

Introduction to Java

TSRK Prasad

Department of CS&IS
BITS, Pilani - KK Birla Goa Campus

October 1, 2014

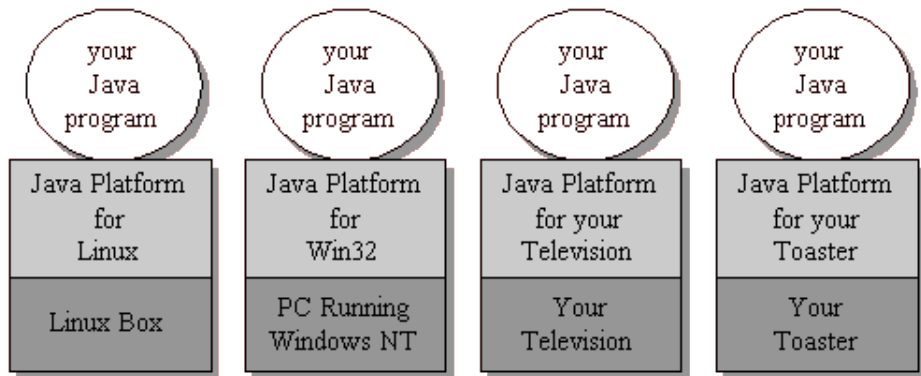
Lecture Outline

- 1 The Idea of Java
- 2 Inside JVM
- 3 Revolution around JVM
- 4 Jargon from Oracle Sun

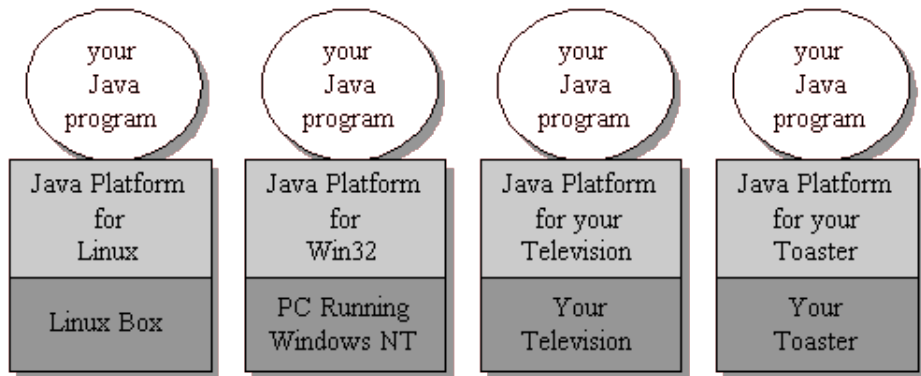
Lecture Outline

- 1 **The Idea of Java**
- 2 Inside JVM
- 3 Revolution around JVM
- 4 Jargon from Oracle Sun

In an Ideal World...



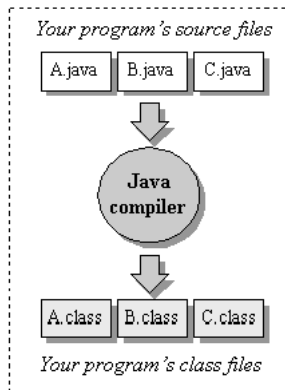
In an Ideal World...



How about your phone?

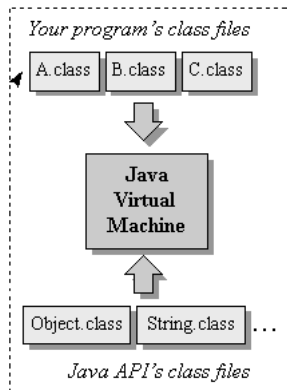
The Idea of Java

compile-time environment



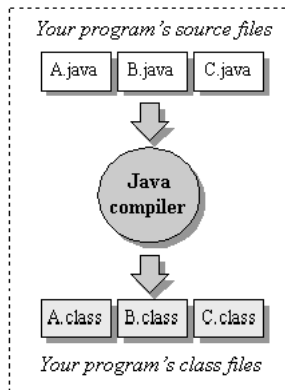
Your class files move locally or through a network

