A strategic approach to IPv6

Dave Wilson

DW238-RIPE

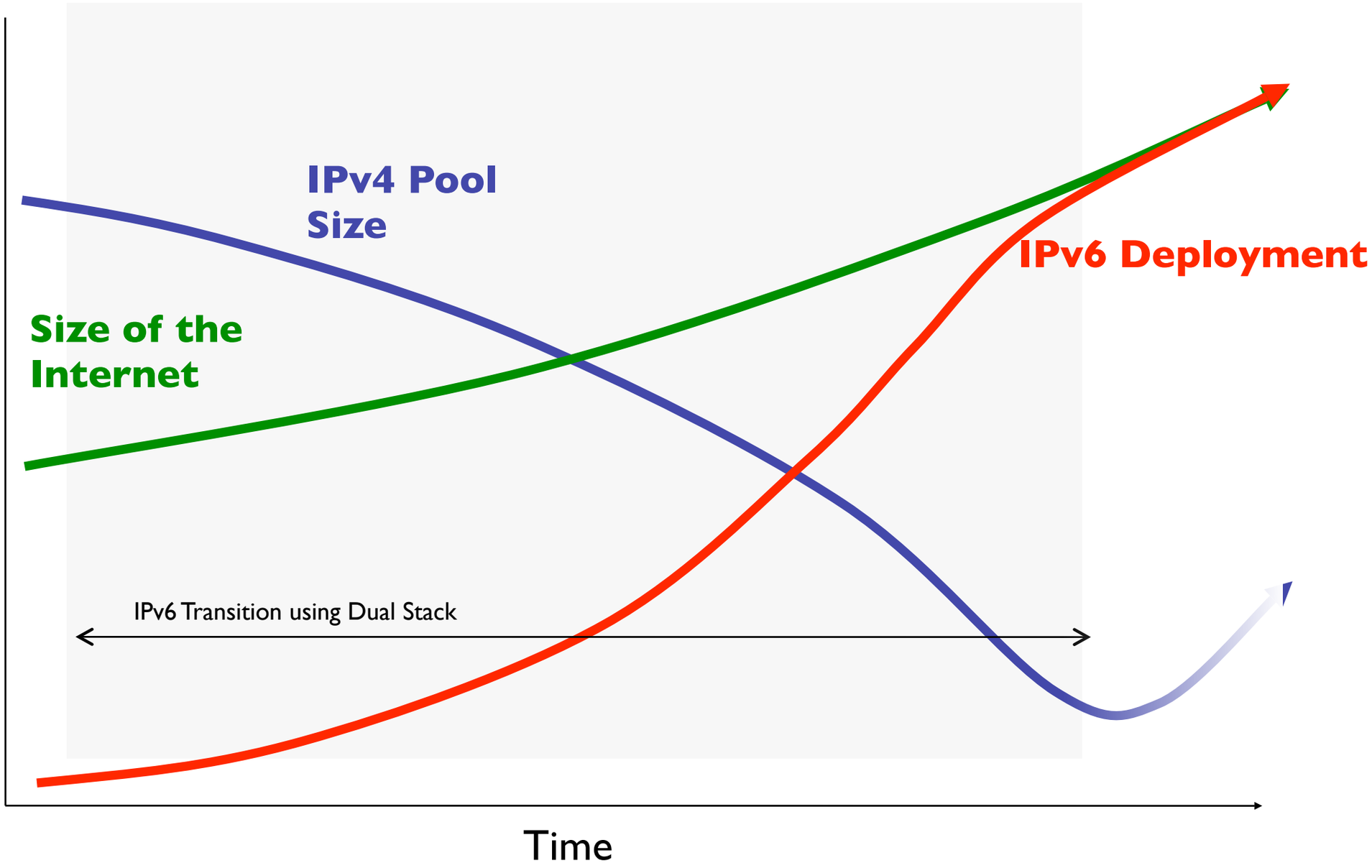
What this talk is (not)

- This is not a talk about HEAnet's ipv6 deployment
  - We finished several years ago.

