NoW – Network on Wheels Communication System Demonstrator

NEC

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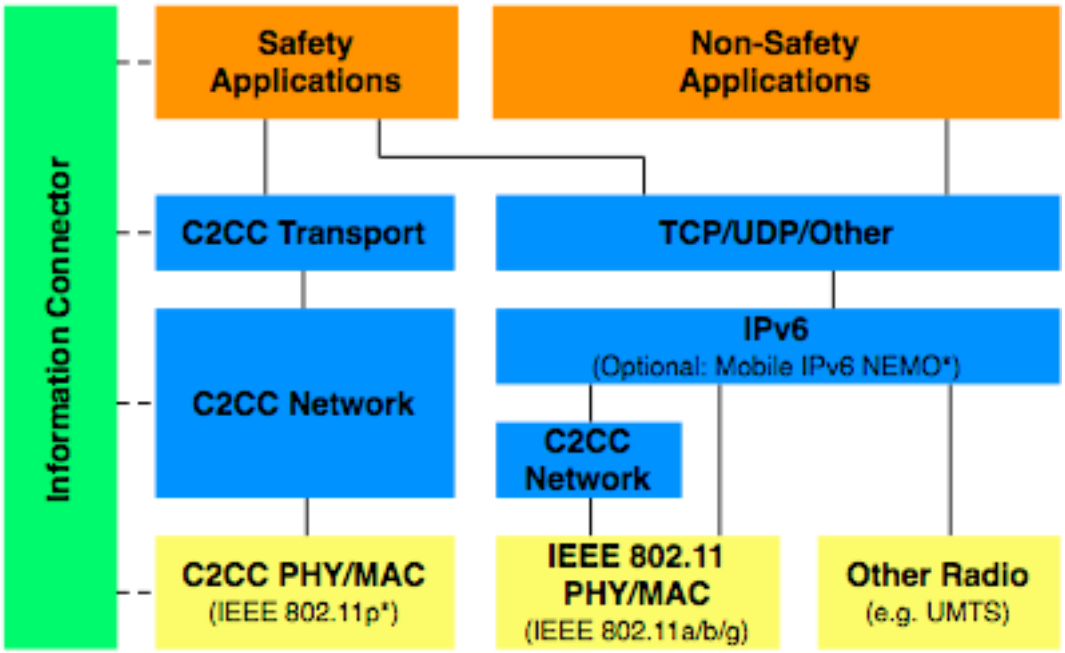
NoW/SEVECOM
Project Internal

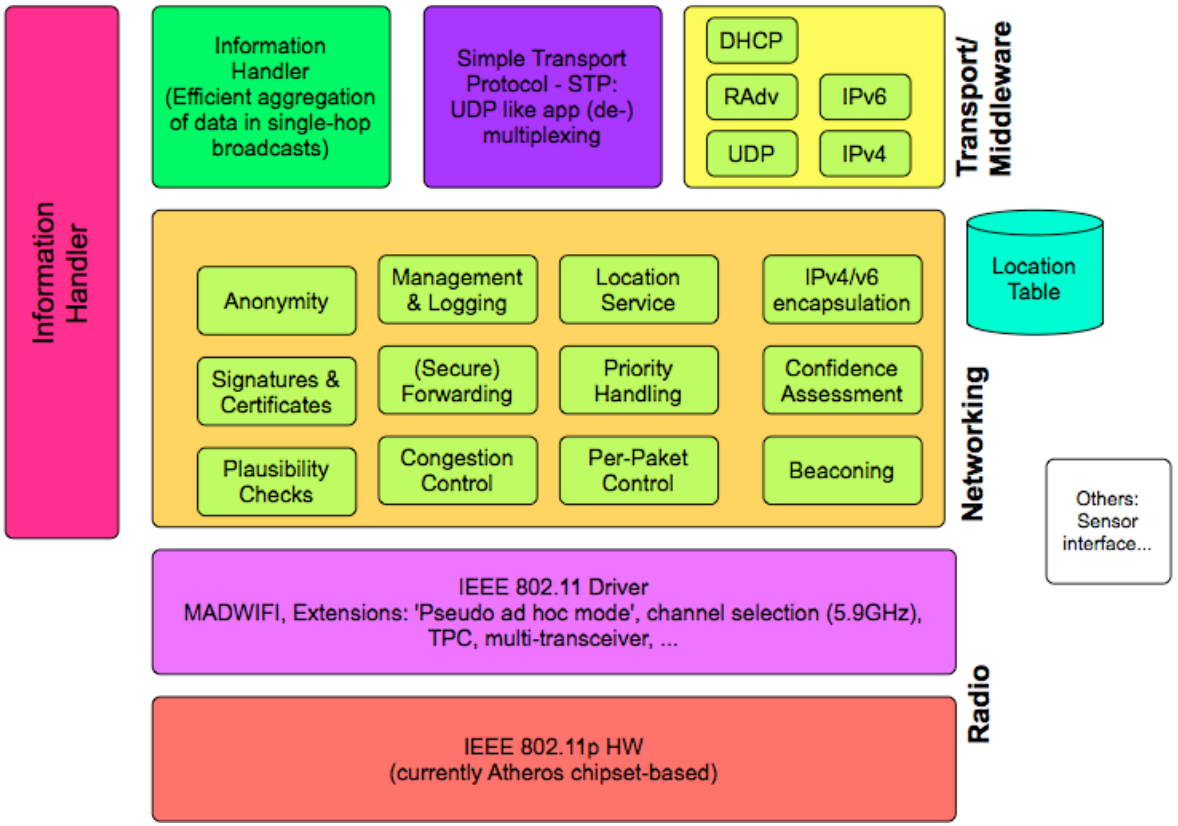
Communication protocol stack

Currently assumed in NoW project and C2C-C consortium:



NoW Communication System Demonstrator

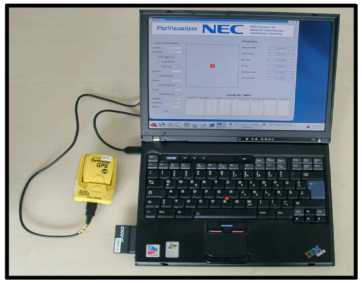
"Represents state-of-the-art implementation of C2C-C protocol stack"

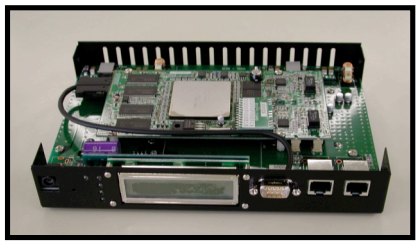


Demonstrator HW and SW

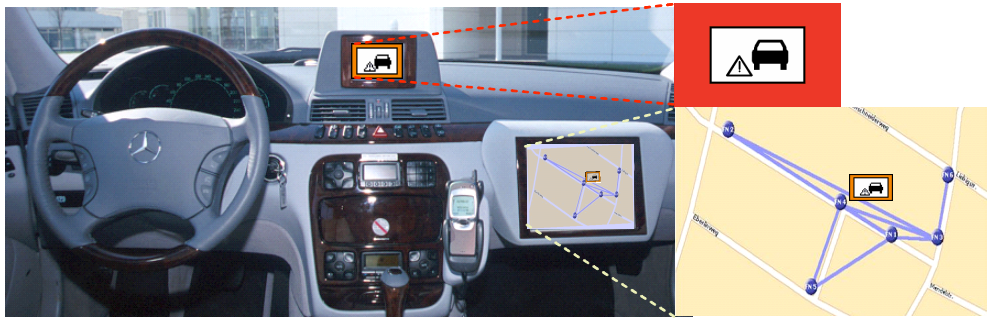
- Developed on i386 platform for Linux operating system
  - User space implementation
- Suggested Linux Kernel version: 2.6.18
  - No changes to the kernel code
  - Recompilation with selected kernel features is required
- Minimum hardware requirements
  - Standard notebook (Intel, USB, PCMCIA)
  - Wireless LAN NIC (Based on Atheros 5212/5213 chip)
  - External antennae (diversity is recommended), low loss cables (1 dB/m)
  - Standard GPS device with USB interface
- Modified wireless WLAN driver (madwifi)

Ported to different platforms





Vehicle Integration from Partners in NoW Project



Features

- Current features of the NoW Communication System Demonstrator:
  - Unicast multi-hop
  - Geographical broadcast and anycast (inside target area, unicast towards target area)
  - Topological broadcast (flooding)
  - Beaconing, location service
  - (Support for multiple in-vehicle attached Application Units)
  - IPv4 and v6 support (without IP mobility)
  - Prioritization of safety messages through multiple queues
  - Link-layer enhancements for WLAN driver (madwifi)
  - Access location table from applications (Management interface)
  - Information connector and information handler (‘message dispatcher’)
  - Pseudonymity
  - Flexible configuration, event logging, packet tracing
  - (Network layer queuing)
  - (Multi-transceiver support)
- The NoW Demonstrator is currently used by the NoW partners as experimental platform for demonstrations and measurements

Outlook for Platform (1)

- Short term (2007-2008)
  - Experimental platform for better understanding of selected mechanisms
  - Proposed as SW platform for C2C-CC demonstration event in 2008
  - Further enhancements for application integration in NoW project and for demonstrations (features seem to be sufficient)
  - Support for partners using the platform
  - Dedicated HW is regarded as less important and not the objective (though CarPCs preferred)

Outlook for Platform (2)

- Mid term (2008-2010)
  - Adapt to consolidated status from C2C-CC working groups (probably also ISO TC204 WG16?)
    - Enhanced forwarding schemes, congestion control, multi-channel
    - Improved support for RSU/infrastructure access (IPv6, NEMO+)
  - Formal specification
  - Improved modular design
  - Provable correctness
  - Emulation
  - Low cost HW, but also considering automotive & C2C-CC requirements incl. dedicated crypto HW
  - Multiple implementations, interoperability tests (different OSs)
  - To be deployed as basis in Field Operational Tests (SIM-TD, EU-FOT)