

# Grid Computing for Real World Applications

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# Motivation: Scientific Challenges

The current and future generations of scientific problems are:

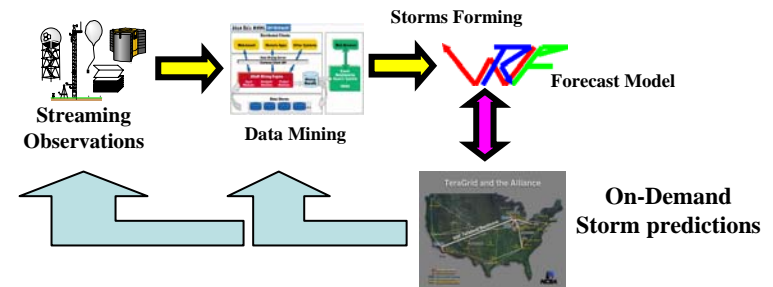
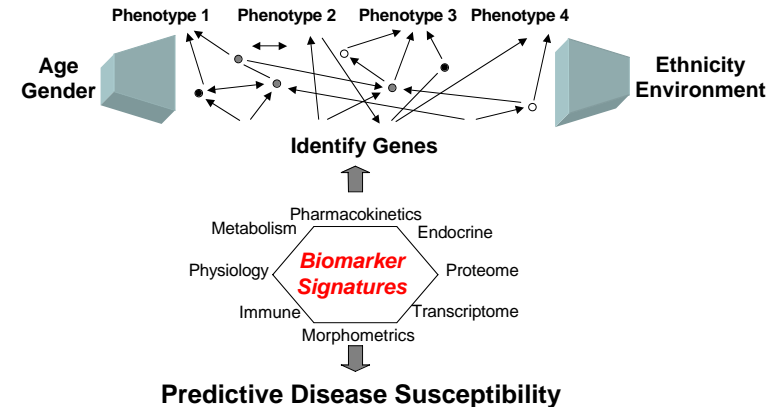
## ➤ Data Oriented

- Increasingly **stream** based.
- Often need **petabyte** archives.

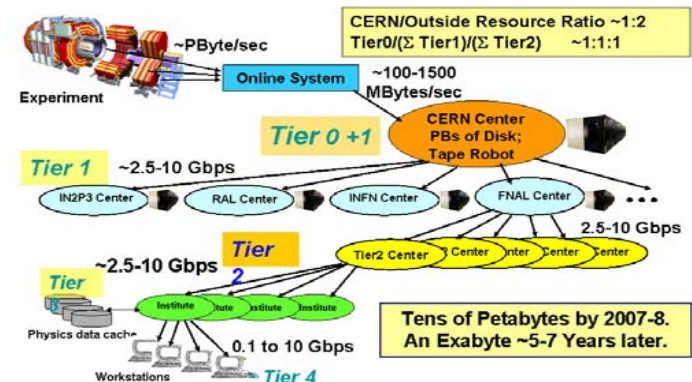
## ➤ In need of **on-demand** computing resources

## ➤ Conducted by **geographically distributed** teams of specialists

- Users **do not** want to expend too much time learning new technologies.



## LHC Data Distribution Model



# Solution

Adapt Grid Computing and solve every computing problem in this world.

Is this true? I wish it is, but not really ..then what ..

- Grid Technology bridges the gap between the applications and the infrastructure.

Fine, but what the heck is grid computing? follow along to find out ...

# Introduction to Grid

Grid Computing enables

- sharing,
- selection and
- aggregation

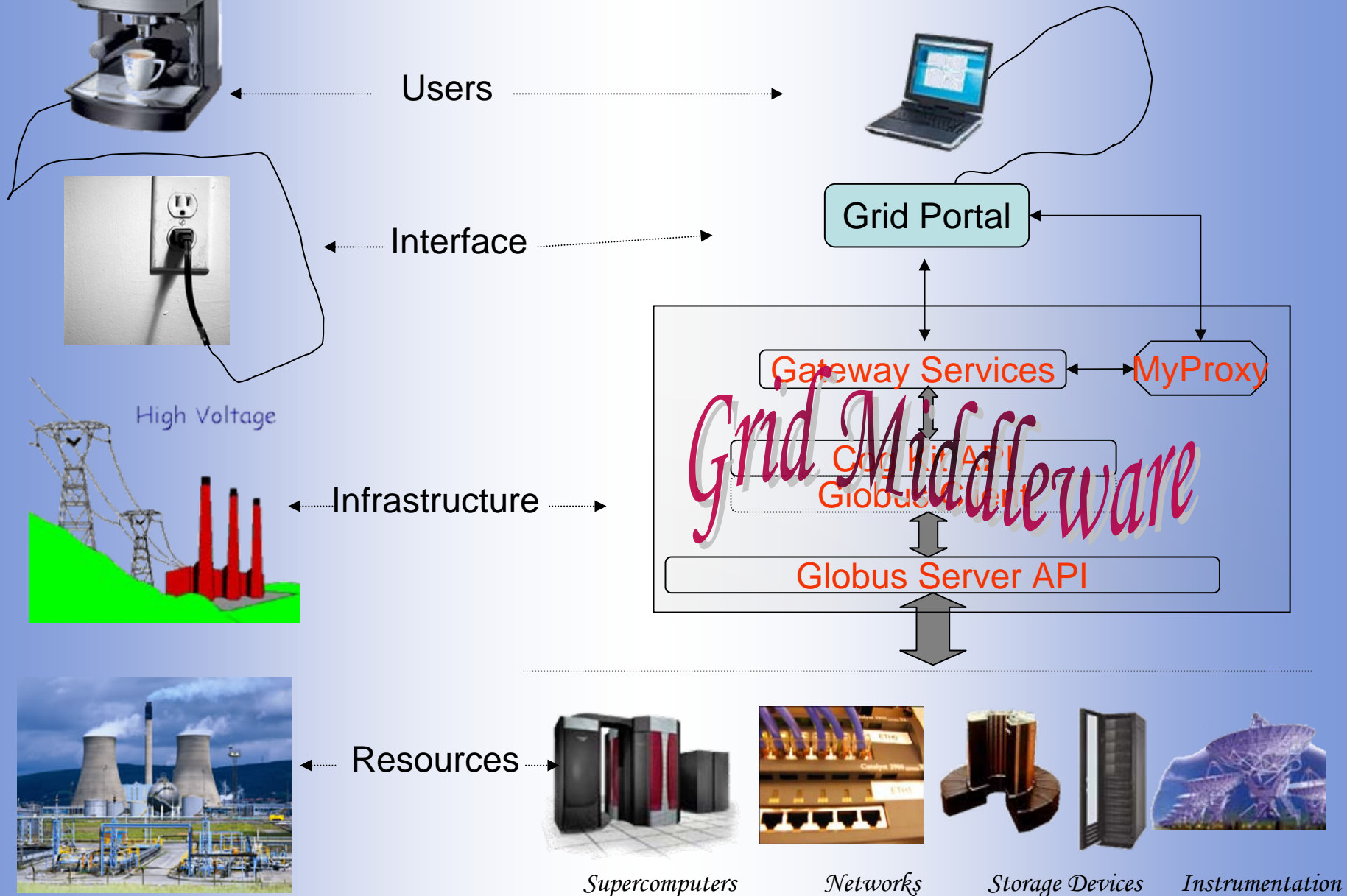
of a wide variety of geographically distributed resources including

- supercomputers,
- storage systems,
- data sources and
- specialized devices

owned by different organizations

for solving large-scale resource intensive problems in science, engineering, and commerce.

# Power Grid Analogy



# Key Features of Grid Computing

- Provides a secure infrastructure for computing on a distributed computing environment
- Provides single sign-on feature by which a user can authenticate once and perform multiple computations over extended period of time
- Facilitates inter-domain access mechanisms
- Better portability (code can run on many kinds of computers) and exportability (move files from one computer to another)

# Grid Security

- Grid Certificates:
- Needed for using the Grid
- Used to provide a set of privileges of one resource to another
- Provide the features of dynamic delegation, dynamic entities and repeated authentication
- Standard PKI infrastructure is used for validation



# Challenges of using Grid computing

- The concept of grid is promising but users have to cope up with ..
  - ❖ Emerging technology
  - ❖ Evolving standards
  - ❖ Frequent new versions of middleware with little or no backwards compatibility
  - ❖ Users have to learn the technology to use it.

Alternatively, use grid-enabled science portals



# Science Portals

- The goals of a Science Portal are
  - To give a community of researchers easy access to the tools, data and computational power needed to solve today's scientific and engineering problems.
  - To do this in a discipline specific language that is common to the target community.
  - To hide any underlying Grid technology.

