

# sbt Reference Manual

## Contents

Preface . . . . .	3
<b>sbt</b> . . . . .	<b>3</b>
sbt . . . . .	3
. . . . .	3
macOS sbt . . . . .	4
. . . . .	4
. . . . .	4
Windows sbt . . . . .	4
. . . . .	4
Windows . . . . .	4
. . . . .	4
Linux sbt . . . . .	4
Installing from SDKMAN . . . . .	4
. . . . .	5
Ubuntu Debian . . . . .	5
Linux RPM . . . . .	5
Gentoo . . . . .	5
Hello, World . . . . .	7
. . . . .	7
. . . . .	7
sbt . . . . .	8
. . . . .	8
. . . . .	8
. . . . .	8
sbt . . . . .	9
. . . . .	9
. . . . .	9
. . . . .	9
. . . . .	9
. . . . .	9
. . . . .	10
. . . . .	10
Tab . . . . .	10

	10
.sbt	11
	11
?	11
build.sbt	12
(Keys)	13
tasks settings	14
sbt Keys	14
build.sbt	14
bare .sbt	15
	15
Scope	15
Key	15
Scope	16
Scope	17
	17
sbt scope key	17
scoped key	17
scope	18
scope	19
scope	20
	20
:	20
: += +=	21
key	21
: += +=	23
	23
	23
	23
	26
	26
	27
root	28
	28
	28
Appendix: Subproject build definition files	28
	29
	29
	29
	29
	30
	31
	31
	31
	31
	32

.....	35
.....	36
sbt .....	36
.....	36
.scala .....	37
.....	37
.....	37
sbt: .....	37
.....	38

## Preface

## sbt

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

## sbt

sbt , :

- sbt
- hello world
- 
- 
- sbt sbt
- .sbt

, Jar Shell , , macOS,Windows, Linux

sbt , (terminal encoding),HTTP ,JVM

**macOS**   **sbt**

ZIP   TGZ

      :          ,

**Homebrew**

```
$ brew install sbt
```

**SDKMAN!**

```
$ sdk install sbt
```

**Windows**   **sbt**

ZIP   TGZ

**Windows**

msi

      :          ,

**Scoop**

```
$ scoop install sbt
```

**Linux**   **sbt**

**Installing from SDKMAN**

To install both JDK and sbt, consider using SDKMAN.

```
$ sdk list java
$ sdk install java 11.0.4.hs-adpt
$ sdk install sbt
```

This has two advantages. 1. It will install the official packaging by AdoptOpenJDK, as opposed to the “mystery meat OpenJDK builds”. 2. It will install **tgz** packaging of sbt that contains all JAR files. (DEB and RPM packages do not to save bandwidth)

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
curl -sL "https://keyserver.ubuntu.com/pks/lookup?op=get&search=0x2EE0EA64E40A89B84B2DF73499"
sudo apt-get update
sudo apt-get install sbt
```

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

## 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:  
emerge dev-java/sbt



Figure 1: Ubuntu Software & Updates Screenshot

## 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 := "2.12.10"
  )

.sbt      build.sbt

    jar , build.sbt      name version
```

```

sbt

    hello/project/build.properties      sbt      ,      1.3.3:
sbt.version=1.3.3
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>
    scala-2.12/
      <main Scala 2.12 specific sources>
    java/
      <main Java sources>
  test/
    resources
      <files to include in test jar here>
    scala/
      <test Scala sources>
    scala-2.12/
      <test Scala 2.12 specific 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

!string

string

!?string

string

**.sbt**

sbt , “ ” build.sbt sbt

1. .sbt

2. bare .sbt

.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
:
ThisBuild / organization := "com.example"
ThisBuild / scalaVersion := "2.12.10"
ThisBuild / version      := "0.1.0-SNAPSHOT"

lazy val root = (project in file("."))
  .settings(
    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 Keys._

( , .scala , Build Plugin .scala )

```

**bare .sbt**

```
bare .sbt      Setting[_]      ,      Project
name := "hello"
version := "1.0"
scalaVersion := "2.12.10"
```

```
      jar      lib/(      ),      build.sbt      ,      :
val derby = "org.apache.derby" % "derby" % "10.4.1.3"
```

```
ThisBuild / organization := "com.example"
ThisBuild / scalaVersion := "2.12.10"
ThisBuild / version      := "0.1.0-SNAPSHOT"
```

```
lazy val root = (project in file("."))
  .settings(
    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 setting(
  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(*:test:fullClasspath)( , project cur-
      rent, Global ; :* “ project” project ; *:test: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.valu
    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 :=,+=    +=
,    classpath    source generator
sourceGenerators in Compile += Def.task {
  myGenerator(baseDirectory.value, (managedClasspath in Compile).value)
}

    task

.sbt    ,    :=    ,task key    Setting[Task[T]]    Setting[T] Set-
ting    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 (Test) 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" % "0.3"
    scalaVersion 2.11.1, ( "org.scala-tools" %):
libraryDependencies += "org.scala-tools" %% "scala-stm" % "0.3"
    Scala , jar

```

## 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]]("resolvers")
    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 configuration )
    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 := "2.12.10"
)

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 config-
uration :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

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

.sbt .sbt .sbt , project/ Scala

```

## Appendix: Subproject build definition files

```

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

```

Style choices:

- Each subproject's settings can go into \*.sbt files in the base directory of that project, while the root build.sbt declares only minimum project declarations in the form of lazy val foo = (project in file("foo")) without the settings.

- We recommend putting all project declarations and settings in the root `build.sbt` file in order to keep all build definition under a single file. However, it up to you.

```

,      project/*.scala  foo/project/Build.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)

, $HOME/.sbt/1.0/plugins/ $HOME/.sbt/1.0/plugins/
classpath sbt , $HOME/.sbt/1.0/plugins/ .sbt .scala
project/
, $HOME/.sbt/1.0/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.")

ThisBuild / organization := "com.example"
ThisBuild / version      := "0.1.0-SNAPSHOT"
ThisBuild / scalaVersion := "2.12.10"

lazy val library = (project in file("library"))
.settings(
  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.")

ThisBuild / organization := "com.example"
ThisBuild / version      := "0.1.0-SNAPSHOT"
ThisBuild / scalaVersion := "2.12.10"

lazy val library = (project in file("library"))
    .settings(
        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  :

```



Figure 2: task-dependency

```

Scala  ,  value      ,      sampleIntTask startServer stopServer      sampleIntTask ,sbt  :
•  sampleIntTask      ( )
•      ,      ( )
•      ,      ( )

,      sbt      sampleStringTask
> 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(
  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._

ThisBuild / organization := "com.example"
ThisBuild / version      := "0.1.0-SNAPSHOT"
ThisBuild / scalaVersion := "2.12.10"

lazy val backend = (project in file("backend"))
  .settings(
    name := "backend",
    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` `,` `!`