# Topic-1
# Stop and Wait Protocol

Prepared by K.Lakshmipathi raju, Assistant professor
Dept of IT

## Useful Terms:

- Propagation Delay: Amount of time taken by a packet to make a physical journey from one router to another router.
  Propagation Delay = (Distance between routers) / (Velocity of propagation)
- **RoundTripTime (RTT)** = 2* Propagation Delay
- **TimeOut (TO)** = 2* RTT
- **Time To Live (TTL)** = 2* TimeOut. (Maximum TTL is 180 seconds)

## Characteristics:

- Used in Connection-oriented communication.
- It offers error and flow control
- It is used in Data Link and Transport Layers
- Stop and Wait mainly implements Sliding Window Protocol concept with Window Size 1

**Sender:**

Rule 1) Send one data packet at a time.

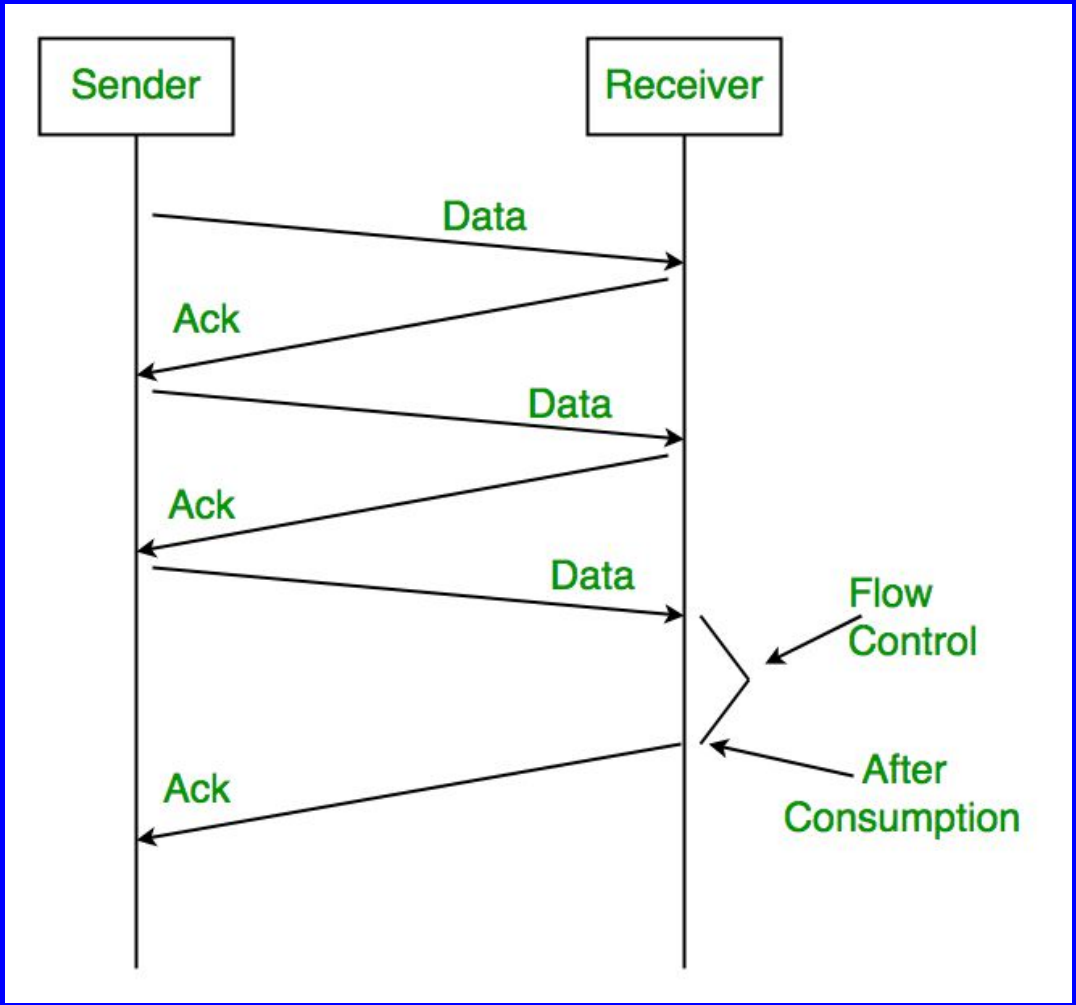
Rule 2) Send next packet only after receiving acknowledgement for previous.

