

ORA Quick Start Guide

Kathleen M. Carley
Carnegie Mellon University
Netanomics

1.0 GENERAL

1.1 WHAT IS ORA?

ORA is a network analysis and visualization software package that helps the user enter, analyze, visualize, and forecast changes in networks using graph, statistical and visualization based techniques. ORA is designed to support the analysis of high dimensionality networks that include relationships that can change through time and that may be geo-temporally located; i.e., dynamic meta-networks. Using ORA, multiple valued relationships among the who, what, where, when, how and why of everyday life can be assessed.

1.2 WHAT SIZE OF NETWORKS?

ORA supports the analysis of networks ranging in size from only a few nodes (e.g., 2) to approximately 15 million nodes per node-class. The size of the networks that can be processed depends on: 1) the memory and number of cores on the machine being used; 2) whether or not you are using the basic version of ORA or the batch version; 3) the number of attributes and the kinds of attributes per node (e.g. attaching images, icons, urls, and full texts to nodes decreases the number of nodes that can be handled); and 4) the number of node-classes (yes there is a size per class versus number of classes tradeoff).

1.3 WHAT KIND OF NETWORKS CAN BE ANALYZED?

Any thing that can be represented as nodes and relations can be analyzed in ORA. A common type of network is the social network where the nodes represent agents, generally people or organizations, and the links represent a type of relationships such as friendships, works together, or mentors. A key feature of ORA is that the networks are organized into meta-networks.

A meta-network is a collection of inter-related networks and the associated node and link attributes for a specific time period. Meta-networks are composed of a set of node-classes, and networks. Each node-class contains a set of nodes of a particular type. The types used by ORA are agents, organizations, knowledge, resources, tasks, events, beliefs, and locations.

A network is a collection of relations of one type between nodes within one or two node-classes. If there are two relations between the same set of nodes, you would create two networks – e.g., friendship and mentoring would each be their own network within the same meta-network between agents.

For over time data a set of meta-networks are used. These can be included in ORA as either discreet networks one per time period, or as “delta’s” on the prior meta-network.

1.4 HOW IS ORA ORGANIZED?

ORA consists of 5 main components:

1. The **Importer**, which allows you to enter data from a variety of formats, such as from excel. This includes importing data from many of the formats in which other tools export network data.

2. The **Editor**, which allows you to edit the nodes and relations within and across networks. This includes the ability to add, delete, and merge nodes, move nodes between node classes, change the values of relations, and add or delete attributes of nodes. Note, the editor can by itself be used to enter data!
3. The **Data Manager**, which allows you to manipulate networks. This includes the application of standard matrix algebra techniques as well as applying special functions across multiple networks.
4. The **Reports**, which allows you to assess and evaluate the networks from both a standard social network perspective and the more highly dimensional meta-network perspective used in dynamic network analysis. Each report addresses a network question and automatically calculates for the user the relevant available metrics. The results of the analysis with simple descriptions of the meaning of those results are provided.
5. The **Visualizers**, which allow you to visually manipulate networks and identify important results such as key actors, groups, and spatial or temporal trends. There are multiple visualizers including 2D graphs, 3D graphs, geo-spatial, trails (space and time), nodel (Word Cloud for nodes), and assorted graphing techniques.

1.5 WHAT ARE THE FIRST THINGS TO LEARN?

The most basic tasks in ORA are to a) import your data, b) run the basic reports, and c) visualize your data. Many users will have simple one mode one time period data. Even those users with more complex meta-network data and/or with dynamic data will want to be able to do these basic functions.

Step 1) Import Data. The easiest way to import data is to use the import wizard. Simply click through and it will help you identify your data type and then help import it.

Step 2) Analyze Data. The basic reports are the Standard Network Analysis Report and the Key Entity Report. Run both! If you have meta-network data the Key Entity Report will be more valuable to you. Both reports can be found under the Analysis tab – then Locate Key Entities. Simply select the report and the report will walk you through the steps needed.

Step 3) Visualize Data. The basic visualizer is the 2d graphic visualizer. This visualizer can be found under the Visualization tab – then View Networks – then 2-D Visualization. Within the visualizer you can color nodes and lines, move things about, size nodes by metric, color nodes by group, identify specific nodes of interest, and so on. For fun, you might try the 3-D Visualization, but for most applications the 2-D Visualization will be the workhorse.

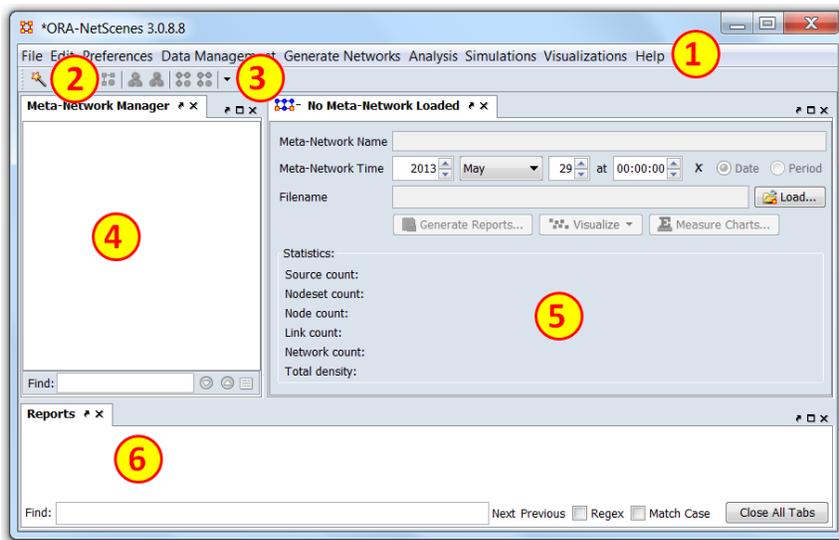
2.0 Basic Features

2.1 BASIC INTERFACE

The ORA interface is organized into three sections which are placed in resizable and dockable panes. Each pane will have one or more individual parts. On each tab are two buttons: **undock and close**. In the upper right corner of each pane are three buttons: **undock, maximize, and close**. This will allow you to arrange the interface to suit your needs.

