MP Gryphon Toolset

USERS MANUAL

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1 Introduction

1.1 Overview

The *MP Gryphon Toolset* supports *Monterey Phoenix* users with tools for building MP Code and generating trace graphs calculated from MP code. The *MP Gryphon Toolset* consists of the *MP Gryphon GUI* and the *MP Gryphon Trace Generator*:

- The *MP Gryphon GUI* tool is the graphical interface tool for editing MP Code and for running the *MP Gryphon Trace Generator* engine to view generated traces.
- The *MP Gryphon Trace Generator* tool compiles MP Code into traces that the *MP Gryphon GUI* can read and graph.

1.2 Compatibility

MP Gryphon GUI Version 0.3.0 is compatible with *Monterey Phoenix* Version 4 pre-alpha and *MP Gryphon Trace Generator* Version 4 pre-alpha.

2 Installing the *MP Gryphon Toolset*

You will need the *MP Gryphon GUI* and the *MP Gryphon Trace Generator*. For now, for Mac/Linux: clone *MP Gryphon Toolset* source code directly from their Git repositories by typing the following:

- `git clone https://gitlab.nps.edu/monterey-phoenix/user-interfaces/MP_Gryphon_GUI.git`
- `git clone https://gitlab.nps.edu/monterey-phoenix/trace-generator.git`

or

- `git clone git@gitlab.nps.edu:monterey-phoenix/user-interfaces/MP_Gryphon_GUI.git`
- `git clone git@gitlab.nps.edu:monterey-phoenix/trace-generator.git`

To clone from GitLab you will need to upload your public RSA Key as described at `https://gitlab.nps.edu/help/ssh/README.md`.

2.1 Installing Python 3

Install Python3 if it is not already present. To see if Python3 is already installed, you may type the following at a command prompt and verify that Python Version 3 is present:

- Mac/Linux:
  - `python3 --version`

If not already present, you may download and install Python3 for your system from `https://www.python.org/download/releases/3.0`.

Linux users may prefer to install Python 3 using their package manager, for example Fedora users might type:

- `sudo dnf install python3+`

2.2 Installing PyQt5

The *MP Gryphon GUI* requires PyQt5. Please type the following at a command prompt to install PyQt5:

- Mac/Linux:
  - `python3 -m pip install PyQt5`

2.3 Building the *MP Gryphon Trace Generator*

If you installed on Linux using the repositories then the *MP Gryphon Trace Generator* must be built. First, please install requisites needed for running `make`. Mac users may be asked to install Command line developer tools, which are required. Linux users need to install 32-bit CLib and the csh shell. Syntax depends on Linux flavor. A Fedora dnf example is to type:

- `sudo dnf install glibc-devel.i686`
- `sudo dnf install tcsh.x86_64`

An Ubuntu apt example is:

- `sudo apt install libc6-dev-i386`
- `sudo apt install csh`

Build the trace generator engine from a command window by navigating to the `MP_Gryphon_Trace_Generator` directory and typing:

- `make`

3 Launching the *MP Gryphon GUI*

For Linux users: from a command window, navigate to the `MP_Gryphon_GUI/python/` subdirectory, for example to path `/Users/<yourname>/Downloads/MP_Gryphon_GUI_<latest version>/python` and type:

- `./mp.py`

3.1 Configuring the *MP Gryphon GUI*

Once launched, the *MP Gryphon GUI* may be configured using its menu controls under `Preferences`:

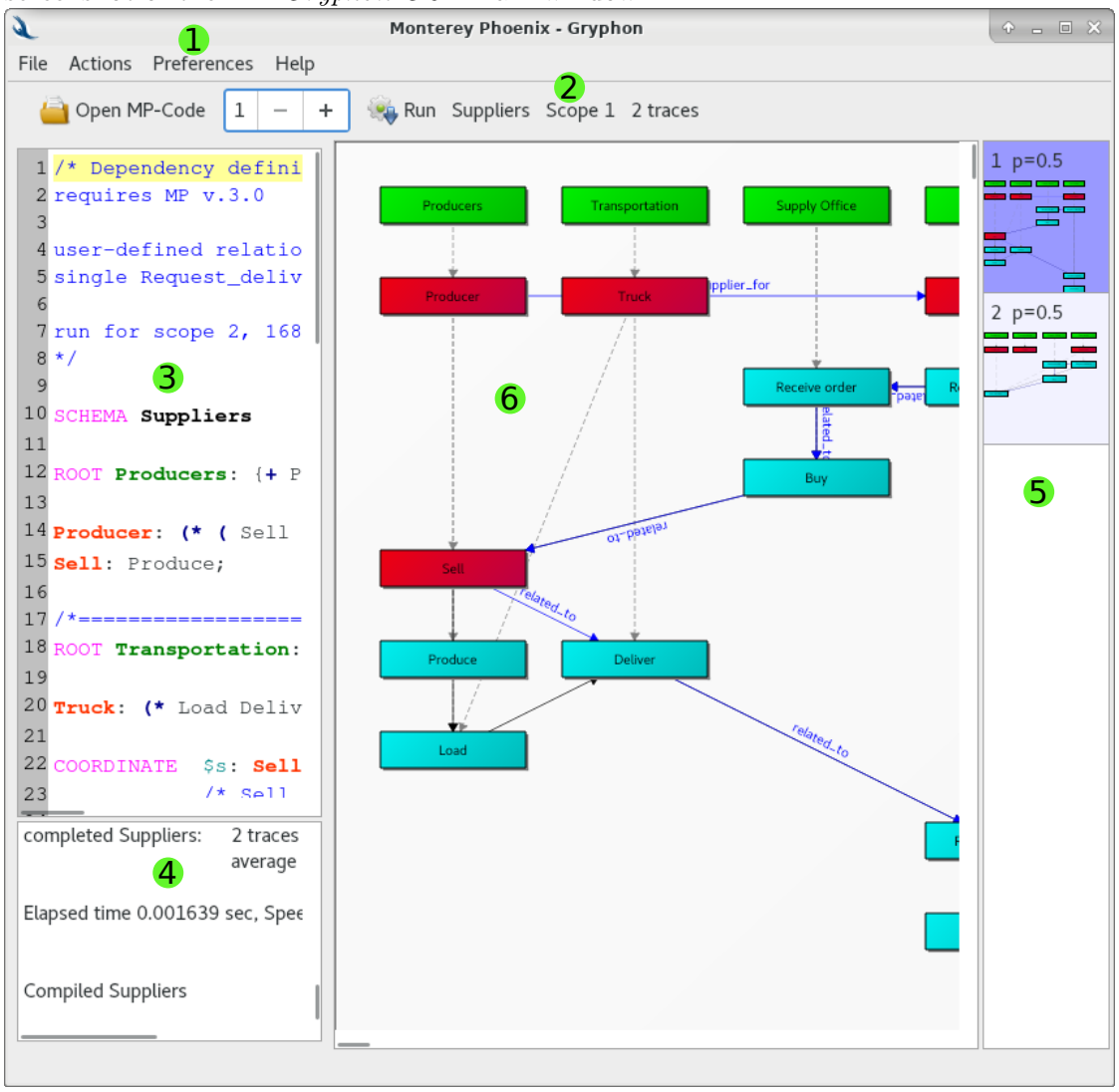
- Several graph appearance options are available optimized for brightness, printing, a classic look, etc.

4 Working with the *MP Gryphon GUI*

To write your own system models, a working knowledge of *Monterey Phoenix* technology and MP Code syntax is required. Please visit `https://wiki.nps.edu/display/MP/Monterey+Phoenix+Home` for information about working with *Monterey Phoenix* technology.

5 *MP Gryphon GUI* User Interfaces

This section describes user interfaces available to *MP Gryphon GUI*. Here is an example screenshot of the *MP Gryphon GUI* main window:



The following parts are shown:

1. Menu controls
2. Trace generator controls and status
3. MP Code editor pane
4. Log pane
5. Trace selection list
6. Main trace view pane

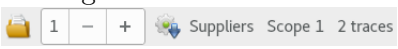
5.1 Menu Controls

Menu controls include:

- **File**
  - Open, save MP Code, open examples.
  - Import and export projects.
  - Export one or all traces.
- **Actions**

  - Run the trace generator engine.
  - Clear the Log pane.
- **Preferences**
  - Graph Settings: Set graph settings:
    * Bright - View with high color contrast.
    * Print - View with colors that are more readable when printed.
    * Classic - Use classic Firebird coloring.
    * Custom - Set, save, share your own color scheme.
  - Server: Set to connect to a *MP Gryphon Trace Generator* Server or to use the *MP Gryphon Trace Generator* locally.
- **Help**
  - View help for the *MP Gryphon Toolset*.
  - View information about *MP Gryphon Toolset*.

5.2 Trace generator controls and status

Trace generater controls and status are available in the toolbar, for example:


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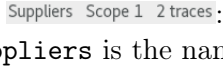
Hover the cursor over controls to see tooltips. Controls include:

- The "Open MP Code File" button () for opening a MP Code file.
- The "Scope" selector (

) for selecting the scope for trace generation.
- The "Run" button (

) for running the trace generator engine on the MP Code.

