db4objects

db4o Version 5.0
Native Queries
Hibernate-enabled Replication

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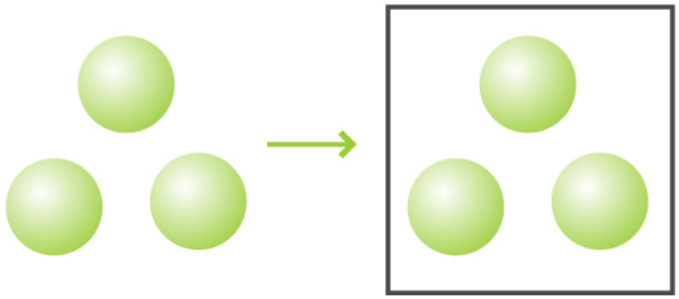
db4o | Open Source Object Database | Version 5



- As native to your programming language as possible
  - **Native Queries (NQ)**
  - .NET standard compliance
  - Transparent Activation and Persistence
- **dRS db4o Replication System** powered by Hibernate
  - db4o to Hibernate/RDBMS
  - db4o to db4o
  - Hibernate/RDBMS to Hibernate/RDBMS

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Native Queries | Existing APIs are not native OO

- JDOQL, EJBQL, SQL, OQL are all based on strings
- IDEs do not check for semantic and syntactic errors
- No automatic refactorings
- Queries break OO encapsulation rules
- Constant switch between implementation and query language
- No support to create reusable query components
- Dynamic creation is error-prone

```
// JDOQL
pm.newQuery(Student.class, "age < 20");

// S.O.D.A.
query.constrain(Student.class);
query.descend("age“).constrain(20).smaller();
```

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Native Queries | Design Goals

- Express queries in plain Java / C#

- 100% native
- 100% object-oriented
- 100% type-safe
- optimizable

```
// Java
student.getAge() < 20

// C#
student.Age < 20
```

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Native Queries | Defining the API

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native, object-oriented, typesafe, optimizable

```
// C#
IList <Student> students = db.Query <Student> (
  delegate(Student student){
    return student.Age < 20;
  });
```

```
// Java
List <Student> students = db.query <Student> (
  new Predicate <Student> () {
    public boolean match(Student student){
      return student.getAge() < 20;
    }
  });
```

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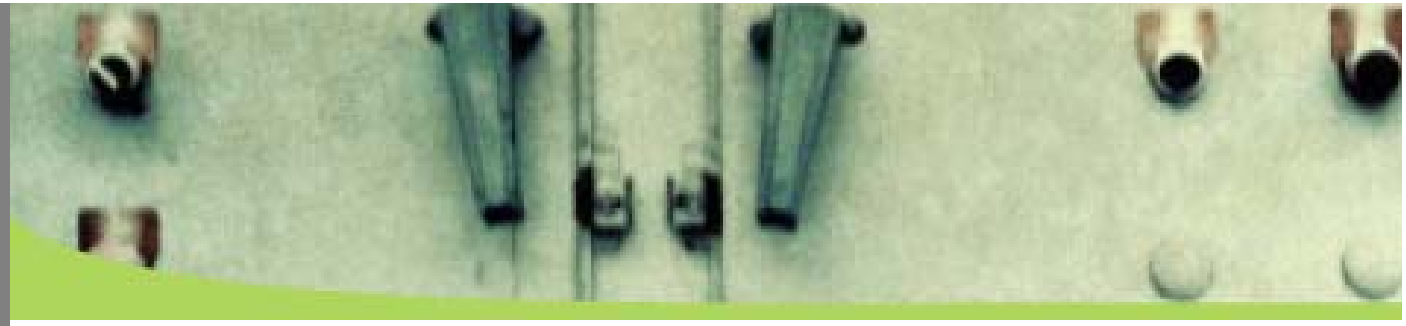

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dRS – db4o Replication System

