

Class 2

The Black Boxes

- What is a compiler?
- What is an interpreter?

Activity: Individually, draw 2 pictures in your notes.

The Black boxes: Compiler, Interpreter

For each black box: Inputs, Outputs

Now, where do the following fit?

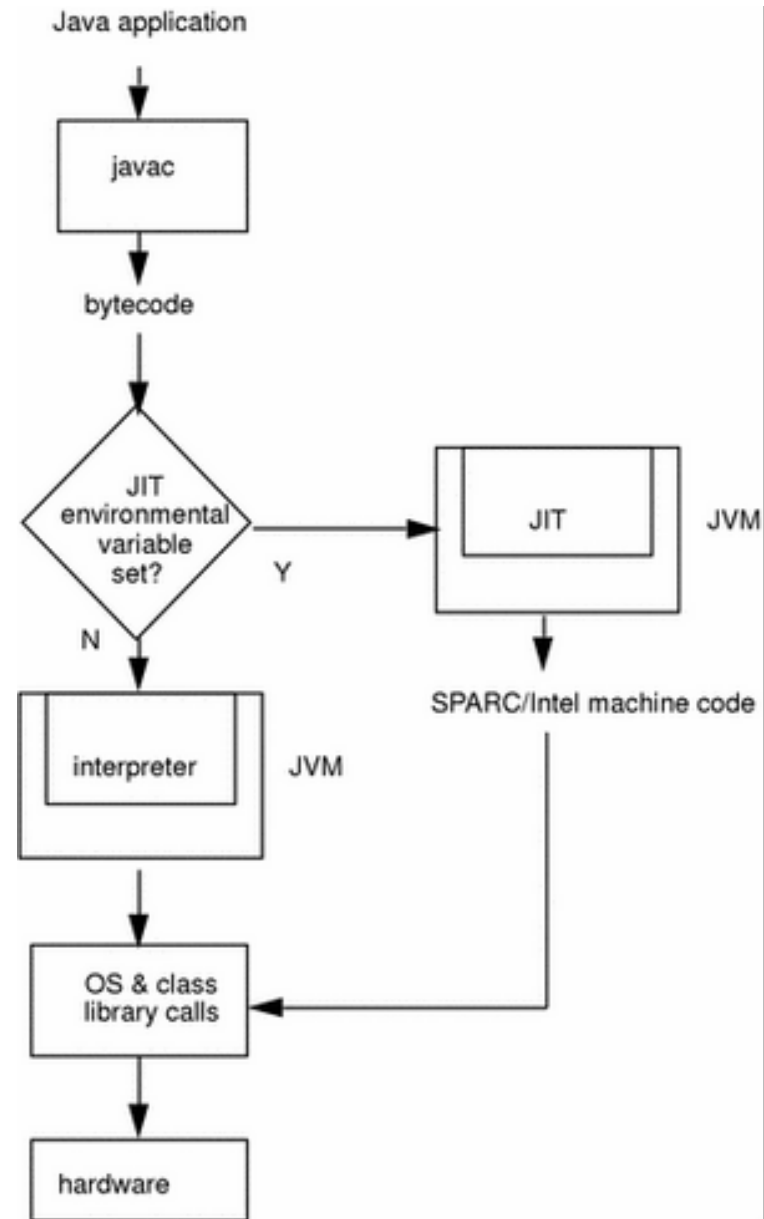
assembler, libraries, linker, preprocessor

Some More Questions

- What is a simulator?
- What is the picture of the Java translation environment?
- How are other languages you know implemented?
- What are the tradeoffs of interpreters and compilers?

Even More Questions

- What is a JIT?



