

IPv6 Activities Update

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Outline

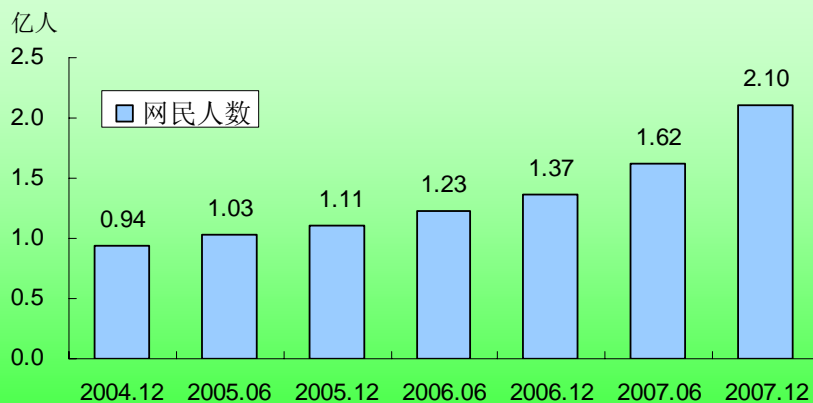
- Statistics by end of 2007
- Intro to CNGI
- IPv6 related activities in CNGI/CERNET2
- International collaboration
- Future works

Internet development in Mainland China

- 13 years history from 1994~2007
- Internet users: 210 Millions in Dec. 2007, released by CNNIC
- IPv4 Addresses: > 8 /8
- IPv6 addresses: 31 /32
- Backbone: 2.5-10G DWDM+Router
- Total International links: 368Gbps
- Exchange Points: over 100G (BJ, SH, GZ)
- Last Miles
 - Ethernet, WLAN, ADSL, Cable Modem, CDMA-1x, GPRS, Dial-up, EDGE/HSDPA and 3G trial

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Statistic of Internet user in China



CNNIC

www.cnnic.cn, 2007.12

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Brief info about CNGI

- **Jan 2002**, Suggestions from 57 Academia via NSFC
- **Oct 2002**, CNGI Strategy report submitted to State Planning Commission
- **Mar 2003**, CNGI planning report submitted to State Planning Commission
- **Aug 2003**, The CNGI proposal by 8 Ministries was proved by State Consul
- **Aug 2003**, bidding process managed by China Academy of Engineering
- **Jul 2004**, CNGI (China Next Generation Internet) project was formally launched
- **Oct 2006**, CNGI-CERNET2/6IX passed project evaluation
- **Feb 2007**, all CNGI members passed evaluation

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CNGI Goals

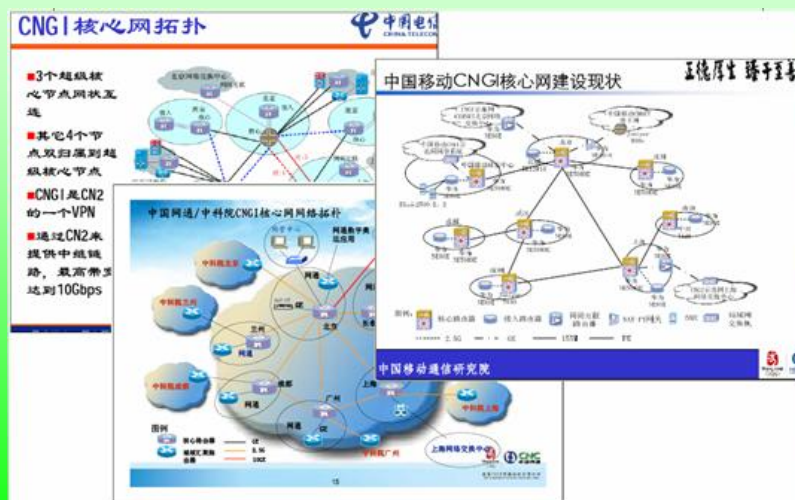
- 2002—2005
 - **CNGI demonstration project**
 - **Key technologies**
- 2006—2010
 - **IPv6 backbone and applications**
 - **Mass production**

