

# **PRISM2GSN: Eclipse Plugin for Transforming PRISM Artefacts into Goal Structuring Notation**

## **User Guide**

**Version: 1.0.0**

**Release Date: 2025-08-26**

**The University of Manchester**

## Document Control

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Repository	<a href="https://github.com/DhamindaA/prism2gsn-eclipse-plugin">https://github.com/DhamindaA/prism2gsn-eclipse-plugin</a>
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## 1. Introduction

This User Guide explains:

- Prerequisites
- How to obtain and import the project
- How to run the plug-in in a runtime workbench
- How to configure PRISM and generate GSN artefacts
- Troubleshooting and known limitations

**Platform scope:** Windows 10/11 (x86\_64) only. We hope to provide support to macOS/Linux in the next release.

**Installation note:** This guide uses PDE runtime (no installation into Eclipse). You can import the source project and run it as an “Eclipse Application”.

## 2. Prerequisites (Windows)

- **Eclipse:** *Eclipse IDE for RCP and RAP Developers 2025-03 (4.35.0)* or newer.  
(This package includes the Plug-in Development Environment, PDE.)
- **Java: JDK 21** (recommended).
  - Verify (Command Prompt): `java -version`
- **PRISM Model Checker (Windows):** e.g., **PRISM 4.8.1** installed locally.
  - You will point the plug-in to the **PRISM bin** directory (e.g., `C:\Program Files\prism-4.8.1\bin` which contains `prism.bat`).

## 3. Download the PRISM2GSN Project

- GitHub Release ZIP file:

Please download the ZIP attached to the FMAS 2025 paper’s release:

<https://github.com/DhamindaA/prism2gsn-eclipse-plugin/releases/tag/v1.0.0>

Save the ZIP file to any location on your computer.

thub.com/DhamindaA/prism2gsn-eclipse-plugin/releases/tag/v1.0.0

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## PRISM2GSN Eclipse Plugin Latest

Compare

DhamindaA released this now · 1 commit to main since this release v1.0.0 9f44ac0

This release provides the first version of the Eclipse plug-in for transforming PRISM specifications and verification results into Goal Structuring Notation (GSN) assurance arguments. These arguments are created in the DSL of the AdvoCATE assurance case tool and are automatically regenerated when the artefacts change.

A full user guide (prism2gsn-userguide.pdf) is available in the repository. It covers both installation and usage.

[Note: Please download only the file named prism2gsn.zip below. Ignore the "Source code" files, as they are not needed for plug-in installation.]

