

Mobility Support in Edge Routers

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- Quo vadis, DFN project?
- Aims of the DFN testbed
- Service platforms
- Remote Socket Architecture (ReSoA)
- Local testbed
- Last Hop Protocol: LLP
- Support Tool for test environment

General project description

- potentialities and limits of a simple approach for Active networking
- application-specific services, specifically mobility
 - terminal mobility
 - personal mobility
- flexible service platform
 - e.g., transport protocols for group communication

Areas of application

- group- and mobile communication
 - proving
 - evaluation
- analysis
 - quality of service
 - safety
 - reliability

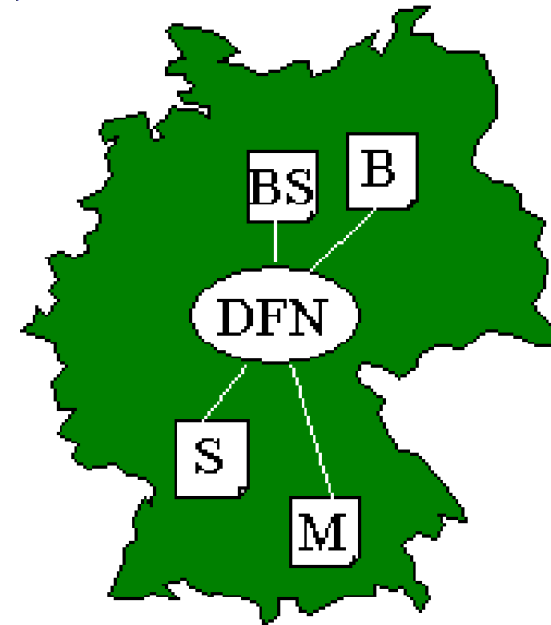
Aims

- prototypic realizations
- experiences in terms of
 - appropriation
 - use of a flexible open service platform

Steps

1. GNU/Linux based PCs with flexible open service platform
2. Extension to high bandwidth IP over WDM (on top or parallel to DFN network).
3. Opening to a broader range of users

