IBM

WebSphere® software

Extend your e-business to mobile devices

Highlights

■ *Production-ready, Java Powered™ runtime speeds device deployment*

■ *Open standards enables connectivity*

■ *Proven over the course of five releases; used in production*

■ *Configurable to address memory and speed constraints*

■ *Integrated tools separate it from the competition*

E-commerce is at hand

The next generation of e-business applications is at hand. Handheld devices play a key role in a variety of applications, from increased communication to increased revenue. According to the Gartner Group, wireless customers are expected to account for 40% of e-commerce by 2004. Intermittent connectivity and configuration challenges are the driving forces behind the leading-edge tools, solutions and expertise required for next generation e-business solutions. IBM pervasive computing is powering these solutions with open standards and Java™ technology, supported by the WebSphere® platform and it's proven, secure and reliable infrastructure.

IBM delivers pervasive computing

In order for Service Providers, carriers and device manufacturers to stay ahead of the wireless game, the competitive edge depends on providing new and innovative features to entice new customers,

maintain customer loyalty and open up new markets. These higher-value features enable the device to connect professionals who need instant access to data capture, data replication and transactions.
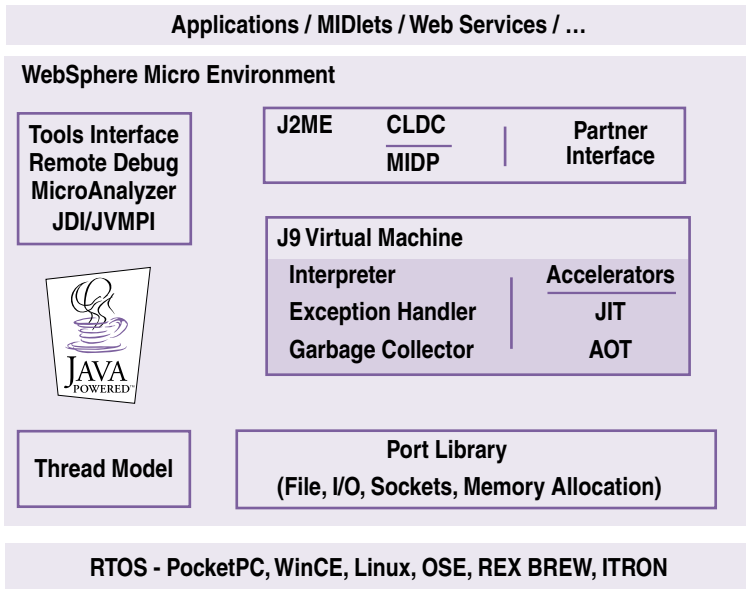
IBM WebSphere Everyplace™ Embedded Software enables you to launch these features by creating applications and services for the new generation of handheld devices. Built from the ground up, our software is designed for the management of both devices and subscribers in a scalable, secure environment. WebSphere Micro Environment provides the foundation for the deployment of e-business applications to small mobile devices. With the assured messaging of MQe, advanced data management capabilities of DB2e and the scalability of WebSphere, IBM has created a complete platform for extending e-business onto millions of small devices.

Breaking through the barriers

As part of an end-to-end solution for deploying enterprise-class applications to small devices, IBM has broken through the "browser barrier," enabling devices to store and forward information as a wireless or wireline device is intermittently connected. The WebSphere Micro Environment has broken through the "device barrier," by providing a production-ready runtime environment across the more popular devices and device operating systems in the market today. Together with the integrated development environment (WebSphere Studio Device Developer), IBM has created the right platform and the right tools — a solution for things that think and link.
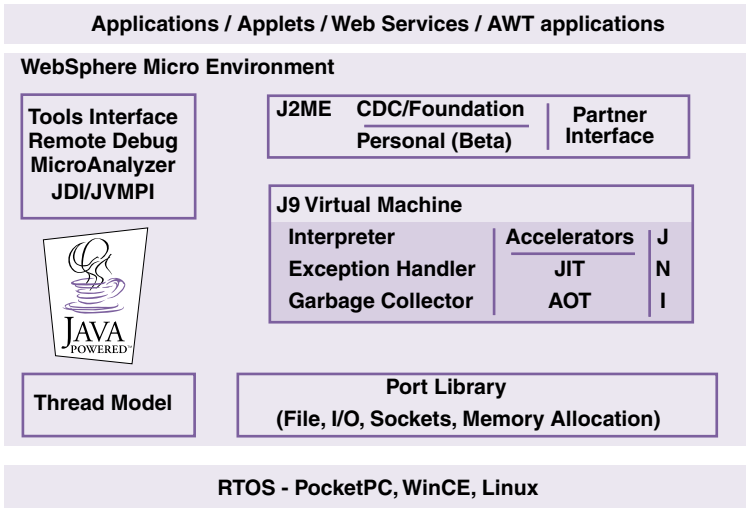
WebSphere Micro Environment contains a production-ready Java Powered runtime environment — and a whole lot more. The next generation of Java applications is supported today by IBM. The environment has been tested and certified to meet the following J2ME® specifications as specified by the Java Community Process℠.

