IBM Workplace Client Technology, Micro Edition

Highlights

■ *A platform for deploying high-value data services on mobile devices to the on demand enterprise*

■ *Pre-tested content with proven performance*

■ *Uses standards-based middleware to provide a Java™ 2 Platform, Micro Edition (J2ME™) run-time that combines the power of e-business with the convenience of mobile devices*

■ *Configurable to address memory and CPU constraints*

■ *Integrated tools separate it from the competition*

■ *Available on multiple platforms and in multiple configurations, supporting application deployment across millions of devices*

IBM enables high-value data services

The needs and solutions of an on demand world — the end-to-end integration of people, processes and information within and beyond the enterprise — often vary dramatically by industry. But for the members of the wireless ecosystem, namely, service providers, carriers and device manufacturers, giving the mobile enterprise easy and immediate access to information and applications is the key to staying ahead in the wireless game.

Using standards-based middleware, IBM enables the wireless ecosystem with products that can combine the power of e-business on demand with the convenience of pervasive devices.

IBM Workplace Client Technology, Micro Edition is a platform onto which the next generation of device applications can be deployed. As a powerful enabler of on demand capabilities, it delivers a Java Powered platform where devices have access to pre-tested content, can be maintained over-the-air (OTA), and are pre-enabled for access to enterprise data, applications and transactions.

The specific services that Workplace Client Technology, Micro Environment provides include:

Client Management Services
Operating Systems Support for many of the most popular devices is provided within the Workplace Client Technology by WebSphere® Everyplace® Micro Environment. WebSphere Everyplace Micro Environment provides a J2ME Java Powered run-time environment, and a whole lot more. For small devices such as cellular telephones, smart phones and personal digital assistants (PDAs), WebSphere Everyplace Micro Environment delivers a Java Run-time Environment (JRE) that meets Connected Limited Device Configuration (CLDC) and Mobile Information Device Profile (MIDP 2.0) specifications. For larger devices such as PDAs, PDA phones and handheld computers, WebSphere Everyplace Micro Environment ships the Connected Device Configuration (CDC), Foundation Profile and Personal Profile. Workplace Client Technology, Micro Edition also provides the ability to use custom profiles for applications where footprint and performance are of the most importance.

Security Services are also supported to provide data encryption and decryption, as well as authentication and authorization.

Platform Management Services enable the management of the underlying platform as well as provide dynamic application and service downloads remotely and can be initiated by the user or server for push and pull support.

Interaction and Access Services
Data Services enable a device to coordinate applications and data with another system, from the user's PC, the carrier's portal or an enterprise IT server. This also includes providing Web services support that can allow content, hosted throughout the network (news, weather, sports, finance and others) to be easily accessed from pervasive devices.

Messaging and Communication Services can provide instant connectivity to other people throughout the network and can enable mobile professionals to remain in contact with their colleagues.

Inter-application and service communications are also supported to facilitate sharing of information and control events. Additionally, mobile media messaging and Java Technology for the Wireless Industry (JTWI) are supported for appropriate platforms.

Session Services provide for the user and network session's management, supporting managed, secure and personalized access and control of information and data independent of the network connectivity.

Workflow and Logic Services provide for the implementation of core business logic and management of workflow as part of the overall solution

