Implementation of Oracle RAC on Oracle Cloud

Skant Gupta Oracle DBA, Etisalat Dubai

ABSTRACT

Today's world is all about technology our life is contingent upon technology. Little change in technology makes huge differences on today's business. Cloud computing is a virtualized compute power and storage delivered via platformagnostic infrastructure of abstracted hardware and software accessed over the internet.

In this paper is equipped with all the details about cloud computing. It also includes brief overview about oracle database, Oracle RAC and oracle cloud computing. This paper is focused on advantages of cloud computing. It also focuses on the steps to setup Oracle RAC on cloud.

Keywords

Oracle RAC, Oracle Cloud, Database as a service

1. INTRODUCTION

Data is the most important element of any alliance. Security of data is of utmost importance. Data plays a very essential role in each n every department of an organization like IT department, R&D department, HR department, Finance department, sales departments etc. In this hi-tech world there are lots of options available in market thereby allowing people to choose any database according to their budget, volume of data, quality etc. Some of the example of most saleable database includes Oracle, DB2, MySQL, SQLite, SQL Server and Sybase.

Oracle Database is the first RDBMS database designed for enterprise grid computing, the most flexible and cost effective way to manage information and applications by Oracle Corporation on 1977. Oracle database is amongst one of the best option for any organization because of its Reliability, Functionality, Customer Satisfaction and Flashback Technology, consistency, isolation, atomicity and durability.

The database has logical structures and physical structures. Because the physical and logical structures are separate, the physical storage of data can be managed without affecting the access to logical storage structures.

2. ORACLE RAC

When we talk about oracle database that is related to single database only. Data is increasing day by day. Due to increment of data organizations felt the need to switch in to Oracle RAC. RAC stands for Oracle Real Application Clusters. Oracle Clusterware is a portable cluster management solution that is integrated with Oracle Database. Oracle Clusterware is also a required component for using Oracle RAC. In addition, Oracle Clusterware enables both single-instance Oracle databases and Oracle RAC databases to use the Oracle high-availability infrastructure. Oracle Clusterware enables us to create a clustered pool of storage to be used by any combination of single-instance and Oracle RAC databases.

Stuti Kaushal Senior System Engineer Infosys

3. RACEVOLUTION

Oracle 8i OPS implementation brought in many outstanding improvements done by oracle Corporation. The extraordinary new feature was the launch of cache fusion technology. Cache fusion, as appears earlier, In Rac cache, or SGA, multiple instances which coordinate the buffers and manages the database access. Oracle 8i (OPS) introduced the initial phase of cache fusion. The data blocks were transferred from the SGA of one instance to the SGA of another instance without the need to write the blocks to disk RAC mainly. The partial implementation of cache fusion in Oracle 8i could help only in certain conditions.

4. THE BENEFITS OF REAL APPLICATION CLUSTERS

- Lower Overall Cost of Ownership
- Expanded Scalability
- High Availability
- Transparency
- Buffer Cache Management
- Row Locking
- Recovery Manager, Online Backups, and Archiving
- Ability to spread CPU load across multiple servers
- Continuous Availability / High Availability (HA)
- RAC can take advantage of larger SGA sizes
- Scalability
- While choosing RAC for used as a cost savings solution
- Never choose RAC to scale

5. WHAT IS CLOUD COMPUTING?

As we know technology changes day by day which is making our life easy? New inventions occur every day. Cloud Computing is in trend. We can have some popular cloud computing products like Oracle Cloud, Amazon Web Service, Google Cloud Platform Services, and Microsoft Azure etc.

The computing which depends on sharing computing resources rather than having local servers or personal devices to handle applications are referred to as cloud computing. Cloud computing is akin to grid computing which is unused processing cycles of all computers in a network are harnesses to solve problems too intensive for any stand-alone machine. We have big advantage in cloud computing that it is based on shared, elastic resources delivered to users in a self-service, metered manner using web technologies.

6. WHAT IS ORACLE CLOUD?

Previous topics were based on RDBMS, Oracle RAC. Let us now learn about latest technology of Oracle Corporation in database. 12c is a latest version in oracle database. C stands for cloud computing Oracle Cloud is the industry's broadest and most integrated public cloud. Oracle provides best-inclass services across software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS), and even lets you put Oracle Cloud in your own data center. Oracle Cloud succor organizations drive innovation and business by increasing business agility, lowering costs, and reducing IT complexity.

