Java CLI JDK command line

CONCEPTS

Source becomes bytecode with javac, bytecode runs on the JVM with java. Tools like jar, jshell and jcmd all ship in the JDK.

Main.java source
↓ javac
Main.class bytecode
↓ jar
app.jar archive
↓ java -jar
JVM running app

Class path separator is : on Linux and macOS, ; on Windows.

RUN

java -version
Print version and exit

java *<File>***.java [args]**
Compile in memory and run

java -cp *<path> <MainClass>* **[args]**
Run a class

java -jar *<file.jar>* **[args]**
Run a JAR's main class

java -Dkey=value ...
Set a system property

java -ea ...
Enable assertions

java -m *<module>*/*<MainClass>*
Run a module

CLASS PATH & MODULES

-cp "lib/*:out"
Add all JARs in lib, plus out

--module-path *<dir>* **/ -p** *<dir>*
Where application modules live

--add-opens *<mod>*/*<pkg>*=**ALL-UNNAMED**
Open a package to reflection

MEMORY & JVM FLAGS

-Xmx<*size*>
Maximum heap

-Xms<*size*>
Initial heap

MEMORY & JVM FLAGS (cont.)

-XX:MaxRAMPercentage=<*n*>
Heap as share of RAM

-XX:+HeapDumpOnOutOfMemoryError
Write a heap dump on OOM

COMPILE (JAVAC)

javac *<File>***.java**
Compile one file

javac -d *<dir> <files>*
Put class files in dir

javac -cp *<path> <files>*
Compile against libraries

javac --release *<n> <files>*
Target a Java version

PACKAGE (JAR)

jar --create --file *<f.jar>* **-C** *<dir>* **.**
Pack a directory

jar --create --file *<f.jar>* **--main-class** *<Class>* **-C** *<dir>* **.**
Runnable JAR

jar -tf *<f.jar>*
List contents

jar -xf *<f.jar>* **[**<*entry*>**]**
Extract all or one entry

JSHELL

jshell
Start the REPL

DIAGNOSE

jcmd
List running JVMs

jps -l
PIDs with main class or JAR

jcmd *<pid>* **Thread.print**
Thread dump

jcmd *<pid>* **GC.heap_dump** *<file>*
Write a heap dump

ENVIRONMENT

JAVA_TOOL_OPTIONS
Options for every JVM