- Object-Oriented Replication between db4o and Hibernate/RDBMS database instances
- Brings the best of two worlds together:
  - Server-centric legacy RDBMSs
  - Distributed client-side db4o
  - Partially connected environments
- Use Cases:
  - Mobile salesforce automation
  - Device data synchronization with corporate IT

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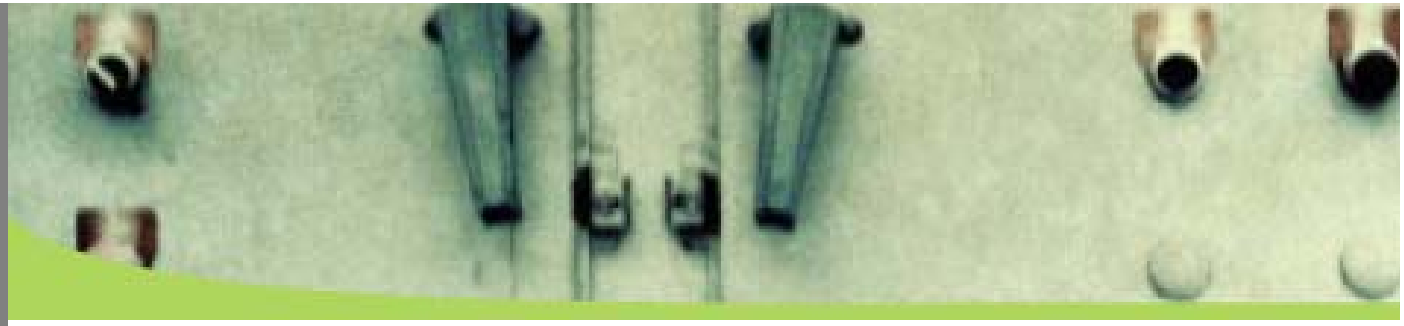

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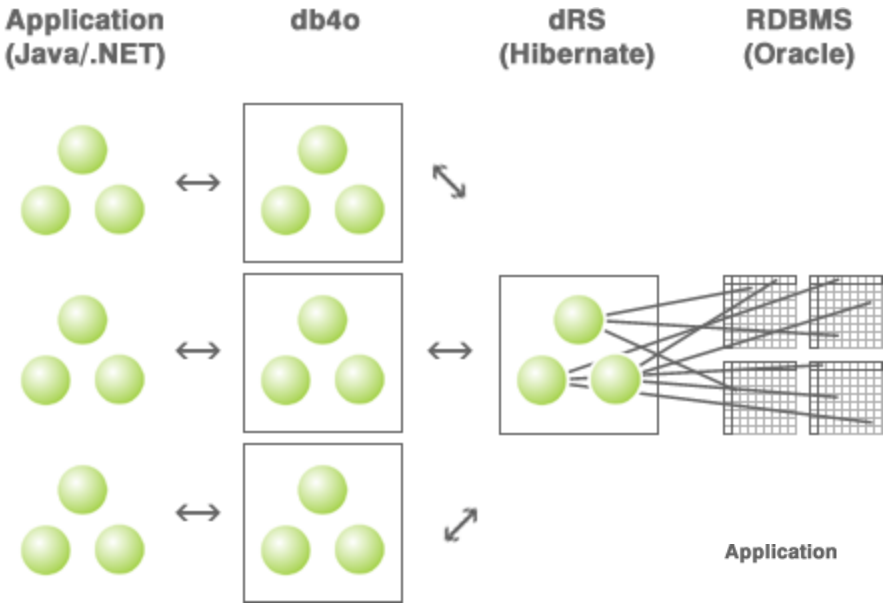
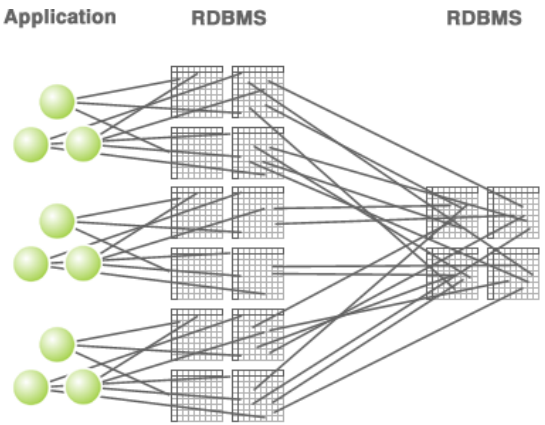
dRS – Benefits of Object-Oriented Replication