testbed

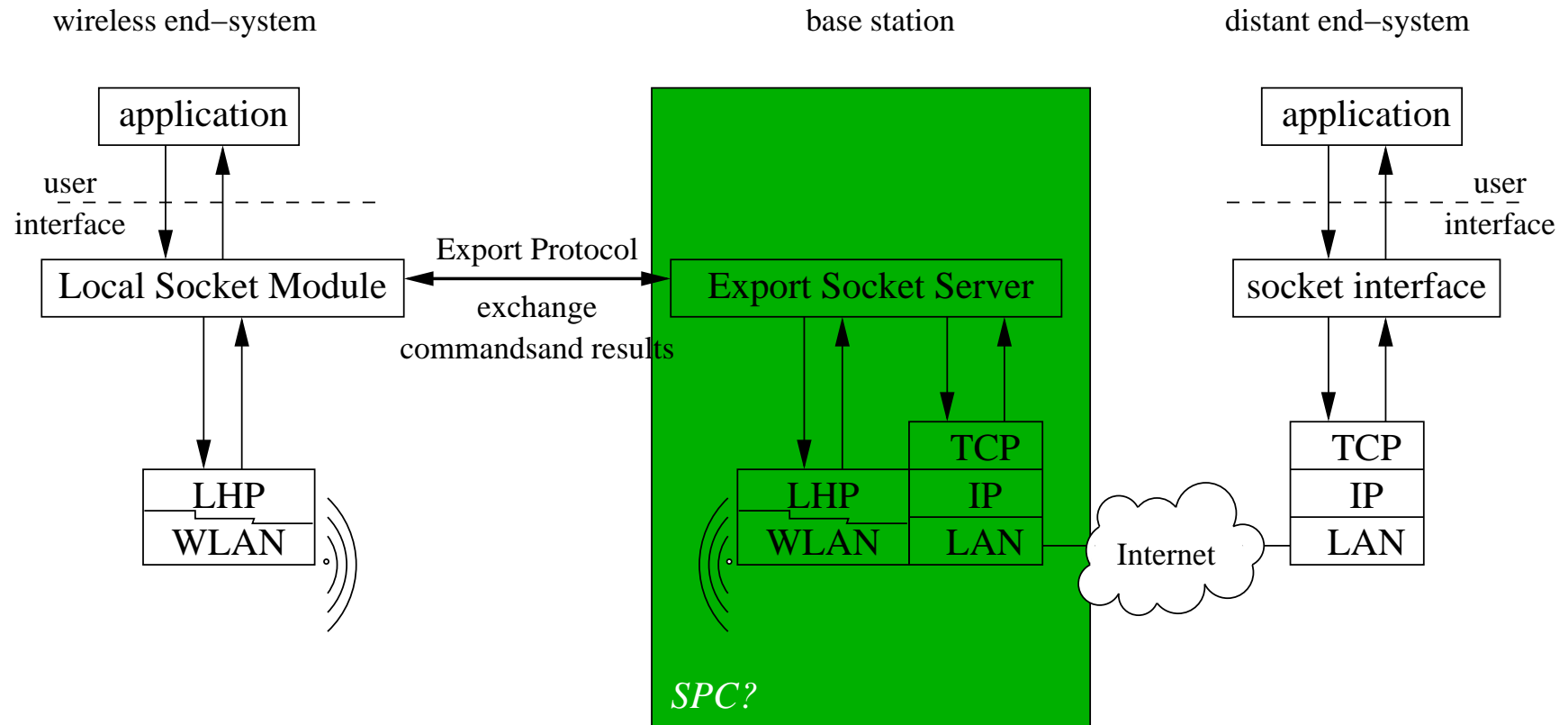


Service platforms

- AMnet (Active Multicasting Network)
- ANN (Active Network Nodes)
based on WUGS (Washington University Gigabit Switch)
- Router Plug-ins

Desired results

- conclusions on necessary functionality
- cycling through steps of
 - conception
 - realization
 - evaluation



ReSoA

- Remote Socket Architecture, consisting of:
- Export Protocol:
 - transport layer proxy approach
 - Transfer of socket functionality
- Last Hop Protocol (LHP): e.g., Link Layer Protocol
 - reliable transmission for TCP streams
 - semi-reliable transmission for UDP streams
 - implemented for GNU/Linux
 - implemented as virtual devices allowing for dynamically interchanging protocols.
- between edge router and mobile node

