

# sbt Reference Manual

## Contents

Preface . . . . .	4
<b>sbt</b> . . . . .	<b>4</b>
sbt . . . . .	4
. . . . .	4
Mac   sbt . . . . .	5
. . . . .	5
. . . . .	5
Windows   sbt . . . . .	5
. . . . .	5
Windows . . . . .	5
Linux   sbt . . . . .	5
. . . . .	5
Ubuntu   Debian . . . . .	5
Linux   RPM . . . . .	6
Gentoo . . . . .	7
Hello, World . . . . .	7
. . . . .	7
. . . . .	8
sbt . . . . .	8
. . . . .	8
. . . . .	8
. . . . .	9

sbt	9
	9
	9
	10
	10
	10
	10
	11
Tab	11
	11
.sbt	12
	12
?	12
build.sbt	13
(Keys)	14
tasks settings	15
sbt Keys	15
build.sbt	16
	16
Scope	16
Key	17
Scope	17
Scope	18
	18
sbt scope key	18
scoped key	19
scope	19
scope	20
scope	21
	22
:	22

: += +=	22
key	23
: += +=	24
.	24
.	25
.	25
.	28
.	28
.	29
root	30
.	30
.	30
.	31
.	31
.	31
.	31
.	32
.	33
.	33
.	33
.	33
.	34
.	38
.	38
sbt	38
.	39
.scala	40
.	40
.	40
sbt:	40
.	41

:Bare .sbt	41
bare .sbt	41
( 0.13.7 )	41
:.scala	41
build.sbt Build.scala	42
	43
:	44

## Preface

### sbt

sbt , sbt , ,  
sbt  
!  
, .sbt ,scopes,  
,  
sbt !

### sbt

sbt , :

- sbt
- [hello world](#)
- 
- 
- [sbt](#) sbt
- [.sbt](#)

, Jar Shell , , [Mac,Windows, Linux](#)

sbt , (terminal encoding),HTTP ,JVM

**Mac** **sbt**

[ZIP](#) [TGZ](#)

**:** **,**

**Homebrew**

```
$ brew install sbt
```

**Macports**

```
$ port install sbt
```

**Windows** **sbt**

[ZIP](#) [TGZ](#)

**Windows**

[msi](#)

**Linux** **sbt**

[ZIP](#) [TGZ](#)

**Ubuntu** **Debian**

[DEB](#) **sbt**

Ubuntu Debian DEB , DEB , ( apt-get,aptitude)  
( Synaptic) sbt( , sudo)

```
echo "deb https://dl.bintray.com/sbt/debian /" | sudo tee -a /etc/apt/sources.list.d/sbt.list
sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv 2EE0EA64E40A89B84B2DF73499E8
sudo apt-get update
sudo apt-get install sbt
```

sbt Bintray, Bintray APT  
sbt, aptitude Synaptic, System Settings ->  
Software & Updates -> Other Software:

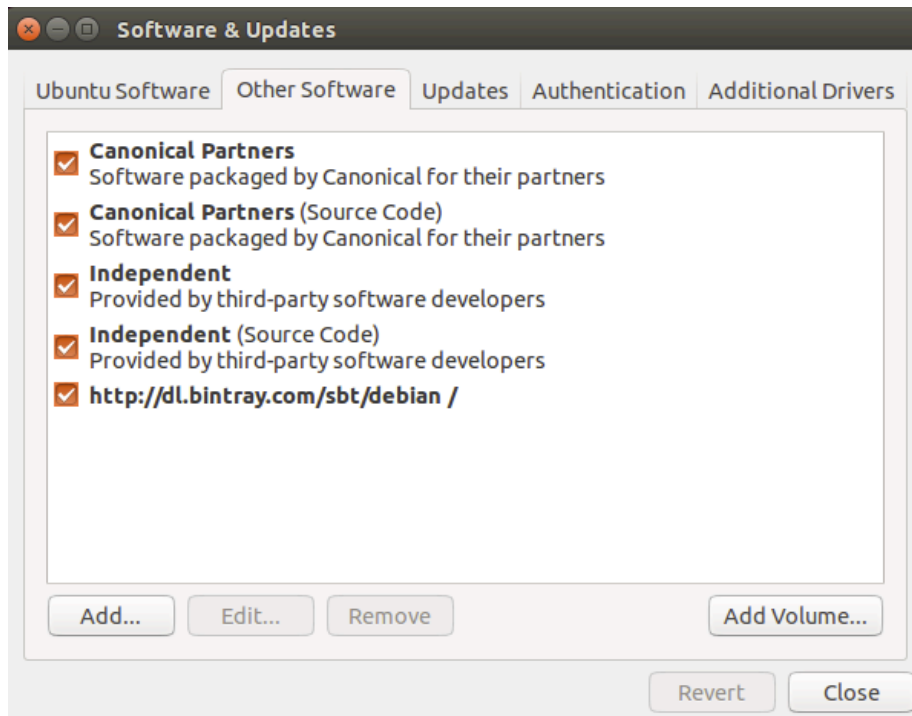


Figure 1: Ubuntu Software & Updates Screenshot

## Linux RPM

RPM sbt

Linux RPM RPM sbt( , sudo)

```
curl https://bintray.com/sbt/rpm/rpm > bintray-sbt-rpm.repo
sudo mv bintray-sbt-rpm.repo /etc/yum.repos.d/
sudo yum install sbt
```

sbt Bintray, Bintray RPM

: [sbt-launcher-package](#)

