geWorkbench Gridification
Analysis Gridification Use Case

Version 0.2

Revision History

Date	Version	Description	Author
06/08/2006	0.1	Initial draft	Eileen M. Daly
7/3/2006	0.2	Draft	Eileen M. Daley, KCS

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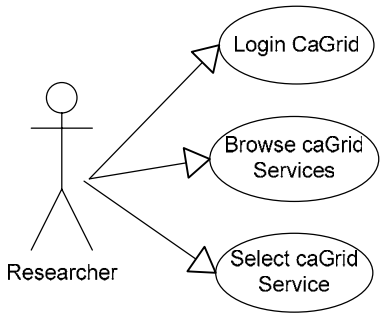
1 Analysis Gridification

1.1 Use Case Model



1.2 Brief Description

geWorkbench components support numerous types of computational analysis locally within the application. This Use Case document describes extending geWorkbench via use of caGRID-based services to provide remote execution of several of these computations. The set of analysis components supported in this Use Case is Self-Organizing Map (SOM), Hierarchal Clustering and Aracne. caGRID index services are used to locate and select remote execution hosts. .

1.2.1 caGRID Authentication

caGRID login credentials can be obtained in the caGrid-browser page (http://cagrid-browser.nci.nih.gov/cagrid-browser/). These required credentials are entered in the Service tab of the selected analysis component.

1.2.2 Service Selection

The service tab offers the ability to execute analysis using one of the following:

- Remote server discovered via caGRID indexing service: After successful authentication, the workbench queries caGrid metadata using the component name as the search keyword (such as Hierarchical Clustering). The query results are displayed in the analysis component Service tab. Users view detailed service descriptions and designate which

instance of a grid service to execute. If the selected service is not available, the system notifies the user and returns to the Service Tab.

- Local: The local server executes the analysis.

Note: Service selection choice is persistent across invocations.

If the selected local or remote service is available, the Project component is updated to reflect a result node with user interface elements to indicate the analysis is in progress. This result node is included in subsequent application invocations (complete or incomplete).

1.3 Actors

1.3.1 Primary

- Researcher

1.3.2 Secondary

- None

1.4 Preconditions

- Expression data has been loaded in the application.

1.5 Basic Flow - Analyze

Actor Action	System Response
1. User selects one of the analysis components: **Hierarchical Clustering Analysis, SOM Analysis** or **Reverse Engineering.**	2. **Parameter step**: System displays the selected component (Aracne, SOM or Hierarchical) . The Parameter tab is the default display.
3. To select where to execute the analysis, the user clicks the Service tab (see Service Selection subflow). 4. User populates parameters sections of the analysis component.	
5. User executes the analysis from the component parameters tab.	6. System verifies the selected service is running. If not, system returns to the **Parameter step** to

□ *Reverse Engineering*: User clicks 'Create Network' or 'Analyze 2D' □ *SOM or Hierarchical Clustering*: User clicks 'Analyze'.	prompt specifying another service. 7. System executes the request using the selected URL. The system passes data and parameters to the service specified. 8. System updates the Project Folders component to include the analysis result node.
9. To stop the execution, see Stop subflow.	10. System completes the analysis; the selected analysis component use case describes the analysis output.
	11. End

1.5.1 Sub Flow – Service Selection

Actor Action	System Response
	1. System displays the Service tab, allowing the user to select a method: □ Local: Invokes the client-side version. □ Grid: Enables the caGRIDexplorer selection method which will allow the user to enter or modify their caGrid user credentials.
2. User selects Local; system will run the analysis locally, return to **Parameters** step in the basic flow. 3. User selects Grid.	4. **Authentication**: If the user has not logged in to caGrid, see subflow Authentication 5. System queries caGrid Indexing Service with the analysis component name as the keyword (such as SOM) and displays the results. Note: If needed, a right scroll bar is included to support scrolling to view all the Index Services.
6. To view service metadata, see subflow View Metadata. 7. User selects a Grid Service and clicks OK.	8. System retains Service Tab selections, and Grid credentials persist across invocations. 9. System returns to **Parameters** step in the basic flow

1.5.2 Sub Flow – Authentication

Actor Action	System Response
	1. System prompts user to enter caGrid login and password.
2. **Login**: User enters credentials.	***3.*** If the login is unsuccessful, a message indicates ***'Grid Login invalid or session expired'.*** 4. If the login is successful, return to Authentication step in the Service Selection flow.
5. User repeats Login step or accesses caGrid-browser page to resolve password issues.	

