Praktické paralelní programování
Obhajoba projektu

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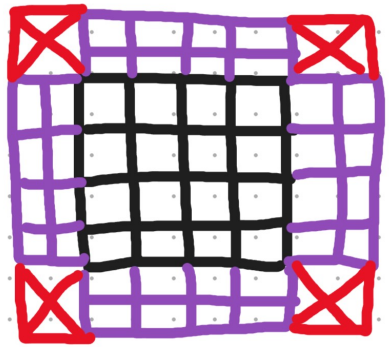
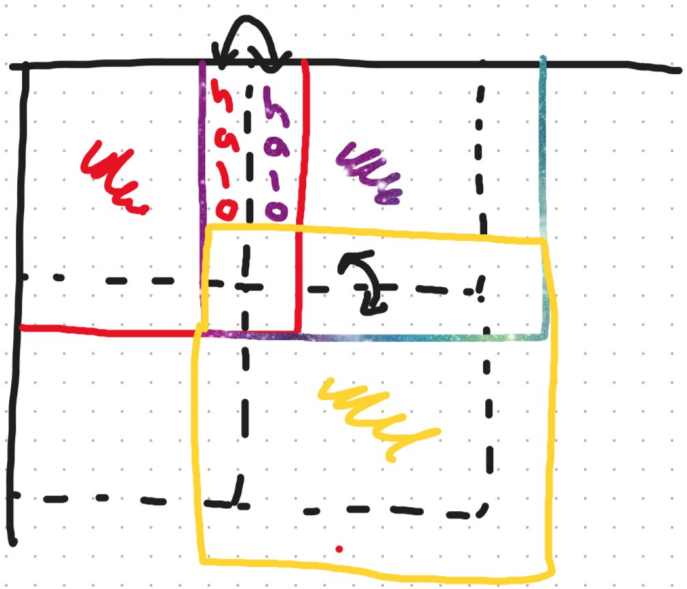
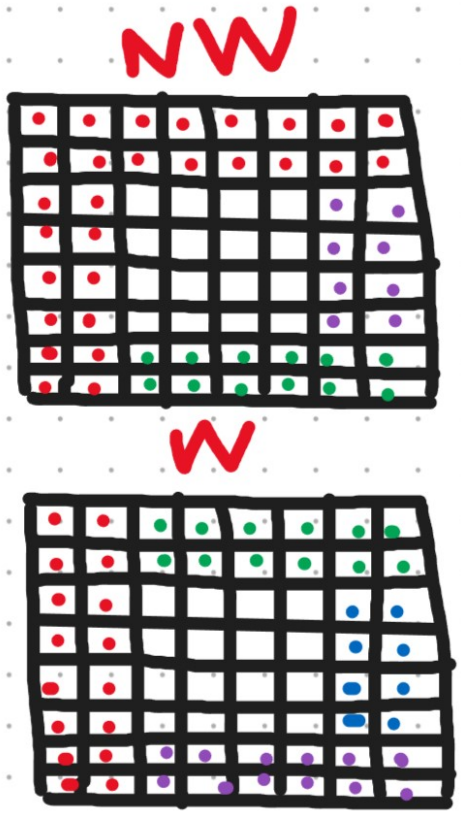
7 May, 2025

Implementation details

- local allocated tiles include halos
- scatter/gather x sendtype/recvtype x int/float
- halo exch. N/S/E/W x send/recv x int/float
- [y, x] – non-square topologies!
- global domain static border – `RankGridPosition`

