



# **SNS COLLEGE OF TECHNOLOGY**

**Coimbatore-35**

**An Autonomous Institution**



Accredited by NBA – AICTE and Accredited by NAAC – UGC with ‘A++’ Grade  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

**19ECT301- COMMUNICATION NETWORKS**

III YEAR/ V SEMESTER

**UNIT 2 –DATA-LINK LAYER & NETWORK LAYER**

**TOPIC – QUALITY OF SERVICE**



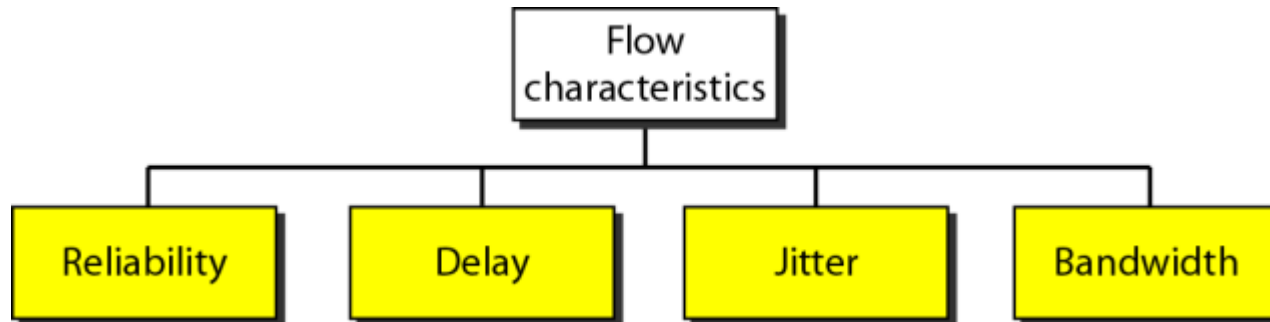
# QUALITY OF SERVICE



*Quality of service (QoS) is an internetworking issue that has been discussed more than defined. We can informally define quality of service as something a flow seeks to attain.*



## *Flow characteristics*





# TECHNIQUES TO IMPROVE QoS



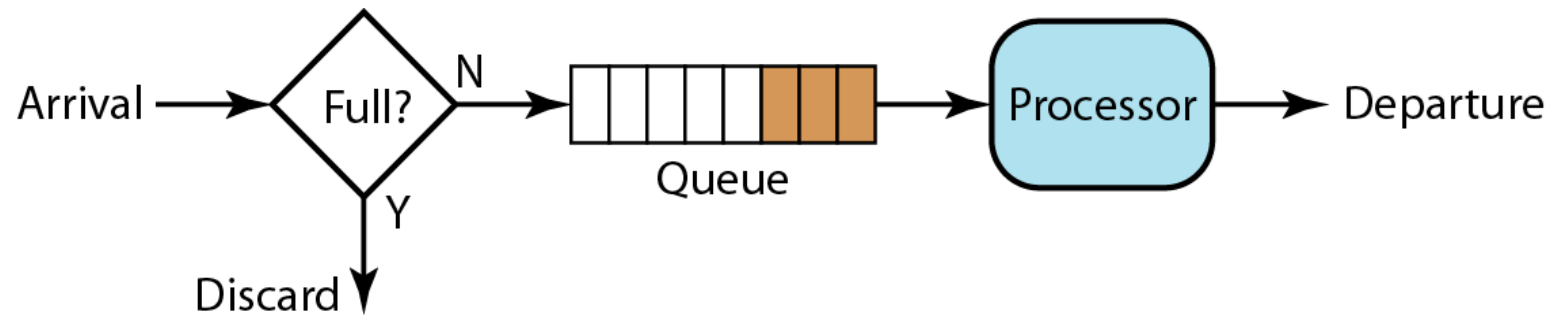
*We briefly discuss four common methods:*

- *scheduling*
- *traffic shaping*
- *admission control*
- *and resource reservation.*

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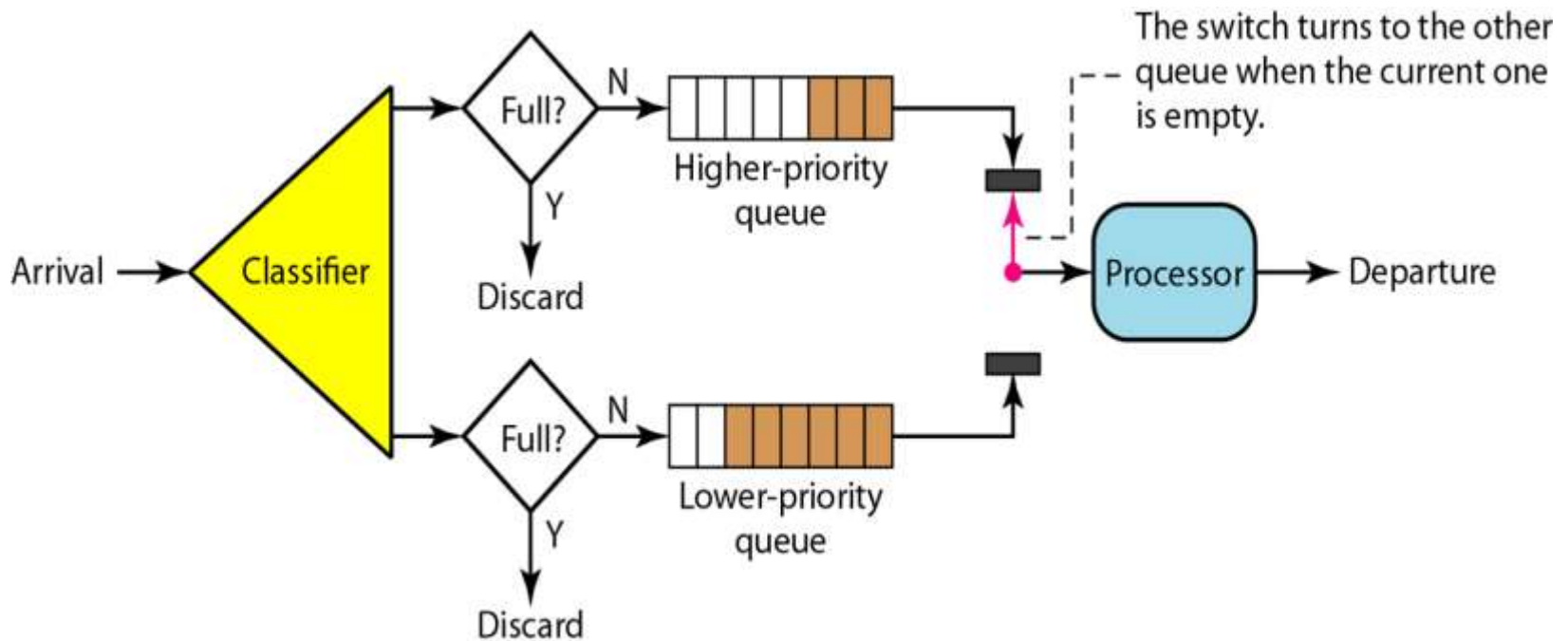