1.5.3Sub Flow – Stop

Actor Action	System Response
1. User right clicks on the result node in the project panel.	2. System displays the option to cancel the request.
3. User selects **"**Stop"**.**	4. System cancels the request to execute the analysis. The result node is removed from the Project Folders component..

1.5.4 Sub Flow – View Metadata

Actor Action	System Response
1. User clicks on the Service URL or selects the radio button next to the service URL in the Service Tab.	2. System updates the service details to display the selected service metadata. Note: If needed, a right scroll bar is included in the service details section to support scrolling to view the entire metadata.
	3. System returns to **Parameters** step in the basic flow.

1.5.5 Post Conditions

- None

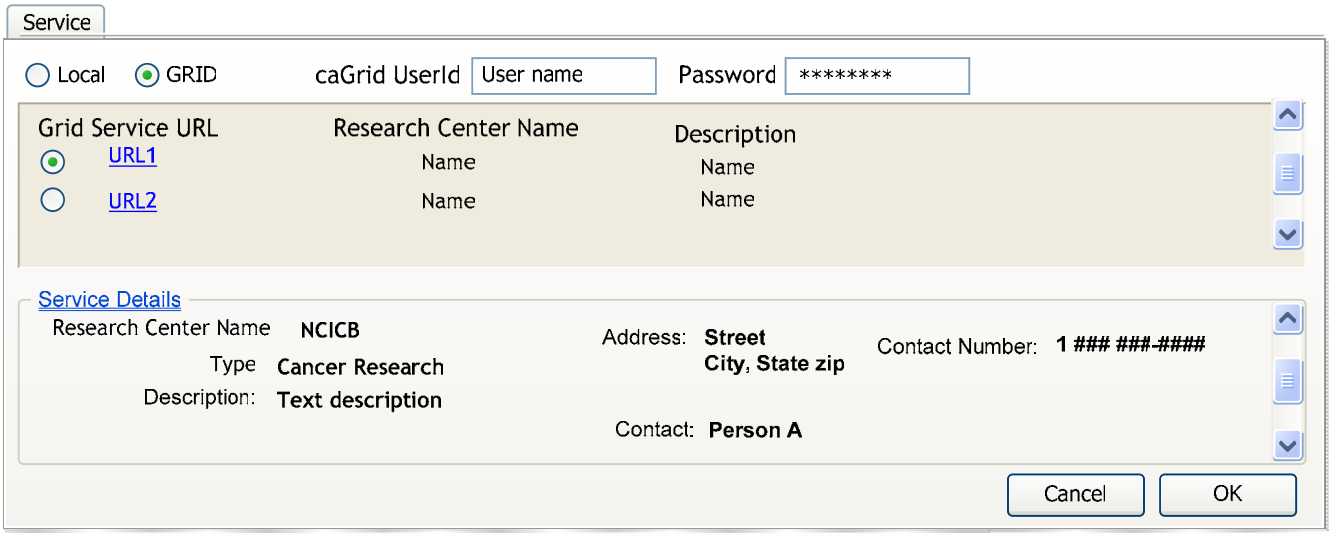
1.5.6 User Interface

The following is a list of some key components of the GUI.

