

Homework Assignment

Suppose a 96x96 array S is distributed by blocks across four processors, so that each contains a 48x48 subarray. At each position S[i,j] is updated by the sum of its 8 nearest neighbors:

$$S'[i,j] = (S[i-1,j-1] + S[i-1,j] + S[i-1,j+1] + S[i,j-1] + S[i,j+1] + S[i+1,j-1] + S[i+1,j] + S[i+1,j+1]) / 8;$$

If each processor updates its own elements, how many messages must be produced to maintain concurrency for a directory based CC-NUMA?

HINT: Assume that an extra row and column, initialized to zero, surrounds A, A is allocated in rmo, and storage for S alternates with S'