Advantages of Oracle Cloud Computing

- 1. Oracle Cloud provides maximum performance and value to businesses.
- 2. In Oracle Cloud we have new feature that we can run Oracle's modern Fusion Applications out of the box.
- 3. Social relationship platform for engaging customers, partners, and employees easily can make in cloud computing.
- 4. Social brilliance and inbound insights are part of it.
- 5. One new feature of Optimizes Platform-as-a-Service integration with Oracle Cloud applications is available in oracle cloud.
- Customers have more independence and decisionmaking in hands of customers.
- 7. Customers world-class security and architecture are on priority of cloud computing.
- 8. Customers can create itineraries for upgrades according their comforts.
- 9. Release of money and time for customers via completeness of the end-to-end solution.
- 10. Systems integrators function is available for Frees customers.

7. CREATION OF ORACLE RAC DATABASE IN THE CLOUD

Let us learn the procedure to create an Oracle RAC Database in the cloud. To do this, we enter with our account for Oracle cloud services, go to the "Oracle Database Cloud Service" page and create a new service.

We provide the Service name then we choose "Oracle Database Cloud Service" as Subscription Type, also provide the SSH public key.

Step 1: Explains about the selection of the database's release as shown in the figure. Select a database "release" and we chose "Enterprise Edition - Extreme Performance" as Software Edition. Then we continue with a click on "Next".

Elaborate about we provide an Administration Password Which is used as your sys password, DB name (SID) with respective (PDB Name) and mark the "Database Clustering with RAC" checkbox. Then we continue with a click on "Next".

	Previous	Cancel	Service Details Confirmation	Next 📏
--	----------	--------	------------------------------	--------

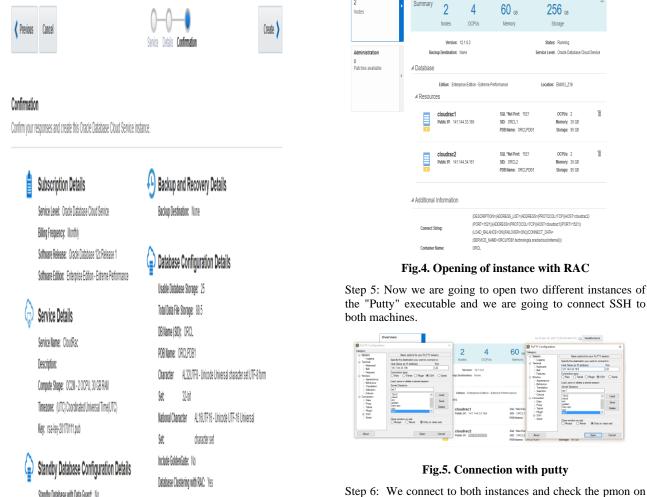
Service Details

Provide details for this Oracle Database Cloud Service instance

Service Configurat	ion		9 Backup and Recovery	Configu	ration	
* Compute Shape	OC5-40CPU, 30 GB RAN		✓ Backup Destination	None		V
* Timezone	(UTC) Coordinated Universal	/				
Database Configur	ation					
* Usable Database Storage (GB)	25		Total Estimated Monthly Storage (GB)	NA	0	
Total Data File Storage (GB)	88.5		* Character Set	AL32UTF8-	Unicode Un 🗸	
* Administration Password		0	* National Character Set	AL16UTF16	- Unicode U 🗸	
* Confirm Password		0	Database Clustering with RAC	0		
* DB Name (SID)	ORCL	0				
* PDB Name	ORCLPDB1	0				

Fig.1. Explains about the administrator's password

Step 2: Finally, we check the configuration and click on "Create" to create Oracle RAC database on cloud.



Standby Database with Data Guard: No

Fig. 3 Creation Summary

After a few minutes, Oracle RAC database is created successfully.

Summary	2 Services	8 OCPUs	90 GB Memory	512 GB Storage	4 Public IPs	_
ervices		Q			Crea	e Service
	CloudRac1 Itatus: In Progress Version: 12.1.0.2 dittion: Enterprise Edition - 1	Extreme Performance	Submitted On: Jan 16, 201	7 1:00:52 AM UTC	OCPUs: 4 Memory: 30 GB Storage: 256 GB	
~	NoudRac		Created On: Jan 16, 2017 1	12:22:31 AM UTC	OCPUs: 4 Memory: 60 GB Storage: 256 GB	Ξ

Fig 4. Main Service console

Step 4: we click on the service name (CloudRac) to open the main page of both instances of RAC.

each server.

