db4objects
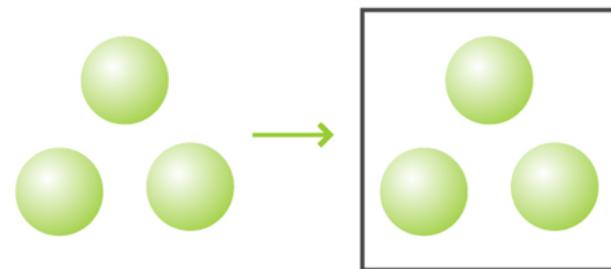
db4objects
Creator of db4o –
the Open Source Object Database

Presentation for EclipseME Team

Carl Rosenberger, CSA db4objects

Christof Wittig, CEO db4objects

May 16, 2007

db4objects

- db4o is the world's most popular object database
- Focus on embedded, zero-admin use
- Open source / dual license business model
- 20,000 registered developers (Java and .NET)
- 100 commercial customers (Boeing, Ricoh, Seagate)

"I stumbled into db4o's highly addictive ease of use and power [...] The savings are substantial even when you factor-in the cost associated with acquiring a commercial license

db4objects

db4o is an <u>embeddable, zero-admin database</u>
- Native to <u>Java and .NET</u> applications
- Enables developers to store their application objects with <u>only one line of code</u>
- Replaces traditional dual schema or O/R mapping approaches
- Requires <u>no DBA</u>

<u>Saves significant time and corresponding cost</u>; enables <u>new types of distributed applications</u> and makes <u>software easier to maintain</u>, refactor, and reuse

db4o has a <u>unique architecture</u> which takes full advantage of Java and .NET's object-oriented programming paradigms

"I demonstrated that the application would reduce the logic code, which is 60% for persistence, to one hundredth of that, and improve performance ten fold, not to mention the overall simplification."

3   *Michael Couck*

db4objects

Content

| Company
| Product
| Market
| Vision

"Tools are available […], but is it perfect? Far from it. One thing that I really appreciate when using Db4o is that I have no such problems. Simply because there is no database schema or in other words: the database schema reflects what I have in my model."

4   *Michal Talaga*

db4objects

Company

Product

Market

Vision

"I have been using db4o a LOT lately, and I don't expect I shall return. I can say without question that it has increased my productivity by at least... 1 million times."

5   *Travis Reeder*

| Founded in 2004

| Headquarters in San Mateo, California (USA)

| Global workforce in 5 continents

| 20,000 community members, 100 contributors, 25 staff

| Spun out of Stanford University
  | CEO Christof Wittig
  | CTO Carl Rosenberger

| High profile backers
  | Mark Leslie (Veritas)
  | Vinod Khosla (Sun)
  | Jerry Fiddler (Wind River)
  | and others

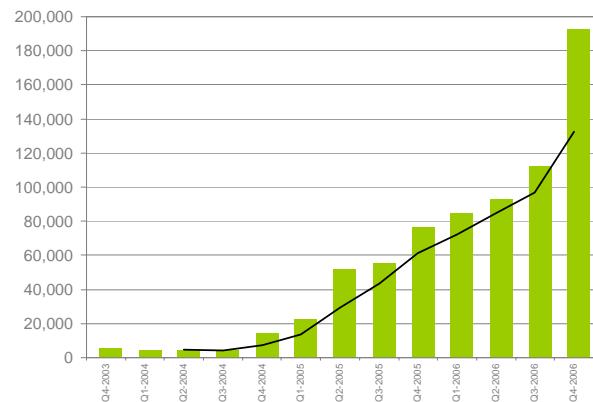# db4objects

The Open Source Dual License Model

Downloads

1,000,000 **downloads** (3/07)

20,000 **registered** users

1,000 **commercial** leads

100 **dDN subscriptions**

30 **runtime** shipments

Download

Register

Qualify

dDN

dRT

GPL

GPL

6

db4objects

Company

Product

Market

Vision

"I'm using DB4O. I'm so behind I'm not going to waste more time messing with Hibernate. DB4O is so quick and simple."

