

# Biweekly MSc Thesis Progress Presentation – Lukas Strebel

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**CSCS**

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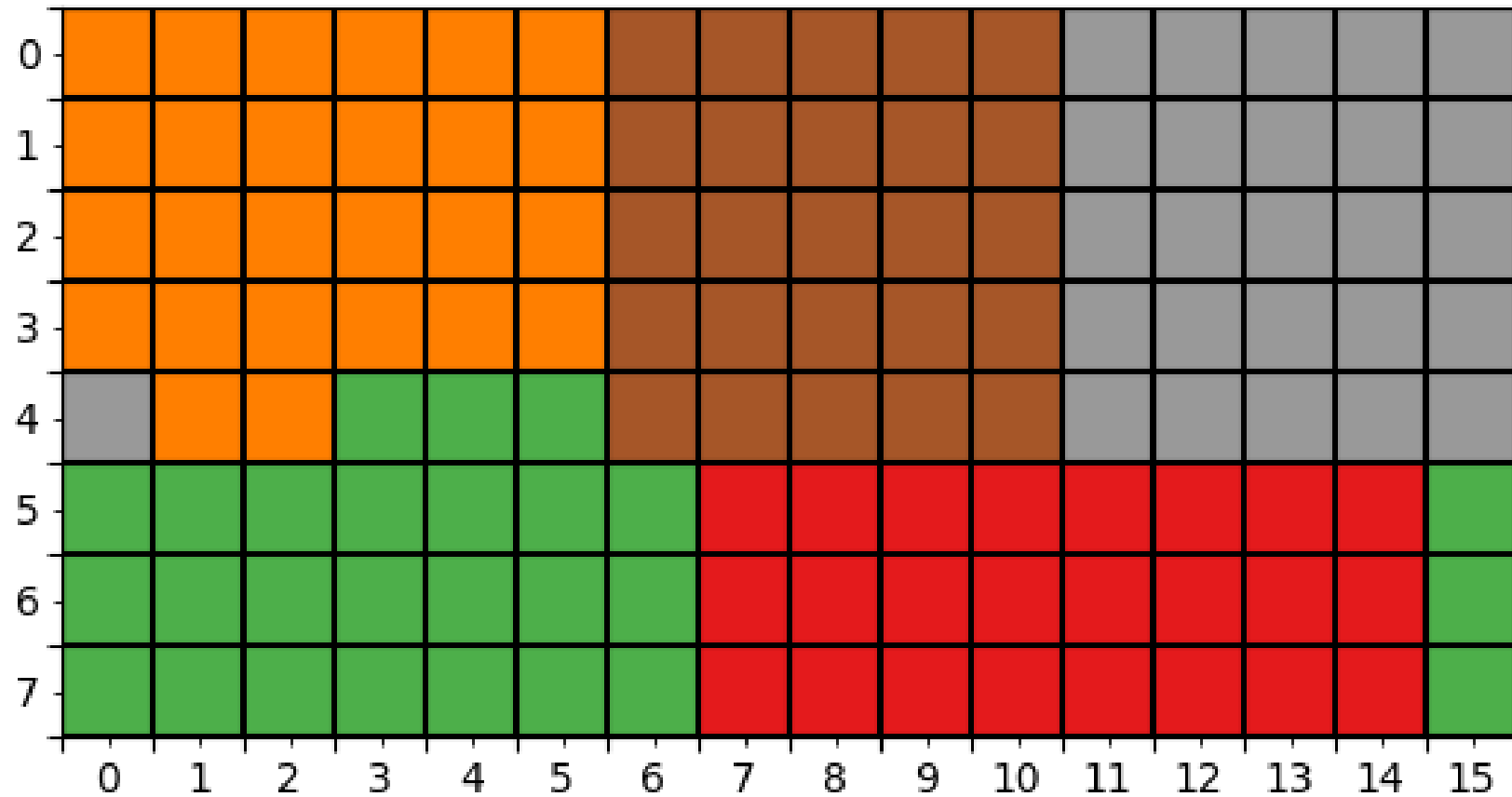
# Completed Steps

- 'Hello World' example (on Greina)
  - 2 MPI4Py processors computing GT4Py stencils and sharing boundary with Send/Recv
- First test case runs serial (on Greina)
  - Burger's equation with 2 different setups (different initial and boundary condition)
- Stencil extend from GT4Py
  - Added `get_extent()` to `ngcompiler.py`
  - Added `get_extent()` to `user_interface/ngstencil.py`
  - Stencil extent / minimum halo available after instantiation of the stencil

# Worked on

- Source graph generation / PyMetis graph partitioning
  - Subdivisions based on number of splits in each dimension
  - Compute boundary area for communication cost
  - Compute subdivision size for computational cost
  - Build adjacency list for graph partitioning
    - Internal or output to File (metis and scotch format for testing)
  - Code needs some clean up but seems to work

## Domain decomposition of 16x8 subdivisions into 5 partitions



# Thesis text progress

- Case study section for Burger's equation
  - Numerical backgrounds (equation, etc)
  - Initial and boundary condition details
  - Description for stencils
  - Not yet: Domain decomposition implementation details and experiment details
- Domain decomposition model for source graph partitioning
  - Worked on, but not finished

# Additional remarks

- Upcoming milestone:
  - Finish source graph generation model including thesis chapter
  - Run first test case scaled for Greina on single node and take measurements.