Logius
Ministerie van Binnenlandse Zaken en Koninkrijksrelaties

IP addresses and AS numbers for governments BoF

RIPE-76 Marseille

17 may 2018

Logius

Glenn Lutke Schipholt

Iljitsch van Beijnum

Agenda

1. Introduction
2. Experiences with IPv6 adresses for Spain and other governments
   - Jordi Palet
3. Experiences with IPv6 adresses for Germany
   - Tahar Schaa
4. Experiences with IPv6 adresses and AS numbers for the Netherlands
   - Iljitsch van Beijnum
5. Experiences from other governments?
6. Discussion
7. Conclusions and next steps

Introduction - IPv6

- The RIPE policies tend to be geared towards ISPs and single organizations
- The ISP/organization usually advertises that address space as a single block in BGP
- However, in the past years several European national governments have created government-wide IPv6 addressing plans:
  - the national government requests a large IPv6 allocation
  - then sub-allocates/assigns smaller blocks out of that large assignment towards branches of the national/federal government, provinces, municipalities and so on
  - these usually advertise these assignments over their own internet connection(s), like PI assignments

Introduction - ASNs

- Generally, national governments have private networks that connect many (hundreds or thousands) entities within various levels of government
  - Coordinating private AS numbers gets very difficult!
- RIPE-679 (2017):
  - "In order to help decrease global routing complexity, a new AS Number should be used only if a new external routing policy is required, see RFC1930."
- RFC 1930 (1996):
  - "... IDRP (The OSI Inter-Domain Routing Protocol, which the Internet is expected to adopt when BGP becomes obsolete ..."
  - "AS Space exhaustion"
  - "An AS must be used for exchanging external routing information with other ASes through an exterior routing protocol."

Government plans

- Jordi Palet: Spain and others
- Tahar Schaa: Germany
- Iljitsch van Beijnum: the Netherlands
- ...

