Asia Pacific Network Information Centre

APNIC

LIR Survey Results (Supporting data for “Application of the HD ratio to IPv4” proposal)

Policy SIG

8 Sep 2005

APNIC20, Hanoi, Vietnam

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Why an LIR survey?

- Application of the HD ratio to IPv4 [prop-020-v001]
  - –Feedback that 80% utilisation is difficult to reach
    - Replace fixed 80% with variable utilisation (HD ratio)
  - –Presented at APNIC18
    - http://www.apnic.net/docs/policy/proposals/
  - –No clear support or disagreement with proposal
- Action on secretariat
  - –“**pol-18-001:** Secretariat, with assistance from NIRs, to conduct a survey of ISPs' resource management practices to allow a better understanding of issues”
- Motivation
  - –To provide a better service to members

Recap…

- HD ratio states
  - –Increasing hierarchy in network leads to decreasing efficiency in addressing
  - –HD ratio value matches % utilisation which decreases as size of address space grow

$$HD = \frac{\log(\textit{utilised host addresses})}{\log(\textit{total addresses})}$$

LIR survey questions

LIR Survey – Current practices in managing IPv4 address space

This survey is conducted at the request of the Policy SIG working group to assist the community in evaluating the policy proposal "Application of the HD ratio to IPv4" [prop-020-v001].

Objective
APNIC seeks up to date information about industry experience to help us improve services and refine policies. This survey will be used to determine how LIRs manage their IPv4 address space allocations, to identify any difficulties in maintaining efficient hierarchies or achieving 80% utilisation.

Confidentiality
All information gathered in this survey will be treated in the strictest confidence. While the findings of the survey and summaries of the data will be made publicly available, individual respondents and their networks will not be identified.

1. **Please describe your organisation (eg. ISP, web hosting, facilities management etc)**

2. **How much IPv4 address space do you currently hold? Please list the sizes of your address prefixes:**

3. **What is the extent of your network?**
   - ❍ international (presence in 2 or more countries)
   - ❍ national (presence in major cities)
   - ❍ sub-national (presence in some but not all major centres)
   - ❍ local (presence in one city or district only)
   - ❍ other, please specify:

4. **How many geographic locations does your network cover?**

5. **Do you, as an LIR, use AS numbers in your network (either private or public)?**
   - ❍ No
   - ❍ Yes. If so, how many?

6. **Please list the major services you provide using the address space you have been allocated.**

7. **When you begin planning how to sub-divide your address space, on which of the following do you base your plans?**
   - ❍ marketing or sales forecasts
   - ❍ existing network design
   - ❍ future network growth projections
   - ❍ other, please specify:

8. **Do you use NAT (or private address space: 192.168/16, 10/8, 172.16/12) in your network to provide services to your customers?**
   - ❍ No
   - ❍ Yes. If yes, please answer the following:

   Describe how NATs are used in your network:

   What are your reasons for using NAT/RFC1918?

9. **Did you know that APNIC policies do not require NAT?**
   - ❍ No
   - ❍ Yes

10. **Do you aggregate your IGP?**
    - ❍ No
    - ❍ Yes. If so, please indicate how many areas or levels of aggregation you have:

11. **Do you currently, or plan to, use IPv6 in your network (either as dual stack or IPv6 only)?**
    - ❍ No
    - ❍ Yes. If you plan to use IPv6, in which year do you expect to request IPv6 addresses from APNIC?

12. **Do you subdivide your IPv4 address space by:**
    - ❍ geographic locations? If you further subdivide this, specify how:
    - ❍ customer type? If you further subdivide this, specify how:
    - ❍ product? If you further subdivide this, specify how:
    - ❍ other, please specify:

13. **Have you experienced any problems reaching 80% utilisation of your IPv4 address space.**
    - ❍ No
    - ❍ Yes. If so, what was the nature of the problems and are you able to suggest any ways APNIC can make this easier for you?

Please turn over to page 2

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Details of LIR survey

- Design phase
  - Consulted network operators (APNIC19, by phone)
- Qualitative not quantitative
  - Face to face interviews
  - Conducted with assistance of NIRs and APNIC training team
    - Many thanks to both
- Opportunity to ask “extra” questions
  - NAT, IPv6
- Responses
  - 67 respondents in total
  - 15 different economies
  - Profile reflected that of APNIC membership

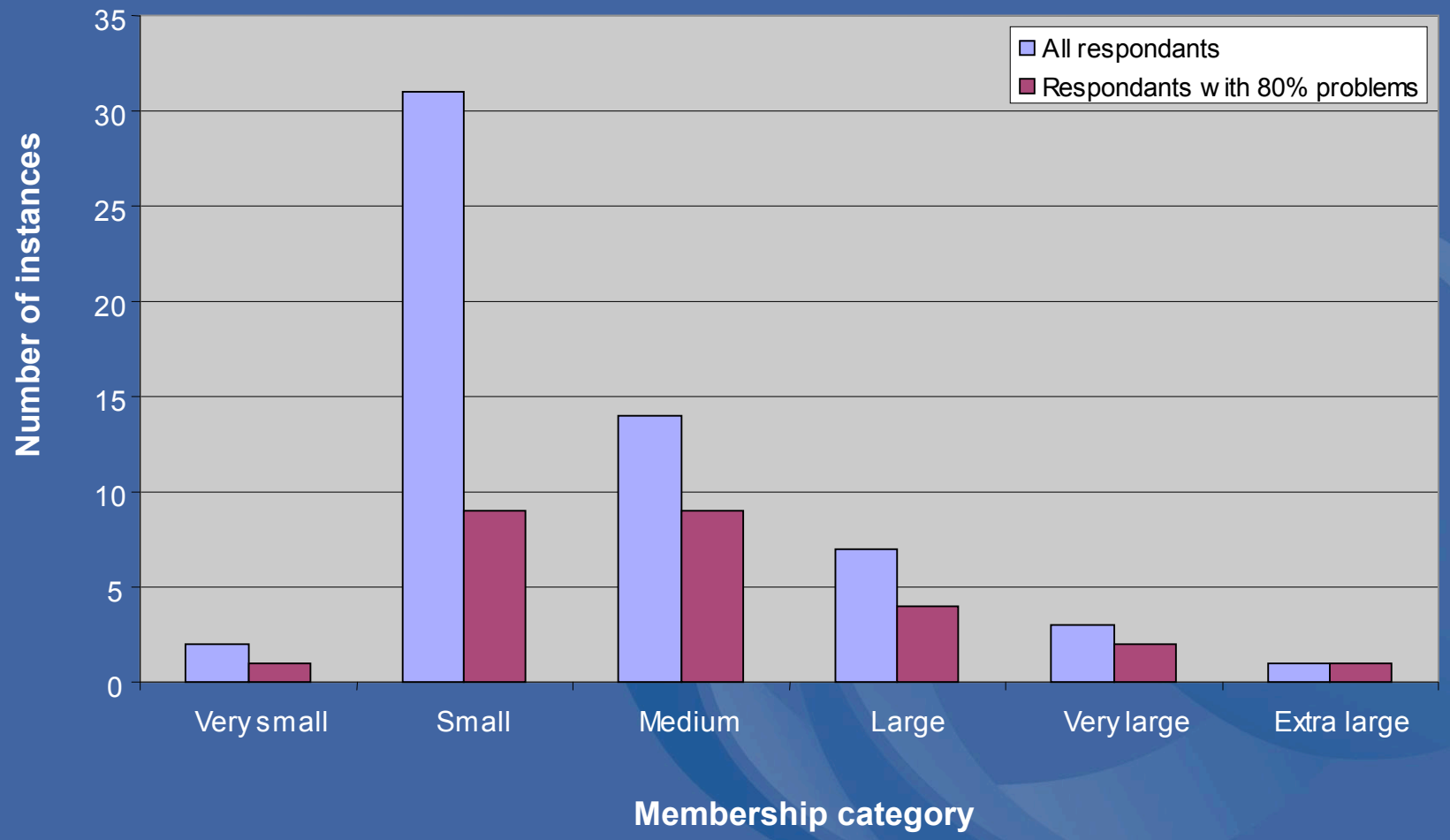
Survey summary

Number of responses	67	
Economies Represented	15	
IPv6 Deployed (and at least planned)	8 (30)	12% (45%)
Members experiencing problems with 80% policy	27	40%
Use of NAT	27	40%

