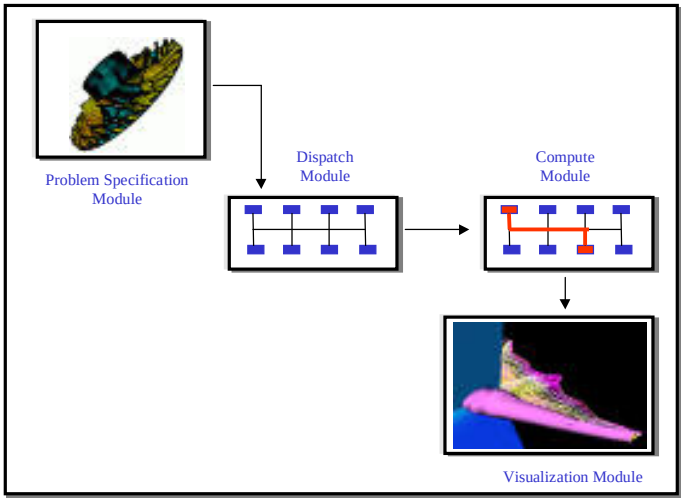
GasTurbnLab MPSE Framework



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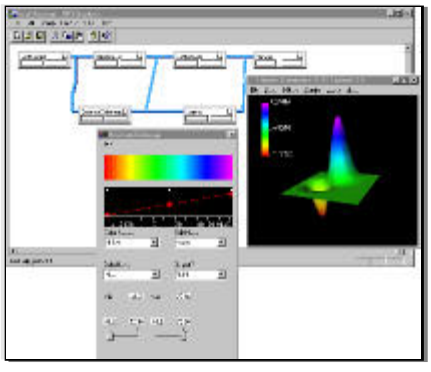
IRIS Explorer

- Platform availability: sun-sparc, sgi, win32
- Application builder and visualization system



- explorer & user built modules
- module connections (wiring) for input and output data
- module parameters
- dataflow map includes all modules and their wiring for a single application

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GasTurbnLab GUI

Explorer GUI provides access to all MPSE components that the user can control:

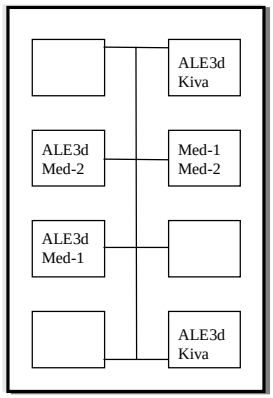
- Problem specification
- Simulation startup
- Simulation process monitoring
- Solution visualization

Problem Specification Module

Geometric domain decomposition of the target simulation object defines a network of PDE problems.

- User selects subdomains and uses TrueGrid to generate mesh and boundary conditions
- User defines interfaces between subdomains (determines the number and types of mediator agents)
- User assigns solvers and parameters to each subdomain (determines the number and types of compute agents)

Dispatch Module



Computational Grid

- Evaluates availability of required
  LCA(legacy code agents) &
  ICA (interface code agents)
  on the computational grid
- Selects hosts from computational grid
  for agents and for data placement
- Distributes partitioned data
- Interacts with the RA (resource agent) &
  DBA (database agent)

Compute Module

- Invokes the simulation controller (SCA) as a
  Grasshopper agent
- Launches each computational Grasshopper agent
- Controls all agent interactions via the SCA
- Provides GUI so user can monitor the progress
  of the simulation

Simulation Agents

SCA (Simulation Control Agent)

controls all the interactions of the computational agents

CA (Compute Agent)

(mobile, one per subdomain)

Travels to destination host and transfers data to/from LCA,

Controls the start/stop of LCA execution

LCA (Legacy Code Agent)

(stationary, one per subdomain)

Interacts with CA for data and runs legacy code

Simulation Agents (cont'd)

MA (Mediator Agent)

(mobile, one per interface)

Travels to destination host and transfers data from/to ICA

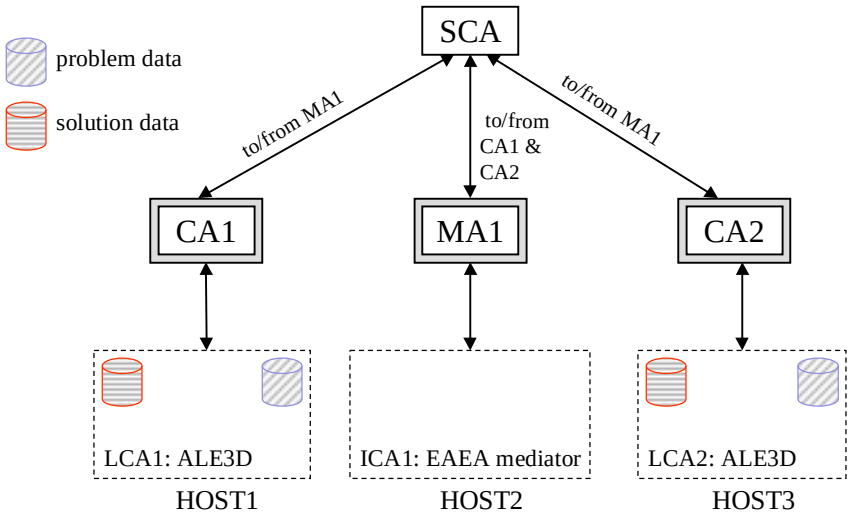
Controls the start/stop of ICA execution

ICA (Interface Code Agent)

(stationary, one per interface)

Interacts with MA for data and runs interface code

2-Domain Example



2-Domain Example : SCA Controller

HOSTS	Stationary Agents	Control Agents	Contact Agents
HOST1	LCA1	CA1	MA1
HOST2	LCA2	CA2	MA1
HOST3	ICA1	MA1	CA1 & CA2