Introduction to IPv6

Miguel Baptista – miguel.baptista@fccn.pt

Why a new version for IP ?

Agenda

- Historical facts

- IPv4 address space status

- From Emergency measures ...

- ... to IPv6

Historical facts

- 1983 : Research network for ~ 100 computers
- 1992 : Commercial activity
- Exponential growth
- 1993 : Exhaustion of the class B address space
- Forecast of network collapse

IPv6DISSemination and Exploitation

Emergency measures

CIDR ...

- Allocate exceptionally class B addresses
- Re-use class C address space
- CIDR (*Classless Internet Domain Routing*)
  - RFC 1519 (PS)
  - network address = prefix/prefix length
  - less address waste
  - allows aggregation (reduces routing table size)
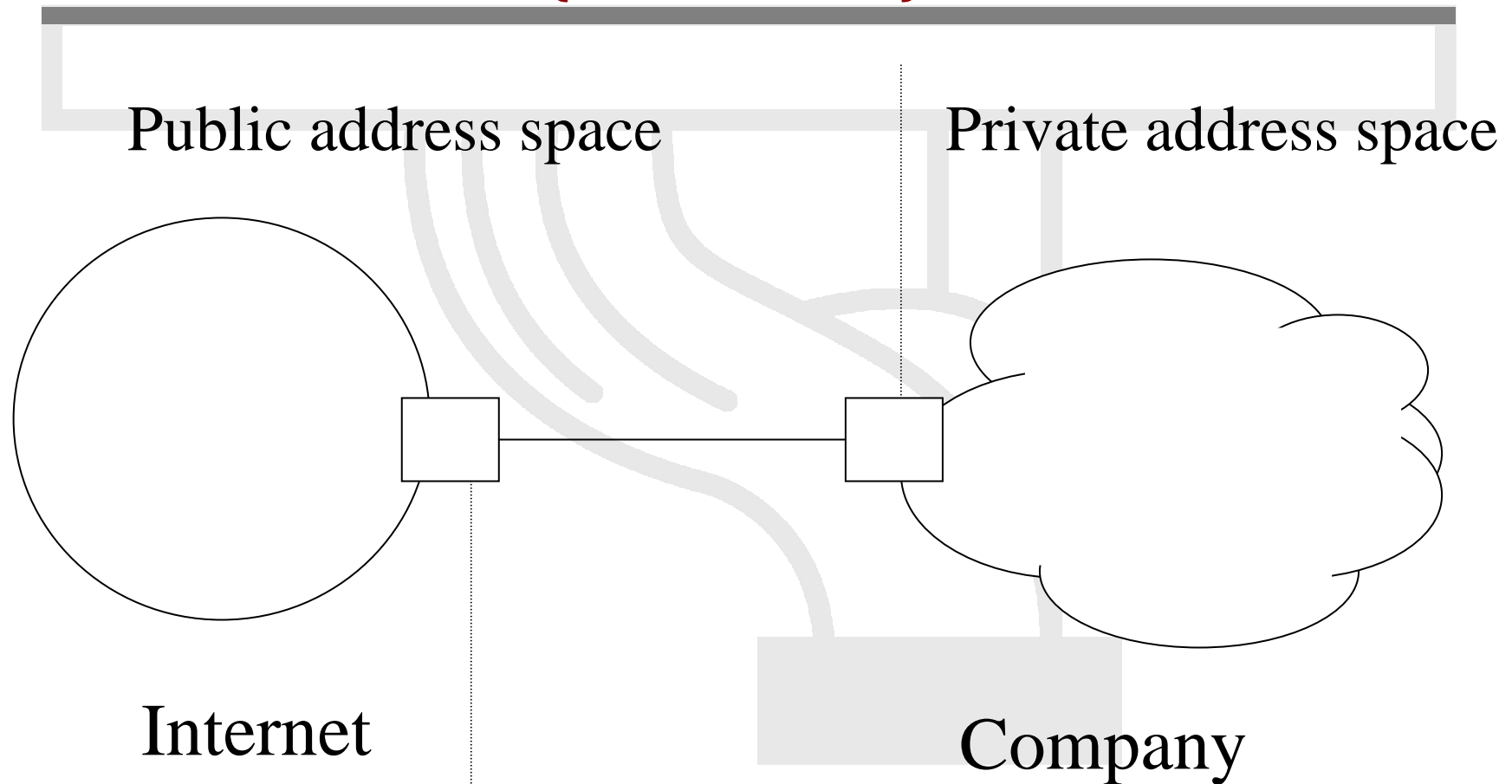
Private Addresses
(RFC 1918 BCP)

- Allow private addressing plans
- Addresses are used internally
- Similar to security architecture with firewall
- Use of proxies or NAT to go outside
  - RFC 1631, 2663 and 2993

IPv6DISSemination and Exploitation

NAT
(RFC 2663)

Public address space

Private address space

Internet

Company

Emergency Measures

- These emergency measures gave time to develop a <u>new version</u> of IP, named IPv6
- IPv6 keeps principles that have made the success of IP
- Corrects what was wrong with the current version (v4)
- BUT are emergency measures enough?

Conclusion #1

- IPv6 is the long run solution
  - ➤ **Now** we can predict IPv4 space exaustion. We already know **today** the IPv4 Internet **will lose** the capability of **expanding** in the next years!

- Anybody remembers the Y2K bug?
  - Emergency is *not cheap*!

Conclusion #2

- The IPv6 revolution is **not** a tidal wave.

  - It will be a silent revolution

- More time = smoother transition!

- Break the chicken and egg status

- Deploying IPv6 in Campus and training LAN managers takes time.

- Good planning and administrative support must also be assured