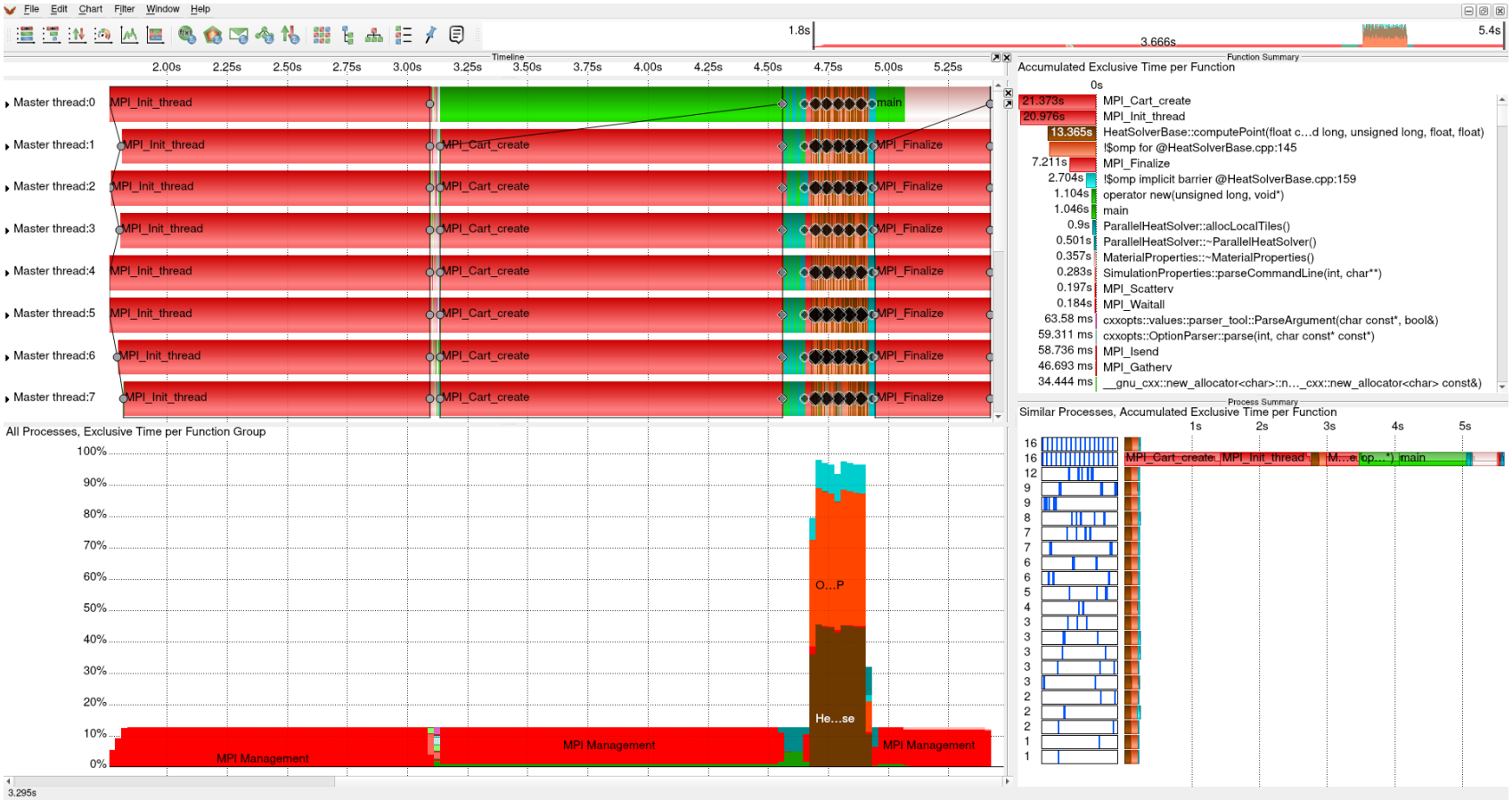




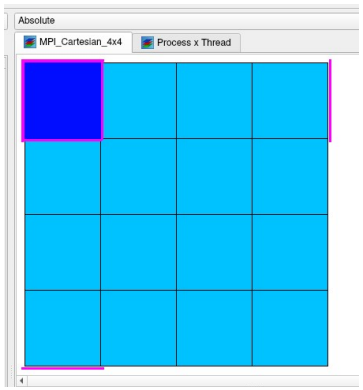


scatter/gather 8 types, halo exchange 16 types

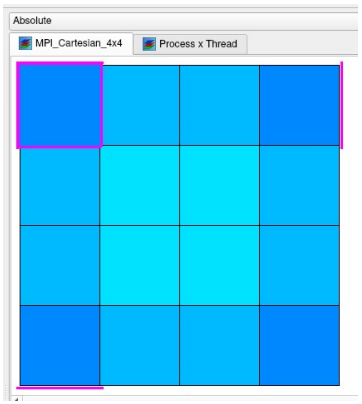
- `MPI_Init_thread()`, `MPI_Cart_create()` & `MPI_Finalize()`!



