



# Arnes

## SIX – Slovenian Internet eXchange

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# Arnes

- Academic and Research Network of Slovenia
- Public, non-profit institution
- Service provider for Research, Education & Culture
- International collaboration
  - GÉANT, Internet2, RIPE, CENTR, EURid, FIRST, Euro-IX, EGI.eu



# User Community

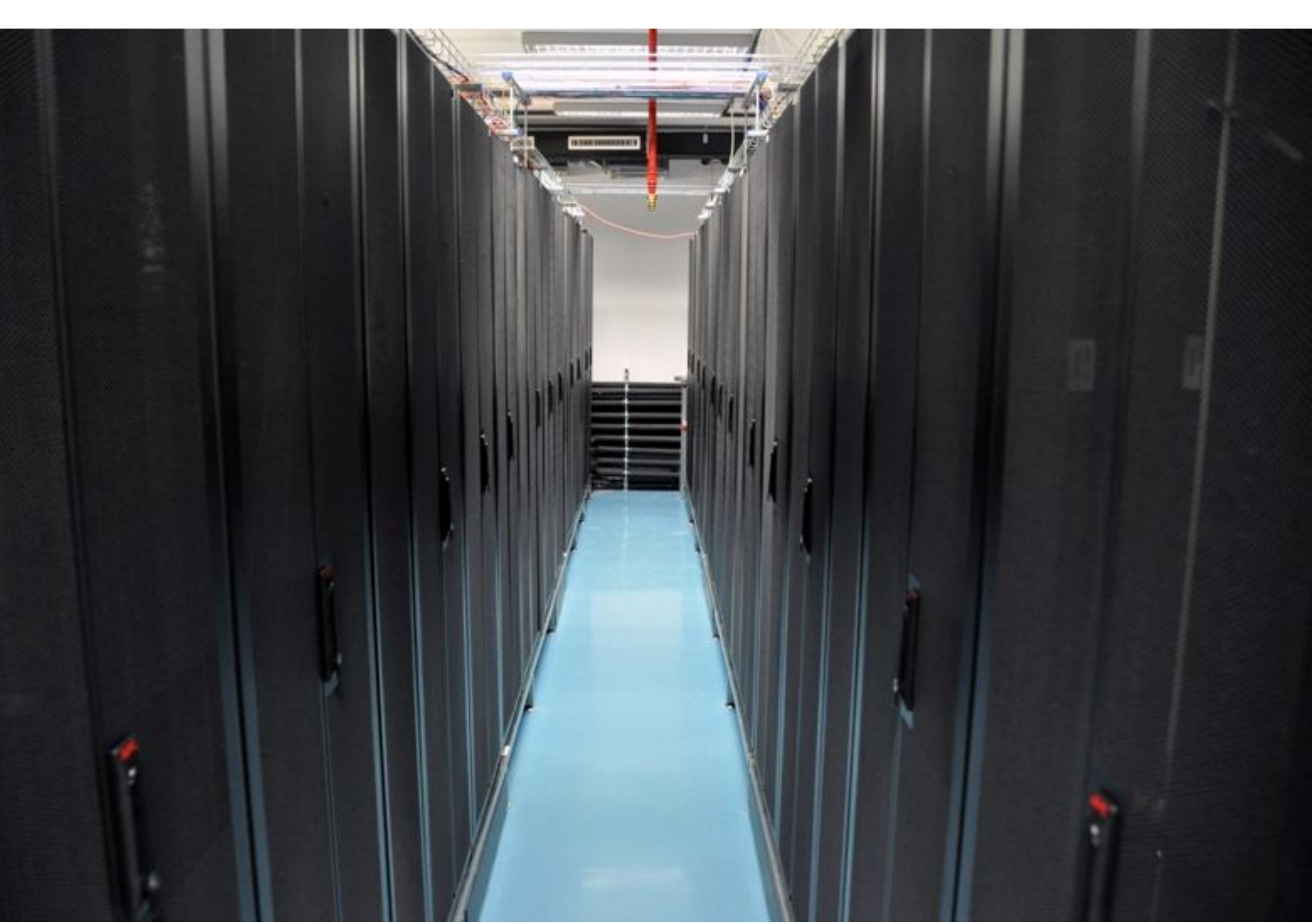
- Closed user group
- 1.424 connected institutions:
  - Universities, Institutes, Research laboratories
  - Schools, Museums, (digital) Libraries
- 250.000 individual users



