Computer Networks

Exercise Session 06

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General Schedule

All exercises will follow this general schedule

- Identify potential understanding problems
  → Ask your questions
  → Recap of the lecture
- Address the understanding problems
  → Answer your questions
  → Repeat certain topics
- Walk through the exercises/solutions → Some hints and guidance
  → Work time or presentation of results

Contention-based Medium Access

You have seen ...

- that participants must compete for medium access in contention-based MAC protocols
- collisions reduce the performance of the network
- they should be detected and avoided
- the trade-off between throughput and latency

Contention-free Medium Access

You have seen ...

- how resources like time or frequencies can be allocated in advance for contention-free medium access
- that (particularly static) contention-free MAC protocols provide less throughput compared to contention-based protocols on low utilization of the network
- that combination of MAC protocols is feasible

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   Fiber-optic cables offer a higher bandwidth ($\rightarrow$ higher data rate) and a lower bit error rate because they are less affected by noise.

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     shielded wires, shielded cable, 26 AWG diameter, Category 5, patched

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3. **Directed** wireless transmission eliminates some of these issues and can achieve higher transmission ranges. Explain why many wireless networks still work with undirected (*omnidirectional*) transmission systems.

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3. **Directed** wireless transmission eliminates some of these issues and can achieve higher transmission ranges. Explain why many wireless networks still work with undirected (*omnidirectional*) transmission systems.
   WLAN access points, for instance, typically provide network access for multiple users in parallel. Omnidirectional transmissions allows the users to move more freely.

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   Because of the reflections ($\rightarrow$ multipath-fading) $\rightarrow$ Faraday cage

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   WLAN is targeted for longer ranges than Bluetooth and devices have typically less energy limitations.

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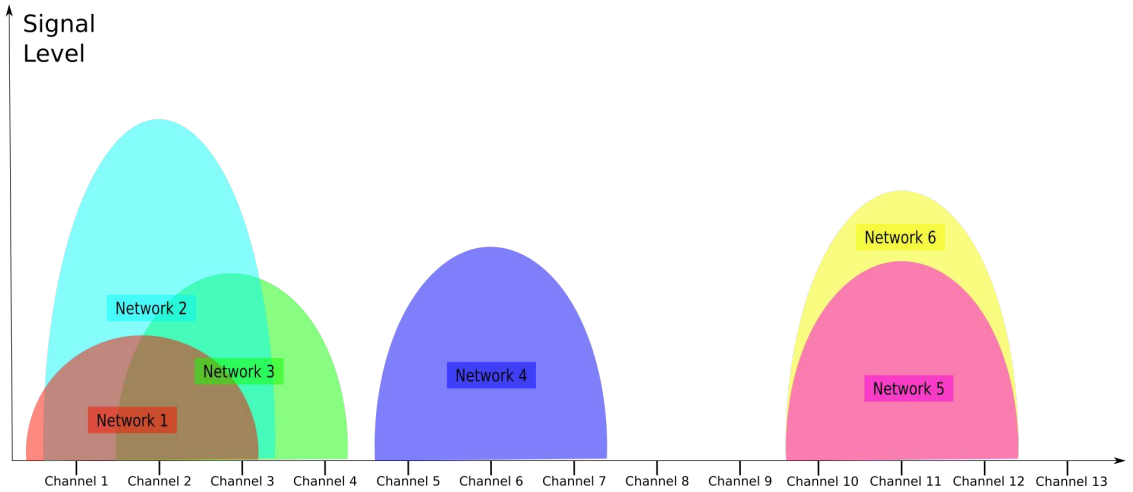