The ORA Interface

- 1) **Menu** – Source for performing the majority of tasks. The Menu Items are separated into categories each with their own functions.
- 2) **Toolbar** – Buttons for main functions to work with Meta-Networks, NodeClasses and Networks.
- 3) **Toolbar Button Adder** – Allows you to add menu functions to the toolbar.
- 4) **Meta-Network Manager** – This pane displays all currently open Meta-Networks.
- 5) **Editor** – This pane displays in multiple tabs information on Node Classes and Networks.
- 6) **Reports** – This pane display reports run on Meta-Networks.



2.2 WHAT IS IN A META-NETWORK

Meta-Network – A representation of a Group of Networks.

Node – A representation of a real-world item (a who, what, where, how, why item).

Node Class – A set of nodes of one type.

Link – A representation of a tie, edge, connection, or relation link between any two nodes.

Network – A representation of a set of nodes (including meta-nodes) of one type and the links (including meta-links) of one type between them.

Attribute – Additional information about a node. Common agent attributes are **age** and **gender**. Common location attributes are **latitude** and **longitude**. Another common attribute is a url pointing to an image or a text with additional information.

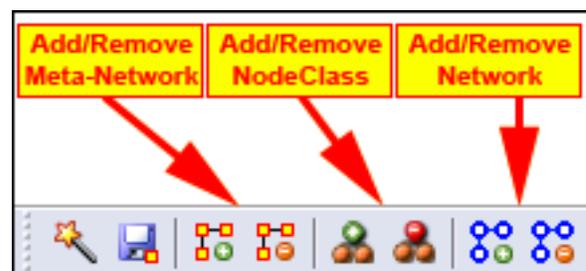
2.3 META-NETWORKS, NODECLASSES, AND NETWORKS BUTTONS

ORA contains tools to Add or Remove **Meta-Networks**, **NodeClasses**, or **Networks**. The **Plus** sign denotes adding and the **Minus** sign denotes removing.

To add a **Meta-Network**, **NodeClass**, or **Network** click the appropriate button. The new item will appear in the Meta-Network Manager.

To remove a **Meta-Network**, **NodeClass**, or **Network** highlight the item and click the appropriate button.

NOTE : When in the actual program only the applicable buttons will be active e.g. if a network is highlighted then only the Network buttons are active. All others would be greyed out.



2.4 MEASURES

A measure is a function that takes as input one or more networks, Meta-Network, or some subset and outputs a single value or a vector of values. ORA includes a variety of measures: standard social network one-mode measures, two-mode measures, and meta-network measures. In addition for specialized data there are a selection of specialized measures. These measures are at various levels, e.g., there are network or graph level measures that

can be used to assess the overall properties of the network or meta-network. Then, there are node level measures that can be used to identify the relative criticality of various nodes within the network or meta-network. In ORA, measures are organized in Reports. A Report includes a collection of measures for answering specific questions. For more information on the measures see the User's Guide.

2.4 SAVE YOUR DATA

Data: It is important to save your data from time to time. If something happens to your computer or ORA then all work done since your last save will be lost. You have two options.

File > Save Meta-Network : Saves your work to the file that was originally open.

File > Save Meta-Network As... : Saves your work to a new file. Give the file a new file name when ORA asks. This can be useful if you are experimenting with different ideas and do not want to affect your original data.

Analyses: ORA reports are natively in html. You can save these and re-open later in your browser to see the result of your analyses.

Visualizations : The visualizations can be saved in a number of standard formats such as .jpg and tiff. Note, options for saving the visualizations as gray-scale exist if you are generating images for journals.

2.5 PREFERENCES

Every user will have their own way they want ORA to perform. The preferences allow for tweaking those functions. There are many parameters that can be set but the important ones to a new user are listed for the individual tabs.

General : Preferences for the look and feel of ORA such as whether tooltips are shown when hovering over items and the size of the toolbar icons.

Data Sets : As a new user concentrate on the three radio buttons near the bottom. These allow you to specify what files you want to load whenever you restart ORA. To start make sure it is set to **Restore previously loaded workspace files at startup**. This can be changed as you learn more about the workings of ORA.

3.0 Importing Data

3.1 CREATING A NETWORK AND NODECLASS FILE

A NodeClass or Network can be created either in ORA or in an external program such as a text editor [NotePad or NotePad++] or a spreadsheet program [Excel].

Using a Text Editor

To create a Network in a Text Editor all information will be separated by commas. The lefthand column consists of the **FROM** nodes and the top row consists of the **TO** nodes. A **"0"** at an intersection means there is no link while a **non-zero number** means there is a connection.

```
,A01,A02,A03,A04,A05
A01,0,0,0,0,1
A02,1,0,0,0,0
A03,1,0,0,0,1
A04,1,0,0,0,1
A05,0,0,0,0,0
```

NOTE : In the text file above notice the **empty value** in the top row just to the left of the top comma. This corresponds to the empty cell in the Excel spreadsheet **Column A – Row 1**.

