EXA2CT

10^{18}

Solvers that scale to ExaScale

Programming models that scale to ExaScale

Using relevant real-life **proto applications**
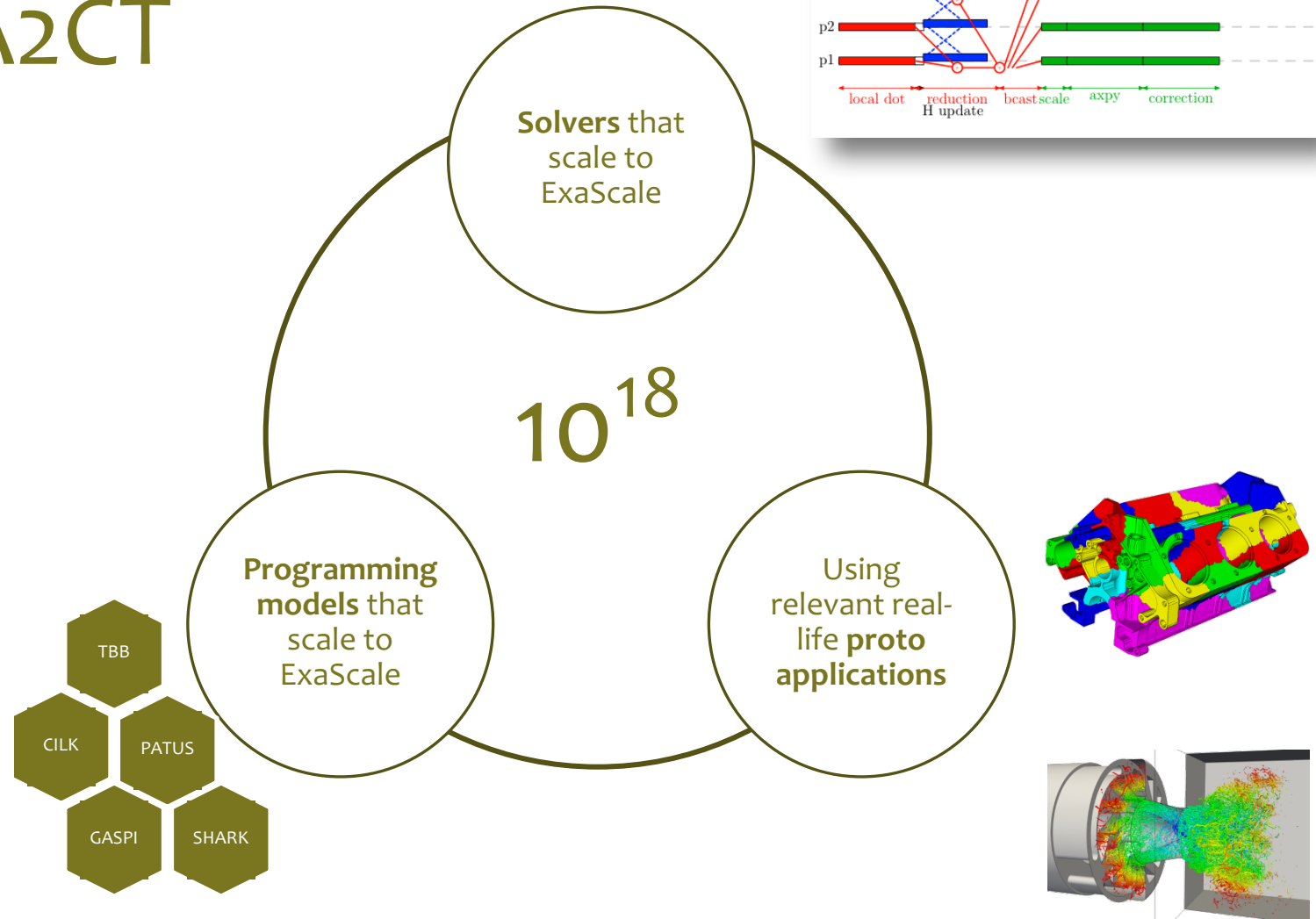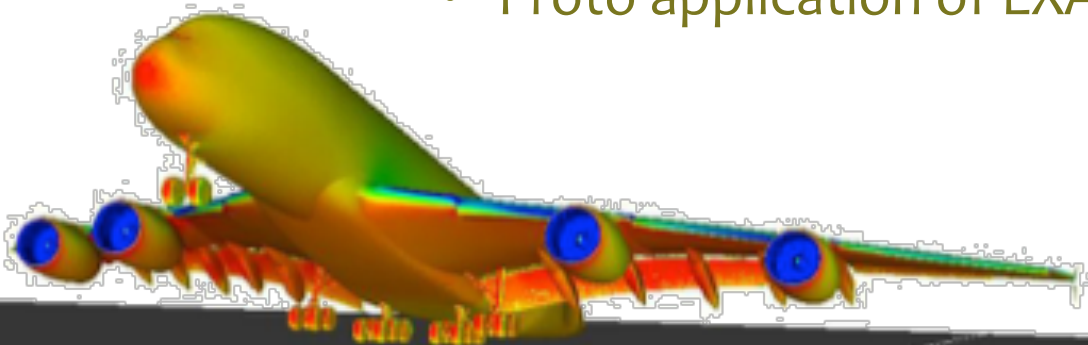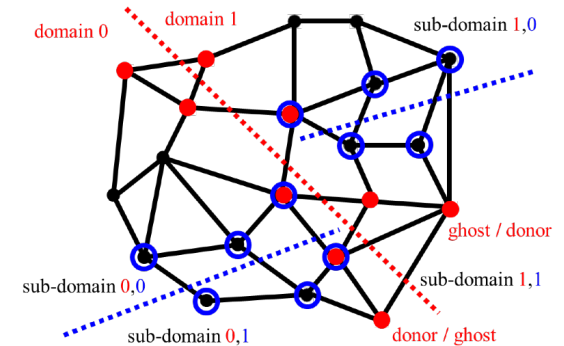
TBB

