Programming OpenMP

Tasking Introduction

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Programming in OpenMP
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Tasking Motivation

Sudoko for Lazy Computer Scientists

- Lets solve Sudoku puzzles with brute multi-core force

- (1) Search an empty field

- (2) Try all numbers:
  - (2 a) Check Sudoku
    - If invalid: skip
    - If valid: Go to next field

- Wait for completion

Parallel Brute-force Sudoku

■ This parallel algorithm finds all valid solutions

■ (1) Search an empty field

first call contained in a
`#pragma omp parallel`
`#pragma omp single`
such that one tasks starts the
execution of the algorithm

■ (2) Try all numbers:
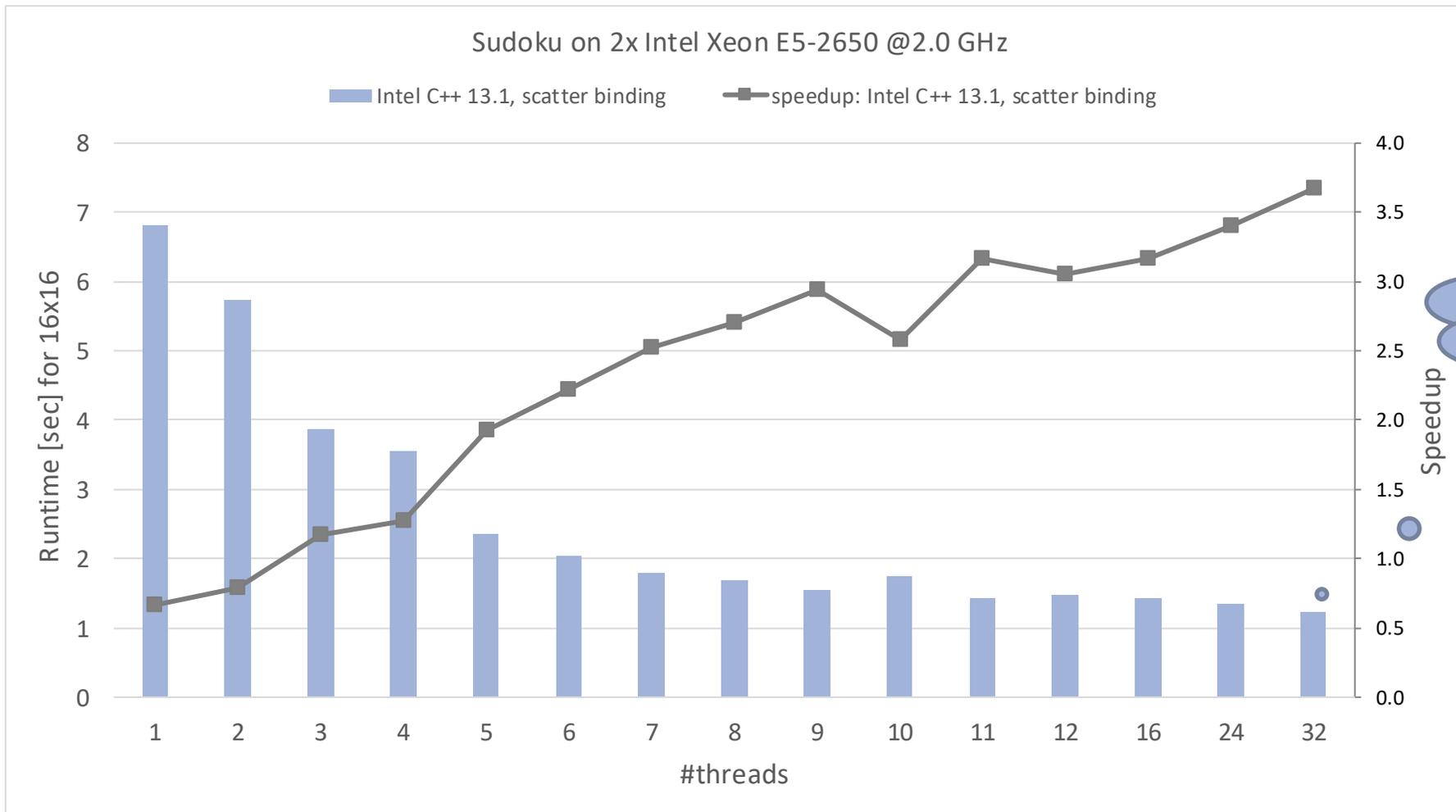
■ (2 a) Check Sudoku

■ If invalid: skip

■ If valid: Go to next field

`#pragma omp task`
needs to work on a new copy
of the Sudoku board

■ Wait for completion

`#pragma omp taskwait`
wait for all child tasks

Performance Evaluation

Sudoku on 2x Intel Xeon E5-2650 @2.0 GHz

Is this the best we can can do?

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