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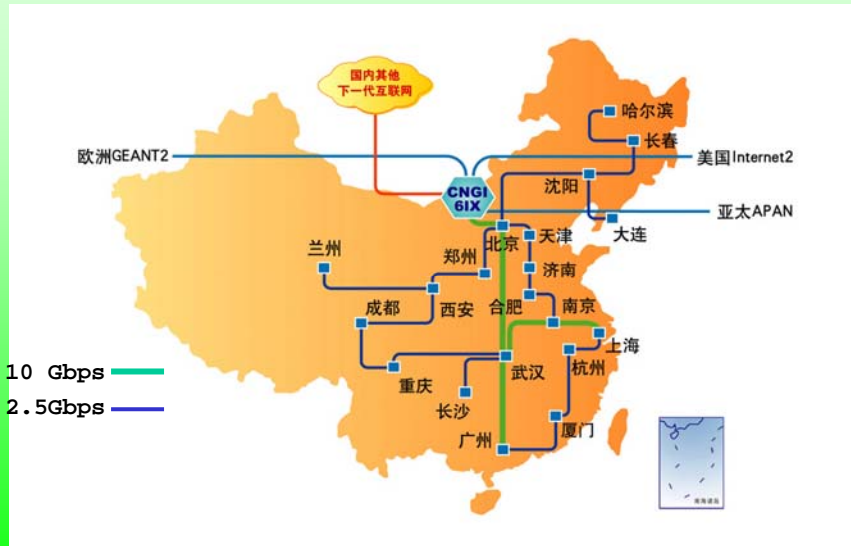
CNGI demonstration

- Demonstration network
 - 6 core networks, China Telecom, China Netcom/CAS, China Mobile, China Unicom, CERNET, China Railcom
 - 300 CPNs
 - IPv6 ExchangePoint set in Beijing and Shanghai
- Research and development
 - Key technology
 - Middleware
 - Applications
- Mass production
 - Equipment
 - Applications

