Test Plan

For GMoDS Visualizer and Test Driver

Version 1.0

Submitted in partial fulfillment of the requirements of the degree of MSE

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Table of Contents

1 Test Plan Identifier

GMoDS-Visualizer-TestDriver-TestPlan-1.0

2 Introduction

This document describes the testing to be performed on the GMoDS Visualizer and Test Driver components. The GMoDS Visualizer component allows visualization of the specification tree and instance tree goals within the Goal Model for Dynamic Systems (GMoDS). The GMoDS Test Driver is a component that allows scripted events (from a file or generated randomly) to be send to GMoDS to test the GMoDS Visualizer. This testing will be performed in accordance with the Project Plan 2.0 and Software Quality Assurance Plan 1.0 available at http://people.cis.ksu.edu/~mfraka/FrakaMSE.html.

3 Test Items

The requirement specifications for all features of each item to be tested can be found in Vision Document 2.0 at http://people.cis.ksu.edu/~mfraka/FrakaMSE.html. The architectural design and formal specification for these items can be found at the same URL.

The following items will be tested.

- GMoDS Test Driver
  - GMoDSTestDriverImpl
  - EventScriptImpl
  - RandomEventScriptImpl
  - GoalEventImpl

- GMoDS Visualizer
  - GMoDSModelImpl
  - GMoDSVisualizerUI
  - AbstractUI
  - AbstractCanvas
  - SpecificationTreeUI
  - SpecificationTreeCanvas
  - SpecificationGoalUI
  - InstanceTreeUI
  - InstanceTreeCanvas
  - InstanceGoalUI
  - AbstractRelationUI
  - AbstractTriggerUI
  - PrecedesRelationUI
  - PositiveTriggerUI
  - NegativeTriggerUI
  - FlashDaemon
  - AbstractPart
  - GMoDSVisualizerPart
  - SpecificationTreePart

- InstanceTreePart
- InstanceGoalPart

4 Features to be tested

This section lists the system requirements that will be tested for the GMoDS Test Driver and GMoDS Visualizer. For each component each feature to be tested is uniquely identified in its own sub-section and associated with the specific system requirement(s) that define the feature. This document uses these tested feature identifiers as a convenient cross-reference to avoid repeating system requirement details.

4.1 GMoDS Test Driver

4.1.1 TF.GTD-1.1

SR.GTD-1.1 - the [GMoDS Visualizer on behalf of the] GMoDS Test Driver shall prompt the user for a goal event script [etc.].

4.1.2 TF.GTD-1.2

SR.GTD-1.2 - the GMoDS Test Driver shall parse the goal event script to generate goal events.

4.1.3 TF.GTD-1.2.1

SR.GTD-1.2.1 - the GMoDS Test Driver shall log errors and drop invalid goal events from the script. In addition, the [GMoDS Visualizer on behalf of the] GMoDS Test Driver shall visually inform the user of these errors.

4.1.4 TF.GTD-1.2.2

SR.GTD-1.2.2 - the GMoDS Test Driver shall support a scripted events language with the following event types: ACHIEVED, FAILED, and MODIFIED events for each active instance goal, and positive and negative trigger events defined by the specification goal corresponding to any active instance goal.

4.1.5 TF.GTD-1.2.3

SR.GTD-1.2.3 - the GMoDS Test Driver Event Script Language (GTD-ESL) shall include the XML elements and attributes defined in all sub-requirements labeled SR.GTD-1.2.3.X where X ranges from 1 to 8.

4.1.6 TF.GTD-1.5

SR.GTD-1.5 - the GMoDS Test Driver shall issue each goal event defined in the event script to GMoDS after the specified delay time (milliseconds) relative to the previously issued goal event (automatic mode) or after the user selects “Next” (manual mode).

4.1.7 TF.GTD-1.6

SR.GTD-1.6 - upon initialization of the GMoDS Test Driver in this use case, the GMoDS Test Driver shall enter manual mode and await user interaction.

