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IBM Rational Software Architect Real-Time Edition

RSARTE 11.3 Installation Instructions

Table of Contents

You can download the RSARTE update site zip file from IBM Fix Central.

1   Introduction

This document guides you through the installation of Rational Software Architect Real-Time Edition (RSARTE). It covers three different installation scenarios:

- An interactively performed local installation in section 2

- A command line based installation suitable for scripting in section 3

- An installation based on the Eclipse Installer in section 4

To follow the instructions in this document and successfully install RSARTE 11.3 you will need the following:

- An installation of **Eclipse IDE for C/C++ Developers** for Eclipse 2022-06. This can be downloaded from https://www.eclipse.org/downloads/packages/release/2022-06. If you use the Eclipse installer it will be downloaded automatically.

- Access to a repository containing the RSARTE update site. This can either be a locally downloaded zip file or the address of a shared repository that has been preconfigured for your usage.

  You can download the RSARTE update site zip file from IBM Fix Central.

- A valid license. This can either be provided by means of a license server that contains RSARTE licenses, or it can be a license key or file (permanent or trial) which you have obtained from IBM.

- An installation of a Java development kit (JDK) 64 bit.

  NOTE: RSARTE 11.3 requires a Java 17 JDK, both when installing and running it. We recommend to use the Open JDK or Oracle JDK (see the System Requirements for the exact recommended versions).

  By default Eclipse 2022-06 distribution includes Open JDK version 17, but if you want to change it you could specify another JDK to use by editing the file `eclipse.ini` (found in the Eclipse installation folder). Specify the path to your JDK installation using the `-vm` argument. For example:

  ```
  -vm
  D:/jdk-17.0.5/bin
  ```

2 Installing from the Eclipse workbench

Here we describe how to install RSARTE as an update site on top of Eclipse 2022.06 (4.24) using the Eclipse graphical user interface. The sections that follow will cover how to install it from the command line or using the Eclipse installer.

NOTE: Some of the screen shots below were generated on the Windows platform for an older version of RSARTE, and will therefore differ slightly when installing the latest version of RSARTE 11.3 and when installing on Linux.

2.1 Install

NOTE: You must have sufficient administration rights so that the OS will allow you to write the files to the installation directory of Eclipse for installing all features of RSARTE. If you don't have rights to write the files to the installation directory of Eclipse follow the instructions in section 5.3.Read-Only Installation.

NOTE: Make sure the Eclipse installation path does not contain any space characters. There are components in RSARTE which do not work correctly if they are located in a path that contains a space.

NOTE: RSARTE can be installed on top of many Eclipse distributions, but we recommend to use "Eclipse IDE for C/C++ Developers". Installing it on other distributions may take a very long time since many dependent plugins need to be downloaded and installed.

1. Start Eclipse.
2. Open **Window - Preferences** and go to the **Install/Update - Available Software Sites** preference page. Make sure to uncheck all the software sites except the following: **2022-06**, **The Eclipse Project Updates**.
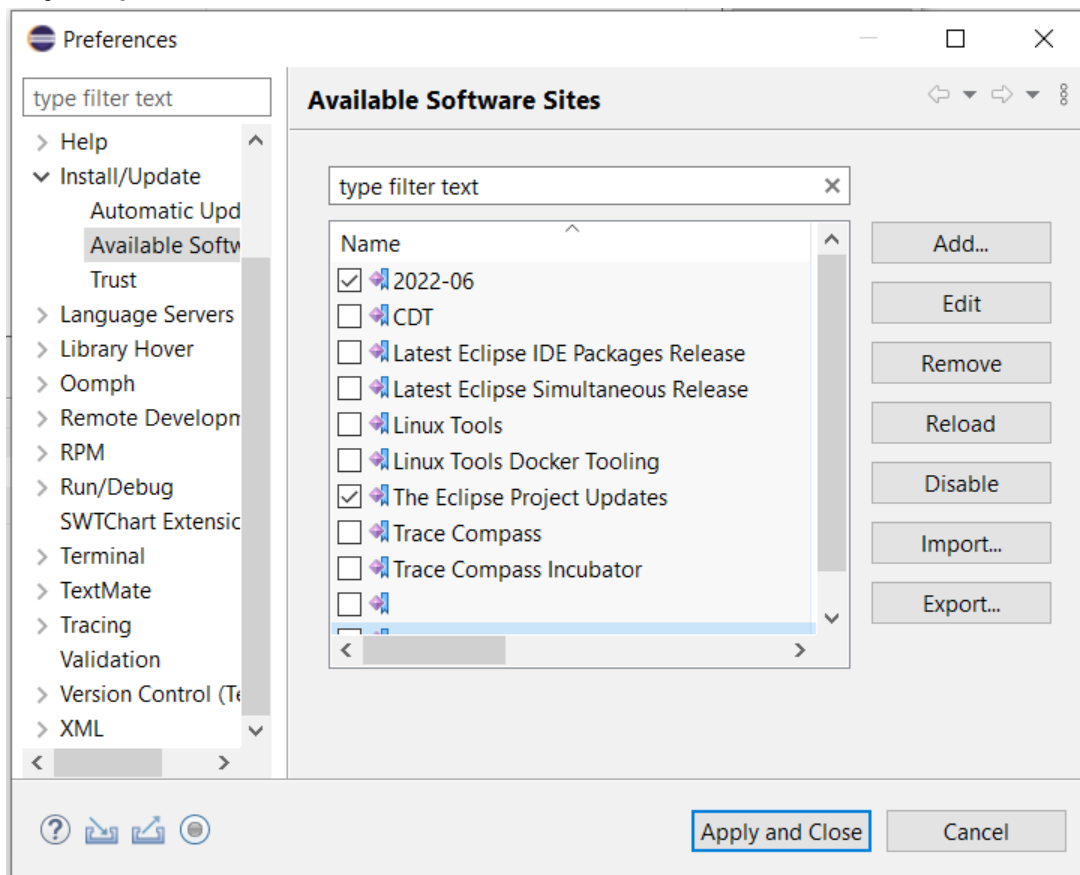
NOTE: It is important to uncheck items like **CDT, Latest Eclipse Simultaneous Release, Latest Eclipse IDE Packages Release** and others that can trigger Eclipse components upgrade, because such upgrades might cause errors during RSARTE installation.