## Gentoo

sbt ebuild sbt [ebuilds](#) ebuilds sbt:

```
mkdir -p /usr/local/portage && cd /usr/local/portage
git clone git://github.com/whiter4bbit/overlays.git
echo "PORTDIR_OVERLAY=$PORTDIR_OVERLAY /usr/local/portage/overlays" >> /etc/make.conf
emerge sbt-bin
```

: ebuild

## Hello, World

[sbt](#)

sbt hello , hw.scala:

```
object Hi {
  def main(args: Array[String]) = println("Hi!")
}
```

hello sbt, run sbt Linux OS X :

```
$ mkdir hello
$ cd hello
$ echo 'object Hi { def main(args: Array[String]) = println("Hi!") }' > hw.scala
$ sbt
...
> run
...
Hi!
```

,sbt sbt :

- 
- src/main/scala src/main/java
- src/test/scala src/test/java

- `src/main/resources` `src/test/resources`
- `lib` `jar`

```
,sbt          Scala          sbt run          sbt console  Scala REPL sbt
console      classpath,      Scala
```

```
build.sbt      ,      hello , hello/build.sbt      :
```

```
lazy val root = (project in file("."))
  .settings(
    name := "hello",
    version := "1.0",
    scalaVersion := "2.12.1"
  )
```

```
.sbt          build.sbt
jar , build.sbt  name version
```

```
sbt
```

```
hello/project/build.properties      sbt      ,      0.13.15:
```

```
sbt.version=0.13.15
```

```
sbt  release  99%      project/build.properties      sbt
```

```
sbt      Hello, World
```

```
sbt  ,“ ”      ,      Hello, World      hello , hello/build.sbt
hello/hw.scala, hello
```



```

    hello/hw.scala      ,      ,      sbt Maven      (      ):

src/
  main/
    resources/
      <files to include in main jar here>
    scala/
      <main Scala sources>
    java/
      <main Java sources>
  test/
    resources
      <files to include in test jar here>
    scala/
      <test Scala sources>
    java/
      <test Java sources>

src/      ,

sbt

    build.sbt  sbt  project  project  .scala ,  .sbt

build.sbt
project/
  Build.scala

  project/  .sbt ,  .sbt  ,

(  classes,  jars,  ,caches  )  target

.gitignore (      ) :

target/

:      / (      )      / (      target/  project/target/ )

```

```
sbt      sbt      Hello, World
```

```
sbt      :
```

```
$ sbt
```

```
sbt      ( tab      )
```

```
, sbt      compile:
```

```
> compile
```

```
compile,      ,      run      exit      Ctrl+D (Unix)  Ctrl+Z (Win-  
dows)
```

```
sbt,      sbt ,      sbt :
```

```
$ sbt clean compile "testOnly TestA TestB"
```

```
,testOnly      TestA TestB      (clean, compile, testOnly)
```

```
- - , sbt      ~ ,      ,      :
```

```
> ~ compile
```

```
~
```

```

    sbt
clean
    ( target )
compile
    ( src/main/scala src/main/java )
test

console

    classpath Scala :quit, Ctrl+D (Unix), Ctrl+Z (Windows)
    sbt
run < >*
    sbt main class
package
    src/main/resources src/main/scala src/main/java class jar
help < >

,

reload
    (build.sbt, project/.scala, project/.sbt )

```

## Tab

```

    tab sbt , tab ,

, sbt :

!

!!

!:
```

```

!n
    n
!n
    !:      n
!-n
    n
!string
    string
!string
    string

.sbt

sbt  ,  “ ” build.sbt      sbt

```

```

1. .sbt
2. bare .sbt
3. .scala

    .sbt  ,      ,      [bare .sbt  ][Bare-Def] .scala
(      )
,      .scala  ,      project/  ,

?

sbt      ,  Project
build.sbt      Project  ,  :

lazy val root = (project in file("."))

```

```

        (immutable map)(
    ,   name key,
        sbt map
    ,   Setting[T],T (value) Setting (map) ,
        value ( , map — map )
        Setting[String], :

lazy val root = (project in file("."))
  .settings(
    name := "hello"
  )

Setting[String] ( )name "hello" map map sbt map
  map,sbt , key , value key, key , sbt
Settings , map
: Project, Setting[T],Setting[T] sbt map ,T
value

build.sbt

build.sbt Project, settings scala
:

lazy val commonSettings = Seq(
  organization := "com.example",
  version := "0.1.0",
  scalaVersion := "2.12.1"
)

lazy val root = (project in file("."))
  .settings(
    commonSettings,
    name := "hello"
  )

Setting Scala settings , , Scala
  val,lazy val,def build.sbt object class project/
Scala
,name,version scalaVersion (keys) (key) SettingKey[T],TaskKey[T]
InputKey[T],T value key
(Keys) Setting[T] := Java :