4.1.8 TF.GTD-1.6.1

SR.GTD-1.6.1 - If the user clicks “Play” in manual mode, the GMoDS Test Driver enters automatic mode and begins to execute each event [etc.].

4.1.9 TF.GTD-1.6.2

SR.GTD-1.6.2 - if the user clicks “Next” in manual mode, the GMoDS Test Driver issues the next unexecuted goal event and waits for the next user interaction [etc.].

4.1.10 TF.GTD-1.6.3

SR.GTD-1.6.3 - if the user clicks “Pause” in automatic mode, the GMoDS Test Driver enters manual mode and waits for the next user interaction.

4.1.11 TF.GTD-1.6.4

SR.GTD-1.6.4 - if there are no more pre-defined events remaining or the specified number of random events have been issued, the GMoDS Test Driver disables the “Play” and “Next” controls.

4.1.12 TF.GTD-2.1.2

SR.GTD.2.1.2 - the GMoDS Test Driver may be configured with the minimum and maximum string lengths for randomly generated strings. The system shall default to a minimum string length of 1 and a maximum string length of 10.

4.1.13 TF.GTD-2.1.3

SR.GTD.2.1.3 - the GMoDS Test Driver may be configured with the minimum and maximum delay time in milliseconds between randomly issued goal events. The system shall default to a minimum delay time of 100 milliseconds and maximum delay time of 5000 milliseconds. The system shall not accept a minimum delay time of less than 1 millisecond.

4.1.14 TF.GTD-2.1.4

SR.GTD.2.1.4 - the GMoDS Test Driver may be configured with the number of random goal events to issue. The system will default to 25 random goal events to issue.

4.1.15 TF.GTD-2.2

SR.GTD-2.2 - the GMoDS Test Driver shall incrementally issue random goal events based on the current active instance goals.

4.1.16 TF.GTD-2.3

SR.GTD-2.3 - the GMoDS Test Driver shall keep a history of randomly-generated goal events to form the current event script being executed.

4.1.17 TF.GTD-3.1

SR.GTD-3.1 - the GMoDS Test Driver shall provide a “Save Script” menu item that will cause the GMoDS Test Driver to save the currently executing goal event script to a file.

4.1.18 TF.GTD-3.2

SR.GTD-3.2 - the [GMoDS Visualizer on behalf of the] GMoDS Test Driver shall allow the user to specify the file to contain the saved script.

4.1.19 TF.GTD-3.2.1

SR.GTD-3.2.1 - if the user selects a file that exists, the [GMoDS Visualizer on behalf of the] GMoDS Test driver shall ask for confirmation that it should overwrite that file.

4.1.20 TF.GTD-3.2.2

SR.GTD-3.2.2 - if the user selects a file name that does not exist or confirms the overwrite-operation, the GMoDS Test Driver shall save the current goal event script to the file.

4.2 GMoDS Visualizer

4.2.1 TF.GV-1.1

SR.GV-1.1 - the system shall display the specification goal tree as a graphical tree using minimum white space padding between adjacent tree elements [etc.].

4.2.2 TF.GV-1.2

SR.GV-1.2 - the system shall display the string name of all specification goals, parent/child connectives («and» and «or»), trigger events, negative trigger events, and precedes relations («precedes»).

4.2.3 TF.GV-1.3

SR.GV-1.3 the system shall use the current “Specification Tree Show/Hide Parameters” setting to decide whether to display the parameter name for goals or events.

4.2.4 TF.GV-1.4

SR.GV-1.4 - the system shall show all parent/child, precedes, positive trigger, and negative trigger relations as lines connecting two specification goals.

4.2.5 TF.GV-1.5

SR.GV-1.5 - the lines connecting the source specification goal to the destination specification goal for positive trigger, negative trigger, and precedes relations shall have an arrow head pointing to the destination goal.

4.2.6 TF.GV-1.6

SR.GV-1.6 - parent/child, precedes, and trigger relation lines shall be solid.

4.2.7 TF.GV-1.7

SR.GV-1.7 - negative trigger relation lines shall be dashed.

