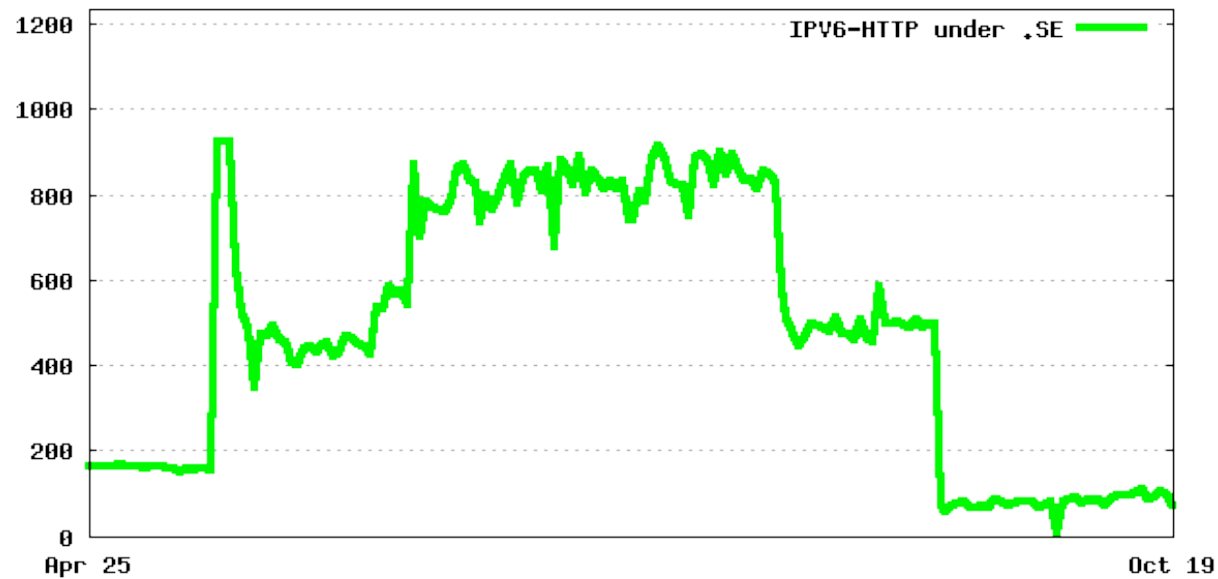# IPv6 usage in Sweden

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How much IPv6 is there?

- Native traffic is per the account from providers non-exiting. Seems supported by other data

- Traffic separated between native, 6to4 and Teredo

- But having an address doesn't generate traffic, so let's try and look at real traffic at sites
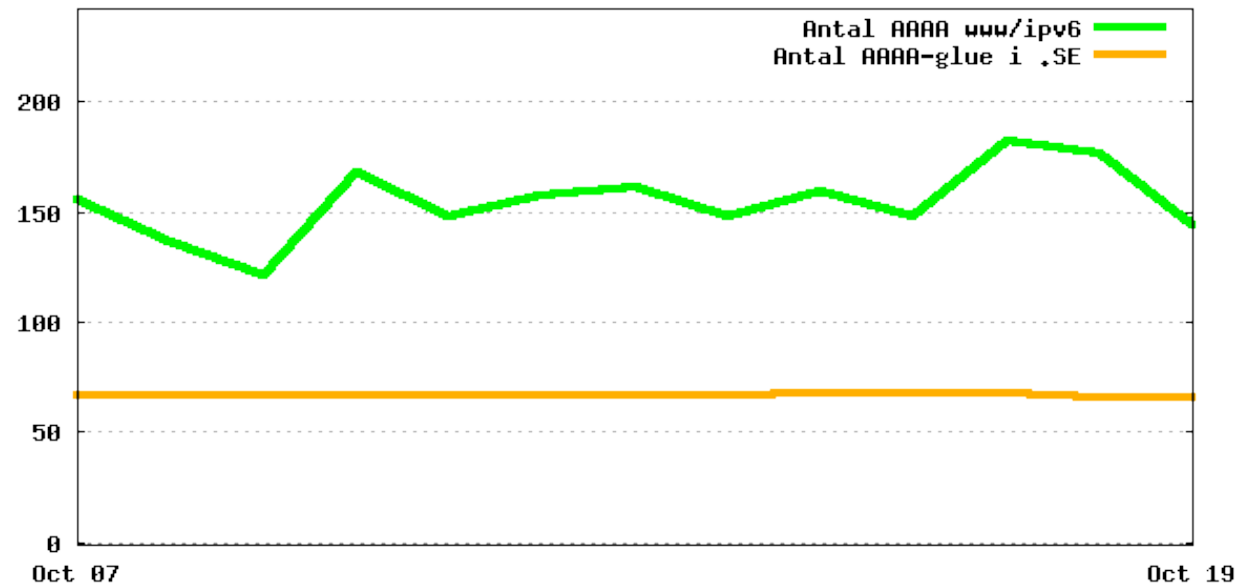
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From .SE stats

Plot av HTTP-servers i IPV6 under .SE

More .SE stats...