```

```

lazy val root = (project in file("."))
  .settings(
    name := ("hello")
  )

,Scala name := "hello" ( Scala , )

(key)name := Setting, Setting[String] String name
SettingKey[String] , Setting[String] sbt map name
, "hello"

value, :

lazy val root = (project in file("."))
  .settings(
    name := 42 //
  )

(Keys)

(Types) key:

• SettingKey[T]: key value( , )
• TaskKey[T]: key task value, ,
• InputKey[T]: key task Input Tasks

Keys keys Keys build.sbt import sbt.Keys._, name
sbt.Keys.name

Keys :settingKey,taskKey inputKey keys key value
key val , task hello key,

lazy val hello = taskKey[Unit](" task ")

.sbt (settings), vals defs (settings)
vals defs (settings)

: , lazy val val

```

```

Task vs Setting keys TaskKey[T] task Tasks compile
package Unit(Unit Scala void), task , package
TaskKey[File] task, jar
task, sbt compile,sbt task
sbt map (setting) , name; task , compile-
key task (setting) , "taskiness" ( ) key (prop-
erty), (value)

```

### tasks settings

```

:= setting task setting, (value) task, task

, hello task:

lazy val hello = taskKey[Unit]("An example task")

lazy val root = (project in file("."))
.settings(
  hello := { println("Hello!") }
)

settings ,

lazy val root = (project in file("."))
.settings(
  name := "hello"
)

```

```

Tasks Settings , task key Setting setting key
Setting taskKey := 42 Setting[Task[T]] settingKey := 42
Setting[T] ;task key T (value)
T Task[T] : setting task, setting ,

```

### sbt Keys

```

sbt , task name task compile compile task compile
task key

setting key name task key name,setting key (value) task
key name task (value); show <task name> <task name>
task key name camelCase, name Scala

key , sbt inspect <keyname> inspect , setting
value setting

```

## build.sbt

```
import build.sbt ;

:

import sbt._
import Process._
import Keys._

( , .scala , Build Plugin .scala )

jar lib/( ), build.sbt , :

val derby = "org.apache.derby" % "derby" % "10.4.1.3"

lazy val commonSettings = Seq(
  organization := "com.example",
  version := "0.1.0",
  scalaVersion := "2.12.1"
)

lazy val root = (project in file("."))
  .settings(
    commonSettings,
    name := "hello",
    libraryDependencies += derby
  )

10.4.1.3 Apache Derby

key libraryDependencies := , % += key ,
% Ivy ID ,
, ,
```

## Scope

```
scope .sbt
```



## Key

```

    name key sbt map ,
, key , "scope"
:

• , key
• ,key compile main test
• Key packageOptions( jar ) , class packageBin,
packageSrc

key name , scope
, scoped key

,sbt map settings , map key scope key set-
ting( build.sbt ) scope key
scope , , build.sbt scope

```

## Scope

```

Scope , scope( , key )
scope :

```

- Projects
- Configurations
- Tasks

```

Project Scope , settings ,keys
Project , setting setting , setting

```

```

Configuration Scope configuration , classpath, Configuration
Ivy MavenScopes
sbt configurations:

```

- Compile (src/main/scala)
- Test (src/test/scala)
- Runtime task run classpath

```

, key configuration, configuration task
key:compile,package run; key key( sourceDirectories,scalacOptions
fullClasspath) configuration

```

```

Task    Scope Settings    task    ,task packageSrc    setting
packageOptions
    , task key( packageSrc)    key( packageOptions) scope
    task(packageSrc,packageBin,packageDoc)    key, artifactName
packageOptions    key    task

```

## Scope

```

scope    ( task    task ),    Global
Global    : setting    task    Global, setting    task

```

```

scope    key    , key
scope,sbt    scope    , key    scope    ,sbt    scope( Global
scope    scope)
    scope    ,    scope
inspect    key    “ ”

```

## sbt scope key

```

,sbt    ( )scope    keys:

```

```

{<build-uri><project-id>/config:intask::key

```

- {<build-uri><project-id> project project scope,  
 <project-id>
- config configuration
- intask task
- key scope key

```

“*”    ,    Global scope

```

```

scoped key,    :

```

- project, project
- configuration task, key configuration

```

,    Configuration

```

## scoped key

- `fullClasspath` key, scope: project, key configuration task scope
- `test:fullClasspath` configuration, `fullClasspath` test configuration scope, scope
- `*:fullClasspath` configuration Global, configuration
- `doc::fullClasspath` key `fullClasspath` doc task, project configuration
- `{file:/home/hp/checkout/hello/}default-aea33a/test:fullClasspath` project, `{file:/home/hp/checkout/hello/}default-aea33a`, `{file:/home/hp/checkout/hello/}` project, project id `default-aea33a` configuration test, task
- `{file:/home/hp/checkout/hello/}/test:fullClasspath` `{file:/home/hp/checkout/hello/}` project
- `{.}/test:fullClasspath` `{.}` project `{.}` Scala `ThisBuild`
- `{file:/home/hp/checkout/hello/}/compile:doc::fullClasspath` scope

