

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

In the name of God



Quality of Service

Introduction of several methods

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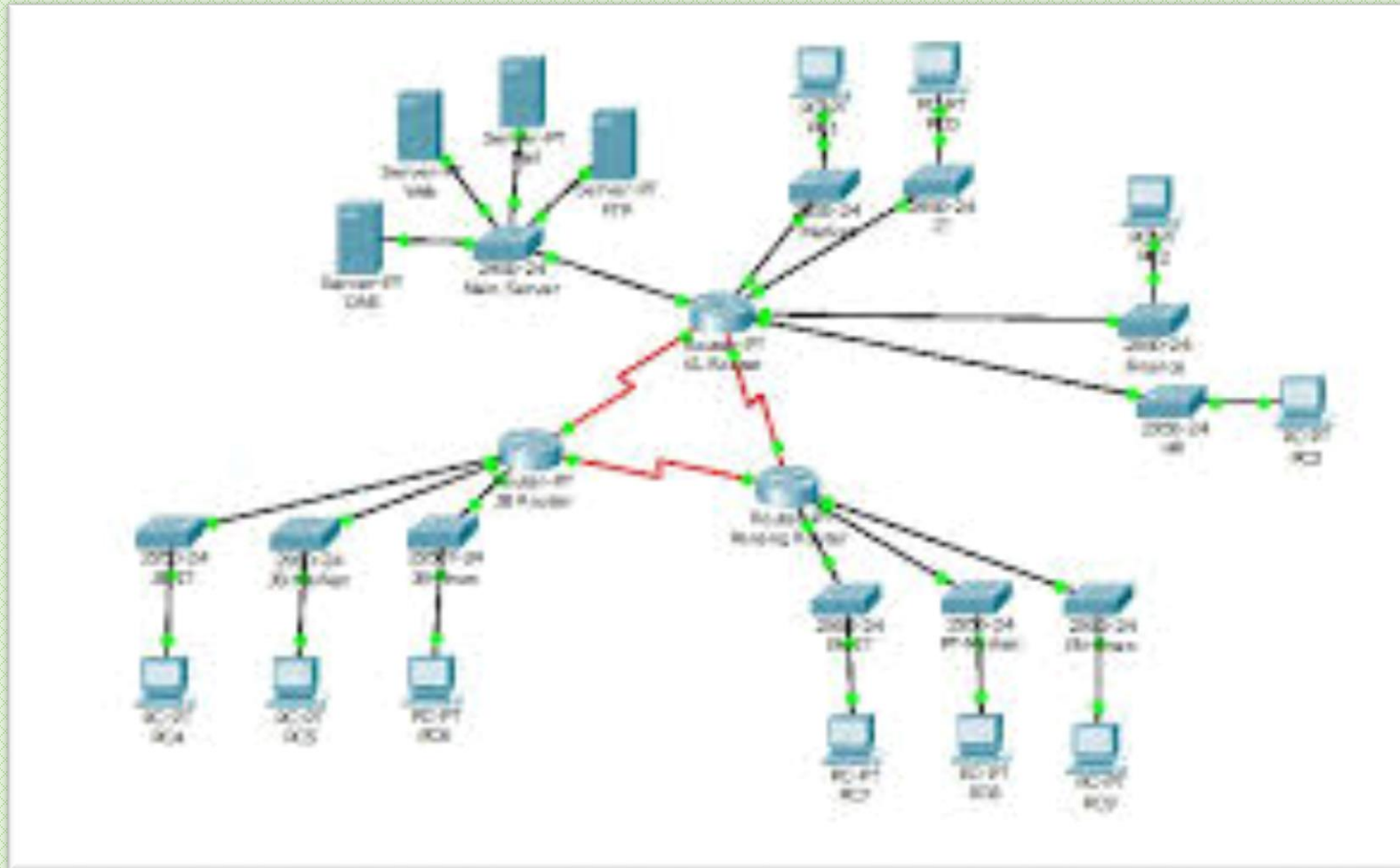
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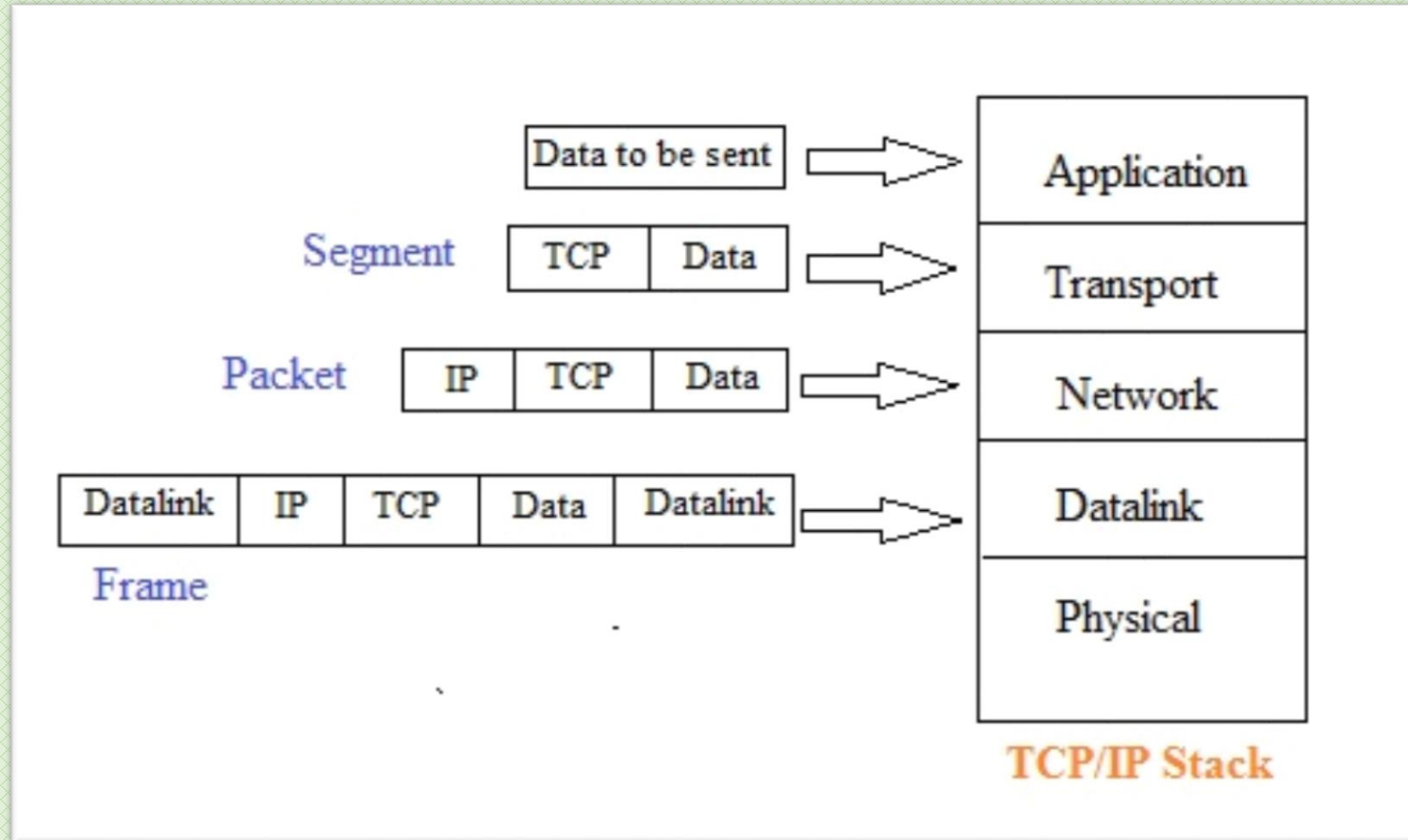
Overview

