

ConnMan usage of NetFilter: a close overview

NFWS 2013

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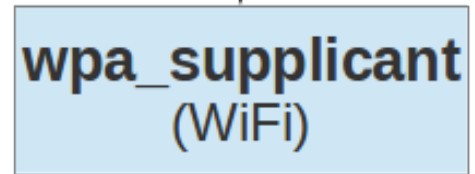
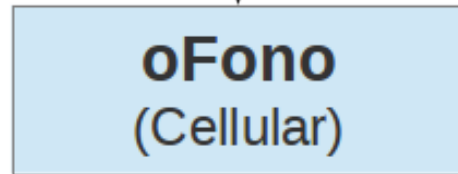
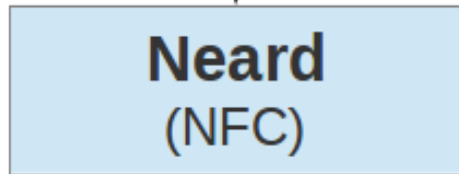
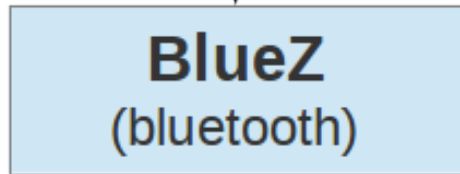
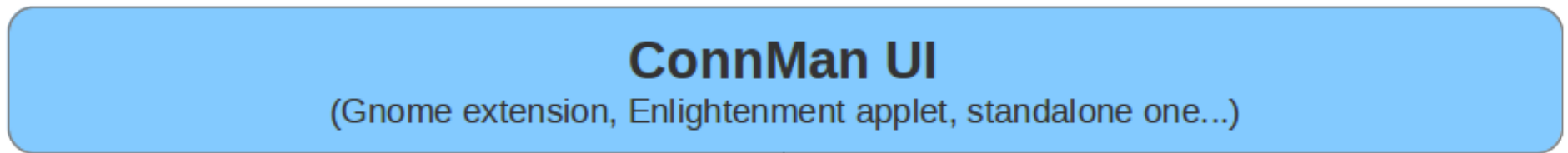
Agenda

- ConnMan
- Connection sharing (aka tethering)
- Application connectivity
- Troubles and solution
- Questions ?

ConnMan

- Slim and fast
- Modular
- Supports nearly all wired and wireless connection technologies (R.I.P. wimax)
- Integrates all critical networking components:
 - DHCP(v4/6) client & server
 - DNS proxy
 - Basic HTTP(S) connectivity check
- Provides a smart D-Bus API

↔ = Dbus messages/signals



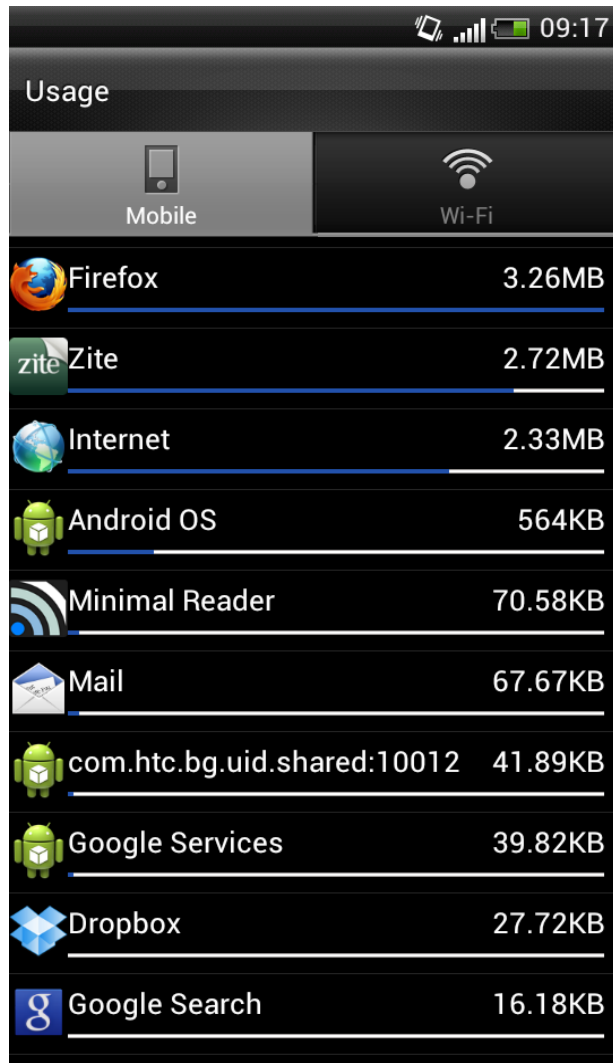
Connection sharing (aka tethering)