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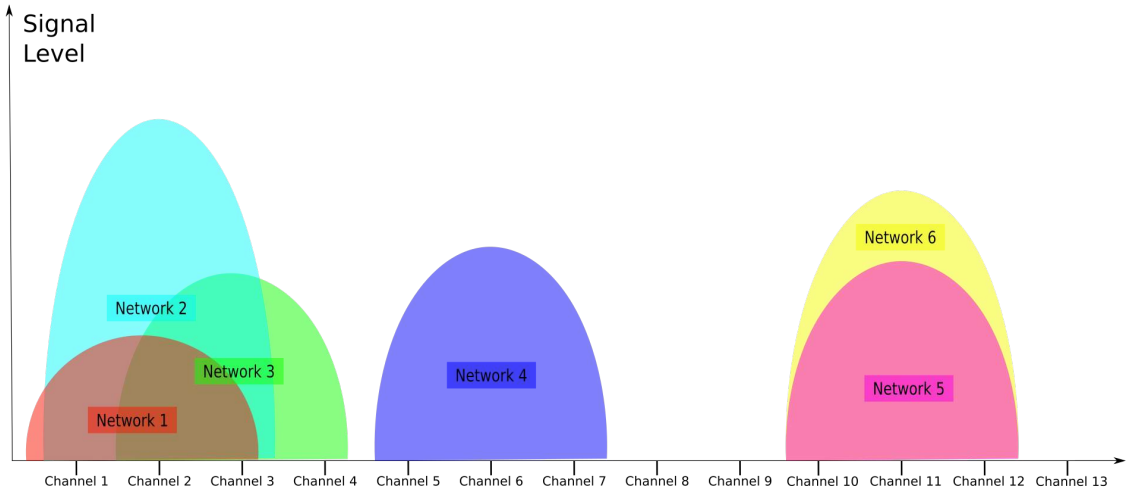

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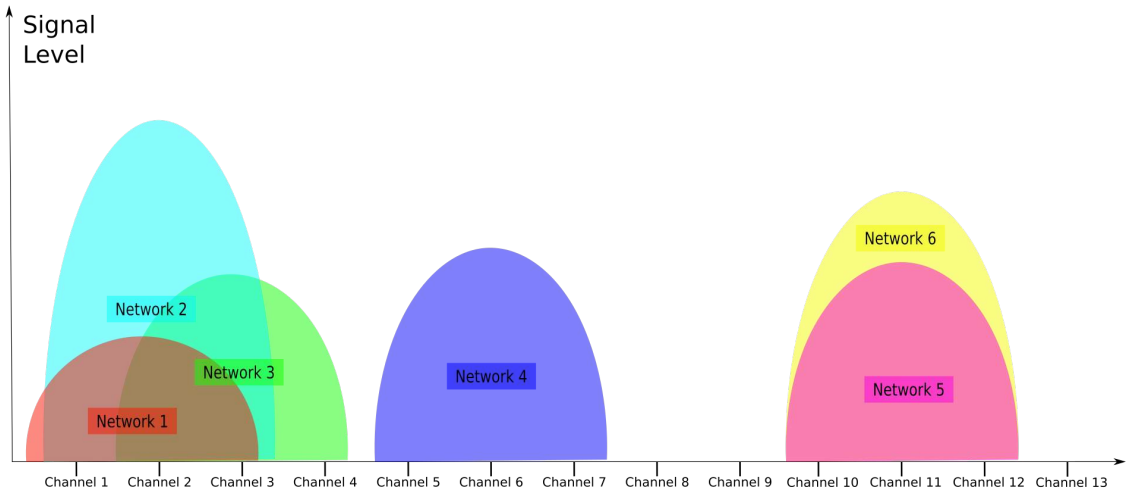

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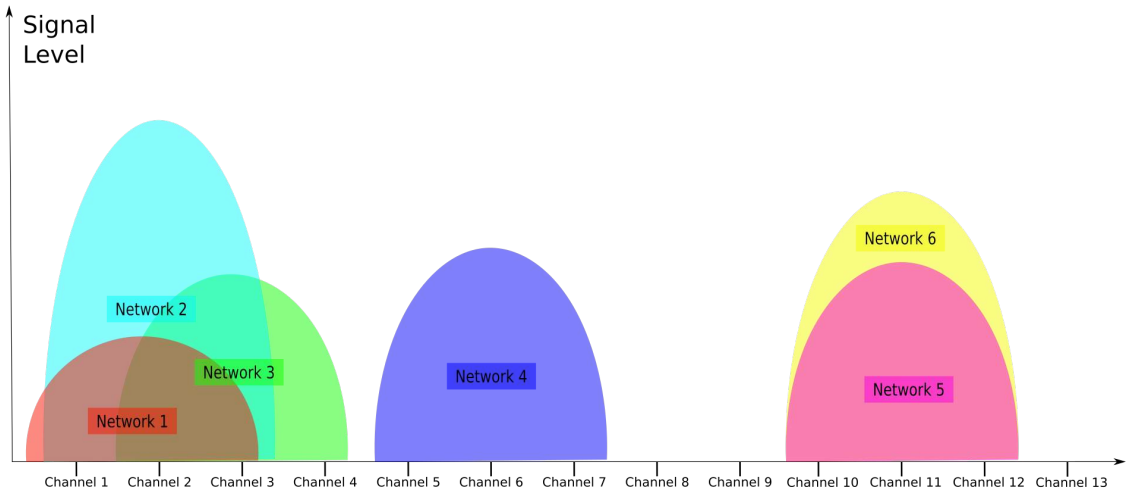