Methods

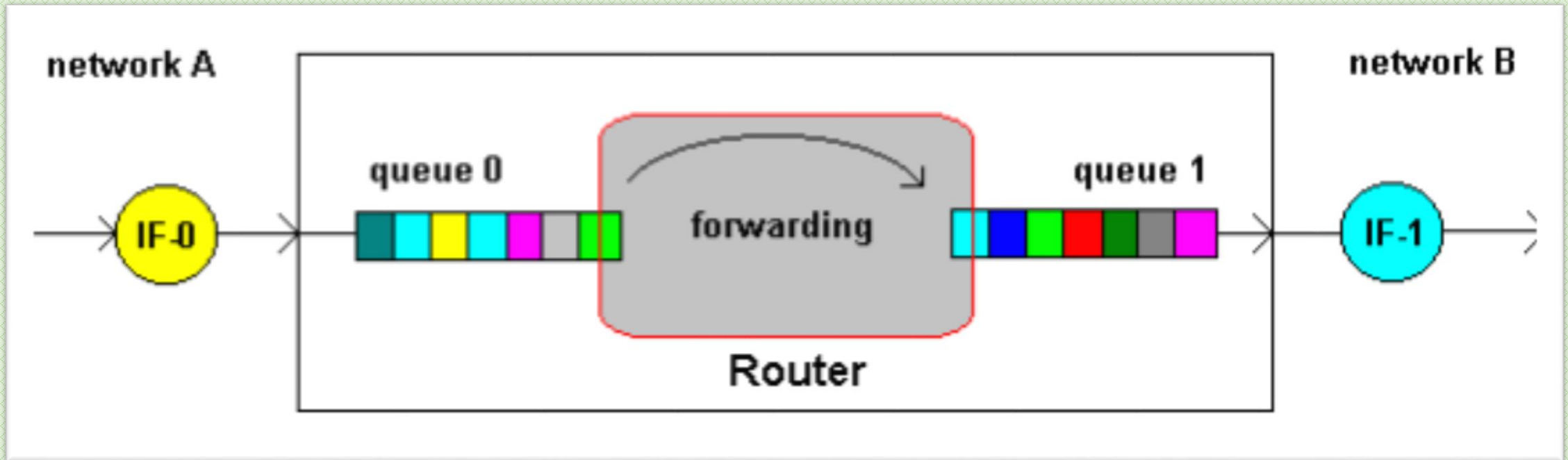
Introduction



Introduction



Introduction



Quality of Service

- Description or measurement of the overall performance of a service such as
 - Telephony or computer network
 - Cloud computing service
 - Email service
 - etc.

Performance seen by the users of the network

Quality of Service

- To quantitatively measure quality of service, several related aspects of the network service are often considered, such as
 - Packet loss
 - Bit rate
 - Transmission delay
 - Availability
 - etc.

