Enforcing Policy and Data Consistency of Cloud Transactions: A Simulation

Tucker Trainor
tmt33@pitt.edu

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Environment Variables

Network Specific Variables

Network Environments: `localhost` (one machine), LAN, WAN

- Delay before Policy Server updates are received by Cloud Servers: na, low, med
- Delay between a request for a Policy Version and receipt of current version: na, low, med
- Delay before Cloud Server receives queries from Robot: na, low, med
- Delay between messages between Robot Threads and Cloud Server Worker Threads: na, low, med
- Delay between messages between two Cloud Server Worker Threads: na, low, med

Client/Server Specific Variables

Client: Robot, Robot Threads

- Frequency of transaction transmissions to Cloud Server
- Maximum number of concurrent threads at a given instance (multi-programming, parallelism)
- Whether or not a series of a specific query types (i.e., consecutive READs or WRITEs) are handled as a group or as discrete operations
- Whether or not significant delays between READs and WRITEs from the Robot side will be implemented to simulate actual usage by a human

Server: Cloud Server, Worker Threads

- Number of Cloud Servers utilized during a simulation
- Length of time for verifying integrity (during commit procedures, may not be implemented in this version of the simulation)
- Length of time for accessing and checking local data
- Length of time for Policy Version authorization checks - local, global, etc.

Server: Policy Server, Policy Updater, Policy Threads, Policy Request Threads

- Delay between Policy Version updates – difference between short and long intervals

Errata & Observations

It is worth noting that the seeding of pseudorandom number generators itself is a variable. Simulations involving the variation of seed values only may be worth pursuing.