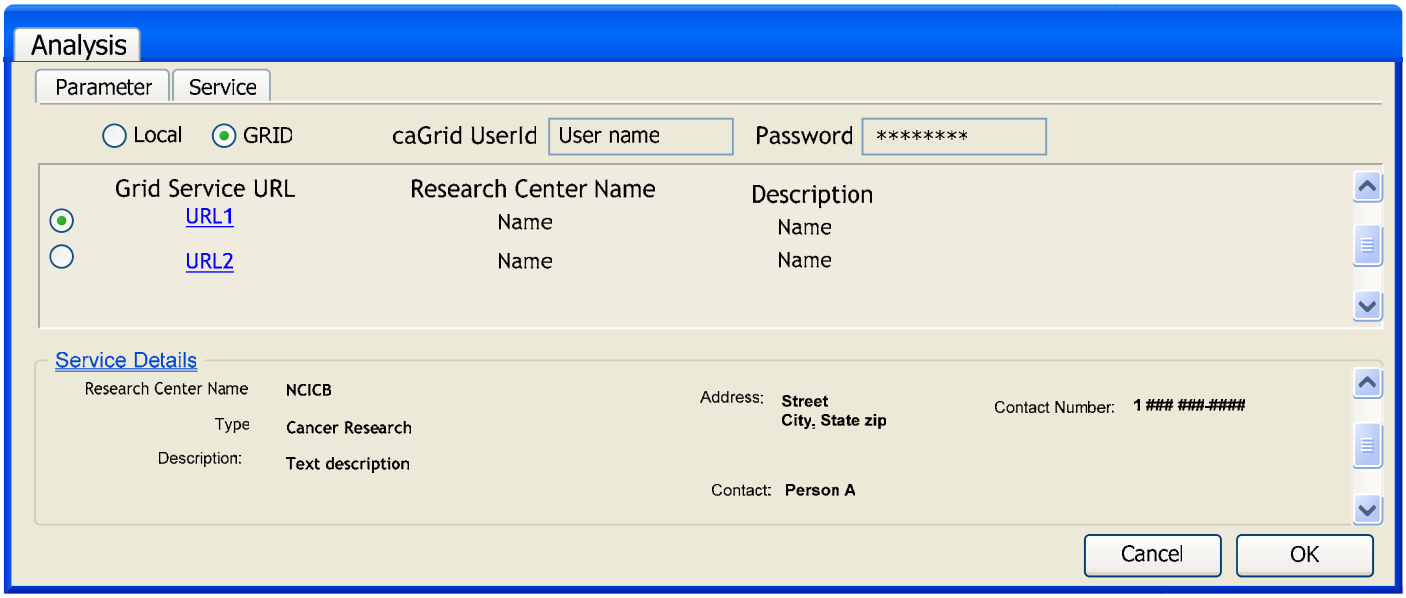
Field Name	Type	Description
OK	Button	Submits the request
Cancel	Button	Cancels the action
Local	Radio Button	Analysis is run locally (e.g. withing geWorkbench).
GRID	Radio Button	Searches the caGRID indexing services
caGrid Userid	Textbox	(editable) Capture caGrid user credentials. This field is enabled/editable when Grid is selected.
Password	Textbox	(editable) Capture caGrid user credentials password fields in the page are hidden by ****. This field is enabled/editable when Grid is selected.
URL	Link	The URL of the index service. Click on the url link to display the service metadata or select using the radio button.
Research Center Name	Display	Displays the name of the research center
Description	Display	A description of the services provided by the center.
Type	Display	The type of research center. This service metadata is displayed when the URL link is clicked on or the center radio button is selected.
Address	Display	The address of the selected research center. This service metadata is displayed when the url link is clicked on or the center radio button is selected.
Contact	Display	The research center contact person. This service metadata is displayed when the url link is clicked on or the center radio button is selected.
Contact Number	Display	The phone number for the research center contact person. This service metadata is displayed when

		the url link is clicked on or the center radio button is selected.