Introduction

QoS in Router



The several various queuing methods available on routers

1. FIFO – Legacy queuing method
2. Priority Queuing – Legacy queuing method
3. Custom Queuing – Legacy queuing method
4. Weighted Fair Queuing – Legacy queuing method
5. Class Based Weighted Fair Queuing – Newer queuing method
6. Low Latency Queuing – Newer queuing method

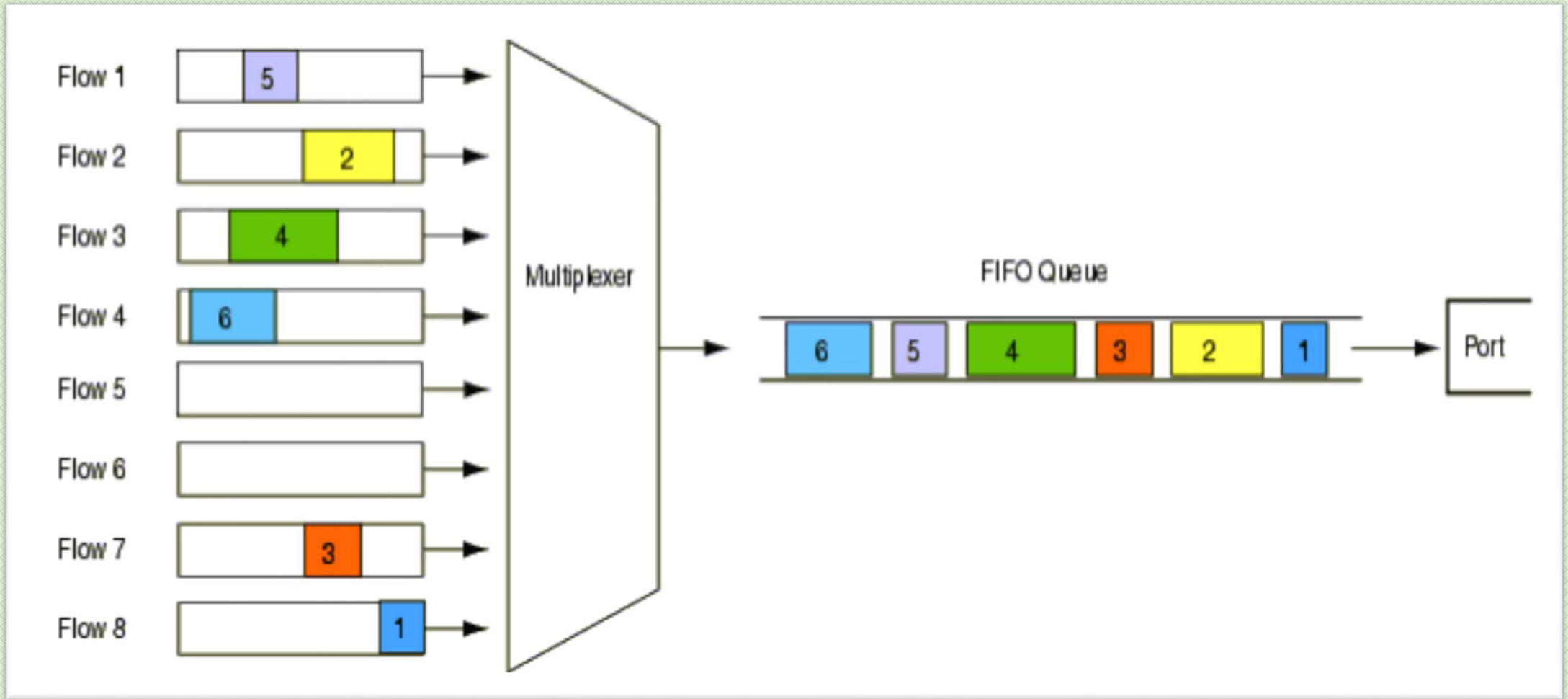
1. FIFO

First In First Out (A normal queue)

the **first** packet to **get** to the router will be the **first** packet to be sent **out**