run-time environment

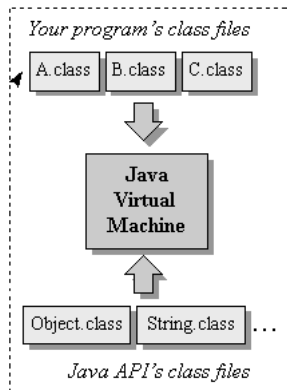


The Idea of Java

compile-time environment



run-time environment

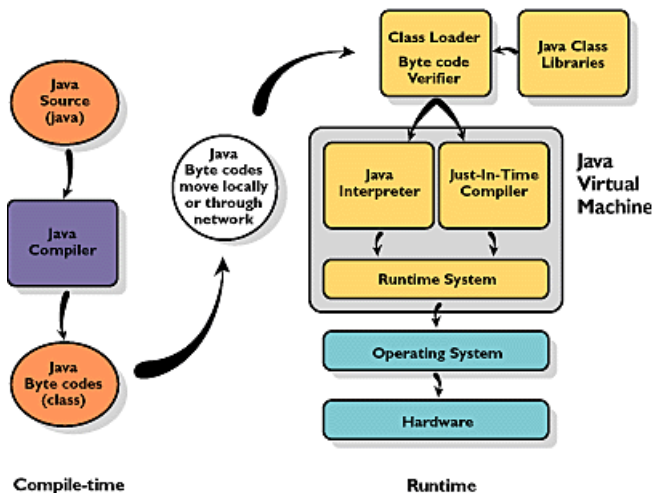


Your class files move locally or through a network

JVM enables the portability

Usual Coding Steps

Java Development and Runtime Environment



On Bytecode

```
public class HelloWorld
{
    public static void main(String[] args)
    {
        System.out.println("Hello_World");
    }
}
```

On Bytecode

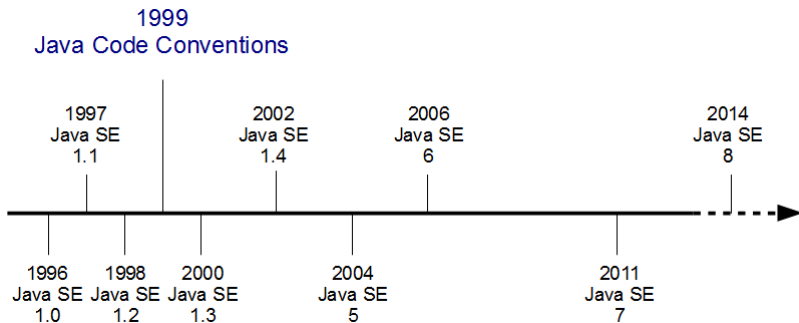
```
public class HelloWorld
{
    public static void main(String[] args)
    {
        System.out.println("Hello_World");
    }
}
```

show byte code

About Experience



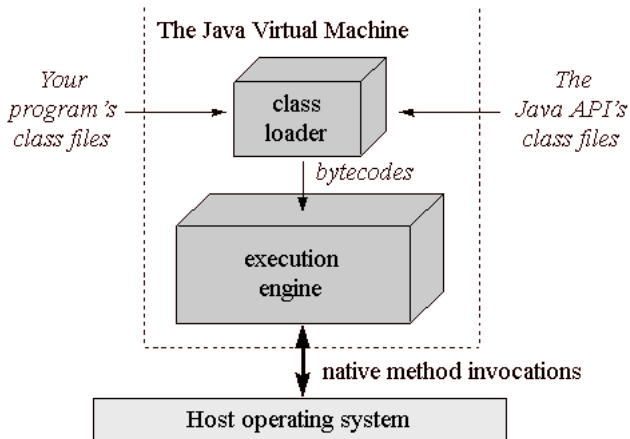
Java Timeline



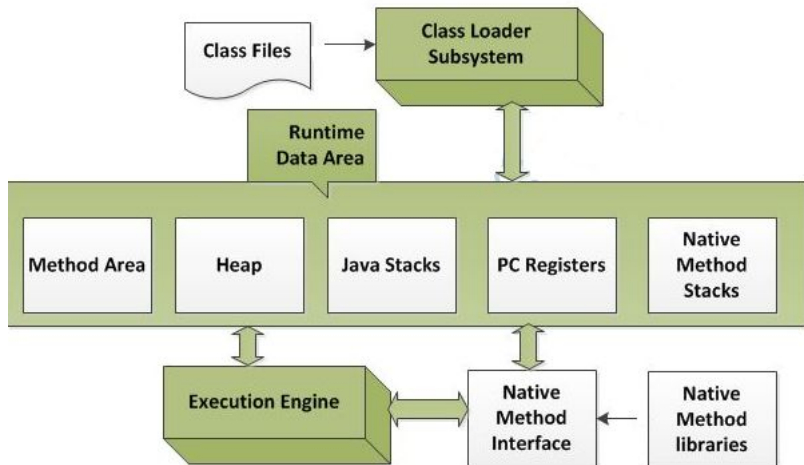
Lecture Outline

- 1 The Idea of Java
- 2 Inside JVM**
- 3 Revolution around JVM
- 4 Jargon from Oracle Sun