## scope

```
sbt , inspect key scope inspect test:fullClasspath,
```

```
$ sbt
```

```
> inspect test:fullClasspath
```

```
[info] Task: scala.collection.Seq[sbt.Attributed[java.io.File]]
```

```
[info] Description:
```

```
[info] The exported classpath, consisting of build products and unmanaged and managed, internal
```

```
[info] Provided by:
```

```
[info] {file:/home/hp/checkout/hello/}default-aea33a/test:fullClasspath
```

```
[info] Dependencies:
```

```
[info] test:exportedProducts
```

```
[info] test:dependencyClasspath
```

```
[info] Reverse dependencies:
```

```
[info] test:runMain
```

```
[info] test:run
```

```
[info] test:testLoader
```

```
[info] test:console
```

```
[info] Delegates:
```

```
[info] test:fullClasspath
```

```
[info] runtime:fullClasspath
```

```
[info] compile:fullClasspath
```

```
[info] *:fullClasspath
```

```

[info] {.}/test:fullClasspath
[info] {.}/runtime:fullClasspath
[info] {.}/compile:fullClasspath
[info] {.}/*:fullClasspath
[info] */test:fullClasspath
[info] */runtime:fullClasspath
[info] */compile:fullClasspath
[info] */*:fullClasspath
[info] Related:
[info] compile:fullClasspath
[info] compile:fullClasspath(for doc)
[info] test:fullClasspath(for doc)
[info] runtime:fullClasspath

```

```

, task( .sbt setting ) task scala.collection.Seq[sbt.Attributed[java.io.File]]
“Provided by” scoped key, {file:/home/hp/checkout/hello/}default-aea33a/test:fullClasspath
test configuration {file:/home/hp/checkout/hello/}default-aea33a
project )
“Dependencies” ;
; ,sbt :

```

```

• configuration(runtime:fullClasspath compile:fullClasspath)
  scoped key ,project “ project” task Global
• project “ project” task Global ,configuration
  Global(*:fullClasspath)
• project ,project {.} ThisBuild
• project Global(*/*:fullClasspath)( , project cur-
  rent, Global ; :* “ project” project ; :/*:fullClasspath
  test:fullClasspath )
• project configuration Global(*/*:fullClasspath)( task
  Global, /*/*:fullClasspath Global)

inspect fullClasspath( inspect test:fullClasspath ) con-
figuration ,sbt compile inspect compile:fullClasspath
inspect fullClasspath
inspect /*:fullClasspath ,fullClasspath Global configuration

```

## Configuration

### scope

```

build.sbt bare key, project ,configuration task Global:

```

```

lazy val root = (project in file("."))
  .settings(
    name := "hello"
  )

sbt inspect name {file:/home/hp/checkout/hello/}default-aea33a/*:name
, ,project {file:/home/hp/checkout/hello/}default-aea33a, configu-
ration *( ),task ( )

Keys in scope in scope , name Compile configuration
, :

name in Compile := "hello"

name packageBin task ( ! ):

name in packageBin := "hello"

name scope , Compile configuration packageBin task :

name in (Compile, packageBin) := "hello"

Global :

name in Global := "hello"

(name in Global scope Global scope Global;task
configuration Global, project Global, , */*:name
{file:/home/hp/checkout/hello/}default-aea33a/*:name)

Scala, :in := , , Scala , Java :

name.in(Compile).:=("hello")

,

scope

key , scope ,compile task Compile Test configuration scope
, scope

key compile , compile in Compile compile in Test compile
project scope task, configuration scope compile task

" " , scope , scope key scope sbt
; " compile:compile?"

,name key , key name scope (scope ) .packageOptions
in (Compile, packageBin) key name packageOptions key
name, ( in key, scope: project,global config,global task)

```

```

:= , .sbt scope

:

.sbt , Setting , Setting sbt ( map) Setting
sbt map map map sbt
setting map .sbt , :=
:= Setting map , name := "hello" map , map
key name "hello"

: += +=

:= , key SettingKey[T] T , , key se-
quence,

• +=
• +=

, key sourceDirectories in Compile Seq[File] key
src/main/scala source ( ), :

sourceDirectories in Compile += new File("source")

, sbt file() :

sourceDirectories in Compile += file("source")

(file() File )
+= :

sourceDirectories in Compile += Seq(file("sources1"), file("sources2"))

Seq(a, b, c, ...) Scala
source , := :

sourceDirectories in Compile := Seq(file("sources1"), file("sources2"))

