

# sbt

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## Preface

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

: ,

## Macports

```
$ port install sbt
```

## Homebrew

```
$ brew install sbt
```

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

## Windows [sbt](#)

Windows

[msi](#)

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

## Linux [sbt](#)

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

RPM DEB

:

- RPM
- DEB

: [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

sbt

[sbt-launch.jar](#),

Unix

[sbt-launch.jar](#) ~/bin jar, ~/bin/sbt :

```
SBT_OPTS="-Xms512M -Xmx1536M -Xss1M -XX:+CMSClassUnloadingEnabled -XX:MaxPermSize=256M"
java $SBT_OPTS -jar ` $0`/sbt-launch.jar "$@"
```

:

```
$ chmod u+x ~/bin/sbt
```

## Windows

Windows Cygwin , batch path , sbt  
sbt , , JVM

**Non-Cygwin** Windows Cygwin , sbt.bat batch :

```
set SCRIPT_DIR=%~dp0
java -Xms512M -Xmx1536M -Xss1M -XX:+CMSClassUnloadingEnabled -XX:MaxPermSize=256M -jar "%SCRIPT_DIR%
```

[sbt-launch.jar](#) sbt.bat

**Cygwin** Windows Cygwin Windows , bash ~/bin/sbt:

```
SBT_OPTS="-Xms512M -Xmx1536M -Xss1M -XX:+CMSClassUnloadingEnabled -XX:MaxPermSize=256M"
java $SBT_OPTS -jar sbt-launch.jar "$@"
```

[sbt-launch.jar](#) sbt-launch.jar, cygpath :

```
$ chmod u+x ~/bin/sbt
```

**Cygwin** **Ansi** Cygwin **Ansi** ( **Ansi** stty ), bash  
~/bin/sbt:

```
SBT_OPTS="-Xms512M -Xmx1536M -Xss1M -XX:+CMSClassUnloadingEnabled -XX:MaxPermSize=256M"
stty -icanon min 1 -echo > /dev/null 2>&1
java -Djline.terminal=jline.UnixTerminal -Dsbt.cygwin=true $SBT_OPTS -jar sbt-launch.jar "$@"
stty icanon echo > /dev/null 2>&1
```

[sbt-launch.jar](#) sbt-launch.jar, cygpath :

```
$ chmod u+x ~/bin/sbt
```

(backspace) Scala , (erase character), stty cygwin  
(mintty), -> , cygwin ^H,“ ^H”

: [pull request](#)

## 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 :

name := "hello"

version := "1.0"

scalaVersion := "2.10.3"

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

```



sbt

hello/project/build.properties sbt , 0.13.7:

sbt.version=0.13.7

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
          .scala
```

```
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

.sbt vs .scala

sbt .sbt , project/ .scala .sbt
.scala .sbt , .scala ( ) .scala
```

?

```
sbt (immutable map)( ) , name key, ,
    sbt map , Setting[T] ,T (value) Setting
    (map) , value ( , map map ,
map ) build.sbt , Setting[String]:
```

```
name := "hello"
```

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

**build.sbt**

```
build.sbt Seq[Setting[_]]; Scala , (sequence)
.sbt Seq( , ), .scala :
```

```
name := "hello"
```

```
version := "1.0"
```

```
scalaVersion := "2.10.3"
```

```
Setting Scala build.sbt , , 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 :
```

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

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

```
name := 42 //
```

build.sbt:

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

sbt , .sbt Scala , Scala

(Keys)

(Types) key:

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

hello := { println("Hello!") }

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

build.sbt ; :

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

( , .scala , Build Plugin .scala )

```

```
jar lib/( ), , build.sbt :
```

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

### 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(\*/\*: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 key, project ,configuration task Global:

name := "hello"

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

build.sbt , “ ” build.sbt ( , build.sbt )

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"

Settings (build.sbt , .scala Setting sbt
)

: += +=

:= , 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    ,

    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 ,

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 con-
figuration )

    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")

,      :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    until,  
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 sbt
,
:
<root>/project/Common.scala:

import sbt._
import Keys._

```

```
object Common {
  def text = "org.example"
}
```

```
<root>/build.sbt:
```

```
organization := Common.text
```

```
.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
, , " "( )
.sbt ,.scala .scala val,Build Plugin plugin val
.sbt

, , ; := :

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

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

sampleStringTask := System.getProperty("user.home")

sampleIntTask := {
  val sum = 1 + 2
  println("sum: " + sum)
  sum
}

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

,
, [ ][sing-Plugins]
;

.scala

, .sbt

```

```

sbt

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

hello/ #
Hello.scala #
build.sbt # build.sbt project/
project/ #
Build.scala #
build.sbt #
project/ #
Build.scala # project/project/

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

.scala

.sbt :

hello/ #
build.sbt # build.sbt project/
project/ #
Build.scala #

build.sbt Scala , Build.scala ( project/ .scala )
*.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
Build.settings , .scala  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,      sanokeC  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      ,

```

```

.scala

```

```

.scala ,  Scala ,      ,      , .scala      .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
“      ”
```

```
,      :
```

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

```
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
  - .sbt vs. .scala
  - build.sbt , .scala task
  - sbt ,
  - 
  - addSbtPlugin project/plugins.sbt ( build.sbt )
- , , sbt  
 !

sbt , !