

sbt Reference Manual

Contents

Preface	3
sbt	3
sbt	3
.	3
macOS sbt	3
.	3
.	4
Windows sbt	4
.	4
Windows	4
.	4
Linux sbt	4
.	4
Ubuntu Debian	4
Linux RPM	5
Gentoo	6
Hello, World	6
.	6
.	6
sbt	7
.	7
.	7
.	7
sbt	8
.	8
.	8
.	8
.	8
.	8
.	9
.	9
Tab	9
.	9

.sbt	10
?	10
build.sbt	11
(Keys)	12
tasks settings	13
sbt Keys	13
build.sbt	13
bare .sbt	14
	14
Scope	14
Key	14
Scope	15
Scope	16
	16
sbt scope key	16
scoped key	16
scope	17
scope	18
scope	19
	19
:	19
: += +=	20
key	20
: += +=	22
	22
	22
	22
	25
	25
	26
root	27
	27
	27
	27
	28
	28
	28
	29
	29
	29
	30
	30
	30
	34
	34

sbt	34
	35
.scala	36
	36
	36
sbt:	36
	37

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

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:

```

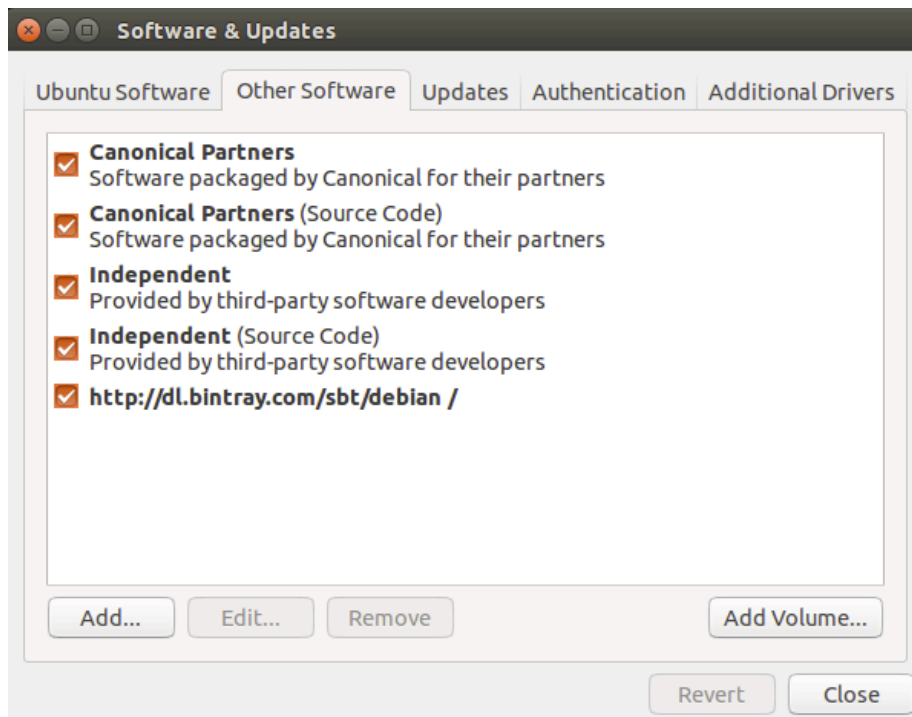


Figure 1: Ubuntu Software & Updates Screenshot

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 := "2.12.10"
    )
    .sbt {
        build.sbt
        jar , build.sbt      name version

sbt

        hello/project/build.properties      sbt      ,      1.3.1:
sbt.version=1.3.1
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

!string

string

!?string

string

.sbt

sbt , “ ” build.sbt sbt

1. .sbt

2. bare .sbt

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

, .scala , project/ ,

?

sbt , Project

build.sbt Project , :

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

```

        (immutable map)(
    ,   name key,
        sbt map
    ,   Setting[T],T (value) Setting (map) ,
        value ( , map — map )
        Setting[String], :
lazy val root = (project in file("."))
  .settings(
    name := "hello"
  )
  Setting[String] ( )name "hello" map map sbt map
  map,sbt , key , value key, key , sbt
Settings , map
: Project, Setting[T],Setting[T] sbt map ,T
value

```

build.sbt

```

build.sbt Project, settings scala
:
ThisBuild / organization := "com.example"
ThisBuild / scalaVersion := "2.12.10"
ThisBuild / version      := "0.1.0-SNAPSHOT"

