Problem: People need help to join IPv6

- plug and play IPv6 using the « legacy » IPv4 Internet as the transport
- ideas:
  - tunnel server (Alain Durand)
  - web site for info/implementations/… (Orlando Bof)

What we did

- a concept of freenet for ipv6
- make an implementation of the tunnel server
- reserve a domain name for the community to own and use it: freenet6.net. This enables people to register their tunnel endpoint with a nickname under freenet6.net
- put a web site with pointers to most implementations, and a faq
- (even designed a logo!)

User interface

- go to www.freenet6.net (2 weeks registration time at NSI!)
- click to get the IPv6 release you need (depending on the platform)
- get a form
  - with IPv4 address (prefiled with what we received from the web client)
  - choose a nickname(which generates an entry in the dns for nickname.country.freenet6.net)
  - choose a country (just for the purpose of naming space: can be anything) (next version: choose a server with a name space)
  - choose platform

User interface

- (server creates its tunnel end point)
- receive a script that you execute: this script creates the tunnel on the client side.
- You are on the net. Well, the real one…

- Other service: check « who is on this IPv6 server» lists all active nicknames

Tunnel server

- perl script that interfaces with the web client
- perl script that:
  - generates the client script based on the platform and on the information of the tunnel to be created
  - sends it to the client
  - saves the information about the tunnel in a database
  - register the nickname in the dns (with a short ttl)
  - templates for client scripts
- monitoring script for cleaning tunnels hanging around
  - scans registered tunnels
  - test the reachability of the IPv6 tunnel end-point
  - if the end-point does not respond after a few attempts, delete the tunnel, the entry in the database and the dns registration

Database format

- IPv4client The client IPv4 address
- IPv6client The client IPv6 address (tunnel endpoint)
- IPv6server The server IPv6 address (tunnel endpoint)
- device Interface name to the tunnel device (server)
- nicname nicname registered in DNS
- creation_time time of creation
- unreachable:
- -1 = new tunnel to be created
- 0 = tunnel active and end-node responded to last ICMPv6 echo
- x>0 = tunnel active, end-node didn't respond for the last x ICMPv6 echo requests

Implementation

- web server
- perl scripts
- dns server primary of « country ».freenet6.net
- freebsd with kame stack
- current clients supported: NT, freebsd/kame, freebsd/inria. Very easy to add new clients (if the tunnel commands can be scripted.)

Considerations and limitations

- potential to have a large proportion of tunnels hanging around
  - made a monitor script that is started in the cron
- scaling: can we support thousands of tunnels?
  - Have to find this (kernel support, utilities, performance)
- scaling: support for multiple tunnel servers:
  - get the code and register your tunnel server in the registry
  - delegate a name space to be the primary of name.freenet6.net
    - so that you will register users.name.freenet6.net
    - name can be anything

Considerations and limitations

- need root/admin privileges to run the script
- Security issues
  - first attempt was click and go!
    - Configure your browser so that when you receive the script, you execute it right away.
  - Well, subject to attack
    - anybody who sends this data will fire any script on your PC
    - especially since this script has to be executed as root/administrator
  - so, now, we send you the script and then you save it and execute it (or you decide)

Future work

- support for more client implementations
- support for multiple servers
  - a server register itself as a tunnel server in the registry
  - syntax for the registry defined in a separate document
  - user choose the server in the list presented based on registry entries
- support for ipv6 routers (having a net behind the tunnel endpoint)
- v6 tunnels over IPv4 nat (ugly!)
- make the code available
- test with MobileIPv4

Questions

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http://freenet6.viagenie.qc.ca (until www.freenet6.net is alive)