

# sbt Reference Manual

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## Homebrew

```
$ brew install sbt -devel
```

## 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-experimental /" | sudo tee -a /etc/apt/sources.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-experimental > 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 console      Scala classpath      sbt run      sbt console      Scala REPL sbt

```

```

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      1.0.0-M6
sbt.version=1.0.0-M6
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
<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; >>*</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>          cla
<td><tt>help <lt; >></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
 

.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 map
              value 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

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

scala Build Plugin scala
```

## bare .sbt

```
bare .sbt Setting[_] Project

name := "hello"
version := "1.0"
scalaVersion := "2.12.1"
```

```
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 := "2.12.1"
)

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 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 */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
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 configuration
task * 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] 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_2.11.1" % "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]]("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 := "2.12.1"
)

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/1.0.0-M5/plugins/      ~/.sbt/1.0.0-M5/plugins/
classpath      sbt      ~/.sbt/1.0.0-M5/plugins/      .sbt      .scala
project/

      ~/.sbt/1.0.0-M5/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

```

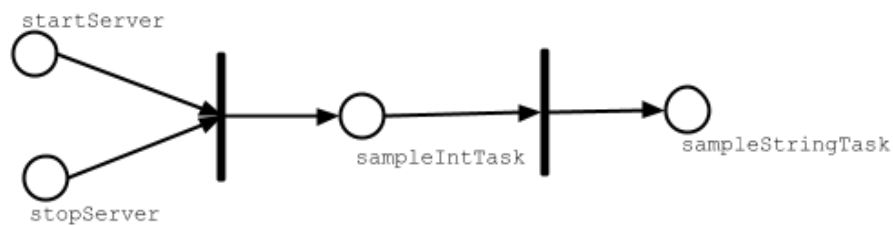


Figure 3: task-dependency

```

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
  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