Asynchronous I/O Using the Earth System Modeling Framework

User Productivity Enhancement, Technology Transfer, and Training (PETTT)

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Numerical Weather Prediction Models

http://www.gfdl.noaa.gov/pix/model_development/climate_modeling/climatemodel.png
The Earth System Modeling Framework (ESMF) programming paradigm. An application is an assembly of (a) one or more gridded and coupler components. Components can use the (b) ESMF infrastructure toolkit, but all components are primarily (c) user written).  

- Open source project
- Component framework used to couple earth system models
- Includes an *infrastructure* of utilities that can be used to build model components
- Includes *superstructure* that is used to couple components together
- Performs fast parallel regridding and redistribution

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NAVGEM Runtime Across I/O Process Counts - T1023L80, 6,600 Total Processors

Wallclock Time (seconds per forecast day)

I/O Processors

Synchronous I/O

Operational Requirement

Compute Time

Communication Time

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