3. Choose the **Install New Software...** command from the **Help** menu.
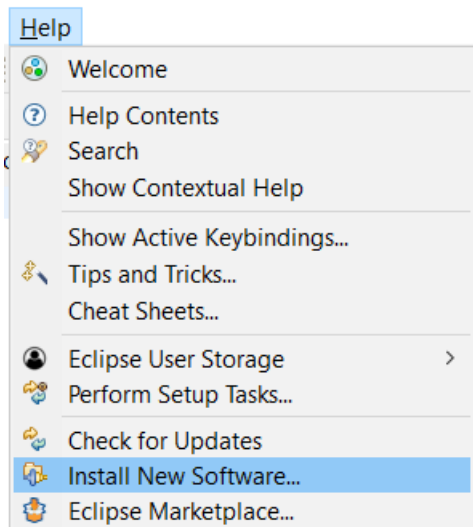
4. Press the **Add...** button and enter the location of the RSARTE update site. If the update site is located on a server, you can directly type its URL in the **Location** field. If instead you have it as a ZIP file in the file system, press the **Archive...** button and select it. If the ZIP file already was unpacked to a folder, you should instead use the **Local...** button and select the folder. You can give a meaningful name to the repository in case you want to install from it again in the future. For example:
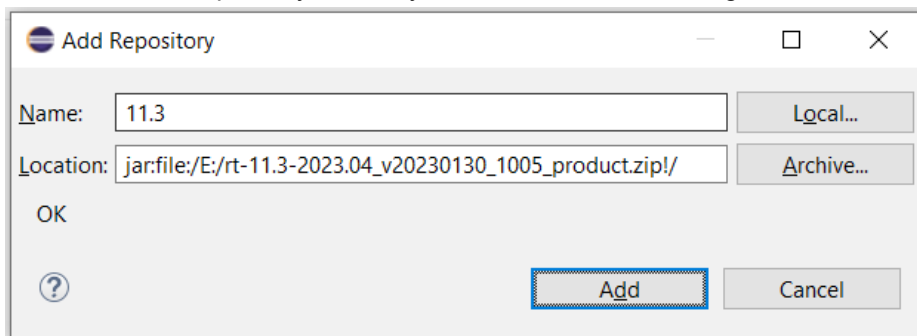
Note that the RSARTE ZIP file that you should install from ends with "product". There is also another ZIP file in what you download that contains an offline version of the documentation.

5. Select the added repository in the **Work with** drop down list. A list of RSARTE installation categories will be shown in the list below. It will look something like this (which categories that are available depends on the exact version of RSARTE):
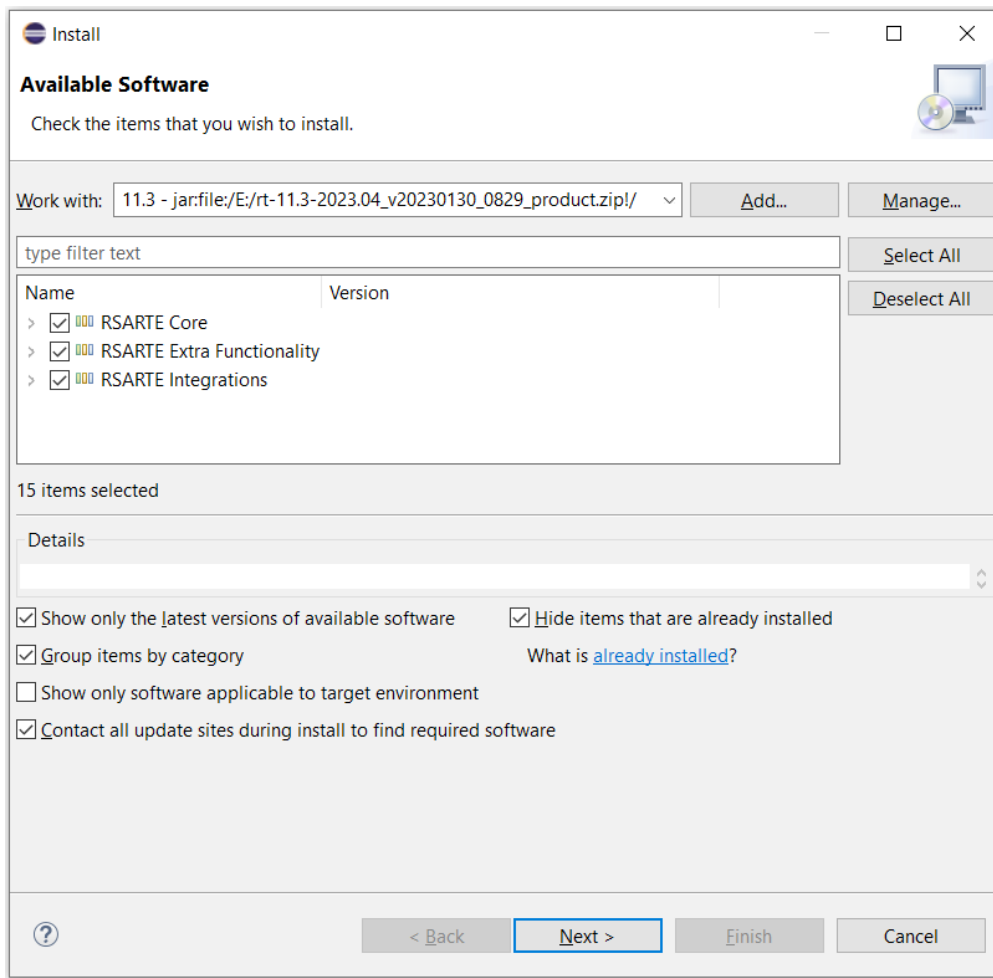
Under each installation category you can see the features it contains. You can select individual features to install, but often you will select only the top-level categories to install all features they contain.

The core RSARTE functionality is contained in the **RSARTE Core** category. All other categories contain optional additional functionality which you may or may not choose to install depending on your needs.

6. Select **RSARTE Core** and any of the other optional categories you want to install. Press **Next**.

- **NOTE**: If you get errors at this step double check that you run with sufficient priviliges to be able to make updates to the system and files. (On Windows you may need to start Eclipse using the "Run As Administrator" command and on Linux with root rights). Also make sure that you use a Java 17 JVM.

