# Program Design for Parallel Execution

Note Title 2/3/2009

Decomposition

serial alg. → collection of tasks that can execute in parallel

tasks are atomic

$A[i,j] = f(A[i,j], A[i-1,j], A[i,j-1])\ldots$

granularity

static vs. dynamic

Assignment

dividing tasks into processes/threads

aggregating tasks based on proc. count

Orchestration

shared memory vs. message passing

author code

Mapping

parallel prog. → who executes what

might be manual

or OS decides

Orchestration

shared addr space (shared mem)
- implicit comm
- load triggered comm
- sync. explicit

message passing
- explicit comm
- send triggered "
- sync implicit

several flavors of explicit comm.

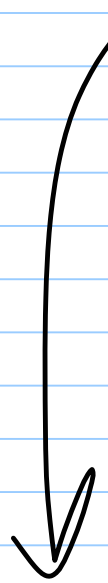
send/recv - pairwise

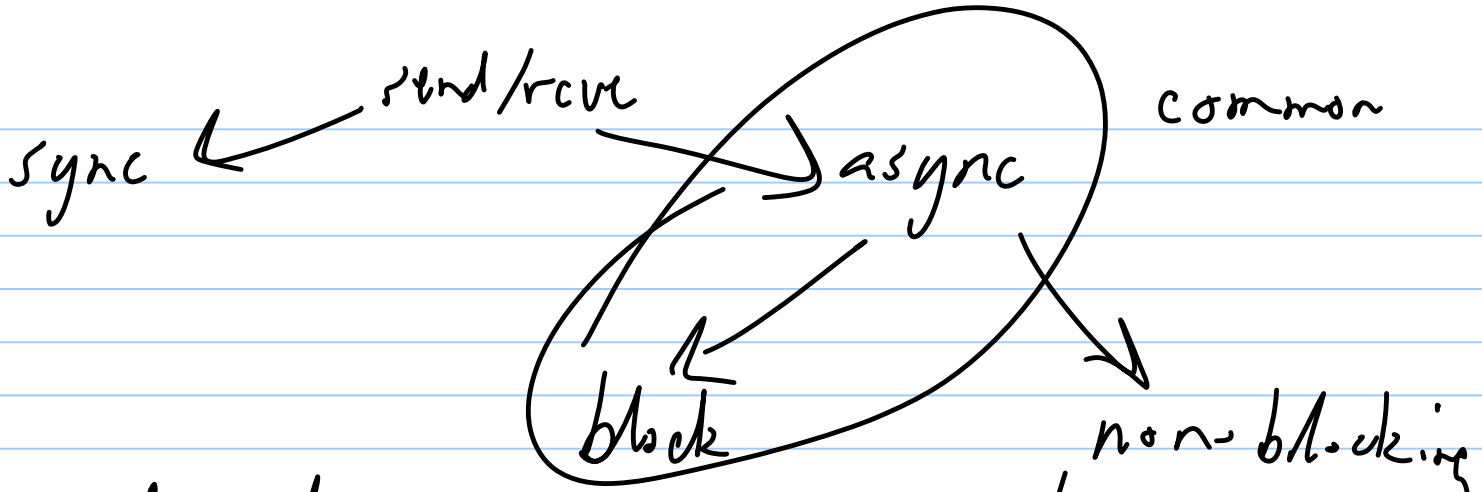
collective ops - group

barrier

reduction  assoc./comm. operator

+, max, min






sync send returns when rcve executed
asych send returns when buffer is free
blocking
non-blocking send the buffer is still vulnerable
non-blocking rcve returns indicating whether successful