



TeliaSonera

IPv6 Deployment in a Service Provider Environment

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The beginning

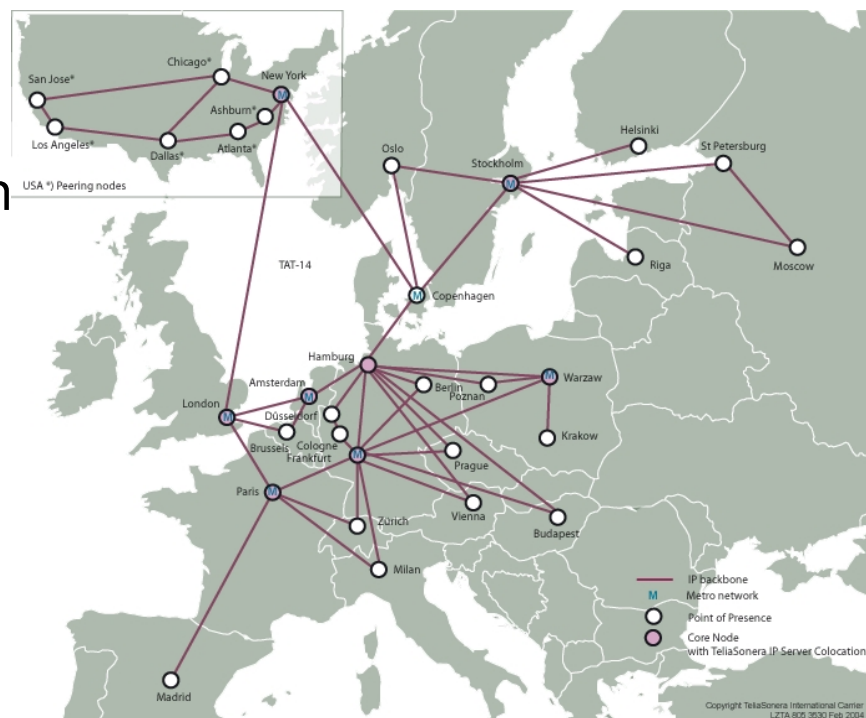
- Tests and basic transport

TeliaSonera's IPv6 beginning

- Started out with a test network
- Evolved into a commercially available IPv6 transport service in 2001
- Today all transit customers can get IPv6 transit in addition to IPv4
- Available everywhere IPv4 is available, tunneled or native depending on the connectivity solution

And then...???

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The Next Step

The Challenge:

Move from a limited service to a large scale deployment

- Where to start?
- What to do?
- How to keep the costs down?



The First Next Step

- Start with the foundation - Addresses
- Get addresses
 - Plan ahead
- Make an address plan
 - IPv6 is different, make use of it

Backbone Link	/20	/32	/40	/48	/56	/64
0010 0000 0000 0001	0010 AAAA AAAA AAAA	NNNN NNNN NNNN NNNN	NNNN NNNN NNNN NNNN	RRRR RRRR LLLL LLLL		
2001	2AAA	NNNN		RRLl		
A	= Aggregation Area					
N	= Networks / Type of use					
R	= Router					
L	= Link					



Enable IPv6

How?

- Depends on the network and the needs
- Design the network with IPv6 in mind
- Specify the IPv6 functionality today
 - Require specific support from vendors
- Prepare the management systems
- Start with the “simple” access networks



Educate

- IPv6 awareness is the key
- Educate
 - Training isn't available today
 - Is a limiting factor
- Essential for a large scale deployment



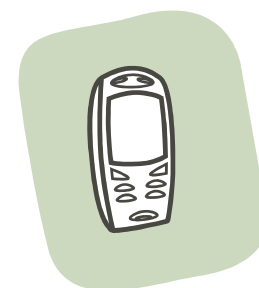
Service

- Residential users don't want IPv6 they want services
- Develop services with IPv6 in mind
- Use the potential
- There are benefits for a SP to use IPv6 in services
 - Requires IPv6 awareness
- Triple play and the move to multi play will make the need for IPv6 more evident



Mobile services

- The wireless networks are the drivers for IPv6
- IPv6 is essential for many large scale mobile phone services
- M2M
- NAT traversal techniques aren't an option





TeliaSonera IPv6 next steps

- Continue implementing IPv6 in the IP-core, move to native IPv6 transport when possible
- Ensure that increase in IPv6 load can be handled, long-term planning
- Continue implementing IPv6 further out in the network (closer to the end customers)
- Prepare the wireless networks
- Prepare for native IPv6 access for corporate customers
- Prepare for migration of private customers platforms



Technical solutions for introducing IPv6 at TeliaSonera

- 6PE
 - IPv6 provider edge = IPv6 over MPLS
 - Gives the possibility to wirespeed even if some routers don't have IPv6 hardware support
 - Minimizes the impact on the core
 - No need to change IOS on core routers
 - Lack of multicast support might be a showstopper in some cases
- Dualstack
 - When possible
 - Access should always be dualstack
 - Routing issues in a mixed environment
- Support for 6to4 and Teredo to make it possible for residential customers to use IPv6 even if the access network isn't upgraded.
- Focus on long term solution



Problems and question marks

- Access networks are lacking functionality
- Management systems are some what of a question mark
- Lack of relevant training
- No understanding among vendors about the use of IPv6 on the residential market



Residential IPv6 Access Requirements

