

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
```

[Macports](#)

```
$ port install sbt
```

Windows **sbt**

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

Windows

[msi](#)

Linux **sbt**

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

Ubuntu **Debian**

[DEB](#) **sbt**

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

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

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

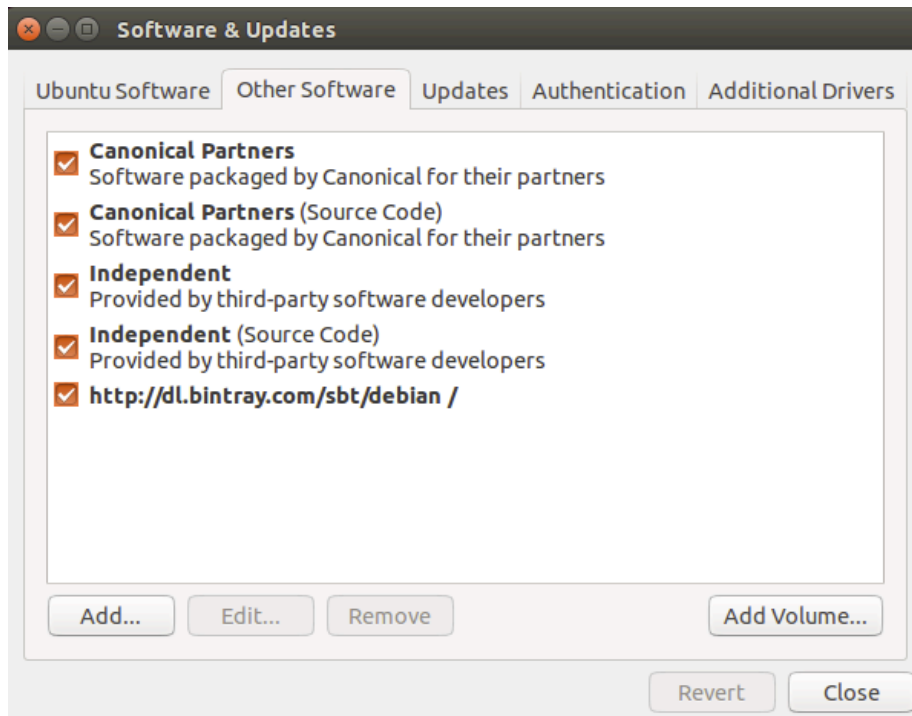


Figure 1: Ubuntu Software & Updates Screenshot

Linux RPM

RPM sbt

Linux RPM RPM sbt(, sudo)

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

sbt Bintray, Bintray RPM

: [sbt-launcher-package](#)

Gentoo

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

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

: ebuild

Hello, World

[sbt](#)

sbt hello , hw.scala:

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

hello sbt, run sbt Linux OS X :

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

,sbt sbt :

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

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

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

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

```
lazy val root = (project in file("."))
  .settings(
    name := "hello",
    version := "1.0",
    scalaVersion := "2.12.2"
  )
```

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

```
sbt
```

```
hello/project/build.properties      sbt      ,      0.13.16:
```

```
sbt.version=0.13.16
```

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

```
sbt      Hello, World
```

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



```

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

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

src/      ,

sbt

    build.sbt  sbt  project  project  .scala ,  .sbt

build.sbt
project/
  Build.scala

  project/  .sbt ,  .sbt  ,

(  classes,  jars,  ,caches  )  target

.gitignore (      ) :

target/

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

```

```
sbt      sbt      Hello, World
```

```
sbt      :
```

```
$ sbt
```

```
sbt      ( tab      )
```

```
, sbt      compile:
```

```
> compile
```

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

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

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

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

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

```
> ~ compile
```

```
~
```

```

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

console

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

,

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

```

Tab

```

  tab sbt , tab ,

, sbt :

!

!!