- This is about what comes after.

What's the problem?

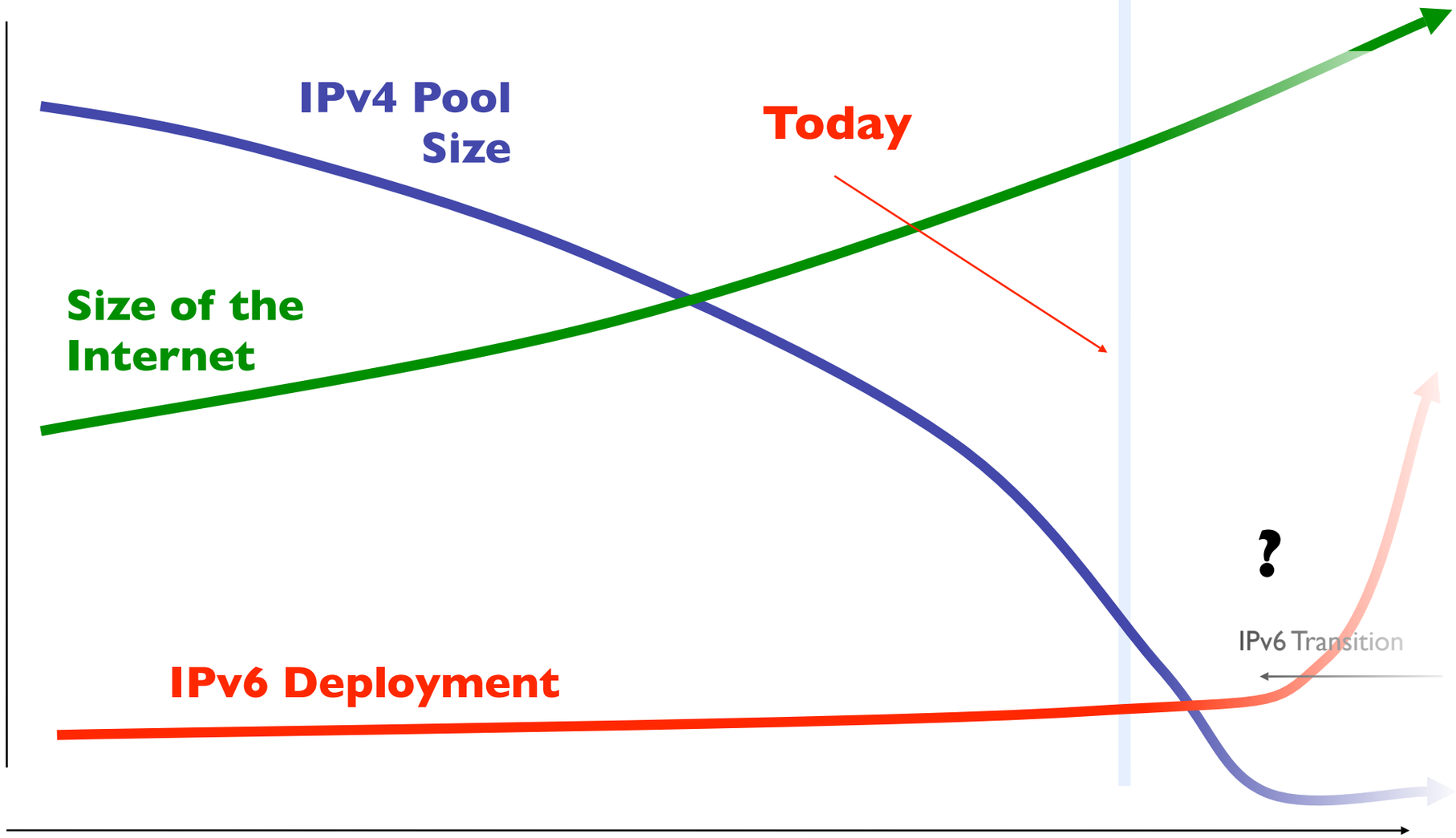
This is how we pictured the transition 15 years ago:



Geoff Huston, www.potaroo.net

Transition plan

This is where we are now:



Geoff Huston, www.potaroo.net

The gap

So the problem we face
is the gap between
the end of the old way (IPv4)
and the start of universal IPv6

The gap

So the problem we face
is the gap between
the end of the old way (IPv4)
and the start of universal IPv6

- We need to deal with IPv4 depletion
  - IPv6 won't save us in time
- We need to prepare for IPv6-only world
- We need to shorten the gap as much as possible

Three strands

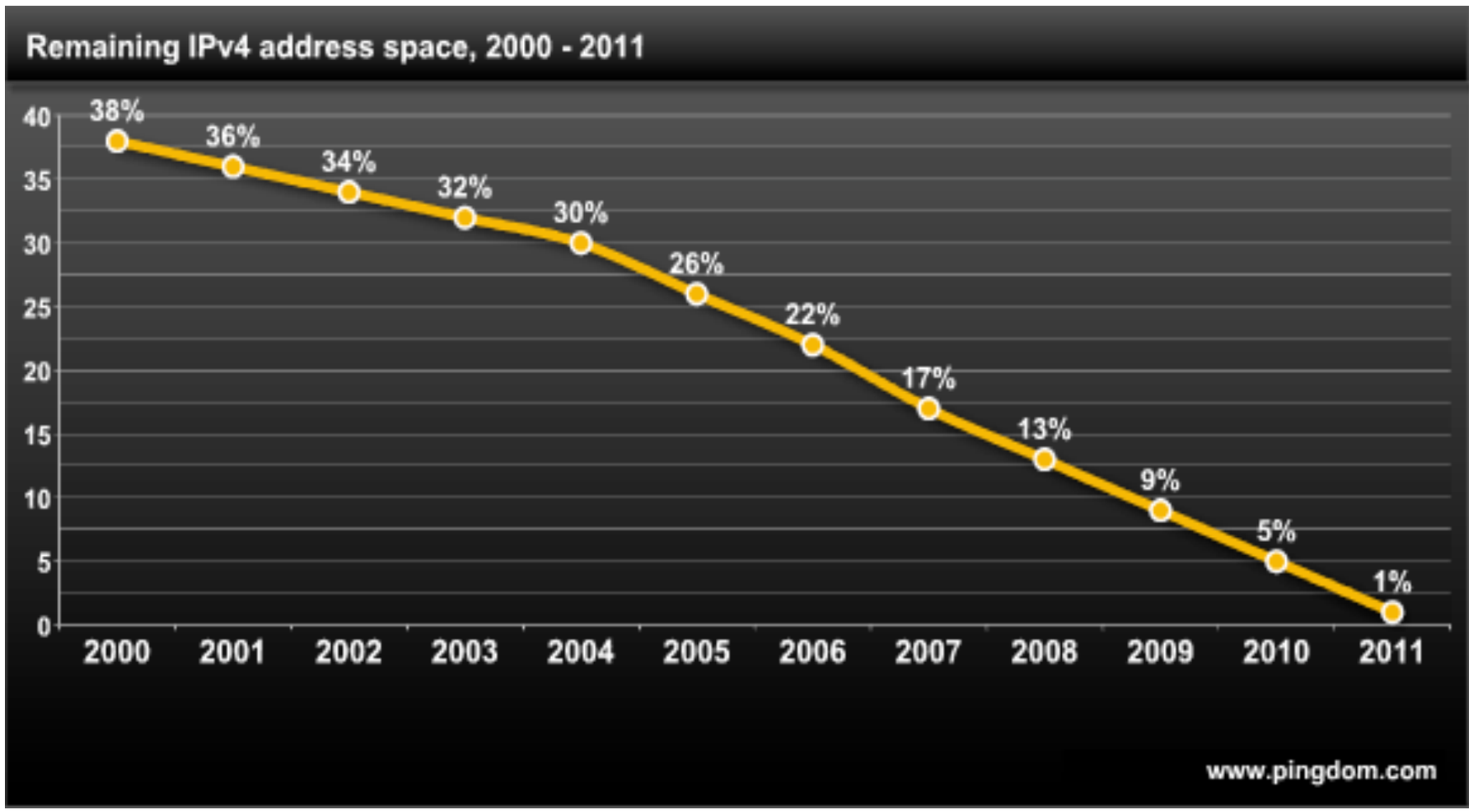
1. IPv4 depletion

2. Truly IPv6-only service (with IPv4 interop)

3. Supporting our customers & partners

What do we do about IPv4?