- **NOTE:** Depending on what Eclipse distribution you use, some Eclipse plugins which RSARTE requires may be missing. Such plugins must be downloaded during the installation. To allow this to happen automatically you must select the checkbox **Contact all update sites during install to find required software**. As explained above, Eclipse 2022-06 (http://download.e-clipse.org/releases/2022-06) must be in the list of available software sites (*Preferences – Install/Update – Available Software Sites*). If your machine does not have internet access, please follow the instructions given in the chapter Installing without Internet Access.

- **NOTE**: If you install the RSARTE EGit Integration (under the category RSARTE Integrations) you also must install EGit (Git Integration for Eclipse). RSARTE has its own version of EGit which is extended compared to the one that is part of Eclipse itself. At a minimum you must install the component called "Git integration for Eclipse".

- **NOTE:** If you choose to install the RSARTE EGit Integration into an Eclipse installation that already contains a version of EGit that is different from the version included in the RSARTE EGit Integration, you will be informed with a page similar to the one shown below that an update of EGit feature will be performed. This will automatically uninstall the existing EGit feature, before installing the RSARTE EGit Integration.
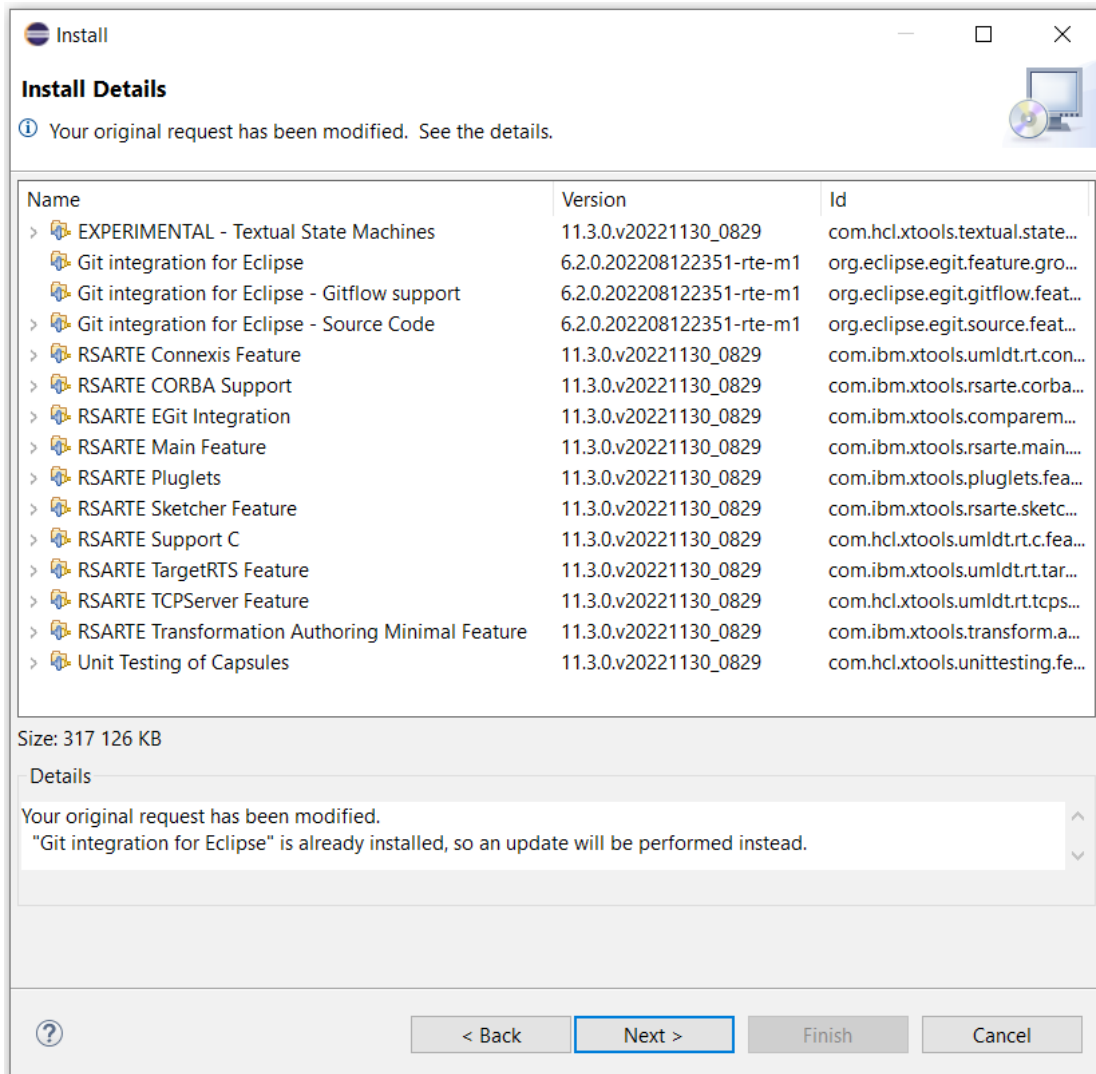
7. If you already had an older version of RSARTE 11.3 installed, you will get an **Install Details** page with a message that "Your original request has been modified". This is just information that Eclipse detected an old version of RSARTE which it will update. See chapter 2.3 for more information. Just press **Next** to proceed.

8. A final **Review Licenses** page will now be shown. If you accept the license agreements, click the appropriate button and then **Finish**.

9. The installation will now start. This can take several minutes so please be patient.
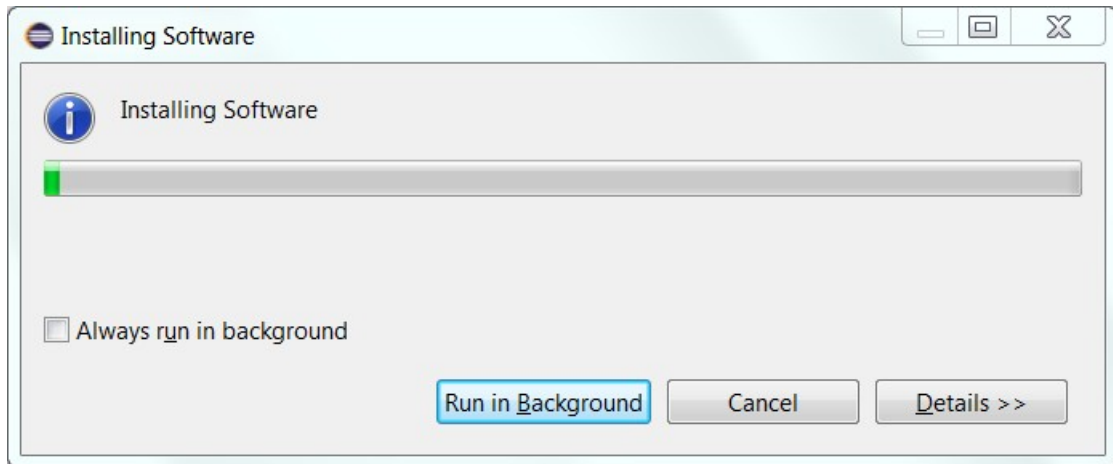
10. After the installation is complete, you will be asked to restart Eclipse. Answer **Yes**. You are not encouraged to try to use RSARTE without first restarting Eclipse.

