


What's New in HCL RTist 11

updated for sprint 2020.03

Overview

- ▶ RTist 11 is based on Eclipse 2019.06 (4.12)
- ▶ HCL RTist is 100% compatible with IBM RSARTE. All features (with very few exceptions) are the same.
- ▶ Note: RTist 11 is currently an experimental release and should not yet be used for production. Feedback is welcome!

 HCL RealTime Software Tooling
*** EXPERIMENTAL ***
Version: 11.0.0.v20200106_2226
Release: 2020.03

(c) Copyright IBM Corporation 2004, 2016. All rights reserved.
(c) Copyright HCL Technologies Ltd. 2016, 2020. All rights reserved.
Visit <https://www.hcltech.com/products-and-platforms/support>

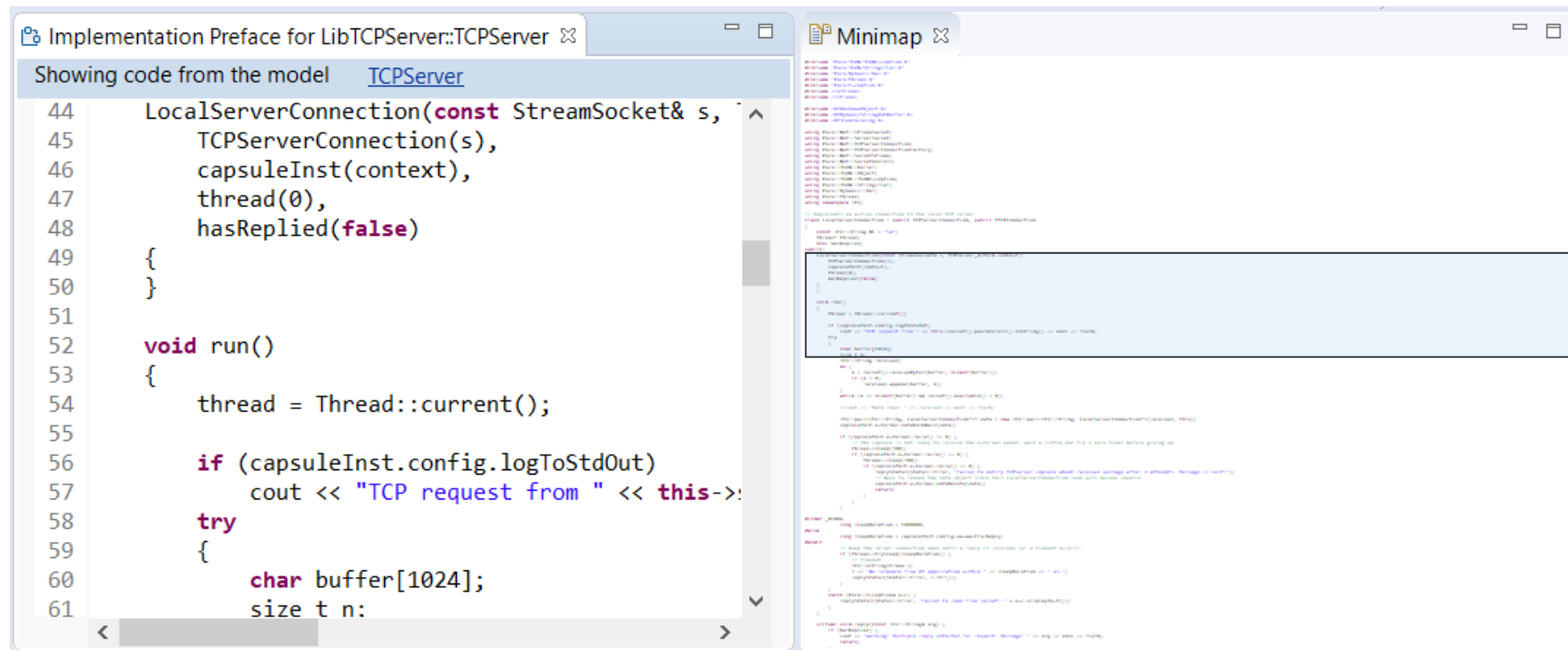


Eclipse 4.12 (2019.06)

- ▶ Compared to RTist 10.3, RTist 11 includes new features from 4 quarterly Eclipse releases:
 - 2018.09 (<https://www.eclipse.org/eclipse/news/4.9/platform.php>)
 - 2018.12 (<https://www.eclipse.org/eclipse/news/4.10/platform.php>)
 - 2019.03 (<https://www.eclipse.org/eclipse/news/4.11/platform.php>)
 - 2019.06 (<https://www.eclipse.org/eclipse/news/4.12/platform.php>)
- ▶ For full information about all improvements and changes in these Eclipse releases see the links above
 - Some highlights are listed in the next few slides...

