



IPv6

Some Observations

Daniel Karrenberg
Chief Scientist

RIPE NCC

IPv6 is Becoming Relevant

Anecdote !

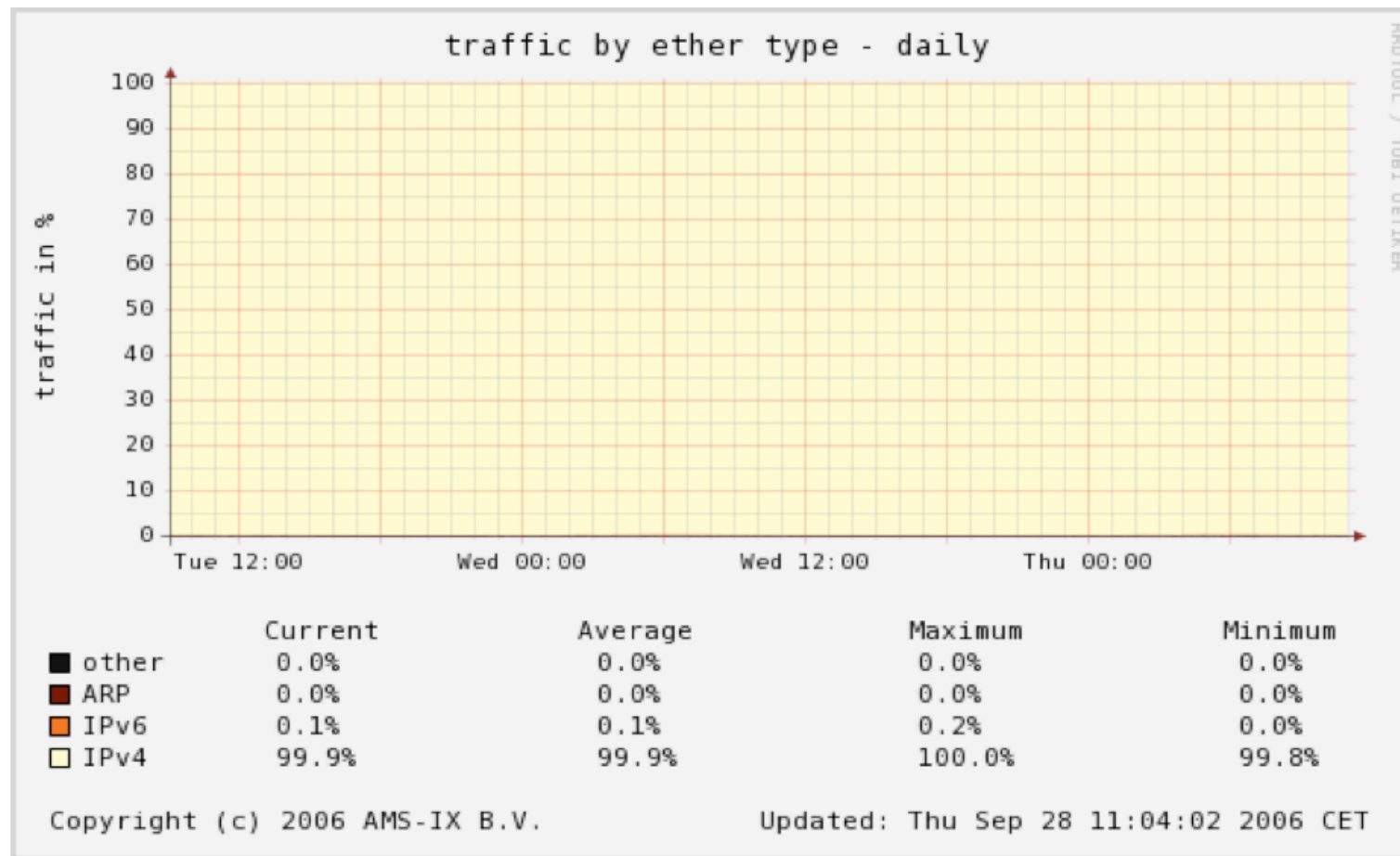
Breakage in the Karrenberg household **IPv4 only** network.

“Dad I cannot play my music anymore !”





