



Erlang

tutorialspoint

SIMPLY EASY LEARNING

www.tutorialspoint.com

 <https://www.facebook.com/tutorialspointindia>

 <https://twitter.com/tutorialspoint>

About the Tutorial

Erlang is a general purpose or you might say a functional programming language and runtime environment. It was built in such a way that it had inherent support for concurrency, distribution and fault tolerance. Erlang was originally developed to be used in several large telecommunication systems. But it has now slowly made its foray into diverse sectors like ecommerce, computer telephony and banking sectors as well.

Audience

This tutorial has been prepared for professionals aspiring to make a career in the field of telecom, banking, instant messaging, e-commerce and computer telephony as well. This tutorial will give you enough understanding on this programming language and also help you in building scalable soft real time systems that will have requirements on higher availability.

Prerequisites

Before proceeding with this tutorial, you must have some basic knowledge on programming in the following languages such as C or C++, Java, Python, Ruby. Furthermore, it might also be helpful, to have some working knowledge on functional programming languages like Clojure, Haskell, Scala or OCaml for advanced programming on Erlang.

Copyright & Disclaimer

© Copyright 2016 by Tutorials Point (I) Pvt. Ltd.

All the content and graphics published in this e-book are the property of Tutorials Point (I) Pvt. Ltd. The user of this e-book is prohibited to reuse, retain, copy, distribute or republish any contents or a part of contents of this e-book in any manner without written consent of the publisher.

We strive to update the contents of our website and tutorials as timely and as precisely as possible, however, the contents may contain inaccuracies or errors. Tutorials Point (I) Pvt. Ltd. provides no guarantee regarding the accuracy, timeliness or completeness of our website or its contents including this tutorial. If you discover any errors on our website or in this tutorial, please notify us at contact@tutorialspoint.com.

Table of Contents

About the Tutorial.....	i
Audience.....	i
Prerequisites.....	i
Copyright & Disclaimer	i
Table of Contents.....	ii
1. ERLANG – OVERVIEW	1
Why Erlang?.....	1
2. ERLANG – ENVIRONMENT	3
Downloading Erlang	3
Erlang Installation	4
Erlang Configuration	10
Installation of Plugin-ins on Popular IDE's.....	10
Installation in IntelliJ.....	19
3. ERLANG – BASIC SYNTAX	23
General Form of a Statement.....	23
Modules.....	24
Import Statement in Erlang.....	24
Keywords in Erlang.....	25
Comments in Erlang	25
4. ERLANG – SHELL	26
5. ERLANG – DATATYPES	33
Built-in Data Types.....	33
6. ERLANG – VARIABLES	37
Variable Declarations.....	37

Naming Variables	38
Printing Variables.....	39
7. ERLANG – OPERATORS	40
Arithmetic Operators	40
Relational Operators.....	41
Logical Operators	43
Bitwise Operators	44
Operator Precedence	45
8. ERLANG – LOOPS.....	46
while Statement Implementation	46
for Statement.....	47
9. ERLANG – DECISION MAKING	50
If statement	50
Multiple Expression	52
Nested if Statements	55
Case Statements	57
10. ERLANG – FUNCTIONS.....	60
Defining a Function	60
Anonymous Functions.....	61
Functions with Multiple Arguments	61
Functions with Guard Sequences	62
11. ERLANG – MODULES	63
Defining a Module	63
Module Attributes	63
Pre-built Attributes.....	64

12. ERLANG – RECURSION	66
Practical Approach to Recursion	66
Duplicate.....	68
List Reversal	68
13. ERLANG – NUMBERS	70
Displaying Float and Exponential Numbers	70
Mathematical Functions for Numbers.....	71
14. ERLANG – STRINGS	78
len.....	78
equal.....	79
concat	79
chr.....	80
str	80
substr.....	81
left	81
left with trailing character	82
right	83
right with trailing character	83
to_upper.....	84
sub_string	85
15. ERLANG – LISTS	86
all.....	86
any.....	87
append.....	87
delete.....	88

droplast	89
duplicate	89
last	90
max	90
member	91
min	91
merge	92
nth	92
nthtail	93
reverse	93
sort	94
sublist	94
sum	95
16. ERLANG – FILE I/O	96
File Operation Methods in Erlang.....	96
Reading the Contents of a File One Line at a Time	96
file_read.....	97
write	98
copy	99
delete.....	99
list_dir.....	100
make_dir.....	100
rename	101
file_size.....	101
is_file	101
is_dir	102

17. ERLANG – ATOMS.....	103
is_atom.....	103
atom_to_list	104
list_to_atom	104
atom_to_binary	105
binary_to_atom	105
18. ERLANG – MAPS	107
from_list	107
find	108
get.....	108
is_key.....	109
keys	109
merge	110
put	111
remove	112
19. ERLANG – TUPLES.....	113
is_tuple.....	113
list_to_tuple	114
tuple_to_list	114
20. ERLANG – RECORDS.....	115
Creating a Record.....	115
Accessing a Value of the Record.....	115
Updating a Value of the Record	116
Nested Records.....	117
21. ERLANG – EXCEPTIONS	118

22. ERLANG – MACROS	121
23. ERLANG – HEADER FILES.....	123
24. ERLANG – PREPROCESSORS.....	124
25. ERLANG – PATTERN MATCHING	125
26. ERLANG – GUARDS	126
Guards for ‘if’ Statements	127
Guards for ‘case’ Statements	127
Multiple Guard Conditions	128
27. ERLANG – BIFS.....	129
date	129
byte_size.....	130
element	130
float	131
get.....	131
put	132
localtime	132
memory	133
now.....	133
ports	134
processes	134
universaltime	135
28. ERLANG – BINARIES	136
list_to_binary.....	136
split_binary.....	137
term_to_binary.....	137

is_binary	138
binary_part	138
binary_to_float	139
binary_to_integer	139
binary_to_list.....	140
binary_to_atom	140
29. ERLANG – FUNCS.....	141
Using Variables	142
Functions within Functions	142
30. ERLANG – PROCESSES.....	143
is_pid	144
is_process_alive	144
pid_to_list.....	145
registered.....	145
self	146
register	146
whereis	147
unregister	148
31. ERLANG – EMAIL.....	149
32. ERLANG – DATABASES	150
Database Connection	150
33. ERLANG – PORTS	155
Types of Protocols Used in Ports	155
34. ERLANG – DISTRIBUTED PROGRAMMING.....	159
spawn	159

node.....	160
spawn on Node	160
is_alive.....	161
spawnlink.....	161
35. ERLANG – OTP	163
36. ERLANG – CONCURRENCY	165
pid = spawn(Fun)	165
Pid ! Message	165
Receive...end.....	166
Maximum Number of Processes	167
Receive with a Timeout.....	167
Selective Receive	168
37. ERLANG – PERFORMANCE	170
38. ERLANG – DRIVERS	171
Creating a Driver	171
39. ERLANG – WEB PROGRAMMING	173

1. ERLANG – OVERVIEW

Erlang is a functional programming language which also has a runtime environment. It was built in such a way that it had integrated support for concurrency, distribution and fault tolerance. Erlang was originally developed to be used in several large telecommunication systems from Ericsson.