# Services

- Connectivity (IPv4, IPv6, multicast, point-to-point)
- Mobility (ArnesAAI, Eduroam)
- SaaS:
  - email, CMS, LMS, Filesender, NTP, FTP archives...
  - Multimedia (video conferencing, web conferencing, streaming, VoD)
- IaaS: servers, storage (iSCSI)
- NGI: National Grid Initiative + cluster
- SIX, Domain registration for .SI + DNS
- Security (Si-Cert, server certificates)
- User support : Helpdesk, NOC, Pert
- User education, conferences
- Development (International collaboration)





# Everything in a cloud

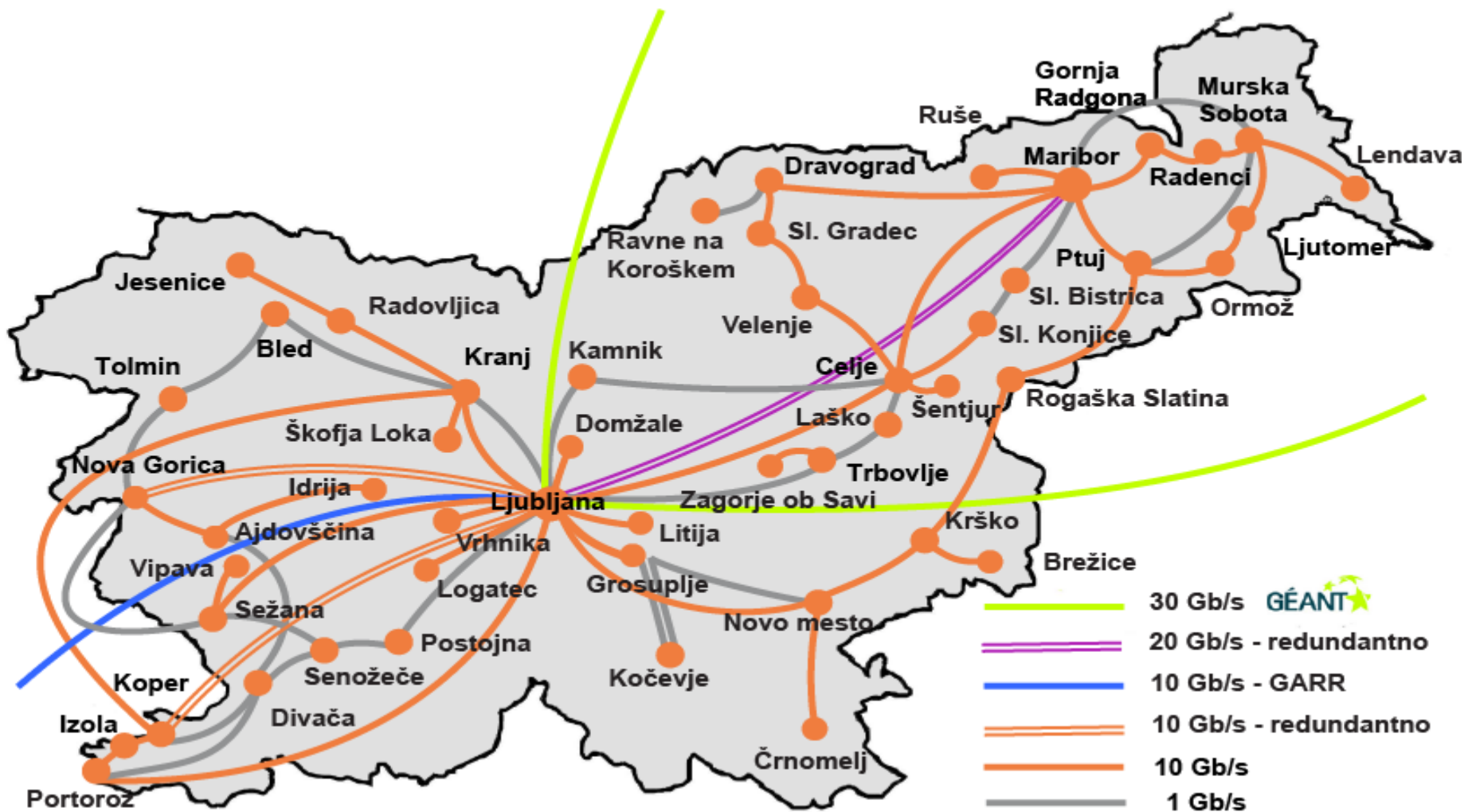




# Arnes backbone: leased dark fibre



# Arnes backbone: IP network





# SIX – Slovenian Internet eXchange

- Established in February 1994
  - Arnes in NIL d.o.o.
  - Location: SIPAX center, PTT Slovenija (Cigaletova)
- Why?
  - Extremely expensive international links
  - PTT location ideal: hub for all links

