

Parallel Maximum Element Search



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Consider a scenario where you have an array of integers distributed across multiple processes, and you want to find the maximum element from the entire array using MPI. Each process initially holds a portion of the array, and you need to efficiently find the global maximum across all processes.

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Assume the global array size is 50 and you have 5 processes. Each process will initialize its local array with $50/5 = 10$ elements. Now, this initialization will be done using a random number generator. Its seed will depend on the rank of the process. Namely,

$$\text{seed} = \text{rank} + 1$$

Once this has been initialized, each process will compute its local maximum and then you need to use the function **MPI_Allgather** to gather these local maximums in order to compute the global maximum.