

Introduction

In this assignment we implemented Parallel version of Jacobi heat distribution algorithm and Maekawa's distributed mutual exclusion algorithm in xv6. The different IPC primitives used for synchronization and data sharing among the processes were: unicast, multicast and barriers.

Performance comparison in Jacobi

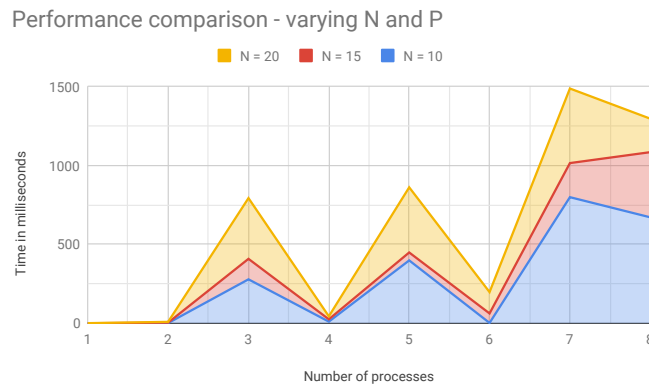


Figure 1: Performance comparison - varying N and P

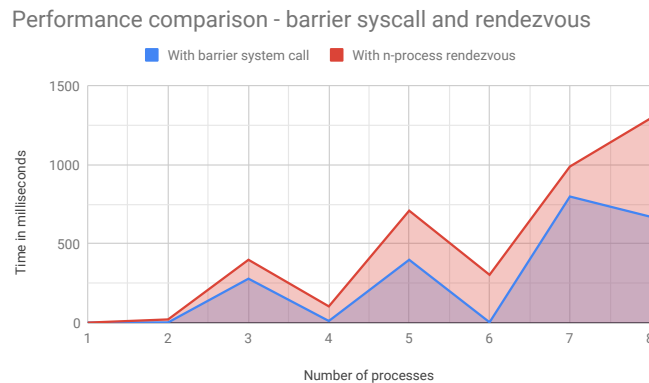


Figure 2: Performance comparison - barrier system call and rendezvous

Observations:

1.

Performance comparison in Maekawa

Analyzing performance in different cases of Maekawa's algorithm is significantly more complex due to large number of variables on which the total time is dependent on, including P = number of processes $\in \{4, 9, 16, 25\}$, P_1 = number of processes that do not acquire lock, P_2 , P_3 = number of processes that acquire lock but for 2 and 0 seconds respectively.

Verifying correctness of implementation

Verifying correctness of implementation of both Jacobi method and Maekawa algorithms has been done using the following steps:

Jacobi

- 1.

Maekawa

- 1.