WebSphere Micro Environment

The Power of WebSphere, The convenience of devices

Dev vs Run-time	Category	Sub-cat.	Feature	Impact	IBM	Vendor B
					WebSphere Micro Environment	
				Quality is paramount. Size is critical. Speed is important		
Runtime						
			Feature	**Benefit**	**Availability**	
		WebSphere Micro Environment				
		VM Speed				
			Ahead-of-time compiler	Much faster (order(s) of magnitude), without the overhead of memory increase. Used primarily for startup code, error recovery code and for 5% developers code that is in need for performance boosting.	YES	
			JIT (Just-in-time) Compiler	Much faster (order(s) of magnitude), but requires JIT compiler on target - space / time tradeoff. Used for highly repetitive code.	YES	
			Adaptive JIT optimization	Frequently used code is compiled at higher level of optimization	YES	
			Can pre-locate/digest whole application	Reduces startup time & footprint significantly	YES - JXE	
			Fast JNI Implementation	Reduces time in calling C/C++ routines	YES	
			Fast Interpreter	12 years experience in building VMs	YES	
			Is the speed of the VM validated by third parties	http://www.csc.ncsu.edu/embedded-java/	YES	
			Optimized for ARM processor	AOT is new in version 5.0 for ARM	Version 5	
		VM Size				
			JXE support	Compresses executables and resources into a single, easy-to-distribute, compact package.	YES	

			Supports XIP (execute in place)	Reduces RAM footprint significantly: fixed bytes stay in flash ROM, only variable part copied to RAM	YES - JXE	
			Class Libraries can be selected to span across device types. From extremely small to Internet Appliance Devices and gateways:	Size is critical for resource-constrained devices where cost per unit is key. Functionality needs to be scalable, and customizable.	YES	
			Tiny J9	Devices under 1MB - ie: Static ARM processor	YES	
			CLDC/MIDP- Static Arm processor	Library for minimal functions for limited devices (CLDC). Java.io, lang, util, x.microedition. MIDlet support.	YES	
			CLDC/MIDP		YES	
			CLDC/MIDP	Security and URL connectivity	YES	
			Full J9	Devices (2 Meg Plus) - SmartPhones, PDAs, Residential Service Gatways, Set Top Boxes, Commercial Gateways, Internet Appliance Devices - Advanced support for floating point, advanced GC (mark / sweep), finalization, Math lib enhancements.	YES	
			CLDC - PocketPC / Windows		YES	
			CLDC/MIDP		YES	
			CDC		YES	
			CDC/Foundation		YES	
			CDC/Foundation/Personal (Adds AWT)	Supports Latest Personal Profile (AWT) on top of J2ME. Awaiting TCK testing, a beta will be delivered in Version 5.0	Beta	
			Supports PersonalJava 1.1 and 1.2 applications	These applications can be run, but are not optimized to J2ME. Applications written to the old specifications (JDK 1.1.8) will take considerable amount of refactoring to move to J2ME	YES	
			Customization of runtime to maintain compatibility, yet reduce the size of the footprint.	More room for the application. Less room on the target device for the runtime - available upon request.	Upon Request	
		VM Standards				
			Supports Latest J2ME Standards	Supports the latest JDK levels	YES	
			JDK 1.3 JRE levels	Newer, more stable base	YES	
			Certified CLDC (1.0a)	TCK Tested and certified compatible to the specifications as outlined in the Java Community Process(SM)	YES	
			Certified CLDC/MIDP (1.0a)	"	YES	
			Certified CDC (1.0_01)	"	YES	
			Certified CDC/Foundation	"	YES	
			J2ME CDC/Foundation/Personal Profile	Awaiting TCK for certification, beta level only	Beta Awaiting TCK	

			Web Update for new specifications as they become available	Having a web update feature to distribute the latest tested profiles and configurations, as they become available (MIDP NG),…	YES	
			TCK Tested to earn the Java Powered(TM) logo.	Product, not reference implementation. Supported. Free and clear of all third party licensing	YES	
		(debug)	Supports JDI (Java Debugging Interface)	Can use standard debugging tools	YES	
		(debug)	JDI code on host or remote target	Code on host saves space / increases speed on target	Host	
		(profiler)	Supports JVMPI (JVM Profiler Interface)	Can use standard tools (I.e. Sitraka JProbe)	YES	
		VM Special Features				
			Supports Multiple Memory Configurations (flash, ROM, discontiguous)	Flexibility to choose the device that is right for the application based on speed, cost, maintenance and upgradability	YES	
			Run Multiple VMs concurrently (per thread, per process)	Allows application isolation and flexible RTOS process control	YES	
			Execute from ROM	Useful when you want to offer additional aftermarket parts, services to a device that has shipped	YES	
			Allows multiple VMs with shared or separate stacks	Allows memory Isolation	YES	
			Single-source JCL and VM	Consistency across all target platforms for portability of application, eases migration and delivers uniform execution environments	YES	
			Structure with portability layer for the application and optimization layer for the platform	Portability layer for applications allows multiple platforms to be targeted Optimization layer takes advantage for each platform for speed,…	YES	
		Memory Management				
		Garbage Collection (GC)				
			Realtime extensions for deterministic execution	Threads can execute at higher priority than GC for critical tasks	YES	
			Precise or conservative?	Precise = better (Conservative = not all objects collected)	Precise	
			Configurable / tunable?	Improves speed & space	YES	
			Incremental	Reduces minimum timeslice needed/GC does not lock VM (needed for realtime)	YES	
			Interruptable	Required to handle time-critical interrupts & tasks	YES	
			Generational	Scanning of generational objects saves lookup time and increases CPU efficiency.	YES	
		OSGi				
		Development Environment				

			Test Environment provided / available - for development use only	Needed for OSGi development	YES	
		Flash support				
			Can write bundles directly to flash	Enables component update and activation without interupting the customer	YES	
			Can execute downloaded code in place (XIP)	Saves RAM - fixed bytes stay in flash ROM, only variable part copied to RAM	YES	
		Natives				
			Supports download of native code, drivers, (non-Java) files	Standardizes downloads, allows config management of non-Java files	YES	
		IDE support				
			Built in bundle upload to server	Greatly simplifies OSGi server management	YES	
			Debug Support for bundles	Debugging bundles avoids Printf debugging	YES	
			Assists in defining prerequisites	Simplifies complex bundle / package relationships, helps debug prereq issues	YES	
		Other				
			Follows prereq chain	Ensures required prerequisites are also downloaded, even if not specified by client	YES	
		GUI				
		AWT				
			AWT / SWT standards-based UI for Java	Allows interoperability of apps - however, significantly larger and slower than bitmap-based systems: full windowing controls	YES	
		Browser Integration				
			Browser Integration across multiple platforms	Has partnerships with Browser companies who support browsing across multiple platforms (NetClue, Opera)	Partner	
			Browser Integration on popular devices (Pocket IE)	Reduces memory required when original browser on device is used - This will be shipped via web update.	Web Update	
		Connectivity to Data Services				
		Carrier				
			Provides a J2ME Java Powered runtime environment	Device becomes a platform for multiple applications written by different developers. Opens up device to applets, midlets,… written by the development community.	YES	
			MIDP Extensions - Can be modified for individual carrier extensions.	Each carrier has their own communications stack, security, HTTP and provisioning engines.	Upon Request	
			SynchML/DM synchronization engine for	For synchronization of files, applications, PIM data and data services	Beta	
			CLDC/MIDP		YES	

			CDC/Foundation		YES	
			Integrates with provisioning servers			
			BREW		YES	
			JSR 124 Generic Provisioning Servers	Download of the VM and applications via provisioning servers.	Upon Request	
			Extensions for individual carriers provisioning engines	MIDP Extensions are carrier specific allowing service providers to control the flow of applications that run on constrained devices	Upon Request	
		e-business				
			Integrated with device databases using Open Standards (JDBC)	Supports popular device RDBs (DB2e)	YES	
			Integrated with Ojbect Oriented databases	Cloudscape	YES	
			Integrated with messaging middleware			
			MQSeries / WebSphere MQ	Asynchronous Messaging	YES	
		Partner Technologies - IBM Parnters with complimentary technology				
		Entertainment				
			MPEG 4 encoder / decoder support	Allows developers to create a multi-media streaming video soltuion on small devices. Tested with WebSphere Micro Environment	PacketVideo Emblaze	
			Multi-media gaming, inHome	Java Browser SDK, email client	Espial	
		Connectivity				
			Jini support	Allows very small devices to share information with enterprise systems, or peer-to-peer	PsiNaptic	
			Mobile Classic Blend Support	Remote control of user interface deployed on client device, minimizes the	Applied Reasoning	
			OSGI server support	Open archtecture allows for other OSGi servers to plug in	Prosyst	
			Bluetooth support	Wireless connectivity	Rococco	
		Security				
			Tested with Secure Sockets Layer Software	Provides a secure socket layer, tested with WebSphere Micro Environment.	Wedgetail	
		Tools Partners				
			PalmOS GUI builders. UML Modelling tools.	Quickly assemble and deploy PalmOS based applications	Data Represtations	
		Platform Coverage				

		Flexibility to target new processors and platforms				
			Does the VM and tools cover the platforms you wish to target and allow you to port applications easilly	VM, Classlibs and tools cover a broad range of embedded target platforms: CPUs and RTOSs (Please visit our website at: http://www.embedded.oti.com/download/platform.phtml)	Compare	
			Vendor capable of porting the runtime to new platforms	IBM can accommodate new platforms on a project basis: Contact IBM or Business Partners for details	Yes	
			Is the vendor open to discussing porting the runtime to new platforms	Are you free to implement on a platform that is right for your application	YES	
			Application portability between the platforms can be demonstrated	Is portability a claim or is it reality?	Single source VM across platforms	
