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RESEARCH TITLE

Developing a tool for Redo log Management in Oracle Database

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Abstract

The log retains the operations that occur in the database. In this paper, a tool was developed to manage database logs, allowing access to information and reviewing the actions of certain individuals. An analysis of the log was conducted using LogMiner, a tool that enables us to view the changes made to the database. A user interface has been designed to interact with the log.

Key Words: LogMiner ; Redo log ; Archived log.

عنوان البحث

تطوير أداة لإدارة السجل في قاعدة بيانات اوراكل

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المستخلص السجل يحتفظ بالعمليات التي تتم في قاعدة البيانات . في هذه الورقة تم تطوير أداة لإدارة قواعد بيانات السجل بحيث يمكن الوصول الى المعلومات واستعراض تصرفات بعض الأفراد . تم عمل تحليل للسجل باستخدام Log Miner وهو أداة نستطيع من خلالها الاطلاع على التغييرات التي تمت على قاعدة البيانات . تم تصميم واجهة للمستخدم للتعامل مع السجل المؤر شف. الكلمات المفتاحية: لو غمينر : إعادة السجل : السجل المؤر شف.

1. Introduction:

There are two oracle memory structures relating to recovery log buffers and data block buffers. the log buffers are the memory buffers that record the changes, or transactions, to data block buffers before they are written to online redo logs or disk .Online redo logs record all changes to the database, whether the transactions are committed or rolled back .The data block buffers are the memory buffers that store all the database information .A data block buffer stores mainly data that needs to be queried, read changed, or modified by users. The oracle file structures relating to recovery include the online redo logs. archived redo logs, control files, data files, and parameter files. The redo logs consist of files that record all the changes to the database [1].

2. Problem definition

The problem at hand pertains to the challenge of accessing the redo log file and archived log file, which collectively store a comprehensive record of all changes and transactions that have taken place within a database over time.

3. Methodology

In this section, the methodology employed for the development and implementation of the proposed tool is presented .

3.1 Design Objectives

- In this section, the key objectives that guide the development and implementation of the proposed tool are defined. The primary objective of this Tool is to enable real-time monitoring and review of modifications made to data. This ensures data integrity and security.
- To provide supplementary information that supports capacity planning and resource allocation, helping optimize system performance.
- The Tool will facilitate the retrieval of critical data required for debugging and troubleshooting complex applications, reducing downtime.
- The tool will incorporate data recovery mechanisms to restore information that has been unintentionally deleted, minimizing data loss risks.
- 3.2 Tool Description

In this section, an overview is provided of the fundamental tool used in this methodology . LogMiner is a robust Oracle utility utilized in this paper. It empowers users to conduct online queries on the contents of both Redo log files and archived log files. the functionality of LogMiner includes:

- **Online Querying:** LogMiner allows for real-time queries, enabling instant access to transactional data stored in Redo log files.
- Archived Log Files: It extends its capabilities to archived log files, ensuring historical data retrieval.
- Audit and Analysis: LogMiner serves as a powerful audit tool, facilitating detailed tracking of data modifications.
- **Data Recovery:** Additionally, LogMiner provides data recovery features, enhancing the system's resilience against data loss incidents.

4. Implementation and Results

This section outlines the transition from the theoretical framework and design phase to the practical implementation .

4.1 LogMiner Configuration

- Enable Supplemental Logging
- Set Initialization Parameters
- Prepare the LogMiner Dictionary
- Start LogMiner
- Specify Log Files and Time Range
- Load Log Files
- Query LogMiner Views

