

Analyzing a Simple Social Network using ORA

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HICSS 47

2014

Meta-Network Manager

No Meta-Network Loaded

Meta-Network Name

Meta-Network Time

Filename

Statistics:

Source count:

Nodeset count:

Node count:

Link count:

Network count:

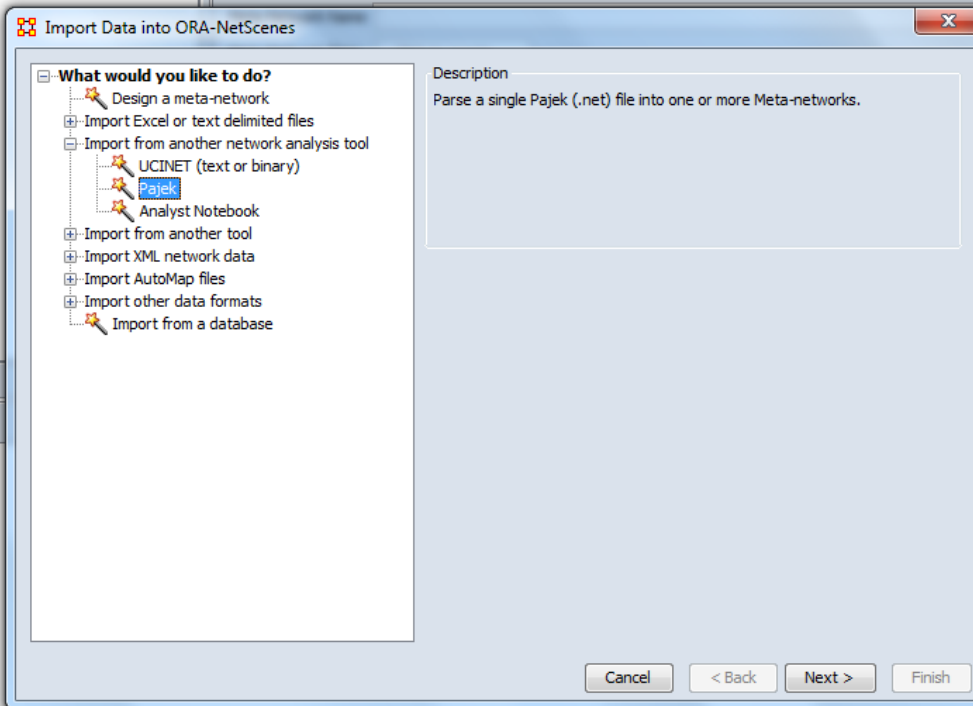
Total density:

Find:

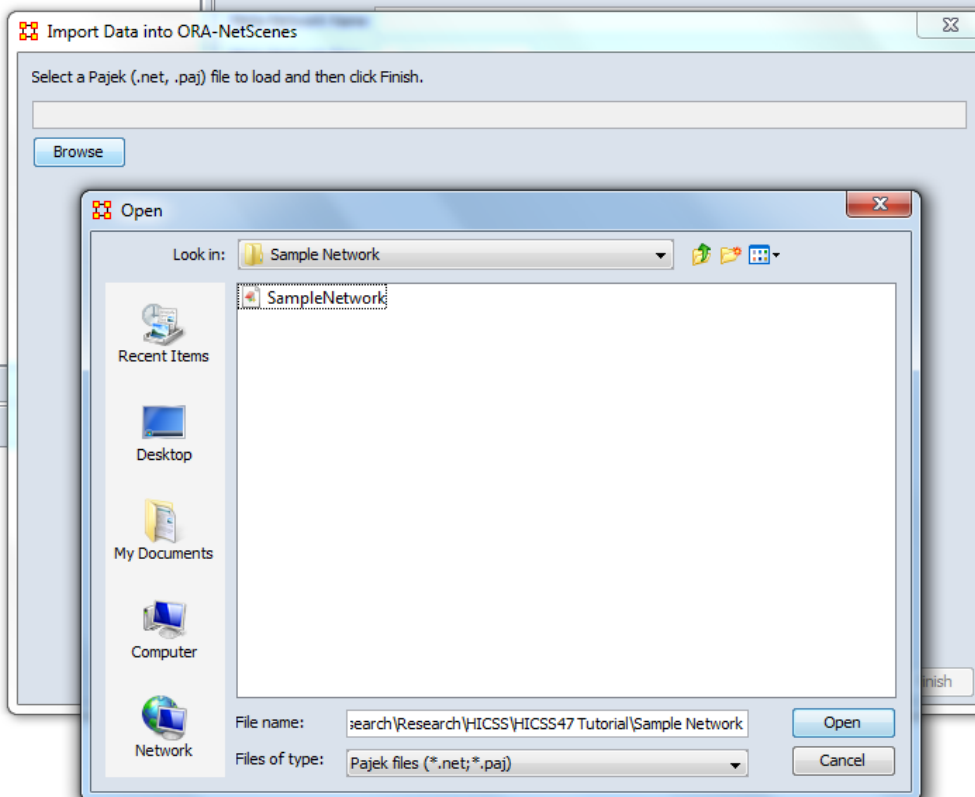
Find:

Next Previous ☐ Regex ☐ Match Case

Step 1A: Open ORA



Step 1B: Importing Pajek File



Step 1C: Selecting SampleNetwork.net file

The screenshot displays the ORA-NetScenes 3.0.9.3 application window. The main interface is divided into several panels:

- Meta-Network Manager:** This panel on the left shows a tree view with a single entry, "SampleNetwork - 1", which is expanded to show "source nodes : size 19" and "network".
- Meta-Network: SampleNetwork - 1:** This panel on the right contains the following fields and controls:
 - Meta-Network Name:** SampleNetwork - 1
 - Meta-Network Time:** Click to create...
 - Filename:** A text input field with a "Load..." button.
 - Buttons:** "Generate Reports...", "Visualize" (with a network icon), and "Measure Charts..." (with a bar chart icon).
 - Statistics:**
 - Source count: 0
 - Nodeset count: 1
 - Node count: 19
 - Link count: 64
 - Network count: 1
 - Total density: .17728532
- Reports:** This panel at the bottom is currently empty.

At the bottom of the window, there is a search bar labeled "Find:" and navigation controls including "Next", "Previous", "Regex", "Match Case", and a "Close All Tabs" button.

Step 1D: Nodes & Network Edges loaded



Meta-Network Manager

- SampleNetwork - 1
 - source nodes : size 19
 - network

Find:

Nodeset: source nodes

Info Editor

Nodeset Name:

Nodeset Class:

Display nodes by:

Statistics:

Node count: 19

Node attribute count: 2

Node attribute names: x-coordinate, y-coordinate

Reports

Find:

Next Previous ☐ Regex ☐ Match Case

Step 1E: Examining Nodes (Vertices)



Meta-Network Manager

SampleNetwork - 1

source nodes : size 19
network

Find:

Reports

Find:

Next Previous ☐ Regex ☐ Match Case

Close All Tabs

Nodeset: source nodes

Info Editor



Contains



Nodes

Create

Delete

Merge

Move

Clean

Attributes

Create

Import

Export

Delete

Measures

Meta-Network

Create

	Node Name	Node Title	x-coordinate	y-coordinate
<input type="checkbox"/>	1	A	0	0
<input type="checkbox"/>	2	B	0	0
<input type="checkbox"/>	3	C	0	0
<input type="checkbox"/>	4	D	0	0
<input type="checkbox"/>	5	E	0	0
<input type="checkbox"/>	6	F	0	0
<input type="checkbox"/>	7	G	0	0
<input type="checkbox"/>	8	H	0	0
<input type="checkbox"/>	9	I	0	0
<input type="checkbox"/>	10	J	0	0
<input type="checkbox"/>	11	K	0	0
<input type="checkbox"/>	12	L	0	0
<input type="checkbox"/>	13	M	0	0
<input type="checkbox"/>	14	N	0	0
<input type="checkbox"/>	15	O	0	0
<input type="checkbox"/>	16	P	0	0
<input type="checkbox"/>	17	Q	0	0
<input type="checkbox"/>	18	R	0	0
<input type="checkbox"/>	19	S	0	0

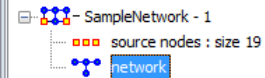
☐ Select All ☐ Select Visible

0 / 19 Selected, 19 / 19 Visible

Step 1F: Table of Nodes (Vertices)



Meta-Network Manager



Find:

Reports

Find:

Next Previous ☐ Regex ☐ Match Case

Close All Tabs

Network: network

Info Editor

Convert Links Remove Links Highlight Hide Display Options

Show list

Find nodes



AND



AND

Show matches

	A	B	C	D	E	F	G	H	I
A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
G	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
J	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
K	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
O	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Q	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Step 1G: Examining Adjacency Matrix

Meta-Network Manager

- SampleNetwork - 1
 - source nodes : size 19
 - network

Network: network

Info Editor

Network Name: network

Source Nodeset: source nodes

Target Nodeset: source nodes

☒ Visualize this Network ☐ Visualize Only this Network

Network properties:

☒ Symmetric (undirected links) ☐ No self-loops ☐ Binary link values

Network statistics:

Source count: 19

Target count: 19

Link count: 64 (excludes self-loops)

Link values: Binary

Density: .17728532

Self-loops (diagonal): None

Symmetric: Yes

When computing measures:

