Communication Protocols

Networks and Embedded Software

Module 5.2.1

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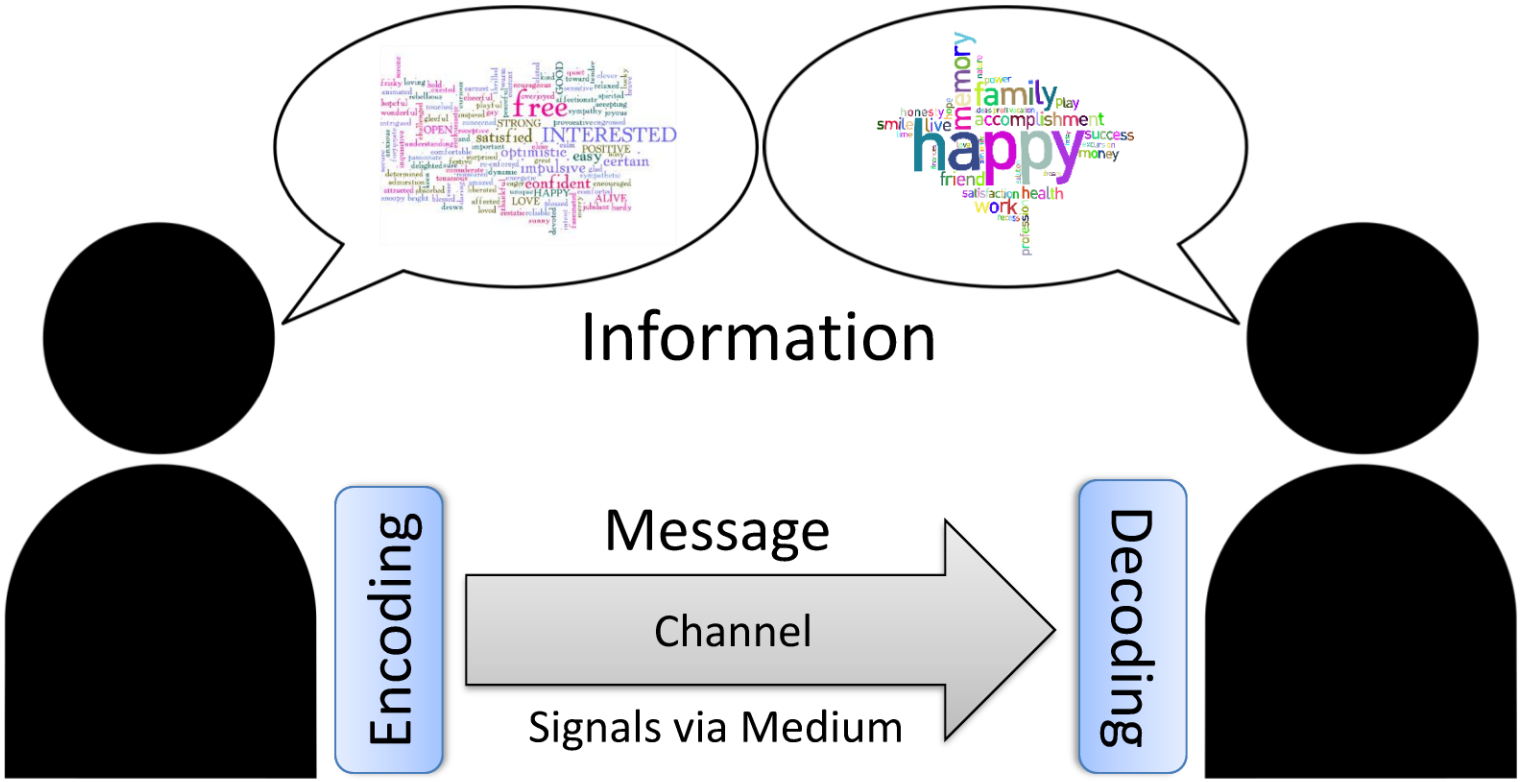
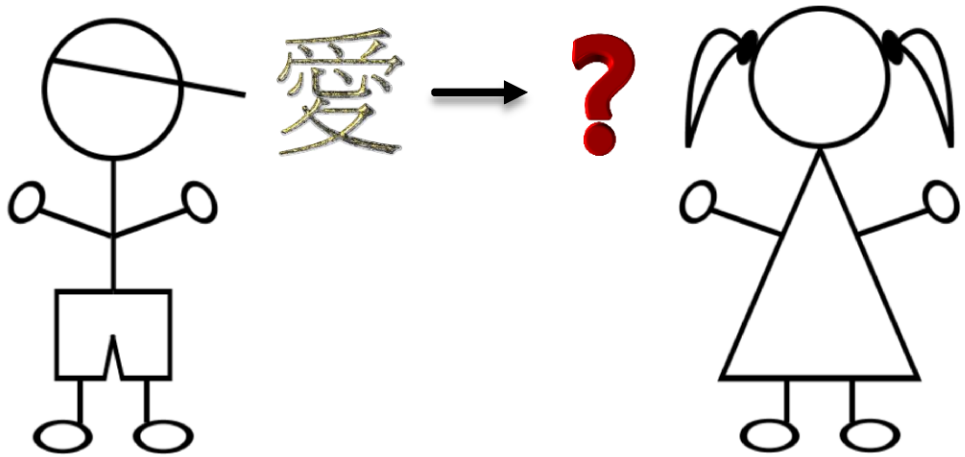
Communication

