Steps for Downloading and/or Installing Java SE 7, the JMF, Apache Tomcat & Eclipse

Java SE 7

The download instructions below refer to the latest version of the Java Standard Edition (Java SE), which (at the time of writing) is *Java SE 7 Update 5*. The Java SE Development Kit (JDK) includes the Java Runtime Environment (JRE) and command-line development tools. It is actually the JDK that you are downloading, but we shall be referring only to the Java SE.

1. Go to *http://www.oracle.com/technetwork/java/javase/downloads/index.html*.

2. Click on the *Download* button underneath **JDK**, which is to the right of the text heading showing the latest version of Java.

3. In the table heading halfway down the page, click on the radio button to accept the licence agreement.

4. Click on the filename that appears alongside *Windows x86*. (This should have the format *jdk-7u<Update version>-windows-i586.exe*, where *<Update version>* is replaced with a number that is either 5 or one slightly higher.

5. Click on the *Save* button and navigate to a suitable location for the download file (probably the top level of your drive C) and then click the next *Save* button. (File takes up 87.95MB or more.)

6. After downloading to a suitable location, click on the *Open Folder* button.

7. Double-click on the executable file that has either been downloaded or been copied from the CD.

8. Click on the *Run* button.

9. Click on the *Next>* button (when it becomes available).

10. Customisation is now allowed, via selection from 3 component groups, but simply leave the default selection of *Development Tools*. (Requires 300MB of disc space.)
    If you wish to change the default (JDK) installation directory to something more distinctive (such as *C:\JavaSE7*), then use the *Change...* button, navigate to your desired location, create a new folder if you wish (e.g., JavaSE7) and click on *OK*.

11. In the next window, click on *Next>*.

12. Click on the *Change…* button if you wish to change the default JRE installation folder (probably to *JavaSE7\jre*), navigate to the desired folder, select it and then click on *OK*. **[Should NOT really be necessary, since you will merely be overwriting contents of existing jre folder, but can't abandon this without abandoning whole download!]**

13. Click on *Next>*.

14. At the end of the installation process, click on *Continue*.

15. You may need to go through a process similar to the above for downloading the SDK, clicking on *Close* at the end.

16. Register with Oracle, if you wish, but there is no need for this.

17. Modify your system's *Path* environment variable so that it references the *bin* folder of the above installation. **This is very important!** In case you are unsure how to modify the *Path* variable, the steps are given below, for Windows 7.

- From the *Start* menu at the bottom left of the screen, select:

  Control panel -> System and Security
  -> System
  -> Advanced system settings (in pane on left)
  ->Advanced (Tab)
  ->Environment variables… (Button).

- Scroll to the *Path* system variable and select the current contents of this variable by clicking on them.

- Click on the *Edit…* button, press the keyboard *Home* button (ensuring that NumLock is **not** on) and insert the full path to Java's *bin* folder at the start of the current contents (probably C:\JavaSE7\bin, if you have followed the earlier suggestions for folder names). **Make sure that you remember to place a semi-colon at the end of this new entry, in order to separate it from the next item.**

- Click *OK* three times to finish off.

Tomcat 7 (Implements the Servlet 3.0 and JSP 2.2 specifications.)

1. Go to *http://tomcat.apache.org/whichversion.html*.

2. Click on the <u>Tomcat 7.0</u> link in the *Download* column on the left of the screen.

3. Click on the <u>7.0.29</u> link (or, if not available, most recent version) under *Quick Navigation*.

4. Click on the <u>32-bit Windows zip</u> link after the *Core* bullet under *Binary Distributions*.

5. Click on *Save*, navigate to a suitable location (your Java SE folder?) and then click on *Save* again. (This will cause file *apache-tomcat-7.0.29-windows-x86.zip* (size 8.36MB) to be downloaded.

6. Click on *Open Folder*.

7. Right-click on the zip file and select the option to extract the file's contents, saving them in the current location.

8. Click on *OK*. This will create a sub-folder structure headed by a folder called *apache-tomcat-7.0.29-windows-x86*.

9. Rename *apache-tomcat-7.0.29-windows-x86* to something shorter, such as *Tomcat7*.

10. Use the Control Panel to set up the three system environment variables listed below. (If unsure how to do this, refer to foot of previous page, but use the *New* button instead of the *Edit* button.)

    (i) *JAVA_HOME*　　　　(**Must** be in upper case!)
    This should hold the path to your Java folder.
    E.g., C:\JavaSE7.