```

```

    key

    task setting value value :=,+= +=
    , project organization

// name our organization after our project (both are SettingKey[String])
organization := name.value

    , :

// name is a Key[String], baseDirectory is a Key[File]
// name the project after the directory it's inside
name := baseDirectory.value.getName

    java.io.File getName baseDirectory
    ,

name := "project " + name.value + " from " + organization.value + " version " + version.value

    name organization version , name

    name := baseDirectory.value.getName ,name baseDirectory
build.sbt , sbt , inspect name, ( ):

[info] Dependencies:
[info] *:baseDirectory

    sbt setting setting setting task, task
    , inspect compile key compileInputs, inspect compileInputs
    key compile , sbt update compile sbt
    update
    ,sbt key , key !

    :=,+= += key , ,sbt , “ ”
    , key scope
    sbt , ; ,sbt

```

```

    key task task setting task task Def.task
taskValue :=, += +=

    , classpath source generator

sourceGenerators in Compile += Def.task {
  myGenerator(baseDirectory.value, (managedClasspath in Compile).value)
}.taskValue

    task .sbt , := ,task key Setting[Task[T]]
Setting[T] Setting Task , Task Setting

    key ( Keys ):

val scalacOptions = taskKey[Seq[String]]("Options for the Scala compiler.")
val checksums = settingKey[Seq[String]]("The list of checksums to generate and to verify for

(scalacOptions checksums , key, task)

    build.sbt scalacOptions checksums, , :

// scalacOptions task checksums setting
scalacOptions := checksums.value

    , setting key task key setting key , task
    , task

// checksums setting scalacOptions task
checksums := scalacOptions.value

:= +=

    setting task key, := , , :

cleanFiles += file("coverage-report-" + name.value + ".txt")

    , , .sbt ,Scopes

    :

• lib jar
• , (repository)

```



```

        : jar lib , classpath !
        jar lib , ScalaCheck,Specs2,ScalaTest

lib classpaths( compile, test, run console ) classpath,
, dependencyClasspath in Compile dependencyClasspath in
Runtime
, build.sbt , unmanagedBase key, lib
custom_lib lib:

unmanagedBase := baseDirectory.value / "custom_lib"

baseDirectory , baseDirectory unmanagedBase,
value

unmanagedBase jar task unmanagedJars ,
task unmanagedJars task, Compile configuration , lib :

unmanagedJars in Compile := Seq.empty[sbt.Attributed[java.io.File]]

sbt Apache Ivy , Ivy Maven ,

libraryDependencies Key , libraryDependencies
Maven POM Ivy , sbt
, groupId, artifactId revision :

libraryDependencies += groupId % artifactID % revision

, Configuration val configuration:

libraryDependencies += groupId % artifactID % revision % configuration

libraryDependencies Keys :

val libraryDependencies = settingKey[Seq[ModuleID]]("Declares managed dependencies.")

```

```

%      ModuleID ,      ModuleID      libraryDependencies
, sbt( Ivy)          sbt          ,      ,Apache Derby      Maven2      :

libraryDependencies += "org.apache.derby" % "derby" % "10.4.1.3"

      build.sbt      ,      update,sbt      Derby      ~/.ivy2/cache/org.apache.derby/(      ,
compile      update,          update )
,      +=      :

libraryDependencies += Seq(
  groupId % artifactID % revision,
  groupId % otherID % otherRevision
)

,      libraryDependencies      :=

%      Scala      groupId %% artifactID % revision      groupId %
artifactID % revision(      groupId      %%),sbt      Scala
%:

libraryDependencies += "org.scala-tools" % "scala-stm_2.11.1" % "0.3"

      scalaVersion      2.11.1,      (      "org.scala-tools"      %%):

libraryDependencies += "org.scala-tools" %% "scala-stm" % "0.3"

      Scala      ,      jar

      Scala      ;      %%      2.10.1,      scalaVersion
:=      "2.10.4",      %%      2.10.1      %%      ,      Scala
,      (      )

Ivy      groupId % artifactID % revision      revision      Ivy
      "latest.integration","2.9.+"      "[1.0,)",      ,
"1.6.1"      Ivy

```

```

        , sbt      Maven2      ,      resolver      Ivy
      :

    resolvers += name at location

        at

      :

    resolvers += "Sonatype OSS Snapshots" at "https://oss.sonatype.org/content/repositories/snapshots"

    resolvers key Keys      :

    val resolvers = settingKey[Seq[Resolver]]("      ")

    at      Resolver

    sbt      Maven      :

    resolvers += "Local Maven Repository" at "file://" + Path.userHome.absolutePath + "/.m2/repository"

    ,      :

    resolvers += Resolver.mavenLocal

    resolvers      ,

    sbt resolvers      externalResolvers

    ,      ,      externalResolvers      resolvers

Per-configuration dependencies      ( src/test/scala , Test con-
figuration )

    Test configuration classpath      Compile configuration,      % "test":

    libraryDependencies += "org.apache.derby" % "derby" % "10.4.1.3" % "test"

    Test configuration:

    libraryDependencies += "org.apache.derby" % "derby" % "10.4.1.3" % Test

    ,      sbt      show compile:dependencyClasspath,      derby jar      show
    test:dependencyClasspath,      derby jar

    ,      , ScalaCheck, Specs2 ScalaTest      % "test"

