

# IPv6 in Belgium

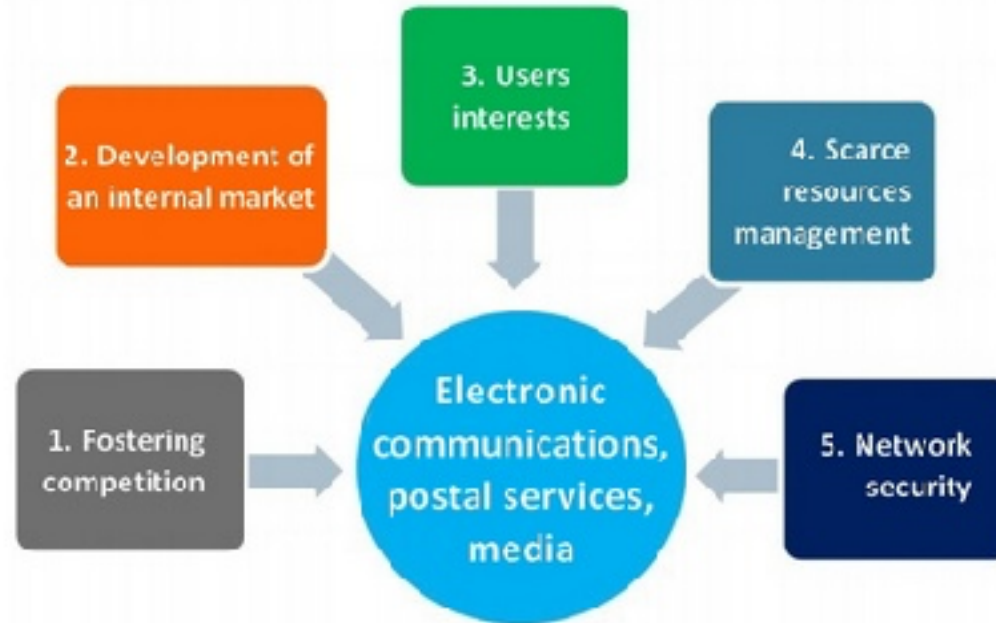
Bahrain, RIPE

Ir. Jan Vannieuwenhuyse, senior advisor

SEPTEMBER 2017



# BIPT in a nutshell



## Vision

"We guarantee that the user has a choice of powerful and trustworthy communications on the best possible terms and conditions in a competitive environment."

# IPv6 context

- ❑ NOT (“NATIONAAL OVERLEG TELECOM”)
  - Platform where BIPT meets Belgian stakeholders responsible for law enforcement and national security
  - To consider all their issues related to electronic communications
- ❑ TELECOM LAW REQUIRES ECS PROVIDERS TO IDENTIFY THEIR USERS (BASED ON A LEGAL ORDER SIGNED BY A COMPETENT MAGISTRATE OF COURSE)
- ❑ BIPT MISSION TO ACCOMMODATE THE DEVELOPMENT OF THE INTERNET IN BELGIUM

# What happened in 2012?

IN NOT PLATFORM COMPLAINTS THAT MORE AND MORE CARRIER GRADE NETWORK ADDRESS TRANSLATION WAS USED (CG NAT)

- Only difference between users is the source port number, which is often not logged → so IP address cannot trace back user
- Operators do not comply with the law
- Criminal investigations are made more difficult, delayed or even dropped

# Code of conduct

- ❑ WITH BIPT AS A MEDIATOR WE BROUGHT THE ISPs TOGETHER WITH THE NOT MEMBERS
- ❑ SUGGESTED A VOLUNTARY CODE OF CONDUCT WITH A VIEW TO
  - REDUCING RISK OF “NO UNIQUE IDENTIFICATION” IF TIMESTAMP AVAILABLE BUT NOT THE SOURCE PORT
  - PROMOTING IPV6
- ❑ NEGOTIATIONS LED TO A CODE SIGNED IN 2012 BY THE MAJOR OPERATORS AND LE COMMUNITY

