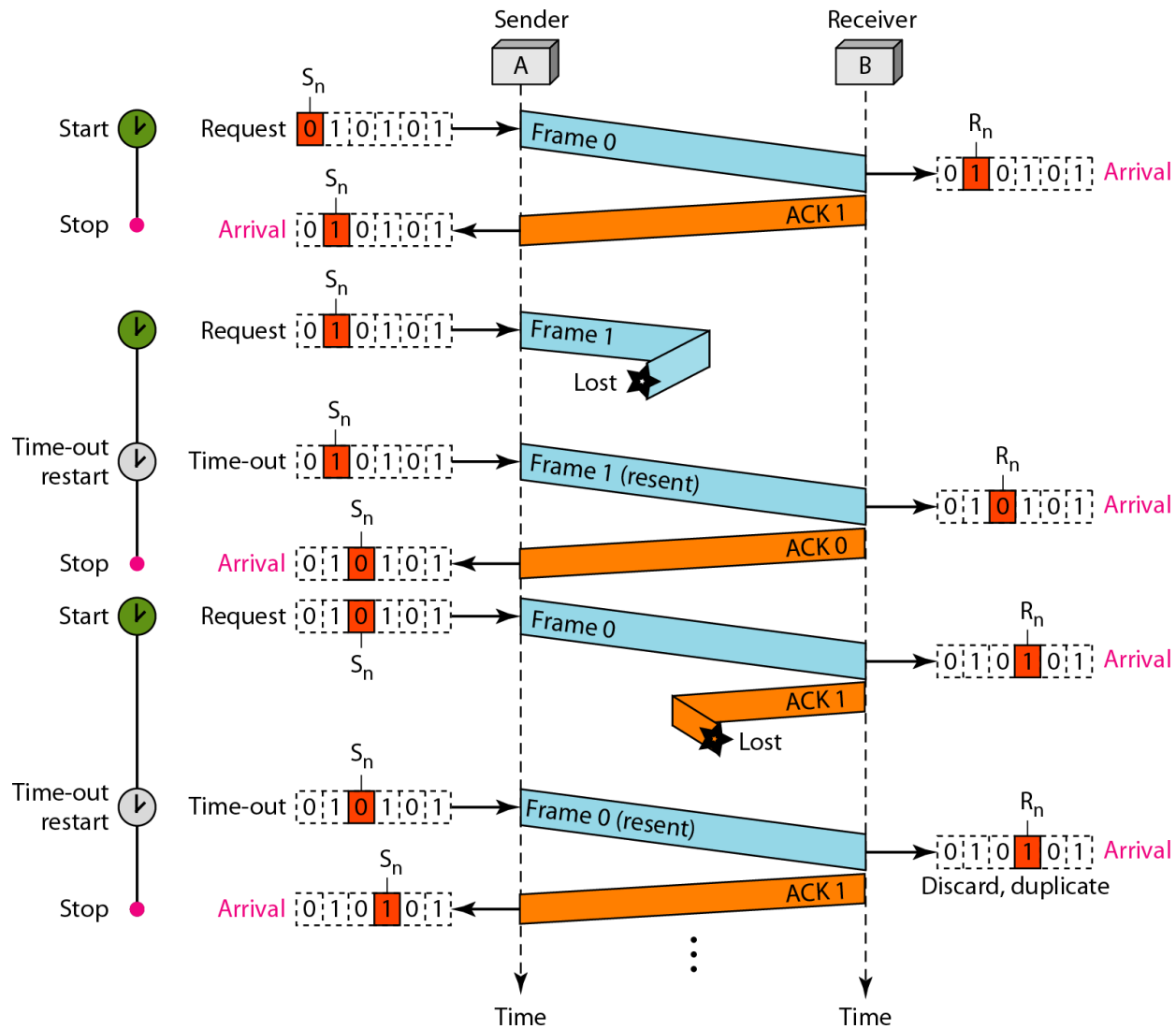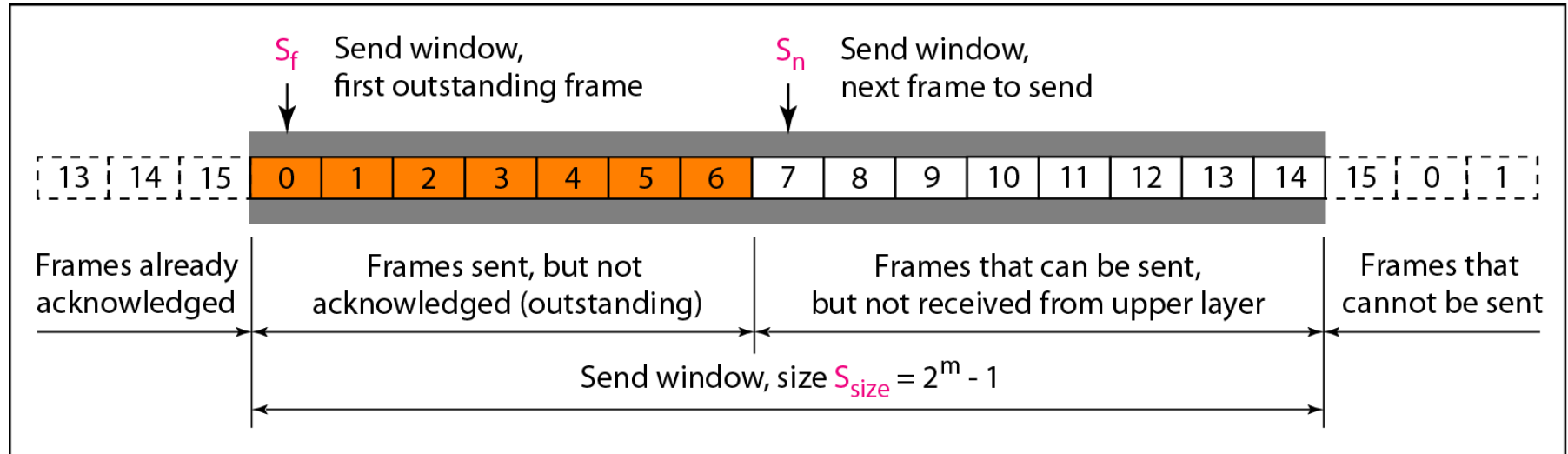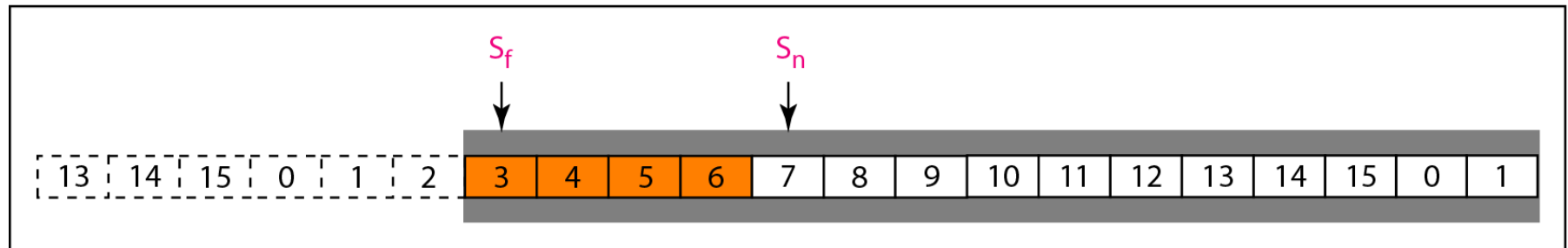# Flow Control Techniques