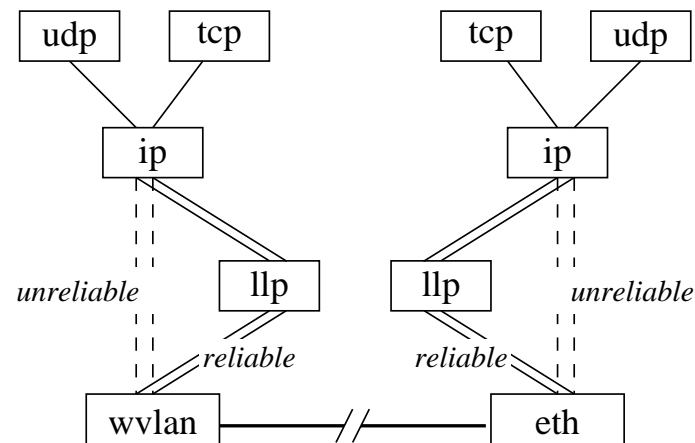
Open issues

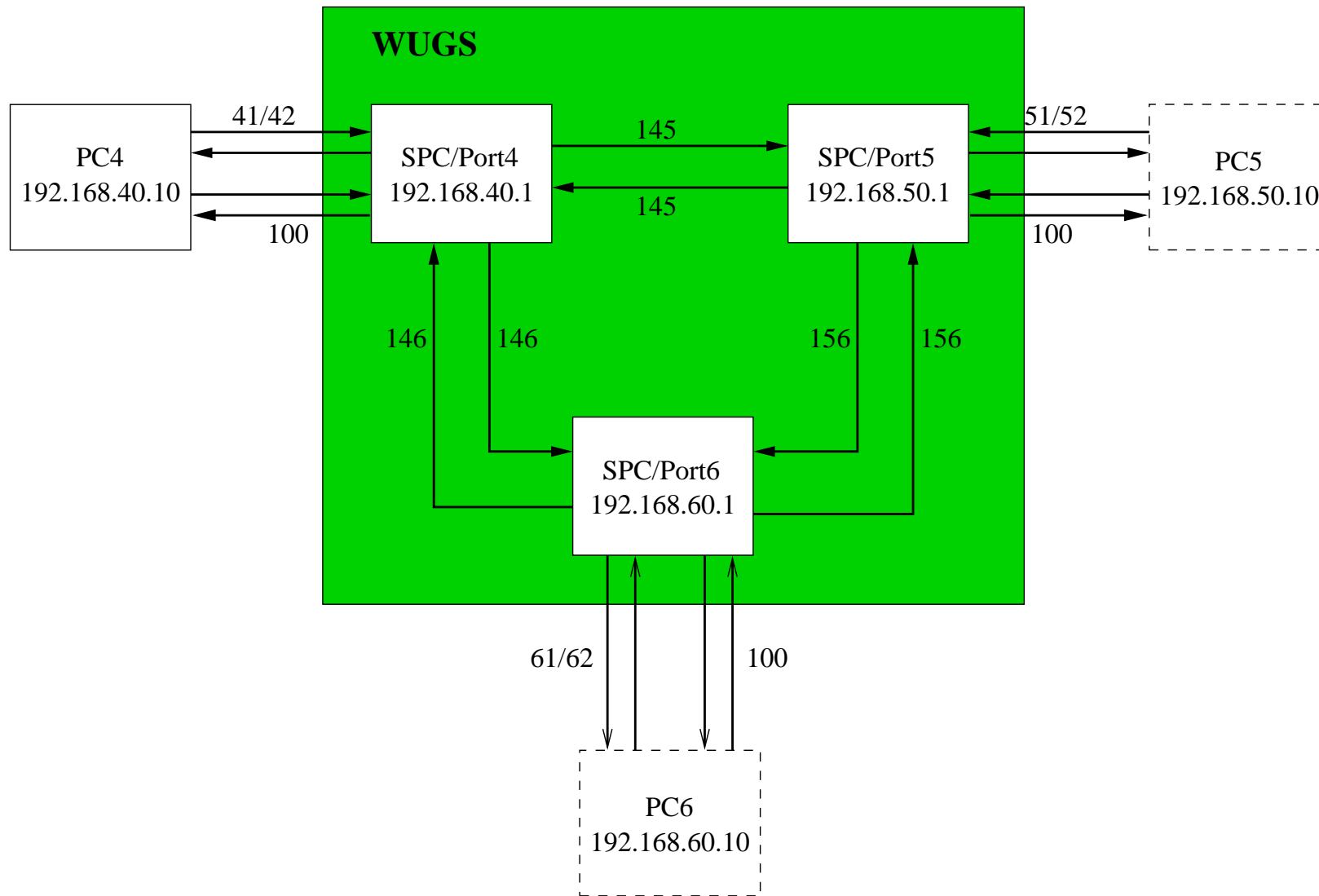
- porting to ★ BSD-ish environment?
- porting Export Protocol to current Linux kernel version (from 2.0.x to 2.2.x or 2.4.x)

Implementation of LLP

- Support layer for MAC protocols
- Reduction of unnecessary multi-hop retransmissions
- Device independent
(tested with ethernet and several wireless devices)
- packet path controlled by standard routing rules
- additional internal refinement (e.g., by ports) to improve transmission reliability for selected applications (e.g., NFS)

Schematic display





Problems of wireless access

- fast (\approx ms) changing environment
- repeatability of tests
 - different kind of losses for each test
- comparability of results

Solution: Soft link device

- simulation of link outages
- rate limitation
- packet drops (single or bulk)
- link delays
- re-ordering of packets
- virtual device (Linux based)
- access to parameters using IO-controls

THANK YOU
FOR YOUR
ATTENTION!

