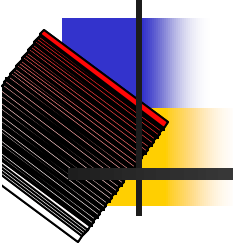
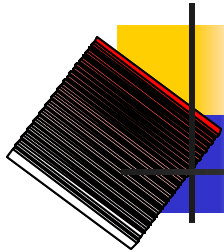


The Beginner's Guide To EJB's with JBoss: Quick and Free



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Agenda

- ✍ Fuzzy Wuzzy Introductions
- ✍ EJB Lingo
- ✍ Entity Bean Defined
- ✍ Types of Entity Beans:
 - ✍ Fine
 - ✍ Coarse
 - ✍ O/E, etc....
- ✍ Differences between regular client DB access and Entity access
- ✍ CMP & BMP Side by side
- ✍ Entity Bean Intricacies
- ✍ Performance Increases
- ✍ Review
- ✍ Resources
- ✍ Demonstration



About The Presenter

- ✍ Cedrick Johnson
- ✍ Cavenger Systems
CTO, co-founder
(old co.)
- ✍ Technology
Evangelist and
100% Geek





Some EJB “Lingo”

✍ Session Beans

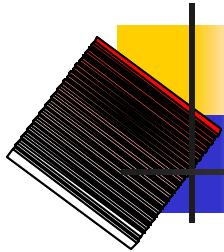
- ✍ A business process (verb)
- ✍ Stateful and Stateless

✍ Value Objects

✍ Local Interfaces (NEW IN 2.0!)

✍ Entity Beans

- ✍ A data object (noun)
 - ✍ CMP
 - ✍ BMP
 - ✍ Finder Methods
- ## ✍ EJB-QL (NEW IN 2.0 TOO!!!!)



Entity Bean Defined

- ✍ A bean that is used to represent a ROW of data within a database
- ✍ BMP and CMP Entity Beans
 - ✍ BMP = harder, but allows for more control over your SQL code
 - ✍ CMP = easier, but can sometimes be TOO easy
- ✍ A REUSABLE “component” of your software application that allows for access to a data resource



Types of Entity Beans: Fine-Grained

- ✍ Usually a client accesses these beans via each of the bean's accessor methods.
- ✍ Client calls each of the get/set methods for reading/manipulating data
- ✍ Fine for small applications or for beginners



Types of Entity Beans: Coarse Grained

- ✍ A client accesses these beans by using a Value Object, an object that contains the fields that represent the EJB's accessor methods
- ✍ Client makes ONE call, gets the VO, then makes changes to the VO and resubmits
- ✍ More suitable for performance-critical applications (as we will see later)



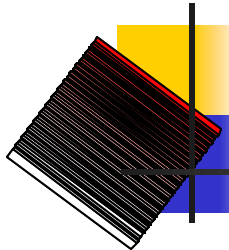
Comparison: Entity Beans vs. Traditional DB Access Methods

Traditional

- ✍ Each client eats up a DB connection
- ✍ Business logic resides on either client or DB
- ✍ Single point of failure, little or no reusable components

Entity

- ✍ Connections to the DB are handled by the container
- ✍ Business logic can now reside in an server-side EJB = reusability
- ✍ Clustering provides redundancy
- ✍ Somewhat complicated to begin learning/implementing properly



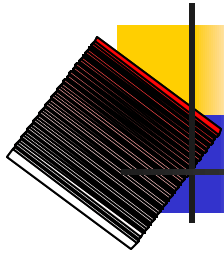
CMP and BMP Differences

Container

- ✍ No client SQL Code (faster to develop)
- ✍ Plug and play with database
- ✍ No DB access code to deal with

Bean

- ✍ More control over queries
- ✍ Semi-Plug and play with DB
- ✍ Less new learning (reuse and extend old JDBC code/components)



How is a EB mapped to a row?

- ✍ Container obtains all the rows in a database, then creates a Remote interface “handle” to that row in the database.
- ✍ 100 Rows, 100 “handles”
- ✍ 1000 Rows, 1000 “handles”

How do you add new rows with Entity Beans?

- ✍ Clients can call the `create()` method on the Entity Bean's REMOTE interface... This tells the **container** to invoke `ejbCreate()` within your EJB to perform the operations needed.

```
MyEntityRemote.create(new Integer(1), "Hello");
```

```
graph TD; A[MyEntityRemote.create(...)] --- B[Container]; B --- C[MyEntityEJBImpl.ejbCreate(...)];
```

Container

```
MyEntityEJBImpl.ejbCreate(new Integer(1), "Hello");
```



How do you modify existing rows with Entity Beans?

- ✎ Usually you need to find the data, then set the attributes on the retrieved row. Container manages the update
- ✎ For better performance, use a Value Object

```
MyEJB.ejb = home.findByPrimaryKey(1);  
.ejb.setName("Alfred");
```



Modifying Existing Rows with a Value Object

```
public PersonVO getPerson() {
    PersonVO lPerson = null;
    MyEJBRemote ejb = null;

    try {
        ejb = ejbHome.findByPrimaryKey(1);
        lPerson = ejb.getPersonVO();
    } catch .....

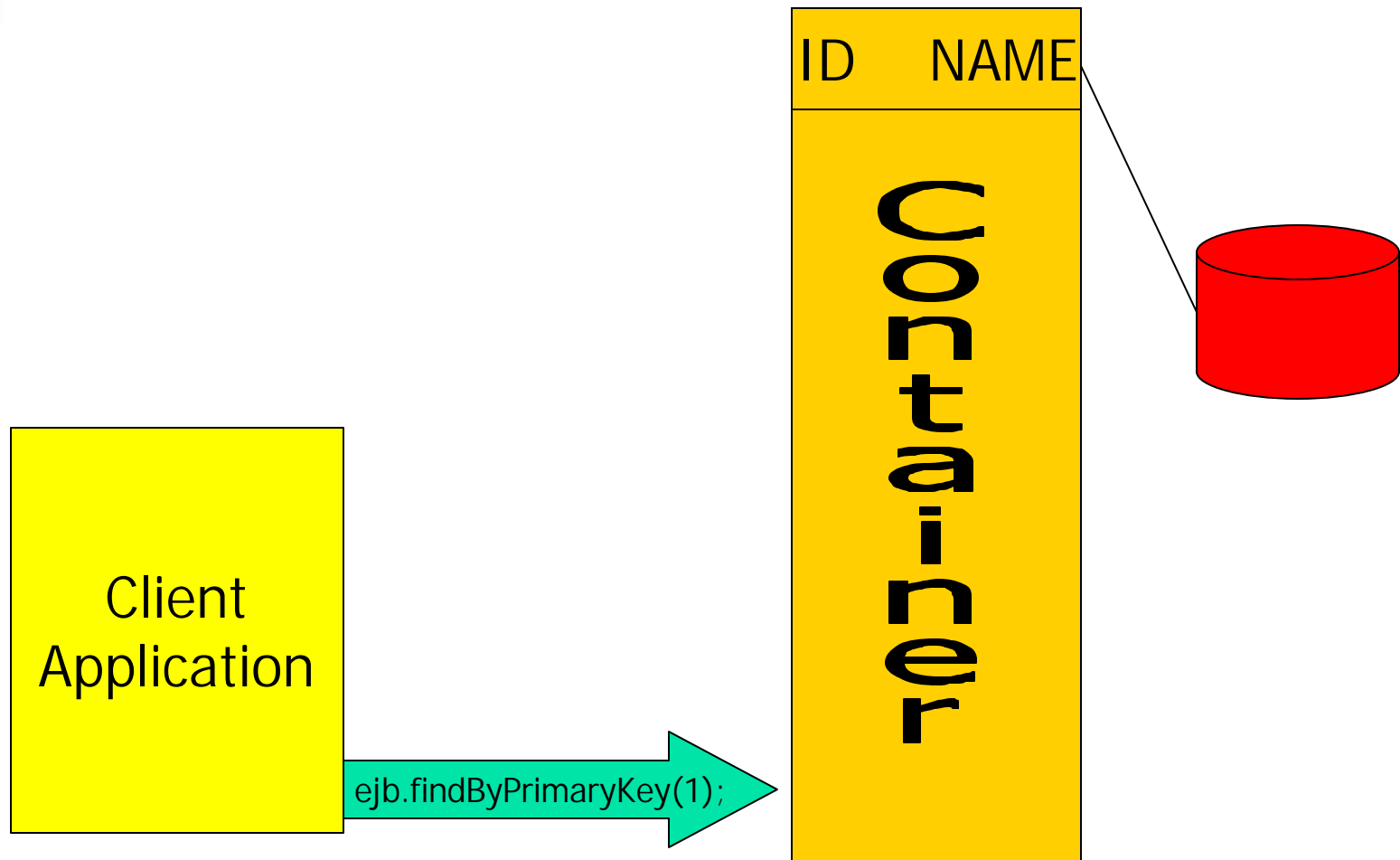
    return lPerson;
}
```