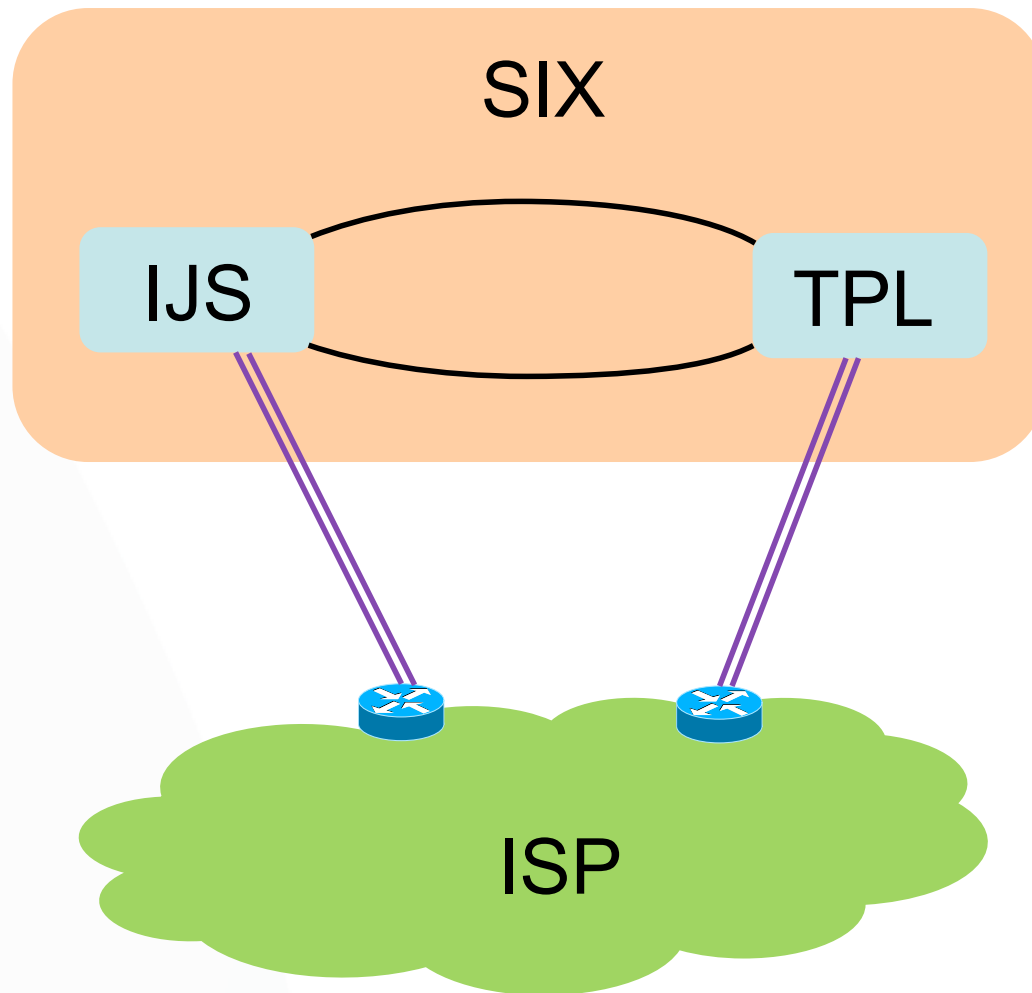


# SIX – history of topology

1. 1994: Cigaletova 10 (Arnes PoP on PTT)
2. 2000: Jamova 39 (Arnes PoP on IJS)  
(2000: LIX (Tivolska 50))
3. 2001 – distributed SIX: Jamova/Cigaletova
4. 2002 – distributed SIX: Jamova/Tivolska
5. 2009 – distributed SIX: Jamova/TPL