Treat as symmetric: Auto-detect

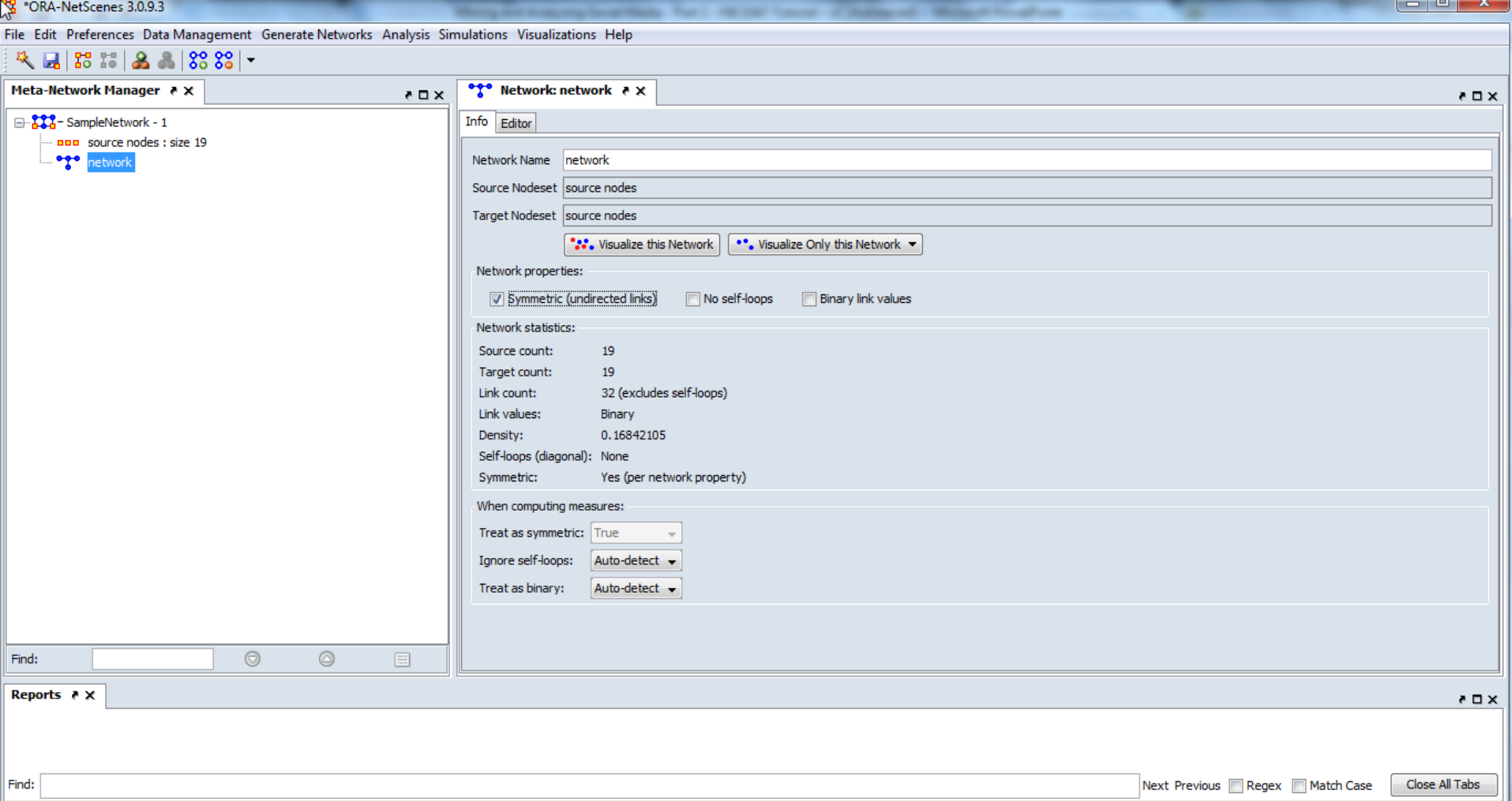
Ignore self-loops: Auto-detect

Treat as binary: Auto-detect

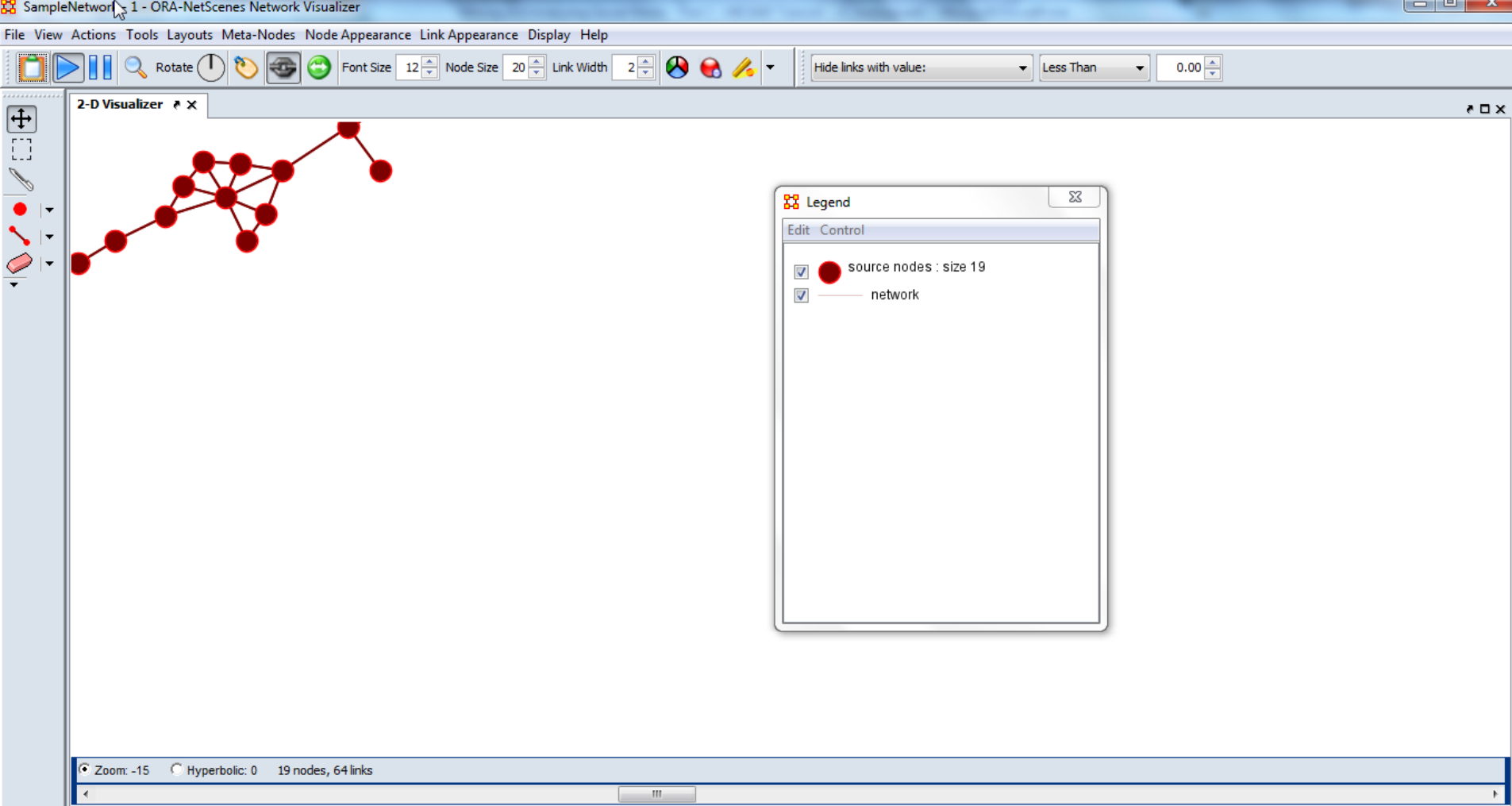
Reports

Find: Next Previous ☐ Regex ☐ Match Case

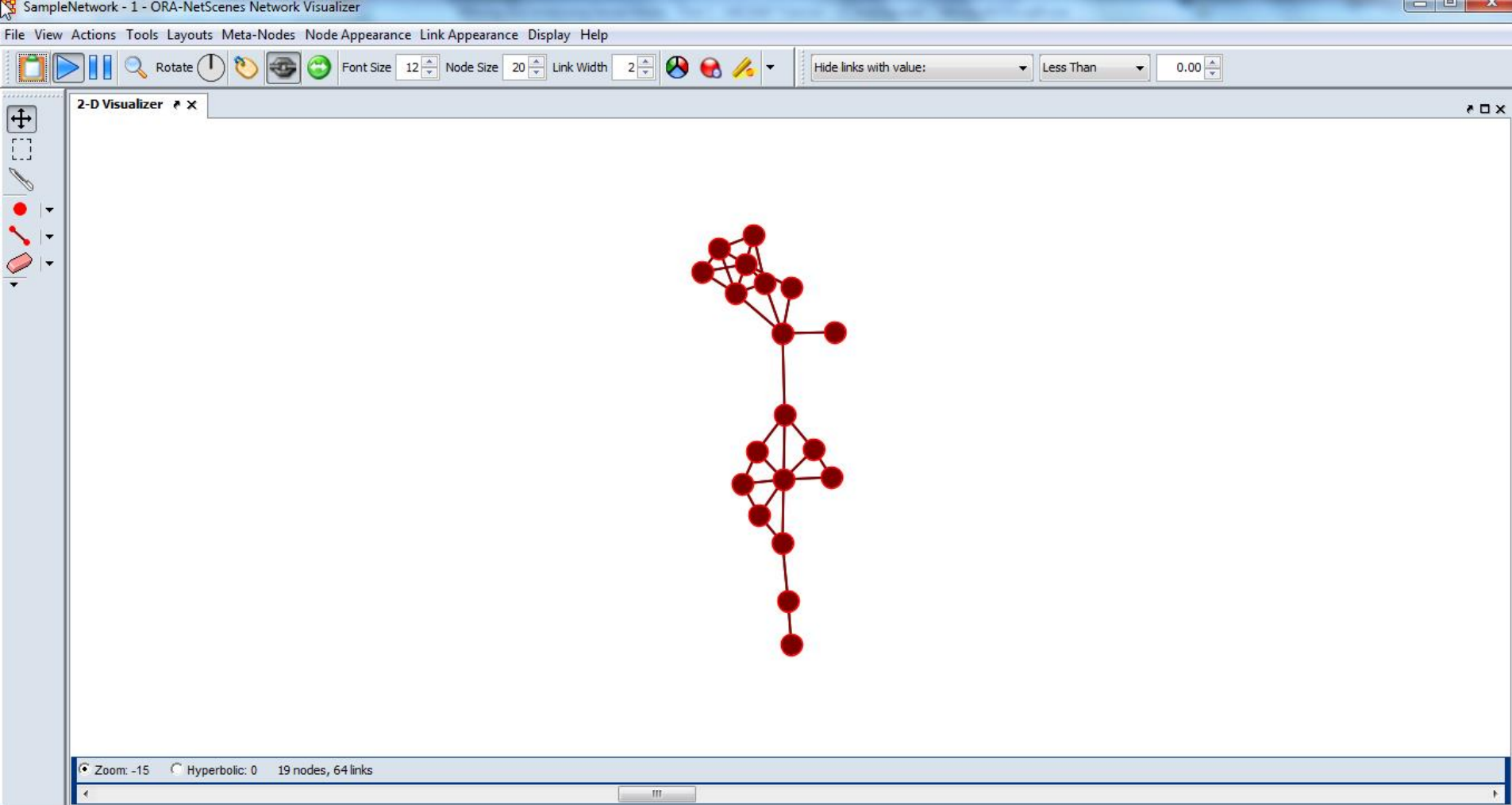
Step 1H: Choosing Symmetric (Unidirected) Setting



