

# Project: Panic

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## Overview:

The software package will be used to assist with link capacity planning. The tool will take into consideration the link capacity's, local bandwidth required and generated at each site, and allow for failure predictions.

## Implementation:

The system shall use Dijkstra's algorithm to calculate the shortest path between two nodes in the system. The path calculations shall be done from every point to the Source, and from the Source to every point. Thus achieving a Transmit Receive model and identifying problems in both directions.

This algorithm is used by OSPF, OSPFv3, RIPv2 and IS-IS routing protocols to compute the shortest path tree for each route in the system. By making use of this algorithm for modelling the data in this simulation, it would be possible to closely simulate the behaviour of real-world network systems.

## Inputs:

The system will take inputs for the three main components of the project

### Sites

The following information will be required for sites:

Site Name	Latitude	Longitude	Local TX	Local RX	Enabled	Notes
Text (unique)	Decimal Degrees		Mbits (int)		Yes/No (Boolean)	Text

Site Name	This is a text field. The name should be unique.
Latitude	This should be presented in decimal degrees.
Longitude	This should be presented in decimal degrees.
Local TX	This should be in Mbits (Megabit) of capacity. Should there be a need to express Gbit it should be expressed as a function of Mbits. Ie: 1Gbit = 1000Mbits.
Local RX	This should be in Mbits (Megabit) of capacity. Should there be a need to express Gbit it should be expressed as a function of Mbits. Ie: 1Gbit = 1000Mbits.
Enabled	This is a Boolean yes/no function.
Notes	This is a general text field that is used for generic descriptions.

There has to be a source site configured. This is the site that will be used for all calculations. This site would indicate the "Internet". *Quote: The internet is never off, it is simply unable to get to you.*

### Link Hardware

Links will be populated in the following table.

Description	Make	Model Number	TX capacity	TX Capacity	Notes
Text (unique)	Text	Test	Mbits (int)	Mbits (int)	Text



Description	This is a text field. The description should be unique to the link hardware system.
Make	This field is not required. It should contain the make of the hardware being used.
Model Number	This field is not required. It should contain the model number of the hardware system.
TX capacity	This should be in Mbits (Megabit) of capacity. Should there be a need to express Gbit it should be expressed as a function of Mbits. Ie: 1Gbit = 1000Mbits.
RX capacity	This should be in Mbits (Megabit) of capacity. Should there be a need to express Gbit it should be expressed as a function of Mbits. Ie: 1Gbit = 1000Mbits.
A note on TX and RX capacity: The direction is defined when the links are configured. SiteA->SiteB. The link capacity will be evaluated in respect to SiteA. (ie: TX from SiteA, and RX to SiteA)	
Enabled	This is a Boolean yes/no function.
Notes	This is a general text field that is used for generic descriptions.

### Links

Link ID	Site A	Site B	Hardware	TX Override	RX Override	Enabled	Notes
INT	<b>Dropdown from sites</b>		Dropdown from hardware	Mbits (int)	Mbits (int)	Yes/No	Text

Link ID	This is an INTEGER number used to represent each link.
Site A	This is Site A. The system is chosen from a dropdown list. All calculations will be conducted with SiteA as the point of reference. Ie: TX from SiteA and RX to SiteA
Site B	This is the second site in the Link. The system is chosen from a dropdown list.
Hardware	This is the link hardware used. The hardware is chosen from a list that is populated from Hardware.
TX Override	Should there be a requirement for TX override, it is done here. This should be in Mbits (Megabit) of capacity. Should there be a need to express Gbit it should be expressed as a function of Mbits. Ie: 1Gbit = 1000Mbits.
RX Override	Should there be a requirement for RX override, it is done here. This should be in Mbits (Megabit) of capacity. Should there be a need to express Gbit it should be expressed as a function of Mbits. Ie: 1Gbit = 1000Mbits.
Enabled	This is a Boolean yes/no function.
Notes	This is a general text field that is used for generic descriptions.

Should we allow for Point to Multi Point. Basically, SiteA->SiteB,SiteC,SiteD. Where The capacity is calculated as a combination of the TX and RX from SiteA.

Each link should have an additional weight assigned to it. This would simulate the impact of latency on the routing protocols. This weight should consider the congestion on the link and dynamically scale based on that. Ie: 50-60% link usage would add an additional 2-3% weight to the link. This should be configurable per link with a global configuration being applied to all links.