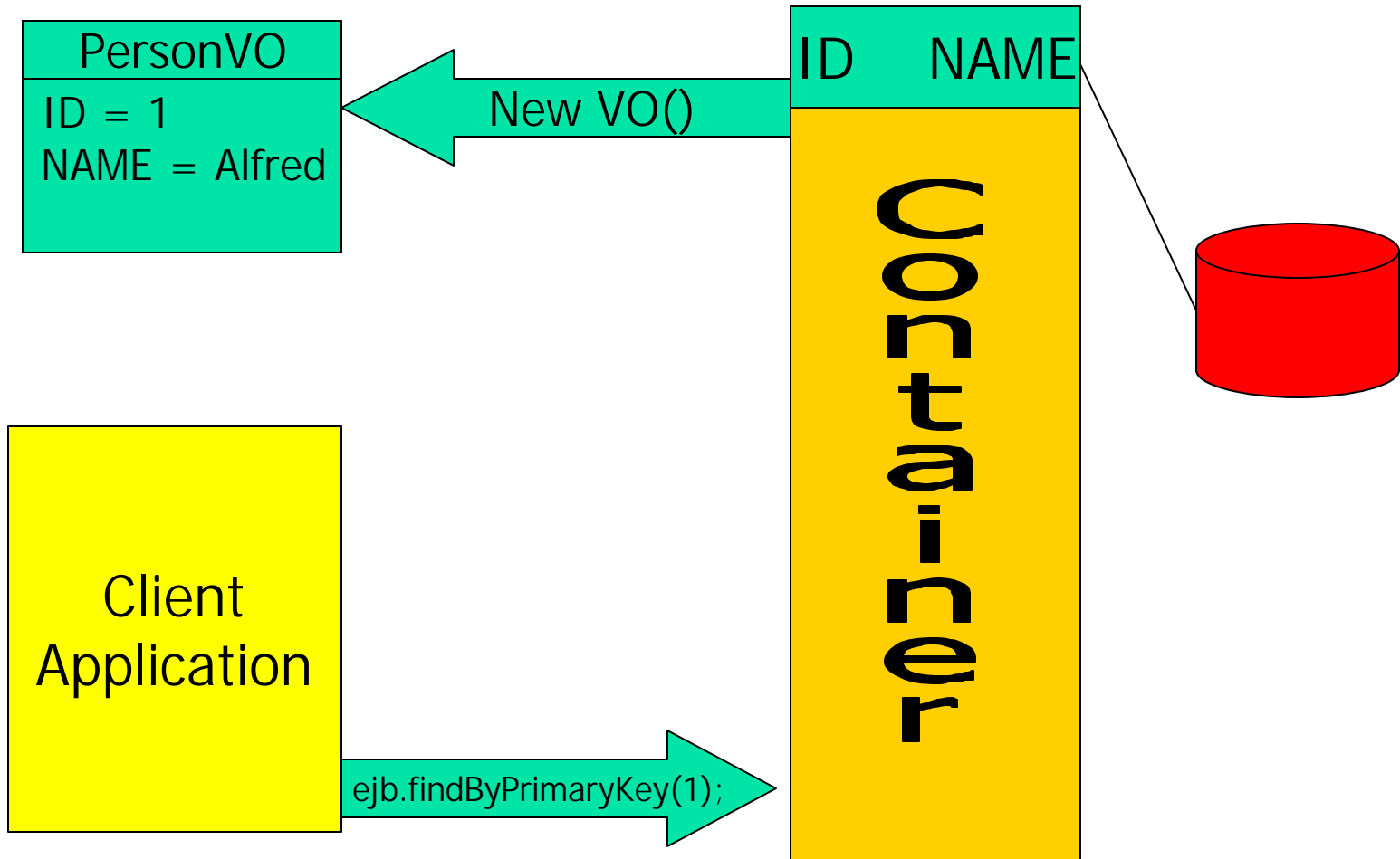
Are We Awake????



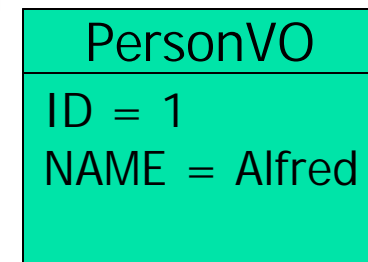
Modifying Existing Rows with a Value Object



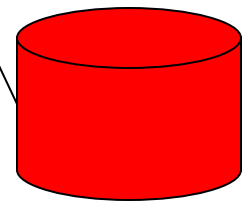
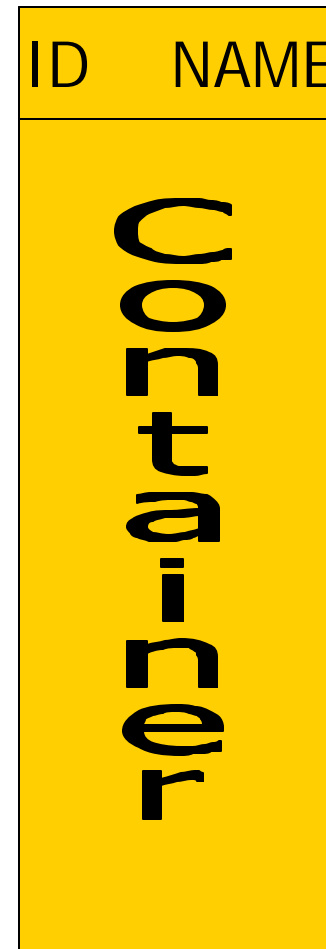
Modifying Existing Rows with a Value Object



