IPv6 in Bulgaria: New Opportunities for Latecomers

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Internet History

- 1970 to 1995: Academic Period
  - Role of Universities and Research Institutions
  - TCP/IP vs. others
  - Introducton of Internet
- 1995 to 2005: Business Period
  - WWW
  - Servers
  - IP addresses still enough
- 2005 + : Social Phenomena
  - Web 2.0
  - Social networks
  - Internet of things

Internet Latecomers

- Bulgaria
  - 1998 to 2005 – mass penetration of Internet
  - IP addresses already a limited resource
  - 1993 – 2 Class B addresses, 1998 – <6 Class B
  - Number of PC - > 1 mln. (150,000 every year)
- Number of computers > IP addresses
- Mobiles – over 100% (potential IP users)

NAT – Solution or Problem

- Solution:
  - Almost unlimited number of computers behind the firewall
- Problem:
  - Anonymity
  - Tracking users by IP address (EC Directive #24 on data retention)
  - Additional hardware and software
  - No sharing of resources and information

Opportunities of IPv6 for ".bg"

- Unleash the information behind NAT
- Internet of Things
- Digital divide – Internet as "equalizer", not "divider"
- Improved security + user identification
- Traffic optimization – multimedia applications over limited capacity lines

Approaches

- Champions?
- Core Players to assume leadership
- Role of Academic and school network
- Role of the Government
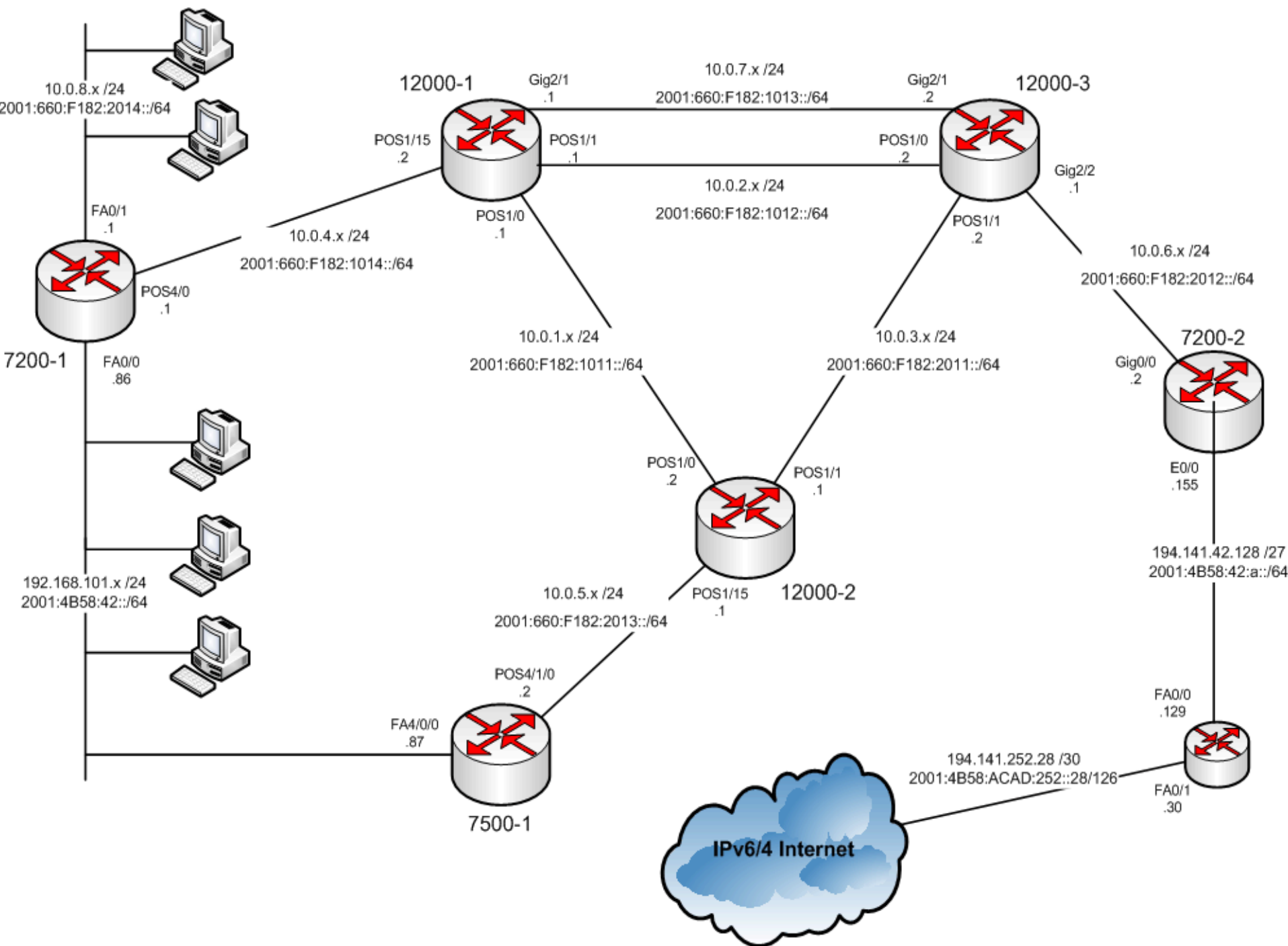 - Address distribution
  - Arbitration
- Training in IPv6

