

Unix `make`

Tom Kelliher, CS 245

Nov. 25, 2002

1 Administrivia

Announcements

Test Analysis report due 12/4.

Second exam on 12/6.

Assignment

From Last Time

“Lessons learned.”

Outline

1. Introduction to `make`.
2. `make` lab.

Coming Up

Open days.

2 Introduction to make

A make file for GalaEvents:

```
# Hi, I'm a comment.

JC = /usr/bin/javac

GalaEvents.class: GalaEvents.java Gigobite.class
    ${JC} GalaEvents.java

Gigobite.class: Gigobite.java
    ${JC} Gigobite.java

GalaEvents.java:

Gigobite.java:

clean:
    /bin/rm -f *.class
    echo "All shiny and new."
```

Notes:

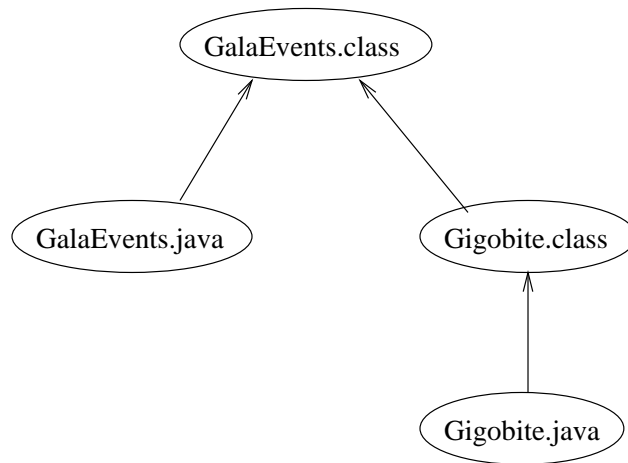
1. Make file constituent parts:
 - (a) Comments.
 - (b) Variable definitions and uses.
 - (c) Targets and dependency specifications.
 - (d) Shell commands (must be preceded by a Tab character).
These are the instructions for making the target.
 - (e) Note the blank lines between target specifications.

2. Make file name: `Makefile`. To run type `make`. To make a specific target, other than the first:

```
make <target>
```

3. Targets are made only when required. How does `make` know this?

Dependency graph for `GalaEvents`:



This information is embedded in the make file target dependencies.

2.1 A More Complex Example

```
XSLOAD = xsload
XSLOAD_SRCS = main.c bitstream.c pport.c jtag.c utility.c xc40.c
XSLOAD_OBJS = ${XSLOAD_SRCS:.c=.o}
```

```
ADDTEST = addTest
ADDTEST_SRCS = addTest.c pport.c utility.c
ADDTEST_OBJS = ${ADDTEST_SRCS:.c=.o}
```

```
EXES = ${XSLOAD} ${ADDTEST}
SRCS = ${XSLOAD_SRCS} ${ADDTEST_SRCS}
OBJS = ${XSLOAD_OBJS} ${ADDTEST_OBJS}
```

```
CC = gcc
CFLAGS = -O
```

```
{XSLOAD}: {XSLOAD_OBJS}
    {CC} {CFLAGS} -o {XSLOAD} {XSLOAD_OBJS}

{ADDTEST}: {ADDTEST_OBJS}
    {CC} {CFLAGS} -o {ADDTEST} {ADDTEST_OBJS}

root:
    chown root {EXES}
    chmod 4555 {EXES}

depend:
    makedepend -I/usr/src/linux-2.2.5/include/linux \
        -I/usr/lib/gcc-lib/i386-redhat-linux/egcs-2.91.66/include \
        -- {CFLAGS} -- {SRCS}

clean:
    /bin/rm -f {OBJS}

spotless:
    /bin/rm -f {EXES} {OBJS}
```

3 make Lab