```

```

    ,      .sbt

    ,      ,
    ,      jar ,
    Project lazy val , :

lazy val util = project

lazy val core = project

val      ID      ID      in      ,      :

lazy val util = project.in(file("util"))

lazy val core = project in file("core")

```

To factor out common settings across multiple projects, create a sequence named `commonSettings` and call `settings` method on each project.

```

    ,      commonSettings ,      settings

lazy val commonSettings = Seq(
  organization := "com.example",
  version := "0.1.0",
  scalaVersion := "2.12.1"
)

lazy val core = (project in file("core"))
  .settings(
    commonSettings,
    // other settings
  )

lazy val util = (project in file("util"))
  .settings(
    commonSettings,
    // other settings
  )

version, ,

```

```

        ,
        :aggregate classpath

Aggregation Aggregation aggregate task aggregated ,

lazy val root = (project in file(".")).aggregate(util, core)

lazy val util = project

lazy val core = project

        ,root util core , sbt,
        , root , task , update task:

lazy val root = (project in file("."))
    .aggregate(util, core)
    .settings(
        aggregate in update := false
    )

[...]
```

aggregate in update update task scope key ( **scopes** )

```

: task,task
```

**Classpath** dependsOn , core classpath util,

core:

```

lazy val core = project.dependsOn(util)

        core util ; core ,util
        , dependsOn(bar, baz) dependsOn
```

**configuration** classpath foo dependsOn(bar) foo compile

```

configuration bar compile configuration :dependsOn(bar %
"compile->compile")

"compile->compile" -> "depends on", "test->compile" foo test
configuration bar compile configuration
```

```

->config ->compile, dependsOn(bar % "test") foo test configu-
ration bar Compile configuration

"test->test" test test , bar/src/test/scala ,
foo/src/test/scala ,
configuration, , :dependsOn(bar % "test->test;compile->compile")

```

**root**

```

,sbt
hello-foo base = file("foo"), foo foo ,
foo/Foo.scala, foo/src/main/scala sbt foo
foo .sbt , foo/build.sbt, , hello-foo scope
hello , hello/build.sbt,hello/bar/build.sbt hello/foo/build.sbt
(version := "0.6") sbt show version ( ):

```

```

> show version
[info] hello-foo/*:version
[info] 0.7
[info] hello-bar/*:version
[info] 0.9
[info] hello/*:version
[info] 0.5

```

```

hello-foo/*:version hello/foo/build.sbt ,hello-bar/*:version
hello/bar/build.sbt ,hello/*:version hello/build.sbt scoped
keys version key scope , build.sbt build.sbt
.sbt , .scala , .scala
, , .scala
, project/*.scala foo/project/Build.scala

```

```

sbt , projects , project <projectname> task
compile, root ,
ID task, subProjectID/compile

```

```

.sbt .sbt .sbt , project/ Scala

```

```

, build.sbt

task , codeCoverage task

hello , sbt-site , hello/project/site.sbt Ivy ID
addSbtPlugin:

addSbtPlugin("com.typesafe.sbt" % "sbt-site" % "0.7.0")

sbt-assembly, hello/project/assembly.sbt :

addSbtPlugin("com.eed3si9n" % "sbt-assembly" % "0.11.2")

, :

resolvers += Resolver.sonatypeRepo("public")

,

0.13.5 sbt, ,

, build.sbt :

lazy val util = (project in file("util"))
  .enablePlugins(FooPlugin, BarPlugin)
  .settings(
    name := "hello-util"
  )

enablePlugins

disablePlugins , util IvyPlugin , build.sbt :

```

```

lazy val util = (project in file("util"))
  .enablePlugins(FooPlugin, BarPlugin)
  .disablePlugins(plugins.IvyPlugin)
  .settings(
    name := "hello-util"
  )

, sbt plugins

:

> plugins
In file:/home/jsuereth/projects/sbt/test-ivy-issues/
  sbt.plugins.IvyPlugin: enabled in scala-sbt-org
  sbt.plugins.JvmPlugin: enabled in scala-sbt-org
  sbt.plugins.CorePlugin: enabled in scala-sbt-org
  sbt.plugins.JUnitXmlReportPlugin: enabled in scala-sbt-org

, plugins sbt sbt 3 :

  1. CorePlugin: task
  2. IvyPlugin:
  3. JvmPlugin: Java/Scala

, JUnitXmlReportPlugin junit-xml

, , ,

, sbt-site , , site.sbt

site.settings

, :

// `util` site
lazy val util = (project in file("util"))

// `core` site
lazy val core = (project in file("core"))
  .settings(site.settings)

, ~/.sbt/0.13/plugins/ ~/.sbt/0.13/plugins/ classpath
sbt , ~/.sbt/0.13/plugins/ .sbt .scala project/

, ~/.sbt/0.13/plugins//build.sbt addSbtPlugin()
,