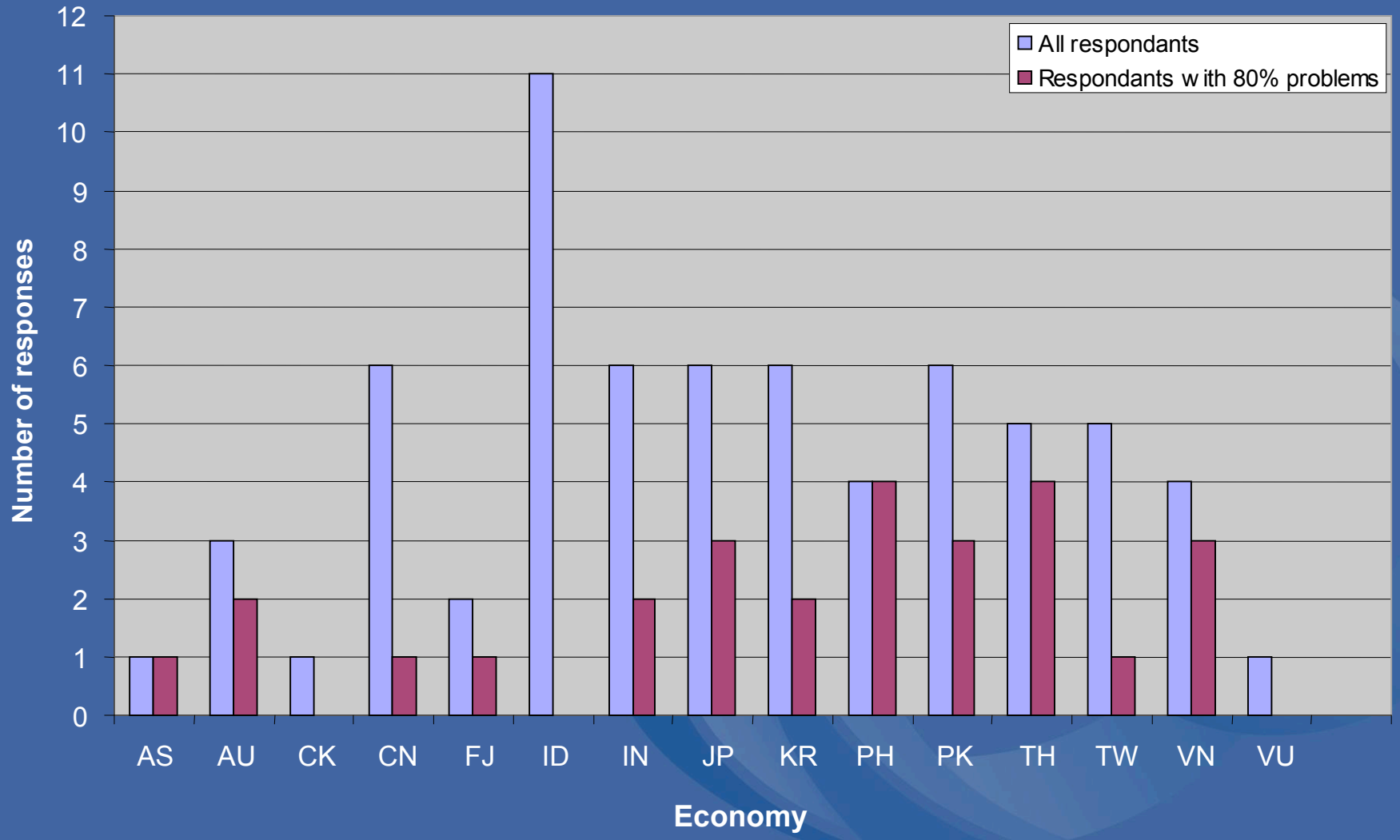
Methodology for analysis

- Use ‘hierarchy’ measures as key to HD impacts
  - If trends show relationship with hierarchy then very likely that HD ratio addresses this
  - Focus on 80% issues respondents
    - Suggests applicability of HD approach
- Considered
  - Existing use of IPv6 and NAT
  - Member tier
  - Address management models
    - Service type offering, geographic location (PoP), technology type