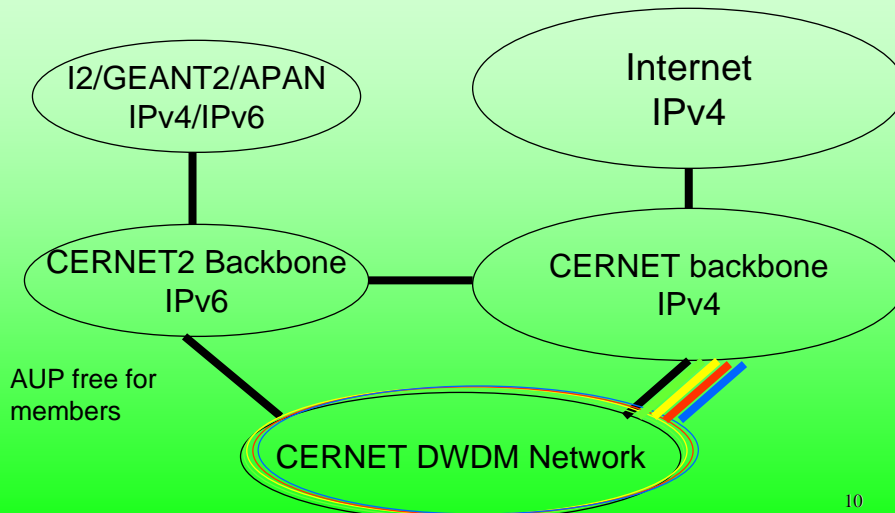
Backbone run by service providers



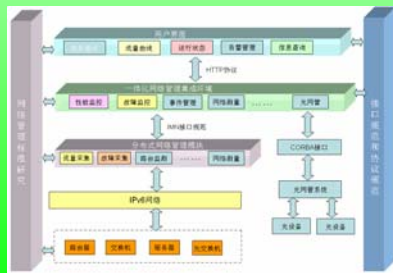
CNGI—CERNET2 Backbone



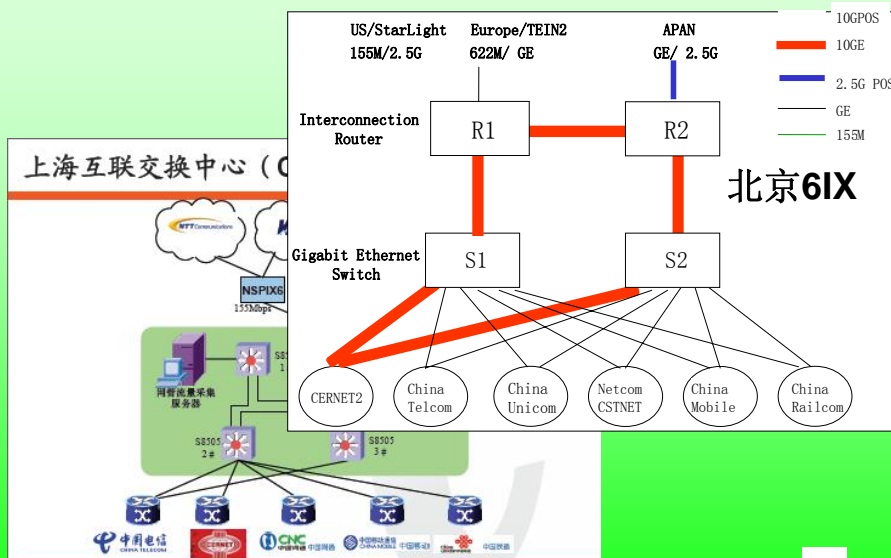
CERNET and CERNET2



IPv6 based Network Management in CERNET2 NOC



CNGI - 6IX



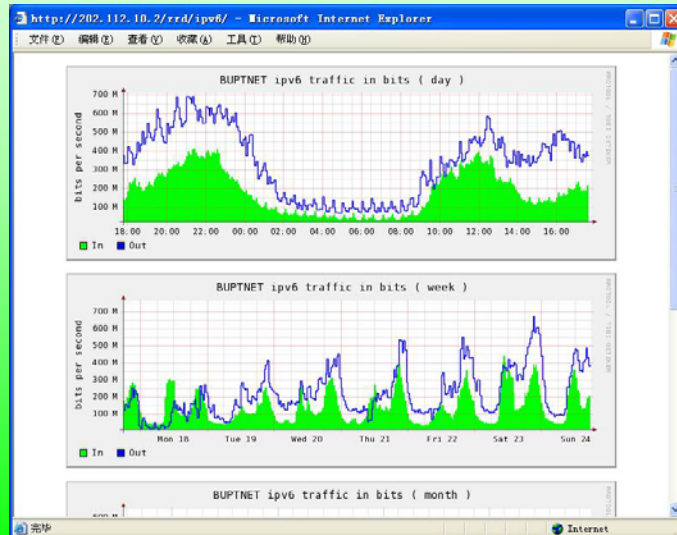
CNGI-6IX



CERNET2 Backbone router monitor



IPv6 traffic of BUPT in 24 Feb 2008



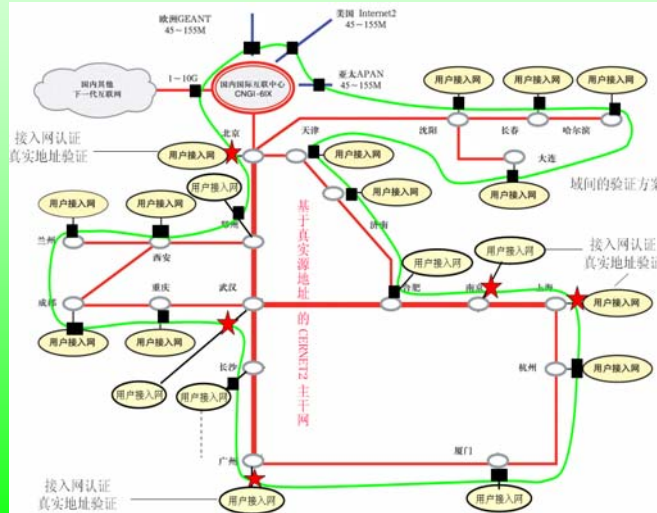
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CNGI-CERNET2's Key Points