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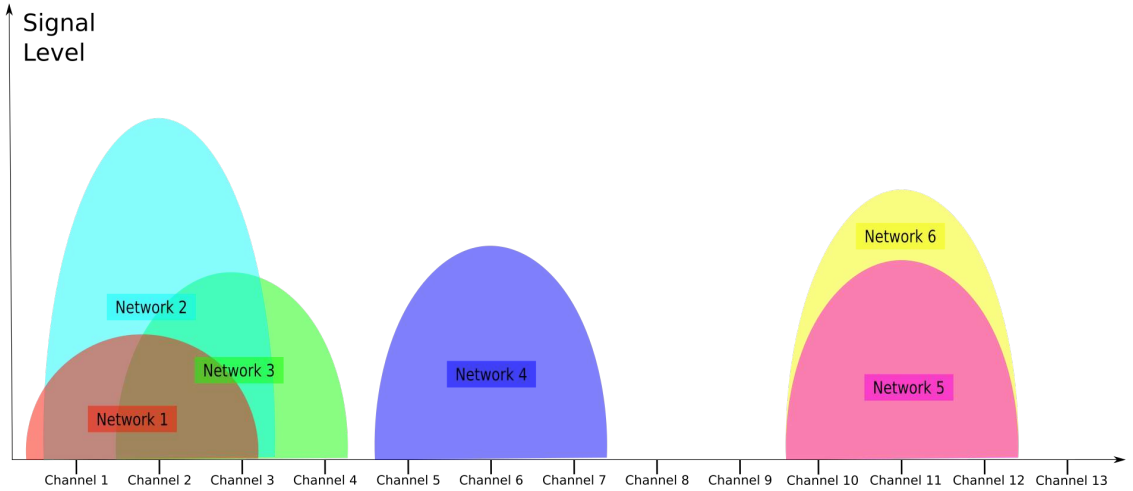

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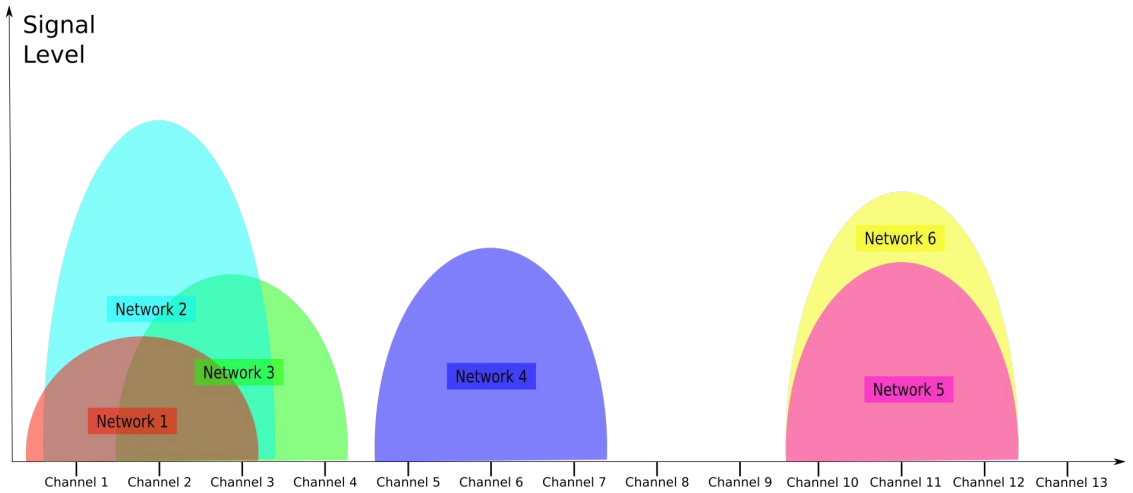

