Problems

- Hard to find old simulations, parameters, input and output
- Scientists use idiosyncratic methods of organization
- Cannot “see” all simulations in one place
- Hard to keep track of post-processing results and associate them with their simulations
Problems

* So...
  * Harder than necessary to compare simulations
  * Harder than necessary to verify some simulations
  * Harder than necessary to reproduce results
  * Harder than necessary to share results
  * Harder than necessary to transfer control between scientists
Solution

- Keep track of as much about a computational science project, from as close to one place, in as standard a way, as possible.
SMA System Requirements

- Control from as small a locus as possible
- Encourage standards
- Automate as much as possible
- Organize & catalog simulation data & metadata in one place
- Record simulation history
- Monitor running simulations
SMA System Requirements

- Enhance analysis of simulation output
- Enhance verification of simulations
- Aid publication of results
- Archive simulation output
- Extend SMA system to any scientific domain
SMA System Design

* Database
  * Collect & store simulation metadata
  * Store associations between simulations, output & post-processing

* Scripts
  * Collect metadata from running simulation
  * Monitor health of running simulation
  * Maintain integrity of metadata
  * Automate file archival

* Web portal
  * Launch scripts
  * Plot metadata
  * View images of running simulations
  * View provenance data
SMA System

* Web portal
* Database
* Scripts

Web Host

Apache w/ Django
Wiki Server

Observer

Email

MySQL Server

Database Host

Web portal

Output

Post-Processing Results

FLASH

Collector
Archiver
Verifier
Associator
Visualizer

Simulation Host

Mass Storage

Mass Storage

User
Desktop

Web Browser