



# Migration Broker service deployment in Renater

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# Agenda

- ✦ Product's overview
- ✦ How does it work ?
- ✦ Benefits for Renater's users
- ✦ Installation & deployment scenarios
  - ✦ Addressing plan
  - ✦ Configurations
  - ✦ Routing
- ✦ Additionnal features
  - ✦ Facilities available
  - ✦ ... and planned

# Product's overview

## ✦ Migration broker (MB)

- ✦ Server for providing IPv6 connectivity
- ✦ to whoever user allowed to request it
- ✦ Simple(st) way to connect to Internet v6
- ✦ Creating dynamic tunnel(s)

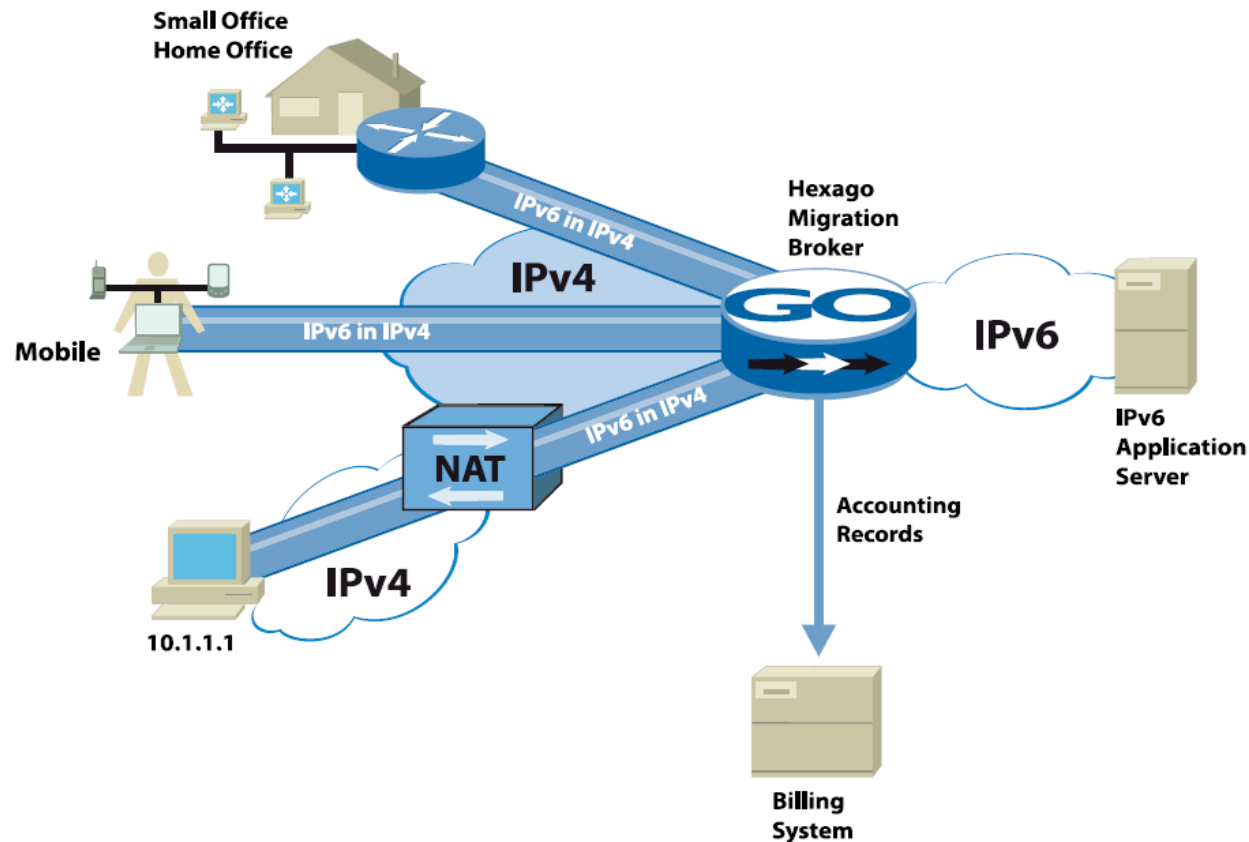
## ✦ Creation of dynamic tunnels

- ✦ TSP (Tunnel Setup Protocol)
- ✦ « Automagic » prefix allocation for
  - Enterprise / Campus sites
  - SOHO (SMEs)
  - End Users

## ✦ Subscription to the service

- ✦ via a Web Interface

# Overview /2



Hexago Migration Broker™ provides:

- IPv6 connectivity over IPv4 networks

# Overview /3

## ☀ What it looks like ?

### ☀ Hardware :

- Rackable PC / NetBSD
- 2 FEth NICs

### ☀ Software :

- HexOS version: HexOS 2.1.1 SC
- NAT traversal (optional)

## ☀ Provided by Hexago

- ☀ <http://www.hexago.com/>

# How does it work ?

- ✦ Initial MB service deployment
  - ✦ Control and check what's going on
  - ✦ Service is not completely automatic yet
    - facility de-activated at this time
- ✦ Later on
  - ✦ Draw benefit from the automatic facilities implemented in MB
    - Users registering
    - IPv6 Prefix allocation
    - Tunnel parameters distribution
- ✦ HTTP:
  - ✦ Web interface to obtain “login/password”
  - ✦ Admin creates an account if the querier fulfills the conditions.