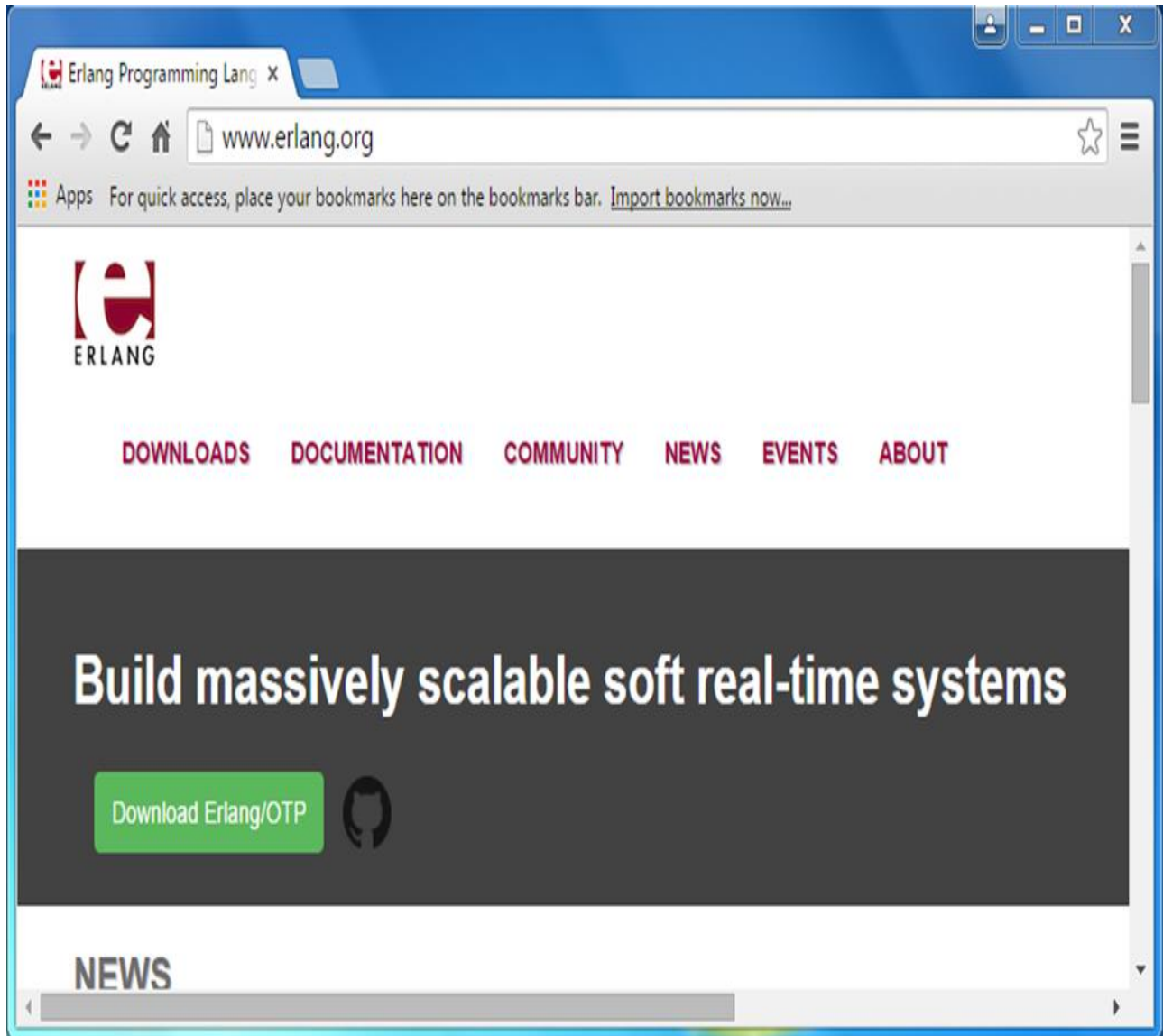
The first version of Erlang was developed by Joe Armstrong, Robert Virding and Mike Williams in 1986. It was originally a proprietary language within Ericsson. It was later released as an open source language in year 1998. Erlang, along with OTP, a collection of middleware and libraries in Erlang, are now supported and maintained by the OTP product unit at Ericsson and widely referred to as **Erlang/OTP**.

Why Erlang?

Erlang should be used to develop your application, if you have the following requirements:

- The application needs to handle a large number of concurrent activities.
- It should be easily distributable over a network of computers.
- There should be a facility to make the application fault-tolerant to both software and hardware errors.
- The application should be scalable. This means that it should have the ability to span across multiple servers with little or no change.
- It should be easily upgradable and reconfigurable without having to stop and restart the application itself.
- The application should be responsive to users within certain strict timeframes.

The official website for Erlang is <http://www.erlang.org/>



2. ERLANG – ENVIRONMENT

Now before you can start working on Erlang, you need to ensure that you have a fully functional version of Erlang running on your system. This section will look into the installation of Erlang and its subsequent configuration on a windows machine to get started with Erlang.

Ensure that the following system requirements are met before proceeding with the installation.

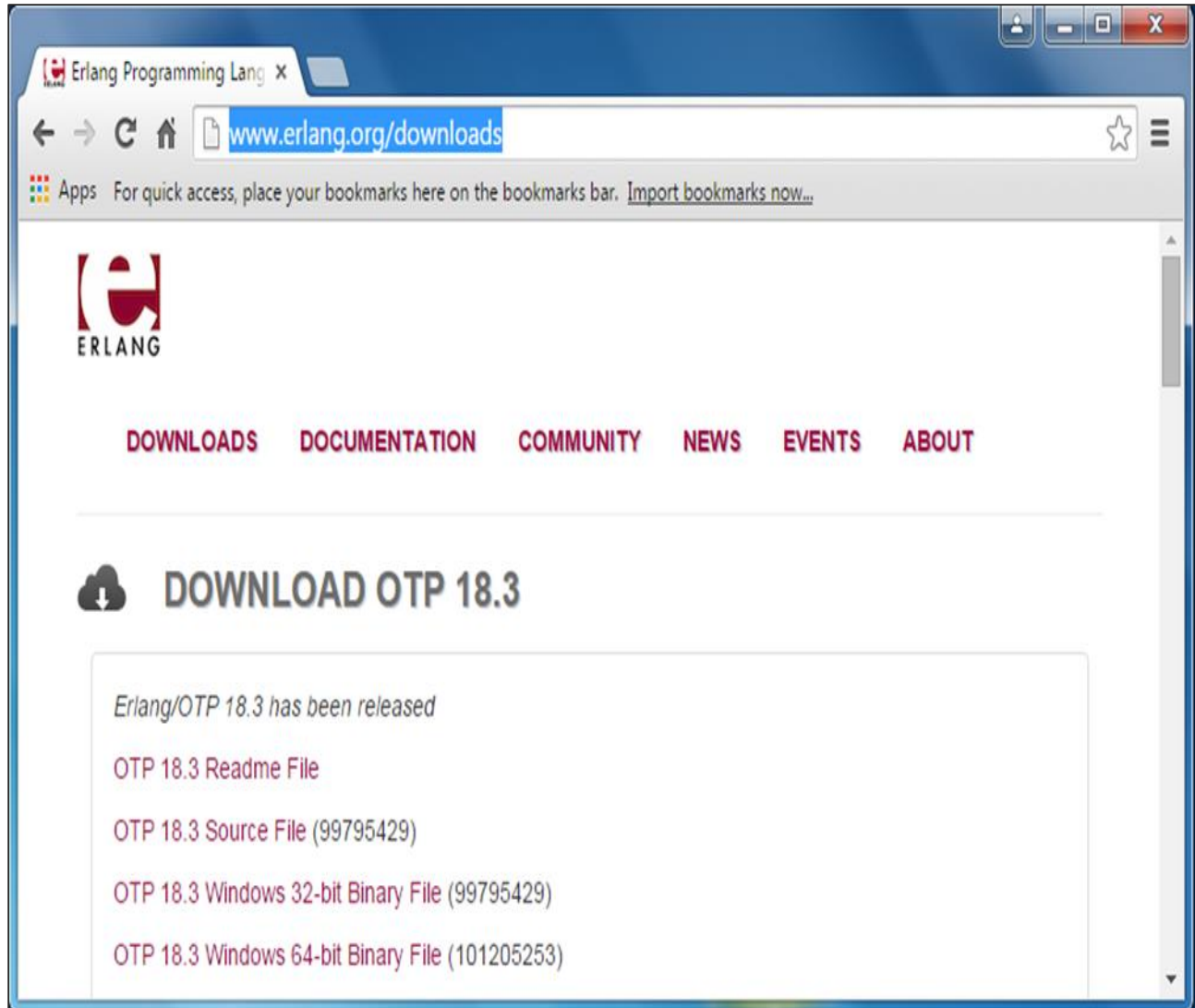
System Requirements

Memory	2 GB RAM (recommended)
Disk Space	No minimum requirement. Preferably to have enough storage to store the applications which will be created using Erlang.
Operating System Version	Erlang can be installed on Windows, Ubuntu/Debian, Mac OS X.

Downloading Erlang

To download Erlang, one must go to the following url - <http://www.erlang.org/downloads>

This page has a variety of downloads and also the steps required to download and install the language on Linux and Mac platforms.

