

# IPv6 Addressing case study

## RENATER



*Dakar, SN -Octobre 2006*

**IPv6DIS**Semination and Exploitation

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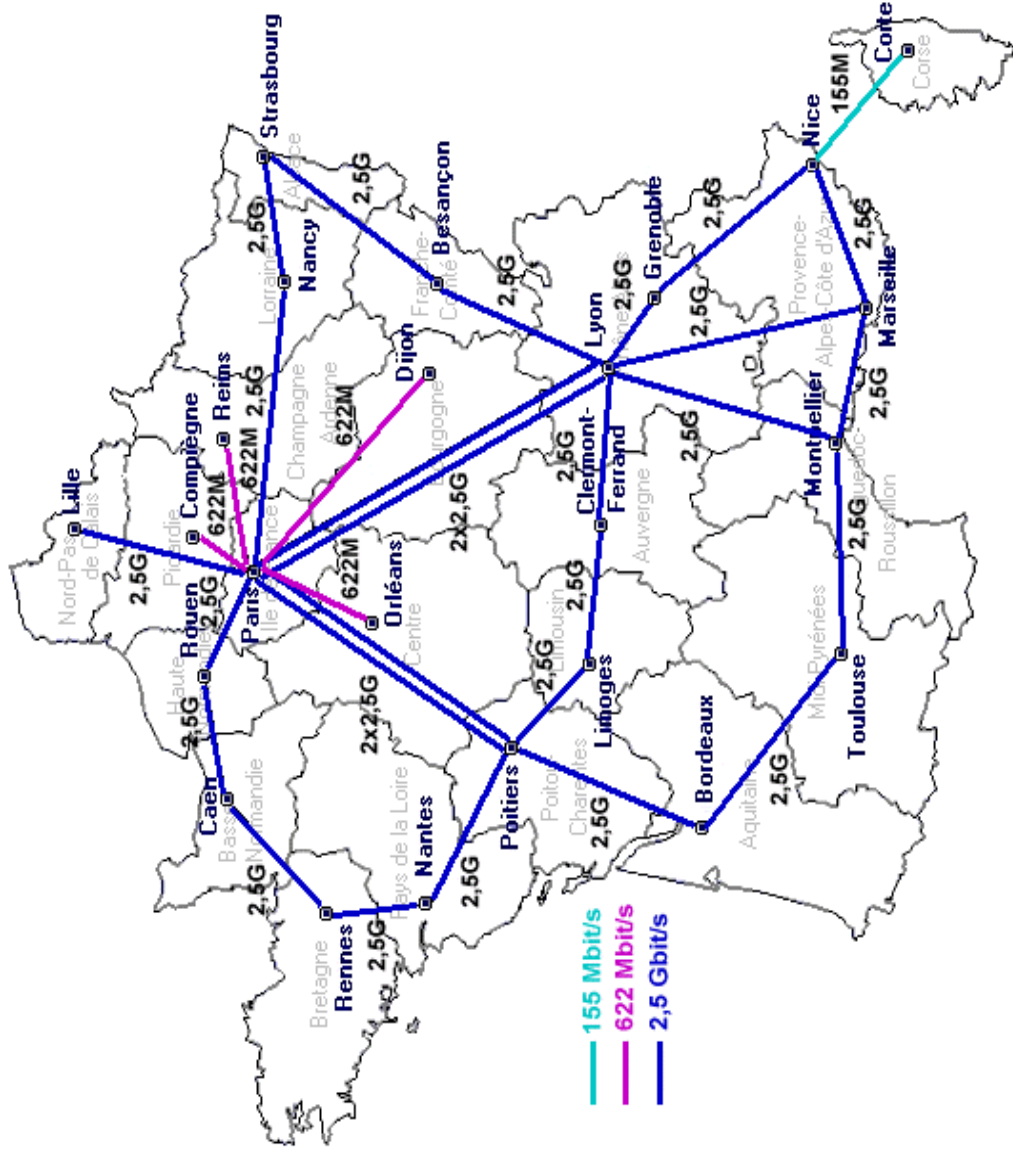


# Agenda

- Renater's topology
  - National links
  - International links
  - Regionals / MANs connected
- Renater's IPv6 services
- IPv6 addressing scheme
- Conclusion