   • **NOTE:** The first start-up of RSARTE can take a long time, especially if you installed it on top of another Eclipse distribution than "Eclipse IDE for C/C++ Developers". The reason is that all downloaded plugins must be reconciled with already existing Eclipse plugins, and this can take a significant amount of time. Subsequent start-up times will be much faster.

11. When Eclipse has started again you can confirm that RSARTE was successfully installed. Open the **About** dialog and locate the RSARTE icon:
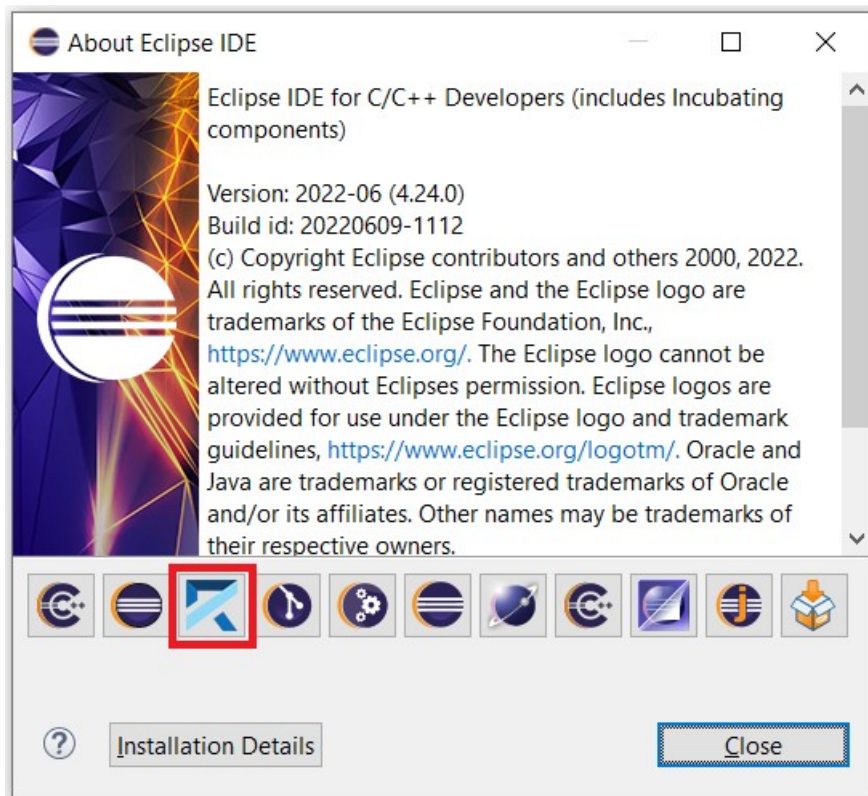

12. Click the button to view the installed version of RSARTE and release.

   You can also find the installed RSARTE features if you press the **Installation Details** button in the About dialog, and then click the **Installed Software** tab.

2.2 License Setup

RSARTE can start without having a license, but you will not be able to do much before you have applied a valid license.

Apply a license using the command **Manage Licenses** in the **Help** menu.
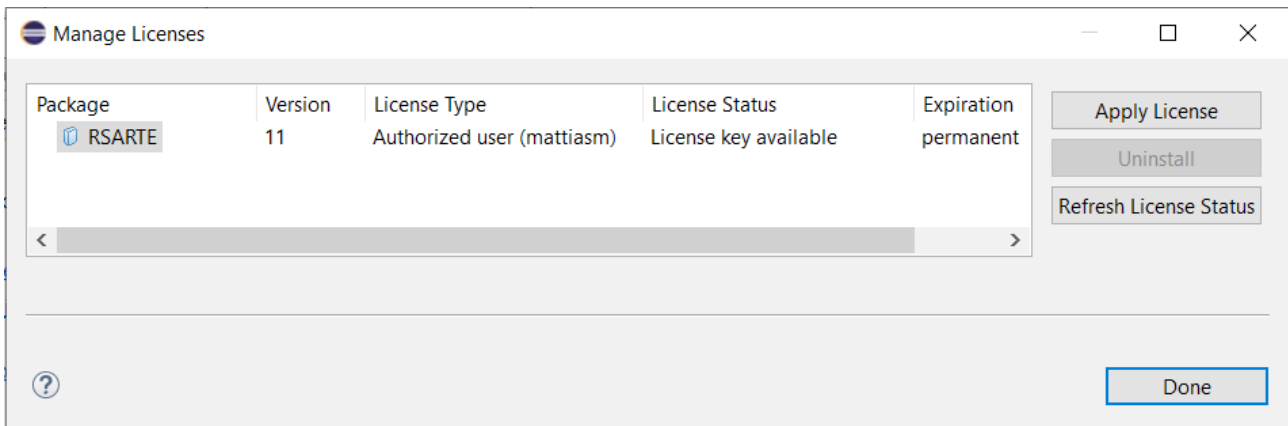
If the license status shows that no license is available you need to apply a license. Do this by selecting the line for RSARTE and press the **Apply License** button.

A dialog appears that lets you select which type of license to apply:
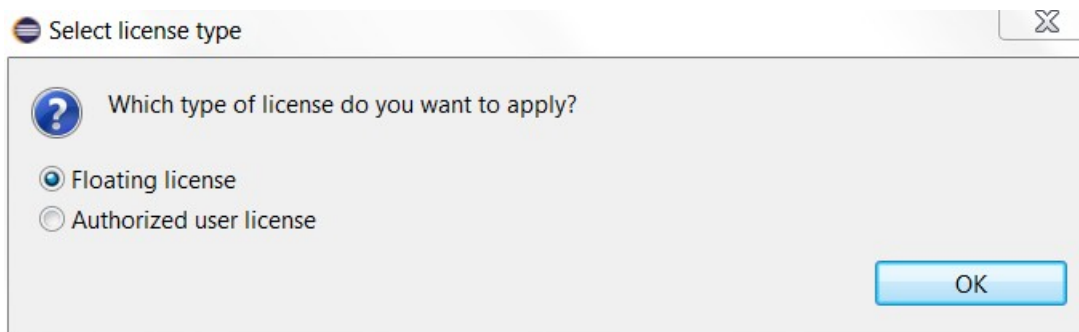
RSARTE supports two types of licenses; floating and authorized user licenses. The steps for applying them are described below.