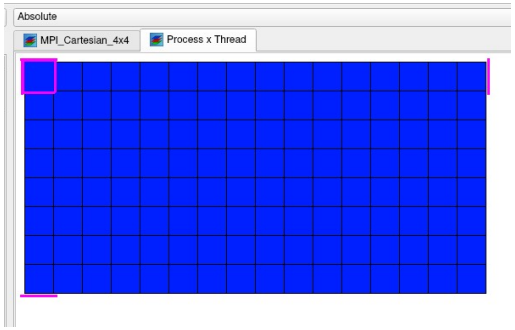
- `Time v initGridTopology()`



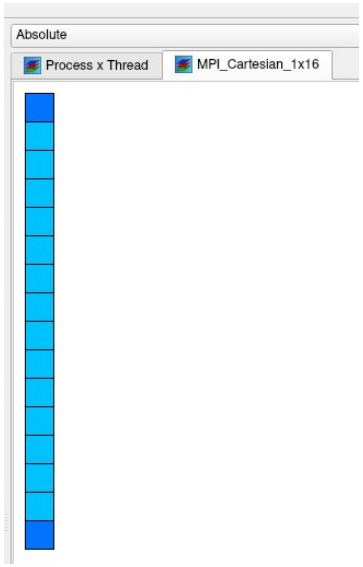
- `bytes_sent v startHaloExchangeP2P()`



