

Extension of UNO to support Active/Active implementation of Oracle Database

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Abstract: The principle concept is to dispose of all of the triggers used within the oracle database in Uno product. Heading off auto era of primary key values whilst inserting or updating with the aid of doing away with all of the dependencies on triggers. A primary key's column or columns that include values that uniquely identify each row in a table. A database table need to have a primary key for to insert, update, restore, or delete statistics from a database. This is either done by a saved PL/sql block or a PL/sql, C, or Java technique associated with a desk, view, schema, or the database itself. Oracle Database mechanically executes a cause while a detailed occasion takes location, which may be inside the shape of a machine occasion or a DML announcement being issued against the desk. Oracle GoldenGate is a era that lets in the oracle database in active-lively mode and calls for applications to observe strict rules for the replication to work smoothly without breaking. UNO platform became changed according to the GoldenGate regulations to assist oracle active-energetic database.

Oracle GoldenGate is a software program product that permits you to replicate, filter, and transform information from one database to every other database.

GoldenGate will assist to enhance the replication elements in oracle database, being utilized in all of the links in UNO platform.

INTRODUCTION

1.1 INTRODUCTION OF THE PROJECT

(Extension of UNO to Support Active/Active Implementation of Oracle Database)

The [4] Uno platform adopts a unified approach to the provisioning, manipulate, and control of messaging & voice services and channels offerings. It simplifies and future proofs the messaging and voice stack through addressing the evolving requirements of the operator across the networks from 5G/RCS/LTE to 3G/2G.

Oracle [4] GoldenGate is an era that lets in the oracle database in active-lively mode and calls for applications to observe strict regulations for the replication to paintings easily without breaking. UNO platform become changed consistent with the GoldenGate guidelines to support oracle energetic-lively database.

In energetic/lively mode, two or extra servers aggregate the community visitors load, and running as a crew, they distribute it to the network servers. The burden balancers can also consider information requests from customers and keep this facts in cache. They need to go back searching out the equal records, the consumer could be locked onto the burden balancer that previously served them. The facts is supplied again from the cache without the community server having to respond. This technique reduces community traffic load.

LITERATURE SURVEY

Ref.	AUTHOR	TITLE	YEAR	METHODS	Results
[6]	Carlos Flavián, Raquel Gurrea, Carlos Orús	Web Design: A Key Factor for the Website Success	2009	We advanced an in depth literature assessment emphasizing the unique role that net layout ought to play in the interplay consumer-interface. Besides, the method related to benchmarking	The developing improvement of the net is associated with a really aggressive context. This studies has targeted on the specialized literature and empirical evidences approximately the main

				lets in firms to know the high-quality practices and to examine some key instructions for developing their corporations on line.	elements which have an effect on the levels of success of the businesses within the electronic trade. extra specially, it's miles feasible to emphasize the components associated with web sites layout
[7]	<u>Renee Garrett, MS, LCSW,¹ Jason Chiu</u>	Webiste design and user engagement	2016	Website Positioning, Target user behavior analysis, Interface function design	Identifying and consolidating the key web site design elements that influence consumer engagement consistent with previous research. The main intention is to determine the website design factors which might be most usually proven or recommended to increase person engagement. Primarily based on these findings, we listed and defined a brief listing of website design factors that first-class facilitate and expect consumer engagement.

METHODOLOGIES AND TECHNICAL ASPECTS

4.1 ABOUT ORACLE DATABASE

[5] Oracle Database is a group of statistics handled as a unit. The motive of the database is to keep and retrieve applicable statistics. The database server is the key to fixing statistics management troubles. Commonly, the server reliably manages a large amount of statistics in a multi-consumer area so that a couple of customers concurrently can get right of entry to the identical statistics. All of this is executed even as handing over high overall performance. The database server also prevents unauthorized get admission to and offers powerful troubleshooting detection answers.

Oracle Grid architecture review

[1] Grid computing is a new IT structure that produces strong and coffee-value commercial enterprise records structures. With grid computing, groups of unbiased, modular hardware and software systems can be connected and reconnected on demand to fulfil the changing needs of businesses.

The computer grid style aims to remedy a few common troubles with the IT enterprise: the trouble of operating device monsters that result in gradual utilization, committed hardware resources, the problem of monolithic structures, uncontrollable steeply-priced to preserve and hard to alternate, and the trouble of separate and non-completely utilized information.