# Renater : national backbone

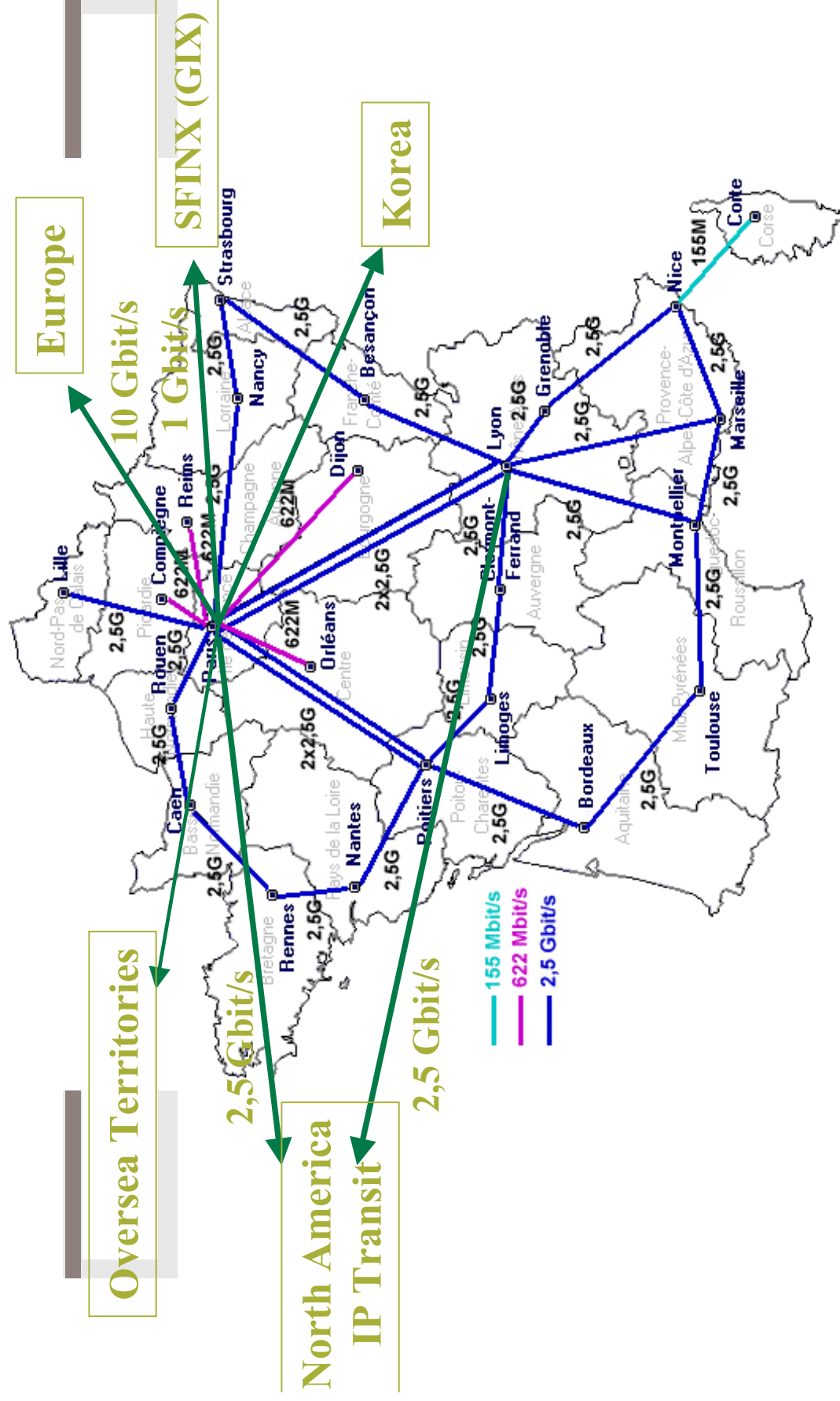


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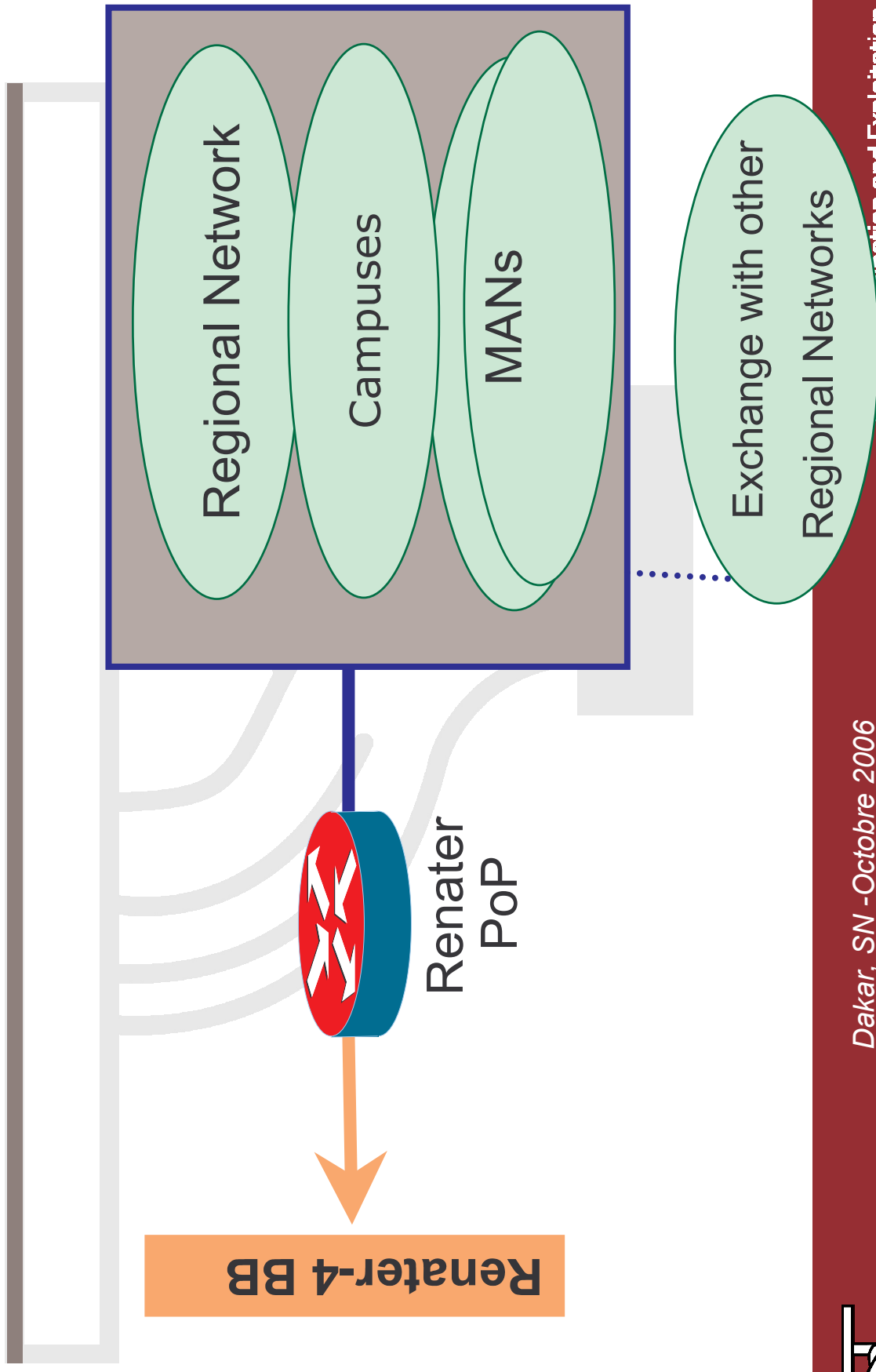
# Renater : international links



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# Renater-4 architecture



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# RENATER's Production IPv6 service

- Why a production-like IPv6 service ?
- ATM removed ...
  - Move all network services on a unique topology
  - Do we want to forget about IPv6, IPv4 multicast ... ?
- Needs for an IPv6 transport
  - Research projects using IPv6
  - Sites with native IPv6 network
  - install a native IPv6 core
  - run both versions of IP on the same equipments
- Monitor the IPv6 service in the same operational way than IPv4



# Renater 4 : IPv6 Native support

- 2.5 Gbits/s backbone
- 30 Regional Nodes (NR)
- Native IPv6 on all regional nodes
  - Dual stack backbone → IPv4 and IPv6
- Global IP Service
  - IPv4 unicast and multicast
  - IPv6 unicast (multicast is being deployed)
  - IPv6 and IPv4 carried without any distinction
- Goal : achieve for both versions of IP an equal level of
  - Performance
  - Availability
  - Management
  - Support

