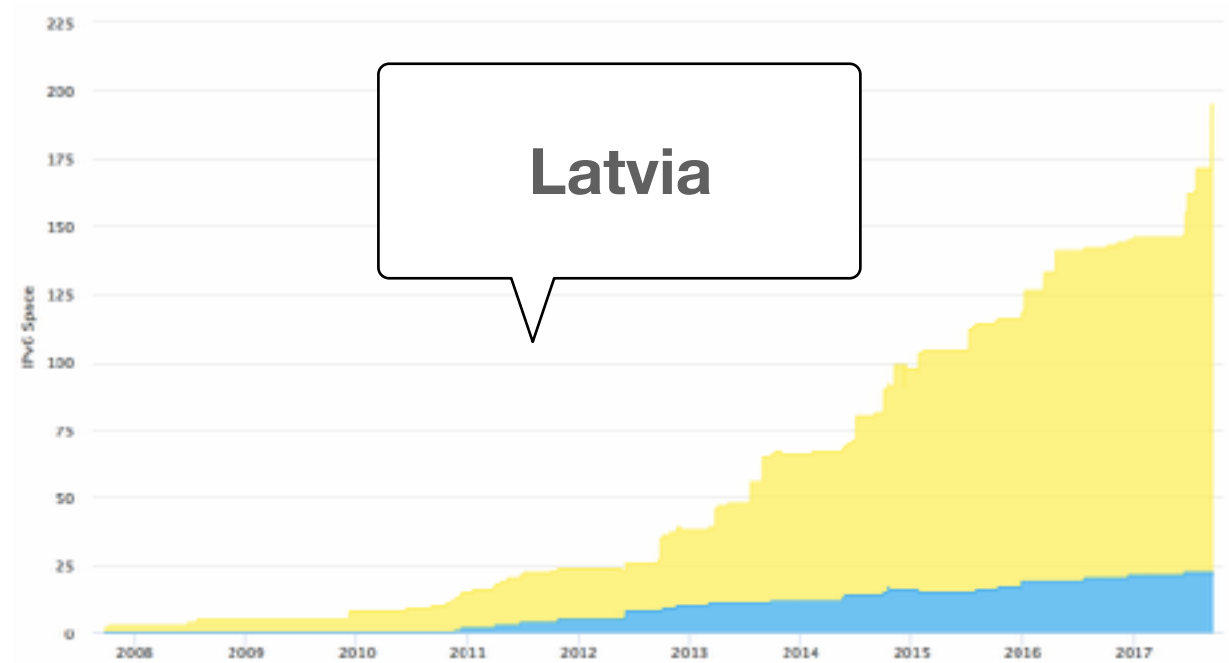
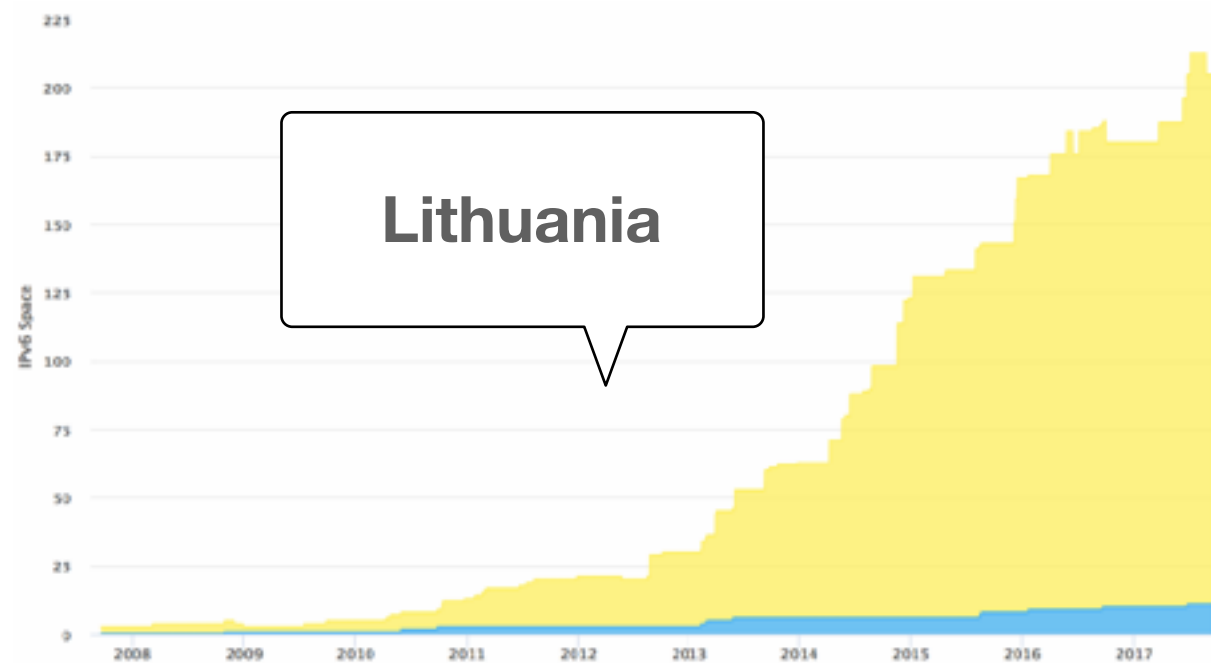
Source: <https://stat.ripe.net>