Eclipse 4.12 (2019.06)

- ▶ A new Minimap view gives a better overview of the text editor contents (useful when it's large)
 - It's easy to launch it by typing "minimap" in the QuickAccess field

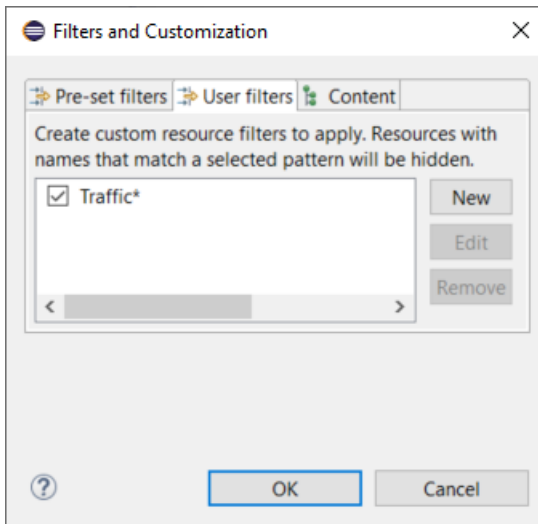
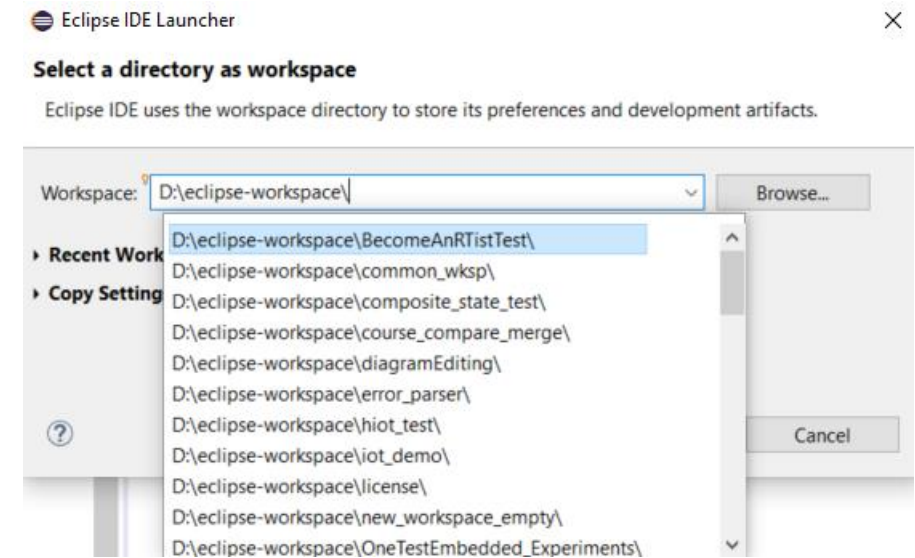


The screenshot displays the Eclipse IDE interface. On the left, the 'Implementation Preface for LibTCPServer::TCPServer' is open, showing C++ code for a TCP server. The code includes a constructor and a `run()` method. On the right, the 'Minimap' view is visible, providing a small-scale overview of the entire code file. A red box highlights a specific section of the code in the minimap, corresponding to the `run()` method in the main editor.

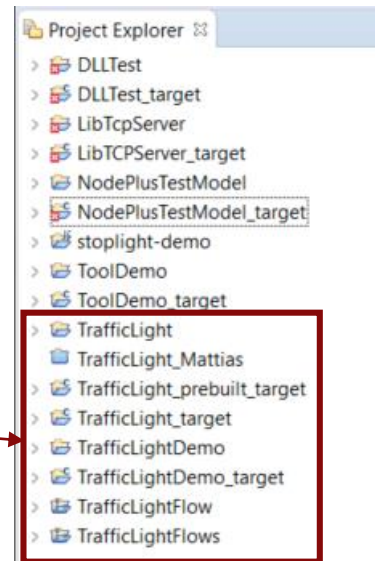
```
44 LocalServerConnection(const StreamSocket& s,  
45 TCPServerConnection(s),  
46 capsuleInst(context),  
47 thread(0),  
48 hasReplied(false)  
49 {  
50 }  
51  
52 void run()  
53 {  
54     thread = Thread::current();  
55  
56     if (capsuleInst.config.logToStdOut)  
57         cout << "TCP request from " << this->  
58     try  
59     {  
60         char buffer[1024];  
61         size_t n:
```