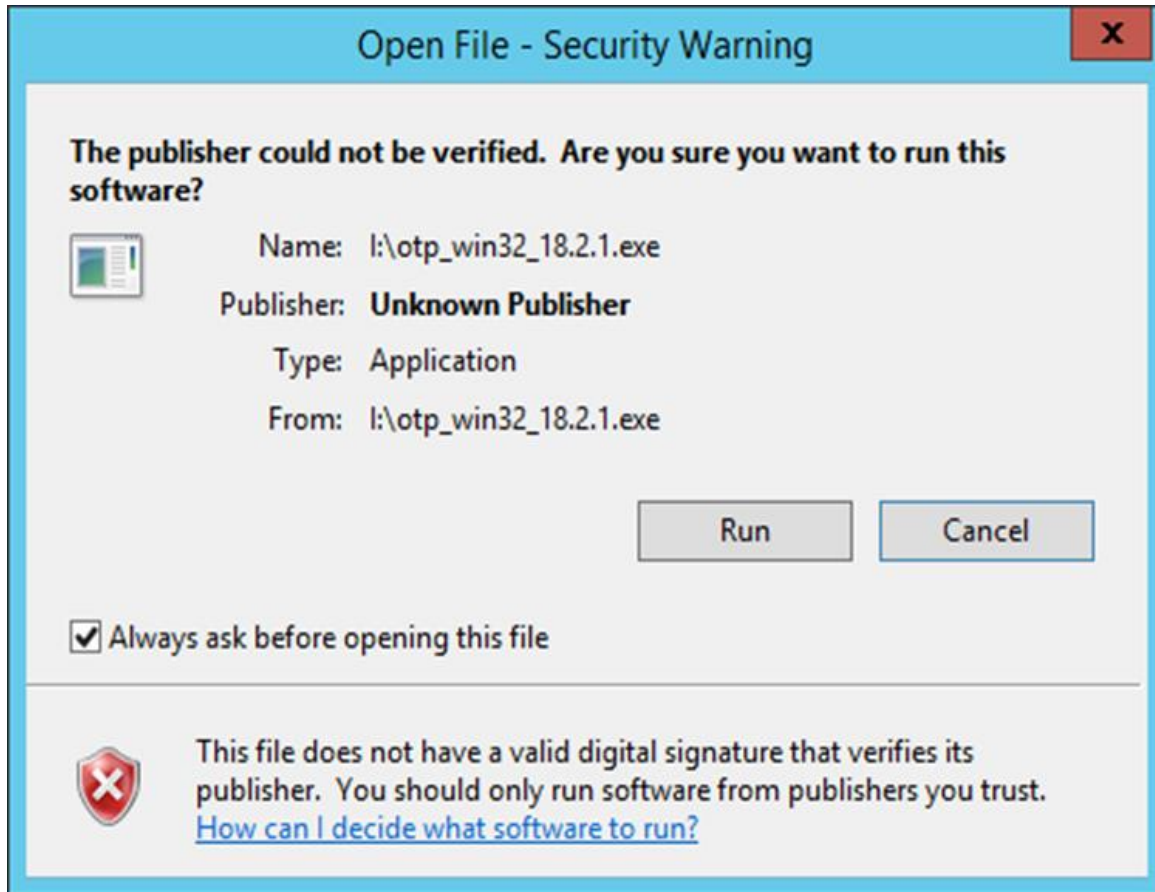


Click on the 'OTP 18.3 Windows 32-bit Binary File' to begin the download of the Erlang Windows Installation file.

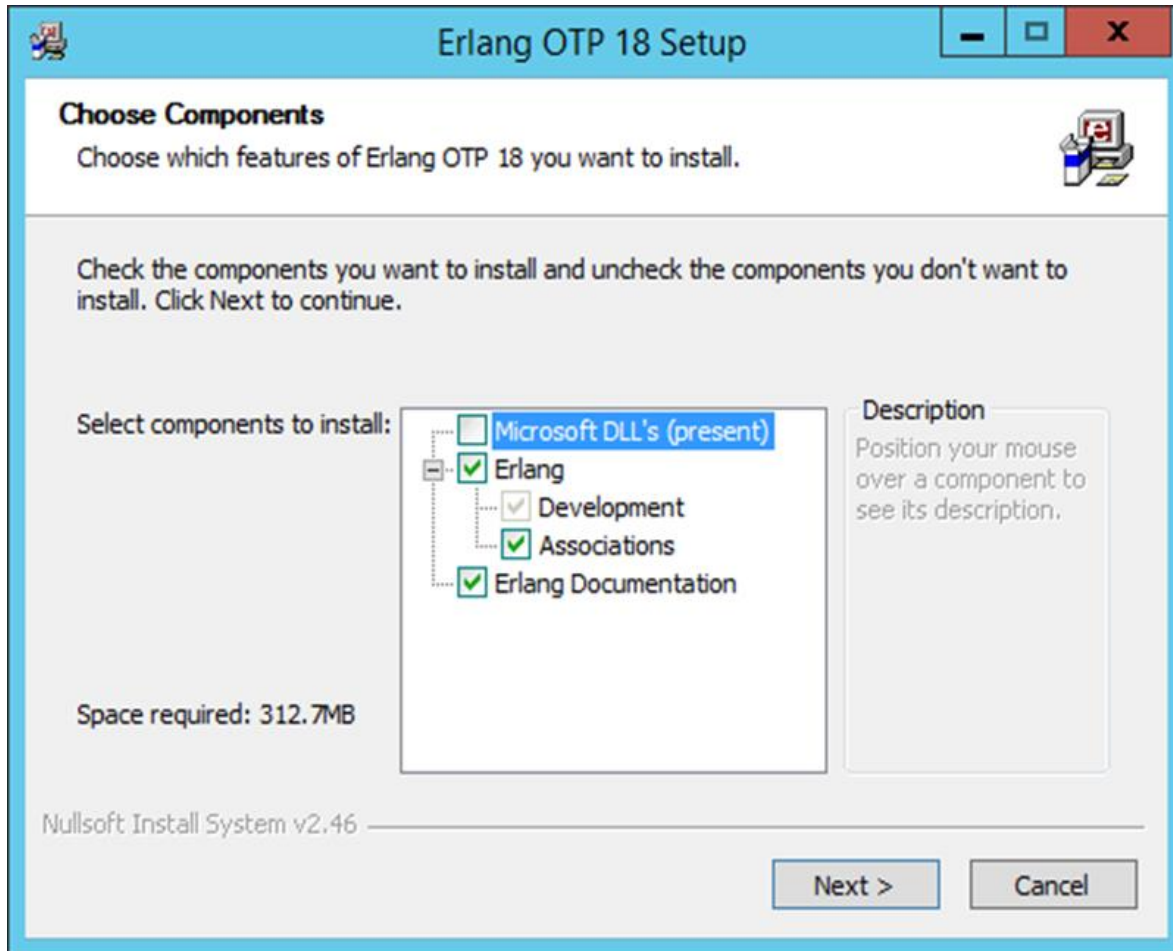
Erlang Installation

The following steps detail how Erlang can be installed on Windows:

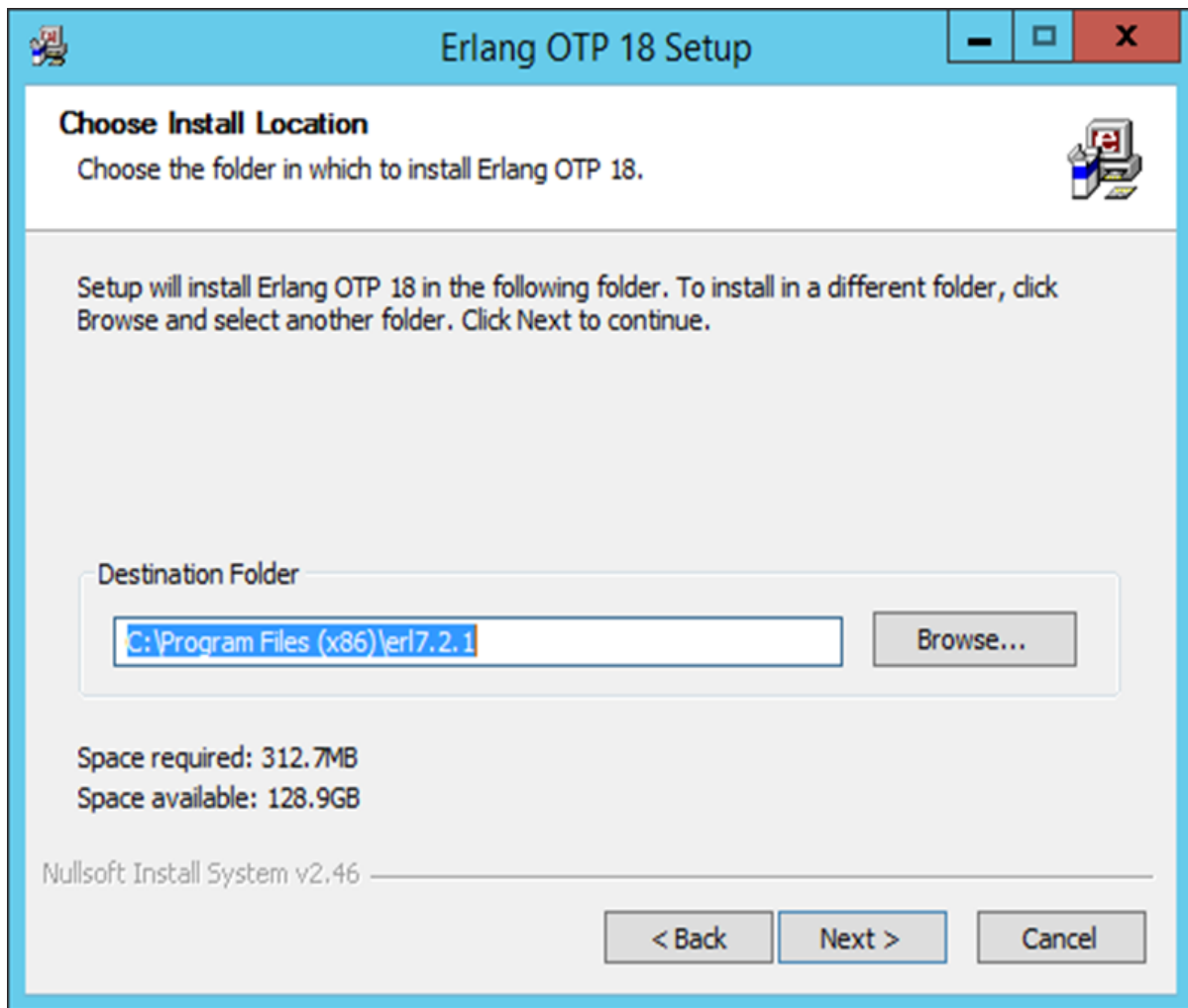
Step 1) Launch the Installer downloaded in the earlier section. After the installer starts, click Run.