4.2.8 TF.GV-1.8

SR.GV-1.8 - the system shall separate specification goal names from parameters using a horizontal line if parameters are displayed. If parameters are not displayed no such horizontal line shall be shown.

4.2.9 TF.GV-1.9

SR.GV-1.9 - the system shall show for each specification goal each parameter name on its own single separate line.

4.2.10 TF.GV-1.10

SR.GV-1.10 - the system shall show all event parameters on a single line between the opening parenthesis and closing parenthesis separated by a comma. The final parameter shall be followed by the closing parenthesis and no comma.

4.2.11 TF.GV-1.11

SR.GV-1.11 - parent/child relation lines shall not intersect with each other.

4.2.12 TF.GV-1.12

SR.GV-1.12 - the system shall minimize the number of intersections between precedes, positive trigger, negative trigger, and parent/child relation lines.

4.2.13 TF.GV-1.13

SR.GV-1.13 - the system shall not allow any lines to intersect goal rectangles.

4.2.14 TF.GV-1.14

SR.GV-1.14 the system shall provide scrolling and zooming of the specification goal tree view.

4.2.15 TF.GV-2.1

SR.GV-2.1 - the system shall display the instance goal tree as a graphical tree using minimum white space padding between adjacent tree elements [etc.].

4.2.16 TF.GV-2.2

SR.GV-2.2 - the system shall display the instance goal name for each instance goal.

4.2.17 TF.GV-2.3

SR.GV-2.3 - the system shall display a collapse/expand toggle rectangle, if the instance goal has children, centered on the lower edge of the instance goal. An instance goal displaying its children will display the character "-" in the collapse/expand toggle. An instance goal hiding its children will display "+" in the collapse/expand toggle.

4.2.18 TF.GV-2.4

SR.GV-2.4 - the system shall display a show/hide parameter toggle rectangle, if the instance goal has parameters, centered on the left edge of the instance goal. An instance goal showing its

parameters will display the character “H” in the show/hide parameter toggle. An instance goal hiding its parameters will display the character “S” in the show/hide parameter toggle.

4.2.19 TF.GV-2.5

SR.GV-2.5 - the system shall connect each parent instance goal to one of its child instance goals using a line with an arrow pointing to the child, whose source is the collapse/expand toggle control on the parent instance goal. The arrow head shall be centered on the top edge of the child instance goal.

4.2.20 TF.GV-2.6

SR.GV-2.6 - the system shall separate instance goal names from parameters using a horizontal line if parameters are displayed. If parameters are not displayed no such horizontal line shall be shown.

4.2.21 TF.GV-2.7

SR.GV-2.7 - the system shall show each instance goal parameter, parameter value, and parameter value origin combination on a single line separated by a space, a semi-colon, and another space. One line will be used for each combination of instance goal parameter, parameter value, and parameters value origin.

4.2.22 TF.GV-2.8

SR.GV-2.8 - the system shall abbreviate the parameter value origin values as I (inherited), T (trigger), and M (modification).

4.2.23 TF.GV-2.9

SR.GV-2.9 - the system shall provide scrolling and zooming of the instance goal tree view.

4.2.24 TF.GV-2.10

SR.GV-2.10 - the system shall allow the user to specify that instance goals of particular specification goals be shown or hidden.

4.2.25 TF.GV-3.1

SR.GV-3.1 - the system shall flash all instance goals for which it has received a change for a pre-defined period.

4.2.26 TF.GV-3.2

SR.GV-3.2 - the default flashing period shall be 2 seconds. The default flashing cycle shall be 0.5 second. Both the flashing period and flashing cycle shall be editable in manual mode.

4.2.27 TF.GV-3.3

SR.GV-3.3 - the system shall flash an instance goal by changing its background and foreground from its state color to its defined flash color and back once every flashing cycle [etc.].

4.2.28 TF.GV-4.1

SR.GV-4.1 - the system shall show or hide all specification goal and event parameters as specified by the user.

4.2.29 TF.GV-5.1

SR.GV-5.1 - the system shall show or hide all instance goal parameters as specified by the user.