Example for Stop and Wait ARQ

Go-Back-N ARQ : Send Sliding Window
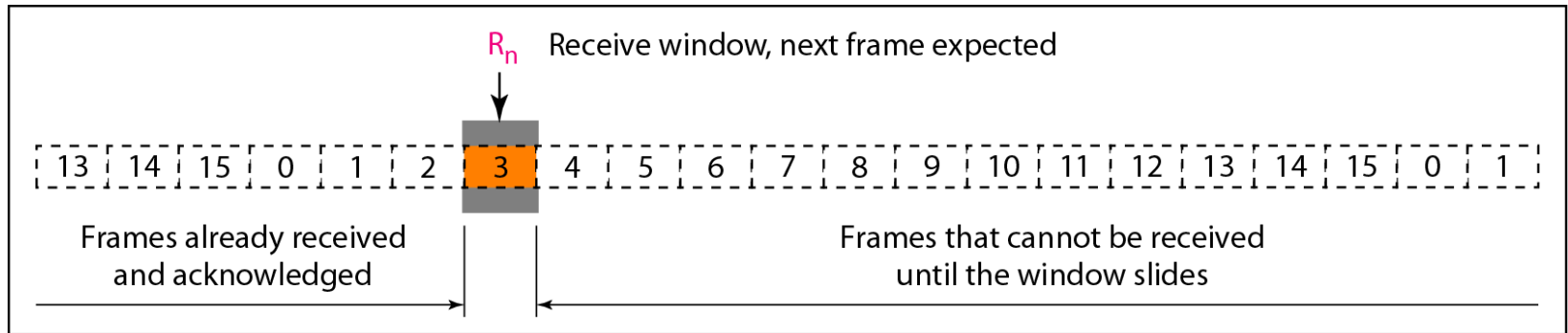

a. Send window before sliding

b. Send window after sliding
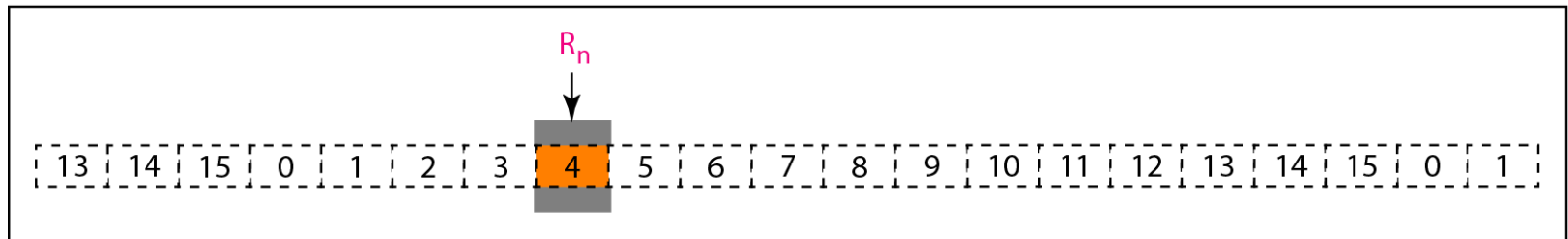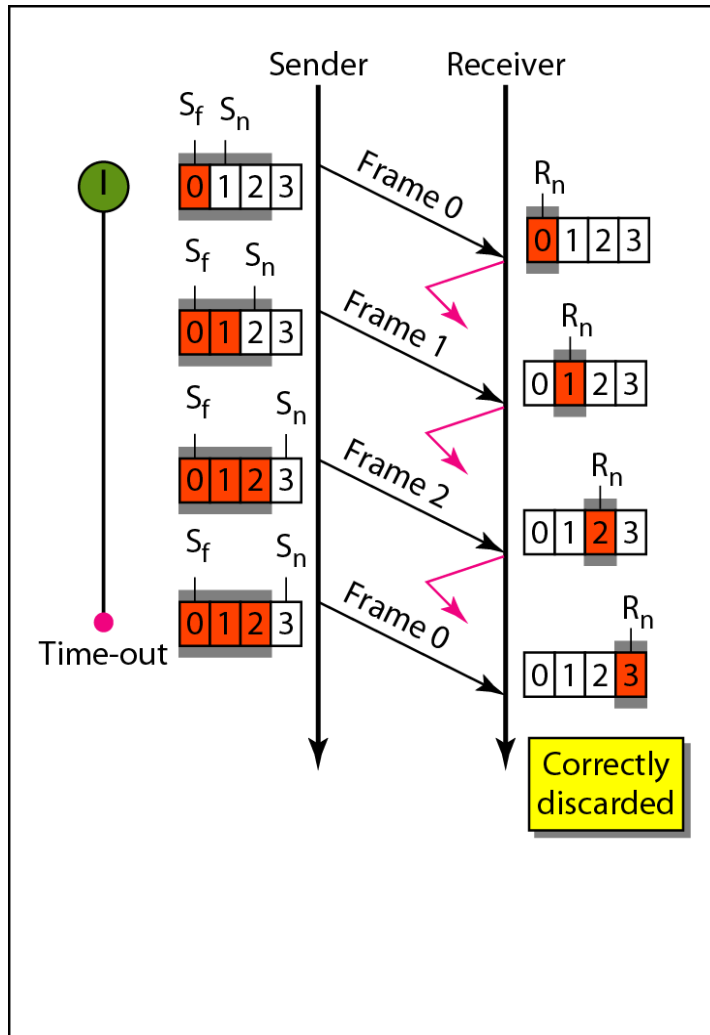
Go-Back-N ARQ : Receive sliding window