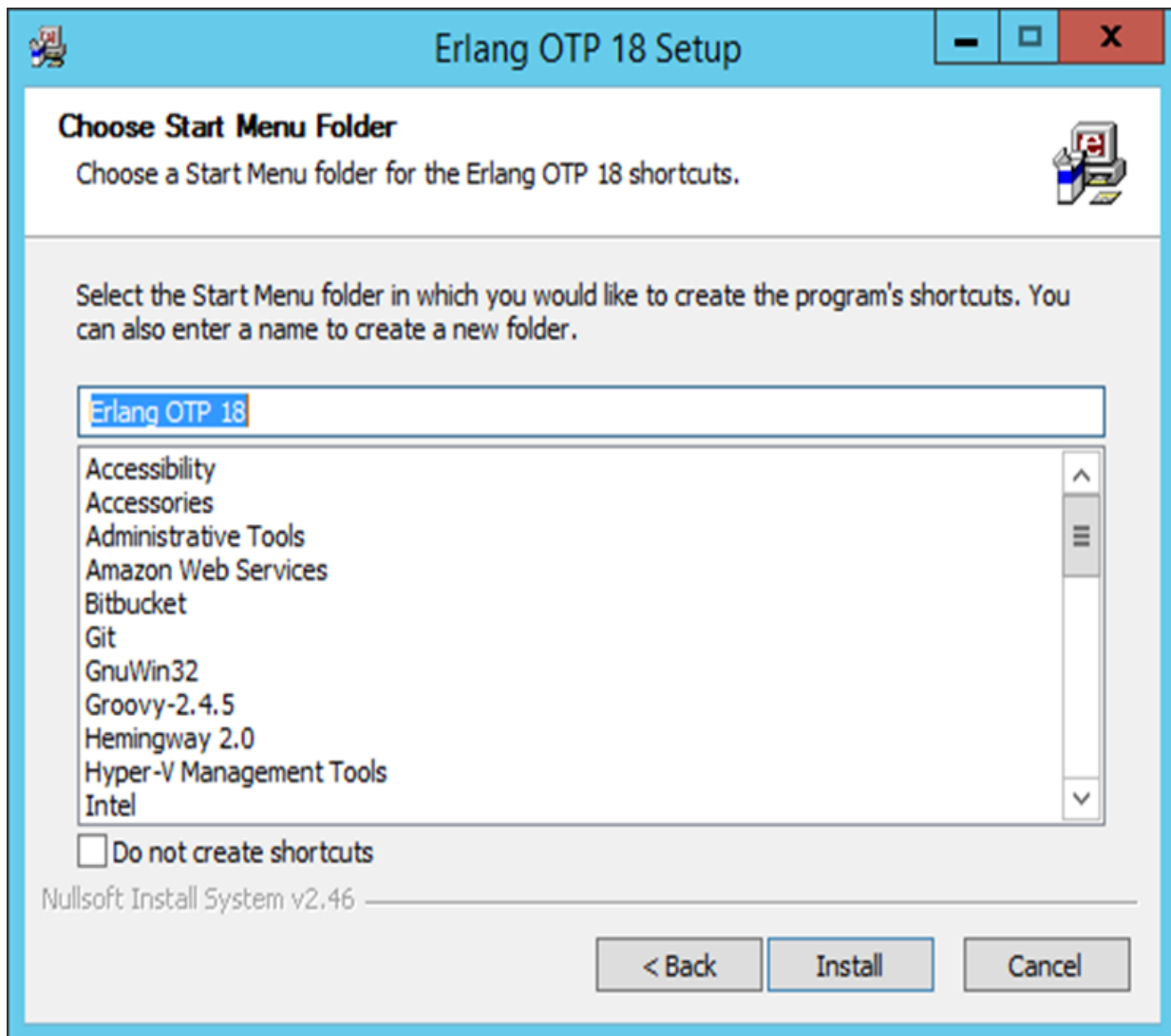
Step 2) Click Next on the following screen to accept the default components, which will be installed.



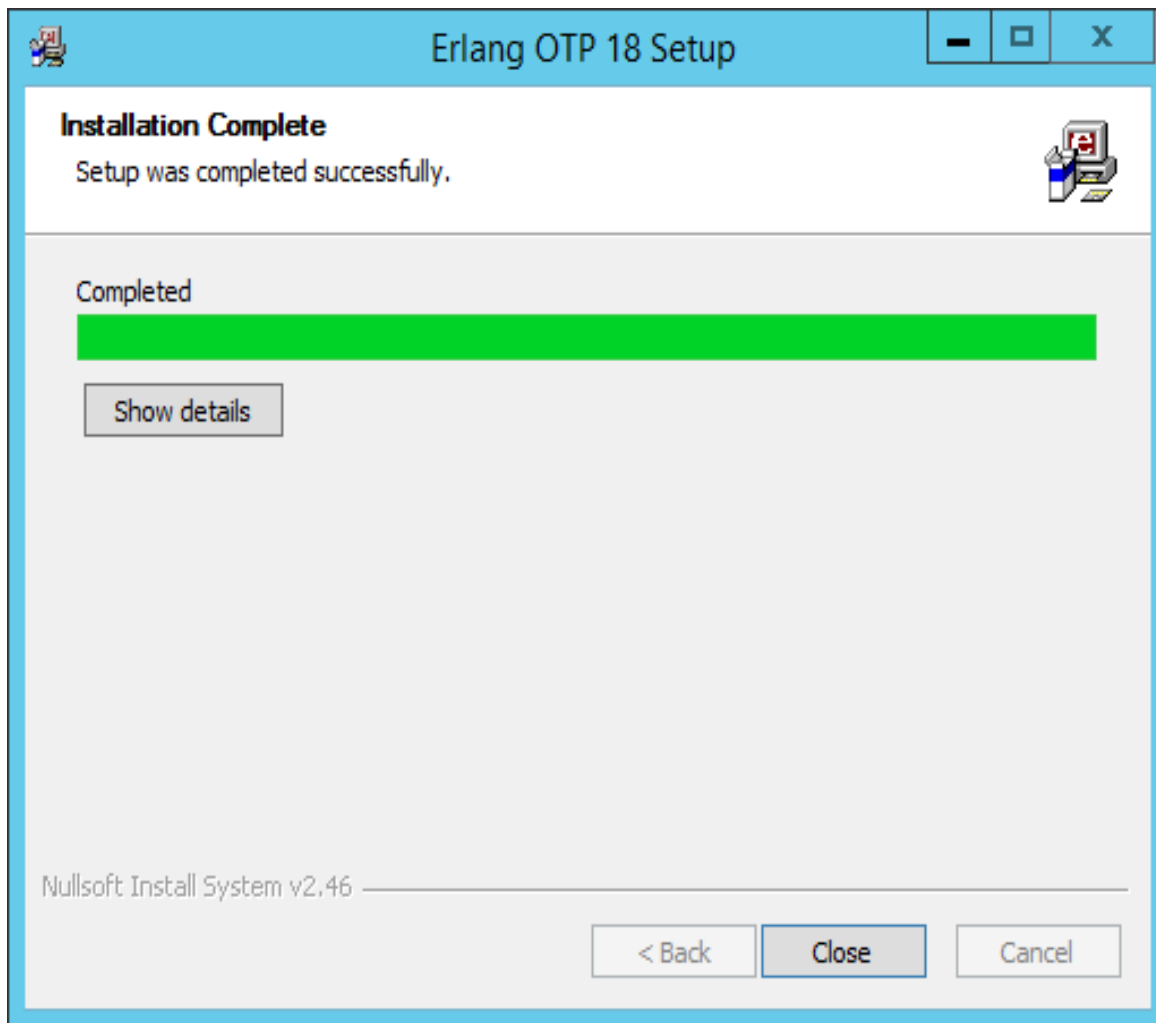
Step 3) Accept the default installation path and click Next.



