

sbt Reference Manual

Contents

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

	11
.sbt	11
	11
?	12
build.sbt	12
(Keys)	13
tasks settings	14
sbt Keys	14
build.sbt	15
bare .sbt	15
	15
	16
	16
	16
.value	18
build.sbt DSL ?	21
	22
Scope	22
Key	22
Scope	22
Scope	23
	23
sbt scope key	24
scoped key	24
scope	24
scope	26
scope	27
	27
: += +=	27
: += +=	28
Scope (.value)	28
scope	29
1: scope	29
2: task	29
3:configuration	30
4:subproject	30
inspect	32
.value	32
	35
	35
	35
	38
	38
	39
root	40
	40

.....	40
Appendix: Subproject build definition files	40
.....	41
.....	41
.....	41
.....	41
.....	42
.....	43
.....	43
.....	43
.....	44
.....	47
.....	48
sbt	48
.....	48
.scala	49
.....	49
.....	49
sbt:	49
.....	50

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



Figure 1: Ubuntu Software & Updates Screenshot

Gentoo

```
sbt          ebuild          sbt ebuilds          ebuilds  sbt:
emerge dev-java/sbt
```

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"
  )
  .sbtopts(build.sbt
    jar, build.sbt, name, version

  sbt

    hello/project/build.properties sbt, 1.3.4:
sbt.version=1.3.4
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
    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      ,

,      ,

```

This page was translated mostly with Google Translate. Please send a pull request to improve it.

```
.sbt , build.sbt
settings , happens-before (DAG) (task graph)

,
• setting/task : .settings(...)
• key: setting SettingKey[A], TaskKey[A] InputKey[A]
• setting: SettingKey[A] setting
• task: TaskKey[A] task

build.sbt DSL , .value method setting value method , :=
( += += )
, update clean scalacOption key ( Keys)
: scalaOptions scalaOptions, :
val scalacOptions = taskKey[Seq[String]]("Options for the Scala compiler.")
val update = taskKey[UpdateReport]("Resolves and optionally retrieves dependencies, producing the update report")
val clean = taskKey[Unit]("Deletes files produced by the build, such as generated sources, class files, etc.")

scalacOptions:
scalacOptions := {
  val ur = update.value // update task happens-before scalacOptions
  val x = clean.value // clean task happens-before scalacOptions
  // ---- scalacOptions begins here ----
  ur.allConfigurations.take(3)
}

update.value clean.value , ur.allConfigurations.take(3)

.value Scala method build.sbt DSL scalacOptions
{, , update clean
:

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

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



```

.settings(
  name := "Hello",
  scalacOptions := {
    val out = streams.value // streams task happens-before scalacOptions
    val log = out.log
    log.info("123")
    val ur = update.value // update task happens-before scalacOptions
    log.info("456")
    ur.allConfigurations.take(3)
  }
)
, sbt shell    scalacOptions:

> scalacOptions
[info] Updating {file:/xxx/}root...
[info] Resolving jline#jline;2.14.1 ...
[info] Done updating.
[info] 123
[info] 456
[success] Total time: 0 s, completed Jan 2, 2017 10:38:24 PM

val ur = ...    log.info("123") log.info("456"),update
:

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

lazy val root = (project in file("."))
.settings(
  name := "Hello",
  scalacOptions := {
    val ur = update.value // update task happens-before scalacOptions
    if (false) {
      val x = clean.value // clean task happens-before scalacOptions
    }
    ur.allConfigurations.take(3)
  }
)
, sbt shell    run,    scalacOptions

> run
[info] Updating {file:/xxx/}root...
[info] Resolving jline#jline;2.14.1 ...
[info] Done updating.
[info] Compiling 1 Scala source to /Users/eugene/work/quick-test/task-graph/target/scala-2.12/
[info] Running example.Hello

```

```

hello
[success] Total time: 0 s, completed Jan 2, 2017 10:45:19 PM
> scalacOptions
[info] Updating {file:/xxx/}root...
[info] Resolving jline#jline;2.14.1 ...
[info] Done updating.
[success] Total time: 0 s, completed Jan 2, 2017 10:45:23 PM

, target/scala-2.12/classes/, , if (false) , clean
, update clean update clean,clean update

.value

,.value method, setting build.sbt , .value
, , .value , task/setting ,
:
scalacOptions := {
  val x = clean.value
  update.value.allConfigurations.take(3)
}
,.value ,

,scalacOptions update clean build.sbt sbt shell,
inspect scalacOptions, ( ):

> inspect scalacOptions
[info] Task: scala.collection.Seq[java.lang.String]
[info] Description:
[info] Options for the Scala compiler.
....
[info] Dependencies:
[info] *:clean
[info] *:update
....

sbt

, inspect tree compile key incCompileSetup, key,
dependencyClasspath ,

> inspect tree compile
[info] compile:compile = Task[sbt.inc.Analysis]
[info] +-compile:incCompileSetup = Task[sbt.Compiler$IncSetup]
[info] | +-*/*:skip = Task[Boolean]

