Typical versus Worst Case

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Abstract

A continuous tension exists between the day to day requirements for a new product and the requirements in exceptional cases. The System Architect must understand both requirements and be able to discuss them in terms of value in order to make a balanced product. This article gives some handles to tackle this problem.
Example Image Retrieval Requirements

- $t_{\text{retrieve}}$ 100 ms
- $t_{\text{retrieve}}$ less than 100 ms
- $t_{\text{retrieve}}$ 250 ms
Technical constraints on retrieve time

\[ t_{\text{retrieve}} = y_{\text{size}} \times (t_{\text{row overhead}} + x_{\text{size}} \times t_{\text{pixel overhead}}) \]

where

\[ t_{\text{row overhead}} = 15\,\mu\text{sec} \]

\[ t_{\text{pixel overhead}} = 100\,n\text{sec} \]
Example formulations of requirements

1. Images upto 1k*1k, retrieve time less than 100 ms

2. Images upto 1k*1k, retrieve time 100ms@500*500

3. Images upto 1k*1k, retrieve time 100ms@500*500, 200 ms@1000*1000

4. Images upto 1k*1k, retrieve time number of pixels * 200 ns.

5. Images upto 1k*1k, \( t_{\text{retrieve}} = y_{\text{size}} \times (15\, \mu\text{sec} + x_{\text{size}} \times 100\,\text{ns}) \)