



IPv6 and the vehicle of the future: The CVIS & GeoNet EU projects

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The vehicle of the future: Why not IPv4 ?

- ◆ Vehicles are connected to the Internet
 - => Several IP addresses per vehicle**
 - ◆ On-board units (**OBU / Router**) maintaining **Internet access** through **several** medias (3G, 802.11p, ...)
 - ◆ Application Units (**AU / Host**) running **ITS applications**
 - ◆ Hand-held devices running **multimedia applications**
 - ◆ OEM: Gateway between IP and CAN
- ◆ Number of cars worldwide
 - ◆ 1997: 600 millions
 - ◆ 2030: 1200 millions (at present trend)
- ◆ IPv4 is a non-go for ITS deployment
 - ◆ $2^{32} = 4,294,967,296$ addresses
 - ◆ Too many vehicles for NAT
 - ◆ Limited mechanisms for IP session continuity (**NEMO**, mobile edge multihoming, etc.)

The vehicle of the future: Why should we care about IPv6 ?

- ◆ IPv6 **not an option** for wide development of IP-based ITS applications
 - ◆ IPv6 is currently being deployed (not an utopia) and will be fully operational by the time ITS systems get deployed
- ◆ Urgent to develop **IPv6 awareness and know-how** within the ITS community
 - ◆ Avoid disruption of business due to bad design and lack of vision
 - ◆ Considering IPv6 at the earlier design stage will further ease the transition from IPv4 to IPv6 and save costs
 - ◆ IPv6 compatibility must be ensured now

The vehicle of the future: CVIS and GeoNet EU Projects

- ◆ **CVIS (FP6)**

- ◆ <http://www.cvisproject.org>

- ◆ IPv6 communications between cars & central systems

- ◆ Communication architecture inspired from CALM

- ◆ CALM:

- ◆ **ISO TC204 WG16**

- ◆ **Communication Architecture for Land Mobile**

- ◆ <http://www.calm.hu>

- ◆ **GeoNet (FP7)**

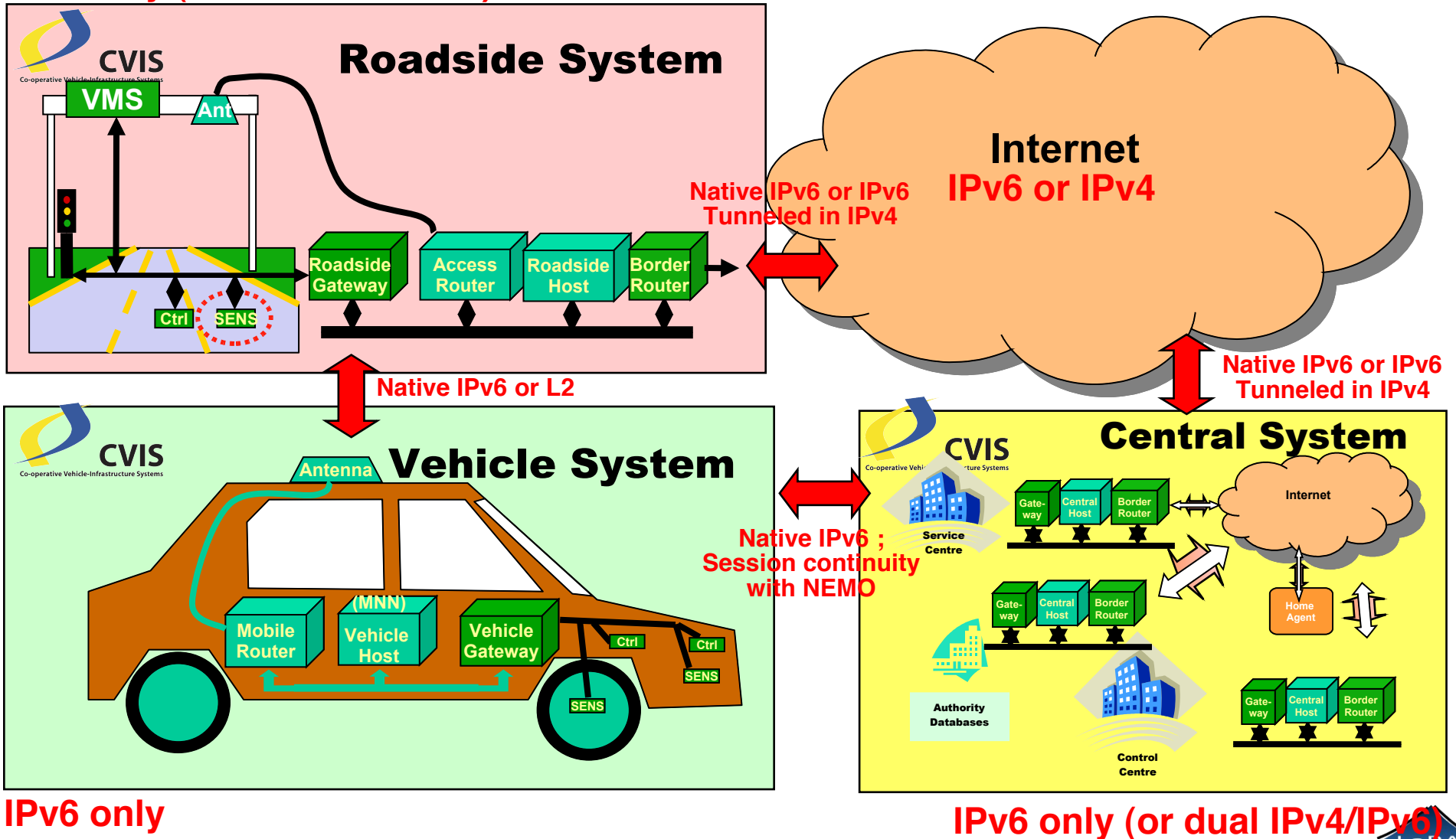
- ◆ <http://www.geonet-project.eu/>

- ◆ Combination of IPv6 (IETF) and C2C-CC standards

- ◆ Geographic addressing and routing

The vehicle of the future: IPv6 Communications in CVIS

IPv6 only (or dual IPv4/IPv6)



Links

- ◆ “IPv6 for ITS” portal
 - ◆ web page recently set up – content under progress
 - ◆ <http://lara.inria.fr/ipv6/>
- ◆ CVIS: **C**ooperative **V**ehicle-**I**nfrastructure **S**ystem
 - ◆ <http://www.cvisproject.org>
- ◆ GeoNet
 - ◆ <http://www.geonet-project.eu/>
- ◆ ISO TC 204 WG 16: CALM Standard
 - ◆ <http://www.calm.hu>
- ◆ IPv6 Task Force France
 - ◆ <http://www.g6.asso.fr/tff>