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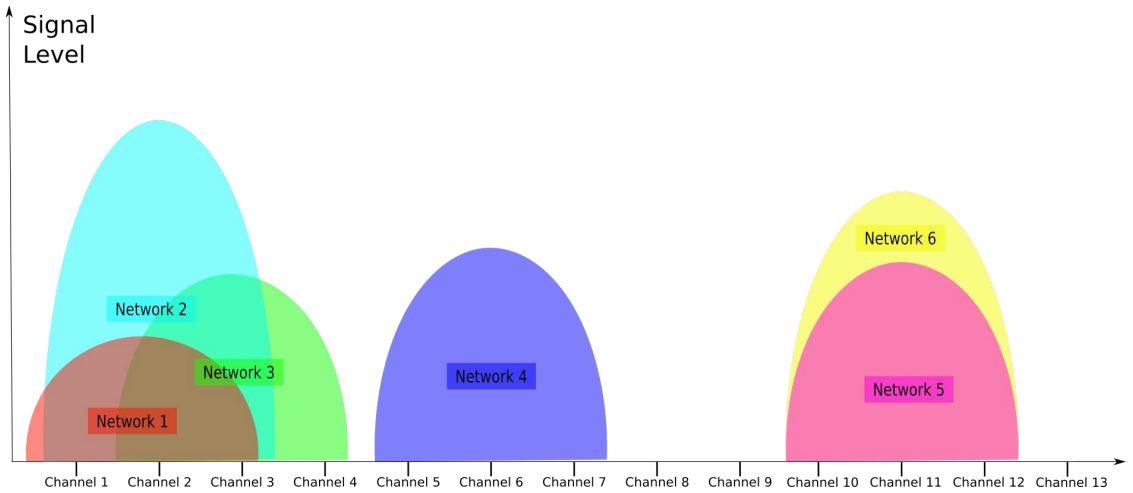

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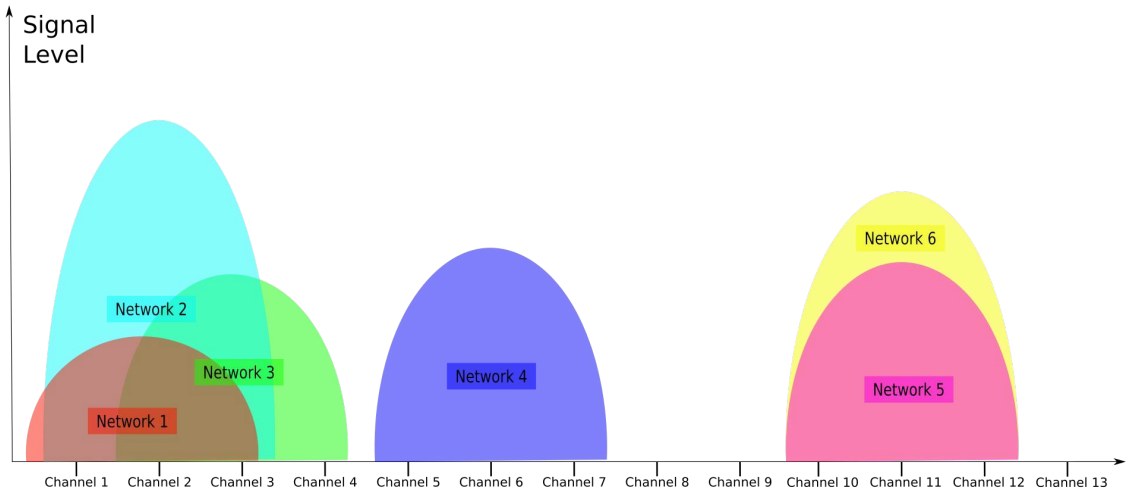

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   Network 1, 2, and 3 use overlapping channels. Typically selecting other channels than 1, 6, 11, and 14 is not recommended.

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   The information, which network devices are accessible via which port in local forwarding tables.