# Registered IPv6 Space



Source: <https://stat.ripe.net>

# Registered IPv6 Space



● IPv6 Allocations /32s (STATS) ● IPv6 Assignments /48 (STATS)

Source: <https://stat.ripe.net>

# IPv6 Capabilities



Top players

CC	Country	IPv6 Capable	IPv6 Preferred	Samples
BE	Belgium, Western Europe, Europe	63.55%	62.86%	973,547
IN	India, Southern Asia, Asia	51.04%	49.86%	75,343,482
DE	Germany, Western Europe, Europe	44.08%	43.36%	3,964,629

<http://stats.labs.apnic.net/ipv6>

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...and Belarus in the long tail!

KZ	Kazakhstan, Central Asia, Asia	0.01%	0.00%	1,564,507
BW	Botswana, Southern Africa, Africa	0.01%	0.01%	52,793
BY	Belarus, Eastern Europe, Europe	0.01%	0.00%	894,868
AI	Anguilla, Caribbean, Americas	0.01%	0.01%	17,918
MH	Marshall Islands, Micronesia, Oceania	0.01%	0.01%	18,132

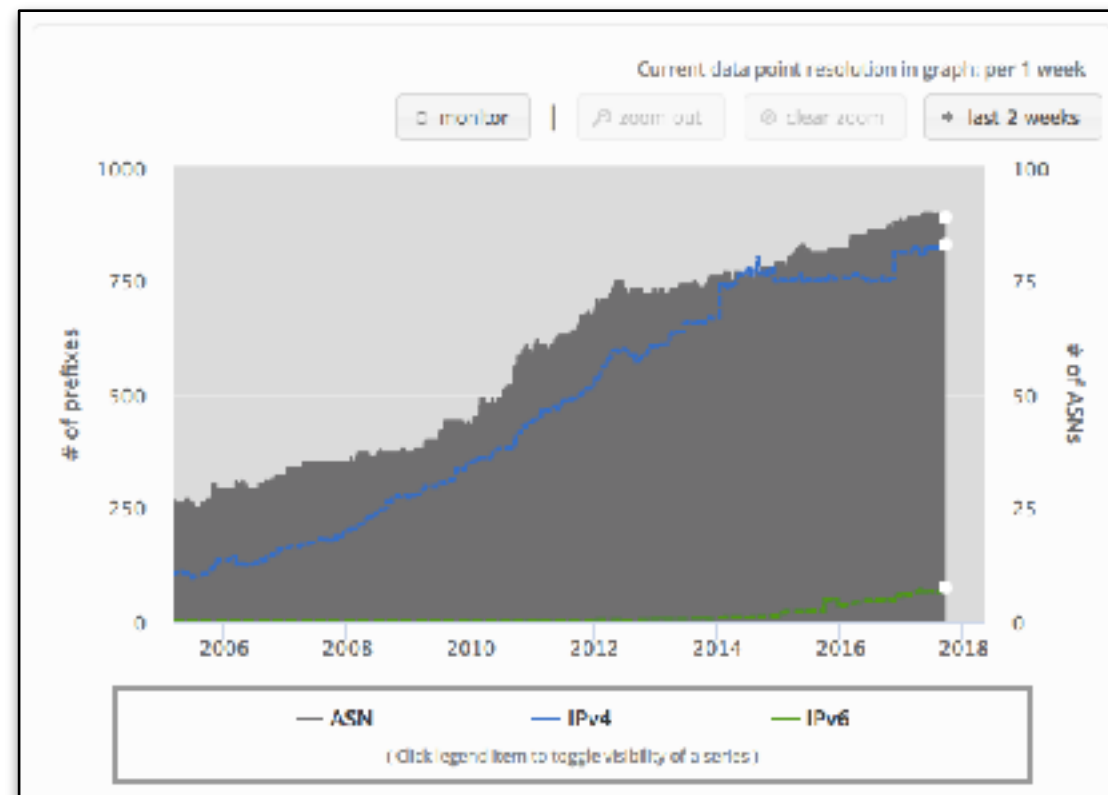
<http://stats.labs.apnic.net/ipv6>



# Internet Resources in Belarus



- Look it up on [stat.ripe.net](https://stat.ripe.net)
- Find all graphs live on:  
[stat.ripe.net/special/statistics/enog14](https://stat.ripe.net/special/statistics/enog14)



Source: <https://stat.ripe.net>



# Active Measurements

RIPE Atlas, M-Lab, etc.

# RIPE Atlas





# RIPE Atlas Coverage in Belarus



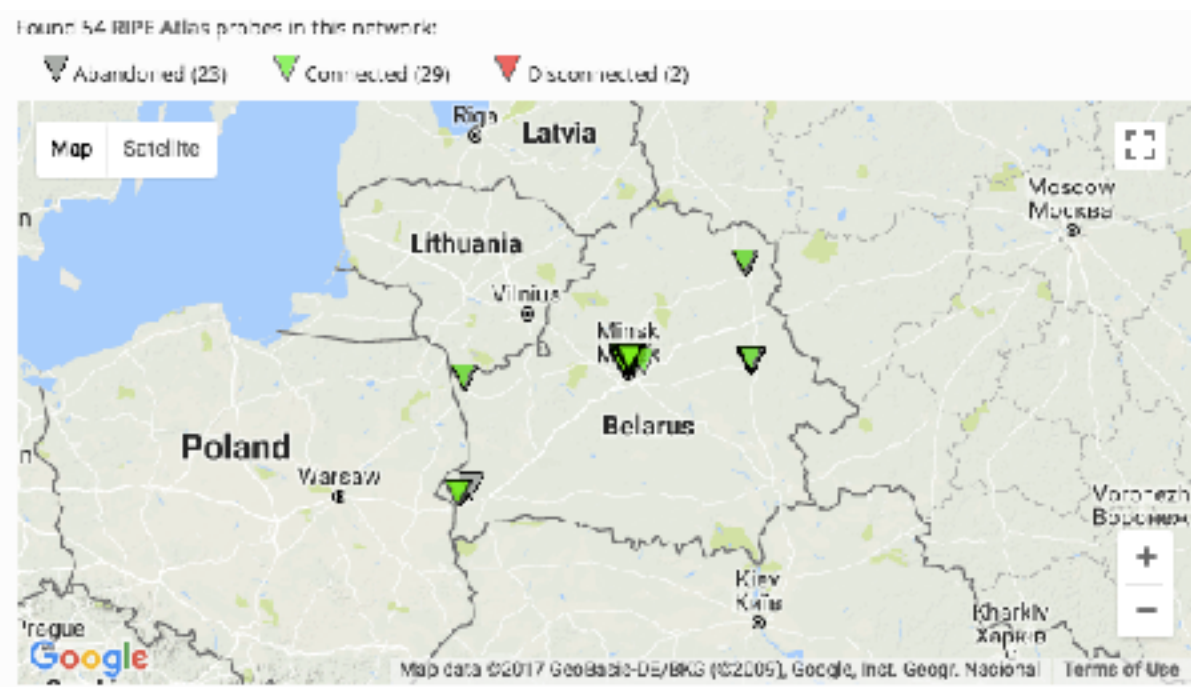
RIPE Atlas probes connected:

29

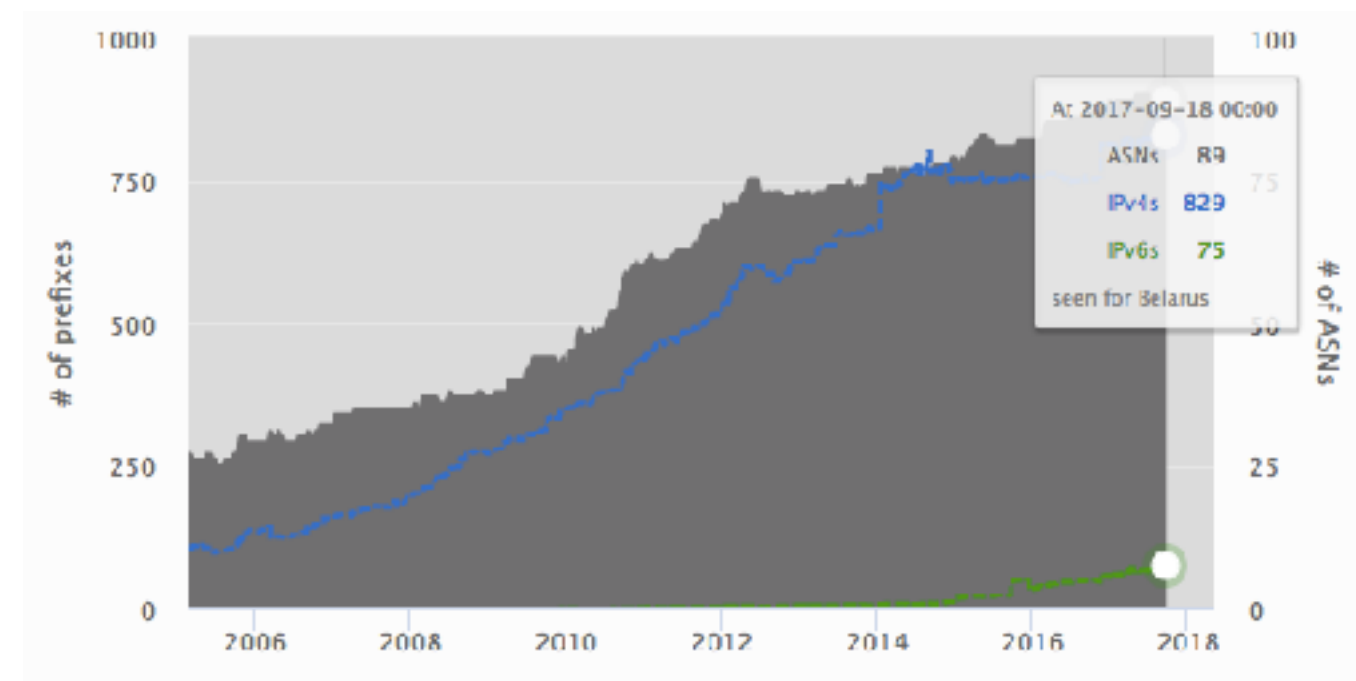
vs

Networks in Belarus (RIS):