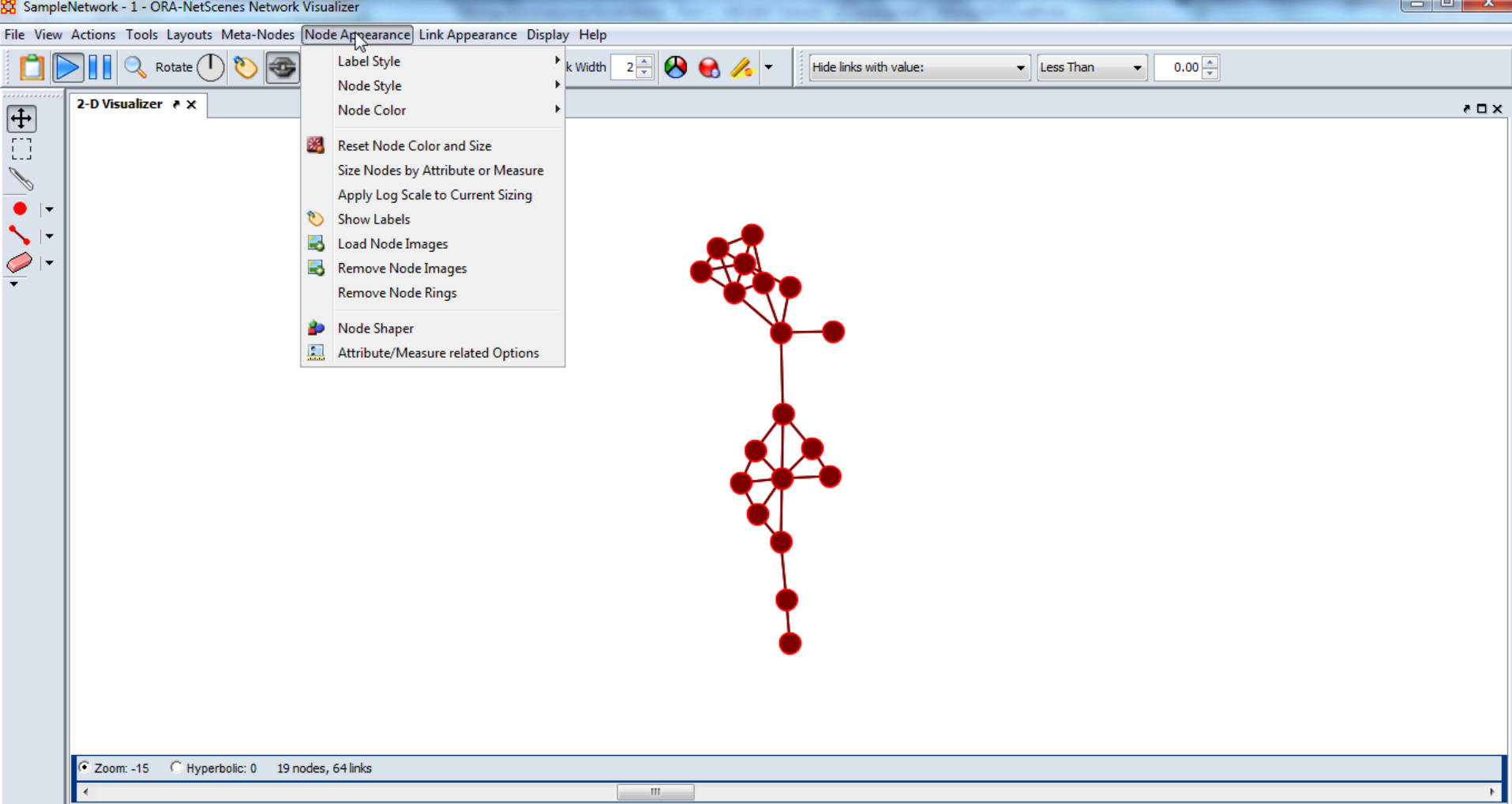
Step 2A: Visualizing the Network



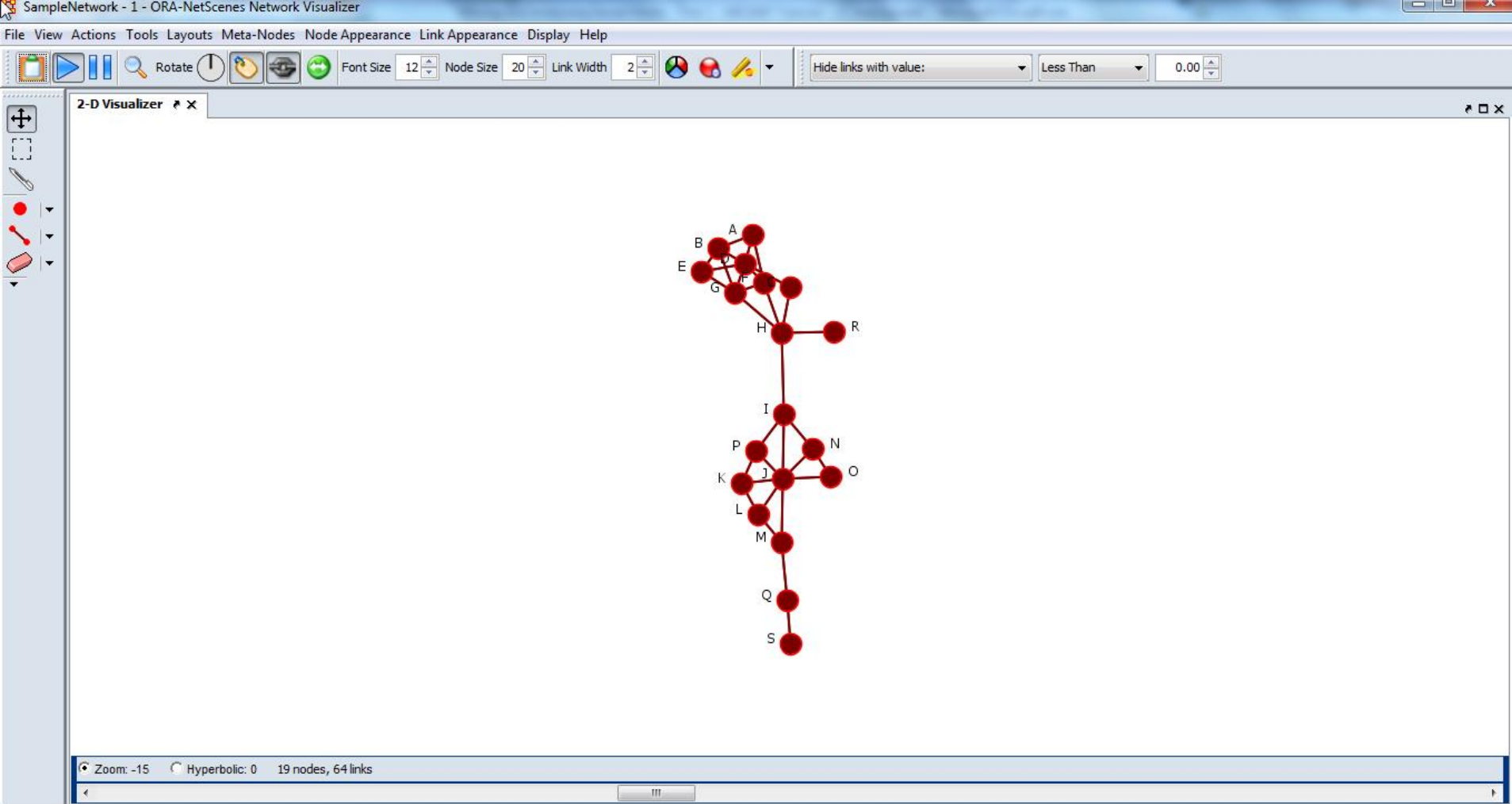
Step 2B: Random Layout Produced



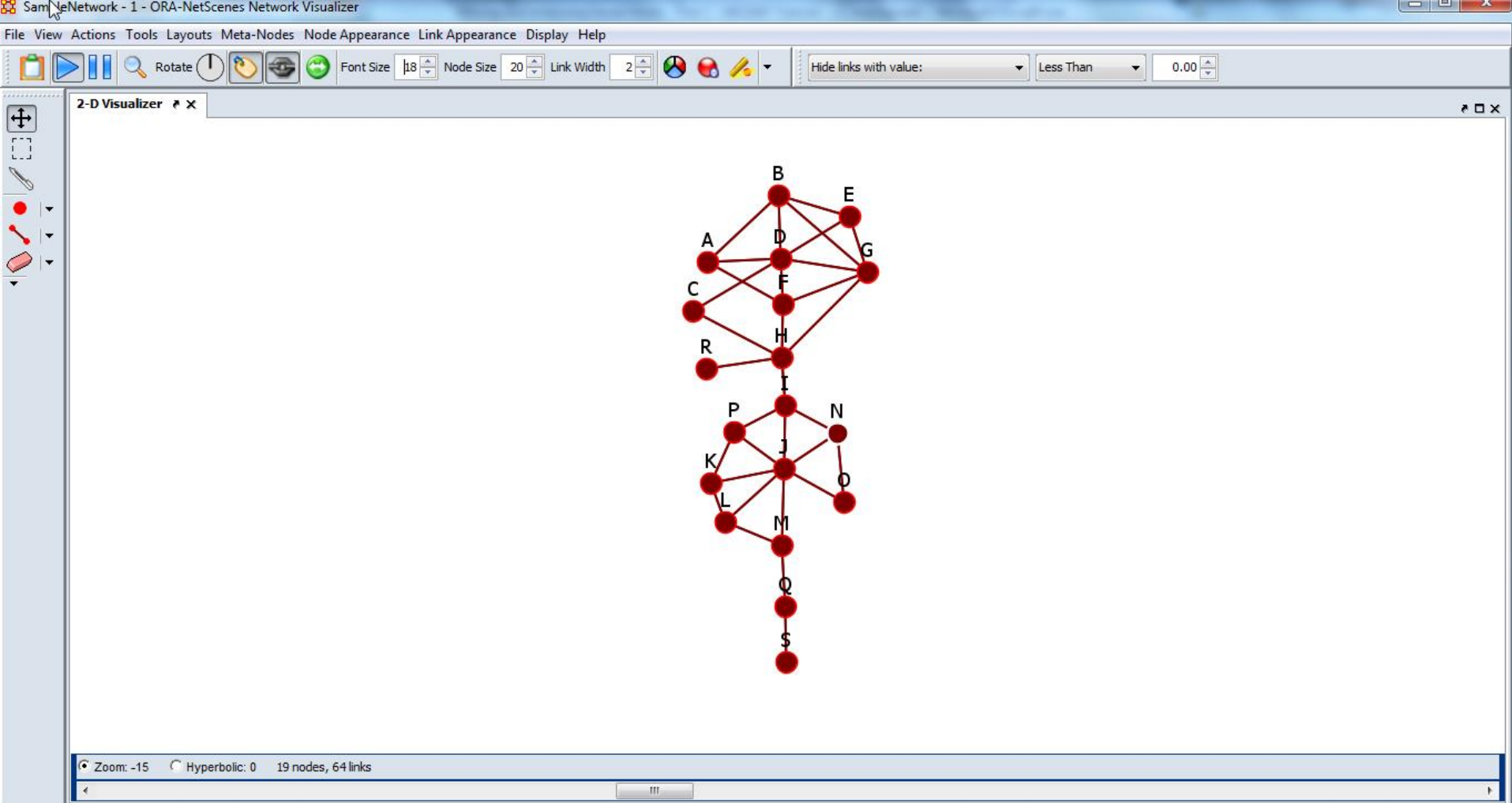
Step 2C: Graph dragged to center and
orientation adjusted by hand