OO replication



Relational replication

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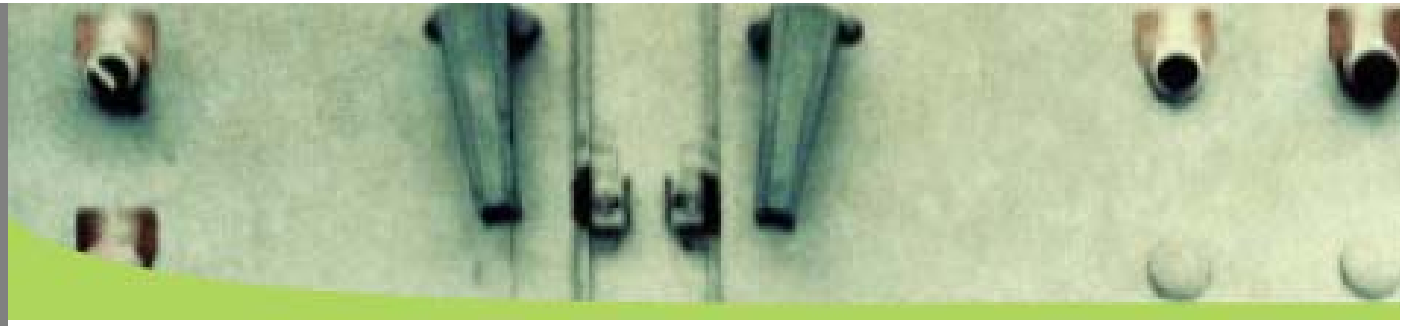

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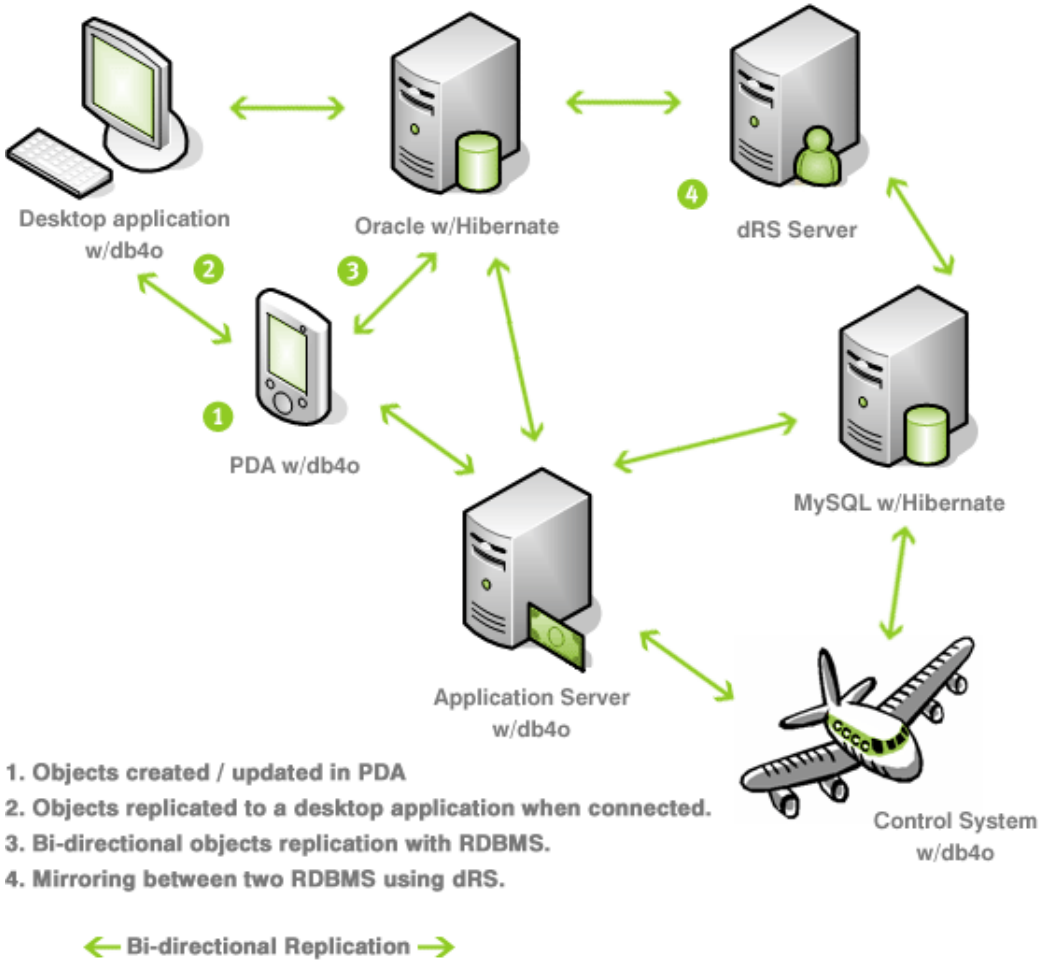
dRS – Topology