```

```

[info] | +-compile:compileAnalysisFilename = Task[java.lang.String]
[info] | | +-*/:crossPaths = true
[info] | | +-{.}/*:scalaBinaryVersion = 2.12
[info] | |
[info] | +-*/:compilerCache = Task[xsbti.compile.GlobalsCache]
[info] | +-*/:definesClass = Task[scala.Function1[java.io.File, scala.Function1[java.lang.S
[info] | +-compile:dependencyClasspath = Task[scala.collection.Seq[sbt.Attributed[java.io.F
[info] | | +-compile:dependencyClasspath::streams = Task[sbt.std.TaskStreams[sbt.Init$Scoped
[info] | | | +-*/:streamsManager = Task[sbt.std.Streams[sbt.Init$ScopedKey[_ <: Any]]]
[info] | | |
[info] | | +-compile:externalDependencyClasspath = Task[scala.collection.Seq[sbt.Attributed
[info] | | | +-compile:externalDependencyClasspath::streams = Task[sbt.std.TaskStreams[sbt.I
[info] | | | | +-*/:streamsManager = Task[sbt.std.Streams[sbt.Init$ScopedKey[_ <: Any]]]
[info] | | | |
[info] | | | +-compile:managedClasspath = Task[scala.collection.Seq[sbt.Attributed[java.io.F
[info] | | | | +-compile:classpathConfiguration = Task[sbt.Configuration]
[info] | | | | +-compile:configuration = compile
[info] | | | | +-*/:internalConfigurationMap = <function1>
[info] | | | | +-*:update = Task[sbt.UpdateReport]
[info] | | | |
....

```

```

, compile sbt , update , compile sbt update
,sbt , key , key

```

setting

```

scalacOptions task key , 2.12 "-Xfatal-warnings"
"-deprecation"

lazy val root = (project in file("."))
.settings(
  name := "Hello",
  organization := "com.example",
  scalaVersion := "2.12.10",
  version := "0.1.0-SNAPSHOT",
  scalacOptions := List("-encoding", "utf8", "-Xfatal-warnings", "-deprecation", "-unchecked"),
  scalacOptions := {
    val old = scalacOptions.value
    scalaBinaryVersion.value match {
      case "2.12" => old
      case _ => old filterNot (Set("-Xfatal-warnings", "-deprecation").apply)
    }
  }
)

sbt shell :

```

```

> show scalacOptions
[info] * -encoding
[info] * utf8
[info] * -Xfatal-warnings
[info] * -deprecation
[info] * -unchecked
[success] Total time: 0 s, completed Jan 2, 2017 11:44:44 PM
> ++2.11.8!
[info] Forcing Scala version to 2.11.8 on all projects.
[info] Reapplying settings...
[info] Set current project to Hello (in build file:/xxx/)
> show scalacOptions
[info] * -encoding
[info] * utf8
[info] * -unchecked
[success] Total time: 0 s, completed Jan 2, 2017 11:44:51 PM

    ,    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
    build.sbt    checksums scalacOptions,
// The scalacOptions task may be defined in terms of the checksums setting
scalacOptions := checksums.value

    ,setting key    task key    setting key    subproject
// Bad example: The checksums setting cannot be defined in terms of the scalacOptions task!
checksums := scalacOptions.value

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

Here's a realistic example. This rewires scalaSource in Compile key to a
different directory only when scalaBinaryVersion is "2.11".

scalaSource in Compile := {
  val old = (scalaSource in Compile).value
  scalaBinaryVersion.value match {
    case "2.11" => baseDirectory.value / "src-2.11" / "main" / "scala"
    case _      => old

```

```

    }
}

```

build.sbt DSL ?

```

build.sbt DSL      ,      DAG setting  setting,
    Make (1976),Ant (2000), Rake (2003)