## *FIFO queue*



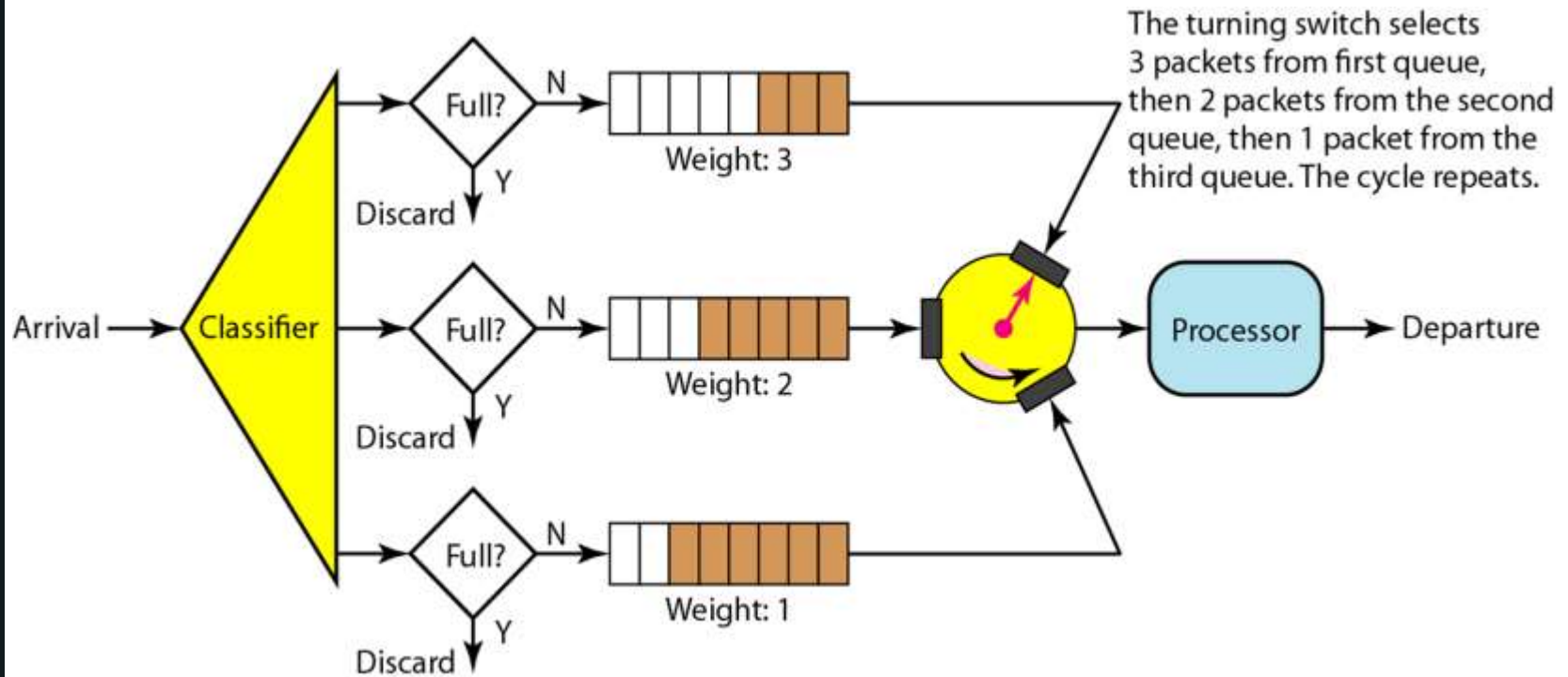


# Priority queuing



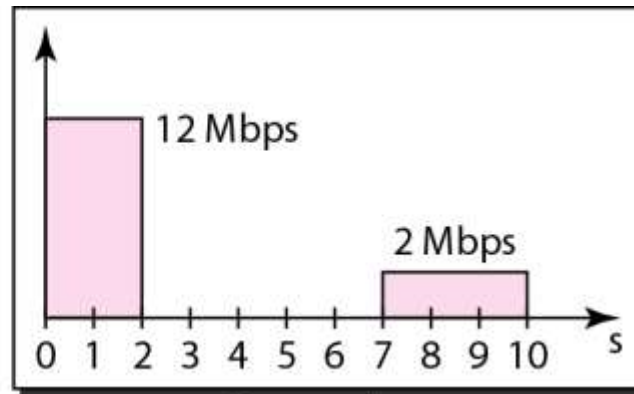
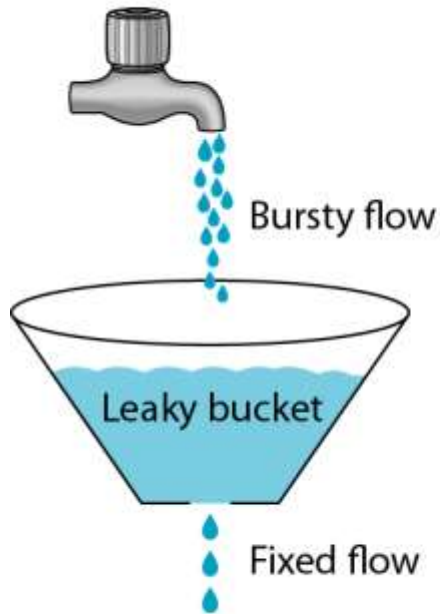