NOTE: After a license has been applied you must restart RSARTE.

2.2.1 Floating License

A floating license resides on a FLEX license server and can be checked out or in by different users over time. Hence, several users can share a single floating license as long as they don't need it at the same time. Token-based licensing is a special variant of floating licensing, where the license that is checked out ("token") can be used by more than one software product.

The dialog for configuring a floating license is shown below.
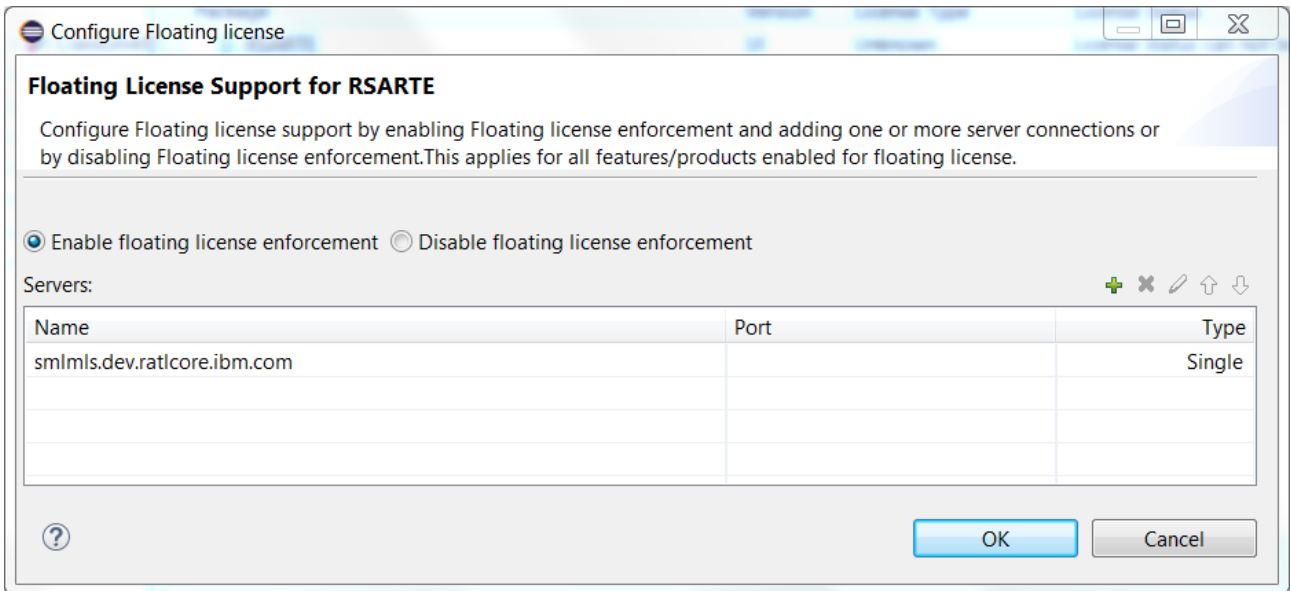
Make sure that floating license enforcement is enabled, and then use the ✚ button to add the necessary information about your license server. If you want you can specify additional license servers to have some redundancy in case the first one does not respond.

Press **OK** and confirm that the applied license appears as a valid license in the table.

Package	Version	License Type	License Status	Expiration
⬦ RSARTE	10	Floating	License key available.	15-01-2017

Finally you must restart RSARTE for changes to take effect.

2.2.2 *Authorized User License*

An authorized user license is based on a license key. Each user which applies such a license key is authorized to use a specific version of RSARTE for a specific period of time (or for ever, in case of a permanent license).

The dialog for entering the license key looks like this:

Enter the license key you have received from IBM. Then press **OK** and confirm that the applied license appears as a valid license in the table.

Package	Version	License Type	License Status	Expiration	
🗊 RSARTE	10	Trial (mattiasM)	License key available	Dec 31, 2016	

Finally you must restart RSARTE for changes to take effect.

2.3   Update

If your Eclipse already contains a version of RSARTE, you can update it to a later version. The steps you follow then are the same as described above. The only difference is that you will get a message telling you that some or all of the selected RSARTE features are already installed, and that an update will be performed.

It is normally not necessary to uninstall the old version of RSARTE before installing the new version.

If you are installing from a repository that is being updated with new releases of RSARTE you can also update your local installation using the Eclipse command **Check for Updates** in the **Help** menu.

2.4   Uninstall

You can uninstall RSARTE from the **About** dialog. Press the **Installation Details** button and then go to the **Installed Software** tab.

1. Select all lines starting with "RSARTE".

    ● **NOTE:** In case RSARTE was installed from the command line (as described in the next chapter), you may see products grouped by several RSARTE categories. In this case just select all top RSARTE categories.

2. Press the **Uninstall...** button and then **Finish**.
3. After RSARTE has been uninstalled, you will be asked to restart Eclipse. Accept it by pressing **Yes**.
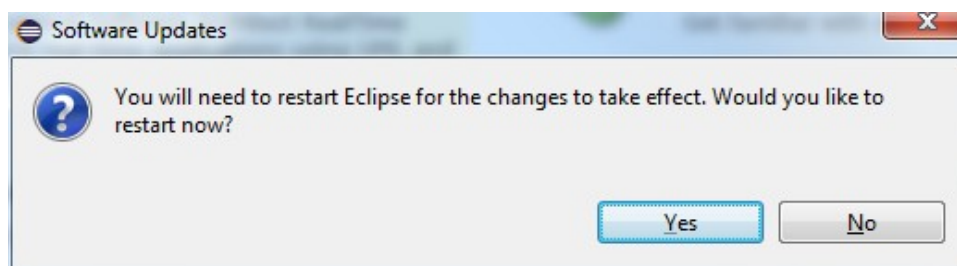
3 Installing from the Command Line