4.2.30 TF.GV-6.1

SR.GV-6.1 - the system shall toggle the display of parameter names, value, and value origins for the specific instance goal whose parameter display toggle control has been clicked.

4.2.31 TF.GV-7.1

SR.GV-7.1 - the system shall collapse the specific instance goal sub-tree hiding all descendant goals if the user clicks on the collapse toggle control of that instance goal.

4.2.32 TF.GV-7.2

SR.GV-7.2 - the system shall expand the specific instance goal sub-tree showing all descendant goals whose parent goal has not been collapsed, if the user clicks on the expand toggle control of that instance goal.

4.2.33 TF.GV-7.3

SR.GV-7.3 - the system shall not change the expand/collapse state of any instance goal whose expand/collapse control was not directly clicked.

5 Features not to be tested

5.1 GMoDS Test Driver

- SR.GTD-1.3 - the GMoDS Test Driver shall cause GMoDS to populate its specification goal tree.
- SR.GTD-1.4 - the GMoDS Test Driver shall cause GMoDS to initialize its instance goal tree.
- SR.GTD.2.1.1 - the GMoDS Test Driver shall treat all parameter types as if they were String.

5.2 GMoDS Visualizer

All features are to be tested as specified in 4.2 above.

6 Approach

This test plan addresses the testing of the GMoDS Visualizer and Test Driver using automated unit (white box) testing using JUnit 3.8, and manual black box testing. The GMoDS Visualizer will be manually tested while stimulated by the GMoDS Test Driver and sample client simulations.

6.1 GMoDS Test Driver

The GMoDS Test Driver modules EventScriptImpl, RandomEventScriptImpl, and GoalEventImpl will be unit tested. Table 1 below lists the GMoDS Test Driver unit tested features. In addition, manual tests will exercise all tested GMoDS Test Driver features.

Table 1 GMoDS Test Driver unit tested features

Unit tested feature
TF.GTD-1.2.1
TF.GTD-1.5
TF.GTD-2.2
TF.GTD-2.3

6.2 GMoDS Visualizer

The GMoDS Visualizer modules will not be unit tested; manual tests will exercise all features with the GMoDS Visualizer stimulated by a simulation or by the GMoDS Test Driver.

7 Item Pass/Fail Criteria

Tests will pass if they meet the requirements specified for the tested feature in Vision Document 2.0 and fail otherwise.

8 Suspension Criteria and Resumption Requirements

8.1 Suspension Criteria

If a manual test fails all tests for features that rely on the failed feature will be suspended. The failed test case will be entered into the test log with a description of the failure and date and time. Tested features that do not depend on the failed feature will continue.
Automated unit tests will continue in the presence of failures.

8.2 Resumption Requirements

Testing for a failed feature will resume once the defect causing the failure has been identified and resolved.

9 Test Deliverables

9.1 Test Log

The test log will document all test cases. The log will include the date and time of the test, the test case identifier, the pass/fail status, reasons for the failure, and the action taken to resolve the failure.

10 Testing Tasks

10.1 GMoDS Test Driver

10.1.1 Unit Tests

Unit tests will be created for the tested features listed in section 6.1, Table 1 above. Every aspect of the classes listed below that lends itself to unit testing of these features will have at least one unit test method dedicated to it. These tests are too numerous to mention in this document.

- EventScriptImpl
- RandomEventScriptImpl
- GoalEventImpl

10.1.2 Manual Tests

The GMoDS Test Driver will be manually tested by having it stimulate the GMoDS Visualizer. All of the manual tests described in this section are conducted using that configuration.