## Weighted fair queuing

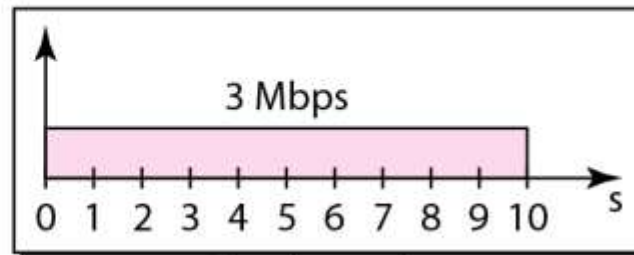




# Leaky bucket



Bursty data

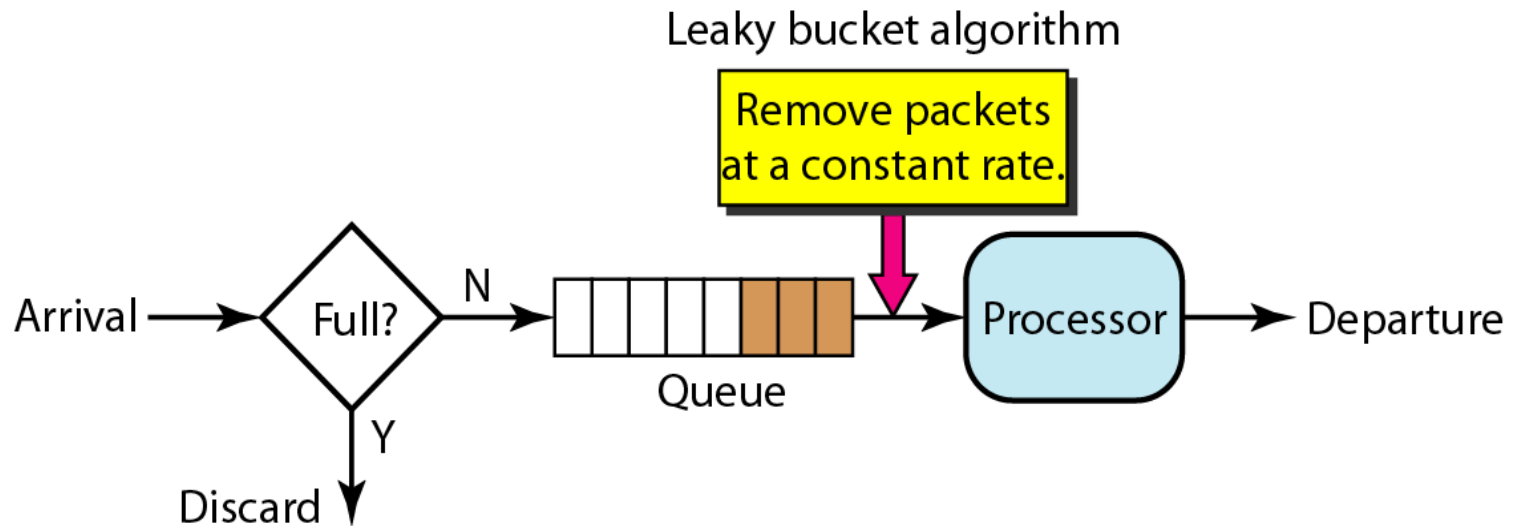


Fixed-rate data





## Leaky bucket implementation





*Note*

**A leaky bucket algorithm shapes bursty traffic into fixed-rate traffic by averaging the data rate. It may drop the packets if the bucket is full.**