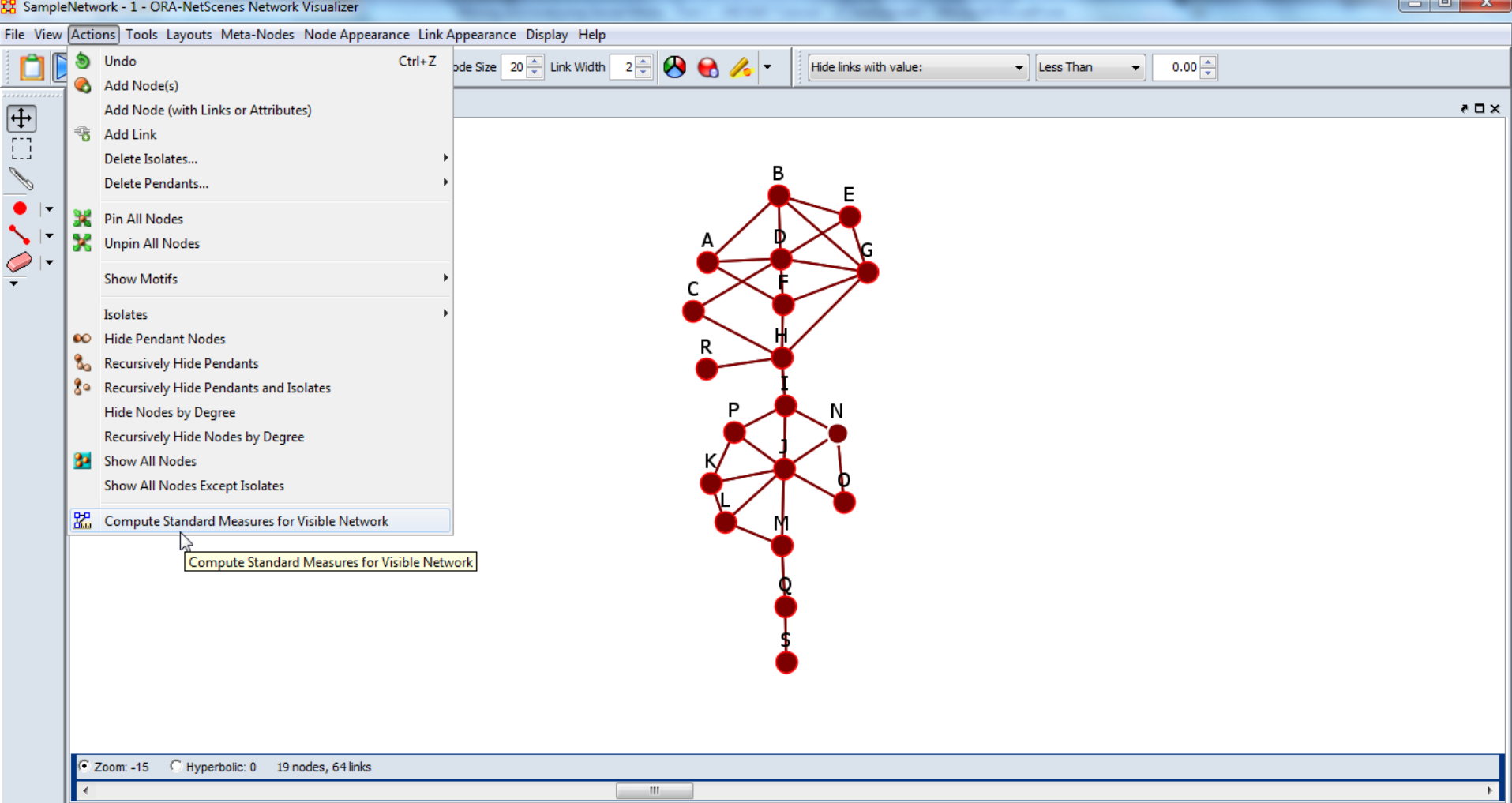
Step 2D: Show Labels Toggled



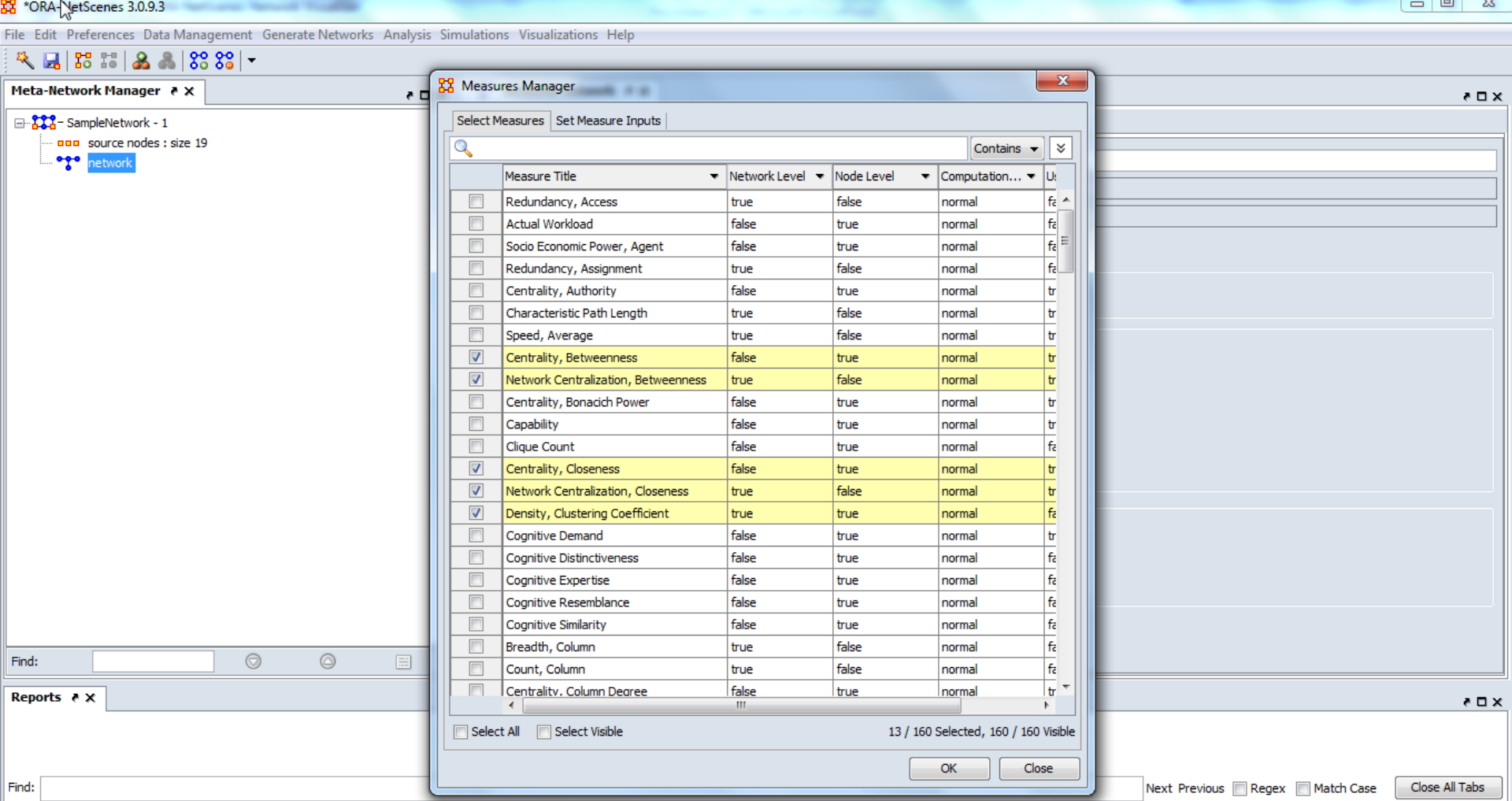
Step 2E: Labels appear



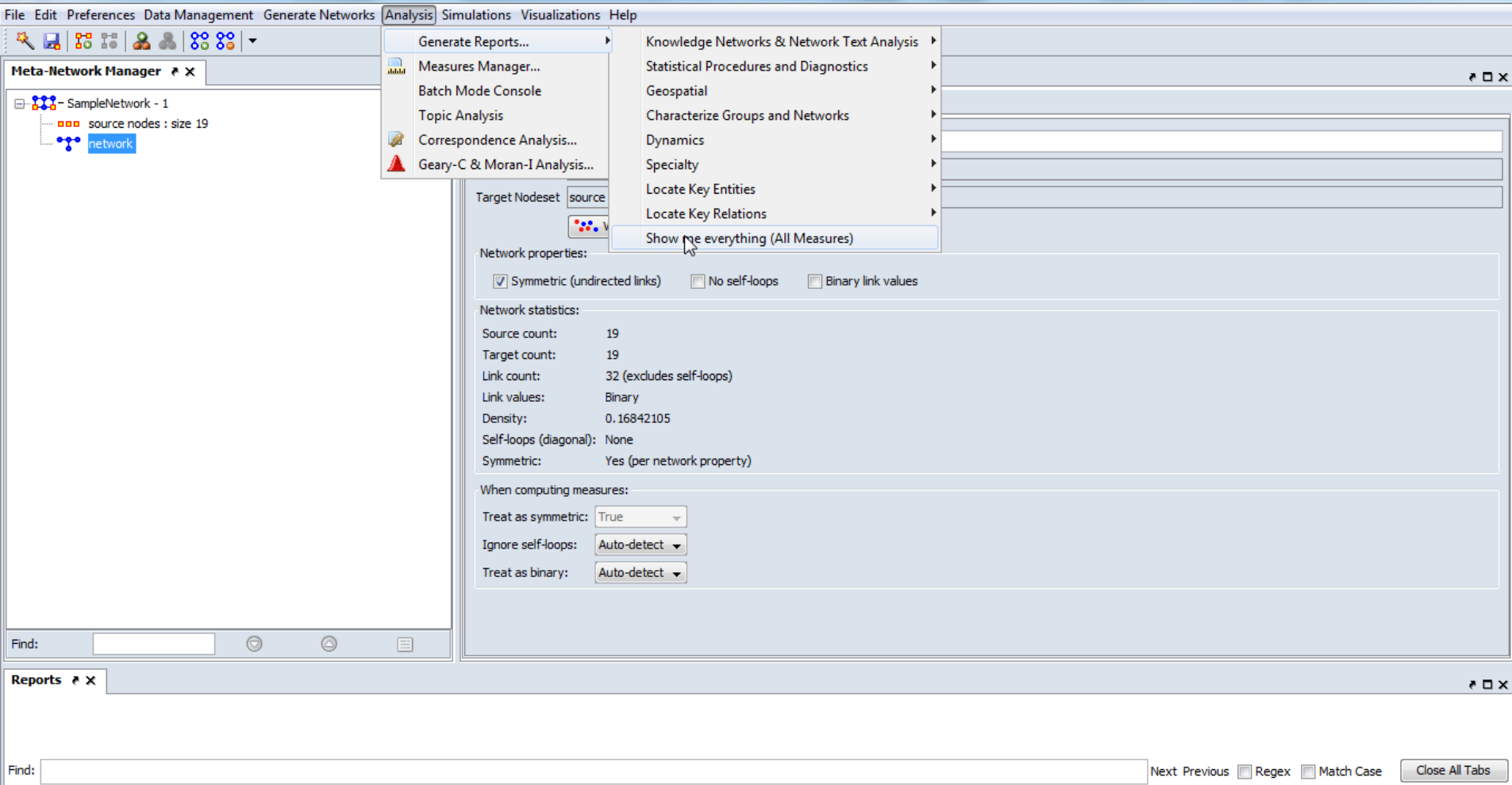