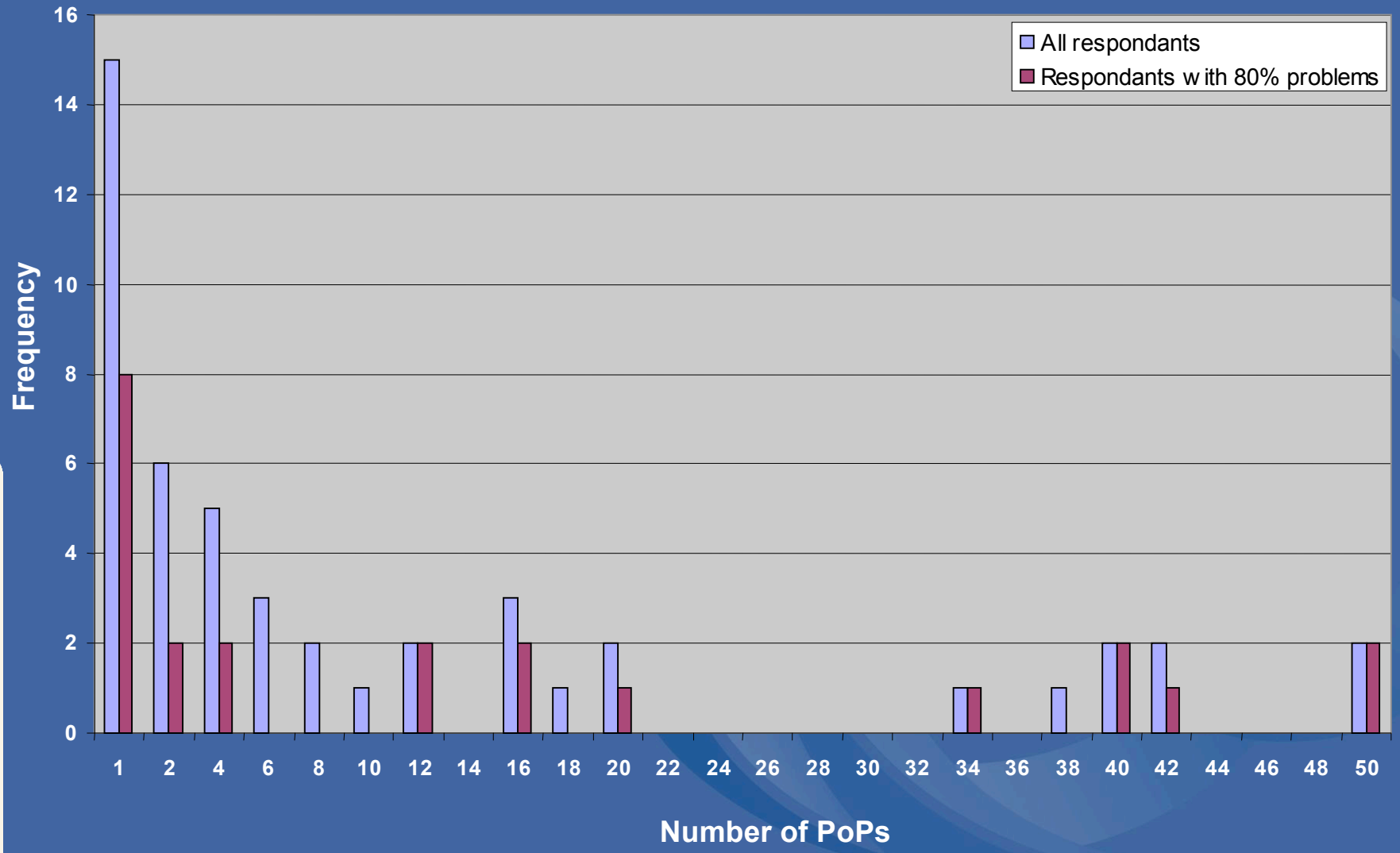
Member categories surveyed



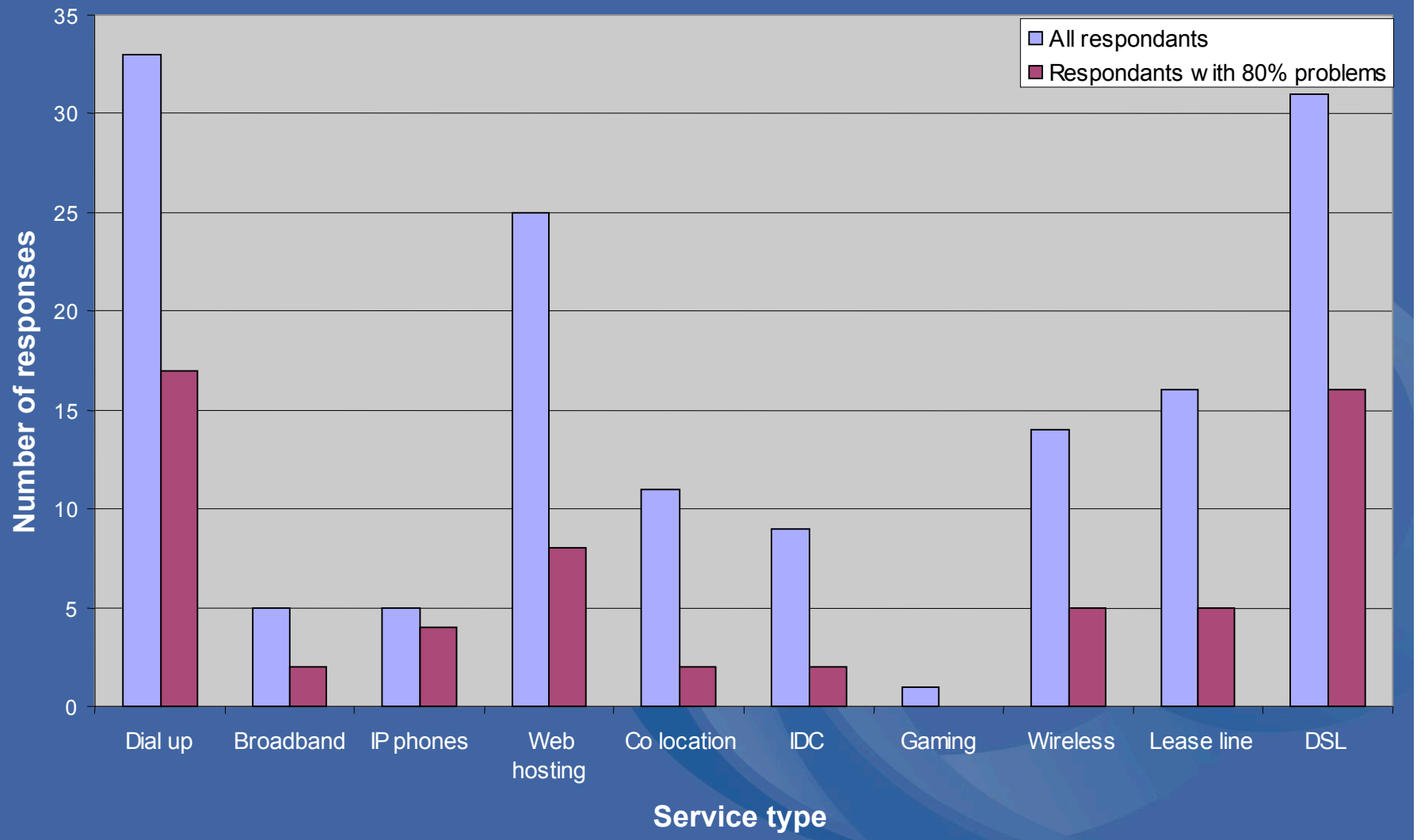
Responses by member economy