# Portal Science Capabilities

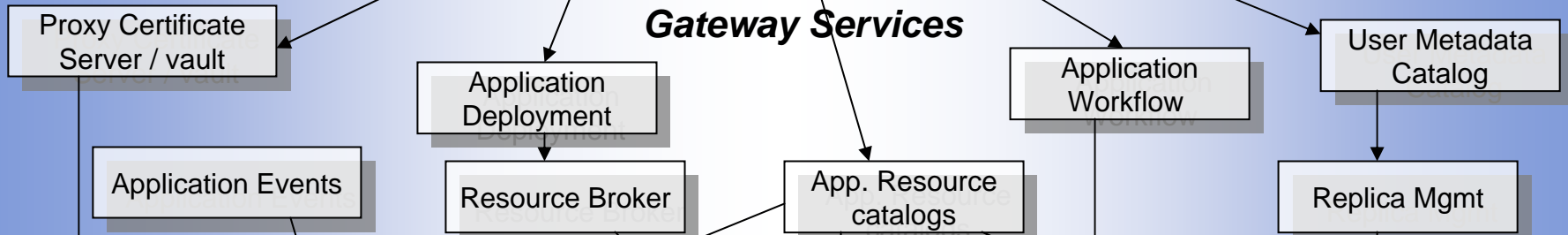
- Data Access is the most important
  - Allow the user community access to important shared data resources
    - Visualize it, publish it, download it, curate it.
  - Data Discovery
    - Searchable metadata directories.
- Web access to important tools
  - Web-form interfaces to allow users to run important community codes
  - Webstart access to common java-based tools
  - Limited shell access - perhaps to a VM
- Workflow tools
  - Allow users to combine community codes into workflows managed by the portal back-end resources.

# The Architecture of Gateway Services

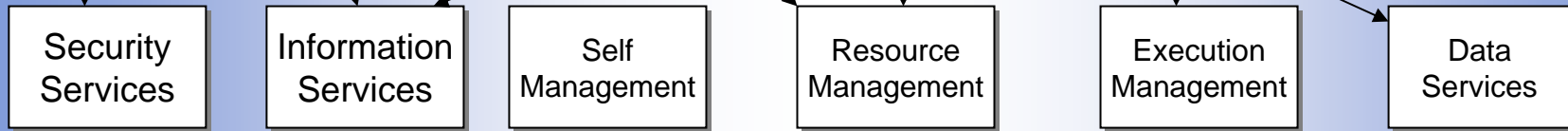
## The Users Desktop.



## Gateway Services

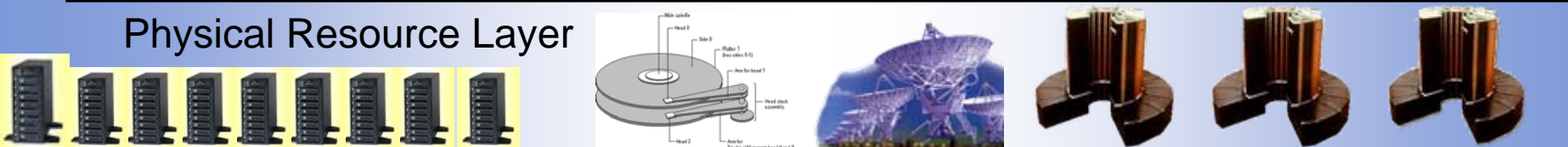


## Core Grid Services



OGSA-like Layer

## Physical Resource Layer

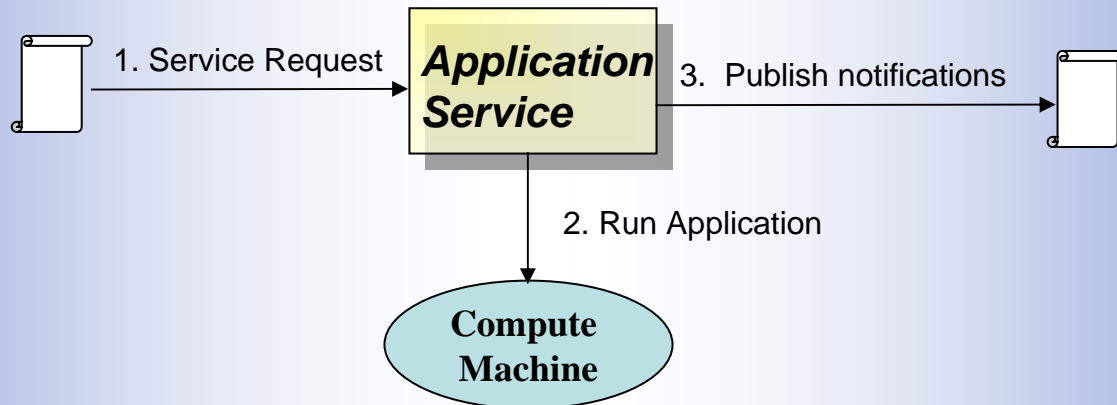


# Service Architecture

- The Foundation of the gateway science portal software is based on the concept of “services” and “service oriented architectures.”

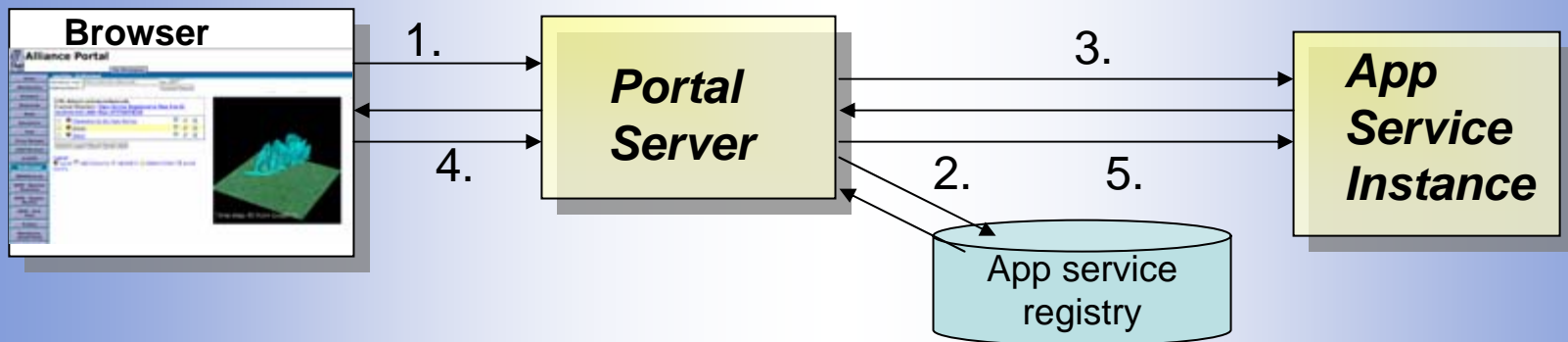
# What's a service anyway?

- A “web server” that runs an application for you.
  - You send it requests (XML documents) and it processes the information and send replies (notifications) when it is done.



# The Portal - Service interaction

- Each application is deployed as a service which can be invoked by the portal or another service.
  - 1. User looks up & selects application services from portal.
  - 2. Portal locates service instance.
  - 3. Service is contacted and replies with a interface description
  - 4. Server displays the interface and user fills it out.
  - 5. Server create ws request and sends it to the app service.



# What do we do with Applications?

- Service-oriented **applications**
  - Wrap applications as services
  - Compose applications into workflows
  - Execute applications on remote resources on behalf of user in a secured manner

# What a User Gains By Using Grid and Portals

- As a direct user
  - – Can easily
  - Execute jobs at one or more remote sites
  - Move data between sites
  - All with single sign-on security
- As a user of a grid enabled application
  - Will not see the grid
  - Will see an application whose development was eased with grid functions or grid-based web services
  - Ease of development should result in more applications or faster availability of applications



# What Application Developers Gain by Using Grids and Portals

- Application web services can be built by re-using
- capabilities provided by existing grid-enabled
- Web services.
- Applications can also be built by using grid
- functions
- Grid functions/services handle distributed
- management of tasks and data
- – Developer can focus on logic of application and not
- logic of distributed interaction

# Example Gateway LEAD – Linked Environments for Atmospheric Discovery (Mesoscale Meteorology)

NSF LEAD project - making the tools that are needed to make accurate predictions of tornados and hurricanes.

- Data exploration and Grid workflow

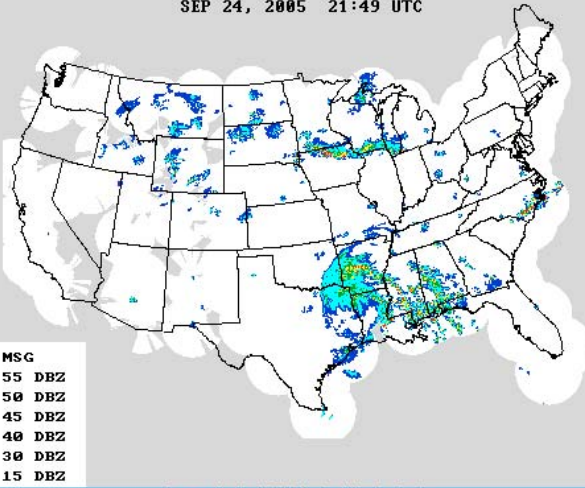
Welcome to the **LEAD PORTAL** Linked Environments for Atmospheric Discovery  
Sponsored by the National Science Foundation

Portal Home Geo GUI Education and Outreach Weather Links About LEAD Help

Home

To view a local radar, select area of interest and click on the image below.