- Create a bridge interface
- Add the tethering interface to the bridge
- Setup the sub-network on the bridge
- Enable IP forwarding
- Set up NAT masquerading on bridge output

Application connectivity

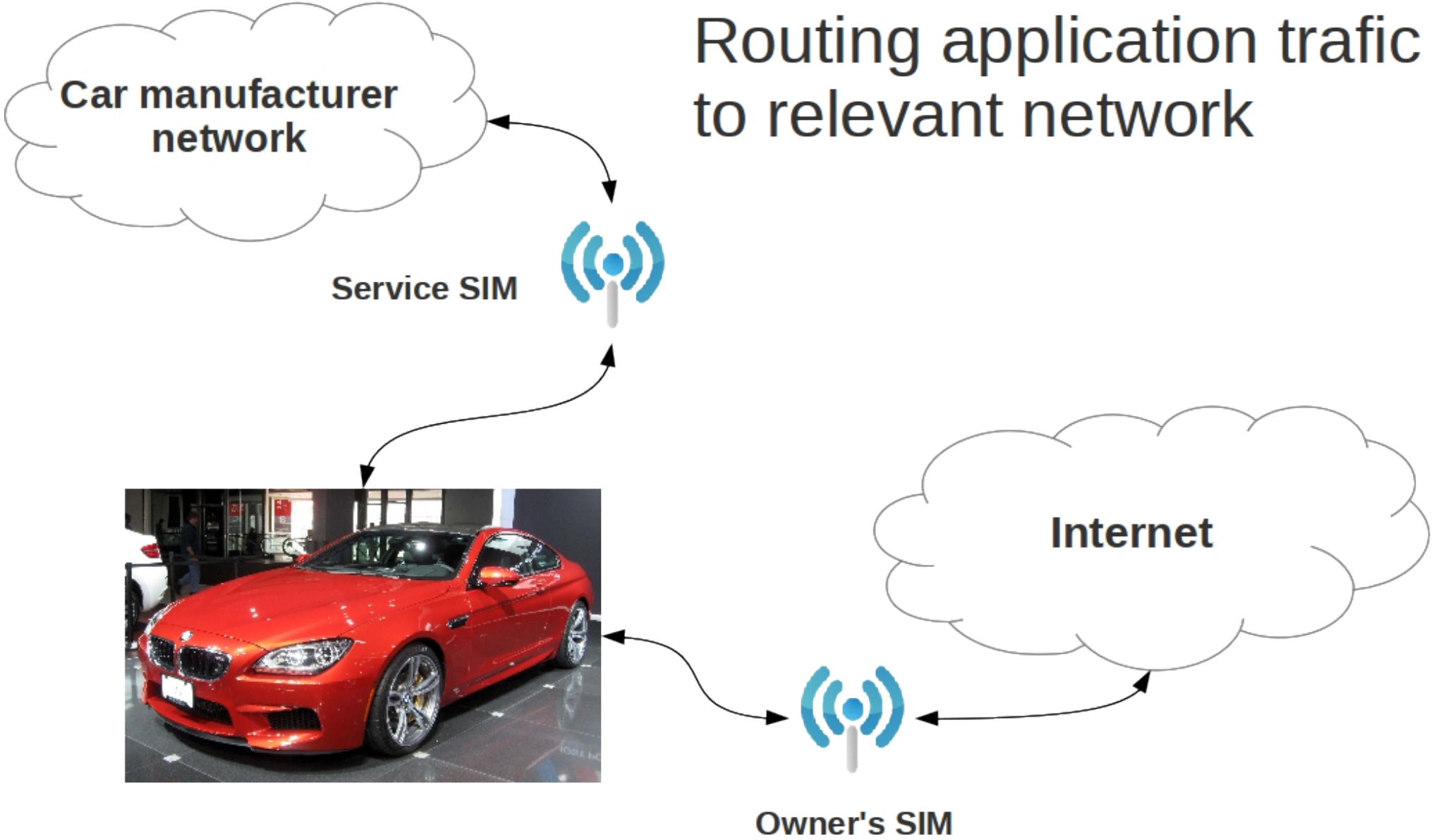
- User experience
- Power efficiency
- Fine controlling network access of every application
- Use cases relevant for:
 - IVI
 - smartphone & tablets
 - other specific devices/setup ...