Is there a requirement to model E1 links?



[Main Page: Layout-Sites](#)

[illegible]

[Main Page: Layout-Hardware](#)

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Sites Hardware Links Graphical

Description	Make	Model Number	TX Capacity	TX Capacity	Enabled	Notes
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	
					<input checked="" type="checkbox"/>	

Status bar Number of links plotted:XXX Number of links over committed: XXX

In this section, the hardware details are entered.

## Main Page: Layout-Links

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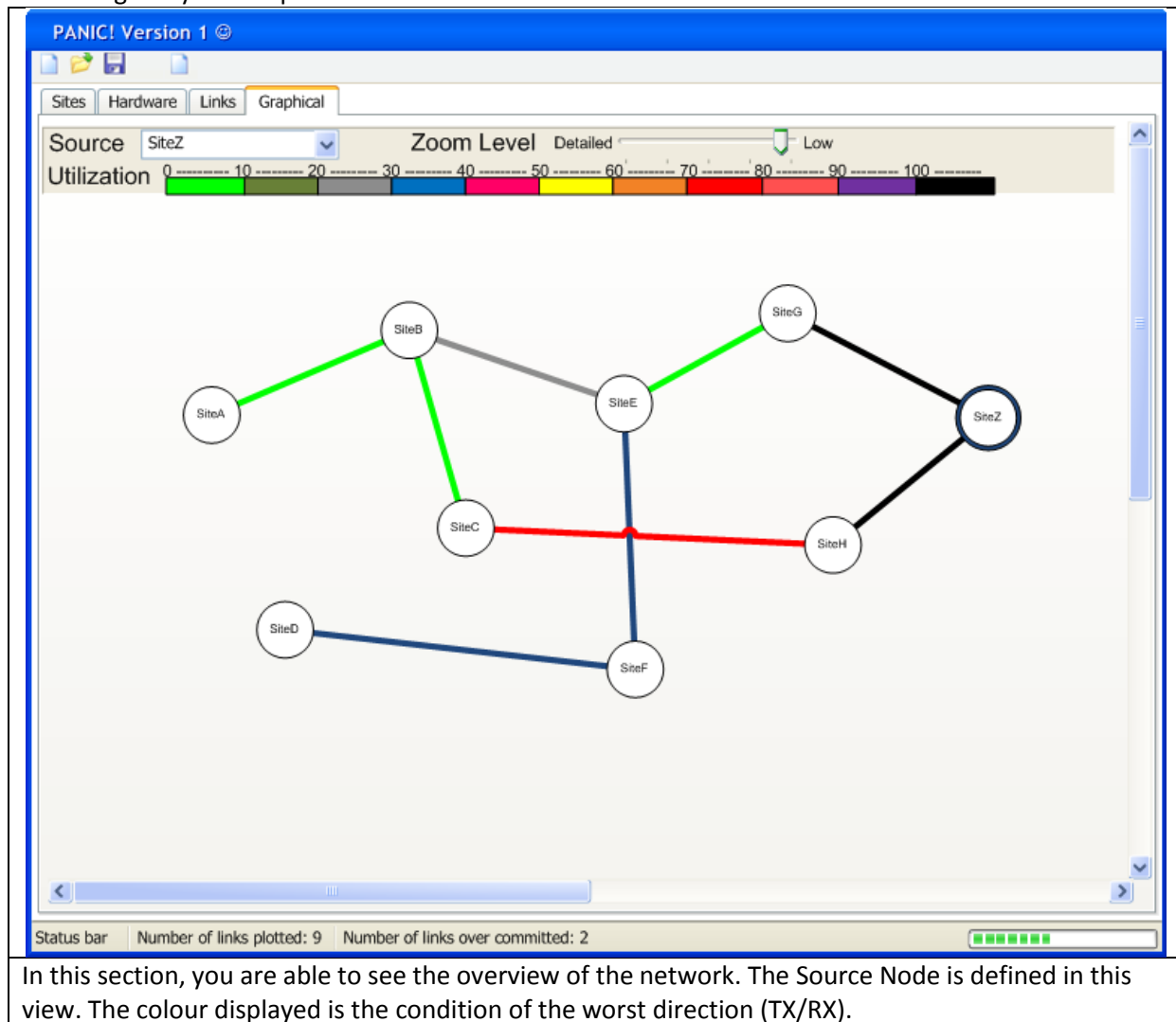
Sites Hardware **Links** Graphical