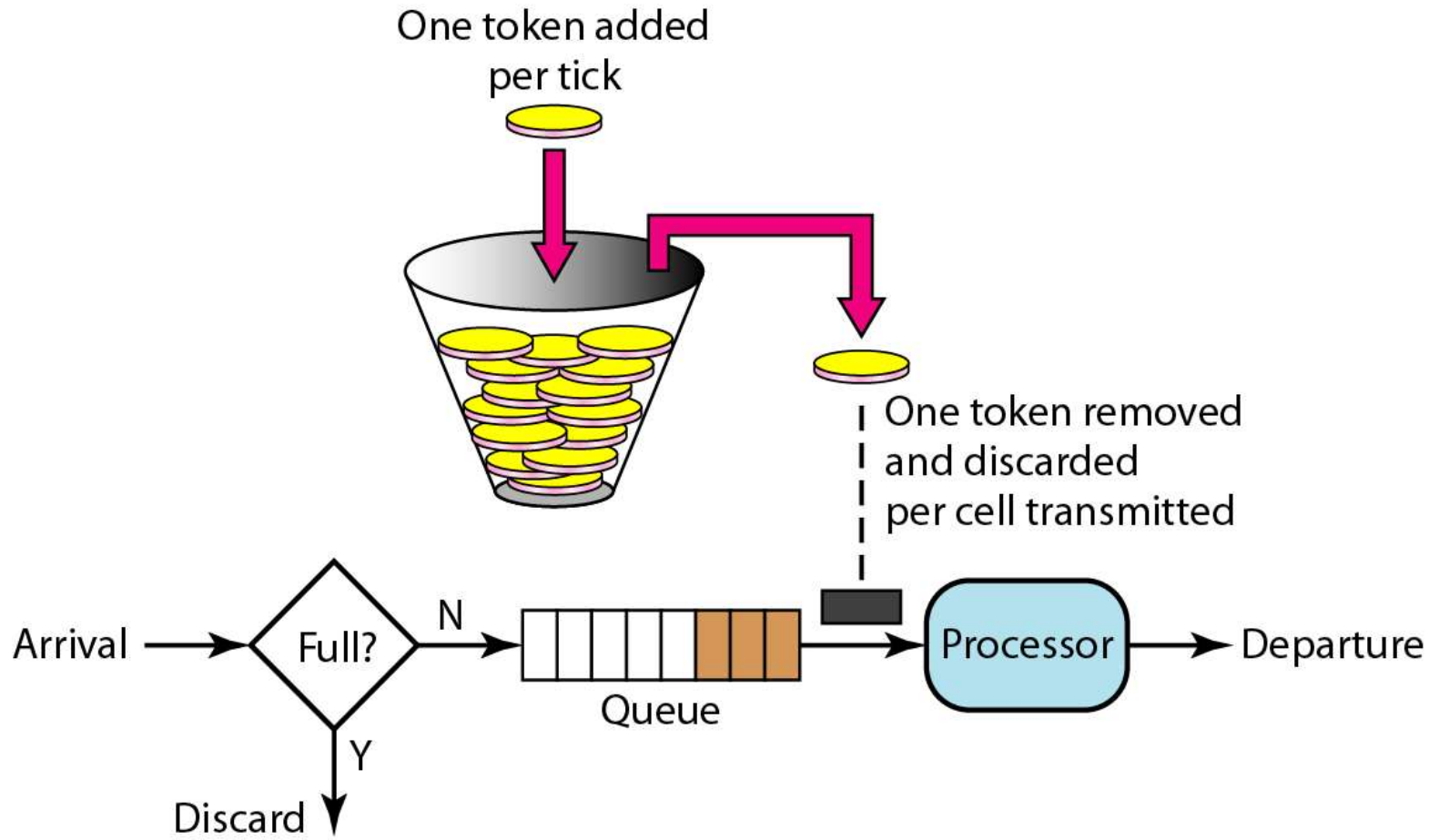


## *Note*

**The token bucket allows bursty traffic at a regulated maximum rate.**



# Token bucket





# INTEGRATED SERVICES



*Two models have been designed to provide quality of service in the Internet: Integrated Services and Differentiated Services.*