R_n Receive window, next frame expected

| 13 | 14 | 15 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 0 | 1 |

Frames already received
and acknowledged

Frames that cannot be received
until the window slides

a. Receive window

R_n

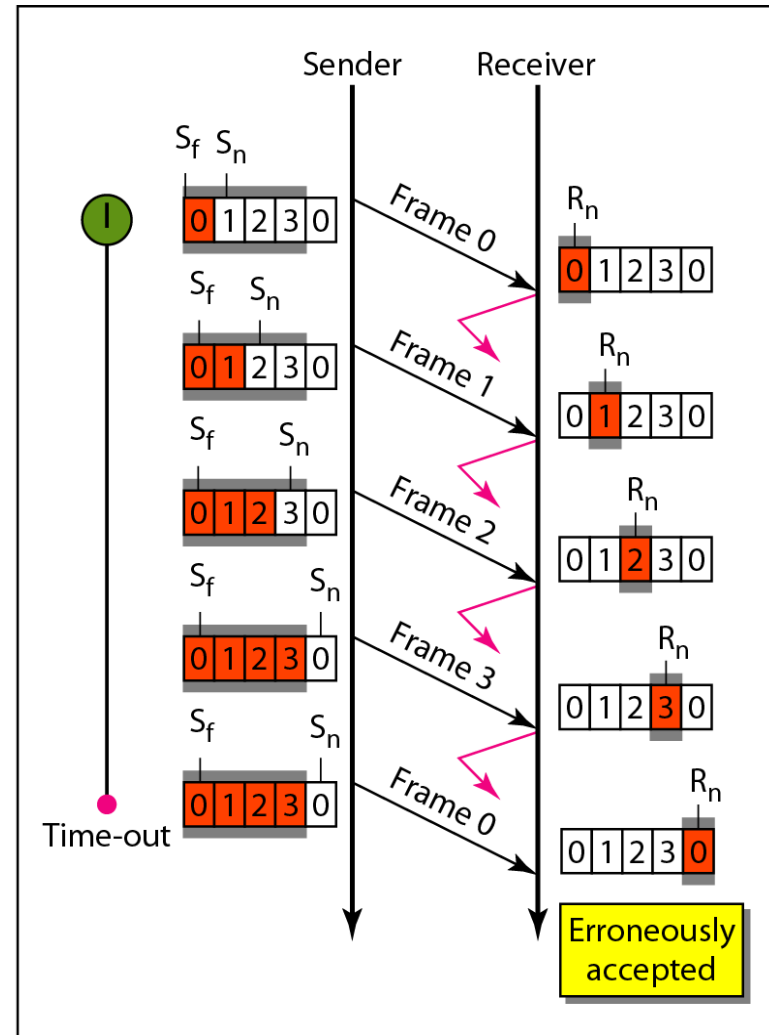| 13 | 14 | 15 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 0 | 1 |

