QoS in Ethernet

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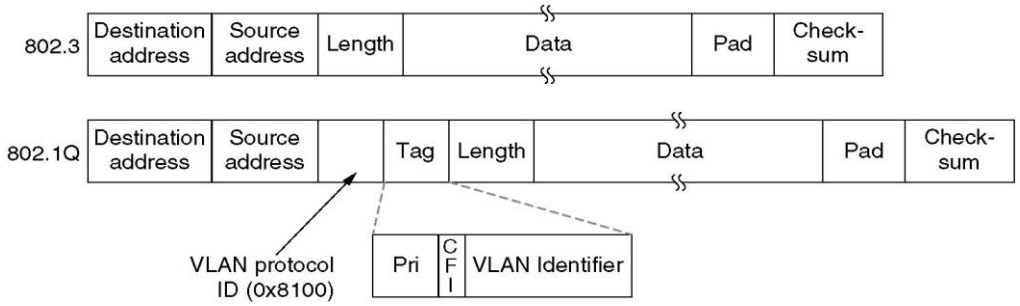
QoS in Ethernet

- Class based QoS model
- Defined in IEEE 802.1p
- Assume Ethernet switched VLAN
- 8 priority levels
- Although named priorities, they may not be in a strict hierarchical relationship
- A label in the packet header of IEEE 802.1q packet format (VLAN) identifies the priority level coded over 3 bits
- Switches are supposed to use a given number of queues, logically separated per priority
  - Minimum number of queues to be supported = 2
  - Maximum number of queues to be supported = 8

IEEE 802.1Q

- 802.3 Packet format (legacy) e 802.1Q



- TCI: Tag Control Information
  - PCP (Priority Code Point) 3 bit of priority
  - DEI (Drop Eligibility Indicator): 1 bit of discarding
  - VID (VLAND Identifier): 12 bit

Ethernet: priority assignment

- MAC card in the source node may insert the tag on the packet header
  - The switch interface connected to the node must support packets with tags
- The switch interface may assign a priority to a packet
  - Normally tagging is executed by the switch to which the source node is connected

Ethernet: priority assignment

User priority	Acronym	Traffic type
0 (default)	BE	Best effort
1	BK	Background
2	-	Undefined
3	EE	Excellent effort
4	CL	Controlled load
5	VI	Video <100ms
6	VO	Voce < 10ms
7	NC	Network control

Ethernet: recommended aggregation

Number of queues	Traffic type							
1	BE BK EE CL VI VO NC							
2	NC VO VI CL				EE BK BE			
3	NC VO		VI CL		EE BK BE			
4	NC VO		VI CL		EE BK		BE	
5	NC VO		VI	CL	EE BK		BE	
6	NC VO		VI	CL	EE	BK	BE	
7	NC	VO	VI	CL	EE	BK	BE	
8	NC	VO	VI	CL	EE	--	BK	BE

Ethernet: scheduling

- The suggested scheduler is a strict priority following the recommended aggregation policies
- More sophisticated algorithms can be used
  - Round Robin, WRR, WFQ
- Different algorithms are provided depending on device quality and cost
- Management and console commands permit to
  - Map priority levels (user priority) to queues
  - Choose the scheduling algorithm to be used