Congestion Management in a Bladed System

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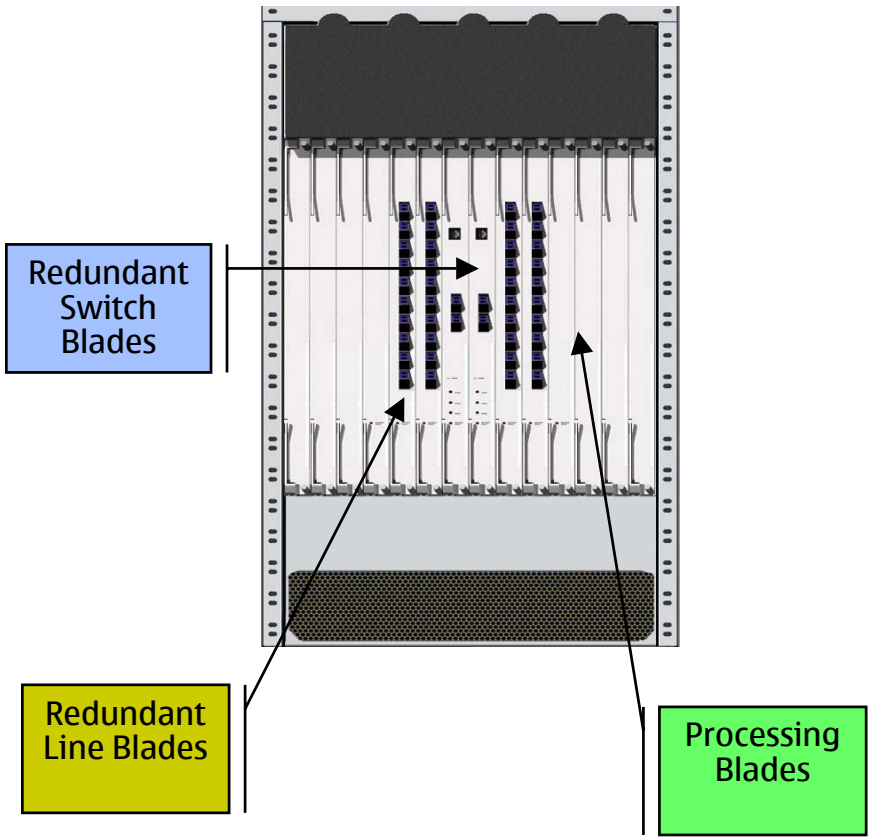
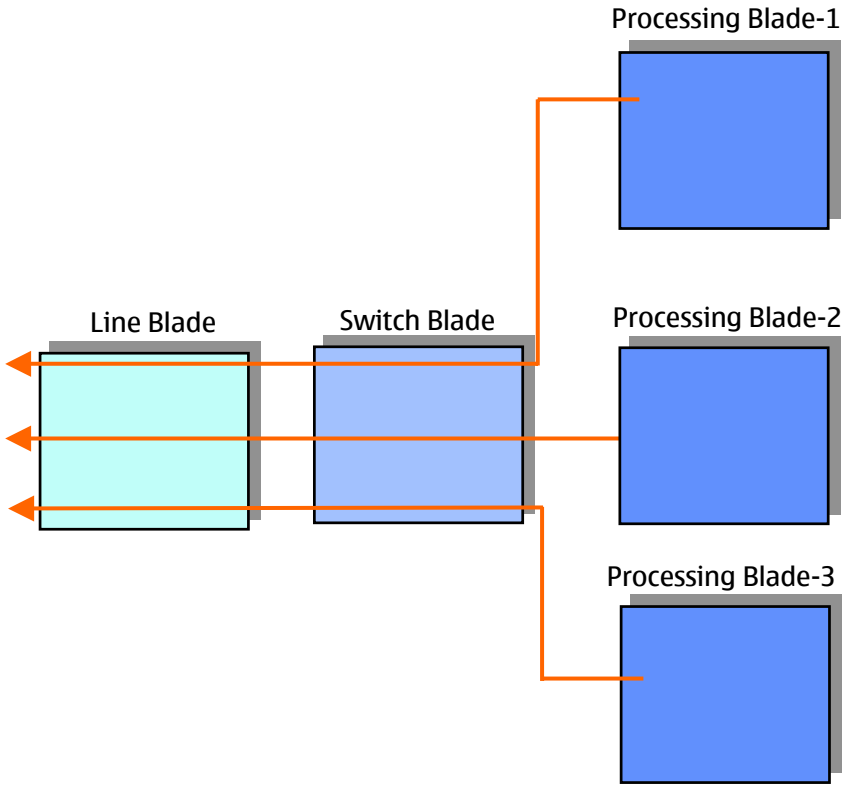
Example System