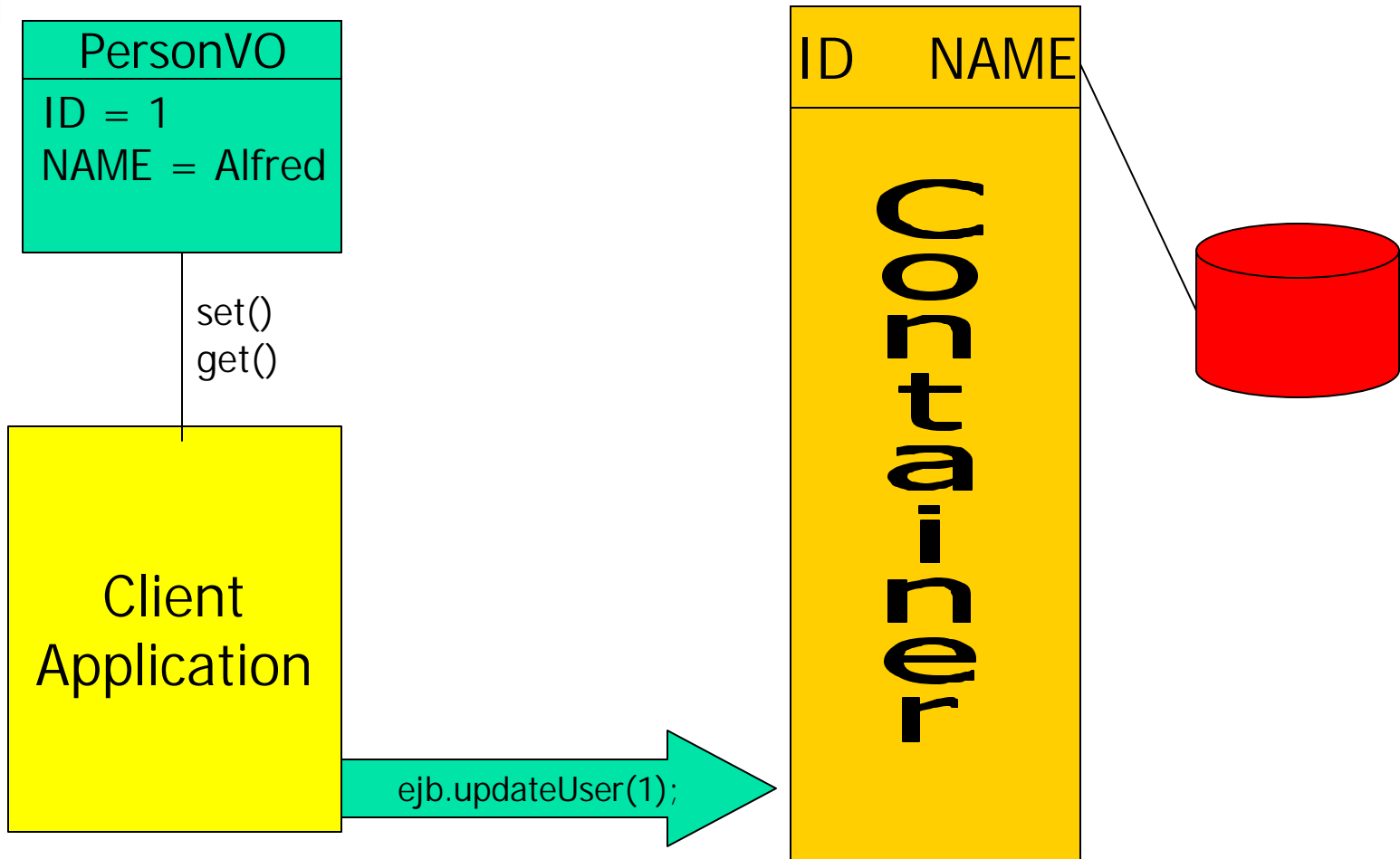
Modifying Existing Rows with a Value Object



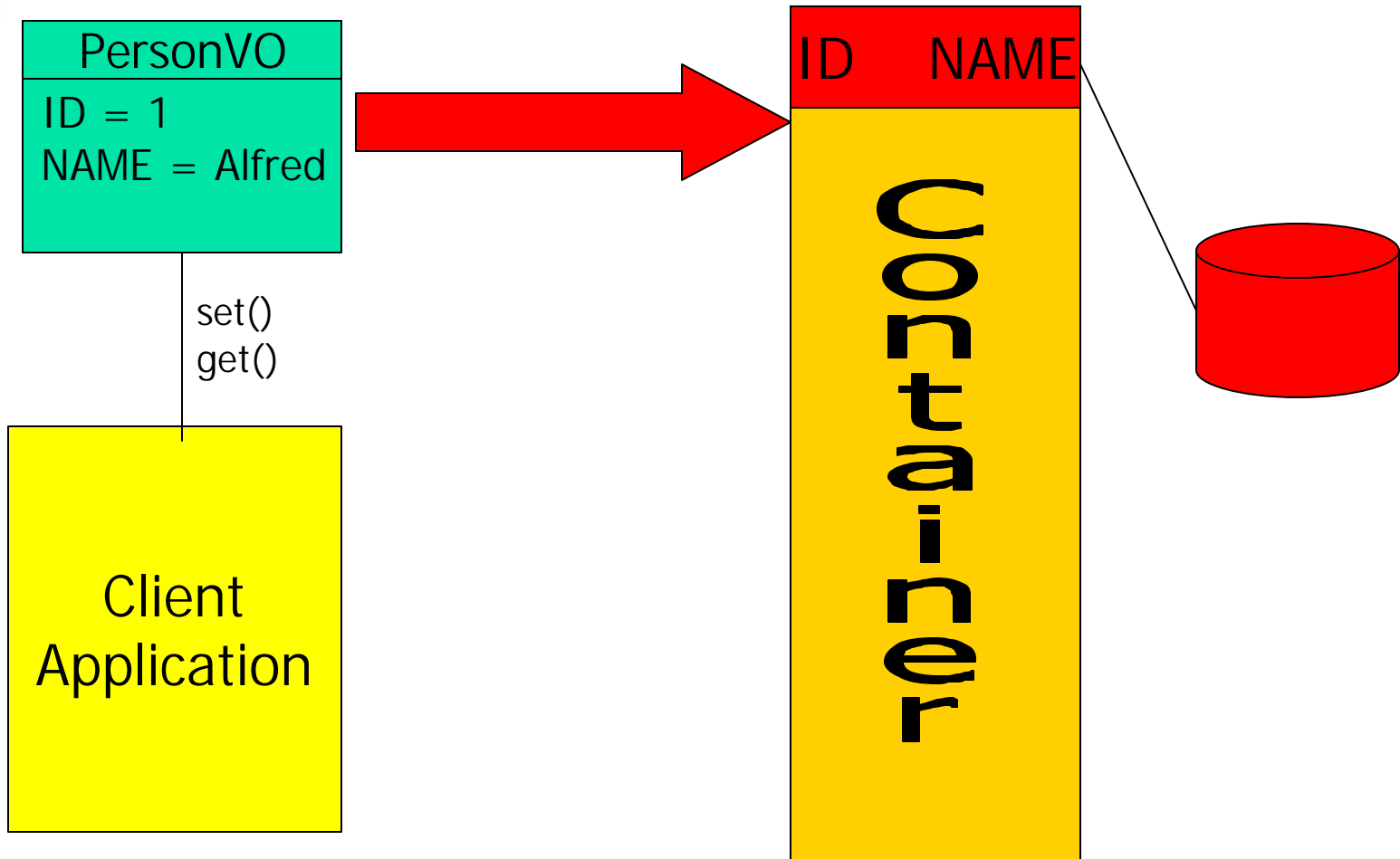
set()
get()