Link ID	Site A	Site B	TX Capacity	TX Capacity	Enabled	Notes
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	
	▼	▼			✓	

Status bar Number of links plotted:XXX Number of links over committed: XXX

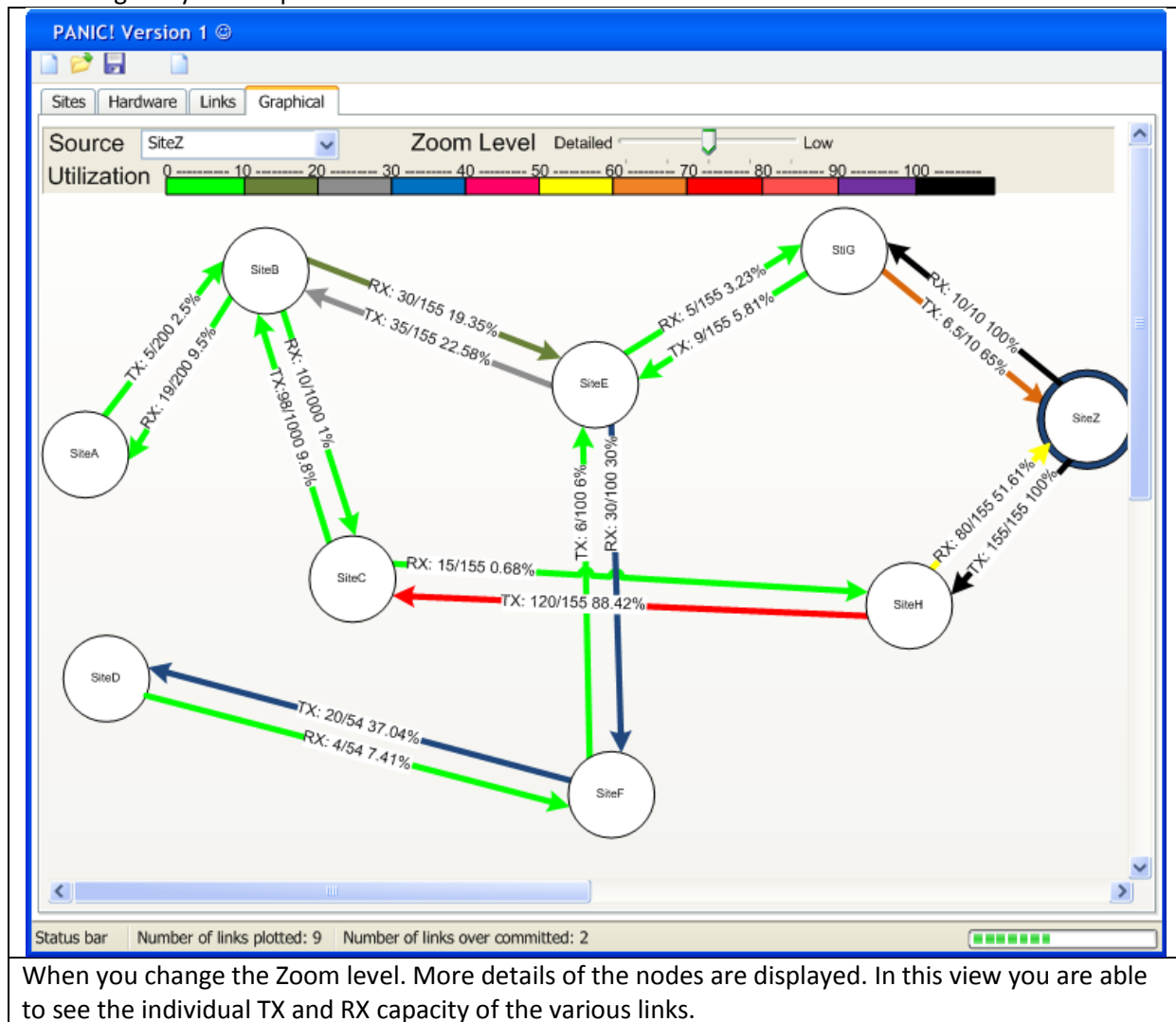
In this section, the link details are entered.