Step 2F: Graph pinned and location of
Nodes adjusted by hand



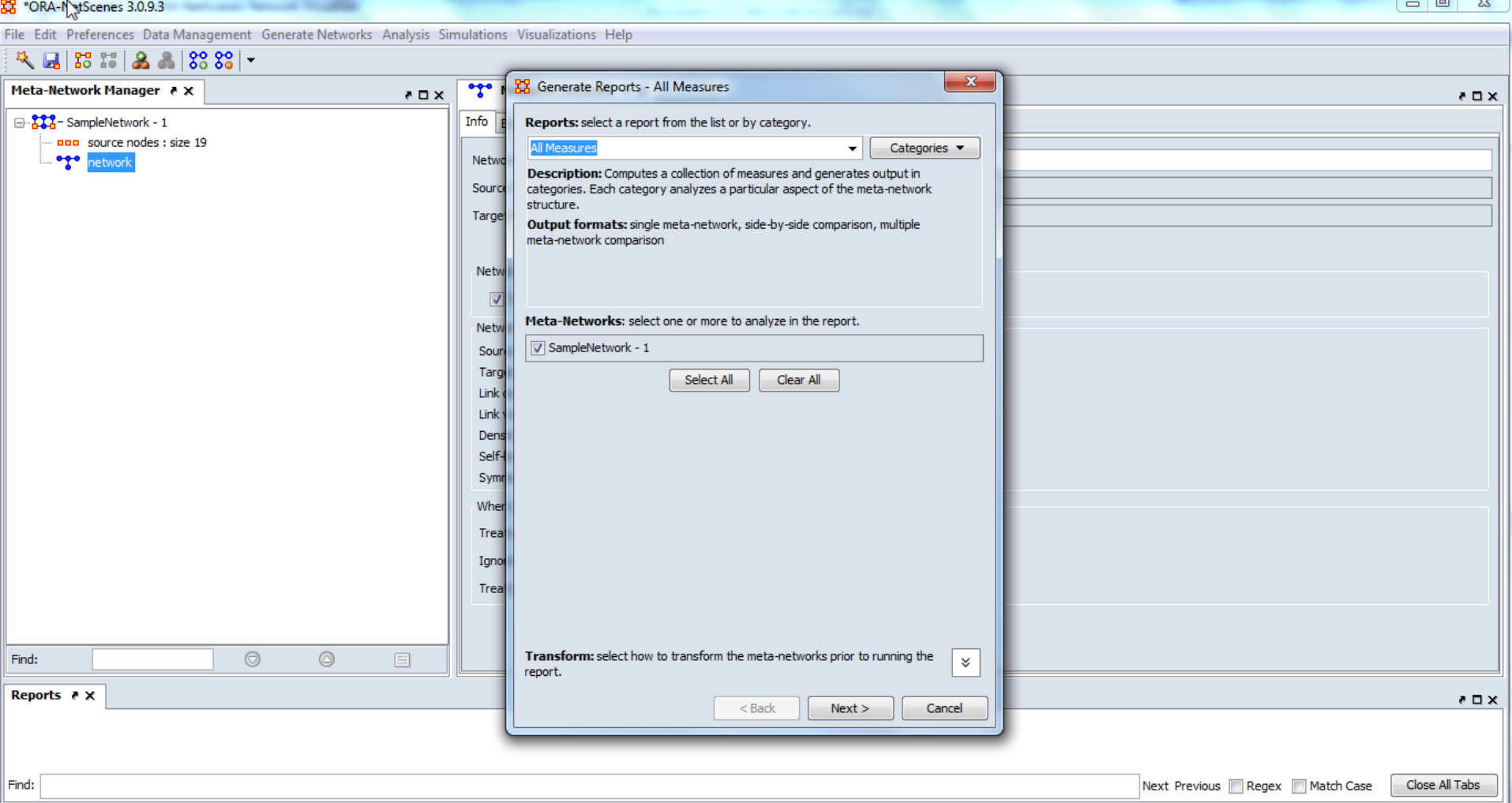
Step 3A: Starting Computation of Standard Measures