The easiest way to install RSARTE from the command-line is to use the "Install Product" script which you can find in the Utilities section on the RSARTE Info Center web site:

Install Product

If you want to write your own script, or directly install with commands on the command-line, you will use the P2 director application which is part of Eclipse. There are two ways to invoke this application:

1. **Using Java**
   ```
   java -jar <eclipse_install_plugin_dir>/
   org.eclipse.equinox.launcher_1.6.400.v20210924-0641.jar -application org.e-
   clipse.equinox.p2.director
   ```

   For example, on Windows it may look like this (exact version number of the JAR file may differ):
   ```
   java -jar C:\eclipseCpp\eclipse\plugins\
   org.eclipse.equinox.launcher_1.6.400.v20210924-0641.jar -application org.e-
   clipse.equinox.p2.director
   ```

2. **Using Eclipse**
   ```
   eclipse -nosplash -application org.eclipse.equinox.p2.director
   ```

   On Windows, use `eclipsec.exe` instead.

In the examples below we use `<p2_director>` to refer to one of the above ways to launch the P2 director application.

NOTE: The same prerequisites regarding running with sufficient privileges apply when using the P2 director application for installing RSARTE, as when installing from the Eclipse UI.

NOTE: When installing or uninstalling components into an Eclipse installation it's recommended not to have that Eclipse running.

The RSARTE update site is a mandatory argument in all invocations of the P2 director application. You specify it using the `-repository` command-line argument. For example, on Windows it can look like this:

```
<p2_director> -repository jar:file:d:\downloads\rsarte-11.3-
2023.04_v20230130_1631_product.zip!/
```

Depending on what action you want to perform, you will use additional arguments to the P2 director application, as described in the sections below.

3.1 Install

Make sure to use an installation of Eclipse that has no RSARTE installed. If RSARTE is already installed you should uninstall it (see chapter 3.2) before installing a new RSARTE version.

Also make sure that the Eclipse installation that you will install RSARTE into is configured to not automatically update the Eclipse version. Launch Eclipse, open the **Window - Preferences - Install/Update - Available Software Sites** preference page, and make sure the **Latest Eclipse Simultaneous Release** checkbox is not checked. Then close Eclipse again before installing RSARTE into it.[1]

Use the following command to install all RSARTE categories.

NOTE: In RSARTE version 11.3 **category identifiers begin with version qualifier**. For example, if the product zip file name is `rsarte-11.3-2023.04_v20230130_1631_product.zip` then the category identifiers for RSARTE will start with **v20230130_1631**.

---

1 *This step can also be done from the command-line. See the section called "Disabling Latest Eclipse Release" in the "Install Product" script linked above.*

```
<p2_director> -repository <rsarte_update_site> -installIU "v20230130_1631.rsarte.core,
v20230130_1631.rsarte.extra, v20230130_1631.rsarte.integrations,
org.eclipse.egit.feature.group" -r http://download.eclipse.org/releases/2022-06
```

The category identifiers are given after the -installIU argument. See chapter 3.3 for how to extract the identifiers for available categories from the update site.

NOTE: The feature org.eclipse.egit.feature.group mentioned above refers to EGit. Normally a version of EGit is already present in Eclipse before you install RSARTE, but if you choose to install the RSARTE EGit Integration you should first uninstall the standard version of EGit using a command similar to:
```
<p2_director> -uninstallIU org.eclipse.egit.feature.group
```

3.2   Uninstall

NOTE: In RSARTE version 11.3 **category identifiers begin with version qualifier**. An example of a command uninstalling all features for version **v20220530_1631** is:

```
<p2_director> -repository <rsarte_update_site> -uninstallIU "v20230130_1631.rsarte.-
core, v20230130_1631.rsarte.extra, v20230130_1631.rsarte.integrations"
```

where the category identifiers are given after the -uninstallIU argument. See chapter 3.3 for how to extract the identifiers for available categories from the update site.

3.3   Extract identifiers for install categories

The command for extracting the identifiers of available categories in the RSARTE update site is:

Windows:

```
<p2_director> -repository <rsarte_update_site> -list | findstr "rsarte." | findstr /V
"com.ibm.xtools." | findstr /V "com.hcl."
```

Linux:

```
<p2_director> -repository <rsarte_update_site> -list | grep "rsarte." | grep -v
"com.ibm.xtools." | grep -v "com.hcl."
```

The interesting lines in the result will look like the following (the qualifiers may be different):

```
v20230130_1631.rsarte.core=1.0.0.827A-cJIx2BBcMAMMAeGx6GYeS
v20230130_1631.rsarte.extra=1.0.0.9l7U-cJJXE6ED-z0Uz0z0VjmUylUkD
v20230130_1631.rsarte.integrations=1.0.0.8_8E-cJKzU6A7QUcQgp0v6ZBbYOz-9iG
```

The category identifier is the name before the equal sign.

The update site also contains an RSARTE specific version of EGit which has the same identifier as the standard version of EGit (org.eclipse.egit.feature.group).

4 Installing using the Eclipse Installer

The Eclipse Installer is a tool suitable for automating Eclipse-based installations. You can find more information about the Eclipse Installer at https://wiki.eclipse.org/Eclipse_Installer. There you also find instructions on how to download and install the Eclipse Installer.

NOTE: You must use version 1.4.0 or later of the Eclipse Installer. Installation errors will occur if you attempt to install RSARTE with an older version of the installer.