Plot av antal AAAA (www/ipv6.domain.se) under .SE

Operator offerings

- A large sub-set is offering trial services for IPv6

  - Delivery methods varies (some native, mostly tunnels)

  - But (mostly) without SLAs

  - But all operators are working on building out IPv6 delivery

  - Missing standardization for broadband networks (xDSL&FTTx) is an issue

Broadband networks

- 5 Municipal fiber networks provide IPv6 services, but not with SLAs and only for testing

  - In addition 5 municipalities in non-owned infrastructure is planning for IPv6

- 3 more have been allocated IPv6 blocks

  - But have so for four years...

- But interest in IPv6 is large

  - But also harmed by the lack of Broadband standards

Operators

- At Netnod we see

  - 24 allocated addresses

  - 15 in use

  - 52 connected networks

- Unfortunately we are not allowed to present traffic data...

View from Operator #1

- 100 Mbps peak for 6to4

- 200 Mbps peak Teredo

- 2 per thousand of peering traffic is IPv6

- Plans for roll out of native IPv6 as soon as possible

View from operator #2

- IPv6 implemented as an overlay network

- No Teredo gateway

- Total traffic is roughly 50Mbps

- Split on Teredo 5%, 6to4 25%, directly 'connected' 70%

View from RIPE stat files

- RIPE NCC has done 57 IPv6 delegations to Swedish providers (1 Supernational)

  - 1 /20

  - 1 /25

  - 37 /32

  - 7 /48 (IX prefixes)

  - 12 prefixes are registered as 32 <> 48 but are either /32s or will be returned to the pool for a larger block

