

Middleware for Grid Portal Development

Marlon Pierce
Community Grids Lab

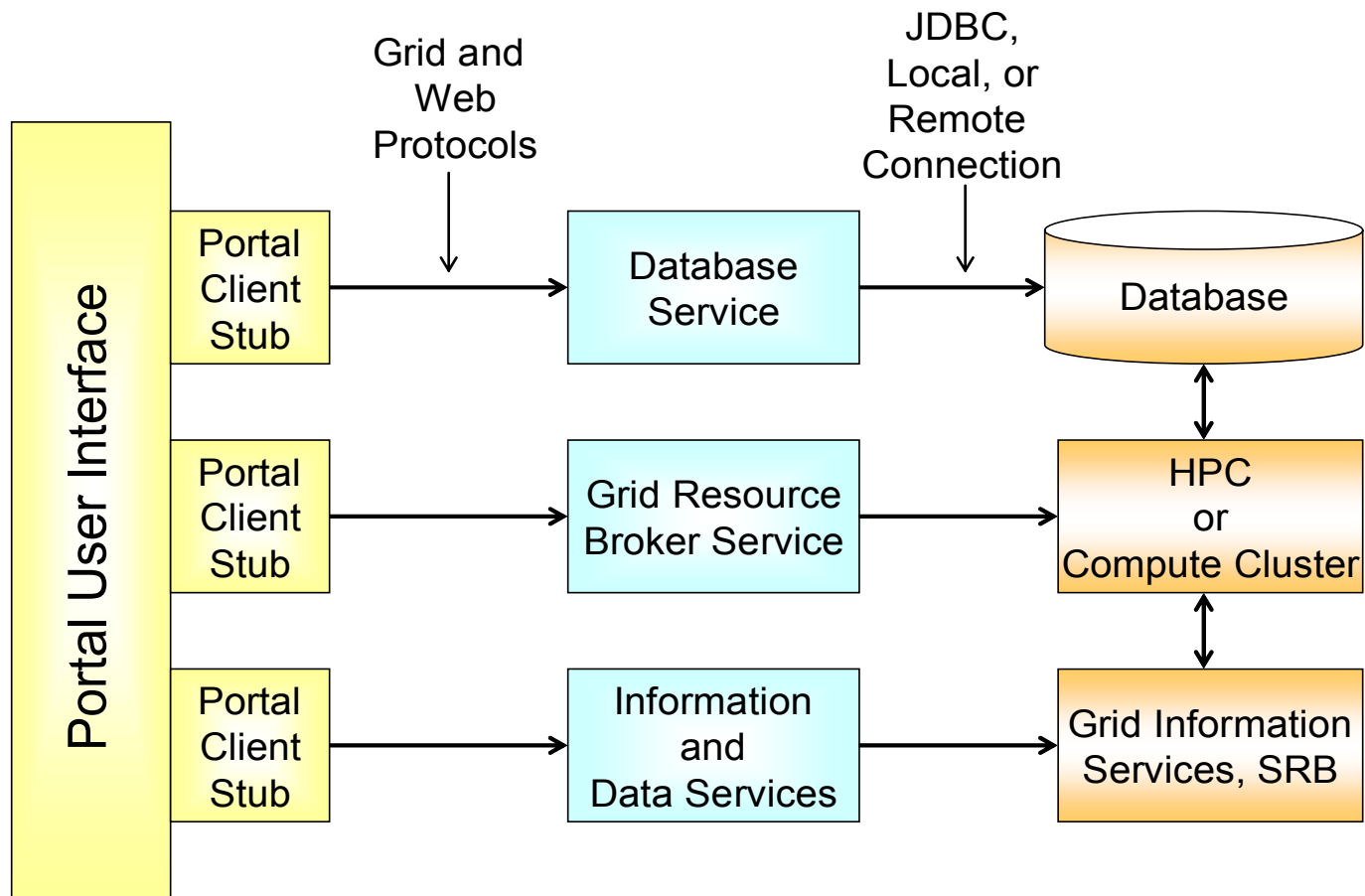
Open Grid Computing Environment Collaboratory

- University of Chicago
 - Gregor von Laszewski
- University of Illinois/NCSA
 - Jay Alameda
 - Joe Futrelle
- Indiana University/Community Grids Lab and CS
 - Marlon Pierce
 - Geoffrey Fox
 - Dennis Gannon
 - Beth Plale
- University of Michigan
 - Charles Severance
 - Joseph Hardin
- University of Texas/TACC
 - Mary Thomas
 - Jay Boisseau

What Are Grid Portals?