Bring it home with a graph



- Projections are converging on ~2011
- Immediacy of problem depends on rate of usage
- This can escalate into a crisis

Fixing IPv4

Fixing IPv4

- Sure we can find individual solutions for...
  - –SSL web servers
  - –Videoconferencing
  - –Providing VPNs
  - –Email for individual customers (so one doesn't cause another to be blacklisted)
- Can we really do all this at the same time?
- Our objective is a smooth, stable transition

We've done this before

We've done this before

Coordinate

Plan for this strand is...

- List everything we do
- Work out its needs for coming five years
- Pick a workaround if we can't meet those needs
- Then make all workarounds mutually achieveable

	A	B	C	D	E	F	G
1			Responsible team	Responsible person	Future address requirements known	Workarounds required	Workarounds implemented
2	**IP Transit**						
3		Service Resilience	NetOps/MNS	GL + ?			
4			NetOps/MNS	OB + GL			
5		Colocation IP transit	NetOps/MNS	GM + ?			
6	**Colocation**	High performance storage		JH			
7		KVM access		JH			
8		PDU control		KD			
9	**Website hosting**			JB			
10		Website failover protection		JB			
11	**Website hot standby**			OB			
12	**Software Mirroring**			RG			
13	**LIR IPv4 function**			BB			
14	**Traffic graphs (throughput, latency)**		NetOps	COC			
15	**Sixxs Tunnels**			OMG			
16	**LISTSERV**			JR			
17	**.ie DNS registration**			RG			
18	**DNS hosting**			RG			
19	**Usenet news**			JR			
20	**NTP**		NetOps/MNS	BN + RG			
21	**DNS Resolving**			RG			
22	**Antispam RBL**		NetOps	BN			
23	**Security scanning**			AC			
24	**Secure certificate service**			AC			
25	**IPv4 Multicast**		NetOps	DL			

Strand 1

- Obviously these plans will be subject to change
  - Business opportunities, pressures, changes
  - Winds of time and fate
  - "Oh, I forgot about that"

- Gets us a first look at how we're doing compared to the availability of space

- Gets us thinking about what might have to go, or what might have to change

What do we do about IPv4?

2

What do we need to do with IPv6?

Strand 2

- We have reached a technical milestone
  - Our services are capable of running on IPv6

- This is not endgame.
  Endgame is a working service.

- We can define this service:
  - A working IPv6 internet service, end-to-end,
    with clients, routing and services,
    which interoperates with the IPv4 internet
- Then we can start to unpick it