4.1 Basic usage of the Eclipse Installer

Using the Eclipse Installer to install RSARTE requires a setup file that specifies what should be installed. The minimal setup file for an RSARTE 11.3 installation that installs all RSARTE features, is the following:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<setup:Product
    xmi:version="2.0"
    xmlns:xmi="http://www.omg.org/XMI"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:setup="http://www.eclipse.org/oomph/setup/1.0"
    xmlns:setup.p2="http://www.eclipse.org/oomph/setup/p2/1.0"
    name="rsarte"
    label="rsarte 11.3">
  <version name="2022_06"
      label="2022_06"
      requiredJavaVersion="1.17">
    <setupTask
        xsi:type="setup.p2:P2Task"
        label="RSARTE including Eclipse 2022-06">
      <requirement
          name="epp.package.cpp"
          versionRange="[4.24.0,4.25.0)"/>
      <requirement
          name="org.eclipse.platform.feature.group"
          versionRange="[4.24.0,4.25.0)"/>
      <requirement
          name="org.eclipse.rcp.feature.group"
          versionRange="[4.24.0,4.25.0)"/>
      <requirement
          name="org.eclipse.sdk"
          versionRange="[4.24.0,4.25.0)"/>
      <requirement name="org.eclipse.jgit.feature.group"/>
      <requirement name="org.eclipse.egit.feature.group"/>
      <requirement name="org.eclipse.jgit.pgm.feature.group"/>
      <requirement name="_VERSION_.rsarte.core"/>
      <requirement name="_VERSION_.rsarte.extra"/>
      <requirement name="_VERSION_.rsarte.integrations"/>
      <repository
          url="http://download.eclipse.org/releases/2022-06"/>
      <repository
          url="url_to_rsarte_repository"/>
    </setupTask>
  </version>
  <description>RSARTE Installation Script</description>
</setup:Product>
```

You can copy the text above and do the following replacements.

1. Replace ***url_to_rsarte_repository*** with your local RSARTE 11.3 repository location and use a file with this contents as a starting point for your Eclipse installer setup script. Note that copying from PDF format may change the hyphens in the text ("-") and introduce "soft hyphens". So check that the "-" characters still remain after copying.

   Here is an example of what the repository URL for a local RSARTE 11.3 repository (unzipped into a folder) can look like in the setup script:

   ```
   <repository url="file:///C:/rsart-11.3-2023.04_v20230130_1631_product"/>
   ```
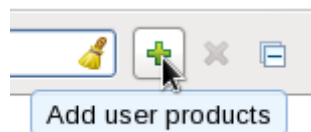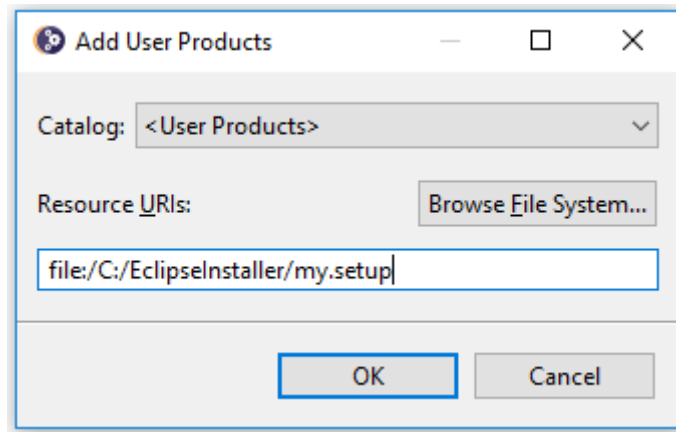
2. Replace **_VERSION_** with the actual version qualifier of the product you will be installing, for example v20230130_1631. See Section 3.3 on how to extract the identifiers from the zip file.

To install RSARTE start the Eclipse installer and switch to Advanced Mode.
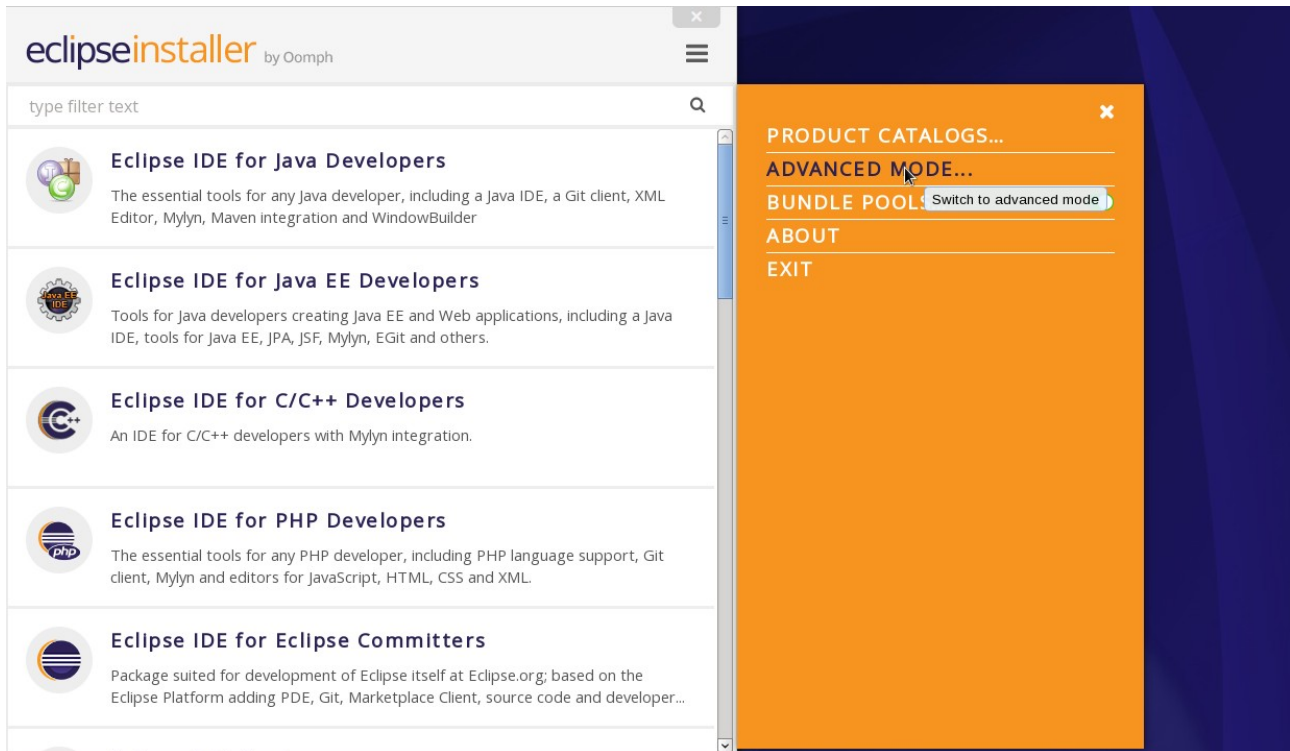
Use the command **Add user products** to choose your setup file.

You can now install RSARTE from the main Eclipse Installer page by selecting **rsarte 11.3** and pressing **Next**.

In the subsequent dialogs the default values work fine, even though you may want to modify the installation folder name. If you add additional Eclipse projects to your installation, remember to confirm that the target platform is set to 2022-06.

NOTE: Make sure the Eclipse installation path does not contain any space characters. There are components in RSARTE which do not work correctly if they are located in a path that contains a space.

5   Shared Installations and Pre-Configured License Setup

If you would like to share one installation among a group of users, e.g. using a network installation, some special considerations concerning the license setup are needed. The main issue with this scenario is how to apply a valid license at the time of installation, to avoid that each user has to do this when they start RSARTE.

To avoid this problem and to configure the license setup for all users during the installation of RSARTE, the following must be taken into account:

- Define a license policy file <u>before</u> installing RSARTE

- Use the location of the license policy file during installation to avoid the manual license setup

In the following two sections we will look at the licence policy file, the related system properties and how to fix a pre-configured license setup for a shared installation scenario. We will also discuss some constraints when using a read only installation structure.

5.1   License Policy File and License Related System Properties

A license policy file is an xml file called `licensep2.opt` that is used by RSARTE to find out where to look for licenses. This file is in a single-user installation modified automatically when using the **Help->Manage Licenses** command in RSARTE. A simple example of a license policy file is the following:

```
<?xml version="1.0" encoding="UTF-8"?>
<license key="authorized-user-license-key">
   <flex enabled="true" readonly="false">
     <server name="my.license.server" port=""/>
   </flex>
   <offeringorder readonly="false">
     <offering
         id="com.ibm.rational.software.architect.rt.10"
         version="11.3.0"
         name="RSARTE"/>
   </offeringorder>
   <componentorder readonly="false"/>
</license>
```

Depending on if you use floating licenses or authorized user licenses, this file will look slightly different. If only floating licensing is used then the "key" attribute for the "license" tag can be omitted. If only authorized user licensing is used, then the "enabled" attribute of the "flex" tag can be set to false.

The location of this file is given by a system property called **com.ibm.cic.licensing.p2.home.dir** that is defined in the **config.ini** file in the **configuration** folder in your RSARTE Eclipse installation. The folder identified by this property must contain the structure: **ibm/p2/license/licensep2.opt**.

Another system property that is relevant for license setup is **install.lic.p2.home**. The key feature of this property is that if this is defined when installing RSARTE, then the value will be used to define the license policy folder structure location and thus to define **com.ibm.cic.licensing.p2.home.dir**.

5.2   Pre-Configured License Setup

To pre-configure the license before installing RSARTE follow these steps:

- Define a license policy file **licensep2.opt** with suitable contents located in a folder structure **ibm/p2/license**.

- Give the system property **install.lic.p2.home** the value of the folder containing the **ibm/p2/license folder** structure. This can be done e.g. by adding a definition in the **eclipse.ini** file in the target Eclipse installation or by providing the definition as a command line argument. As discussed in section 5.3 updating the **eclipse.ini** is recommended.

- Install RSARTE as usual.

NOTE: If you install without defining **install.lic.p2.home** you have to add manually the property **com.ibm.cic.licensing.p2.home.dir** to you **config.ini** file.

5.3   Read-Only Installation

In a shared installation scenario it is common to have the installation folder to be read-only for regular users. In general this works for an RSARTE installation but there are two constraints:

- If a scheme is used to dynamically provide end users with plugin updates when starting RSARTE (e.g. using dropin folders) then due to the way Eclipse works it is necessary to have the system property **install.lic.p2.home** or **com.ibm.cic.licensing.p2.home.dir** assigned to the path of the folder containing the **ibm/p2/license** folder structure also when running RSARTE. The easiest way to accomplish this is to add the definition to the **eclipse.ini** file in the RSARTE installation.

- The TargetRTS, Connexis and TcpServer features cannot be installed into a read-only Eclipse installation. **NOTE**: You still can use these features if you install RSARTE in a different Eclipse and then copy the **rsa_rt/C++**, **rsa_rt/Connexis** and/or **rsa_rt/tcpserver** folders to some shared folder **rsa_rt** and use this folder from the main RSARTE.

6   Post-Installation Setup

After installation you should do some post-installation setup tasks before starting to use RSARTE. This is needed because the standard Eclipse settings with regards to memory etc. are usually not sufficient when working with RSARTE.

6.1   Modifications in eclipse.ini file

Please refer to this article for information about setup tasks that are commonly needed for performance and other reasons.

NOTE: Starting from version 4.19 of Eclipse Standard Widget Toolkit (SWT) will report the following error for every non-disposed widget.

```
java.lang.Error: SWT Resource was not properly disposed
```

The errors will be visible in the Error Log view and workspace log file. To disable reporting of such errors a user should locate the following line in `eclipse.ini` file
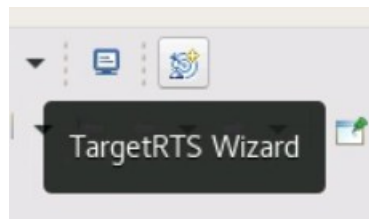
```
-Dorg.eclipse.swt.graphics.Resource.reportNonDisposed=true
```

and replace true with false, so it looks like this:

```
-Dorg.eclipse.swt.graphics.Resource.reportNonDisposed=false
```

6.2   Configuring GTK Theme

On Linux some GTK themes (for example Adwaita on RHEL8) can set tooltip backgrounds to be dark like in the image below.

This should be avoided, because it can cause issues with tooltips RSARTE will be showing in diagrams. To address this a user can either look for a theme with a light tooltips background or override the theme's settings by creating a file `~/.config/gtk-3.0/gtk.css` with the following contents:

```
tooltip { text-shadow: none; }
tooltip.background { background-color: rgba(255, 255, 255, 1.0);
border: 1px solid rgba(0, 0, 0, 1.0); }
tooltip decoration { background-color: transparent; }
tooltip * { background-color: transparent; color: black; }
```

After saving the file RSARTE should be restarted for the changes to become effective.

7 Installing without Internet Access

As explained in the chapter Install it may be necessary during the installation of RSARTE to download additional Eclipse plugins, that are needed by RSARTE but are missing in your Eclipse installation. Usually this happens automatically (provided you have marked the option **Contact all update sites during install to find required software**). However, if you don't have access to the internet this obviously won't work. For example, this can happen if your machine is behind a firewall which blocks access to some internet sites such as eclipse.org.

If you get errors like "missing required plug-in" it's likely that Eclipse failed to download the necessary Eclipse plugins. If you cannot temporarily enable the internet access on the installation machine, you can work-around the problem in the following way: install RSARTE on a different machine which has access to internet and then copy the installation folder to the target machine.