Eclipse 4.12 (2019.06)

- ▶ The Select Workspace dialog now supports auto-completion
 - Allows to pick a workspace more easily by only using the keyboard
- ▶ User-defined filtering of the Project Explorer
 - You can now create your own regular expressions for filtering out items from the Project Explorer
 - Can be used as an alternative to working sets



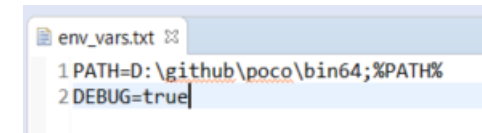
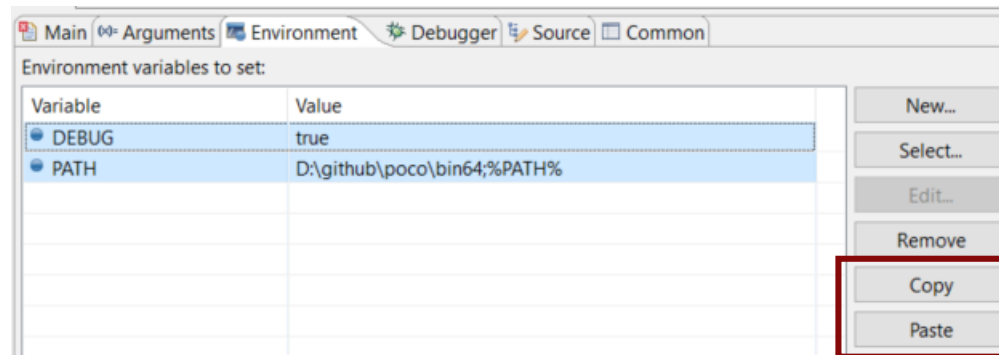
will be hidden
by the user filter



Eclipse 4.12 (2019.06)

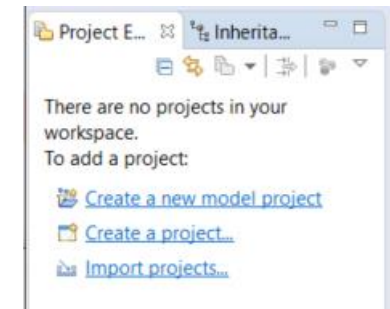
▶ Copy/Paste of environment variables

- Setting up environment variables in a launch configuration is now much easier thanks to copy/paste support
- Environment variables can be copied from one launch configuration to another, or from a text editor to a launch configuration (or vice versa)



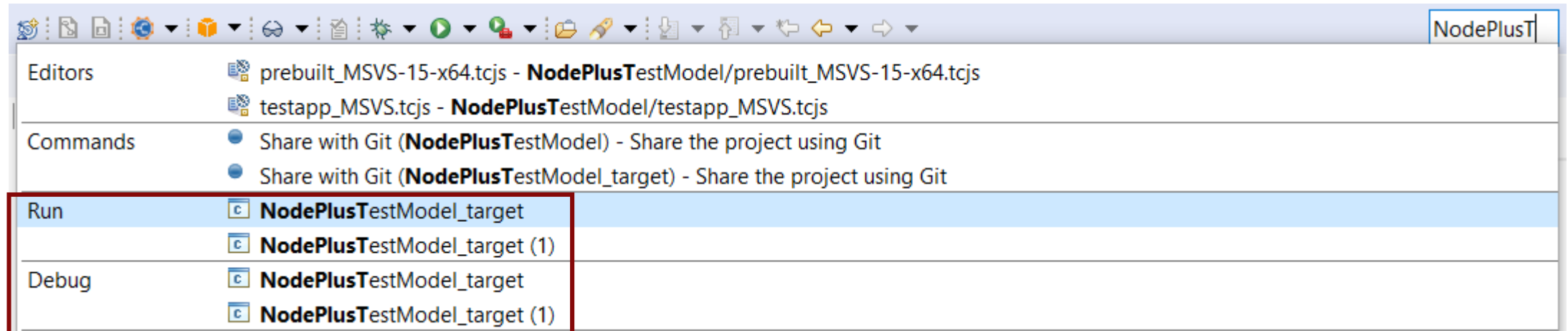
▶ Useful quick links for an empty workspace

- Quick links for creating or importing projects make it easier for new users to get started with an empty workspace
- Which quick links that are shown depend on the current perspective



Eclipse 4.12 (2019.06)