89



source: <https://stat.ripe.net/BY#tabId=activity>



source: <https://stat.ripe.net/BY#tabId=routing>

# IXP-Country-Jedi

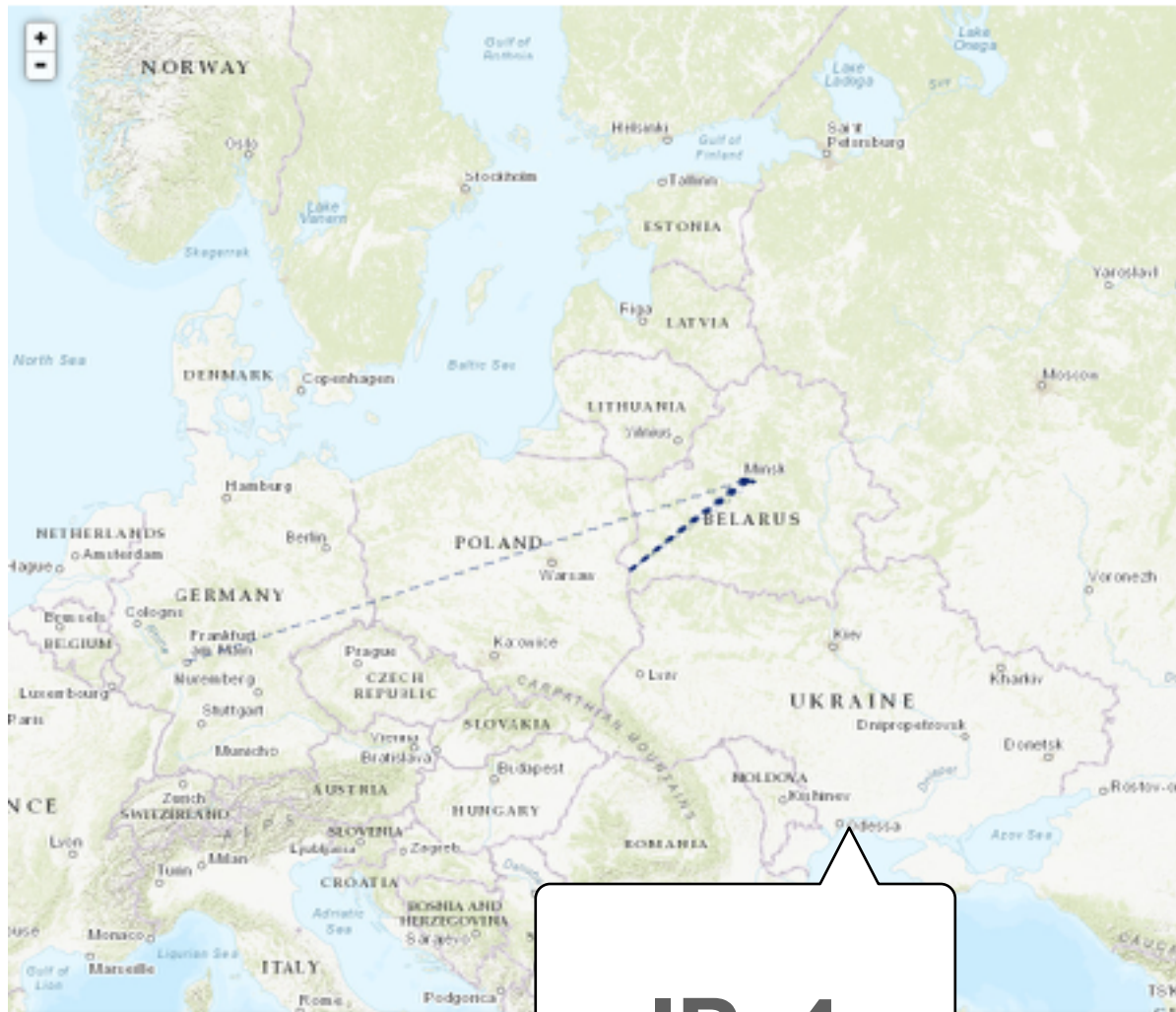


- What is IXP Country Jedi?
  - RIPE Atlas traceroute measurements
  - Geolocating observed hops
  - Indicator whether local traffic stays local