Blogger Sam

7

Renown Customers

BOEING

RICOH

Seagate

Indra

BOSCH

L3 communications

BMW

Hertz #1 Club Gold

Hertz

LOCKHEED MARTIN

SIEMENS

intel

Merrill Lynch

db4objects

Emerging Partner Network

Commercial

Open Source

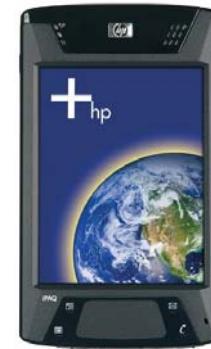(>30 community integration projects)

2007

?

8

db4objects

"db4o a great, open source, OODB that can beat SQL Server anytime when it comes to persisting native objects.

No mapping, no nothing, store your object model, not a flat, relational model. It supports native queries (query in native C#).

Anyways, MS is still too hung up on the old RDBMS product and it shows. So 80's. :-)"

9 *ThomasJ*

db4objects at Heart of "Triple Convergence"

Fast growth of
embedded and smart
device software

Open Source
business models
are validated

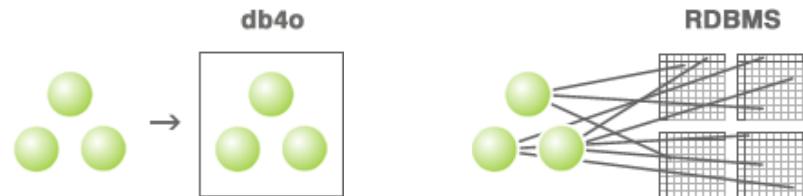Java and .NET
make OO
mainstream

db4objects

db4objects

"After experimenting with db4o I realized that object oriented databases have really the potential to boost up productivity by relieving the programmer of the burden of having to convert all the data between the relational and the object oriented world."

Martin Unterholzner

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Object Persistence Options

db4o

RDBMS

Serialization

- Requires loading full object graph into memory

- Cannot be partially retrieved/queried

- Breaks if the class model changes

db4o

- Objects stored and retrieved as needed

- Full index and query capabilities

- Small footprint

- Zero admin.

- Native implementation (Java/.NET)

RDBMS

- Mapping layer required to store/retrieve objects

- Resource intensive (memory/cpu)

- Slower performance

- Object class modifications require costly schema changes

db4o's Success Relies on 3 Key Benefits

Company
Product
Market
Vision

Slashes 90% of cost to develop persistence

10% faster to market with your application

Runs **up to 55x faster** than conventional systems

Better memory management

More robust and economical than RYO solutions

Brings DBMS grade robustness to small devices

Deployable in large volumes without local administration

Build lean and truly object-oriented software

Build distributed, fully synchronized data architectures

Fewer errors, better refactorability and software longevity

"I'm tossing and turning at night out of sheer excitement of the fact that I can store _real_ objects in a database, without OR mapping!"

11   *Carlos Muentes*

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Company
Product
Market
Vision
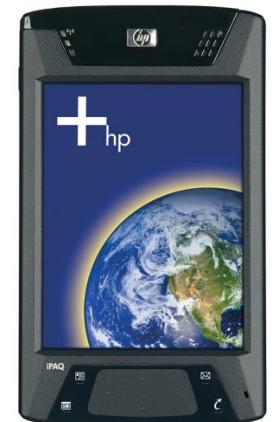
One line of code stores any object

Class model = object schema

Smooth production process

```
public void store(Car car){
    ObjectContainer db =
        Db4o.openFile("car.yap");
    db.set(car);
    db.commit();
    db.close();
}
```

