

Active databases and Oracle Triggers

Triggers are the rules that specify actions that are automatically triggered by certain events.

Trigger is a technique for specifying certain type of active rules.

Trigger existed in early versions of SQL specification for relational databases.

The model that has been used to specify active database rules is referred to as the Event-Condition-Action (ECA) model; which has three components: Event, Condition, Action.

The events trigger the rule.

The conditions determine whether the rule action should be executed; these are optional.

The action specifies what is to be done upon the event.

CREATE TRIGGER <trigger name>

(AFTER | BEFORE) <triggering event> ON <table name>

[FOR EACH ROW]

[WHEN <condition>]

<trigger actions>;

Employee(name, ssn, salary, dno, supervisor_ssn);

Department(dname, dno, total_sal, manager_ssn);

[FOR EACH ROW] – specifies row level trigger; omitting it defines statement level trigger.

CREATE TRIGGER total_sal1

AFTER INSERT ON Employee

FOR EACH ROW

WHEN (NEW.dno IS NOT NULL)

UPDATE Department SET total_sal = total_sal+NEW.salary WHERE dno=NEW.dno;

CREATE TRIGGER total_sal2

AFTER UPDATE OF salary ON Employee

FOR EACH ROW

WHEN (NEW.dno IS NOT NULL)

UPDATE Department

SET total_sal = total_sal + NEW.salary – OLD.salary

WHERE dno = NEW.dno;

CREATE TRIGGER total_sal2

AFTER delete ON Employee

FOR EACH ROW

WHEN (OLD.dno IS NOT NULL)

UPDATE Department

SET total_sal = total_sal– OLD.salary

WHERE dno = OLD.dno;

Design and Implementation Issues for Active Database

1. Activation, deactivation, and grouping of rules: the rules must have names by which user can activate/deactivate/drop it. There should also be a provision for creating a set of similar rules.
2. Whether the trigger is to be executed before, after or concurrently with the event; and also that whether it falls under same transaction as of the event or it is separate transaction.
3. How the row level rules and statement level rules are distinguished.
4. Validation of the consistency of various rules is difficult.
5. It is difficult to determine the dependency in case of termination of the rule.

Potential Application of Active Database

1. Allow notification of certain conditions that occur.
2. Enforce integrity constraints.
3. Automatic maintenance of derived data.
4. Flat table implementation
5. Replication of tables.