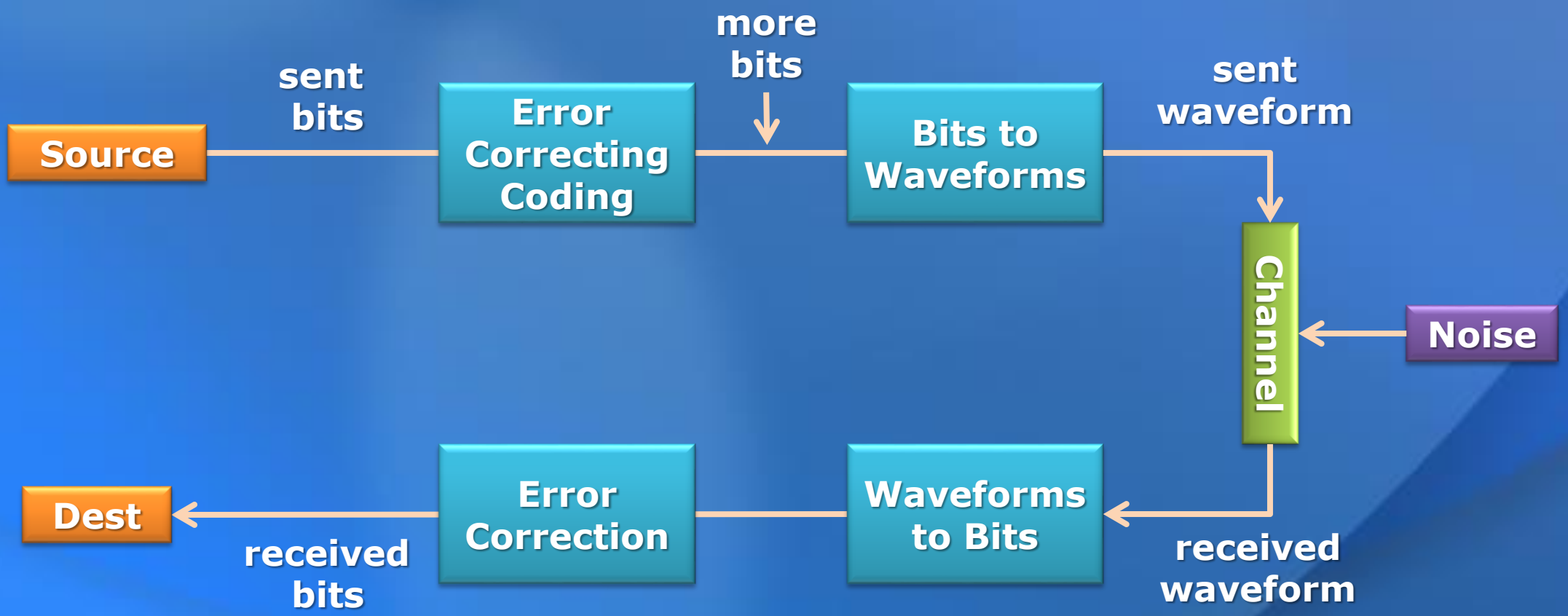
Communication Protocols and Metrics

Communication System



Communication Protocols

- A communication protocol is an agreement between the transmitter and receiver that allows them to communicate.
- Protocols are necessary for any communication system.
- In data communication, protocols cover all aspects of data representation and signaling including
  - The bit representation of symbols, e.g.
    - ASCII vs Unicode
    - Send LSB or MSB first
  - Grouping of bits into frames
  - Synchronization methods (e.g. start/stop bits)
  - The representation of individual bits (e.g. the bit time)
  - Training sequences

Metrics for Communication Systems

- **Bit rate – the number of bits transmitted per second.**
  - **We want this to be large**
  - **Bit rate is inversely proportional to bit time (SPB)**
- **Bit error rate (BER) – the fraction of bits that are received with errors**
  - **We want this to be small.**
- **Tradeoffs: BER decreases**
  - **As bit rate decreases**
  - **As channel noise decreases**
  - **As signal transmit power increases**