- Computing portals provide ubiquitous, browser-based access to grid resources.
 - No special client software or platform needed
 - Access information in visually intuitive form
- Provide services to support user interactions
 - Job archiving → portal metadata management services
- Combine core grid services into custom services
 - Launch multistage jobs with dependencies
 - Couple execution, file transfer, visualization/analysis
- Many, many such projects
 - *Concurrency and Computation: Practice and Experience's* special issue described more than two dozen in 2001.
- GCE Research Group of the GGF is the community forum.
 - Thomas, Gannon, and Fox are chairs.

General Portal Architectures



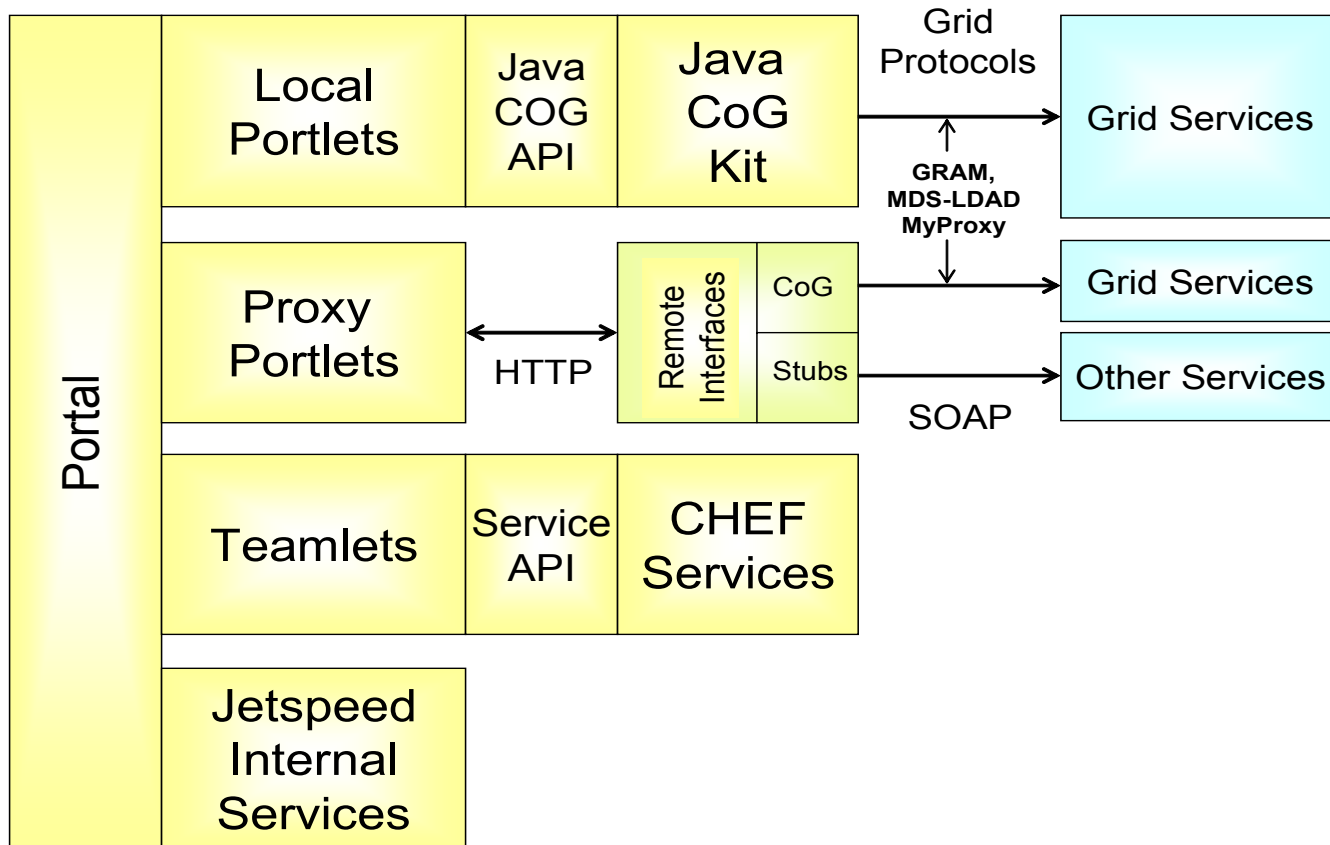
What Are the Problems?