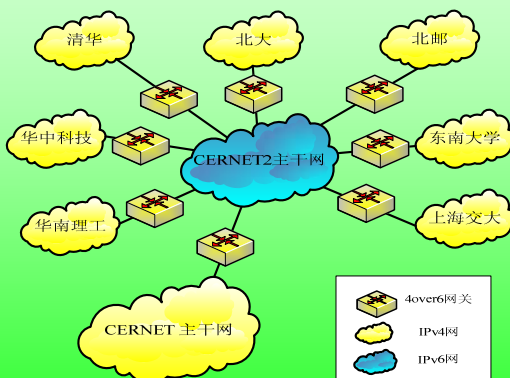
- Native IPv6 Network
- Dual stack campus network
- Multi-vender Core Routers
- Authentic IPv6 Addressing Architecture
 - SAVA/SAVI: Source Address Validation Architecture
 - as a BoF proposal in IETF69 Meeting and discussed in IETF70
- IPv4 / IPv6 transition
 - Softwire: an IETF working group setup in IETF69, RFC4925
- Application trials
 - 6PlantLab
 - SIP over IPv6
 - IPv6 IPTV Applications
 - IPv6 based P2P Model Applications
 - IPv6 Multicast trials
 - ...

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SAVA trail and SAVI BoF in IETF



Softwire trial and WG



[RFCw/ID](#) [\[Plain Text\]](#) [\[From draft-ietf-softwire-problem-statement\]](#)

INFORMATIONAL

Network Working Group
Request for Comments: 4925
Category: Informational

X. Li, Ed.
CERNET
S. Dawkins, Ed.
Huawei
D. Ward, Ed.
Cisco Systems
A. Durand, Ed.
Comcast
July 2007

Softwire Problem Statement

Status of This Memo

This memo provides information for the Internet community. It does not specify an Internet standard of any kind. Distribution of this memo is unlimited.

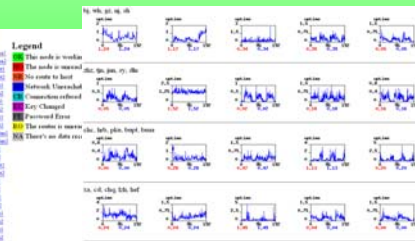
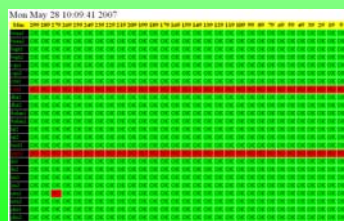
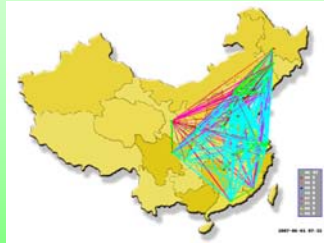
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Abstract

This document captures the problem statement for the Softwire Working Group, which is developing standards for the discovery, control, and encapsulation methods for connecting IPv4 networks