```

Make

```

    Makefile      :

target: dependencies
[tab] system command1
[tab] system command2

    (    all),

    1. Make      ,
    2. Make

    Makefile:

CC=g++
CFLAGS=-Wall

all: hello

hello: main.o hello.o
    $(CC) main.o hello.o -o hello

%.o: %.cpp
    $(CC) $(CFLAGS) -c $< -o $@

make,      all      hello      ,      , Make      hello
,Make      hello      hello      : main.o      hello.o      ,
    , main.o hello.o      hello

    make,      ,      Make      flow-based      Make
    ,      DSL      ,

```

Rake

```

    Make ( Ant,Rake sbt),      Rakefile      :

task name: [:prereq1, :prereq2] do |t|
    # actions (may reference prereq as t.name etc)
end

Rake

```

flow-based

```
flow-based , , , Compile / compile
,
, sbt ( , )
```

```
    DAG, happens-before build.sbt DSL, flow-based
, Makefile Rakefile
flow-based ,
```

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)

: += +=

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

• +=
• +=

, key sourceDirectories in Compile Seq[File] key
src/main/scala source ( ), :
Compile / sourceDirectories += new File("source")
, sbt file() :
Compile / sourceDirectories += file("source")
(file() File )
+= :
Compile / sourceDirectories += Seq(file("sources1"), file("sources2"))
Seq(a, b, c, ...) Scala
source , := :
Compile / sourceDirectories := Seq(file("sources1"), file("sources2"))

:=,+= += key , ,sbt , " " , key
scope
sbt , ; ,sbt

```

```

key task
task setting task task Def.task :=, += +=
, classpath source generator
Compile / sourceGenerators += Def.task {
  myGenerator(baseDirectory.value, (managedClasspath in Compile).value)
}

;+= +=

setting task key, := , , :
cleanFiles += file("coverage-report-" + name.value + ".txt")

```

Scope (.value)

This page was translated mostly with Google Translate. Please send a pull request to improve it.

```

scope .sbt scopes
scope , .value ,
:
• scope : subproject configuration task
• scope scope Zero
• subproject scope ThisBuild
• Test Runtime, Runtime Compile configuration
• , build.sbt key scope ${current subproject} / Zero / Zero
• / key scope
, :
lazy val foo = settingKey[Int]("")
lazy val bar = settingKey[Int]("")

lazy val projX = (project in file("x"))
.settings(
  foo := {
    (Test / bar).value + 1
  },
  Compile / bar := 1
)

foo setting , scoped key Test / bar , projX Test / bar,sbt
Test / bar scoped key, foo 2
sbt , scope scope , scope

```

scope

scope :

- 1: scope :subproject ,configuration , task
- 2: scope , task scope: task scope, Zero (scope task scope)
- 3: scope , configuration scope: configuration, , , Zero(configuration)
- 4: scope , subproject scope: subproject,ThisBuild, Zero
- 5: , scoped key settings/tasks

1: scope

- 1: scope :subproject ,configuration , task , , subproject , configuration task scope , , subproject , task scope , configuration

2: task

- 2: scope , task scope: task scope, Zero (scope task scope)

key,sbt scope, , (xxx / yyy).value

A: :

```
lazy val projA = (project in file("a"))
.settings(
  name := {
    "foo-" + (packageBin / scalaVersion).value
  },
  scalaVersion := "2.11.11"
)
```

projA / name ?

1. "foo-2.11.11"
2. "foo-2.12.10"
- 3.

```
"foo-2.11.11" .settings(...) ,scalaVersion scope projA /
Zero / Zero, packageBin / scalaVersion projA / Zero / packageBin
/ scalaVersion scoped key 2,sbt task Zero projA / Zero
/ Zero ( projA / scalaVersion) scoped key "2.11.11"
```

3:configuration

- 3: scope , configuration scope: configuration, , ,
Zero(configuration)
projX:
`lazy val foo = settingKey[Int]("")`
`lazy val bar = settingKey[Int]("")`
`lazy val projX = (project in file("x"))`
 `.settings(`
 `foo := {`
 `(Test / bar).value + 1`
 `},`
 `Compile / bar := 1`
 `)`
 scope,projX / Test / Zero Test Runtime ,Runtime Compile

Test / bar , 3,sbt scope projX / Test / Zero,projX / Runtime
/ Zero, projX / Compile / Zero , Compile / bar

4:subproject

- 4: scope , subproject scope: subproject,ThisBuild,
Zero
B: :
ThisBuild / organization := "com.example"
`lazy val projB = (project in file("b"))`
 `.settings(`
 `name := "abc-" + organization.value,`
 `organization := "org.tempuri"`
 `)`
projB / name ?
 1. "abc-com.example"
 2. "abc-org.tempuri"
 3.
 abc-org.tempuri , 4, projB / Zero / Zero scope
organization, projB "org.tempuri" setting ThisBuild /
organization