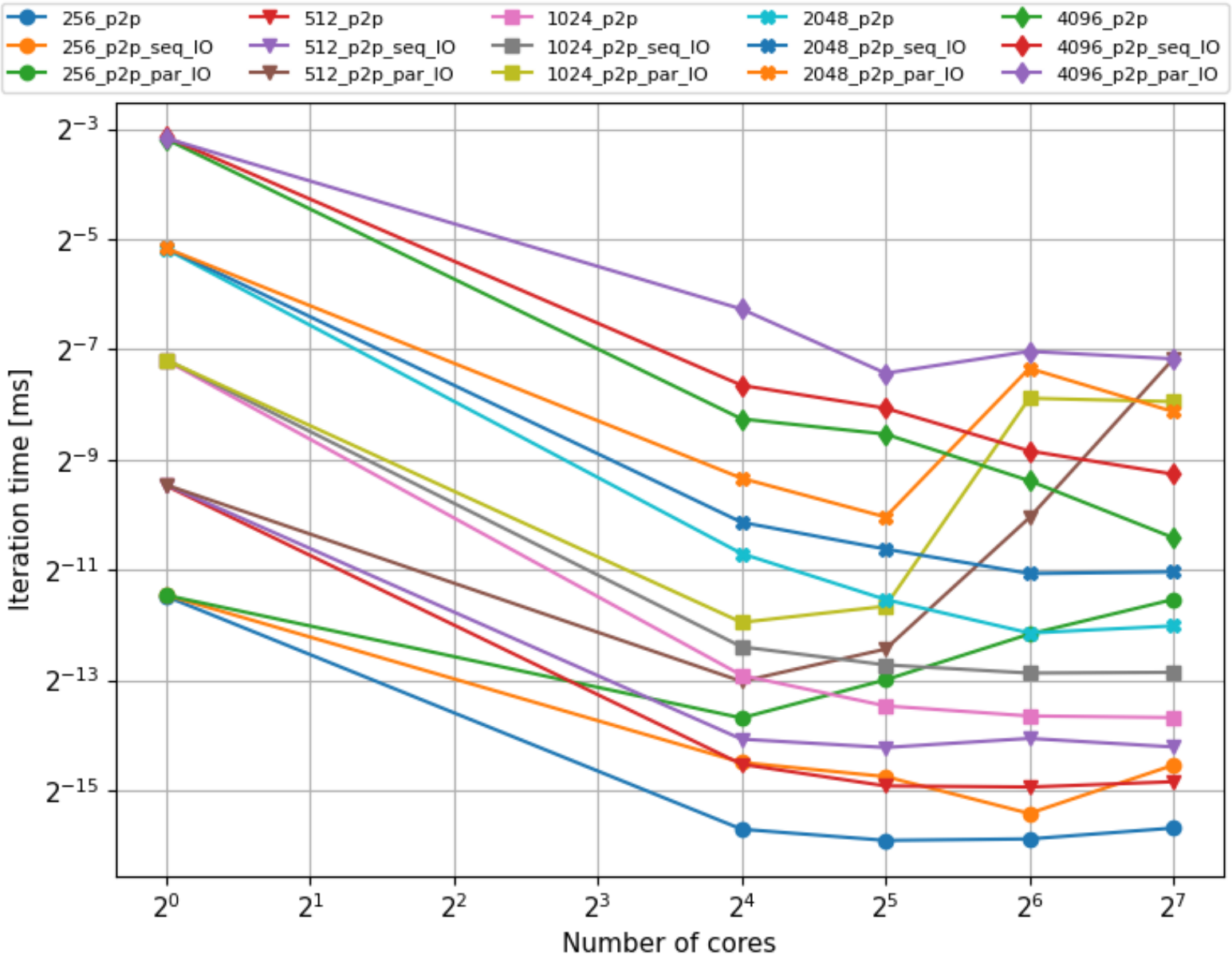
- `Time v updateTile()`



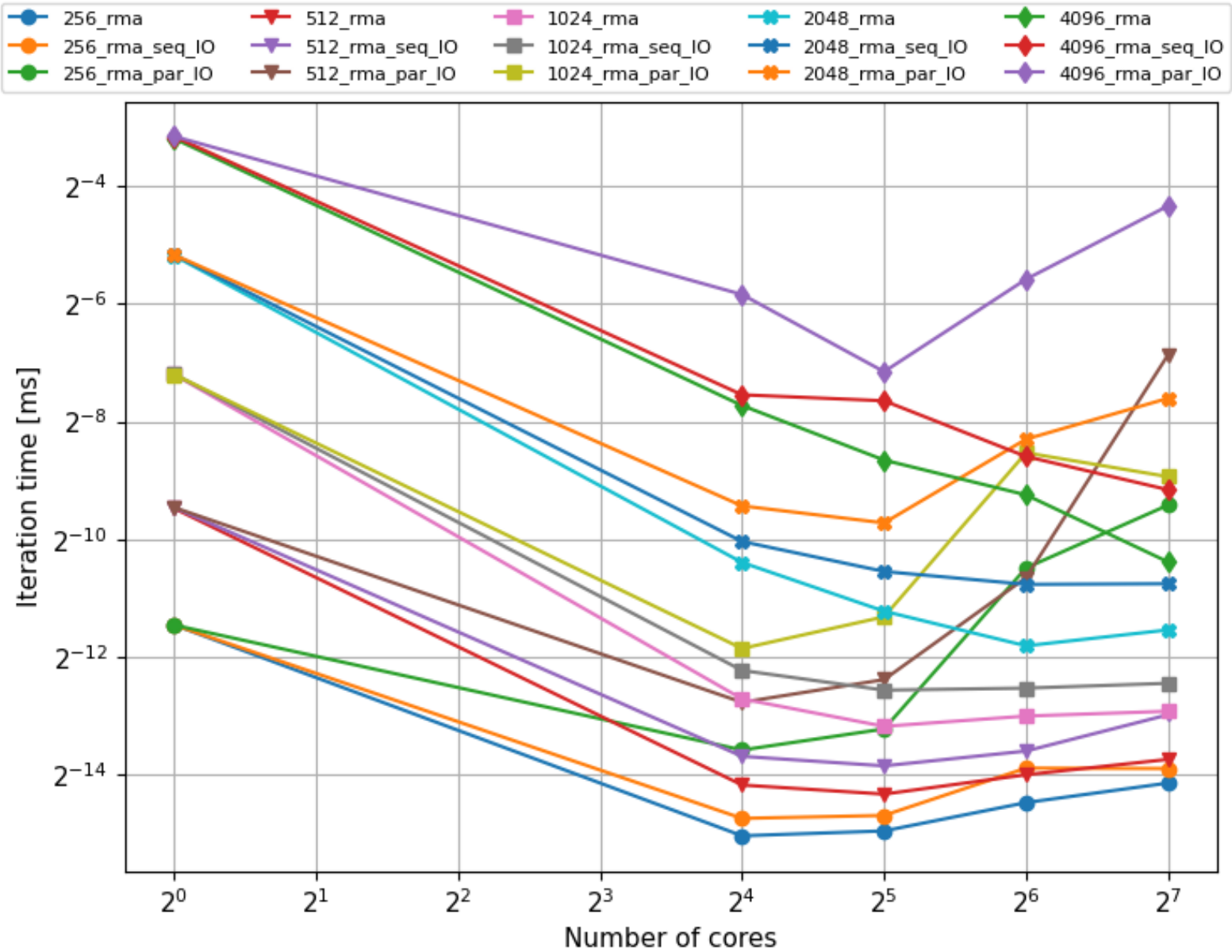
- `bytes_received v awaitHaloExchangeP2P()`



