Performance Questions

COMP755
Performance Example

The time values represent the average service time for that unit. A performance monitor was run for a 60 minute period. The above data was collected.

web page requests: 8,976
requests to disk 1: 26,928
requests to disk 2: 94,248
requests to the network: 13,464
CPU utilization: 26%
Questions

1. What is the percent utilization of each device?
2. What is the bottleneck device?
3. How much total CPU time does each transaction consume?
4. What is the minimum response time for a transaction on this system \textit{without} queuing?
5. What is the minimum response time for a transaction on this system \textit{with} queuing?
6. What is the maximum number of transactions that the system can process in an hour \textit{without} queuing?
## Completed Table

<table>
<thead>
<tr>
<th>action</th>
<th>measurement</th>
<th>Lambda</th>
<th>Service time</th>
<th>Vi</th>
<th>util</th>
<th>Vi*Si</th>
<th>1/Vi*Si</th>
<th>Tq</th>
<th>Vi*Tqi</th>
<th>1/V*Tq</th>
</tr>
</thead>
<tbody>
<tr>
<td>web page requests</td>
<td>8,976</td>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>CPU utilization</td>
<td>26%</td>
<td>39.9</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>requests to disk 1</td>
<td>26,928</td>
<td>7.5</td>
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</tr>
<tr>
<td>requests to disk 2</td>
<td>94,248</td>
<td>26.2</td>
<td></td>
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<tr>
<td>requests to the network</td>
<td>13,464</td>
<td>3.7</td>
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</tbody>
</table>

| Transaction time              |             |        |              |    |      |       |         |    |        |        |
| maximum number of transactions|             |        |              |    |      |       |         |    |        |        |

| 17143                         | 4.76        |        |              |    |      |       |         |    |        |        |

| 0.403                         | 0.682       |        |              |    |      |       |         |    |        |        |
Questions

1. What is the percent utilization of each device?
   see the table

2. What is the bottleneck device?
   The device with the largest utilization

3. How much total CPU time does each transaction consume?
   The V*S of the CPU, 0.104 seconds
Questions

4. What is the minimum response time for a transaction on this system without queuing?
Sum the $V*S$ for all devices

5. What is the minimum response time for a transaction on this system with queuing?
Sum the $V*Tq$ for all devices

6. What is the maximum number of transactions that the system can process in an hour without queuing?
$1/(V*S)$ of the bottleneck device