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db4o Key Features: Embeddable

db4objects

| Easy deployment
  | Simple deployment as a library/jar
  | No separate database installation

| Zero administration
  | Hot backup
  | Defragment
  | Application-managed authorization

| Automatic object schema versioning
  | Database upgrades objects automatically to match current class definitions

| Small memory footprint
  | 350k JAR file size (expected to drop to 250k)

db4objects

Company

Product

Market

Vision

| Runs natively in .NET and Java (dll/jar)
  | .NET 1.1, 2.0
    | Compact Framework 1.1, 2.0
    | Mono
  | Java 1.1.x through 5.0
    | J2ME, CDC (Future support for CLDC/MIDP)
  | Requires no IDE plug-ins or specialized compilers
    | Visual Studio 2003, 2005
    | Eclipse
    | IDEA
  | Easily leverage IDE code refactoring to maintain database queries and object code simultaneously

| Mobile, PCs and servers

| Runs cross-platform

"I demonstrated that the application would reduce the logic code, which is 60% for persistence, to one hundredth of that, and improve performance ten fold, not to mention the overall simplification."

14   *Michael Couck*

Microsoft® .net

db4objects

Company

Product

Market

Vision
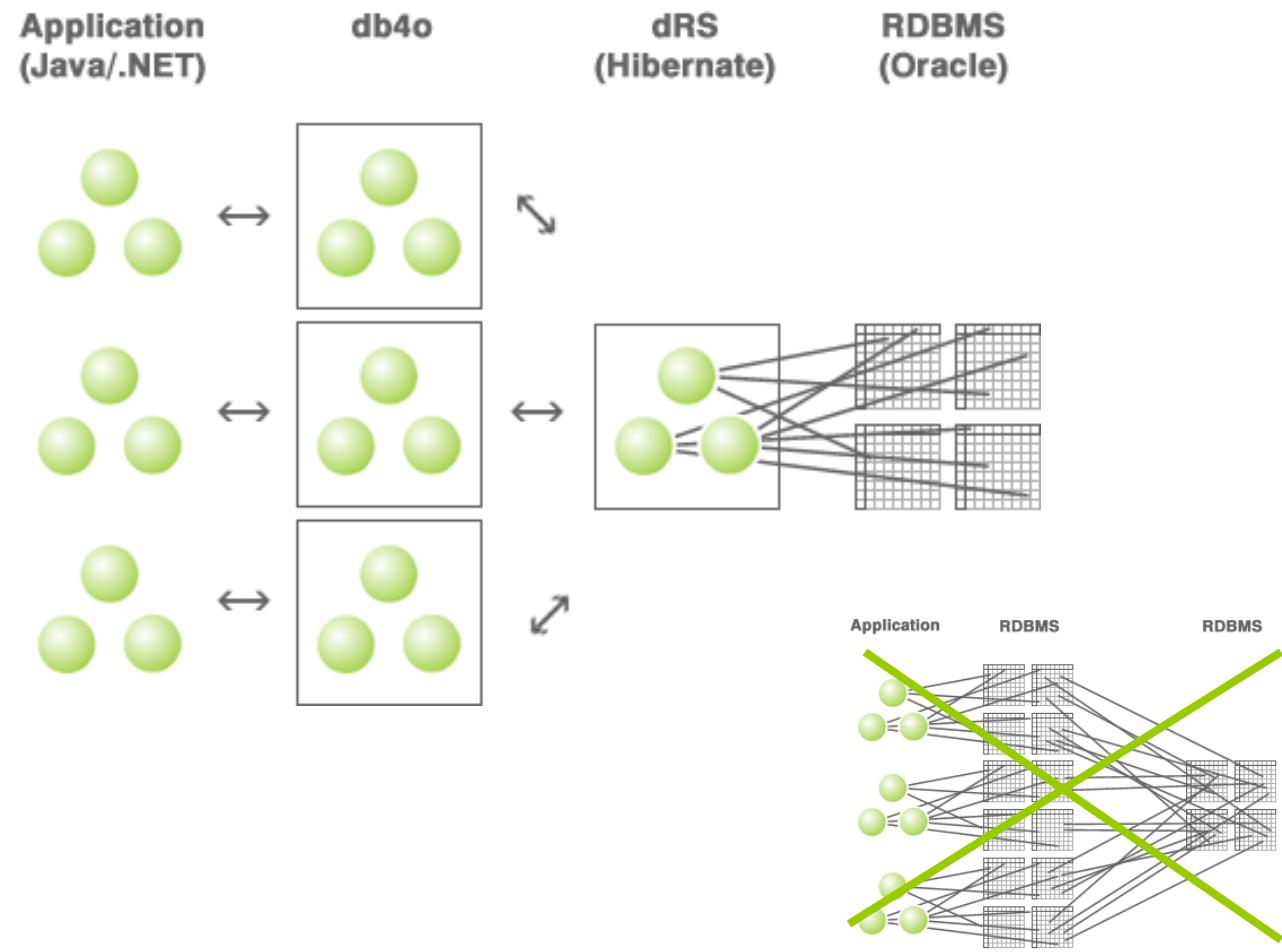
| Object-oriented replication (dRS)
| Object-oriented queries (Native Queries)
| ObjectManager browser

```
List <Student> students = database.query <Student> (
   new Predicate <Student> () {
      public boolean match(Student student){
         return student.getAge() < 20
            && student.getName().contains("f");
      }
   });
```

```
IList <Student> students = database.Query <Student> (
   delegate(Student student){
      return student.Age < 20
         && student.Name.Contains("f");
   });
```

