WebSphere Custom Environment

Ultimate control over embedded devices

Dev vs Run-time	Category	Sub-cat.	Feature	Impact	Weight	IBM	Vendor B
						WebSphere Micro Environment	
Runtime				**Quality is paramount. Size is critical. Speed is important**			
	WebSphere Custom Environment						
		Fast					
			Supports Realtime extensions / deterministic execution	Critical for events that must occur on schedule		YES	
			RT Extensions (in VM or in Java?)	VM is better, faster		VM	
			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	URL HERE		YES	
			Optimized for ARM processor (Jazelle)			Version 5	
		Compact					
			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	
		Architecture designed for embedded					
			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						
		Flash support					
			Supports OSGi Bundles for device management	Refeshing applications and runtime components on a device		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	
	GUI						
		Bitmap					
			Bitmap-based P3ML framework provided	Much faster, better graphics/look & feel designed for embedded - eliminates 'Windows-like' - allows graphic artists to create reconfigurable compelling UI. Allows different "Brand" appearances to use the same functions		YES	
		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	
		Multi Media					
			MPEG4 encoder / decoder	Provides a multi-media experience, streaming video to end user		Partner	
		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		Version 5	
	Connectivity to Data Services						
		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			YES	
	Partner Technologies						
		Entertainment					
			MPEG 4 encoder / decoder support	Allows developers to create a multi-media streaming video soltuion on small devices. Tested with WebSphere Micro Environment	Partner	PacketVideo Emblaze	
			Scalable Vector Graphics	Used in a wide variety of ways to deliver detailed drawings, schematics, mapping information, without large overhead on the device		Bitflash	

			Multi-media gaming, inHome	Java Browser SDK, email client	Partner	Espial	
		Connectivity					
			Jini support	Allows very small devices to share information with enterprise systems, or peer-to-peer	Partner	PsiNaptic	
			Mobile Classic Blend Support	Remote control of user interface deployed on client device, minimizes the	Partner	Applied Reasoning	
			OSGI server support	Open archtecture allows for other OSGi servers to plug in	Partner	Prosyst	
		Security					
			Tested with Secure Sockets Layer Software	Provides a secure socket layer, tested with WebSphere Micro Environment.	Partner	Wedgetail	
		Tools Partners					
			PalmOS GUI builders. UML Modelling tools.	Quickly assemble and deploy PalmOS based applications	Partner	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	
Quality							
	Commitment						
			Depth of embedded knowledge. Long term vendor commitment to OO and VM technologies	How much experience does your vendor have in building VMs for embedded systems		15 years	
			Ongoing commitment (financial / resources) to survive in the embedded market	Or will the vendor chase the next 'hottest' thing		15 Years experience	

			Single code-base across all target platforms	More platforms relying on one code base increases quality. There is only one code base to extend, modify and maintain (from one Lab). New platforms can be targeted quickly and easily. Avoid relying on split codestreams from multiple labs.		YES	
			Vendor uses its own tool to build WebSphere Studio Device Developer, to maintain the product	Problems found early in development cycle. Any configuration shipped to customers can be immediately recreated.		YES	
			Vendor customizes the solution for project opportunities	Vendor and partners create custom solution to match your project needs (reconfigure Classlibs and VM for a specific application)		Call	
