sbt Reference Manual

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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

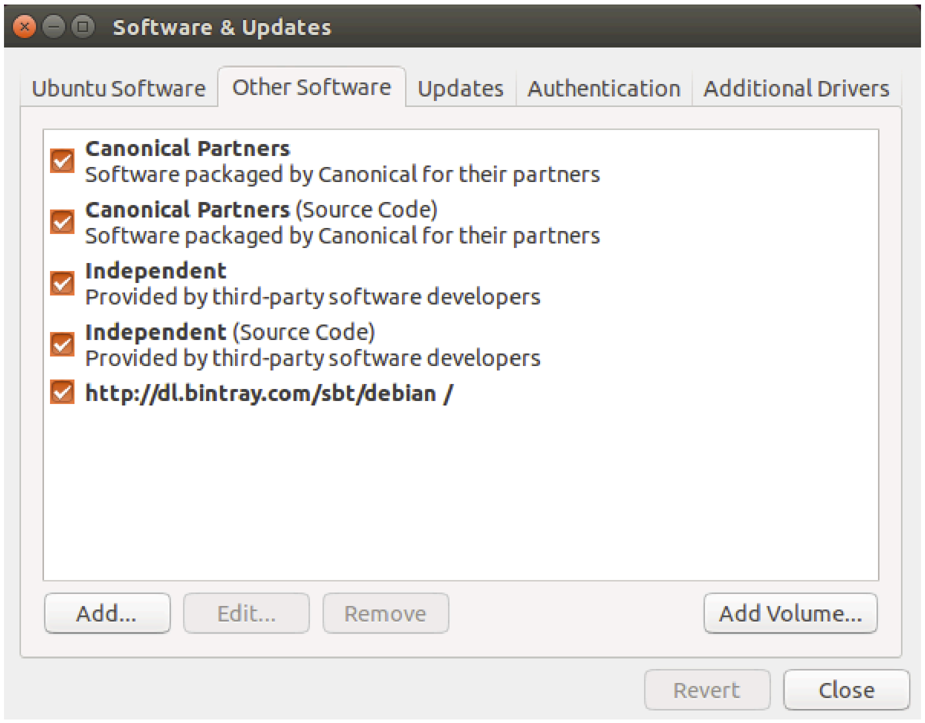
Ubuntu Debian

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`



Software & Updates

Ubuntu Software | Other Software | Updates | Authentication | Additional Drivers

- ✓ **Canonical Partners**
  Software packaged by Canonical for their partners
- ✓ **Canonical Partners** (Source Code)
  Software packaged by Canonical for their partners
- ✓ **Independent**
  Provided by third-party software developers
- ✓ **Independent** (Source Code)
  Provided by third-party software developers
- ✓ **http://dl.bintray.com/sbt/debian /**

Add... | Edit... | Remove | Add Volume...

Revert | Close

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`

```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 := "2.12.1"
  )
```

.sbt build.sbt

jar build.sbt name version

sbt

hello/project/build.properties sbt 0.13.13

```
sbt.version=0.13.13
```

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 Windows sbt sbt sbt

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

testOnly TestA TestB clean compile testOnly

- - sbt ~

```
> ~ compile
```

~

sbt

```
<td><tt>clean</tt></td>
<td>        <tt>target</tt>    </td>
```

```
<td><tt>compile</tt></td>
<td>     <tt>src/main/scala</tt>
```

src/main/java

```
<td><tt>test</tt></td>
<td>     </td>
```

```
<td><tt>console</tt></td>
<td>            classpath   Scala      <tt>:quit</tt>
```

Ctrl+D Unix Ctrl+Z Windows sbt

```
<td><nobr><tt>run &lt; &gt;*</tt></nobr></td>
<td>  sbt           main class </td>
```

```
<td><tt>package</tt></td>
<td> <tt>src/main/resources</tt>    <tt>src/main/scala</tt>   <tt>src/main/java</tt>     clas
```

```
<td><tt>help &lt; &gt;</tt></td>
<td>                    </td>
```

```
<td><tt>reload</tt></td>
<td>     <tt>build.sbt</tt> <tt>project/*.scala</tt> <tt>project/*.sbt</tt>      )
```

Tab

tab sbt tab

sbt

```
<td><tt>!</tt></td>
<td>      </td>
```

```
<td><tt>!!</tt></td>
<td>     </td>
```

```
<td><tt>!:</tt></td>
<td>     </td>
```

```
<td><tt>!:n</tt></td>
<td>    <tt>n</tt>   </td>
```

```
<td><tt>!n</tt></td>
<td>  <tt>!:</tt>       <tt>n</tt>   </td>
```

```
<td><tt>!-n</tt></td>
<td>      n   </td>
```

```
<td><tt>!string</tt></td>
<td>     string    </td>
```

```
<td><tt>!?string</tt></td>
<td>      string   </td>
```