"I chose db4o as database-technology and this was the best choice … I could have made for this project regarding the performance: my database-queries return in a few milliseconds, so updates of the GUI are almost instantly. … no-one has to wait for anything anymore... thanks to db4o

15   *Maik Jablonski*

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Object-oriented Replication

Application (Java/.NET) — db4o — dRS (Hibernate) — RDBMS (Oracle)

Application — RDBMS — RDBMS

Blogger Orbifold

db4o Key Benefits: Performance! Performance!

Company

Product

Market

Vision

- 100% native implementation ensures fastest performance
- Running the db4o engine in-process eliminates needless data transportation
- Elimination of O/R Mapping logic allows db4o to run up to 44 times faster
- Smart object caching gives huge boosts in performance when re-querying the same data
- Integration with native garbage collection saves memory and reduces footprint when needed

"I really love db4o, it really does save more than 50% on my development time, and it's really nice to only have to think in objects, and not relational.

db4o Key Benefits: Reliability

- Full ACID transaction model
  (Atomic, Consistent, Isolated, Durable)
- Data transaction journaling ensures zero data loss
  in case of system failure
  - Automatic data recovery after system failure
- db4o core is thread-safe for simultaneous operations

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Target Market: Embeddable Java/.NET Databases

Application		
	Data in **DBA** domain "**exposed** DBMS"	… in **developer** domain | zero-admin "**embedded** DBMS"
Java and .NET	Oracle, MSFT, IBM Direct Access or ORMs (Hibernate, Toplink)	db4o Oracle, MSFT, IBM BerkeleyDB, HSQL, Derby, Firebird
C, C++, P*, others	Oracle, MSFT, IBM MySQL Direct Access or ORMs	Oracle, MSFT, IBM BerkeleyDB, Encirq HSQL, Firebird, MySQL Direct Access

Programming language (vertical axis label)

Company

Product

Market

Vision

RICOH

| Market leader in digital office solutions with $17B of sales

| Important Sun partner – here at JavaOne 2006

| Project at headquarters in Tokyo, Japan

| New product platform includes db4o

Tatsuo Ito, new multi-functional platform team lead

"db4o provides a persistence solution for our broad range of technical challenges and for our stringent quality standards. After a long period of evaluation, we found that db4o has the flexibility to fit our cutting-edge architectures, which aim to achieve better productivity in our object-oriented software development."

"db4o rocks, db4o is just plain good technology […]

It is purposeful, cool, fun, impressive, well coded - all sorts of good."

20   *Chris Donnan*

db4objects

21   *jdwyah*

Customers : Intel

intel.

World's largest silicon company

Optimization of production planning and wafer forecasts in three Intel plants

Agility is key for Intel

Project in Chandler, AZ

Sean DeMartino, software engineer and XP coach

"db4o will make application development much easier for our group. The OR mapper/SQL database alternative really did not allow us to do everything we needed and forced us to contort our application designs. By comparison, implementing with db4o was seamless and worked within our existing architecture."