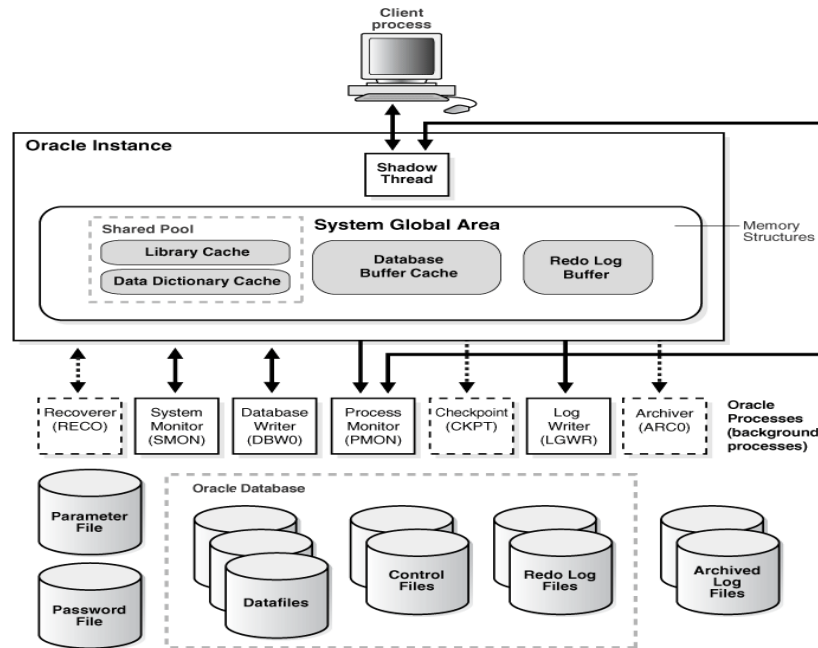


Fig. 1.1 Computer Grid Style

4.2 TRIGGERS

An Introduction to Triggers

[5] Oracle lets in you to outline approaches that are used constantly while the assertion INSERT, update, or DELETE is issued in opposition to a related data. Those procedures are referred to as triggers databases.

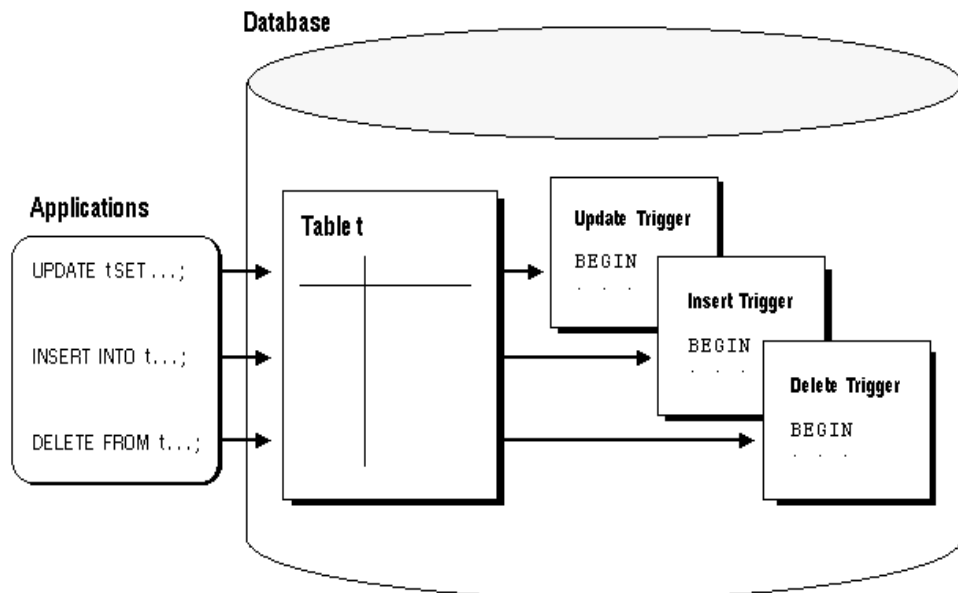


Fig. 1.2 Triggers in Database

4.3 ORACLE GOLDENGATE

Commercial enterprise records is regularly dispensed throughout the enterprise across numerous web sites. To get data between different information resources, you can use Oracle [4] GoldenGate to add, distribute, and clear out activity inside your commercial enterprise in real time and allow migration between extraordinary websites near 0.

To do this, you need a way to correctly circulate facts from one gadget to any other in actual time and without less time. Oracle GoldenGate is Oracle's answer for duplicating and compiling statistics.

Oracle GoldenGate has the following key capabilities:

- Data transfer is actual-time, decreasing delays

- Best dedicated transactions are removable, allowing for flexibility and improving performance.
- Specific versions and releases of the Oracle Database are supported as well as a huge variety of various information that works on special running structures. you could reproduction facts from the Oracle Database to a extraordinary web website
- Simple structures and smooth setup.
- Excessive performance with minimum detail on the internet site and infrastructure.