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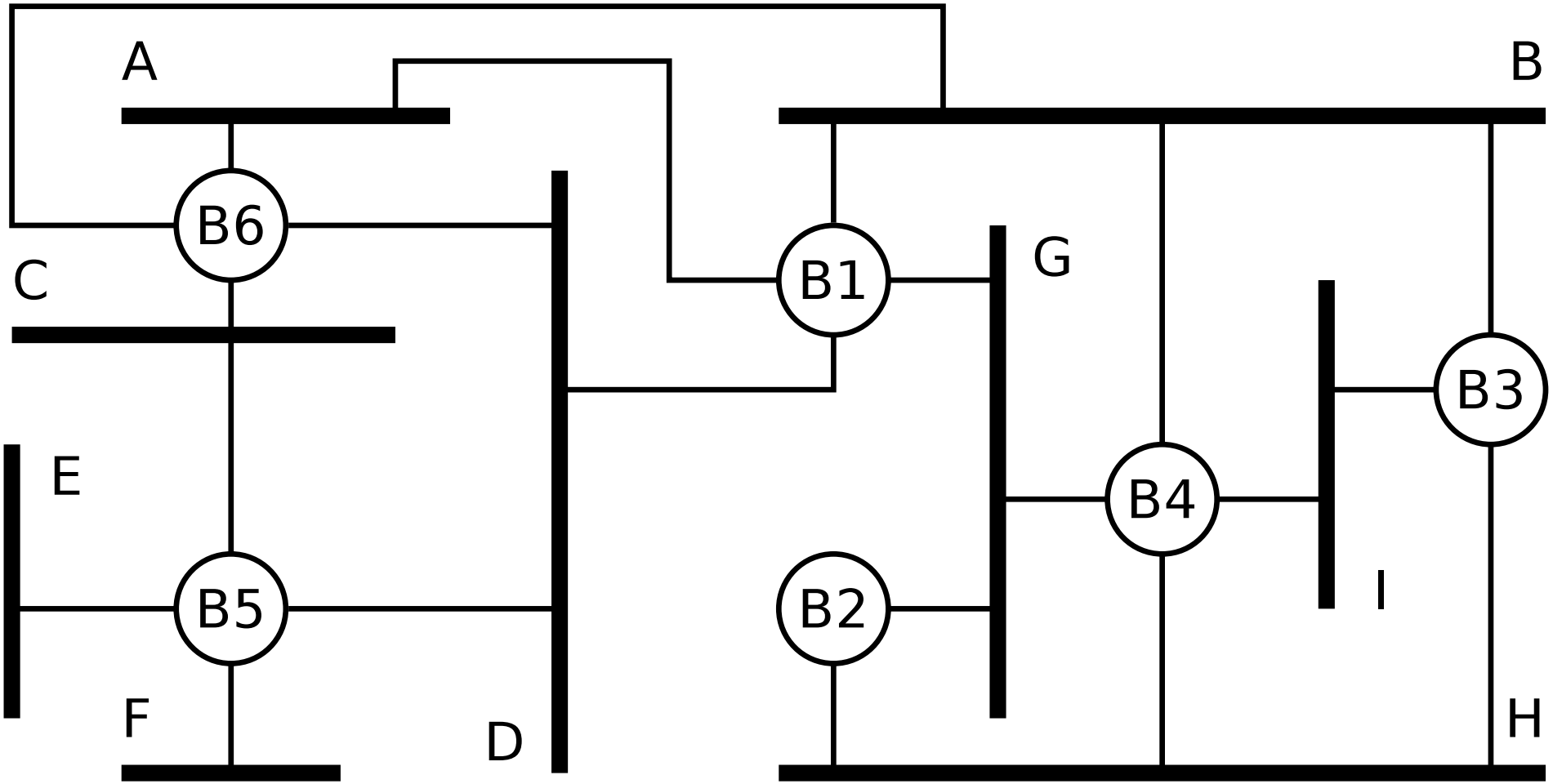
   The Bridge ID consists of the Bridge priority (2 bytes) and MAC address (6 bytes) of the Bridge port with the lowest port ID.

