



# TeliaSonera

## IPv6 Deployment in a Service Provider Environment

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# The beginning

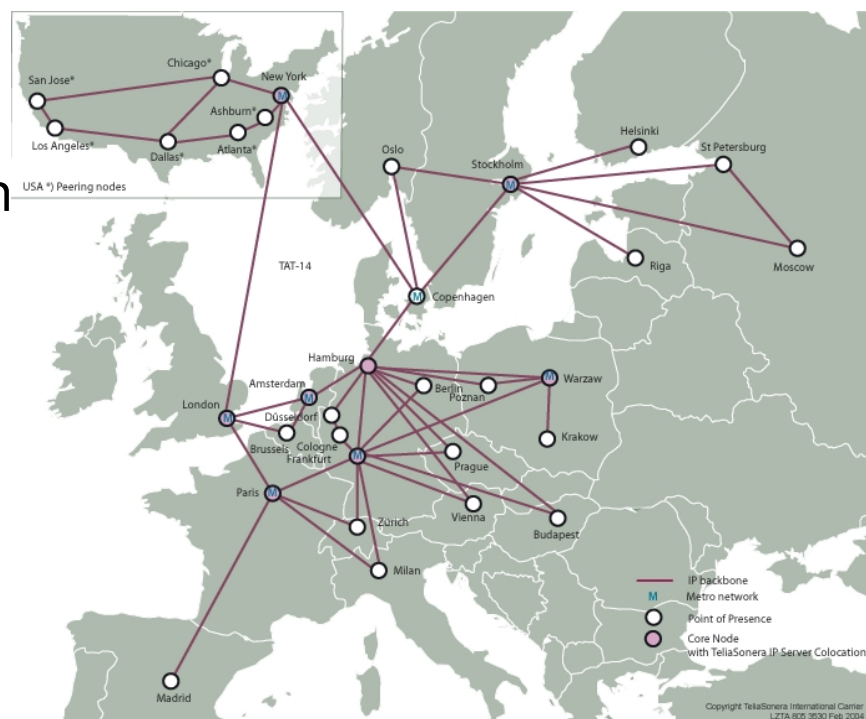
- Tests and basic transport

## 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

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## 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	RRRR RRRR LLLL LLLL		
2001	2AAA	NNNN	RLLL			

**A** = Aggregation Area  
**N** = Networks / Type of use  
**R** = Router  
**L** = Link



# Enable IPv6

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## 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

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



# Service

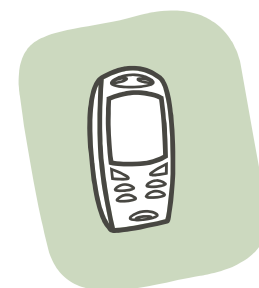
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- Residential users don't want IPv6 they want services
- Develop services with IPv6 in mind
- Use the potential
- There are benefits for a SP to use IPv6 in services
  - Requires IPv6 awareness
- Triple play and the move to multi play will make the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

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- 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

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- 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

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- 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