Application connectivity



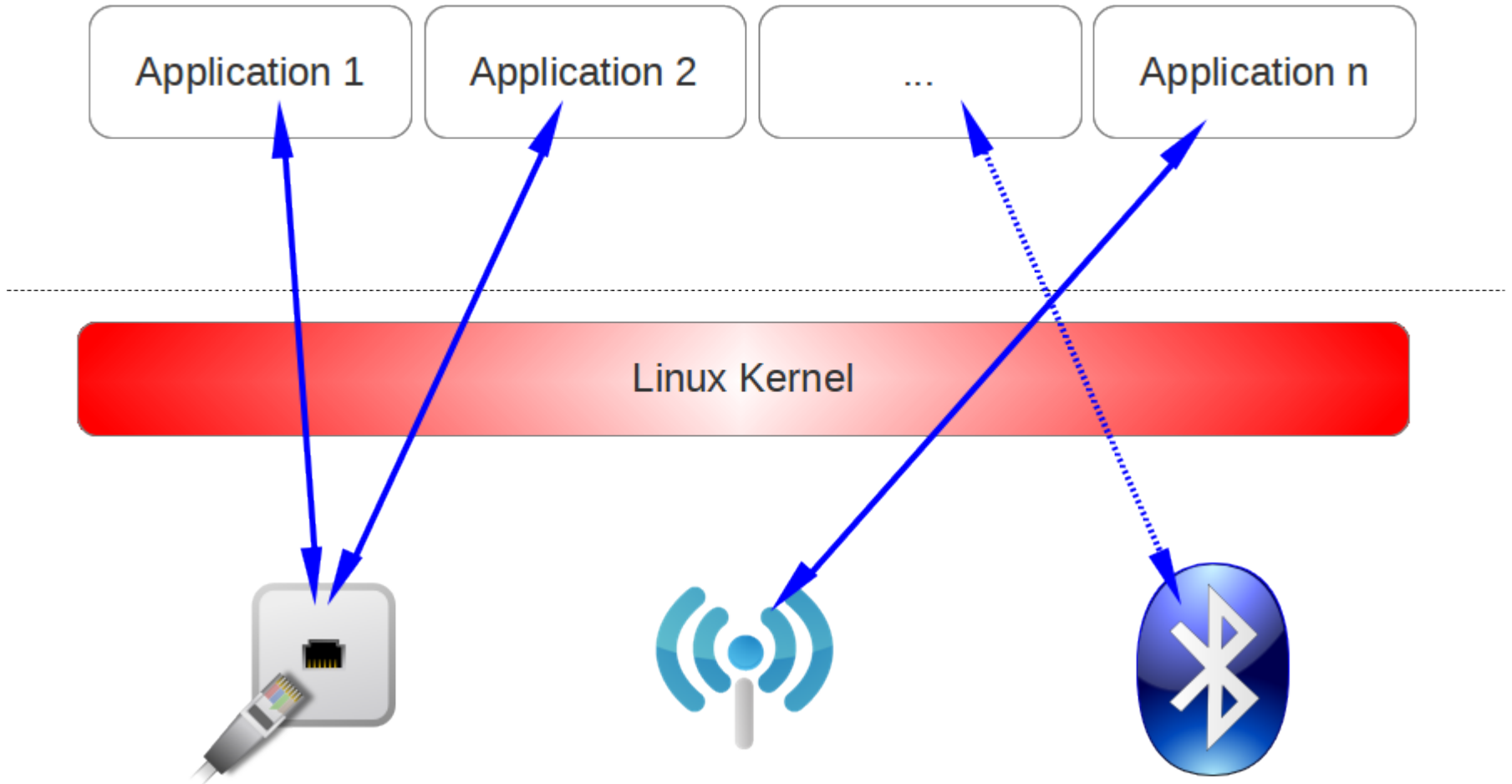
Gathering per-application network statistics