```

scope
  C:      :
ThisBuild / packageBin / scalaVersion := "2.12.2"

lazy val projC = (project in file("c"))
  .settings(
    name := {
      "foo-" + (packageBin / scalaVersion).value
    },
    scalaVersion := "2.11.11"
  )
projC / name ?
1. "foo-2.12.2"
2. "foo-2.11.11"
3.
foo-2.11.11 scope projC / Zero / packageBin scalaVersion
scalaVersion scoped to projC / Zero / packageBin is undefined. 2 projC
/ Zero / Zero 4 ThisBuild / Zero / packageBin , 1 subproject
, "2.11.11" projC / Zero / Zero

D:      :
ThisBuild / scalacOptions += "-Ywarn-unused-import"

lazy val projD = (project in file("d"))
  .settings(
    test := {
      println((Compile / console / scalacOptions).value)
    },
    console / scalacOptions -= "-Ywarn-unused-import",
    Compile / scalacOptions := scalacOptions.value // added by sbt
  )
projD/test ?
1. List()
2. List(-Ywarn-unused-import)
3.
List(-Ywarn-unused-import) 2 projD / Compile / Zero, 3 projD
/ Zero / console, 4 ThisBuild / Zero / Zero 1 projD / Compile /
Zero subproject projD, configuration task
, Compile / scalacOptions scalacOptions.value, projD / Zero
/ Zero 4 ThisBuild / Zero / Zero, List(-Ywarn-unused-import)

```

inspect

```
inspect
```

```
sbt:projD> inspect projD / Compile / console / scalacOptions
[info] Task: scala.collection.Seq[java.lang.String]
[info] Description:
[info]   Options for the Scala compiler.
[info] Provided by:
[info]   ProjectRef(uri("file:/tmp/projD/"), "projD") / Compile / scalacOptions
[info] Defined at:
[info]   /tmp/projD/build.sbt:9
[info] Reverse dependencies:
[info]   projD / test
[info]   projD / Compile / console
[info] Delegates:
[info]   projD / Compile / console / scalacOptions
[info]   projD / Compile / scalacOptions
[info]   projD / console / scalacOptions
[info]   projD / scalacOptions
[info]   ThisBuild / Compile / console / scalacOptions
[info]   ThisBuild / Compile / scalacOptions
[info]   ThisBuild / console / scalacOptions
[info]   ThisBuild / scalacOptions
[info]   Zero / Compile / console / scalacOptions
[info]   Zero / Compile / scalacOptions
[info]   Zero / console / scalacOptions
[info]   Global / scalacOptions
,“Provided by”    projD / Compile / console / scalacOptions    projD
/ Compile / scalacOptions    “Delegates” ( ),                !
•    subproject    projD scope    scope,    ThisBuild Zero
•    subproject ,    configuration    Compile scope    scope,    Zero
•    task    task scope console /    scope,    task scope console /
    scope
```

.value

```
• 5:      ,    scoped key    settings/tasks
,scope      ,    Scala    OO ,    trait Shape    drawShape
method,    Shape trait    method    drawShape,    ,
, sbt ,scope    scope    scope,    project-level    setting    build-level set-
ting,    build-level setting    project-level setting
E:      :
```



```

lazy val root = (project in file("."))
  .settings(
    inThisBuild(List(
      organization := "com.example",
      scalaVersion := "2.12.2",
      version      := scalaVersion.value + "_0.1.0"
    )),
    name := "Hello"
  )

lazy val projE = (project in file("e"))
  .settings(
    scalaVersion := "2.11.11"
  )

projE / version ?
1. "2.12.2_0.1.0"
2. "2.11.11_0.1.0"
3.
2.12.2_0.1.0 projE / version ThisBuild / version,    ThisBuild
/ scalaVersion ,build-level setting

F:      :