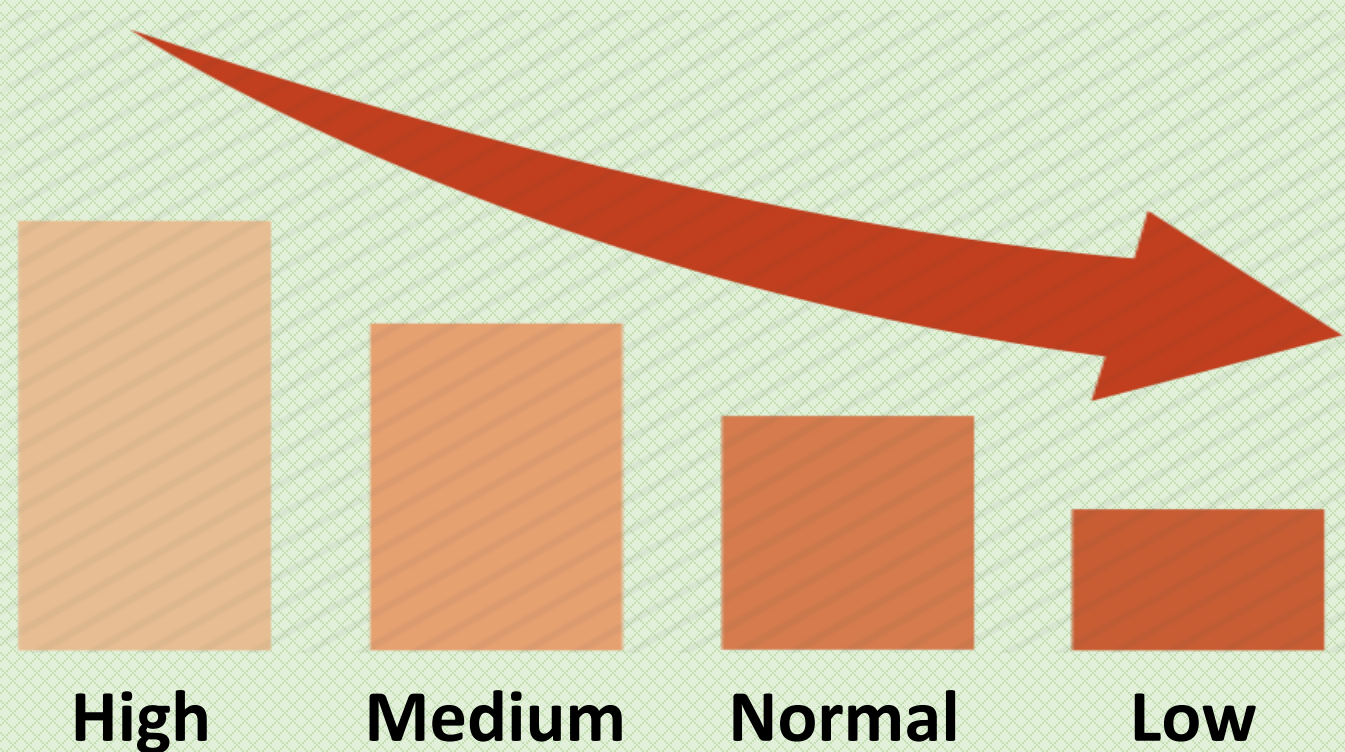
- ✓ **One Queue** for **received** traffic and **one queue** for traffic being **sent** out of the router
- ✗ **No priority** to any traffic types
- ✗ **Not recommended** for **voice** and **video** traffics

1. FIFO

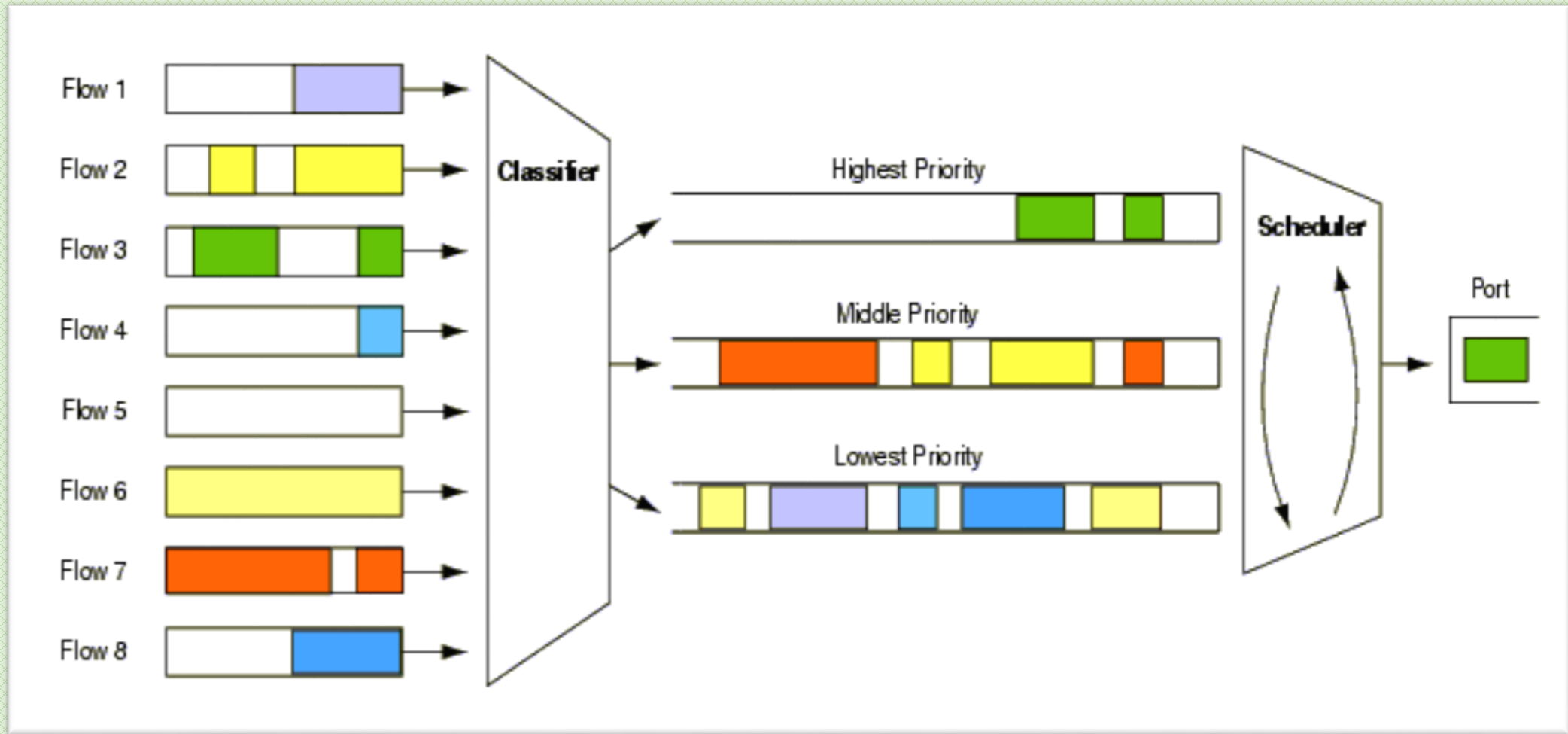


2. Priority Queuing

There are **4 Queues** of Traffic in **Priority** queuing, and **you define** what type of traffic goes into these queues.