b. Window after sliding

Window size for Go-Back-N ARQ

a. Window size < 2^m

b. Window size = 2^m

Example 1 : Go-Back-N ARQ

11.6
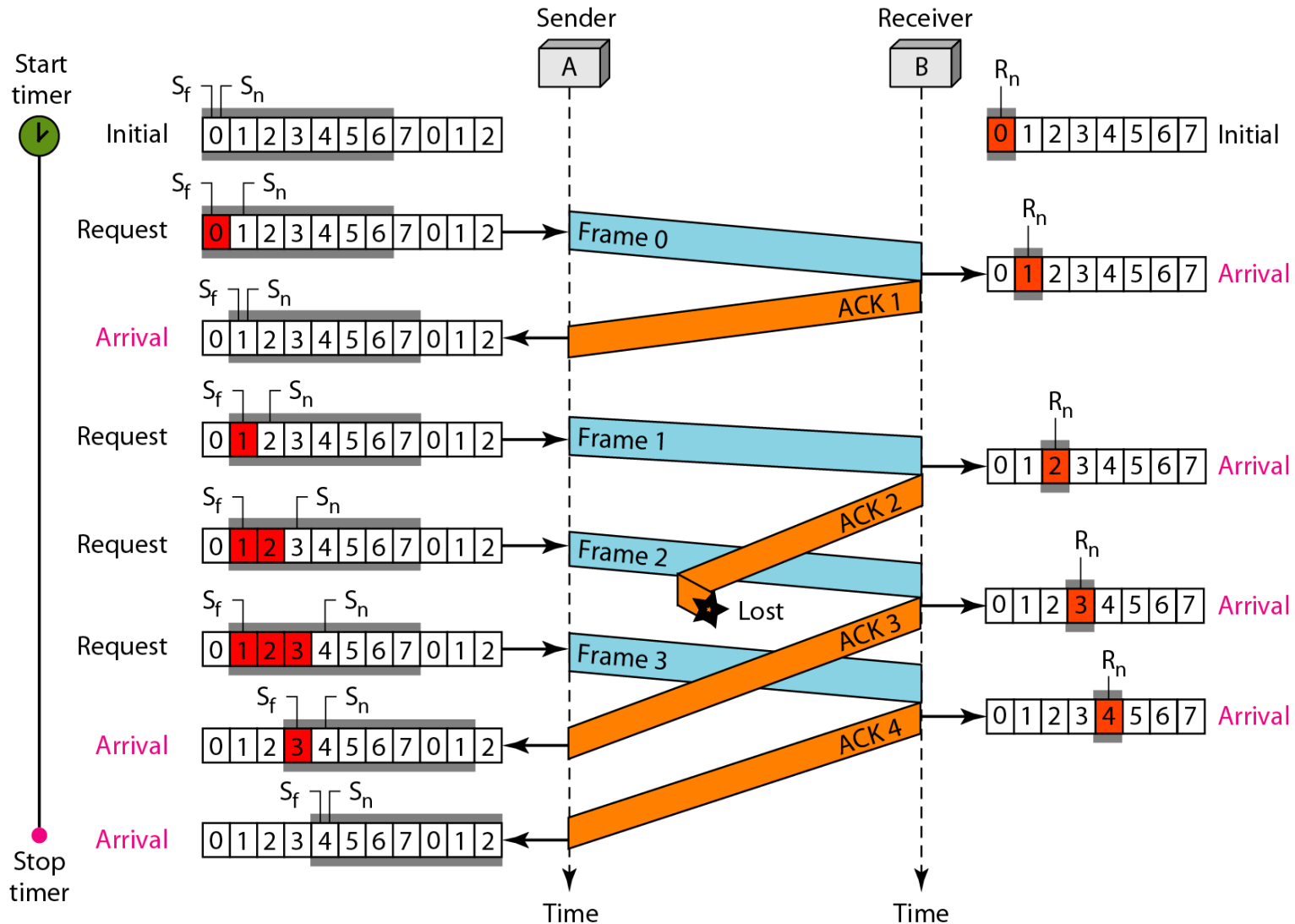
Example 2: Go-Back-N ARQ
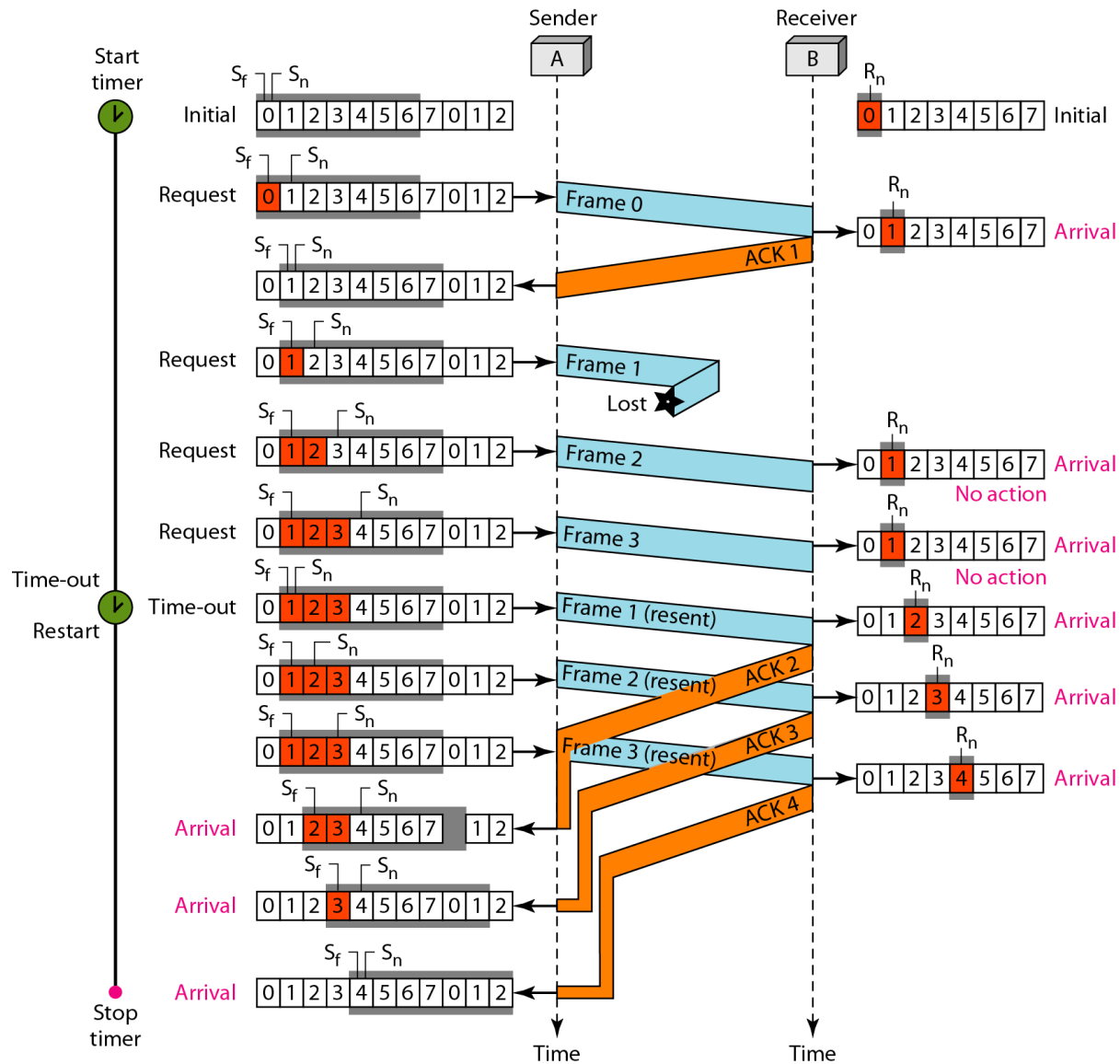
Selective Repeat ARQ