- ❑ ONLY CGN IF STOCK IPv4 < 20%
- ❑ IDENTIFICATION BASED ON PUBLIC IP ADDRESS, PORT AND TIME
- ❑ IF CGN IS APPLIED:
  - ONE PUBLIC IP ADDRESS IS SHARED WITH MAXIMUM 16 USERS
  - ONE SHARED PUBLIC IP ADDRESS IS USED FOR MAXIMUM 24 HOURS
  - A NEW IP ADDRESS IS ASSIGNED AT RANDOM (LOW CHANCE THAT 2 USERS SHARE THE SAME PUBLIC IP ADDRESS AGAIN)

IF DURING AN INVESTIGATION >2 IP ADDRESSES + TIMESTAMPS ARE AVAILABLE  
CROSSCHECK ANALYSIS IS POSSIBLE!

**RESULT WAS THAT MAJOR OPERATORS INTRODUCED IPv6**

# IPv6 Council



## IPv6 Council - Belgium

The IPv6 Council has as task to create awareness of IPv6 technology to keep the Internet and its applications growing.



To show the importance of the step towards IPv6 in Belgium the 'IPv6 Council - Belgian Chapter' has been created. The purpose of the Belgian IPv6 Council is to create awareness of the importance and necessity of IPv6 and to exchange application experiences of IPv6 and to realize agreed deployment models to implement IPv6 technology.

When interested to participate within the Belgian IPv6 Council, please feel

free to subscribe to our mailing list [belgianv6council@ipv6forum.com](mailto:belgianv6council@ipv6forum.com) (click on the previous link) or have a look at the list archive.

Good cooperation between engineers -> incremental cost of IPv6 is low if introduced together with new technology roll out

