ESSI3.5 Enabling Reproducibility in Earth System Science research through open and FAIR data, workflows and models

A web-based strategy to reuse grids in geographic modeling

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Grids are essential for the production of geospatial data and environmental modeling. Over many years of research, numerous grids have been designed and developed. Reusing grids can reduce usage costs. However, there are still factors that impede grid reusability. Gridding algorithms are difficult to share and reuse on another device because most gridding algorithms have certain requirements for the devices' operating system (Windows or Linux) and runtime environment (Python, C++, or C#). Additionally, grid data are organized into various formats by the gridding algorithms, and parsing schemes need to be customized prior to using the data based on the rules governing the data organization. However, data customization tasks are difficult to replicate.

This article presents a grid-service method tailored to the specific requirements of open geographic model integration applications, and the research work is carried out in the following three areas:
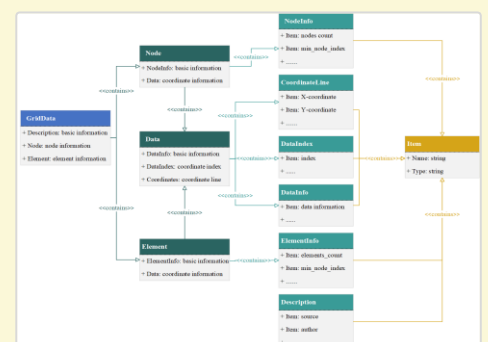
- The basic strategy of grid servitization.
- Method for constructing a grid data generating service.
- Method for constructing a grid data conversion service.
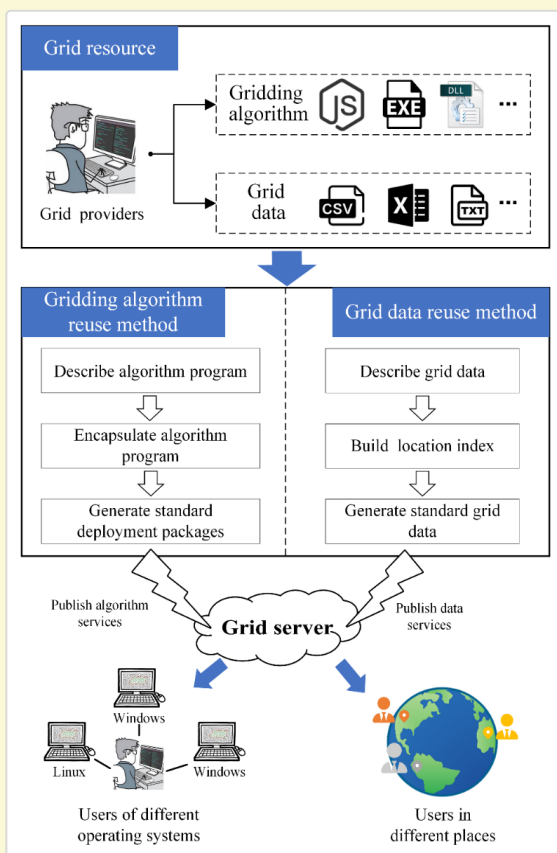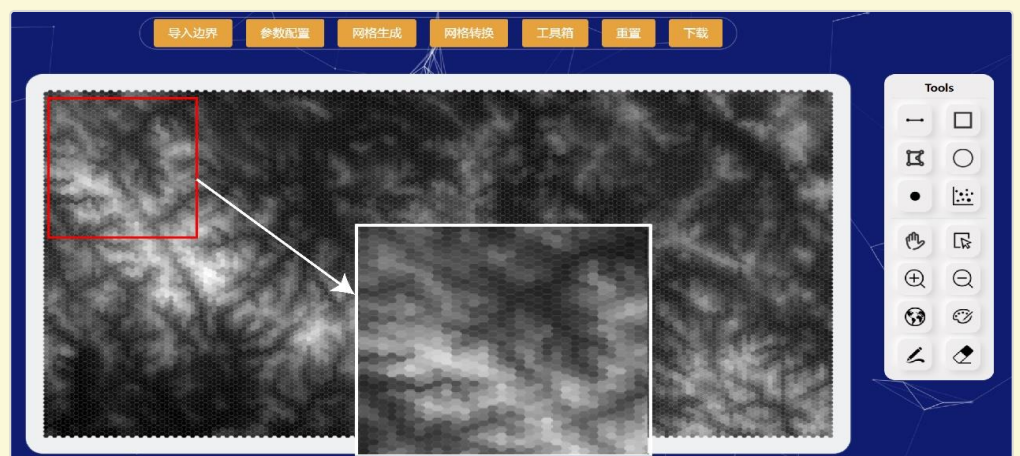

Conceptual framework
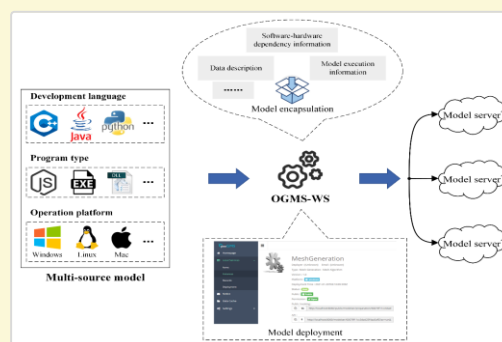
OpenGMS Wrapper System

Universal grid data description method

Hexagonal grid generated and edited using the grid editor