assignment - 4

computer network

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ASSINGMENT-4

Scenario ;

A data center uses a single server queue to handle file download requests.

Parameters ;

Arrivals rate $\lambda = 10/s$. service rate $\mu = 20/s$

Questions ;

1. what is the traffic intensity (P) ?

* Arrival rate (λ) : How many customers or jobs arrive at the system per unit of time.
* Service rate (μ) : How many customers or jobs the server can handle per unit of time.
* Traffic intensity (P) : The fraction of time the server is occupied.

example :

If a server receives average of 5 customers per minute ($\lambda = 5$) serve average of 10 customers ($\mu = 10$) intensity be. $P = \lambda/\mu = 5/10 = 0.5$

2. what is the average number of request in system (L)?

* L (Average number of customers): This is what you're asking about. It represents the average number of items. (Customers, requests. etc).

* λ (Average arrival rate): This is the average rate at which new customers / request enter system.

* W (Average time in the system): This is the average amount of time a customers / request spends in the system.

3. what is average time a request spends in system (W)?

* W; is also known as the average system time or average sojourn time.

* It's the total time a request spends in the system. from arrival to departure.

* Therefore. $W = L/\lambda$.

* In queuing theory, W is often calculated using little's law, which relatives the average number of customers.

* number of arrivals (N) approaches infinity, the average time spent in the system (W).