# Why IPv6?

## CONTRAS

NO BUSINESS CASE

## PROS

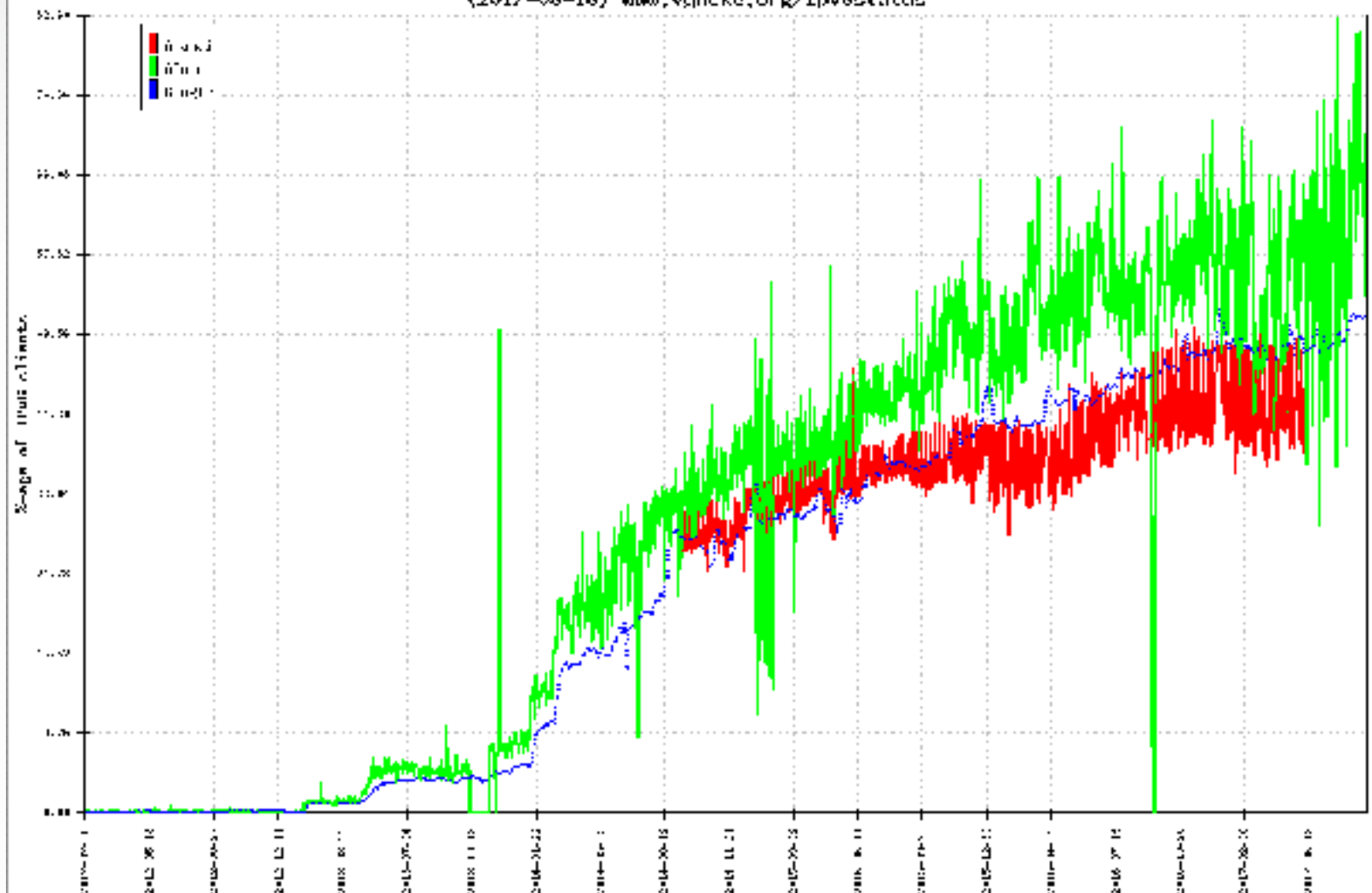
- PERFORMANCE IS BETTER COMPARED WITH CGN IPv4
- CODE OF CONDUCT CAUSES COSTS/CONSTRAINTS COMPARED WITH IPv6
- ONLY LONG TERM SOLUTION FOR THE SCARCITY
- DUAL STACK CAUSES EXTRA COSTS





BIPT

IPv6 Penetration in Belgium as measured by Akamai, APNIC and Google  
(2017-08-16) [www.vsn.be/en/ipv6status](http://www.vsn.be/en/ipv6status)