Exercise 6: Spanning Tree Protocol



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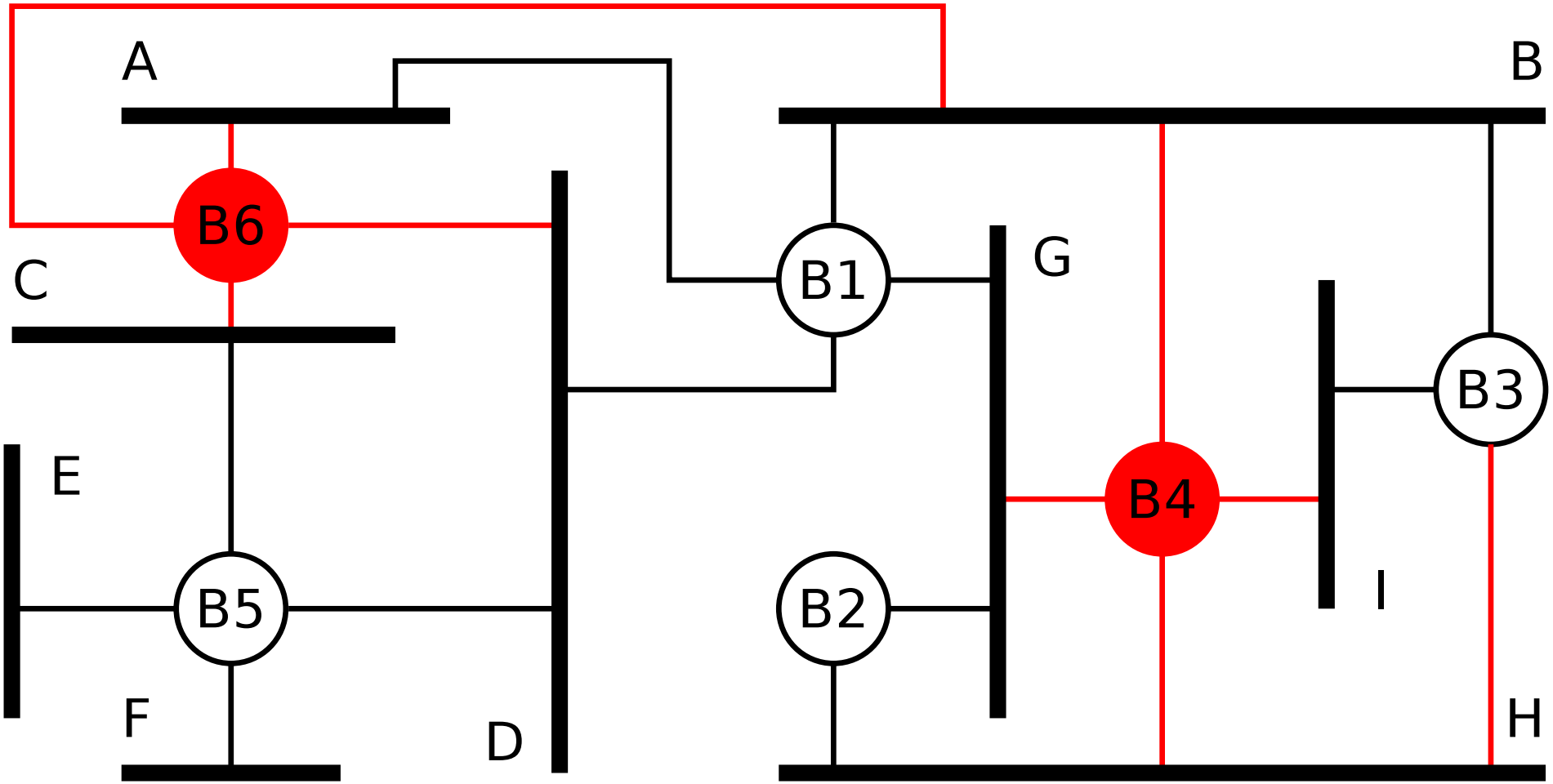

Exercise 7: Addressing in the Data Link Layer

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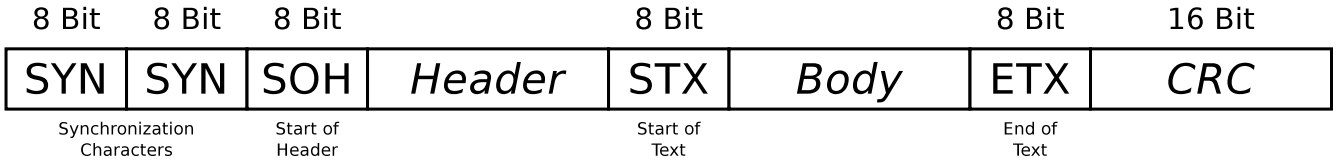