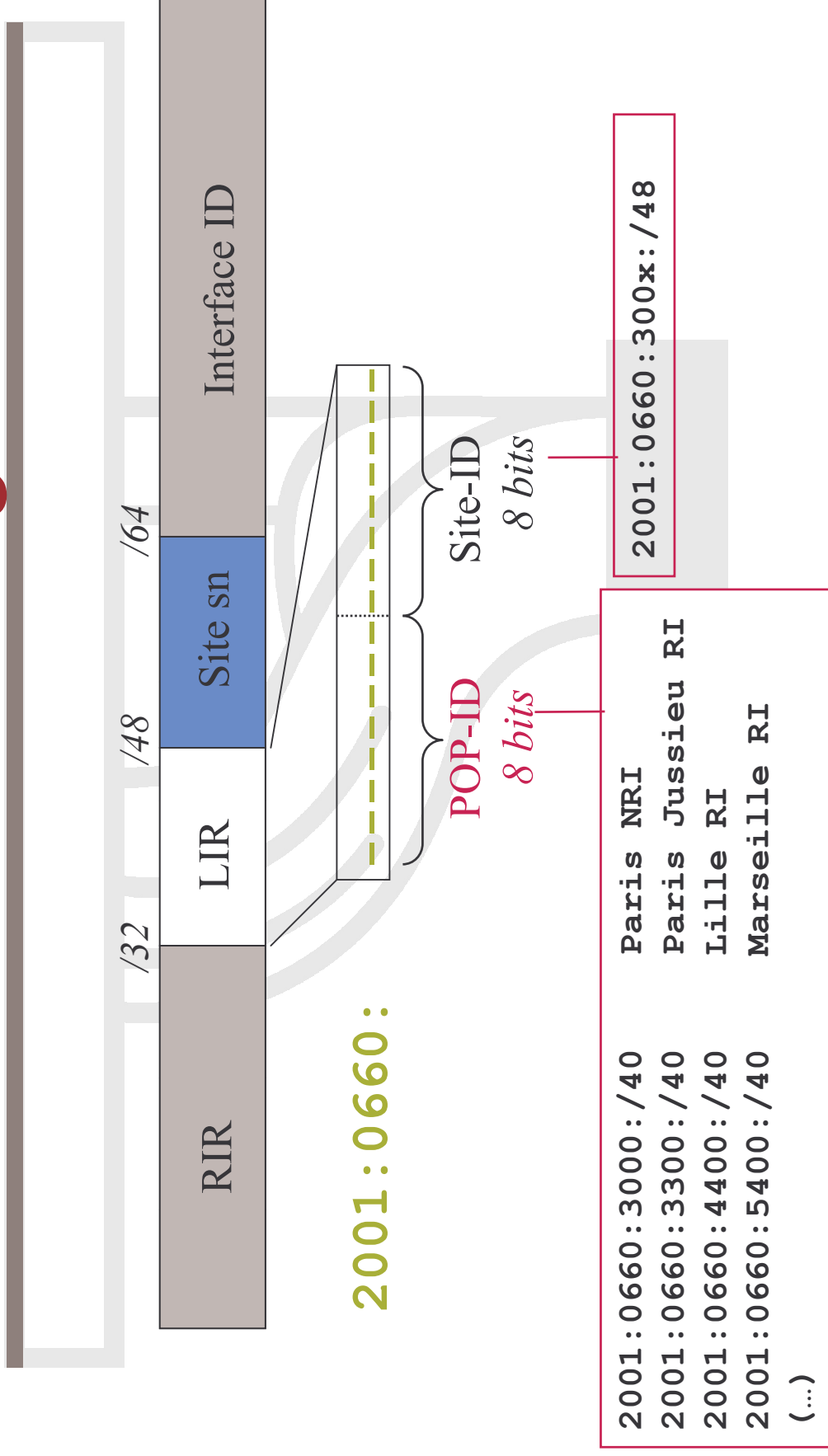


# Addressing

- Hierarchical addressing
- Renater
  - Prefix = 2001:0660::/32
  - Allocated by the RIR (RIPE NCC)
- Regional Nodes
  - POP-ID = 2001:0660:xy::/40
- Site
  - Site-ID : a /48
    - from RN's prefix (/40) it's connected to
  - Site-IDs allocated by Renater (LIR)
  - 16 bits are available for the site topology



# Addressing



# Example

|                                       |                     |
|---------------------------------------|---------------------|
| Renater's prefix                      | 2001:0660::/32      |
| POP-ID Strasbourg                     | 2001:0660:4700::/40 |
| Sites connected to<br>Strasbourg's RI | 2001:0660:4701::/48 |
|                                       | 2001:0660:4702::/48 |
|                                       | ...                 |