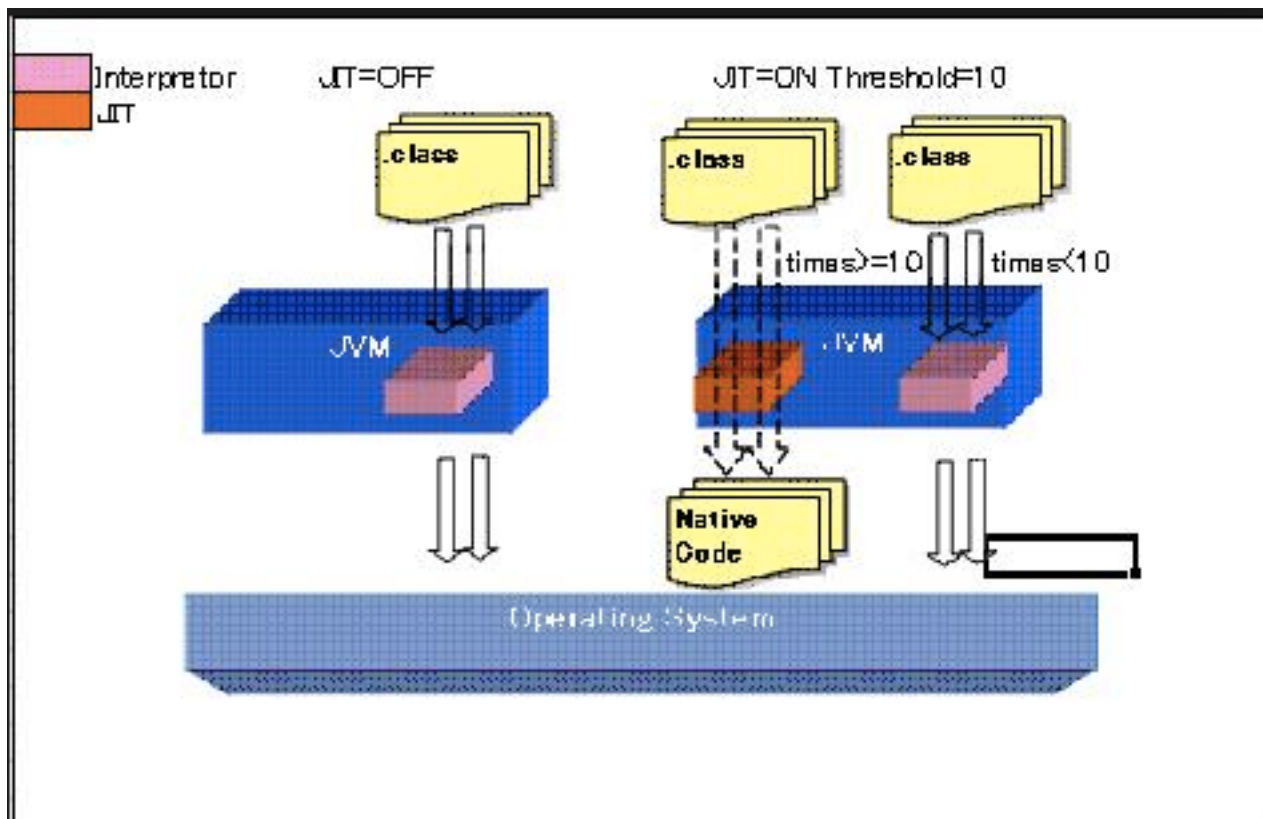
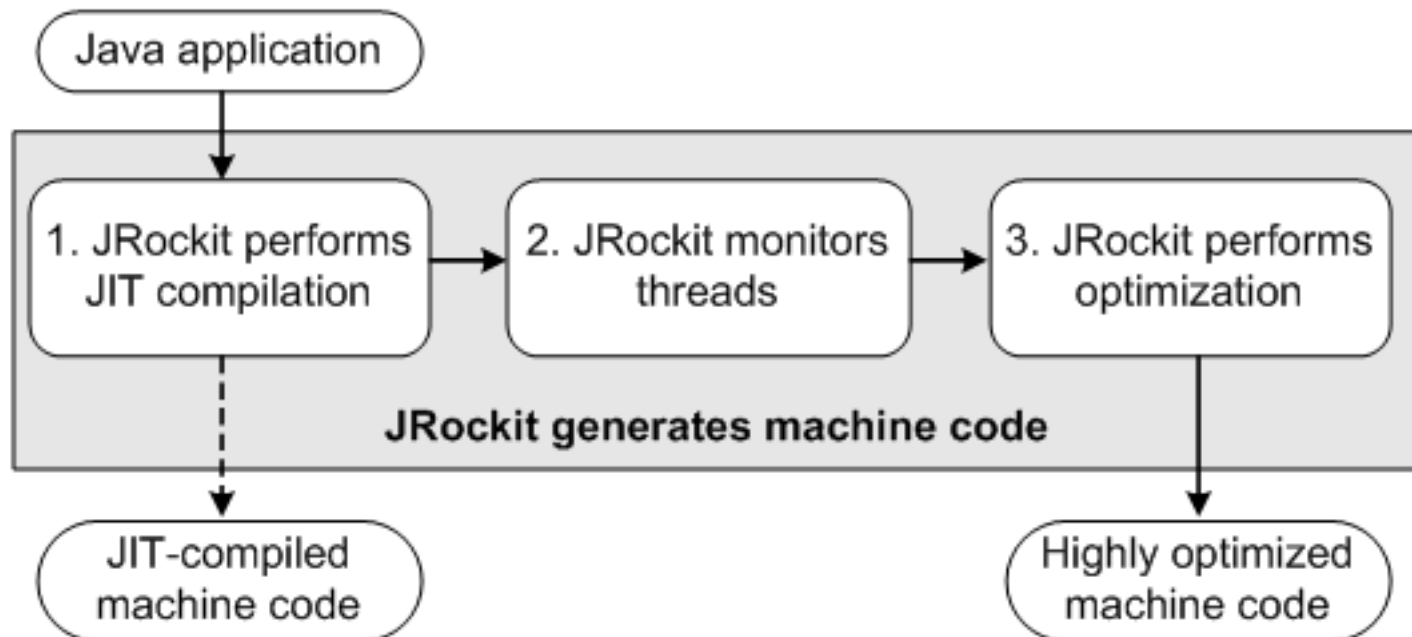


Figure 2-3 How the JRockit JVM Generates Machine Code for Your Java Application



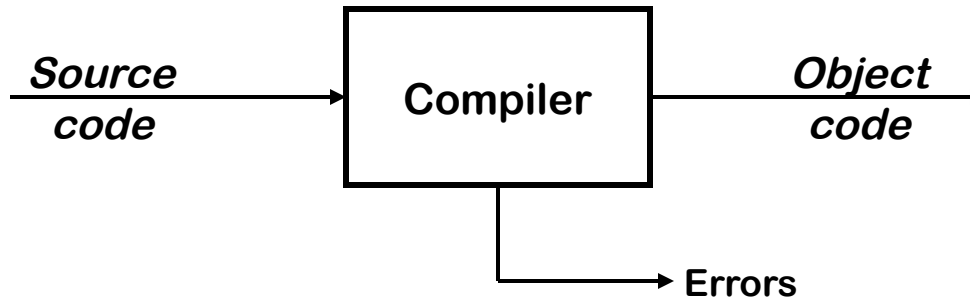
Characteristics of a Good Compiler

You have used several compilers.

What qualities do you want in a compiler that you use?

What does it mean for a compiler to be correct?

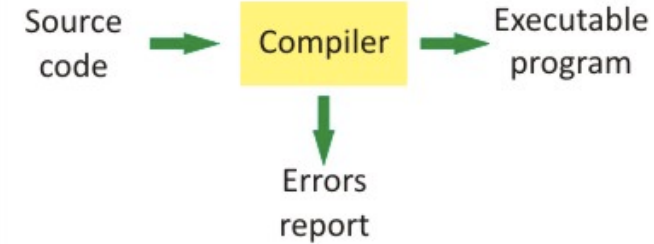
For correctness, what does a Compiler NEED to do?



- Recognize legal (and illegal) programs
- Generate correct code
- Manage storage of all variables (and code)
- Agree with OS & linker on format for object code



OK, Let's take a look inside the compiler now...



Let's watch the translation occur...

From:

```
float answer, initial, rate ;  
answer := initial + rate * 60 ;
```

To:

```
load id3, R0  
mult 60.0, R0  
load id2, R1  
add R1, R0  
store R0, R1
```