Send Sliding Window

Send window, first outstanding frame — S_f

S_n Send window, next frame to send

| 13 | 14 | 15 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 0 | 1 |

Frames already acknowledged | Frames sent, but not acknowledged | Frames that can be sent | Frames that cannot be sent

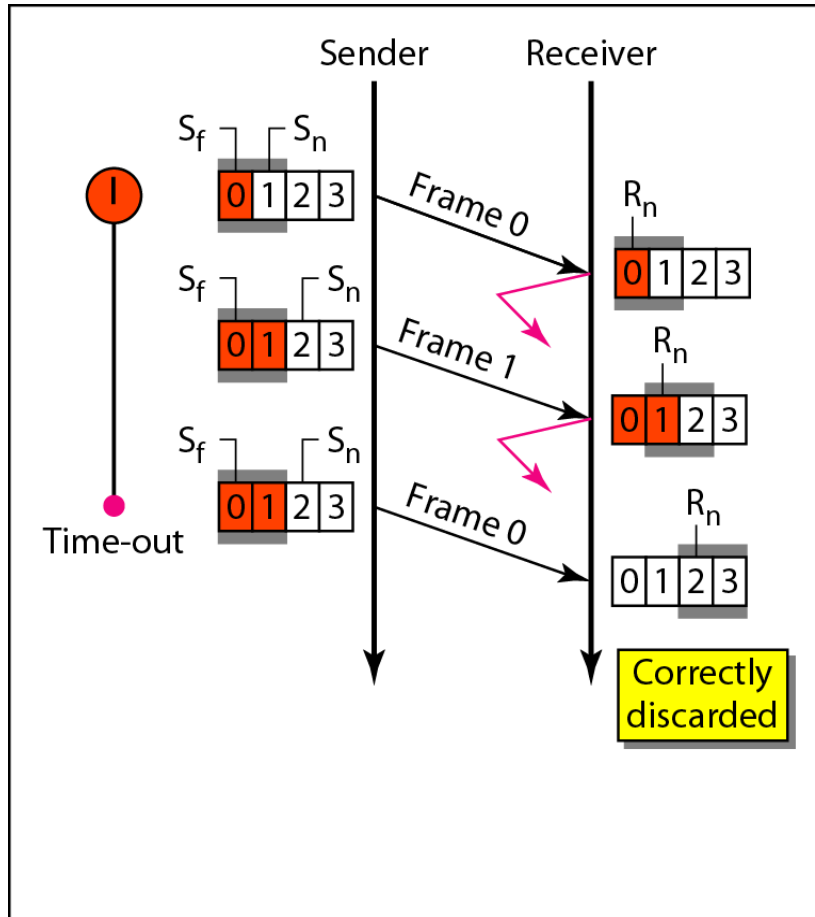$S_{size} = 2^{m-1}$
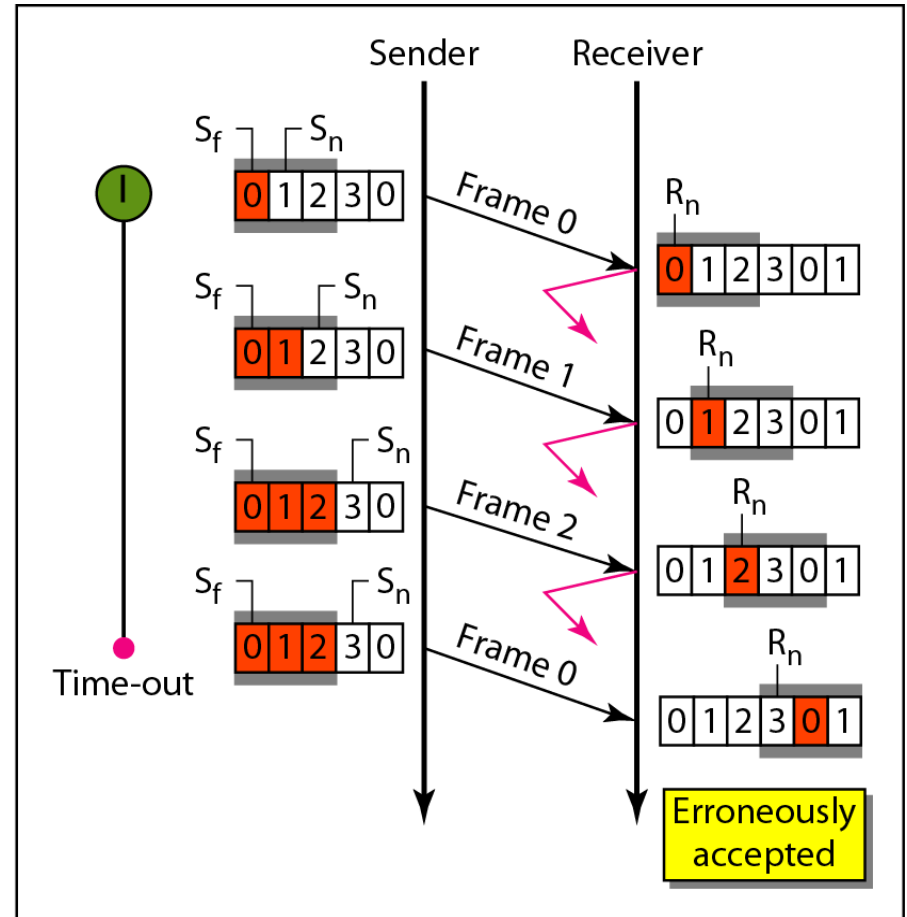
11.8
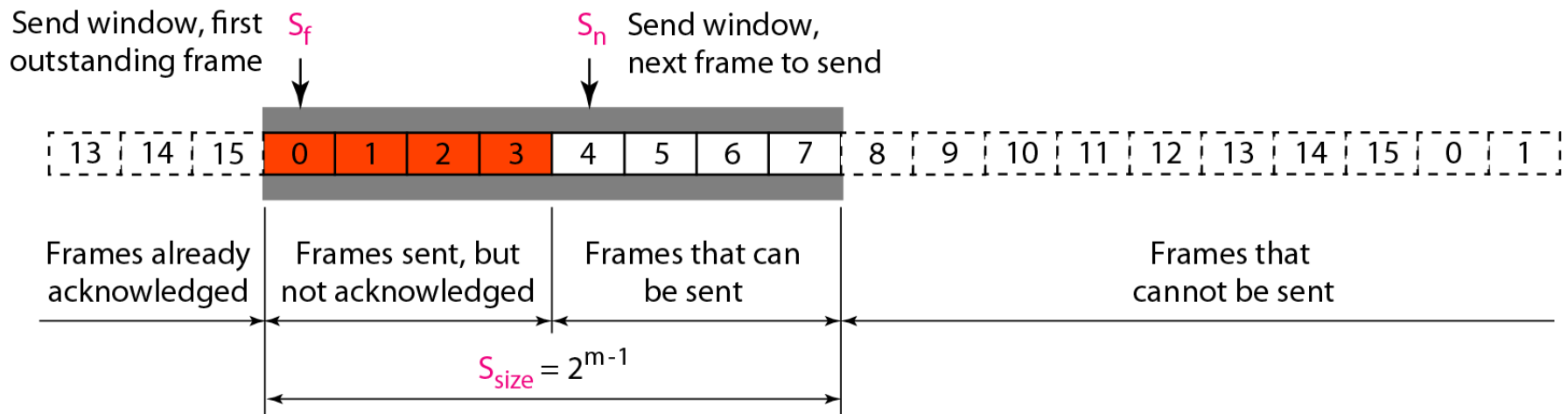
Selective Repeat ARQ

