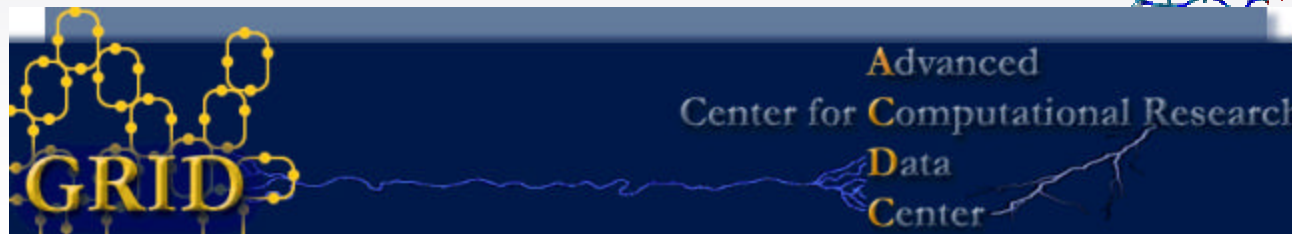
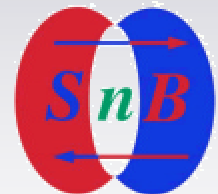
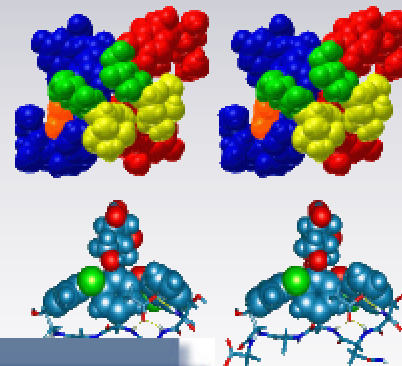


GT'04 Panel: Storage Considerations for Grid Computing Environments

Russ Miller & Mark Green
Center for Computational Research &
Computer Science & Engineering
SUNY-Buffalo
Hauptman-Woodward Medical Inst