- Bladed System
  - Redundant Switch Blades
  - Multiple Line & Processing Blades
    - 1:1 or n:1 redundant
- Highly available (99.999% +)
  - Fast switch-over, minimum packet loss
- Line Blades provides I/O interfaces, and some processing
- Protocol and service processing in the processing blades
- Asymmetric bandwidth/ performance, and bursty traffic among blades

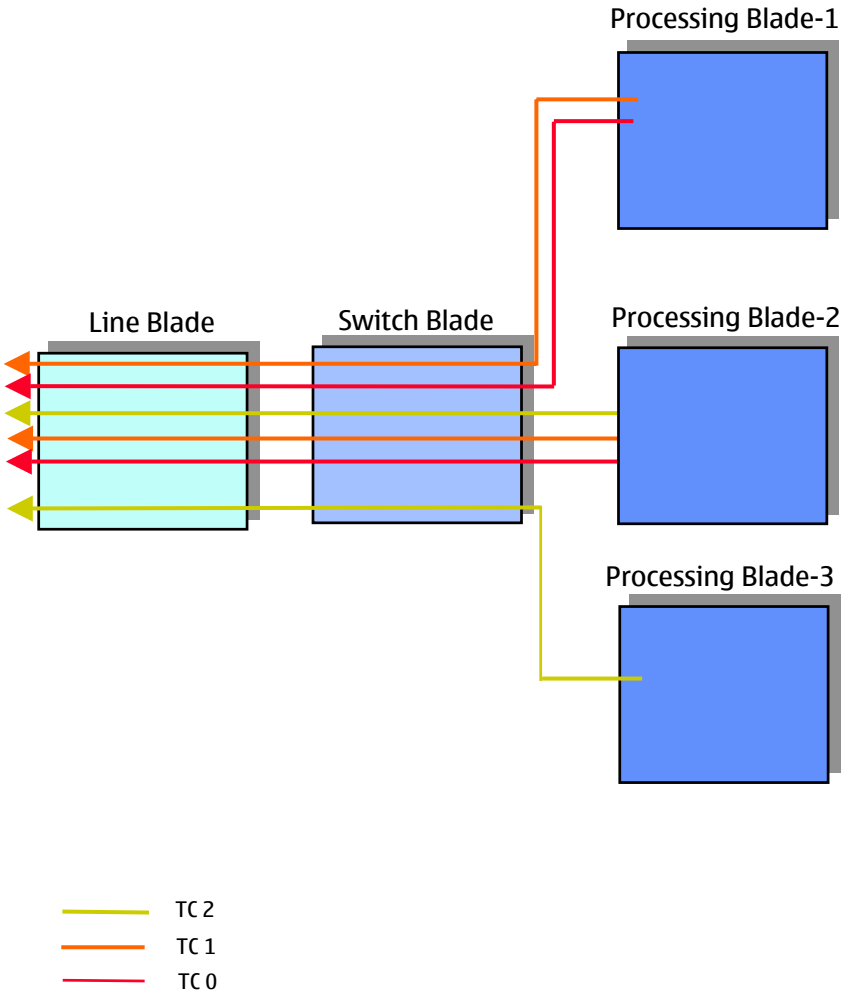
  Traffic aggregation and segregation is a natural consequence
- Latency/jitter for certain traffic classes is an absolute must

Scenario 1



- Traffic flowing from multiple processing blades to single line card
  - Single priority class
    (each one is independent, and not aware of other traffics)
- Packets should not be discarded in the switching sub-system
  - Discard else where based on service/traffic type

Scenario 2



- Traffic flowing from multiple processing blades to single line card
  - Multiple traffic classes
- Congestion information per traffic class
- Different latency/jitter requirements per traffic class
- Packets should not be discarded in the switching sub-system
  - Discard else where based on service/traffic type

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Observations

- Effective congestion management is an absolute must for the carrier-grade systems
- Congestion Management implementations should be in Hardware.
  - Software involvement for configuration and monitoring purpose only
- XON/XOFF protocol provides simplicity but
  - Increases latency and Jitter
  - Decreases throughput
- 'Intelligent' rate limiting may be required
  - However system complexity and cost needs to be understood
- At least 3 traffic classes are required – one for control, two (high/low) for data
- High availability requirements like fast switch-over, and minimum packet loss must not be compromised due to any congestion management solution
- Use of Ethernet as a backplane technology requires understanding and solving these concerns