Quantitative
Modeling
In
Parallel
Systems

Response Times in Two–Headed Queues

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Abstract In this paper we derive the response time distribution in a "two–headed" queue in which a low priority class of customers join the queue at the back, and high priority class join (non–preemptively) at the front. We assume the arrival processes to be Poisson but allow general service times. The high priority traffic analysis is an adaptation of the M/G/1 LCFS analysis which takes into account the possibility of a low priority customer being in service on arrival. The low priority traffic is more interesting as each customer's progression is affected by high priority arrivals. The two–headed queue has a number of applications, for example in performance models for road traffic analysis and networked communication systems.

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