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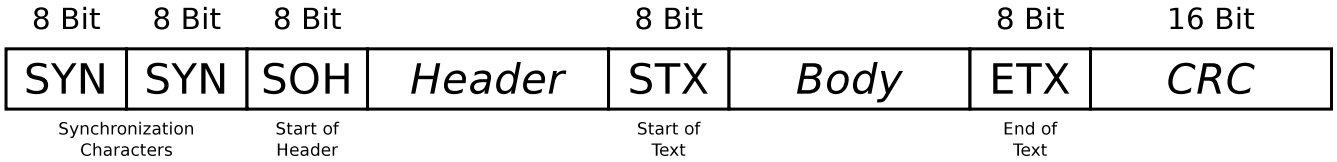

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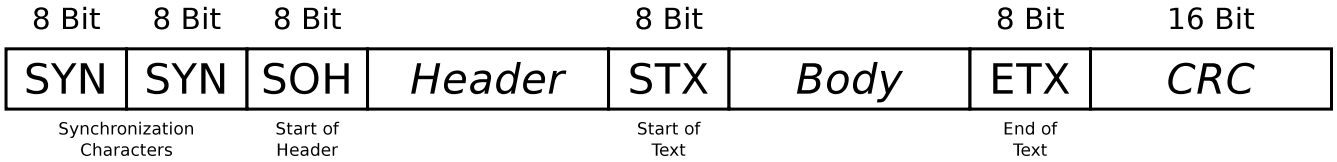

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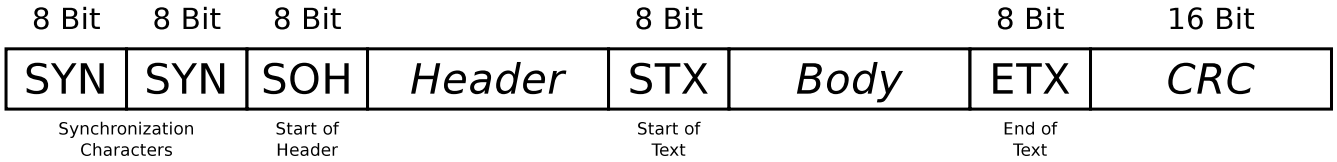

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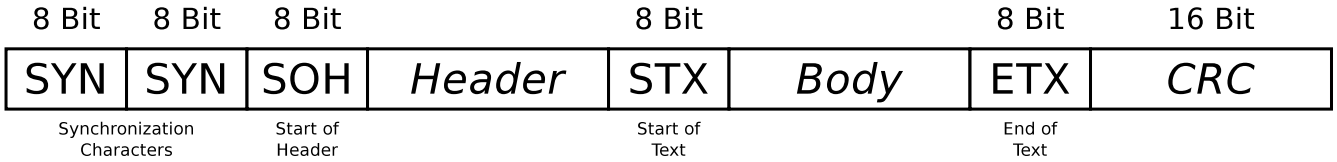

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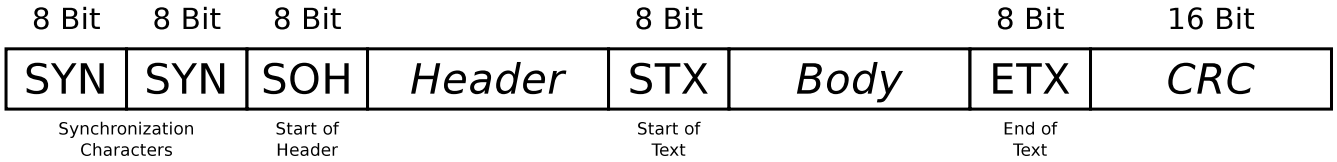