    (ii) *CATALINA_HOME*　(**Must** be in upper case!)
    This should hold the path to your Tomcat folder.
    E.g., C:\JavaSE7\Tomcat7.
    (iii) *JRE_HOME*　　　　(**Must** be in upper case!)
    This should hold the path to your JRE folder.
    E.g., C:\JavaSE7.

11. Again accessing the environment variables, add file *servlet-api.jar* to your *CLASSPATH* variable. This file will be in *<TomcatDir> \lib*. E.g., C:\JavaSE7\Tomcat7\ lib\servlet-api.jar.

12. Within your Tomcat folder is a folder called *bin*. Add the path to this folder to your *PATH* variable. (This step gives easy access to the *startup.bat* and *shutdown.bat* files mentioned below. Alternatively, of course, you can move into the above folder before using the *startup* and *shutdown* commands.)

13. Click on *OK* three times as you come out of the Control Panel.

14. Open up a command window and enter the following command:　　`startup`

    Five lines of output should appear in the window and a second command window will begin to fill up with output. When a line commencing *INFO: Server startup* appears in this second window, the Tomcat server is running.

15. To see information about Tomcat and to access example servlets and JSPs, open up a browser window and enter:

    `http://localhost:8080`

    If the Tomcat Web page appears, the installation has been successful.

16. To stop Tomcat, enter the following command: `shutdown`

    (This assumes, of course, that your *PATH* variable has been modified as described three steps earlier.)

Java Media Framework (JMF)

1. Go to *http://www.oracle.com/technetwork/java/javase/tech/index-jsp-140239.html*.

2. Click on the small <u>Download JMF</u> link (near the bottom of the page, immediately under the **Downloads** header).

3. Click on the *Download* button.

4. Click on the radio button in the table header to accept the terms of the licence agreement.

5. Click on the *jmf-2_1_1e-windows-i586.exe* link (alongside *Windows Performance Pack*).

6. Click on the *Save* button, navigate to a suitable location for the downloaded file (which will probably be the top level of your drive C) and then click on *Save* again. (File takes up 4.97MB.)

7. Click on *Open Folder*.

8. Double-click on the .exe file.

9. Click on *Run*.

10. Click on the *Yes* button to accept the terms of the licence agreement and then click on *Run*.

11. Follow the straightforward setup procedure, using the *Browse...* button to navigate to your Java SE7 folder for the destination location and accepting all other default settings.

12. Click on *Finish* to confirm that you want to restart your computer now.

13. Successful installation will result in the following changes within your Java folder:
    - several new files in *<JavaSE7>\bin*;
    - new files in *<JavaSE7>\lib*;
    - new files in *<JavaSE7>\jre\lib\ext*;
    - five sub-menu options from *start->All Programs->Java Media Framework 2.1.1e*, including utilities *JMF Customizer*, *JMF Registry* and *JM Studio*.

Eclipse

1. Go to *http://download.eclipse.org/webtools/downloads*.

2. Click on the <u>3.4.0</u> link under the *Build Name* column of the *Latest Downloads* table.

3. Click on the following link under *All-in-one Packages*:   ***Eclipse IDE for Java EE Developers***.

4. Click on *Windows 32 Bit* alongside *Eclipse IDE for Java EE Developers* (the top option).

5. Click on the large green arrow immediately below ***Download*** *eclipse-jee-juno-win32.zip* ***from:***, click on the *Save* button, navigate to the desired location (probably the top level of drive C or maybe C:\JavaSE7) and click on *Save* again. (File occupies 221MB.)

6. Click on *Open Folder*.

7. Right-click on file *eclipse-jee-juno-win32.zip* and then select the option to extract the contents of this zip file to a convenient location (possibly the top level, alongside your main Java folder, or possibly immediately below your Java folder, but **don't** create a new folder, since one entitled *eclipse* will be created automatically). If you are accepting the default location, then delete *\eclipse-java-juno-SR1-win32.zip* from the end of the path, since this will create a redundant folder level. The resultant folder structure will take up 257MB.

8. Right-click on the *eclipse.exe* file inside the *eclipse* folder that has now appeared, create a shortcut to it and then pin the icon to the taskbar.

9. Start Eclipse running, either by single-clicking on the taskbar icon or by double-clicking on the icon for file *eclipse.exe*.

10. When prompted by Eclipse, navigate to a suitable location (probably within your Eclipse folder or your main Java folder) and create a new workspace folder called *Workspace*.

