Apache Ant Java build tool

START HERE

ant
Run default target

ant -Dname=value
Set a property

ant <target>
Run one target

ant clean jar
Chain targets

ant -p
List documented targets

ant -v
Verbose output

ant -f <file>
Use another build file

ant -version
Show Ant version

CONCEPTS

Ant reads build.xml in the current directory. Run with no target and it runs the project's default target.

Project build.xml, default target
Target named step, depends on others
Task javac, jar, copy ...

Properties are immutable: the first definition wins, so -D on the command line overrides build.xml.

depends only orders targets. It does not rerun a target that already ran in this invocation.

RUN

ant
Run the project's default target

ant <target> [<target>...]
Run targets in order

ant -projecthelp / ant -p
List targets that have a description

ant -buildfile <file> / ant -f <file>
Use a different build file

ant -find [<file>] / ant -s [<file>]
Search parent dirs for the build file

ant -version
Print Ant version

ant -diagnostics
Print Java, classpath and Ant diagnostics

ant -help / ant -h
Show command line options

ant -keep-going / ant -k
Continue with targets not depending on a failure

ant -noinput
Never prompt for input (CI)

PROPERTIES AND OUTPUT

ant -D<name>=<value>
Set a property from the command line

ant -propertyfile <file>
Load properties from a file
-D values still take precedence over the file.

ant -quiet / ant -q
Less output

ant -silent / ant -S
Only task output and failures

PROPERTIES AND OUTPUT (cont.)

ant -verbose / ant -v
Extra output

ant -debug / ant -d
Debugging output

ant -emacs / ant -e
Log without [task] adornments

ant -logfile <file> / ant -l <file>
Write the log to a file

ant -logger <class>
Use a custom logger class

ant -listener <class>
Add a project listener

ant -lib <path>
Add jars or dirs to Ant's classpath

ant -nouserlib
Skip jars in ~/.ant/lib

ant -noclasspath
Ignore the CLASSPATH variable

ant -autoproxy
Use OS proxy settings

ant -nice <1-10>
Set main thread priority

ANT_OPTS="-Xmx1g" ant
Pass options to the JVM

ANT_ARGS="-noinput"
Default Ant arguments from environment

BUILD FILE BASICS

<project name="<n>" default="<target>" basedir=".">
Root element

<target name="<n>" depends="<a>,<b>" description="<text>">
Define a target
Only targets with a description show in ant -p.

<property name="<n>" value="<v>"/>
Define a property

<property file="build.properties"/>
Load properties from a file

<property environment="env"/>
Read env vars as ${env.NAME}

${<name>}
Reference a property

${basedir}
Project base directory

<target name="<n>" if="<prop>">
Run only if a property is set

BUILD FILE BASICS (cont.)

<target name="<n>" unless="<prop>">
Run only if a property is not set

<import file="<other.xml>"/>
Include another build file

<macrodef name="<n>">
Define a reusable task

<path id="<id>"><fileset dir="lib" includes="*.jar"/></path>
Reusable classpath

<fileset dir="<d>" includes="/*.java" excludes="<pat>"/>**
Select files by pattern

<echo message="<text>"/>
Print a message

<exec executable="<cmd>"><arg value="<a>"/></exec>
Run an external command

<antcall target="<n>"/>
Call a target (new context)

COMMON TASKS

<mkdir dir="<d>"/>
Create a directory

<delete dir="<d>"/>
Remove a directory tree

<copy todir="<d>"><fileset dir="<s>"/></copy>
Copy files

<move file="<f>" tofile="<t>"/>
Move or rename a file

<javac srcdir="src" destdir="build/classes" classpathref="<id>" includeantruntime="false"/>
Compile Java sources
Set includeantruntime="false" to silence the runtime warning.

<jar destfile="dist/<n>.jar" basedir="build/classes"/>
Build a jar

<manifest><attribute name="Main-Class" value="<cls>"/></manifest>
Set jar manifest (inside <jar>)

<java classname="<cls>" classpathref="<id>" fork="true"/>
Run a Java class

<junit printsummary="yes" haltonfailure="yes">
Run JUnit tests
Needs the junit task and ant-junit jar; JUnit 5 uses <junitlauncher>.

COMMON TASKS (cont.)

<junitlauncher>
Run JUnit Platform tests (Ant 1.10.6+)

<javadoc sourcepath="src" destdir="docs"/>
Generate API docs

<zip destfile="<f>.zip" basedir="<d>"/>
Create a zip archive

<war destfile="<f>.war" webxml="<web.xml>"/>
Build a war

<get src="<url>" dest="<file>"/>
Download a file

<replace file="<f>" token="<a>" value="<b>"/>
Text replace in a file

<tstamp/>
Set DSTAMP, TSTAMP, TODAY

<fail message="<msg>"/>
Fail the build

RECIPES

Minimal build.xml

```
<project name="app" default="jar" basedir=".">
  <target name="compile">
    <mkdir dir="build/classes"/>
    <javac srcdir="src" destdir="build/classes" includeantruntime="false"/>
  </target>
  <target name="jar" depends="compile" description="Package">
    <jar destfile="dist/app.jar" basedir="build/classes"/>
  </target>
  <target name="clean" description="Remove output">
    <delete dir="build"/><delete dir="dist"/>
  </target>
</project>
```

Clean build with a property

```
ant -p
ant clean jar -Dversion=1.2
# in build.xml: <jar destfile="dist/app-${version}.jar" .../>
```

Runnable jar and run it

```
<jar destfile="dist/app.jar" basedir="build/classes">
  <manifest><attribute name="Main-Class" value="com.example.Main"/></manifest>
</jar>
java -jar dist/app.jar
```

Debug a failing build

```
ant -v <target>
ant -d -l build.log <target>
ant -diagnostics
```