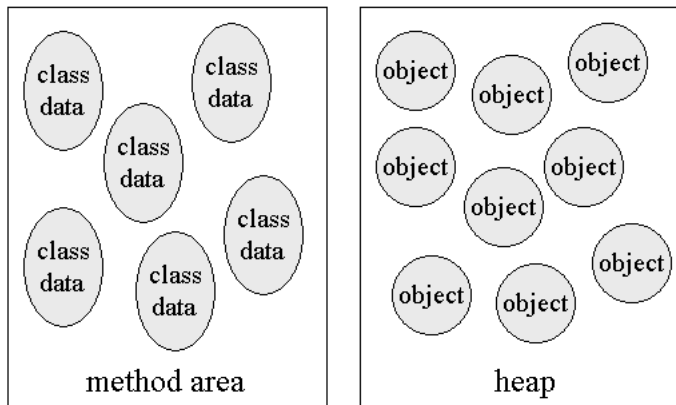
JVM Architecture



JVM Architecture



Method and Head Areas



Stack Frame

runClassMethod()

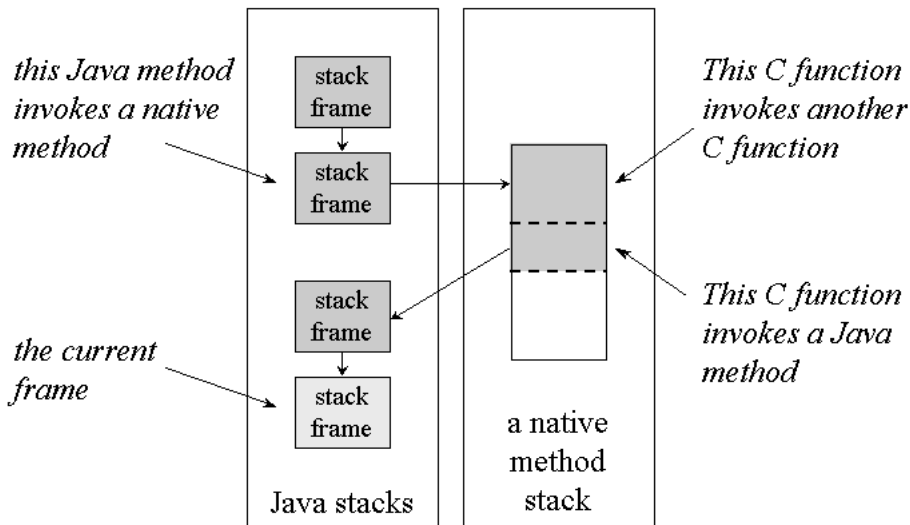
index	type	parameter
0	int	int i
1	long	long l
3	float	float f
4	double	double d
6	reference	Object o
7	int	byte b

runInstanceMethod()

index	type	parameter
0	reference	hidden this
1	int	char c
2	double	double d
4	int	short s
5	int	boolean b

