Sharif University of Technology

Department of Computer Engineering

Embedded System Design

CAN: Controller Area Network

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Important Features (Cont.)

- **Physical Layer + Data Link Layer**

- **Number of nodes not limited and may be changed dynamically.**

- **No node addressing**
  - **Actually the address information is contained in the identifiers of the transmitted messages.**
  - **The identifiers indicate the message content and the priority of the message.**
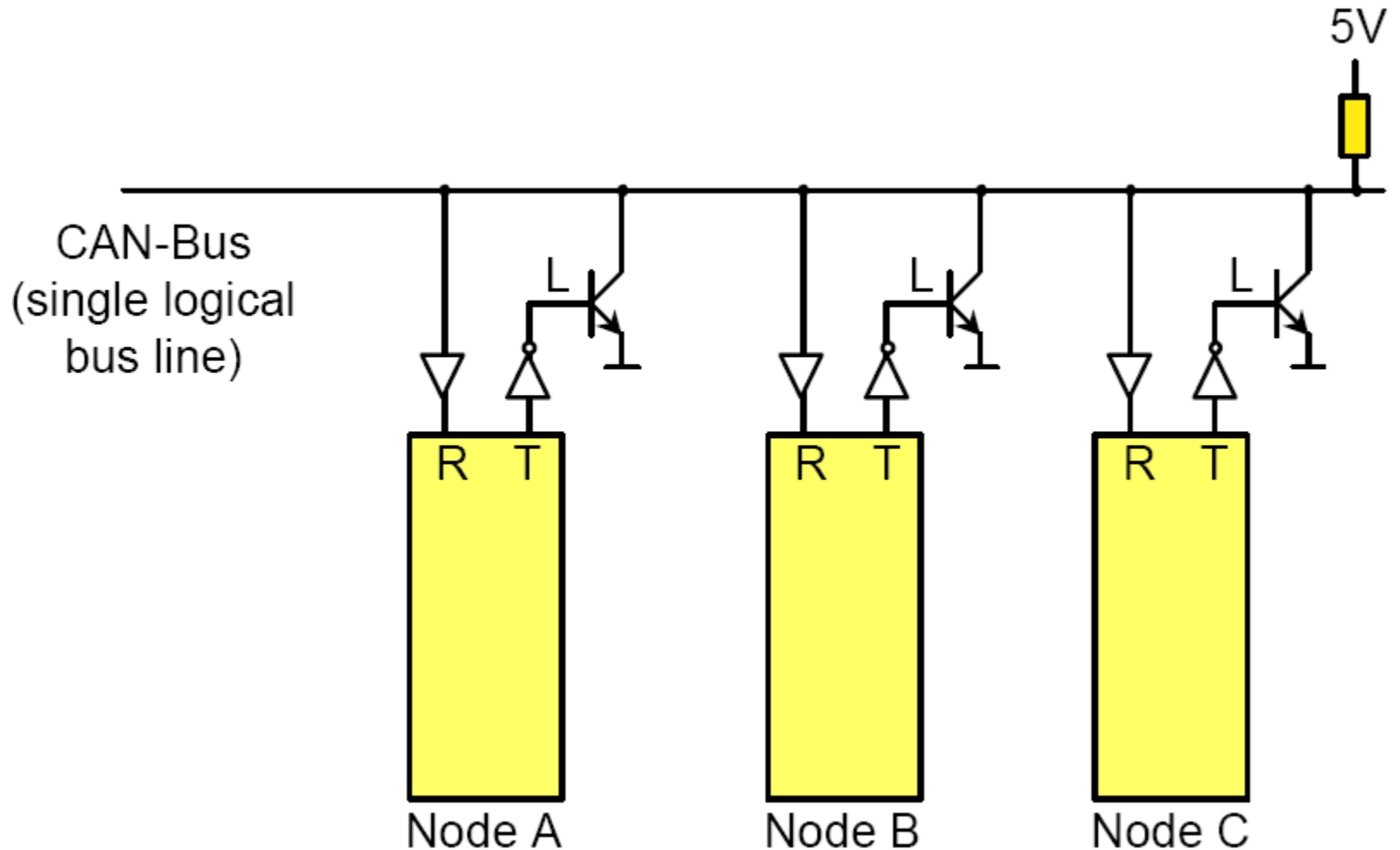
Important Features (Cont.)