Receive sliding window
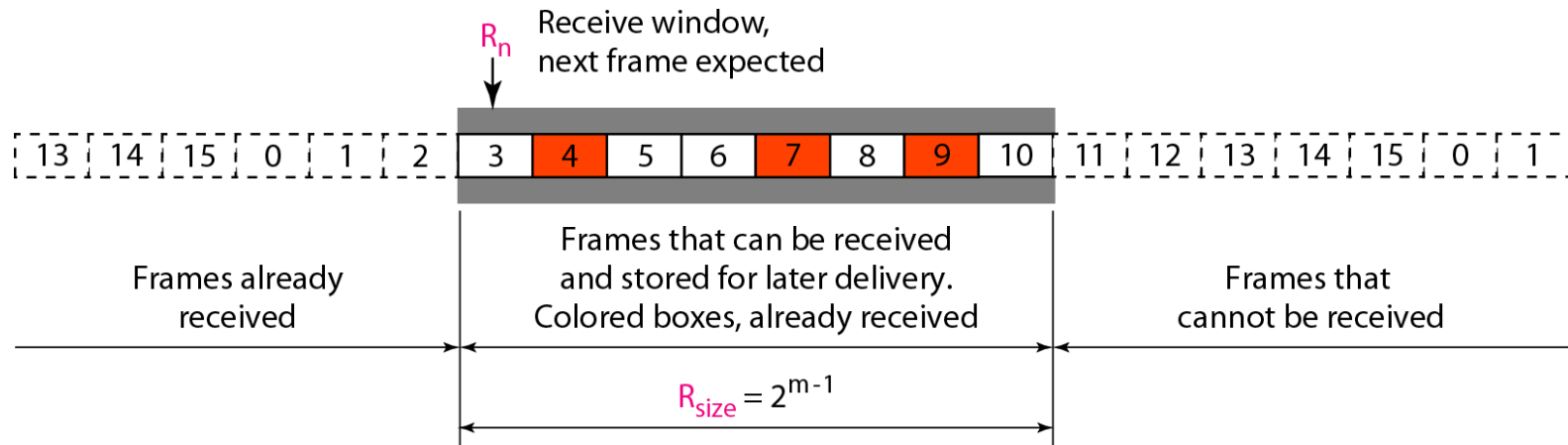
Selective Repeat ARQ, window size

a. Window size = 2^{m-1}

b. Window size > 2^{m-1}

Example 1: Selective Repeat ARQ