Traffic Categories & Overall Performance Goals

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Purpose

- To build consensus on
  - Traffic types
  - Priority
  - Overall required performance goals

- Understanding and agreeing on above parameters is required for optimum TSN strategy

Automotive In-Vehicle Traffic Types

- Command & Control 1 – Time critical and safety-relevant control signals
- Command & Control 2 – A/C, seats, vehicle status, infotainment system, etc.
- Network Control/Management – PTP, LLDP, network configuration, network diagnostics
- Audio – Chimes/Alerts, entertainment
- Video Stream 1 – Sensor fusion related features (AR/V2V DAT etc.)
- Video Stream 2 – Camera at low speed, Entertainment
- Best Effort – Data collection upload, OTA download, vehicle diagnostic

Traffic Priority

PCP	Priority	Traffic Class	Traffic type	Attributes	Criticality	Loss Tolerance
7	Highest	TC 8	**Command & Control 1** Timing constraint: **1ms**	Size: 64 – 512 bytes Periodicity: 1 – 20ms	High	None
6	.	TC 7	**Reserved for future use**	N/A	N/A	N/A
5	.	TC 6	**Video Stream 1** (ADAS) Timing constraint: **16ms**	Size: 1580 bytes Periodicity: 16ms	High	Few
4	.	TC 5	**Command & Control 2** Timing constraint: **100ms**	Size: 64 –1024 bytes Periodicity: 21 – 500ms	Medium	Few
3	.	TC 4	**Network Control/Management** Timing constraint: **100ms**	Size: 64 – 500 bytes Periodicity: Variable	Medium	Few
2	.	TC 3	**Reserved for future use**	N/A	N/A	N/A
1	.	TC 2	**Video Stream 2** (Infotainment) Timing constraint: **33ms**	Size: 1580 bytes Periodicity: 33ms	Low	Some
0	Lowest	TC 1	**Best Effort** (Data Tx, Diag., Others) Timing constraint: **2000ms**	Size: 64 – 1580 bytes Periodicity: Variable	Low	Some

Definitions

- PCP: Priority Code Point.

- Timing constraint (latency) is the time within which an Ethernet frame is required to be received.
  - This is not application to application latency. This is the time taken for an ethernet frame (last bit in – last bit out) starting at layer 2 (source) and ending at layer 2 (destination). Max of 3 hops.

- Criticality -
  - High: Critical system malfunction may occur if packet is lost or delayed.
  - Medium: Degraded operation may occur if packet is lost or delayed.
  - Low: Packet loss can be compensated by retransmission; delayed packets will not cause major loss in functionality.

- Loss Tolerance -
  - None: 0 frame loss
  - Few ??
  - Some ??