To create CSV files save them as a text file (.txt) but change the extension name to **.csv**.

Using Excel

In an **Excel Spreadsheet** you would place each set of nodes in a separate row or columns with each piece of information in a separate intersecting cell. To create a CSV file select **File > Save As...** and save it as a comma-delimited file.

	A	B	C	D	E	F	R	S	T	U
1		A01	A02	A03	A04	A05				
2	A01	0	0	0	0	1				
3	A02	1	0	0	0	0				
4	A03	1	0	0	0	1				
5	A04	1	0	0	0	1				
6	A05	0	0	0	0	0				

Excel with the SG-1 Network data

Links will run from the node in **Column A** to the node in **Row 1**. For example there is a link from A02 > A01 [cell B3] but there is no link from A01 > A02 [cell C2].

Again note that the cell **[A1]** is blank. This is common in all network files created in this manner.

3.2 IMPORT CSV FILES INTO ORA TO CREATE NODECLASS AND NETWORK:



With **NodeClass** and **Network** created it is time to import them into ORA. For this we use the **Data Import Wizard**.

Select **Import existing data? > Table Data from Excel of delimited formats > Rectangle of link weights (a Matrix)**. Click [**Next >**].

Click **Create a new meta-network with ID:**

Replace **Meta Network** with the name for your new Meta-Network then click [**Next >**]

Import Data into ORA

Construct a meta-network by combining data from one or more files. The file format is determined by the filename extension.

Select a file: C:\myStuff\data\stargate sg-1\csv files\sg1_agent_x_agent.csv [Browse]

Source type: Agent Target type: Agent Source node labels Create new nodes

id: Agent id: Agent Target node labels Delimiter: ,

Network ID: Agent x Agent

[Click to import from another file]

[Cancel] [< Back] [Next >] [Finish]

The Import Data Interface

Click [**Browse**] and locate the CSV file of the agents.

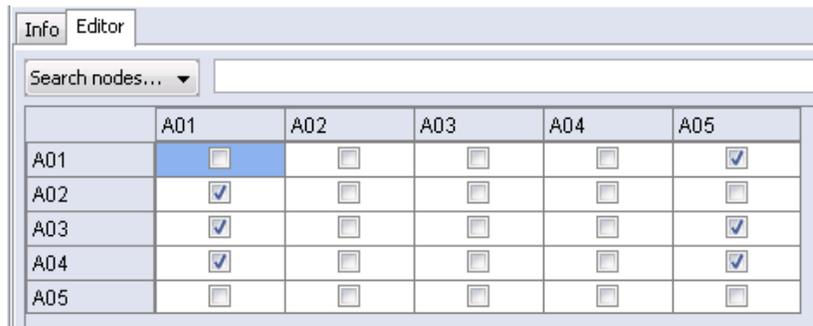
Set **Source type** and **Target type** to agent.

NOTE : For this Network both are set to agent. Depending on the data you are importing these may be set to different nodeclasses.

NOTE : Clicking on the **Click to import from another file** allows you to import additional networks.

Click [**Finish**].

To import additional files into the **Meta-Network** choose **Add to the existing meta-network** instead of **Create a new Meta-Network with ID:**. Then select the Meta-Network to add.



	A01	A02	A03	A04	A05
A01	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A02	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A03	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A04	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A05	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The ORA Editor with the SG-1 network loaded

3.3 CREATING A NODE TITLE/ATTRIBUTE FILE

CSV files are used to create NodeClass and Network files. These can be created in either a text editor or a spreadsheet program.

In a **Text Editor** you would place each node on a separate line with all information separated by commas. To create CSV files same them as a text file (.txt) but change the extension name to **.csv**. For this example the file will create Node Titles. This could be used to import any attribute. The top row contains the names of the fields that will be imported.

```
id,title
A01,col_jack_o'neill
A02,maj_samantha_carter
A03,daniel_jackson
A04,teal'c
A05,gen_hammond
```

In an **Excel Spreadsheet** place each node name or attribute into a separate row with each piece of information in a separate cell. The juxtaposition of the various cells on a row code the relations of interest To create CSV files **Save As...** a comma-delimited file.

In a **Text Editor** place each node on a separate line. Save as a text file with the **.csv** extension.

NOTE : Only rows with ids which match up to existing nodes will be imported unless the **Create new nodes** option is checked.

3.4 IMPORT ATTRIBUTES INTO ORA:

Select **Import existing data? > Table Data from Excel of delimited formats > Simple Table > Node Attributes**. Click [**Next >**].

Select the Meta-Network to add information. Click [**Next >**].

Click **Browse** and navigate to your attribute file.

Select from the drop down which column to use to identify your node IDs.

For each column a box will appear allowing you to choose which attributes to import. Place a check mark next to each attribute you want and give it a Type: Text Category, Text, URI, Number Category, Number, or Date. An attribute without a check mark will not be imported.

Select the NodeClass to add the attributes. This drop down will contain multiple entries if your Meta-Network contains more than one NodeClass.

Click [**Finish**].

The A01, A02, etc will be replaced with the titles in the attribute file.

NOTE : Only the attributes you check mark will be imported. All others will be ignored.

3.5 CREATING DATA

In case you do not have a data set and simply want to create an artificial one for evaluation that can be easily done. In this case use the tab – Generate Networks. There are a number of options available. As you are getting started the one to try is Create Stylized Network. Here you will see options to create networks of the size and structure you desire that are of various stylized forms. Simply click on the desired topology and ORA will lead you through a series of questions to create the network of your choice. For example, to create a random network select Erdos-Renyi. Then specify the type of nodes (pick a source and target nodeset – which can be the same!), the number of nodes, and the density. When done click on create. The network will appear under the meta-network manager.