Pre-enable devices
Workplace Client Technology, Micro Edition also allows you to pre-enable your devices so you can deploy these high-value data services across your network. Built from the ground up, it is a scalable, secure environment that fits with your existing infrastructure. It is designed for the management of both devices and content. As a result, the Workplace Client Technology, Micro Edition allows service providers, carriers and device manufacturers to provide high-value data services that can expand a subscriber base, maintain customer loyalty and open up new markets.
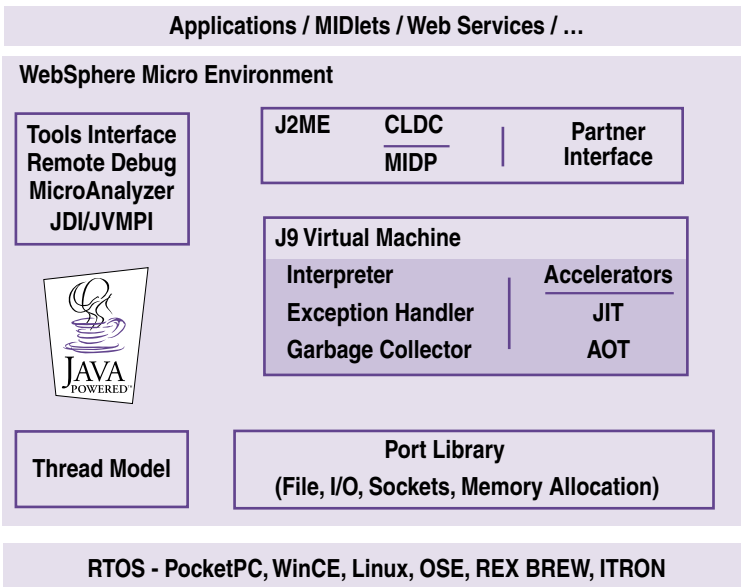
Breaking through the barriers
Workplace Client Technology, Micro Edition has also broken through the 'maintenance barrier,' providing a run-time environment that enables carriers and device manufacturers to maintain and update their devices once they have been shipped to the field. A wide variety of options are available, from synchronizing run-time components (SyncML/DM) and personal information management data (SyncML/DS), through the managed maintenance of software bundles such as the OSGI (Open Standards Gateway Initiative) Service Platform and device management (Tivoli Device Management Agent).
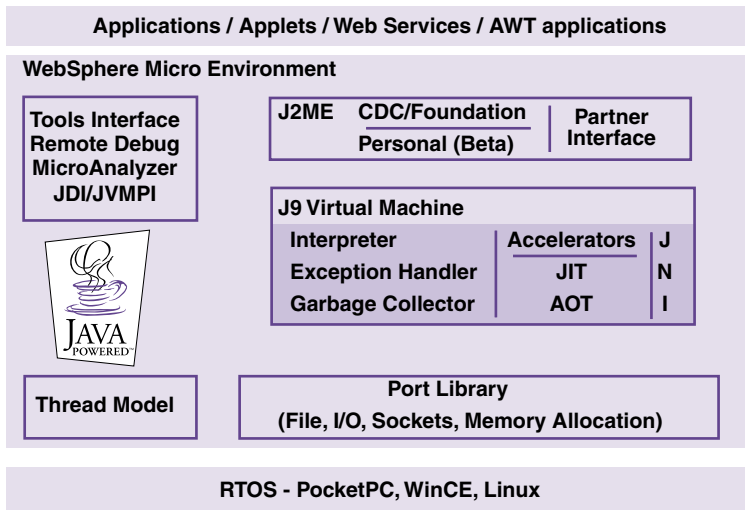
Standards compliance
As mentioned, Workplace Client Technology, Micro Edition contains a production-ready Java Powered run-time environment, and more. The next generation of Java applications is supported today by IBM. As shown in the diagrams, the environment has been tested and certified to meet the following J2ME specifications for both cellular telephones and personal digital assistants and other embedded devices.

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.*

Workplace Client Technology, Micro Edition has achieved quite a few notable design-ins. PalmOne, PalmSource, Symbol, Nokia, Banksys and Sharp have all announced devices utilizing IBM's device platform software. Proven over the course of five releases, Workplace Client Technology, Micro Edition is already used in production field force automation, factory floor Supervisory Control and Data Acquisition Systems, and to provide transactional integrity to support secure, wireless banking payment terminals.

Connectivity

The major differentiating factors for selecting Workplace Client Technology, Micro Edition are industry support and connectivity. The use of open standards ensures that manufacturers have an expanded choice of features and functions to offer on their devices. By testing middleware and server connectivity, Workplace Client Technology, Micro Edition combines the convenience of mobile devices with the power of e-business.

Testing with assured messaging software, such as MQe and Java Message Service (JMS), enables financial transactions. Together with enablement for the advanced data management capabilities of IBM DB2e, IBM has combined the portability of Java technology together with open and industry standards to deliver a comprehensive platform for extending existing business processes onto millions of small devices.

Memory and speed

Workplace Client Technology, Micro Edition 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 PDA and smart phone devices. By using native widgets, Workplace Client Technology, Micro Edition maintains the performance of the device as well, preserving the native look and feel of applications deployed to the device.

Native interfacing

Workplace Client Technology, Micro Edition 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, and so forth) 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. Workplace Client Technology, Micro Edition is available through IBM and our Business Partners on many reference platform implementations including Palm OS, Sharp Zaurus and Windows® Mobile as well as a wide variety of embedded device platforms supporting QNX, Linux, OSE, VxWorks, LynxOS, MontaVista Linux and µiTRON. Please visit **ibm.com**/embedded for a complete list of supported platforms.

It delivers the right platform for the deployment of embedded Java applications across millions of devices ranging from real-time manufacturing controllers and automotive information and diagnostic systems to point-of-sale barcode scanners, Internet appliances, PDAs and cellular phones. Together with WebSphere Studio Device Developer, an integrated development environment (IDE), IBM has created the right platform and the right tools for connected devices — a solution for things that think and link.

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, speed your time to return on investment, and enable an on demand world. With worldwide resources and an extensive Business Partner network, IBM stands ready to help.

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