10.1.2.1 Test Case TC.GTD-1 – Load Event Script

Table 2 Test Case TC.GTD-1 Load Event Script

Use Cases Tested	GTD-1 Issue Scripted Events
Features Tested	TF.GTD-1.1 TF.GTD-1.2 TF.GTD-1.2.1 TF.GTD-1.2.2 TF.GTD-1.2.3
Goal Diagrams	A goal diagram compatible with the event scripts.
Required Event Scripts (repeat procedure for each script listed here)	1. An event script file that lists a valid event of every type. 2. An event script file with events that are invalid with respect to the specification tree (fault: goal name). 3. An event script file with events that are invalid with respect to the specification tree (fault: parameter name). 4. An event script file with events that are invalid with respect to the specification tree (fault: positive trigger with missing parameter). 5. An event script file with events that are invalid with respect to the specification tree (fault: positive trigger with extra parameter). 6. An event script file with events that are invalid with respect to the specification tree (fault: modify event with missing parameter). 7. An event script file with events that are invalid with respect to the specification tree (fault: modify event with extra parameter).
Procedure	1. Click “File | Load Event Script” on visualizer menu bar. 2. Navigate to and select the desired event script file. 3. Click OK.
Expected Results For Each Required Event Script	1. Debug log records that every valid event is created successfully. 2. Debug log records an error for every invalid event and a popup window notifies the user of the same errors.

10.1.2.2 Test Case TC.GTD-2 – Event Script Operation

Table 3 Test Case TC.GTD-2 Event Script Operation

Use Cases Tested	GTD-1 Issue Scripted Events GV-3 Update Instance Tree
Features Tested	TF.GTD-1.5 TF.GTD-1.6 TF.GTD-1.6.1 TF.GTD-1.6.2 TF.GTD-1.6.3 TF.GTD-1.6.4 TF.GV-3.1 TF.GV-3.2 TF.GV-3.3
Goal Diagrams	A goal diagram compatible with the event scripts.
Required Event Scripts (repeat procedure for each script listed here)	1. An event script file that lists a valid event of every type. 2. An event script file with events that are invalid with respect to the instance tree (fault: instance goal does not exist). 3. An event script file with events that are invalid with respect to the instance tree (fault: instance goal not active for event type not MODIFIED).

	4. An event script file with events that are invalid with respect to the instance tree (fault: negative trigger with a parameter value not matching any instance goal parameter values).
Procedure	1. Click “File | Load Event Script” on visualizer menu bar. 2. Navigate to and select the desired event script file. 3. Click OK. 4. Click Play. 5. Click Pause. 6. Click Next. 7. Click Play. 8. Let script finish. 9. Repeat this test using Next only.
Expected Results For Each Required Event Script	1. Debug log records that every valid event is issued to GMoDS successfully. 2. Debug log records an error for every invalid event and a popup window notifies the user of the same errors. 3. The Test Driver stops issuing events upon Pause and enters manual mode. Examination of the debug log confirms no event is issued while paused. 4. In manual mode, events are issued only after Next is selected. 5. Selecting Play enters automatic mode. Time stamps in the debug log confirm that the Test Driver is sleeping an appropriate time between issuing events. 6. Appropriate changes to the instance tree are displayed depending on the event issued. These changes include addition and coloring of goals and flashing. The debug log will record addition, state change, and flash occurrences for instance goals.

10.1.2.3 Test Case TC.GTD-3 – Random Event Script Operation

Table 4 Test Case TC.GTD-3 Random Event Script Operation

Use Cases Tested	GTD-2 Issue Random Events GV-3 Update Instance Tree
Features Tested	TF.GTD-2.1.2 TF.GTD-2.1.3 TF.GTD-2.1.4 TF.GTD-2.2 TF.GTD-2.3 TF.GV-3.1 TF.GV-3.2 TF.GV-3.3
Goal Diagrams	A goal diagram with at least 1 precedes relation, 1 positive trigger, 1 negative trigger, 1 “<<or>>” connective, and 1 “<<and>>” connective.
Required Event Scripts	None.
Procedure	1. Click “Issue Random Events” on visualizer toolbar. 2. Click Play. 3. Click Pause. 4. Click Next. 5. Click Play. 6. Let script finish. 7. Repeat this test using Next only. 8. Change Random Event parameters using “Edit | Preferences” on the visualizer

	menu bar and repeat this testing.
Expected Results For Each Required Event Script	1. Debug log records that every event is valid and issued to GMoDS successfully. 2. The Test Driver stops issuing events upon Pause and enters manual mode. Examination of the debug log confirms no event is issued while paused. 3. In manual mode, events are issued only after Next is selected. 4. Selecting Play enters automatic mode. Time stamps in the debug log confirm that the Test Driver is sleeping an appropriate time between issuing events. 5. Appropriate changes to the instance tree are displayed depending on the event issued. These changes include addition and coloring of goals and flashing. The debug log will record addition, state change, and flash occurrences for instance goals.