2. Priority Queuing



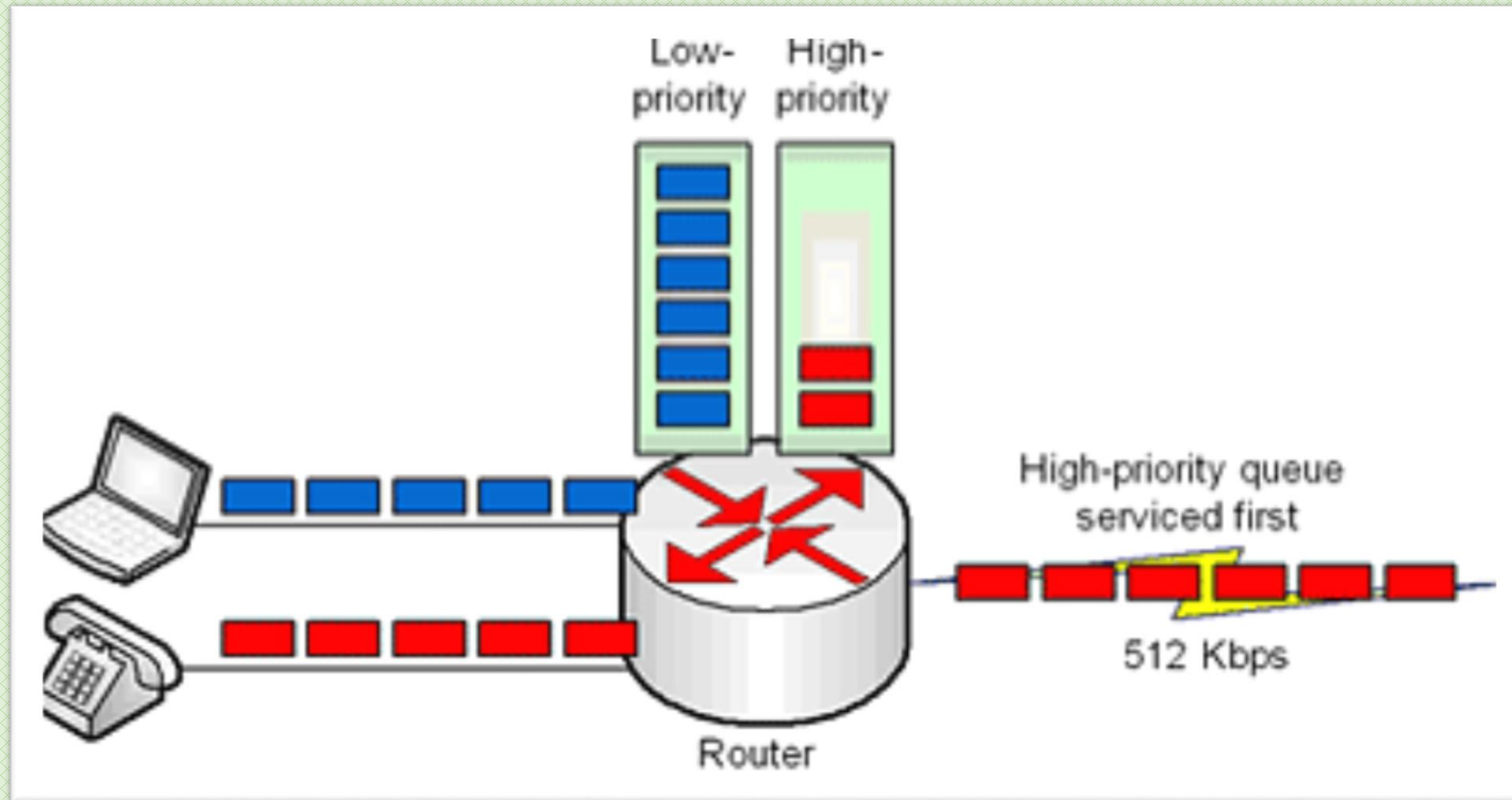
2. Priority Queuing

III

High Priority > Medium Priority > Normal Priority > Low Priority

- ✓ Can give **delay guarantee** to traffic in **high** Queues
- ✗ Is a **strict** Priority method
- ✗ Can also lead to resource **starvation** to traffic in **other** queues