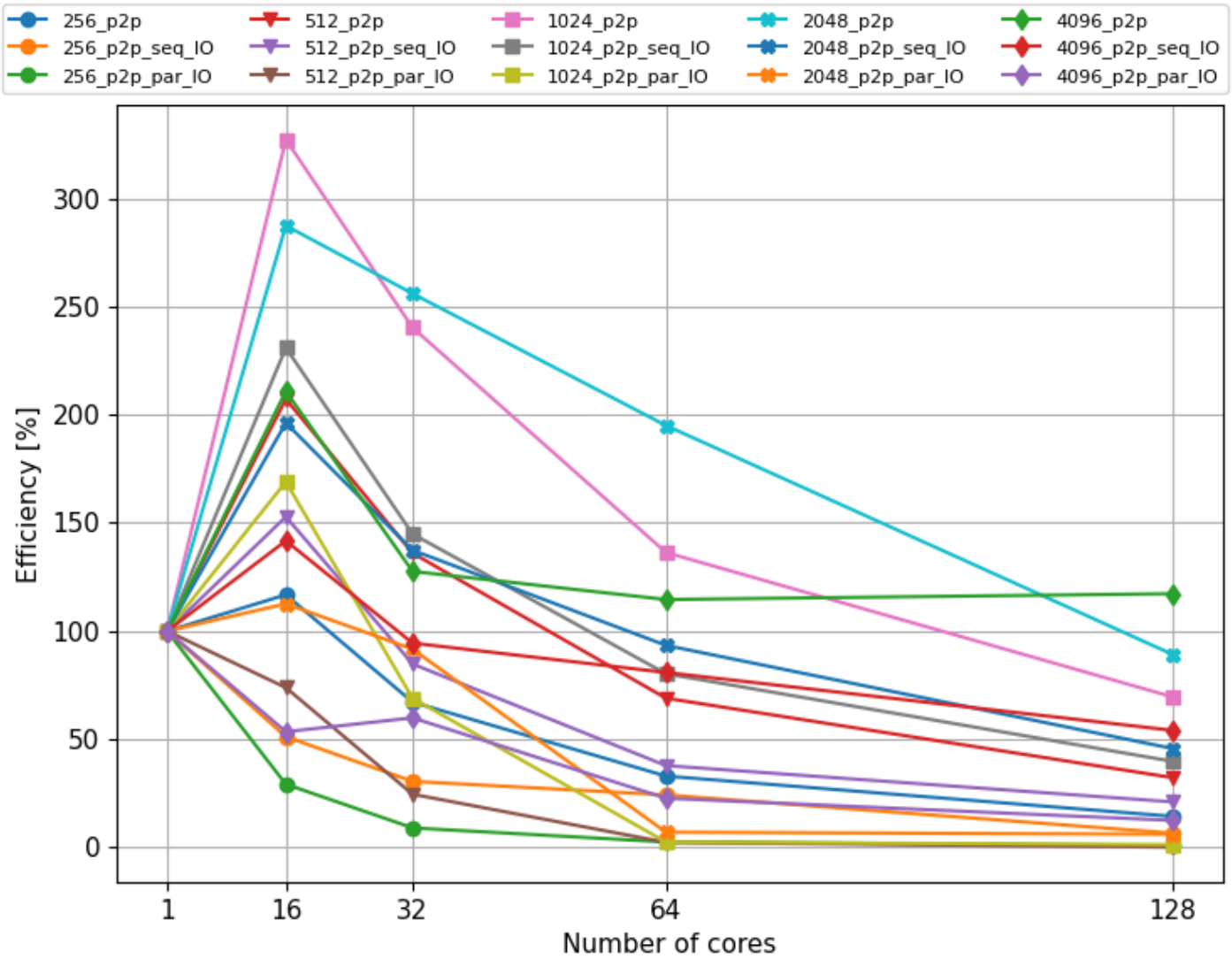
Scaling 2D MPI P2P



Scaling 2D MPI RMA