**Receiver:**

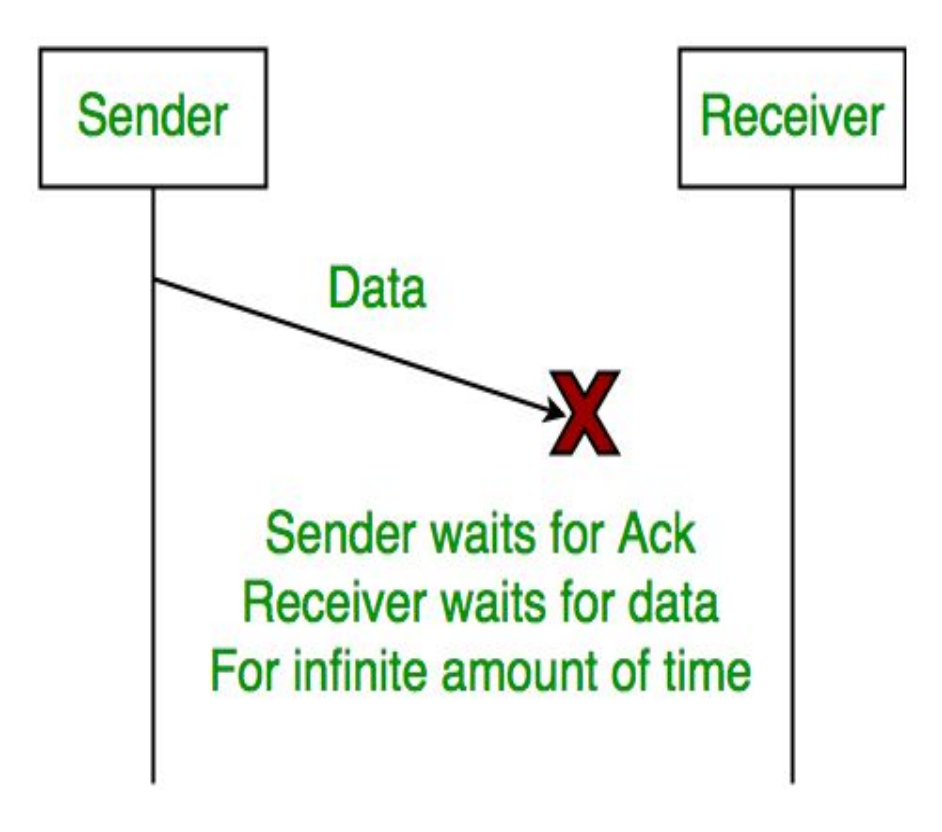
Rule 1) Send acknowledgement after receiving and consuming of data packet.

Rule 2) After consuming packet acknowledgement need to be sent (Flow Control)

