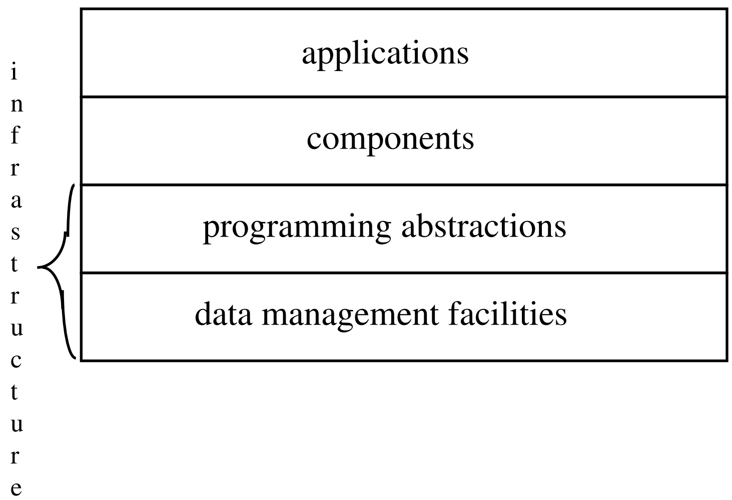
This message reports my view of what transpired at the Toolbox meeting of 1/27/95. The attendees were the addressees of the message. Please give me corrections and edits by 2/5/95 after which this message will be distributed to the full BBHGC mailing list.

1. Structure and Content of Toolbox

The figure which follows is a schematic of Toolbox structure.



The Toolbox will be developed in phases with the lower two levels implemented first The content/semantics of each level will be defined following.

1.1. Programming Abstractions and Data Management Facilities Levels

Manish Parashar presented the programming abstractions he has evolved for support of parallel adaptive hierarchical grids. The key elements are: (i) parallelism and hierarchy are transparent to computation operations but (ii) there are explicit operations for grid adaptation. A full set of base operations for instantiation, refinement, initialization, etc. will be provided. A minimal set of computational operations will be provided and a framework for ready incorporation of user-provided computational operations will be provided.

The target date for availability of an initial working version of the two lower levels is March 1, 1995.

The initial version of the lower two levels will support only fully nested grids. This restriction may be lifted in a later version, depending on feedback from usage of the first version.

1.2 Component Level

"Components" are the common direct building blocks for full applications. The initial list of components agreed upon include: interpolators, iterative solvers, error estimators, boundary condition generators, analysis and visualization routines (runtime and post-postprocessing). Other requirements at the component level include F90 array intrinsics, HPF array intrinsics, sparse matrix stripper/inserters, parallel I/O operations, profilers and performance evaluation modules.

1.3 Application Level

The "application level" is support for program composition. Robert Marsa presented his text-based declarative specification system. Henry Neeman presented his high-level data definition capability. It was agreed that our eventual goal would be a graphical interface which will assist application developers in composition/assembly of applications from "components" and new code.

1.4 Pseudo-Spectral Method Support

It was reported that the programming abstractions were suitable for pseudo-spectral methods.

2. Action Items

2.1 Evaluation of Infrastructure

It was agreed that John Towns would work with Manish Parashar to convert John's current 3D code to use the infrastructure developed by Manish. Manish will travel to NCSA on or about March 1, 1995 to install the infrastructure and train John and the other NCSA troops in its use.

2.2 Evaluation of Infrastructure

Nikos Chrisochoides and Tom Haupt are going to do an evaluation of the infrastructure by integrating the infrastructure into an F90/HPF code (Greg Cook's code? I was not clear on which code would be the basis for the evaluation).

2.3 Write-up of Data Generation Facility

Henry Neeman agreed to write up his data structure generation system targeting a document suitable for the Toolbox WWW page.

2.4 Write-up of Marsa's Application Generator

Robert Marsa agreed to create a write-up of his system suitable for the Toolbox WWW page.

2.5 Progress Reports

Manish and John and Nikos and Tom agreed that May 1, 1995 was a suitable target date for a progress report on the application of the programming abstractions in the codes upon which they are working.

2.6 Application Level Interface

JCB is to prepare, by March 1, 1995, a strawman specification for the facilities to be included in the top (application composition) level of the Toolbox.

2.7 Users Reference Manual for Programming Abstraction

Manish is responsible for a draft "Users Reference Manual for the Programming Abstractions" by March 1, 1995.

2.8 Project Page on Interpolators

Ed Seidel agreed to set up and coordinate a project page on the WWW for interpolators, to post some examples and to request input. Speed of execution, functionality and robustness are the concerns for interpolation algorithms and codes.

2.9 Sparse Matrix Solver Page

Ed also agreed to set up and "seed" a WWW project page on sparse solvers appropriate from a multi-grid representation.

2.10 Configuration Management

Matt Choptuik agreed to formulate and post a proposal for a format for code exchange based on gzip, config and imake. This standard will target code exchange through Mosaic or its equivalent.

3. Comments

3.1 Relationships

We should inform the ANL (Bill Gropp) and LANL (Brian Smith, Bill Quinlan) and other about our work and try to get input from them. Perhaps some of these researchers should be invited to our next meeting. Please suggest further names and give your opinions on whether (and who) we should invite to our next meeting.

3.2 Maurice Van Hutton

Someone mentioned Maurice Van Hutton as a person we should have on our contact list. Will whoever made this suggestion remind me of the connection and send his email address.

3.3 Elaine Kant

JCB is to follow-up with Elaine Kant.