Modifying Existing Rows with a Value Object



Modifying Existing Rows with a Value Object

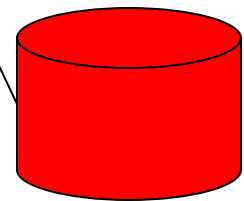


Modifying Existing Rows with a Value Object

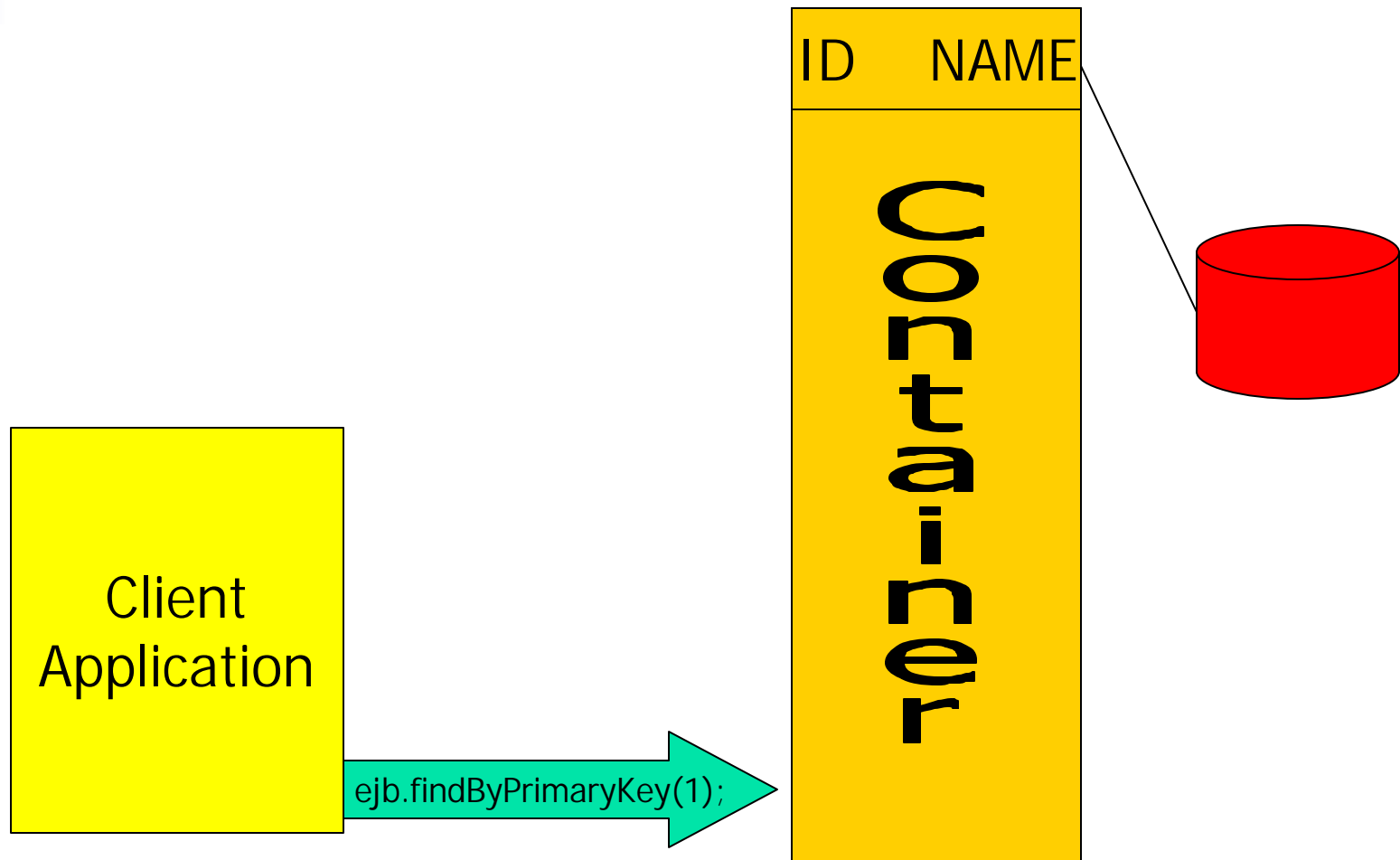
Values are now persisted in the database



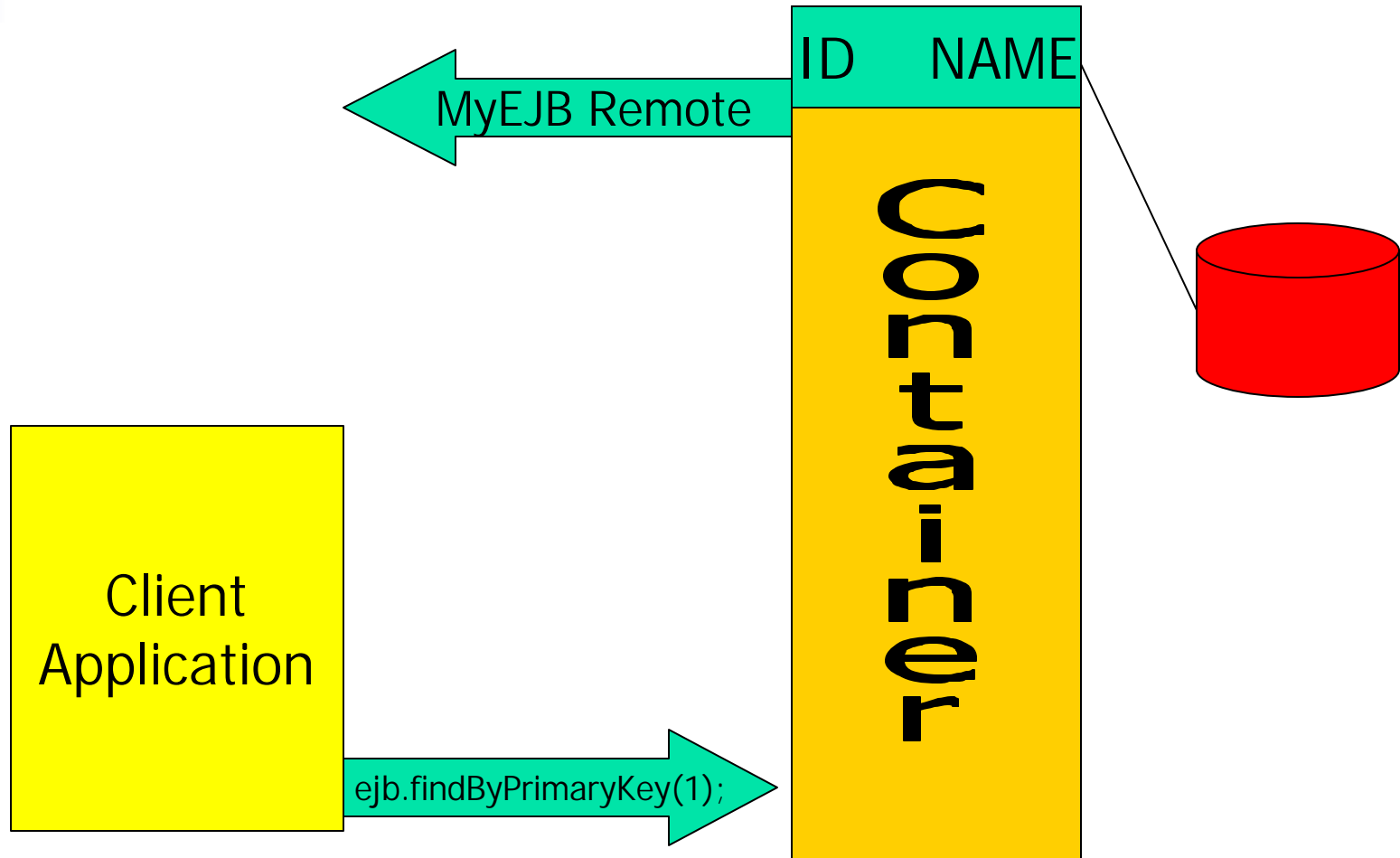
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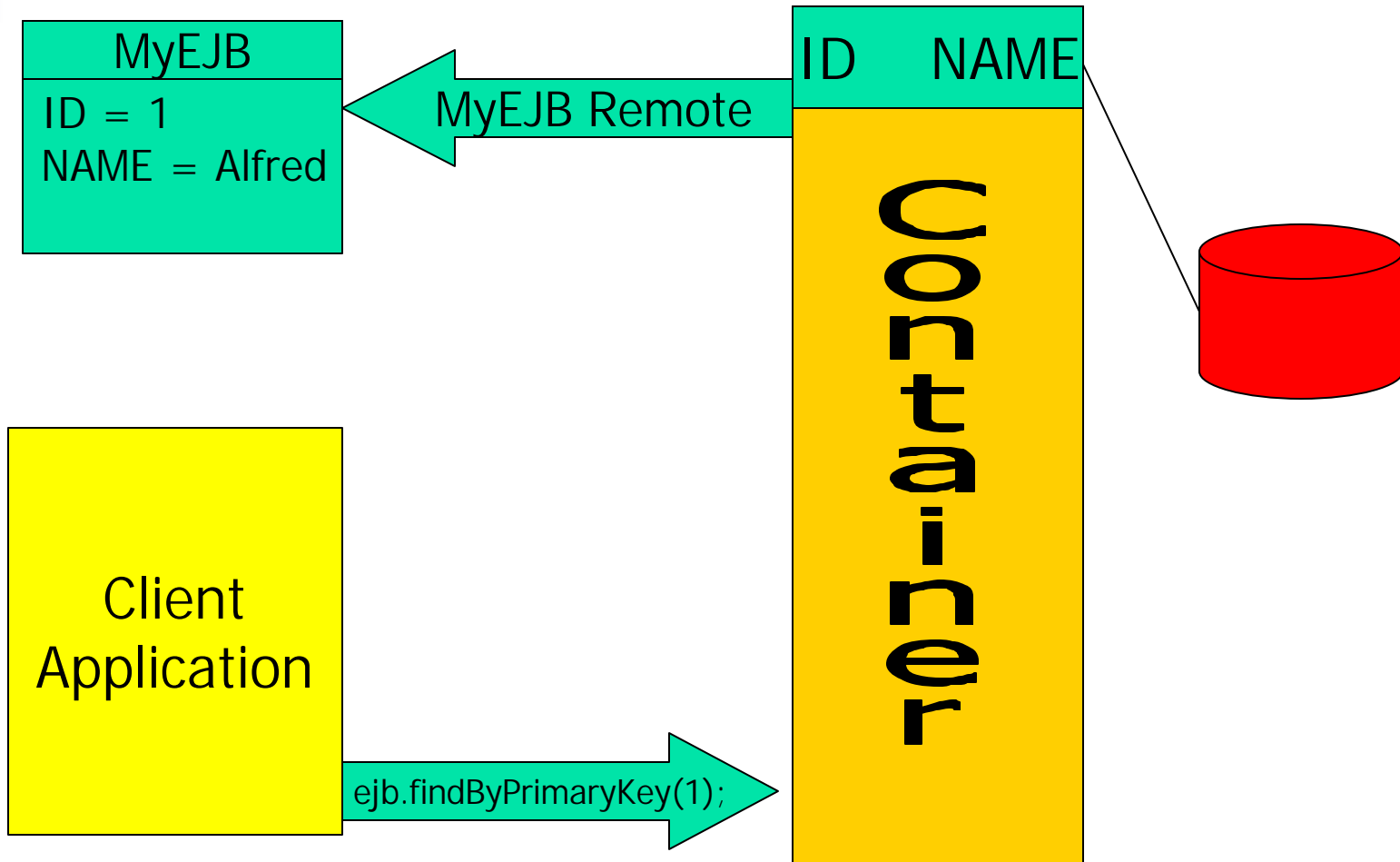
Modifying Existing Rows with a Remote Interface