```



```

      :

    • IDE ( sbt IDE)
    • web , xsbt-web-plugin

, , ,

, sbt , .sbt

SettingKey TaskKey .sbt InputKey
Keys :

val scalaVersion = settingKey[String]("scala ")
val clean = taskKey[Unit](" , source , ")

: ( "scalaVersion" ) ( " scala " )
.sbt , T SettingKey[T] T TaskKey [T] .sbt
, , “ ”( batch )
.sbt ,scala autoImport val .sbt

, , ; := :

val sampleStringTask = taskKey[String]("A sample string task.")
val sampleIntTask = taskKey[Int]("A sample int task.")

lazy val commonSettings = Seq(
  organization := "com.example",
  version := "0.1.0-SNAPSHOT"

```

```

)

lazy val library = (project in file("library"))
  .settings(
    commonSettings,
    sampleStringTask := System.getProperty("user.home"),
    sampleIntTask := {
      val sum = 1 + 2
      println("sum: " + sum)
      sum
    }
  )

,      , value
      sbt ; Scala      ,      , HTML,      , HTML
(      HTML )
sbt      ,      API IO

      value ,      ,
sampleIntTask ,      :

sampleIntTask := {
  val sum = 1 + 2      // first
  println("sum: " + sum) // second
  sum                  // third
}

,JVM sum 3,

startServer stopServer, sampleIntTask, :

val startServer = taskKey[Unit]("start server")
val stopServer = taskKey[Unit]("stop server")
val sampleIntTask = taskKey[Int]("A sample int task.")
val sampleStringTask = taskKey[String]("A sample string task.")

lazy val commonSettings = Seq(
  organization := "com.example",
  version := "0.1.0-SNAPSHOT"
)

```

```

lazy val library = (project in file("library"))
  .settings(
    commonSettings,
    startServer := {
      println("starting...")
      Thread.sleep(500)
    },
    stopServer := {
      println("stopping...")
      Thread.sleep(500)
    },
    sampleIntTask := {
      startServer.value
      val sum = 1 + 2
      println("sum: " + sum)
      stopServer.value // THIS WON'T WORK
      sum
    },
    sampleStringTask := {
      startServer.value
      val s = sampleIntTask.value.toString
      println("s: " + s)
      s
    }
  )
)

```

```
sbt      sampleIntTask      :
```

```

> sampleIntTask
stopping...
starting...
sum: 3
[success] Total time: 1 s, completed Dec 22, 2014 5:00:00 PM

```

```

      , sampleIntTask :
Scala    , value      ,      sampleIntTask startServer stopServer      sampleIntTask ,sbt      :

• sampleIntTask      ( )
•      ,      ( )
•      ,      ( )

      , sbt      sampleStringTask

```



Figure 2: task-dependency

```
> sampleStringTask
stopping...
starting...
sum: 3
s: 3
[success] Total time: 1 s, completed Dec 22, 2014 5:30:00 PM
```

```
sampleStringTask startServer sampleIntTask , sampleIntTask startServer ,
Scala , , value , sampeStringTask :
```



Figure 3: task-dependency

```
, test , compile in Test test in Test
```

```
stopServer ? , stopServer sampleStringTask, stopServer
sampleStringTask
```

```
lazy val library = (project in file("library"))
.settings(
  commonSettings,
  startServer := {
    println("starting...")
```

```

        Thread.sleep(500)
    },
    sampleIntTask := {
        startServer.value
        val sum = 1 + 2
        println("sum: " + sum)
        sum
    },
    sampleStringTask := {
        startServer.value
        val s = sampleIntTask.value.toString
        println("s: " + s)
        s
    },
    sampleStringTask := {
        val old = sampleStringTask.value
        println("stopping...")
        Thread.sleep(500)
        old
    }
}
)

```

```

,      sampleStringTask:

```

```

> sampleStringTask
starting...
sum: 3
s: 3
stopping...
[success] Total time: 1 s, completed Dec 22, 2014 6:00:00 PM

```



Figure 4: task-dependency

Scala

Scala , project/ServerUtil.scala , :

```

sampleIntTask := {
    ServerUtil.startServer

```

```

try {
  val sum = 1 + 2
  println("sum: " + sum)
} finally {
  ServerUtil.stopServer
}
sum
}

```

```

,

```

```

,

```

```

,

```

```

;

```

```

, build.sbt,

```

```

sbt

```

```

build.sbt , sbt sbt Scala sbt ?
project , , project
  sbt

```

```

, project/project/

```

```

:

```

```

hello/ #

```

```

Hello.scala # ( src/main/scala)

```

```

build.sbt # build.sbt project/

```

```

project/ #

```

```

Build.scala # ,

```

```

        build.sbt      #      --project/project  ;

        project/      #      ;

        Build.scala # project/project/

    !      project/project/
, .scala .sbt      , build.sbt Build.scala

project .scala      project/Dependencies.scala

import sbt._

object Dependencies {
    // Versions
    lazy val akkaVersion = "2.3.8"

    // Libraries
    val akkaActor = "com.typesafe.akka" %% "akka-actor" % akkaVersion
    val akkaCluster = "com.typesafe.akka" %% "akka-cluster" % akkaVersion
    val specs2core = "org.specs2" %% "specs2-core" % "2.4.17"

    // Projects
    val backendDeps =
        Seq(akkaActor, specs2core % Test)
}

Dependencies build.sbt      val      , Dependencies._

import Dependencies._

lazy val commonSettings = Seq(
    version := "0.1.0",
    scalaVersion := "2.12.1"
)

lazy val backend = (project in file("backend"))
    .settings(
        commonSettings,
        libraryDependencies ++= backendDeps
    )

,

