204 - Interacting with Relational Databases

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Other Sessions of Interest

• DTP
  - 106. How to Improve Database Connectivity with the Data Tools Platform (Thu 8:30)
  - 306. Architect and Build High-End Data Tools Solutions (Thu 1:15)

• Other
  - T-4. Develop Better J2EE Applications with the Web Tools Platform (Wed 8:45)
  - 401. Consuming and Producing Web Services with Web Tools (Thu 3:15)
  - 706. Step by Step: Making Enterprise JavaBeans with J2EE Standard Tools (Fri 1:45)

Agenda

• DTP Overview
  • Apache Derby Database
  • Using SQL Development Tools
  • Conclusion
Data Tools Platform Project (DTP)

- Top Level Eclipse Project
- www.eclipse.com/datatools/
- Included in Callisto release
- Current version 0.9
- Tools and frameworks for managing data-centric system
  - Refactor common data-centric management into one place
  - Vendor independent
  - Vendor extensible
- Subprojects
  - Connectivity
  - Enablement
  - Model Base
  - SQL Dev Tools
- Dependencies
  - Eclipse 3.2 SDK
  - Eclipse Modeling Framework (EMF) 2.2.0
  - Graphic Editor Framework (GEF) 3.2

DTP Replaces WTP RDB

- WTP Relational Database (RDB) will be removed in the near future. Until then there are two sets of tools that can cause confusing.
- Don’t use the following
DTP Uses

• Build data centric applications
  - Eclipse plug-ins
  - Rich Client Platform (RCP) applications

• Developer toolset
  - Executing SQL and DDL
  - View database elements
  - Saving and export results
  - Debugging stored procedures and triggers

DTP Adopters

• Business Intelligence and Reporting Tools (BIRT)
• Web Tools Platform (WTP)
• Sybase
  - WorkSpace
• Actuate
  - BusinessReport Studio
  - BIRT Report Designer Pro
DTP Subprojects

- Connectivity
- Model Base
- Enablement
- SQL Development Tools

Connectivity

- Driver Management Framework (DMF)
- Connection Management Framework (CMF)
  - Connection Profile
- Open Data Access (ODA)
  - Data abstraction
  - Access data regardless of structure

Solves the problem of each plug-in having its own method of configuring a data source and having to create a new connection for each plug-in.
Model Base

- Domain model
- EMF model not database modeling tools
- General Models
  - Database definition
  - SQL model
  - SQL query model
  - SQL XML query model
- Implementation Models
  - Derby
  - Derby SQL model

Enablement

- Specialized support built on DTP core extensions
  - Database support
    - DB2 databases
    - Sybase databases
    - Oracle databases
    - MySQL database
  - Data sources
    - XML
SQL Development Tools

- Perspectives
  - Database Development
  - Database Debug
- Editors
  - SQL File Editor & Outline
- Wizards
  - SQL File
- Views
  - Data Source Explorer
  - SQL Results
  - Execution Plan
- Configurations

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# Apache Derby

- Relational database
- 100% Java
- Small footprint
- Open Source
- Apache License Version 2.0
- [http://db.apache.org/derby/](http://db.apache.org/derby/)
- Current version is 10.1.3.1
- Embedded or Network Server
- IBM donated part of Cloudscape’s code base
  - DB2 like
  - 10.0

## Database Features

- ANSI SQL Standards
  - SQL-92 core subset
  - Some SQL-99 features
- Security
- Schema
- Transactional
  - Full ACID
  - All four isolation levels
- Stored Procedures & Triggers
- Views
- Drivers
  - JDBC
  - ODBC
Uses

• Unit Testing
• Proofs of concepts
• Embedded database
• Small applications
  - Web
  - Desktop
• Java Web Start (JWS) deployment

Competition

• hsqldb
• IBM Cloudscape
• Borland JDataStore
• MySQL
• PostgreSQL
• Oracle
• IBM DB2
• Microsoft SQL Server
Architecture

- Embedded
- Network Server

Embedded

- Single JVM
- Single Application
- Single User
- Classpath
  - derby.jar
Embedded Connection Information

- **Driver**
  - `org.apache.derby.jdbc.EmbeddedDriver`

- **URL**
  - `jdbc:derby:[subsubprotocol:]\{databaseName\}[:attribute=value]*`
  - `subprotocol`
    - `directory`
    - `classpath`
    - `jar`

- **Example**
  - `jdbc:derby:C:\DerbyDB\MyDB;create=true`

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Network Server

- **Classic Client/Server**
- **Separate process/JVM**
- **Multi-user**
- **Multi-application**
- **Server Classpath**
  - `derby.jar`
  - `derbynet.jar`
- **Server Drivers**
  - Network Client (10.1)
  - DB2 Universal Driver
- **Distributed Relational Database Architecture**
Network Client Driver

- **Included in Distribution**
- **Client Classpath**
  - derbyclient.jar

- **Driver**
  - org.apache.derby.jdbc.ClientDriver

- **Connection URL**
  - jdbc:derby://<server>[:port]/<db>[;<derby attribute>=<value>]

- **Example**
  - jdbc:derby://localhost:1527/SAMPLE;create=true

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DB2 Universal Driver

- **Provided by IBM**
- **Client Classpath**
  - db2jcc.jar
  - db2jcc_license_c.jar

- **Driver**
  - com.ibm.db2.jcc.DB2Driver

- **Connection URL**
  - jdbc:derby:net://<server>[:port]/<db>[;<derby attribute>=<value> [;...][;universal attribute]=<value>; [...]]

- **Example**

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Define Driver

- Window > Preferences
- Establishing Connection
Define Driver

- Select driver template

![Select Driver Template Image]

Define Driver

- Configure driver classpath & properties

![Configure Driver Classpath Image]
Database Development Perspective

Creating Connection Profile

- New Connection Profile button on Data Source Explorer
- Database Node context menu
Creating Connection Profile

- Provide a descriptive name
- Optionally provide a description

Creating Connection Profile

- Configure driver details and test connection
Creating Connection Profile

• Review Summary

![Connection Summary](image)

Data Source Explorer

• View database elements
• Context menus
  - Connect
  - Filter
• Import/Export Connection Profiles

![Data Source Explorer](image)
Data Source Explorer - Filtering

- Context filters
  - Schema
  - Tables
  - Views
  - Stored procedures

SQL File Editor

- Associated with *.ddl, *.sql, and *.sqlpage
- Must “Set Connection Info” to associate editor with connection
- SQL Scrapbook (*.sqlpage)
  - User specific SQL
  - Ignore version control
- Features
  - Syntax highlighting
  - Content Assist
  - Format
  - Content Tip
  - Execute All or Execute Selected Text
SQL Results View

- Results of query
  - Data (grid or text)
  - Status
- History of statements
- Export results (text, XML, HTML or CSV)

Debugging Perspective
Debug Stored Procedure

- Run > Debug > Eclipse Data Tools

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Likely To Follow

- Visual query builder
- Data modeler
- Execution Plan
- More databases supported

Resources

- Wiki
- Tutorial
- Article
  - [http://www.eclipsezone.com/articles/graeham-dtp/?source=archives](http://www.eclipsezone.com/articles/graeham-dtp/?source=archives)
- New Group
Alternative

- SQLExplorer
  - sourceforge.net/projects/eclipsesql

Contact Information

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  - http://blogs.apress.com/authors.php?author=Christopher%20Judd
- Pro Eclipse JST
  - http://www.projst.com
- Enterprise Java Development on a Budget
Questions?

Please fill out your evaluations.

Slides can be found at

http://www.juddsolutions.com/ew2006/