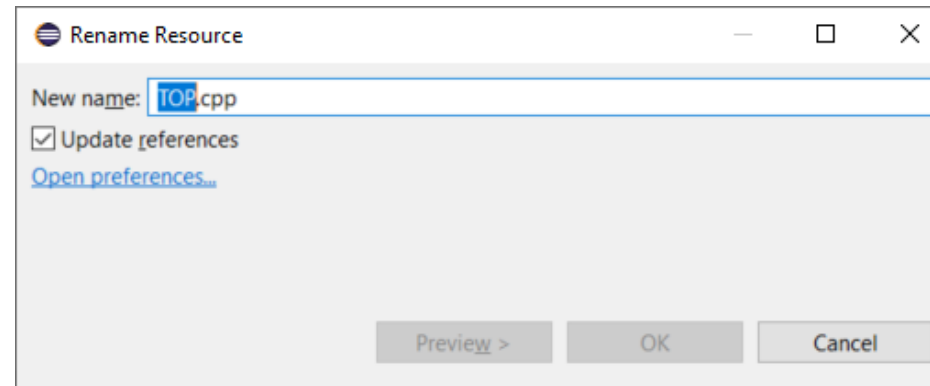
- ▶ Launch configurations are now accessible from Quick Access
 - Can start either a Run or a Debug session



CDT 9.8 (included as part of Eclipse 2019.06)

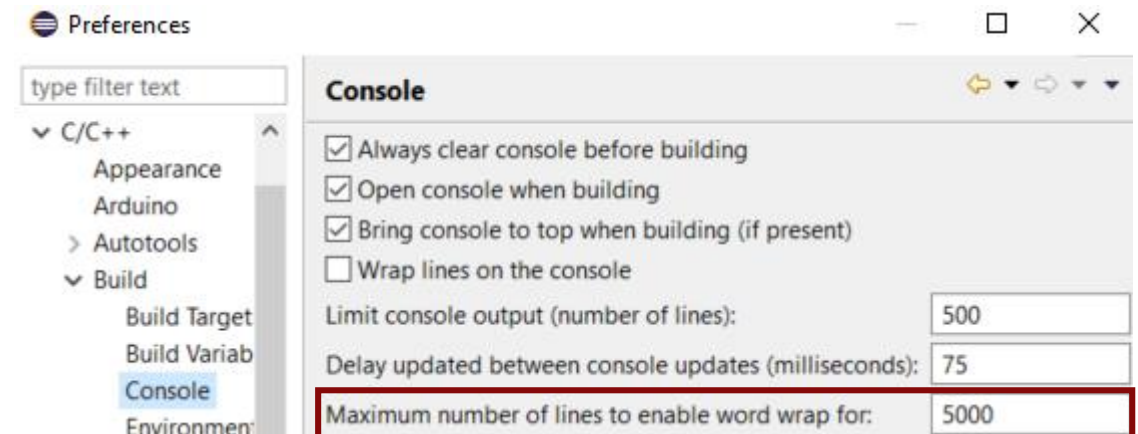
- ▶ Possible to rename a file without triggering a refactoring