10.1.2.4 Test Case TC.GTD-4 – Save Event Script

Table 5 Test Case TC.GTD-4 - Save Event Script

Use Cases Tested	GTD-2 Issue Random Events GTD-3 Save Event Script
Features Tested	TF.GTD-2.3 TF.GTD-3.1 TF.GTD-3.2 TF.GTD-3.2.1 TF.GTD-3.2.2
Goal Diagrams	A goal diagram compatible with the event scripts.
Required Event Scripts (repeat procedure for each script listed here)	1. No inputs. 2. An event script file that lists a valid event of every type. 3. An event script file with events that are invalid with respect to the specification tree (faults: goal name, parameter name, missing parameter, extra parameter).
Procedure	1. For the no input case, click “Issue Random Events” and “Play” and allow the event script to end. Then, select “File | Save Event Script”. Restart the GMoDS Test Driver and select “File | Load Event Script” and choose the previously saved random event script file. Click “Play” and let the script end. 2. For the other input cases, load the event script and then select “File | Save Event Script” saving to a new script name. Compare the input script with the saved script.
Expected Results For Each Required Event Scripts	1. For the no input case, the two runs should have exactly the same debug logs except for actual time stamps. 2. For the event script with all valid events the saved script should match the input script. 3. For the event script with invalid events, the saved script should be empty.

10.2 GMoDS Visualizer

10.2.1 Manual Tests

Manual test cases listed in this section for the GMoDS Visualizer will be performed while the Visualizer is stimulated by the GMoDS Test Driver and by at least one agent simulation if that simulation's goal diagram is compatible with the test.

10.2.1.1 Test Case TC.GV-1 – Display Specification Tree

Table 6 Test Case TC.GV-1 Display Specification Tree

Use Cases Tested	GV-1 Display Specification Tree
Features Tested	TF.GV-1.1 TF.GV-1.2 TF.GV-1.3 TF.GV-1.4 TF.GV-1.5 TF.GV-1.6 TF.GV-1.7 TF.GV-1.8 TF.GV-1.9 TF.GV-1.10 TF.GV-1.11 TF.GV-1.12 TF.GV-1.13
Goal Diagrams (repeat procedure for each diagram listed here)	1. A goal diagram with a goal with no parameters, a goal with at least 2 parameters, a positive trigger with at least 2 parameters, and a negative trigger with at least 2 parameters, and a precedes relation. 2. A goal diagram with non-adjacent goals connected by positive or negative triggers. 3. A goal diagram with more than one positive or negative trigger emanating from the same goal to a non-adjacent goal.
Required Event Scripts	None.
Procedure	1. Start the GMoDS Test Driver and visually examine the displayed specification tree.
Expected Results For Each Required Goal Diagram	1. No requirement from the Vision Document is violated.

10.2.1.2 Test Case TC.GV-2 – Display Instance Tree

Table 7 Test Case TC.GV-2 Display Instance Tree

Use Cases Tested	GV-2 Display Instance Tree
Features Tested	TF.GV-2.1 TF.GV-2.2 TF.GV-2.3 TF.GV-2.4 TF.GV-2.5 TF.GV-2.6

	TF.GV-2.7 TF.GV-2.8
Goal Diagrams (repeat procedure for each diagram listed here)	1. A goal diagram with a goal with no parameters, a goal with at least 2 parameters, a positive trigger with at least 2 parameters, and a negative trigger with at least 2 parameters, and a precedes relation. 2. A goal diagram with non-adjacent goals connected by positive or negative triggers. 3. A goal diagram with more than one positive or negative trigger emanating from the same goal to a non-adjacent goal.
Required Event Scripts	None.
Procedure	1. Start the GMoDS Test Driver and visually examine the displayed instance tree.
Expected Results For Each Required Goal Diagram	1. No requirement from the Vision Document is violated.