Step 4) Accept the default Start Menu item, which will be created and click Next.



Step 5) After the installation is complete, click Close to complete the installation.

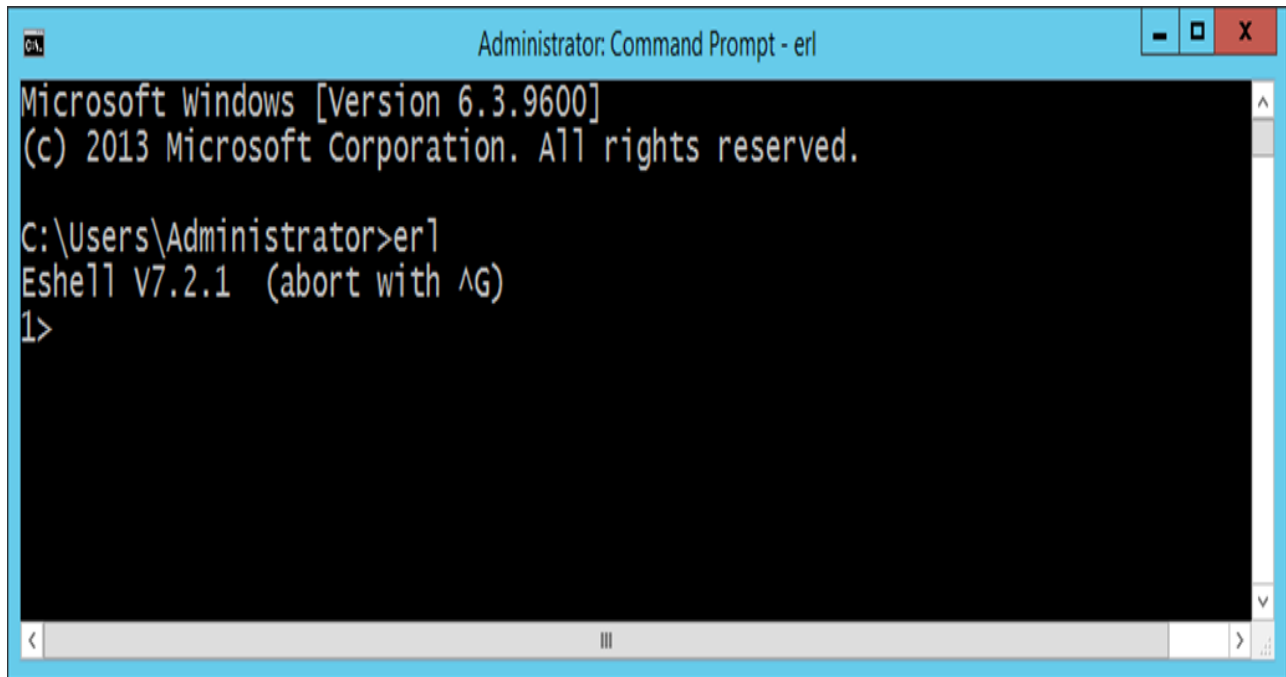


Erlang Configuration

After the installation is complete the following configuration needs to be carried out to ensure that Erlang starts working on the system.

OS	Output
Windows	Append the String; C:\Program Files(x86)\erl7.2.1\bin OR C:\Program Files\erl7.2.1\bin to the end of the system variable PATH.

If you now open the command prompt and type **erl**, you should be able to get the erl command prompt.



```

Administrator: Command Prompt - erl
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>erl
Eshell V7.2.1 (abort with ^G)
1>

```

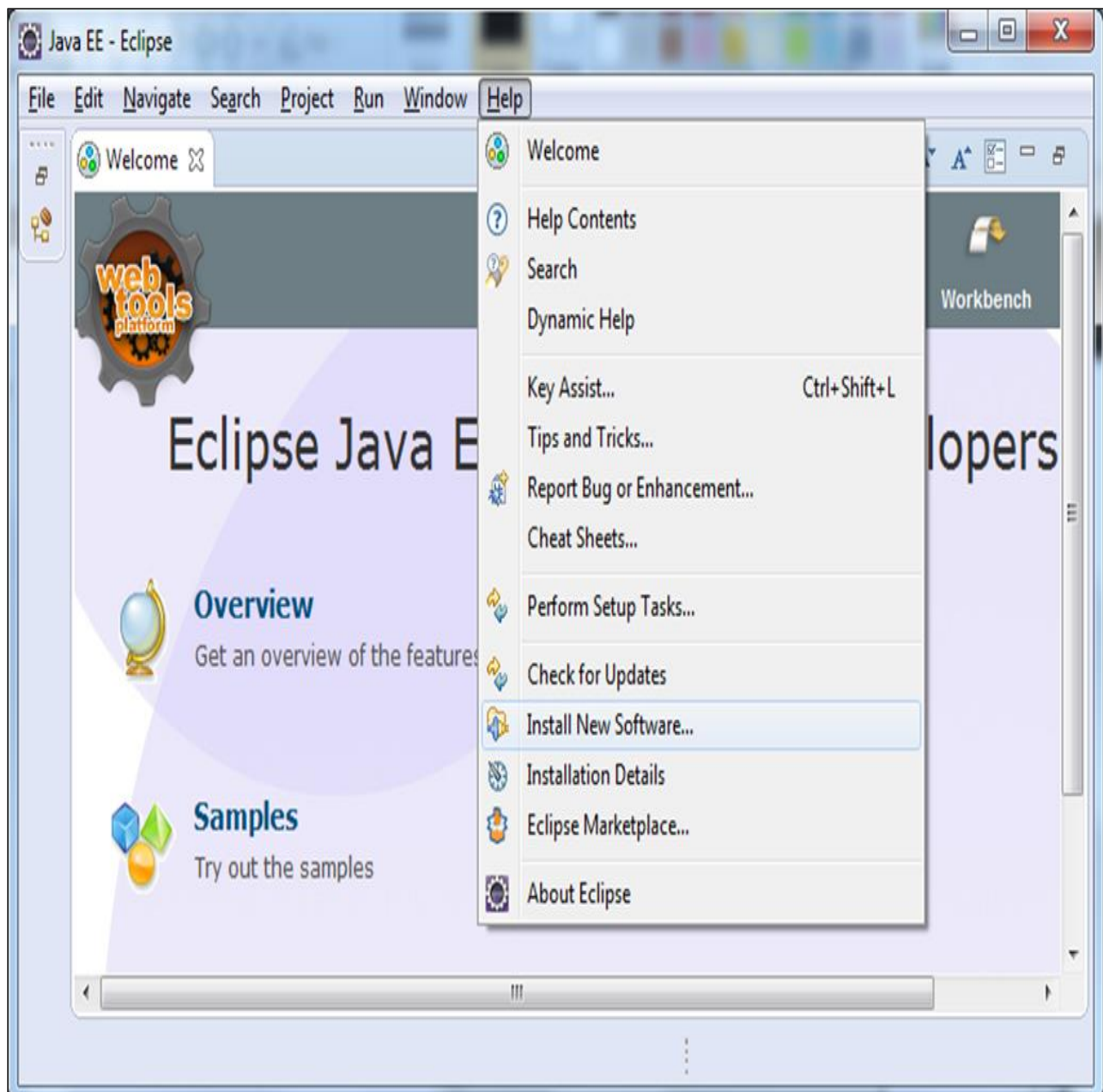
Congratulations, you now have erl successfully configured on your laptop.

Installation of Plugin-ins on Popular IDE's

Erlang as a programming language is also available in popular IDE's such as **Eclipse and IntelliJ**. Let's look at how we can get the required plugin's in these IDE's so that you have more choices in working with Erlang.

