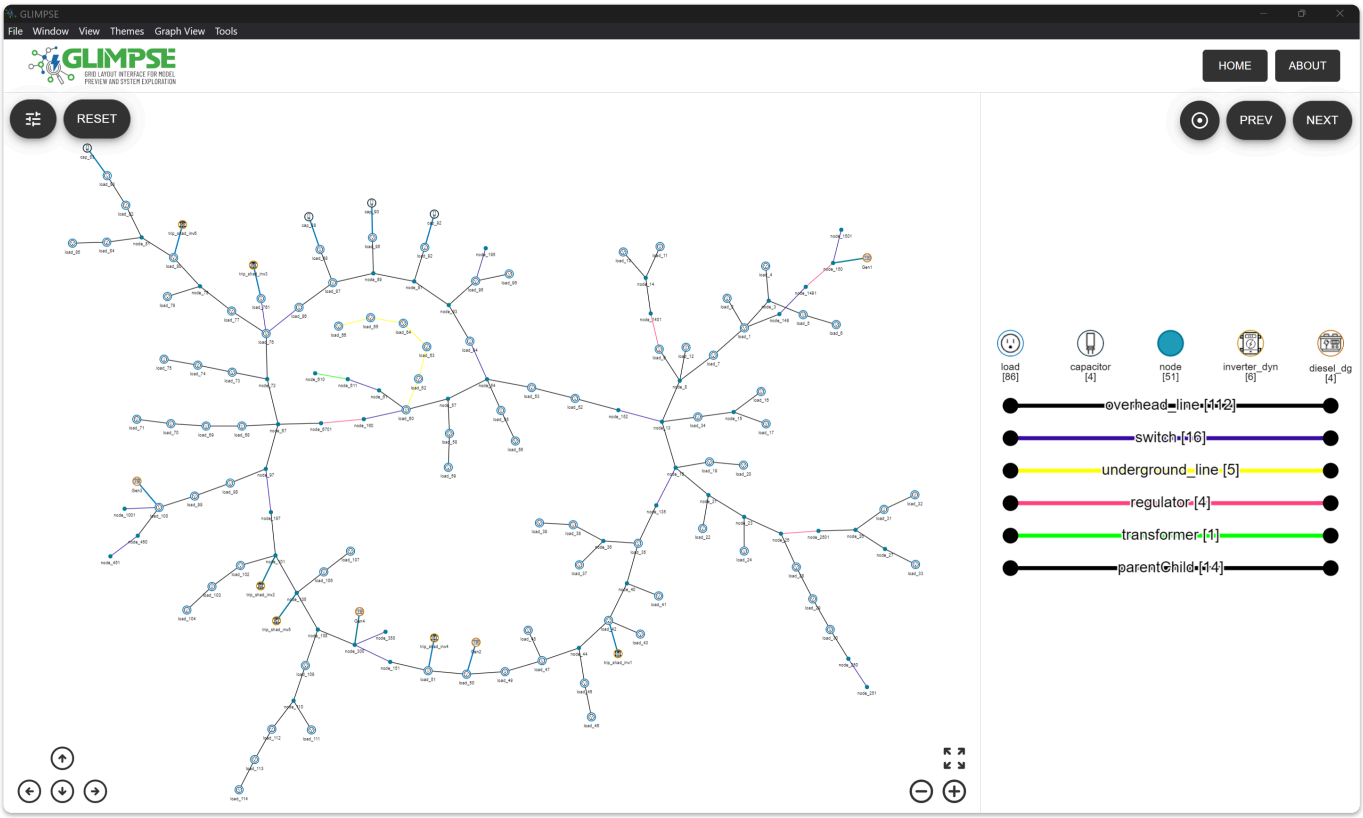
User Manual

Getting Started

GLIMPSE is a graph-based desktop application to visualize and update GridLAB-D power grid models. The tool can be used to search and highlight power grid model objects. Additionally, it also update the model attributes and export the modified model future simulations.