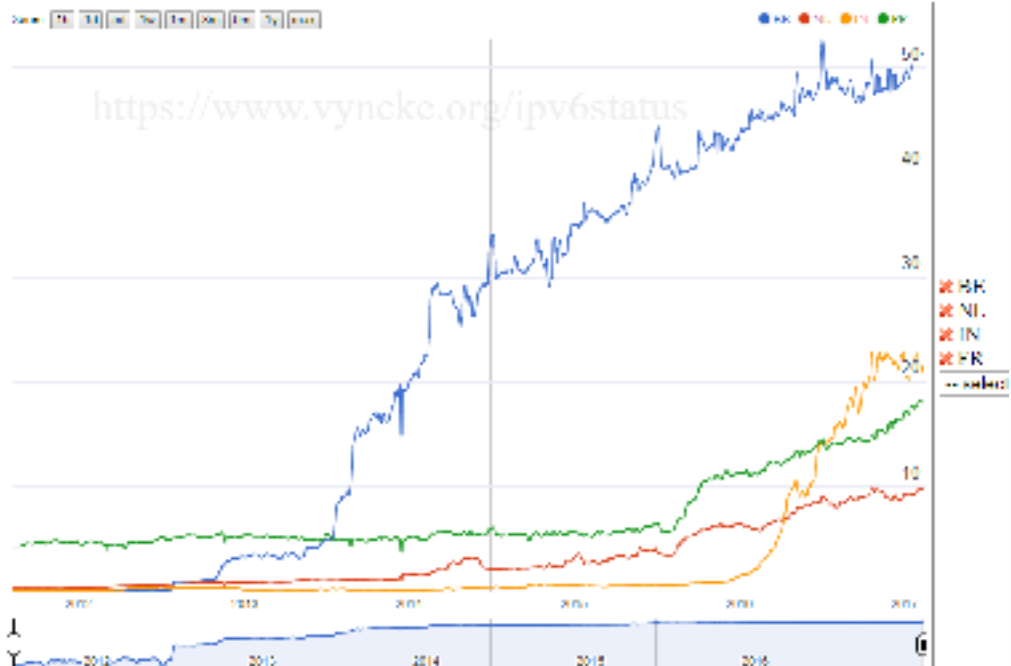


B I P T

## Comparison of IPv6 IPv6-Enabled Web Browsers (courtesy Google) in Different Countries

IPv6-Enabled Web Browsers (courtesy Google)

Metriku to display all listed prefixes - all listed prefixes - all listed prefixes - IPv6 web browsers (Google) - IPv6 web browsers (Akamai)





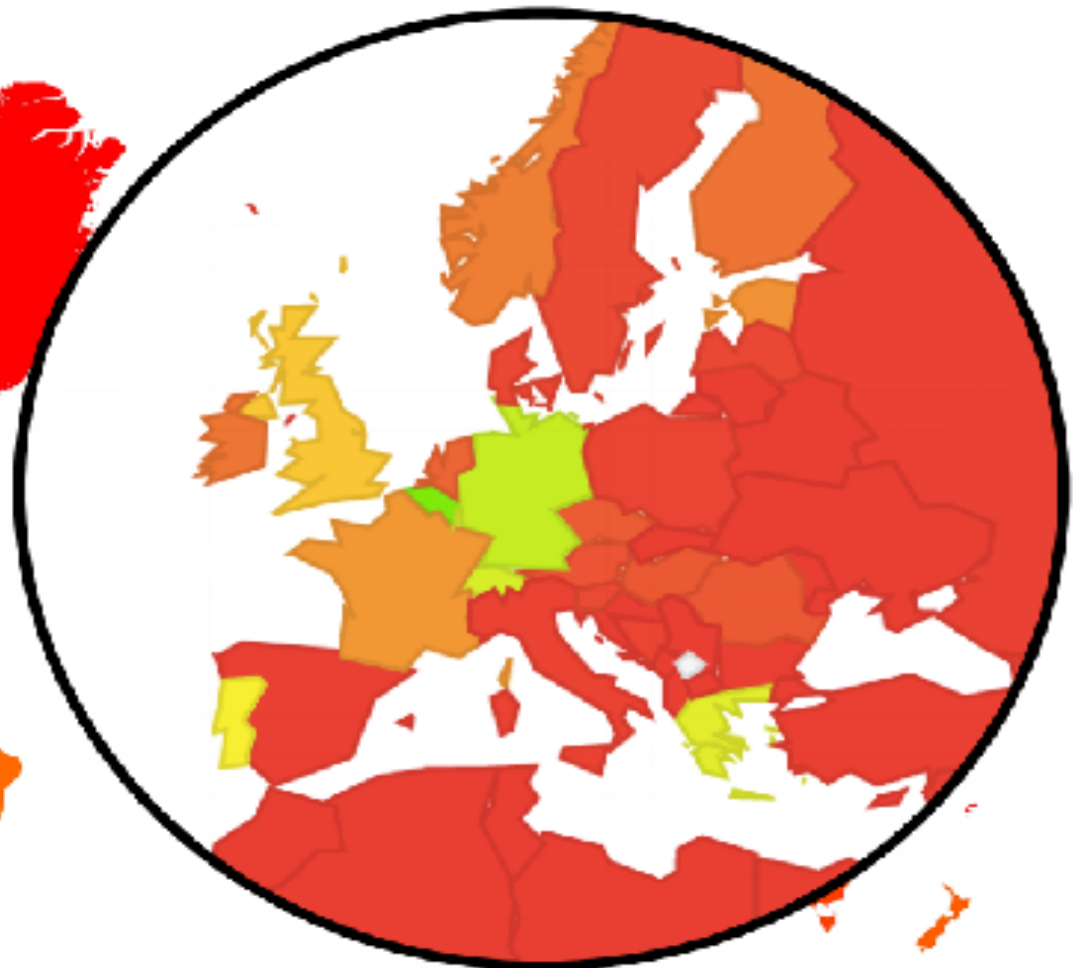
# Result (source RIPE 24 Jan 2017)

