# ActiveX and Java

ActiveX™ is a set of technologies that enables developers to combine the output of many programming languages into a single, integrated World Wide Web site. Microsoft Corp. has recently enabled Java, the new Internet programming language that runs on many platforms, to work with the ActiveX specification, bringing a richer set of programming options to Java.  Java developers can now extend their Java Applets to work with Web objects created in other languages, and can make calls to the operating system to improve performance or take advantage of standard interface conventions such as sound control.  For Web site developers, this means a broader range of options for creating active content.

## Microsoft Supports Java

Microsoft has included support for Java Applets in its Microsoft® Internet Explorer version 3.0 Web browser, which incorporates the company's implementation of the Java Virtual Machine.  In licensing Java™ to Microsoft, Sun Microsystems Inc., designated the Microsoft implementation of the Java Virtual Machine as the reference implementation for the Windows® operating system.  This reference implementation will be returned to Sun for widespread distribution and inclusion in other Web browsers.  Microsoft's Java reference implementation, supported by tools vendors such as Borland International Inc., Symantec Corp. and Sybase-Powersoft, does more than simply run Java Applets, however.  It extends Java by allowing applets to work with other Web objects using ActiveX.

Microsoft has also introduced its Java development tool, the Visual J++™ development system, which enables developers to create fast and high-performance Java Applets on the Web.  This tool is designed to give developers, both novices and experts, everything they need to quickly and productively create applications that take full advantage of Java's capabilities.

## Extending Java With ActiveX

ActiveX makes it possible for Java developers to take advantage of the full range of available Internet tools.  Because of the ActiveX extensions to Java, developers can now enhance their Java Applets with multimedia effects, highly

tuned performance, and an extensive collection of software objects, including ActiveX Controls, ActiveX Documents and ActiveX Scripting.  Over 1,000 ActiveX Controls are available today, offering high-performance interactive applets, many with multimedia effects, that developers can use as ready-to-go building blocks for their Web sites.  ActiveX Documents allow Web developers to access the full power of PC desktop applications such as Microsoft Word, Microsoft Excel, or Visio Corp.'s Visio® from their Web site.  And ActiveX Scripting provides the ability to automate the interactions between multiple objects, including Java Applets, ActiveX Controls and ActiveX Documents, enabling them all to work together as part of an integrated, active Web site.  In addition, extending Java with ActiveX enables Java Applets to take advantage of audio and video controls, enhanced performance, printing and other operating system-level features.  By giving Java developers the option to work with ActiveX, Microsoft has brought together the most powerful Web technologies in an open, integrated platform and enabled Web developers to exploit the full range of technology building blocks for the Internet.
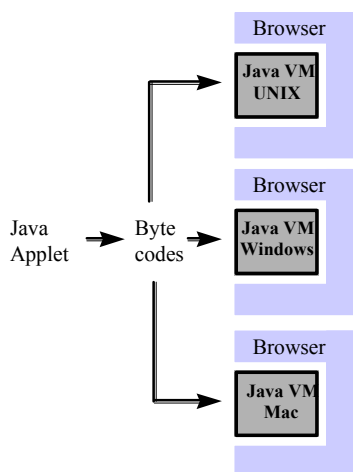


**Fig. 1.**  The Java Virtual Machine enables Java Applets to run on many platforms.
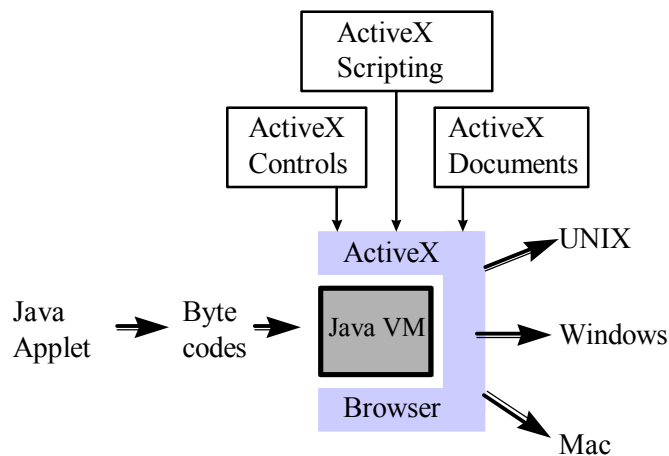
**Fig. 2.**  Microsoft extends Java to integrate with the ActiveX specification, delivering a rich assortment of additional capabilities.

## Across a Choice of Platforms

ActiveX will be supported by the most popular operating systems, giving users their choice of desktop platform on which to experience the rich integration of Java with ActiveX.  ActiveX is currently supported on Windows by both Microsoft Internet Explorer 3.0 and Netscape™ Navigator using a plug-in from nCompass Labs Inc.  Microsoft is working with Metrowerks Inc. to support ActiveX on the Macintosh® and with Bristol Technology Inc. and Mainsoft Corp. to support ActiveX on UNIX® systems.  Each of these platforms will support the integration of Java with ActiveX, delivering the widest range of Internet capabilities to the widest audience of users.

## Using a Choice of Tools

By extending Java to work with ActiveX, Microsoft has given Web site developers a wide range of tool choices.  ActiveX Controls can be created using the Visual Basic® programming system, the Visual C++® development system set, Borland® Delphi®, Borland C++ and other popular PC development tools, including those that use the Java language.  ActiveX Documents are created using a wide range of desktop applications such as Microsoft Excel, Word, the PowerPoint® presentation graphics program and others.  ActiveX Scripts can be written using Visual Basic, Scripting Edition, a natural subset of Visual Basic, or JavaScript™. Java Applets are created using an assortment of Java development tools from leading PC tools vendors.  Whatever tool is used, the result can be integrated with any other object through ActiveX.  ActiveX allows the output of many different tools and the work of many developers of different backgrounds to be combined into a single active Web site.
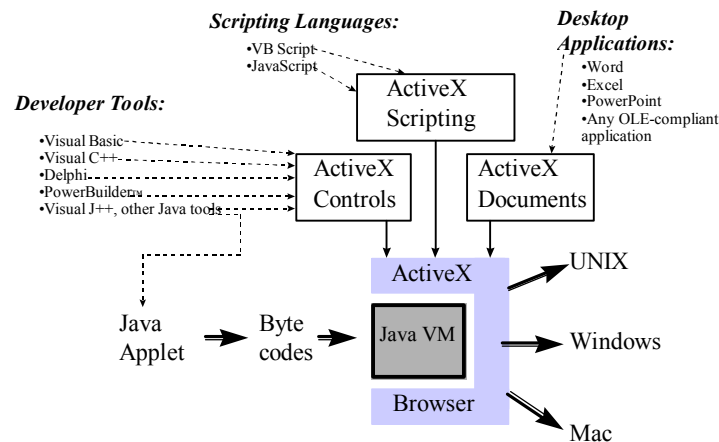
**Fig. 3.**  A choice of tools for creating active Web content.

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