er ondell douback-	- 0 X 🖗 osde@doutact- 0	Х
Dsing username "opo".	 Using username "cpo". 	
Authenticating with public key "rsa-key-20170111"	Authenticating with public key "rsa-key-20170111"	
Passphrase for key "rsa-key-20170111":	Passphrase for key "rsa-key-20170111":	
[opc@cloudrac2 ~]\$ ps -ef grep pmcn	[opc%cloudracl ~]\$ ps −ef grep pon	
oracle 3632 1 0 02:22 ? 00:00:00 ora pmon orcl2	opc 6189 4799 0 02:39 pts/0 00:00:00 grep pon	
grid 4946 1 0 01:53 ? 00:00:00 asm pmon +ASM2	[opc%cloudracl ~]\$ ps −ef grep pmon	
opc 13385 13323 0 02:39 pts/2 00:00:00 grep pmon	grid 4227 1 0 01:50 ? 00:00:00 asm pmcn +ASM1	
[cpc%cloudrac2 ~]\$ sqlplus / as sysdba	opc 6697 4799 0 02:39 pts/0 00:00:00 grep pmcm	
-bash; sqlplus; command not found	oracle 13779 1 0 02:22 ? 00:00:00 ora pmcm orcl1	
[opc\$cloudrac2 ~]\$ sudo su - oracle	[opc%cloudracl ~]\$ sudo su - oracle	
[oracle&cloudrac2 -]\$ sqlplus / as sysDa	[oracle#plouinacl -]\$ sqlplus / as syndha	
\$QD#Elus: Release 12.1.0.2.0 Froduction on Mon Jan 16 02:40:26 201	017 017 SQL992us: Belease 12.1.0.2.0 Production on Hon Jan 16 02:40:39 2017	
Copyright (c) 1982, 2014, Oracle. All rights reserved.	Copyright (c) 192, 2019, Gradie. All rights reserved.	
Connected to:	Connected to:	
Oracle Database 12c EE Extreme Perf Release 12.1.0.2.0 - 64bit Pro	roduction Oracle Database 12c EE Extreme Perf Release 12.1.0.2.0 - 64bit Production	
With the Partitioning, Real Application Clusters, OLAP, Advanced A	Analytics With the Partitioning, Real Application Clusters, OLAP, Advanced Analytics	
and Real Application Testing options	and Heal Application Testing options	
ato []	ata l	

Fig.6. Check of pmon process

Step 7: We check number of instance in Oracle RAC database as shown below.

🖡 nadelji tudni 2- 🛛 X	🕴 mack@cluutacl 🗆 X
A SQLMPIus: Belease 12.1.0.2.0 Production on Hon Jan 16 02:40:26 2017	SQUPPLos: Release 12.1.0.2.0 Production on Non Jan 16 02:40:39 2017
Zgyright (c) 1982, 2014, Ocaole. All rights reserved.	Copyright (c) 1982, 2014, Oracle. All rights reserved.
lamentei no: brañe Brañaee Uz II Inneze Perf Belesee (1.1.0.2.0 - 660) Production Dint de Amritikadag, Paul Applicación Clastera, GUA, Advancel Analysico and Beal Applicación Teoring optimas	Cometed to: Anale Backee 11: F2 Entrane Perf Relaxee 12.1.0.2.0 - 4601: Broduction Rich die Pertification, Heil Application Constany, 4028, Advance Anlytics auf Reil Application Testing optimis
QLA SILECT inst name FRUM viactive instances;	SQL> SILECT inst mame FAUM všactive instances;
IST NAS	IIST_IONE
lowites) soci) lowites? soci)2	elouinael soci l elouinael soci l
(D) enit Sonmersel from Veralle Bondanse 110 III Dimzense Perf Relasses 13.1.0.2.0 - 4645 Resolution	SQD anit Discomented from Oracle Database 10: 10 Distance Perf Belease 10:1.0.2.0 - 68cc Production
ith the Pertitioning, Heal Application Clusters, VLP, Advanced Analytics ad Heal Application Testing optims conclude/clusters2 = 15 []	Ath the Partitioning, Beal Application Clusters, OLP, Maraned Analytics and Beal Application Texting optimes [concleficionized =)]\$

Fig.7 checking number of instance

Step 8: We can cross verify the status of Oracle Database by using "srvctl" utility.