Customers : Seagate

"If you think of a database system that can process thousands of updates in a few seconds. What hardware requirements do you think you need? No, that's not it...think smaller, think much more smaller. Maybe even more. Hello DB4O! This object database can run on your smart phone and still have the processing power that makes even a big Oracle database jealous."

Seagate

- Leading storage company
- Consumer electronic backup device for private individuals and SMBs
- Retail product

Robert Osaki, director of Mirra customer support

- *"With db4o running seamlessly on the back end, supporting vast scalability and top-notch performance, the company's customer support caseload has been reduced by more than 10%"*

Ward Bekker

db4objects

Company

Product

Market

Vision

"I'm using DB4O. I'm so behind I'm not going to waste more time messing with Hibernate. DB4O is so quick and simple."

23   *Blogger Sam*

Customers : Boeing

Leading aircraft manufacturer and defense company

MMA for U.S. Navy

db4o used on-board

Boeing uses db4o for the P-8A Multi-Mission Maritime Aircraft, because the native object database required significantly lower database administration and improved developer productivity over conventional, non-native database solutions.

db4objects

Customers : Bosch

BOSCH

- World market leader for H.P. packaging robots with $600M in sales
- db4o used for system control and configuration
- First pilot rolled out in Tulsa, OK, to package 180 McDonald apple pies per minute!

"db4o... wow this is something else! the best bit of software I have seen since google earth […]

I now have my application working great, it's faster, easier and handles even bigger tables... and currently all in under 3 meg. [...]

There is no going back!"

Sebastian Hubrich, XR31 project lead

"Our biggest concern is shortening our commissioning time. The use of db4o on the data-backend has helped us to achieve a time-saving effect of at least 10% on each project."

Ove Nordström

Customers : INDRA Sistemas

Indra

- Company
- Product
- **Market**
- Vision

- After merger, now Europe's #3 IT shop with 18,000 employees and $2B in sales
- Pilot user since 2002
- db4o used to run high speed train network in Spain (and soon more countries)

José Miguel Rubio Sánchez, director railway systems

> "Possibly the most important benefit is the ability to query with objects, enabling us to have a very complex Java OOD without requiring data transformation. Another key benefit is the zero maintenance environment, a must when designing real-time systems."

"In my eyes the developers of DB4O really got it. Have very low minimal hardware requirements, test the user experience against that and make the performance a big priority."

db4objects

Our Mission

**Make the life of software developers easier
by providing a database,
which simply matches the object world,
and thus saves time and costs**

*"Tools are available […], but is it
perfect? Far from it. One thing
that I really appreciate when using
Db4o is that I have no such
problems. Simply because there is
no database schema or in other
words: the database schema
reflects what I have in my model."*
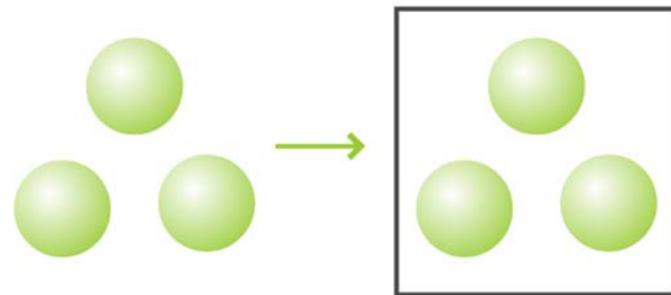
db4objects

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27   *Ward Bekker*

The leader in zero-admin databases for Java and .NET

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→ download now

More information and free download: www.db4o.com

"I really love db4o, it really does save more than 50% on my development time, and it's really nice to only have to think in objects, and not relational."

Lastone

entwickler.press

db4o

Larysa Visengeriyeva
Patrick Römer

schnell + kompakt

THE EXPERT'S VOICE®

The Definitive Guide to

db4o

Stefan Edlich, Reidar Hörning,
Henrik Hörning, and Jim Paterson

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