

IPv6 usage in Sweden

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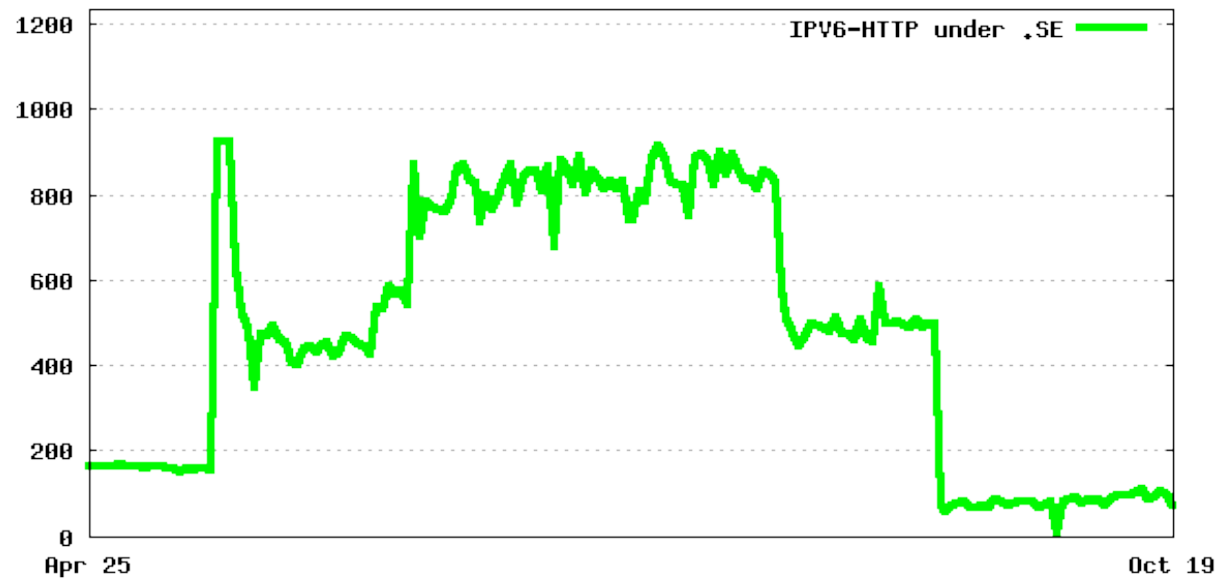


How much IPv6 is there?