6PlanetLab

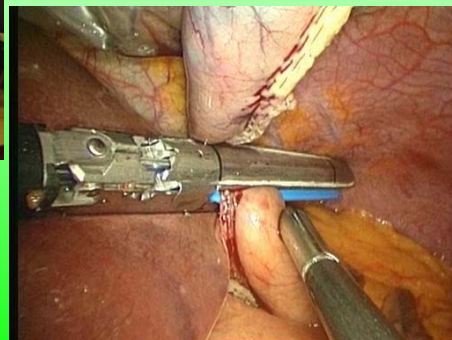


IPv6 Cooperation Working

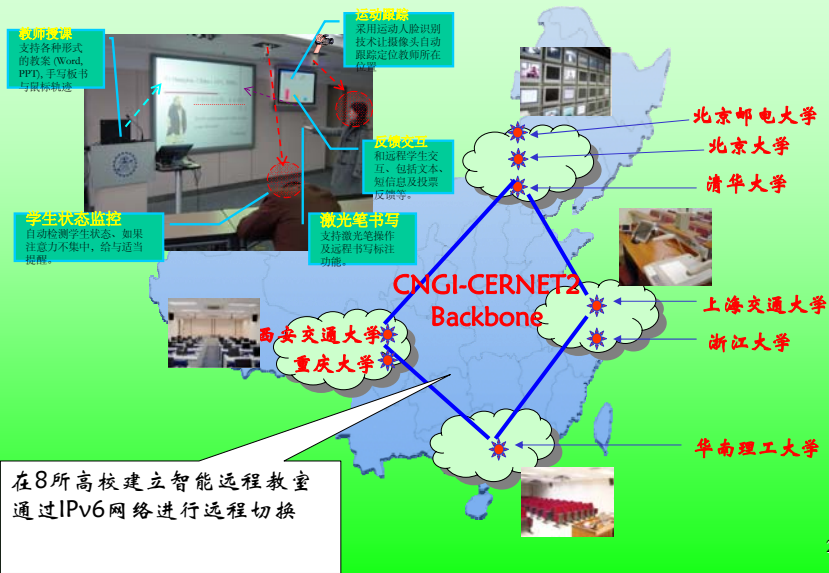


IPv6 based streaming for e-Learning

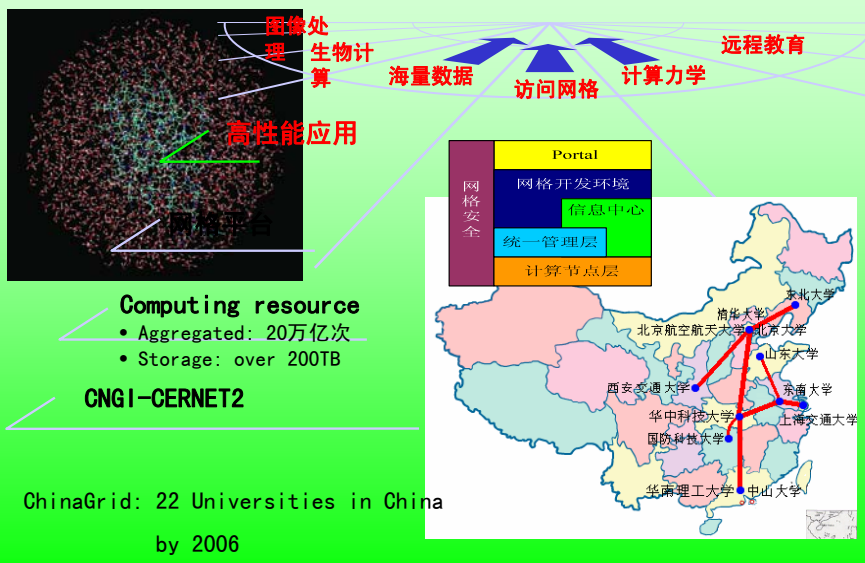
Art performance across the continents



IPv6 Remote Education System



IPv6 based Grid Computing



IPv6 P2P Sharing Content Deliver



P2P File Sharing
ngMaze
P2P Streaming
AnySee

| | |
|--------|------|
| 清华大学 | 836 |
| 北京大学 | 7695 |
| 华南理工大学 | 3552 |
| 华中科技大学 | 1799 |
| 浙江大学 | 8790 |
| 上海交通大学 | 20 |
| 北京邮电大学 | 582 |
| 西安交通大学 | 26 |
| 兰州大学 | 176 |
| 重庆大学 | 18 |
| 中南大学 | 2 |
| 东南大学 | 39 |
| 中国科技大学 | 3419 |
| 山东大学 | 2372 |
| 复旦大学 | 13 |
| 同济大学 | 7 |
| 厦门大学 | 3 |
| 东北大学 | 102 |
| 吉林大学 | 5 |

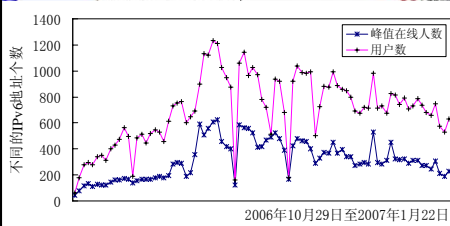
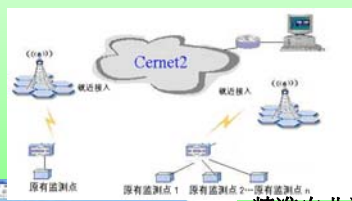