Sofia IPv6 Lab

- Donation from Cisco
- Equipment at the cost of $1,300,000
- Second lab in Europe
- Located in the premises of SAITC but access remotely
- Access to IPv6 curriculum developed by 6DISS

6DEPLOY

- Follows 6DISS (Dissemination of IPv6 in Europe): Training
- Objectives:
  - IPv6 Training
  - Supporting IPv6 Deployment
- Partners: *Martel CH, Cisco NL, Renater FR, GRNET GR, FCCN P, NIIF HU, Consulintel ES, UCL UK, Soton-ECS UK, UNINETT N, AfriNIC MU, LACNIC UY, BREN BG*
- Budget: €1,284,776
- Kick-off meeting: April 2-3, 2008 (30 months)

8

10.0.8.x /24
2001:660:F182:2014::/64

12000-1
Gig2/1
.1

10.0.7.x /24
2001:660:F182:1013::/64

Gig2/1
.2

12000-3

POS1/15
.2

POS1/1
.1

POS1/0
.2

FA0/1
.1

POS1/0
.1

10.0.2.x /24
2001:660:F182:1012::/64

Gig2/2
.1

POS4/0
.1

10.0.4.x /24
2001:660:F182:1014::/64

POS1/1
.2

10.0.6.x /24
2001:660:F182:2012::/64

7200-1

FA0/0
.86

10.0.1.x /24
2001:660:F182:1011::/64

10.0.3.x /24
2001:660:F182:2011::/64

7200-2

Gig0/0
.2

POS1/0
.2

POS1/1
.1

E0/0
.155

192.168.101.x /24
2001:4B58:42::/64

10.0.5.x /24
2001:660:F182:2013::/64

POS1/15
.1

12000-2

194.141.42.128 /27
2001:4B58:42:a::/64

POS4/1/0
.2

FA0/0
.129

FA4/0/0
.87

194.141.252.28 /30
2001:4B58:ACAD:252::28/126

7500-1

IPv6/4 Internet

FA0/1
.30

Main Players

- **Bulgarian Research and Education network**
  - ◦ Government and Academic Network in one
  - ◦ School network
  - ◦ GEANT Project, SEEREN, SEELight
  - ◦ 6DEPLOY
  - ◦ IPv6 Lab
  - ◦ Public Internet Register
- **Big Internet providers**
  - ◦ LAN
  - ◦ xDSL
  - ◦ mobile

Conclusions

- Government role will increase
  - Security and stability
  - Arbitration for resources – names, addresses, backbone networking
  - Introduction of new global technologies – IPv6, satellite, wireless
  - Competition regulations
- IPv6 as "equalizer" but be aware of new "divide" – "exclusive" IPv6 technologies
- Cost of deployment – the upgrade challenge to vendors

Thank you!