!:
```

```

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

.sbt

sbt  ,  “ ” build.sbt      sbt

```

```

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

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

?

sbt      ,  Project
build.sbt      Project  ,  :

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

```

```

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

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

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

build.sbt

build.sbt Project, settings scala
:

lazy val commonSettings = Seq(
  organization := "com.example",
  version := "0.1.0",
  scalaVersion := "2.12.2"
)

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

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

```

```

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

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

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

value, :

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

(Keys)

(Types) key:

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

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

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

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

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

: , lazy val val

```

```

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

```

tasks settings

```

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

, hello task:

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

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

settings ,

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

```

```

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

```

sbt Keys

```

sbt , task name task compile compile task compile
task key

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

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

```

build.sbt

```
import build.sbt ;

:

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

( , .scala , Build Plugin .scala )

jar lib/( ), build.sbt , :

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

lazy val commonSettings = Seq(
  organization := "com.example",
  version := "0.1.0",
  scalaVersion := "2.12.2"
)

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

10.4.1.3 Apache Derby

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

Scope

```
scope .sbt
```


Key

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

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

key name , scope
, scoped key

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

Scope

```
Scope , scope( , key )
scope :
```

- Projects
- Configurations
- Tasks

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

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

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

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

```

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

```

Scope

```

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

```

```

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

```

sbt scope key

```

,sbt    ( )scope    keys:

```

```

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

```

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

```

“*”    , Global scope

```

```

scoped key,    :

```

- project, project
- configuration task, key configuration

```

,    Configuration

```

scoped key

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

scope

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

```
$ sbt
> inspect test:fullClasspath
[info] Task: scala.collection.Seq[sbt.Attributed[java.io.File]]
[info] Description:
[info] The exported classpath, consisting of build products and unmanaged and managed, internal
[info] Provided by:
[info] {file:/home/hp/checkout/hello/}default-aea33a/test:fullClasspath
[info] Dependencies:
[info] test:exportedProducts
[info] test:dependencyClasspath
[info] Reverse dependencies:
[info] test:runMain
[info] test:run
[info] test:testLoader
[info] test:console
[info] Delegates:
[info] test:fullClasspath
[info] runtime:fullClasspath
[info] compile:fullClasspath
[info] *:fullClasspath
```

```

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

```

```

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

```

```

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

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

```

Configuration

scope

```

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

```

```

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

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

Keys in scope in scope , name Compile configuration
, :

name in Compile := "hello"

  name packageBin task ( ! ):

name in packageBin := "hello"

  name scope , Compile configuration packageBin task :

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

  Global :

name in Global := "hello"

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

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

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

,

scope

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

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

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

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

```

```

:= , .sbt scope

:

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

: += +=

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

• +=
• +=

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

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

, sbt file() :

sourceDirectories in Compile += file("source")

(file() File )
+= :

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

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

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

```

```

    key

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

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

    , :

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

    java.io.File getName baseDirectory
    ,

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

    name organization version , name

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

[info] Dependencies:
[info] *:baseDirectory

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

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

```

```

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

    , classpath source generator

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

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

    key ( Keys ):

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

(scalacOptions checksums , key, task)

    build.sbt scalacOptions checksums, , :

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

    , setting key task key setting key , task
    , task

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

:= +=

    setting task key, := , , :

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

    , , .sbt ,Scopes

    :

• lib jar
• , (repository)

```



```

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

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

unmanagedBase := baseDirectory.value / "custom_lib"

baseDirectory , baseDirectory unmanagedBase,
value

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

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

sbt Apache Ivy , Ivy Maven ,

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

libraryDependencies += groupId % artifactID % revision

, Configuration val configuration:

libraryDependencies += groupId % artifactID % revision % configuration

libraryDependencies Keys :

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

```

```

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

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

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

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

,      libraryDependencies      :=

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

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

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

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

Scala      ,      jar

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

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

```

```

        , sbt      Maven2      ,      resolver      Ivy
      :

    resolvers += name at location

        at

      :

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

    resolvers key Keys      :

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

    at      Resolver

    sbt      Maven      :

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

    ,      :

    resolvers += Resolver.mavenLocal

    resolvers      ,

    sbt resolvers      externalResolvers

    ,      ,      externalResolvers      resolvers

Per-configuration dependencies      ( src/test/scala , Test 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 := "2.12.2"
)

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

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

  version,      ,

```

```

        ,
        :aggregate classpath

Aggregation Aggregation aggregate task aggregated ,

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

lazy val util = project

lazy val core = project

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

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

[...]
```

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

```

: task,task
```

Classpath dependsOn , core classpath util,

core:

```

lazy val core = project.dependsOn(util)

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

configuration classpath foo dependsOn(bar) foo compile

```

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

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

```

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

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