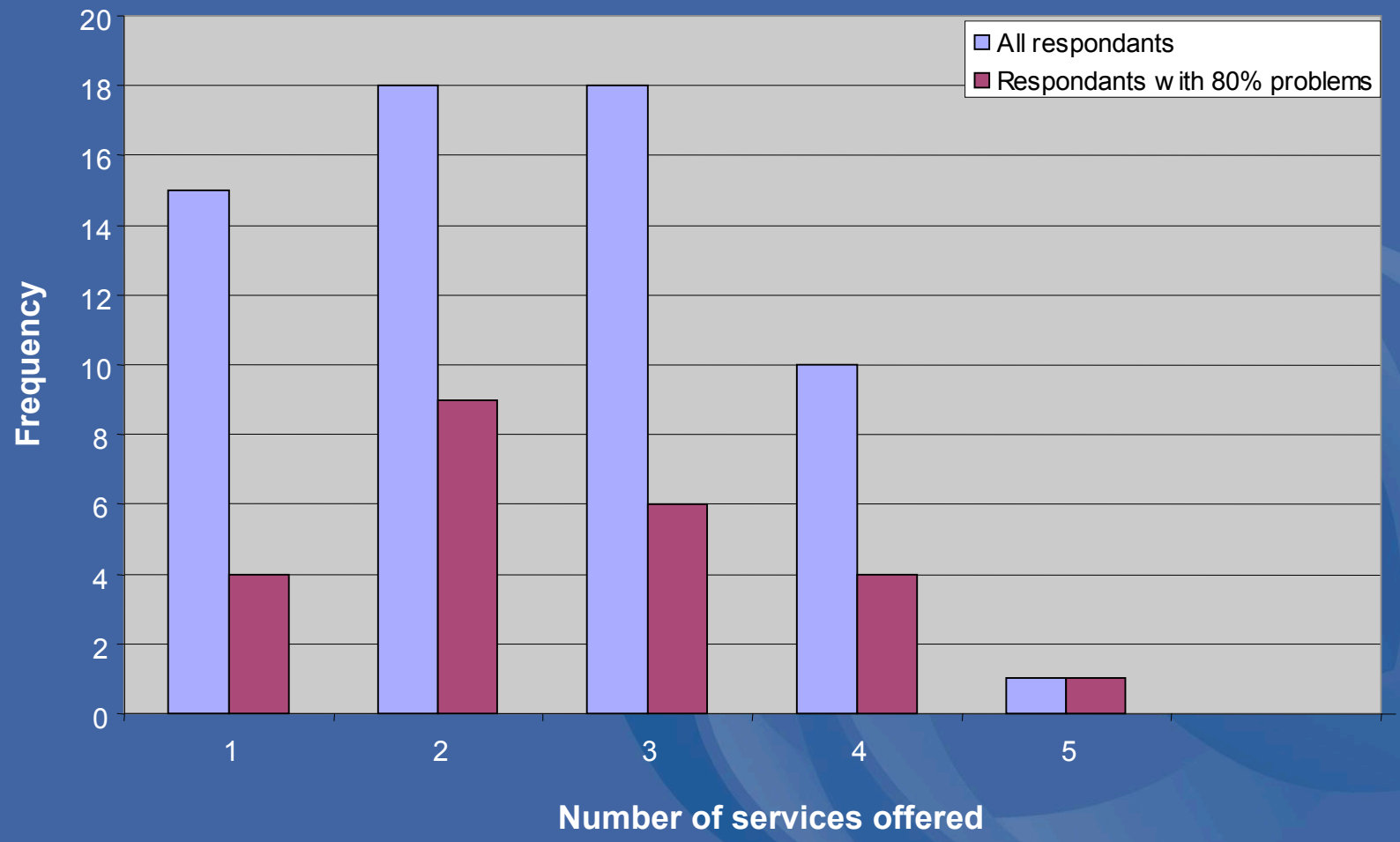
Number of PoPs



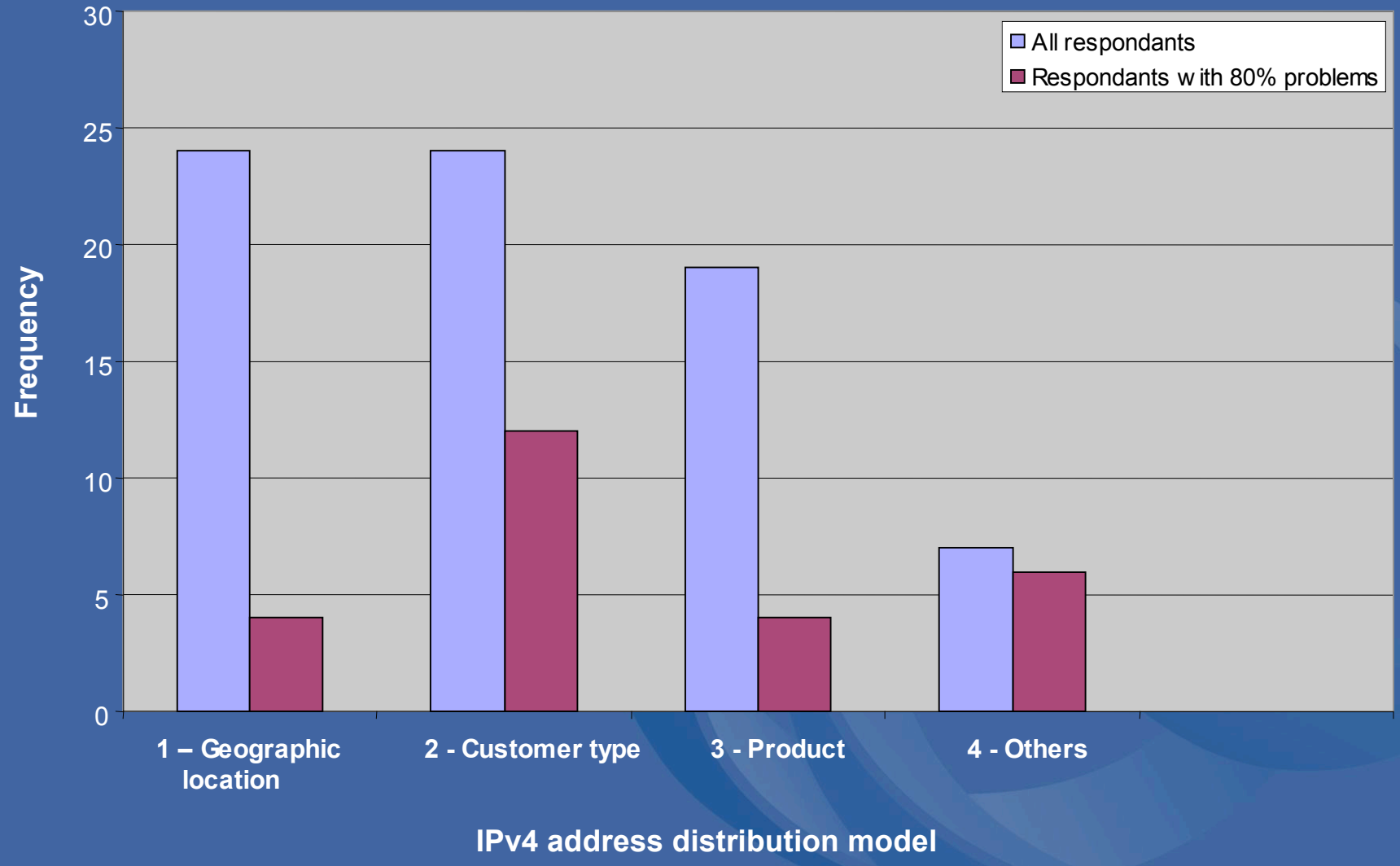
Service categories



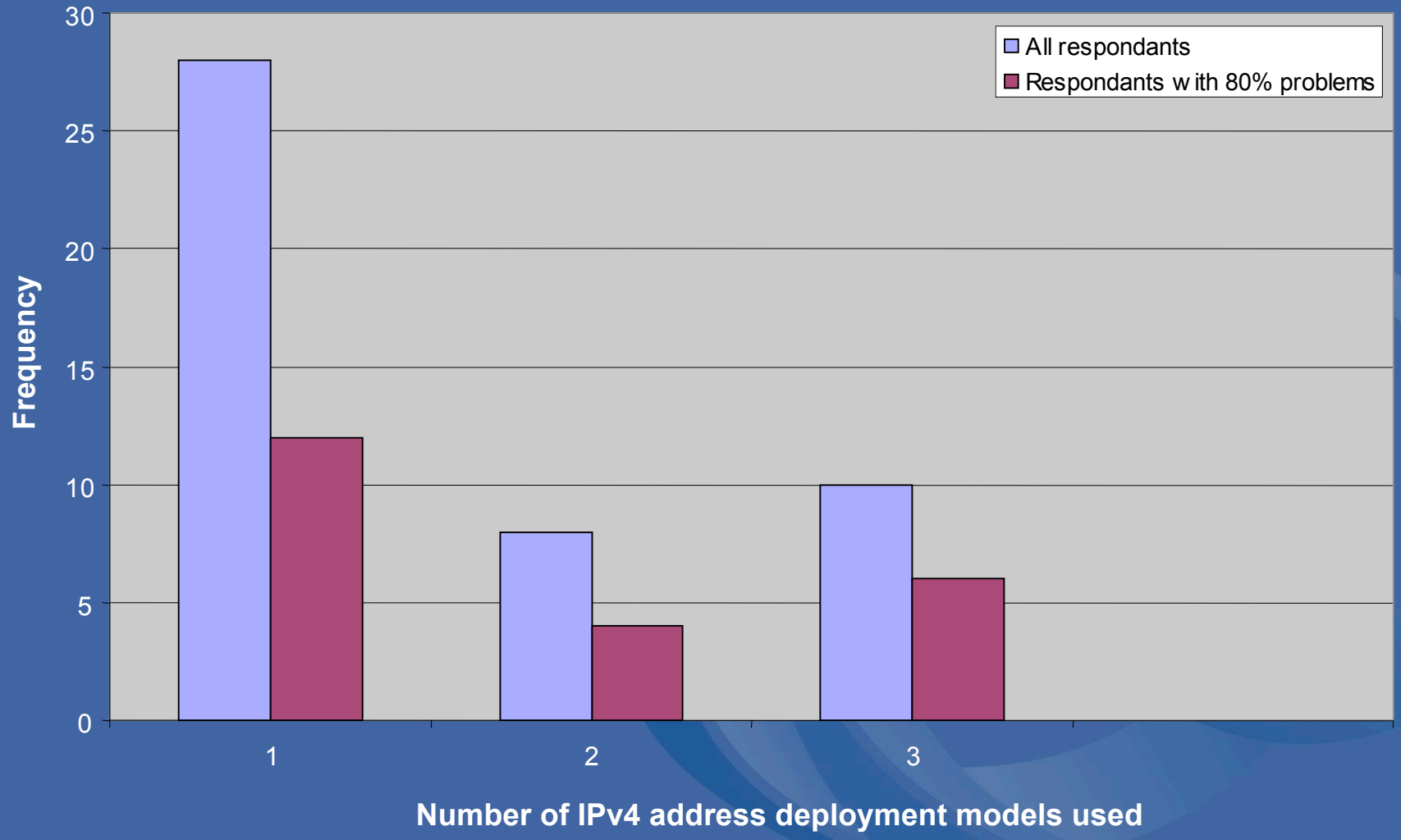