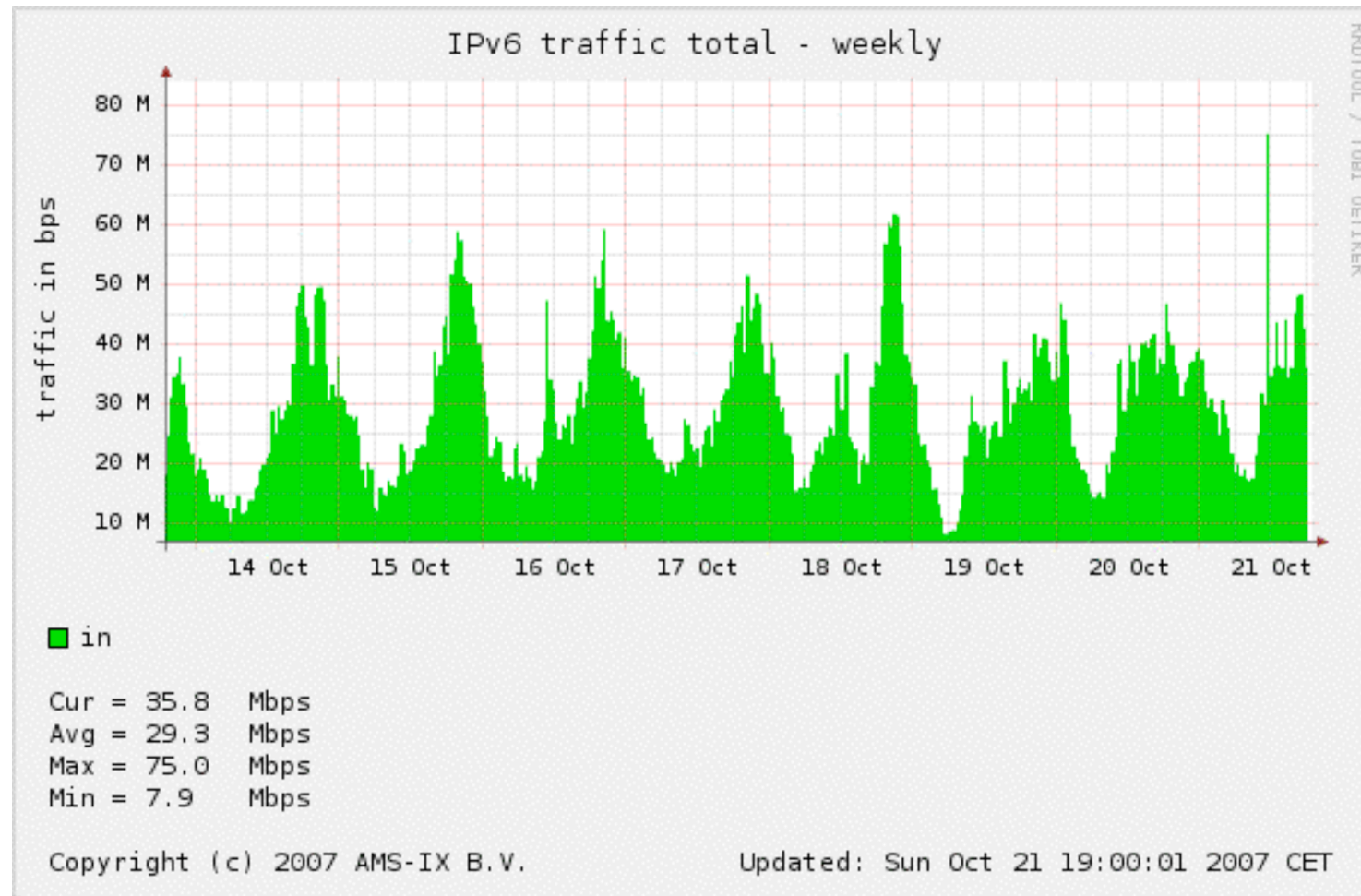
On the Amsterdam Internet Exchange



- IPv6 Invisible on the Chart, 0.1% of all packets on average



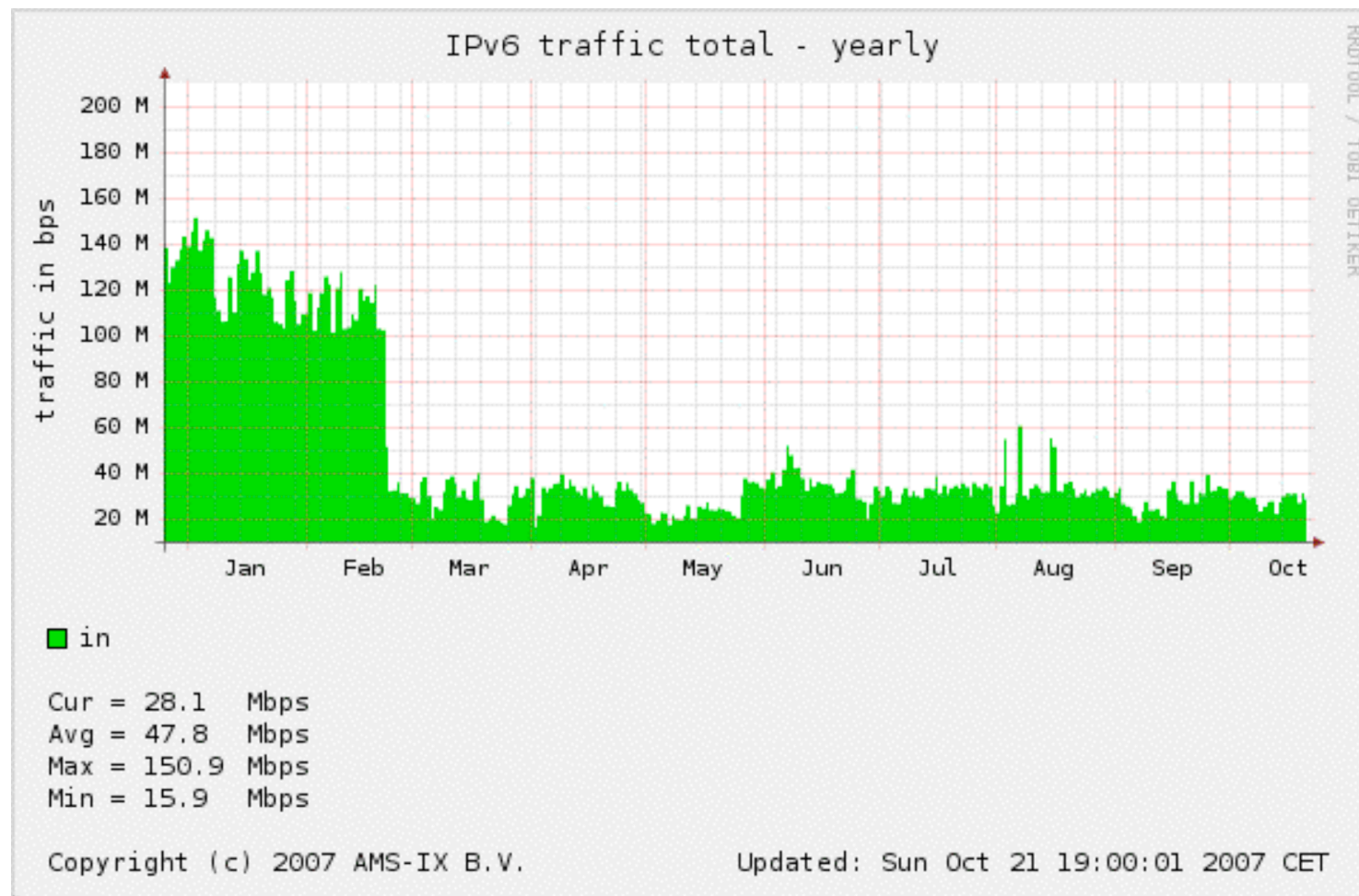
On the Amsterdam Internet Exchange



- **Peak** IPv6 traffic ~ 8 high speed DSL connections



On the Amsterdam Internet Exchange



- It went down, not up. End of free news via IPv6 by xs4all?

Why IPv6 ?

- **Not**

- Security
- Functionality
- Better Routing
- New Applications
- ...