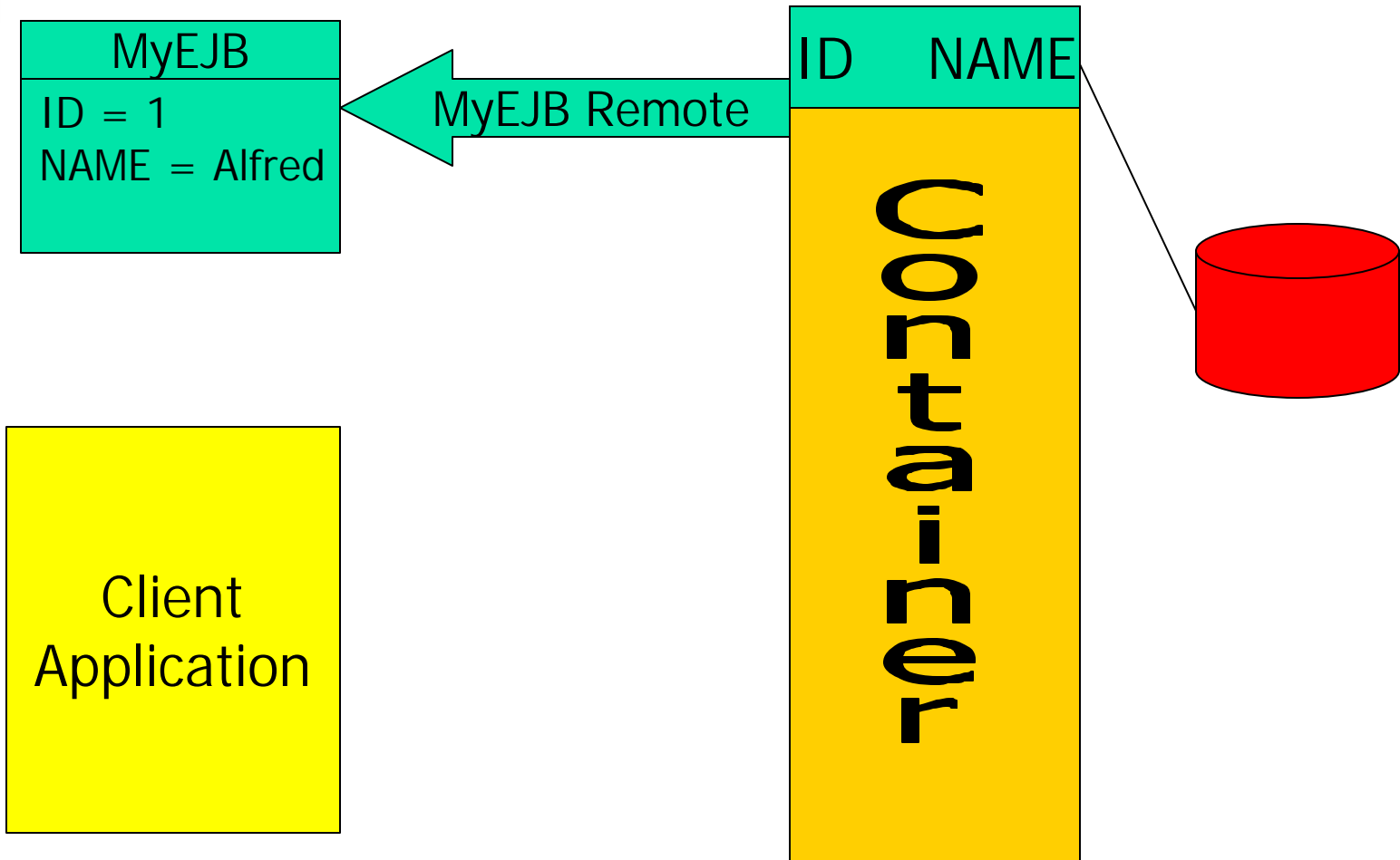
Modifying Existing Rows with a Remote Interface