Number of service categories offered



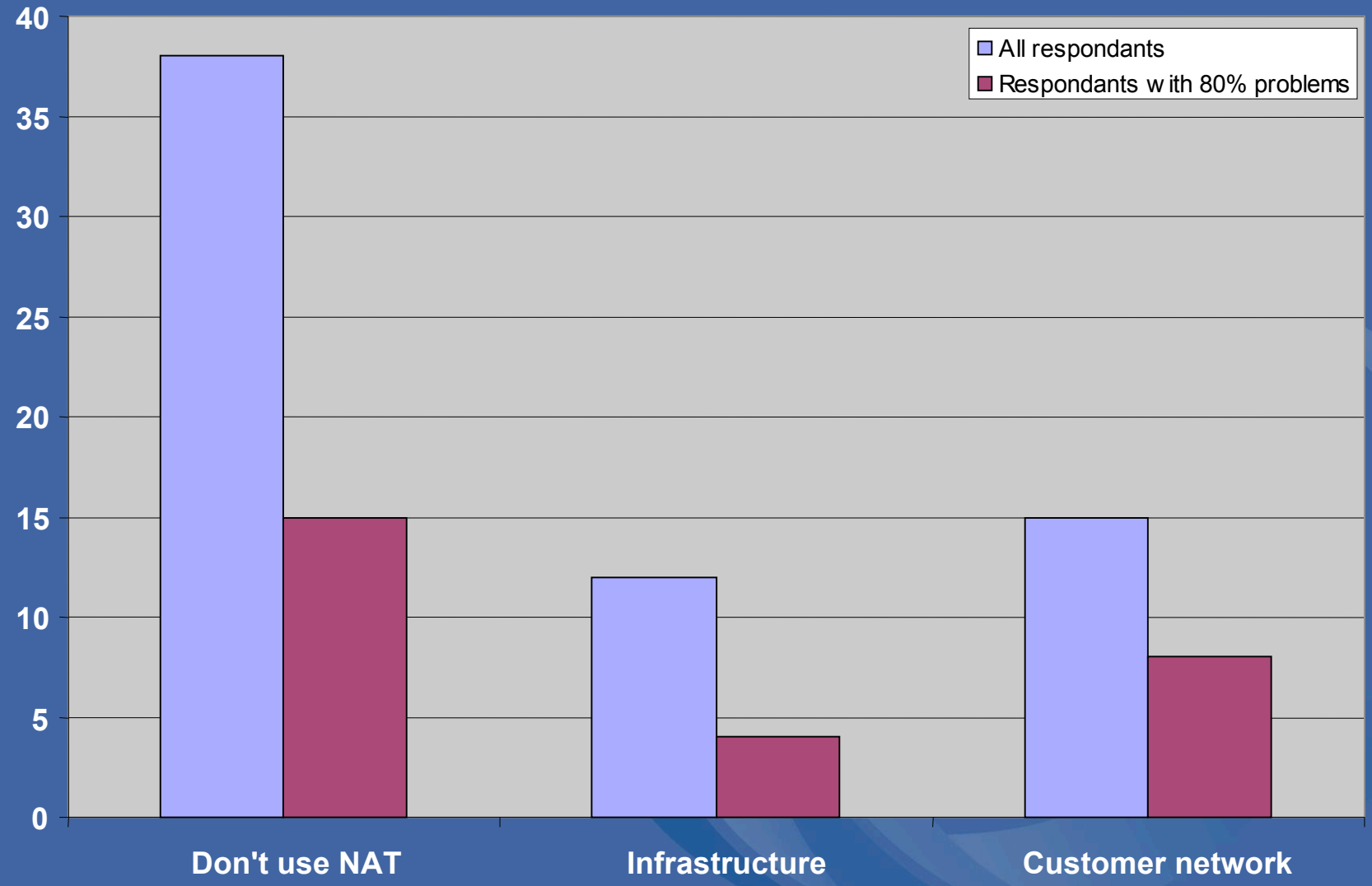
Address distribution models



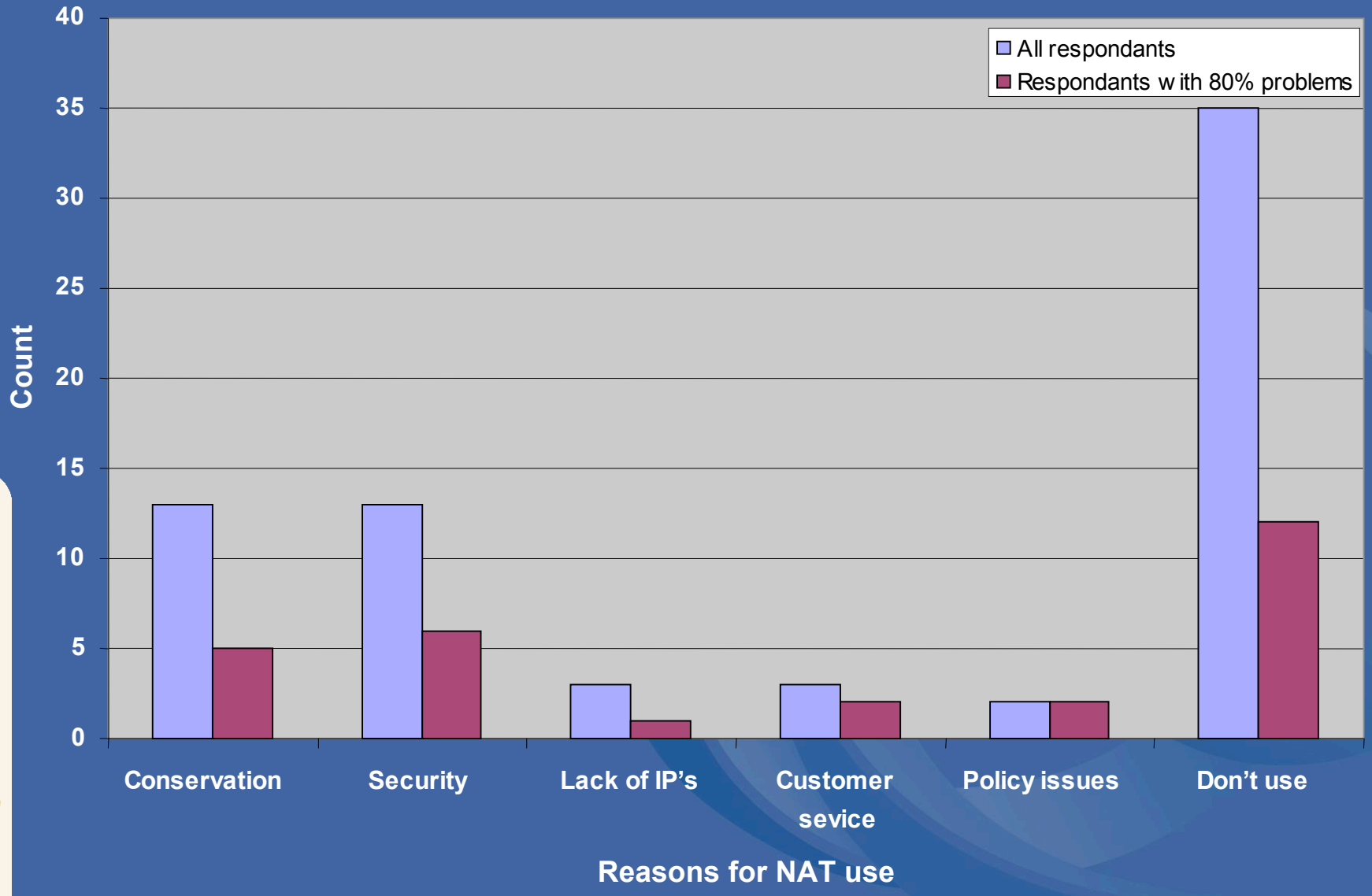