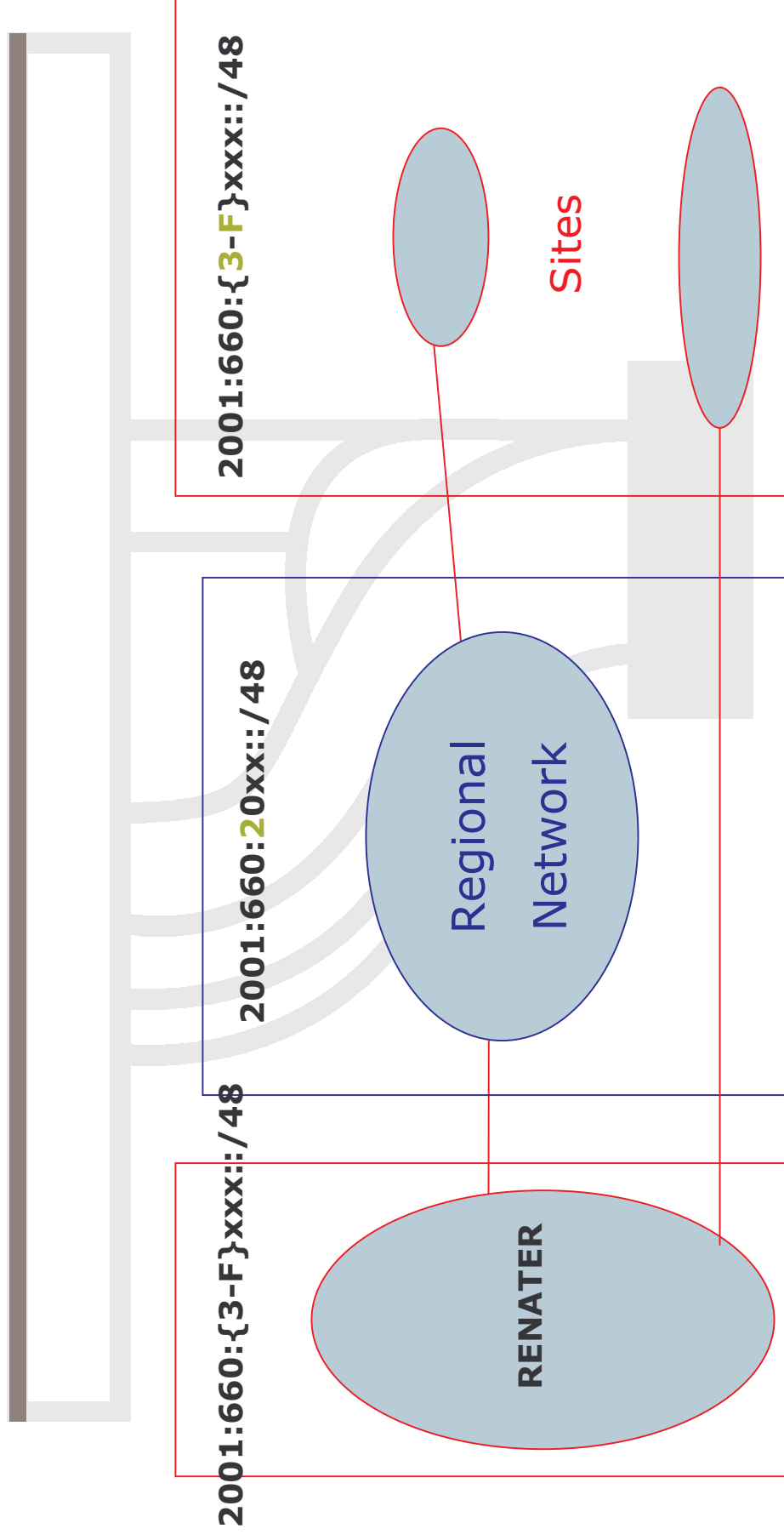


# Regional Nets Addressing

- Two possibilities
  - Uses its own prefix (Commercial ISP)
  - Uses Renater's address space
    - 2001:0660:**2**---::/48
  - In both cases
    - Sites are addressed in Renater's prefix
    - 2001:0660:{**3-F**}---::/48
  - Interco Network (site – Regional / MAN)
    - First /64 prefix of the Site-ID allocated



# Addressing scheme



# Conclusion

- Preparing an IPv6 plan is a bit complex
- Plan it in advance ...
  - Not forgetting your PoPs equipment (loopbacks, admin LANs, interconnects ...)
  - Renater's internal BB equipment addressing plan is 15+ pages !
- Draw benefit from aggregation
  - Smaller routing tables to manage (even in the core)
  - Less prefixes to advertise to BGP peers
- Lot of people have an experience yet ...
  - Not necessary to reinvent the wheel ;)