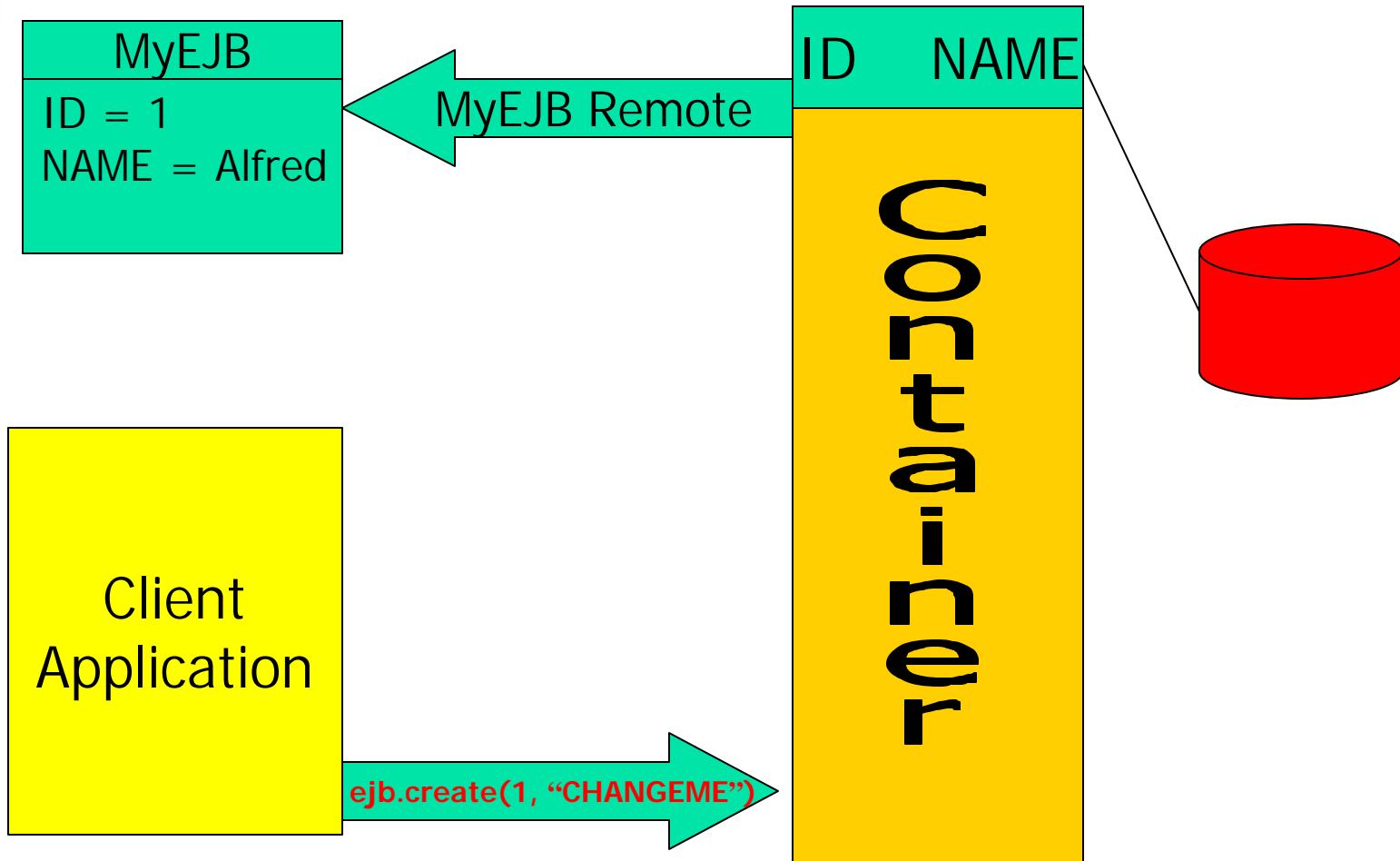
Modifying Existing Rows with a Remote Interface



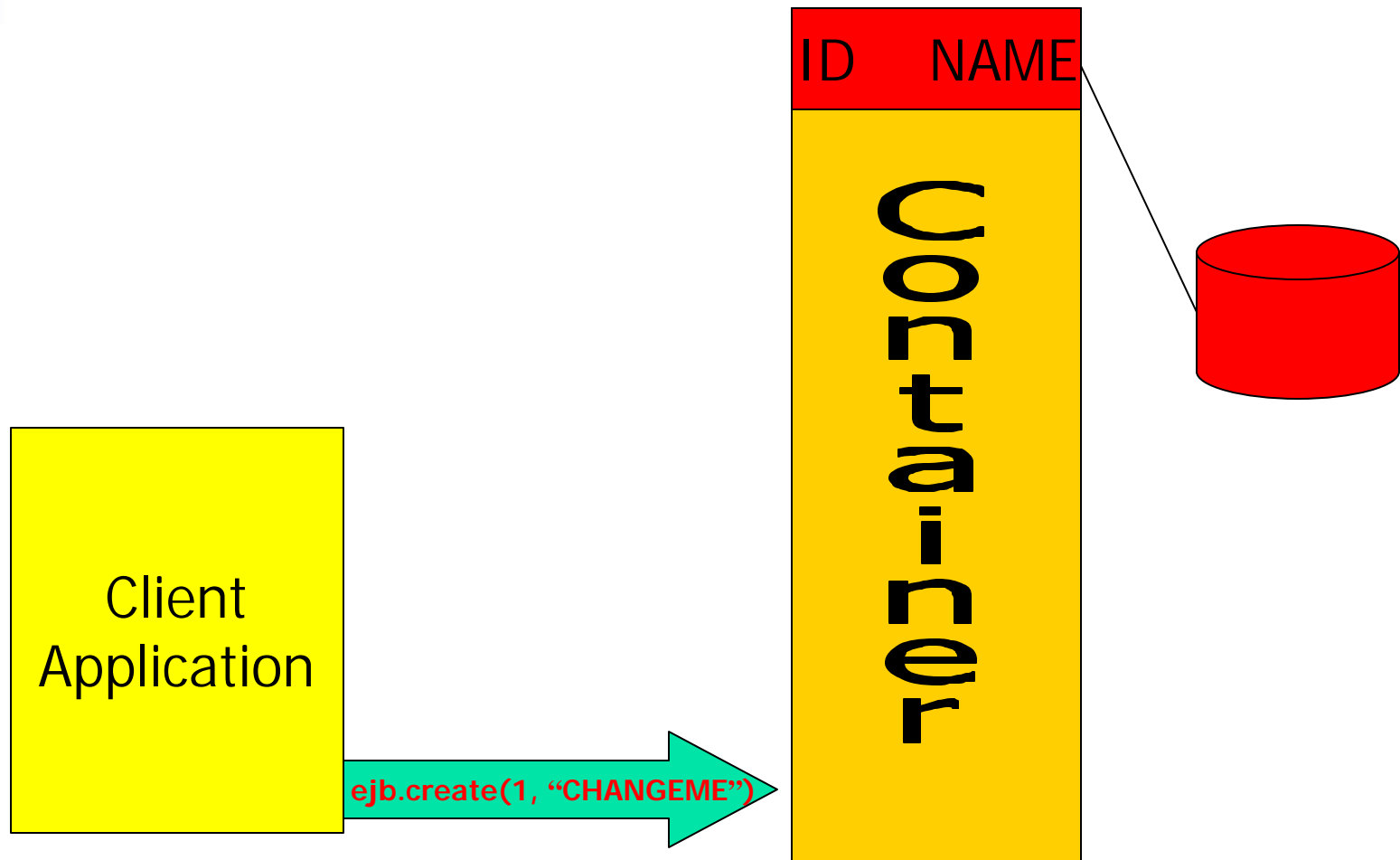
Modifying Existing Rows with a Remote Interface