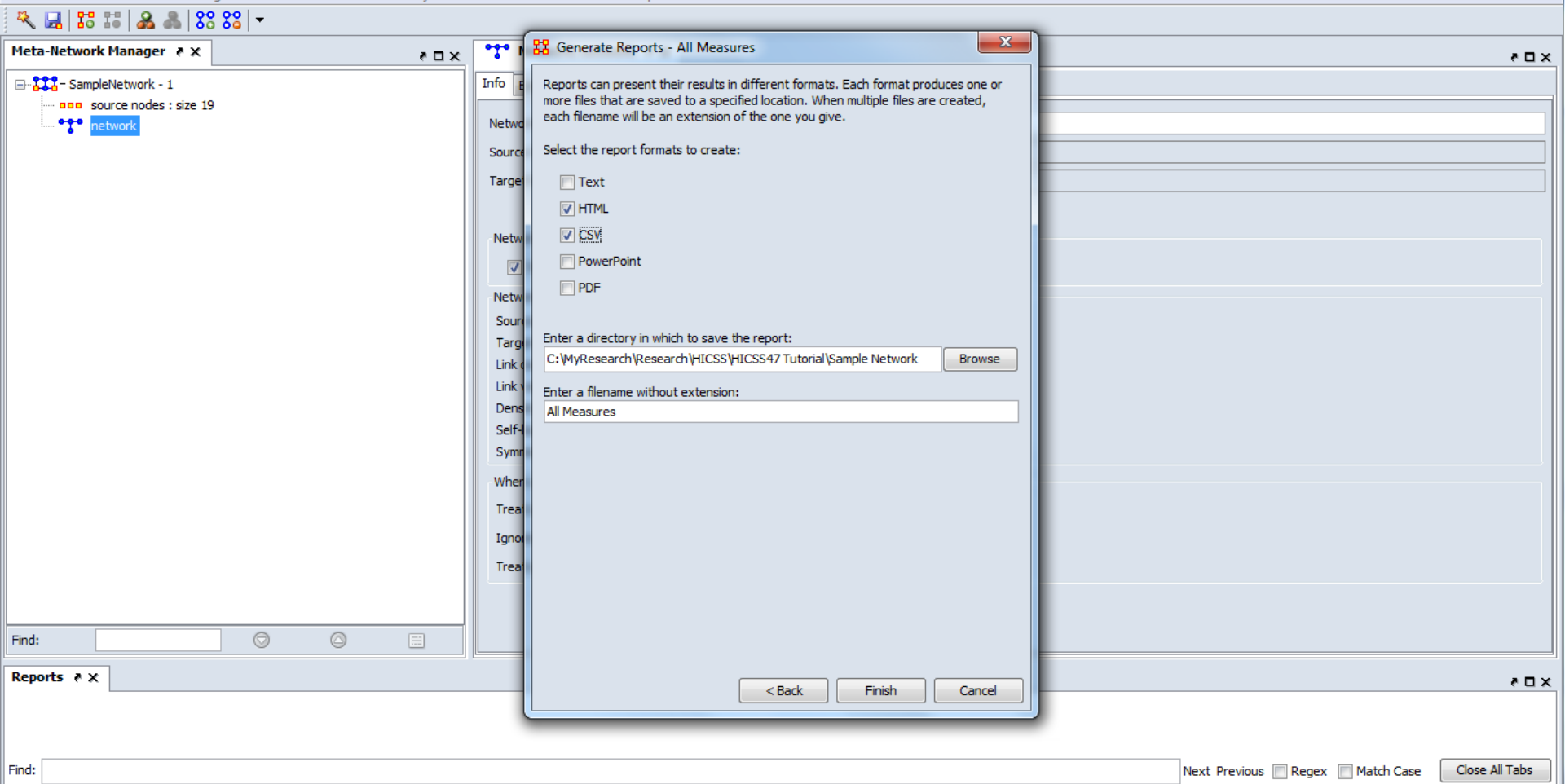
Step 3B: Selecting desired measures from list of 160 available for final reports



Step 3C: Requesting reports for
All (selected) Measures



Step 3D: .GDF File Opening



Step 3E: Requesting report formats

ALL MEASURES REPORT

Input data: SampleNetwork - 1

Start time: Sun Jan 05 20:59:40 2014

[Data Description](#)

Table of Contents

[Analysis for network network](#)

[Analysis for nodeset source nodes](#)

Produced by ORA-NetScenes, a joint product of the CASOS center at Carnegie Mellon University and Netanomics

Step 3F: Reviewing HTML Reports

Input data: network

Start time: Sun Jan 05 20:59:40 2014

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These measures take as input only the network network and output a single value (network-level measures) or a collection of values (node-level).

Network-Level Measure	Value
Characteristic Path Length	3.064
Characteristic Path Length	3.064
Density, Clustering Coefficient	0.445
Density, Weighted	0.187
Diameter	7.000
Diameter	7.000
Network Centralization, Betweenness	0.479
Network Centralization, Betweenness	0.479
Network Centralization, Closeness	0.269
Network Centralization, Closeness	0.269
Network Centralization, Eigenvector	0.456
Network Centralization, In-Closeness	0.269
Network Centralization, In-Closeness	0.269
Network Centralization, Total Degree	0.225
Network Levels	7.000
Network Levels	7.000
Speed, Average	0.326

Step 3G: Review Network Level Measures

Source nodes-level Measures

Input data: SampleNetwork - 1

Start time: Sun Jan 05 20:59:40 2014

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	Centrality, Betweenness: network	Centrality, Betweenness: network, [unscaled]	Centrality, Betweenness: network, inverted = 1	Centrality, Betweenness: network, inverted = 1, [unscaled]	Centrality, Closeness: network	Centrality, Closeness: network, [unscaled]	Centrality, Closeness: network, inverted = 1	Centrality, Closeness: network, inverted = 1, [unscaled]	Centrality, Eigenvector: network	Centrality, Eigenvector: network, [unscaled]	Centrality, In- Closeness: network	Centrality, In- Closeness: network, [unscaled]
A	0.002	0.333	0.002	0.333	0.290	0.016	0.290	0.016	0.405	0.286	0.290	0.016
B	0.005	0.833	0.005	0.833	0.295	0.016	0.295	0.016	0.509	0.360	0.295	0.016
C	0.026	4.000	0.026	4.000	0.346	0.019	0.346	0.019	0.257	0.181	0.346	0.019
D	0.037	5.667	0.037	5.667	0.305	0.017	0.305	0.017	0.6571*	0.4647*	0.305	0.017
E	0.000	0.000	0.000	0.000	0.290	0.016	0.290	0.016	0.430	0.304	0.290	0.016
F	0.107	16.333	0.107	16.333	0.360	0.020	0.360	0.020	0.502	0.355	0.360	0.020
G	0.188	28.833	0.188	28.833	0.367	0.020	0.367	0.020	0.606	0.429	0.367	0.020
H	0.5752*	88.0000*	0.5752*	88.0000*	0.450	0.025	0.450	0.025	0.400	0.283	0.450	0.025
I	0.533	81.500	0.533	81.500	0.4615*	0.0256*	0.4615*	0.0256*	0.188	0.133	0.4615*	0.0256*
J	0.435	66.500	0.435	66.500	0.429	0.024	0.429	0.024	0.166	0.117	0.429	0.024
K	0.003	0.500	0.003	0.500	0.316	0.018	0.316	0.018	0.084	0.060	0.316	0.018
L	0.010	1.500	0.010	1.500	0.327	0.018	0.327	0.018	0.076	0.054	0.327	0.018
M	0.209	32.000	0.209	32.000	0.333	0.019	0.333	0.019	0.063	0.044	0.333	0.019

Step 3H: Reviewing Node-Level Measures

SampleNetwork - 1 - ORA-NetScenes Network Visualizer

File View Actions Tools Layouts Meta-Nodes **Node Appearance** Link Appearance Display Help

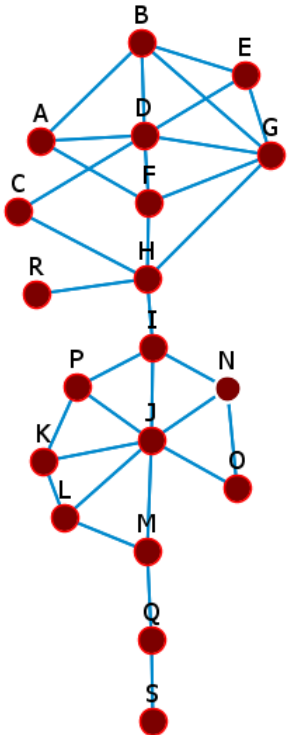
2-D Visualizer

Node Appearance menu:

- Label Style
- Node Style
- Node Color**
- Reset Node Color and Size
- Size Nodes by Attribute or Measure
- Apply Log Scale to Current Sizing
- Show Labels
- Load Node Images
- Remove Node Images
- Remove Node Rings
- Node Shaper
- Attribute/Measure related Options