图1: CNGI04-12-2A项目IPv6用户发展情况

IPv6 Sensor Networks

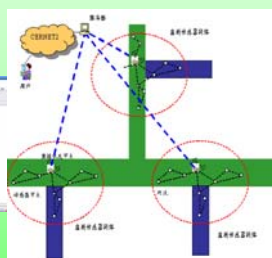
河道水情监测



入河水质监测



精准农业灌溉监测



传感器部署



WiFi/WiMax and SIP based IPv6 Mobile Communication



WLAN phone / PDA



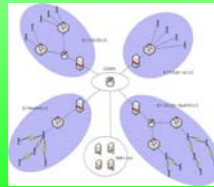
Wifi AP in Campus



WLAN phone communication



Wireless IPTV/VOD



Wireless Campus Network



Wifi Coverage in Campus 25

IPv6 Digital Home Network



UPnP

UPnP

Home Gateway

FTTH

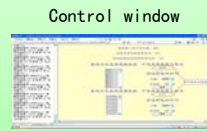
CNGI-CERNET2 (IPv6)

基于IPv6家庭网关，支持多种异构网络家电的统一控制，实现数字化生活。



IPv6 based Telematics application

- Traffic sensor
- GPS based traffic data collection and guidance
- Video surveillance



Trail line by using Sensor

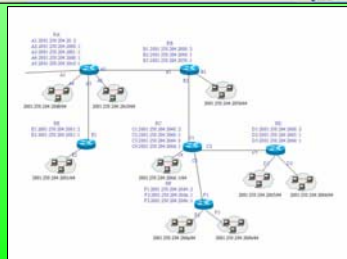
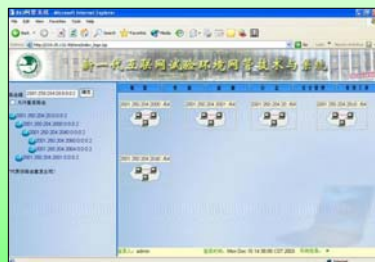


Traffic Monitor

Video Monitor

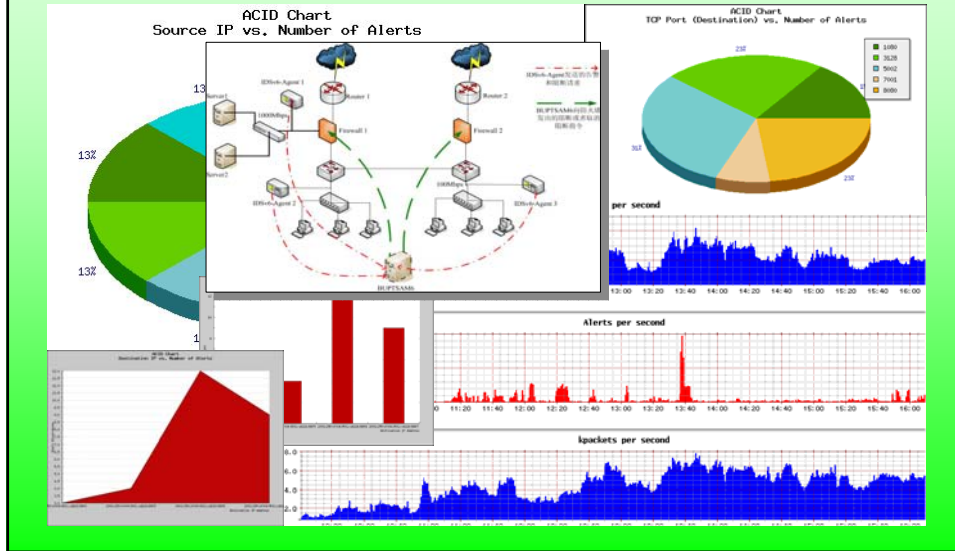


IPv6 network management system



- Joint project with Nokia
- Funded by: China 863 Project
- Standards Supported
 - SNMPv1, v2c, v3
 - RMON, disman
- Support WLAN MIBs
- RFC2465-MIB-based Topology Discovery
- IPv4/IPv6 Dual stack

IPv4/IPv6 dual stack IDS system



DARS6 – a solution to Dynamic and Secure DNS

The figure illustrates the DARS6 solution for Dynamic and Secure DNS. It features a screenshot of the 'NameUpdate client for windows' application interface and a network diagram.