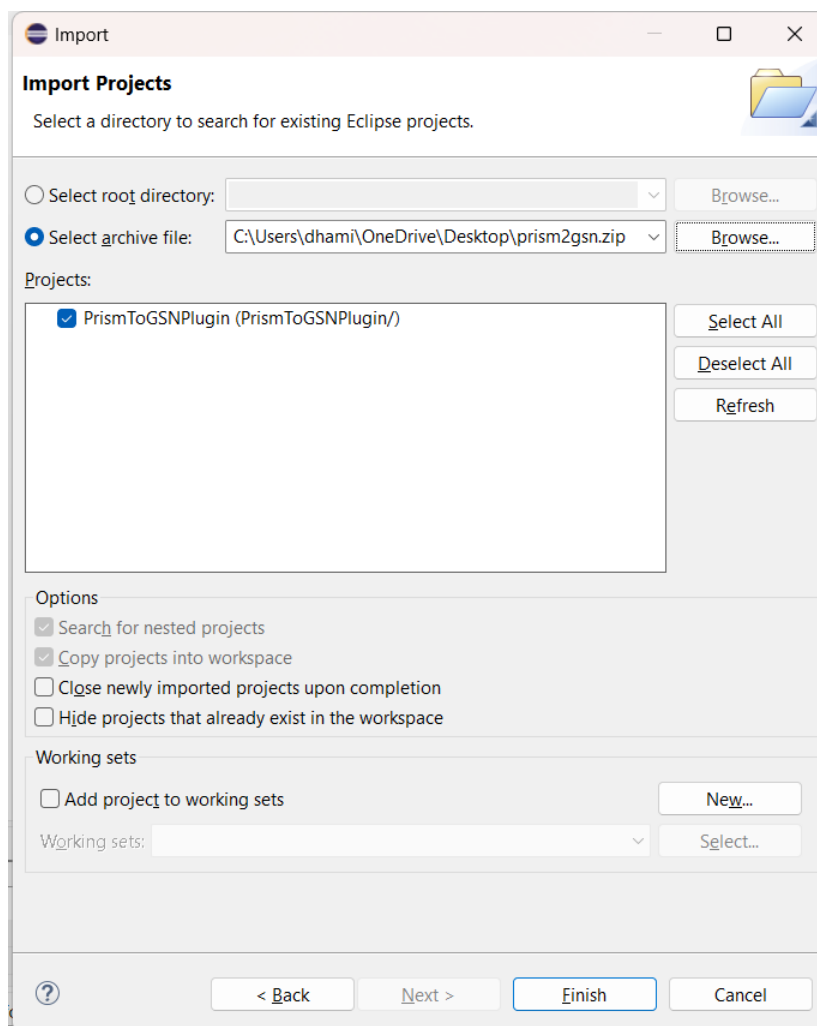
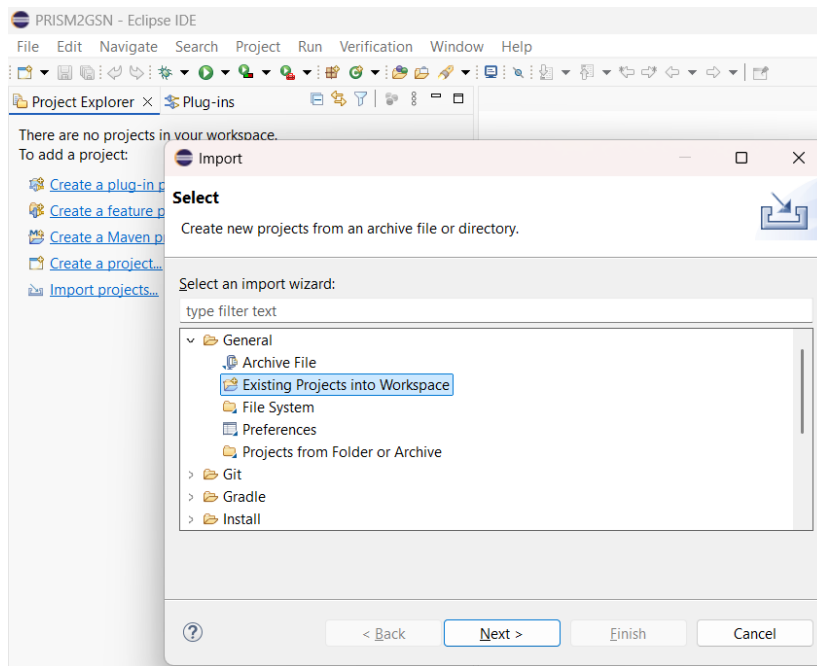
Assets 3

prism2gsn.zip	sha256:d0139820fcc94b52b77841cb5bd46...	11.5 KB	1 minute ago
Source code (zip)			3 days ago
Source code (tar.gz)			3 days ago

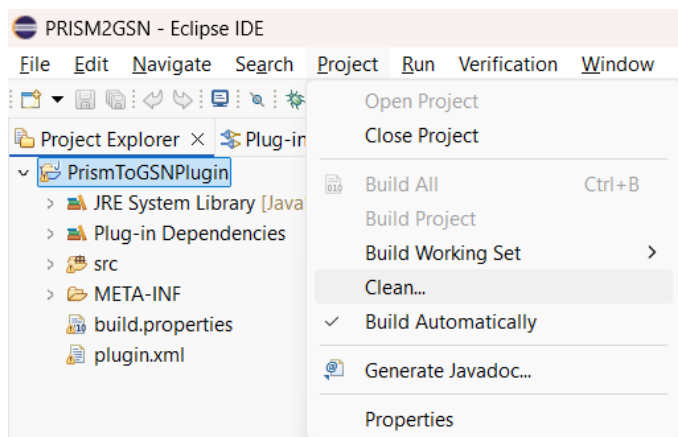
## 4. Import the Project (Development Workspace)

- Start **Eclipse (development workspace)**.
- **File** → **Import...** → **General** → **Existing Projects into Workspace** → **Next**.
- Choose:
  - **Select archive file** → browse to the downloaded ZIP, **or**
  - **Select root directory** → browse to the cloned project folder.
- Ensure the project (e.g., PrismToGSNPlugin) appears ticked → **Finish**.

The project should build cleanly with Java 21.