2. Priority Queuing

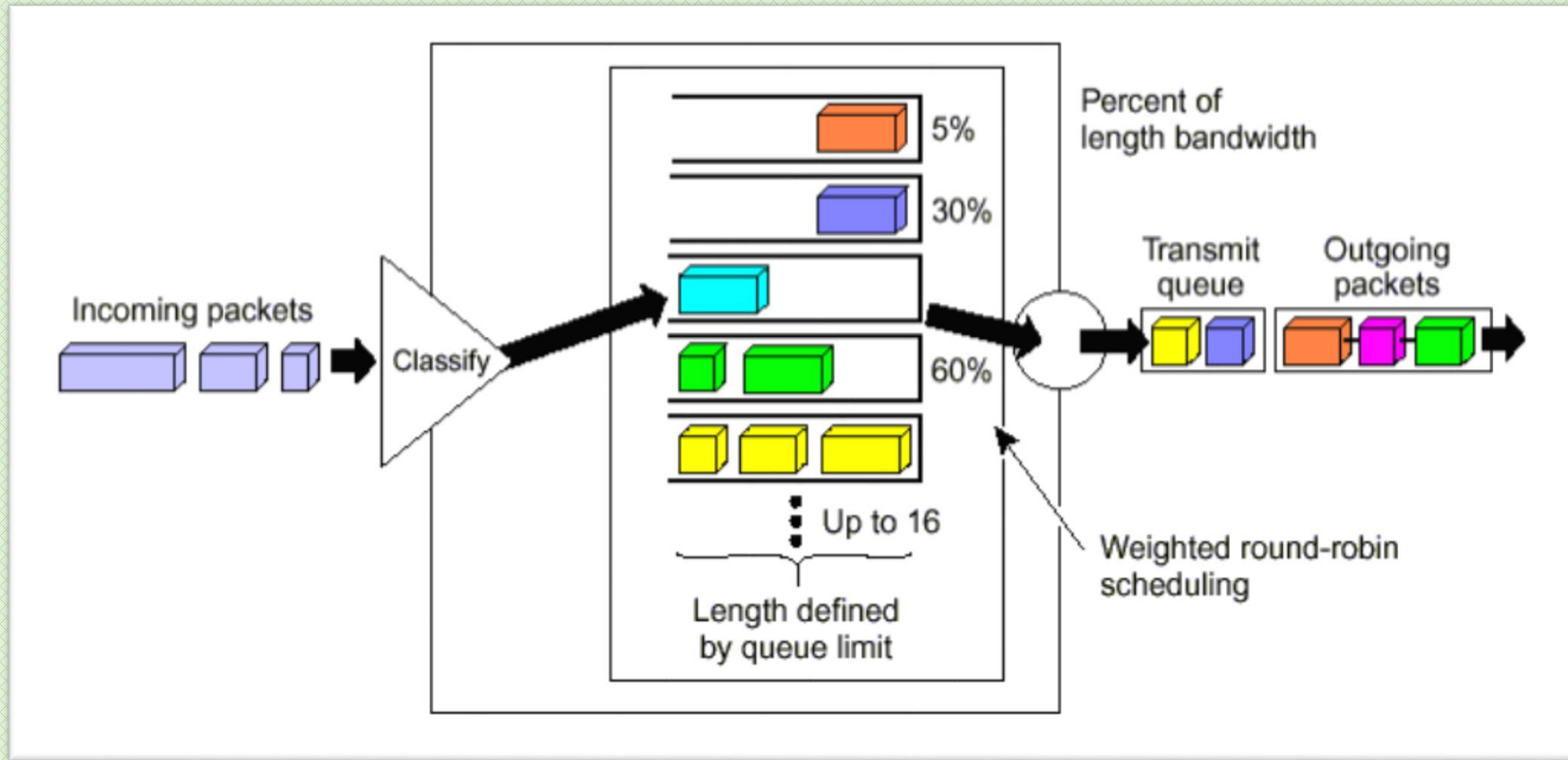


3. Custom Queuing

There are **16 queues** where you define which traffic will go in which queue. It **starts from clearing the traffic** in the **first** queue then it will jump to **next** queue and **clear all traffic** in the second queue then jump to **next** queue and clear the traffic and so on...

- Works in a **round robin** method
- **Clearing all traffic** from the **first** queue **one after the other**
- It will **go back** to the **first queue** and start the process all over **again**

3. Custom Queuing



3. Custom Queuing

- ✓ Will **make sure** that no traffic queue will ever have a resource **starvation**
- ✓ Can follow order in a round robin fashion
- ✗ At the same time it **cannot give delay guarantee**
- ✗ **Not recommended** for **voice** and **video** traffics

