

LAB 4: DESIGN A SMART WIRELESS NETWORK

PROF. MICHAEL TSAI

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OVERALL GOAL

Design the software (MAC/routing) to relay the packets in the optimal way you can think of.

10-20 Zigduino will be installed in the CSIE Building



Source/dest. Zigduino will be connected to a PC via USB (serial port)

Host 2
tuno: 192.168.0.2

Host 1
(Gateway to Internet)
tuno: 192.168.0.1

Packets are relayed by the Zigduinos from the source to the destination (transparent to the PCs, they only see a point-to-point link)

CONSTRAINTS

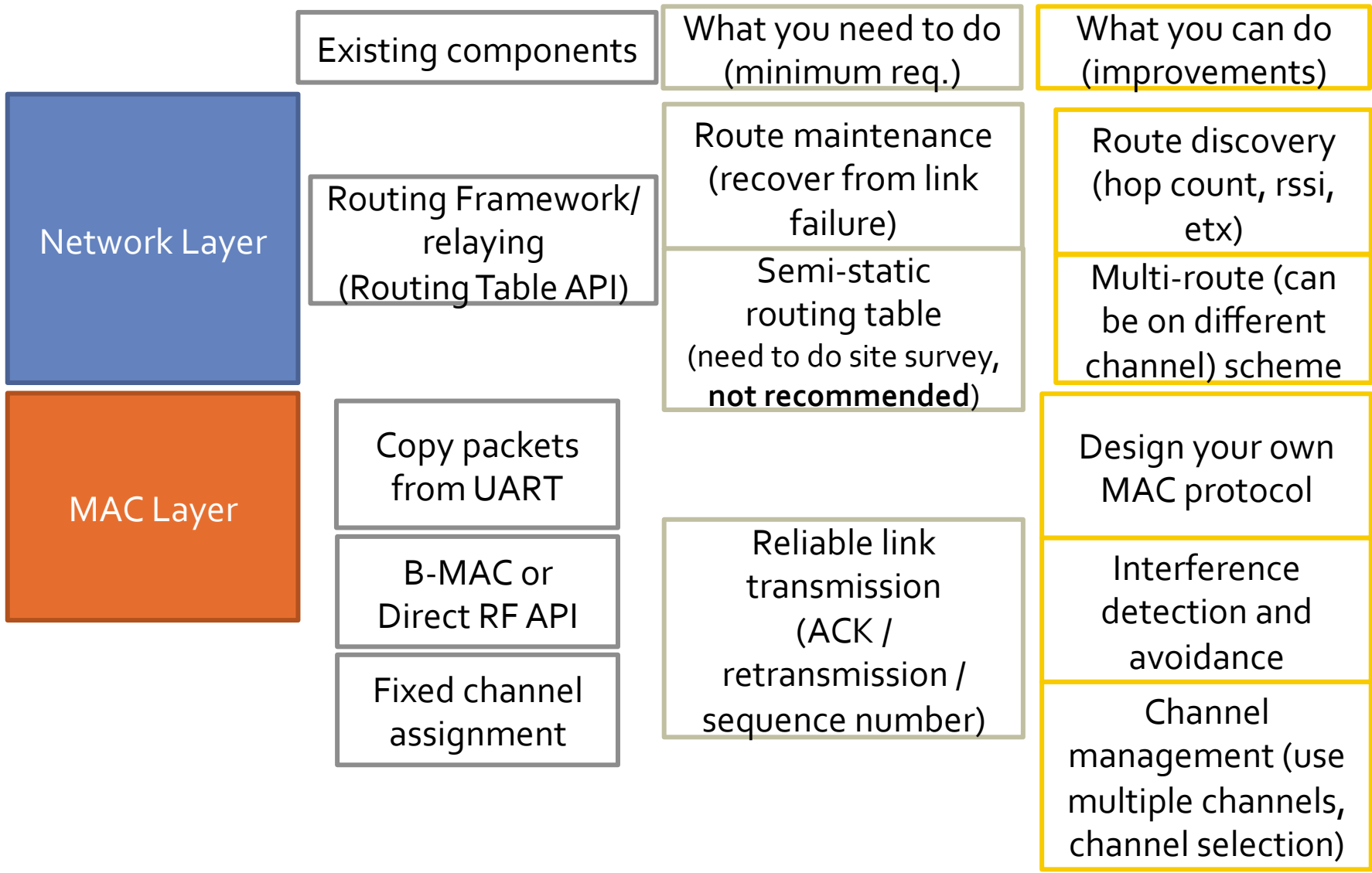
- **No energy constraints. All nodes will have unlimited energy supply.**
 - No need to go back to sleep very often
- **All nodes have fixed locations.**
 - However, do not forget about fading (links might not be stable).
 - We will create artificial node failure too.
- **You are allowed to use any channels within frequency 2.400 – 2.423 GHz and channel 26 (2.480 GHz)**
 - Can use them simultaneously!
 - Need to cope with interference from WiFi/Bluetooth!

TESTS WE WILL DO

- **Ping test:**
 - Different size: 1, 10, 100, 1000 bytes
 - Performance metrics: delay & received ratio
- **FTP test:**
 - File size: 100 MB
 - Performance metric: time to complete transfer
- **Route robustness test:**
 - We will turn off 2 nodes in the network (very likely two nodes in your active route(s))
 - Re-run one set of ping test, and your network should be able to recover from the failures

DESIGN SPACE

(WHAT YOU NEED TO DO/CAN DO)



GRADING CRITERION

- **Grading Criterion:**
 - Presentation on 12/29 40%
present your system design and your unique improvements
 - Tests result and demonstration 40%
 - Test results
 - Show us **proofs** that you have completed the components that you described in the presentation
 - Documentation and source code 20%
- **This will contribute to 40% of your total course grade, so please do invest time on this!**