1st IPv6-Conference of the IPv6-Forum in Germany
Berlin
Dec.08-09,1999

DFN Deutsches Forschungsnetz

IPv6 Reference Center
of DFN

JOIN Project
Guido Wessendorf

ZENTRUM FÜR INFORMATIONS VERARBEITUNG

Westfälische Wilhelms-Universität Münster
Zentrum für Informationsverarbeitung

Topics

- ~~Why an IPv6 Reference Center?~~
- Overview about JOIN Project
  - History
  - Objectives
- IPv6 lab
- 6bone
- Quantum Test Program
- JOIN us and IPv6

Why an IPv6 Reference Center?

- Thesis: IPv6 will be the next Internet
  - ✓ Crisis of IPv4
  - ✓ Features of IPv6
  - ✓ Migration from IPv4 ⏭ IPv6 is in progress since June 1996
  - ✓ The who is who of IT manufacturers have IPv6 capable products in portfolio
  - ✓ Increasing requests for 6bone connectivity
  - ✓ Increasing international activities to evaluate, prepare, introduce and push IPv6 production services (e.g. 6ren, 6tap, QTPv6, IPv6 Forum)

JOIN Project History

- ~~1993–1996: DFN JOIN Project to prepare and introduce ISO-CLNP in WiN~~
- Since the IPng decision in favour of IPv6 in 1994 the JOIN project changed focus to IPv6
- 1996–1998: JOIN Project „IP Version 6 in WiN“
- 1st of October 1999: JOIN Project officially restarts for at least two further years ☺

JOIN Project Objectives

- Establish and maintain (native) IPv6 connectivity
  - JOIN as 6bone pTLA backbone site
  - Cooperation and participation in (inter)national IPv6 projects (e.g. QTPv6)
  - Temporary: allocation and assignment of IPv6 address space
  - Temporary: operating of IPv6 DNS

JOIN Project Objectives (cont. 1)

- Activation and support of DFN members
  - Workshops, working groups at DFN meetings, …
  - Reference installations of routers and hosts including serveral applications (e.g. DNS and WWW servers)
  - Recommendations for migration and operation of member networks, e.g.
    - » Addressing
    - » Autoconfiguration
    - » Network Management
    - » DNS

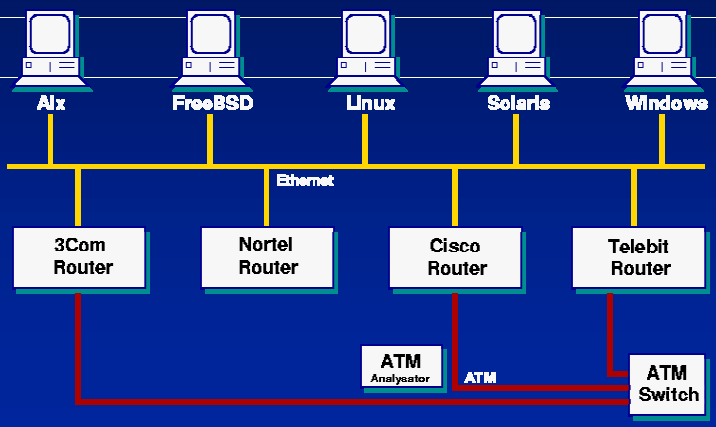
JOIN Project Objectives (cont. 2)

- Support of DFN and WiN
  - Recommendations for addressing structure
  - Recommendations for migration of WiN
  - Cooperations with other ISPs and organisations in Europe
- Dissemination of IPv6 relevant information, e.g. via
  - Web
  - Mailing list
  - Conferences
  - Workshops

IPv6 lab

Current equipment and setup

IPv6 connectivity to
- 6bone
- QTPv6
- LAN of university



A global IPv6 test network

- Charter of IETF 6bone working group
  - Deployment of global IPv6 transport and routing
  - Creation of „practice and experience“ documents
  - Feedback to various IETF IPv6-related activities
  - Development of mechanisms and procedures to aid in
    - » Transition to (native) IPv6
    - » Operation of global IPv6 routing

What is it? How does it work?

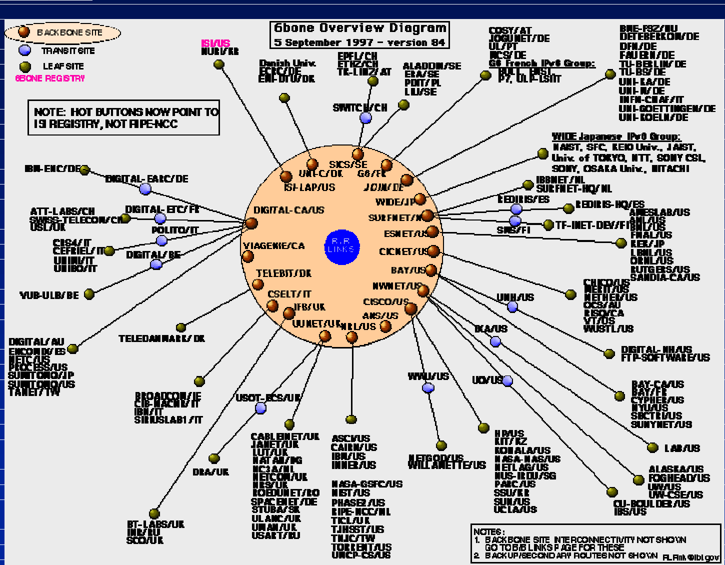
- As far as there is no native IPv6 connectivity the 6bone is a virtual overlay network on top of the IPv4 Internet infrastructure
  - IPv6 capable islands are interconnected via IPv6-over-IPv4 tunnels
  - Tunnel endpoints are typically workstations or routers with IPv4 and IPv6 capable operating systems
- As soon as possible tunnels should be dismantled to achieve native IPv6 connectivity as much as possible
- The 6bone as global IPv6 test network will smoothly disappear and turn into the next generation Internet