- A checkbox controls if references to the renamed file should be updated



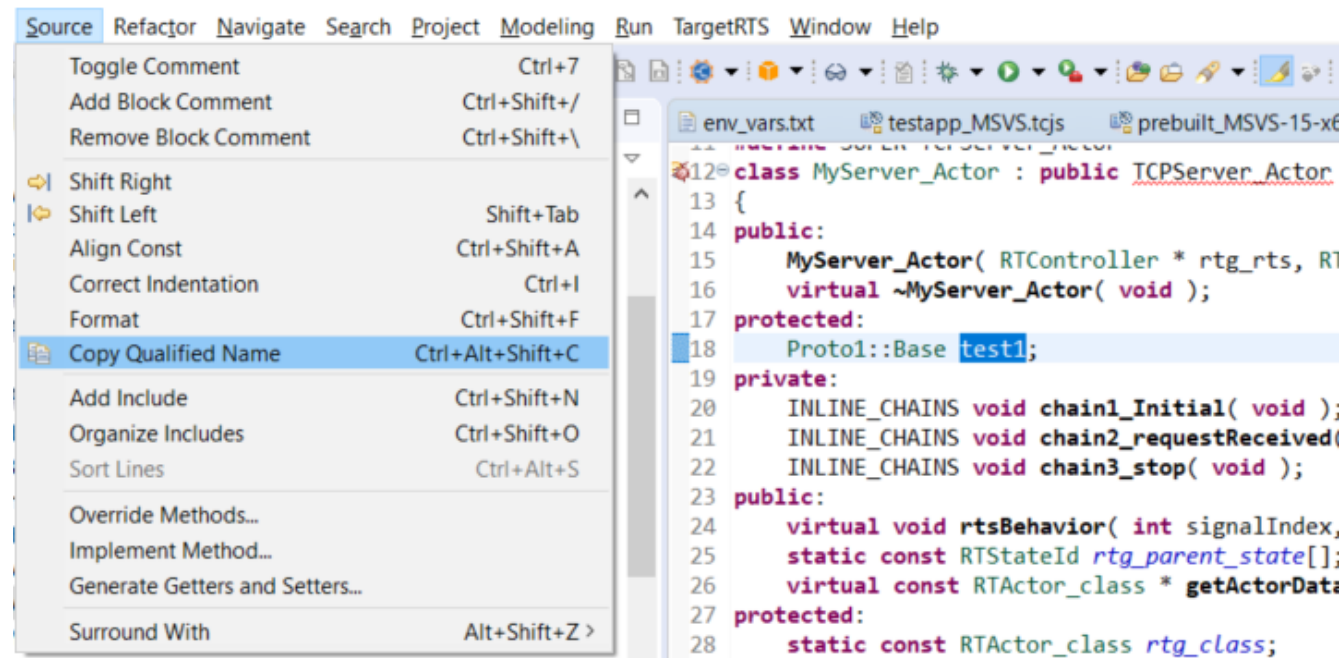
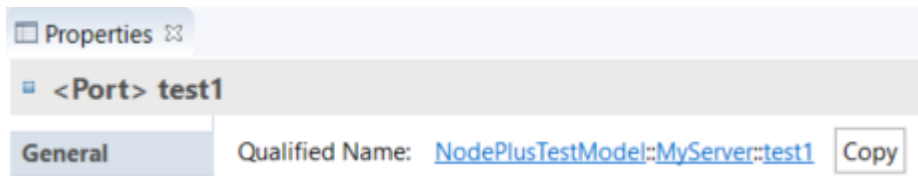
- ▶ New preference to address a performance issue with line wrapping a large number of lines in the console

- *C/C++ - Build – Console – Maximum number of lines to enable word wrap for*
- Don't set this too high if *Wrap lines on the console* is turned on



CDT 9.8 (included as part of Eclipse 2019.06)

- ▶ Improved dialog for attaching to a C++ application to debug
 - Command-line arguments for the process are now shown (allows to more easily find the process to debug)
 - The dialog now remembers a previously entered filter expression (to make it easier to attach to the same process multiple times)
- ▶ Copy the qualified name of a C++ declaration
 - A new command is available in the Source menu
 - Similar usecase as for the Copy button of the Qualified Name for a model element in the Properties view

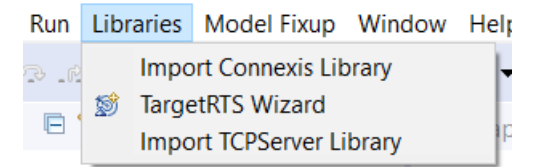


CDT 9.8 (included as part of Eclipse 2019.06)

- ▶ CODAN improvements
 - Additional checks implemented, for example to detect C-style casts and goto-statements
- ▶ For more information about CDT improvements see
 - <https://wiki.eclipse.org/CDT/User/NewIn96>
 - <https://wiki.eclipse.org/CDT/User/NewIn97>
 - <https://wiki.eclipse.org/CDT/User/NewIn98>








Libraries Menu

- ▶ A new menu in the menu bar with a few useful commands related to libraries
 - Contains the command for launching the TargetRTS wizard (i.e. the menu replaces the TargetRTS menu)
- ▶ Commands for importing the Connexis and TCPServer libraries
 - Available if these features have been installed
 - They import the Connexis or TCPServer library projects from the installation into the workspace



NodePlus

- ▶ HCL NodePlus is a new install component of HCL RTist
 - Note: Currently NodePlus is not available in IBM RSARTE
- ▶ NodePlus provides all necessary tooling for developing IoT applications using Node-RED (and related technologies)
 - Node-RED projects - both for creating Node-RED nodes and flows of interconnected nodes
 - Node-RED server - for convenient deployment of Node-RED flows within the Eclipse workbench
 - Node.js projects - for creating Node.js applications
 - Node.js server - for convenient deployment of Node.js applications within the Eclipse workbench
 - Swagger - for specifying APIs using Swagger documents
 - Node.js Debugger - for debugging Node.js applications
 - Pug (formerly known as Jade) – for template-based rendering of webpages
 - Unit test

| Name |
|---|
| > <input type="checkbox"/>  Git integration for Eclipse |
| > <input type="checkbox"/>  Git integration for Eclipse - experimental features (incubation) |
| > <input type="checkbox"/>  Java implementation of Git |
| > <input checked="" type="checkbox"/>  NodePlus |
| > <input type="checkbox"/>  RTist Core |
| > <input type="checkbox"/>  RTist Extra Functionality |
| > <input type="checkbox"/>  RTist Integrations |