ThisBuild / scalacOptions += "-D0"
scalacOptions += "-D1"

lazy val projF = (project in file("f"))
  .settings(
    compile / scalacOptions += "-D2",
    Compile / scalacOptions += "-D3",
    Compile / compile / scalacOptions += "-D4",
    test := {
      println("bippy" + (Compile / compile / scalacOptions).value.mkString)
    }
  )

projF / test ?
1. "bippy-D4"
2. "bippy-D2-D4"
3. "bippy-D0-D3-D4"
4.
"bippy-D0-D3-D4"    Paul Phillips          , someKey += "x"

someKey := {
  val old = someKey.value

```

```

    old := "x"
  }

  , 5, scoped key +=, :

ThisBuild / scalacOptions := {
  // Global / scalacOptions <- Rule 4
  val old = (ThisBuild / scalacOptions).value
  old := "-D0"
}

scalacOptions := {
  // ThisBuild / scalacOptions <- Rule 4
  val old = scalacOptions.value
  old := "-D1"
}

lazy val projF = (project in file("f"))
.settings(
  compile / scalacOptions := {
    // ThisBuild / scalacOptions <- Rules 2 and 4
    val old = (compile / scalacOptions).value
    old := "-D2"
  },
  Compile / scalacOptions := {
    // ThisBuild / scalacOptions <- Rules 3 and 4
    val old = (Compile / scalacOptions).value
    old := "-D3"
  },
  Compile / compile / scalacOptions := {
    // projF / Compile / scalacOptions <- Rules 1 and 2
    val old = (Compile / compile / scalacOptions).value
    old := "-D4"
  },
  test := {
    println("bippy" + (Compile / compile / scalacOptions).value.mkString)
  }
)

:

ThisBuild / scalacOptions := {
  Nil := "-D0"
}

scalacOptions := {
  List("-D0") := "-D1"
}

```

```

lazy val projF = (project in file("f"))
  .settings(
    compile / scalacOptions := List("-D0") :+ "-D2",
    Compile / scalacOptions := List("-D0") :+ "-D3",
    Compile / compile / scalacOptions := List("-D0", "-D3") :+ "-D4",
    test := {
      println("bippy" + (Compile / compile / scalacOptions).value.mkString)
    }
  )

```

```

, , .sbt ,Scopes

```

```

:

```

- lib jar
- , (repository)

```

: jar lib , classpath !
jar lib , ScalaCheck,Specs2,ScalaTest
lib classpaths( compile, test, run console ) classpath,
, Compile / dependencyClasspath Runtime / dependencyClasspath
, 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 :
Compile / unmanagedJars := 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  :

```

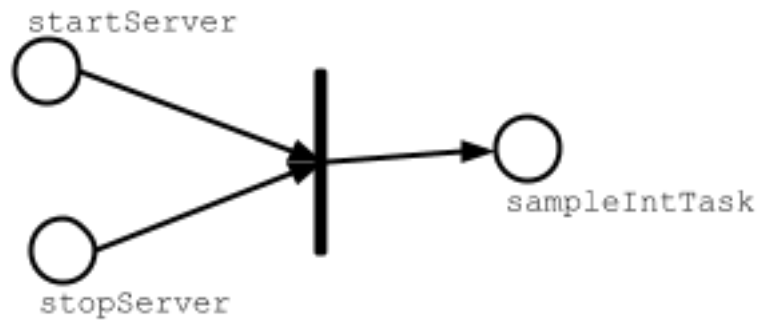


Figure 2: task-dependency

```

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 :

```

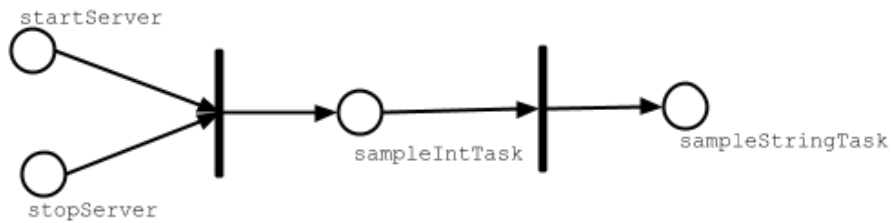


Figure 3: task-dependency

```

, test , Test / compile Test / 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

```

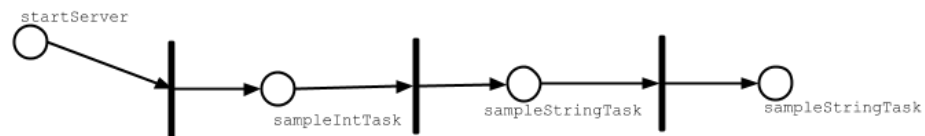


Figure 4: task-dependency

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` `,` `!`