4.4 Active-Active Availability

[1] Active - Active availability manner a database has as a minimum active nodes that shard information and carry out writes to the database. Active - Active availability represents an evolution from energetic-passive, permitting databases to scale past single machines by means of letting nodes in a cluster serve reads and writes.

Considering that the information shared turned into difficult to manage and not completely disclosed, engineers started out developing structures that would at the least remedy one of the problems. The emergence of systems that don't but guide transactions, however are a whole lot less complicated to control. With the developing call for well-timed applications, it has been a sensible choice to assist groups meet their SLAs.

IMPLEMENTATION

5.1 CODE CHANGES

Major changes:

[5] Avoiding auto generation of primary key values while inserting or updating by removing all the dependencies on triggers.

Active - Active One Way replication w.r.t Redirection Accounts in IMGUI

1. [1] Active Active one-way replication is present and triggers are used to auto increment the smsc_id value in oracle DB.
2. Create trigger for smsc_host_seq and same trigger will increment the smsc_id by 1 and insert into smsc host

Trigger Creation for Auto Increment

//trigger query is present in

http://172.19.1.19/CRM/MBS/Uno/branches/Uno_8.1/Code/src/database/db_smsplatform.sql

```
[5] CREATE OR REPLACE TRIGGER smsc_host_seq_tr
BEFORE INSERT ON smsc_host FOR EACH ROW
WHEN (NEW.smsc_id IS NULL OR NEW.smsc_id = 0)
BEGIN
SELECT smsc_host_seq.NEXTVAL INTO :NEW.smsc_id FROM dual;
END;
```

3. Below query will be run from application side to insert data in smsc_host table and at the same time oracle will trigger to increment smsc_id by 1 insert in smsc_host

Inserting data into SMSC Host without SMSC ID

// Query Defined in

http://172.19.1.19/CRM/MBS/Uno/branches/Uno_8.1/Code/src/IM_UI/conf/IMOracleQueries.properties

```
REDIRECTION_ACCOUNTS_INSERT_DATA = insert into smsc_host
(smsc_name,conn_type,msg_capacity_per_sec,msg_capacity_per_min,msg_capacity_per_hour,smc_host,smc_port,alt_host,alt_port,smc_user_name,smc_pwd,system_type,address_range,maximum_pending,tranceiver_mode,keep_alive,msg_id_type,reconnect_delay,stat_refresh_delay,src_address_ton,src_address_npi,dst_address_ton,dst_address_npi,our_host,our_port,val_period,receive_port,idle_timeout,flowcontrol>window,waitack,active_nodes,force_delivery_report) values (?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?)
```

4. Insertion query is being executed in /Code/src/IM_UI/src/com/comviva/im/ui/action/settings/sms/RedirectionAccountsAction.java

Active Active Two Way Replication

1. Triggers can't be use for two way replication in Oracle DB
2. So Triggers need to be drop

Drop Triggers for SMSC Host table

```
drop TRIGGER smsc_host_seq_tr;
```

3. Will fetch the last smsc_id from sequences and incremented by 1 post that will insert smsc_id in the smsc_host table along with whole data,

Auto Increment SMSC ID and Insert into smsc_host table

```
// define query in Code/src/IM_UI/conf/IMOracleQueries.properties
```

```
REDIRECTION_ACCOUNTS_GET_INCRE_SMSCID=SELECT smsc_host_seq.NEXTVAL FROM dual; // fetch the
smsc_id and auto increment
```

```
//insert smsc_id in smsc_host table
```

REDIRECTION_ACCOUNTS_INSERT_DATA = insert into smsc_host

(smsc_name,conn_type,msg_capacity_per_sec,msg_capacity_per_min,msg_capacity_per_hour,smsc_host,smsc_port,alt_host,alt_port,smsc_user_name,smsc_pwd,system_type,address_range,maximum_pending,tranceiver_mode,keep_alive,msg_id_type,reconnect_delay,stat_refresh_delay,src_address_ton,src_address_npi,dst_address_ton,dst_address_npi,our_host,our_port,val_period,receive_port,idle_timeout,flowcontrol>window,waitack,active_nodes,force_delivery_report,smsc_id) values (?,?)

