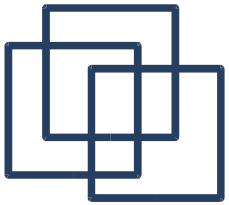

BIAS

Bioinformatics Integrated Application Software

BOSC 2004

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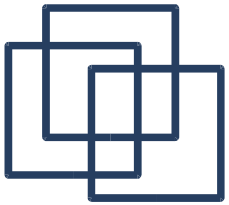
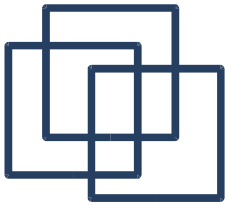


Outline

- Motivation
- Requirements
- Object-relational system
- Libraries
- Modules

Motivation

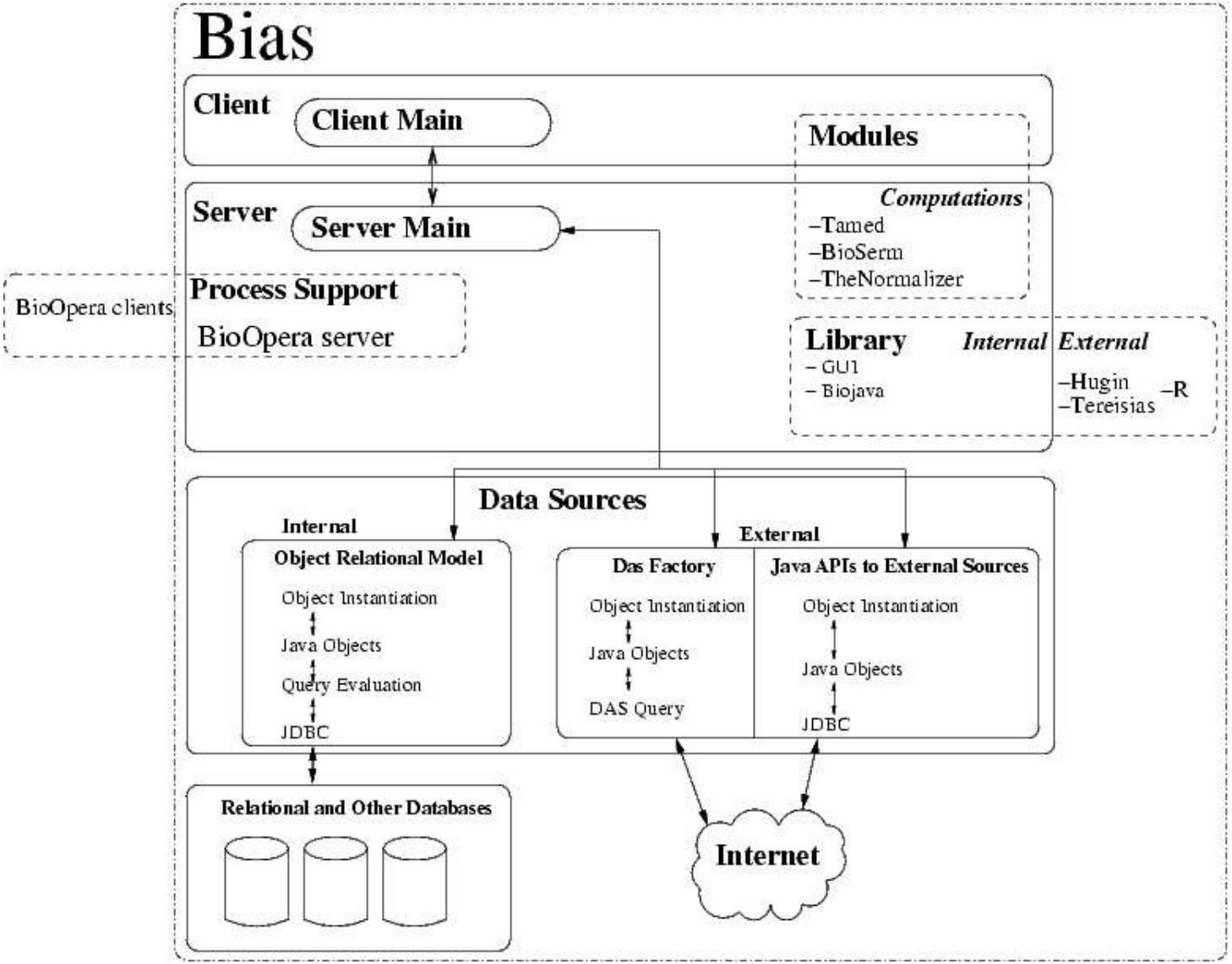
- Systems Biology / Integrative Bioinformatics
- Development platform
- Integration
  - data
    - Structural, sequences, interactions, …
  - Algorithms and statistics
    - pipelining existing algorithms
    - developing new algorithms
    - Large-scale computations (machine learning, data mining)