No. of address distribution models used



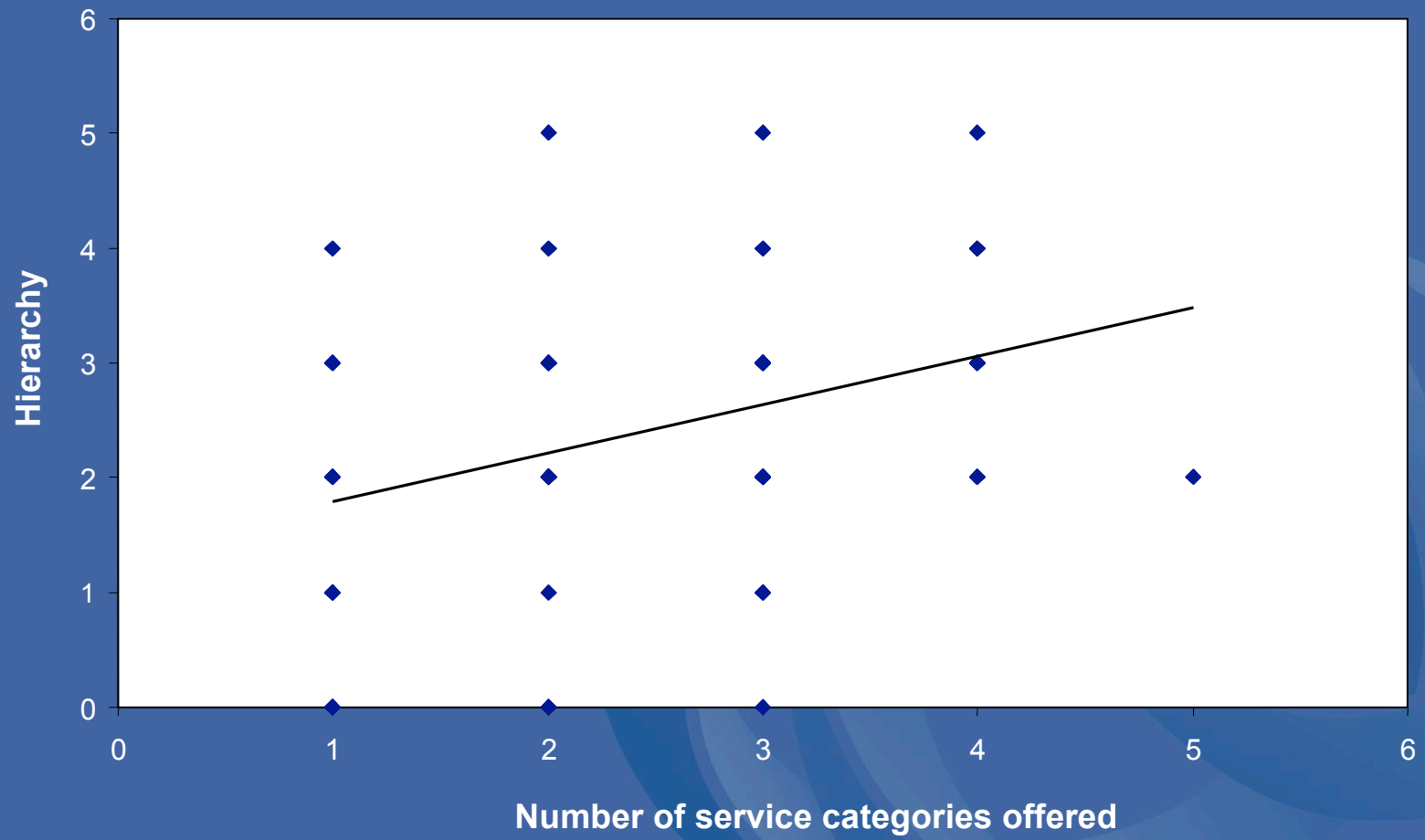
Types of NAT use



Reasons for NAT use