- GLIMPSE comes with a data folder found at `GLIMSPE/glimpse/data/`. In this folder you will find multiple Feeder model files as well as some example JSON files that have a custom graph.
    - Each feeder model folder contains 1 - 4 `.glm` files
    - Drag and drop them on the upload area in the GLIMPSE UI
    - Or click on the upload area to simply find and select the files you want to visualize



UI Tour

- At the top right there is the `HOME` and `ABOUT` buttons
    - `HOME` - Click to go back and upload a new file
    - `ABOUT` - Click to read more about the tool and it's features

- Bellow The `HOME` and `ABOUT` buttons there is the `Vis Actions`, `PREV`, and `NEXT` buttons for interacting with the overall visualization
  - `Vis Actions` - Hover over to reveal a `Rotate CW` (Clock Wise) and a `Rotate CCW` (Counter Clock Wise) buttons. These buttons rotate the entire visualization by 15 degrees.
  - `PREV` and `NEXT` - These buttons cycle through any highlighted nodes. To highlight nodes double click on a node type in the legend just bellow these buttons.
- To the top left there is a `RESET` button for clearing all the style changes when highlighting nodes and edges from the legend.
- Next to the `Reset` button there is a `Vis Options` button that opens a drawer of different options.
  - Search Field - Type the ID of a node to find it in the visualization. The search field supports autocorrect to help narrow down your search.
  - `Auto Layout` - This toggle resumes `Vis.js` physics engine so that the visualization unravels itself.
  - `Hide Legend` - This toggle will hide the Legend to the right of the window for greater visualization real estate.
  - `ATTACH OVERLAY` - This is a button that will pop up an similar drag and drop area when first loading up GLIMPSE. Click and select or drag and drop your overlay files. You can also upload multiple Feeder models. An example use of this button is to upload the `123` model from the `data/123-bus-model/` location and then clicking the `ATTACH OVERLAY` button to then upload the `data/123-bus-mode/overlay/grid.json` file.
- Double click on a node in the visualization to modify the attributes that belong to that node.
- After any modifications click `File > Export`. This will have you select a location to save that new modified `.glm` files

Context Menu Actions

- `Node Right-Click` - Right-Clicking on a node will show a couple of options
  - `Delete Node` - This will delete the node from the visualization and can be reflected on the export of the uploaded `.glm` files.
  - `Cluster` - This is best for when you have multiple models or when you upload the larger models and you decided to open a cluster.
  - `Open Cluster` - On larger models a community detection algorithm is ran in the background to categorize the nodes into communities to then cluster. This option will open the selected clustered node to view any nodes and edges inside that cluster.
- `Edge Right-Click` - Right-Clicking on an edge will give the user some of the following options.
  - `Hide Edge` - Hide only this edge

    - `Hide Edges of This Type` - If the edge has a type all of the edges of that same type will be hidden
    - `Delete Edge` - Remove the edge from the visualization
    - `Animate Edge` - Show a small orange arrow animation going from source to target node.
    - `Remove Animation` - This option shows up when you right click on an animated edge to remove the animation
- `Right-Click` - Right-Clicking on an empty area of the visualization will show other options
    - `New Node` - This option will open a new node form to add new nodes
    - `New Edge` - Same as the new node form you will be able to create a new edge between two existing nodes.
    - `Save image as ...` - This option will have you select where you would like to save a png image of the current visualization.

Legend Context Menu Actions

- Right clicking on a node or edge will give the user two options.
    - `Hide All` - This will hide all edges or nodes of that type.
    - `Edit Theme` - This option will bring up the them builder form that allows the user to modify the color, shape, and size for a selected node type or the width and color for a selected edge type.

