

A Scalable DCEL implementation

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February 9, 2021

Outline

Compared to sequential tool

Compared to 1-core execution

Speed up Analysis

Scale up Analysis

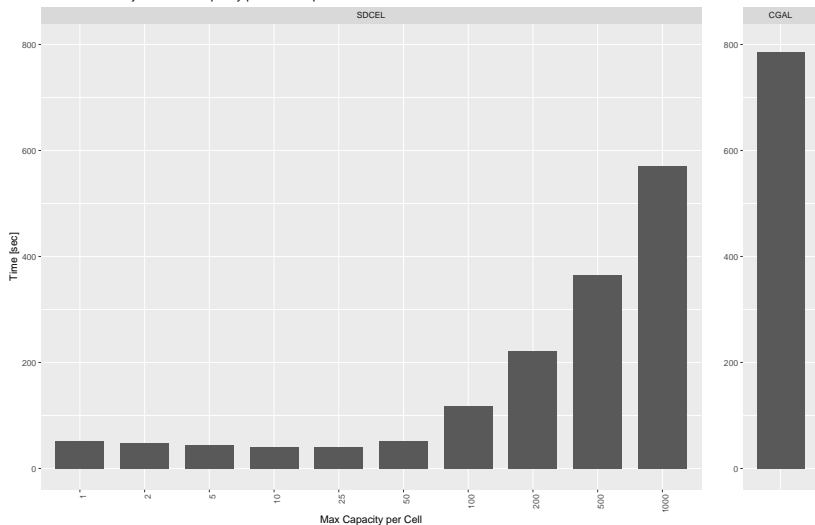
Compared to sequential tool

- ▶ Using California Census Dataset.
- ▶ Inputs: the census-track administrative levels for California in 2000 and 2010.
- ▶ Output: the merged DCEL for both inputs.
- ▶ Measuring time of construction for the final merged DCEL (including the DCELs for both layers and the merge).
- ▶ Compare the proposal (SDCEL) using different values of maximum number per partition and the sequential alternative (CGAL).

Compared to sequential tool

General

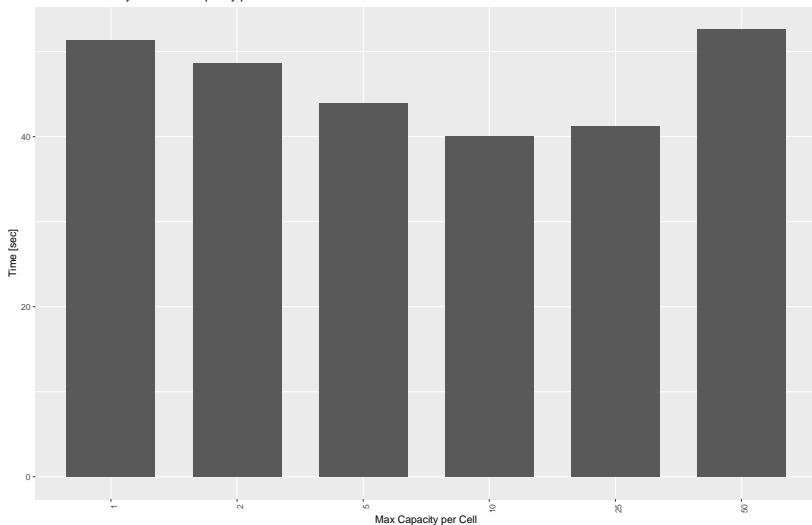
Execution time by maximum capacity per cell compared with CGAL