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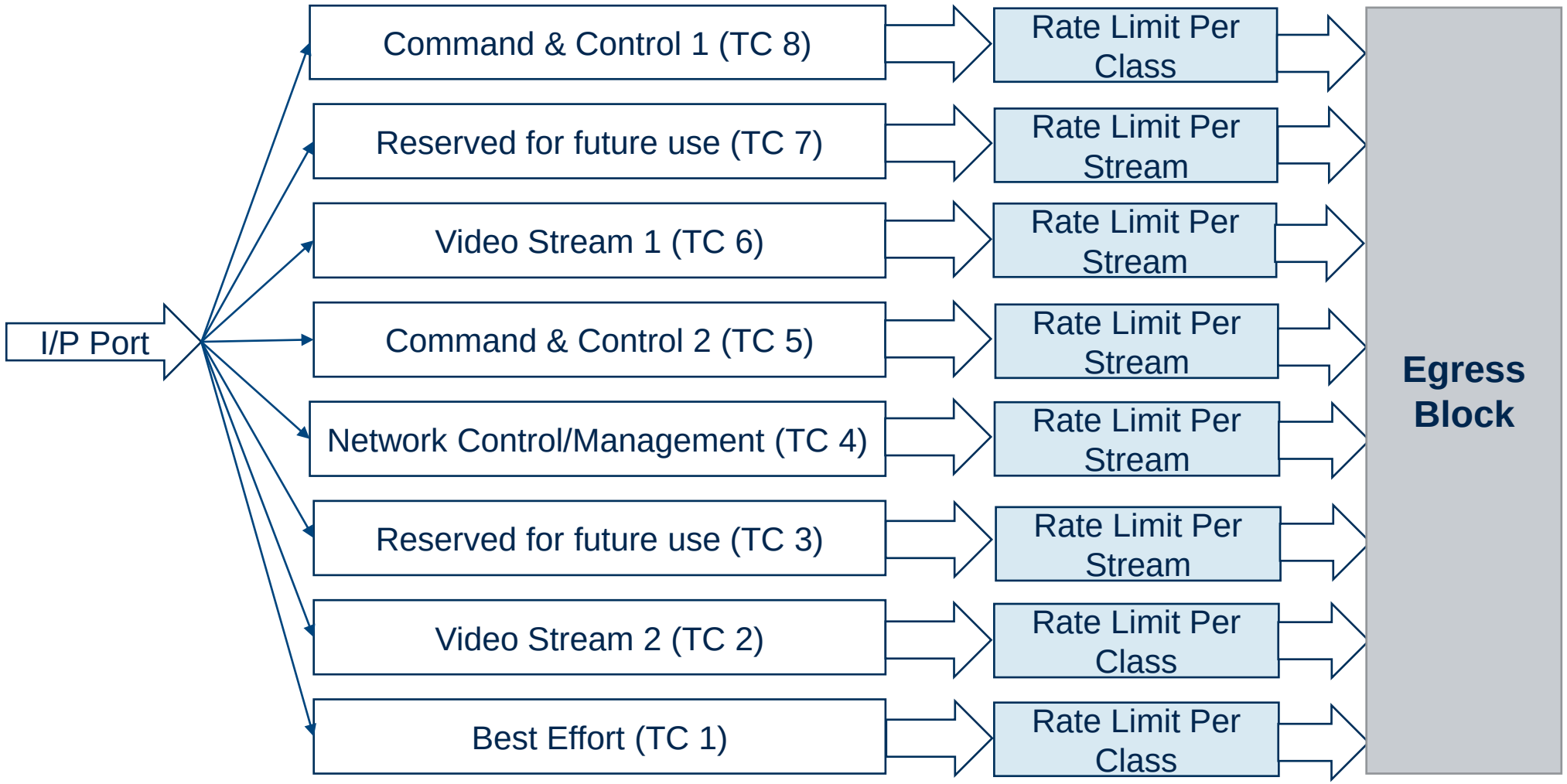
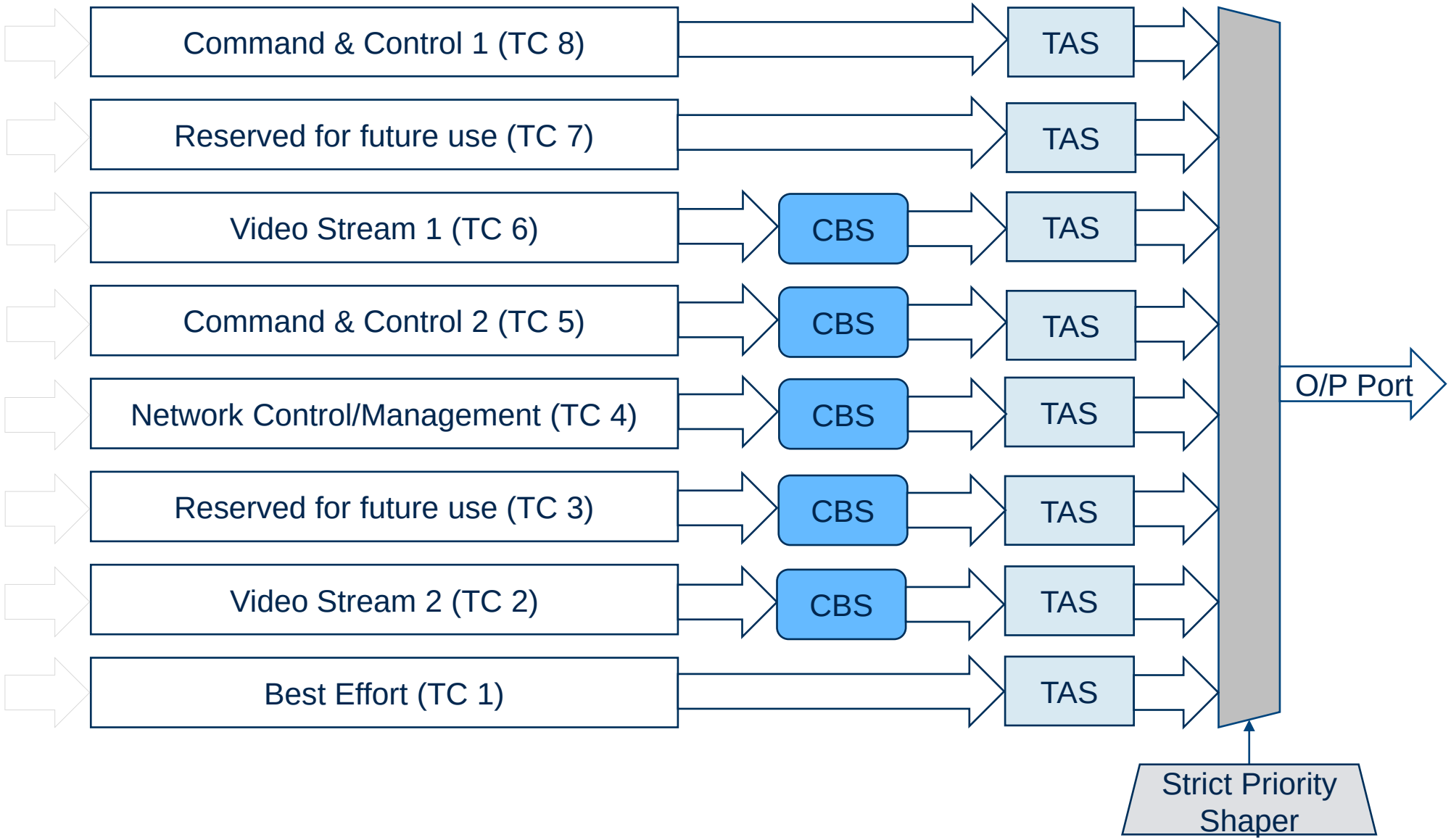
Examples of Ingres/Egress profile that well-defined priority classes can feed into

Ingress Profile



Egress Profile



Definitions

- CBS – Credit Based Shaper
- TAS – Time Aware Shaper

Thank you!