4.0 Editing Data

4.1 ADD/REMOVE NODES IN THE EDITOR:

Nodes can be added or removed to any NodeClass through the Editor. Highlight the NodeClass then use the buttons on the right side of the Editor to manipulate the nodes. Some of the functions require that you place a check mark next to the node you are working with [i.e. deleting a node].

Create: Insert new nodes into meta-network

Move: Move node(s) from one node set to another

Delete: Remove node from NodeClass

Merge: Combine two or more nodes into one

Clean: Condense all references of one person into a single node.

4.2 CHANGE DISPLAY TO BINARY OR NUMERICAL

The grids in the Editor can display link data as numeric or check marks. Binary data is usually done with check marks as it is simply on or off. Numerical data [for weighted links] can show a link as 0 of a positive/negative number.

Click **Display Options** near the bottom right of the Editor interface.

Select **Binary link vales** to display data as check marks.

Select **Numerical link vales** to display data as numbers

4.3 ADD/REMOVE LINKS IN THE EDITOR TAB [BINARY]

Click the [Options...] button in the lower right of the Editor.

Highlight a **Network** in the Meta-Network panel

Select the **Editor Tab**.

In the grid find the intersection of the column node and row node.

To **create** a link place a **check mark** in the cell. This can be done by clicking the box or pressing the spacebar while the cell is active.

To **remove** a link deselect a cell by removing the **check mark**.

4.4 ADD/REMOVE LINKS IN THE EDITOR TAB [NUMERICAL]

Highlight a **Network**

Select the **Editor Tab**.

In the grid find the intersection of the column node and row node.

To **create** a link place a **non-zero number** in the cell.

To **remove** a link place a [**0**]in the cell.

5.0 Manipulating Data

The Data Management tab is valuable for transforming and manipulating your data. Under this tab are all the standard matrix algebra options, as well as special options for meta-networks. Blank Meta-networks can be created directly by selecting Meta-Network and then Add New Meta-Network.

6.0 Analyzing Data - Reports

Reports give you information about your Meta-Networks. These are the four most important reports. The other reports are more specialized.

Key Entity : Identifies key entities and groups who, by virtue of their position in the network, are critical to its operation.

Networks: agent x agent, agent x knowledge, agent x resource, agent x task, agent x event, agent x location, all knowledge networks, any resource networks, task x event, task x task

Standard Social Network Analysis : Calculates the standard network analysis measures

Networks: Any square Network [i.e. agent x agent]

Sphere of Influence : For each individual, identifies the set of actors, groups, knowledge, resources, etc. that influence, and are influenced, by that actor.

Networks: agent x agent, agent x knowledge, agent x resource, agent x task, agent x location

Locate Sub-Groups : Identifies the subgroups present in the network using various grouping algorithms. Most algorithms only work on a single network at a time .

Networks: Networks selected by the user

These reports are run from the Editor menu.

From the menu select **Analysis > Generate Report >[type in name of specific report]**

In the searchbox at top type in the name of the report.

You can type in the entire name or select the report from the drop down menu.

Place a check mark next to the Meta-Networks to process and click [**Next >**].

Place a check mark next to the NodeClasses and Networks to process. Click the box to remove unwanted check marks.

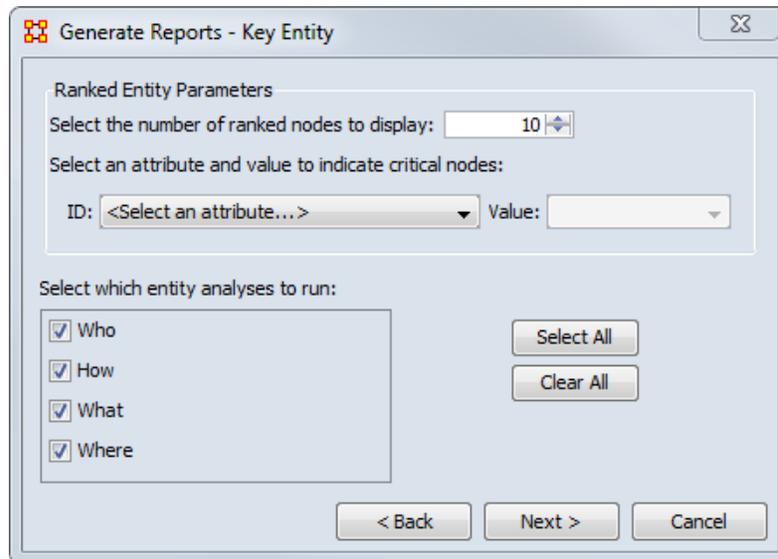
Select the number of nodes to display and click [**Next >**].

Select the location to save the files and the filename for the report and click [**Finish**].

The reports will open in the Report tab of the editor in a text format. They will also open your browser and display with animated graphics

6.1 FOCUS ON ACTOR

One item you need to discover is who is important in a Meta-Network. To obtain this information you can run the **Key Entity report**. Go to **Analysis > Generate Reports > Locate Key Entities > Key Entity**.