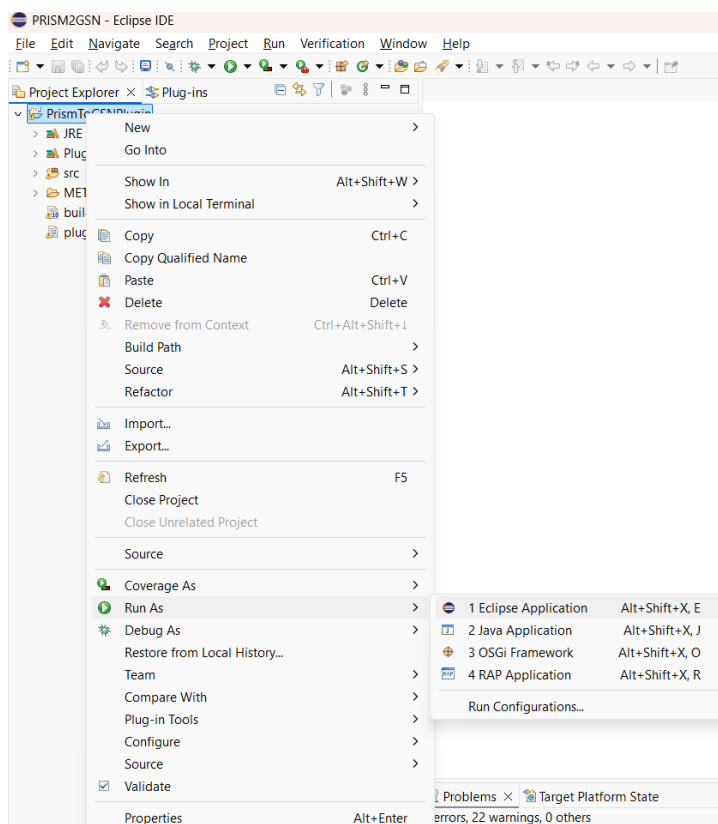
Build the Project:

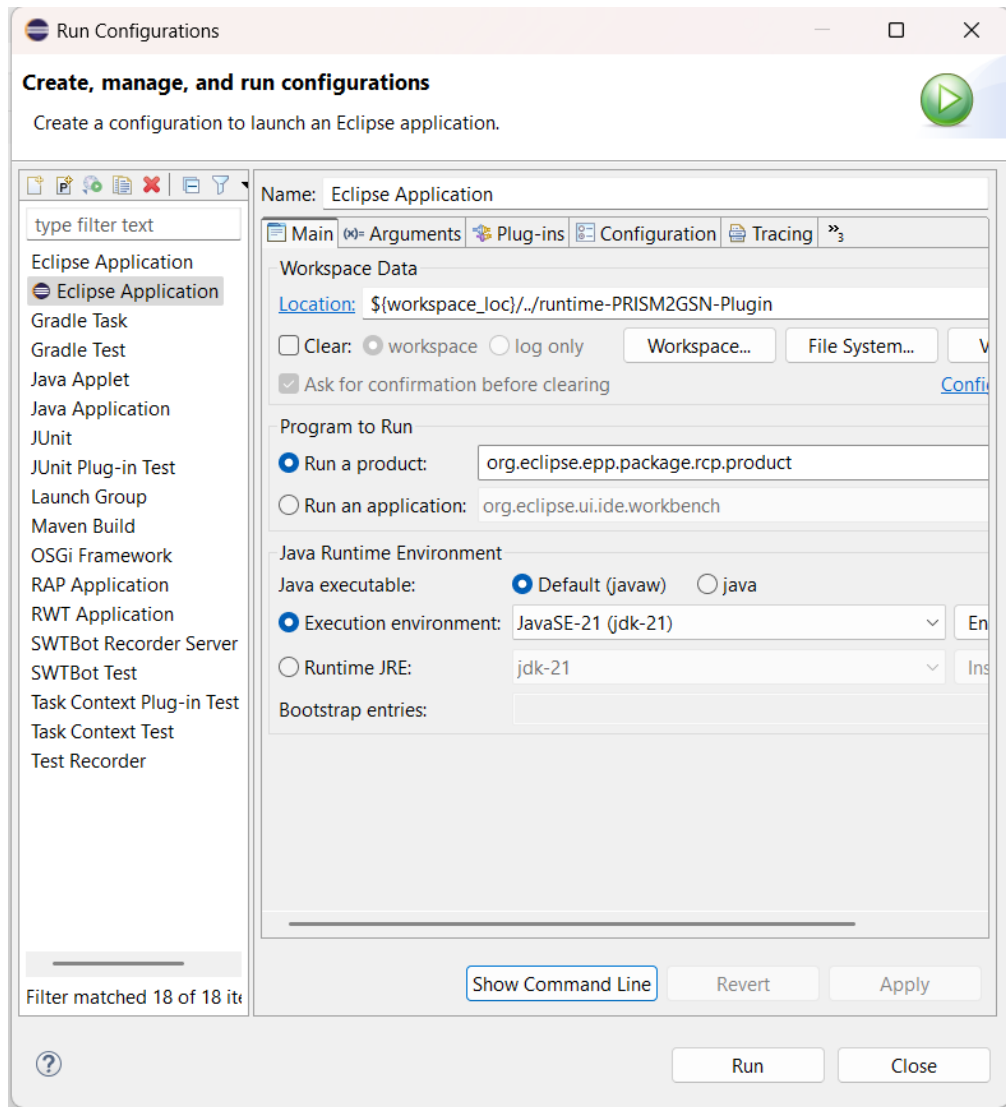


## 5. Launch the Runtime Workbench (PDE)

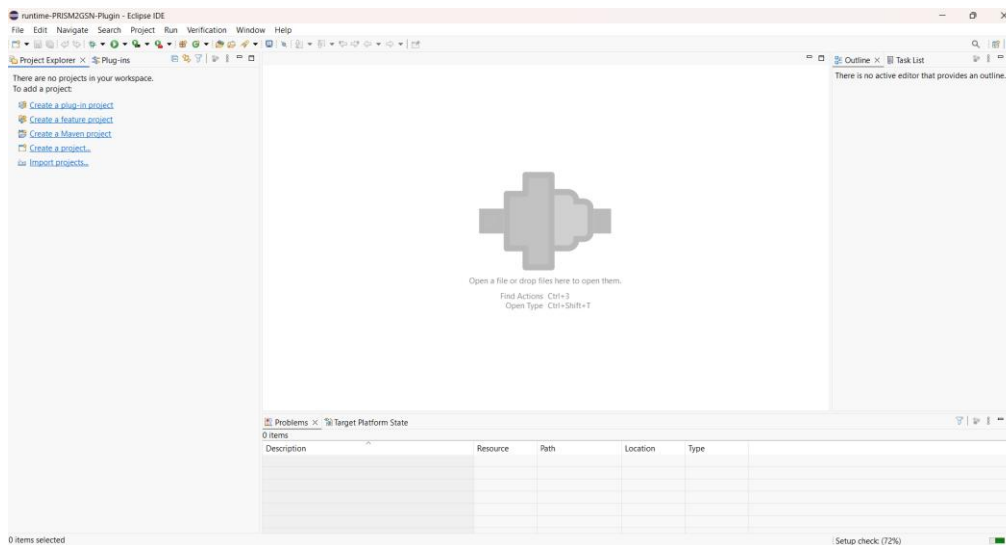
- In **Project Explorer**, select the project.
- **Run** → **Run As** → **Eclipse Application**.

A second Eclipse window opens: this is the **runtime workbench** where the plug-in is active. Select Run Configurations:





## Runtime Workbench:

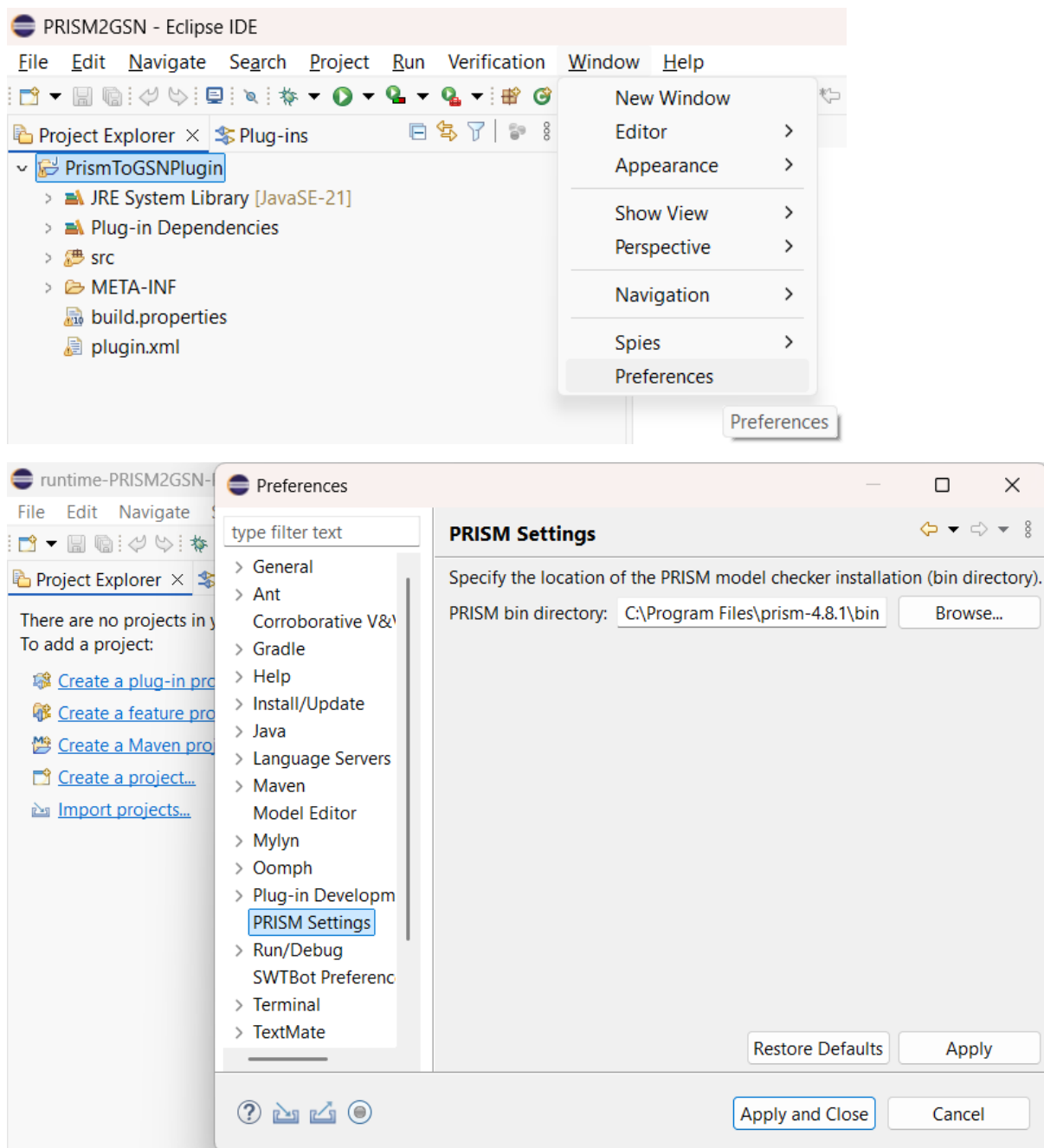


## 6. Configure PRISM (in the Runtime Window)

**Important:** Perform this in the **runtime** window (the second Eclipse), not the development window.

- **Window → Preferences → PRISM Settings.**
- Set **PRISM bin directory** to the folder that contains **prism.bat**, e.g.:  
C:\Program Files\prism-4.8.1\bin
- **Apply and Close.**

No restart is required. The plug-in reads this setting each time it invokes PRISM.





## 7. Create a Test Project (Runtime Window)

- **File** → **New** → **Project...** → **General** → **Project** → name it (e.g.) TestPRISM2GSN → **Finish**.
- Right-click the project → **New** → **File** → create model.prism.

You can use the model.prism provided in GitHub:

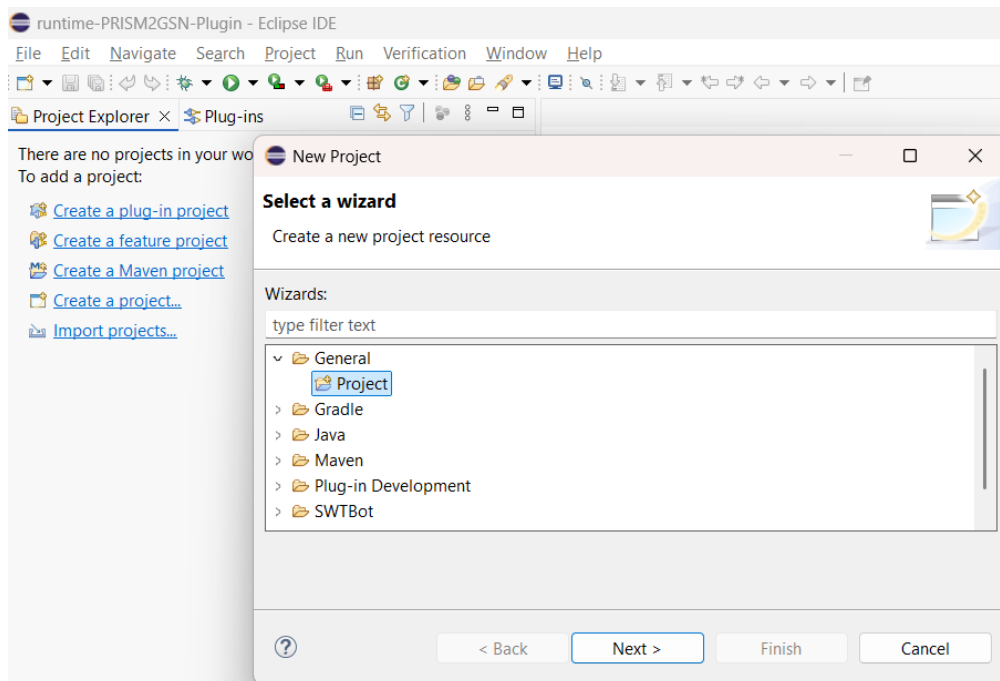
<https://github.com/DhamindaA/prism2gsn-eclipse-plugin/blob/main/model.prism>

- Right-click the project → **New** → **File** → create properties.props.  
Add one property **per line**, for example:

You can use the properties.props file provided in GitHub:

<https://github.com/DhamindaA/prism2gsn-eclipse-plugin/blob/main/properties.props>


Note: Keep model.prism and properties.props in the **same folder**.