4. Weighted Fair Queuing

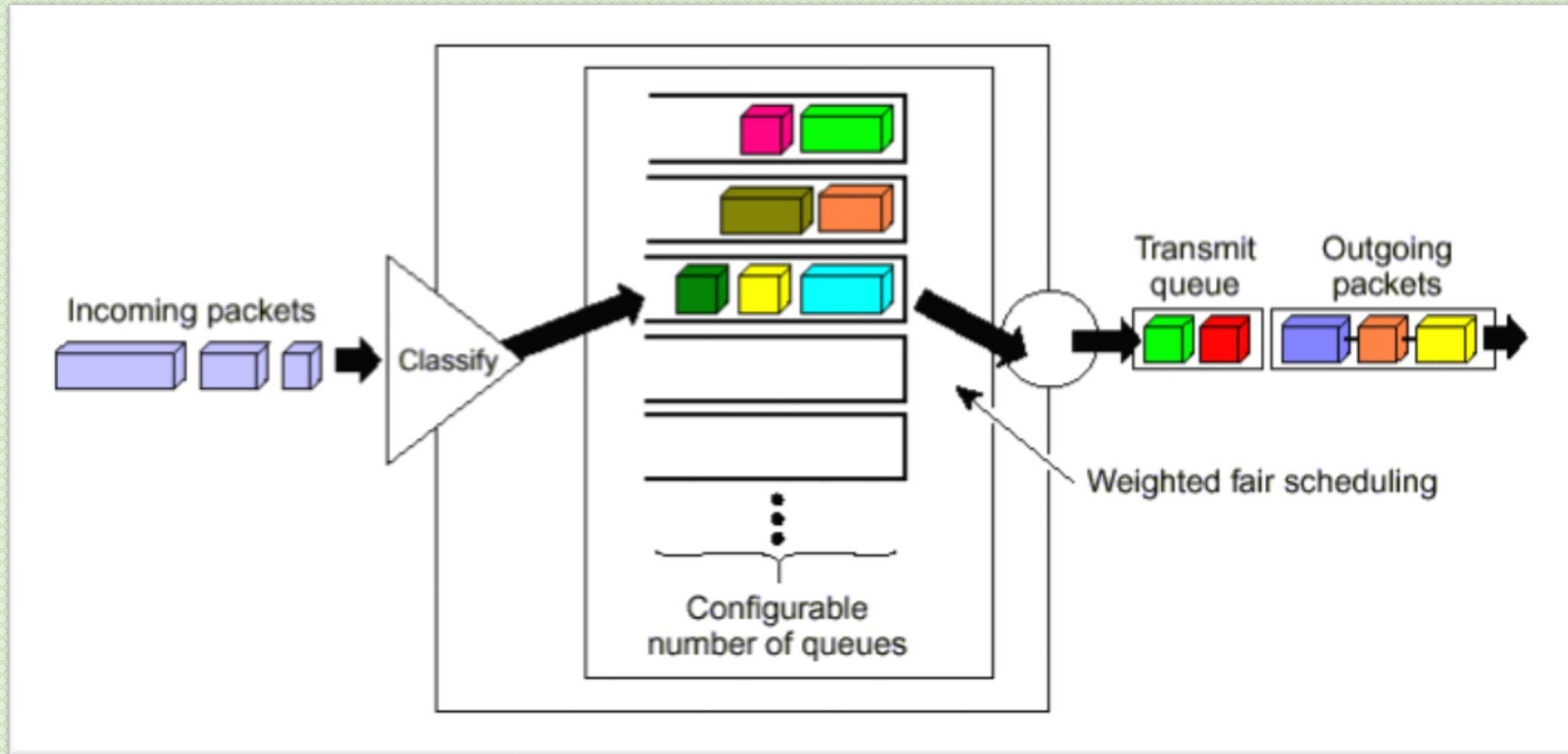
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This is the **default** queuing method Cisco

The number of Queues are defined per flow

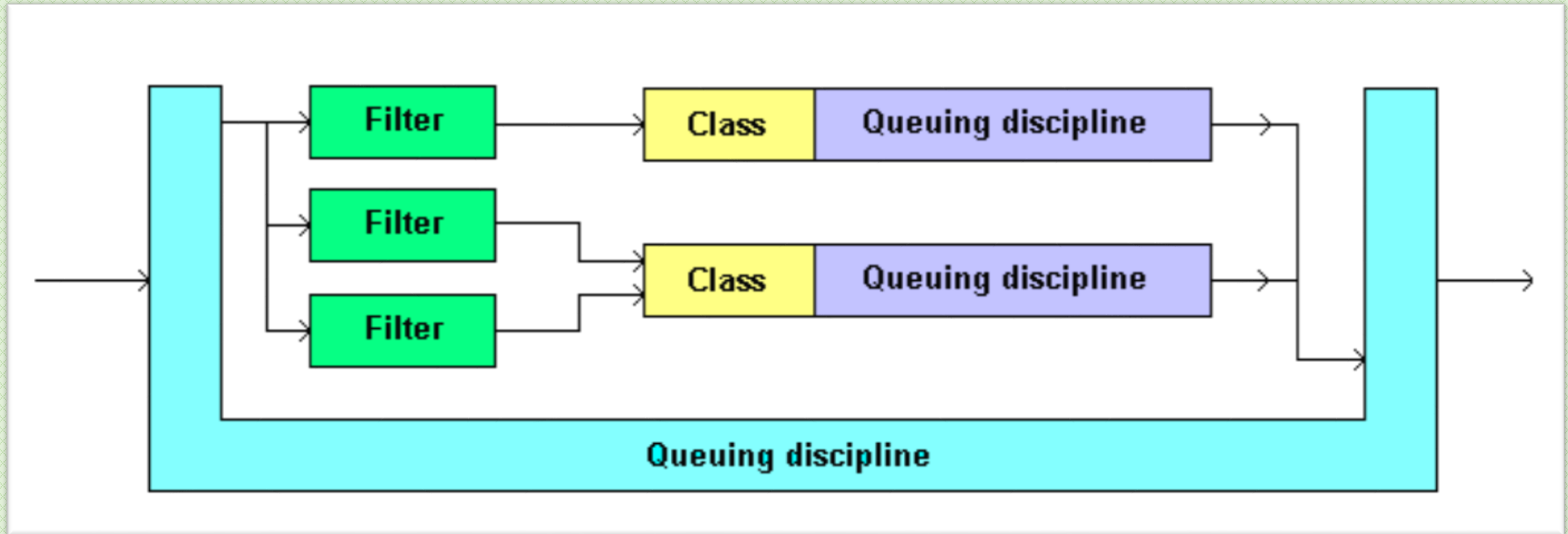
- ✓ Will **make sure** that no traffic queue will ever have a resource **starvation**
- ✓ Follow order which has **more traffic** and **smaller packet**
- ✗ Is **no bandwidth guarantee**
- ✗ Is **no delay guarantee**
- ✗ **Not recommended** for **voice** and **video** traffics