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

```

```

,Scala name := "hello" ( Scala , )
(key)name := Setting, Setting[String] String name
SettingKey[String] , Setting[String] sbt map name
, "hello"
value, :
lazy val root = (project in file("."))
.settings(
  name := 42 //
)

```

(Keys)

(Types)

key:

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

Keys

```

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

```

Keys

```

:settingKey,taskKey inputKey keys key value key
val , task hello key,
lazy val hello = taskKey[Unit](" task ")
.sbt (settings), vals defs (settings)
vals defs (settings)
: , lazy val val

```

Task vs Setting keys

```

TaskKey[T] task Tasks compile package Unit(Unit Scala
void), task , package TaskKey[File] task, jar
task, sbt compile,sbt task
sbt map (setting) , name; task , compile-
key task (setting) ,“taskiness” ( ) key (prop-
erty), (value)

```

```

tasks settings

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

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

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

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

```

Tasks Settings

```

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

T Task[T] : setting task, setting ,

```

sbt Keys

```

sbt , task name task compile compile task compile
task key

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

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

```

build.sbt

```

import build.sbt ;

:

import sbt._
import Keys._

( , .scala , Build Plugin .scala )

```

bare .sbt

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

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

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

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

10.4.1.3 Apache Derby

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

Scope

scope .sbt

Key

```
      name      key      sbt      map      ,
,      key      ,      "scope"
:
•      ,      key
•      ,key compile      main      test
• Key packageOptions(      jar      )      ,      class      packageBin,
packageSrc
```

```

    key name , scope
,   scoped key
    ,sbt map settings , map key scope key setting( build.sbt ) scope key
    scope , , build.sbt scope

```

Scope

```

Scope , scope( , key )
    scope :
    • Projects
    • Configurations
    • Tasks

```

Project Scope

```

    , settings ,keys
Project , setting setting , setting

```

Configuration Scope

```

configuration , classpath, Configuration Ivy
MavenScopes
sbt configurations:
    • Compile (src/main/scala)
    • Test (src/test/scala)
    • Runtime task run classpath
    , key configuration, configuration task
key:compile,package run; key key( sourceDirectories,scalacOptions
fullClasspath) configuration

```

Task Scope

```

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

```

Scope

```

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

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

```

sbt scope key

```

,sbt ( )scope keys:
{<build-uri>}<project-id>/config:intask::key
• {<build-uri>}/<project-id> project project scope,
  <project-id>
• config configuration
• intask task
• key scope key
“*” , Global scope
scoped key, :
• project, project
• configuration task, key configuration
, Configuration

```

scoped key

- fullClasspath key, scope: project,key configuration task scope
- test:fullClasspath configuration, fullClasspath test configuration scope , scope
- *:fullClasspath configuration Global, configuration
- doc::fullClasspath key fullClasspath doc task ,project configuration

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

scope

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

```

[info] test:fullClasspath(for doc)
[info] runtime:fullClasspath
    , task( .sbt setting ) task scala.collection.Seq[sbt.Attributed[java.io.File]]
“Provided by” scoped key, {file:/home/hp/checkout/hello/}default-aea33a/test:fullClasspath
test configuration {file:/home/hp/checkout/hello/}default-aea33a
project )
“Dependencies” ;
    ; ,sbt :
    • configuration(runtime:fullClasspath compile:fullClasspath)
      scoped key ,project “ project” task Global
    • project “ project” task Global ,configuration
      Global(*:fullClasspath)
    • project ,project {..} ThisBuild
    • project Global(*:test:fullClasspath)( , project cur-
      rent, Global ; :* “ project” project ; *:test:fullClasspath
      test:fullClasspath )
    • project configuration Global(*:fullClasspath)( task
      Global, *:fullClasspath Global)
inspect fullClasspath( inspect test:fullClasspath ) con-
figuration ,sbt compile inspect compile:fullClasspath
inspect fullClasspath
inspect *:fullClasspath ,fullClasspath Global configuration

Configuration

scope

build.sbt bare key, project ,configuration task Global:
lazy val root = (project in file("."))
.settings(
  name := "hello"
)

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

Keys in scope in scope , name Compile configuration
, :

name in Compile := "hello"
name packageBin task ( ! ):

```

```

name in packageBin := "hello"

    name    scope , Compile configuration packageBin task :
name in (Compile, packageBin) := "hello"

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

,

scope

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

key compile , compile in Compile compile in Test compile
project scope task, configuration scope compile task
    " " , scope , scope key scope sbt
    ; " compile:compile?"