- **Only !!!!**

- **More Address Space**

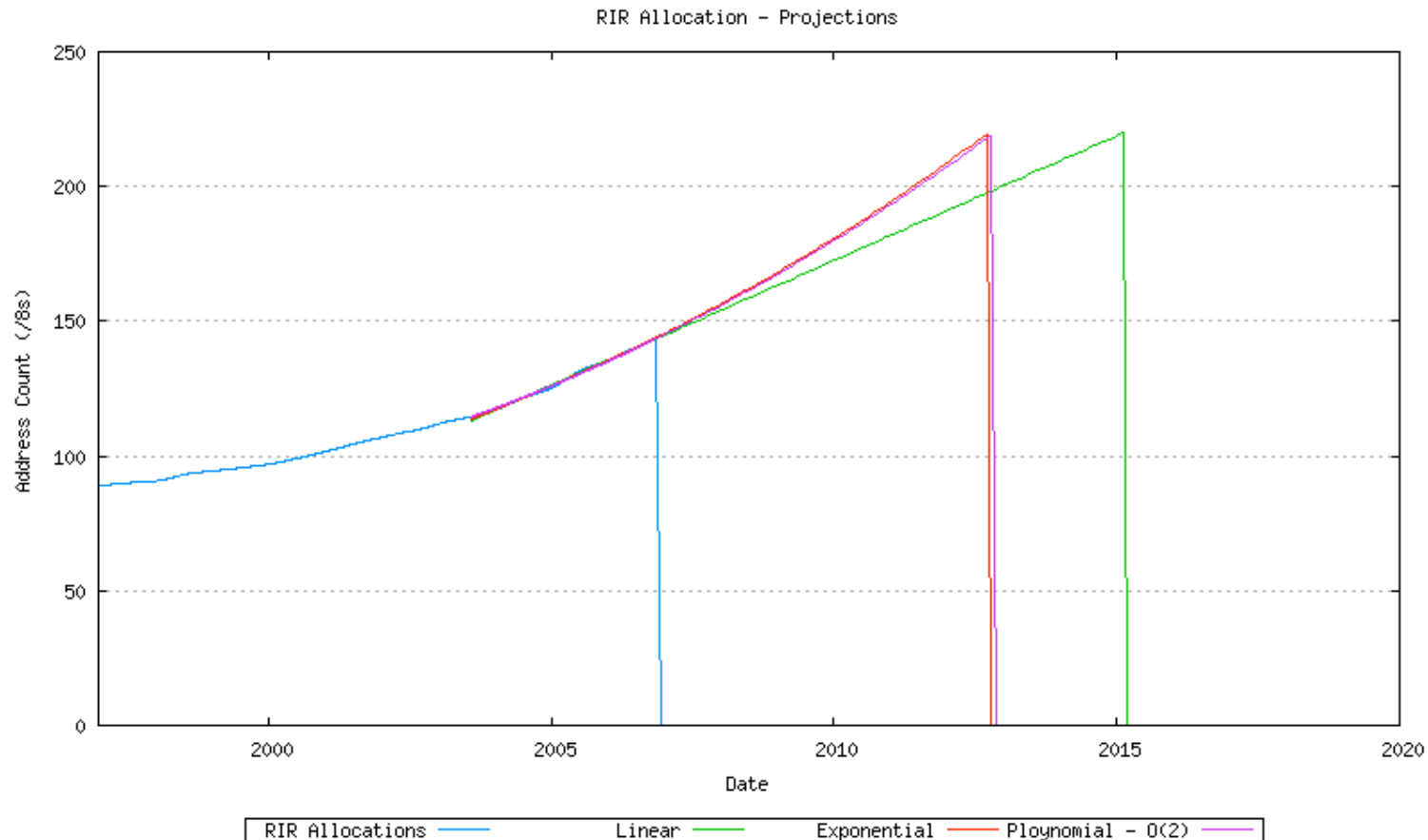


Why Deploy IPv6 ?

Cost vs Cost

- Cost of obtaining IPv4 address space
 - Cost of designing and deploying IPv4 network
 - Cost of operating IPv4 network
- Cost of obtaining IPv6 address space
 - Cost of designing and deploying IPv6 network
 - Cost of operating IPv6 network

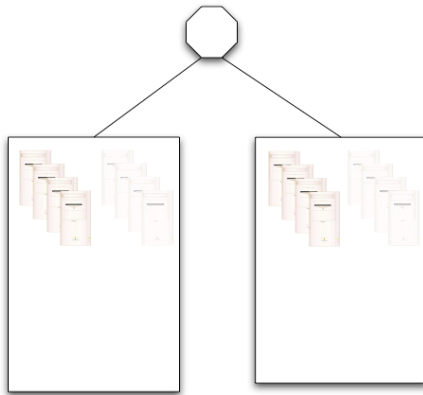
Cost of Obtaining IPv4 Address Space ?



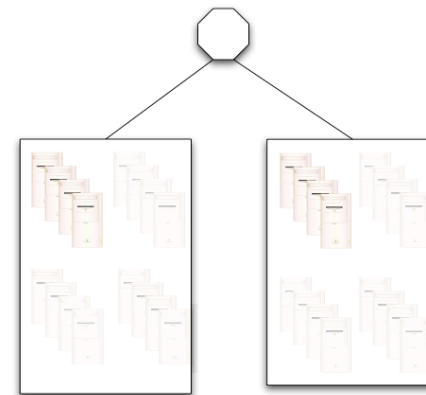
- Predicting the future is easy, getting it right is the hard part
- For full understanding read <http://www.potaroo.net/tools/ipv4> !

Address Space and Network Design

Little Address Space



Much Address Space



- More address space allows more flexible network design
 - Potential savings in design, deployment and operational costs
- This is about layer 3 design



Costs of Operating IPv6 Networks

- Where is my NAT ?
 - Nowhere, that is the whole point !
 - “But I ***need*** my NAT !”
- Where is my Firewall ?
 - Anecdote
 - Gotchas, do not forget those \$@\$!@ middle boxes !
- Dual Stack
 - Double everything ?
 - Add “Gotcha” cost
- Be Aware !