## IPv6 Deployment



IPv6 Capable Rate by country (%)

Country	IPv6 Capable	IPv6 Preferred
Belgium	57.33%	55.41%
Switzerland	37.54%	36.26%
Germany	37.22%	35.97%
USA	34.20%	31.65%
Greece	33.30%	32.75%
Luxembourg	32.31%	30.96%
Portugal	26.80%	26.26%
UK	24.48%	23.60%
Peru	19.36%	18.88%
Estonia	18.86%	18.49%



# State of play (2017)

## PUBLIC CONSULTATION 2016

## PROXIMUS

### Fixed Internet: dual stack IPv4/IPv6

- 62% of consumers (2016); 100% before 2020

- 10% of business users (2016)

### Mobile

- Gradual introduction start Q4 2017

## TELENET

- Fixed Internet: dual stack IPv4/IPv6: 100%

# State of play (2017)

- ❑ **CGN: AVERAGE USERS PER IPV4 ADDRESS?**
  - ❑ PROXIMUS fixed 16; mobile 3
  - ❑ TELENET fixed 16 (refinement ongoing depending on the application)
  - ❑ Orange 8 (mobile)
- ❑ **BICS ARGUES CODE GIVES THEM A COMPETITIVE DISADVANTAGE**
- ❑ **IoT CAN BE A TRIGGER APPLICATION FOR IPV6 (NOT ALWAYS A NEED FOR BACKWARD COMPATIBILITY)**
- ❑ **COST TO SUPPORT DUAL STACK COULD GIVE AN INCENTIVE TO MOVE TO ALL IPV6**

# Success factors

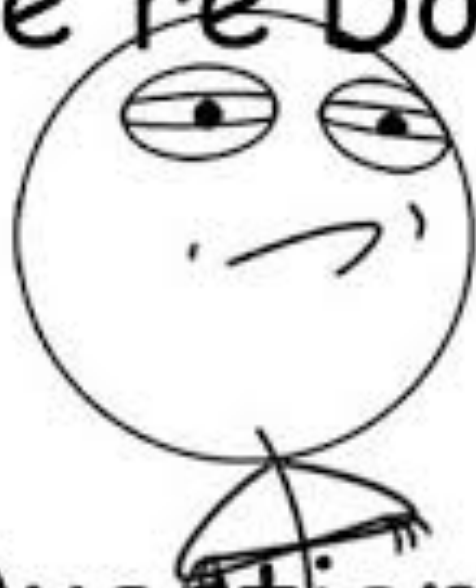
- ❑ PARTNERSHIP TRYING TO FIND COMMON GROUND BETWEEN ISPs/OPERATORS, BIPT AND LAW ENFORCEMENT AGENCIES
- ❑ KEY ENGINEERS AT LEADING ISPs ARE COLLABORATING/ SHARING EXPERIENCE
- ❑ LONG TERM VISION KEEPS INVESTMENT/OPERATIONAL COST LOW (INCREMENTAL COST IF DONE TOGETHER WITH A NEW GENERATION OF EQUIPMENT)

**Creation of an enabling environment**



BIPT

We're Done.



Questions?

[www.4mat.com](http://www.4mat.com)