



# ANT Basics

## Automating Build

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# Ant Features

- Platform-independent
- Automates the build process
- Integrates Testing
- Supports Continuous Integration
- Incorporates Deployment

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## Installing Ant

- [ant.apache.org](http://ant.apache.org)
- Download the latest version or beta release
- Place the zip where you want the Ant files to reside.
- Unzip: `jar xvf downloadedFile`
- Create ANT\_HOME environment variable
- Add %ANT\_HOME%\bin to Path

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## Build File

- One build file per project
- Project is divided into Targets
- Targets contain Tasks
- Targets can depend on other Targets
- Tasks handle file dependencies
- XML format – elements, subelements, attributes

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## Sample Build File Format

```
<?xml version="1.0"?>
<project name="myProject" default="mainTarget">
  <target name="init">
    <mkdir dir="java/classes">
  </target>
  <target name="mainTarget" depends="init">
    <javac srcdir="java/src" destdir="java/classes" />
  </target>
</project>
```

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## Mock Project

- Make sure Ant is installed
- Create a directory for this project
- Write a java program to print out any supplied command line arguments
- Do not compile the program
- We'll create a build file for this project together

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## Directory Structure

- Most projects store source and compiled code in different directories:
  - src
  - build/classes
  - dist
- Package your java program and place it in the corresponding directory

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## Task: `<mkdir .../>`

- `<mkdir .../>` creates directories
- Format:  
`<mkdir dir="newdir" />`

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## Attribute: depends

- The target element can have a *depends* attribute
- Indicates dependencies between targets
- Format:  
`<target name="b" depends="a" >`

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## Task: `<jar .../>`

- The jar task creates a jar archive file
- Has attributes for the source files location and the destination jar file
- Format:  
`<jar destfile="dist/targetFile.jar"  
basedir="build/classes" />`

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## Task: <delete ... />

- The delete task can delete a directory
- Has an attribute for the directory to be deleted
- Format:  
`<delete dir="build" />`

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## Mock Project

- Create an *init* target
  - Create the build/classes and dist directories
- Make *compile* depend on *init*, set the *srcdir* and *destdir* attributes.
- Create an *archive* target
  - Jar the class files and put the jar in dist
- Create a *clean* target
  - Remove the build/classes and dist directories
- Change the default target to *archive*

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## Running within Ant

- Ant simplifies complex java run commands
- Can ensure that the latest code is being executed
- Simplifies setting the classpath
- Can take action based on return code of program

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## Task: `<java ... />`

- Runs a java executable
- Has attributes, including:
  - classpath
  - classname
- Has subelement for arguments:
  - `<arg value="abc"/>`
  - `<arg file="."/>`

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## Mock Project

- Add a target to execute your program
- Have this target depend on *compile*
- Supply the classname
- Supply the classpath
- Supply several arguments
- Run the build supplying this target as an argument

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## Ant Command Options

- Get a list by typing: `ant -help`
- `-buildfile` allows you to select which build file to run
- Control amount of output with `-emacs`, `-verbose`, `-debug`, `-quiet`
- Get project information with `-projecthelp`

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## Attribute: description

- Targets can have a description attribute for a brief description of the target.
- Project elements can also have a description, but it is an (sub)element, not an attribute.

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## Selecting Files

- Ant provides additional tools to select files for operations:
  - Fileset
  - Patternset
  - Selectors
  - Selector Containers

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## Mutating Files

- Ant can be used to make edits to files.
- This is often done in the process of moving or copying the file
- Ant uses Filtersets to do this.

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## Properties

- Mappings between names and values
- Ant provides several built-in properties
- Users can define their own properties
- Properties are later referenced by:  
  `${propertyName}`
- Properties can also be loaded from a file
- This tag can be outside a target tag

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## Assigning Identifiers

- Datatypes can be named using the *id* attribute
- Named datatypes can be reused using the *refid* attribute
- Properties don't use this because they already have a name
- Properties are reused using `${property}`

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## Conditions

- Ant supports conditional testing via the condition element
- Condition elements can contain boolean elements and, or, and not
- Condition elements can use built-in conditions, such as available
- Targets can have an *if* or *unless* attribute

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## Recommended Practices

- Put source and generated files in separate directories
- Add descriptions to projects and targets
- Adopt a consistent indentation scheme
- Use `<property location="..." />` to define paths

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