Software Interface: The 'NameUpdate client for windows' window shows the following configuration:

- domain name: aytest.6test.bupt.edu.cn
- password: ****
- server: 2001:20...
- server's port: 3495
- max seconds between updates: 1209600
- local IP address: 2001:20..., 2001:20..., 2002:d2..., 210.25..., fe80:1:c...

Network Diagram: The diagram shows a 'DARSv6 server' connected to a 'DNS server' and multiple 'client' devices. The DARSv6 server acts as a proxy between the clients and the DNS server.

- DNS is important for IPv6
- DHCPv6 does not support DNS Dynamic Update
- We developed a solution by DNS proxy server and Linux/Windows clients to provide DNS dynamic update and secured binding.

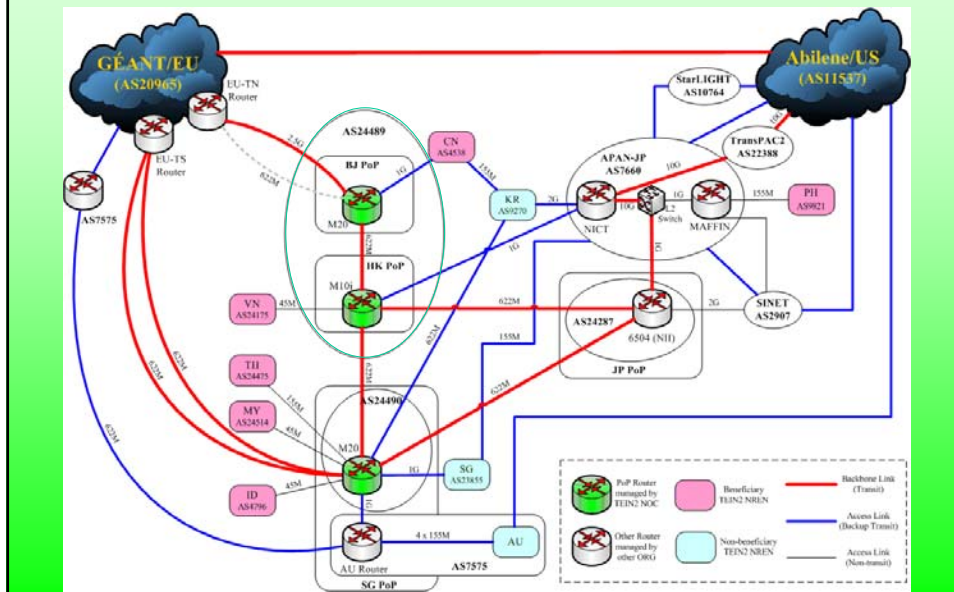
Dual stack NTP trial service

- IPv4 <http://ntp.buptnet.edu.cn>
- IPv6 [http://\[ntp.buptnet.edu.cn\]](http://[ntp.buptnet.edu.cn])



- Go4IT project is one of the European Union founded 6th Framework Programme (FP6) for IPv6 testing
- Total 13 partners in this project.
 - Inno/ETSI/INRIA/CETECOM/FOKUS/ISPRAS/Jtest/BII/CATR/BUPT/IPT
- Go4IT project aims to provide Research Infrastructure users with free **TTCN-3** based **IPv6** testing environment including **test tools**, **test suites** and the related **services**.

Link to TEIN2 – Internet2



Future works

- Backbone upgrade
- Access network migrate to dual-stack
- Service deployment and enhancement
- Provide more applications
- Promote scientific researches
- Deliver difference level of trainings
- Cooperation with all partners

**Let us create
our great future together!**

Thanks!