**RADAR REFLECTIVITY FROM RADAR CODED MESSAGES  
NATIONAL WEATHER SERVICE  
AUTOMATED EDITING APPLIED  
SEP 24, 2005 21:49 UTC**



MSG  
55 DBZ  
50 DBZ  
45 DBZ  
40 DBZ  
30 DBZ  
15 DBZ

Data provided by NOAA's National Weather Service

LEAD Home FAQ Privacy Terms of use Contact us

User Name   
Password   
☐ Remember my login

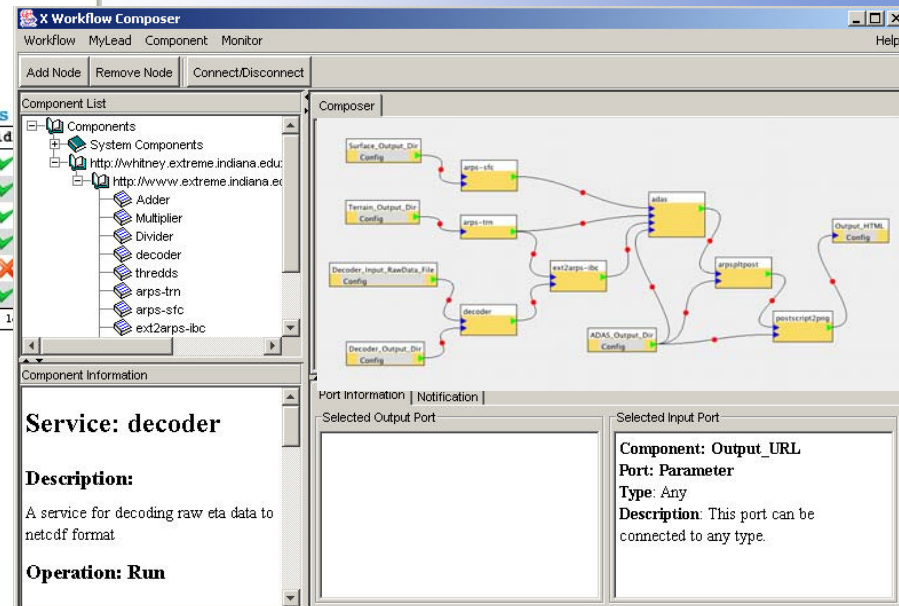
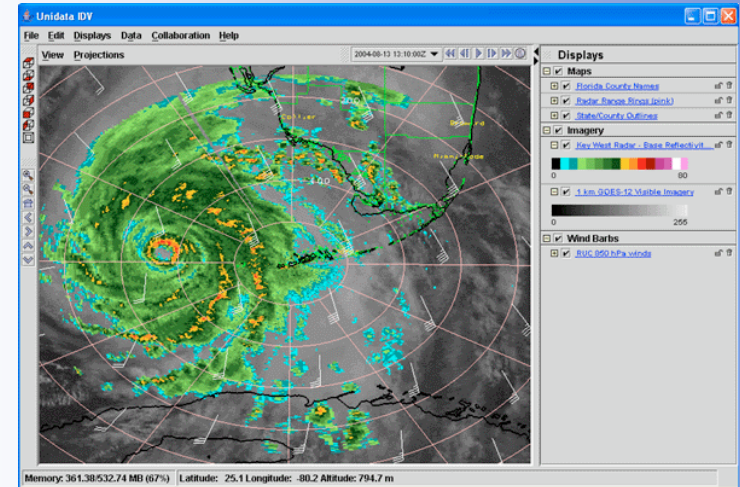
[Create new account](#)

[Forget your password?](#)

#### LEAD Grid Testbed Status

Testbed	Grid	Auth	GRAM	Grid
IU [chinkapin]	✓	✓	✓	✓
NCSA [copper]	✓	✓	✓	✓
OU [aquaman]	✓	✓	✓	✓
UAH [frozone]	✓	✓	✓	✓
UNC [dante0]	✗	✗	✗	✗
Unidata [lead1]	✓	✓	✓	✓

Last updated: Sat Sep 24 17:00:00 2005 Indiana I.



# Example Gateway - LEAD (Mesoscale Meteorology)



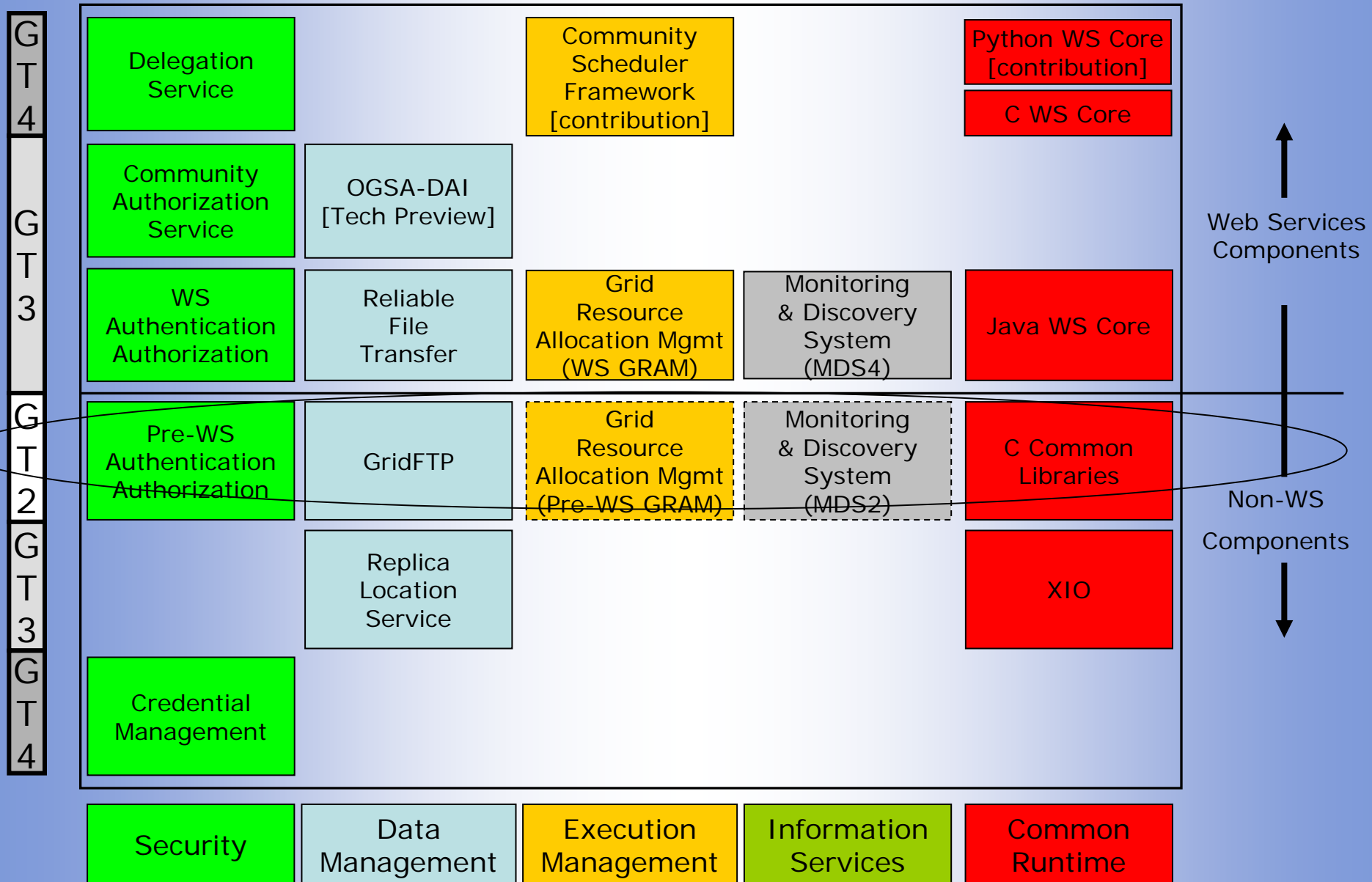
L I N K E D  
E N V I R O N M E N T S  
F O R A T M O S P H E R I C  
D I S C O V E R Y



## LEAD utilizes grid tools adopting a strategy to deal with middleware issues

- Stick with pre-ws globus version (Globus 2.4) and slowly transition to GT 4
- Develop software on self-controlled test grid constituting of machines distributed at various partner institutions
- port the tested version on to teragrid – production grid resources by working closely with the resource providers