Status describes information about the currently loaded trace generation view. In this example, 

:

- `Suppliers` is the name of the schema as defined in the MP Code.
- `Scope 1` indicates that the trace generator engine was run for the MP Code at scope level 1.
- `2 traces` indicates that the trace generator engine produced two traces.

5.3 MP Code Editor Pane

Manage MP Code using the MP Code editor pane:

- Open, import, paste, or edit your MP Code.
- Syntax highlighting identifies keywords, root events, composite events, etc.
- Run the trace generator engine (

) at the desired scope to generate traces from your MP Code.

5.4 Log Pane

The log pane provides a log of actions taken and of trace generator output. It is available for reference. You may clear it using menu control `File | Actions | Clear MP Code Log`.

5.5 Trace selection list

The trace selection list contains a list of all possible traces given your MP Code and scope. At the top of each trace is its trace index and the probability of that trace occurring. The sum of probabilities across all traces is 1.0.

- Scroll down the trace list to view all traces.
- Click on a trace to select it in the main trace view pane.

5.6 Main Trace View Pane

The Main trace view pane contains the currently selected trace. You may adjust this view as follows:

- Pan by dragging the mouse or moving the scrollbars.
- Zoom by moving the mouse wheel or by pressing the `+` or `-` keys. The zoom focal point is at the cursor.
- Drag nodes to move them.
- You may also adjust view settings using menu control `Preferences | Graph Settings | Custom...`.
- Future work:
  - Nodes will have menus for collapse, expand, etc.
  - Edges may be movable.

5.7 Keyboard Shortcuts

5.7.1 Graph Window Shortcuts

- CTRL + Click on event (Command + Click on Mac): Toggle select or unselect individual events.
- SHIFT + Click on event: Select event and all events below it bound by IN relation.
- Click empty space: Unselect all events.
- Click on empty space and drag: Pan the view.
- SHIFT + Click empty space and drag: Select events in range.
- CTRL + A (Command + A on Mac): Select all events.
- Keyboard arrow keys: Pan the view.
- + and - keys: Zoom in and out.
- Click menu tab: Open menu for an event.
- Right-click event: Open menu for an event.
- H: Toggle hide/unhide selected event(s).
- C: Toggle collapse/uncollapse selected Root and Composite event(s). Results may be unexpected if multiple events are selected.

5.7.2 Code Window Shortcuts

- Click word to highlight word.
- Click or Navigate to parenthesis to find its mate.
- CTRL + Spacebar or type first three letters: Show auto-complete hints for existing events or keywords.

5.7.3 Graph List Shortcuts

- Up and down arrows: Select previous or next trace.

6 Examples

Please obtain, install, and start the *MP Gryphon GUI* graphical interface per installation instructions, above.

6.1 Load and run MP Code Example 1

In this example we open and run MP Code example 1 at Scope 2, select and adjust trace 2, and save the view as a `.png` image file.

1. Under menu control `File | Open MP Code Example` select example `Example_1_simple_message_flow.mp`. The MP Code listing will show up in the code editor pane.
2. Set the scope to 2 by adjusting the Scope spinner trace generator control.
3. Run the trace generator engine by pressing the run icon (

). Three traces will be generated. All three traces will be visble in the trace selection list. The first trace will be visible in the main trace view pane.
4. Select the third trace in the list. This trace will be drawn in the main trace view.
5. Move some nodes as desired by dragging them with the cursor.
6. Export the third trace to a `.png` file using menu `File | Export Trace...`.
7. If you would like to print your exported traces, you may wish to select menu control `Preferences | Graph Settings | Contrast` for higher contrast for printing before exporting them. Or select menu control `Preferences | Graph Settings | Custom...` to configure your own graph view scheme.

7 Reporting Bugs

Please report any bugs encountered during operation of the *MP Gryphon Toolset*. To assist in diagnosing your bug, please include the following informtion:

- The `.mp` code, Scope number, and selected Trace used when the error occurred.
- The steps taken that can be used to recreate the error.
- The version of the *MP Gryphon GUI* tool used.
- The Operating System you used.

8 Post-processing Analysis

The *MP Gryphon GUI* tool exports graph data in JSON Graph format (JGF). This output may be used during post-processing analysis of graph data or for input to third party tools which can accept JGF data as input. The JGF standard defines names for `graph`, `node`, and `edge` fields. The *MP Gryphon GUI* tool extends these fields by including additional information such as graph positioning, the trace `mark` field, Cubic Bezier edge points for curved edges, and whether nodes are hidden or collapsed. For more information on JGF please see `http://jsongraphformat.info`. For syntax of JSON data exported by the *MP Gryphon GUI* tool, please use the export command to create your own JSON `.gry` file and use that as a reference.