Node-RED Tools in NodePlus

▶ Node-RED editor

- Configure nodes and wire them together into flows
- View debug output and execution within the flow
- Deploy changes to the Node-RED server
- Install new nodes to the palette (e.g. from the public library)

The screenshot displays the Node-RED editor interface. The top bar shows the URL `http://localhost:1882` and a `Deploy` button. The main workspace is titled `TrafficLight` and contains a flow with several nodes:

- `green`, `yellow`, and `red` nodes (light blue) are connected to an `RTIST send` node (blue).
- A `getActiveLight` node (light blue) is connected to two `RTIST invoke` nodes (blue), which are then connected to a `msg.payload` node (green).
- Another `msg.payload` node (green) is connected to an `empty` node (orange).

The left sidebar shows the `network` and `HCL` categories with various nodes like `http response`, `http request`, `tcp request`, `rtist request`, `rtist receive`, and `rtist response`.

The right sidebar shows the `debug` console with two log entries:

```
2019-11-07 10:53:58 node: bf76724b.820b1
msg.payload: string[169]
{"event": "lightChanged",
"type": "RTString", "data":
"RTString\\Red\\", "command":
"sendEvent", "priority": "General",
"port": "lightControl",
"portIndex": 0}

2019-11-07 10:53:58 node: 8ecacec9.4ee53
msg.payload: string[20]
"Light changed: "Red"
```

Node-RED Tools in NodePlus

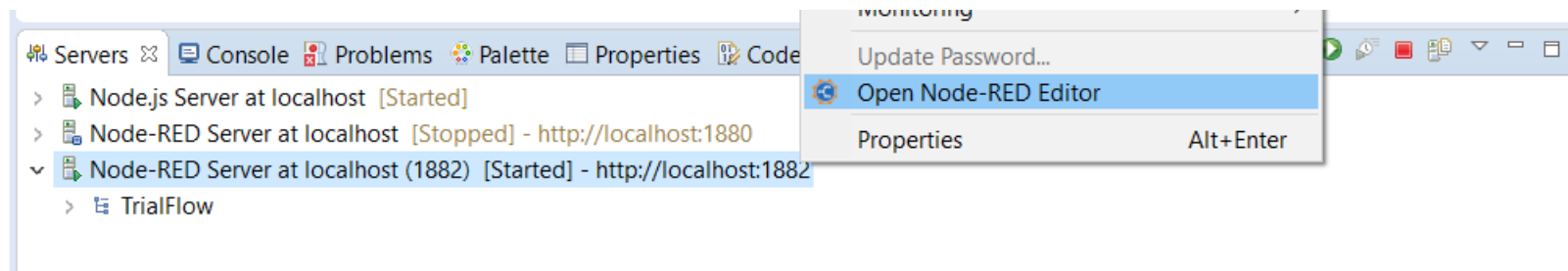
▶ Node-RED Flow Projects

- Flows can be created directly in the Node-RED editor, but creating them as Eclipse projects has many benefits (e.g. team development using SCM integration)
- An intuitive wizard for creating Node-RED Flow projects
- Either create a flow from scratch or start from one of the existing flows in the public library

▼ TrialFlow
{ } TrialFlow (8045bd21.5095f).json

▶ Node-RED Server

- A dedicated Servers view lets you create, start and stop Node-RED servers within the Eclipse workbench
- Deploy a Node-RED flow onto a selected server and open its Node-RED editor