Routing application traffic to relevant network



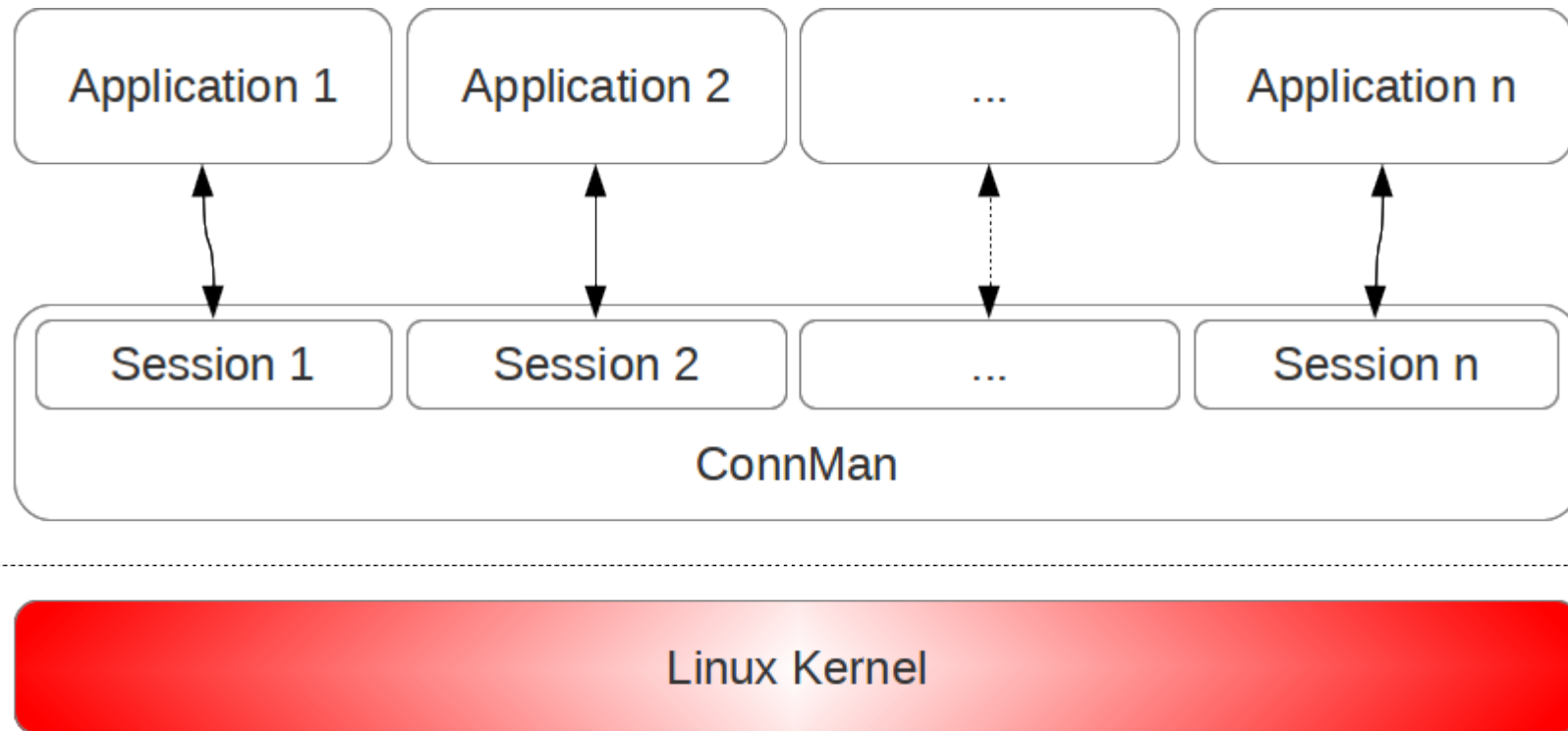
What should be reached

↔ = Network traffic

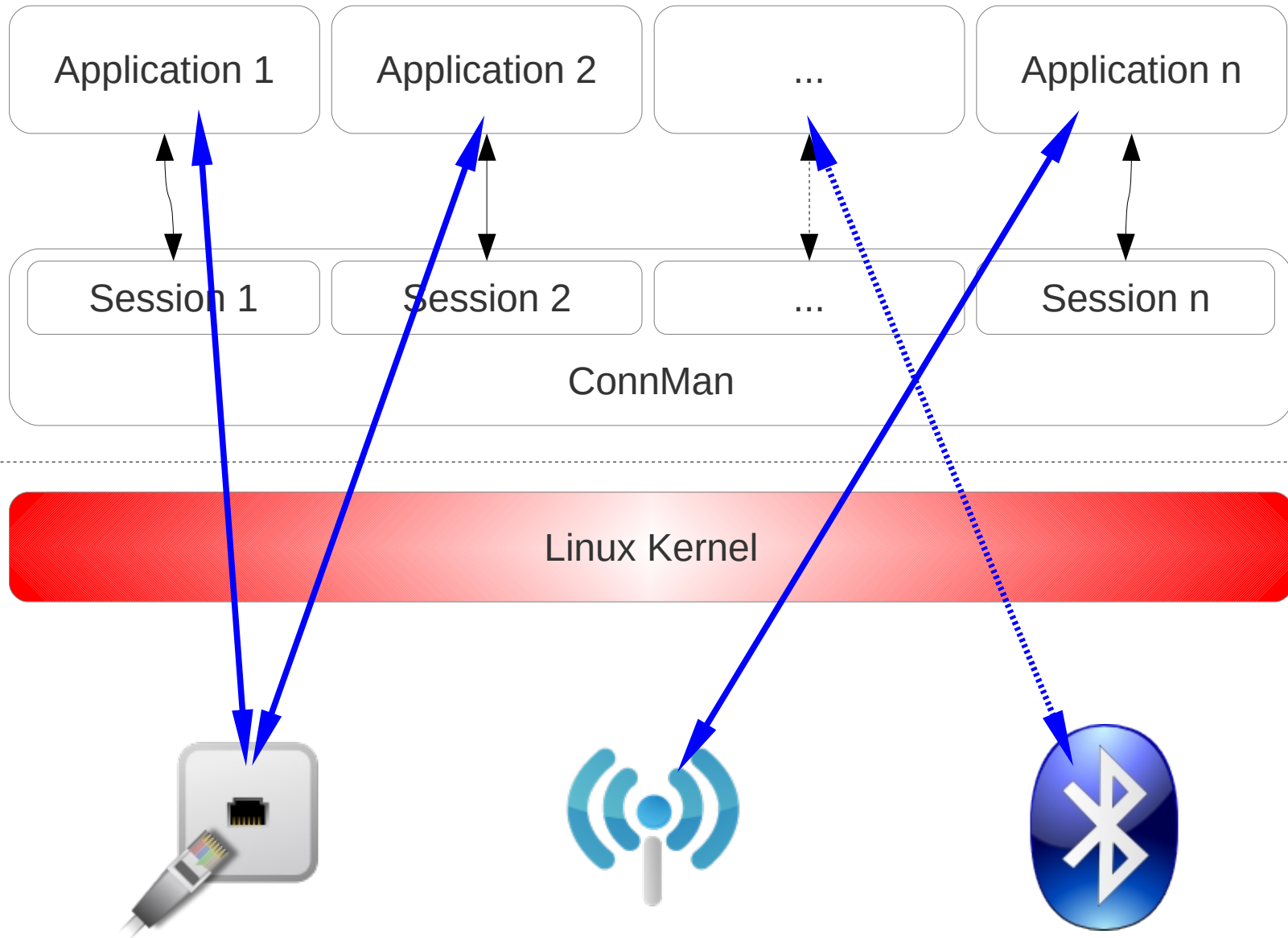


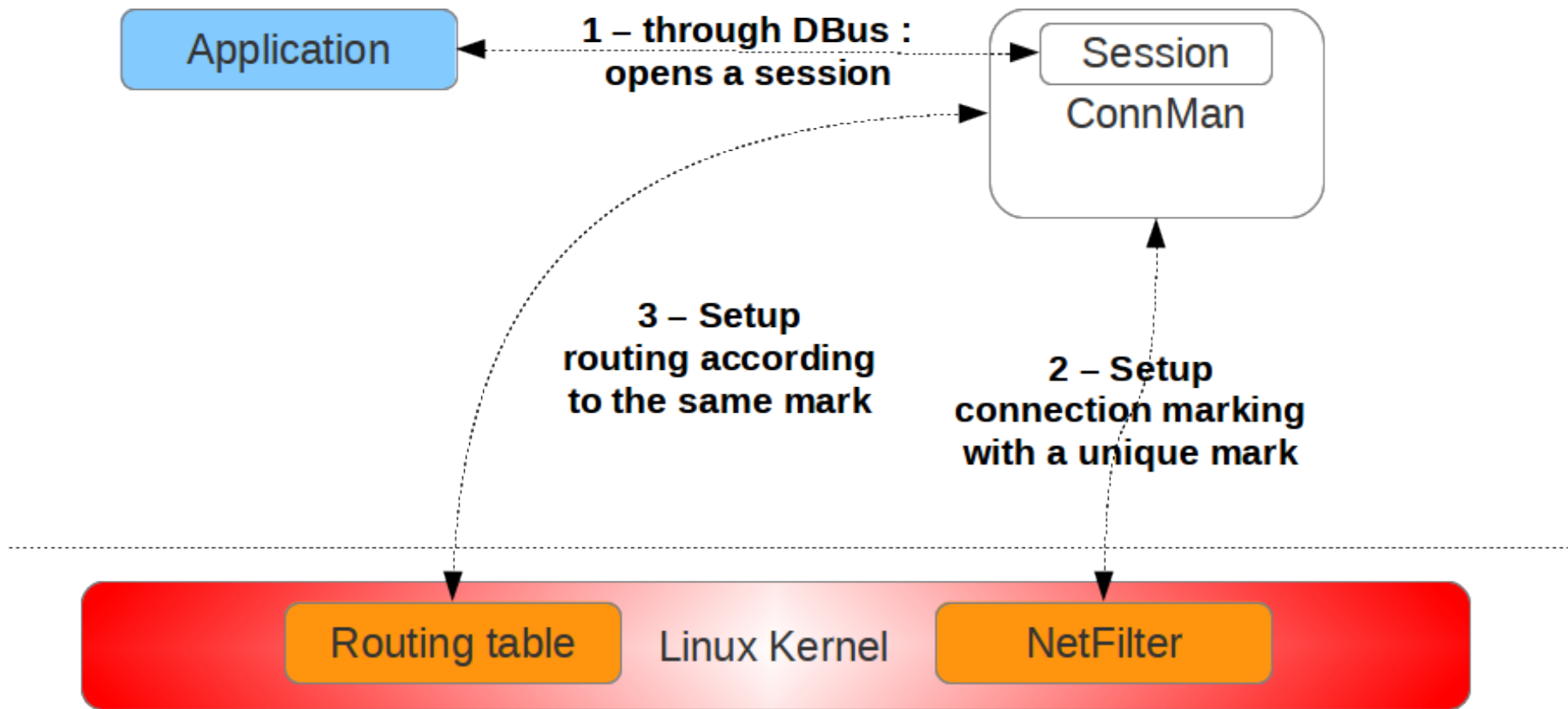
ConnMan's Session API

- Every network related application owns one
 - through D-Bus, connline, ...
- To be connected via requested bearer (ethernet, wifi, cellular, bluetooth)
- To be notified when network is up/down



↔ = Network traffic





Result : All traffic generated by the application follows the specified route, and statistics is provided to ConnMan through NFACCT.

Troubles

- Iptables known issues
- xtables library:
 - too complex (low level)
 - design issues
 - API change in minor release

Solution

We decided to move on with **nftables**

Requirements :

- 1 - Improve, fix and stabilize **nftables** API
- 2 - Get it adopted by community (**iptables-nftables**)
- 3 - Create and maintain a high level library to access it
- 4 - Trying not to use xtables compatibility

Questions ?