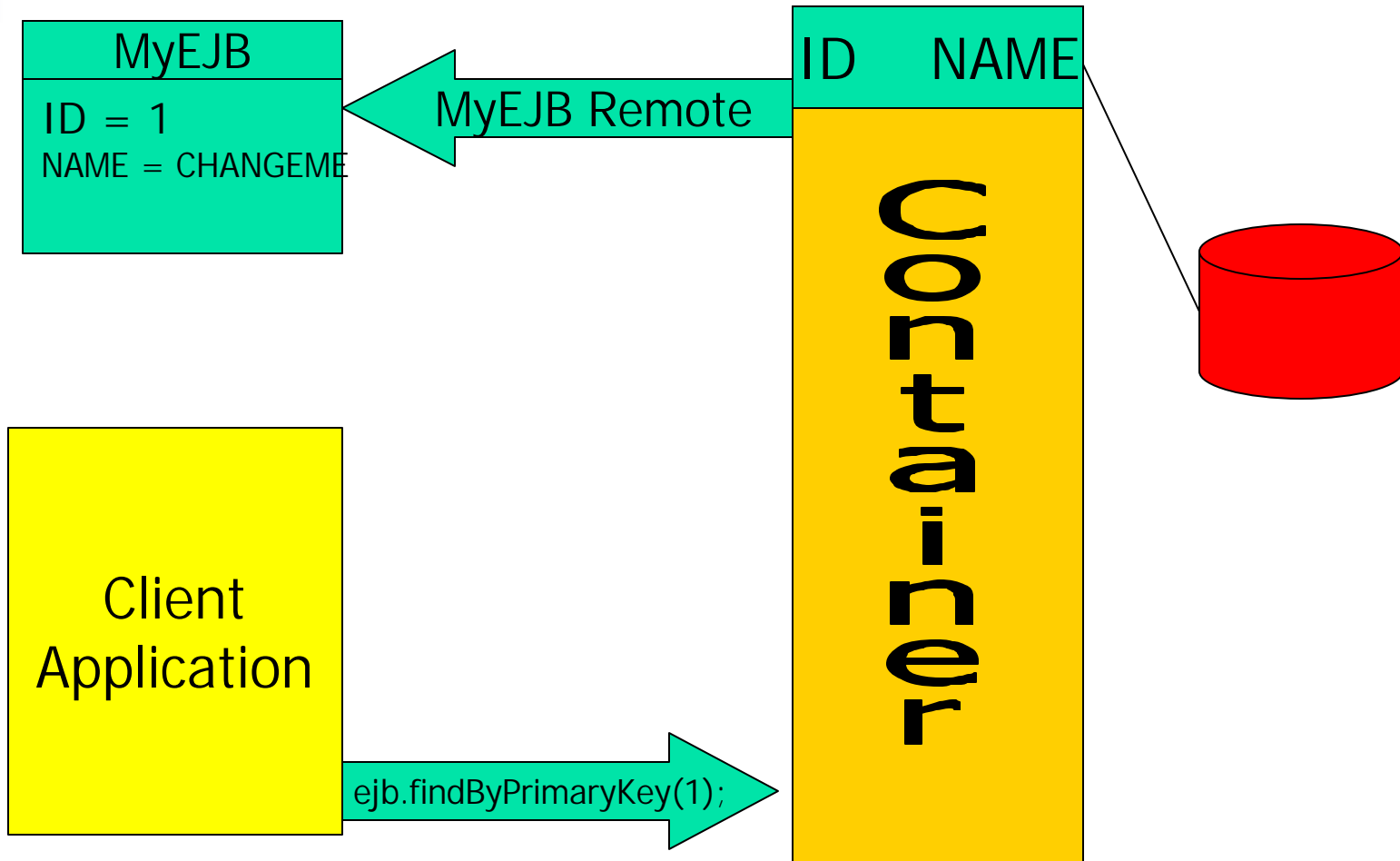
Modifying Existing Rows with a Remote Interface

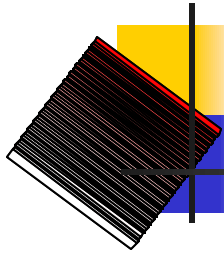


Modifying Existing Rows with a Remote Interface



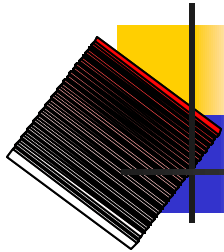
Modifying Existing Rows with a Remote Interface





EJB Performance

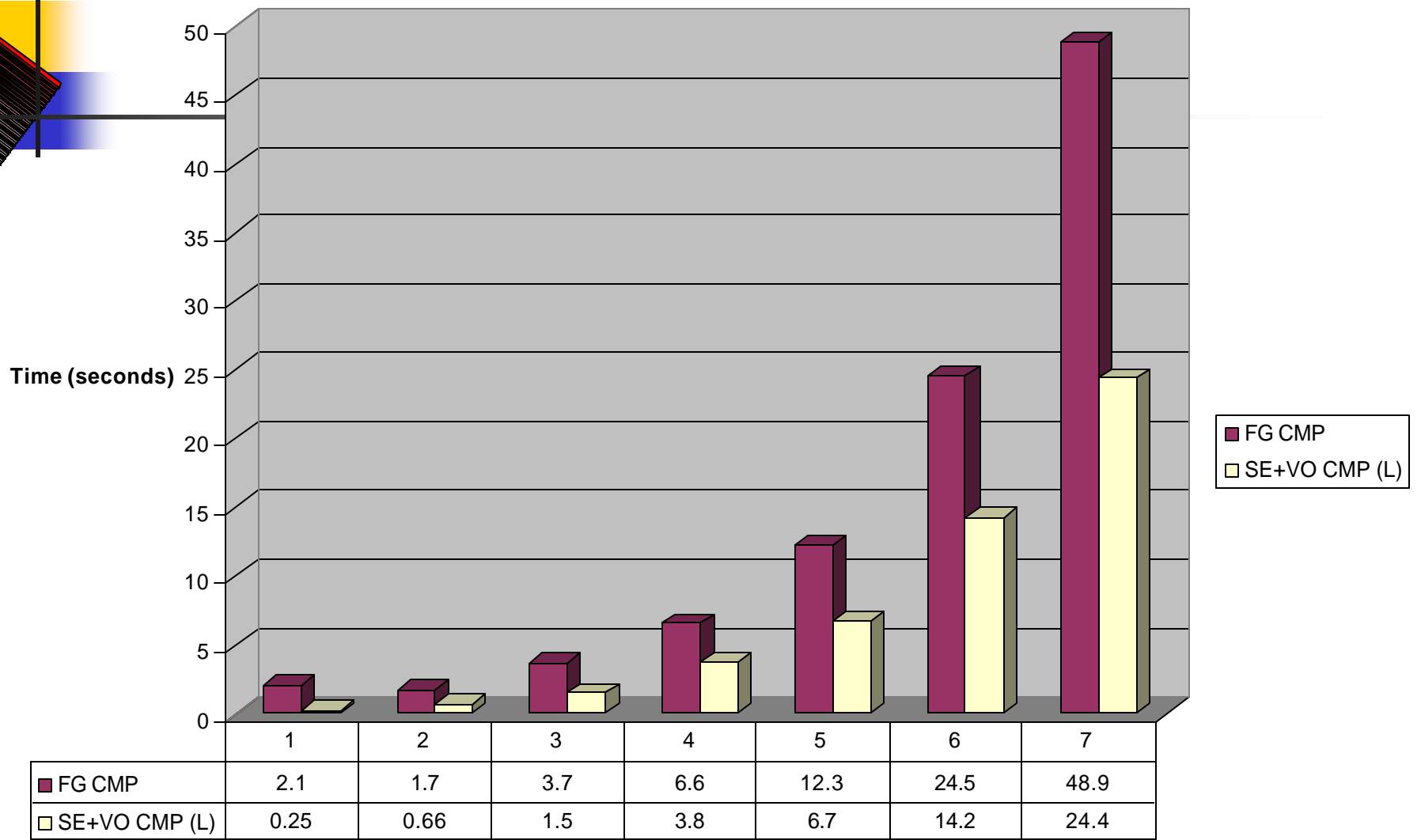
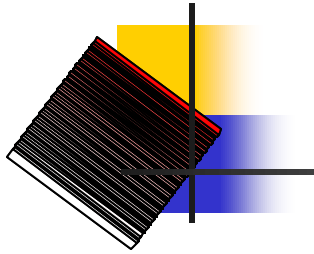
- ✍ YES! EJB's are slow compared to other methods of access
- ✍ BUT: Optimization is key to achieving maximum performance and scalability
- ✍ If you use EJB's, you must architect systems from the ground up with proper design decisions, else it WILL be slow.
- ✍ Use Value Objects
- ✍ Use Local Interfaces
- ✍ Lazy Instantiation
- ✍ Session or Message Driven Bean façades, etc.



