

sbt Reference Manual

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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@1
```

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:

```
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 := "2.12.8"
  )

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

```
sbt

hello/project/build.properties      sbt      ,      1.2.8:

sbt.version=1.2.8

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

```

    .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 := "2.12.8"
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 := "2.12.8"

jar lib/( ), build.sbt, :

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

ThisBuild / organization := "com.example"
ThisBuild / scalaVersion := "2.12.8"
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 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 :=,
  += +=

    , classpath source generator

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

    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" % "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 := "2.12.8"
)

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/1.0/plugins/ ~/.sbt/1.0/plugins/ classpath
sbt , ~/.sbt/1.0/plugins/ .sbt .scala project/

, ~/.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 := "2.12.8"

```

```

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 := "2.12.8"

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      :
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

```



Figure 2: task-dependency

```
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 := "2.12.8"

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 , !
```