INF3190 – Second Home Exam

UNIVERSITY OF OSLO

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HE-2 stands for **20%** of the final grade

Individual work!

The **goal** is to implement the network-layer *routing* functionality (disable the bridging function at L2!)

Implement *Link State Routing* (LSR) with Network layer providing reliable end-to-end communication to the L4

Requirements:

- ❑ Dynamic routing
- ❑ Implementing and updating the routing tables
- ❑ Sending routing packets to measure the actual distance of the direct neighbors (RTT?)
- ❑ Loop handling

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The Network layer (L3) doesn’t touch anything in L2 => flow control doesn’t apply to the routing packets

Two equal-graded approaches to handle L2:

1) use your implementation of HE-1

2) use HE-2 pre-code

Program's Structure (UI)

1. Create PHY links between two machines using UDP packet exchanges, while being able to accept new PHY connections even on the *same machine with different port number*

2. Machines are included in the routing process as soon as the "connect" is performed

3. Network layer (L3) forwards the packets according to the "routing table"

> CONNECT <hostname> <port_number>

> SEND <L3 address> <filename>

> Quit

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Data is sent to *Transport layer (L4)* through *l4_recv()*

l3_send int (int dest_address, const char * buf, int length);

Receives data from the transport layer and adds network layer header

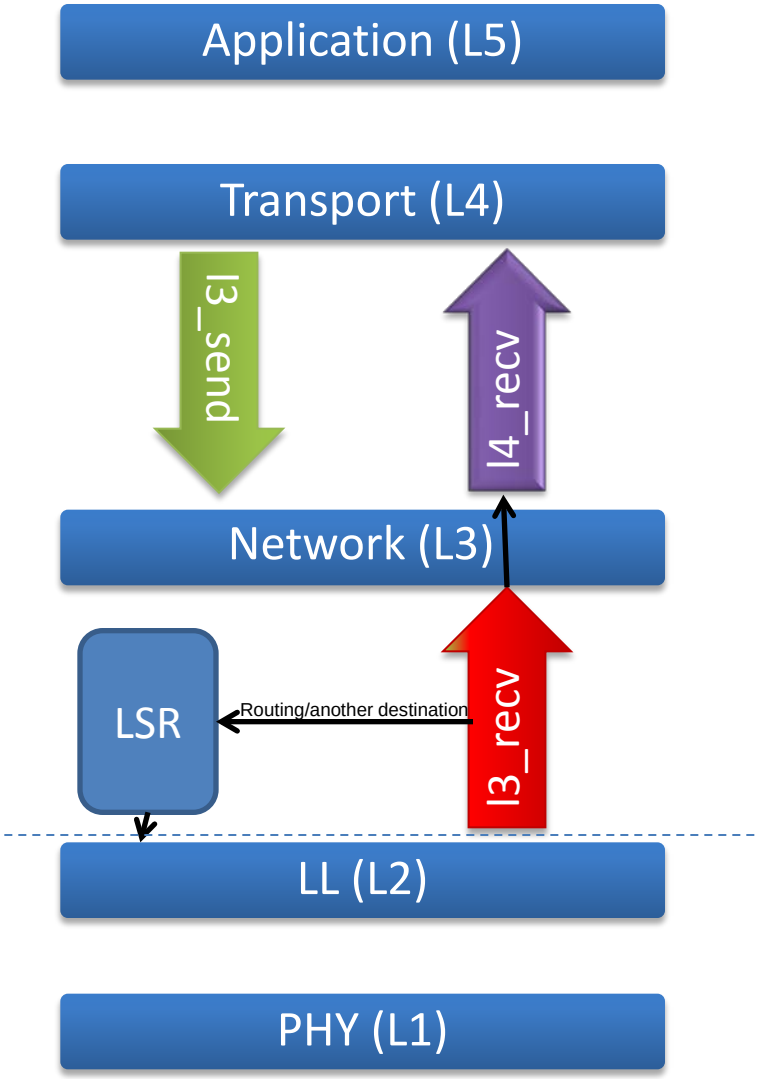
l3_recv int (int mac_address, const char * buf, int length);

l3_recv called by the link layer upon a new frame arrival

finds out if:

- o packet belongs to the routing protocol
  - Use *LSR*
- o if a "data packet" to be forwarded to another machine
  - Use *LSR*
- o if a "data packet" addressed to itself
  - Call *l4_recv()*

Extra points! Proper use of the *Dijkstra shortest path* to calculate the routing table.



Delivery

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Q&A?