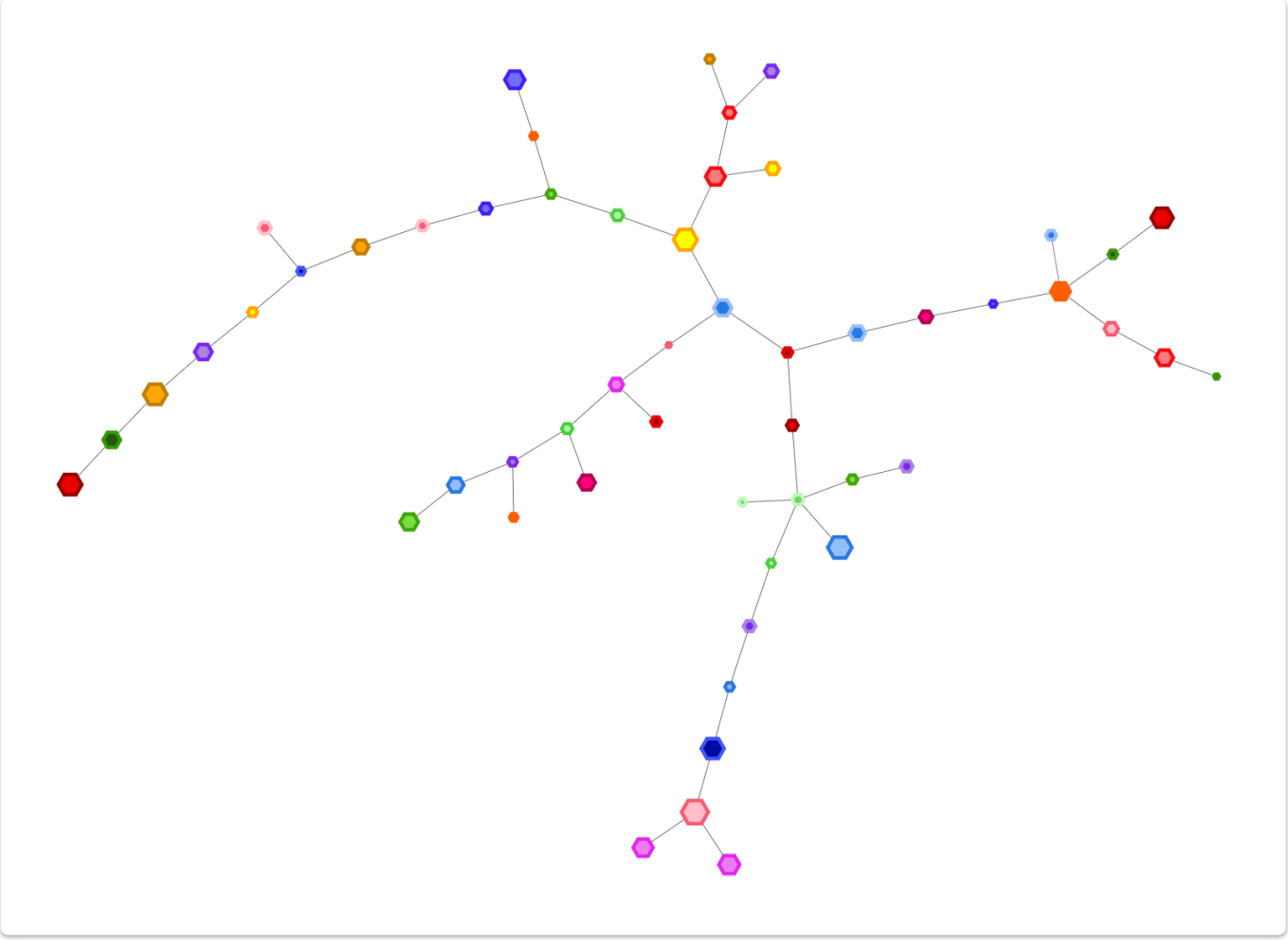
Custom Graphs

To visualize custom graphs GLIMPSE accepts two different JSON structures

1. GLIMPSE Structure - This structure is based on the glm2json output from the parser GLIMPSE uses in the back ground.
2. Networkx Node Link Data - If you have a networkx GRAPH object in python you can use the `node_link_data` function to generate a JSON dump of your graph and upload it to GLIMPSE as a JSON file.

Uploading Large Graphs

When uploading large graphs that contain more than 2k nodes and edges that graph will be fed through a community detection algorithm from the Networkx library. Particularly the Louvain community detection algorithm. The clustered nodes are visualized as hexagons and scaled based on how many nodes are in the cluster. The larger the cluster node that more nodes are in it.



The above screenshot shows how a graph with 2829 nodes and 2834 edges is clustered down.

GLIMPSE WebSocket Server API

GLIMPSE has API so more power users can create a JavaScript or python script to connect to GLIMPSE's local WebSocket server. The API revolves around styling existing nodes and edges while also being able to create and delete nodes and edges. A pdf of the API can be found here. You can also find code examples in the GLIMPSE GitHub repository here.