

Java is a Platform

- Originally designed as a language to be used to write software for different consumer electronic devices each with differing software and hardware
 - Write once, run anywhere philosophy
 - Emphasis was on developing a platform-independent language a program should run the same on every computer (regardless of hardware).
- Java is a platform for application development.
 - Internet applications
 - Enterprise applications
 - Personal applications
 - Embedded system applications
- Java solves the problem of platform-independence by using byte code.
 - Unlike machine language Java byte code is exactly the same on every platform.
 - An interpreter reads the byte code and translates it into the native language of the host machine on the fly. The most common such interpreter is Sun's program java (with a little j).
 - The interpreter and a few native libraries need to be ported to get Java to run on a new computer or operating system.

Notes:

- Dr. Zanden
 - What are the issues in making a program platform independent?
 - Microprocessor
There are many different microprocessors each has a different set of assembly language instructions that it can execute
 - Operating System
Programs contact the operating system to perform tasks such as sending data to a printer, to the hard disk, or across the network; to allocate more memory space, etc.. Each different operating system has a different set of function calls to perform these tasks.
 - With the traditional approach (C++ compiler), the compiler produces code that can directly run on a particular platform thus it produces code in a particular microprocessors assembly language and makes function calls to a particular operating system (but this is not portable to another platform!)
 - The Java compiler does NOT produce executable object code
 - Produces an object file containing bytecodes
 - Bytecodes are similar to assembly-language instructions and operating system calls but are not specific to any particular CPU or operating system
 - A Java Virtual Machine must be written for any platform that will run Java programs (Windows 98, Windows NT, Unix, Solaris, Mac OS)
- Java (with a capital J) is a platform for application development. A platform is a loosely defined computer industry buzzword that typically means some combination of hardware and system software that will mostly run all the same software. For instance PowerMacs running System 7.5 would be one platform. DEC Alphas running Windows NT would be another.
- There's another problem with distributing executable programs from web pages. Computer programs are very closely tied to the specific hardware and operating system they run. A Windows program will not run on a computer that only runs DOS. A Mac application can't run on a Unix workstation. VMS code can't be executed on an IBM mainframe, and so on. Therefore major commercial applications like Microsoft Word or Netscape have to be written almost independently for all the different platforms they run on. Netscape is one of the most cross-platform of major applications, and it still only runs on a minority of platforms.

- Java solves the problem of platform-independence by using byte code. The Java compiler does not produce native executable code for a particular machine like a C compiler would. Instead it produces a special format called Java byte code. Java byte code looks like this

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CA FE BA BE 00 03 00 2D 00 3E 08 00 3B 08 00 01 08 00 20 08
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- This looks a lot like machine language, but unlike machine language Java byte code is exactly the same on every platform. This byte code fragment means the same thing on a Solaris workstation as it does on a Macintosh PowerBook. Java programs that have been compiled into byte code still need an interpreter to execute them on any given platform. The interpreter reads the byte code and translates it into the native language of the host machine on the fly. The most common such interpreter is Sun's program java (with a little j). Since the byte code is completely platform independent, only the interpreter and a few native libraries need to be ported to get Java to run on a new computer or operating system. The rest of the runtime environment including the compiler and most of the class libraries are written in Java.
- All these pieces, the javac compiler, the java interpreter, the Java programming language, and more are collectively referred to as Java.
- OS
 - i. OS from Microsoft

Windows NT Is Dead; All Hail Windows 2000 ____ After seven years of building name-brand recognition for Windows NT, Microsoft announced yesterday that it's changing the name of the next release from NT 5.0 to Windows 2000. Microsoft officials were quick to point out that the new nomenclature does not mean the system will be delayed until 2000. Instead, they say, the third beta test cycle will begin in the first quarter of 1999, putting it on track for release next summer.

Microsoft has also changed the naming conventions for the various editions of NT. For instance, the desktop edition of NT, until now called NT Workstation, will be called Windows 2000 Professional. NT Server will be called Windows 2000 Server. NT Server Enterprise Edition will be renamed Windows 2000 Advanced Server.

Microsoft VP of Windows marketing Brad Chase said the company will also create a new edition of the server for high-end usage. Called Windows 2000 Datacenter Server, users will be able to run it on symmetrical multiprocessor machines with up to 16 processors using the shrink-wrapped package, or up to 32 processors on original equipment manufacturer versions bundled on specific hardware vendors' computers.

Microsoft is also changing some of the capabilities of the other products in concert with the creation of Datacenter Server. Windows 2000 Server, for example, will work on servers with up to two processors, while Windows 2000 Advanced Server will work on machines with up to four processors. Currently, NT Server 4.0 Enterprise Edition--the comparable system to Advanced Server--works on machines with up to eight processors. In addition, NT Server 4.0, which is comparable to Windows 2000 Server, supports up to four processors.

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