- **Error-detection and error handling**
  - **Temporary errors**
    - **ARQ (CRC)**
  - **Permanent errors**
    - **Automatic switch-off of defective nodes**
- **Maximum bus length of 40 meters (twisted pair)**
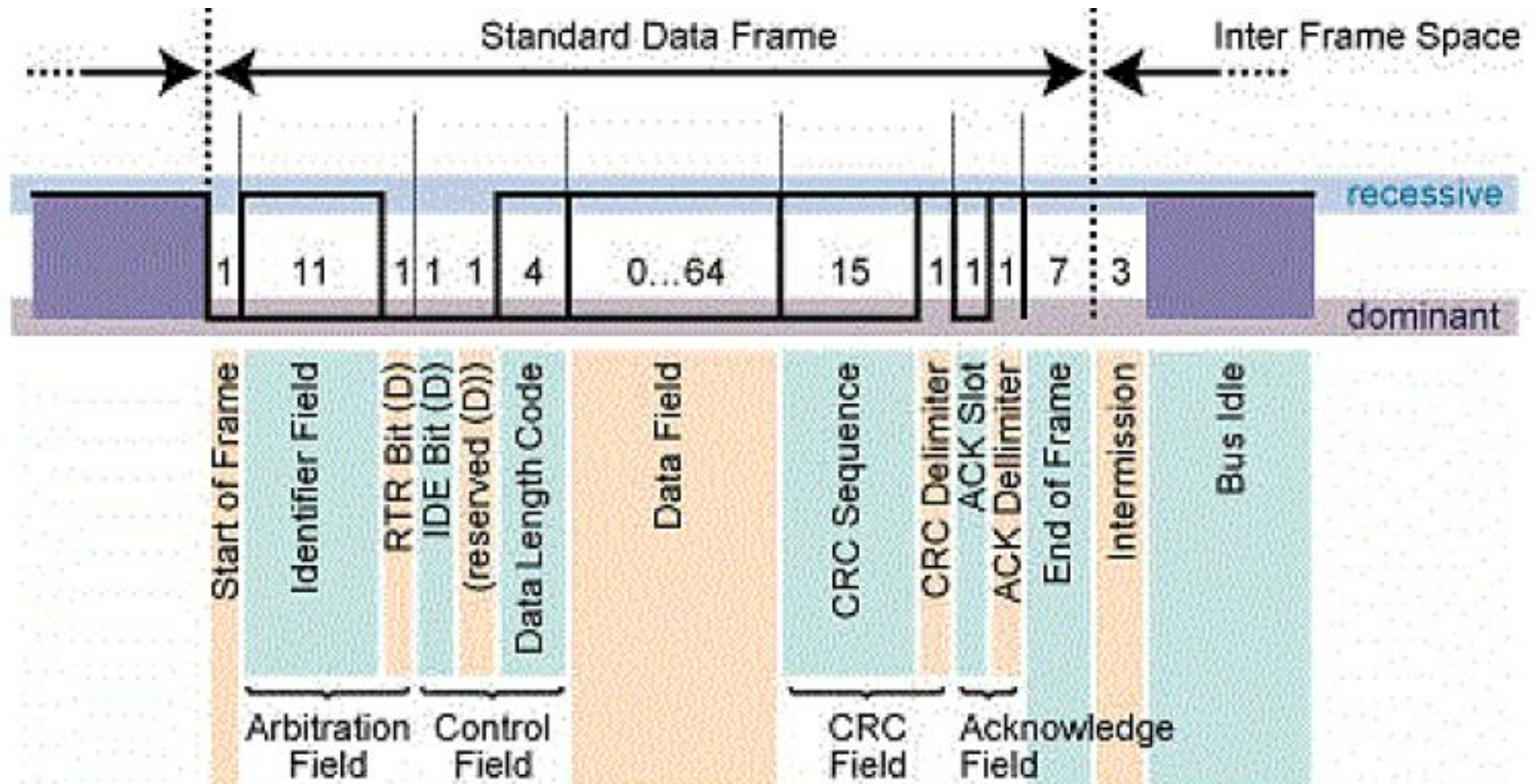- **Message length = maximum of 8 data bytes per message**

Non-Destructive Arbitration

- **Collision is only allowed for arbitration (Non-destructive collision).**

- **The arbitration is based on the wired-AND mechanism.**

Wired-AND in CAN Bus

Frame Format

Frame Format

- **12-bit arbitration field= 11-bit identifier + 1-bit RTR**
  - **RTR = Remote transmission request**
    - **Distinguishes between data frame (RTR set to zero) and data request frame (RTR set to 1)**
- **IDE = Identifier extension**