Requirements

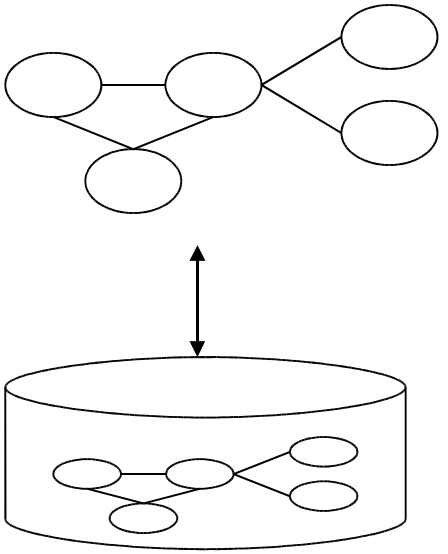
- Central consistent data repository
  - Databases
- Easy to create prototypes
  - Java
- Useable by non-experts
  - GUI library

Bias infrastructure



Object-oriented database

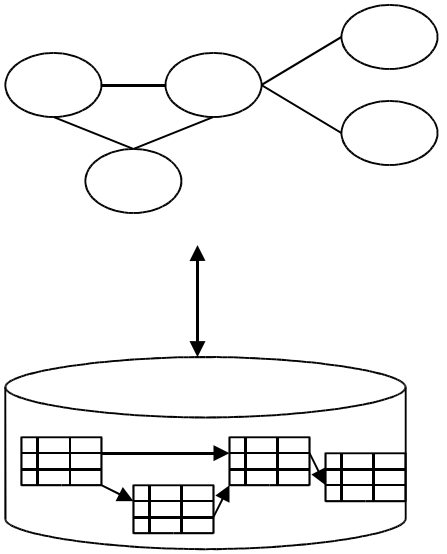
- Save objects “as-is” in the database.



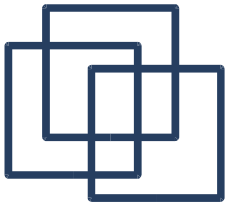
- Very flexible
- Too flexible?

Relational databases

- Force to respect predefined schema and relationships.

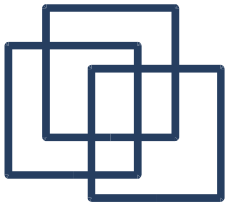


- Structure helps to optimize queries, ensure consistency.
- Too much restrictive?



Object-Relational database

- Relational database:
  - + Mature and well established
  - - Requires a lot of database-specific access code
- Object-oriented databases:
  - + Intuitive with Object-Oriented languages
  - - More difficult to maintain.
- Object-Relational:
  - Object-based, backed by a relational database