Fig.8. cross verify the status of Oracle Database

Step 9: Now we are connecting to "grid" user and check the clusterware resource by using "crsctl" utility.

	drac2 -]\$ sudo su - g udrac2 ~]\$ crectl sta			A OULINE OULINE cloudrach STABLE	
HINE CLO	untetz ~ją cracti sta	- 163 -0		OWLINE OWLINE cloudrac2 STABLE	
19	Target State	Server	State details	ora.cos OWLINE OWLINE cloudract STABLE	
415	tatget State		JUSIC UCIDITS	ULINE UNLINE CICUITACI SIASLE UNLINE UNLINE CICUITACI SIASLE	
				ora.redo.acfs citotisci Sidela	
ncal Res				ONLINE ONLINE clouinsel monnted	en fat
a.CATA.	IRIA. advn			- 12	
	ONLINE ONLINE	cloudracl	STRELE	OULINE OULINE cloudrac2 mounted	on /u0
	ONLINE ONLINE	cloudrac2	STABLE	3	
ra.DATA.	dg			LE.	
	OSLINE OSLINE	cloudrac1	STABLE		
	ONLINE ONLINE	cloudrac2	STABLE	Cluster Resources	
a.794.7	RA, advn				
	ONLINE ONLINE	cloudracl	STABLE	ore.LISTENER SCRUI.lenr	
	ONLINE ONLINE	cloudrac2	STABLE	1 OULINE OULINE cloudrach STABLE	
a.73A.d				ora.LISTENER_SCHU2.lanr	
	OKLINE OKLINE	cloudrac1	STABLE	1 OULINE OULINE clouirac2 STABLE	
	ONLINE ONLINE	cloudrac2	STABLE	ora.clouiracl.wip	
ra.LISTE	NEB.lsnr			1 OULINE CULINE cloudrac1 STABLE	
	ONLINE ONLINE	cloudracl	STABLE	ora.cloudrac2.vip	
	ONLINE ONLINE	cloudrac2	STABLE	1 OBLINE OBLINE clouirac2 STABLE	
a.SEDO.	REDO.advm			ora.070	
	ONLINE ONLINE	cloudracl	STREET	1 OULINE COULINE clouiracl STABLE	
	OWLINE OWLINE	cloudrac2	STRATE	ora. 00%j	
ra.SEDD.				1 OFFLINE OFFLINE STABLE	
	OWLINE OWLINE	cloudracl	STABLE	ora.orel.do	
	OWLINE OWLINE	cloudrac2	STABLE	1 OULINE OULINE cloudrac1 Open,ST	
18.85T				2 OULINE OULINE cloudrac2 Open, STR	
	OSLINE OSLINE	cloudracl	Started, STABLE	ora.scanl.vip	
	OSLINE ONLINE	cloudrac2	Started, STABLE	1 OULINE OULINE cloudrac1 STABLE	
8.0853.	data.acfs		and the last of	ora.scan).vip	
	OWLINE OWLINE	cloudracl	mounted on /uN2,ST	1 OULINE OULINE cloudrac2 STABLE	
			12	v [grid§cloudracl ~]\$	

Fig.9. Connection with "grid"

Step 10: Now we can connect to PDB database in each instance of Oracle RAC.

oracle@cloudiac2+	-	0	X	🖁 oracle@cloudrack-	- 0	
oracleßcloudrac2 ~]\$ sqlplus / a	as sijačba		٨	[oracle@cloudracl ~]\$ sqlplus / a:	e syedba	
[L*Plus: Release 12.1.0.2.0 Pro	duction on Mon Jan 16 02:54:51 2017			SQL*Plus: Release 12.1.0.2.0 Prod	uction on Mon Jan 16 02:54:55 2017	
opyright (c) 1982, 2014, Ocacle	. 111 rights reserved.			Copyright (c) 1982, 2014, Oracle.	All rights reserved.	
	erf Belease 12.1.0.2.0 - 66bit Froduct ication Clusters, CLB, Advanced Analy				rf Release 12.1.0.2.0 - 6Hbit Production action Clusters, OLAP, Advanced Analytics	
(L) (L) show politis				SQL> show pobe		
CON 1D CON NAME	OPEN MODE RESTRICTED			CON ID CON HENR	OPEN HIDE RESTRICTED	
				2 FOB\$SEED	READ COLY NO	
2 FUBȘSEED 3 ORCLEIBI	READ COEF 100 READ WRITE 100			3 ORCIFUB1 SUL> alter session set container≓	READ WRITE NO	
5 WILLEIGI 15 alter session set container				ofte, arren sessini sen phinamene	Weighter;	
2;				Session altered.		
ession altered.			P	SQL>		

Fig.10. Connection with PDB

8. CONCLUSION

It is very easy to create a RAC database in the cloud. Moreover monitoring and troubleshooting is also not much difficult.

9. REFERENCES

- [1] http://docs.oracle.com/en/cloud/paas/database-dbaascloud/csdbi/index.html
- [2] https://docs.oracle.com/en/cloud/paas/database-dbaascloud/csdbi/index.html
- [3] https://docs.oracle.com/en/cloud/paas/database-dbaascloud/csdbi/use-rac-this-service.html
- [4] https://docs.oracle.com/cd/E11882_01/rac.112/e41960/to c.htm