- Information Exchange



Protocol (1)

- Sort of Language
  - System of rules
  - Agreement of communication partners
  - Allows the transmission of information

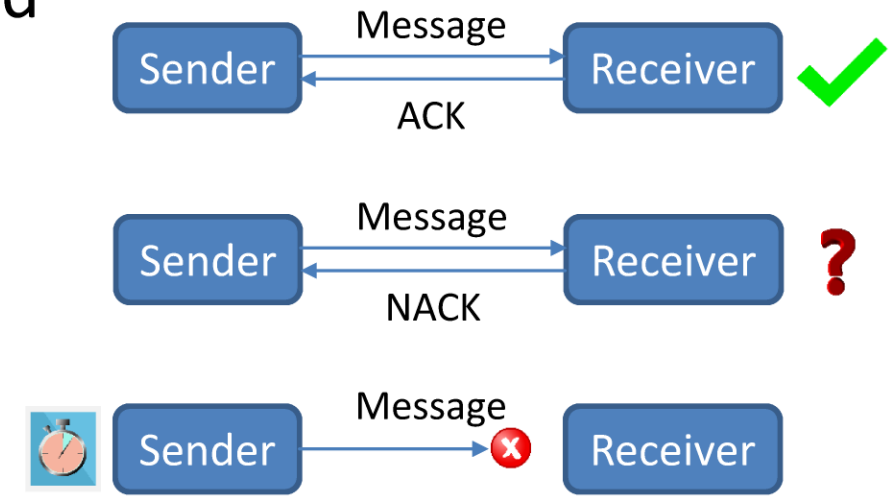


Protocol (2)

- System of rules
  - Type of communication
  - Character set
  - Syntax
  - Semantic
  - Error Correction
  - Flow Control
  - Etc.

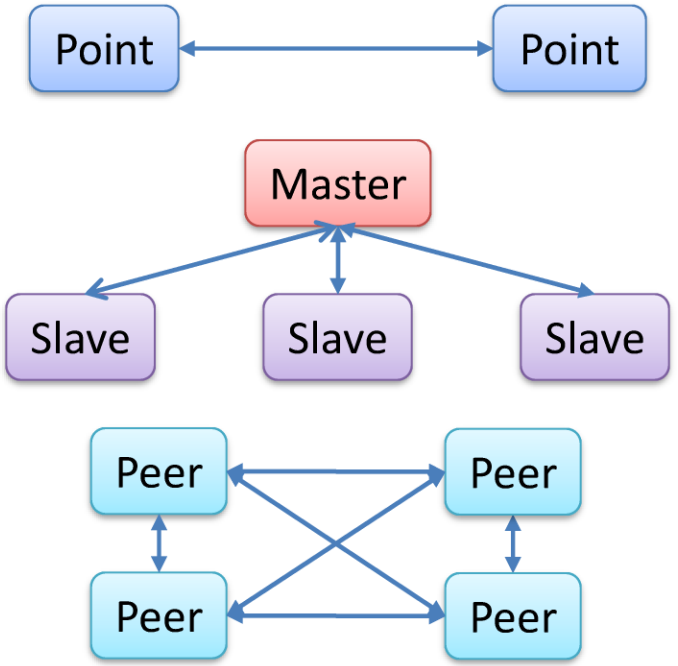
Protocol (3)

- Type of communication
  - Connectionless
  - Connection-oriented
    - ACK
      - Acknowledgement
    - NACK
      - Negative-ACK
    - Timeout



Protocol (4)

- Type of communication (continued)
  - Number of partners
    - Point-to-Point
      - One-to-One
    - Master/Slave
      - One-to-Many
    - Peer-to-Peer
      - Many-to-Many



Protocol (5)

- Character set
  - Set of all valid characters
  - Example: Boolean Algebra
    - a, b, c, …, ∧, ∨, ¬, (,)
- Syntax
  - Valid sequences of characters
  - Example: Boolean Algebra
    - Valid: a∧b, ¬(a∧b), …
    - Invalid: a¬b, ∨(a∧b),)a∧b(…

Protocol (6)

- Semantic
  - Meaning of a valid sequence of characters
  - Example: Boolean Algebra
    - ¬(a∧b) → Calculate logical AND a and b then negate
- Error Detection or Correction
  - Detect of correct errors found in communication
  - Example: RS-232
    - Parity Bit → Module 4.2.5 (Serial Ports)

Protocol (7)

- Flow Control
  - Manage rate of data transmission
  - Hardware
    - Example: RTS and CTS line (RS-232)
  - Software
    - Example: XON and XOFF characters (RS-232)