.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 := "2.12.1"
)

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 property 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`

```scala
import sbt._
import Process._
import Keys._
```

.scala Build Plugin .scala

jar lib/ build.sbt

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

lazy val commonSettings = Seq(
  organization := "com.example",
  version := "0.1.0",
  scalaVersion := "2.12.1"
)

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 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:fullClasspa`
`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 current
  `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`

```scala
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

```scala
name in Compile := "hello"
```

`name` `packageBin` task

```
name in packageBin := "hello"
```

name scope Compile configuration packageBin task

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

Global

```
name in Global := "hello"
```

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

Scala in := Scala Java

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

scope

key scope compile task Compile Test configuration scope scope

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

“ ” scope scope key scope sbt “ compile:compile ”

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

:= .sbt scope

.sbt Setting Setting sbt map Setting sbt map map map sbt

setting map .sbt :=

:= Setting map name := "hello" map map key name "hello"

`+=` `++=`

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

- `+=`
- `++=`

key `sourceDirectories` `in` `Compile` `Seq[File]` key
`src/main/scala` source

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

sbt `file()`

```
sourceDirectories in Compile += file("source")
```

`file()` `File`

`++=`

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

`Seq(a, b, c, ...)` Scala

source `:=`

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

key

task setting value value `:=` `+=` `++=`

project organization

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


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

`java.io.File` `getName` `baseDirectory`

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

name organization version name

name := baseDirectory.value.getName name baseDirectory build.sbt sbt inspect name

```
[info] Dependencies:
[info]  *:baseDirectory
```

sbt setting setting setting task task

inspect compile key compileInputs inspect compileInputs key compile sbt update compile sbt update

sbt key key

:= += ++= key sbt “ ” key scope

sbt sbt

key task

task setting task task Def.task 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 fo
```

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/snap
```

`resolvers` key Keys

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

`at` `Resolver`

sbt Maven

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

```
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 := "2.12.1"
)

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` configuration `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

sampeIntTask

```
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.")

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`

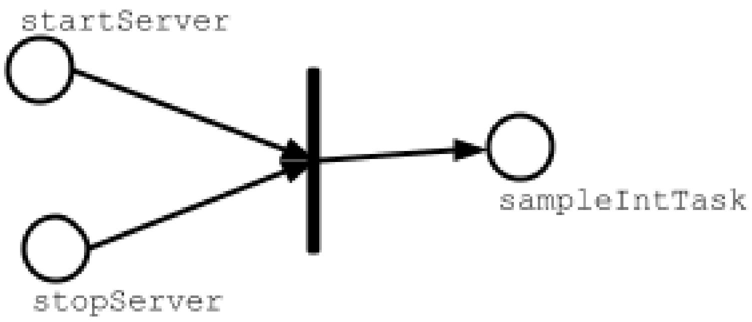


Figure 2: task-dependency

Scala `value` `sampleIntTask` `startServer` `stopServer` `sampleIntTask` sbt

- `sampleIntTask`
-
-

sbt sampleStringTask

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

sampleStringTask startServer sampleIntTask sampleIntTask startServer
Scala value sampeStringTask

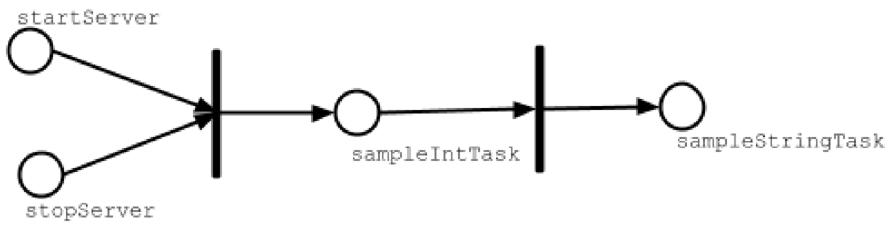


Figure 3: task-dependency

test compile in Test test in Test

stopServer stopServer sampleStringTask stopServer
sampleStringTask

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

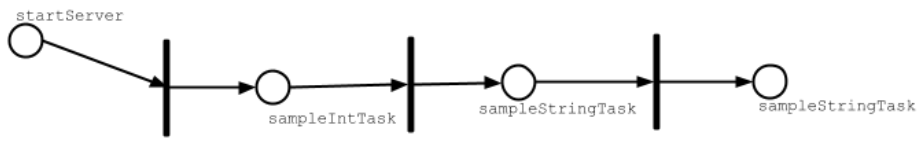


Figure 4: task-dependency

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 := "2.12.1"
)

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 := "2.12.1"
```

(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/`