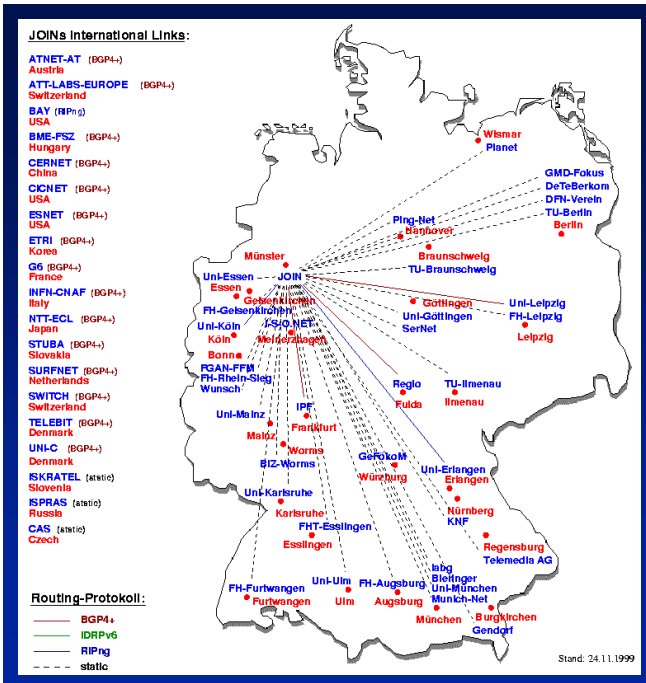
⇒The 6bone translates the IETF transition strategies into action

A terrific increasing network

- On 15th July 1996 the 6bone was born with three initial partitipants (G6 in France, UNI-C in Denmark and WIDE in Japan)
- In November 1999 there are 490 sites in 42 countries connected to the 6bone!

Overview Diagram (1997!)





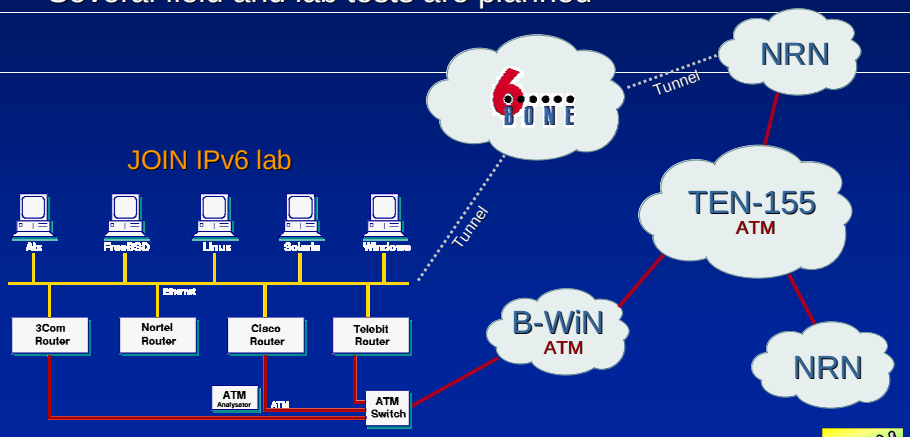
6bone in WiN

- 58 sites
  - 44 registered
  - 14 pending
- 19 internat. links
- IPv6-over-IPv4 tunnels

JOIN is backbone site with most leaf sites in the 6bone!

Quantum IPv6 Test Program (QTPv6)

- Shortly JOIN will participate Pan-European native IPv6 over ATM test network
- Several field and lab tests are planned



JOIN us and IPv6

- JOIN Project
  - team: Dr. W. Held, Dr. G. Richter, G. Wessendorf, C. Müller-Böhm, C. Schild, DFN: Dr. J. Rauschenbach
  - email: join@uni-muenster.de
  - web: http://www.join.uni-muenster.de (via IPv4)
    http://www.ipv6.uni-muenster.de (via 6bone)
- More web links
  - http://www.6bone.net
  - http://www.dante.net/quantum/qtp/
  - http://www.ipv6.org
  - http://www.6ren.net
  - http://playground.sun.com/ipng/
  - http://www.ipv6forum.com