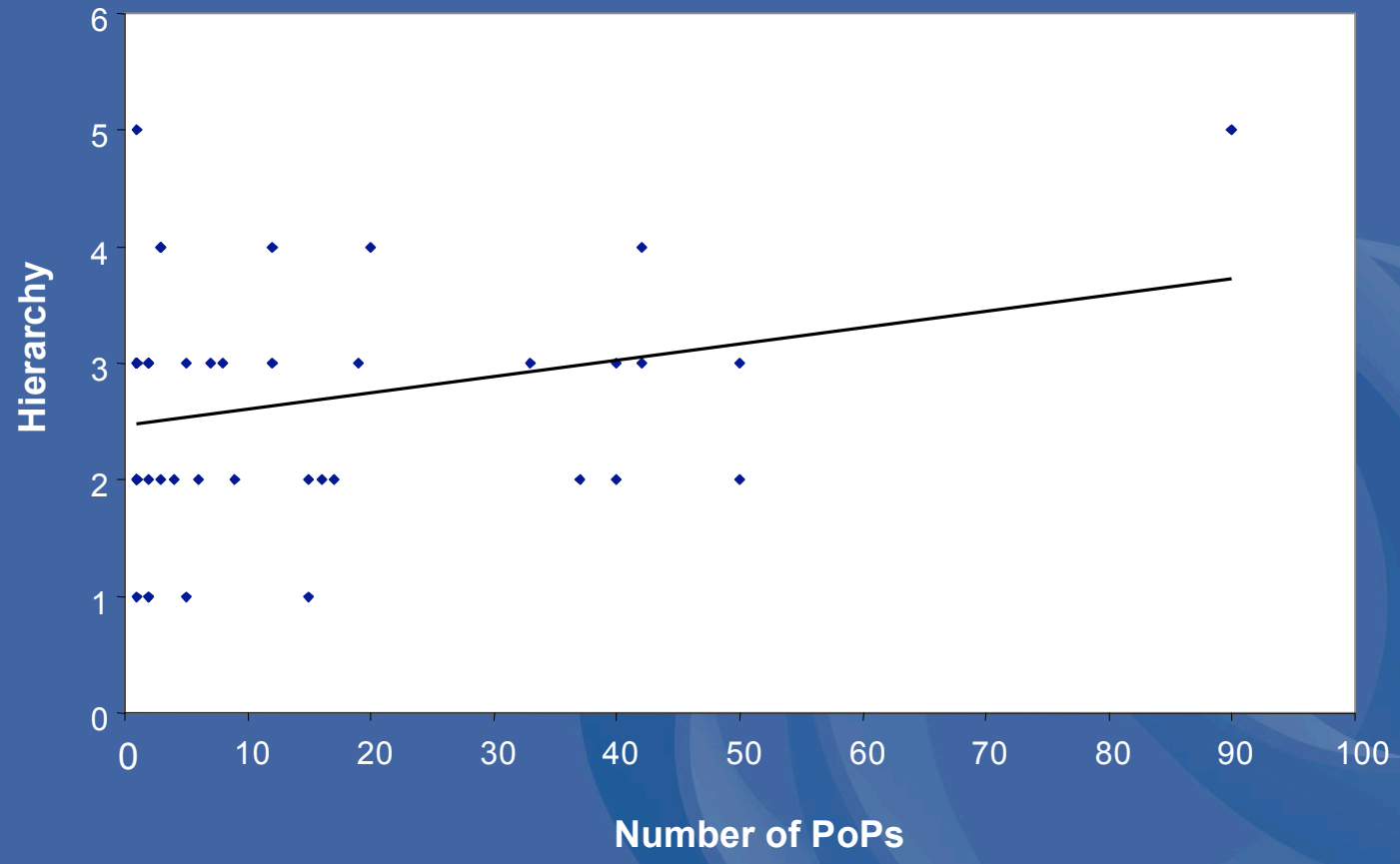


Service types vs hierarchy



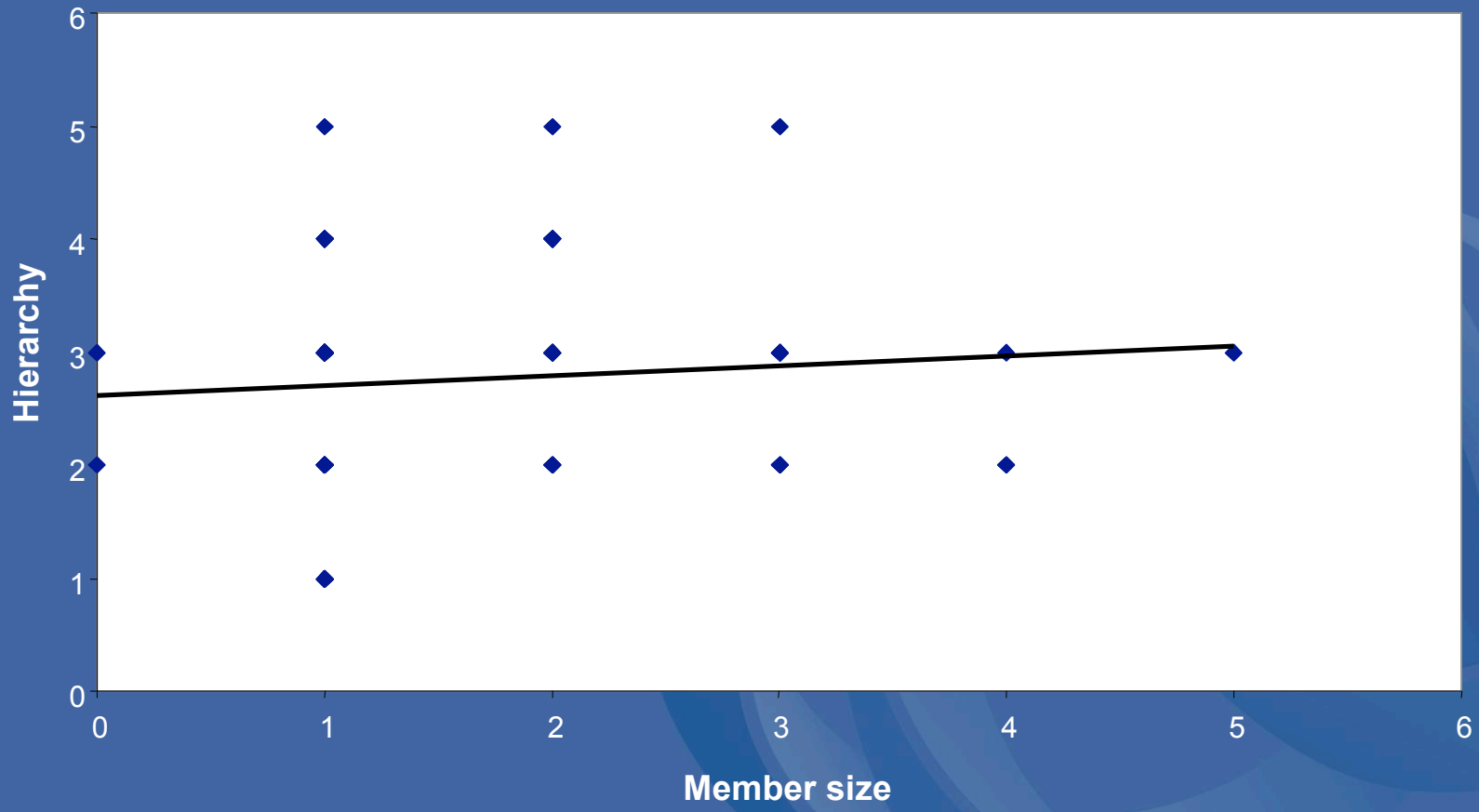
Weak trend: more services types implies more hierarchy

