Network Performance Modeling and Evaluation: Theory and Simulation

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Introduction

- If a “system” is to be used as intended, it must have “acceptable” performance (e.g., small response time).
- It is common, but unfortunate, that performance is not seriously considered until the later stages of system evolution.
- Many systems have unacceptable performance when completed.
- By then, there will be relatively few avenues available to improve performance.
- The most frequently chosen taking is to acquire additional hardware.
Performance as a System Requirement

- Performance to be considered:
  - in the design and development stages
  - during the operational stages

- Modeling must be used.
  - Finding the performance bottleneck.
  - Design to meet performance targets

- The system is not yet operational.

- Performance is not measurable.
Making Modeling Fun and Useful

- Modeling in general requires a lot of mathematical background and is not widely understood.
- To make modeling methodology accessible to system designers, system developers, and system managers, so to benefit from modeling.
- Avoid sophisticated mathematics and do modeling on an intuitive basis.
Performance modeling and analysis

- Has been and continues to be of great practical and theoretical importance in the design development and optimization of computer and communication systems and applications.
- This includes a broad spectrum of activities from the use of more empirical methods
- "Simple models"
- Prototype implementations
- The use of simulation to more sophisticated mathematical methods.