- 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

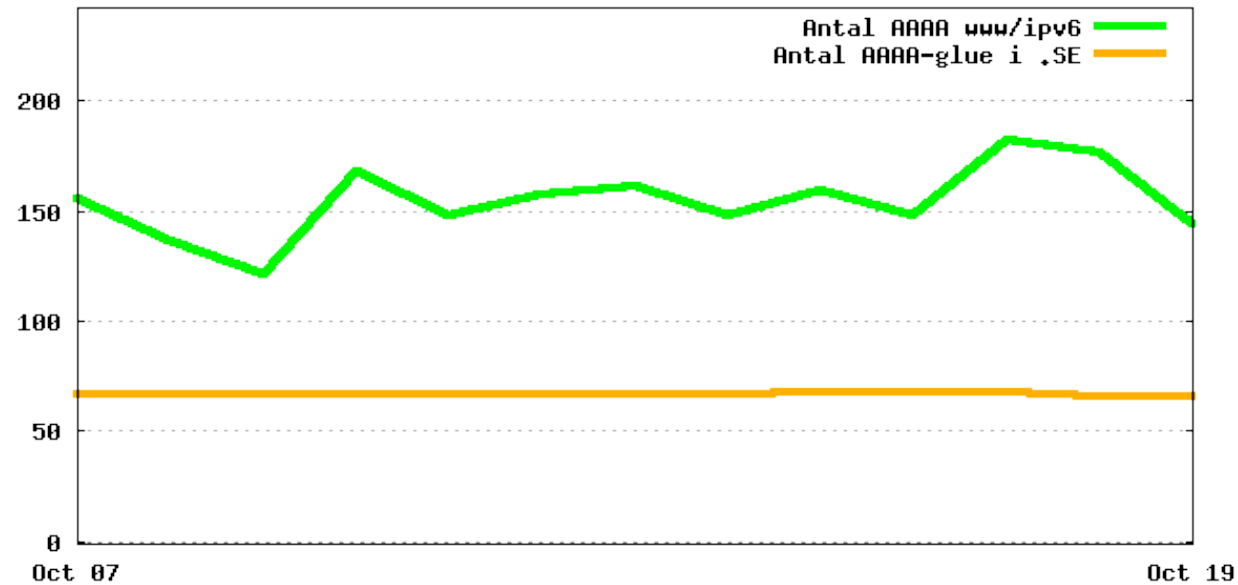
From .SE stats

Plot av HTTP-serverns 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

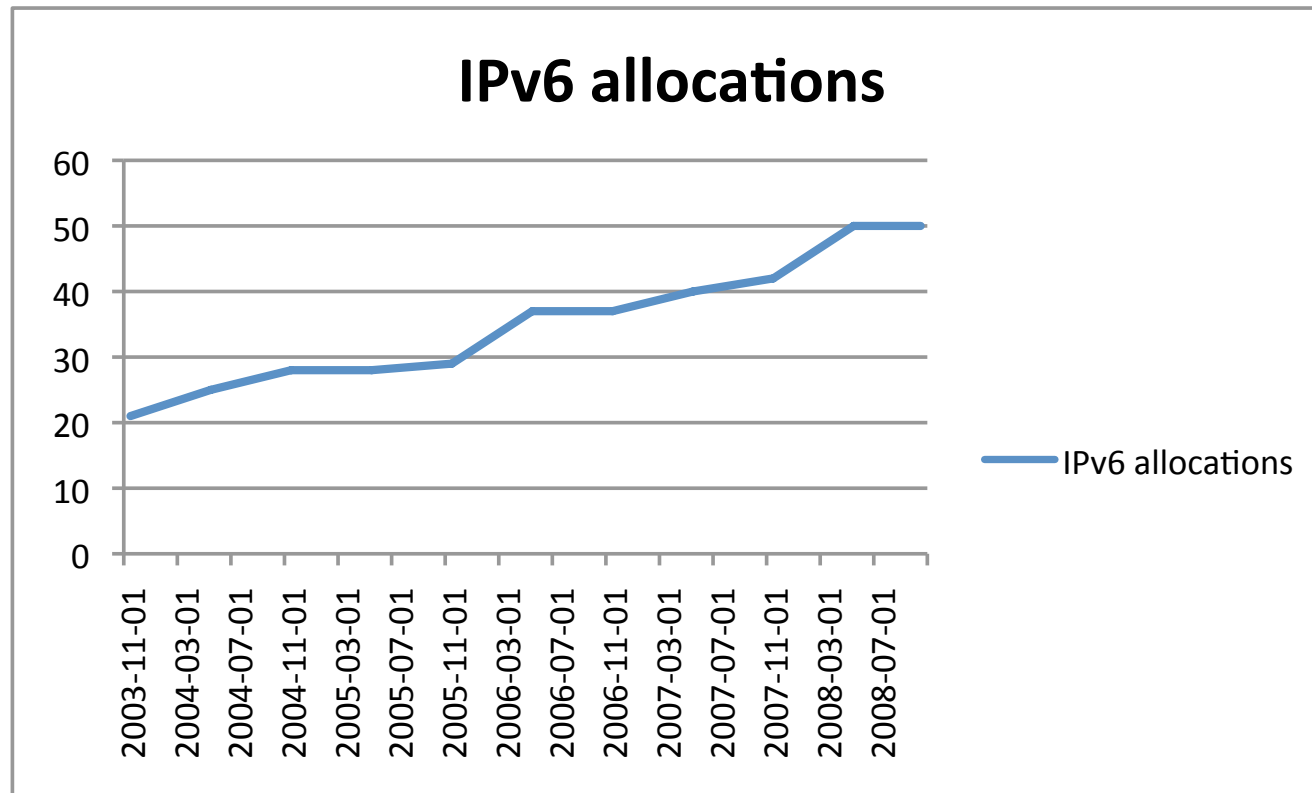
View from operator #2

- 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

The screenshot shows the HD.se website interface. At the top, there's a search bar and navigation links. The main content area features a large article titled "Tuff debatt om nytt äldreboende i Landskrona" with a sub-headline "Hämnd befaras mot misstänkta". Below the article is a small photo of a building. To the right, there's a sidebar with "Senaste nytt på hd.se" and "DAGENS FRÅGA". At the bottom, there are advertisements for "MAXI ICA STORMARKNAD" and "hd.se/ MOTOR".

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

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

www.netnod.se

- 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