- NMI team members have worked in various combinations on other projects
 - Alliance Portal (Gannon, PI)
 - SciDAC Fusion Portal (Thomas, PI)
 - DOD Computing Portal (Thomas, PI)
 - SciDAC CMCS (contributions from Severance, Hardin, and von Laszewski).
- Problems are always the same:
 - How do we share portal services?
 - How do we reuse components between projects and groups?
- Can we provide a standard abstraction for portal services and interfaces?
- Can we provide an architecture that allows services and user interface components to be added in a standard way?
- Need to shorten the “standard service” deployment phase so that we can concentrate on harder problems, specific sophisticated services
 - Fusion Grid needs very interactive, visual interface for setting up problems
 - Need to be able to deploy standard components like MyProxy, GridFTP, etc interfaces quickly

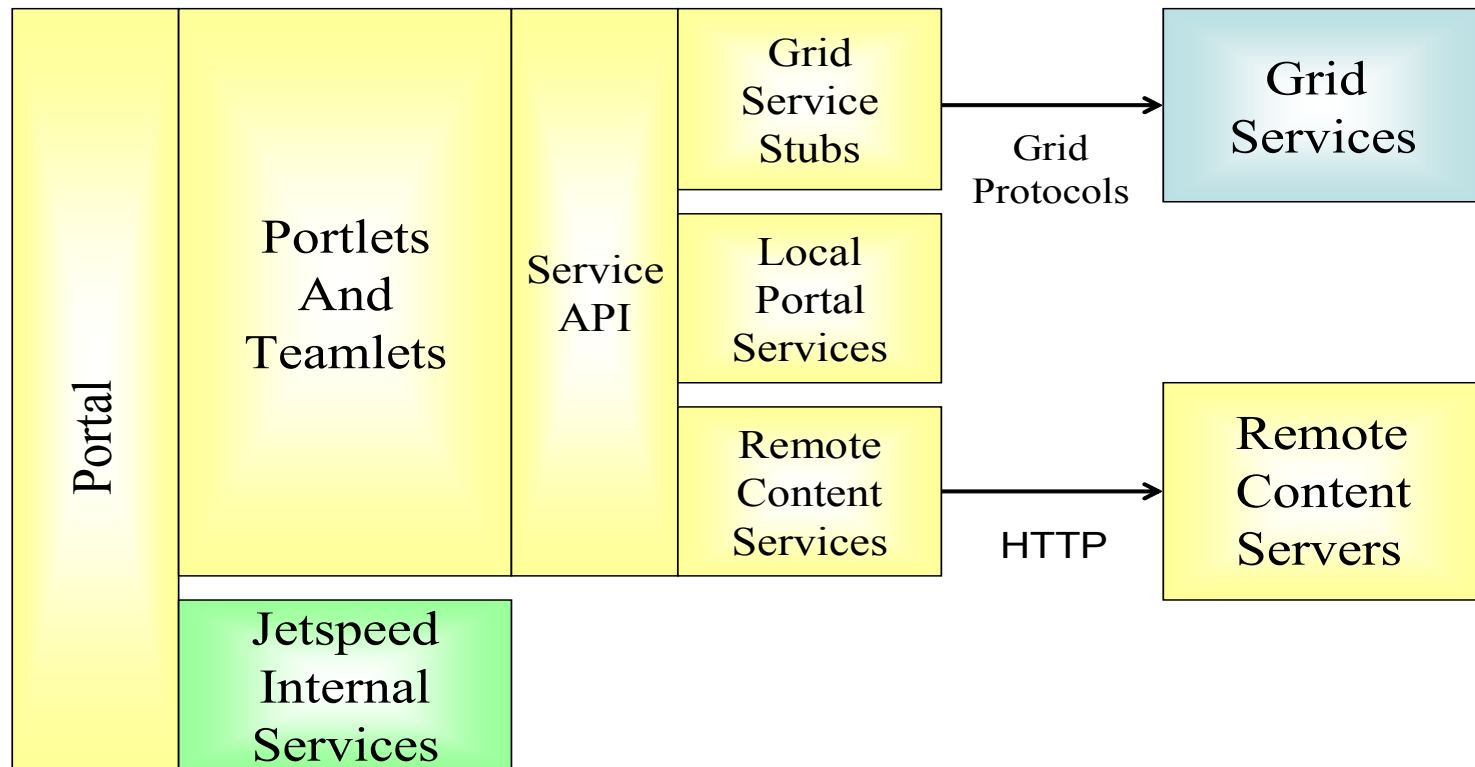
Portlets and Containers

- Provide a portal container/component system
 - Portal components are called “portlets”
- Create a packaged, easy-to-install, customizable portal system with standard, useful components.
 - Pick and choose from available functionality
- Support community extensions
 - Plug useful contributions from other groups
- We base our system on Jakarta’s Jetspeed project
- JSR 168 (released this summer): standardizes portlet systems
 - Commercial and open source implementations should interoperate
- WSRP: will provide standard ways to build remote portlets