PoPs vs hierarchy



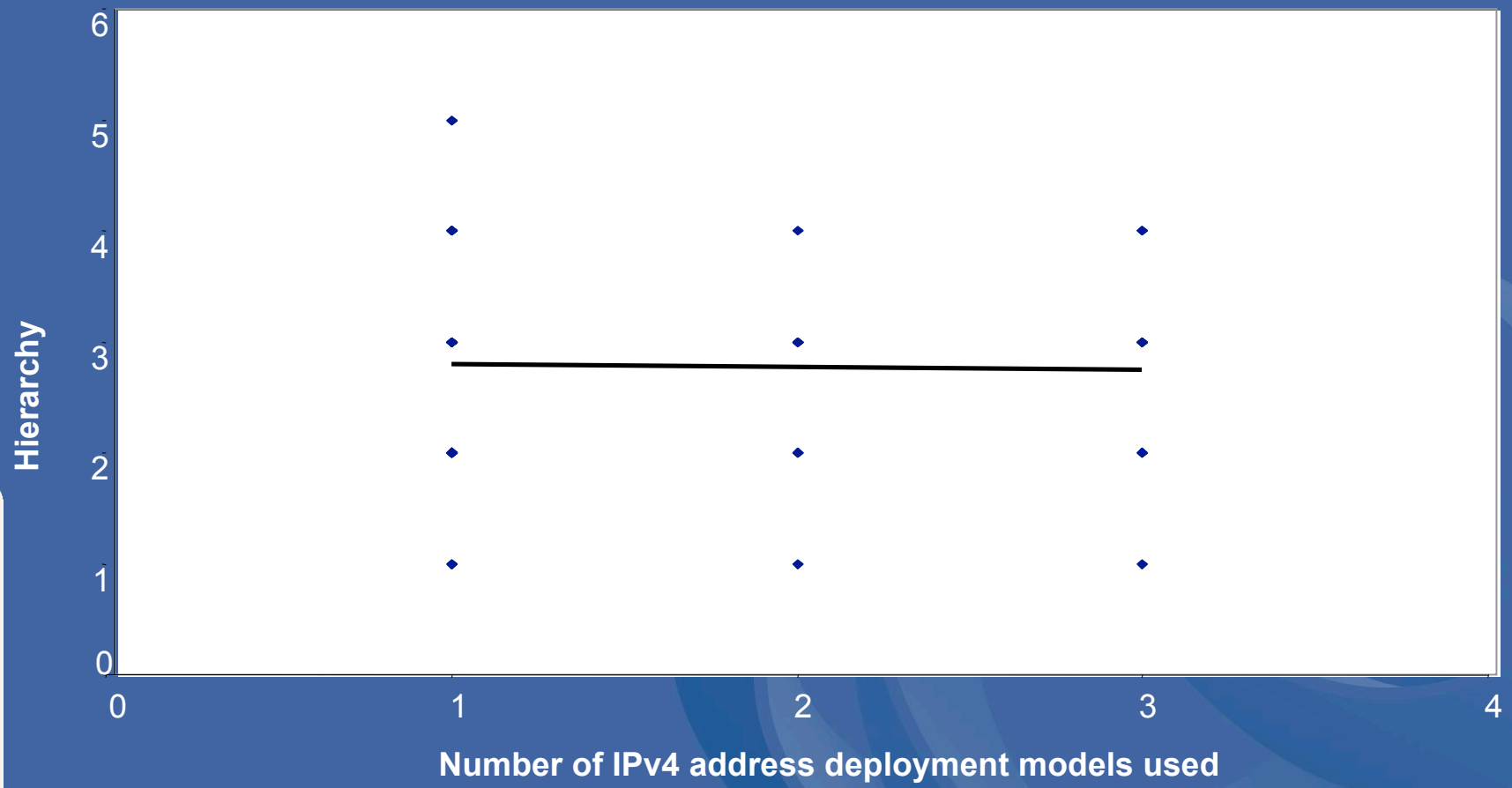
Weak trend: more PoPs require more hierarchy

Member size vs hierarchy



No strong trend. All member-sizes have range of hierarchies

Address deployment vs hierarchy



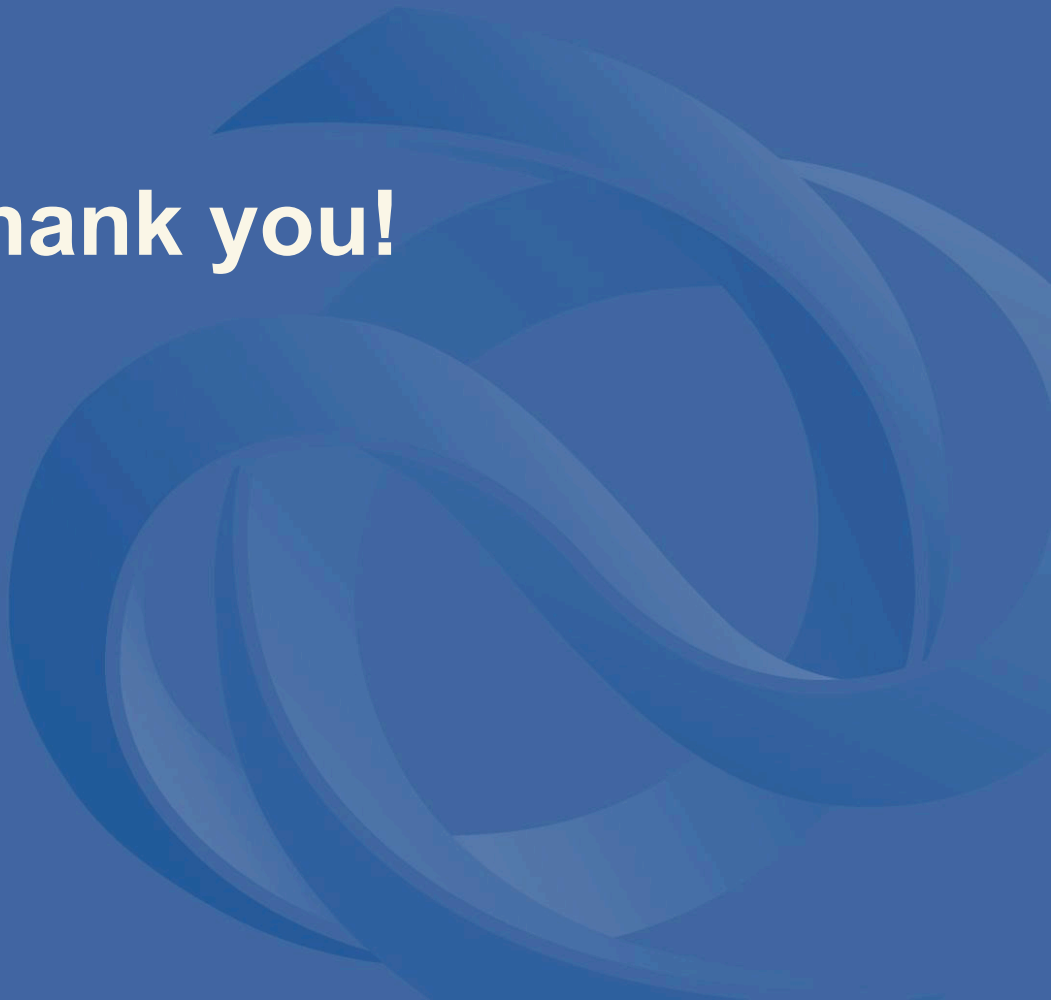
No Trend. Range of address deployment models used

Conclusion from survey

- Total of 40% reported problems reaching 80% utilisation
- No correlation between problems and network size or complexity
  - –Measured as
    - No. of PoPs
    - No. of services deployed
    - No. of levels of hierarchy

Next steps?

- Do we need to widen the sample size?
- Should this proposal cease?
- Continue discussions on the list?
- Wait and see - situations in other RIRs

Questions?

Thank you!