# SIX Topology

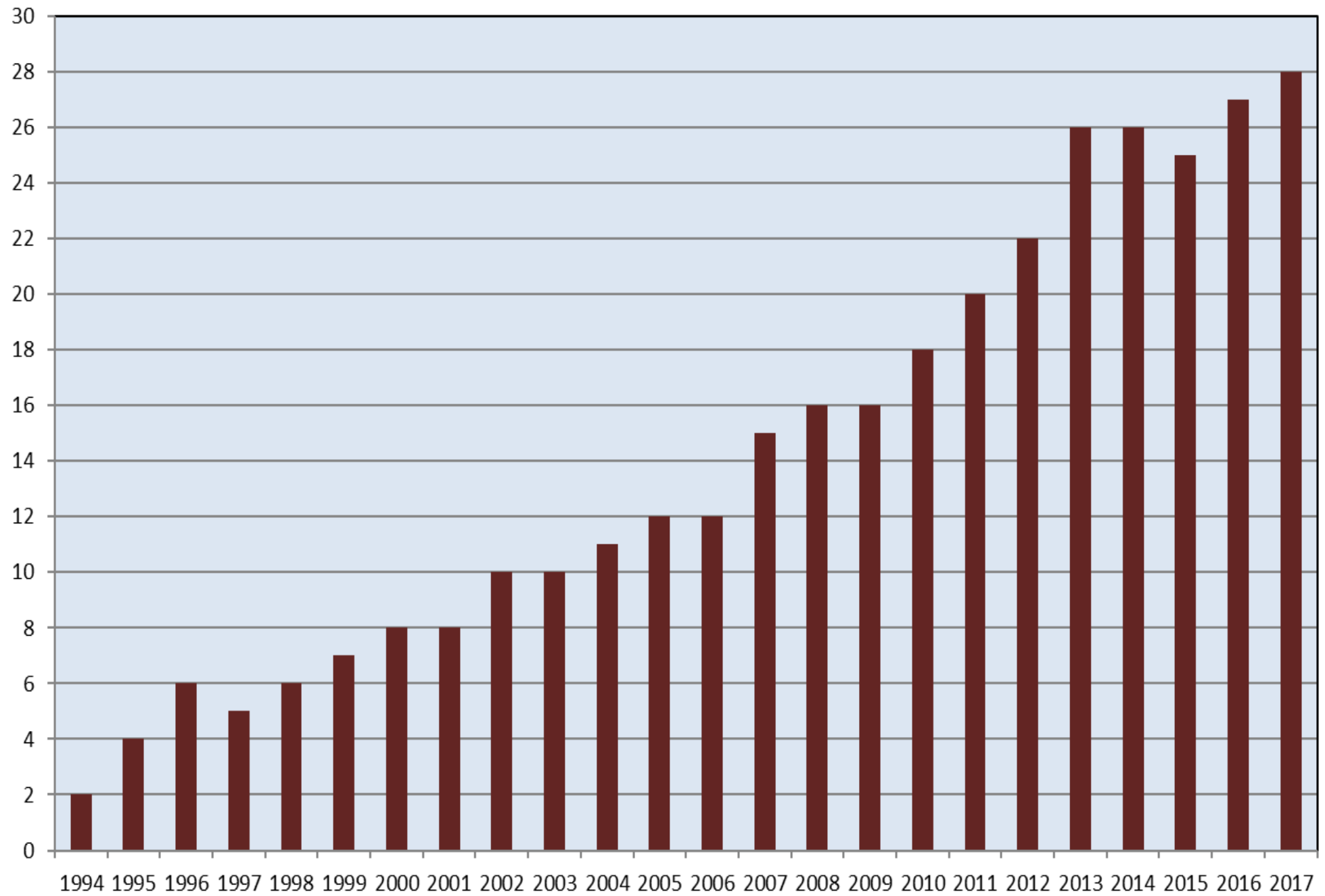


# SIX - details

- Equipment: Cisco Catalyst 4500X
- Port types: 1 GE, 10 GE
- Route Servers (Bird)
- IXP Manager



## SIX members



# SIX – statistics

- 28 members
- > 1/3 on both locations
- > 50% of members with  $\geq 10\text{Gb/s}$
- 60% also with IPv6
- Traffic:
  - peaks > 65 Gb/s
  - ~ 50% growth from Q1/16 to Q1/17





# Contacts

- [WWW.SIX.SI](http://WWW.SIX.SI)
- `noc@six.si`





# SIX – aggregate traffic