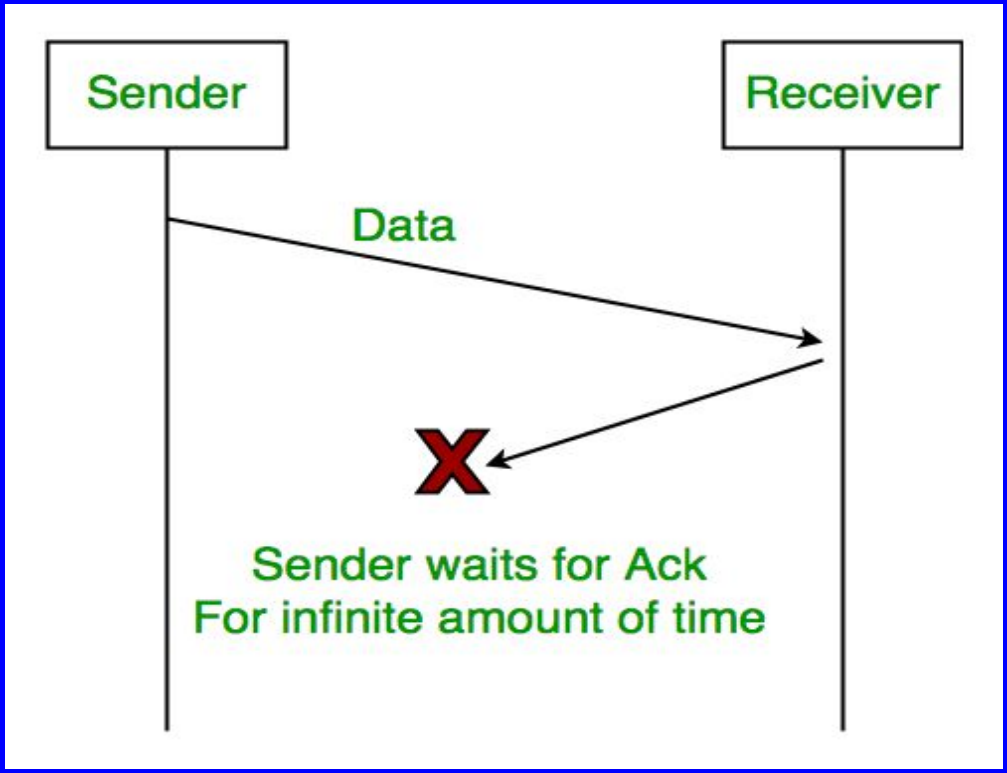
# Simple Stop And Wait



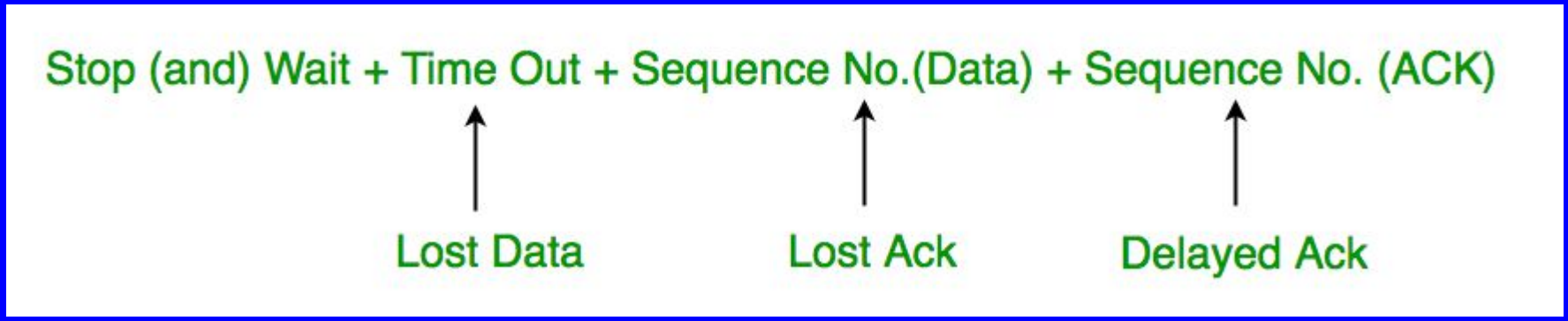
## 1.Lost Data


Sender
Receiver
Data
X
Sender waits for Ack
Receiver waits for data
For infinite amount of time

## 2.Lost Acknowledgement:

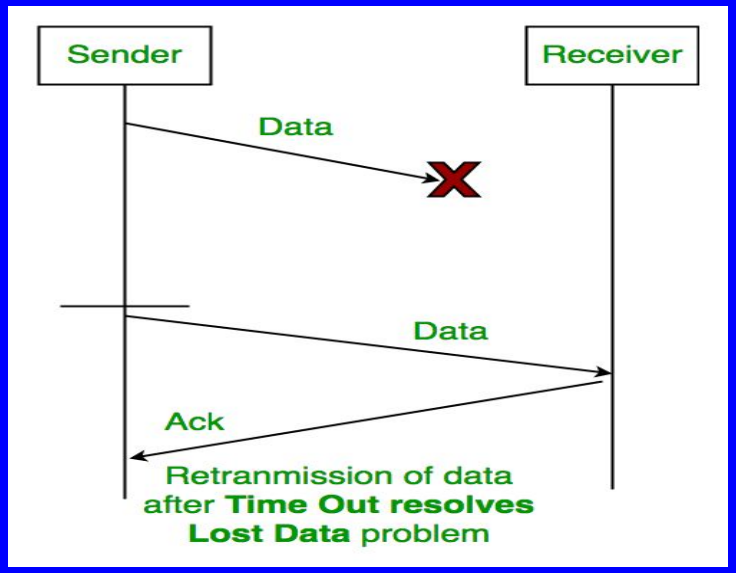


3.**Delayed Acknowledgement/Data:** After timeout on sender side, a long delayed acknowledgement might be wrongly considered as acknowledgement of some other recent packet.