New Project

Project

Create a new project resource.



Project name:


☒ Use default location

Location:

Working sets

☐ Add project to working sets


Working sets:






Create New File


File

Create a new file resource.




Enter or select the parent folder:

>  TestPRISM2GSN

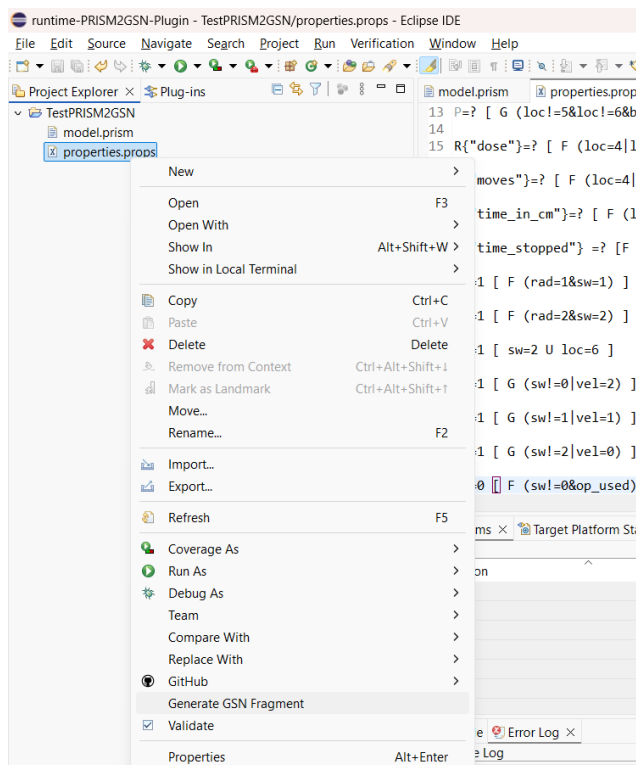
File name:



## 8. Generate GSN Artefacts

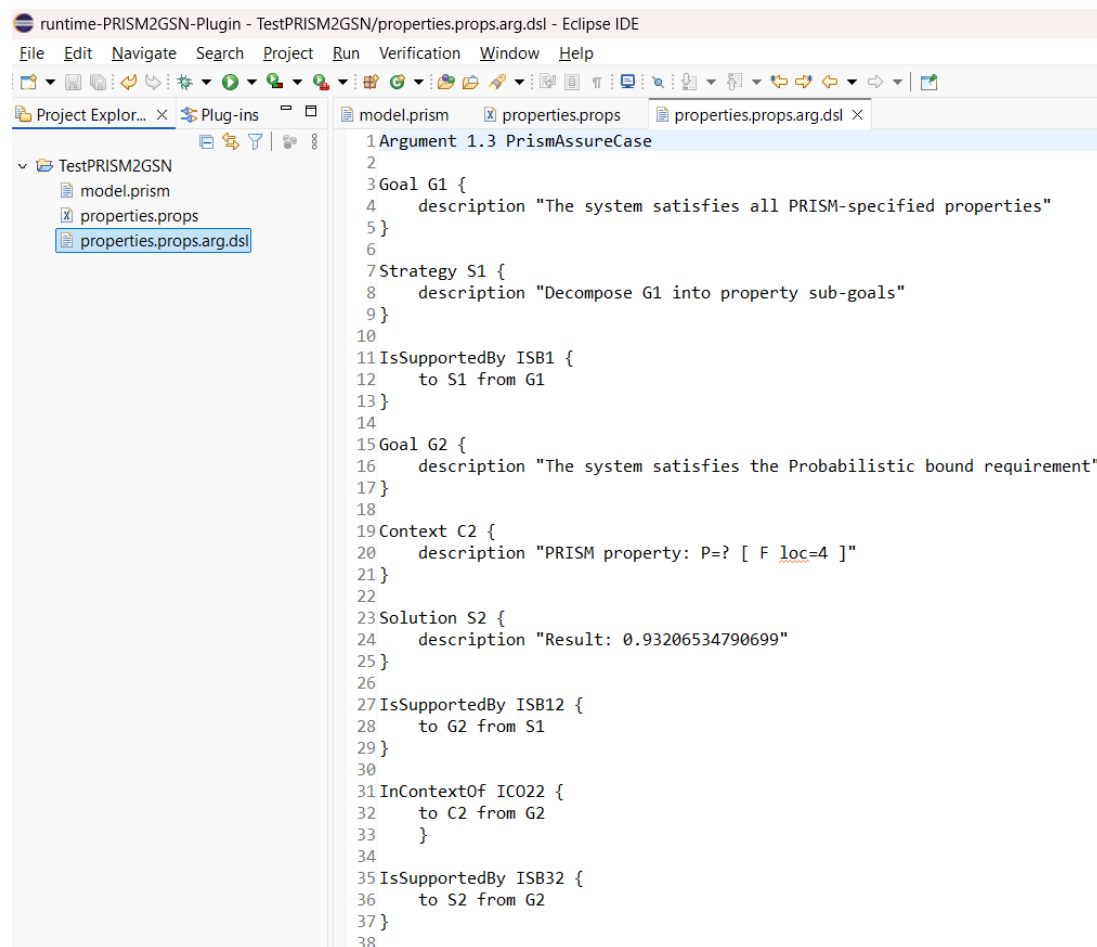
You can generate in two ways:

- **Automatic on Save**
  - Open properties.props, make a small edit (even a space), **Save**.
  - The plug-in runs PRISM and writes: **properties.props.arg.dsl** (in the same folder).
- **Manual via Context Menu**
  - Right-click properties.props → **Generate GSN Fragment**.
  - Also produces **properties.props.arg.dsl**.
- **Notes**
  - For **multi-property** output, use a \*.props file with **one property per line**.



A new file appears next to your .props file: properties.props.arg.dsl. Whenever the properties are changed and saved DSL will be updated.

Generated DSL file:



```
runtime-PRISM2GSN-Plugin - TestPRISM2GSN/properties.props.arg.dsl - Eclipse IDE
File Edit Navigate Search Project Run Verification Window Help
Project Explorer Plug-ins model.prism properties.props properties.props.arg.dsl
TestPRISM2GSN
  model.prism
  properties.props
  properties.props.arg.dsl
1 Argument 1.3 PrismAssureCase
2
3 Goal G1 {
4   description "The system satisfies all PRISM-specified properties"
5 }
6
7 Strategy S1 {
8   description "Decompose G1 into property sub-goals"
9 }
10
11 IsSupportedBy ISB1 {
12   to S1 from G1
13 }
14
15 Goal G2 {
16   description "The system satisfies the Probabilistic bound requirement"
17 }
18
19 Context C2 {
20   description "PRISM property: P=? [ F loc=4 ]"
21 }
22
23 Solution S2 {
24   description "Result: 0.93206534790699"
25 }
26
27 IsSupportedBy ISB12 {
28   to G2 from S1
29 }
30
31 InContextOf IC022 {
32   to C2 from G2
33 }
34
35 IsSupportedBy ISB32 {
36   to S2 from G2
37 }
38
```

## Console in Development Eclipse (Runtime):

When the runtime window starts, you should see messages like:

[Prism2GSNPlugin] earlyStartup() called

[Prism2GSNPlugin] Listener registered in earlyStartup

-----

When generating GSN:

[Prism2GSNPlugin] Transform called for: /TestPrism/properties.props

[Prism2GSNPlugin] Loaded PRISM path from preferences: C:\Program Files\prism-4.8.1\bin

[PRISM] Version: 4.8.1

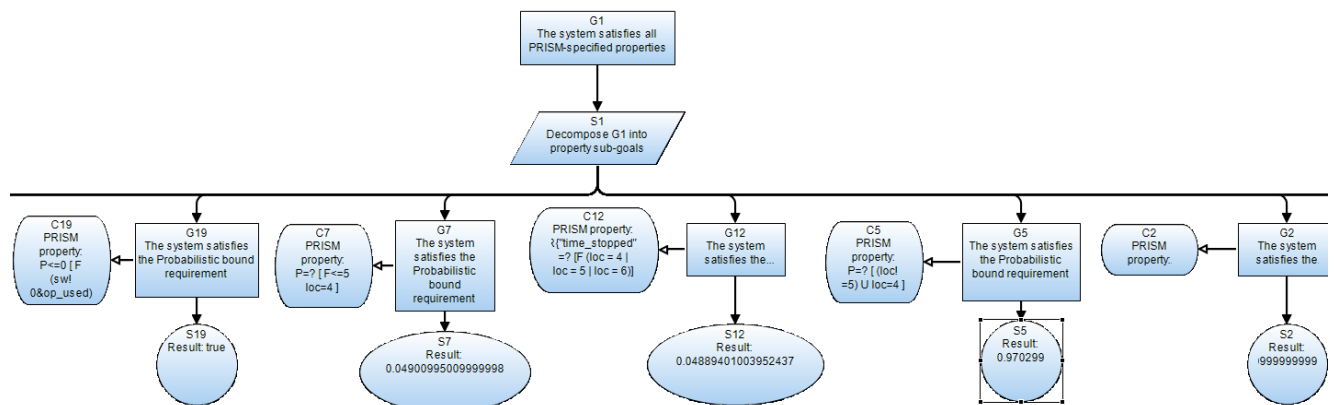
...

