

Types of Errors

In digital transmission systems, an error occurs when a bit is altered between transmission and reception; that is, a binary 1 is transmitted and a binary 0 is received, or a binary 0 is transmitted and a binary 1 is received. Two general types of errors can occur: single-bit errors and burst errors. A single-bit error is an isolated error condition that alters one bit but does not affect nearby bits. A burst error of length B is a contiguous sequence of B bits in which the first and last bits and any number of intermediate bits are received in error.

Thus, in an error burst, there is a cluster of bits in which a number of errors occur, although not necessarily all of the bits in the cluster suffer an error. A **single-bit error** can occur in the presence of white noise, when a slight random deterioration of the signal-to-noise ratio is sufficient to confuse the receiver's decision of a single bit. Burst errors are more common and more difficult to deal with. **Burst errors** can be caused by impulse noise.