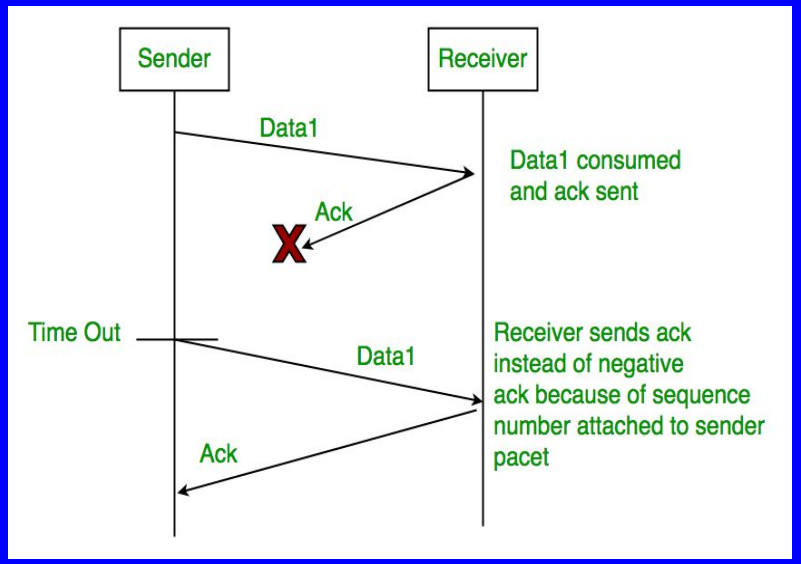


Above 3 problems are resolved by Stop and Wait ARQ (Automatic Repeat Request) that does both error control and flow control.

1. **Time Out:**




2. **Sequence Number (Data)**



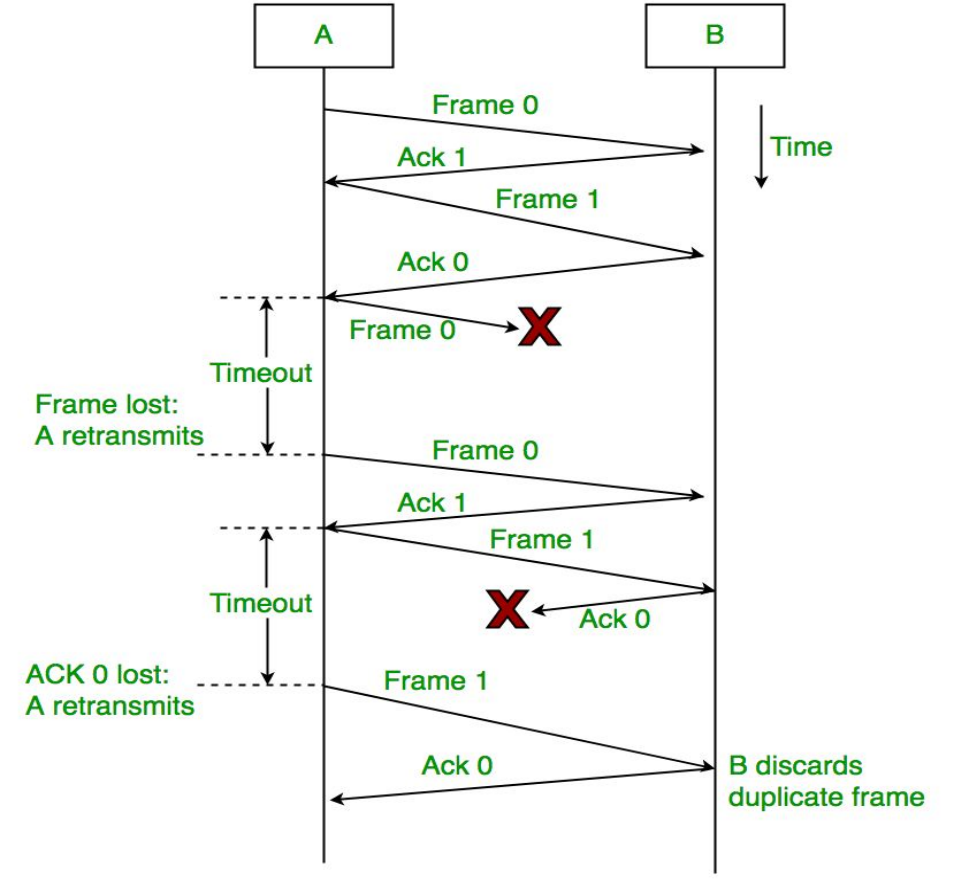

3. **Delayed Acknowledgement:**

This is resolved by introducing sequence number for acknowledgement also.

## Working of Stop and Wait ARQ:

1) Sender A sends a data frame or packet with sequence number 0.
2) Receiver B, after receiving data frame, sends and acknowledgement with sequence number 1 (sequence number of next expected data frame or packet)
There is only one bit sequence number that implies that both sender and receiver have buffer for one frame or packet only.

## Working of Stop and Wait ARQ:



## Characteristics of Stop and Wait ARQ:

- It uses link between sender and receiver as half duplex link
- Throughput = 1 Data packet/frame per RTT
- If Bandwidth*Delay product is very high, then stop and wait protocol is not so useful. The sender has to keep waiting for acknowledgements before sending the processed next packet.
- It is an example for “Closed Loop OR connection oriented “ protocols
- It is an special category of SWP where its window size is 1
- Irrespective of number of packets sender is having stop and wait protocol requires only 2 sequence numbers 0 and 1

VISHNU
UNIVERSAL LEARNING

# Thank You