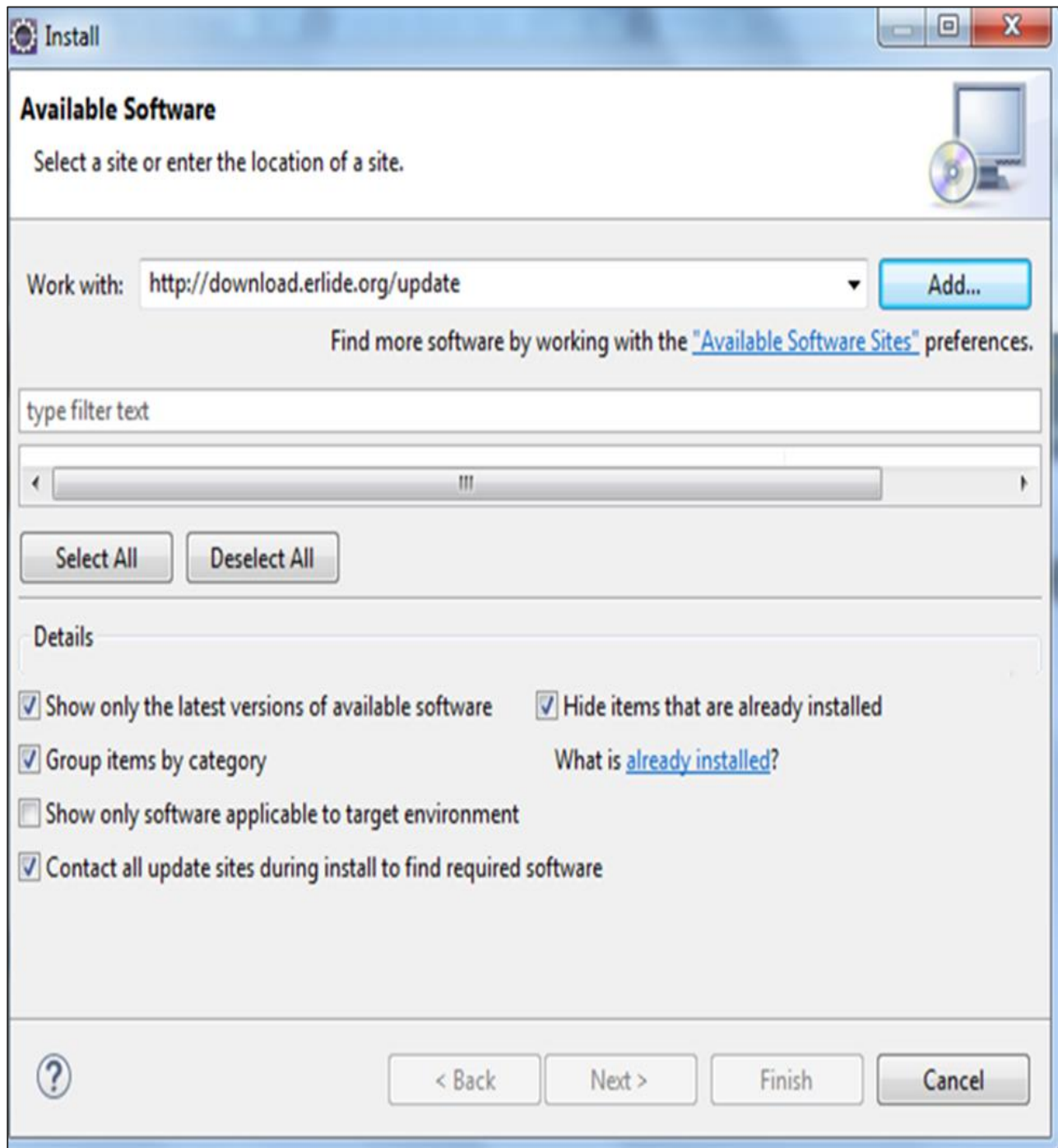
Installation in Eclipse

Step 1) Open Eclipse and click the Menu item, **Help -> Install New Software.**

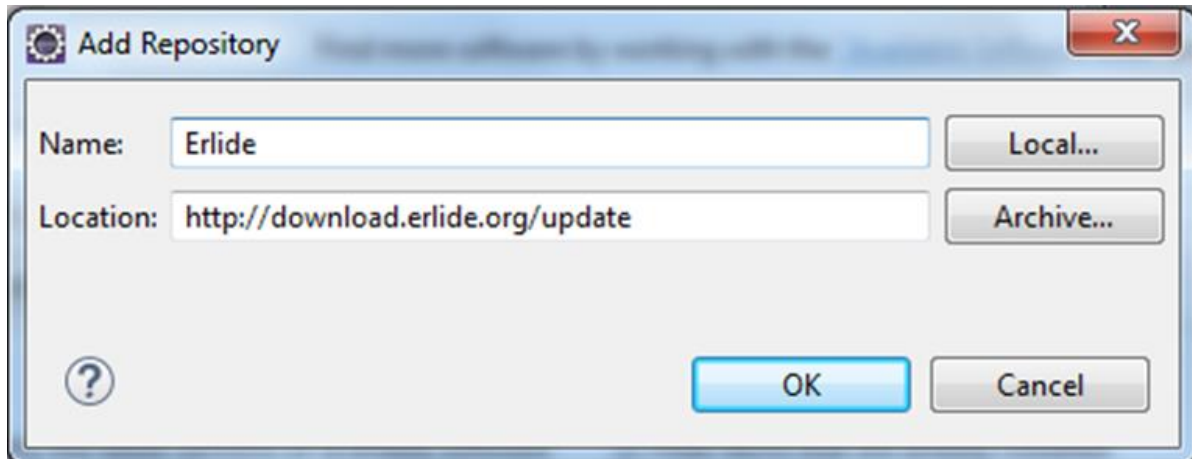


Step 2) Enter the Work with link as <http://download.erlide.org/update>

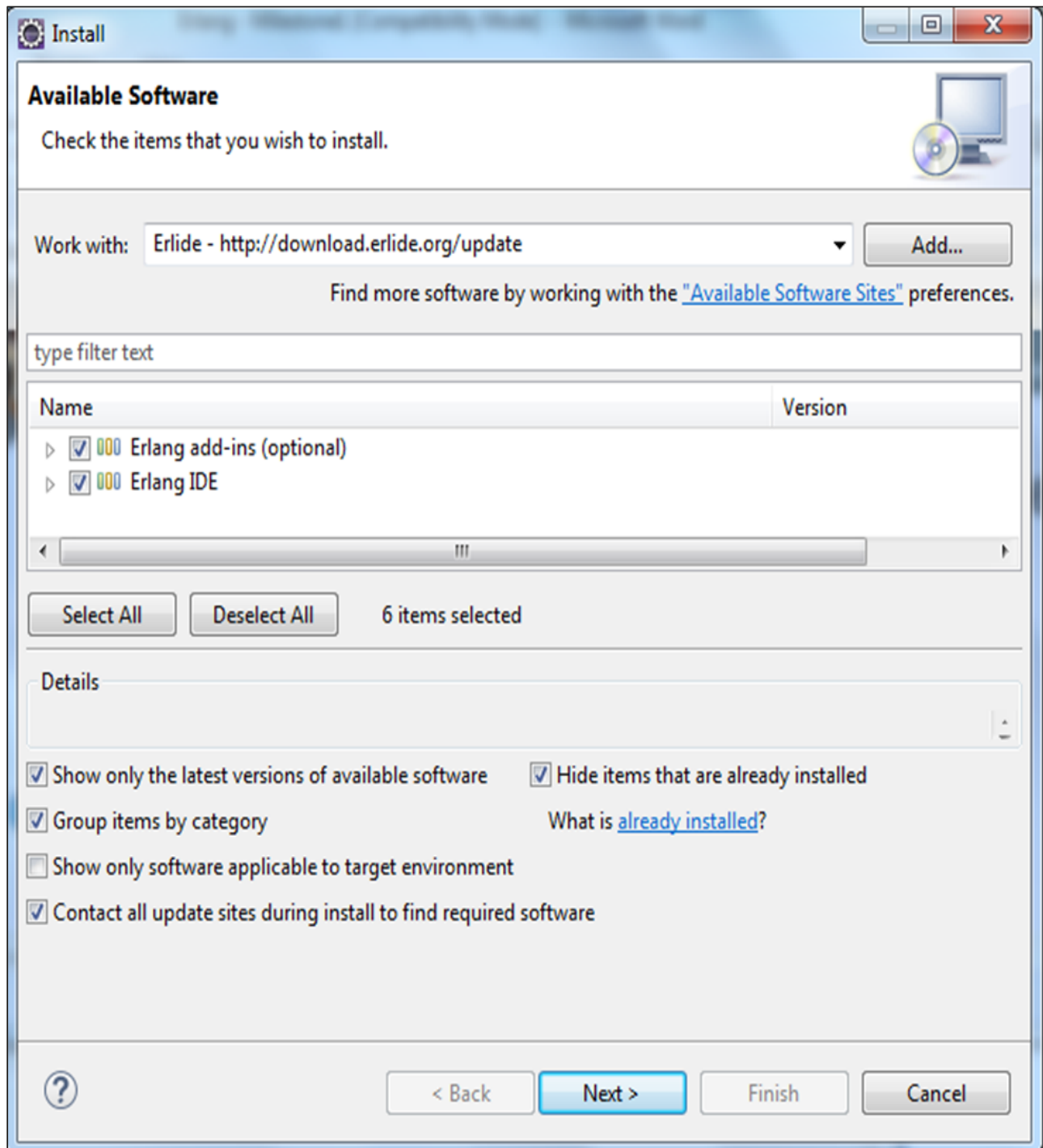
Then click Add.