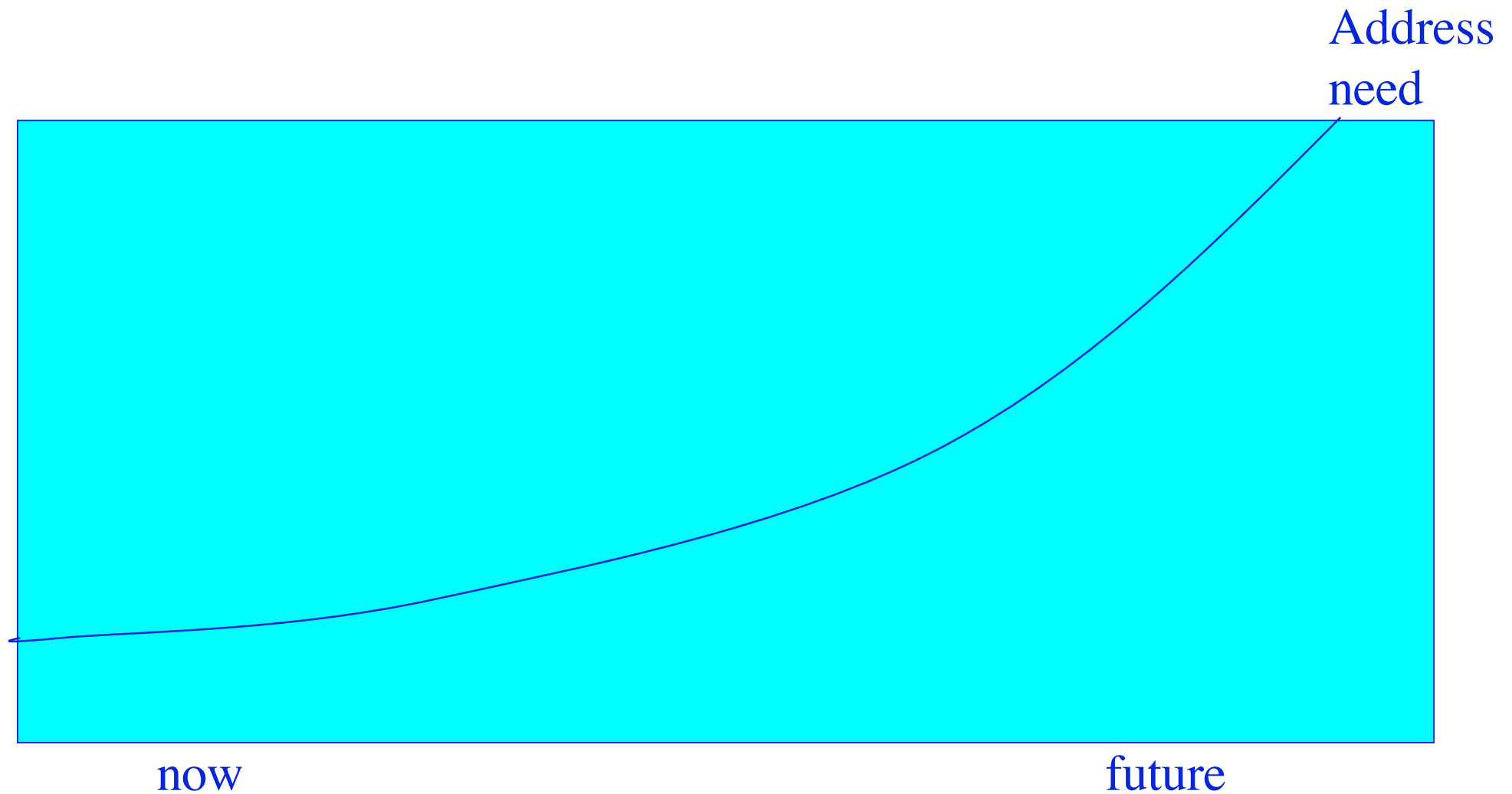
Why Deploy IPv6 ?

Cost vs Cost

- Cost of obtaining IPv4 address space
 - Cost of designing and deploying IPv4 network
 - Cost of operating IPv4 network
- Cost of obtaining IPv6 address space
 - Cost of designing and deploying IPv6 network
 - Cost of operating IPv6 network