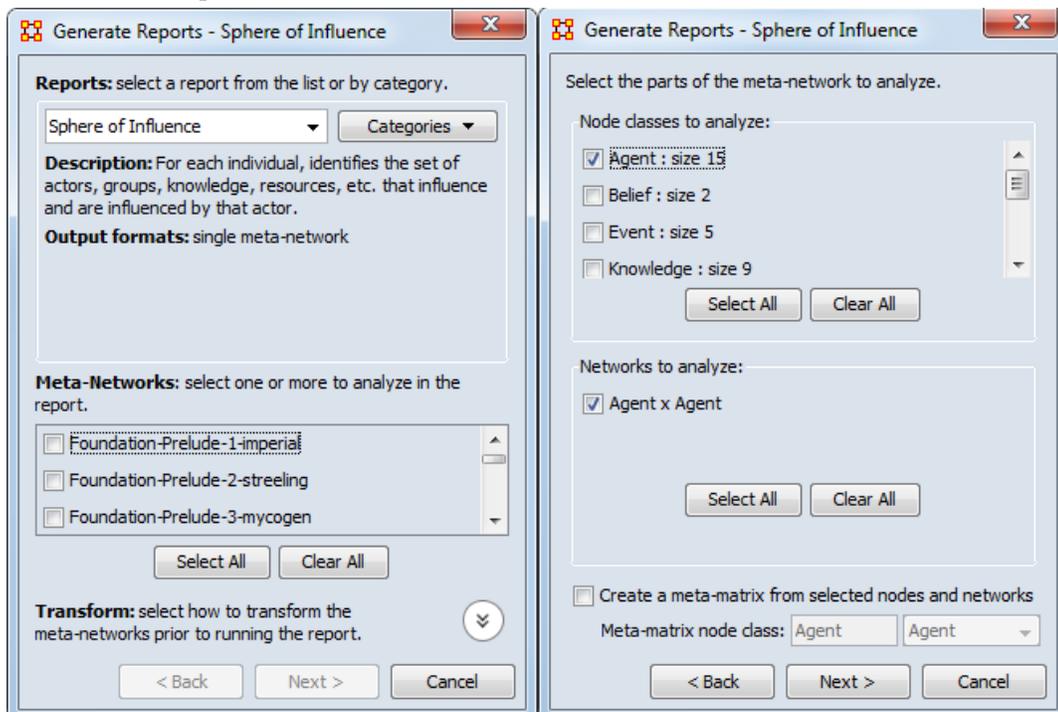


The screenshot shows a dialog box titled "Generate Reports - Key Entity". It contains the following elements:

- Ranked Entity Parameters:**
 - "Select the number of ranked nodes to display:" with a text box containing "10" and a spin button.
 - "Select an attribute and value to indicate critical nodes:" with an "ID:" dropdown menu (currently showing "<Select an attribute...>") and a "Value:" dropdown menu.
- Select which entity analyses to run:**
 - A list of four items: "Who", "How", "What", and "Where", each with a checked checkbox.
 - "Select All" and "Clear All" buttons to the right of the list.
- Navigation buttons at the bottom: "< Back", "Next >", and "Cancel".

The report will ask you for the number of nodes to display and if you want to use a particular attribute in the calculation. The most important selection is the **Who, How, What, and Where**. When focusing on actors place a check mark in the **Who** only. By default the report lists the top 10. This can be changed when running the report.

To find out how a particular person is connected run the **Analysis > Generate Reports > Locate Key Entities > Sphere of Influence** report.



The image shows two side-by-side screenshots of the "Generate Reports - Sphere of Influence" dialog box.

Left Screenshot:

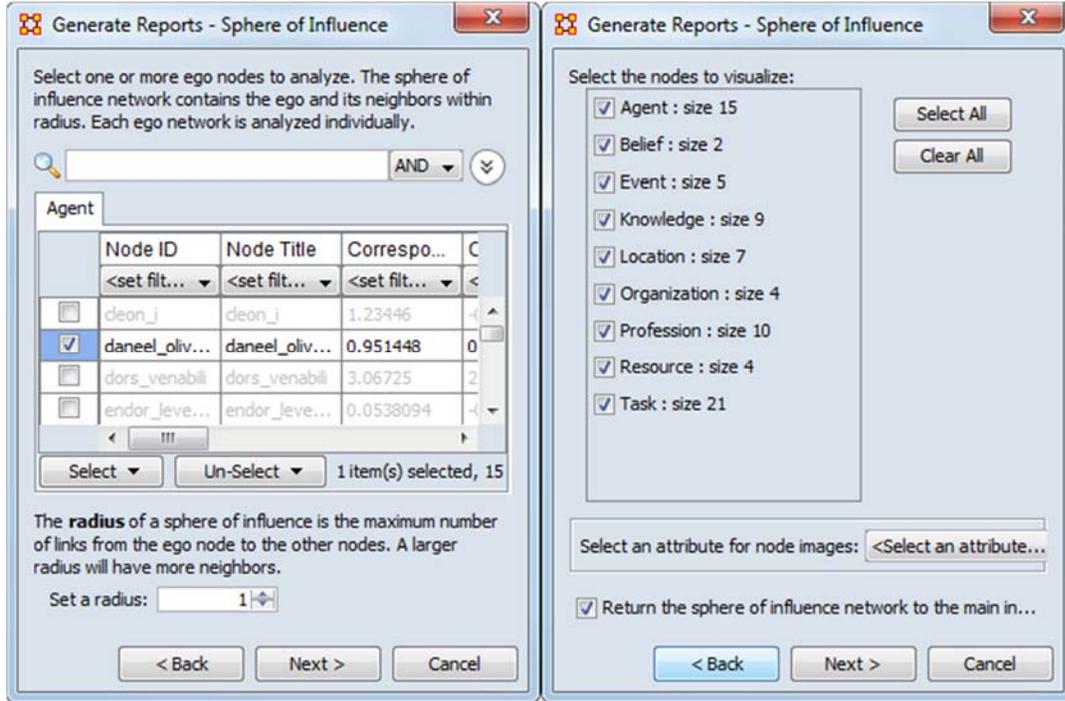
- Reports:** "Sphere of Influence" selected in a dropdown, with a "Categories" dropdown.
- Description:** "For each individual, identifies the set of actors, groups, knowledge, resources, etc. that influence and are influenced by that actor."
- Output formats:** "single meta-network".
- Meta-Networks:** "select one or more to analyze in the report." A list with three items: "Foundation-Prelude-1-imperia", "Foundation-Prelude-2-streeling", and "Foundation-Prelude-3-mycogen", all with unchecked checkboxes. "Select All" and "Clear All" buttons are below.
- Transform:** "select how to transform the meta-networks prior to running the report." A dropdown arrow is shown.
- Navigation buttons: "< Back", "Next >", and "Cancel".