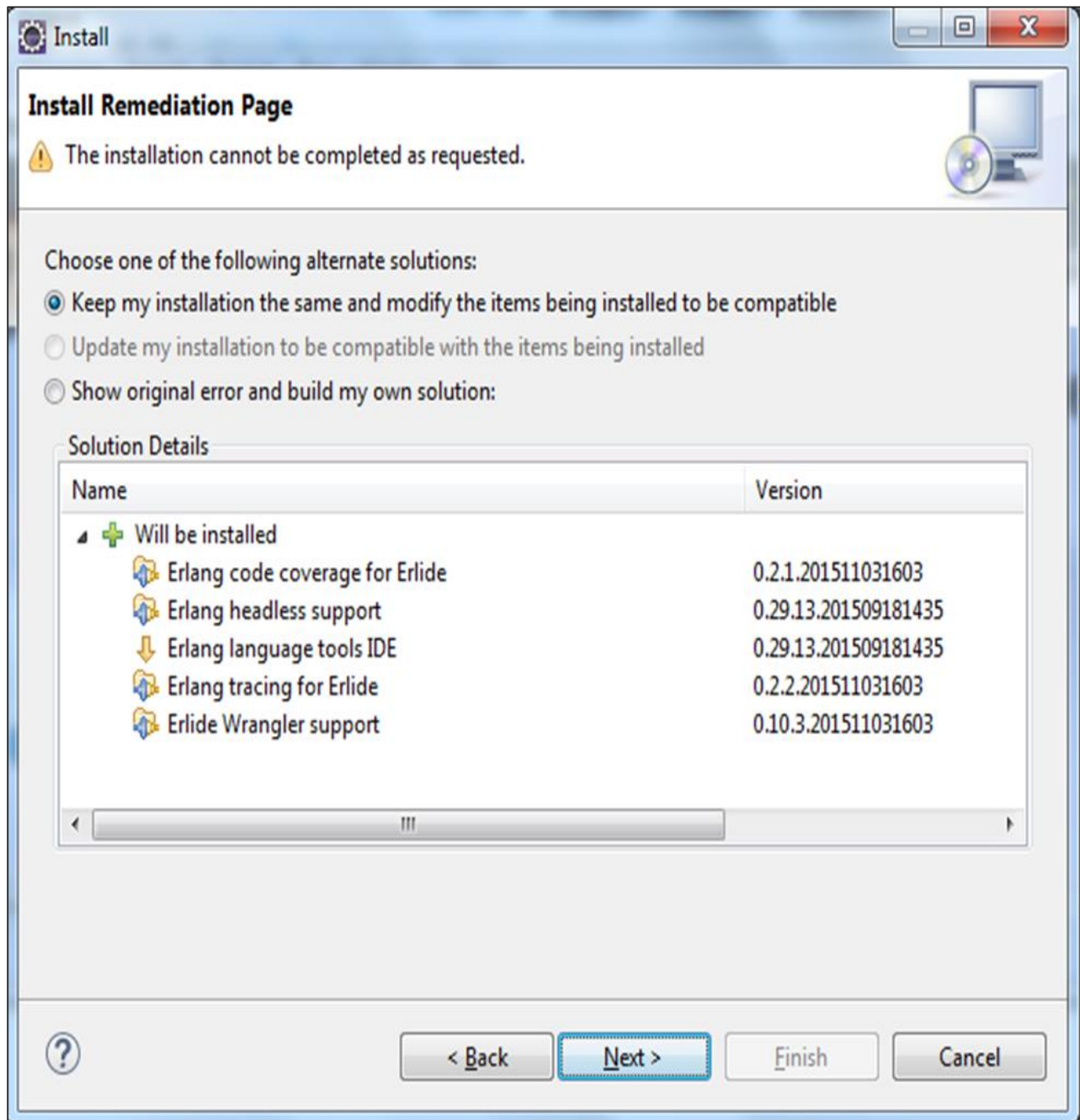
Step 3) You will then be prompted to enter a Name for the plugin, enter the name as **Erlide**. Click Ok.



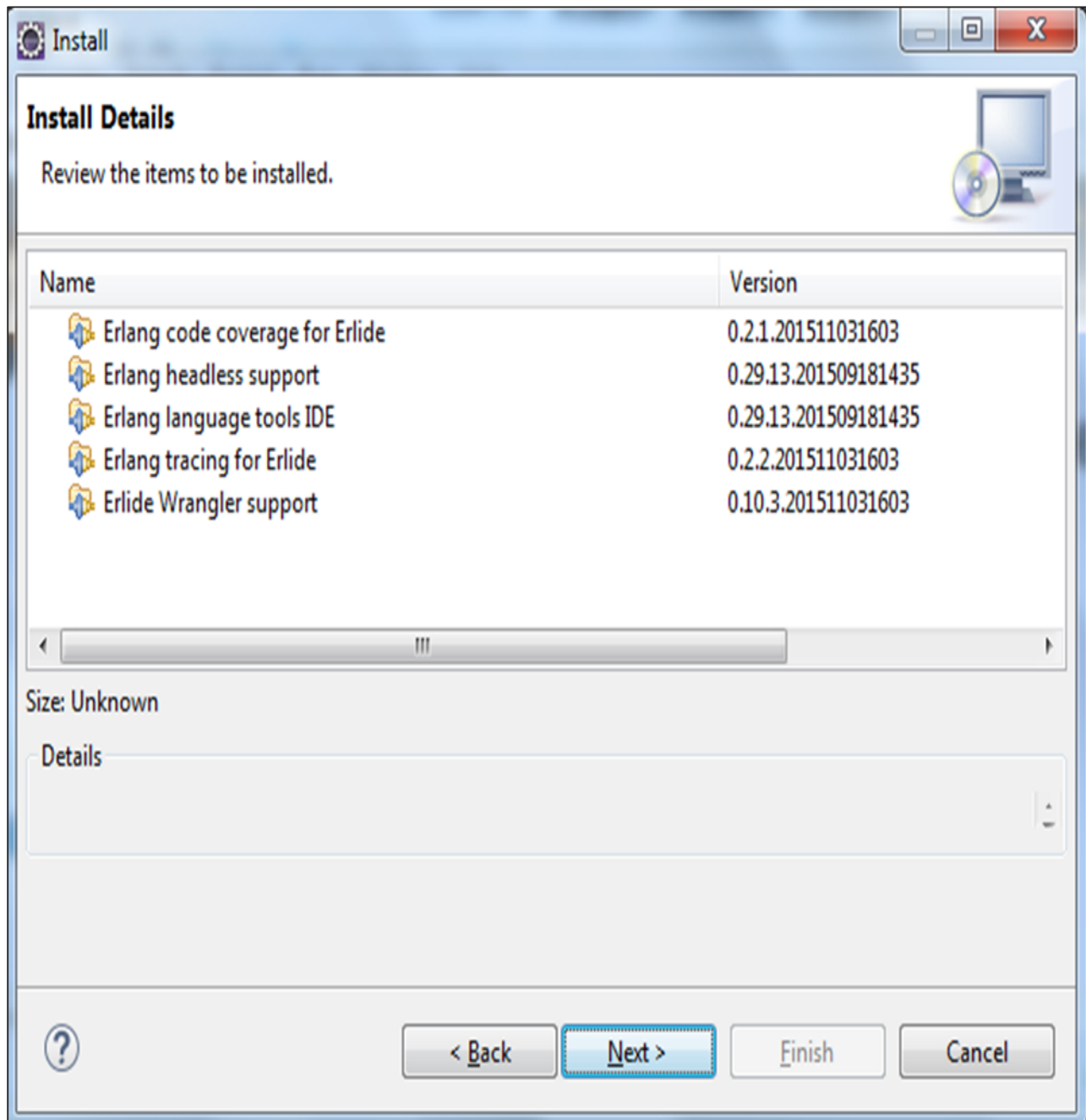
Step 4) Eclipse will then scan the link provided and get the required plugins. Check the plugins and click Next.