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

:= , .sbt scope

:

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

```

```

    := ++= ++=

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

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

key

task setting value value :=, += ++=
    , project organization
// name our organization after our project (both are SettingKey[String])
organization := name.value
    , :
// name is a Key[String], baseDirectory is a Key[File]
// name the project after the directory it's inside
name := baseDirectory.value.getName
    java.io.File getName baseDirectory
    ,
name := "project " + name.value + " from " + organization.value + " version " + version.valu
    name organization version , name

```

```

    name := baseDirectory.value.getName ,name    baseDirectory
build.sbt ,    sbt    ,    inspect name,    ( ):
[info] Dependencies:
[info] *:baseDirectory

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

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

    key    task

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

    task

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

    key    ( Keys ):
val scalacOptions = taskKey[Seq[String]]("Options for the Scala compiler.")
val checksums = settingKey[Seq[String]]("The list of checksums to generate and to verify for
(scalacOptions    checksums    ,    key,    task )
    build.sbt    scalacOptions    checksums,    ,    :
// scalacOptions task    checksums setting
scalacOptions := checksums.value
, setting key    task key    setting key    , task
, task

```

```

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

:= +=

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

, , .sbt ,Scopes
:
• lib jar
• , (repository)

: jar lib , classpath !
jar lib , ScalaCheck,Specs2,ScalaTest
lib classpaths( compile, test, run console ) classpath,
, dependencyClasspath in Compile dependencyClasspath in
Runtime
, build.sbt , unmanagedBase key, lib
custom_lib lib:
unmanagedBase := baseDirectory.value / "custom_lib"
baseDirectory , baseDirectory unmanagedBase,
value
unmanagedBase jar task unmanagedJars ,
task unmanagedJars task, Compile configuration , lib :
unmanagedJars in Compile := Seq.empty[sbt.Attributed[java.io.File]]

sbt Apache Ivy , Ivy Maven ,

```

```

libraryDependencies Key
    , libraryDependencies Maven POM Ivy , sbt

    , groupId, artifactID revision :
libraryDependencies += groupId % artifactID % revision
    , Configuration val 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
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 := "2.12.10"

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, sampeIntTask, :

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 :

```

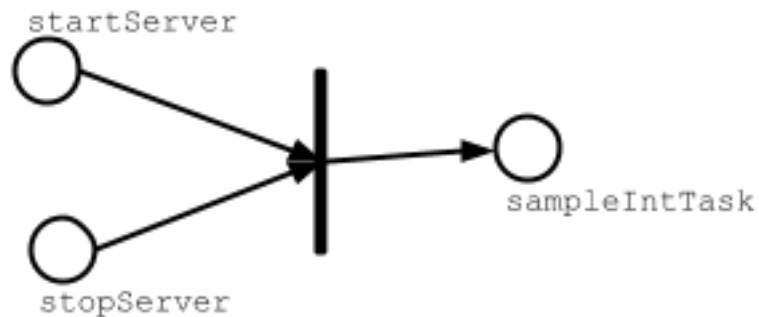


Figure 2: task-dependency

```

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 :
, test , compile in Test test in Test

stopServer ? , stopServer sampleStringTask, stopServer
sampleStringTask
lazy val library = (project in file("library"))
.settings(

```

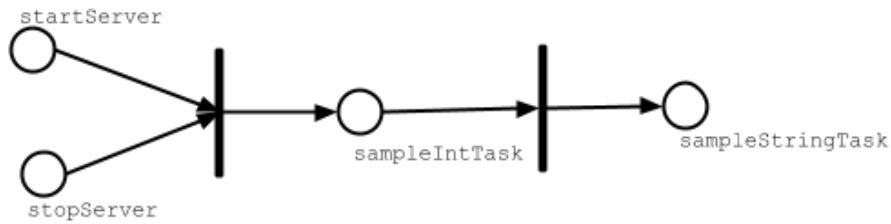



Figure 3: task-dependency

```

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

```

Scala

Scala , project/ServerUtil.scala , :

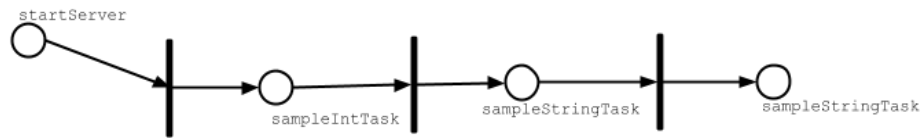


Figure 4: task-dependency

```

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 , !