Right Screenshot:

- Select the parts of the meta-network to analyze:**
 - Node classes to analyze:** A list with four items: "Agent : size 15" (checked), "Belief : size 2", "Event : size 5", and "Knowledge : size 9". "Select All" and "Clear All" buttons are below.
 - Networks to analyze:** A list with one item: "Agent x Agent" (checked). "Select All" and "Clear All" buttons are below.
 - "Create a meta-matrix from selected nodes and networks".
 - Meta-matrix node class: "Agent" selected in a dropdown.
- Navigation buttons: "< Back", "Next >", and "Cancel".

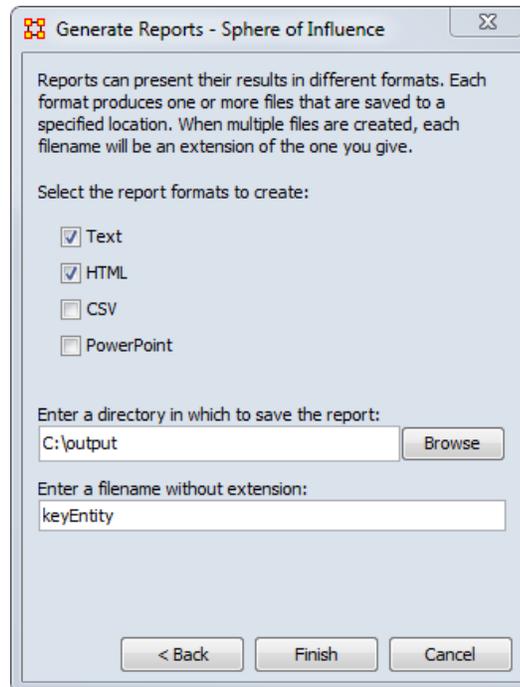
Begin with placing a check mark next to one or more a Meta-Networks from the list. Then click [**Next >**]. In the second window place a check mark next to the **NodeClass(es)** to analyze. In this case choose **Agent**.

All networks which contain any of the NodeClasses selected appear in the bottom pane. Having only chosen **Agent** only the **Agent x Agent** Network appears. Place a check mark next to **Agent x Agent**. Then click [**Next >**].



Next place a check mark next to the agent(s) to track. Then click [**Next >**].

Finally place a check mark next to all the nodes to visualize. Then click [**Next >**].



The final screen allows you to choose where to send the results. The two most common choices are: **Text** will display it in the **Report Tab** in ORA. **HTML** will open a file in your browser. The browser version is usually best for presentations as it contains more visual elements.

6.2 FOCUS ON REGION

In addition to finding out who the important agents are in a Meta-Network the Key Entity Report can also show you the important locations.

As with **Focus on Actor** above the check mark should be placed in the **Where** box only.

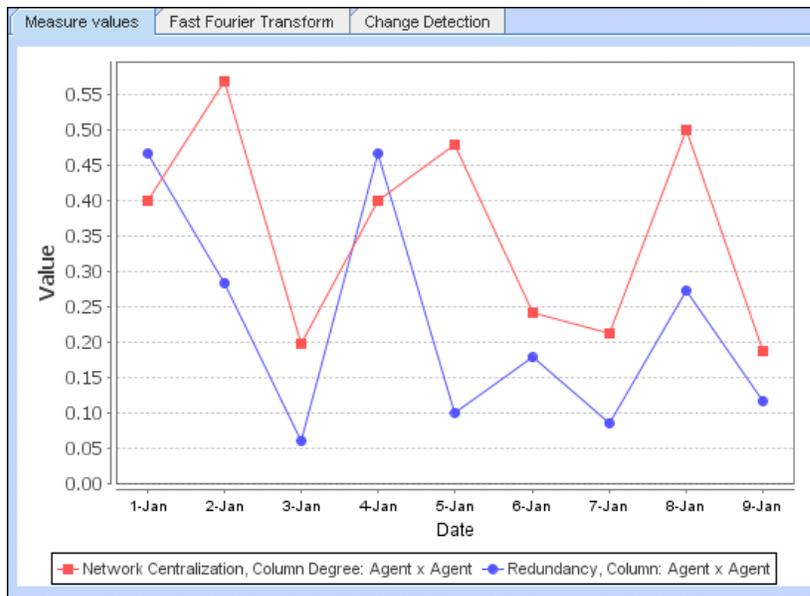
Once the key locations are discovered agents connected to that location can be analyzed. In time marked data it will also show **when** those agents were in those locations.

6.3 FOCUS ON TIME

In the Editor the **Measures Over Time** allows you to see how a network measures changes over multiple time periods.