Code Schema

1. Maintain mapping of Table Name along with sequence names in DB,
2. During application start-up load the same into map where table name can be as key and sequence name as value
3. Write a generic method in DAO for all the links. So for each link just need to pass keyword i.e. table name and then
 - a. function will fetch sequence name from the map and if,
 - i. If DB type is Oracle, will fetch the field value and return the increment value
 - ii. else return 0 i.e. (for DB type MySQL)

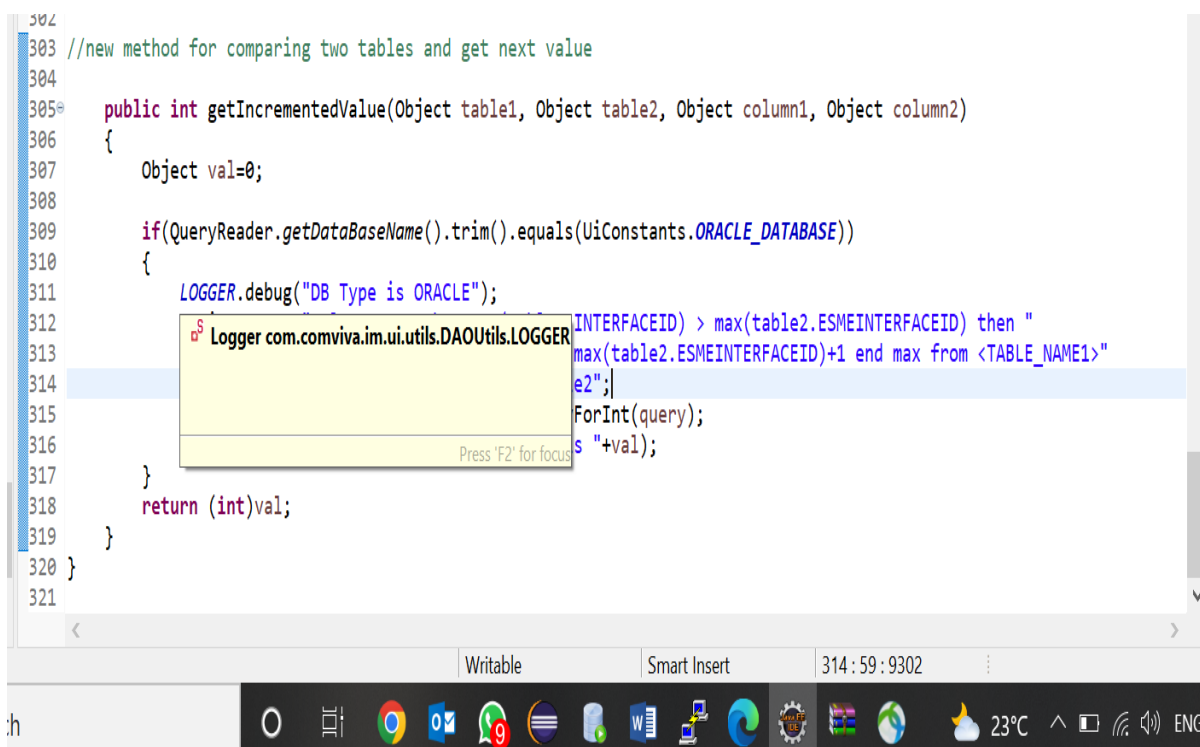


Fig. 2.1 Implementation Screenshot

```

81  /*
82  * If DB Type is Oracle, fetch the incremented seqvalue , previously done by triggers
83  *   for all the links using trigger
84  * If DB Type is MYSQL return 0
85  */
86  public int incrementSeqValue(Object SEQNAME)
87  {
88      Object val=0;
89
90      if(QueryReader.getDataBaseName().trim().equals(UiConstants.ORACLE_DATABASE))
91      {
92          LOGGER.debug("DB Type is ORACLE");
93          String query = QueryReader.getQuery(QueryConstants.IM_INCRE_SEQVAL_GET_QUERY);
94          query = query.replace("?", (String)SEQNAME);
95          val = getSimpleJdbcTemplate(CONF_DB).queryForInt(query);
96          LOGGER.debug("For Sequence "+SEQNAME+" Next ID is "+val);
97      }
98      return (int)val;
99  }
00
01
02

```

Fig. 2.2 Implementation Screenshot

CONCLUSION

[5] Using Oracle GoldenGate, you can pass committed transactions throughout a couple of heterogeneous structures on your organization. Oracle GoldenGate permits you to copy information among Oracle databases to other supported heterogeneous database, and between heterogeneous databases. All dependencies of triggers are removed from oracle database.

In Active Active Two Way Replication Triggers can't be use for two-way replication in Oracle DB. So all the Triggers are dropped from the database and oracle sequences are used.

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