異質性分散式資料庫系統的績效評估

PERFORMANCE ANALYSIS FOR HETEROGENEOUS DISTRIBUTED DATABASE SYSTEMS

吳宜鴻、蔡秀滿、羅壽之
陳彥寰、徐嘉連、陳良弼
國立清華大學資訊科學系

劉惠玲
資訊工業策進會技術研究處

Outline

- **Traditional DBMS Benchmark**
- **Multi-database Benchmark**
- **HDDB System Architecture**
- **Benchmarking Methodology**
- **Performance Analysis**
- **Conclusion**

Traditional DBMS Benchmark

- **On-line transaction processing**
  - ☞**TPC-series**
- **Interactive query processing**
  - ☞**Wisconsin benchmark**

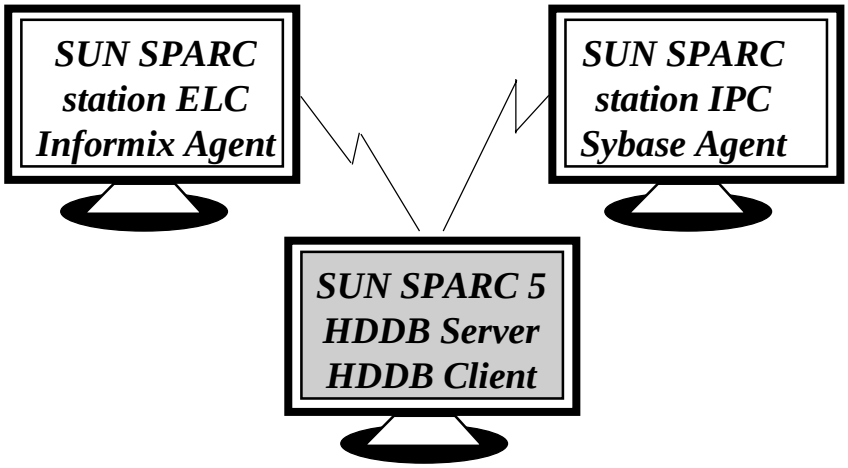
Multi-Database Benchmark

- **Data heterogeneity**
  - ☞**converting function**
- **Data distribution**
  - ☞**table fragmentation**
- **Schema integration**
  - ☞**global schema mapping**
- **Data access**

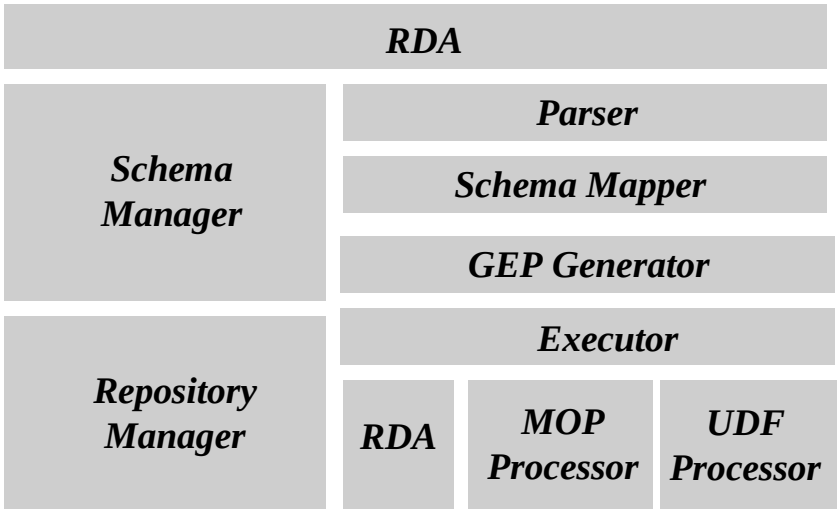
HDDB System Architecture

- **Client-server-agent three-layer structure**
- **Distributed query server**
  - ☞**query decomposition**
  - ☞**query execution**
  - ☞**data dictionary/directory access**

HDDB System Architecture



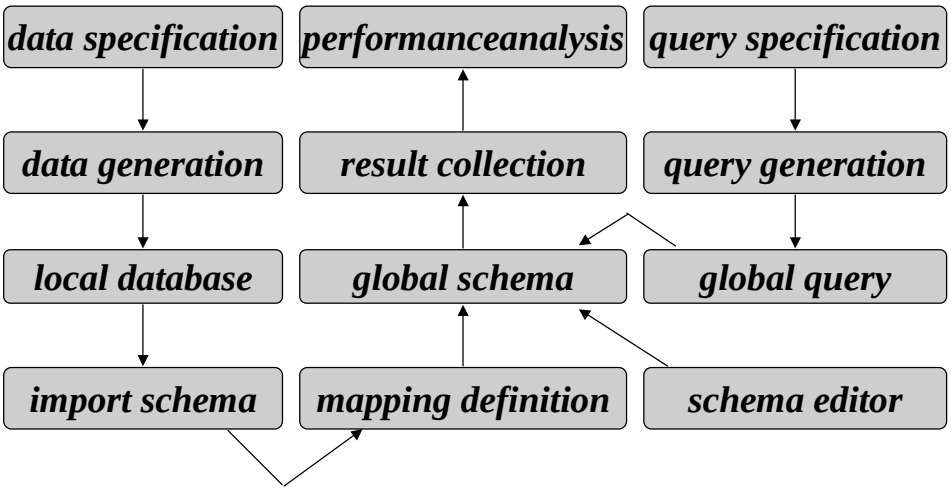
HDDB System Architecture



Benchmarking Methodology

- **Data generation**
  - ☞**local schema**
- **Query generation**
  - ☞**global schema**
- **Performance analysis**
  - ☞**measurement**

Benchmarking Methodology



Benchmarking Methodology

- **Converting function**
  - ☞**number**
  - ☞**type**
- **Table fragmentation**
- **Schema mapping**
- **Join order**

Benchmarking Methodology

<q1> no converting function

```
select sid, name, department, degree, address, blood-type, pid
from nthu-c   where degree="undergraduate"
```

<q2> weight : PoundToKG()

```
select sid, name, department, degree, address, weight, pid
from nthu-c   where degree="undergraduate"
```

<q3> weight : PoundToKG(), age : BirthToAge()

```
select sid, name, department, degree, address, weight, age
from nthu-c   where degree="undergraduate"
```

Benchmarking Methodology

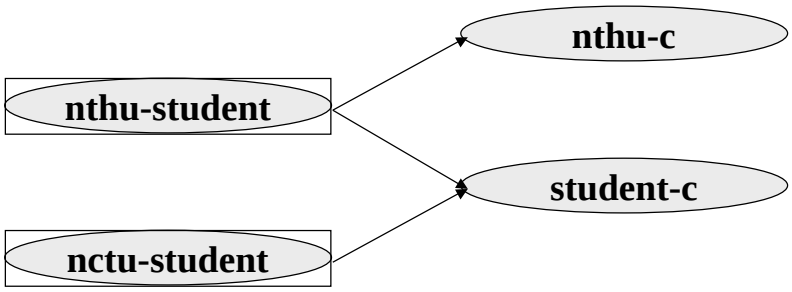
<q9> height : inchToCM()

```
select name, department, degree, school, height
from student-c   where degree="graduate" and school="nthu"
```

<q10> weight : PoundToKG()

```
select name, department, degree, school, weight
from student-c   where degree="graduate" and school="nthu"
```

Benchmarking Methodology



Performance Analysis

Performance Analysis

Conclusion

- Query optimization for converting function
- Query optimization for table fragmentation
- Join optimization