NSF, NIH, DOE, NYS



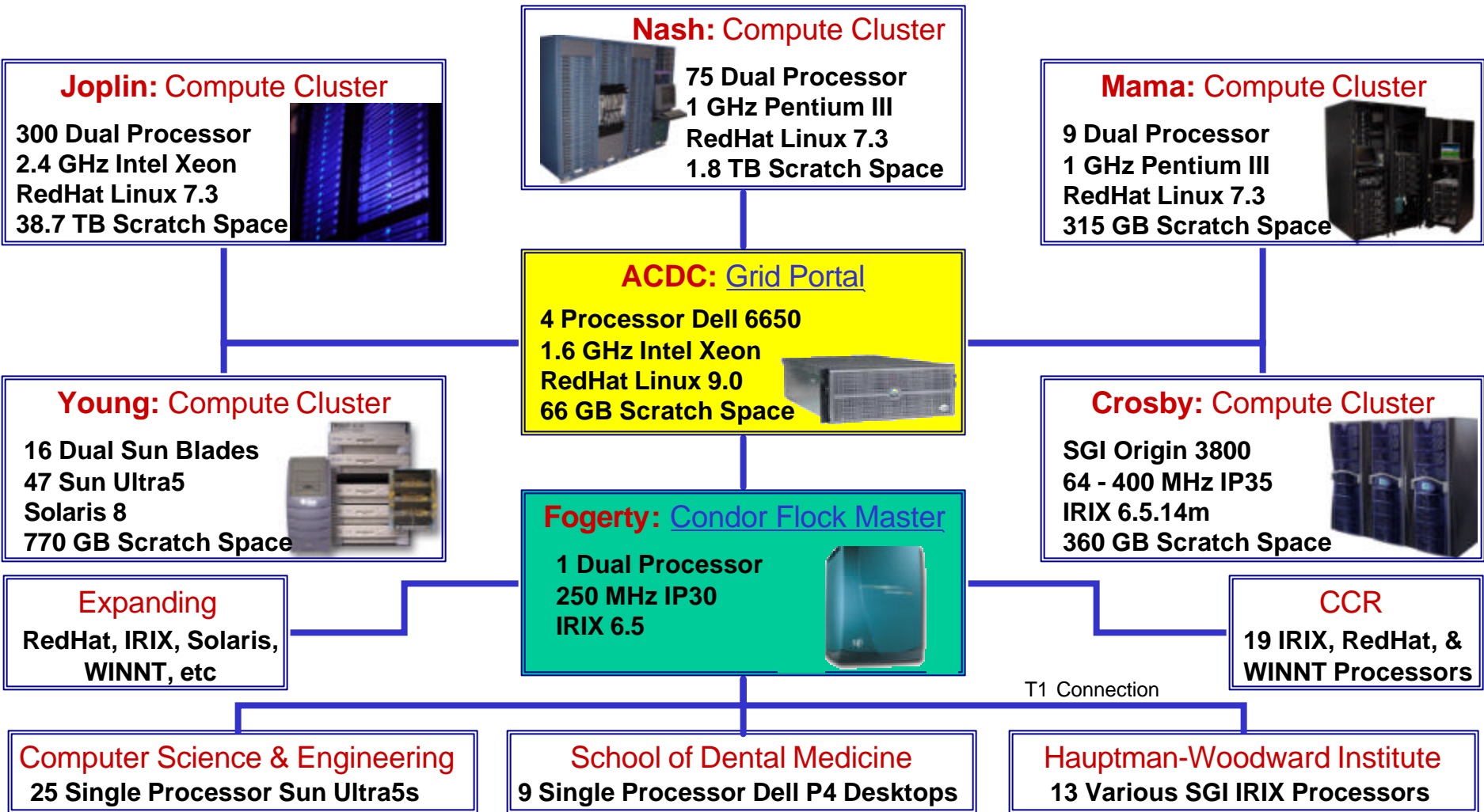
University at Buffalo

The State University of New York

Major CCR Resources (12TF & 290TB)