Using Apache's OJB system

- Using the ODMG standard
- Query

```
gene = Gene.getGeneByName(''YAL001C'');
```

or

```
gene = yeast.genes.get(“YAL001C”);
```

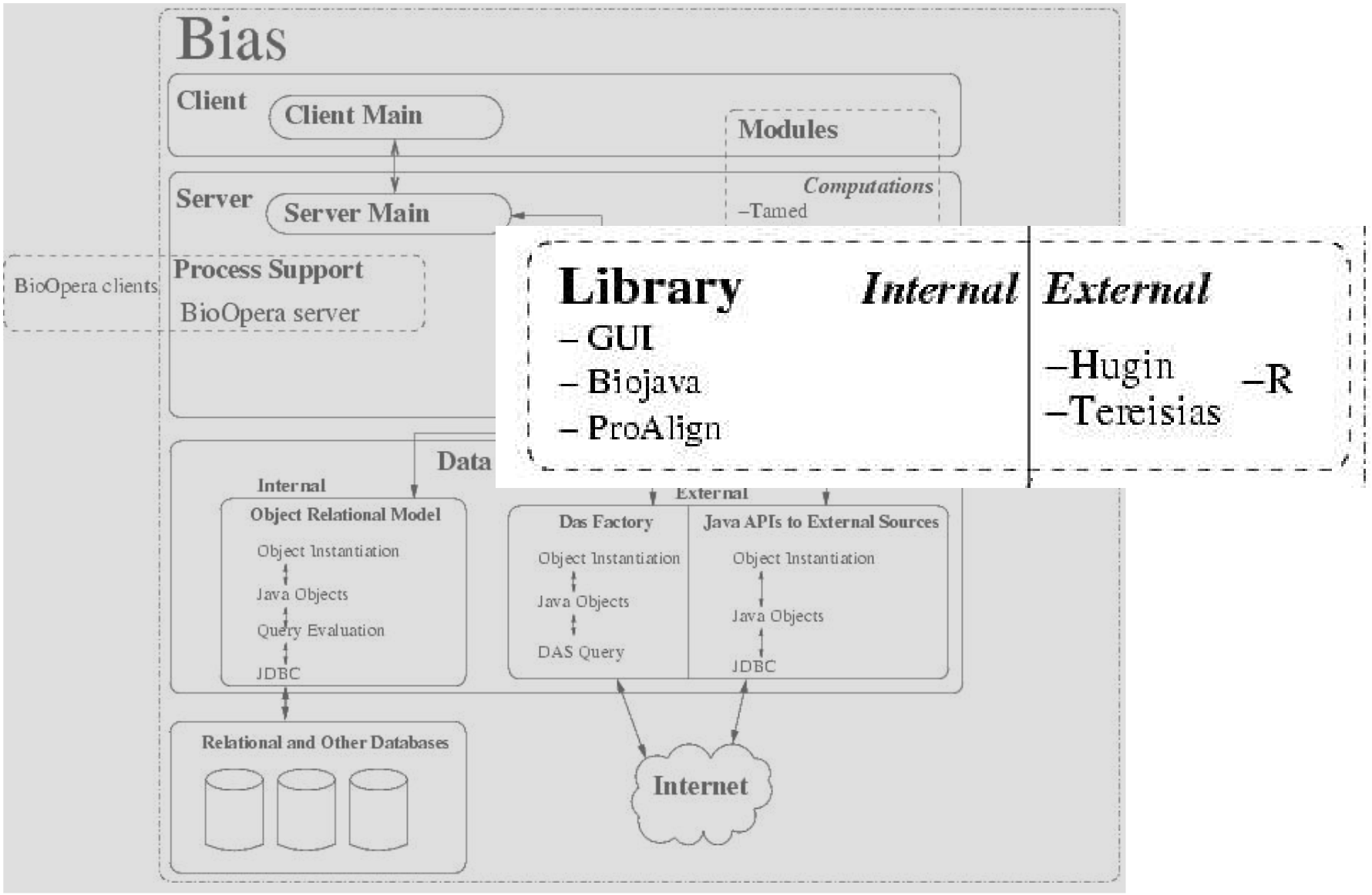
- Store new objects

```
new Gene(“YAL001C“, yeast ,sync);
```