Compared to sequential tool

Focus on

Execution time by maximum capacity per cell



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Speed up Analysis

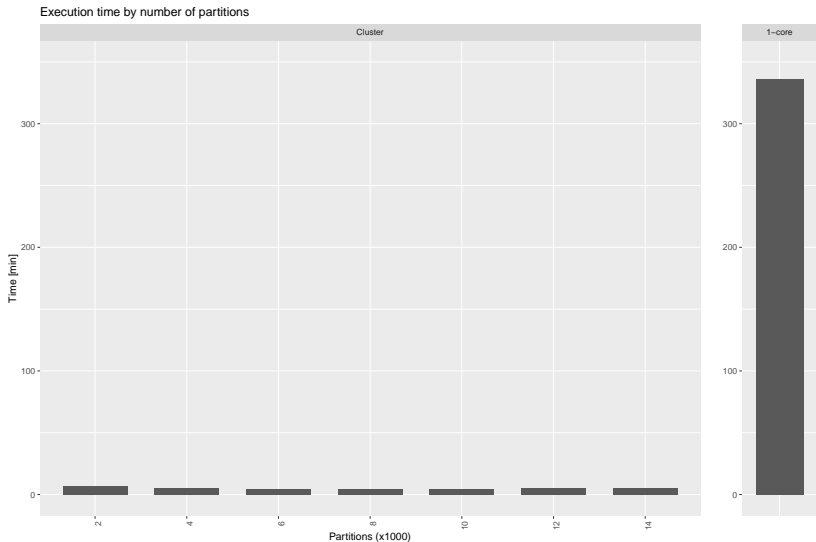
Scale up Analysis

Compared to 1-core execution

- ▶ Using GADM Dataset.
- ▶ Inputs: Administrative levels for the whole world. Level 0 (Countries) and Level 1 (States) disaggregated by individual polygons.
- ▶ Output: the merged DCEL for both inputs.
- ▶ Measuring time of construction for the final merged DCEL (including the DCELs for both layers and the merge).
- ▶ Compare SDCEL using different number of partitions and SDCEL running on just 1 core.

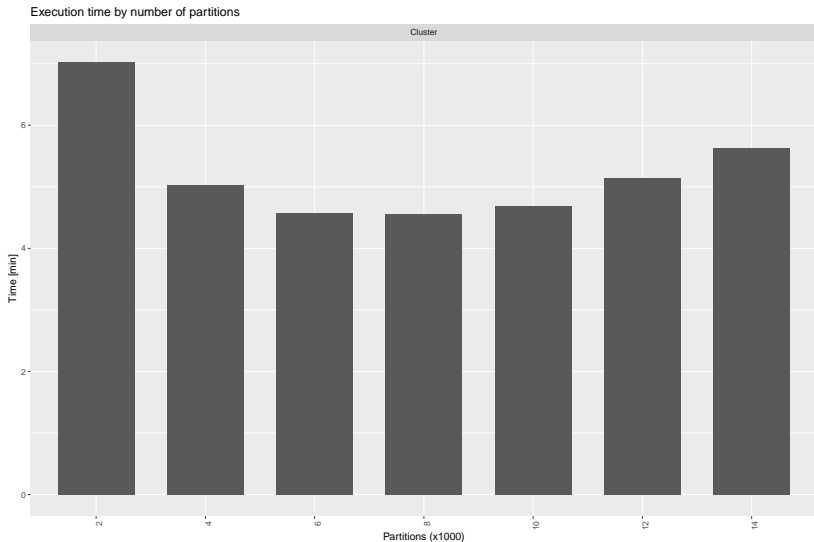
Compared to 1-core execution

General



Compared to 1-core execution

Focus on



Outline

Compared to sequential tool

Compared to 1-core execution

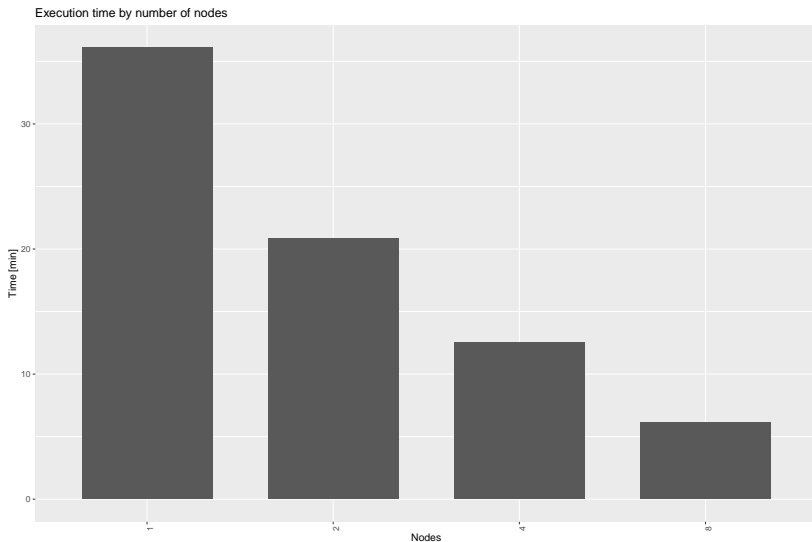
Speed up Analysis

Scale up Analysis

Speed up Analysis

- ▶ Using GADM Dataset.
- ▶ Inputs: Administrative levels for the whole world. Level 0 (Countries) and Level 1 (States) disaggregated by individual polygons.
- ▶ Output: the merged DCEL for both inputs.
- ▶ Measuring time of construction for the final merged DCEL.
- ▶ Compare SDCEL using different number of nodes (each node with 9 cores).

Speed up Analysis



Outline

Compared to sequential tool
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Speed up Analysis
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Scale up Analysis

- ▶ Using GADM Dataset.
- ▶ Inputs: 4 sections of the previous GADM dataset spatially dividing its extension in approximate the same number of polygons and edges.
- ▶ Output: the merged DCEL for both inputs to each section.
- ▶ Measuring time of construction for the final merged DCEL.
- ▶ Compare SDCEL increasing the size of the inputs (1 section, 2 sections, 3 section and 4 sections) and also increasing number of available nodes.

Scale up Analysis

