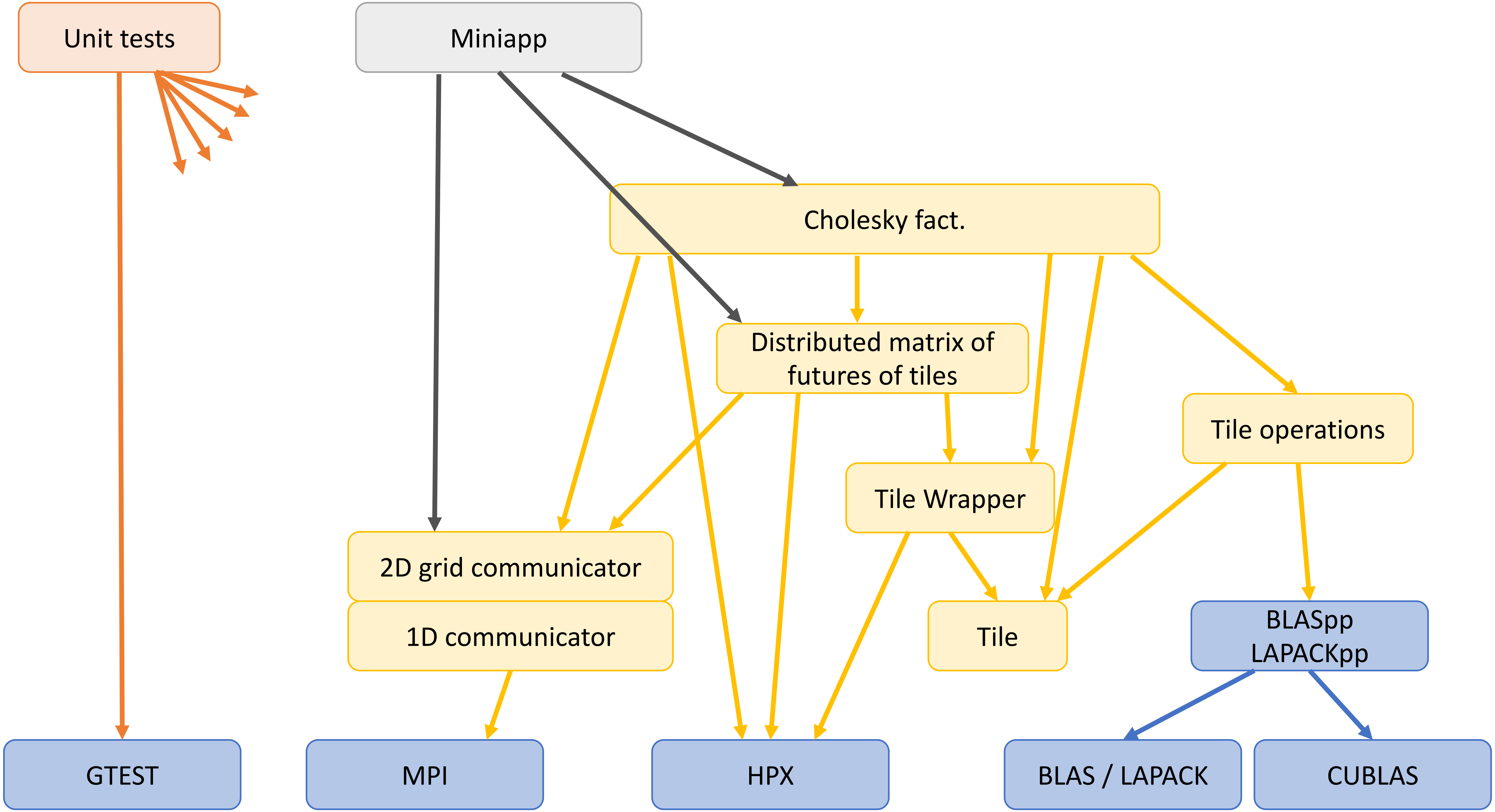
Code structure

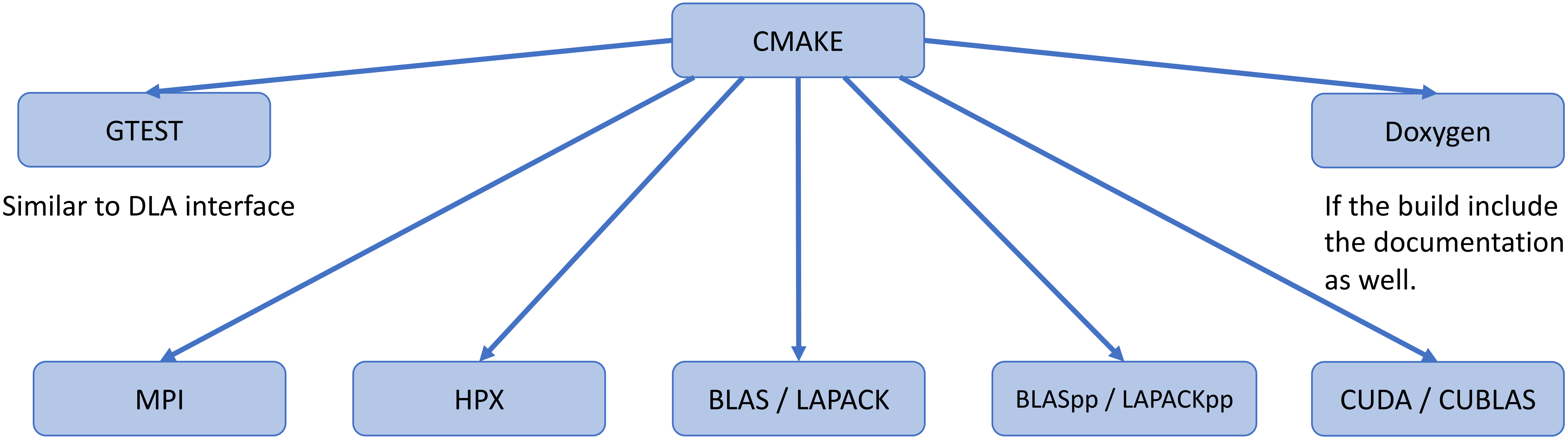
- We start in the “refactoring” branch in the current repository. This branch will be moved to a new repo next month.

- See Coding style (coding.md)
  - Use clang-format (only version 8) with the given .clang-format file

- Class names are indicative, feel free to use better options.


Unit tests
Miniapp
Cholesky fact.
Distributed matrix of futures of tiles
Tile operations
Tile Wrapper
2D grid communicator
1D communicator
Tile
BLASpp LAPACKpp
GTEST
MPI
HPX
BLAS / LAPACK
CUBLAS

CMAKE structure



CMAKE

GTEST

Similar to DLA interface

Doxygen

If the build include
the documentation
as well.

MPI

Check if MPI wrapper
are used as compiler.

HPX

If possible check that
”Networking” is off.

BLAS / LAPACK

Similar to DLA interface

BLASpp / LAPACKpp

CUDA / CUBLAS

Builds with
GPU support

Communicators

- Changes w.r.t. prototype:
    - Use MPI_Comm_split instead of MPI grid functions for 2d grids:
        - Compute row and col index w.r.t. the ordering (row/col major)
        - Create row comm. using MPI_Comm_split with color = row index and key = col index,
        - Create col comm. in a similar way.
- Requirements:
    - Construction
    - Construction from existing MPI comms
    - tests

Tile

- Requirements:
  - Construction from (m, n, pointer, leading dimension)
  - Move constructor/ move assignment
  - Copy constructor / copy assignment (only if really needed)
  - Get pointer of (i, j) element
  - Get value of (i, j) element (operator())
  - Get size
  - Get leading dimension
  - tests

Tile operations

- Execute blas operations with the correct pointers, sizes and leading dimensions of the involved tiles.
- E.g. gemm(alpha, tileA, tileB, beta, tileC)
- Operations:
  - gemm
  - trsm
  - Others as needed
  - tests

Tile wrapper, distributed matrix of futures, MatrixRead and MatrixRW

- See m.h for a 1D local example with single element tiles.
- Dist. Matrix of futures requirements:
  - Constructor (allocates memory and created ready futures of tiles)
  - Constructor (for existing memory)
  - Move constructor / assignment
  - Operator(tile_i, tile_j) (tile_i and tile_j are global tile indices)
  - Read(tile_i, tile_j)
  - tests

Cholesky

- Argument should be MatrixRW&&

- Using read and operator() of MatrixRW the code should be simpler.