Middleware Labs: OpenEJB

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Enterprise JavaBeans 3.0

- http://d3s.mff.cuni.cz/teaching/middleware/files/OpenEJB-4.7.4.tar.gz
  - Uncompress into ~/OpenEJB

- http://d3s.mff.cuni.cz/teaching/middleware/files/as5.zip
  - Example/ - EJB demo, including README and few helper scripts
  - Input-Files/ - local implementation of the task
Notes

- EJB server must be running (run-server)
  - Different port when already used
    - Server: ~/OpenEJB/conf/ejbd.properties
      port = XYZ (XYZ > 1024)
    - Similarly admin.properties (for stop-server)
    - Client:
      props.put(Context.PROVIDER_URL, "ejbd://127.0.0.1:XYZ");
- Server part deployed with run-deploy
  - Needed after each re-compilation!
  - Persistent data stored in ~/OpenEJB/data
    - In case of rather bigger changes it is safer to stop-server
      and delete the (hsqldb) data
Task - compute distances in the graph

```java
public interface Searcher {
  public int addNode();
  public void connectNodes
      (int nFrom, int nTo);
  public int getDistance
      (int nFrom, int nTo);
}

public class Node {
  private int id;
  public Collection<Node> getNeighbors ();
  public void addNeighbor (Node oNeighbor);
}
```
1. Local implementation

- Class Node
- Interface Searcher and class SearcherImpl
- Launchable class Main (java Main)
- Measure the speed on the random graph
2. Searcher as the stateless session bean

- Searcher as a remote business interface
  - Use appropriate annotation
- Annotation of class SearcherImpl
- Compilation and deployment
  - See scripts in Example
  - Output also contains JNDI name of the bean - Jndi(name=<ClassName>Remote)
- Client - class Main
  - JNDI context creation – see ExampleClient
  - Searcher instance retrieved by JNDI lookup
3. Node as an entity bean

- See Movie and Director in Example
- Annotation of class Node
- Getter/setter for id with appropriate annotation
- Neighbour nodes as relations among entities
  - Getter/setter with appropriate annotation of the relation
4. Persistence of Node objects

- Update the class SearcherImpl
  - See ExampleEntityBeans
  - Replace hashmap nodeMap with EJB equivalents

- Annotated EntityManager
  - unitName - corresponds to persistence.xml
  - Method persist() for persistence of created Node
  - Method find() for finding Node by id

- The deployed JAR must contain file
  META-INF/persistence.xml - see Example
  - Set persistence-unit name and class correctly
5. Verify persistence

- Stop the server after creating the graph, start it before searching through it
- Where to get the node id for the second launch?
  - Try not to assume anything about automatic id assignment to Node
  - Remember which id was returned during creation
  - Optimal: add method to Searcher that selects a random id from existing nodes
Implementation

- Reuse available code
  - Algorithm implementation of the local variant
  - Scripts and code from the example
    - Do not add packages etc.
- Use Eclipse, NetBeans etc., if you like
- Report issues, ask questions when unclear
  - Mailing list...
Submission

- Part of the solution is also documentation of the chosen approach
  - See point 4 where you can chose among different approaches
- By e-mail (deadline is on the web)
- Make sure it works in the lab downstairs
- The submission shall be easy to start