[Prism2GSNPlugin] PRISM returned <n> result(s)

[Prism2GSNPlugin] Wrote /TestPrism/properties.props.arg.dsl

```
PRISM2GSN - Eclipse IDE
File Edit Navigate Search Project Run Verification Window Help
Eclipse Application [Eclipse Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (29 Aug 2025, 00:30:32 elapsed: 0:31:37) [pid: 33380]
[PRISM] Property satisfied in 1 of 1 initial states.
[PRISM]
[PRISM] Time for model checking: 0.001 seconds.
[PRISM]
[PRISM] Result: true
[PRISM]
[PRISM] -----
[PRISM]
[PRISM] Model checking: P>=1 [ G (sw!=2|vel=0) ]
[PRISM]
[PRISM] Probability bound in formula is 0/1 so not computing exact probabilities...
[PRISM]
[PRISM] yes = 0, no = 142, maybe = 0
[PRISM]
[PRISM] Property satisfied in 1 of 1 initial states.
[PRISM]
[PRISM] Time for model checking: 0.0 seconds.
[PRISM]
[PRISM] Result: true
[PRISM]
[PRISM] -----
[PRISM]
[PRISM] Model checking: P<=0 [ F (sw!=0&op_used) ]
[PRISM]
[PRISM] Probability bound in formula is 0/1 so not computing exact probabilities...
[PRISM]
[PRISM] Prob0: 4 iterations in 0.00 seconds (average 0.000000, setup 0.00)
[PRISM]
[PRISM] Prob1: 3 iterations in 0.00 seconds (average 0.000000, setup 0.00)
[PRISM]
[PRISM] yes = 56, no = 58, maybe = 28
[PRISM]
[PRISM] Property satisfied in 0 of 1 initial states.
[PRISM]
[PRISM] Time for model checking: 0.002 seconds.
[PRISM]
[PRISM] Result: false
[PRISM]
[Prism2GSNPlugin] PRISM returned 21 result(s)
[Prism2GSNPlugin] Wrote /TestPRISM2GSN/properties.props.arg.dsl
[Prism2GSNPlugin] Resource change event detected
```

To visualize the generated DSL file as a partial assurance case (goal structuring notation model), create an Argument Model in the AdvoCATE assurance case tool and paste the DSL into the underlying DSL of the diagram.



## 9. Uninstall

Because this workflow uses the **PDE runtime**, nothing is installed into your Eclipse. To remove:

- Close the **runtime** window.
- In the **development** workspace, delete the imported project if desired.

## 10. Troubleshooting

- **“PRISM not found” / CreateProcess error=2**
  - You likely didn’t set the PRISM path **in the runtime window**.  
→ **Window** → **Preferences** → **PRISM Settings** (runtime window), point to the folder that contains prism.bat (e.g., ...\\prism-4.8.1\\bin).
- **No .arg.dsl appears on save**
  - The file must be named **\*.props** and be **co-located** with a \*.prism or \*.pm model.
  - Make a small edit and **Save** to trigger the automatic transformation, or use the **Generate GSN Fragment** menu.
- **Context menu item missing**
  - Right-click a **file** (not a folder). For multi-property output, right-click the \*.props file.
- **Java / bundle errors in the development workspace**
  - If Eclipse shows bundle-resolution errors, confirm you’re using the **RCP/RAP** package and that the project’s Java compliance is **21**.  
Use **JDK 21** and the **RCP/RAP** Eclipse package.
- **Different machine with a different PRISM path**
  - Just re-set **PRISM Settings** in the **runtime** workspace you launch on that machine. No code changes required.

## 11. Limitations

- Currently **Windows-only** artifact (this release does not support macOS/Linux). We intend to extend the plugin in future releases.
- PRISM path preference is stored **per runtime workspace**—if you create a new runtime workspace, please set it again.
- Multi-property generation expects **one property per line** in a \*.props file, located next to the model.

## 12. Support

For any questions, please contact: [Dhaminda.Abeywickrama@manchester.ac.uk](mailto:Dhaminda.Abeywickrama@manchester.ac.uk)

## License

The PRISM2GSN plug-in is provided **for academic and research use only**. Redistribution, modification, or commercial use is not permitted without prior written permission from the author.

This work is part of a submission that is currently under review for the FMAS 2025 workshop.