# How does it work /2

## ☀ TSP: Tunnel Setup Protocol

- ☀ 0 - install TSP client
  - Configuration is straight forward for Windows ...
  - The sources must be compiled for Linux, MAC, freeBSD
  - A Debian package is available (“apt-get install tspc”)
- ☀ 1 - TSPc: Client initiates communication to establish a tunnel with the MB
  - Authentication phase (MD5)
- ☀ 2 - MB allocates an IPv6 prefix to the client
  - And sends tunnel parameters
  - MB updates the database where users parameters are stored
- ☀ 3 - Tunnel configuration at both sides

# How does it work /3

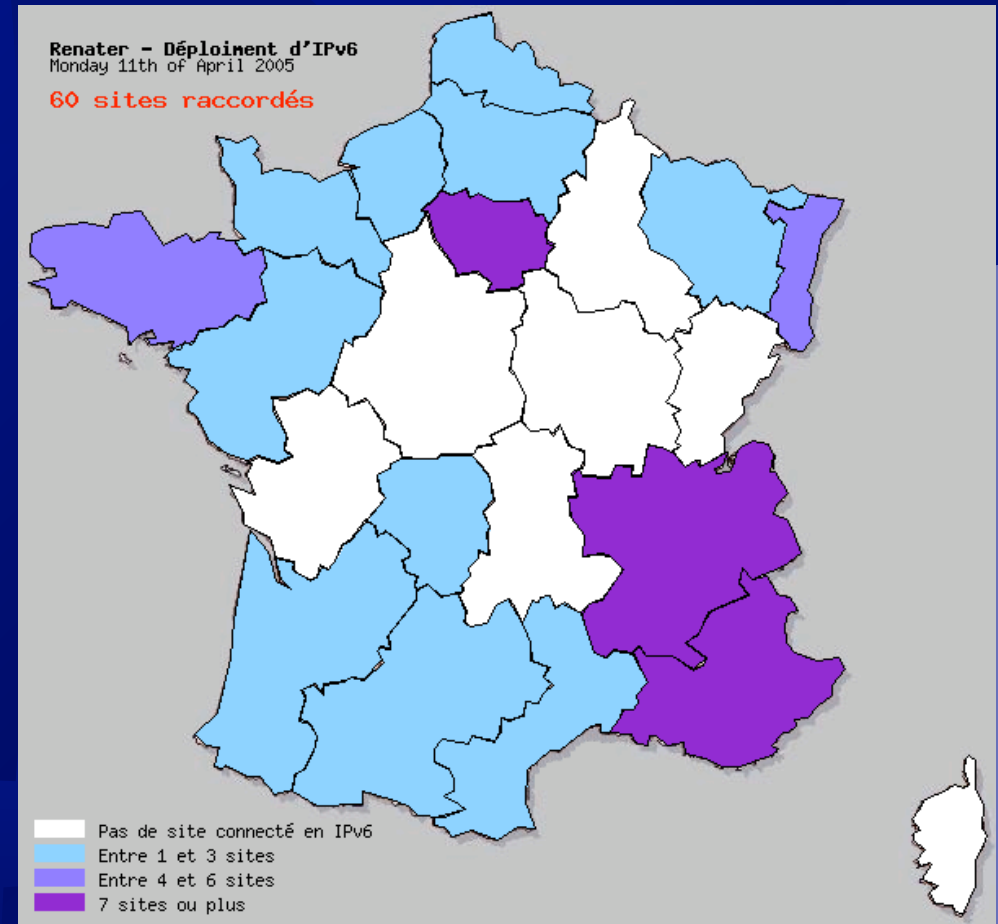
## ✦ Automatic IPv6 Prefix Delegation

End user / Single Host	/128
SOHO / SMEs	/64
Enterprise / Campus R&D projects	/48

# Benefits for Renater's users

Provide IPv6 connectivity to

- ☀ sites not connected to Renater's IPv6 service
  - 30% of Regional networks support IPv6
- ☀ "mobile" users
  - Authentication allows to rebuild securely the tunnel to the MB wherever you're
- ☀ Temporary Events
  - Conférences, démos, meetings ...
- ☀ Enterprises R&D departments
  - Partners of projects with research centers