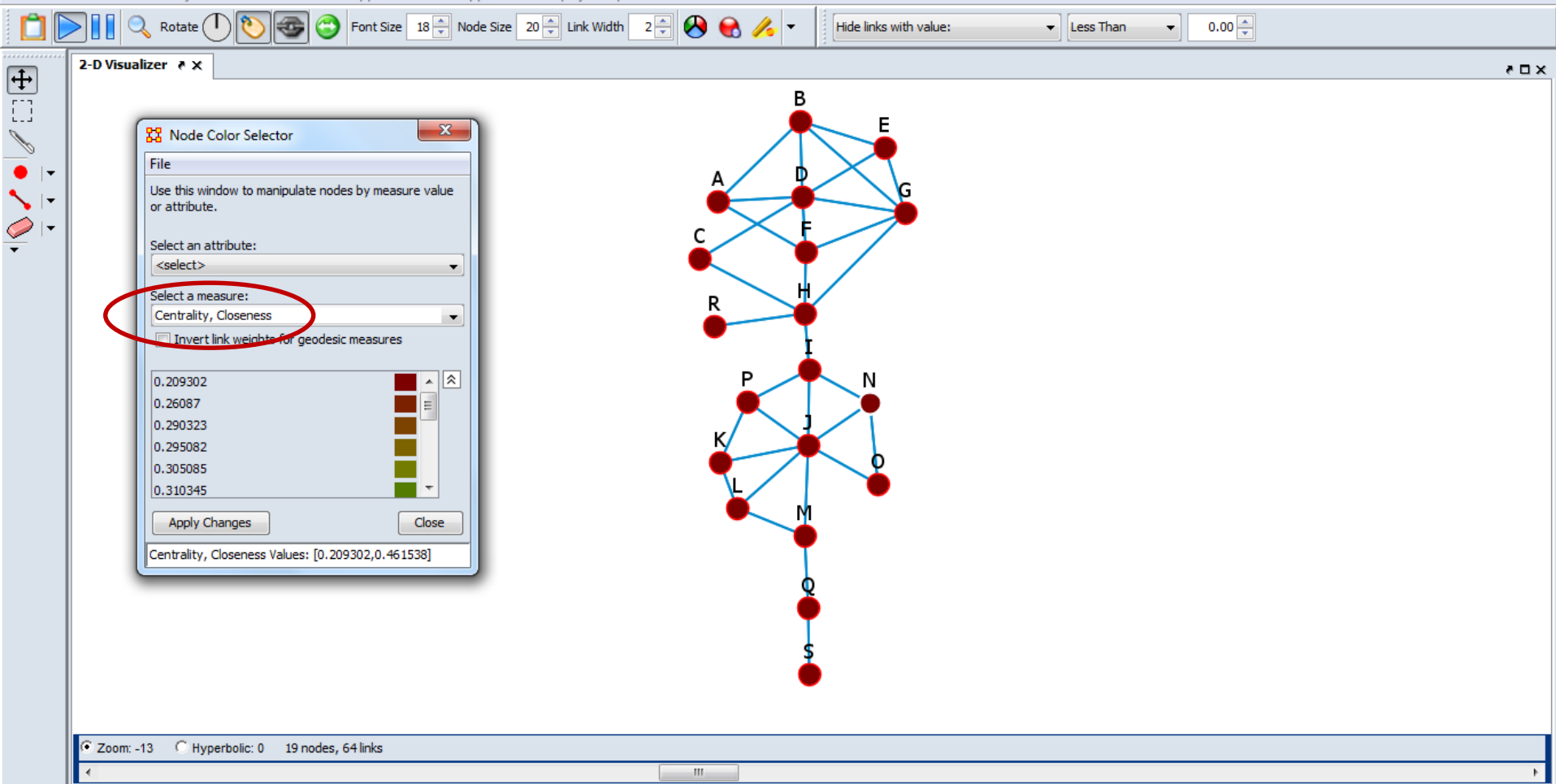
Link Width: 2

Hide links with value: Less Than 0.00

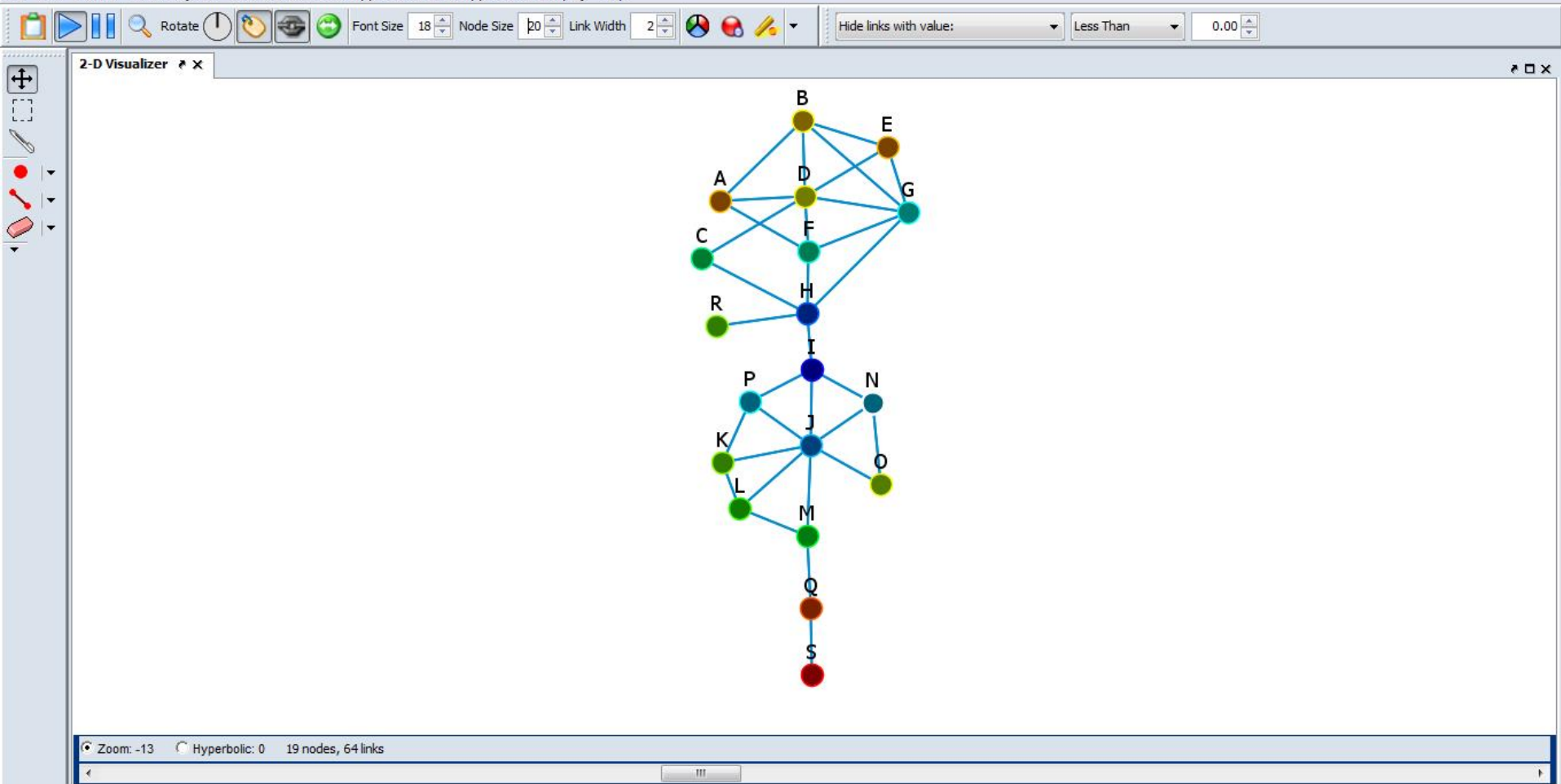


Zoom: -13 Hyperbolic: 0 19 nodes, 64 links

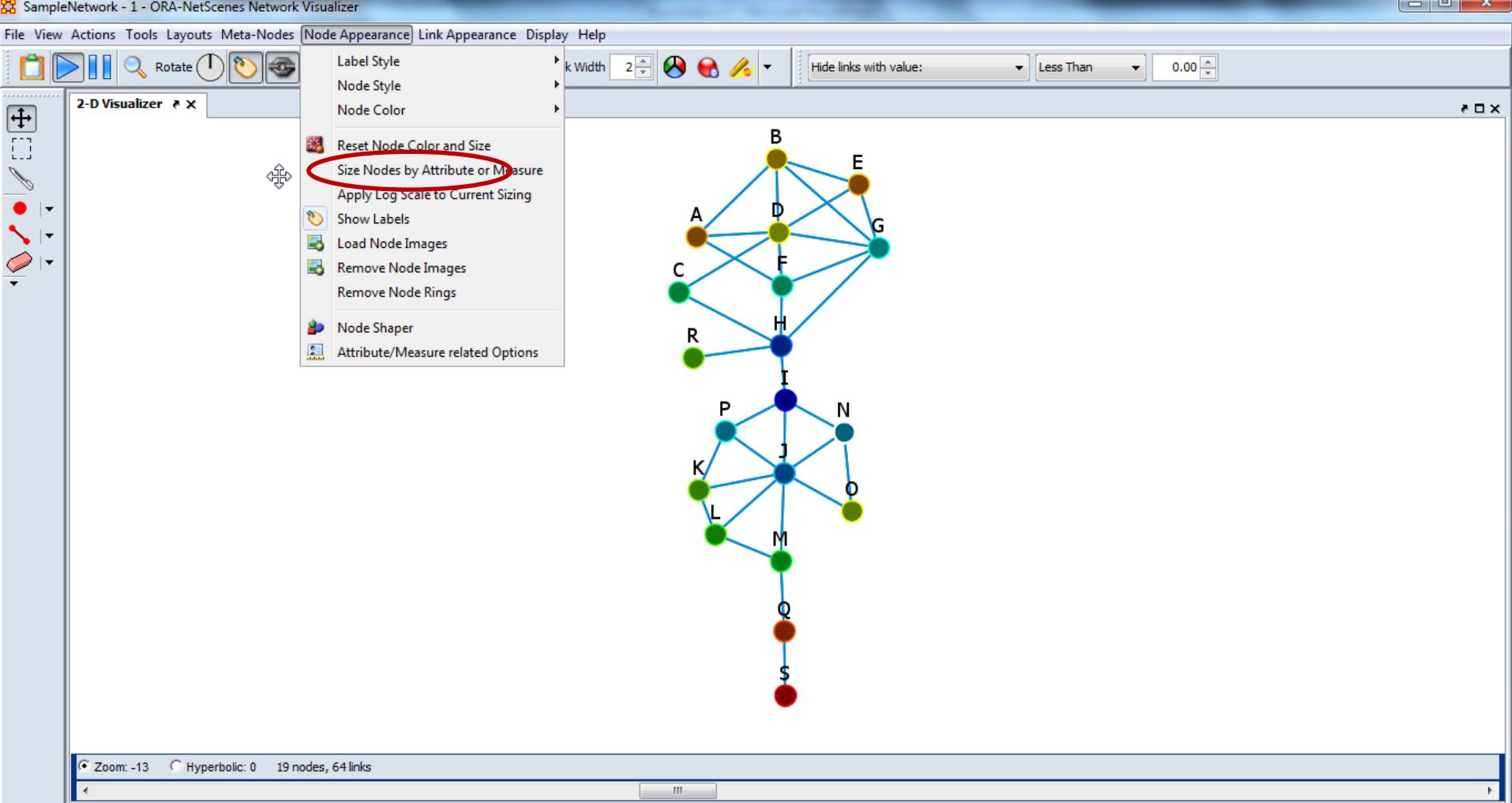
Step 4A: Adjusting Node Color