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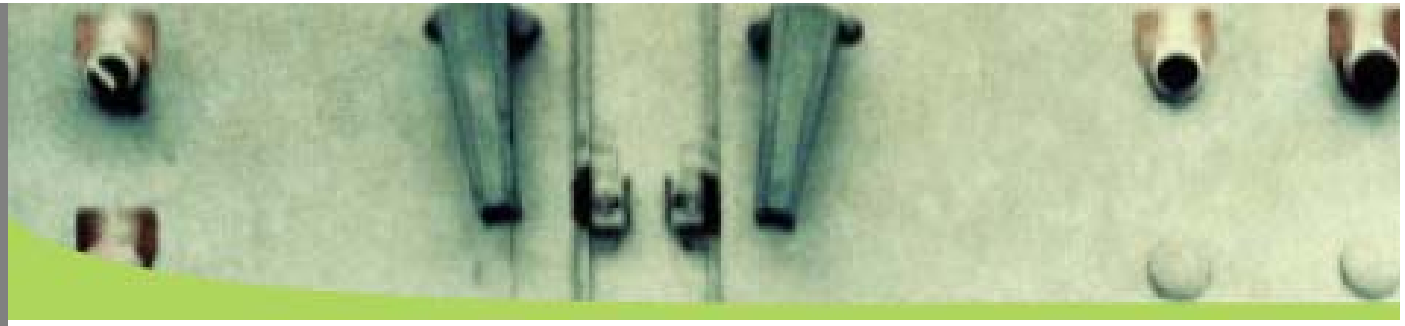

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dRS – Code Example

1. Use db4o ObjectContainer and Hibernate configuration

```
Db4oReplicationProvider db4oProvider = new Db4oReplicationProvider(objectContainer);
HibernateReplicationProvider hibernateProvider
     = new HibernateReplicationProvider(hibernateConfiguration);
```

2. Start a Replication Session

```
ReplicationSession replication = Replication.begin(db4oProvider, hibernateProvider);
```

3. Query for changed objects

```
ObjectSet changedObjects = hibernateProvider.objectsChangedSinceLastReplication();
```

4. One-line-of-code replication

```
while (changedObjects.hasNext())
   replication.replicate(changedObjects.next());
```