## Main Page: Layout-Graphical-low detail



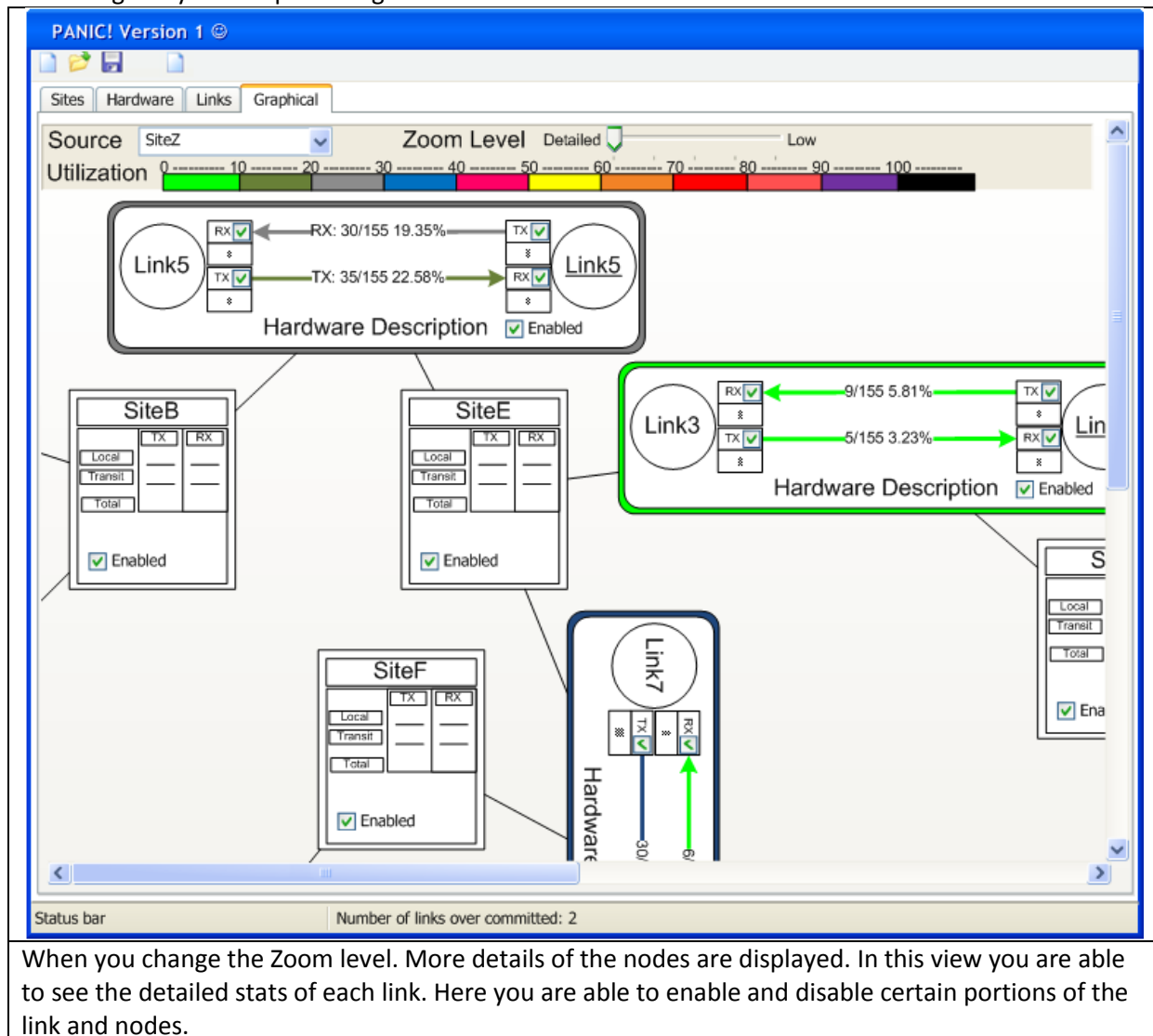
In this section, you are able to see the overview of the network. The Source Node is defined in this view. The colour displayed is the condition of the worst direction (TX/RX).

## Main Page: Layout-Graphical-Medium Detail



When you change the Zoom level. More details of the nodes are displayed. In this view you are able to see the individual TX and RX capacity of the various links.

## Main Page: Layout-Graphical-High Detail



When you change the Zoom level. More details of the nodes are displayed. In this view you are able to see the detailed stats of each link. Here you are able to enable and disable certain portions of the link and nodes.