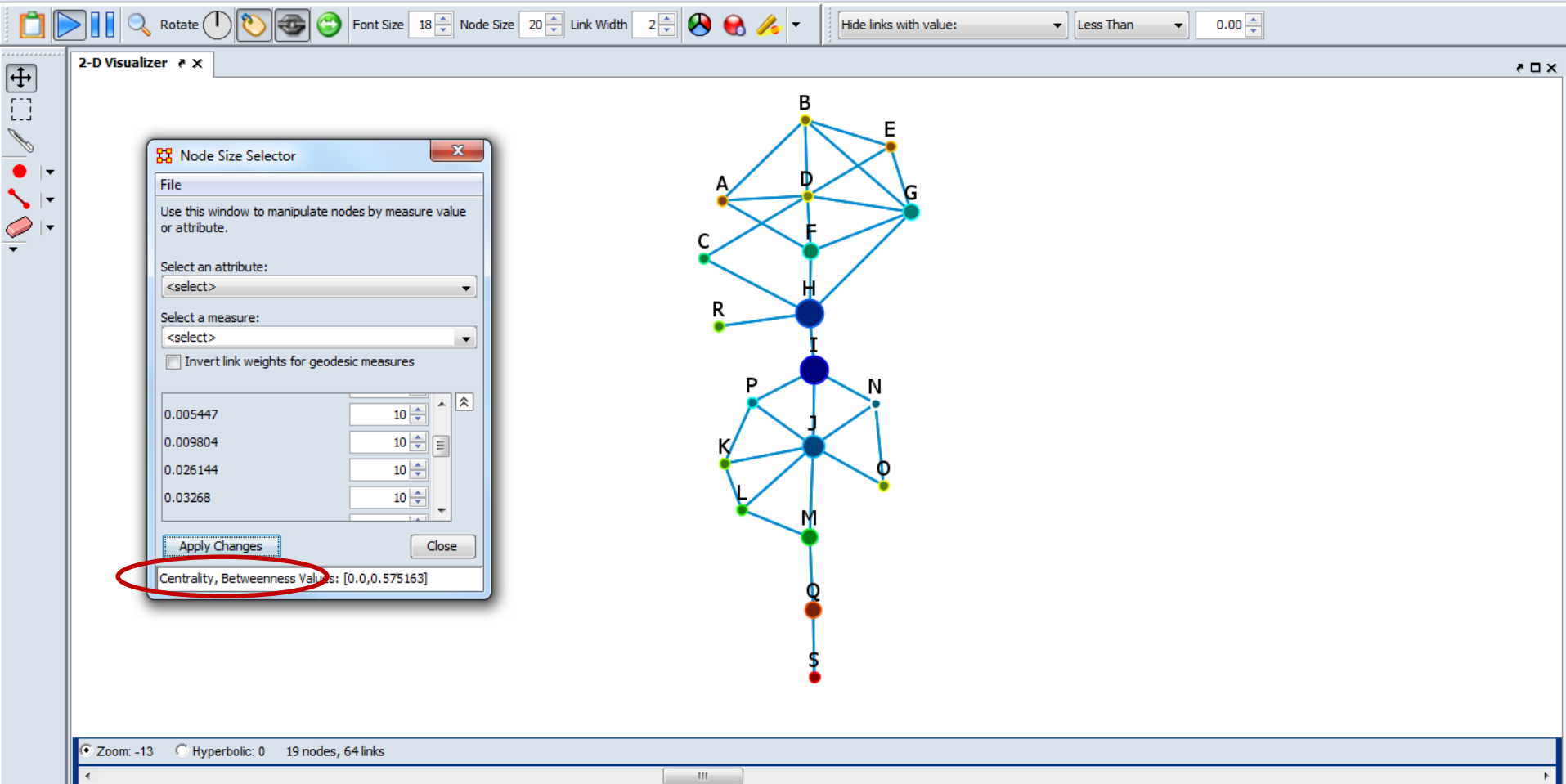
Step 4B: Color Based on Centrality-Closeness



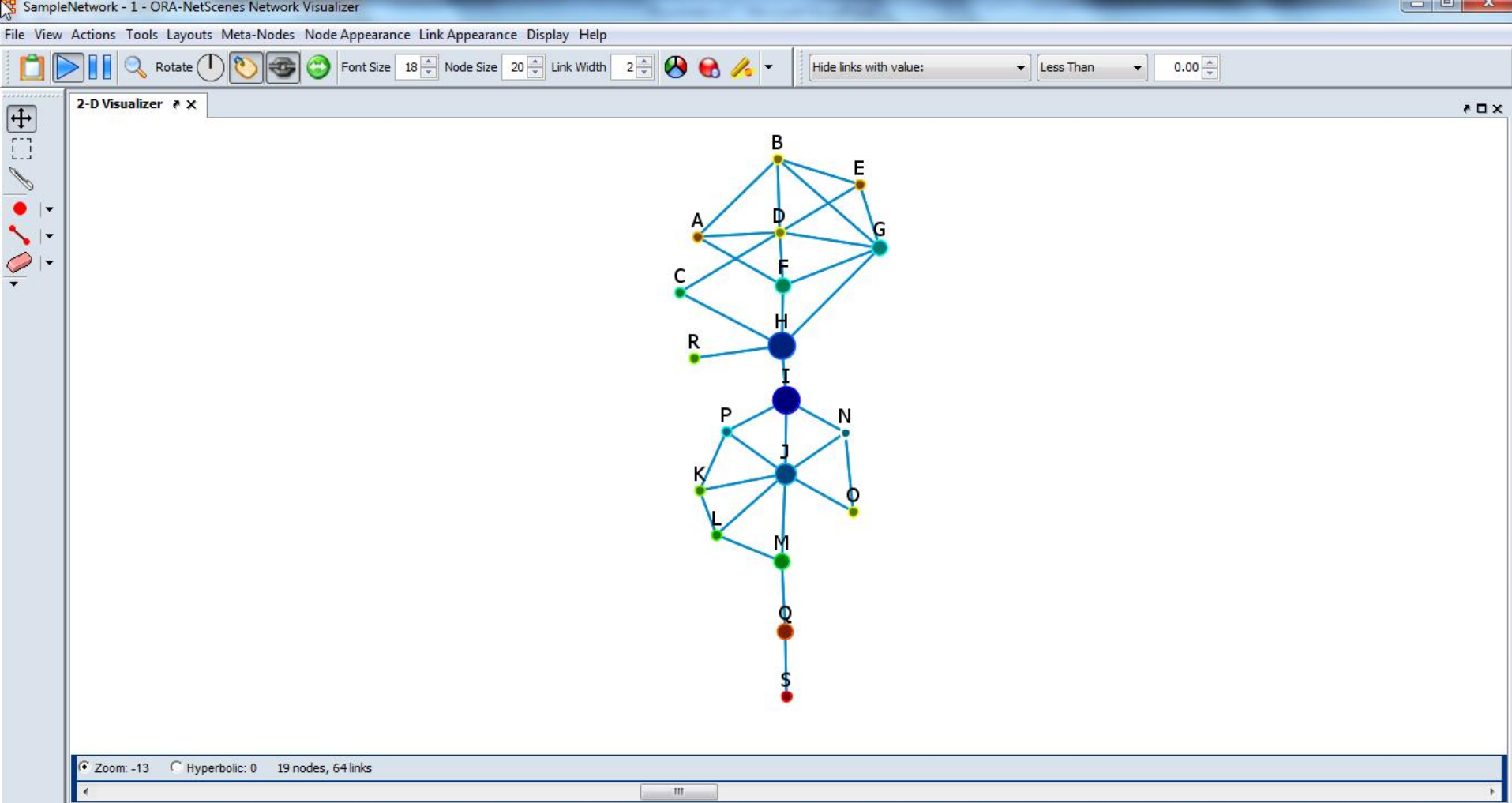
Step 4C: Highest Closeness -> Blue



Step 4D: Adjust Node Size



Step 4E: Size Based on Centrality-Betweenness



Step 4F: Color -> Closeness, Size 0-> Betweenness