This requires your data to have **time data**. Highlight a Meta-Network and in the Editor pane to **Date**. If the area is blank your Meta-Network does not have time data and the function will not run. You can click the [**Click to create...**] button to assign a data to each time slice.

Below is an example of the type of display viewing two measures over nine time periods.



Any Networks included in a Meta-Network can be displayed in the fashion.

In the Visualizer the **View Networks Over Time** allow you to see how Networks change over the specified time periods.

Each Meta-Network included should contain nodes and networks named the same. This is necessary in order for ORA to assess how individual items have changed for each time period. If a node has a slightly different name then ORA will assume they are not the same node.

The animated sequence will display the selected networks for each Meta-Network.

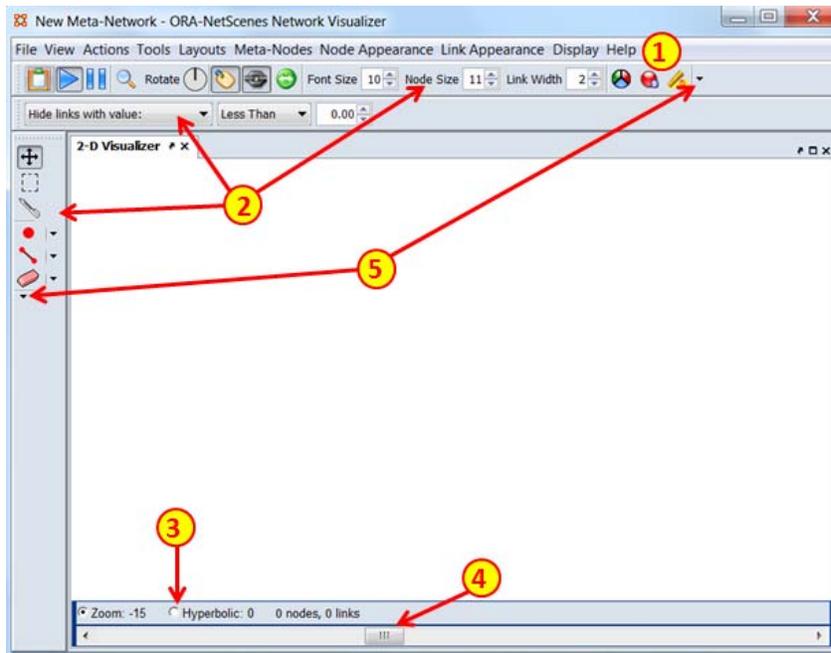
This display is the normal Visualizer display.

Refer to the User's Guide for more information.

7.0 2D Visualizing Data

7.1 2-D VISUALIZATION GUI

Contains the visual representation of your Meta-Network. (Note the 3-D Visualization GUI is a near match!)



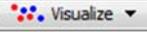
The ORA Visualizer Interface

- 1) **Menu** – Source for performing the majority of tasks.
- 2) **Toolbars** – Main functions for working with displayed Meta-Network.
- 3) **Zoom/Hyperbolic selector** – Select the radio button for the either the sizing or fish-eye view
- 4) **Zoom/Hyperbolic controller** – Controls degree of function.
- 5) **Toolbar Button Adder** – Allows you to add menu functions to the toolbar.

7.2 DISPLAYING META-NETWORKS:

Meta-Networks can be visualized in many ways.

Highlight a Meta-Network. Note we are back in the main ORA interface, not the Visualizer.

Click the  **Visualize** button

Or from the Editor Menu select **Visualizations > View Networks > 2D Visualization**

NOTE : The Visualizations menu also contains other display functions for your Meta-Networks. Many of which are advanced functions.

7.3 ADD/REMOVE NODES WITH THE VISUALIZER MENUS:

Actions > Add Node(s): Allows you to add nodes to existing or new NodeClasses.

Tools > Node Status: Displays all the information about the selected node.

Tools > Node Locator: Selecting a node from the dialog box will reveal the location of the node in Visualizer.

Node Appearance > Node Shaper: Use this tool to change the size and shape of the selected node.

3.4 ADD NODE IN VISUALIZER WITH NODE CREATOR



The **Node Creator** button is in the left toolbar. **NOTE:** [2] on *The ORA Visualizer interface*.

In the drop down menu select a **NodeClass**.

Place a **check mark** in the box. ORA will ask for a name for each new node

Click in the Visualizer to create a new node.

7.5 ADD LINKS IN VISUALIZER WITH LINK CREATOR



The **Link Creator** button in the left toolbar. **NOTE:** [2] on *The ORA Visualizer interface*.

Select the **Network** from the dropdown menu to add a link.

Select the weight for new links created.

Click and hold on the **source node**.

Drag the mouse to the **target node**

Release the mouse to create a new link.

7.6 REMOVE NODES OR LINKS IN VISUALZER WITH LINK ERASER



Click **Node/Link Eraser** is in the left toolbar. **NOTE:** [2] on *The ORA Visualizer interface*.

Remove node(s) and link(s) from the Visualizer display. Click on a **node** or a **link** to remove it from the display and Meta-Network.

If the **Permanently Delete** check box is empty ORA will hide the node(s) or link(s) from the display only. The node(s) or links(s) will be retained in the Meta-Network.

If the **Permanently Delete** check box contains a check mark the node(s) or links(s) will be permanently deleted from the Meta-Network as well.

7.7 SHOW/HIDE VISUALIZER LABELS, LINKS, & ARROWS:

In the display various items can be shown or hidden. **NOTE:** [2] on *The ORA Visualizer interface*.