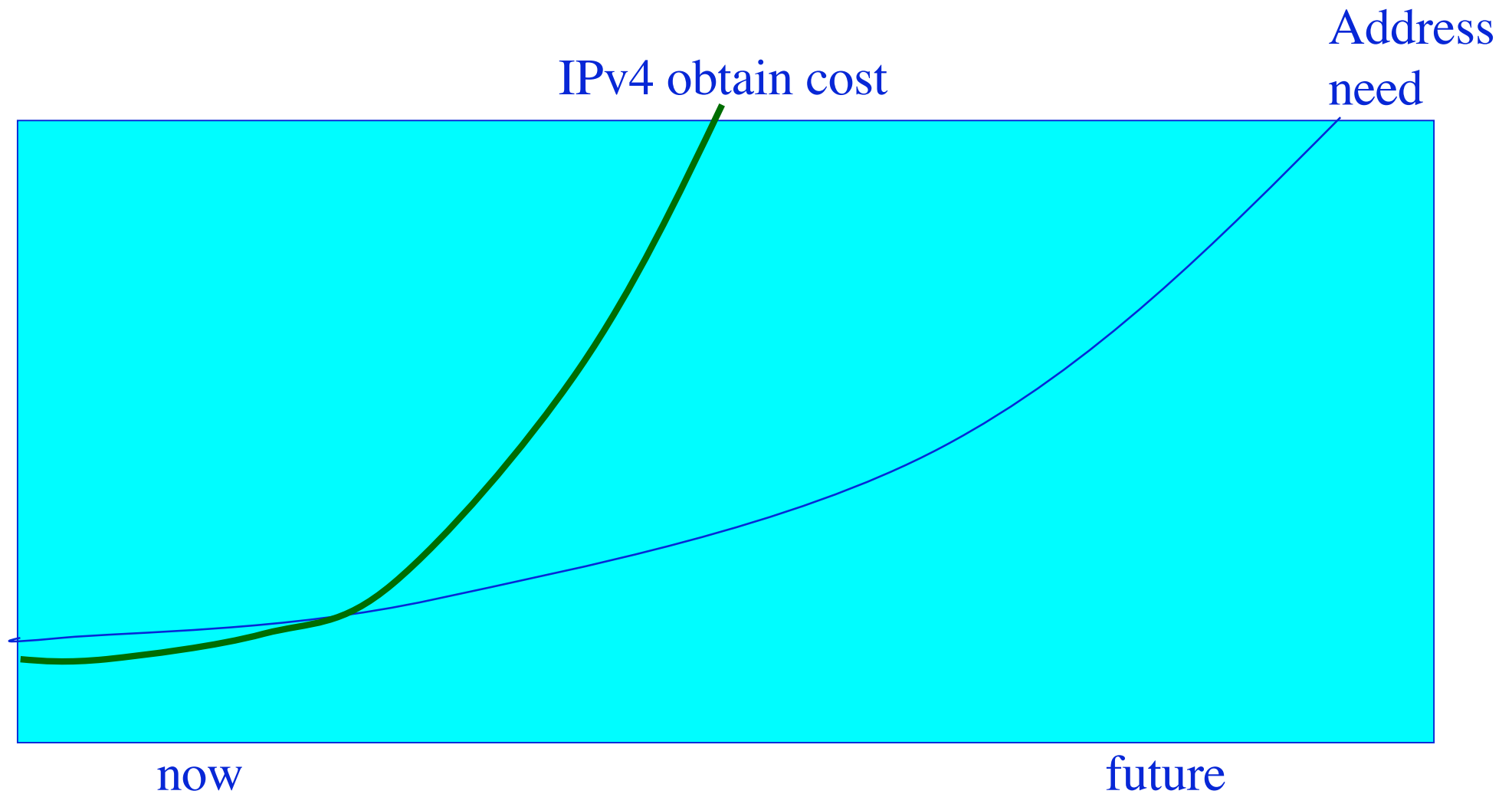


Olaf's Crystal ball view

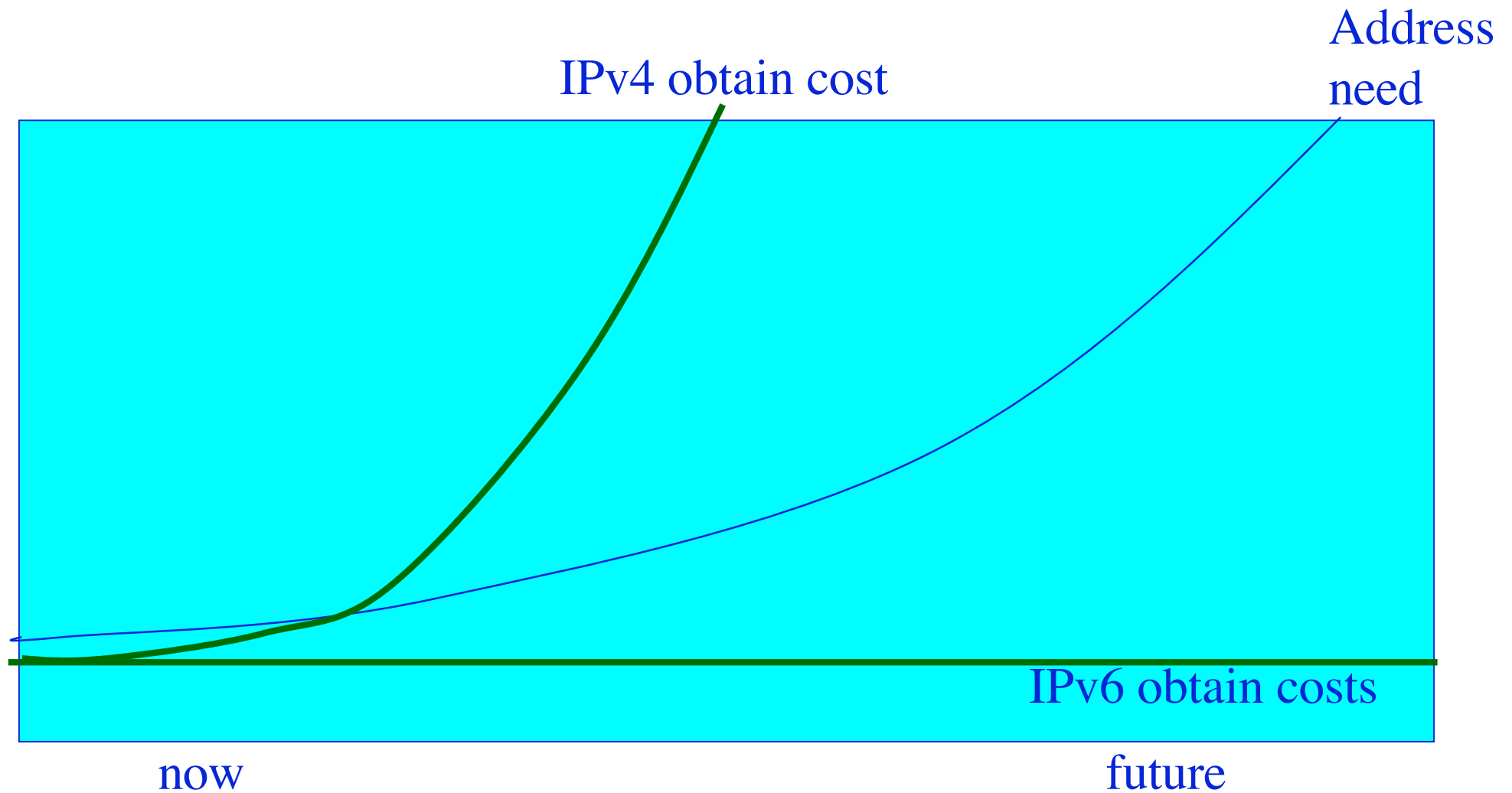




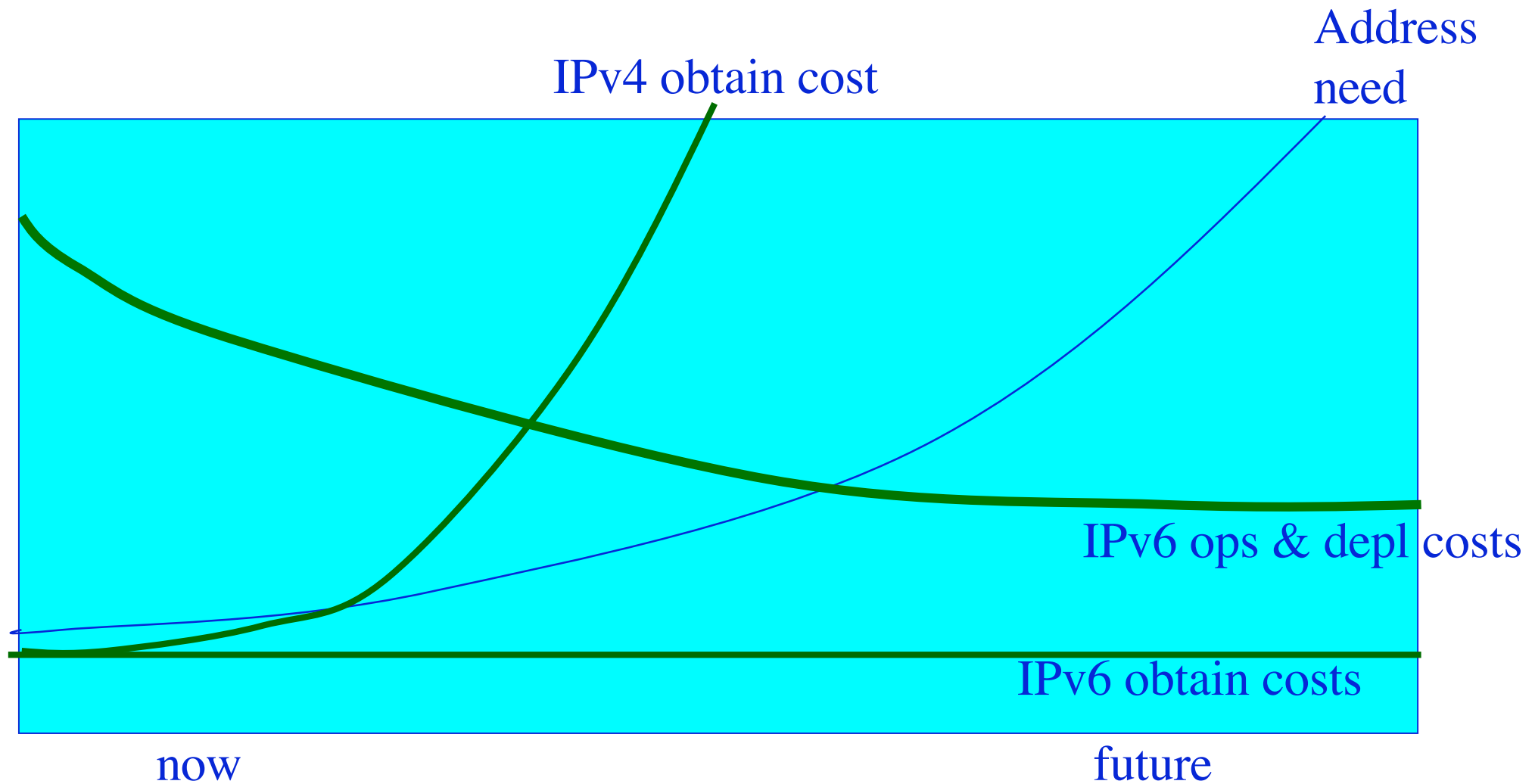