CILK

PATUS

GASPI

SHARK

Strong Exa-Scaling is Hard

- CFD Application
  - Today: 50M mesh points
  - In ten years: 500M
- ExaScale Computers
  - 10M cores
  - Hence 50 mesh points per core
- CFD Proxy Application
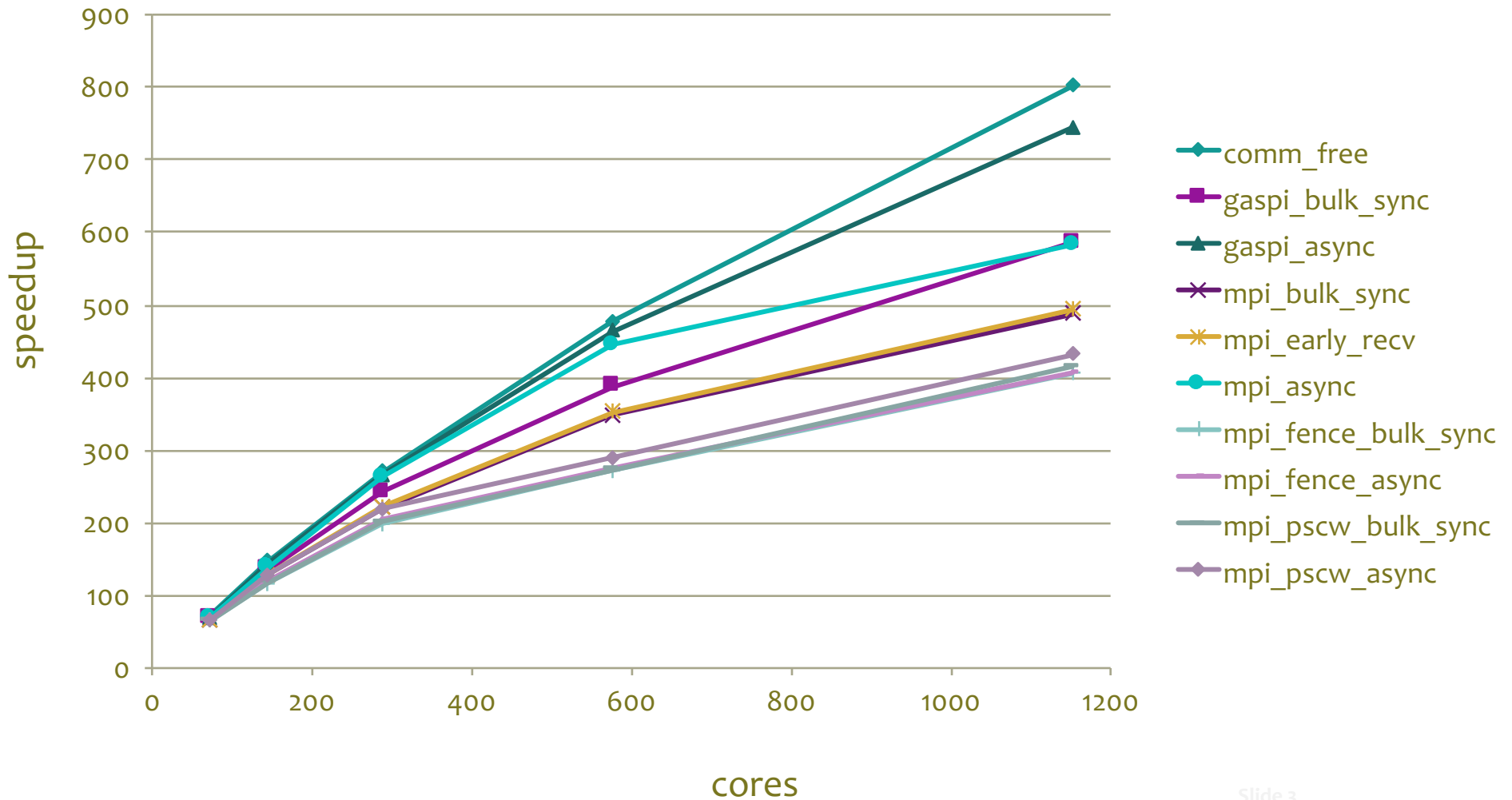 - Proto application of EXA2CT

CFD-Proxy on >1 Xeon-Phi

Strong Exa-Scaling is Possible

DON'T

- Bulk Synchronous

- Single Threaded Communication

- MPI Data Types

DO

- Asynchronous
  - GASPI write+notify
  - MPI ISend/IRecv
- Thread-to-thread communication
- Multi-threaded packing

GASPI in a nutshell

PGAS API - designed to be

- Simple

- Multithreaded

- Global asynchronous dataflow

- Interoperability with MPI

gaspi_notify   gaspi_write

Global
Address Space
Programming Interface
GASPI