# Pre-WS Globus components are still supported



# GT4 Components

## CLIENT

Your  
Java  
Client

Your  
C  
Client

Your  
Python  
Client

Your  
Java  
Client

Your  
C  
Client

Your  
Python  
Client

Interoperable  
WS-I-compliant  
SOAP messaging

X.509 credentials =  
common authentication

## SERVER

Your  
Java  
Service

GRAM

RFT

Delegation

Index

Trigger

Archiver

CAS

OGSA-DAI

GTCP

Your  
Python  
Service

pyGlobus  
WS Core

Your  
C  
Service

C WS  
Core

GridFTP

SimpleCA

MyProxy

RLS

Pre-WS GRAM

Pre-WS MDS

Java Services in Apache Axis  
Plus GT Libraries and Handlers

Python hosting,  
GT Libraries

C Services using GT  
Libraries and Handlers



# LEAD Test-bed Grid



# DEMO

- LEAD Portal demo



# The top level view

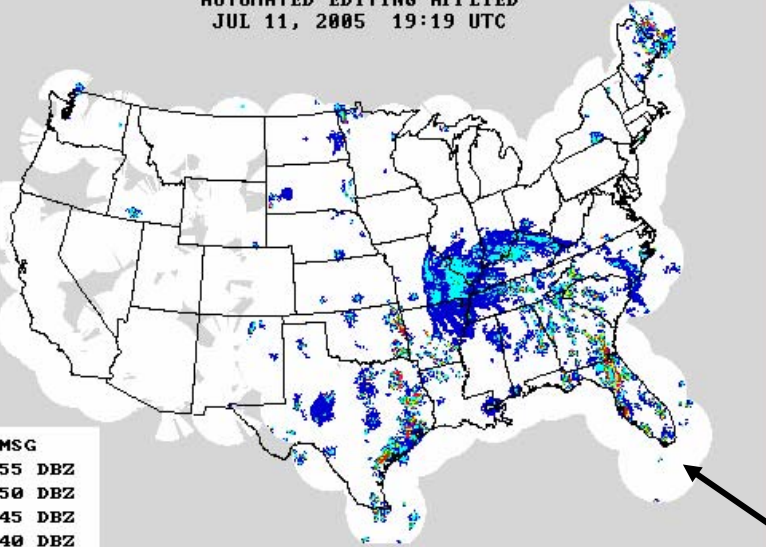
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To view a local radar, select area of interest and click on the image below.

**RADAR REFLECTIVITY FROM RADAR CODED MESSAGES**  
NATIONAL WEATHER SERVICE  
AUTOMATED EDITING APPLIED  
JUL 11, 2005 19:19 UTC



MSG  
55 DBZ  
50 DBZ  
45 DBZ  
40 DBZ  
30 DBZ  
15 DBZ

Data provided by NOAA's National Weather Service

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User Name   
Password   
☐ Remember my login  
  
[Create new account](#)  
[Forget your password?](#)

**LEAD Grid Testbed Status**

Testbed	Grid Auth	GRAM	GridFTP
IU [chinkapin]	✓	✓	✓
NCSA [copper]	✓	✓	✓
OU [aquaman]	✓	✓	✓
UAH [frozone]	✓	✓	✓
UNC [dante0]	✓	✓	✓
Unidata [lead1]	✓	✓	✓

Last updated: Mon Jul 11 14:00:01 2005 Indiana local

Top Level tabs to public Tools and information.

To get to your stuff, log in here  
Or create a new account

The current testbed status

The current weather.  
Click on a location for more data


# GEO Reference GUI Prototype

[Portal Home](#) [Geo GUI](#) [Education and Outreach](#) [Weather](#) [Links](#) [About LEAD](#) [Help](#)

Geo Reference GUI

initialize

Spatial Extent



Zoom to State(s)

Selection Layers Legend

refresh

☒ Select by Rectangle

Left: -180.0 Top: 90.00  
Right: 180.00 Bottom: 0.00

☐ Select by Polygon

(lon, lat) Pairs:

Lon, Lat: -88.2528, 34.4075

Temporal Range

From Date: 07-10-05 Time: 12:00

To Date: 07-11-05 Time: 9:00

Data Products

☒ Hourly Surface METAR Obs  
☐ 12-hourly UpperAir Balloons (Rawinsondes)  
☐ 5-minute ACARS Commercial Aircraft T, V  
☒ NEXRAD Level II (5-10 min)  
☐ NEXRAD Level III (5-10 min)  
☐ Half-hourly GOES Vis/IR

- Use mouse to drag a region of interest.
- Fill in the data requirements
- The tool, when finished will gather the data for you.

# Educational Resources


[Portal Home](#) [Geo GUI](#) [Education and Outreach](#) [Weather](#) [Links](#) [About LEAD](#) [Help](#)

Education Home

**LEAD Education and Outreach**

[Home](#) [LEAD Learning Communities](#) [Shared Workspace](#) [News LEADers](#) [LEAD Educator Workshops](#) [Evaluation Rubric](#)

## Modules



**LEAD Main Home**


[Lead E&O Vision](#)

[IDV Beginner's Tutorial](#)

[IDV Webstart Download](#)

[IDV Users Guide](#)

[Links to Related Material](#)



LEAD is funded by the  
National Science  
Foundation

### LEAD-TO-LEARN

#### EXPLORING TEMPERATURE CONTRASTS THROUGH VISUALIZATIONS

**Purpose**  
To introduce students to visualization as a tool for scientific problem solving using temperature data from the [NCEP Eta Model](#) as an example.

**Overview**  
In this learning activity, students will use the [Integrated Data Viewer \(IDV\)](#) tool to visualize temperature data from a numerical model output in order to explore the relationship between temperature contrasts, weather patterns, and geographical features so that important patterns become evident. The IDV will allow the student to visualize how temperature contrasts vary across North America, as well as how they change over time.

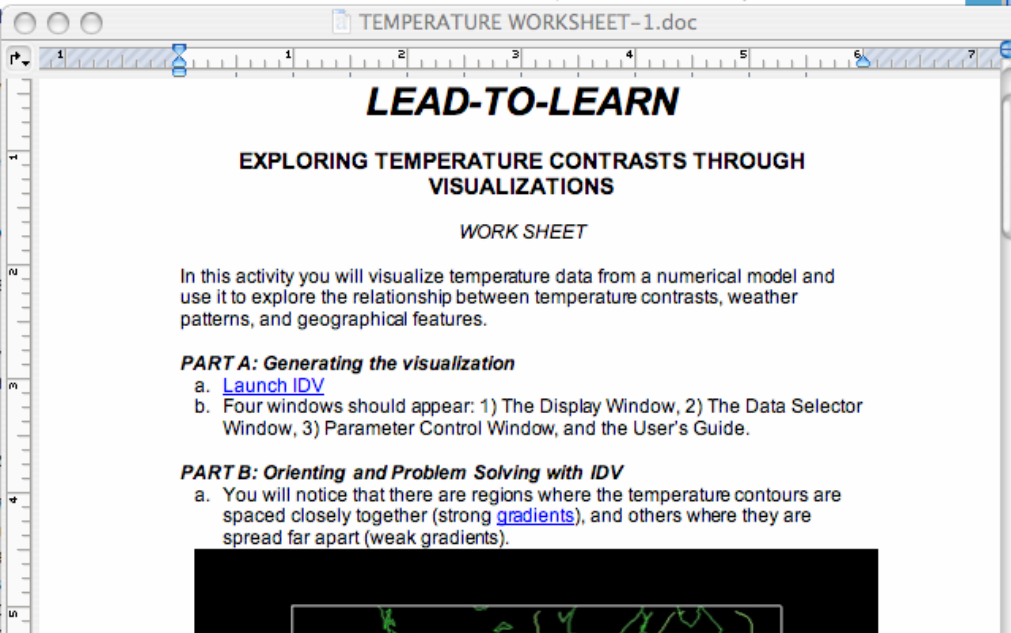
**Student Outcomes**  
By exploring a LEAD module, students will be able to:  
Students can analyze weather patterns in the model using visualization as a tool.

**Science Concepts** (National Science Foundation)  
*General*  
Visual models help us understand complex systems.

*Earth Sciences*  
Visualizations help us understand the Earth's atmosphere and how it changes over time and space.

*Geography*  
Geographical visualization helps us understand the spatial distribution of weather patterns and how they change over time.

*Science Inquiry Abilities*  
Identify answerable questions and design a study to investigate them.  
Design and conduct a study.  
Use appropriate tools and techniques to gather data.  
Develop and construct explanations and models.  
Think critically and logically about the evidence and conclusions.



TEMPERATURE WORKSHEET-1.doc

### LEAD-TO-LEARN

#### EXPLORING TEMPERATURE CONTRASTS THROUGH VISUALIZATIONS

**WORK SHEET**

In this activity you will visualize temperature data from a numerical model and use it to explore the relationship between temperature contrasts, weather patterns, and geographical features.

**PART A: Generating the visualization**

- [Launch IDV](#)
- Four windows should appear: 1) The Display Window, 2) The Data Selector Window, 3) Parameter Control Window, and the User's Guide.