Strand 2

Strand 2

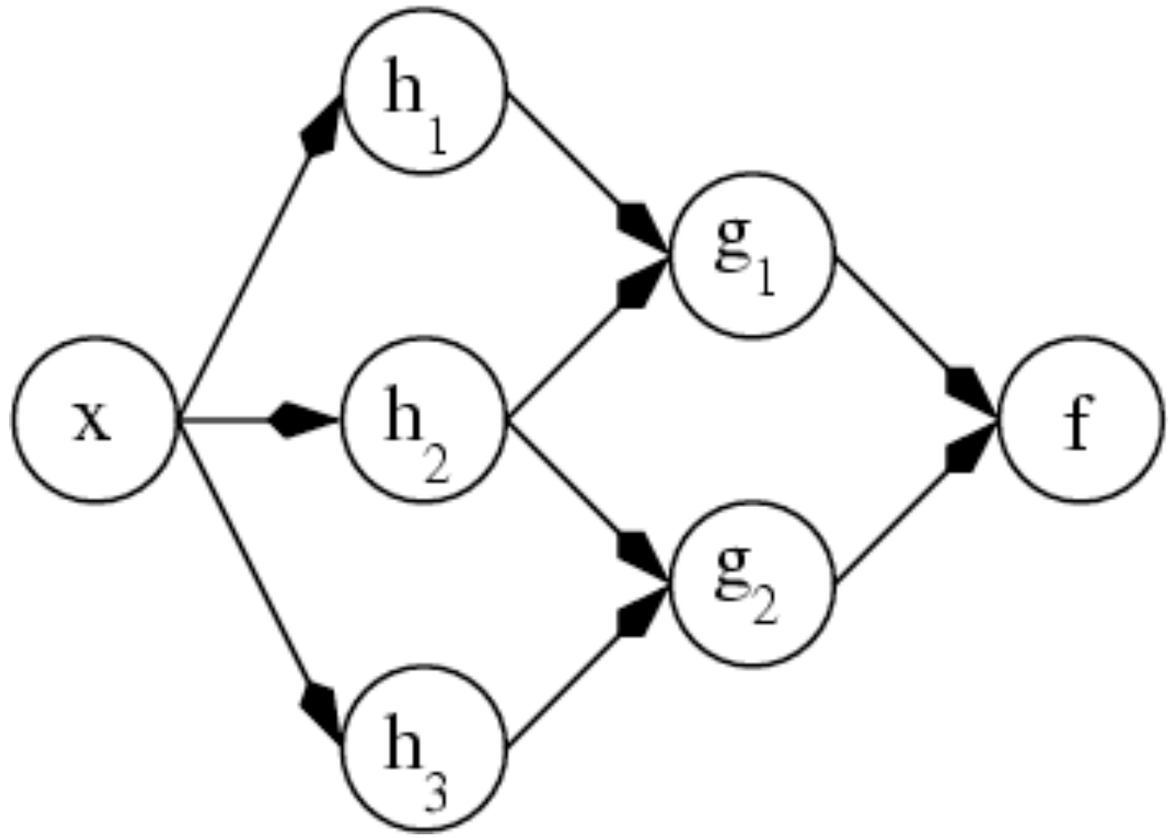
- Why is the IPv6-only part so important?
  It is the definition of our end game.
  Working service.

- This is a big deal.
  We need to plan to turn off IPv4 in finite time.

- Unless we plan for this, we will never reach
  a network independent of IPv4.

Strand 2

- Some dependencies
- Make it work end to end
- Refine them to get to production



2

What do we need to do with IPv6?

3

What do we need to do about the rest of the world?

Strand 3

- This is where all those dependencies we stripped out of earlier strands start to clutter

- But it also gets the benefit of the work being done in the other two strands
  - It's already started. Hopefully some of you are already making spreadsheets with your IPv4 services.
  - Start to think in terms of compromises on v4 service
  - Start to show measurable progress on a plan toward a real IPv6 only service

Strand 3

- We've been focusing heavily on straw men
  - "I'll deploy IPv6 when www.google.com has a AAAA record"
  - "(please read small print)"
  - "Market demand..."
  - "*Strongly encouraged...*"
  - "If only there was [material of dubious academic value] for free on IPv6, then it would take off"

- The thing that's missing here is any kind of strategy - some plan to reach a goal

My least favourite question

My least favourite question

What's the business case?

My least favourite question

What's the business case?

- Why you do something
- What are the options
- What are the benefits and disbenefits
- What are the timescales and costs
- What are the risks

Strand 3

- Detail our strategy
- Discussion about translation and workarounds
- Identify tools and documentation needed by customers
- Draft business cases
- Showcase IPv6 only service

The plan

- We're working out the compromises in advance if we have no more IPv4 addrs

- We're working out what lies between us and an IPv6 service our customers can use

- Given these, we're working out how to help our customers and suppliers justify the change

Thank you!

dave.wilson@heanet.ie

DW238-RIPE