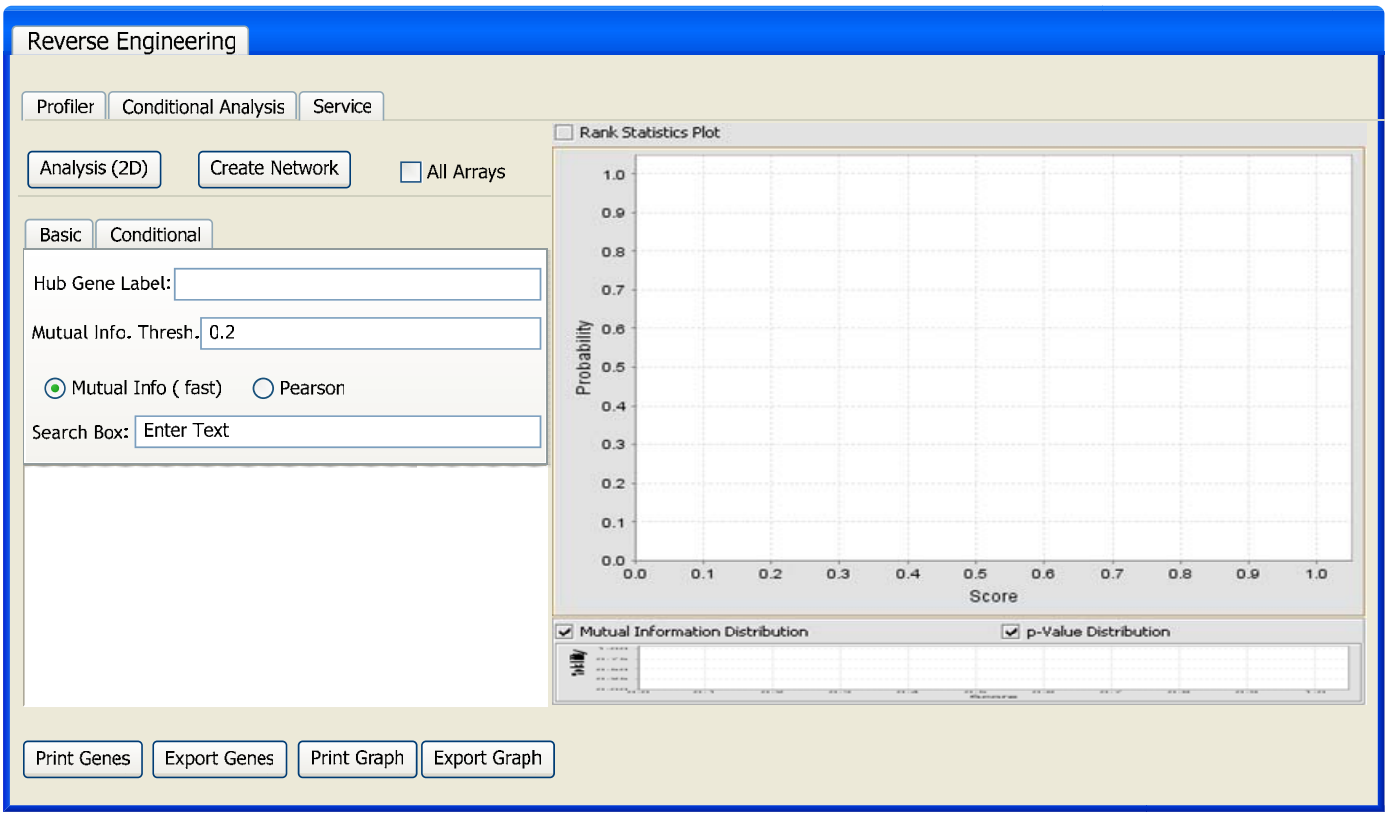
1.5.6.1 Service Tab



1.5.6.2 Analysis (SOM & Hierarchal Clustering)

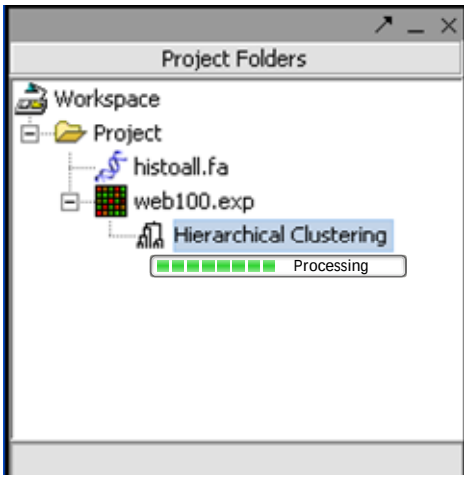


1.5.6.3 Aracne (Reverse Engineering)



1.5.6.4 Project Folders component

Field Name	Type	Description
Stop	Right click	Right clicking on a result node displays the option to discontinue analysis. A visual progress indicator is displayed below the result node.


Project Folders
Workspace
Project
histoall.fa
web100.exp
Hierarchical Clustering
Processing