**PART B: Orienting and Problem Solving with IDV**

- You will notice that there are regions where the temperature contours are spaced closely together (strong [gradients](#)), and others where they are spread far apart (weak gradients).

# Log in and see your MyLEAD Space

The screenshot displays the MyLEAD Portal interface. At the top, a banner reads "Welcome to the LEAD PORTAL" with the LEAD logo and "Linked Environments for Atmospheric Discovery". Below the banner is a navigation bar with tabs: LEAD, Portal Home, Education and Outreach, Help, Profile, OGCE, LEAD, and LEAD-DEV. A secondary bar shows "MyLEAD Workspace" and "Security". The main content area is titled "My Workspace Portlet" and is divided into two panes. The left pane shows a hierarchical tree of workspace items, with "Experiment: 84hr ARPS forecast" selected. The right pane, titled "Information of your current selection", displays details for the selected experiment: "Desc: 84hr ARPS forecast" and "ExpDate: 2004-10-28 00:00:00".

Welcome to the **LEAD PORTAL** Linked Environments for Atmospheric Discovery  
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LEAD Portal Home Education and Outreach Help Profile OGCE LEAD LEAD-DEV

MyLEAD Workspace Security

My Workspace Portlet

- myWorkSpace
  - Hurricane Ivan
    - Workflow template vizEta 2004-08-03 13:35:
    - Workflow template ARPS 2004-09-22 05:25:5
    - TestWorkflowTemplate01
  - Experiment: Ensemble run-5
    - Workflow instance ARPS 2004-09-22 05:25
    - Collection: Ensemble Run Input Collection
    - Collection: Case 1
    - Collection: Case 2
    - Collection: Case 3
    - Collection: Case 4
    - Collection: Case 5
  - Experiment: 84hr ARPS forecast**
    - Collection: Input Observational for 84hr AR
    - Collection: ARPS-out for 84hr ARPS forecas
  - CompletelyNewExperiment
  - HurricaneExperiment01
  - Mesoscale meteorology for college school stu

Information of your current selection

**Desc:** 84hr ARPS forecast  
**ExpDate:** 2004-10-28 00:00:00

# Searching MyLEAD

MyLEAD Query Client Interface (v0.3alpha)

Your DN

/C=US/O=National Center for Supercomputing Applications

Target: Experiment

Set Creator Search Range

	Month	Day	Year	Hour	Minute	Second	AM/PM
Start:	Jul	19	20...	01	35	20	PM
End:	Jul	19	20...	02	35	20	PM

myLEAD Query Result

## myLEAD Query Results

**Experiment: test\_adas**

- **GUID:** E242
- **Description:** testing adas
- **Date Added:** 2005-05-11 00:00:00
- **Experiment Date:** 2005-05-11 00:00:00
- **Attribute:** WFInstance
  - Element: WFInstName = WRF-Initialization-ADAS\_2
  - Element: WFInstDesc = Adas components to initialize both arps and wrf
  - Element: WFInstCont = Text Details Omitted - Length: 47895



# The Experiment Builder

- To review your previous experiments and create new ones
- Experiments are organized into projects
  - You can select an old one to look at,
  - Or create a new project or experiment.
  - Let's do a new experiment! (click "new")

The screenshot shows the LEAD Portal interface. At the top is a banner with the text "Welcome to the LEAD PORTAL" and "Linked Environments for Atmospheric Discoveries". Below the banner is a navigation bar with links: LEAD, Portal Home, Education and Outreach, Help, Profile. Below this is another navigation bar with links: MyWorkspace, Experiment Builder, Generic Service Toolkit, Security. The main content area is titled "Experiment Builder Portlet". It shows the user "Dennis Gannon" and a project selection dropdown set to "ADaM Data Mining" with an "Add Project" button. Below this is a section titled "Experiments" containing a table with two rows of experiment data.

LEAD Portal Home Education and Outreach Help Profile

MyWorkspace Experiment Builder Generic Service Toolkit Security

**Experiment Builder Portlet**

User: Dennis Gannon Project: ADaM Data Mining Add Project

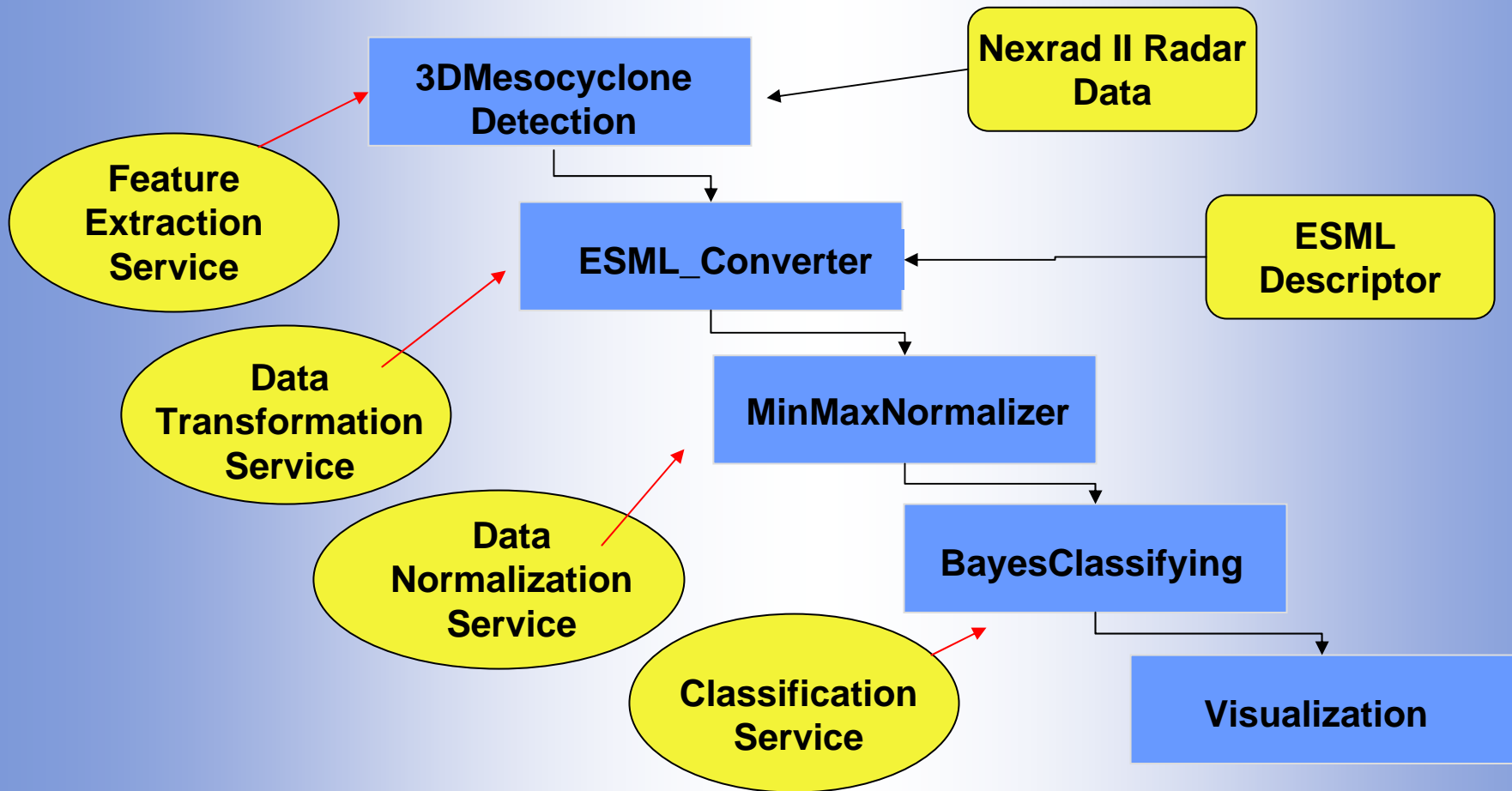
**Experiments**

Experiment Name	Description	Last Action Time
Simple_ADaM_test	This is a simple ADaM experiment using a fixed data set.	2005-07-20T15:48:46.499-05:00
EZ_ADaM	an easy version of the ADaM demo with canned input	2005-07-20T15:48:47.278-05:00

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# Creating a workflow for Data Mining

- Use ADaM services from UAH



# Provide a name and description

- Next select an application from the dropdown list or create a new workflow.
- Once we have selected the app, we push “next” to add data.

The screenshot shows the 'Experiment Wizard' interface within the 'Experiment Builder Portlet'. The top navigation bar includes links for 'LEAD', 'Portal Home', 'Education and Outreach', 'Help', and 'Profile'. Below this, a secondary bar contains 'MyWorkspace', 'Experiment Builder', 'Generic Service Toolkit', and 'Security'. The main content area is titled 'Experiment Wizard' and displays the user 'Suresh Marru' and project 'template\_workflows'. A blue header bar indicates the current step: 'Specify a name, description, and select workflow'. The form includes a 'Name' field with the value 'Datamining\_Experiment' and a 'Description' field with the text 'This is a test of the ADaM data mining sysem from UAH. We are using the "ADaM Demo" from the sample workflows.' Below these fields is a 'Workflow' section with two tabs: 'My Workflows' and 'Sample Workflows'. The 'Sample Workflows' tab is active, showing a dropdown menu with 'ADaM Demo' selected and a 'Refresh' button. A 'Description' box below the dropdown contains the text 'Dataming services workflow'. At the bottom right, there are four buttons: '< Back', 'Next >', 'Cancel', and 'Launch'. The footer contains links for 'LEAD Home', 'FAQ', 'Privacy', 'Terms of use', and 'Contact us'.

LEAD Portal Home Education and Outreach Help Profile

MyWorkspace Experiment Builder Generic Service Toolkit Security

Experiment Builder Portlet

Experiment Wizard

User: Suresh Marru Project: template\_workflows

Specify a name, description, and select workflow

Name: Datamining\_Experiment

Description: This is a test of the ADaM data mining sysem from UAH. We are using the "ADaM Demo" from the sample workflows.

Workflow

My Workflows Sample Workflows

ADaM Demo Refresh

Description

Dataming services workflow

< Back Next > Cancel Launch

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# Composing the Workflow

- Graphical Composer
  - Standard drop-and-drag composer model (like Kepler and others)
  - Compiles Python or PBEL code

The screenshot displays the ADaM-FeatureExtraction graphical composer interface. The top menu bar includes 'Workflow', 'MyLead', 'Component', 'Monitor', and 'Help'. Below the menu is a toolbar with 'Add Node', 'Remove Node', and 'Connect/Disconnect' buttons. The 'Component List' on the left shows a tree structure of components, with 'ADaM-FeatureExtraction' selected. The main 'Composer' area shows a workflow diagram with an 'Output\_Dir' component connected to 'ADaM-FeatureExtraction'. The 'Port Information' section at the bottom is divided into two panes: 'Selected Output Port' for 'Output\_Dir' and 'Selected Input Port' for 'ADaM-FeatureExtraction'.

**Component List:**

- http://whitney.extreme.indiana.edu:22002/resource
- http://www.extreme.indiana.edu/lead
- MyLEADNotificationTest
- Terrain\_Preprocessor
- ARPS\_to\_WRF\_Data\_Interpolator
- ARPS\_Plotting\_Program
- 3D\_Model\_Data\_Interpolator
- PostScript\_to\_Image\_Converter
- WRF\_Forecasting\_Model
- WRF\_to\_ARPS\_Data\_Interpolator
- ADaM-Applications
- ADaM-Classification
- ADaM-DataNormalization
- ADaM-DataTransformation
- ADaM-FeatureExtraction**
- WRF\_Ensemble\_Launcher

**Composer:**

Output\_Dir (Config) → ADaM-FeatureExtraction

**Port Information:**

**Selected Output Port:**

- Component:** Output\_Dir
- Port:** Parameter
- Type:** any
- Description:** This port can be connected to any type.

**Selected Input Port:**

- Component:** ADaM-FeatureExtraction
- Port:** Output\_Dir
- Type:** string
- Description:** Enter the gridftp URL of the data file, the service will put the results in this location

**Component Information:**

**Service:**

**ADaM-FeatureExtraction**

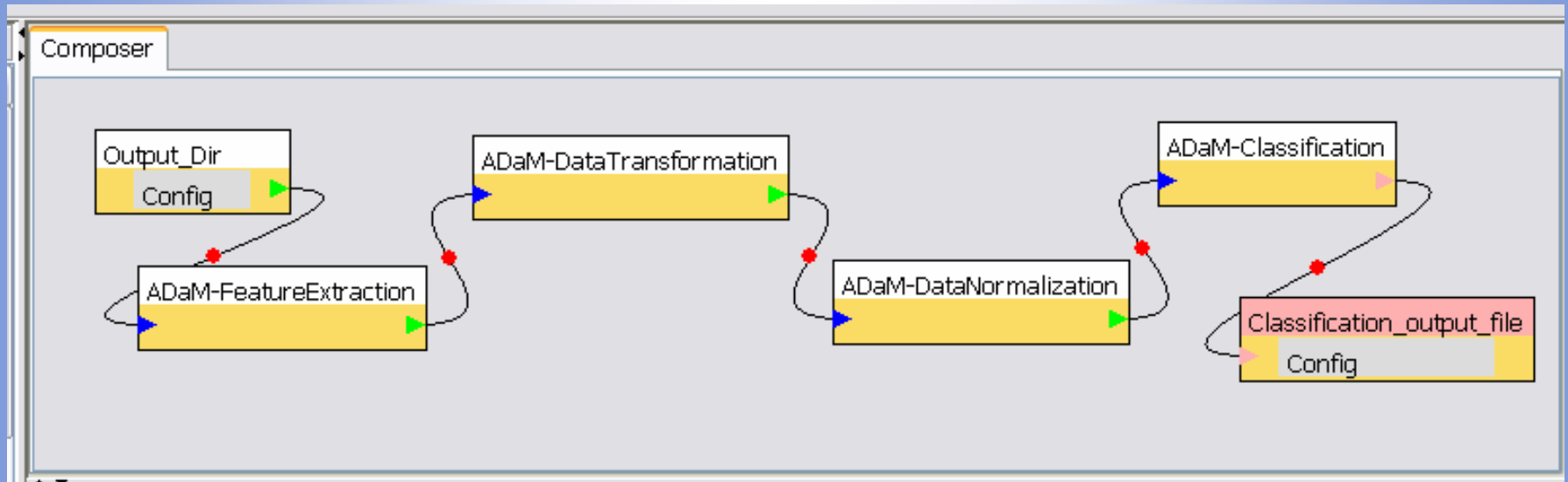
**Description:**

A set of methods for extracting features from raw data

**Operation:** Run

# Final Workflow

- Save it back to my lead
- Next we must bind the inputs to the workflow



# Wizard understand the workflow requirements

Welcome to the  
**LEAD PORTAL**

Linked Environments for Atmospheric Discovery  
Sponsored by the National Science Foundation

Logout  
Welcome, dennis  
gannon

Education and OutreachHelpProfile

Experiment BuilderGeneric Service ToolkitSecurity

Experiment Builder Portlet

Experiment Wizard

User: Dennis GannonProject: ADaM Data Mining  
Name: building\_a\_workflow  
Description: demo of composer  
Workflow: ADaM test version

Select Data Stores

Output\_Dir   
Enter the gridftp URL of the data file, the service will put the results in this location

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# Select an output location

[Back to Search Home](#)

**Search for Storage Resource**

ClearFind

Name

Protocol

GridFTP

Found 8 match(es) ...

**Query Results**

Select

<input type="checkbox"/> Chinkapin Tmp Storage	<a href="#">Toggle XML...</a> <a href="#">Toggle Details...</a>
<input type="checkbox"/> IU Testbed Public Space	<a href="#">Toggle XML...</a> <a href="#">Toggle Details...</a>
<input type="checkbox"/> IU Testbed Public Space	<a href="#">Toggle XML...</a> <a href="#">Toggle Details...</a>
<input type="checkbox"/> UAH Testbed Public Space	<a href="#">Toggle XML...</a> <a href="#">Toggle Details...</a>
<input type="checkbox"/> UNC Testbed Public Space	<a href="#">Toggle XML...</a> <a href="#">Toggle Details...</a>
<input type="checkbox"/> Unidata Testbed Public Space	<a href="#">Toggle XML...</a> <a href="#">Toggle Details...</a>
<input type="checkbox"/> OU Testbed Public Space	<a href="#">Toggle XML...</a> <a href="#">Toggle Details...</a>
<input type="checkbox"/> NCSA Testbed Public Space	<a href="#">Toggle XML...</a> <a href="#">Toggle Details...</a>

Select

# Submitting the workflow

LEAD

Portal Home

Education and Outreach

Help

Profile

MyWorkspaceExperiment BuilderGeneric Service ToolkitSecurity

Experiment Builder Portlet

Experiment Wizard

User: Suresh MarruProject: template\_workflowsName: Datamining\_ExperimentDescription: This is a test of the ADaM data mining sysem from UAH. We are using the "ADaM Demo" from the sample workflows.Workflow: ADaM DemoData Stores: Selected

Review and Submit

Please review the created workflow and if satisfied, click the "Launch" button below. You may use the "Back" button to change or review in greater detail your selections for this experiment.

[Start the workflow composer](#) in monitoring mode prior to launching the workflow so that you can see a visualization of the workflow's progress as well as the workflow's notifications as they arrive.

The [RENCI monitoring applet](#) provides additional additional information relating to the performance characteristics of the hosts where the workflow is executing.

For debugging purposes only, you may want to [start the notification viewer](#) prior to launching the workflow so that you can see the workflow notifications as they arrive.

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# Monitor results in real time

Add Node Remove Node Connect/Disconnect

Composer

```

graph LR
    Config1[Output_Dir Config] --> FE[ADaM-FeatureExtraction]
    FE --> DTrans[ADaM-DataTransformation]
    DTrans --> DNorm[ADaM-DataNormalization]
    DNorm --> Class[ADaM-Classification]
    Class --> Config2[Classification_output_file Config]
    
```

Port Information Notification

Time	Component	Status	Message
07/20/05 16:0...	Workflow	Started	
07/20/05 16:0...	ADaM_Feature...	Invoking	
07/20/05 16:0...	ADaM_Feature...	Started	Host: 146.229.234.73
07/20/05 16:0...	ADaM_Feature...	INFO	install location of the lead tools is /home/grid5070/production/adam-services
07/20/05 16:0...	ADaM_Feature...	INFO	the local temporary directory is /tmp
07/20/05 16:0...	ADaM_Feature...	INFO	the input url of the data file is gridftp://frozone.itsc.uah.edu/home/grid5070/production/adam...
07/20/05 16:0...	ADaM_Feature...	INFO	the output url to push the output files is gridftp://frozone.itsc.uah.edu/tmp
07/20/05 16:0...	ADaM_Feature...	INFO	the site name is KOUN
07/20/05 16:0...	ADaM_Feature...	INFO	the local work directory is /tmp/nexrad_1121893788358/3DMesocycloneDetection
07/20/05 16:0...	ADaM_Feature...	INFO	attempting to copy input data file to /tmp/nexrad_1121893788358/3DMesocycloneDetection/in...
07/20/05 16:0...	ADaM_Feature...	Received a file	From gridftp://frozone.itsc.uah.edu/home/grid5070/production/adam-services/FeatureExtract...
07/20/05 16:0...	ADaM_Feature...	DEBUG	attempting to run the detection
07/20/05 16:0...	ADaM_Feature...	Consumed a file	gridftp://frozone.itsc.uah.edu/home/grid5070/production/adam-services/FeatureExtraction/in...
07/20/05 16:0...	ADaM_Feature...	Finished comp...	0 sec
07/20/05 16:0...	ADaM_Feature...	INFO	attempting to push output files to gridftp://frozone.itsc.uah.edu/tmp

# Check it out in MyLEAD

## Experiment Builder Portlet

User: Suresh Marru

Project: demo-demo-run

### Experiment Status Page

#### Experiment Details

**Name:** Datamining-demo

**Last Notification Time:** 2005-07-19T14:25:32.590-05:00

**Description:** Datamining demo

**Status:** INFORMATION

#### Workflow

**Name:** ADaM Demo

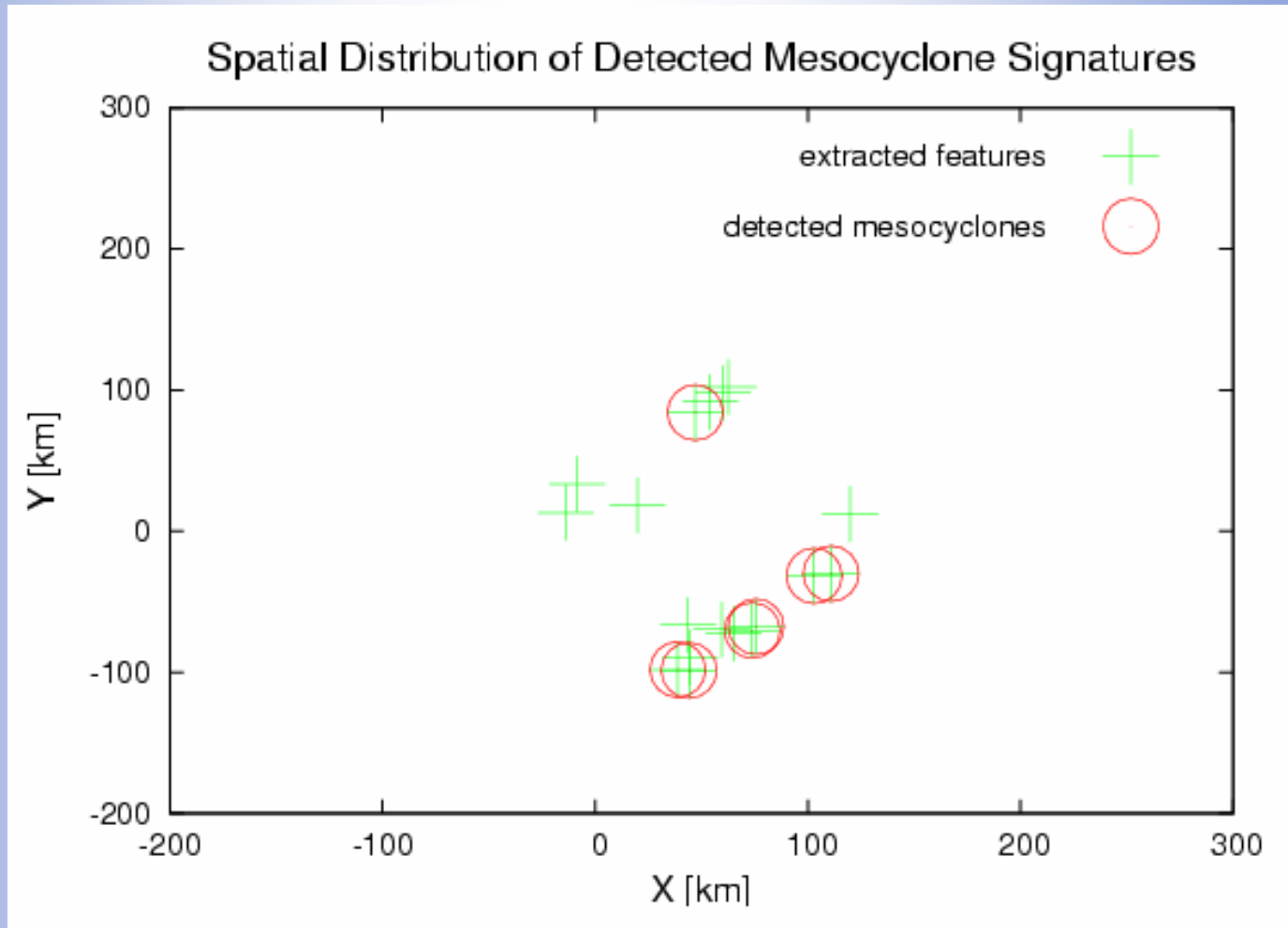
**Description:** Datamining services workflow

Parameter	Value
Output_Dir	gridftp://frozone.itsc.uah.edu/tmp

#### Notifications

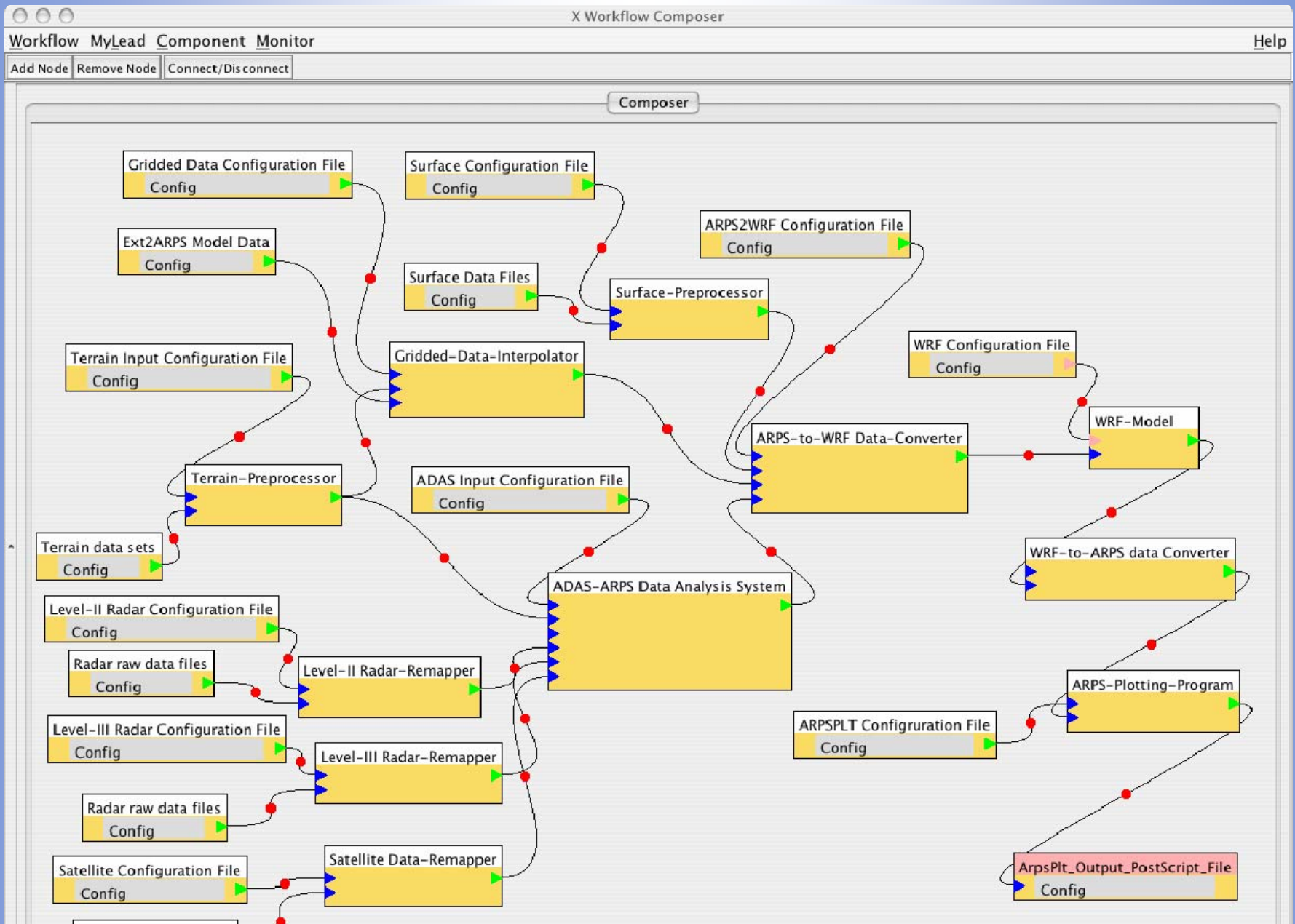
Message	Status	Timestamp
INVOKE SERVICE START	INFORMATION	2005-07-19T14:25:32
APPLICATION START	INFORMATION	2005-07-19T14:25:32
LEVEL: INFO MESSAGE: install location of the lead tools is /home/grid5070/production/adam-services	INFORMATION	2005-07-19T14:25:32
LEVEL: INFO MESSAGE: the local temporary directory is /tmp	INFORMATION	2005-07-19T14:25:32
LEVEL: INFO MESSAGE: the input url of the data file is gridftp://frozone.itsc.uah.edu/home/grid5070/production/adam-services/FeatureExtraction/input.dat	INFORMATION	2005-07-19T14:25:32
LEVEL: INFO MESSAGE: the output url to push the output files is gridftp://frozone.itsc.uah.edu/tmp	INFORMATION	2005-07-19T14:25:32
LEVEL: INFO MESSAGE: the site name is KOUN	INFORMATION	2005-07-19T14:25:32
LEVEL: INFO MESSAGE: the local work directory is /tmp/nexrad_1121800848241/3DMesocycloneDetection	INFORMATION	2005-07-19T14:25:32
LEVEL: INFO MESSAGE: attempting to copy input data file to /tmp/nexrad_1121800848241/3DMesocycloneDetection/input.data	INFORMATION	2005-07-19T14:25:32
FILE RECEIVE DURATION Duration(Millis): 1452 FILE UUID: testUUID	INFORMATION	2005-07-19T14:25:32
FILE CONSUMED FILE UUID: testUUID	INFORMATION	2005-07-19T14:25:32
LEVEL: INFO MESSAGE: attempting to push output files to gridftp://frozone.itsc.uah.edu/tmp	INFORMATION	2005-07-19T14:25:32
FILE SEND DURATION FILE SIZE (Bytes): 1025 FILE UUID: testUUID	INFORMATION	2005-07-19T14:25:32
PUBLISH URL: <a href="http://chinkapin.cs.indiana.edu/data-output/input.data_3Dmesocyclone_1121800848241.dat">http://chinkapin.cs.indiana.edu/data-output/input.data_3Dmesocyclone_1121800848241.dat</a>	INFORMATION	2005-07-19T14:25:32
PUBLISH URL: <a href="http://chinkapin.cs.indiana.edu/data-output/detection_1121800848241.output">http://chinkapin.cs.indiana.edu/data-output/detection_1121800848241.output</a>	INFORMATION	2005-07-19T14:25:32

# Click on the output file to see visualization



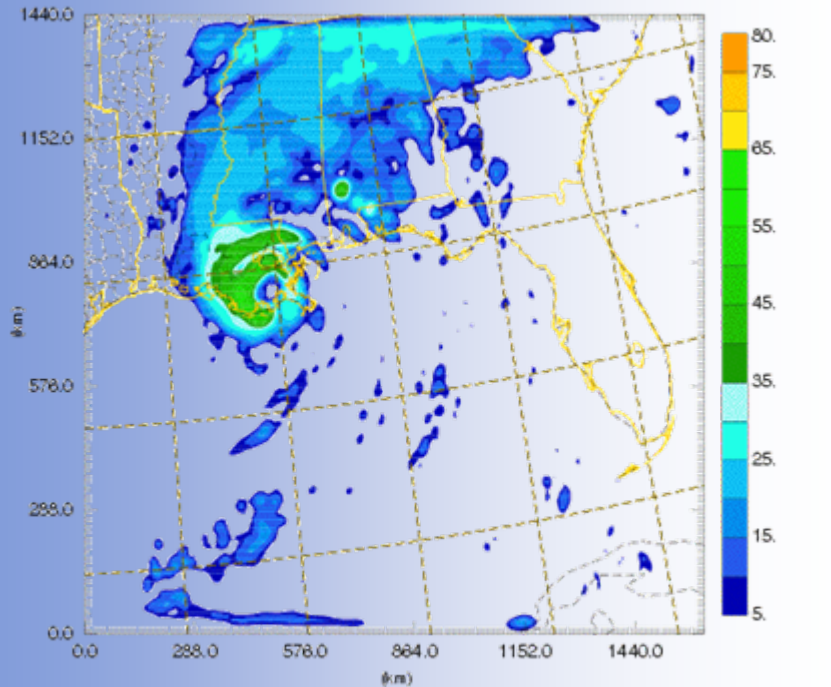


# Large workflows can be composed



# Output from the Weather Workflow

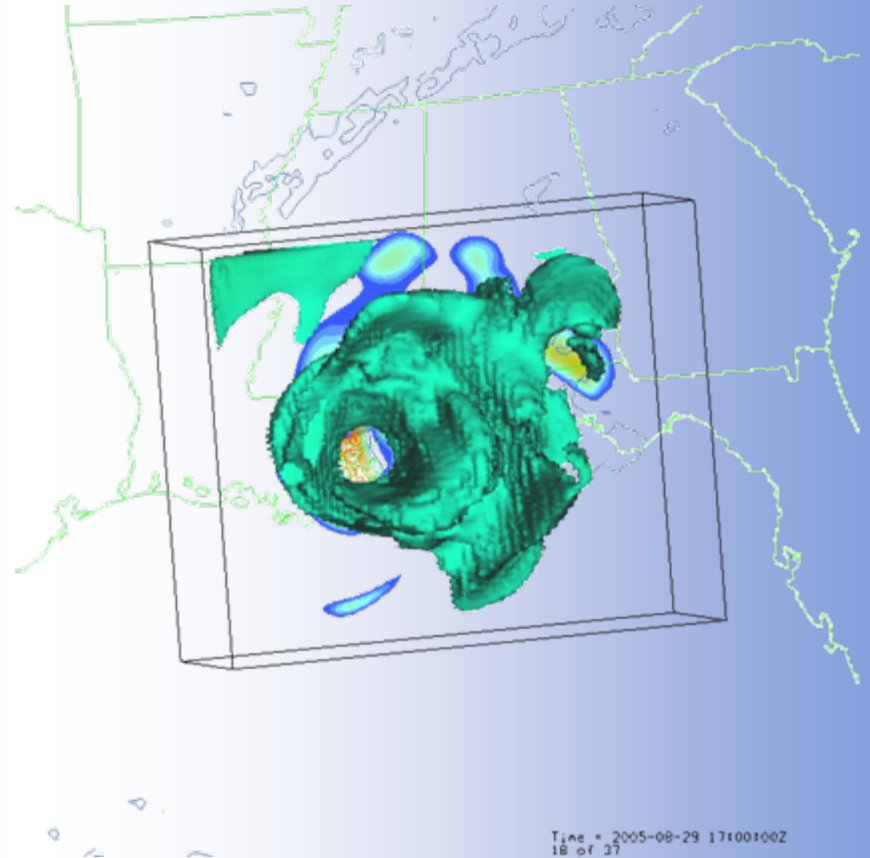
19:00Z Mon 29 Aug 2005 T=90000.0 s (25:00:00)



Composite Ref (dBZ, SHADED)

MIN=0.00 MAX=55.5

ARPS/ZXPLUT Katrina, version 5.2 Plotted 2005/09/22 12:08 Local Time



Time = 2005-09-29 17:00:00Z  
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# Acknowledgements

Slide Courtesy:

- Dr. Dennis Gannon
- Globus Website (<http://globus.org>)



Questions ?