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Machine Improvement Proposals Simulation Findings

The current server processing has a unique server processing widgets through two distinct steps. The first step takes an average of twenty time units to complete, while the second step takes an average of fifteen time units. The main issue with the current setup is the inability for a widget to be serviced on the first step while there is a widget on the second step.

In this simulation are produced the statistics for this current server processing setup and for two alternatives to it. The first alternative (or Alternative A) consists of adding a second server that will process the widgets through step two while leaving step one to the original server. This way, a widget can be serviced on step one while another one is serviced on step two. The second alternative (or Alternative B), on the other hand, would keep the number of server to one but upgrade the existing server to more effectively process the first step. The upgrade would decrease the existing average step one time from twenty time units to fifteen; the average step two time will however remain to fifteen time units.

Through a simulation lasting for three hundred time units, the following statistics were produced:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Current** | **Alternative A** | **Alternative B** |
| **Number of Widget Processed** | 31 | 31 | 31 |
| **Average Queue Time for Server 1** | 352 | 130 | 319 |
| **Average Queue Time for Server 2** | **N/A** | 3 | **N/A** |
| **Average Time in System** | 386 | 167 | 350 |

While Alternative B proved to bring only non-substantial improvements to the average queue time and time in system, Alternative A proved to be more than twice as fast as the better of the two other alternatives (Alternative B). Based on this simulation, adding a second server to take care of step two and repurposing the first server to only take care of step one should be, by far, the most effective server processing alternative.