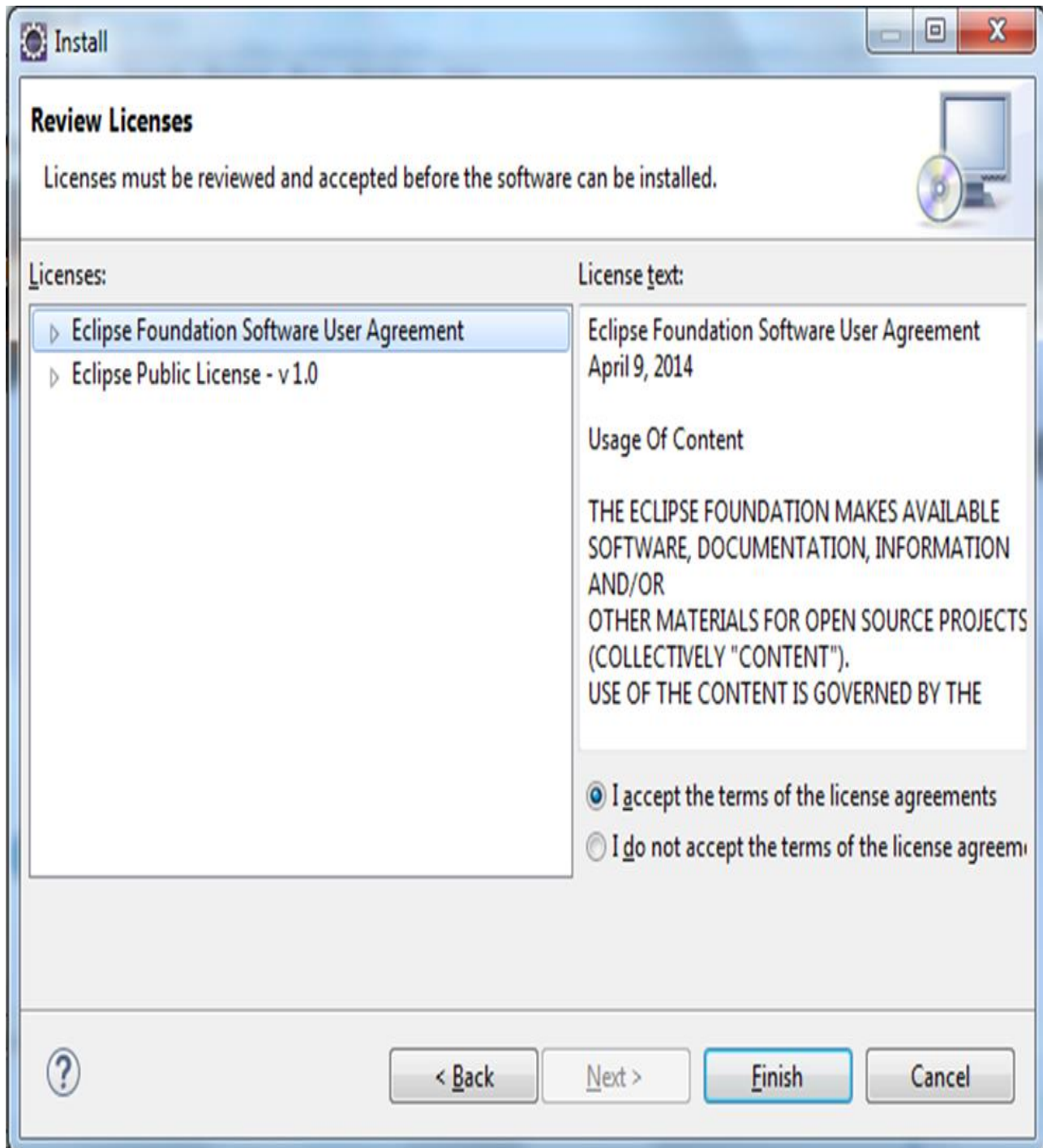
Step 5) In the next dialog box, Eclipse will show all the components which will be installed. Click Next.



Step 6) In the next dialog box, Eclipse will just ask to review the components being installed. Click Next.

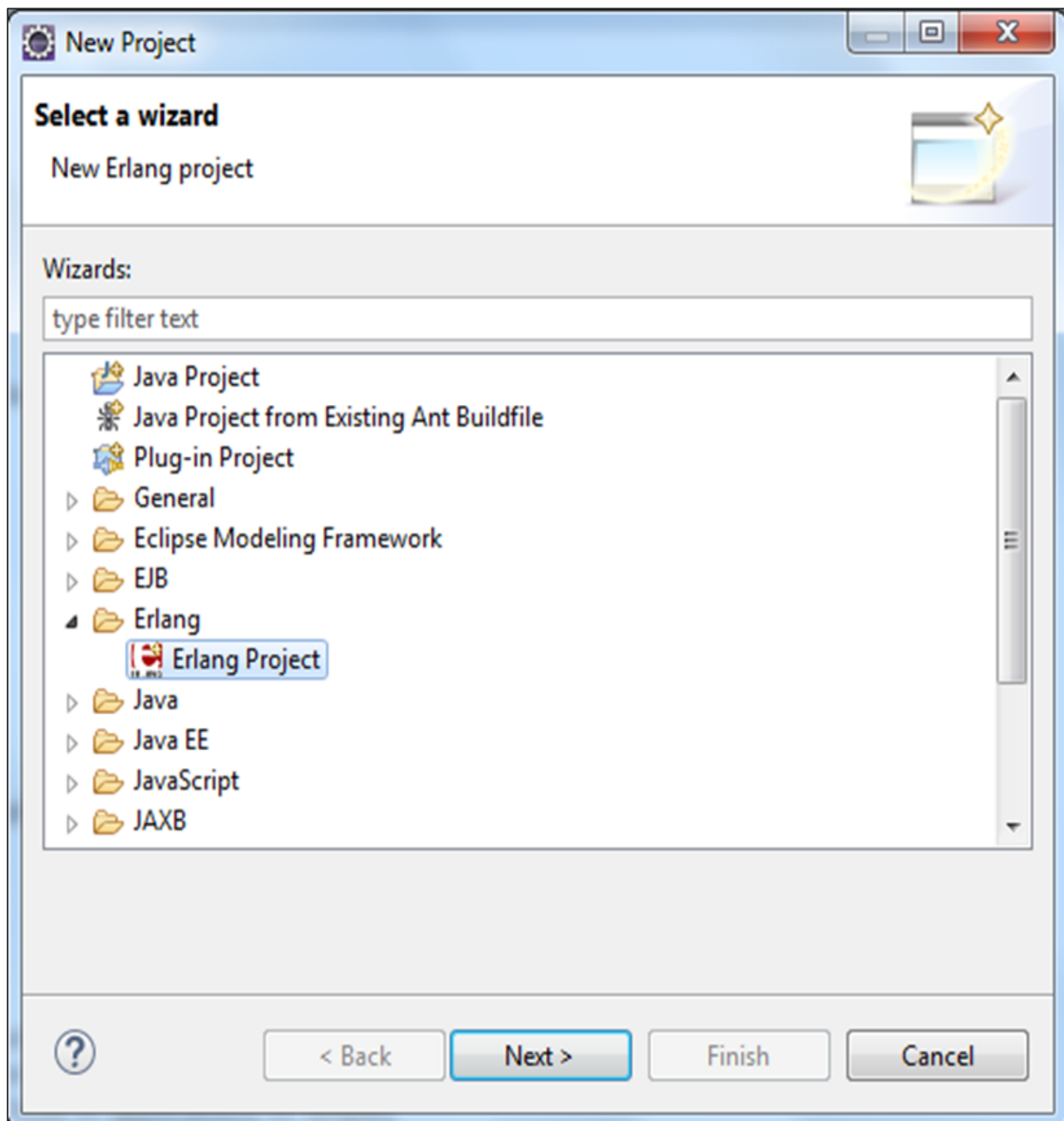


Step 7) In the next dialog box, you just need to accept the license agreement. Finally, click the Finish button.



The installation will then begin, and once completed, it will prompt you to restart Eclipse.

Once Eclipse is restarted, when you create a project, you will be able to see Erlang as an option as well.



End of ebook preview

If you liked what you saw...

Buy it from our store @ <https://store.tutorialspoint.com>