Our Approach

Agenda

1. Project Description
- The NetTraveler Architecture is aimed at mobile devices, most of the times restarting the query from scratch if the Query Service Broker becomes unavailable may not be the best option. A more efficient approach for this issue is needed.
- Our goal is to design a distributed and parallel recovery scheme to allow the NetTraveler architecture to recover if the Query Service Broker were to crash.
- This recovery scheme would allow the client to resume queries from the point the crash occurs. Instead of starting over whenever a crash occurs.
- It should provide some significant increase in throughput in the case of a crash or unavailability of the Query Service Broker.
- Enhance the current recovery scheme in order to obtain further benefits from the NetTraveler Architecture.

2. NetTraveler Architecture
- Database middleware system for WANs that is designed to efficiently run queries over sites that are either mobile clients or enterprise servers. NetTraveler is designed to cope with dynamic WANs where data sources go off-line, change location, have limited power capabilities, and form ad-hoc federations of sites.[1]
- Query Service Broker (QSB)
  - Coordination of the Execution Process.
  - Interface exposed to the client
  - P2P behavior
  - Central element in the NetTraveler Architecture
- Registration Server (RS)
  - Coordinates federations and acts as a Catalog Manager.
- Data Processing Server (DPS)
  - Interface for grid services and sensors
- Information Gateway (IG)
  - Interface for DB access
- Data Synchronization Server (DSS)
  - Acts as a data source when needed.
  - Used for recovery of queries.

3. Current Recovery
- The current recovery system, only supports a client crash or disconnection. In this case a Data Synchronization Server executes the client-side work for the given query.
- This is the goal of this project.
- Complexity increases when multiple IG’s are queried.
- Evaluate and compare other recovery approaches that may be used by the NetTraveler Architecture.
- Perform tests with this recovery scheme and evaluate its benefits and/or disadvantages.

4. Problem Description
- The Query Service Broker coordinates all the execution process of a query.
- If the QSB were to crash or become unavailable as shown in Figure 4.1, the data requested to each IG would need to be re-fetched once the QSB becomes available.
- A crash recovery scheme should be used in order to retrieve as little data as possible from the IG’s. This is the goal of this project.

5. Our Approach

6. Issues & Future Work
- This approach has issues if new data was inserted or if data changes occurred during the QSB downtime.
- Complexity increases when multiple IG’s are queried.
- Expand current recovery scheme to work when multiple IG’s are queried.
- Evaluate and compare other recovery approaches that may be used by the NetTraveler Architecture.
- Perform tests with this recovery scheme and evaluate its benefits and/or disadvantages.

7. References
1. E. Vargas-Figueroa, “Recovery of Client Query Work in the NetTraveler Middleware System”.

Supported by: