



Connected Device Configuration (CDC) HotSpot™ Implementation

Java™ virtual machine technology for consumer and embedded device platforms

Highlights

- Java virtual machine (JVM™) compliant
- Supports resource-constrained devices
- High performance and reliability with low memory footprint
- Scalable and robust in heavily threaded scenarios
- Retargetable for a broad range of products
- Faster time to market through rapid porting to new target CPUs and operating systems
- Compatible with developer tools for Java Platform, Standard Edition

Overview

Sun's Connected Device Configuration (CDC) HotSpot™ Implementation is a fully compliant, Java™ virtual machine that is highly optimized for resource-constrained devices, such as consumer products and embedded devices. The CDC HotSpot Implementation combines excellent performance and reliability with a low memory footprint to meet the needs of a broad range of product scenarios.

Benefits

The CDC HotSpot Implementation is designed for the world of PDAs, set-top boxes, smart phones, and other consumer products and embedded devices. It complies with the same Java virtual machine and core library specifications as the Java Platform, Standard Edition (Java SE, formerly J2SE) runtime environment, but its implementation is tailored to the needs of resource-constrained devices.

Because product designs vary, the CDC HotSpot Implementation allows device-friendly tradeoffs between performance and constrained resources. The CDC HotSpot Implementation achieves best-of-class performance with a modern dynamic compiler and solid reliability for multithreaded and low-memory conditions. In addition, portability interfaces enable rapid porting to new target CPUs and operating systems, while maintaining excellent performance.

Java Virtual Machine compliant

- Multiple user-defined class loaders
- Serialization
- Reflection
- Weak references
- Full I/O and networking

Device support

- Excellent performance
- Reliability
- Low-memory conditions
- Multithreaded scenarios

Device friendliness

- Portable
- Configurable
- Low memory footprint

Retargetable

Modular implementation

- Narrow porting interfaces focus effort on target system, rather than virtual machine internals
- Written in ANSI C and assembly language
- Build-time options for selecting runtime features, including performance-tuning and testability

Supported platforms

- Linux/xScale processors
- Linux/ARM
- Linux/MIPS
- Other platforms supported on demand through Sun's Engineering Services group

Design features

Just In Time (JIT) compiler

- Space efficient
- Fast
- Reliable
- Portable
- Configurable
 - code cache size
 - compilation and decompilation policies

Interpreter

- Fast
- Written in ANSI C
- Uses GCC extensions

Class preloading

- Space saving
- Data sharing
- In-place execution from ROM
- Faster startup time
- Avoids fragmentation

Runtime

- Fast startup and shutdown
- No resource leaks
- Small class footprint for both dynamically loaded and preloaded classes
- Process model independent
 - virtualized JVM state
 - no global variables or statics
- Native and software floating point support

Memory management

- Heap management
 - virtual memory not required
 - fully compactible heaps
 - no fragmentation
- Pluggable garbage collector interface
- Default generational collector
 - short pauses
 - optional discontinuous, segmented generational garbage collection
- coexists with native system

Thread support

- Fast locking
- Scalable and robust in heavily threaded scenarios
- C stack safety for tight memory conditions
- Porting layer supports both native and user-level threads

Standard Java virtual machine interfaces

- Policy-based security model
- Java Native Interface (JNI) native method support
- Java Virtual Machine Debugger Interface (JVMDI) debug support
- Java Virtual Machine Profiler Interface (JVMPI) profiling support

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For more information

To learn more about the CDC HotSpot Implementation virtual machine, visit java.sun.com/products/cdc-hi.