  - There are 300 LIRs in Sweden and 387 ASNs delegated to Sweden
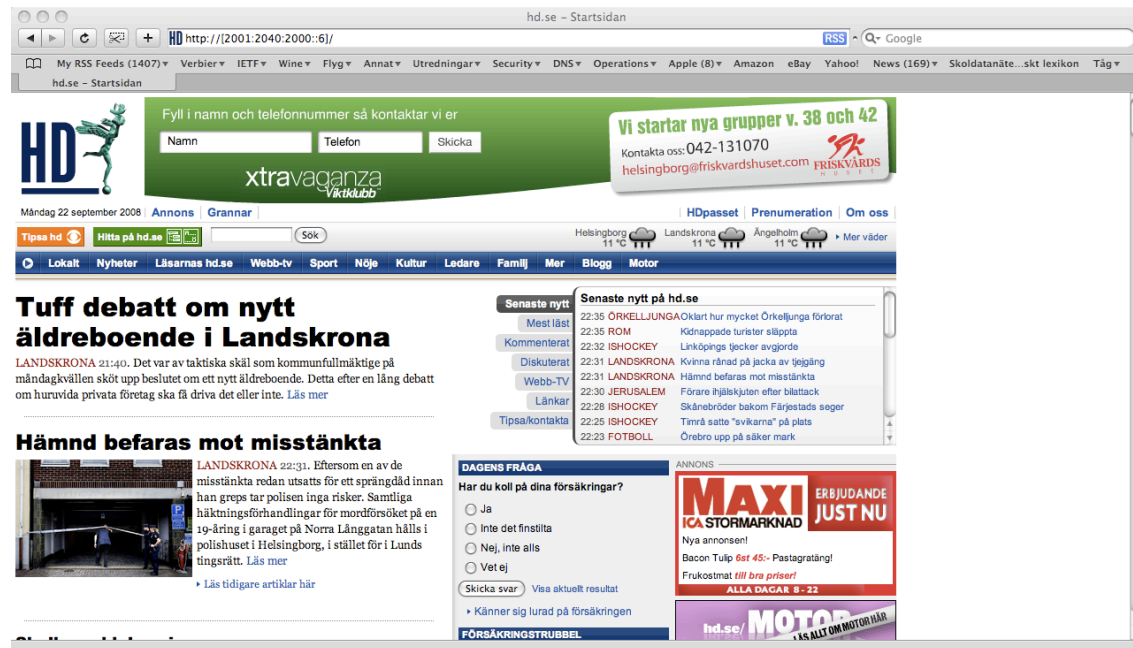
View from RIPE stats files
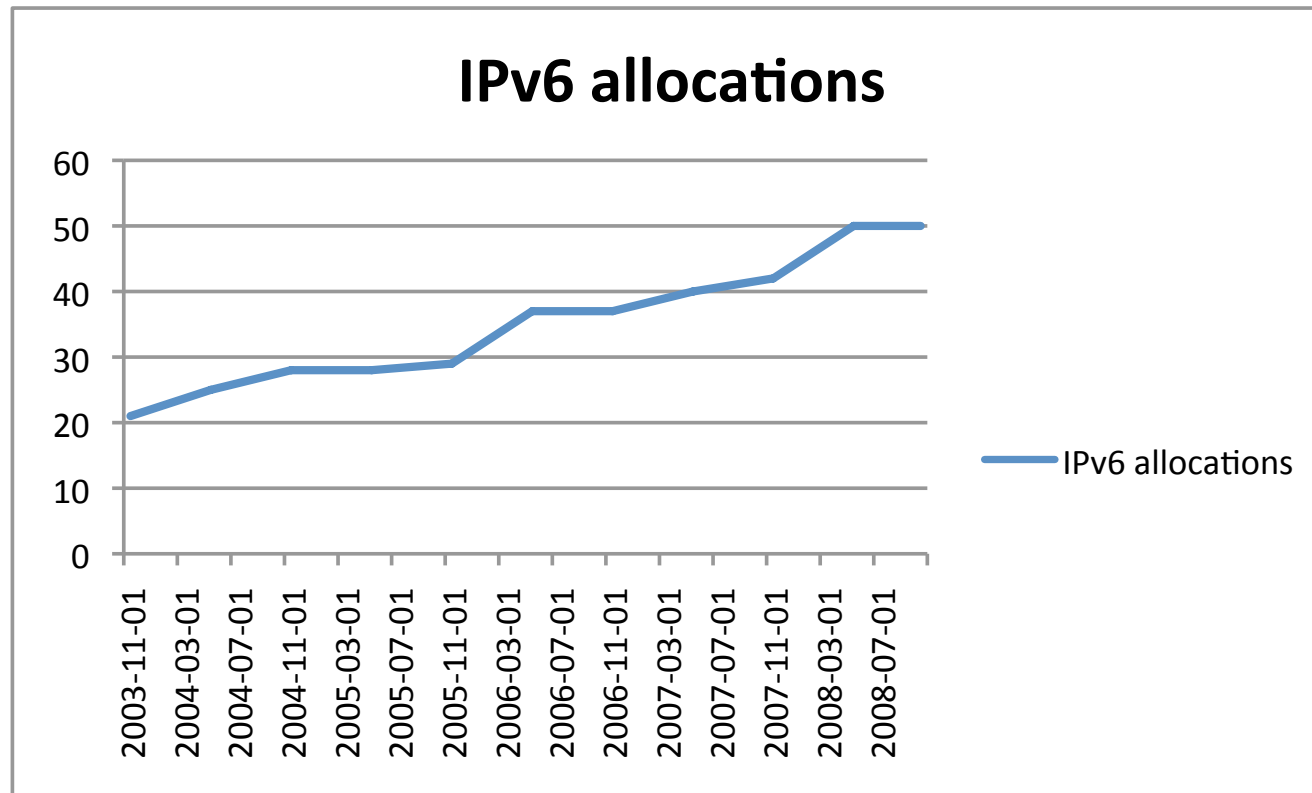
Content...

- But the interesting data is from content providers....

- This data is from several sources

    - Content providers WITH A/AAAA records

    - No relation to IPv6

Content providers

- One regional newspaper group have actually enabled all their content over IPv6

Their stats

- From the period Jan 1 2008 - Sep 21 2008

- Only includes IPv6 access

- 11504 unique addresses

- Native spread on 55 /32s

Block	#	%
6to4	9569	83
native	1208	10.5
Teredo	277	2

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OS Distribution

OS	#	%
OS X	6018	52
Vista	2421	21
XP	562	5
Other	2125	22

Content providers

- Having asked around

  - Major news-papers don't have a real plan for migration

    - The current IP version 'works'

  - National radio 'plans for 2009' deployment

"Another content provider"

- Data and analysis courtesy of Mikael Abrahamsson

- Three links to a pixel with A, A/AAAA and AAAA

- Measured over ~1 week

What transport was used

- 0.5% of users used IPv6 for the v4v6.gif

- 6% where able to download the v6only.gif

- For the v6only.gif

  - 89% were 6to4 access

  - 9% were Teredo

  - 2% were 'other' IPv6 space spread over 134 different /32s

OS Distribution

OS	% of IPv6 able
Windows Vista	79
Windows XP	18
Max OS X	5
Linux (Ubuntu)	0.3
Linux (Unspecified)	0.2
Windows 2003	0.1
Windows CE	0.02

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- From Nov 2 2006 - Oct 20 2008

- 3275 unique IP addresses

  - 3040 if you remove Netnod/Autonomica :-)

  - Native spread on 36 /32s

Block	#	%
Native	2615	86
6to4	400	13
Teredo	25	0.8

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