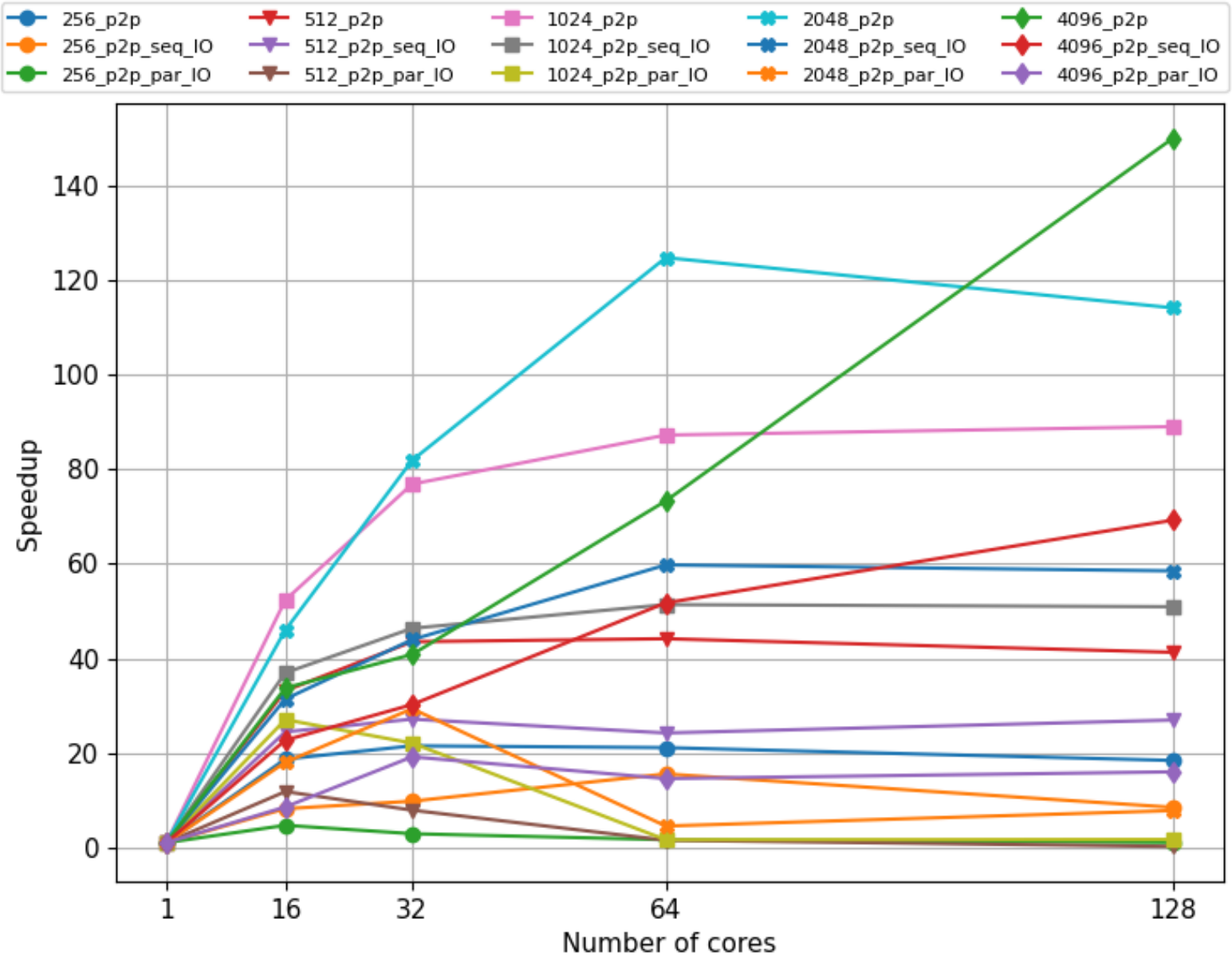
Efficiency 2D MPI P2P(Xeon 6240 L1 $ 576KB)



