S3 Text. Method to deal with the limitation of computer nodes

This process provides a widespread way to use LSGPA on the other machine which may contain different computing nodes. *Max_N* is the maximum number of computing nodes.

Master process:

Data input
→ Calculate MI value of between all gene pairs and get the MI matrix.
→ Clustering genes through MI matrix, *M* clusters.
→ MPI_Broadcast *M* to all Slaves.
→ If *M* <= *Max_N*
  do[
    → Extract every cluster data
      {
        MPI_Send data1 to Slave 1.
        MPI_Send data2 to Slave 2.
        ...
        MPI_Send dataN to Slave M.
      }
    → MPI_Reve Net 1 to Slave 1.
    → MPI_Reve Net 2 to Slave 2.
    ...
    → MPI_Reve Net M to Slave M.
  ]
→ If *M* > *Max_N*
  do[
    → Extract every cluster data
      {
        MPI_Send data1 to Slave 1% Max_N
        MPI_Send data2 to Slave 2% Max_N
        ...
        MPI_Send dataN to Slave N% Max_N
      }
    → MPI_Reve Net 1 to Slave 1% Max_N
    → MPI_Reve Net 2 to Slave 2% Max_N
    ...
    → MPI_Reve Net N to Slave N% Max_N
  ]

Note: % said modular arithmetic, which is the largest Slave number was 169, when the block number is greater than *Max_N*, such as cluster(*Max_N+1*) assigned Slave 1, (*Max_N+1*)% of *Max_N* = Slave and cluster (*Max_N+2*) assigned Slave 2, (*Max_N+2*)% of *Max_N* = Slave so cycle.
→ Combine Net 1~N and finally we obtain Net
→ Out put Net
Slave process No.1:
→ MPI_Reve N from Master process.
→ If N <= *Max_N*
  do[
    → MPI_Reve data1 from Master process.
    → MPI_Reve data from other slave processes.(the data which other clusters act on Slave NO.1)
    → MPI_Send data to all Slaves.(the data which Slave NO.1 act on other clusters)
    → Get Net 1 result from optimization method
    → MPI_Send Net 1 to Master Process
  ]
→ If N > *Max_N*
  do[...]}
→ MPI_Recv data from Master process.
→ MPI_Recv data from other slave processes. (the data which other clusters act on cluster NO.1)
  MPI_Send data to all Slaves (the data which Slave cluster NO.1 act on other clusters)
→ Get Net 1 result from optimization method
→ MPI_Send Net 1 to Master Process
→ MPI_Recv data (Max. N+1) from Master process.
→ MPI_Recv data from other slave processes. (the data which other clusters act on cluster NO. (Max. N+1))
  MPI_Send data to all Slaves (the data which Slave cluster (Max. N+1) act on other clusters)
→ Get Net (Max. N+1) result from optimization method
→ MPI_Send Net (Max. N+1) to Master Process
}

Slave 2~Max. N repeat the same operation as Slave 1.
Slave process No.2:
Slave process No.3:
...
Slave process No. Max. N