Using Apache Derby: The Open Source Database Embedded in ColdFusion 8

Additional Notes

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In addition to the information offered in the Presentation Slides (at
http://www.carehart.org/presentations/#derby) , the following expands some of the topics.

How does it perform and scale?

Additional Resources:

- *Tuning Derby*, http://db.apache.org/derby/docs/dev/tuning/tuningderby.pdf
- *IBM's Cloudscape Versus MySQL*, http://www.devx.com/ibm/Article/28526
- Apache Derby Performance, http://wiki.apache.org/apachecon-data/attachments/Us2005OnlineSessionSlides/attachments/ApacheCon05usDerbyPerformance.pdf
    o Derby Architecture
    o Performance Evaluation of Derby
    o Performance Tips
    o Comparing Derby, MySQL and PostgreSQL
- Clustering Derby:
    o Sequoia: http://community.continuent.com/community/sequoia
        ▪ And related Tungsten project: http://www.continuent.org
        ▪ And predecessor to Sequoia: c-jdbc: http://c-jdbc.objectweb.org

Some Tips: Various Derby environment settings can be tweaked

Changes can be made in the derby.properties file in [coldfusion8]\db or
[jrun4]\servers\[instance]\cfusion-ear\cfusion-war\WEB-INF\cfusion\db

There are other (programmatic) ways to set properties, but this is easiest for CF users

Interesting ones to consider:

- derby.language.logQueryPlan; derby.language.logStatementText; derby.locks.monitor; derby.storage.pageCacheSize; derby.storage.pageSize; derby.system.bootAll; among others
- Some discussed in Chapter 3 of Tuning Derby:
    http://db.apache.org/derby/docs/dev/tuning/tuningderby.pdf
- More at http://db.apache.org/derby/docs/dev/tuning/ctunproper22250.html

Note that settings made in property file are static (do not take effect upon change, until restart of CF)

Some configuration changes to consider whenworking with larger datasets:

- Increase page size to 32k (derby.storage.pageSize to 32k)
- Increase page cache size (derby.storage.pageCacheSize)
- Increased memory available for joins (derby.language.maxMemoryPerTable to JVM max ~15% of RAM)

Some settings, per database, can be set on DSN connectionstring

- For example, see traceLevel
- For more information, see Derby Developer's Guide
  http://db.apache.org/derby/docs/dev/devguide/derbydev.pdf
    o "Setting attributes for the database connection URL"

Derby jar files (in coldfusion lib dir)

- **derby.jar:** engine library
- **derbytools.jar:** Required for running all the Derby tools (such as ij, dblook, and import/export).
- **derbyrun.jar:** used to start the Derby tools
- **derbynet.jar:** Derby Network Server (and derbyclient.jar for Derby Network Client)

Derby Developer tools: Command line
- http://db.apache.org/derby/docs/dev/tools/
- http://www.java2s.com/Tutorial/Java/0340__Database/JavaDBTools.htm

Other Derby Developer tools: IDEs
- Eclipse
    o Eclipse Derby plugin: http://db.apache.org/derby/integrate/index.html#eclipse
    o Eclipse Data tools Platform (DTP) project: http://www.eclipse.org/datatools/
        ▪ See also "Exploring Your DB With Eclipse 101" articles, starting at
            • http://cfsilence.com/blog/client/index.cfm/2007/11/19/Introspecting-Your-DB-With-Eclipse-101-Including-Derby-DBs
    o ij also accessible from within Eclipse:
      http://db.apache.org/derby/integrate/plugin_help/ij2.html
    o These do not rely on RDS connection
        ▪ Cannot access an embedded database while CF is running. Use Network mode
- Other IDEs
    o Squirrel: http://db.apache.org/derby/integrate/SQuirreL_Derby.html
    o RazorSQL: http://www.razorsql.com/index.php
    o Aqua Data Studio (7): http://www.aquafold.com/index-apache-derby.html
    o These do not rely on RDS connection
        ▪ Cannot access an embedded database while CF is running. Use Network mode

- o See also my list of DB query tools, in my CF411.com site
  - Query tools: http://www.cf411.com/#query
  - Code Generators: http://www.cf411.com/#cfcodegen

Some Common Challenges with Derby on CF

A couple of known problems in CF 8.0

- Can't select 2 columns with same name
- To create new database, must add create=true on datasource connectstring
- See http://www.adobe.com/support/documentation/en/coldfusion/8/releasenotes.pdf