Contains local data, operands, frame data

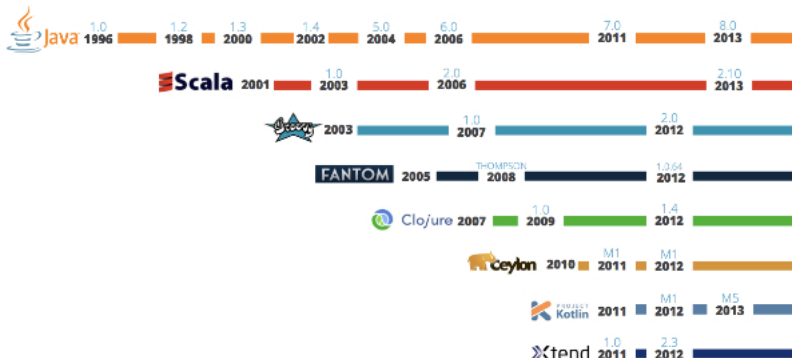
Stack Frame



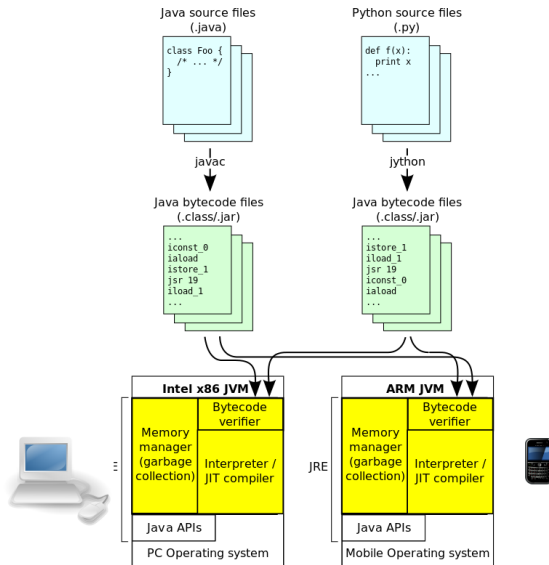
Lecture Outline

- 1 The Idea of Java
- 2 Inside JVM
- 3 Revolution around JVM**
- 4 Jargon from Oracle Sun

JVM Languages



JVM Portability



You Said It

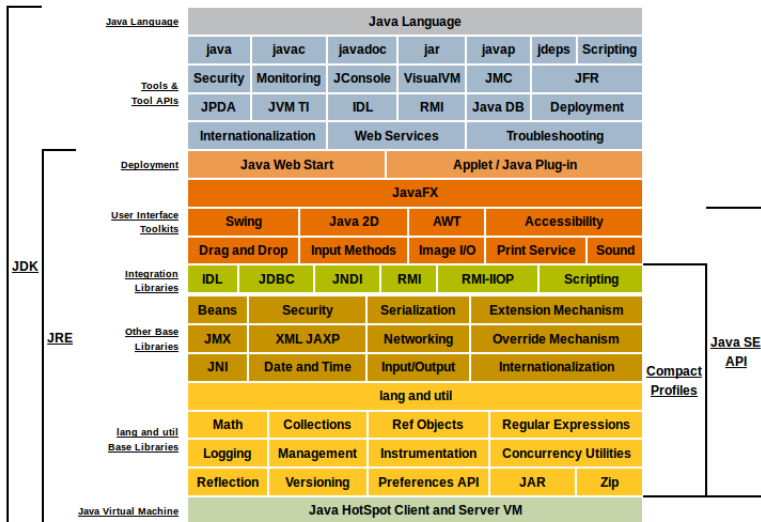
What I really care about is the Java Virtual Machine as a concept, because that is the thing that ties it all together; it's the thing that makes Java the language possible; it's the thing that makes things work on all kinds of different platforms; and it makes all kinds of languages able to coexist.

*JAMES GOSLING,
creator of the Java programming language (2011,
TheServerSide)*

Lecture Outline

- 1 The Idea of Java
- 2 Inside JVM
- 3 Revolution around JVM
- 4 Jargon from Oracle Sun**

Jargon from Oracle Sun



Reading Material

Ch 1 & 6, Inside the Java Virtual Machine, Bill Venners

<http://www.artima.com/insidejvm/ed2/index.html>

Java Class file format

[http://viralpatel.net/blogs/
tutorial-java-class-file-format-revealed/](http://viralpatel.net/blogs/tutorial-java-class-file-format-revealed/)

Acknowledgements

jvm-languages-report-1.jpg	http://zeroturnaround.com/wp-content/uploads/2013/05/jvm-languages-report-1.jpg
code_development.png	http://www.netlab.tkk.fi/opetus/s38130/s98/web/jdk_sc_jre403x337.gif
java.png	http://docs.oracle.com/javase/8/docs/index.html
jvmarch.png	http://www.c-sharpcorner.com/UploadFile/3614a6/java-virtual-machine/Images/jvm%20architecture.jpg
java-coffee.png	http://38.media.tumblr.com/tumblr_m3xijg3K2m1rs3p5uo1_1280.png
JavaTimeling.png	http://4.bp.blogspot.com/-BrSCIqtQKVI/UemhU5h8zDI/AAAAAAAAApU/QIRW82zE4Pc/s1600/JavaTimeline.png
jvmarch2.png	http://upload.wikimedia.org/wikipedia/commons/3/3a/Java_virtual_machine_architecture.svg