Policy-Driven Control and Management of Data Integrity

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Integrity Requirements

1. Control of Information flow
   High integrity objects should not be contaminated by low integrity objects.

2. Data verification
   Only verified data should be provided to critical transactions.

3. Prevention of fraud and error
   Only legitimate data should be introduced to system.

4. Autonomous data validation
   Integrity of data should be maintained or enhanced by system.

Challenges

- Each requirement calls for a different approach.
- Information system contains various types of data, each of which requires a different level of integrity.
- A comprehensive solution requires a systematic control of data access.

Our Solutions

1. Policy-driven control and management of data integrity.
2. Rich and flexible metadata to store detailed description of data.
3. Add-on control mechanism to existing access control.

Access Controller

Integrity Validator

Current Achievements

- Development of integrity policy specification languages
- Design of comprehensive integrity control system architecture
- Comparative study and analysis of existing integrity models

Future Work

1. Implementation on top of a real DBMS
   : Evaluation of performance, scalability, and usability
2. Refinement of policy specification language
   : Investigation of expressiveness & completeness of current language
3. Development of automatic data integrity enhancement/recovery
   : Integration of policy-driven data cleansing techniques