# IXP-Country-Jedi



- Belarus



IPv4



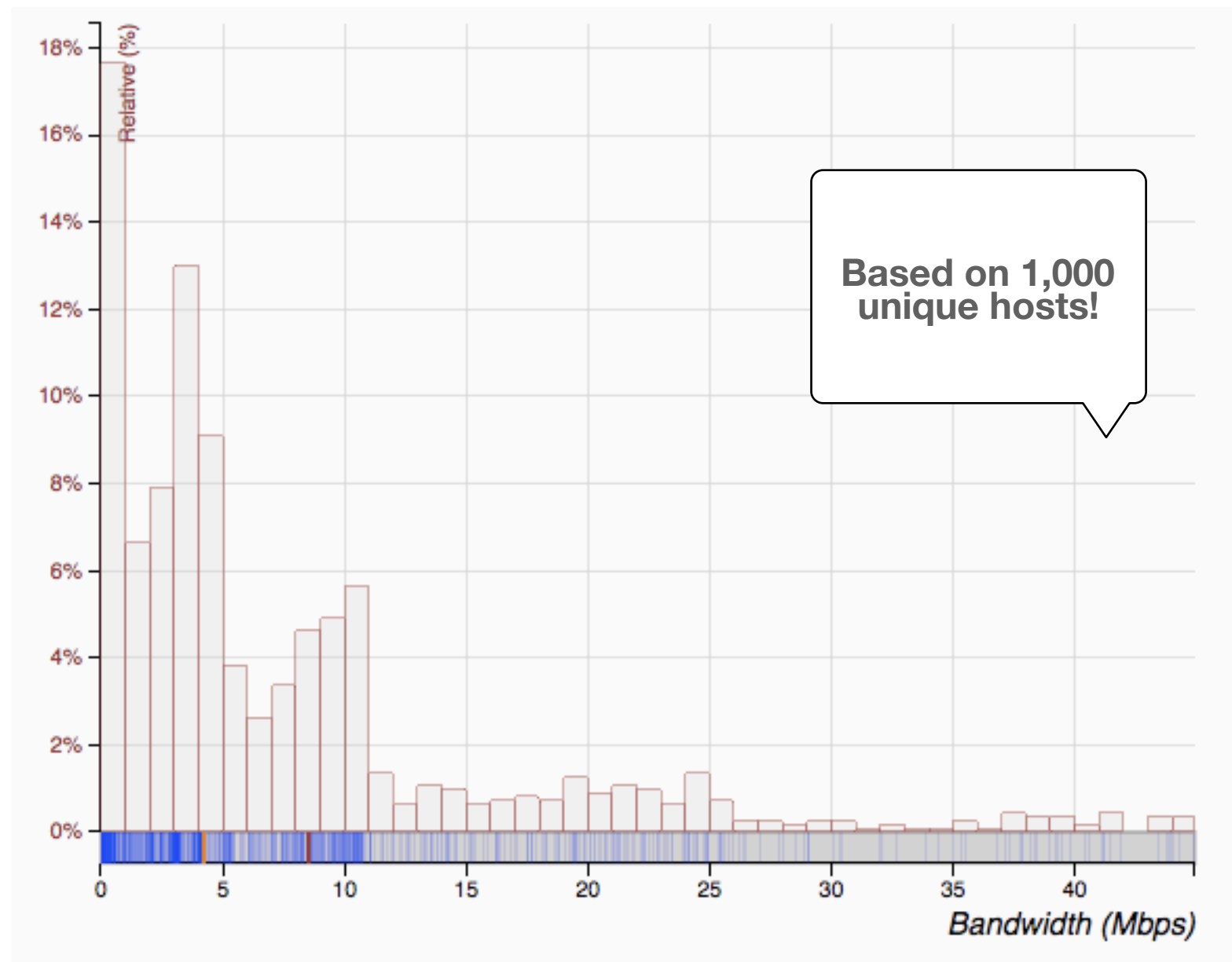
IPv6

<http://sg-pub.ripe.net/emile/ixp-country-jedi/latest/BY/geopath/>

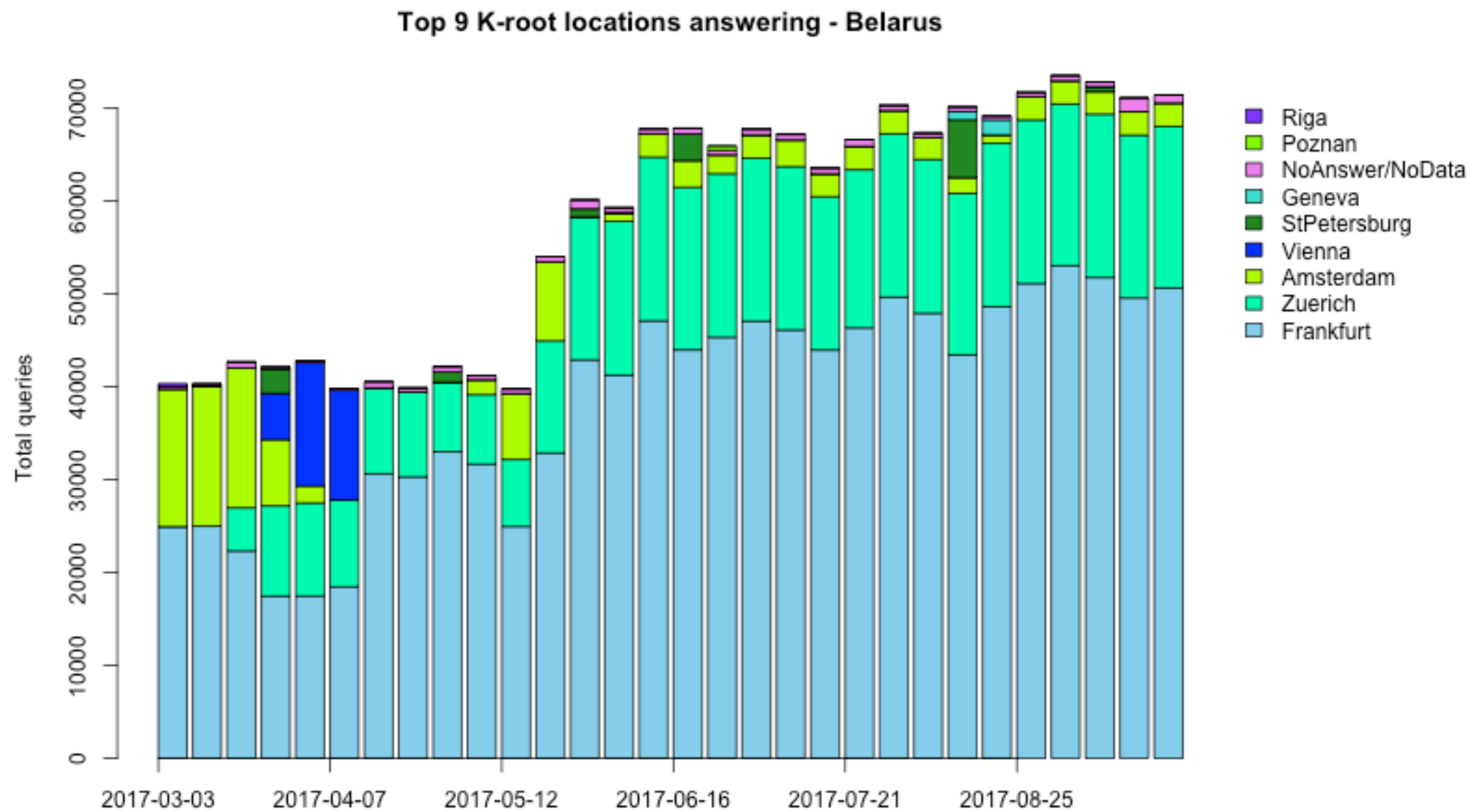
# Bandwidth Capacity in Belarus



- Observed from M-Lab (Google)