4.2 Results

	e Management	System For Log	ID 64000C0043010000	RED SOL	Operation	User Na.	THE
			040000042010000	set transactam read write:	START	SCOTT	2012-01-0
			6400000043010000	opune STS, ODIS SEL OBJE = L. DATADEJE = .	UPDATE	SCOTT	2012-01-0
Add Log File			0400140042010000	set transaction read write	COMPET	SCOTT	2012-01-0
			0400140043010000	commit	SIAKI	SCOTT	2012-01-0
LOG	Hame REDo01		04001A0042010000	set transaction read write:	START	SCOTT	2012-01-0
	and the second second	100	04001A0042010000	cammit	COMMETT	SCOTT	2012-01-
1			04000F9042010000	set transaction read write:	START	SCOTT	2012-01-
Add Log File			04000F0042010000	insert into "SYS" "SEGS" values "TS#" = 4. "FILF#" =	DISTAT	SCOTT	2012-01-
			04000F0042010000	update "SYS", "TSOS" set "GRAITOR#" = 0. "NLOCKS"	UPDATE	SCOTT	2012-01-
			04000F0042010000	commit	COMMETT	SCOTT	2012-01
			0400160042010000	set transaction read write:	START	SCOTT	2012-01-
			0400160042010005	commit	COMMIT	SCOTT	2012-01
Start Logminer Ranged			0400080042010000	set transaction read write;	START	SCOTT	2012-01
			0400050042010000		Pencen	SCOTT	2012-01
Start Time	81/2012		0400080042010000	insert into "SYS", "OBJS" values "OBJ#" = 52946, "DAT	TISERT	SCOTT	2012-01
			0400080042010000	insert into "SYS", "TABS" values "OELs" = 52946, "DA.	INSERT	SCOTT	2012-01
End Time	10/1/2012		6400060042010000	insert into "SYS"."COLS" values "OBJ#" = 52946. "COL	DISERT	SCOTT	2012-01
			0400080042010000	create table st(no number(3)):	DOL	SCOTT	2012-01
			0400050042010000	update "SYS"."SEGS" set "TYPE#" = 5, "BLOCKS" = 8,	UPDATE	SCOTT	2012-01
	Start Logminer		6400050042010000	commit;	COMMIT	SCOTT	2012-01
			050000050010000	set transaction read write:	START	SCOTT	2012-01
			050000050010000	insert into "SCOTT"."ST" values "NO" = 1;	INSERT	SCOTT	2012-01
			0500000050010000	commit	COHIMIT	SCOTT	2512-01
						-	
Query LogHts	er Costesta						
	MATT					-	
User fila_	SCOT						
User Na	SCOTT						
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User Ra	Fetch						
User Na	Fetch						
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User Na.	Fetch						

Figure 1 illustrates the activation of LogMiner for the time period from 8/1/2012 to 10/1/2012 specifically for the "SCOTT" user. The information is obtained in 13 seconds.

DataBase	e Managemen	t System For Log	0	RED BOL	Operation	1/94/122/14	TAMESTAL	
CHEGOLO	e managemen	a system for Log	0430003042010000	set transaction read write:	START	SCOTT	2012-01-08-00:19:12.0	854
			0400003042610000	apdate "\$75","0835" set "083#" =.	UPDATE	SCOTT	3013-01-08-00:39:13.0	856
adding the			64000C0043010000	commit;	CONNIL	SCOTT	2012-01-08 00:19:12.0	\$54
wood cold the			0400140043010000	net transaction read write:	START	MOTT	2012-01-08 00:19:12.0	
			0400140042010000	cammat;	CONNELLI	SCOTT	2012-01-08-00:19:12.0	454
LOG	Name REDo01		04001A0043030008	set transaction read write;	START	SCOTT	2013-01-08.0019.12.0	8.04
			04001A0043010000	commit;	COMPART	SCOTT	3013-01-04 00:19:12.0	
			0400070042010000	set transaction read write:	START	scorr	2012-01-08 0819:12.0	- 22
	was rod too		04000F0042010006	maert arta "\$75"."\$255" aakers "TS	_INSERT	NOTT	2012-01-08 00:19:13.0	100
			0400070042210000	apdate "SPS", "TSQS" set "GRANTO	_UPDATE	SCOTT	3012-01-08 00:19:12.0	2.5
			9430099042010006	cannet	COMMUT	SCOTT	2012-01-08-0019-12.0	-
			6400160543010000	set transaction read write:	START.	SCOTT	2012-01-08 00:19:12.0	
and a second		0400160043010000	cament	CONNELL	SCUTT	2012-01-08 00:39:32.0	1.60	
Scart Logman	er Kanged		6406080643030000	set transaction read write;	START	SCOTT	2012-03-08 00:19:11.0	- 60
and and			6400080642010000			SCUTT	2012-01-08-00:19:11.0	
Start Fame	4.82041		0400080643010000	maert anto "SYS", 'OEJS' values "0.	INSERT	SCOTT	3013-01-08-00/19/120	- 60
And These	Caburdows		8400080043010008	maert ada "SYS", "TAds" values. "O.	. INSERT	SCOTT	3013-01-08 00:19:12.0	
COLLINE	Ta Santa		0400080042019000	maert ata "SYS","COLS" salars "O.	INSERT	SCOTT	2012-01-08 09:19:12.0	1
			8430080042019000	create table st(os number(3))	DOL	SCOTT	2012-01-08 00:19:124	110
	In statistics of the little		0400080042010000	apdate "\$75", "SEGS" aet "TYPE#".	UPDATE	SCOTT	2012-01-08-00.19:123	1.100
	Start Logmen.		0400050542035000	commit;	COPUTET	SCOTT	2012-01-08 00:19:12.	8. 80
			250000025003.0000	set transaction read write:	START	SCOTT	2013-01-08 00:19:281	3. 30
			e50000050030000	insert into "SCOTT"."ST" unlars "R.	INSERT.	SCOTT	2012-01-08 00:19:28.	1.163
			650000050010000	cannet	COMBILIT	SCOTT	3015-01-08 0618157	8. 80
Query Lagition	er Contents							
User Sa.	SCOTT							
	(and the second							
	Fetch							
	Stor Direr							