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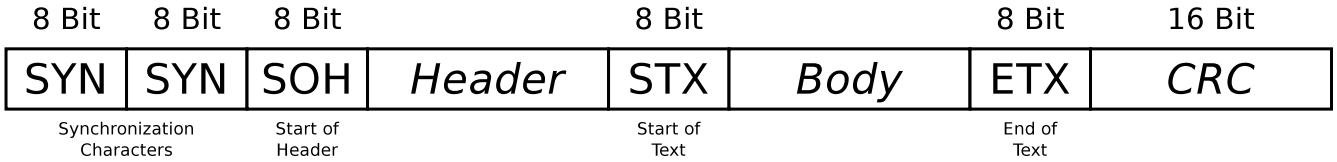

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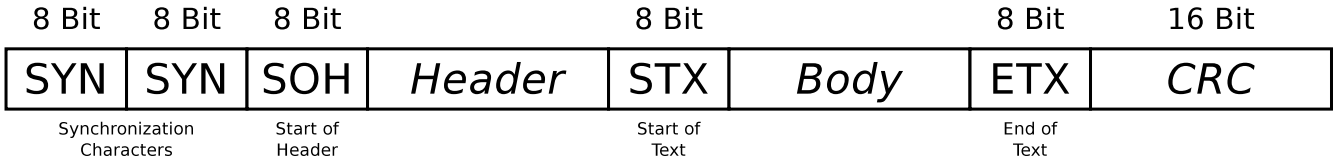

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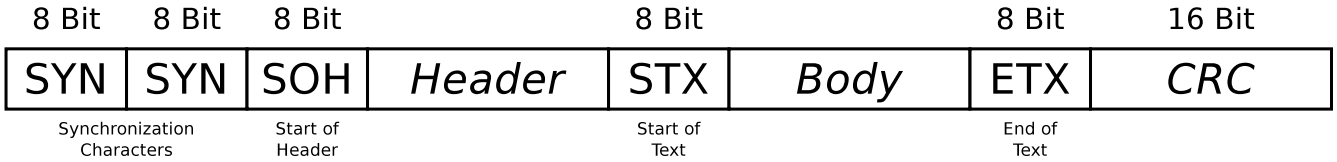

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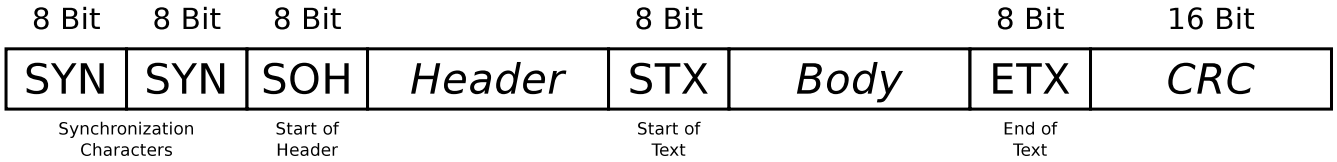

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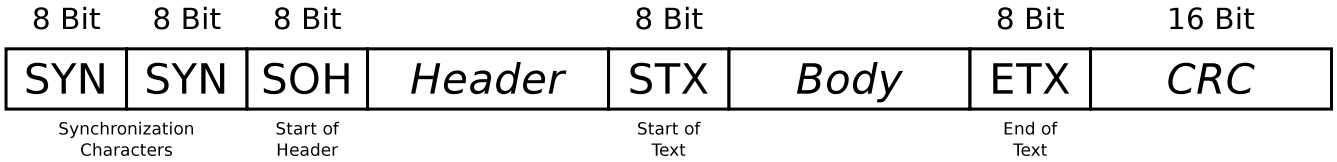

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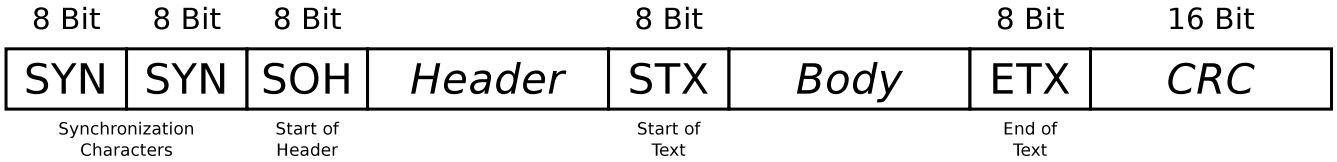

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1. `01111110 10100111 11111000 11110010 10011111 10111111 11100101`

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1. 01111110 10100111 11111000 11110010 10011111 10111111 11100101
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