5. Commit

```
replication.commit();
```

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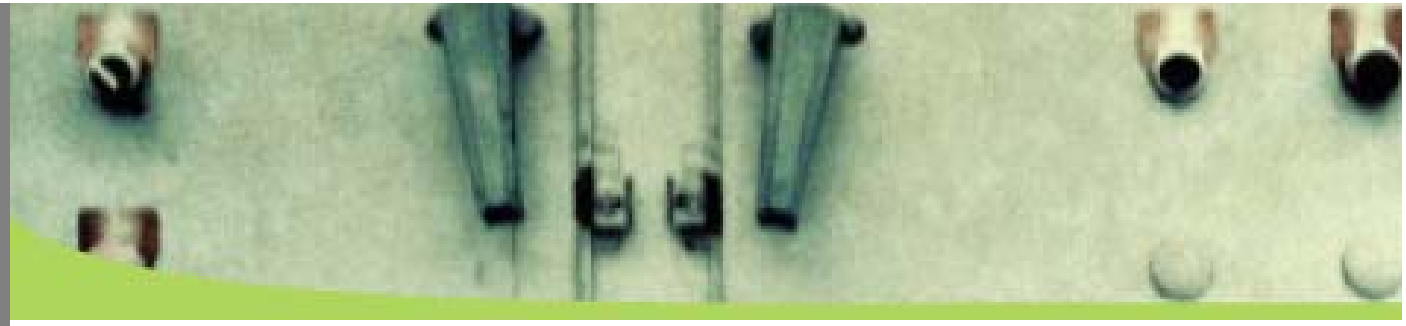

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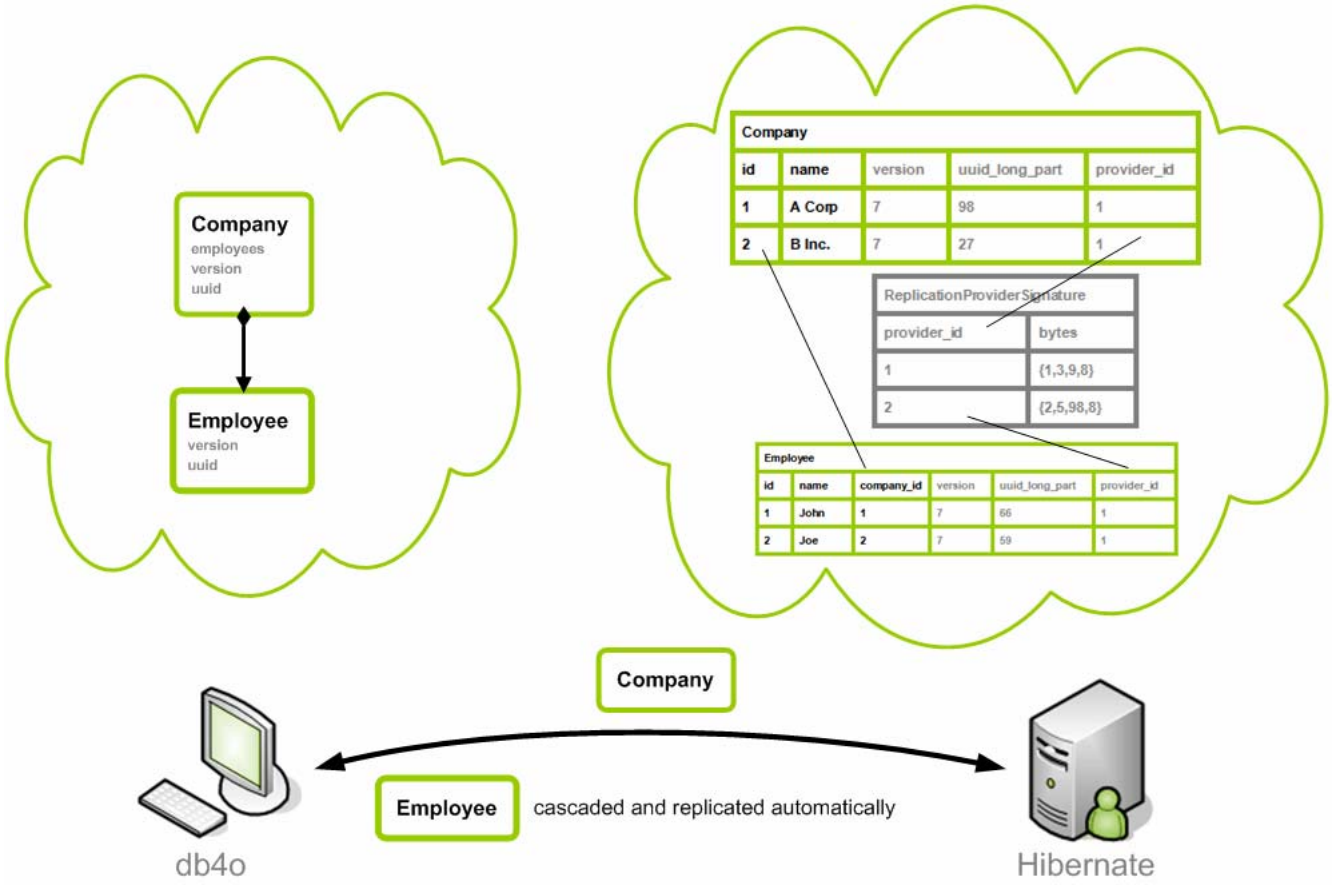
dRS – Managing Object Identities



