

TSN: Lecture 22

Scrambling

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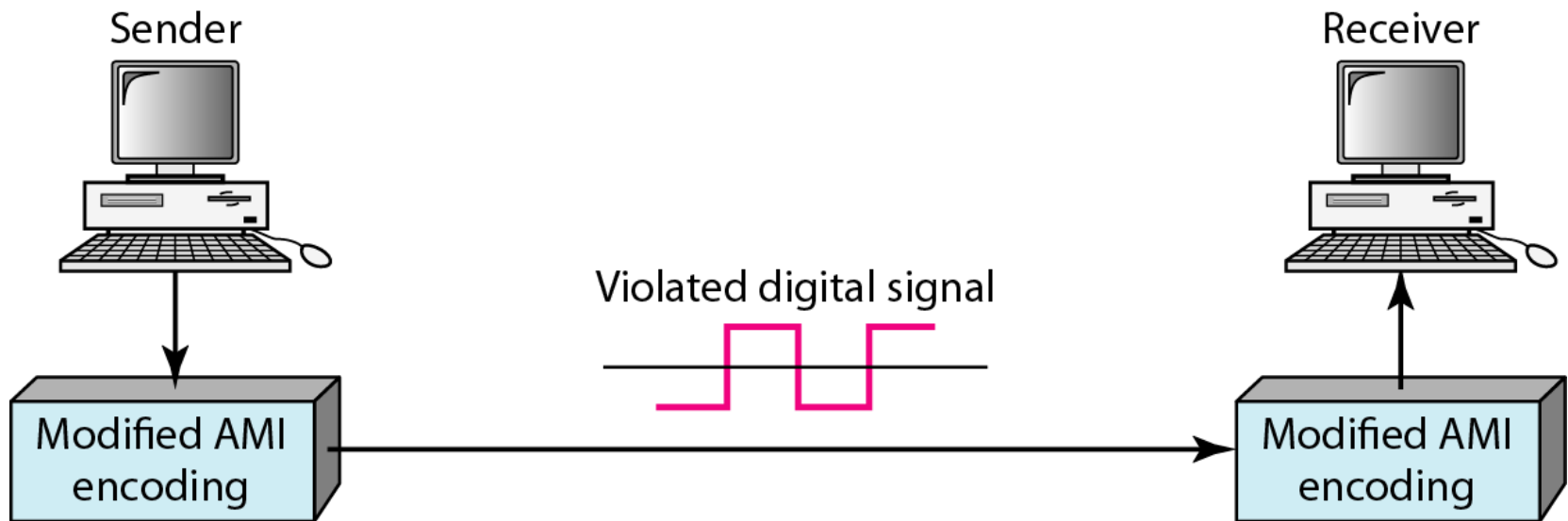
Topics Covered

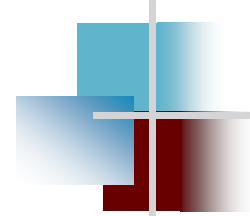
- Scrambling

Scrambling

- The best code is one that does not increase the bandwidth for synchronization and has no DC components.
- Scrambling is a technique used to create a sequence of bits that has the required c/c's for transmission - self clocking, no low frequencies, no wide bandwidth.
- It is implemented at the same time as encoding, the bit stream is created on the fly.
- It replaces 'unfriendly' runs of bits with a violation code that is easy to recognize and removes the unfriendly c/c.

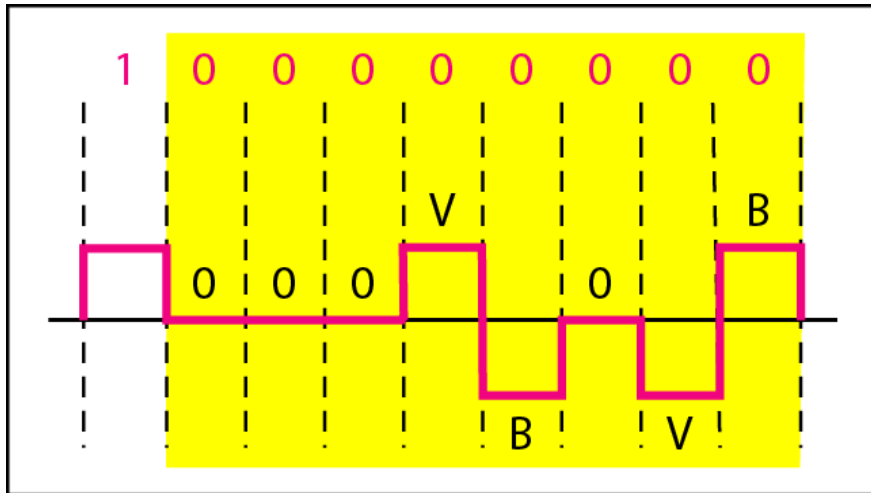
Figure 4.18 *AMI used with scrambling*



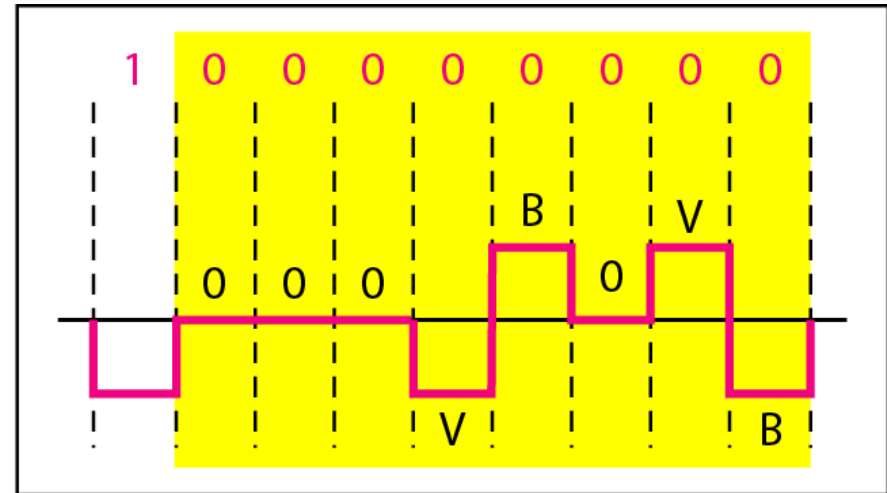


**For example: B8ZS substitutes eight consecutive zeros with 000VB0VB. The V stands for violation, it violates the line encoding rule
B stands for bipolar, it implements the bipolar line encoding rule**


Figure 4.19 *Two cases of B8ZS scrambling technique*



a. Previous level is positive.



b. Previous level is negative.



HDB3 substitutes four consecutive zeros with 000V or B00V depending on the number of nonzero pulses after the last substitution.

If # of non zero pulses is even the substitution is B00V to make total # of non zero pulse even.

If # of non zero pulses is odd the substitution is 000V to make total # of non zero pulses even.

Figure 4.20 *Different situations in HDB3 scrambling technique*