OGCE Initial Architecture

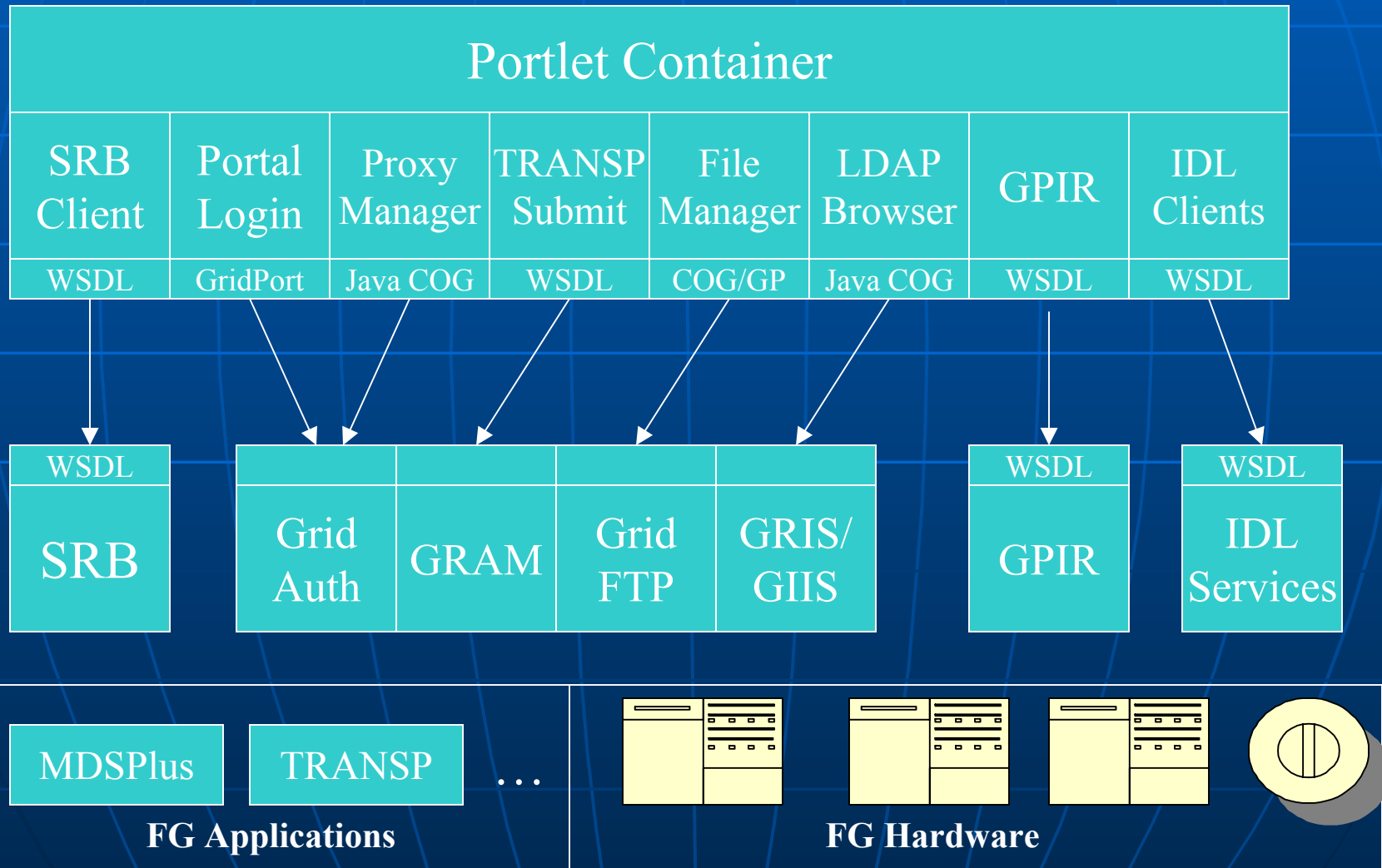


Evolving Portal Architecture



Portal Service Components

SciDAC Fusion Grid Example



SciDAC DOE Fusion Grid Portal Welcome to the Fusion Grid Portal Demo - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://danube.ucs.indiana.edu:4080/jetspeed/portal/media-type/html/language/en/role/user/page/default.psm1/template/Home

U.S. Department of Energy National Collaboratories Fusion Grid Portal Demo

Welcome SciDAC 1 Edit account: scidac1 Logout

Demo TRANSP Job Submission Alliance Portlets XGSP Servo Logbook Monitor SRB Anabas

Proxy Manager GridFTP LDAP Browser

xportlets : ProxyManager

The following GSI proxy credentials are loaded into your account:

(default proxy) /O=Grid/O=Globus/OU=ucs.indiana.edu/CN=Gateway Gateway [View](#) [Remove](#)

Click the button below to add another GSI proxy credential to your account:

[Get New Proxy](#)

xportlets : GridContext

Grid Context Host:
 Port:
 Address/Search:
[Browse](#) [Search](#)

URL: <http://linbox1.extreme.indiana.edu>
 Current Directory: /

- [_alek-test](#)
- [_aslom](#)
- [_MyServices](#)
- [_ysimmhan](#)
- [Gannon context](#)
- [ochipara](#)
- [CHEF](#)
- [_edit-test](#)
- [Hello Dir](#)
- [_srikrish-test](#)
- [BIMA](#)
- [liang-test](#)

[Delete](#) [Copy](#) [Move](#) [Add](#) [Paste](#)

xportlets : GridPing

Service List:

gsiftp://baldy.extreme.indiana.edu:2811
 hunk.extreme.indiana.edu
 k2.extreme.indiana.edu
 rainier.extreme.indiana.edu

[Remove](#)

Service:

[->](#)

Services to be checked:

chunk.extreme.indiana.edu

[Ping!](#) [Refresh](#)

Yes, the resources pinged are available

Direction:

With your proxy (for authentication and authorization) stored locally through **ProxyManager** portlet, you can either choose one or multiple items from the service list on the left, or enter a new service URL in the bottom textbox. Then click the corresponding [->](#) button to add the item(s) to the right to-be-checked list. Click [<-](#) button to move the item(s) back to the backup service list. If there is any item listed in the to-be-checked list on the right side, you can either check them all, or selectively choose some of them first, then click [Ping!](#) button. If the item listed in the

Internet

Deliverables: Initial Portal Toolkit

- A component-based portal container
 - Jetspeed with CHEF enhancements, patches
 - Will evolve to JSR 168 standards
- Portlet components and services
 - Discussion boards, MOTDs, message boards, chat
 - Calendar tools
 - Newsgroups and citation/reference managers
 - Grid information services (LDAP-based, GPIR)
 - Portlet interfaces to MyProxy; credential management
 - Portlet interfaces to GridFTP
- Scheduled for release, SC2003

Deliverables: Science Portal Tools

- Will concentrate on science applications
 - Provide services and examples for building Science Portals
- Deliverables include
 - Application Manager Web Service with sample application
 - Portlets for IU Extreme Lab's Application tools: Application Factories, XEvents, Xdirectory, Xbooks
 - Portlets and services for QuakeSim Earthquake simulation
 - Metadata repository user interfaces and services

Deliverables: Portal Collaboratory

- We will use our own tools to provide a community portal
 - Provide information, collaboration for portal building community
 - Demonstrate capabilities
 - Provide a repository for community contributions
 - CMCS, NEESGrid, GridLab, and others

In the Pipeline

- OGSI Portlets
 - Many in Science Portal set use this under the hood
 - Service data browsing portlets
- OGSA-DAI portlets
- Collaborative portlets to support Access Grid, Polycomm
- Portal service composition