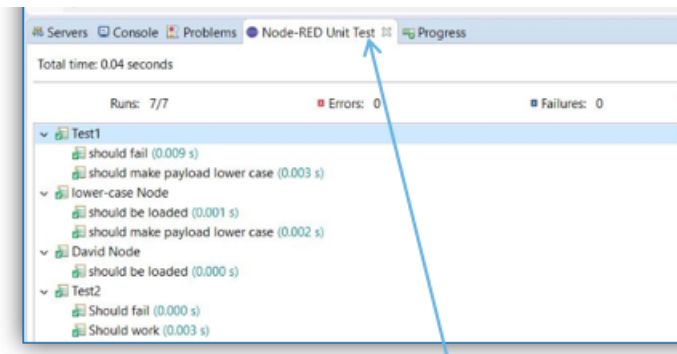
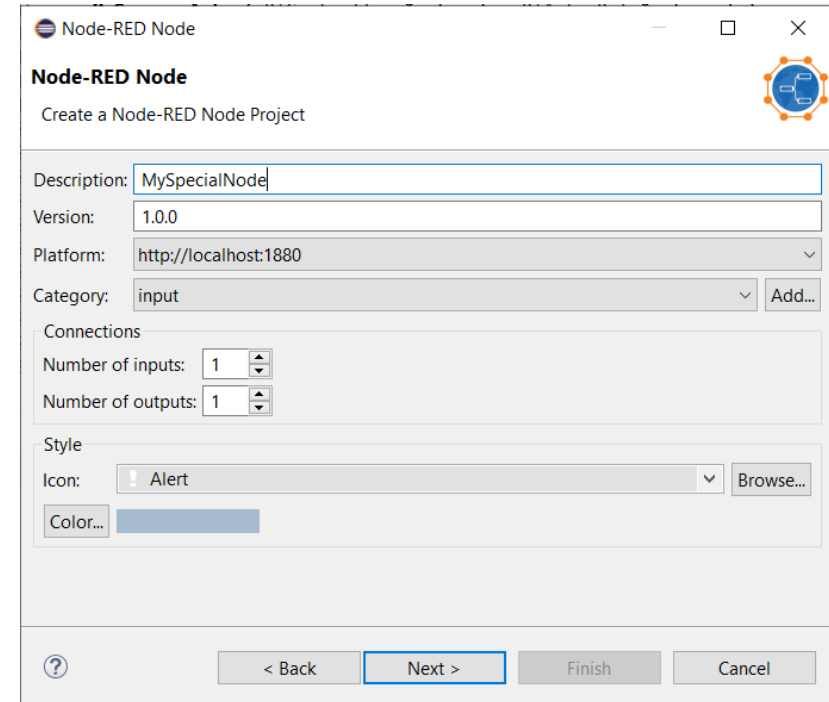
Node-RED Tools in NodePlus

▶ Node-RED Node Projects

- More than 1900 nodes exist in the public library, but sometimes you may need to create your own specific node
- An intuitive wizard for creating Node-RED Node projects
- Benefit from all the usual Eclipse features when developing your node (e.g. SCM integration)
- Either create a node from scratch or start from one of the existing nodes in the public library

▶ Unit test of Node-RED nodes

- Unit tests are created using the Mocha framework and results are shown in a special Node-RED Unit Test view



Custom "Unit Test" view

Node-RED Tools in NodePlus

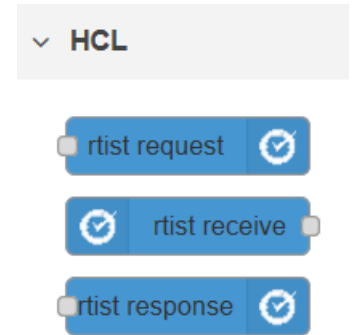
The screenshot displays the Node-RED Editor interface within the NodePlus IDE. The interface is divided into several sections:

- Project Explorer (Left):** Shows a tree view with a "Node project" containing "MyFlowProject" and "MyNode".
- Node-RED Editor (Center):** The main workspace showing a "Flow project" named "MyFlowProject". A flow diagram is visible with nodes: "timestamp" → "MyNode" (labeled "Node in use in a flow") → "Tweet".
- Node Palette (Left of Editor):** A list of nodes including "MyNode", "function", "template", "delay", "trigger", and "comment".
- Info Panel (Right):** Displays information for the selected "MyNode", including a description field (currently "None") and instructions: "Import a flow by dragging its JSON into the editor, or with `ctrl-i`".
- Servers Panel (Bottom):** Shows a "Node-RED Server at localhost [Started]" with sub-items for "MyFlowProject" and "MyNode".

Blue arrows point from external labels to these components: "Node project" points to the Project Explorer; "Flow project" points to the main editor area; and "Node in use in a flow" points to the "MyNode" node in the flow diagram.