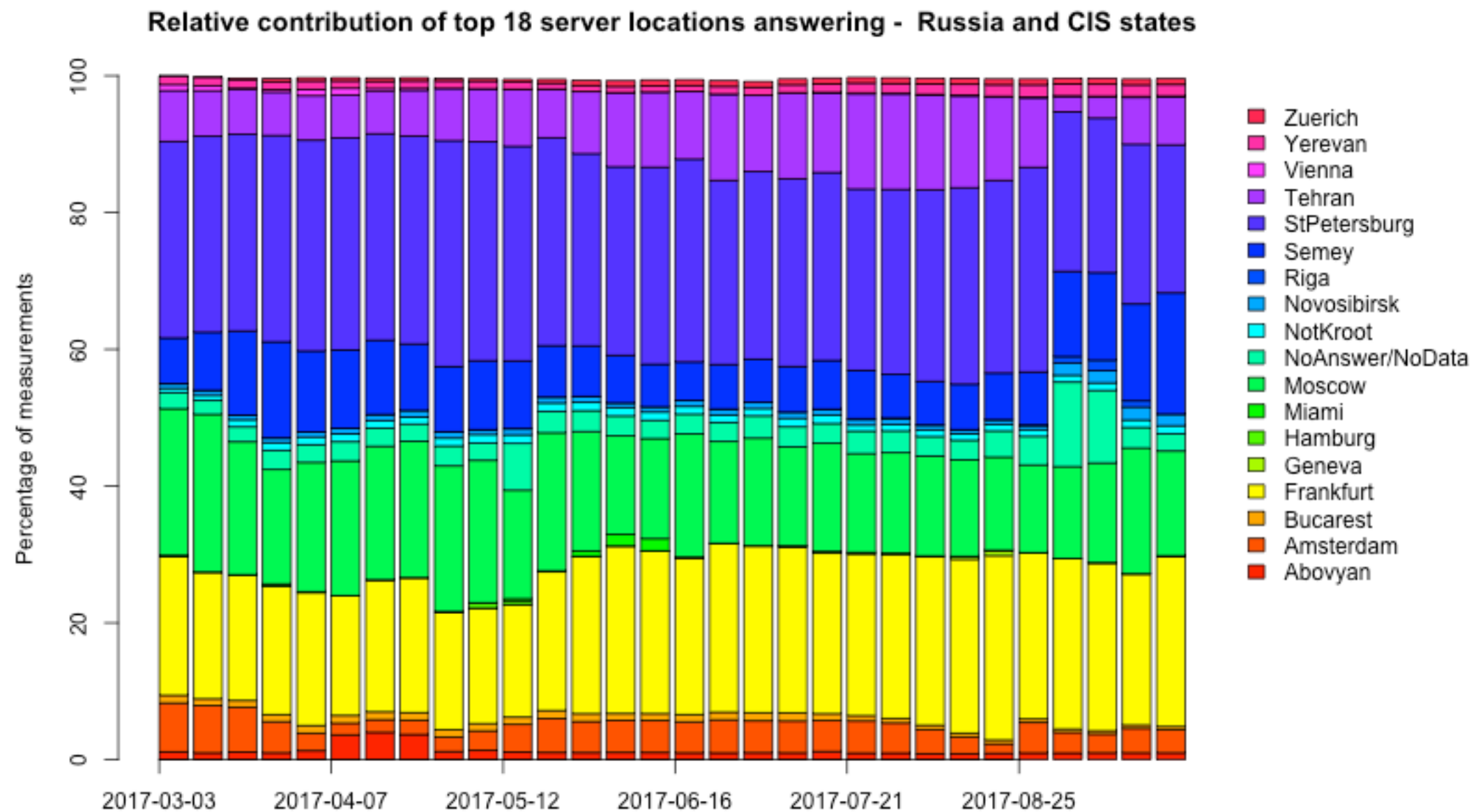
source: <https://stat.ripe.net/BY#tabId=activity>



source: RIPE Atlas



# K-root



source: RIPE Atlas



# Questions



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@cteuschel