

Java 7 New Features

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Common Application Development



Agenda

- Background
- Project Coin
- New File System API (NIO 2.0)
- Fork and Join
- Supporting dynamism
- Misc
- Future changes

Background

- Should be major language improvement
- Sun postponed many times & Oracle acquired Sun
- Major changes left out (-> Java 8 and beyond)
- Java 7 became evolutionary evolvement of Java (6 years of development)
- Released July 28, 2011

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- Package of small language improvements
- Syntax sugar usually
- Features:
 - Automatic resource management (ARM)
 - Multiple Exceptions catching
 - Underscore in numeric literals
 - String in switch statement
 - Diamond operator
 - Binary literals
- Moved to Java 8
 - Elvis & other null-safe operators
 - Large arrays (holds more than Integer.MAX_VALUE elements)

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NIO 2 - Background

- I/O in Java 1.1 (1997)
 - Simple blocking IO
 - File, Readers, Writers, Streams, Console, ...
 - Package java.io.*
- NIO in Java 1.4 (2002)
 - New Buffers, Channels, Selectors, Character Sets, Regular Expressions, ...
 - Provides non-blocking & multiplexed IO
 - Package java.nio.*
- NIO.2 in Java 7 (2011)
 - Extension of NIO
 - Package java.nio.*

NIO 2 – Added Features

- Supports platform specific file systems
- File tree walk
- New file operations (copy, delete, move, ...)
- Symbolic link support
- File attributes & permissions support
- File change notifications
- Focused on async (via Futures or CompletionHandlers) work & performance

NIO 2 – Key Classes

- FileSystems (factory) & FileSystem (interface) as doorway file system
- Path – represents existing or non-existing file & dir
- FileStore – represents storage devices, partitions, ...
- WatchService – observer for file & dir changes
- Attributes – reading & writing attributes
- Permissions – reading & writing permissions

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Fork/Join Framework

- “Simple fork/join framework with flexible and reusable sync barriers, transfer queues concurrent linked double-ended queues, and thread-local pseudo-random-number generators”

```
If (my amount of work < threshold)
    do work directly
Else
    split my work into pieces and wait for
    results
```

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Supporting Dynamism

- Invoke Dynamic
- JVM Enhancement
- Support for dynamic languages on JVM
 - Major performance boost
- JVM became multi-language platform
 - New languages - Clojure, Groovy, Scala, ...
 - Implementation of existing languages - JGNAT(Ada), Jawk, C to JVM compilers, Lisp, Rhino & Nashorn(JavaScript), Pascal, Prolog, Jython, NetRexx, JRuby, Scheme, Jacl (Tcl), ...

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- Better and more predictable multicore optimization
- JIT improvements
- Parallel garbage collector
- Improved memory management
- Support for Sockets Direct Protocol
- Support for SCTP
- Warnings modified
- Compressed 64-bit pointers
- Java 2D improvements
- Library-level support for elliptic curve cryptography
- ...

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Future changes

- Features left out Java 7
- Project Lambda
 - Lambdas introduced to Java
 - Probably be the biggest single change ever made on the JVM
 - Better anonymous classes, improved collections, filter, map, reduce, lazy, ...
 - Filtered = goods.filter(t -> t.getAmount() > 100), ...
- Project Jigsaw
 - Modules introduction
 - Easier versioning, new classpaths
 - No more JAR-hell
 - Moved to Java 9

Thank you!

– Questions ?