Node-RED Tools in NodePlus

- ▶ Nodes for communicating with an RTist application
 - **rtist request**
Let a flow send or invoke an event into an RTist application
 - **rtist receive**
Trigger a flow when receiving an event that is sent or invoked from an RTist application
 - **rtist response**
Reply to a received event that is sent or invoked from an RTist application
- ▶ These nodes make use of the JSON API provided by [lib-tcp-server](#) (i.e. the RTist application must use this library)
 - The nodes can be statically configured in the Node-RED editor
 - It's also possible to provide many of the node properties in the message payload for a more dynamic behavior



Swagger Support in NodePlus

- ▶ Document APIs using Swagger in a new Swagger editor

The screenshot displays the Swagger editor interface. On the left, a code editor shows the Swagger JSON definition for the Petstore API, with syntax highlighting and content assist. On the right, a visual representation of the API is shown, including metadata like version (1.0.0) and base URL (petstore.swagger.io/v2), a list of methods (store, user, pet), and a detailed view of the [post] /pet method. This view includes a 'Try it' button, request and response type dropdowns, and a table of error codes (e.g., 405 Invalid input).

Support for JSON and YAML syntax

Visual API representation

Syntax highlight and content assist

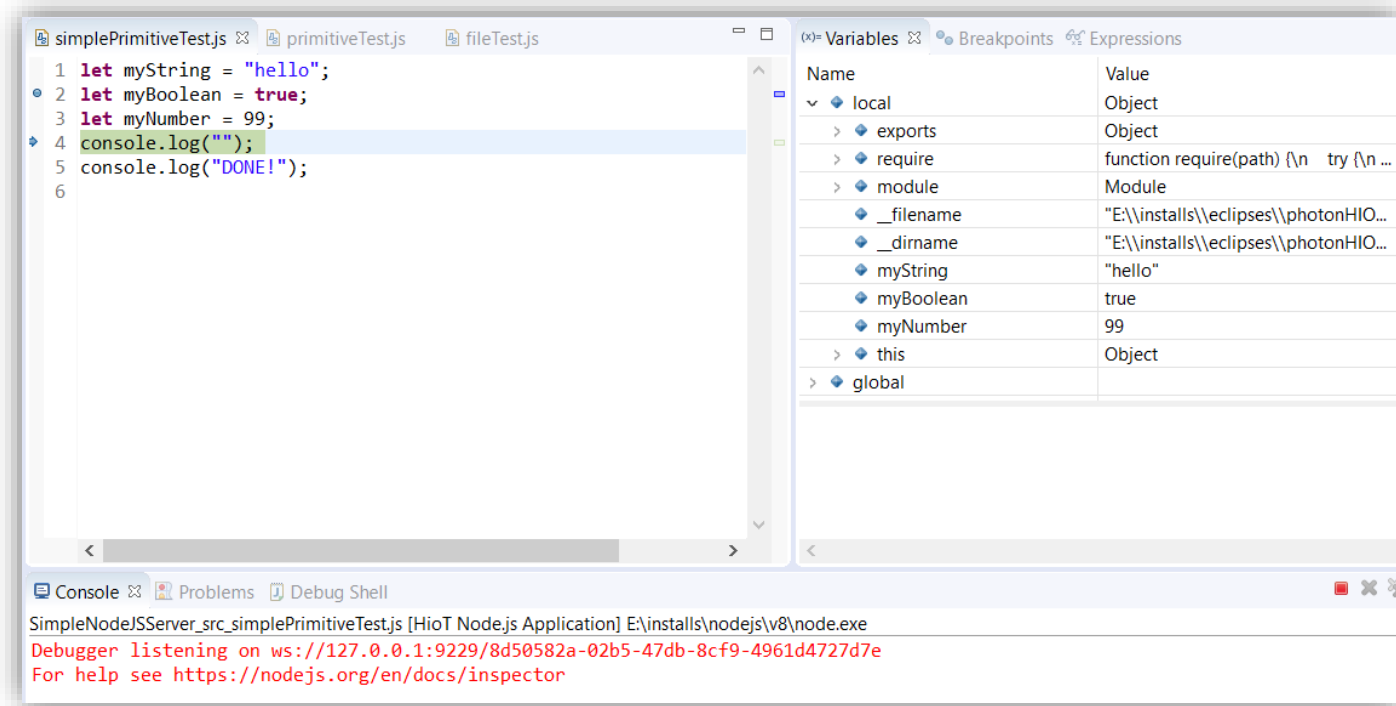
Support for executing / testing API

Automated generation of example data

Content types selections

Node.js Tools in NodePlus

- ▶ Wizard for creating Node.js projects
- ▶ Create, start and stop a Node.js server from within the Eclipse workbench
- ▶ Debug Node.js applications with a modern JavaScript debugger
- ▶ New editor for developing HTML pages for your Node.js application using the Pug template engine



HCL

*Relationship*TM
BEYOND THE CONTRACT

\$7 BILLION ENTERPRISE | 110,000 IDEAPRENEURS | 31 COUNTRIES

 WATCH THE FILM