Those are fixed in 8.01, but some issues still remain:

- table names in CFINSERT/CFUPDATE must be uppercase
- See http://www.adobe.com/support/documentation/en/coldfusion/801/cf801releasenotes.pdf

Other challenges observed:

- Not documented, but I find that must add create=true on datasource connectstring for Client/Network database type
- Creating a new datasource sometimes goes to "Other" driver screen
  - o http://www.mkville.com/blog/index.cfm/2008/4/1/Apache-Derby-Embedded-datasource-in-ColdFusion-on-Linux
  - o http://alagad.com/go/blog-entry/easy-rich-internet-applications-with-coldfusion-8
- Problem with Unicode, easily solved
  - o http://www.sustainablegis.com/blog/cfg11n/index.cfm?mode=entry&entry=63C82044-20ED-7DEE-2A8C19192DD21646
- Renaming a column (via Alter Table)
  - o The version of Derby in CF 8/8.01 (version 10.2) does not support this. Fixed in 10.3

Resources for Learning More

Derby site and resources

- http://db.apache.org/derby/
- http://db.apache.org/derby/quick_start.html
- http://db.apache.org/derby/papers/DerbyTut/index.html
- http://db.apache.org/derby/docs/dev/getstart/
- http://wiki.apache.org/db-derby/

Other sites and resources

- Sun Java DB site: http://developers.sun.com/javadb/
- IBM Cloudscape site: http://www-306.ibm.com/software/data/cloudscape/
- Wikipedia entry: http://en.wikipedia.org/wiki/JavaDB

- Swik Derby site: http://swik.net/Derby
- Book, Apache Derby -- Off to the Races, http://www.amazon.com/dp/0131855255
- "Getting Started with Derby": http://www.informit.com/articles/article.aspx?p=730287&rl=1
- "Using Apache Derby in the real world":
  http://www.papercut.com/anonftp/pub/open-source/apache-derby/ApacheDerbyAJUGPresentation.pdf
- "Getting Started with the Derby plug-ins for Eclipse":
  http://db.apache.org/derby/integrate/plugin_help/start_toc.html
- "Securing Data with Apache Derby":
  http://db.apache.org/derby/binaries/djd_derby_security.pdf

Resources describing Derby in a CF Context

- My "Getting Started with the Apache Derby Open Source Database in CF8":
  http://www.carehart.org/resourcelists/derby_for_CFers/
- Derby subsite at CFCommunity.org:
  http://www.coldfusioncommunity.org/group/derby/
- "Working with the Apache Derby Database and ColdFusion", by Chip Temm:
  http://coldfusion.sys-con.com/read/441652.htm
- "Using Apache Derby - The built-in CF8 Database", by Scott Stroz:
  http://www.alagad.com/download.cfm?downloadfile=073F69E3-3048-55C9-435A202E6E8A4A5C&typename=dmFile
- "Derby != SQLite and Other Derby Myths", by Scott Stroz:
  http://www.alagad.com/go/blog-entry/derby--sqlite-and-other-derby-myths
- "Using the Derby Database", by Steve Bryant:
  http://www.bryantwebconsulting.com/blog/index.cfm/2007/6/8/using_the_derby_database
- "Creating Derby embedded databases in ColdFusion 8", Kay Smoljak:
  http://kay.smoljak.com/index.php/creating-derby-embedded-databases-in-coldfusion-8/
- Exploring Your DB With Eclipse 101 (Including Derby DBs!), Todd Sharp:
  - http://cfsilence.com/blog/client/index.cfm/2007/11/19/Introspecting-Your-DB-With-Eclipse-101-Including-Derby-DBs
  - http://cfsilence.com/blog/client/index.cfm/2007/11/20/Introspecting-Your-DB-With-Eclipse-101--Part-2
  - http://cfsilence.com/blog/client/index.cfm/2007/11/21/Exploring-Your-DB-With-Eclipse-101--Part-3

Resources on using Derby with CF, prior to CF8

- "Installing Apache Derby Database on ColdFusionMX 7.0.2"
  http://nagpals.com/blog/index.cfm/2006/9/19/Installing-Apache-Derby-Database-on-ColdFusionMX-702
- "ColdFusion Everywhere PART 2"
  http://coldfusion.sys-con.com/node/48655