WebSphere Micro Environment — Cellular Telephone

Applications / MIDlets / Web Services / …

WebSphere Micro Environment

Tools Interface Remote Debug MicroAnalyzer JDI/JVMPI	J2ME CLDC MIDP	Partner Interface

	J9 Virtual Machine	
	Interpreter	Accelerators
	Exception Handler	JIT
	Garbage Collector	AOT

Thread Model	Port Library (File, I/O, Sockets, Memory Allocation)

RTOS - PocketPC, WinCE, Linux, OSE, REX BREW, ITRON

For small devices such as cell phones, Stinger-based phones and small PDAs, WebSphere Micro Environment ships a platform that meets Connected Limited Device Configuration (CLDC) and Mobile Information Device Profile (MIDP) specifications.

WebSphere Micro Environment — PDA

Applications / Applets / Web Services / AWT applications

WebSphere Micro Environment

Tools Interface Remote Debug MicroAnalyzer JDI/JVMPI	J2ME CDC/Foundation Personal (Beta)	Partner Interface

	J9 Virtual Machine		
	Interpreter	Accelerators	J
	Exception Handler	JIT	N
	Garbage Collector	AOT	I

Thread Model	Port Library (File, I/O, Sockets, Memory Allocation)

RTOS - PocketPC, WinCE, Linux

For larger devices, such as larger PDAs, PDA Phones and handheld computers, WebSphere Micro Environment supports the Connected Device Configuration (CDC) and Foundation Profile. The J2ME Personal Configuration will also be available from the **ibm.com**/*embedded Web site, once the TCK testing has been completed. A beta of the Personal Configuration is available today.*

Standards compliance

WebSphere Micro Environment was the first virtual machine to support the new J2ME specifications, simultaneously, across 15 platforms. Unlike other virtual machine offerings, it provides a platform that is certified to J2ME specifications. This allows device manufacturers to start today, to build devices that will host the next generation of Java applications. Proven over the course of five releases, WebSphere Micro Environment is already used in production to coordinate construction schedules, drill for oil in the North Sea, and deliver instantaneous messaging to mobile employees.

Connectivity

The major differentiating factors for selecting WebSphere Micro Environment are industry support and connectivity. The network of third-party vendors reselling and integrating their products and services with WebSphere Micro Environment, all using the same open standards, ensures that manufacturers have an expanded choice of features and functions to offer on their devices. By pre-testing middleware and server connectivity, using open standards, WebSphere Micro Environment delivers the convenience of mobile devices, with the power of e-business. More than a stand-alone device for Personal Information Management (PIM) and entertainment, WebSphere Micro Environment provides a platform where high value data services become a reality through relational database access data store and forward, transactions and application synchronization extensions. Connectivity to existing applications running e-business applications forms a complete end-to-end solution.

Memory and speed

WebSphere Micro Environment was designed with the constraints of limited memory availability and processing power in mind. By building the virtual machine to perform under the constraints of cellular telephones, the underlying architecture easily scales to deliver performance and footprint capabilities needed for the next generation of Personal Digital Assistant (PDA) and smart phone devices. By using native widgets, WebSphere Micro Environment maintains the performance of the device as well, preserving the native look and feel of applications deployed to the device.

Native interfacing

WebSphere Micro Environment supports the Java Native Interface (JNI), which allows you to directly access native (non-Java) application interfaces, device drivers and Operating System (OS) functions. This provides maximum flexibility for original device manufacturers to select the peripheral devices (point-of-sale, barcode scanners, USB devices, etc.) for industry specific applications, or just to meet the ever-increasing demands for differentiating functions.

The right platform

IBM can help you rapidly extend Internet-enabled transactions to a wide range of pervasive devices, enabling end-to-end solutions across multiple market segments. WebSphere Micro Environment is available through IBM and our Business Partners on many reference platform implementations including PocketPC, Palm OS® and Qualcomm BREW™, as well as

25 embedded device platforms supporting QNX®, MontaVista™, Linux, OSE™ and ITRON. It delivers the right platform for the deployment of e-business applications across millions of devices ranging from point-of-sale barcode scanners, realtime manufacturing controllers, automotive telematics systems, Internet appliances, PDAs and cellular phones. IBM brings to market a pervasive device platform based on open standards, making it easier to adapt new devices to any mobile environment, now and down the road. Please visit **ibm.com**/embedded for a complete list of platforms supported.

IBM stands ready to help

At IBM, we have built lasting relationships with industry leaders in telecommunications, network services and Internet services. We understand your business and can provide custom solutions to expand your portfolio of services and speed your time to ROI. With worldwide resources and an extensive Business Partner network, IBM stands ready to help.

For more information

To learn more about IBM pervasive computing software solutions visit **ibm.com**/pvc or call your local IBM representative.

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