10.2.1.3 Test Case TC.GV-3 – Zooming

Table 8 Test Case TC.GV-3 Zooming

Use Cases Tested	GV-1 Display Specification Tree GV-2 Display Instance Tree
Features Tested	TF.GV-1.14 TF.GV-2.9
Goal Diagrams	1. Any goal diagram.
Required Event Scripts	1. A compatible event script.
Procedure	1. Start the GMoDS Test Driver. 2. File | Load Event Script and select the compatible script. 3. Click Play and allow the script to end. 4. Zoom in on the specification tree. 5. Zoom out on the specification tree. 6. Zoom in on the instance tree. 7. Zoom out on the instance tree.
Expected Results	1. When zooming in the affected tree gets proportionally larger in its pane and if large enough causes scroll bars to appear. 2. When zooming out the affected tree gets proportionally smaller and if small enough scroll bars disappear if previously present.

10.2.1.4 Test Case TC.GV-4 - Show/Hide Instance Goals of Specific Types

Table 9 Test Case TC.GV-4 Show/Hide Instance Goals of Specific Types

Use Cases Tested	GV-2 Display Instance Tree
Features Tested	TF.GV-2.10
Goal Diagrams	1. Any goal diagram.
Required Event Scripts	1. A compatible event script.

Procedure	1. Start the GMoDS Test Driver. 2. File | Load Event Script and select the compatible script. 3. Click Play and allow the script to end. 4. Select View | Instance Goal | Goal Types (uncheck a box). Click OK. 5. Select View | Instance Goal | Goal Types (recheck the box). Click OK.
Expected Results	1. When a goal type is unchecked, all instance goals of that specification goal type and their descendant instance goals are not visible. 2. When a goal type is rechecked, all instance goals of that specification goal type and their descendant instance goals are visible again.

10.2.1.5 Test Case TC.GV-5 - Show/Hide All Specification Goal Parameters

Table 10 Test Case TC.GV-5 Show/Hide All Specification Goal Parameters

Use Cases Tested	GV-4 Change Specification Tree View
Features Tested	TF.GV-4.1
Goal Diagrams	1. Any goal diagram with a goal and an event that have parameters.
Required Event Scripts	1. None.
Procedure	1. Start the GMoDS Test Driver. 2. Select View | Specification Goal | Parameters (uncheck the box). 3. Select View | Specification Goal | Parameters (recheck the box).
Expected Results	1. When View | Specification Goal | Parameters is unchecked, all specification goals' and events' parameters are not visible. The horizontal line separating the goal parameters from the goal name is not visible. 2. When View | Specification Goal | Parameters is rechecked, all specification goals' and events' parameters are visible. The horizontal line separating the goal parameters from the goal name is visible.

10.2.1.6 Test Case TC.GV-6 - Show/Hide All Instance Goal Parameters

Table 11 Test Case TC.GV-6 Show/Hide All Instance Goal Parameters

Use Cases Tested	GV-5 Change Instance Tree View
Features Tested	TF.GV-5.1
Goal Diagrams	1. Any goal diagram with a goal that has parameters.
Required Event Scripts	1. Any compatible event script with valid events.
Procedure	1. Start the GMoDS Test Driver. 2. File | Load Event Script and select the compatible script. 3. Click Play and allow the script to end. 4. Select View | Instance Goal | Parameters (uncheck the box). 5. Select View | Instance Goal | Parameters (recheck the box).
Expected Results	1. When View | Instance Goal | Parameters is unchecked, all instance goals' parameters are not visible. The horizontal line separating the goal parameters from the goal name is not visible. 2. When View | Instance Goal | Parameters is rechecked, all instance goals' parameters are visible. The horizontal line separating the goal parameters from the goal name is visible.