Figure 2 illustrates the activation of LogMiner for the time period from 8/1/2012, to 12/1/2012, specifically for the "Scott" user .

The information is obtained in 27 seconds.

	e Management	System F	for Log	G 6406250672018000	RED 9/2. set transaction read sette:		Company Statt	Caw tils.	RAFECTION CONTRACTOR	32 9873
Add Log File				5400290073013000 8400250073013000 6750390073013000	anset ido "OF", "PROHOTORS" values commit, ant transaction read write	"MONO_L	CONNET START	CR CR	H12-01-12 H12248 H12-01-12 H12248 H12-01-13 H12248	967379 967379 9839693
10	Giame RECold			1705280673818080 1705280673818080	invertints "Of", "PROPERTIES" unkers	"PERMIT	TRISERT CONNET	OK OF	2012-01-13 2329348	1010
	and party									
	Add Log File									-
StartLagen	er Ranged									
Start Time	812212									
End Time	1512012									
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Figure 3 illustrates the activation of LogMiner for the time period from 8/1/2012 to 15/1/2012 specifically for the "OE" user . The information is obtained in 46 seconds.

DataBase Management System For Log	D.	RED 9%	Operation	Userliana	THEST ALS
	S799900941519909	set transaction read write;	THEFT	-	2012-02-04
	17000C094F110000	RESCALING THE RESIDED NUMBER RESIDENCE.	((WINTT	12	2012-01-05
Add Log File	12305375555615658	commut,	START	HR	2012-01-09
	1300270550010000	delete bran "NR" "BIGION" advers "BIGION ID"	DELITE	18	2012-01-05
Incline Bould	0300370950010000	rommit	CONNELL	15	2012-01-05
CONTRACT TREASURY			and a literature		
	The second				
Add Log File	1				
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Outlinement Inned			1		
Shall's surgeringer harringen					
Start Time 04/01/19	-				
START STRUCK MEET ST					1
End Time 10/1/2012 20:00:00					
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	1			-	_
Start Logmmer			-		12
				-	
			-	-	
Query LogHaner Contents					
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Figure 4 illustrates the activation of LogMiner for the time period from 8/1/2012 to 10/1/2012 specifically for the "HR" user . The information is obtained in 13 seconds.

5. Conclusion

In conclusion, the proposed tool offers a robust solution to address the critical needs of data management and system performance optimization. By enabling real-time monitoring and review of data modifications, it ensures data integrity and security in an ever-evolving digital landscape. Moreover, the supplementary information it provides supports efficient capacity planning and resource allocation, leading to enhanced system performance.

The tool's role in facilitating the retrieval of critical data for debugging and troubleshooting complex applications cannot be understated, as it significantly reduces downtime and accelerates issue resolution. Furthermore, with its integrated data recovery mechanisms, the tool acts as a safeguard against unintended data loss, minimizing risks and ensuring the continuity of data-driven operations.

In summary, the proposed tool stands as a valuable asset in the realm of data management and system optimization, offering a holistic solution that empowers organizations to maintain data integrity, optimize resources, streamline troubleshooting, and mitigate data loss risks effectively.

References

AULT, M., Liu, D., & Tumma, M. (2005) . Oracle database 10g new features.