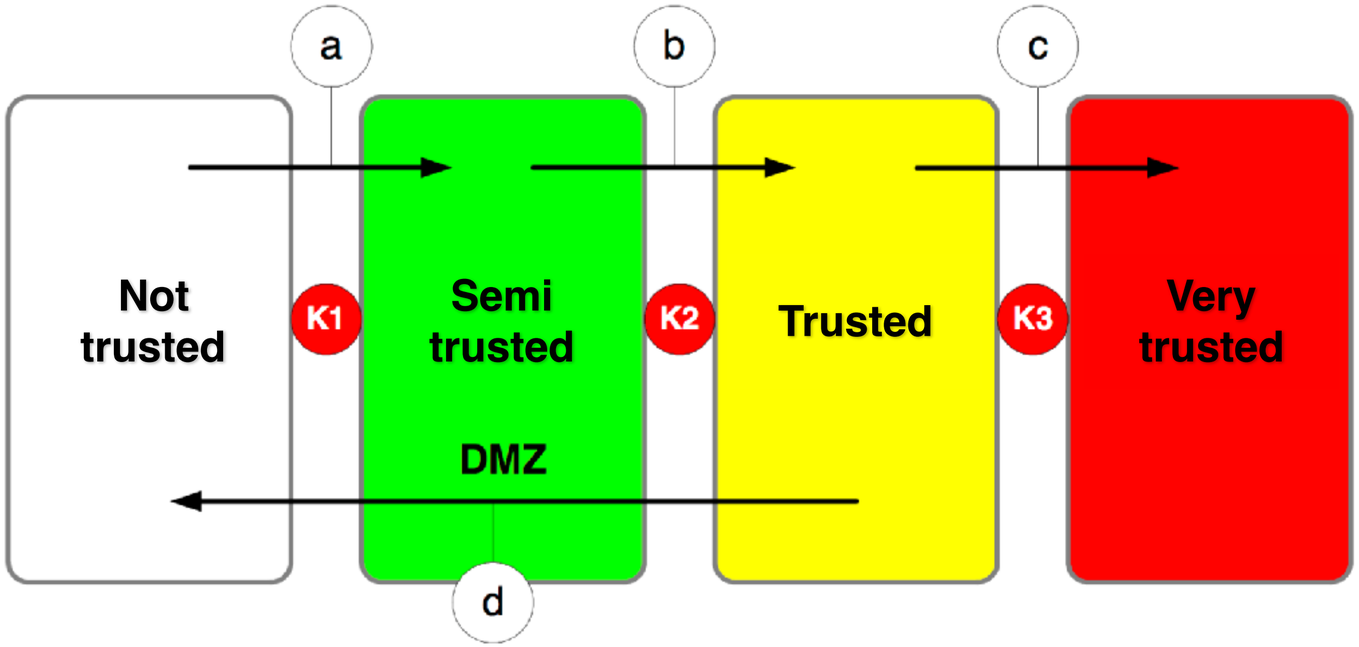
Logius

- "Logius is the digital government service of the Netherlands Ministry of the Interior and Kingdom Relations (BZK). It maintains government-wide ICT solutions and common standards"
- Logius got tasked by the ministry to be an LIR and distribute IPv6 address space to the national government
  - except the Ministry of Defense, because they have different needs in relation to NATO

2015: national only

Prefix	Used by
2a04:9a00::/32	Other organizations
2a04:9a01::/32	Finance
2a04:9a02::/32	Infrastructure and Environment
2a04:9a03::/32	Interior and Kingdom Relations
2a04:9a04::/32	Justice and Safety
2a04:9a05::/32	Unused
2a04:9a06::/32	Unused

Security bits



Base model for zones

4 bits in the IPv6 address are used to encode security zones (16 possible, 4 used today)

Government-wide

- Report by TNO: advantages to having an integrated IPv6 numbering plan for the *entire* Dutch government
  - including municipalities, provinces, water boards
- But: not enough space for that in the existing /29
  - so, let's grow to a /28
- So in early 2016 we started talking to the RIPE NCC
  - /29 → /28: we didn't qualify for a subsequent allocation
  - but we did qualify for a /28 *initial* allocation... if we return the /29
- What we did:
  - made the Ministry of the Interior an LIR
  - got a /29 initial allocation
  - transferred the /29 to Logius

2016: government-wide

Prefix	Used by
2a04:9a00::/32	Other organizations (large blocks)
2a04:9a01::/32	Finance
2a04:9a02::/32	Infrastructure and Environment
2a04:9a03::/32	Interior and Kingdom Relations
2a04:9a04::/32	Justice and Safety
2a04:9a05::/32	Reserved (national)
2a04:9a06::/32	Reserved (national)
2a04:9a07::/32	Reserved (national)
2a07:3500::/32	Unused
2a07:3501::/32	Unused
2a07:3502::/32	Unused
2a07:3503::/32	Unused
2a07:3504::/32	Monicipalities
2a07:3505::/32	Provinces / water boards
2a07:3506::/32	Other organizations (small blocks)
2a07:3507::/32	Suppliers of services to governmental organizations

- If you want to practice your Dutch:
  - https://www.logius.nl/diensten/ipv6/
  - https://www.logius.nl/fileadmin/logius/ns/diensten/IPv6/Overheidsbreed_IPv6-nummerplankader_v1_0.pdf
  -

AS numbers

- The policy or RFC 1930 don't explicitly say you can't get an ASN for a private network, but that seems to be the interpretation of the NCC
- We now have 32-bit ASNs so they're no longer scarce
- With large networks clashing of private use ASes ware common
  - for instance, couple of months ago we noticed that two of our contactors both used AS 65067
- Managing private ASNs in such networks is really, really hard
- Then again, we don't want this to be completely unrestricted...

Conclusions?

- Conclusions?
  - IPv6:
    - do we need to do anything?
    - interest in doing anything?
  - AS numbers:
    - do we need to do anything?
    - interest in doing anything?
- Next steps?
  - IPv6?
    - what, who?
  - AS numbers:
    - what, who?

Next steps

- IPv6:
  - what?
  - where?
  - who?

- AS numbers:
  - what?
  - where?
  - who?