Toggles the display to **show/hide** the node titles.



Toggles the display to **render/not-render** the links.



Toggles the display to **show/hide** the node arrows.

7.8 CHANGE NODE-CLASS COLOR:

You can change the color of an entire NodeClass in the Visualizer.

If the **Legend** is not visible, open it by selecting **Tools > Legend**.

Click on the color node for a NodeClass.

In the color selector dialog box select a new color.

Click [**OK**].

7.9 DATA REDUCTION STRATEGIES

At times the Visualizer display can be difficult to read. There are multiple ways to reduce unneeded information temporarily from the display.

7.9.1 HIDE ISOLATES

You can remove Isolates from the display without permanently removing them from the Meta-Network.

From the Visualizer menu select **Actions > Isolates > Hide Isolate Nodes**.

7.9.2 REMOVE ISOLATES

You can permanently remove Isolates from a Meta-Network in two ways:

From the Visualizer menu select **Actions > Delete Isolates > Delete Currently Visible Isolates**. This will remove from the Meta-Network only those nodes that are visible.

From the Visualizer menu select **Actions > Delete Isolates > Delete Underlying Isolates**. This will remove all Isolates from the Meta-Network.

7.9.3 HIDE PENDANTS

You can remove Pendants from the display without permanently removing them from the Meta-Network.

From the Visualizer menu select **Actions > Hide Pendant Nodes**.

7.10 ADD ICONS OR PICTURES

Nodes can be replaced by icons or pictures [pictures will be resized to fit within a 50 x 50 pixel box] for easier identification.

Icons

Right-Click a node and select **Appearance Submenu > Set Picture**.

From the drop down menu select a category then click and highlight your icon.

Click [**OK**] when finished, The node will then display the icon

7.11 CHANGE SIZE/COLOR NODES BY METRIC

Node Appearance > Size Node by Attribute or Measure

This will scale the size of all nodes by using the attribute or measure selected.

Numbers for each node value are user adjustable.

Node Appearance > Node Color > Color Node by Attribute or Measure

This will color all nodes by using the attribute or measure selected.

Colors for each node value is adjustable.

To reset color and size select **Node Appearance > Reset Color and Size**.

8.0 ORA Information

ORA is a joint product of Netanomics, and Carnegie Mellon University's CASOS center. For additional information contact Dr. Kathleen M. Carley – Professor, Director of CASOS, and CEO of Netanomics, Inc.

A special student version, that runs under windows, is available free of charge to enrolled undergraduate, masters, and Ph.D. students in academic institutions. Note, that the free academic version is limited to analyzing data sets with fewer than 1000 Nodes per Node Class.

A professional version of ORA, and various specialized versions for specific needs are available from Netanomics. In addition, Netanomics sells Mac and Linux versions of ORA.

8.1 CONTACT INFORMATION

Kathleen M. Carley

kathleen.carley@cs.cmu.edu

www.casos.cs.cmu.edu

CEO, Netanomics

kathleen.carley@cs.cmu.edu

www.netanomics.com

Netanomics, Inc:

L. Rick Carley

CFO, Netanomics

rick.carley@netanomics.com

www.netanomics.com

8.2 PRICING INFORMATION

For pricing information visit the Netanomics website at www.netanomics.com and click on the “Products” tab. You may send an e-mail message to info@netanomics.com.

Volume and educational discounts are available.

8.2 QUESTIONS, BUGS, AND COMMENTS

To support the ORA community there is an on-line ORA Google Group. You should consider joining. In this forum multiple individuals provide answers to various how-to questions.

Instructions:

1. Go to: <http://groups.google.com/group/ORA-google-group>

2. Login to Google Account*

**Please Note: A Google Account is required to Join a Google Group via the web interface, Post to groups via the web interface, Change your subscription type, and Read a restricted group's posts online. Signing up for a Google Account does not mean you are signing up for Gmail. If you already have a Gmail account then you automatically have a Google Account, and you may sign in with that login.*

If you already have a Google Account: Sign in with your Google Account email and password.

If you don't have a Google Account: Click the "Create an Account" button. Once you've finished registering you'll receive a verification email. Just click the link in that email to complete the verification process. Revisit the [ORA Google Group](#) page and click the "Apply for group membership" link. Sign in with your new Google Account email and password.

3. Click the "Apply for group membership" link on the right side of the webpage.

4. Choose how you'd like to read messages from the group.

5. Type in a nickname for yourself. This is a name that others in the group will see.

6. In the text box type your name, organization and a brief description of how you are using Social/Dynamic Network Analysis.

7. Click the "Apply to this group" button.

8. You will get a message saying that "Your subscription to this group is still pending." Your request to join has been sent to the Google Group Manager, and you will have access to the site once the Manager approves your membership.

9. Revisit the site (located [here](#)) to check the status of your membership. Membership status will be on the right side of the webpage. It will say "Edit my membership - pending" if your account hasn't been approved yet. If your account has been approved the word "pending" will be absent, and you will have access to the ORA Google Group.

Please contact: Dr. Kathleen M. Carley (kathleen.carley@cs.cmu.edu) with detailed bugs. Do not contact students or programmers directly.

If you believe you have found a bug, please provide this information:

1. The version of ORA you are using
2. The operating system
3. Characteristics of the data – e.g., number of nodes, relations, node-classes, etc.
4. Details of what you did
5. Details of what ORA did

8.3 COPYRIGHT NOTIFICATION

COPYRIGHT (c) 2001-2017 Kathleen M. Carley
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