

CERSe
Component-based Environment for Remote
Sensing
Work in Progress

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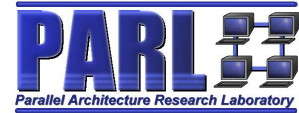
<http://www.parl.clemson.edu/>

Motivation



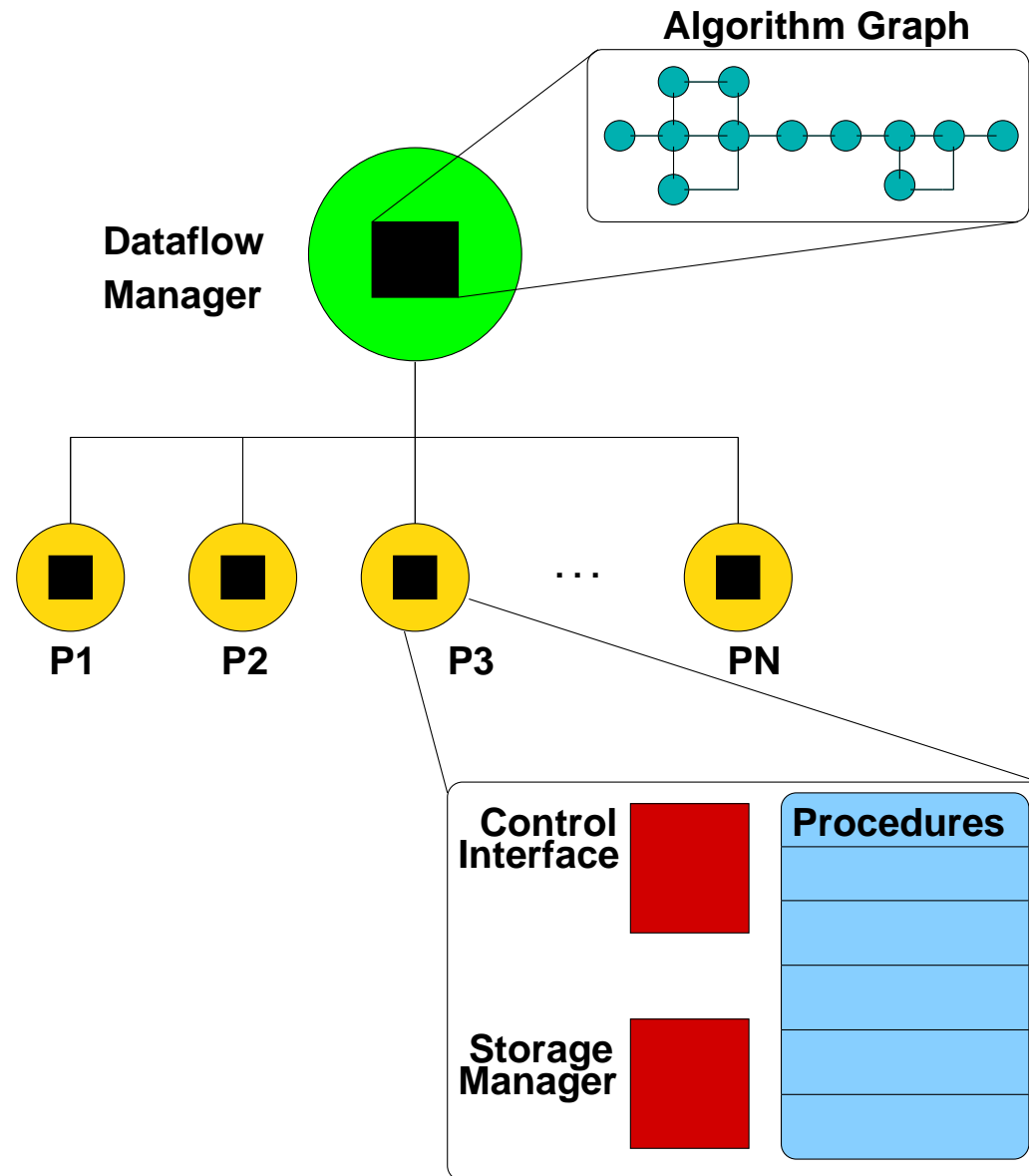
- NASA, remote sensing, and earth science
- Projected rate: 1-2 terabytes of data per day
- Regional Application Center
- Need for parallel computing:
 - Low cost philosophy of the RAC
 - Beowulf systems
- Software development problems:
 - Code reuse
 - Fast development
 - Production performance

Approach



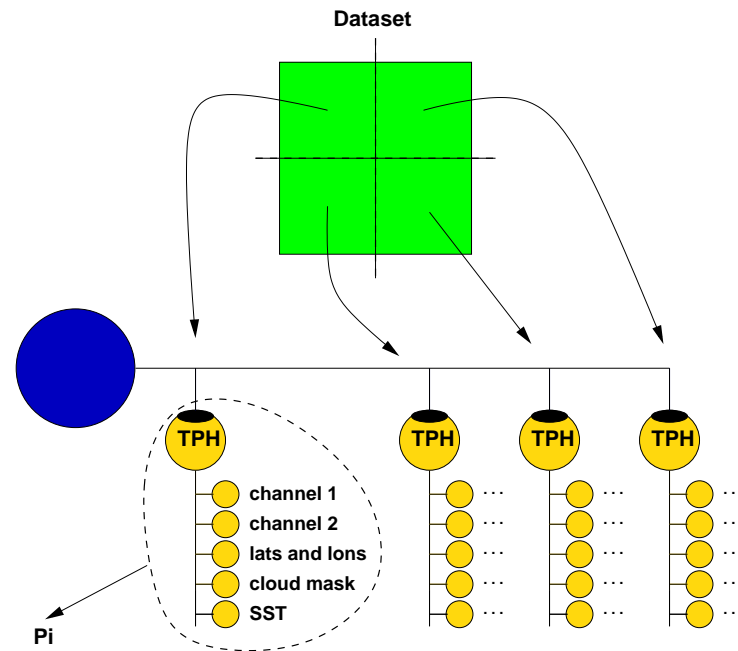
- Plug compatible modules
- Dataflow Manager handles:
 - Data partitioning
 - Memory allocation
 - Data distribution
 - I/O
 - Routing
- Take advantage of parallelism here

CERSe Graphically



Data Representation

- Not simple data types
- Tagged Partition Handle
- Planning and automatic planning
- Garbage collection



Completed Work



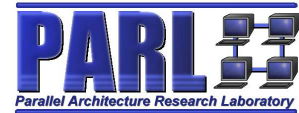
- About 40 components for navigation, calibration, georectification, and common RS algorithms
- 8 map projections
- Hand-coded CERSe programs
- Parallel processing and parallel I/O
- Graphical interface to design algorithms and evaluate performance

Future Work



- Language-based representation
- Translation of graphical representation into language representation
- More components

Conclusion



- Not just prototyping of algorithms
 - Production performance:
 - * Parallelism
 - * Memory management
 - * High performance I/O
 - * Fault tolerance (?)
 - Interactive development
- Component-based architecture
- <http://webwulf.parl.clemson.edu>