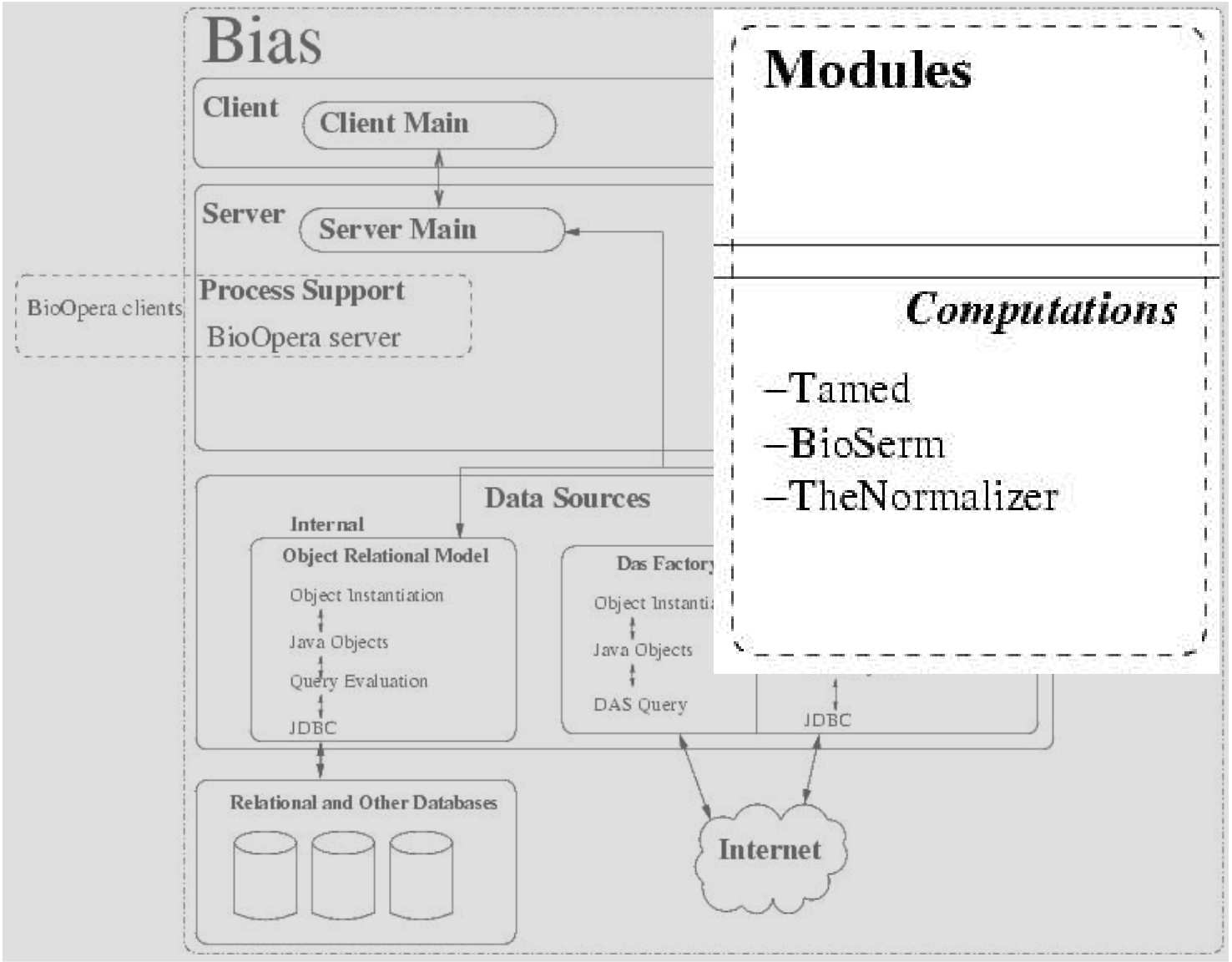
- Update

```
gene.setName(''TFC3'');
gene.sync();
```

Bias infrastructure (library)



Bias infrastructure (modules)



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