```

root

```

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

```

```

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

```

```

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

```

```

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

```

```

.sbt .sbt .sbt , project/ Scala

```

```

, build.sbt

task , codeCoverage task

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

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

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

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

, :

resolvers += Resolver.sonatypeRepo("public")

,

0.13.5 sbt, ,

, build.sbt :

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

enablePlugins

disablePlugins , util IvyPlugin , build.sbt :

```

```

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

, sbt plugins

:

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

, plugins sbt sbt 3 :

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

, JUnitXmlReportPlugin junit-xml

, , ,

, sbt-site , , site.sbt

site.settings

, :

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

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

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

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

```



```

      :

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

, , ,

, sbt , .sbt

SettingKey TaskKey .sbt InputKey
Keys :

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

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

, , ; := :

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

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

```

```

)

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

, value

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

value ,
sampleIntTask , :

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

,JVM sum 3,

startServer stopServer, sampleIntTask, :

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

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

```

```

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

```

```
sbt      sampleIntTask      :
```

```

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

```

```

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

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

,      sbt      sampleStringTask

```



Figure 2: task-dependency

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

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



Figure 3: task-dependency

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

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

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

```

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

```

```

,      sampleStringTask:

```

```

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

```



Figure 4: task-dependency

Scala Scala , project/ServerUtil.scala , :

```

sampleIntTask := {
    ServerUtil.startServer

```

```

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

```

```

,

```

```

,

```

```

,
```

```

;
```

```

, build.sbt,
```

```

sbt

```

```

build.sbt , sbt sbt Scala sbt ?
project , , project
  sbt
  , project/project/
  :

```

```

hello/ #
Hello.scala # ( src/main/scala)
build.sbt # build.sbt project/
project/ #
Build.scala # ,

```

```

        build.sbt      #      --project/project  ;

        project/      #      ;

        Build.scala # project/project/

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

project .scala      project/Dependencies.scala

import sbt._

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

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

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

Dependencies build.sbt      val      , Dependencies._

import Dependencies._

lazy val commonSettings = Seq(
    version := "0.1.0",
    scalaVersion := "2.12.2"
)

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

,

```

```

    .scala

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

        ,      project/*.scala      ,

sbt,      ,      sbt      sbt
    ,

sbt:

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

      ,      ,      sbt
!

```



```

sbt      ,      !

:Bare .sbt

      .sbt      .sbt

bare .sbt

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

name := "hello"

version := "1.0"

scalaVersion := "2.12.2"

( 0.13.7 )

:      0.13.7
      bare build.sbt:

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

sbt      ,

:.scala

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

```

build.sbt Build.scala

```
.sbt   .scala   ,  
      ,   hello   , hello/project/Build.scala:  
  
import sbt._  
import Keys._  
  
object HelloBuild extends Build {  
  val sampleKeyA = settingKey[String]("demo key A")  
  val sampleKeyB = settingKey[String]("demo key B")  
  val sampleKeyC = settingKey[String]("demo key C")  
  val sampleKeyD = settingKey[String]("demo key D")  
  
  override lazy val settings = super.settings ++  
    Seq(  
      sampleKeyA := "A: in Build.settings in Build.scala",  
      resolvers := Seq()  
    )  
  
  lazy val root = Project(id = "hello",  
    base = file("."),  
    settings = Seq(  
      sampleKeyB := "B: in the root project settings in Build.scala"  
    ))  
}  
  
  , hello/build.sbt:  
  
sampleKeyC in ThisBuild := "C: in build.sbt scoped to ThisBuild"  
  
sampleKeyD := "D: in build.sbt"  
  
  sbt   inspect sampleKeyA,   :  
  
[info] Setting: java.lang.String = A: in Build.settings in Build.scala  
[info] Provided by:  
[info]   {file:/home/hp/checkout/hello/}/*:sampleKeyA  
  
  inspect sampleKeyC,   :  
  
[info] Setting: java.lang.String = C: in build.sbt scoped to ThisBuild  
[info] Provided by:  
[info]   {file:/home/hp/checkout/hello/}/*:sampleKeyC
```

```

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

```

```

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

```

```

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

```

```

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

```

```

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

```

```

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

```

```

:

```

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

```

sbt , project/      reload plugins

```

```

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

```

```

, reload return
,

:

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

,      :

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

```