11. Click on *OK*, tick the *Use this as the default and do not ask again* checkbox and click on *OK* again.

12. Close the *Welcome* window by clicking on the cross in the window's tab.

13. Select menu *Window->Preferences->General->Editors->Text Editors*, making sure that *Text Editors* is highlighted.

14. Tick/select the *Show line numbers* checkbox and click on *OK*.

15. Select *Window->Preferences->Java->Code Style->Formatter*.

16. Click on the *New...* button, enter a name (e.g., *JavaFormat*) for the profile name, select *Java Conventions [built-in]* from the drop-down list and click on *OK*.

17. Select each required formatting tab in turn [See *Formatting Categories and Their Settings* below], make the required format changes and click on *Apply*. Do **not** click on *OK* until changes to **all** required formatting categories have been made. If *OK* is clicked early by mistake, then click on *Edit* to continue changes.

18. Click on *OK* twice and continue from step 19.

Formatting Categories and Their Settings
[Remember to click *Apply*, **not** *OK*, at the end of each category!]

Indentation

Tick/select *Statements within 'switch' body*.
Leave all other Indentation options unchanged.

Braces

Change **all** options apart from the last (the *Array initializer* option) from *Same line* to *Next line*.

White Space

No changes.

Blank Lines

Change the number of blank lines from 1 to **0** for each of the 3 items below.

- *Before import declaration*
- *Between import groups*
- *Before declarations of the same kind*

Leave all other Blank Lines options unchanged.

New Lines

Tick/select *at end of file*.
Leave all other New Lines options unchanged.

Control Statements

Tick/select the following options:
- *Insert new line before 'else' in an 'if' statement*
- *Insert new line before 'catch' in a 'try' statement*
- *Insert new line before 'finally' in a 'try' statement*

Line Wrapping

Change *Maximum line width* to **65**.

Comments

Change *Maximum line width* to **65**.

[Now click on *OK* twice.]

19. Select *Window->Preferences*.

20. Select *Java->Code Style->Code Templates*.

21. Click on the '►' symbol next to *Comments* in the top right window.

22. For each category under *Comments* (*Files*, *Types*, etc.), click on the category, click on the *Edit…* button, drag with the mouse across the whole pattern, press the *Delete* key (on the keyboard) and click on *OK*.

23. Now click on the '►' symbol next to *Code* in the centre-most window and do the same for each of its categories, starting at *Method body*.

24. Click on *OK*.

25. Select *Window->Preferences*.

26. From navigation pane on left, select *Java->Installed JREs->Execution Environments*.

27. Click on line of table that shows the path to your JRE (Java Runtime Environment), probably *JavaSE-1.7*.

28. Tick the box that appears next to the appropriate option in the *Compatible JREs* column and then click on *OK*.

29. Again select *Window->Preferences* and then, from the navigation pane on the left, select *Java->Installed JREs* (making sure that you click on this option to select it).

30. Click on line of table that shows the path to your JRE. (There will probably be only one line.)

31. Click on the *Edit…* button and then on *Add External JARs... .*

32. Click on *Add External JARs…, b*rowse to the location of *jmf.jar* (*JavaSE7\JMF2.1.1e\lib*??), select jmf.jar and click on *Open*.

33. Click on *Finish* and then on *OK*.

(Steps 34-37 below get rid of an access restriction error message that versions of Eclipse from Galileo onwards generate when using the JMF.)

34. Select *Window->Preferences->Java->Compiler->Errors/Warnings*.

35. Click on **Deprecated and restricted API** to expose the associated settings.

36. Alongside *Forbidden reference (access rules):*, you will see a drop-down list with *Error* as the current setting. Change this to **Ignore** and then click on *OK*.

Though programs run in the command window will play videos without problem via the JMF, Eclipse requires the necessary dll files to be in a folder that is not the default folder for the JMF installation. Step 37 below ensures that these files are where Eclipse expects to find them.

37. Navigate to C:\Windows\SysWOW64 and scroll down to the group of dll files that have names commencing with 'jm'. (You should find that there are 20 of these, all with a creation date of 28/04/2003.) Copy these files and then paste them into C:\<JavaSE7>\jre\bin.

38. Select *File->Switch Workspace->Other... .*

39. Click on *Browse...* and navigate to Tomcat's *webapps* folder, making sure that this folder is selected.

40. Click on *OK* and then click on *OK* in the next window.

(Eclipse should close down at this point and then open up again, in order for the new workspace to be recognised.)

41. This completes the setup procedure for Eclipse, so you can now either experiment with Eclipse or select *File->Exit*.

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