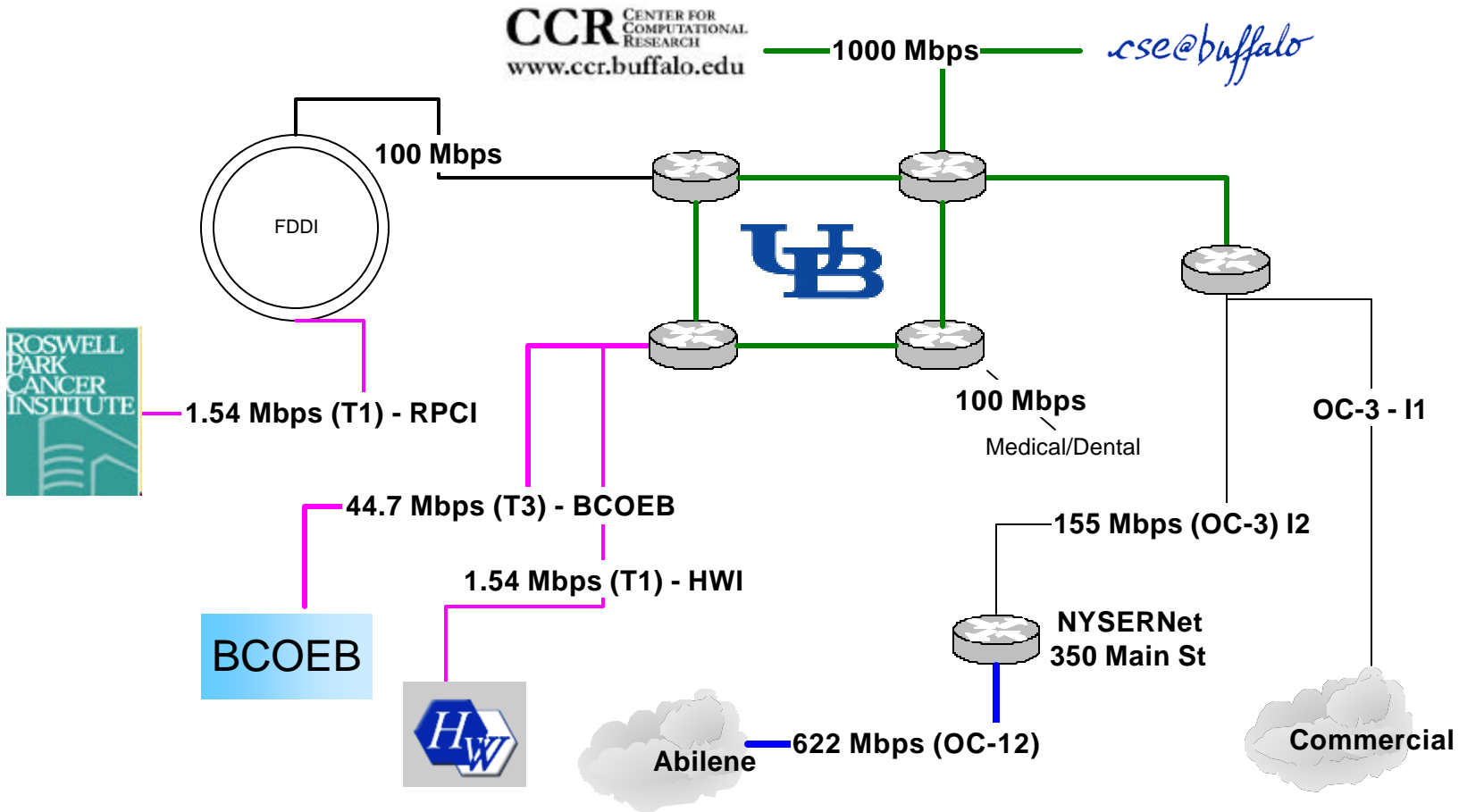
- **Dell Linux Cluster: #22 ® #25 ® #38**
 - ❑ 600 P4 Processors (2.4 GHz)
 - ❑ 600 GB RAM; 40 TB Disk; Myrinet
- **Dell Linux Cluster: #187 ® #368 ® off**
 - ❑ 4036 Processors (PIII 1.2 GHz)
 - ❑ 2TB RAM; 160TB Disk; 16TB SAN
- **IBM BladeCenter Cluster**
 - ❑ 532 P4 Processors (2.8 GHz)
 - ❑ 5TB SAN
- **SGI Origin3700 (Altix)**
 - ❑ 64 Processors (1.3GHz ITF2)
 - ❑ 256 GB RAM
 - ❑ 2.5 TB Disk
- **SGI Origin3800**
 - ❑ 64 Processors (400 MHz)
 - ❑ 32 GB RAM; 400 GB Disk
- **Apex Bioinformatics System**
 - ❑ Sun V880 (3), Sun 6800
 - ❑ Sun 280R (2)
 - ❑ Intel PIIIs
 - ❑ Sun 3960: 7 TB Disk Storage
- **HP/Compaq SAN**
 - ❑ 75 TB Disk
 - ❑ 190 TB Tape
 - ❑ 64 Alpha Processors (400 MHz)
 - ❑ 32 GB RAM; 400 GB Disk
- **IBM RS/6000 SP: 78 Processors**
- **Sun Cluster: 80 Processors**
- **SGI Intel Linux Cluster**
 - ❑ 150 PIII Processors (1 GHz)
 - ❑ Myrinet