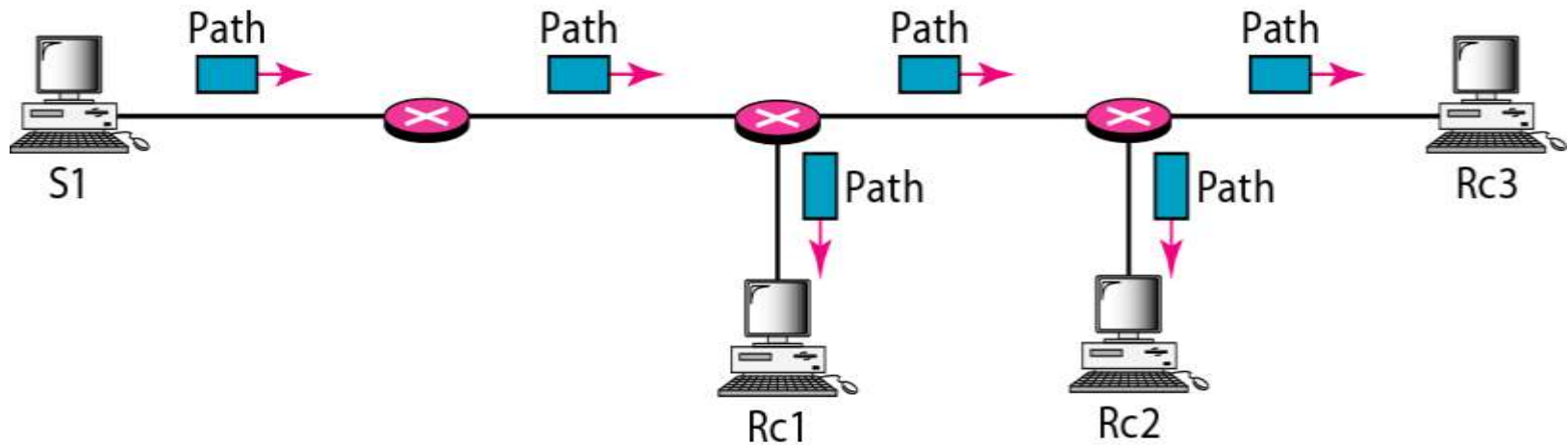


*Note*

**Integrated Services is a flow-based QoS model designed for IP.**

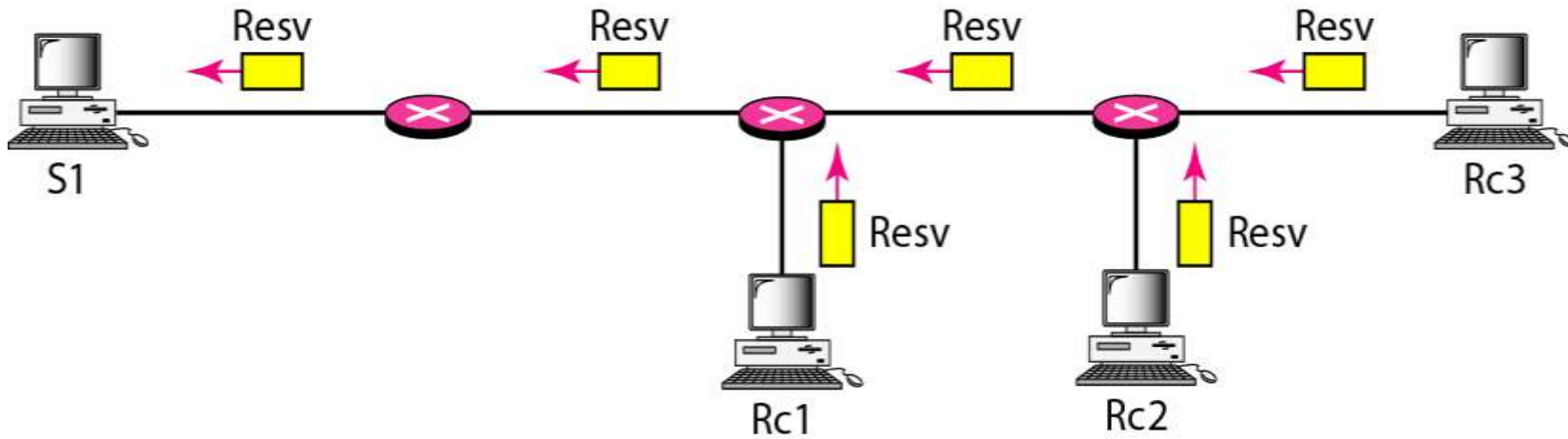


## Path messages





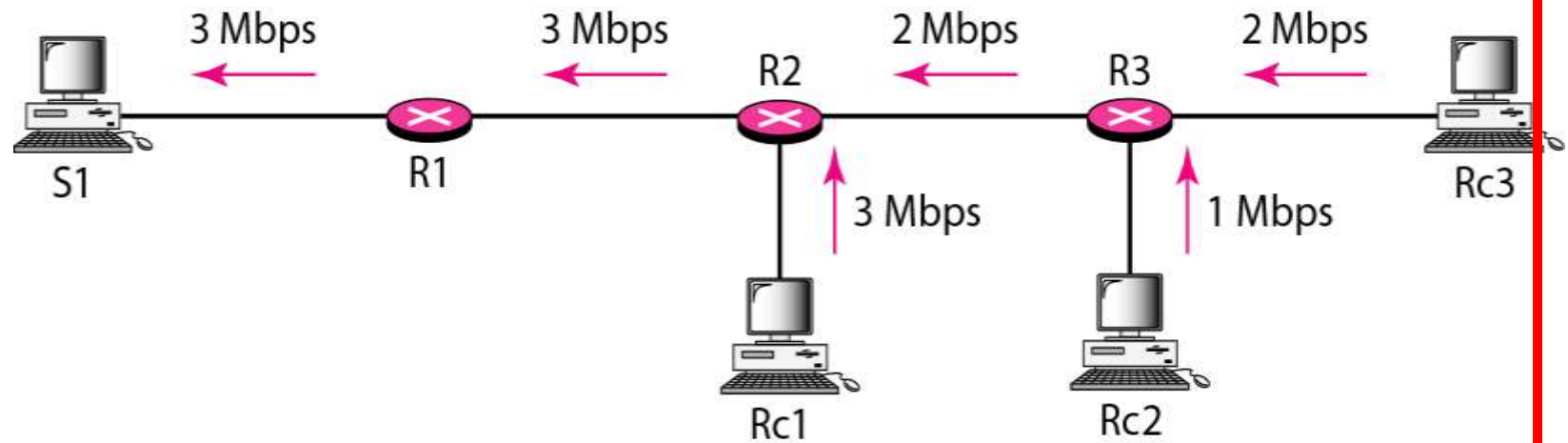
## *Resv messages*





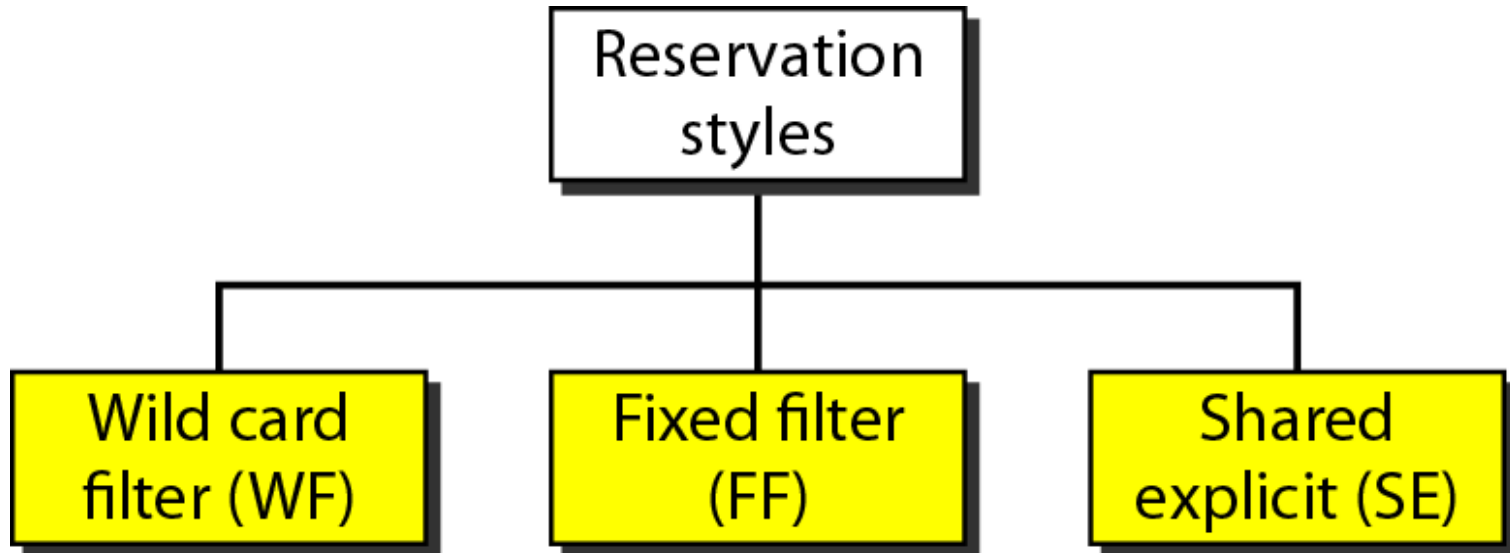


## Reservation merging





## *Reservation styles*





# DIFFERENTIATED SERVICES



*Differentiated Services (DS or Diffserv) was introduced by the IETF (Internet Engineering Task Force) to handle the shortcomings of Integrated Services.*