e.g. 1024x1024x4 = 4MB on 16 (4x4) ranks: 256x256x4 = 256KB

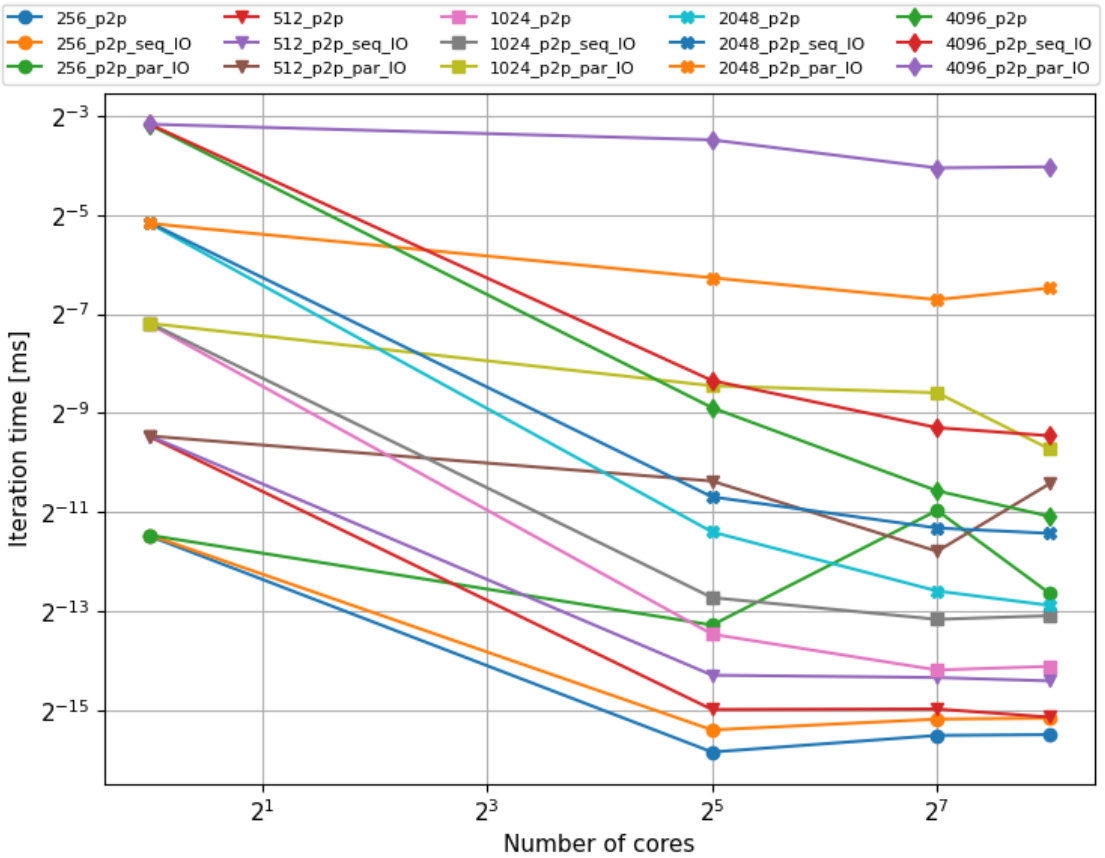
?? 2048x2048x4 = 16MB on 16 (4x4) ranks: 512x512x4 = 1MB

Speedup 2D MPI P2P



- incorrect parallel IO setup, job timeout

114	32	4	8	8	2048	9765
115	32	4	8	8	2048	9765
116	32	4	8	8	4096	4882
117	32	4	8	8	4096	4882
118	32	4	8	8	4096	4882
119	32	4	8	8	4096	4882
120	32	4	8	8	4096	4882
121	32	4	8	8	4096	4882
122						
123						
124						
125						
126						



VisIt parallel output (`h5diff -d 0.001` OK)