```

```

    .scala

    .scala ,      Scala ,
        build.sbt ,  project/*.scala      .scala      scala

        ,      project/*.scala      ,

sbt,      ,      sbt      sbt
    ,

sbt:

• Scala      , Scala      Programming in Scala,Scala
• .sbt
•      Setting      ,sbt      Setting      task
•      Setting, key      ::=,+=      +=
•      , ; , Setting      sbt
•      , key
• tasks      , key      value      task      Non-task
• Scopes
•      key      value, scope
• scope      :configuration,project,task
• scope      task      configuration
•      configuration      , Compile      Test
• project      “      ” scope
• scopes      scope
•      build.sbt ,      .scala      task
•      sbt ,
•
•      addSbtPlugin      project/plugins.sbt      (      build.sbt )

      ,      ,      sbt
!

```



```

sbt      ,      !

:Bare .sbt

      .sbt      .sbt

bare .sbt

      .sbt      .scala      , bare      .sbt
bare .sbt      Setting[_]      ,      Project

name := "hello"

version := "1.0"

scalaVersion := "2.12.1"

( 0.13.7 )

:      0.13.7
      bare build.sbt:

//      ,
name := "hello"
version := "1.0"
scalaVersion := "2.10.3"

sbt      ,

:..scala

      .scala      sbt ,.scala      , sbt 0.13      .sbt      ,
      ,      .sbt

```

```

build.sbt  Build.scala

.sbt .scala      ,
      , hello    , hello/project/Build.scala:

import sbt._
import Keys._

object HelloBuild extends Build {
  val sampleKeyA = settingKey[String]("demo key A")
  val sampleKeyB = settingKey[String]("demo key B")
  val sampleKeyC = settingKey[String]("demo key C")
  val sampleKeyD = settingKey[String]("demo key D")

  override lazy val settings = super.settings ++
    Seq(
      sampleKeyA := "A: in Build.settings in Build.scala",
      resolvers := Seq()
    )

  lazy val root = Project(id = "hello",
    base = file("."),
    settings = Seq(
      sampleKeyB := "B: in the root project settings in Build.scala"
    ))
}

, hello/build.sbt:

sampleKeyC in ThisBuild := "C: in build.sbt scoped to ThisBuild"

sampleKeyD := "D: in build.sbt"

sbt      inspect sampleKeyA,  :

[info] Setting: java.lang.String = A: in Build.settings in Build.scala
[info] Provided by:
[info] {file:/home/hp/checkout/hello/}/*:sampleKeyA

      inspect sampleKeyC,  :

[info] Setting: java.lang.String = C: in build.sbt scoped to ThisBuild
[info] Provided by:
[info] {file:/home/hp/checkout/hello/}/*:sampleKeyC

```

```

    "Provided by"      value      .sbt      sampleKeyC in ThisBuild
.scala Build.settings      sbt      ,
,inspect sampleKeyB:

```

```

[info] Setting: java.lang.String = B: in the root project settings in Build.scala
[info] Provided by:
[info] {file:/home/hp/checkout/hello/}hello/*:sampleKeyB

```

```

    sampleKeyB      : ({file:/home/hp/checkout/hello/}hello)
({file:/home/hp/checkout/hello/})
    ,inspect sampleKeyD      sampleKeyB:

```

```

[info] Setting: java.lang.String = D: in build.sbt
[info] Provided by:
[info] {file:/home/hp/checkout/hello/}hello/*:sampleKeyD

```

```

sbt .sbt      Build.settings      Project.setting      , ,.sbt
Build.scala,      sampleC      sampleD,      build.sbt      build.sbt      " "
Build.sbt

```

```

    :sampleKeyC      sampleKeyD      build.sbt      sbt      Build      .sbt
,import HelloBuild._      build.sbt

```

```

:

```

- .scala , Build.settings ,
- .scala , Project.settings ,
- .scala Build .sbt
- .sbt .scala
- .sbt ,

```

sbt , project/      reload plugins

```

```

> reload plugins
[info] Set current project to default-a0e8e4 (in build file:/home/hp/checkout/hello/project/)
> show sources
[info] ArrayBuffer(/home/hp/checkout/hello/project/Build.scala)
> reload return
[info] Loading project definition from /home/hp/checkout/hello/project
[info] Set current project to hello (in build file:/home/hp/checkout/hello/)
> show sources
[info] ArrayBuffer(/home/hp/checkout/hello/hw.scala)
>

```

```
, reload return ,

:

build.sbt      Build Project settings      .Build Project
settings , build.sbt , , sbt Build Project
“ ”

, :

• .scala Build.settings Project.settings
• ; ~/.sbt/0.13/global.sbt
• ,
• .sbt
• ( project ) (~/.sbt/0.13/plugins/)
```