Advanced CCR Data Center (ACDC) Computational Grid Overview



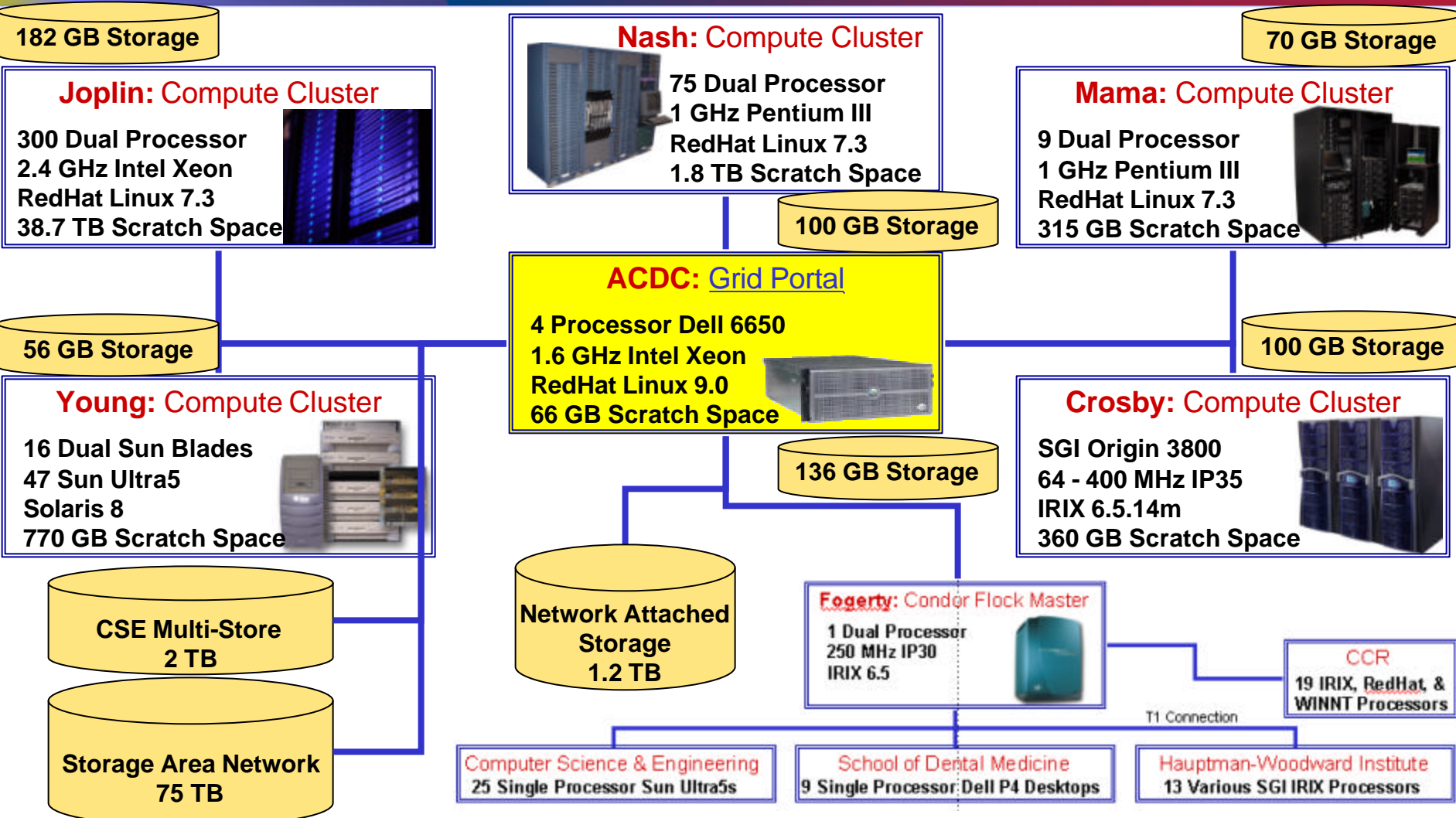
Note: Network connections are 100 Mbps unless otherwise noted.

Network Connections



ACDC Data Grid Overview

(Grid-Available Data Repositories)



Note: Network connections are 100 Mbps unless otherwise noted.



ACDC-Grid

CCR Grid Computing Services - Microsoft Internet Explorer

CCR University at Buffalo The State University of New York
Center for Computational Research GRID PORTAL
High Performance Grid Computing

WELCOME TO GRID COMPUTING SERVICES

University at Buffalo Center for Computational Research is currently forming the first Western New York computational grid. The computational grid consist of many supercomputers located at the Center and several other networked supercomputers throughout the Western New York region. These resources will be shared by many researchers from several departments working on a diverse suite of problems including Biomimetics, Computational Chemistry, and Medical Imaging to name a few.



We also provide grid computing support for the University's Center for Computational Research learning, teaching and research activities plus the infrastructure for both high performance computing and grid enabled software.


Get your "Grid Computing Guide"?

CCR Grid Computing Services Data Management - Microsoft Internet Explorer

CCR University at Buffalo The State University of New York
Center for Computational Research GRID PORTAL
High Performance Grid Computing

PORTAL LOGOUT

VIEW: Group | GROUP: miller | UserList: rpplye



Browser view of "miller" group files published by user

CCR Grid Computing Services Grid Admin - Microsoft Internet Explorer

CCR University at Buffalo The State University of New York
Center for Computational Research GRID PORTAL
High Performance Grid Computing