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More in V5 | .NET standard compliance

- PascalCase method names
- Properties
- ObjectSet derives from IList
- Optimal native query syntax
- Compatibility with 4.x versions

```
IList<Student> students = db.Query<Student>(
    delegate(Student student){
        return student.Age < 20;
});

foreach (Student student in students){
    Console.WriteLine(student.ToString());
}
```

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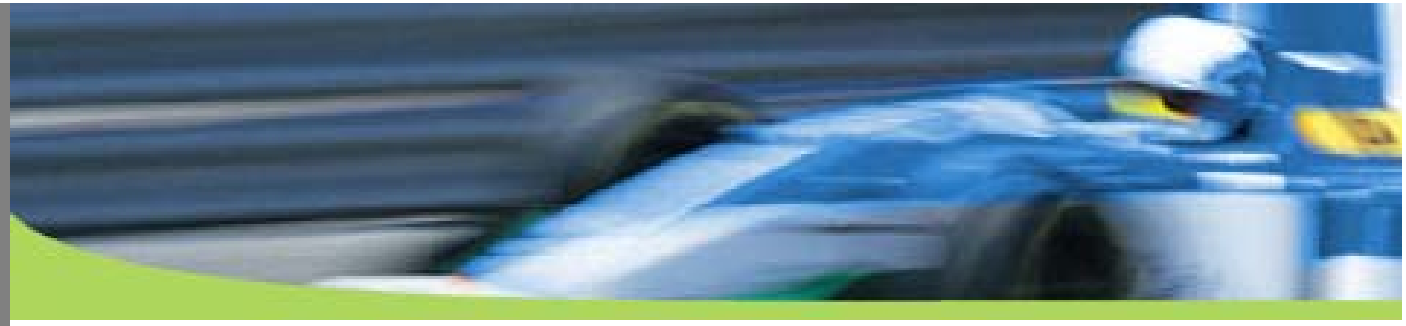

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Roadmap V5 through June 2006

- Improved defragmentation
- Improved ObjectManager V2.0
- Fast Collections
- Visual Basic tutorial
- J2ME CLDC/MIDP platform support
- Transparent activation

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Thank You!

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- Download the free db4o **Version 5.0** now:
  www.db4o.com/community/

- Download the **Whitepaper on Native Queries**
  www.db4o.com/about/productinformation/whitepapers/