10.2.1.7 Test Case TC.GV-7 - Show/Hide Specific Instance Goal Parameters

Table 12 Test Case TC.GV-7 Show/Hide Specific Instance Goal Parameters

Use Cases Tested	GV-6 Change Instance Goal View
Features Tested	TF.GV-6.1
Goal Diagrams	1. Any goal diagram with a goal that has parameters.
Required Event Scripts	1. Any compatible event script with valid events.
Procedure	1. Start the GMoDS Test Driver. 2. File | Load Event Script and select the compatible script. 3. Click Play and allow the script to end. 4. Click the Hide toggle for an instance goal with parameters. 5. Click the Show toggle for that instance goal.
Expected Results	1. When the Hide toggle is clicked, that instance goal's parameters are not visible. The horizontal line separating the goal parameters from the goal name is not visible. 2. When the Show toggle is clicked, that instance goal's parameters are visible. The horizontal line separating the goal parameters from the goal name is visible.

10.2.1.8 Test Case TC.GV-8 - Collapse/Expand Instance Goal Sub-tree

Table 13 Test Case TC.GV-8 Collapse/Expand Instance Goal Sub-tree

Use Cases Tested	GV-7 Change Instance Sub-tree View
Features Tested	TF.GV-7.1 TF.GV-7.2 TF.GV-7.3
Goal Diagrams	1. Any goal diagram.
Required Event Scripts	1. Any compatible event script with valid events.
Procedure	1. Start the GMoDS Test Driver. 2. File | Load Event Script and select the compatible script. 3. Click Play and allow the script to end. 4. Click the Collapse toggle for an instance goal with children. 5. Click the Expand toggle for that instance goal.
Expected Results	1. When the Collapse toggle is clicked, that instance goal's descendants are not visible. 2. When the Expand toggle is clicked, that instance goal's descendants return to the same visibility as prior to the Collapse.

10.2.1.9 Test Case TC.GV-9 – Change Instance Goal State Colors

Table 14 Test case TC.GV-9 Change Instance Goal State Colors

Use Cases Tested	GV-3 Update Instance Tree
Features Tested	TF.GV-3.3
Goal Diagrams	1. A goal diagram with a goal with a positive trigger and a negative trigger, a <<precedes>> relation, and at least on <<or>> connective.
Required Event Scripts	1. Any compatible event script with valid events that will cause all possible goal states to be shown in the instance tree when executed.

Procedure	1. Start the GMoDS Test Driver. 2. Edit | Preferences and change the goal state colors as desired. Click OK. 3. File | Load Event Script and select the compatible script. 4. Click Play and allow the script to end. 5. Edit | Preferences and change normal goal state colors as desired. Click OK.
Expected Results	1. The desired colors should be used during script execution. 2. The normal desired colors should replace the previous colors upon OK being clicked. Flash colors cannot be changed since the script is not executing.

11 Environmental Needs

- Application environment
  - JDK 1.6 or higher available at http://www.sun.com/java.
- Development environment
  - Eclipse IDE for Java Developers 1.2.1.20090918-0703
- GMoDS Version 2
  - The GMoDS component is the GoalModel2 module in the CVS repository cvs.projects.cis.ksu.edu at the repository path /cvsroot/gmods.

11.1 Automated Unit Testing

The following software will be used to unit test the GMoDS Test Driver and Visualizer.

- JUnit 3.8

11.2 Manual Testing

11.2.1 GMoDS Test Driver

The GMoDS Test Driver will be manually tested by having it stimulate the GMoDS Visualizer. See 11.2.2.1 below.

11.2.2 GMoDS Visualizer

Manual test cases identified in 10.2.1 above for the GMoDS Visualizer will be performed while the Visualizer is stimulated by the GMoDS Test Driver and by at least one agent simulation.

11.2.2.1 Stimulation by GMoDS Test Driver

- GMoDS Test Driver main program launches the GMoDS Visualizer.

11.2.2.2 Stimulation by agent simulation

- The agent simulation component that populates GMoDS launches the GMoDS Visualizer.