*Note*

**Differentiated Services is a class-based QoS model designed for IP.**

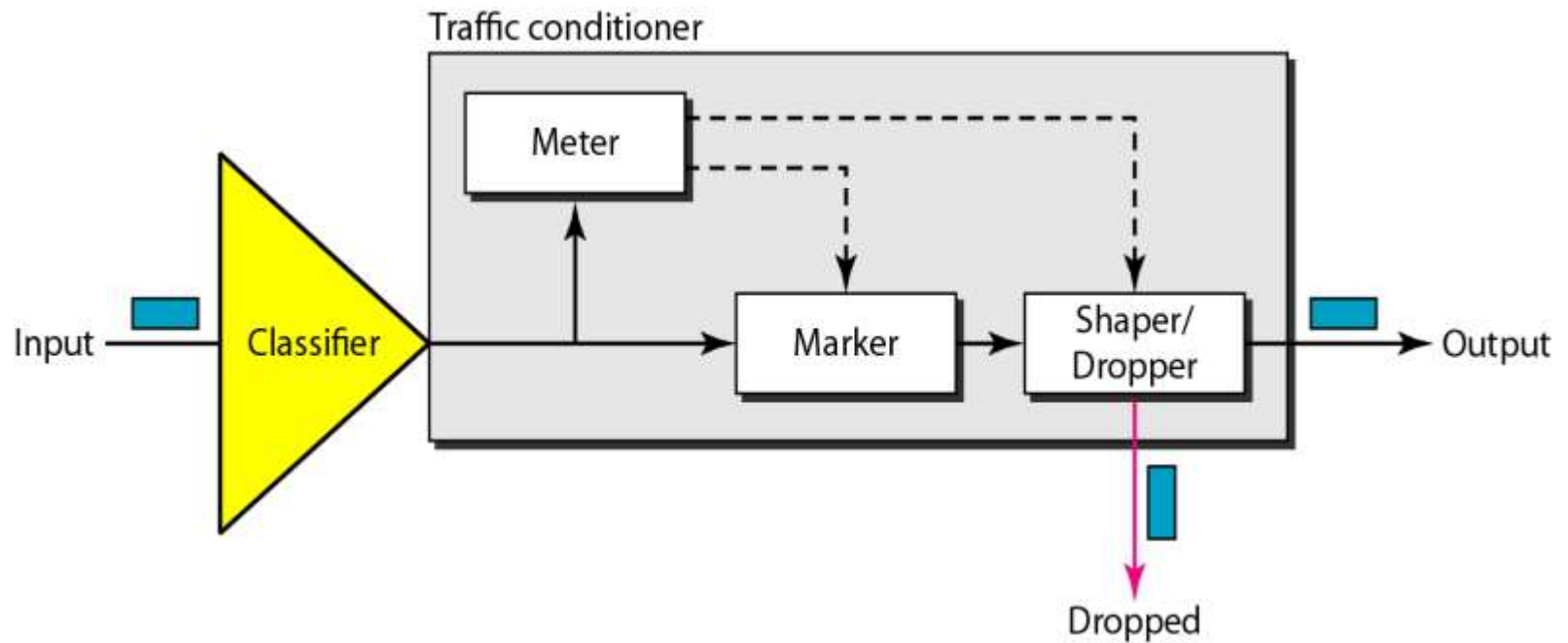


*DS field*





## Traffic conditioner





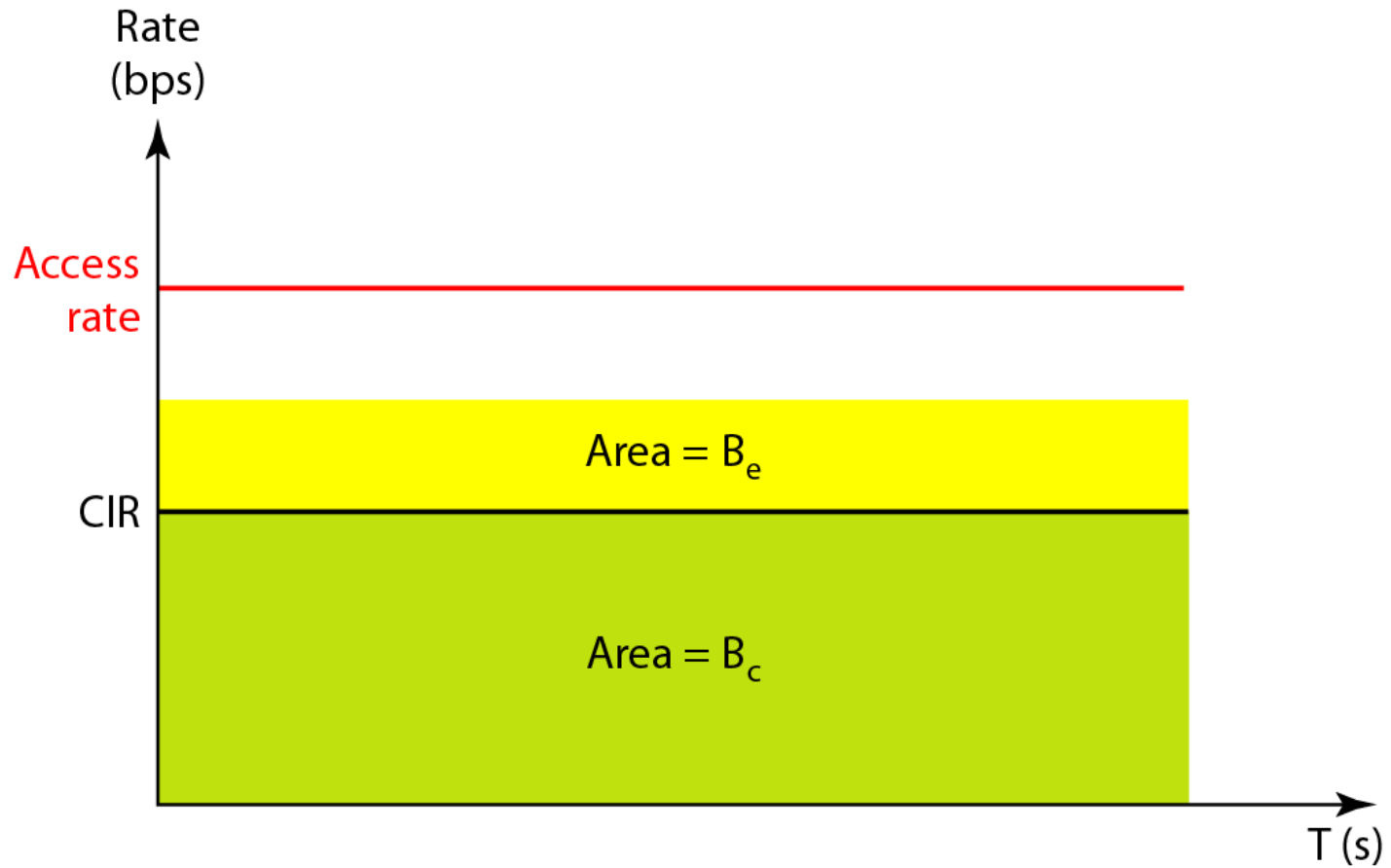
# QoS IN SWITCHED NETWORKS



*Let us now discuss QoS as used in two switched networks: Frame Relay and ATM. These two networks are virtual-circuit networks that need a signaling protocol such as RSVP.*