4. Weighted Fair Queuing



4. Weighted Fair Queuing

III



5. Class Based Weighted Fair Queuing

III

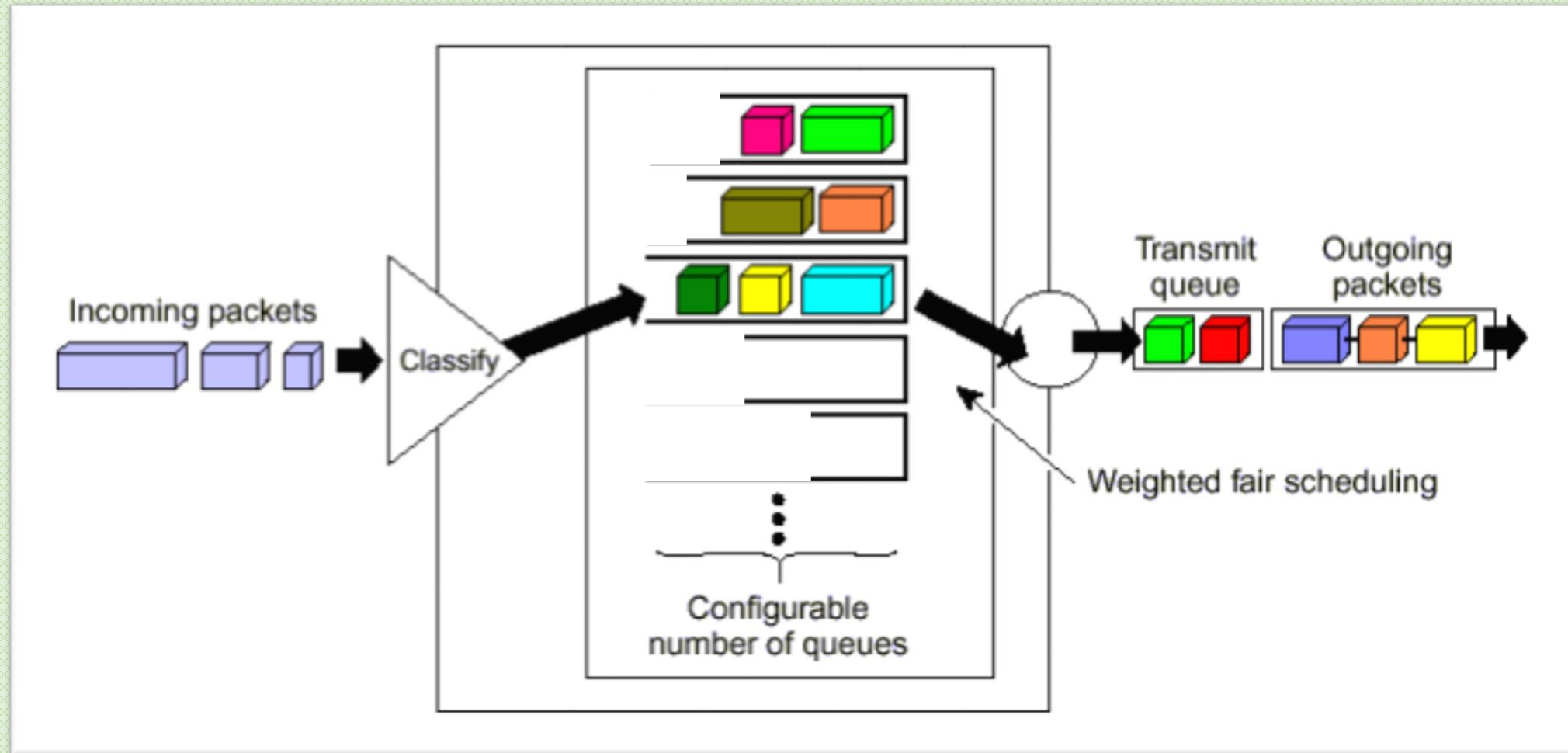
Newer queuing method

Can use class-maps to define up to 256 classes of traffic

- ✓ Will **make sure** that no traffic queue will ever have a resource **starvation**
- ✓ Assign the **bandwidth percentage guarantee** to each class
- ✓ Follow order which has **more traffic** and **smaller packet**
- ✓ Is **bandwidth guarantee**
- ✗ Is **no delay guarantee**
- ✗ **Not recommended** for **voice** and **video** traffics

5. Class Based Weighted Fair Queuing

III



6. Low Latency Queuing

III

Newer queuing method

This queuing method is a **combination** of
“**Priority Queuing**” and “**Class Based Weighted Fair Queuing**”

6. Low Latency Queuing

III

Sum of all Guarantees = 75% (this includes the 33% for the Priority Queue)
This is to make sure that 25% is left for the Default Class (everything else)

- ✓ **Priority Queue = 33%** (Voice and Video)
- ✓ **Can be used for voice and video traffic**
- ✓ **Will make sure that no traffic queue will ever have a resource starvation**
- ✓ **Assign the bandwidth percentage guarantee to each class**
- ✓ **Follow order which has more traffic and smaller packet**
- ✓ **Is bandwidth guarantee**
- ✓ **Is delay guarantee**



END

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