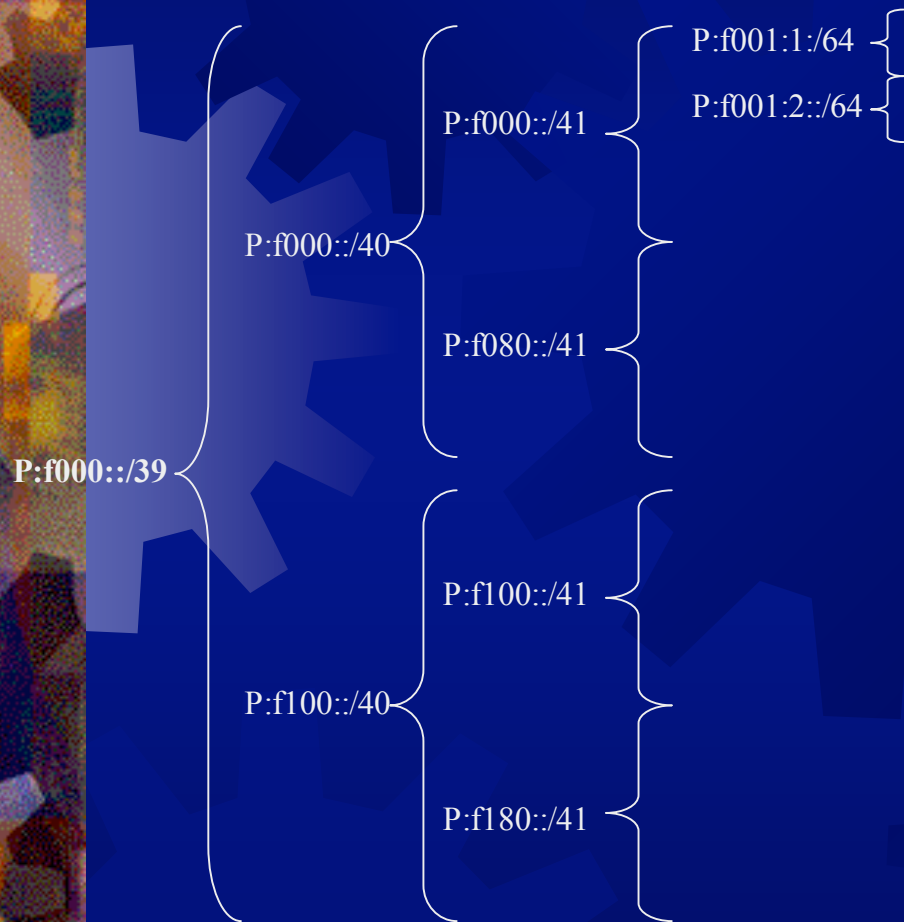



# Installation & Deployment Scenario

## ✦ Structuring the address space

- Prefix length to be allocated / used
  - /48s
  - /64s
  - /128s
- Address Pools have to be defined and reserved
  - A pool for /48s
  - A pool for /64s
  - A pool for IPv6 interconnections (/128s)

# Addressing plan



Interco for sites (allocated with a /48)
Interco for users (allocated with a /64)

/64 Allocations for users
/48 Allocation for sites (TSP configuration)
/48 Allocation for sites (manual configuration)

# Configuration

- ✦ Automatic (the goal !...)
- ✦ but Manual configuration possible too
  - When TSP client is not available at the other end (manufacturers : Cisco, Juniper ...)
- The same equipment for static and dynamic tunnels
- ✦ One tunnel per user (limit DoS attacks)
- ✦ Config file with command syntax ala Cisco/Unix

# Client Configuration

- ✱ **client\_v4=auto**      # IPv4 address is found by tspanc
- ✱ **userid=test**        # Login
- ✱ **passwd=test**        # Password
  
- ✱ **template=windows** # OS
  
- ✱ **server=1.2.3.4**      # IPv4 address of MB
  
- ✱ **tunnel\_mode=v6v4** # TCP or UDP (for NAT) mode
  
- ✱ **if\_tunnel\_v6v4=2**    # IPv4 interface used to create the tunnel
- ✱ **host\_type=host**     # Host or router
  
- ✱ **if\_prefix=4**        # Tunnel interface

# MB configuration

- **#Pools declaration**
- **ipv6 local pool P\_IntercoSites 2001:660:f001:1::/64 128**
- **ipv6 local pool P\_Sites48 2001:660:f100::/41 48**
  
- **#TSP Server**
- **tsp TSP\_Sites48**
- **ip address 1.2.3.4**
- **transport tcp 3653**
  
- **#Tunnel Server**
- **tunnel server TS\_RenaterSites48**
- **ip address 1.2.3.4**
- **ipv6 pool prefix P\_Sites48**
- **ipv6 pool endpoints P\_IntercoSites**
  
- **#Tunnel Broker**
- **tunnel broker TB\_Renater\_48**
- **set tsp TSP\_Sites48**
- **set tunnel server TS\_RenaterSites48**

# Static tunnel configuration

## ★ Static tunnel:

- >conf t
- >(config)>int tunnel
- >(config-tunnel)> tunnel source 1.2.3.4
- >(config-tunnel)> tunnel destination 1.2.3.5

# Additional features

## ☀ Already available

- ☀ DNS update (for point to point hosts)
- ☀ NAT Traversal (if equipment supports UDP encapsulation)
- ☀ Authentication: Digest-MD5
- ☀ Monitoring:
  - ssh or telnet
  - SNMP + MIBs
  - logs

# Additional features /2

- ✦ Under discussion
  - ✦ SSL for the IPv4 tunnel
  - ✦ Multicast support for IPv6
  - ✦ Others ?



# Questions ?

... and may be some answers