EJB Performance

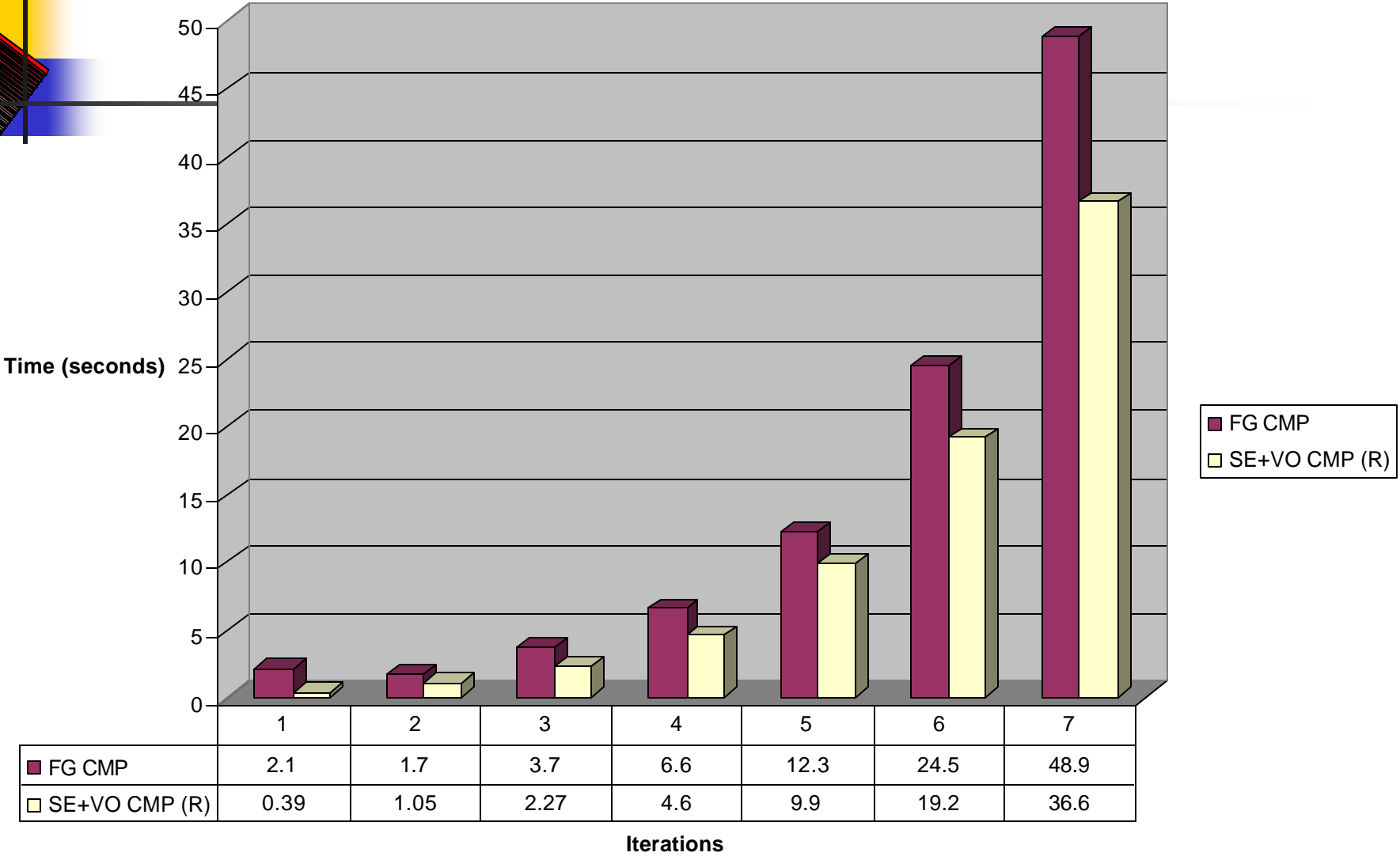
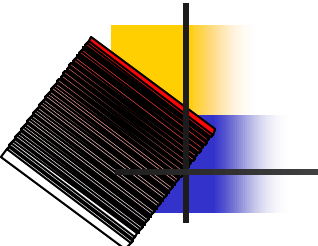
- ✍ Serialization
 - ✍ Use the **transient** keyword for fields not being serialized
 - ✍ Smaller transport (value) objects that transmit only data you need
- ✍ “Coarse Grained” Network calls
- ✍ Garbage Collection
 - ✍ Null out references to objects that are no longer needed
- ✍ Cached Row Sets and a Updater EJB
 - ✍ Client gets a row set, disconnects (Disconnected DS) performs operations, then “publishes” that RS to a listener EJB which performs the necessary DB updates/checking

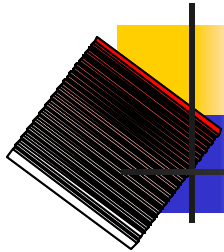
CMP Optimized SE+VO (Local Interface) vs CMP FG Entity



Iterations

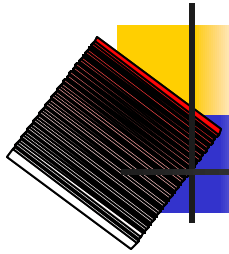
CMP Optimized Remote Interface SE+VO vs. FG Entity





Review

- ✍ EJB is NOT all there is to J2EE
 - ✍ Evaluate project needs
 - ✍ Not needed for small applications, usually
- ✍ Investigate and learn!!
- ✍ Why do we use EJB?
- ✍ What is an entity bean
- ✍ Entity Bean Types
- ✍ Differences between DAO and EJB data access
- ✍ CMP & BMP: Side by Side
- ✍ Performance Issues



Resources To Get You Started

- ✍ JBuilder 5/6 (NOW WITH UML!!!)
 - ✍ <http://www.borland.com/jbuilder>
- ✍ Sybase EAServer 4.1 Developer Edition
 - ✍ <http://www.sybase.com/products/easerver>
- ✍ JBoss Open Source App Server
 - ✍ <http://www.jboss.org>
- ✍ Orion App Server
- ✍ BEA Weblogic App Server
 - ✍ <http://www.bea.com>
- ✍ Eclipse IDE
 - ✍ www.eclipse.org

- ✍ Your local EJB nut
- ✍ The presenter



Resources To Get You Started (Continued)

- ✍ The ServerSide
 - ✍ <http://www.theserverside.com>
- ✍ The Middleware Company
 - ✍ <http://www.middlewarecompany.com>
- ✍ JGuru Forums
 - ✍ <http://www.jguru.com>
- ✍ AspectJ
 - ✍ <http://www.aspectj.org>
- ✍ EJB Performance Measurements – November 2001 CJUG
Presenter- Maciej Zawadski
 - ✍ <http://www.urbancode.com>



Demonstration

JBoss 3.0 Application Server
JBoss Druid - CMP Generator
Eclipse IDE
No cards up my sleeve