Olaf's Crystal ball view



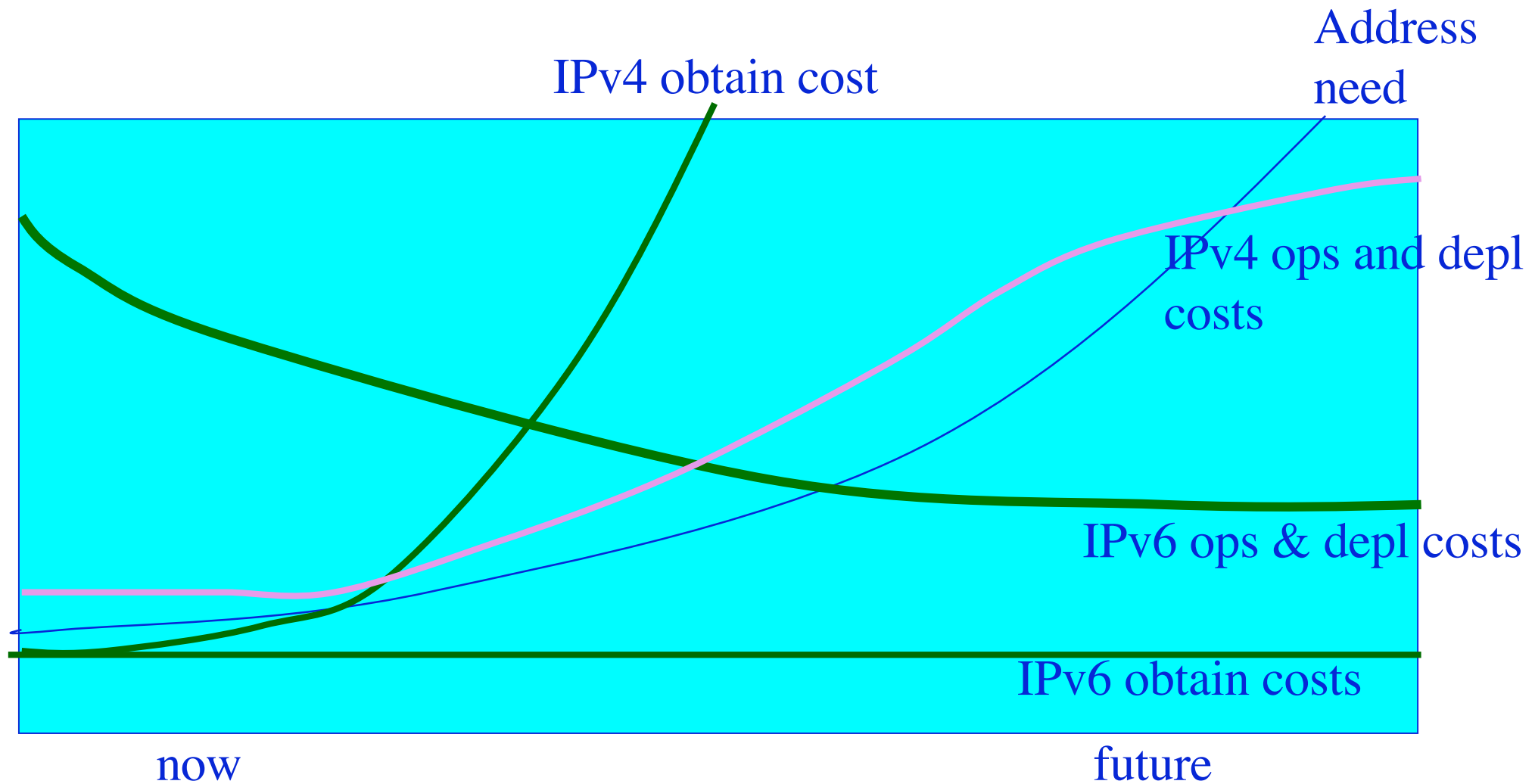
Olaf's Crystal ball view



Olaf's Crystal ball view



Olaf's Crystal ball view





Free Advice

Think, prepare and plan now !

To change and deploy in panic mode is *expensive* !

Think, prepare and plan now !



Questions?