View statistics for: disk_space

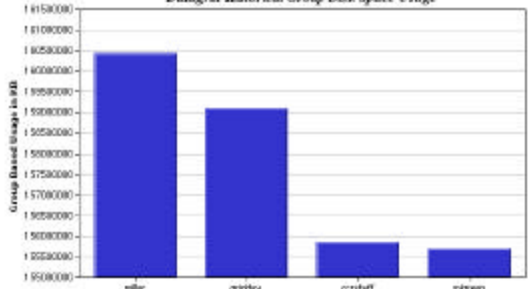
Data based on: group

from starting date: January 1 2000

to ending date: September 13 2003 inclusive

for: Grid Portal resources OK

Daagrid Historical Group Disk Space Usage



Group	Disk Space Usage (KB)
miller	~1,050,000,000
griddev	~1,000,000,000
ccrstaff	~1,000,000,000
mlgreen	~1,000,000,000

CCR Grid Computing Services: Grid Admin - Microsoft Internet Explorer

CCR University at Buffalo The State University of New York
Center for Computational Research GRID PORTAL
High Performance Grid Computing

PORTAL LOGOUT

View statistics for: disk_space

Data based on: user

from starting date: January 1 2000

to ending date: September 13 2003 inclusive

for: Grid Portal resources OK

File_num	File_ID	Filename	Dir_ID	Resource_ID	Owner	Groupname	Type
1	56033	Cypher.txt	52831	10	mlgreen	griddev	txt
2	56034	Cypher.sh	52858	10	mlgreen	griddev	sh
3	56035	Oracle.asc	52958	10	mlgreen	griddev	asc
4	56036	Cypher.sh	52634	10	mlgreen	miller	sh
5	56037	Rabbit.dat	52830	10	mlgreen	ccrstaff	dat
6	56038	Agent.exe	53064	10	mlgreen	griddev	exe
7	56039	Dozer.sh	52852	10	mlgreen	griddev	sh
8	56040	Neo.asc	52187	10	mlgreen	mlgreen	asc
9	56041	Agent.mpg	52833	10	mlgreen	mlgreen	mpg
10	56042	Tank.txt	52188	10	mlgreen	mlgreen	txt
11	56043	Smith.xls	52258	10	mlgreen	ccrstaff	xls
12	56044	KeyMaster.csh	52186	10	mlgreen	miller	csh
13	56045	Oracle.csh	52622	10	mlgreen	griddev	csh
14	56046	Dozer.xls	52808	10	mlgreen	mlgreen	xls
15	56047	Cypher.exe	52204	10	mlgreen	griddev	exe
16	56048	Rabbit.ppt	52861	10	mlgreen	miller	ppt
17	56049	Neo.dat	52217	10	mlgreen	ccrstaff	dat
18	56050	Cypher.asc	53086	10	mlgreen	griddev	asc

ACDC-Grid Administration

CCR Grid Computing Services: Grid Admin - Microsoft: Internet Explorer

Center for Computational Research **GRID PORTAL**
High Performance Grid Computing

Grid Site Administration

PORTAL LOGOUT
User Tools
Manage Account
Grid General Info
Projects
Resources
Computational Grid
Job Submission
Job/Queue Status
Data Grid
Data Grid Statistics
Network Status
Running/Queued Jobs
PBS Job History
Grid Portal Statistics
Center Fleck Statistics
User Information
Education/Outreach
Staff Only
CCR HOME

Users
Groups
Portal Event Log
Database Job List

Organizations (add, edit, delete)
Resources (view, refresh, ping, delete, create host certificate)

Globus Administration
Reports (machine usage, user access to machines, etc.)

Generate Globus grid-mapfile

Specifying an optional include file will cause the contents of this file to be included at the top of the generated grid-mapfile. If a grid-mapfile path is specified a copy of the generated file will be saved into this location. The generated file will be staged to the grid nodes unless the box is checked.

Optional include file:

Optional grid-mapfile path:

Do not stage this file to the grid nodes

CCR Grid Computing Services: Database Job Admin - Microsoft: Internet Explorer

Center for Computational Research **GRID PORTAL**
High Performance Grid Computing

Create New Database Job

Create a new database job that can be run by the portal. Job scripts must reside in `home/griddev/www/jobscripts` prior to creating the database job entry.

Job Name:

Full Path To Script:

Accepts Arguments:

Run Script:

Run As User:

[Return to the Database Job Admin menu.](#)
[Return to the Grid Admin menu.](#)

CCR Grid Computing Services: Grid Admin - Resources - Microsoft: Internet Explorer

Center for Computational Research **GRID PORTAL**
High Performance Grid Computing

MDS Resource Update Status

Current Time: 16-September-2003 10:59:12

Resource	Last Updated	Next Update	Status
crasby.ccr.buffalo.edu	16-September-2003 09:15:30	2 minutes	OK
rogerty.ccr.buffalo.edu	16-September-2003 10:45:30	2 minutes	OK
joplin.ccr.buffalo.edu	16-September-2003 10:45:15	2 minutes	OK
mama.ccr.buffalo.edu	16-September-2003 10:45:15	2 minutes	OK
nash.ccr.buffalo.edu	16-September-2003 10:45:15	2 minutes	OK
newus.hwi.buffalo.edu	16-September-2003 10:45:20	2 minutes	OK
yardbirds.ccr.buffalo.edu	16-September-2003 10:45:13	2 minutes	OK
young.ccr.buffalo.edu	16-September-2003 10:45:27	2 minutes	OK

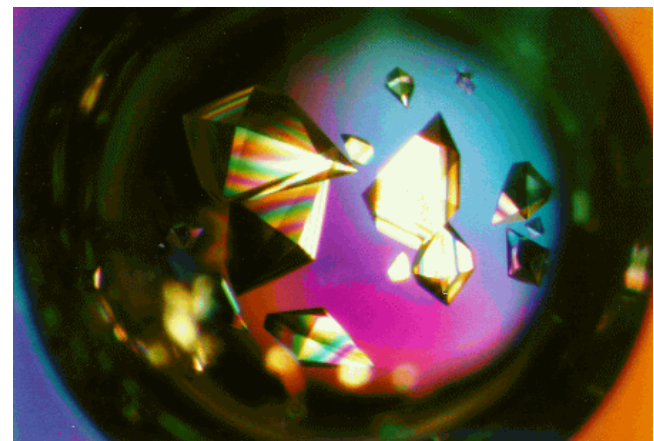
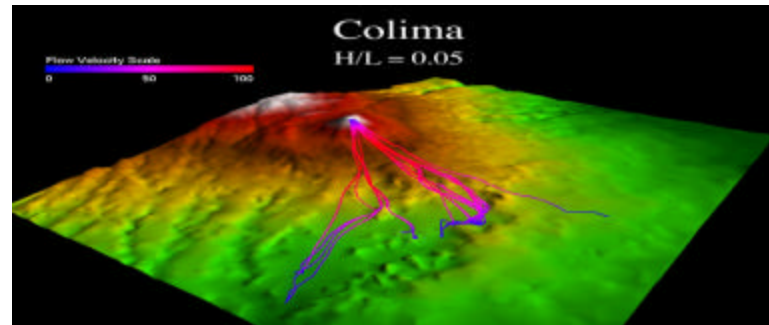
[Return to the Grid Resource Admin menu.](#)
[Return to the Grid Admin menu.](#)

Advanced
Center for Computational Research
Data
Center



Grid-enabling Application Templates

- Structural Biology
- Earthquake Engineering
- Pollution Abatement
- Geographic Information Systems & BioHazards



ACDC-Grid Collaborations

- **Advanced Computational Data Center – Grid (ACDC-Grid)**
- **Innovative Laboratory Prototype**
- **Grid3+ Collaboration**
- **High-Performance Networking Infrastructure**
- **HP Labs Collaboration**
- **IBM (under discussion)**
- **Open Science Grid (Future)**

ACDC-Grid Cyber-Infrastructure

■ Predictive Scheduler

- Define quality of service estimates of job completion, by better estimating job runtimes by profiling users.

■ Data Grid

- Automated Data File Migration based on profiling users.

■ High-performance Grid-enabled Data Repositories

- Develop automated procedures for dynamic data repository creation and deletion.

■ Dynamic Resource Allocation

- Develop automated procedures for dynamic computational resource allocation.

Middleware

- **Globus Toolkit 2.2.4 ® direct upgrade WSRF**
- **Condor 6.6.0**
- **Network Weather Service 2.6**
- **Apache2 HTTP Server**
- **PHP 4.3.0**
- **MySQL 3.23**
- **phpMyAdmin 2.5.1**