## *Relationship between traffic control attributes*

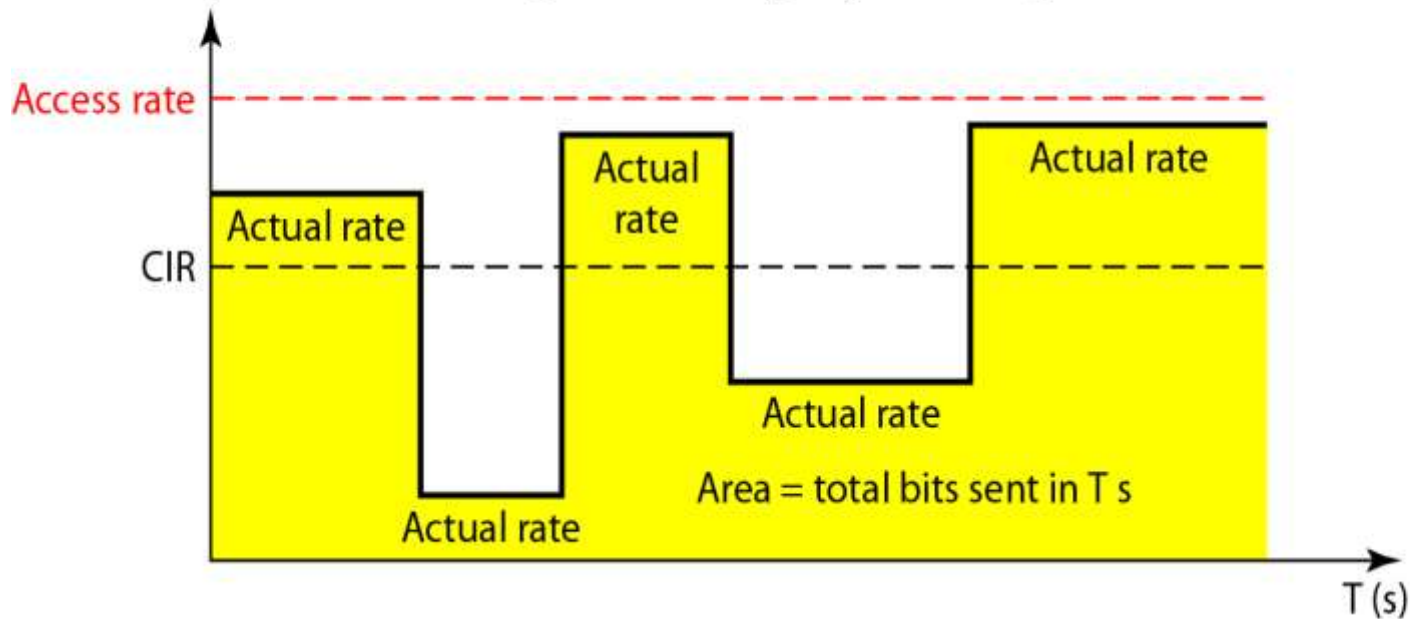






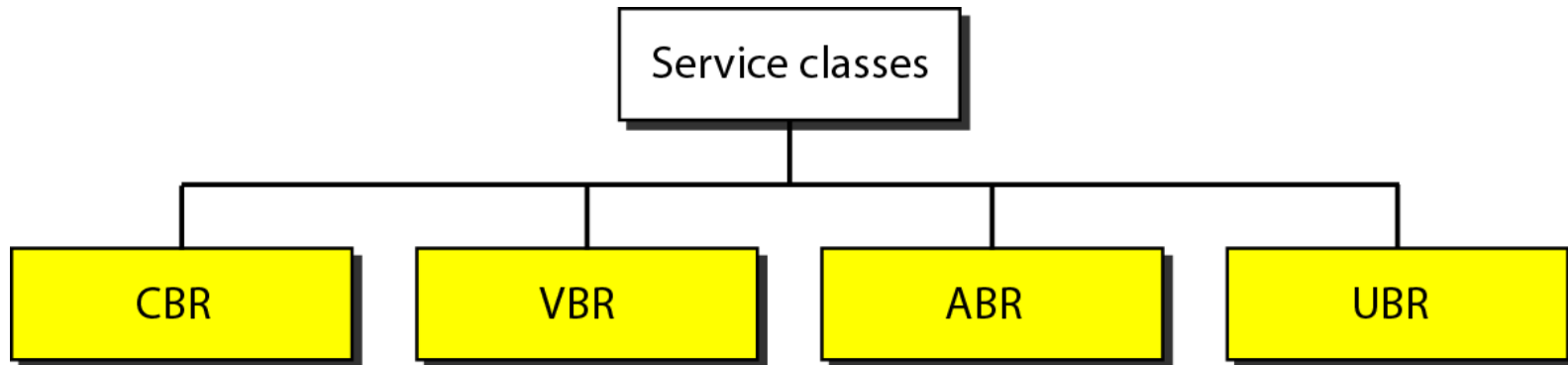
## User rate in relation to $B_c$ and $B_c + B_e$

If area is less than  $B_c$ , no discarding ( $DE = 0$ ).  
If area is between  $B_c$  and  $B_c + B_e$ , possible discarding if congestion ( $DE = 1$ ).  
If area is greater than  $B_c + B_e$ , discarding occurs.



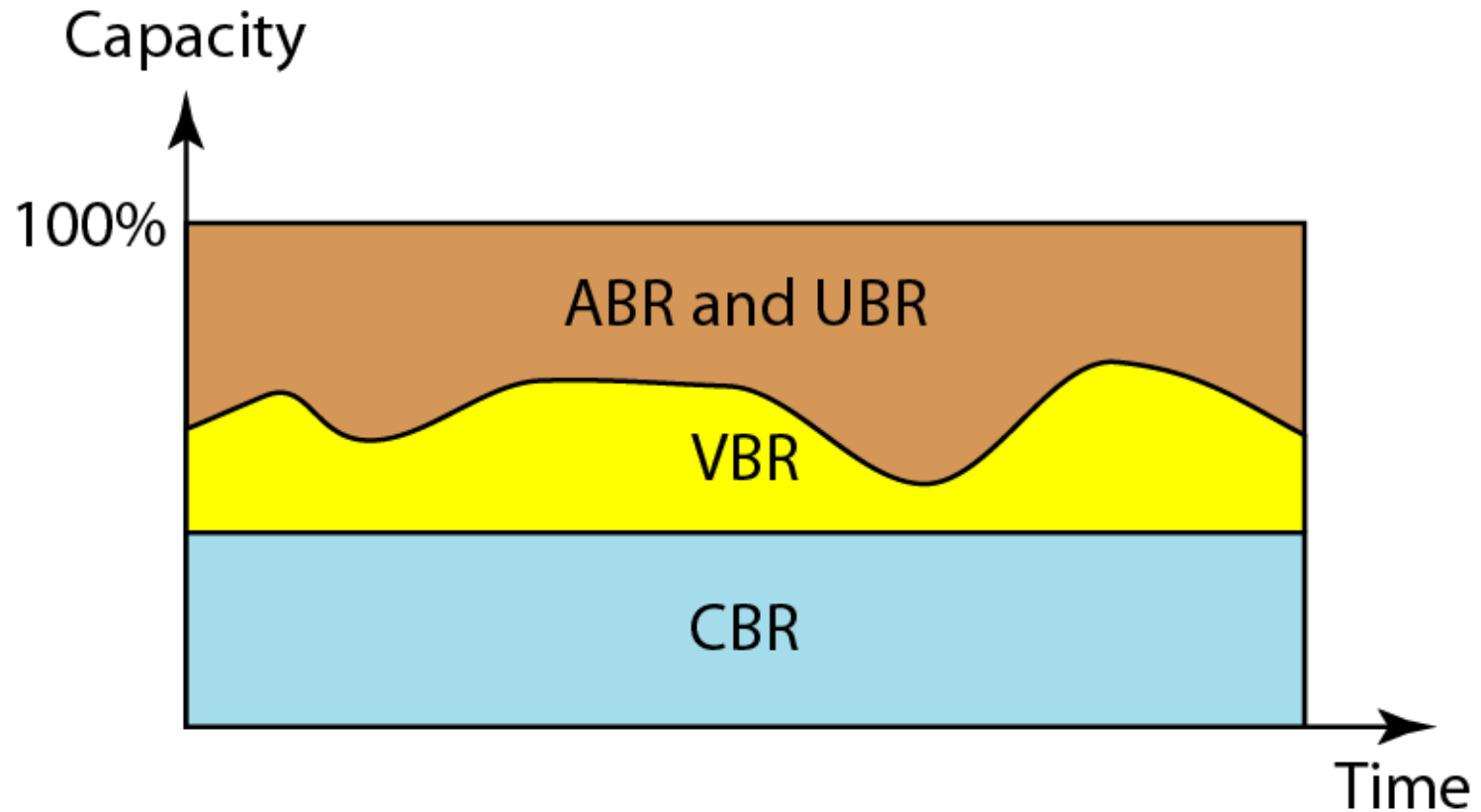


## *Service classes*





*Relationship of service classes to the total capacity of the network*





**THANK YOU**